Ordering equipment

On your order please specify :

PNEUMATIC ACTUATORS

Examples :

▪ ROD CYLINDERS :

- Code number _____ 450 00 011
- and/or reference number _____ PES 40 A 200-DM
- Code number of option _____ . . . . . .
- Quantity and code number(s) of mounting(s) _____ 434 00 179
- Quantity and code number(s) of magnetic position detector(s) _____ 881 00 142
- Quantity and code of detector/cylinder mounting kit(s) _____ 881 00 153
- Note : For other stroke lengths,
  please specify exact reference number (eg. : stroke length 215) _____ PES 40 A 215-DM
  (take into account max. stroke lengths)

▪ RODLESS CYLINDERS, MAGNETIC COUPLING (STN/STG) / BANDS (STB) :

- Base code number + stroke length (in mm) _____ 446 50 006 + 1000 mm
  (take into acccount max. stroke lengths)
- and/or reference number (stroke length included, in mm) _____ STB 25 A 1000-DMA
- Quantity and code number(s) of mounting(s) or accessory(ies) _____ 434 00 237
- Quantity and code number(s) of magnetic position detector(s) _____ 881 44 603

▪ BALL BEARING GUIDE ACTUATORS :

- Code number of actuator, series 447 _____ 447 00 022
- and/or reference number _____ CIB 32 A 160-DM
- Code number(s) of mounting(s) or accessory(ies) _____ 439 00 237
- Quantity and code number(s) of magnetic position detector(s) _____ 881 00 142
- Quantity and code of detector/cylinder mounting kit(s) _____ 881 00 167

▪ CYLINDER + BEARING GUIDE UNIT "U" or "H"

- Code of cylinder PES _____ 450 00 032
- and/or reference number _____ PES 63 A 400-DM
- Optional code number of guiding unit ("H" ball bearing unit) (corresponding to Ø and stroke length) _____ 010 683
- Quantity and code number(s) of magnetic position detector(s) _____ 881 00 144
- Quantity and code of FRONT mounting kit(s) (for detectors and PES profiled cylinders) _ 881 00 183
- Quantity and code of REAR mounting kit(s) (for detectors and PES profiled cylinders) __ 881 00 154

▪ ROTATABLE CYLINDERS :

- Code of cylinder, series 429 _____ 429 00 046
- and/or reference number _____ R 20 D 90-M
  For the 4 position model, specify angle degree for angles α and β
- Quantity and code number(s) of magnetic position detector(s) _____ 881 43 801

SOLENOID VALVES

▪ WITH STANDARD CONNECTOR :

- Code number WITH standard connector _____ 189 00 001 - 230 V - 50 Hz
- Voltage and frequency of the current _____
- Code number of subbase (optional) _____ 353 00 069

▪ WITHOUT CONNECTOR OR WITH OTHER CONNECTOR :

- Code number WITHOUT connector _____ 189 00 002 - 230 V - 50 Hz
- Voltage and frequency of the current _____
- Code number of connector with built-in
  visual indicator and protection _____ 881 22 410
- or another type of connector : with TRANSIL protection, with flying leads, etc. _____ . . . . . .
- Code number of subbase (optional) _____ 353 00 069

▪ SOLENOID HEADS FOR EXPLOSIVE ATMOSPHERES :

- Code number of solenoid valve designed to be equipped with a solenoid head EEx... ___ 886 11 408 + T6
- Class of temperature _____
- Voltage and frequency of the current _____ 230 V - 50 Hz

Ordering equipment

On your order please specify :

AIR OPERATED VALVES

Exemples :

- Code number _____ 541 00 857
- Code number of subbase _____ 355 00 165
- Code number of one set of 2 endplates for joinable subbases _____ 355 00 166
- Quantity and code number(s) of accessory(ies) (optional) _____ 881 35 517

SOLENOID OPERATED VALVES

- Code number of the solenoid valve desiqned to be equipped with pilots _____ 541 90 022
- Quantity and code number(s) of pilot solenoid valve(s) with connector (see opposite ordering information for solenoid valves) _____ . . . . . .
- Code number of subbase _____ 355 00 382
- Quantity and code number(s) of accessory(ies) _____ 346 00 173

SOLENOID OPERATED VALVES WITH BUILT-IN PILOT

. WITH STANDARD CONNECTOR :

- Code number of valve WITH standard connector _____ 551 00 052 - 230 V - 50 Hz
- Electrical supply : voltage-frequency _____
- Code number of subbase (optional) _____ . . . . . .

. WITH OTHER CONNECTORS :

- Code number WITHOUT connector _____ 551 00 051 - 230 V - 50 Hz
- Electrical supply : voltage-frequency _____
- Quantity and code number of connector with built-in visual indicator and protection _____ 881 22 407
- or quantity and another type of connector : with TRANSIL protection, with flying leads, etc. _____ . . . . . .

AIR SERVICE EQUIPMENT :

- Code number _____ 342 03 291 + 662 535
- Code number of option _____
- Quantity and code number of accessory(ies) _____ 343 03 003

OTHERS :

- Code number of the unit _____ 309 . . . . .
- Code number of option or accessory (optional) _____ . . . . . .

189 00 001 : Code numbers which are highlighted are standard references.

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Practical information

PNEUMATIC ACTUATORS

Pneumatic cylinders convert pressure to a linear or rotative movement
Factors in a choice of a cylinder are :

- Single or double acting
- Standard dimensions or not
- Efforts developed, Ø bore, stroke
- Pressure of the pilot fluid
- Cushioned or not cushioned, mounting
- High or low working cycle
- Ambient temperature
- Aggressiveness surrounding medium
- Equipped or not for magnetic position detectors

Table of cylinder loads and cylinders, see chapter 2

SOLENOID VALVES, CONTROL VALVES

Solenoid valves and control valves 3 ports, 2 positions (3/2) are available in the following versions :

- Normally Closed at rest (symbol : NC)
- Normally Open at rest (symbol : NO)
- Universal (Symbol : U) : depending on connections, they can be used for the 4 following functions :
  - 3/2 NC - 3/2 NO - Distribution (1 inlet - 2 outlers) - Mixing (2 inlets - 1 outlet)

Factors in choice between spool valves and poppets valves are :

- Size : spool valves from ØM5, G 1/8 to G 1 ; poppet valves from G 1/8 to G 1 1/2
- Pilot : spool valves can be two position positive (bistable-memory) ; poppet valves are always spring return (monostable).
- Functions : poppet valves 3/2 NC : NO-4/2
  spool valves 3/2 NC-NO-U ; 5/2 ; 5/3
- Flow : spool valves have the same KV or flow coefficients from supply and to exhaust. However some poppet valves have a greater KV or flow coefficients to exhaust.
- Response time : in high speed movement, the response time can be important
  Spool valves have a faster response time than poppet valves

Poppet valves and spool valves do not compete, they are complementary. For each application, the correct valve should be selected bearing in mind the precise requirements.

CONNECTIONS TO VALVES

SUBBASE mounting body = Connection by means of a single oi joinable subbases

TAPPED body = Connections directly to the body

Tapped bodies of pbeumatic components comply with both standards : ISO 228 : (G) and ISO 7 : (Rp)

AIR SERVICE EQUIPMENT

Filters, regulators, lubricators and drip leg drain allow smooth operation of compressed air circuit. For the lubrication, it is recommended to use a non-detergent oil without aggressive components, viscosity from 2 to 3.5° jEngler at 50°C - Aniline point from 90 to 105

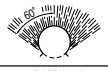
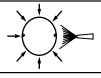
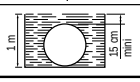
Oil types of several makes :

- ELF : type Spinelf 22
- LABO : type Prima 32
- SHELL : type Tellus 22
- ESSO : type Spinesso 32
- MOBIL : type DTE 22

DEGREES OF PROTECTION PROVIDED BY ELECTRICAL ENCLOSURES (IP Code)

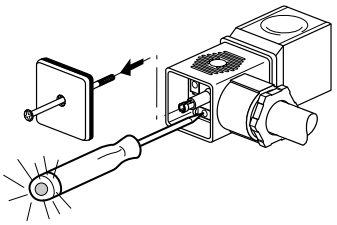
(following standards EN 60529 and IEC 529)

The code letters IP (International Protection) followed by 2 characteristic numeral : e.g. IP65
The first characteristic numeral indicates the degree of protection of the energized parts and internal moving parts against ingress of solid foreign objects.
The second characteristic numeral indicates the degree of protection against ingress of water with harmful effects.

1st NUMERAL	Abridged definition	Test	2nd NUMERAL	Abridged définition	Test
0	Non-protected		**0**	Non-protected	
1	Protected against solid foreign objects Ø 50 mm (eg accidental contact with the hand)		**1**	Protected against vertically falling water drops (condensation)	
2	Protected against solid foreign objects Ø 12,5 mm (eg finger)		**2**	Protected against vertically falling water drops when enclosure tilted up to 15°	
3	Protected against solid foreign objects Ø 2,5 mm (eg tools, wires)		**3**	Protected against spraying water up to 60° on either side of the vertical	
4	Protected against solid bodies Ø 1 mm (eg fine tools and small wires)		**4**	Protected against splashing water from any direction	
5	Dust-protected (no harmful deposit)		**5**	Protected against water jets from any direction	
6	Dust-tight		**6**	Protected against powerful water jets from any direction	
			7	Protected against the effects of temporary immersion in water	

The degree of protection of each product is indicated in its appropriate leaflet, usually IP 65.

EASY CONNECTIONS



The pilot valves series 190/192 and solenoid operated valves equipped with these pilots, are delivered with a connector size 30, rotatable x 90°, complying with standard ISO 4400. Top cover removable so that one can chek that the coil is energized without unplugging the connector and hence **without interrupting operation** of the solenoid valve.
These valves can be equipped with cable outlets, 2 m long, or with built-in visual indicator (LED) and electrical protection, or with transil protection.

SAFETY EQUIPMENT FOR EXPLOSIVE ATMOSPHERES

Most of our solenoid valves, spool and poppet valves can be equipped with EEx solenoid heads complying with CENELEC European standards for use in explosive atmospheres :

- Flameproof enclosures "d" (solenoid valves series 192)
- Encapsulation "m" (solenoid valves series 189 and 192)
- Instrinsically safe equipment "ia" (solenoid valves 195 and 302)
  (See end of chapter 5)

PRESSURES

- **Maximum allowable pressure (MAP) :** The maximum allowable pressure (MAP) in pipework is the maximum effective pressure (in bar or in Pa) which can be applied to the pipework in the relevant installation (1 bar = 10^2 kPa)
- **Inlet pressure :** fluid pressure at the entrance to the pneumatic component
- **Outlet pressure :** fluid pressure at the exit from the pneumatic component
- **Differential pressure** Δ **P :** difference in pressure between the inlet pressure and the outlet pressure.

FLOW COEFFICIENTS

- **KV** (following standard NF E 29312) :
  The flow rating of a valve is expressed as the KV - a French coefficient established experimentally for each valve. It corresponds to the flow of water in litres per minute with a pressure differential ΔP of 1 bar with the orifice fully open.
- **CV :** The CV indicated in the tables is an equivalent KV flow coefficient but expressed in US gallons per minute with ΔP = 1 psi.
  CV and KV can be transfered as follows : **KV = 14,3 CV** and **CV = 0,07 KV**
- **C** and **b** (following standard ISO 6358) :
  Coefficients C (sonic conductance) and b (critical pressure ratio) following standard ISO 6358 allow flow calculation in sonic state (See spool valves 541 - 543 - chapters 4 and 5).

CALCULATION OF FLOW (for air and gas)

- **Defining flow at 6 bar :**
  Corresponding leaflets give for each product its mean flow in litres per minute at 6 bar in Normal Atmosphere Pressure (ANR) following standards ISO 8778 (**with Δ P = 1 bar**)

- **Calculation of flow :**

$\Delta P < P_{inlet} / 2$

$$Q = 28{,}16 \times KV \times \sqrt{\Delta P \times P_{in}}$$

including correction for temperature and density

$$Q = 475 \times KV \times \sqrt{\frac{(\Delta P \times P_{in})}{(T_a \times d)}}$$

$\Delta P \geq P_{inlet} / 2$
(Maximum allowable flow)

$$Q = 14 \times KV \times P_{ou}$$

including correction for temperature and density

$$Q = 238{,}33 \times KV \times P_{ou} \times \frac{1}{\sqrt{(T_a \times d)}}$$

Q = Flow in l/min
ΔP = Differential pressure, in bar
P_{in} = Absolute inlet pressure, in bar
P_{ou} = Absolute outlet pressure, in bar
T_a = Absolute temperature, in Celsius degrees
d = Density compared with air

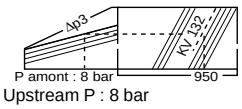
- **Flow graphs :** (see overleaf).

Flow graphs

HOW TO USE THE GRAPHS

Depending on the supply of pressure use the appropriate graph either 0 - 2 bar or 0 - 40 bar.

Graph shows the relationship between the flow and the pressure drop, depending upon the upstream pressure and the co-efficient of the valve (KV in litres per minute).



Example : a valve Ø 25 mm KV = 132, one needs to know the flow under the following conditions :

– upstream gauge pressure : 8 bar

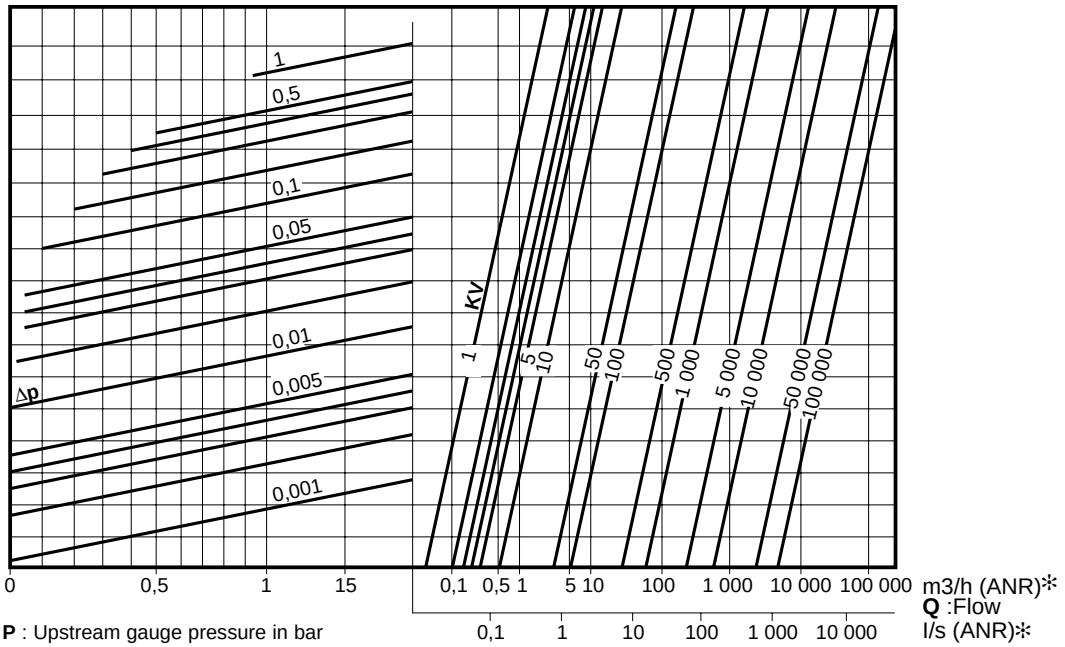
– pressure drop Δp = 3 bar

Proceed as shown on the table, one finds flow = 950 m³/h.

If the pressure drop is superior to the value shown in the graph, the flow is identical to that with "critical pressure drop", so that :

$$\Delta p = \text{absolute downstream pressure} = \frac{\text{absolute upstream pressure}}{2}$$

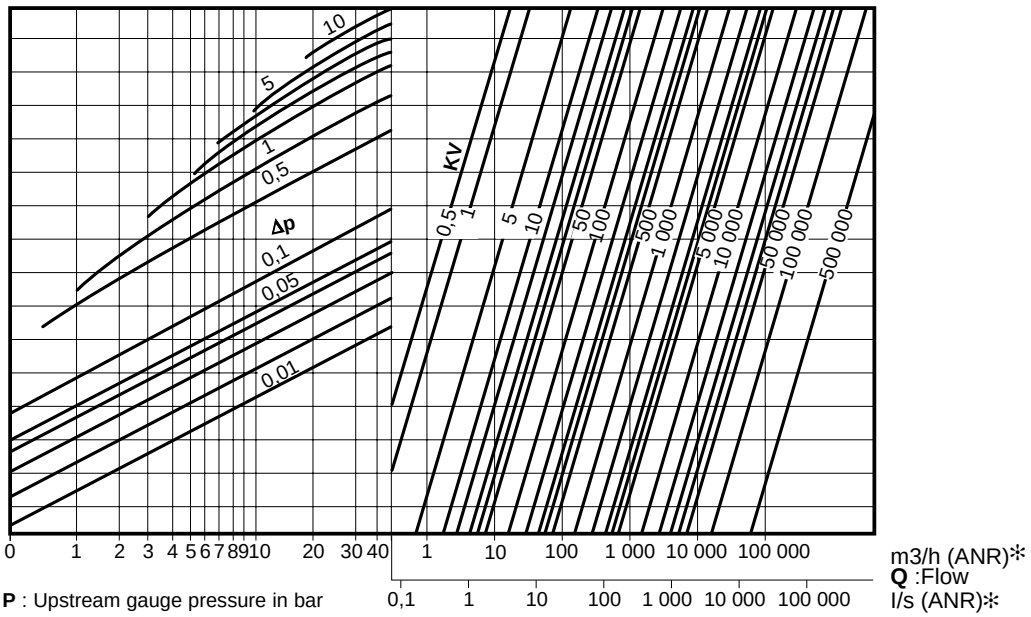
PRESSURE OF AIR 0 to 2 bar



P : Upstream gauge pressure in bar

✻ ANR : Normal reference atmosphere

PRESSURE OF AIR 0 to 40 bar



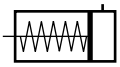
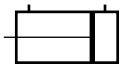
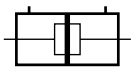
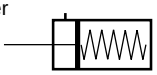
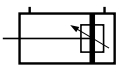
P : Upstream gauge pressure in bar

✻ ANR : Normal reference atmosphere

Pneumatic symbols

Complies with standard ISO 1219-1 (1991)

PNEUMATIC ACTUATORS

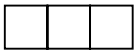
Single-acting cylinder rod returned at rest (SER) 	Double-acting cylinder Non cushioned 	Doubled-ended piston rod cylinder 
Single-acting cylinder rod out at rest (SES) 	Double-acting cylinder with adjustable pneumatic cushioning 	Double-acting rotatable cylinder 

SOLENOID VALVES, CONTROL VALVES, PILOT VALVES

- The function of a valve is indicated by two figures. The first figure indicates the number of ports, the second one the number of valve positions (pilot ports excluded).

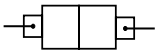
  E.g. : 3/2* 3 ports / 2 positions
  5/2 5 ports / 2 positions

  * An addtitional symbol defines the function of valves 2/2 and 3/2 :
  NC : Normally closed at rest (de-energized, unpressurized)
  NO : Normally open at rest (de-energized, unpressurized)
  U : Function universal ; inlet may be fitted to any port
- The valve symbol for pneumatic valves includes as many boxes as valve positions.

  2 positions  3 positions 

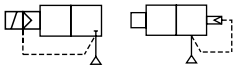
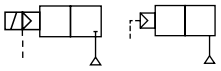
  . 2 positions pneumatic valves : the right hand box stands for the rest position
  . 3 positions pneumatic valves : the middle box stands for the rest position
- The arrows in the boxes show the direction of the flow : 
- Connections to ports must reach the box standing for the rest position.
- Symbols of connections to ports are as follows :

  Connected to supply pressure  Exhaust wich can be piped  Exhaust which cannot be piped 
- Complete with the additional symbol of :
  - control function (on the left)
  - return function (on the right)

  Control side  Return side
- **Examples of symbols in this catalogue are as follows :**

Air operated	Solenoid pilot operated	Direct solenoid valve	Solenoid pneumatic differential	Spring return	Air operated and spring return (5/3)	Solenoid air operated and spring return (5/3)	Double pulse coil (bistable function)
							
+	+	+	+			+	+
Manual override on control valve (or position testor)	Auxiliary manual override on solenoid valve	Manual override	Auxiliary manual override on solenoid valve	Symbol for manual override		Auxiliary manual override on solenoid valve	Manual override
							

- Type of pneumatic supply for control and return function :

  internal supply  external supply 
- Ports numbers comply with standard ISO 5599 as follows :

  . Main ports :

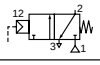
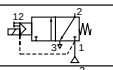
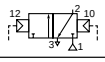
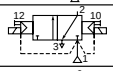
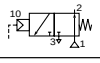
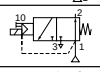
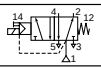
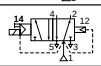
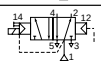
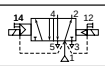
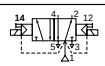
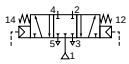
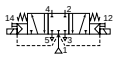
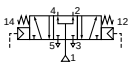
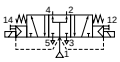
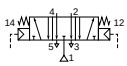
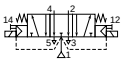
2/2 - 3/2	4/2 - 5/2 - 5/3
1 - 2 - 3	1 - 2 - 3 - 4 - 5
1 : Supply pressure (NC) 2 : Outlet 3 : Exhaust	1 : Supply pressure 2 - 4 : Outlets 3 - 5 : Exhausts

  In solenoid valves 3/2 NO, pressure is usually in port 3, exhaust in port 1.

  . A functional symbol of two figures describes pilot ports (12 - 14 or 10). It indicates which ports are activated by signal :
  - signal 12 : activates ports 1 and 2
  - signal 14 : activates ports 1 and 4
  - signal 10 : deactivates ports 1 and 2 (2/2 and 3/2 valves)

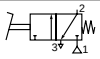
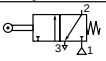
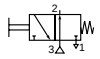
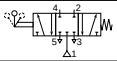
Pneumatic symbols

Examples of symbols in this catalogue are as follows

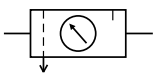
Ports/ Positions		Function	Air operated			Solenoid operated (1)		
			Symbols	Control	Return	Symbols	Control	Return
3/2	Direct operated	NC	-	-	-		solenoid	spring
		NO	-	-	-		solenoid	spring
	Pilot operated	NC		air	spring		solenoid / air	spring
		NC		air	air		solenoid / air	solenoid / air
		NO		air	spring		solenoid / air	spring
4/2				air	spring		solenoid / air	spring
5/2				air	spring		solenoid / air	spring
				air	differential		solenoid / air	air differential
				air	air		solenoid / air	air
			-	-	-		solenoid / air	solenoid / air differential
			-	-	-		solenoid / air	solenoid / air
5/3		W1		closed position (W1) air operated			closed position (W1) solenoid operated	
		W2		open position to pressure (W2) air operated			open position to pressure (W2) solenoid operated	
		W3		open positon to exhaust (W3) air operated			open position to exhaust (W3) solenoid operated	

(1) With manual override on solenoid pilots.

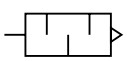
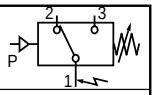
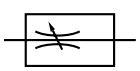
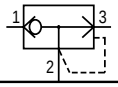
MANUAL AND MECHANICAL OPERATED SOLENOID VALVES

Ports/ Positions	Function	Manual control			Mechanical control		
		Symbols	Control	Return	Symbols	Control	Return
3/2	NC		pedal	spring		roller	spring
	NO		manual	spring		plunger	spring
5/2 - 5/3	-		lever	spring		plunger	spring

AIR SERVICE EQUIPMENT

Filter		Regulator		Lubricator		FRL unit (simplified diagram)	

PNEUMATIC ACCESSORIES

One way ajustable restrictor valve		Silencer		Non-return valve		Adjustable pressure switch	
ajustable restrictor valve bi-directional		Quick exhaust valve		Shuttle valve		Indicator	

PNEUMATIC LOGIC (following standard ISO 5784)

OR element (sum)		YES element (identity)		Program sequencer module		Timer	
AND element (product)		NOT element (negation)		Memory relay		Single pulse generator	

PNEUMATIC ACTUATORS

(linear - rotatable cylinders and tables)

Summary

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SINGLE ACTING CYLINDERS

STANDARDS: ISO 6431	ISO 6432	VDMA 24562	CNOMO/NFE 49001	NFE 49003	NFE 49004	NFE 49030	CONSTRUCTION rod cylinder: Short stroke	Cylinder	Tie rods	Profiled barrel	Rodless cylinder	CUSHIONING: Elastic	Adjust. pneumatic	Ø CYLINDERS: 2,5...6	8	10	12	16	20	25	32	40	50	63	80	100	125	160	Piston rod returned/at rest (SER)	Piston rod out/at rest (SES)	Equipped for magnetic detector: No	Yes	EQUIPMENT - TYPE	PAGE N°
							●	●						●															●		●		**MICRO 10**	P205
							●	●						●		●		●										●		●		**E**	P210
							●								●	●	●	●											●			●	**K**	P215
						●	●												●	●									●	●		●	**KN**	P216
❊		❊		❊			●					●									●	●	●	●	●	●			●	●		●	**PEC**	P227
	●					●		●				●	●		●	●	●	●	●	●									●	●	●	●	ISOCLAIR - **C/AS**	P220-3
	●					●		●				●					●	●	●	●									●	●	●	●	ISOCLAIR - **CC/AS**	P220-12
●								●				●									●	●	●	●					●		●	●	ISOCLAIR - **CIS**	P225-3

❊ Consult us.

DOUBLE ACTING CYLINDERS

STANDARDS: ISO 6431	ISO 6432	VDMA 24562	CNOMO/NFE 49001	NFE 49003	NFE 49004	NFE 49030	CONSTRUCTION rod cylinder: Short stroke	Cylinder	Tie rods	Profiled barrel	Rodless cylinder	CUSHIONING: Elastic	Adjust. pneumatic	Ø CYLINDERS: 6	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250	Equipped for magnetic detector: No	Yes	EQUIPMENT - TYPE	PAGE N°
							●	●						●																	●		**MICRO 10**	P205
								●						●		●		●													●		**E**	P210
							●								●	●	●	●													●	●	**K**	P215
						●	●												●	●												●	**KN**	P216
❊		❊		❊			●					●									●	●	●	●	●	●					●	**PEC**	P227
	●					●		●				●	●		●	●	●	●	●	●											●	●	ISOCLAIR - **C/AS**	P220-4
	●					●		●				●						●	●	●											●	●	ISOCLAIR - **CC/AS**	P220-13
●								●				●	●								●	●	●	●							●	●	ISOCLAIR-**CIS**	P225-4
●		●		●						●		●	●								●	●	●	●	●	●	●				●	●	**PES** profiled barrel	P230
●		●		●					●	●			●								●	●	●	●	●								**PES** Omega	P231
●		●		●					●			●	●								●	●	●	●	●	●	●	●	●		●	●	**PES** with tie rods	P232
											●	●		●		●		●	●	●	●	●										●	**STN**	P260
											●		●					●		●												●	**STBN**	P265
											●		●							●	●	●	●	●							●	●	**STB**	P265-12

❊ Compatible cylinders AFNOR,VDMA,ISO

ANTIROTATION CYLINDERS

STANDARDS: ISO 6431	ISO 6432	VDMA 24562	CNOMO/NFE 49001	NFE 49003	NFE 49004	NFE 49030	CONSTRUCTION rod cylinder: Short stroke	Cylinder	Tie rods	Profiled barrel	Rodless cylinder	Ball bearing guide	CUSHIONING: Elastic	Adjust. pneumatic	Ø CYLINDERS: 6	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	Equipped for magnetic detector: No	Yes	EQUIPMENT - TYPE	PAGE N°
					●		●													●	●	●	●	●	●	●	●					●	**KN**	P216-8
●		●		●					●	●			●	●								●	●	●	●	●	●				●	●	**U** guiding	P237
●		●		●					●	●		●	●	●								●	●	●	●	●	●				●	●	**H** guiding	P237
											●		●	●	●		●		●	●	●	●	●									●	**STG**	P260-10
											●			●							●	●	●	●	●						●	●	**STB**	P265-12
								●				●	●	●				●	●	●	●	●	●									●	**CIB**	P275-4
													●						●	●	●	●										●	**P2L**	P275-9
												●	●						●	●	●	●										●	**P2B**	P275-9
												●			●		●															●	**TMB**	P275-16
												●					●		●		●											●	**TLB**	P275-22
												●	●				●		●	●	●											●	**TUB**	P275-26

ANTICORROSIVE CYLINDERS

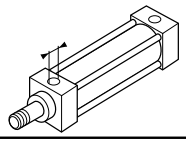
STANDARDS							CONSTRUCTION rod cylinder					CUSHIONING		Ø CYLINDERS																Equipped for magnetic detector		EQUIPMENT - TYPE	PAGE N°
ISO 6431	ISO 6432	CETOP - RP 43 P	CETOP - RP 52 P	CNOMO/NFE 49001	NFE 49003	NFE 49030	Short stroke	Cylinder	Tie rods	Profiled barrel	Rodless cylinder	Elastic	Adjust. pneumatic	6	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250	No	Yes		
	●		●			●		●				●					●	●	●	●												●	**CIX**	P252
●		●						●					●								●	●	●	●	●						●	**CIX**	P258

ROTATABLE CYLINDERS

ROTATION ANGLE		NUMBER OF POSITIONS			CUSHIONING		Ø CYLINDERS					Equipped for detector		EQUIPMENT - TYPE	PAGE N°
90°	180°	2	3	4	Elastic	Adjustable pneumatic	12	16	18	20	22	No	Yes		
●	●	●					●			●			●	**R**	P285-3
●	●	●	●	●	●	●		●	●		●		●	**RS**	P285-5

PNEUMATIC CYLINDER PORT DIAMETER

The table enables selection of pneumatic connectors and accessories of the correct sizes for direct fitting to cylinder ports (orientable flow control regulator, blocking fittings)



Type	Serial No.	Cylinder bore (mm)															
		6	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200
MICRO 10	435	M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
threaded - E	429	❊	-	❊	-	❊	-	-	-	-	-	-	-	-	-	-	-
K	441	-	M5	M5	M5	M5	-	-	-	-	-	-	-	-	-	-	-
KN	442	-	-	-	-	-	M5	M5	-	-	-	-	-	-	-	-	-
ISOCLAIR - C.AS	435	-	M5	M5	M5	M5	1/8	1/8	-	-	-	-	-	-	-	-	-
ISOCLAIR - CIS	438	-	-	-	-	-	-	-	1/8	1/4	1/4	3/8	-	-	-	-	-
PEC	449	-	-	-	-	-	-	-	1/8	1/8	1/8	1/8	1/8	1/4	-	-	-
PES	450	-	-	-	-	-	-	-	1/8	1/4	1/4	3/8	3/8	1/2	1/2	3/4	3/4
INOX - CIX	435	-	-	-	M5	M5	1/8	1/8	1/8	1/4	1/4	3/8	3/8	-	-	-	-
STN - STG	445	M5	-	M5	-	M5	1/8	1/8	1/8	1/4	-	-	-	-	-	-	-
STBN - STB	446	-	-	-	-	M5	-	1/8	1/4	1/4	3/8	3/8	-	-	-	-	-
CIB	447	-	-	-	M5	M5	1/8	1/8	1/8	1/4	-	-	-	-	-	-	-
P2L - P2B	447	-	-	-	-	M5	M5	M5	1/8	-	-	-	-	-	-	-	-
TMB - TLB	447	M3	-	M3-M5	-	M5	-	M5	-	-	-	-	-	-	-	-	-
TUB	447	-	-	M5	-	M5	1/8	1/8	-	-	-	-	-	-	-	-	-
rotatable - R - RS	429	-	-	-	M5	M5	M5	M5	-	-	-	-	-	-	-	-	-

❊ With tubing nozzles

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With its long-standing experience in fluid automatation, ASCO/JOUCOMATIC manufactures and markets a wide range of standard air cylinders catering for automation in all areas of industry.

• A COMPREHENSIVE RANGE
Our range includes:
- short stroke, single or double acting clamping air cylinders Ø 8 to 100 mm - type K, KN, PEC
- single or double acting air cylinders, Ø 8 to 63 mm, conforming with ISO/CETOP and AFNOR standards. Type: ISOCLAIR,
- double acting cylinders with profiled barrel or tie rods, Ø 32 to 200 mm conforming with VDMA/ISO standards. Type: PES,
- special-purpose air cylinders (anti-rotation, rod lock, adjustable stroke, etc.),
- rodless cylinders with or without carrier bracket: band cylinders or magnetic drive cylinders,
- rotatable cylinders.

• WITH INTEGRAL POSITION DETECTION
All ASCO/JOUCOMATIC air cylinders are available in 2 versions: with or without provision for incorporating magnetic position-detectors. In the former case, the air cylinder piston is equipped with an annular permanent magnet. Magnetic position detectors reed switch or magneto-resistive are used to provide detection without mechanical contact. The bulbs are connected electrically by wire output or by plug-in connector, and are always equipped with a LED indicator lamp. Self-contained, compact and economic, the air cylinders equipped with detectors provide the up-to-the-minute solution to the problems of compressed-air automation.

• WITH ADJUSTABLE CUSHIONING
Some of the air cylinders we manufacture are produced with built-in pneumatic cushioning. The cushioning can be adjusted using a fine adjustment screw.

• FOR USE WITH UNLUBRICATED AIR
The sophisticated construction technology used for the air cylinders allows them to operate using either lubricated air or not.

• QUALITY
The effort put in, and the resources deployed - CAD design, production and testing using state-of-the-art equipment - demonstrate the determination of ASCO/JOUCOMATIC to manufacture air cylinders that are robust, high-performance and ever-increasingly competitive.

• AVAILABILITY
Backed by specific production logistics and a large sales network, these air cylinders are rapidly available.

• FASTENERS
A large range of mountings is available, including trunnion mountings, for the cylinder barrel and the rod ends, thus offering wide scope for adapting the air cylinders to any type of mechanism.

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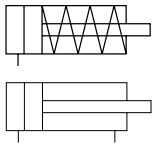
MICRO-CYLINDERS Ø 2,5 - 4 and 6 mm

single and double acting
Strokes 5 to 25 mm



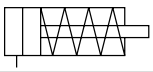
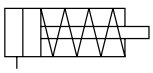
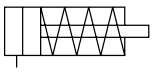
SPECIFICATIONS

CONTROL FLUID : Air or neutral gas, lubricated or not, filtered to 5µm
OPERATING PRESSURE : min. 3.5 (3 bar for Ø 6 mm)
max. 8 bar
ALLOWABLE TEMPERATURE : + 5°C to + 60°C

CONSTRUCTION

TYPE : Piston cylinder (single acting with steel spring)
TUBE : Brass (nickeled)
SEAL : Nitrile (NBR)
ROD : Stainless steel
Supplied with 2 rod-nuts

CHOICE OF EQUIPMENT

Bore Ø mm	Stroke (mm)	Weight (g)	Connection	Pressure range (bar) min.	Pressure range (bar) max.	Min. force (N) at 8 bar	Return spring force (N) min.	Return spring force (N) max.	CODES
2,5 	5	1,5	Hose for 2mm int.-dia. tube	3,5	8	2,5	0,65	1,2	**435 00 460**
	10	1,9					0,65	1,2	**435 00 461**
4 	5	3,4	Hose for 2mm in.-dia. tube	3,5	8	7	1,5	2,9	**435 00 462**
	10	4,4					1,5	2,9	**435 00 463**
	15	5,2					1,5	2,9	**435 00 464**
	20	6,1					1,5	2,9	**435 00 465**
6 	5	10	M3 Tapped type	3,0	8	17	3,0	5,3	**435 00 466**
	10	12					2,9	5,3	**435 00 467**
	15	15					2,9	5,3	**435 00 468**
	20	18					2,9	5,3	**435 00 469**
	25	21					3,0	5,3	**435 00 470**
6 	5	10	M3 Tapped type	3,0	8	22	—	—	**435 00 500**
	10	12							**435 00 501**
	15	15							**435 00 502**
	20	18							**435 00 503**
	25	21							**435 00 504**

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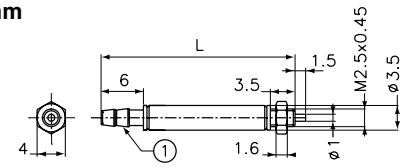
DIMENSIONS

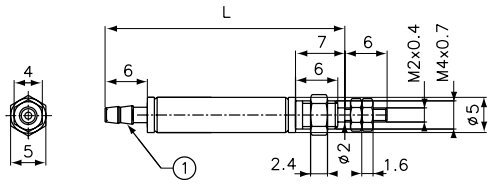
Ø 2,5 mm



Scale 1

Stroke	L	Weights (in g)
5	27,5	2
10	34	3

Ø 4 mm

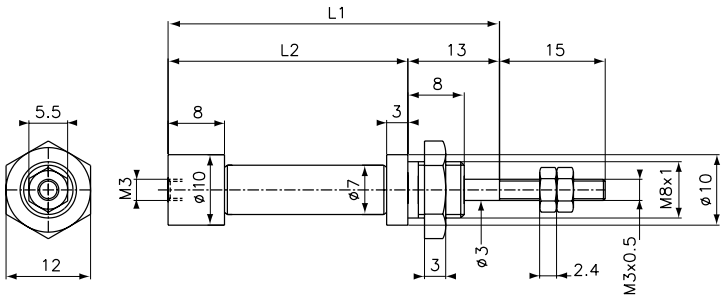


Scale 1

Stroke	L	Weights (in g)
5	34	4
10	40	5
15	47	6
20	52	7

(1) Hose for flexible tube in. Ø 1,8 or 2 mm

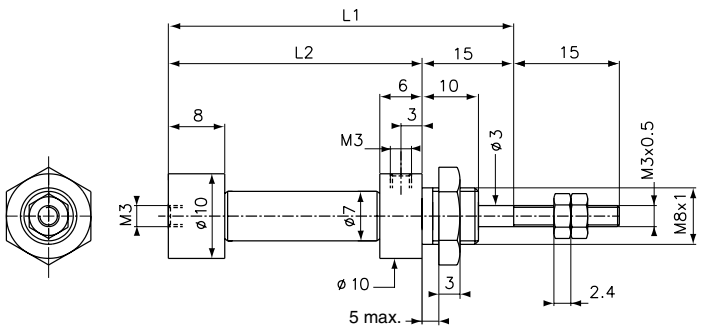
Ø 6 single-acting



Scale 1

Stroke	Single-acting		Double-acting		Weights (in g)
	L1	L2	L1	L2	
5	47	34	49	34	20
10	52	39	54	39	21
15	58	45	59	44	22
20	65	52	64	49	24
25	73	60	69	54	26

Ø 6 double-acting



Scale 1

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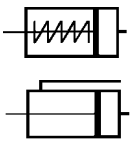
Series 429
Type: E

PANEL CYLINDERS Ø 6 - 10 - 16 mm

Single and double acting - strokes 5 - 10 - 15 mm



GENERAL

Compact cylinder with rear connection(s), including double acting cylinder.
Its threaded body and nuts afford :
- Easy adaptation on any support through its tapped or smooth hole
- Adjustable body axis opposite the support.

SPECIFICATION

FLUID : Air or neutral gas, filtered, lubricated or not
PRESSURE : 3 - 7 bar (single acting cylinder)
1,5 - 7 bar (double acting cylinder)
TEMPÉRATURE : + 5°C to + 60°C
BORE Ø : 6 - 10 - 16 mm
STROKES : 5 - 10 - 15 mm

CONSTRUCTION

- Body nickeled brass
- Nuts nickeled brass
- Rod iron steel
- Sealing nitrile (NBR)

EFFORTS DEVELOPED at 6 bar (in daN)

Ø cilynder	Single acting rod out	Double acting rod out	Double acting rod returned
Ø 6	1,3	1,7	1,3
Ø 10	3,6	4,2	3,4
Ø 16	8,8	10	9,2

The return of the piston rod must be without load.

CHOICE OF EQUIPMENT

SINGLE ACTING CYLINDER (rod returned at rest)

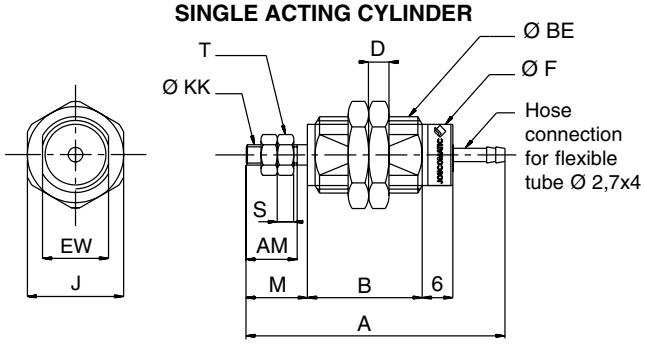
Bore Ø (mm)	Strokes (mm)	CODES	REFERENCES	Weights (g)	Con-nection Ø
Ø 6	5 10 15	**429 00 024** **429 00 025** **429 00 026**	E 6 S 5 E 6 S 10 E 6 S 15	10 15 18	Hose connection 2,7x4
Ø 10	5 10 15	**429 00 027** **429 00 028** **429 00 029**	E 10 S 5 E 10 S 10 E 10 S 15	30 37 42	Hose connection 2,7x4
Ø 16	5 10 15	**429 00 030** **429 00 031** **429 00 032**	E 16 S 5 E 16 S 10 E 16 S 15	86 93 100	Hose connection 2,7x4

DOUBLE ACTING CYLINDER

Bore Ø (mm)	Strokes (mm)	CODES	REFERENCES	Weights (g)	Con-nection Ø
Ø 6	5 10 15	**429 00 033** **429 00 034** **429 00 035**	E 6 D 5 E 6 D 10 E 6 D 15	34 42 50	Hose connections 2,7x4
Ø 10	5 10 15	**429 00 036** **429 00 037** **429 00 038**	E 10 D 5 E 10 D 10 E 10 D 15	82 94 106	Hose connections 2,7x4
Ø 16	5 10 15	**429 00 039** **429 00 040** **429 00 041**	E 16 D 5 E 16 D 10 E 16 D 15	126 138 155	Hose connections 2,7x4

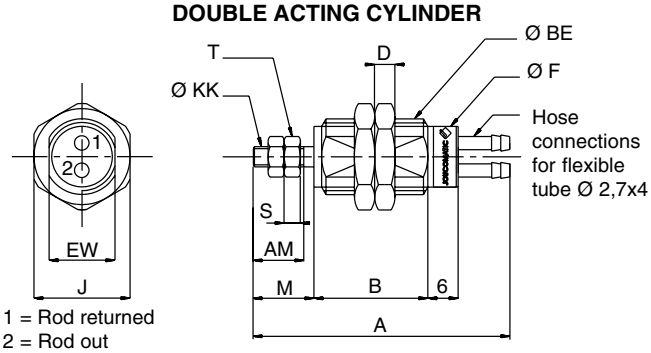
DIMENSIONS

SINGLE ACTING CYLINDER



	Strokes 5	Strokes 10	Strokes 15	Strokes 5	Strokes 10	Strokes 15	AM	BE	D	EW	F	J	KK	M	S	T
	A			B												
Ø 6	38	45	52	13,5	20,5	27,5	7	M10x1	3	9	8,5	12	M3	8,5	2,4	5
Ø 10	44	51	57	16	22,5	28,5	10	M15x1,5	4	13	12	19	M4	12	3,2	6
Ø 16	53	58	63	22,5	27,5	32,5	12	M22x1,5	5	20	18,5	27	M5	14	5	7

DOUBLE ACTING CYLINDER



1 = Rod returned
2 = Rod out

	Strokes 5	Strokes 10	Strokes 15	Strokes 5	Strokes 10	Strokes 15	AM	BE	D	EW	F	J	KK	M	S	T
	A			B												
Ø 6	39	44	49	19	24	29	7	M15x1,5	4	13	12	19	M3	8,5	2,4	5
Ø 10	47	52	57	18,5	23,5	28,5	10	M22x1,5	5	20	18,5	24	M4	12	3,2	6
Ø 16	50	55	60	19,5	24,5	29,5	12	M26x1,5	6	24	23	32	M5	14	5	7

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ASCO JOUCOMATIC

SHORT STROKE CYLINDERS
SINGLE AND DOUBLE ACTING
SERIES 441 - TYPE : **K**

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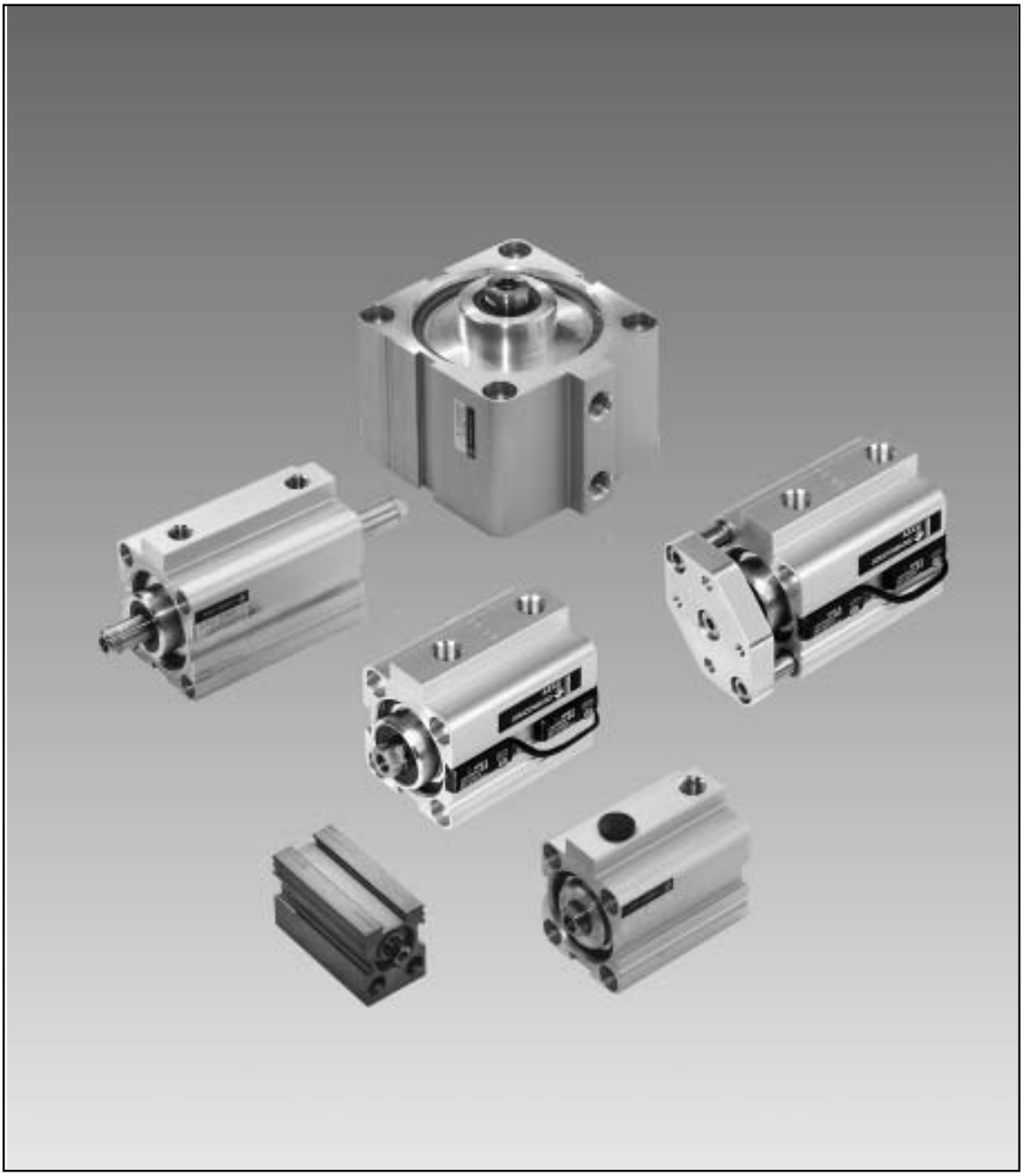


P215-GB-R7

ASCO® JOUCOMATIC

SHORT STROKE AIR CYLINDERS

APPLICATIONS

Their compact construction and rapid response times make the short stroke air cylinders suitable for clamping, stopping, ejection, indexing and locking of parts in all industrial applications.
Short stroke air cylinders are manufactured in single acting and double acting versions, double crossbar, rotation proof in a wide range of diameters (8 to 100 mm).
They are available in versions designed to receive magnetic position detectors. The barrel of the air cylinder is grooved to enable the mini-detectors to be adapted, providing effective, space-saving solutions for all clamping situations.

AVAILABLE RANGE

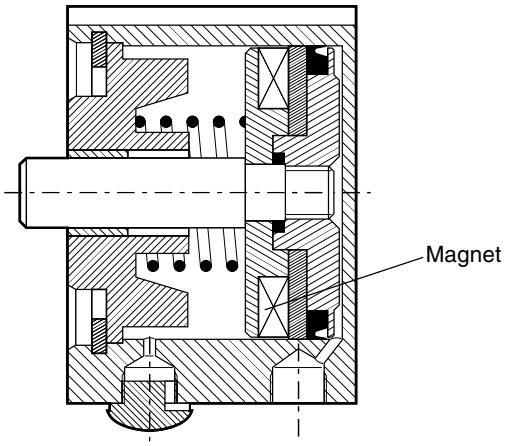
Standard cylinder
single and double acting
(page P215-3/6)

Cylinder with
double crossbar
(page P215-7)

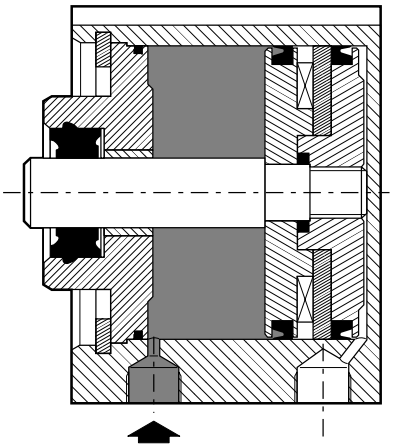
Double acting cylinder with
rotation-proof device on the
rod (page P215-11/12)

OPERATIONAL DIAGRAM

SINGLE ACTING AIR CYLINDER
(Rod retracted when at rest)



DOUBLE ACTING AIR CYLINDER



DEFINING THE PART NUMBER OF A SHORT STROKE AIR CYLINDER

K . . . . . — M

Short stroke air cylinder
Air cylinder diameter (Ø 8 to 100 mm)
S : single acting, rod retracted when at rest
D : double acting
Length of stroke (mm)
Air cylinder designed to receive magnetic position detectors : add suffix **M**

ORDERING

When ordering, please specify : **441. . . . .*** **K . . . . . - .**
Air cylinder code
Air cylinder part number

* **Magnetic position detectors should be ordered separately.**

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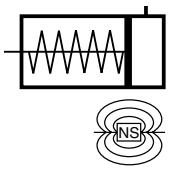
SHORT STROKE CYLINDERS Ø 8 to 100 mm SINGLE ACTING

equipped for magnetic position detectors



SPECIFICATIONS

FLUID : Air or neutral gas, filtered, lubricated or not
PRESSURE : 2 to 10 bar
TEMPERATURE : -10°C, +60°C
CYLINDER BORE : 8 to 100 mm
STROKE : 4 - 5 - 10 - 25 mm

CONSTRUCTION

Body : light alloy
Piston rod : stainless steel (Ø8 to 25 mm)
Piston rod : hard chrome steel (Ø 32 to 100 mm)
Piston rod : tapped
Internal parts : acetal (POM) brass or light alloy
Sealing : polyurethane (PUR)
Self lubricating bearing
Front, rear or side mounted: - with screws (not supplied)
- or flange (see mounting section)

CHOICE OF EQUIPMENT

SINGLE ACTING CYLINDER (rod returned at rest)

Ø bore (mm)	Force developed at 6 bar (daN)	Spring return force (daN)	Strokes (mm)	CYLINDER EQUIPPED FOR DETECTORS CODES	REFERENCES	DETECTOR TYPES TO BE USED ILS reed switch type	DETECTOR TYPES TO BE USED magnetoresistant electronic type	Weight (Kg)	Ø Ports
8	2,5	0,3	4	**441 00 001**	K 8 S 4-M	—	•	0,025	M 5
			10	**441 00 154**	K 8 S 10-M	•	•	0,030	
10	3,9	0,5	4	**441 00 002**	K 10 S 4-M	—	•	0,030	M 5
			10	**441 00 155**	K 10 S 10-M	•	•	0,035	
12	5,6	0,7	4	**441 00 003**	K 12 S 4-M	—	•	0,035	M 5
			10	**441 00 004**	K 12 S 10-M	•	•	0,045	
16	10	1,2	4	**441 00 005**	K 16 S 4-M	—	•	0,080	M5
			10	**441 00 006**	K 16 S 10-M	•	•	0,090	
			25	**441 00 156**	K 16 S 25-M	•	•	0,120	
20	16	1,4	4	**441 00 007**	K 20 S 4-M	—	•	0,105	G 1/8
			10	**441 00 008**	K 20 S 10-M	•	•	0,120	
			25	**441 00 157**	K 20 S 25-M	•	•	0,165	
25	25	2,2	5	**441 00 009**	K 25 S 5-M	—	•	0,175	G 1/8
			10	**441 00 010**	K 25 S 10-M	•	•	0,200	
			25	**441 00 158**	K 25 S 25-M	•	•	0,275	
32	40	3,6	5	**441 00 011**	K 32 S 5-M	—	•	0,240	G 1/8
			10	**441 00 012**	K 32 S 10-M	•	•	0,260	
			25	**441 00 013**	K 32 S 25-M	•	•	0,320	
40	63	4,8	10	**441 00 014**	K 40 S 10-M	•	•	0,350	G 1/8
			25	**441 00 015**	K 40 S 25-M	•	•	0,430	
50	100	6,3	10	**441 00 016**	K 50 S 10-M	•	•	0,495	G 1/8
			25	**441 00 017**	K 50 S 25-M	•	•	0,600	
63	160	8,5	10	**441 00 018**	K 63 S 10-M	•	•	0,715	G 1/8
			25	**441 00 019**	K 63 S 25-M	•	•	0,860	
80	251	11,5	25	**441 00 020**	K 80 S 25-M	•	•	1,450	G 1/4
100	400	12	25	**441 00 243**	K 100 S 25-M	•	•	2,600	G 1/4

• Detector to be used

Magnetic detectors should be ordered separately
In order to prolong the product's service life, it is recommended to use external stoppers.
Tolerance on stroke length ± 1 mm

OPTION

• Other strokes on request
• Version non equipped for use with detector (consult us)

For installations using short stroke **32 to 100** mm bore, it is recommended to select the new models of the **PEC** type compatible with ISO 6431 (see page P227)

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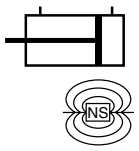
Series 441
Type **K**

SHORT STROKE CYLINDERS Ø 8 to 100 mm DOUBLE ACTING

equipped for magnetic position detectors



SPECIFICATIONS

FLUID : Air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : -10°C, +60°C
CYLINDER BORE : 8 to 100 mm
STROKE : See table below

CONSTRUCTION

Body : light alloy
Piston rod : stainless steel (Ø 8 to 25 mm)
Piston rod : hard chrome steel (Ø 32 to 100 mm)
Piston rod : tapped
Internal parts : acetal (POM) brass or light alloy
Sealing : polyurethane (PUR)
Self lubricating bearing
Front, rear or side mounted: - with screws (not supplied)
- or flange (see mounting section)

CHOICE OF EQUIPMENT

Ø bore (mm)	Force developed at 6 bar (daN)	Spring return force 6 bar (daN)	Strokes (mm)	CYLINDER EQUIPPED FOR DETECTORS CODES	REFERENCES	DETECTOR TYPES TO BE USED ILS reed switch type	DETECTOR TYPES TO BE USED magnetoresistant electronic type	Weight (Kg)	Ø Ports
8	2,7	2	5	**441 00 159**	K 8 D 5-M	—	•	0,025	M5
			10	**441 00 021**	K 8 D 10-M	•	•	0,030	
			15	**441 00 160**	K 8 D 15-M	•	•	0,035	
			20	**441 00 161**	K 8 D 20-M	•	•	0,040	
			25	**441 00 162**	K 8 D 25-M	•	•	0,045	
10	4,2	3,4	5	**441 00 163**	K 10 D 5-M	—	•	0,030	M5
			10	**441 00 022**	K 10 D 10-M	•	•	0,035	
			15	**441 00 164**	K 10 D 15-M	•	•	0,040	
			20	**441 00 165**	K 10 D 20-M	•	•	0,045	
			25	**441 00 166**	K 10 D 25-M	•	•	0,050	
12	6	5,4	5	**441 00 167**	K 12 D 5-M	—	•	0,035	M5
			10	**441 00 023**	K 12 D 10-M	•	•	0,045	
			15	**441 00 168**	K 12 D 15-M	•	•	0,055	
			20	**441 00 169**	K 12 D 20-M	•	•	0,065	
			25	**441 00 170**	K 12 D 25-M	•	•	0,075	
			30	**441 00 171**	K 12 D 30-M	•	•	0,085	
16	10	8,1	5	**441 00 172**	K 16 D 5-M	—	•	0,080	M5
			10	**441 00 024**	K 16 D 10-M	•	•	0,090	
			15	**441 00 173**	K 16 D 15-M	•	•	0,100	
			20	**441 00 174**	K 16 D 20-M	•	•	0,110	
			25	**441 00 175**	K 16 D 25-M	•	•	0,120	
			30	**441 00 176**	K 16 D 30-M	•	•	0,130	
			40	**441 00 177**	K 16 D 40-M	•	•	0,150	
20	16	13,5	5	**441 00 178**	K 20 D 5-M	—	•	0,105	G 1/8
			10	**441 00 025**	K 20 D 10-M	•	•	0,120	
			15	**441 00 179**	K 20 D 15-M	•	•	0,135	
			20	**441 00 180**	K 20 D 20-M	•	•	0,150	
			25	**441 00 026**	K 20 D 25-M	•	•	0,165	
			30	**441 00 181**	K 20 D 30-M	•	•	0,180	
			40	**441 00 182**	K 20 D 40-M	•	•	0,210	
			50	**441 00 183**	K 20 D 50-M	•	•	0,240	
25	27	22	5	**441 00 184**	K 25 D 5-M	—	•	0,175	G 1/8
			10	**441 00 027**	K 25 D 10-M	•	•	0,200	
			15	**441 00 185**	K 25 D 15-M	•	•	0,225	
			20	**441 00 186**	K 25 D 20-M	•	•	0,250	
			25	**441 00 028**	K 25 D 25-M	•	•	0,275	
			30	**441 00 187**	K 25 D 30-M	•	•	0,300	
			40	**441 00 188**	K 25 D 40-M	•	•	0,350	
			50	**441 00 189**	K 25 D 50-M	•	•	0,400	

Magnetic detectors should be ordered separately
Tolerance on stroke length ± 1 mm

• Detector to be used

OPTION : • Other strokes on request
• Version non equipped for use with detector (consult us)

All leaflets are available on: **www.ascojoucomatic.com**

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DOUBLE ACTING CYLINDER

Ø bore (mm)	Force developed at 6 bar (daN)	Spring return force at 6 bar (daN)	Stroke (mm)	CYLINDER EQUIPPED FOR DETECTORS CODES	REFERENCES	DETECTOR TYPES TO BE USED ILS reed switch type	DETECTOR TYPES TO BE USED magnetoresistant electronic type	Weight (Kg)	Ø Ports
32	44	37	5	**441 00 190**	K 32 D 5 - M	—	•	0,240	G 1/8
			10	**441 00 029**	K 32 D 10 - M	•	•	0,260	
			15	**441 00 191**	K 32 D 15 - M	•	•	0,280	
			20	**441 00 192**	K 32 D 20 - M	•	•	0,300	
			25	**441 00 030**	K 32 D 25 - M	•	•	0,320	
			30	**441 00 193**	K 32 D 30 - M	•	•	0,340	
			40	**441 00 194**	K 32 D 40 - M	•	•	0,380	
			50	**441 00 195**	K 32 D 50 - M	•	•	0,420	
			60	**441 00 196**	K 32 D 60 - M	•	•	0,460	
			80	**441 00 197**	K 32 D 80 - M	•	•	0,540	
40	68	62	5	**441 00 198**	K 40 D 5 - M	—	•	0,330	G 1/8
			10	**441 00 031**	K 40 D 10 - M	•	•	0,360	
			15	**441 00 199**	K 40 D 15 - M	•	•	0,390	
			20	**441 00 200**	K 40 D 20 - M	•	•	0,420	
			25	**441 00 032**	K 40 D 25 - M	•	•	0,450	
			30	**441 00 201**	K 40 D 30 - M	•	•	0,480	
			40	**441 00 202**	K 40 D 40 - M	•	•	0,540	
			50	**441 00 203**	K 40 D 50 - M	•	•	0,600	
			60	**441 00 204**	K 40 D 60 - M	•	•	0,660	
			80	**441 00 205**	K 40 D 80 - M	•	•	0,780	
			100	**441 00 259**	K 40 D100 - M	•	•	0,900	
50	106	95	10	**441 00 033**	K 50 D 10 - M	—	•	0,515	G 1/8
			15	**441 00 206**	K 50 D 15 - M	•	•	0,550	
			20	**441 00 207**	K 50 D 20 - M	•	•	0,585	
			25	**441 00 034**	K 50 D 25 - M	•	•	0,620	
			30	**441 00 208**	K 50 D 30 - M	•	•	0,655	
			40	**441 00 209**	K 50 D 40 - M	•	•	0,725	
			50	**441 00 210**	K 50 D 50 - M	•	•	0,795	
			60	**441 00 211**	K 50 D 60 - M	•	•	0,865	
			80	**441 00 212**	K 50 D 80 - M	•	•	1,005	
			100	**441 00 260**	K 50 D 100 - M	•	•	1,145	
63	169	158	10	**441 00 035**	K 63 D 10 - M	•	•	0,750	G 1/8
			15	**441 00 213**	K 63 D 15 - M	•	•	0,795	
			20	**441 00 214**	K 63 D 20 - M	•	•	0,840	
			25	**441 00 036**	K 63 D 25 - M	•	•	0,885	
			30	**441 00 215**	K 63 D 30 - M	•	•	0,930	
			40	**441 00 216**	K 63 D 40 - M	•	•	1,020	
			50	**441 00 217**	K 63 D 50 - M	•	•	1,110	
			60	**441 00 218**	K 63 D 60 - M	•	•	1,200	
			80	**441 00 219**	K 63 D 80 - M	•	•	1,380	
			100	**441 00 261**	K 63 D 100 - M	•	•	1,560	
80	272	255	10	**441 00 220**	K 80 D 10 - M	•	•	1,275	G 1/4
			15	**441 00 221**	K 80 D 15 - M	•	•	1,350	
			20	**441 00 222**	K 80 D 20 - M	•	•	1,425	
			25	**441 00 037**	K 80 D 25 - M	•	•	1,500	
			30	**441 00 223**	K 80 D 30 - M	•	•	1,575	
			40	**441 00 224**	K 80 D 40 - M	•	•	1,725	
			50	**441 00 225**	K 80 D 50 - M	•	•	1,875	
			60	**441 00 226**	K 80 D 60 - M	•	•	2,025	
			80	**441 00 227**	K 80 D 80 - M	•	•	2,325	
			100	**441 00 262**	K 80 D100 - M	•	•	2,625	
100	400	398	10	**441 00 244**	K 100D 10 - M	•	•	2,250	G 1/4
			15	**441 00 245**	K 100D 15 - M	•	•	2,370	
			20	**441 00 246**	K 100D 20 - M	•	•	2,500	
			25	**441 00 247**	K 100D 25 - M	•	•	2,600	
			30	**441 00 248**	K 100D 30 - M	•	•	2,720	
			40	**441 00 249**	K 100D 40 - M	•	•	2,950	
			50	**441 00 250**	K 100D 50 - M	•	•	3,200	
			60	**441 00 251**	K 100D 60 - M	•	•	3,420	
			80	**441 00 252**	K 100D 80 - M	•	•	3,900	
			100	**441 00 253**	K 100D100 - M	•	•	4,350	

Magnetic detectors should be ordered separately

• Detector to be used

In order to prolong the product's service life, it is recommended to use external stoppers

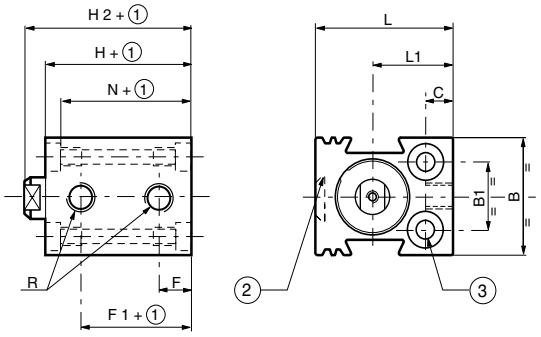
Tolerance on stroke length ± 1 mm

OPTION : • Other strokes on request

• Version non equipped for use with detector (consult us)

For installations using short stroke **32 to 100** mm bore, it is recommended to select the new models of the **PEC** type compatible with ISO 6431 (see page P227)

Ø 8 to 25 mm - SINGLE ACTING and DOUBLE ACTING



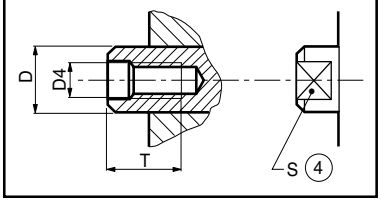
② 3rd track on Ø16 to 100

③ Mounting holes and counterbores (see detailed view below and following pages)

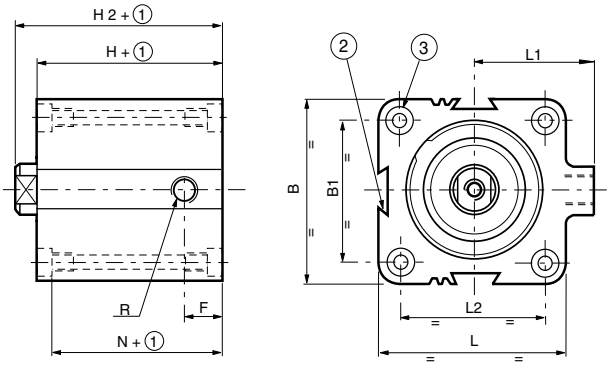
④ Dimensions across flats

NOTE : In the single-acting version, the connection takes place on the port located in F.

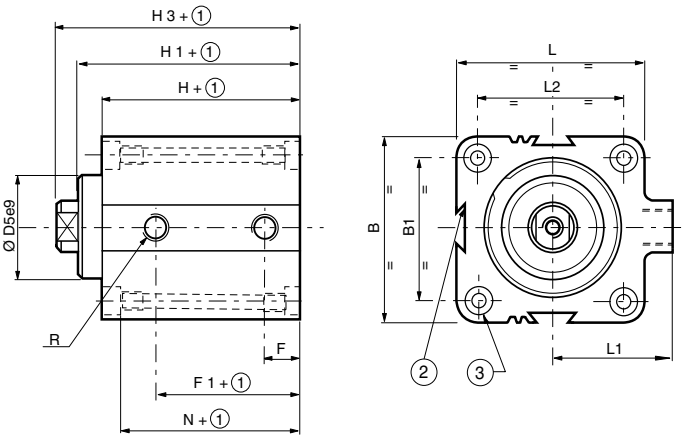
Piston rod details
Ø 8 to 100 mm



Ø 32 to 100 mm - SINGLE ACTING



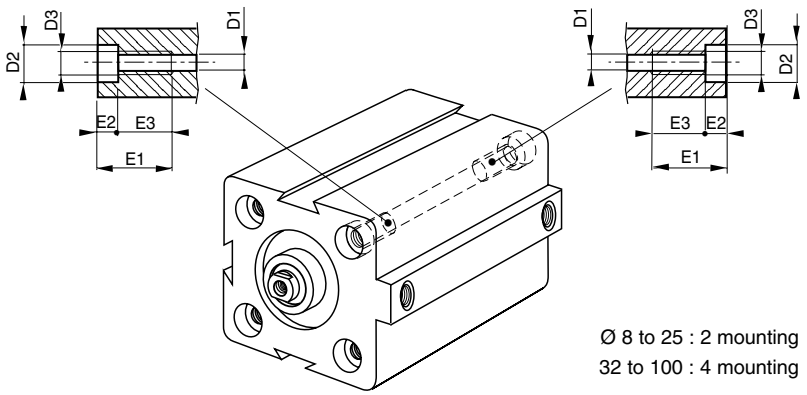
Ø 32 to 100 mm - DOUBLE ACTING



Ø bore (mm)	B	B_1	C	Ø D	Ø D_1	Ø D_2	Ø D_3	Ø D_4	Ø D_5	E_1	E_2	E_3	F	F_1 +	H +	H_1 +	H_2 +	H_3 +	L	L_1	L_2	N +	ØR	S	T
8	20	11	4,5	4	3,4	6	M4	M2,5	-	12	3,4	8,6	5	14	23	-	24	-	24	15	-	19,6	M5	-	3,5
10	21	12	6	4	3,4	6	M4	M2,5	-	12	3,4	8,6	5	15	24	-	25	-	25,5	16,5	-	20,6	M5	-	3,5
12	23	13	6,5	4	3,4	6	M4	M2,5	-	12	3,4	8,6	5	16	24	-	25	-	27,5	18,5	-	20,6	M5	-	3,5
16	28	18	8	7,8	4,5	8	M5	M4	-	15	4,6	10,4	6	18	32	-	36,5	-	34	20	-	27,4	M5	6	8
20	32	20	9	9,8	5,5	10	M6	M5	-	18	5,7	12,3	8	20	32	-	36,5	-	40	24	-	26,3	G1/8	8	11
25	38	26	9	9,8	5,5	10	M6	M5	-	18	5,7	12,3	9,5	24,5	38,5	-	44	-	44	25	-	33,8	G1/8	8	11
32	45	32	-	11,8	5,5	10	M6	M6	26	18	5,7	12,3	9,5	22	39,5	44,5	45	50,5	48	32	36	33,8	G1/8	10	13
40	55	42	-	11,8	5,5	10	M6	M6	28	18	5,7	12,3	11	25,5	39,5	45,5	46	52	55	37,5	42	33,8	G1/8	10	13
50	65	50	-	15,8	6,6	11	M8	M8	34	20	6,8	13,2	11	25,5	39,5	45,5	47	53	65	42,5	50	32,7	G1/8	13	12
63	80	62	-	15,8	9	15	M10	M8	38,5	25	9	16	11	27,3	42	50	48,5	57,5	80	47,5	62	33	G1/8	13	14
80	100	82	-	19,8	9	15	M10	M10	44	25	9	16	12,5	29,3	46	56	54	64	100	60	82	37	G1/4	17	16
100	124	103	-	24,6	11	18	M12	M12	56	30	11	19	12,5	36	56	66,5	66	76,5	124	72	103	45	G1/4	22	20

(1) : + stroke. The stroke length must be added to dimensions F_1, H, H_1, H_2, H_3 and N .
For non-standard strokes, add the value of the immediately higher standard stroke.

MOUNTING HOLES



Ø 8 to 25 : 2 mounting holes
32 to 100 : 4 mounting holes

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SHORT STROKE CYLINDERS Ø 8 to 100 mm
DOUBLE CROSSBAR
Double acting cylinder equipped for magnetic position detectors

SPECIFICATIONS AND CONSTRUCTION:
identical to the standard double acting version

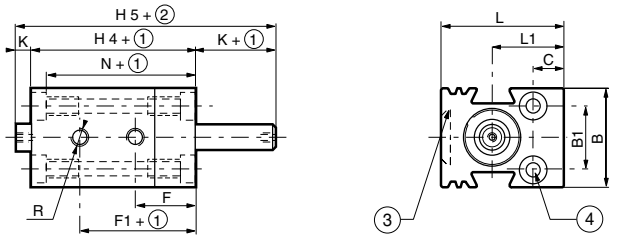
CHOICE OF EQUIPMENT

Ø Bore (mm)	DOUBLE CROSSBAR CYLINDER CODES (1)	REFERENCES	Max. stroke capabilty (mm)	Ø Port
8	**441 50 049**	K 8 D (1) T 2 - M	30	M5
10	**441 50 050**	K 10 D (1) T 2 - M	30	M5
12	**441 50 051**	K 12 D (1) T 2 - M	40	M5
16	**441 50 052**	K 16 D (1) T 2 - M	40	M5
20	**441 50 053**	K 20 D (1) T 2 - M	60	G 1/8
25	**441 50 054**	K 25 D (1) T 2 - M	60	G 1/8
32	**441 50 055**	K 32 D (1) T 2 - M	100	G 1/8
40	**441 50 056**	K 40 D (1) T 2 - M	120	G 1/8
50	**441 50 057**	K 50 D (1) T 2 - M	130	G 1/8
63	**441 50 058**	K 63 D (1) T 2 - M	130	G 1/8
80	**441 50 059**	K 80 D (1) T 2 - M	130	G 1/4
100	**441 50 060**	K 100 D (1) T 2 - M	130	G 1/4

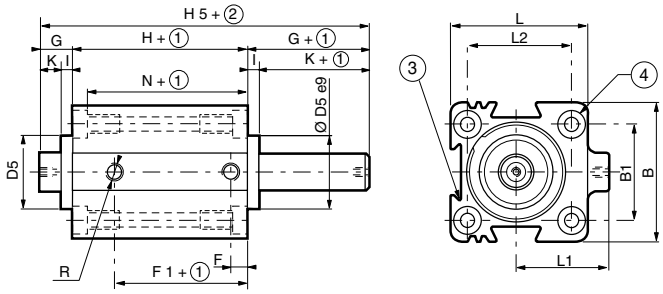
(1) Please specify stroke length (in mm)
The magnetic detectors must be ordered separately
In order to prolong the product's service life, it is recommended to use external stoppers for both directions

DIMENSIONS

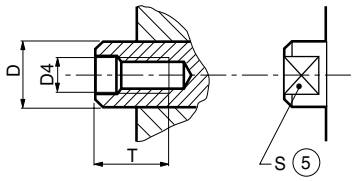
Ø 8 to 25 mm



Ø 32 to 100 mm



Piston rod details
Ø 8 to 100 mm



(3) 3rd track on Ø16 to 100

(4) Mounting holes and counterbores (see detailed view on page 6 and following pages)

(5) Dimensions across flats

Ø	B	B_1	C	Ø D	Ø D_1	Ø D_2	Ø D_4	Ø D_5	E_1	E_2	E_3	F	F_1 +	G + G	H +	H_4 +	H_5 +	I	K + K	L	L_1	L_2	N +	R	S	T
8	20	11	4,5	4	3,4	6	M2,5	-	12	3,4	8,6	9	21,5	-	-	30,5	32,5	-	1	24	15	-	27,1	M5	-	3,5
10	21	12	6	4	3,4	6	M2,5	-	12	3,4	8,6	9	22,5	-	-	31,5	33,5	-	1	25,5	16,5	-	28,1	M5	-	3,5
12	23	13	6,5	4	3,4	6	M2,5	-	12	3,4	8,6	9	20	-	-	28	30	-	1	27,5	18,5	-	24,6	M5	-	3,5
16	28	18	8	7,8	4,5	8	M4	-	15	4,6	10,4	14	31	-	-	45	54	-	4,5	34	20	-	40,4	M5	6	8
20	32	20	9	9,8	5,5	10	M5	-	18	5,7	12,3	12	26	-	-	38	47	-	4,5	40	24	-	32,3	G1/8	8	11
25	38	26	9	9,8	5,5	10	M5	-	18	5,7	12,3	14	34	-	-	48	59	-	5,5	44	25	-	42,3	G1/8	8	11
32	45	32	-	11,8	5,5	10	M6	26	18	5,7	12,3	17,5	30	11	47,5	-	69,5	5	6	48	32	36	41,8	G1/8	10	13
40	55	42	-	11,8	5,5	10	M6	28	18	5,7	12,3	14	32	12,5	46	-	71	6	6,5	55	37,5	42	40,3	G1/8	10	13
50	65	50	-	15,8	6,6	11	M8	34	20	6,8	13,2	14	32,5	13,5	46,5	-	73,5	6	7,5	65	42,5	50	39,7	G1/8	13	12
63	80	62	-	15,8	9	15	M8	38,5	25	9	16	15	33	16	48	-	80	8	8	80	47,5	62	39	G1/8	13	14
80	100	82	-	19,8	9	15	M10	44	25	9	16	16,7	34,3	18	51	-	87	10	8	100	60	82	42	G1/4	17	16
100	124	103	-	24,8	11	18	M12	56	30	11	19	20	44	20,5	64	-	105	10,5	10	124	72	103	53	G1/4	22	20

(1) : +stroke. Dimensions F_1, H, H_4, K, G and N the stroke length must be added
For non-standard strokes, add the value of the immediately higher standard stroke.

(2) : + twice stroke.

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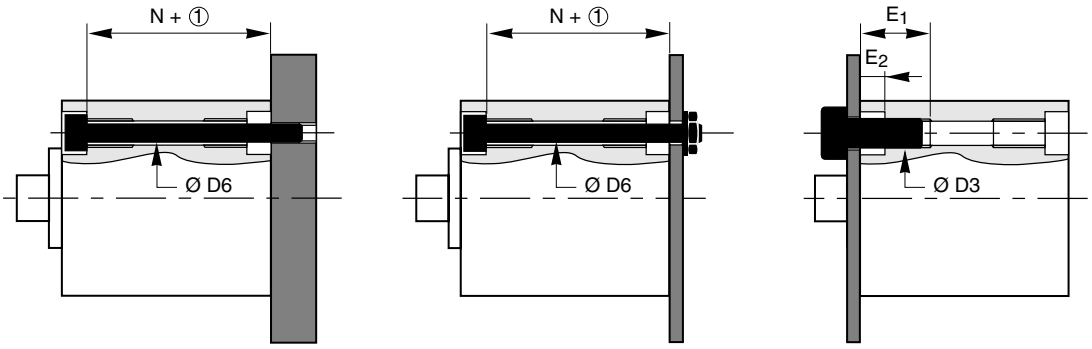
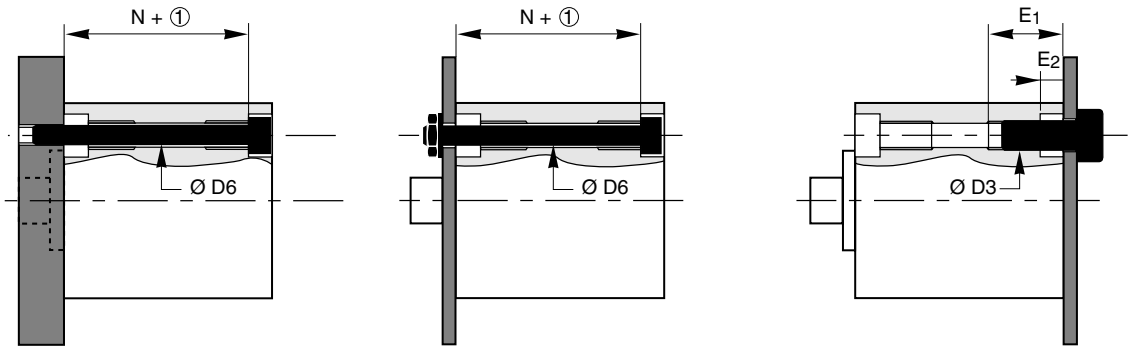
MOUNTING OPTIONS

The tapped and sunten mounting holes provide great flexibility for mounting. The tappings simplify securing the cylinders, particularly when the stroke is long

• Front mounting

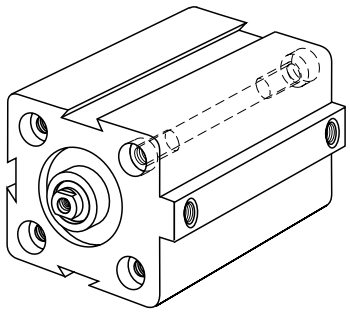


• Rear mounting



Ø bore (mm)	Ø D3	Ø D6	E_1	E_2	N +
8	M4	M3	12	3,4	19,6
10	M4	M3	12	3,4	20,6
12	M4	M3	12	3,4	20,6
16	M5	M4	15	4,6	27,4
20	M6	M5	18	5,7	26,3
25	M6	M5	18	5,7	32,8
32	M6	M5	18	5,7	33,8
40	M6	M5	18	5,7	33,8
50	M8	M6	20	6,8	32,7
63	M10	M8	25	9	33
80	M10	M8	25	9	37
100	M12	M10	30	11	45

(1) The length of stroke must be added to dimension N.
For non-standard strokes, add the next higher standard one.



Ø 8 to 25 : 2 mounting holes per face
Ø 32 to 100 : 4 mounting holes per face

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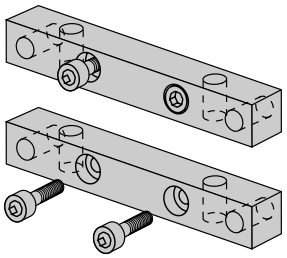
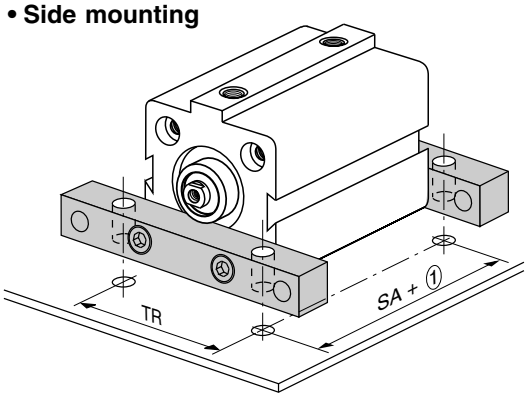
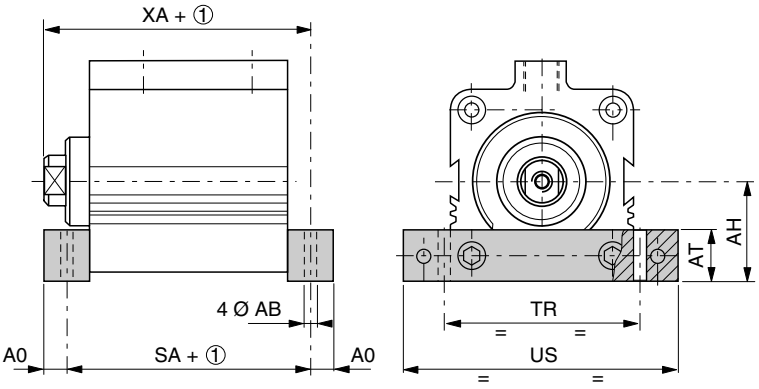
A set of two flanges enables front, rear or side mounting of cylinders with bores of 32 to 100mm, for single-acting, or double-acting, single rod or double crossbar type.
(The set comprises two flanges and four screws for securing them to the cylinder).



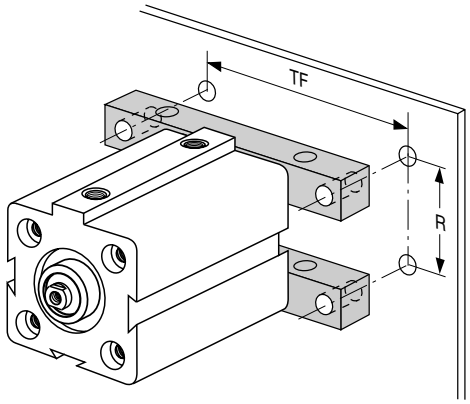
Ø bore (mm)	CODES set of two flanges
32	439 00 268
40	439 00 269
50	439 00 270
63	439 00 271
80	439 00 272
100	439 00 273

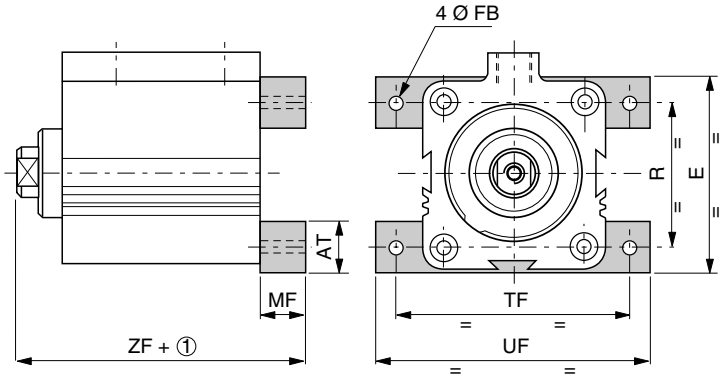
• Side mounting





• Front or rear mounting





Ø bore (mm)	Ø AB	AH	AO	AT	E	Ø FB	MF	R	TF	TR	UF US	SA + (2)	SA + (3)	XA + (2)	XA + (3)	ZF + (2)	ZF + (3)	Weight (Kg)
32	5,5	25	5	14	50	5,5	10	36	63	50,5	72,5	49,5	57,5	55,5	63,5	60,5	68,5	0,065
40	5,5	28	5	14	56	5,5	10	42	73	60,5	82,5	49,5	56	57	63,5	62	68,5	0,080
50	6,6	33	6	16	66	6,6	12	50	88	72,5	99	51,5	58,5	59	66	65	72	0,135
63	9	41	7,5	20	82	9	15	62	111	91	125	57	63	65	71	72,5	78,5	0,250
80	9	51	7,5	20	102	9	15	82	116	53	131	61	66	71,5	76,5	79	84	0,260
100	10,5	62,5	8,5	22	125	10,5	17	103	142,5	64,5	160	73	81	85	93	93,5	101,5	0,400

(1) Add stroke length to dimensions SA, XA and ZF.
(2) Dimensions for single rod cylinder
(3) Dimensions for double crossbar cylinder
- Dimensions of bare cylinder, see specific overall dimensions pages.
- 32 mm bore cylinders are installed with the supply ports on top face.
  The bodies of 40 to 100mm bore cylinders can be rotated by 90° increments.
- For side-mounted 80 and 100mm bore cylinders, distance between TR centres is **less** than the distance between the centres of the mounting holes.

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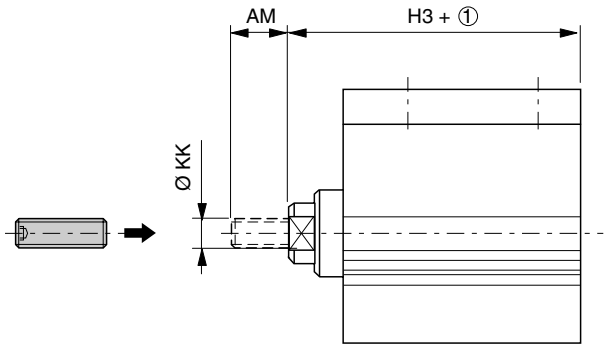
THREADED END PIECE

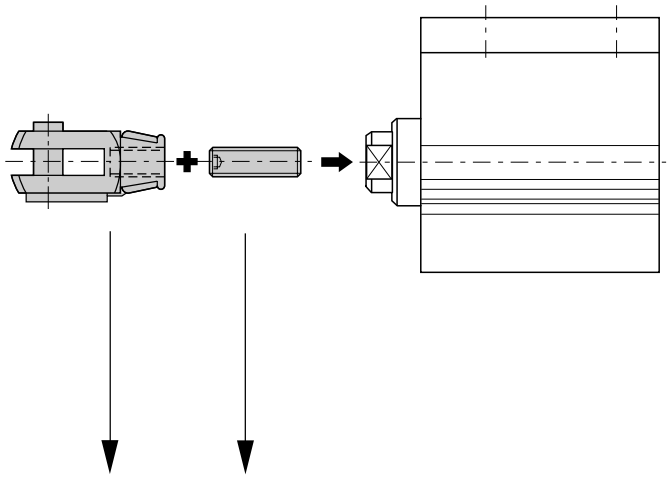
Threaded rod endfitting for the tapped rod end of standard 16 to 100 mm bore cylinders.

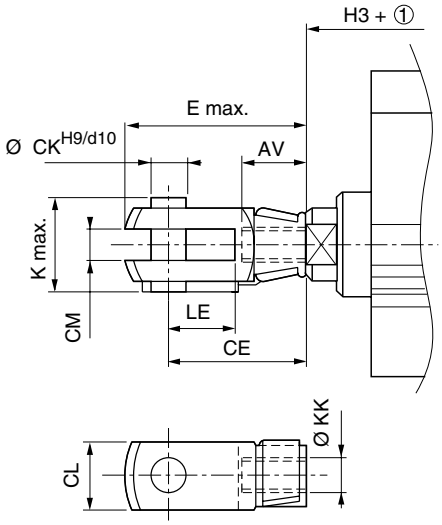


Ø bore (mm)	CODE threaded end piece	AM	H3+	Ø KK
16	**439 00 259**	8	36,5	M4
20	**439 00 260**	12	36,5	M6
25		12	44	M6
32	**439 00 262**	12	50,5	M6
40		12	52	M6
50	**439 00 264**	15	53	M8
63		15	57,5	M8
80	**439 00 266**	19	64	M10
100	**439 00 267**	20	76,5	M12

(1) Add the stroke to this value.
In your order, indicate the code of the end piece, which is supplied separately.

FEMALE ROD CLEVIS





Ø bore (mm)	CODE female end piece	+ CODE threaded end piece	AV	CE	Ø CK	CL	CM	E	K	Ø KK	LE	H3+	Clevis weight (Kg)
16	**43900193**	**43900259**	8	16	4	8	$4^{+0,4}_{+0,1}$	22,5	11	M4	8	36,5	0,010
20	**43900159**	**439 00 260**	12	24	6	12	$6^{+0,4}_{+0,1}$	33,5	16,5	M6	12	36,5	0,020
25												44	
32		**439 00 262**										50,5	
40												52	
50	**43900161**	**439 00 264**	16	32	8	16	$8^{+0,5}_{+0,15}$	45	22	M8	16	53	0,050
63												57,5	
80	**43900163**	**439 00 266**	20	40	10	20	$10^{+0,5}_{+0,15}$	56	26	M10	20	64	0,100
100	**43900164**	**439 00 267**	22	48	12	24	$12^{+0,5}_{+0,15}$	67	32	M12	24	76,5	0,150

Please indicate the threaded and clevis end piece code in your order. These two items are supplied installed on the cylinder.
(1) Add the stroke to this value

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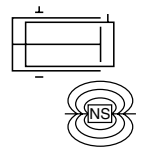
SHORT STROKE CYLINDERS Ø 20 to 100 mm

WITH A ROTATION-PROOF DEVICE ON THE BEARING-ROD

Double acting cylinder equipped for magnetic position detectors



SPECIFICATIONS

FLUID	: Air or neutral gas, filtered, lubricated or not
PRESSURE	: 2 to 10 bar
PRESSURE	: -10°C, +60°C
Ø CYLINDER BORE	: 20 to 100 mm
STROKE	: See table below

CONSTRUCTION

Body in light alloy
Piston rod in chrome plated steel
Load carrying plate in light alloy
Stainless steel guide rod
Self lubricating bearing
Internal parts in acetal (POM) brass or light alloy
Polyurethane (PUR) sealing
Front or rear mounting by 2 screws (not supplied)

CHOICE OF EQUIPMENT

Ø Bore (mm)	Stroke (mm)	CYLINDERS WITH ROTATION-PROOF DEVICE CODES	REFERENCES	Ø Port
20	5	**441 00 440**	K 20 D 5L-M*	G1/8
	10	**441 00 441**	K 20 D 10L-M	
	15	**441 00 442**	K 20 D 15L-M	
	20	**441 00 443**	K 20 D 20L-M	
	25	**441 00 444**	K 20 D 25L-M	
	30	**441 00 445**	K 20 D 30L-M	
	40	**441 00 446**	K 20 D 40L-M	
	50	**441 00 447**	K 20 D 50L-M	
25	5	**441 00 448**	K 25 D 5L-M*	G1/8
	10	**441 00 449**	K 25 D 10L-M	
	15	**441 00 450**	K 25 D 15L-M	
	20	**441 00 451**	K 25 D 20L-M	
	25	**441 00 452**	K 25 D 25L-M	
	30	**441 00 453**	K 25 D 30L-M	
	40	**441 00 454**	K 25 D 40L-M	
	50	**441 00 455**	K 25 D 50L-M	
32	5	**441 00 275**	K 32 D 5L-M*	G1/8
	10	**441 00 276**	K 32 D 10L-M	
	15	**441 00 277**	K 32 D 15L-M	
	20	**441 00 278**	K 32 D 20L-M	
	25	**441 00 279**	K 32 D 25L-M	
	30	**441 00 280**	K 32 D 30L-M	
	40	**441 00 281**	K 32 D 40L-M	
	50	**441 00 282**	K 32 D 50L-M	
	60	**441 00 283**	K 32 D 60L-M	
	80	**441 00 284**	K 32 D 80L-M	
40	5	**441 00 285**	K 40 D 5L-M*	G1/8
	10	**441 00 286**	K 40 D 10L-M	
	15	**441 00 287**	K 40 D 15L-M	
	20	**441 00 288**	K 40 D 20L-M	
	25	**441 00 289**	K 40 D 25L-M	
	30	**441 00 290**	K 40 D 30L-M	
	40	**441 00 291**	K 40 D 40L-M	
	50	**441 00 292**	K 40 D 50L-M	
	60	**441 00 293**	K 40 D 60L-M	
	80	**441 00 294**	K 40 D 80L-M	
	100	**441 00 295**	K 40 D 100L-M	

Ø Bore (mm)	Stroke (mm)	CYLINDERS WITH ROTATION-PROOF DEVICE CODES	REFERENCES	Ø Port
50	10	**441 00 296**	K 50 D 10L-M	G1/8
	15	**441 00 297**	K 50 D 15L-M	
	20	**441 00 298**	K 50 D 20L-M	
	25	**441 00 299**	K 50 D 25L-M	
	30	**441 00 300**	K 50 D 30L-M	
	40	**441 00 301**	K 50 D 40L-M	
	50	**441 00 302**	K 50 D 50L-M	
	60	**441 00 303**	K 50 D 60L-M	
	80	**441 00 304**	K 50 D 80L-M	
	100	**441 00 305**	K 50 D 100L-M	
63	10	**441 00 306**	K 63 D 10L-M	G1/8
	15	**441 00 307**	K 63 D 15L-M	
	20	**441 00 308**	K 63 D 20L-M	
	25	**441 00 309**	K 63 D 25L-M	
	30	**441 00 310**	K 63 D 30L-M	
	40	**441 00 311**	K 63 D 40L-M	
	50	**441 00 312**	K 63 D 50L-M	
	60	**441 00 313**	K 63 D 60L-M	
	80	**441 00 314**	K 63 D 80L-M	
	100	**441 00 315**	K 63 D 100L-M	
80	10	**441 00 316**	K 80 D 10L-M	G1/4
	15	**441 00 317**	K 80 D 15L-M	
	20	**441 00 318**	K 80 D 20L-M	
	25	**441 00 319**	K 80 D 25L-M	
	30	**441 00 320**	K 80 D 30L-M	
	40	**441 00 321**	K 80 D 40L-M	
	50	**441 00 322**	K 80 D 50L-M	
	60	**441 00 323**	K 80 D 60L-M	
	80	**441 00 324**	K 80 D 80L-M	
	100	**441 00 325**	K 80 D 100L-M	
100	10	**441 00 326**	K 100D 10L-M	G1/4
	15	**441 00 327**	K 100D 15L-M	
	20	**441 00 328**	K 100D 20L-M	
	25	**441 00 329**	K 100D 25L-M	
	30	**441 00 330**	K 100D 30L-M	
	40	**441 00 331**	K 100D 40L-M	
	50	**441 00 332**	K 100D 50L-M	
	60	**441 00 333**	K 100D 60L-M	
	80	**441 00 334**	K 100D 80L-M	
	100	**441 00 335**	K 100D 100L-M	

Magnetic detectors should be ordered separately.
In order to prolong the product's service life, it is recommended to use external stoppers for both directions.
* reed switch type detector cannot be fitted on 5 mm strokes or less

OPTION . Other strokes on request

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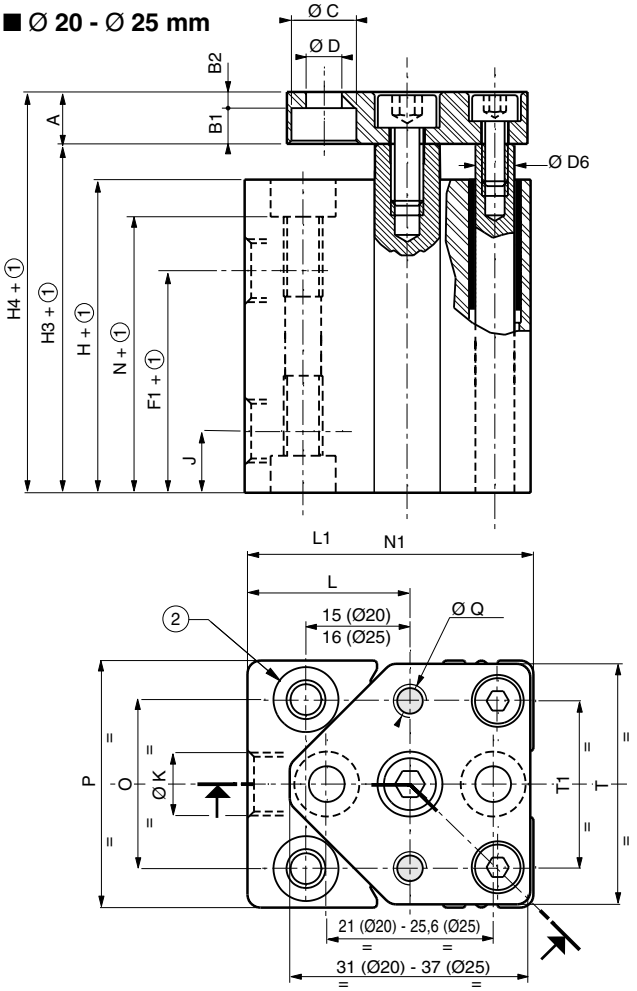
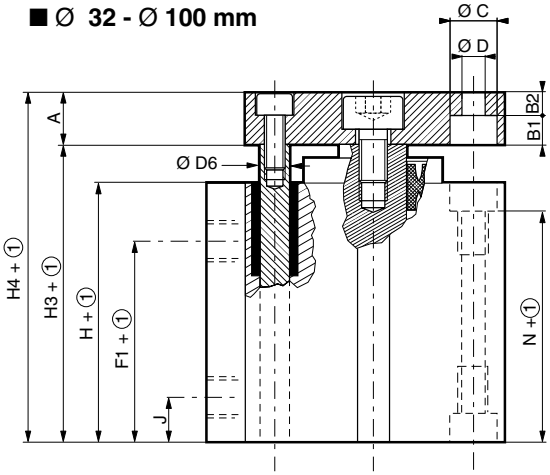
DIMENSIONS

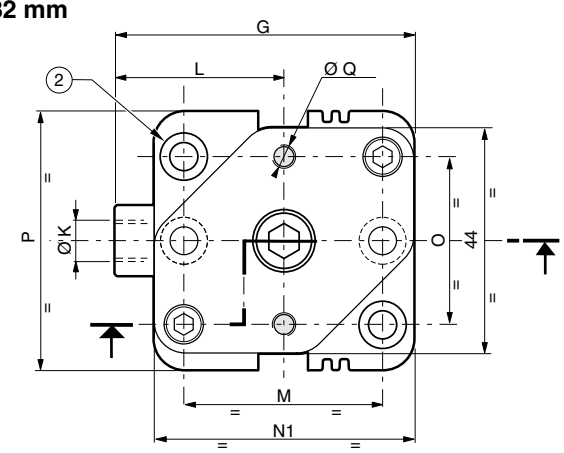
■ Ø 20 - Ø 25 mm



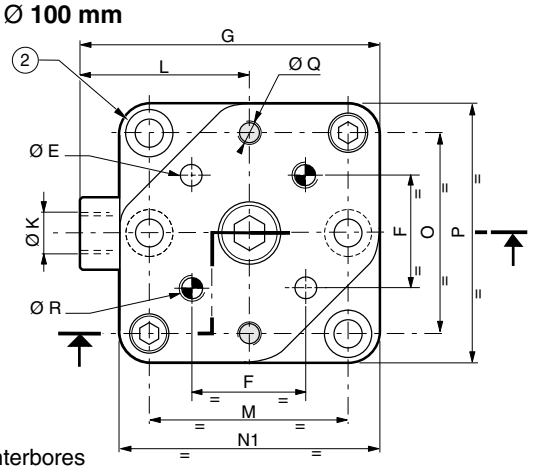
■ Ø 32 - Ø 100 mm



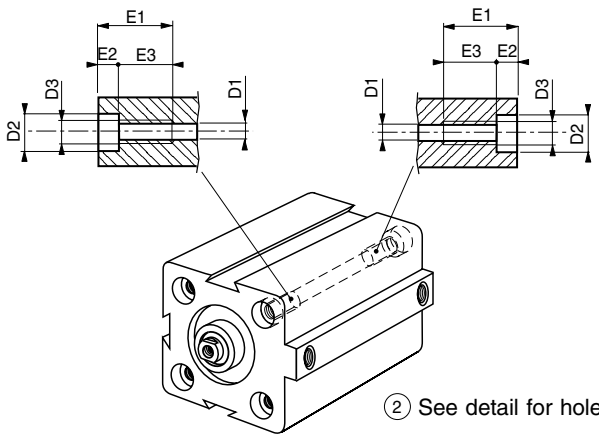
■ Ø 32 mm



■ Ø 40 - Ø 100 mm



MOUNTING HOLES



② See detail for holes and counterbores

Ø (mm)	A	B1	B2	Ø C	Ø D	Ø D_1	Ø D_2	Ø D_3	Ø D_6	Ø E	E_1	E_2	E_3	F	F_1 +	G	H +	H_3 +	H_4 +	J	Ø K	L	M	N +	N_1	O	P	Ø Q	Ø R
20	8	4,5	3,5	8	4,5	5,5	10	M6	5	-	18	5,7	12,3	-	20	-	32	36,5	44,5	8	G1/8	24	-	26,3	40	20	32	M3	-
25	8	5,5	2,5	10	5,5	5,5	10	M6	6	-	18	5,7	12,3	-	24,5	-	38,5	44	52	9,5	G1/8	25	-	32,8	44	26	38	M5	-
32	10	5,7	4,3	10	5,5	5,5	10	M6	8	-	18	5,7	12,3	-	22	56	39,5	50,5	60,5	9,5	G1/8	32	36	33,8	48	32	45	M5	-
40	10	5,7	4,3	10	5,5	5,5	10	M6	8	5,1	18	5,7	12,3	23,3	25,5	65	39,5	52	62	11	G1/8	37,5	42	33,8	55	42	55	M5	M5
50	12	5,7	6,3	10	5,5	6,6	11	M8	8	6,1	20	6,8	13,2	29,7	25,5	75	39,5	53	65	11	G1/8	42,5	50	32,7	65	50	65	M5	M6
63	12	6,8	5,2	11	6,6	9	15	M10	10	6,1	25	9	16	35,4	27,3	87,5	42	57,5	69,5	11	G1/8	47,5	62	33	80	62	80	M6	M6
80	14	6,8	7,2	11	6,6	9	15	M10	10	8,1	25	9	16	46	29,3	110	46	64	78	12,5	G1/4	60	82	37	100	82	100	M6	M8
100	16	9	7	15	9	11	18	M12	10	10,1	30	11	19	56,6	36	134	56	76,5	92,5	12,5	G1/4	72	103	45	124	103	124	M8	M10

(1) The stroke length must be added to dimensions F_1, H, H_3, H_4 and N.
For non-standard strokes, add the value of the immediately higher standard stroke.

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SHORT STROKE CYLINDERS Ø 8 to 100mm - type K

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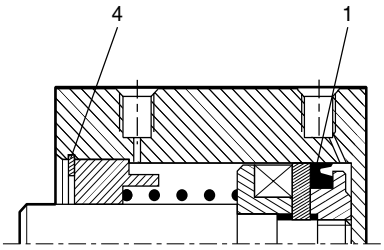
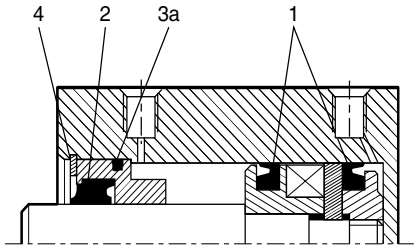
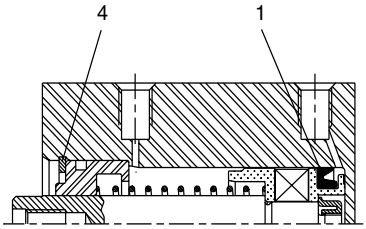
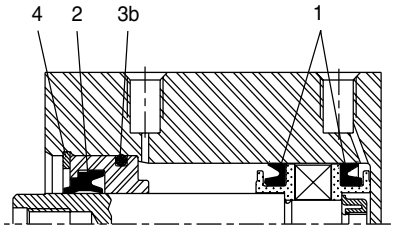
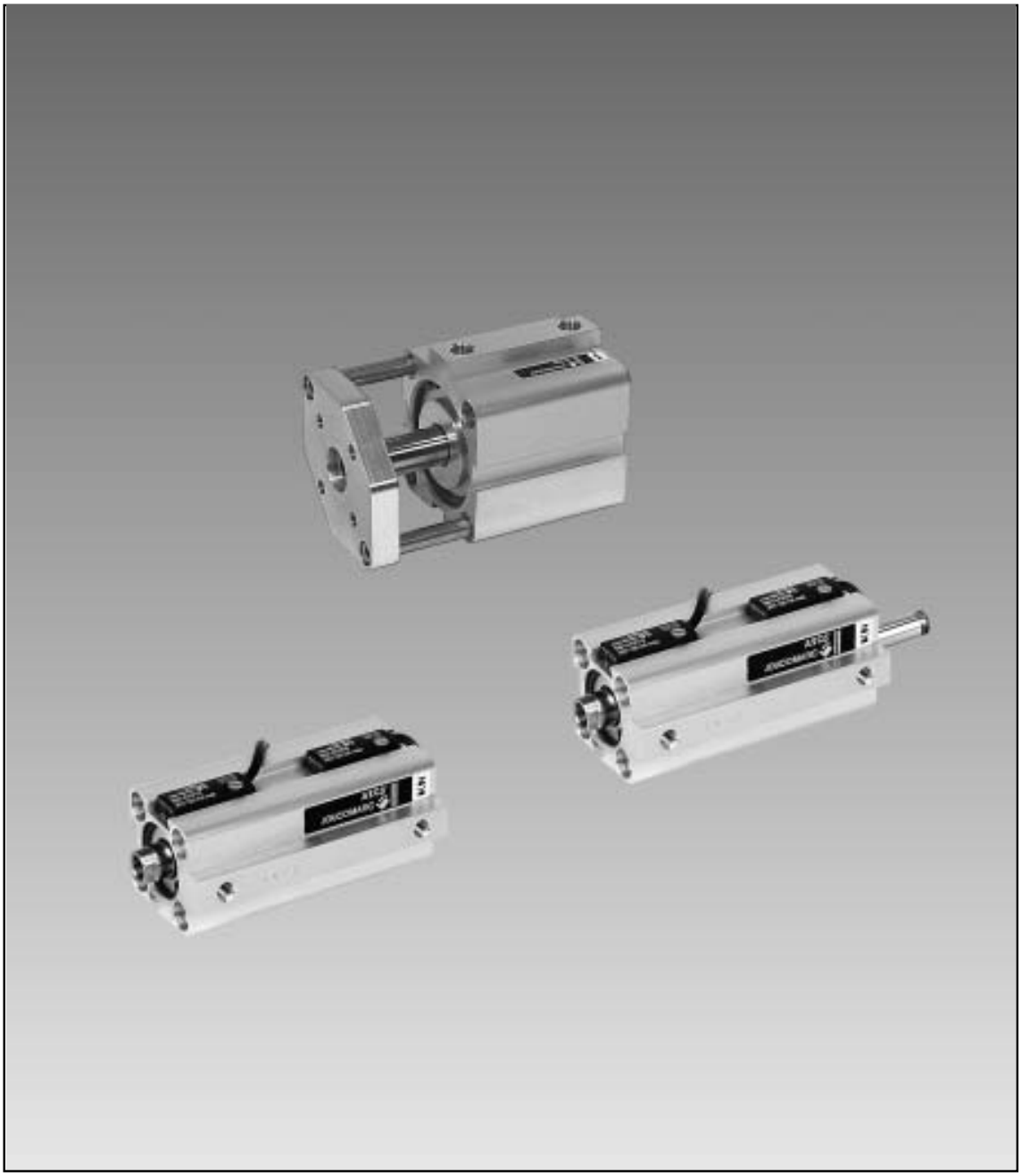
	SINGLE ACTING	DOUBLE ACTING
Ø 8 ... 20 mm		
Ø 25 ... 100 mm		

The kits contain wearing parts. They are suitable for both single and double acting cylinders.

Ø bore (mm)	**CODE** spare parts kits
8	**978 01 348**
10	**978 01 349**
12	**978 01 350**
16	**978 01 351**
20	**978 01 352**
25	**978 01 353**
32	**978 01 354**
40	**978 01 355**
50	**978 01 356**
63	**978 01 357**
80	**978 01 358**
100	**978 01 591**
1 Tube of grease,11 cm^3	**978 02 100**

383 65 06

SHORT STROKE CYLINDERS, Ø 20 - 25 mm
SINGLE AND DOUBLE ACTING
CONFORMING WITH AFNOR NF E 49-004 STANDARDS
SERIES 442 - TYPE : **KN**



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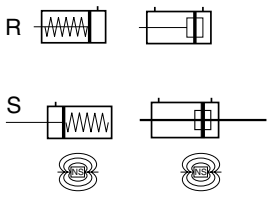
P216-GB-R3

ASCO® JOUCOMATIC

Series 442
Type: **KN**-DM
KN-T2-DM

SHORT STROKE CYLINDERS Ø 20 - 25 mm SINGLE ACTING and DOUBLE ACTING

Conforming with AFNOR NF E 49-004 standards
equipped for magnetic position detectors



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SPECIFICATIONS

FLUID	: air or neutral gas, filtered, lubricated or not
PRESSURE	: 2 to 10 bar max.
TEMPERATURE	: -20°C, +70°C
CYLINDER BORE	: 20 - 25 mm
STROKE	: 5 to 50 mm
MAX. SPEED	: 0,5 m/s

CONSTRUCTION

Body	: aluminium alloy
Rod	: stainless steel
Rod end	tapped (threaded rod end: see accessories)
Piston	: acetal resin (POM) or light alloy fitted with a permanent annular magnet
Piston seal	: polyurethane (PUR)
Bearing	: self lubricating
Mounting	: front or rear with screw (not supplied)

CHOICE OF EQUIPMENT

SIMPLE ACTING CYLINDER - NF E 49-004-1

Minimum pressure to compress the spring: according to NF E 49-004 standards
The return of the piston rod must be without load

Bore Ø (mm)	Forces developed at 6 bar (daN)	Spring return force (daN)	CODES	REFERENCES (2)	Standards strokes (mm) 5	10	15	20	Connection Ø
SINGLE ACTING CYLINDER -ROD RETURNED at rest (R)									
20	14	1,2	**442 50 001** (1)	KN 20 R (1) ... DM	●	●	●		M5
25	24	1,6	**442 50 002** (1)	KN 25 R (1) ... DM	●	●	●	●	M5
SINGLE ACTING CYLINDER -ROD OUT at rest (S)									
20	12	1,2	**442 50 009** (1)	KN 20 S (1) ... DM	●	●	●		M5
25	19	1,6	**442 50 010** (1)	KN 25 S (1) ... DM	●	●	●	●	M5

DOUBLE ACTING CYLINDER - NF E 49-004-2

Bore Ø (mm)	CODES	REFERENCES (2)	Recommended standards strokes (mm) 5	10	15	20	25	30	40	50	Max. stroke capability (mm)	Connection Ø
DOUBLE ACTING CYLINDER - SINGLE ROD												
20	**442 50 017** (1)	KN 20 D (1) ... DM	●	●	●	❊	❊	❊	❊	❊	60	M5
25	**442 50 018** (1)	KN 25 D (1) ... DM	●	●	●	●	❊	❊	❊	❊	90	M5
DOUBLE ACTING CYLINDER - THROUGH ROD												
20	**442 50 025** (1)	KN 20 D (1) ... T2-DM	●	●	●	❊	❊	❊	❊	❊	60	M5
25	**442 50 026** (1)	KN 25 D (1) ... T2-DM	●	●	●	●	❊	❊	❊	❊	90	M5

(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Other strokes on request (min.: 5 mm, max.: 25 mm)
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)
or COMPACT model, reed switch or magneto-resistive type (see P293)
Specifications for use: see installation leaflet
Tolerance on stroke length according to NF E 49-004 standards
Other bores : see PEC documentation - P227

● Recommended strokes according to NF E 49-004
❊ Other strokes available as standard

OPTIONS

Version with rotation-proof device on the bearing-rod (see page 8)
Version non equipped for use with magnetic position detector
Version with threaded rod end: procure male threaded rod end fitting (see accessories)

ACCESSORIES: see following pages

: The strokes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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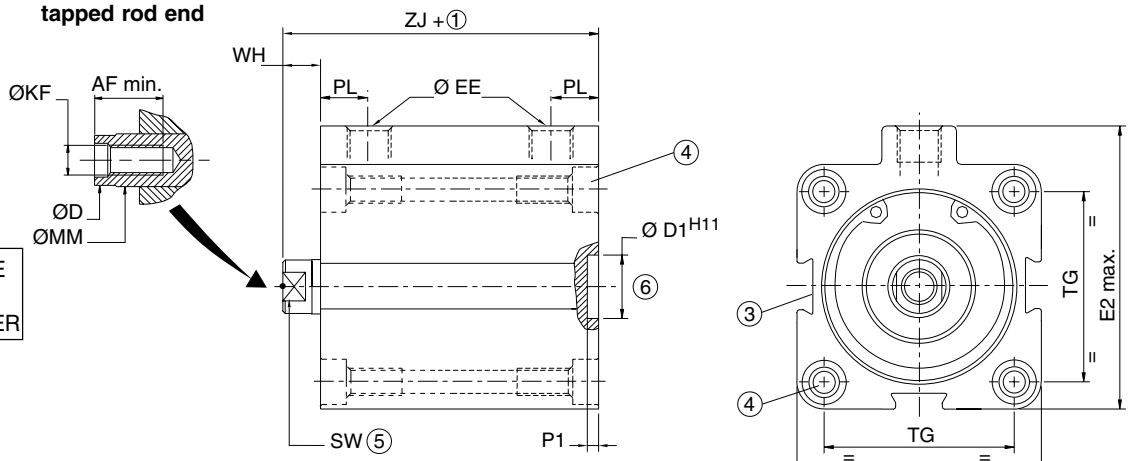
DIMENSIONS AND WEIGHTS

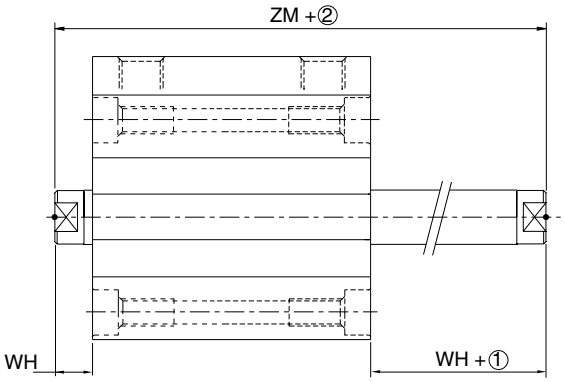
SINGLE AND DOUBLE ACTING CYLINDERS

tapped rod end

SINGLE ROD CYLINDER



THROUGH ROD CYLINDER

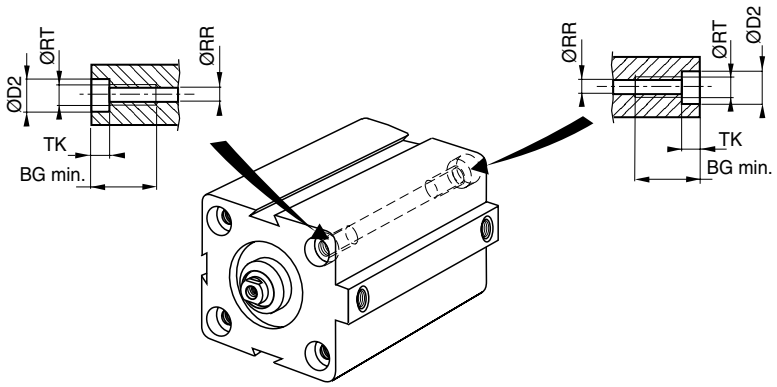


① : + stroke
② : 2 x stroke
③ : Ø 20 - 25 mm = 1 track per face
④ : Mounting holes and counterboreds
(see detailed view below and following pages)
⑤ : Dimensions accross flats
⑥ : Standard countersinking for centring at rear

Bore Ø (mm)	DIMENSIONS (mm)																			Weights (kg)	
	AF	BG	ØD	ØD1	ØD2	EE	E1	E2	ØKF	ØMM	PL	P1	ØRR	RT	SW	TG	TK	WH	ZJ	ZM	(7)	(8)
20	10	15	9,8	12	8	M5	36	44	M6x1	10	7,8	2,5	4,2	M5	8	22	4,7	6	43	49	0,082	0,0022
25	10	15	9,8	12	8	M5	40	48	M6x1	10	9,3	2,5	4,2	M5	8	26	4,7	6	45	50,5	0,125	0,0028

Tolerance on dimensions according to NF E 49-004 standards
(7) Cylinder weight with 0 mm stroke.
(8) Weight to be added per additional mm length.

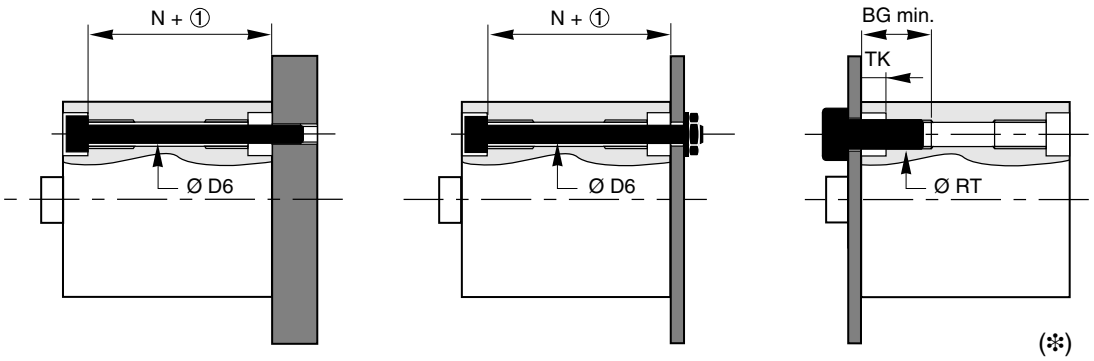
MOUNTING



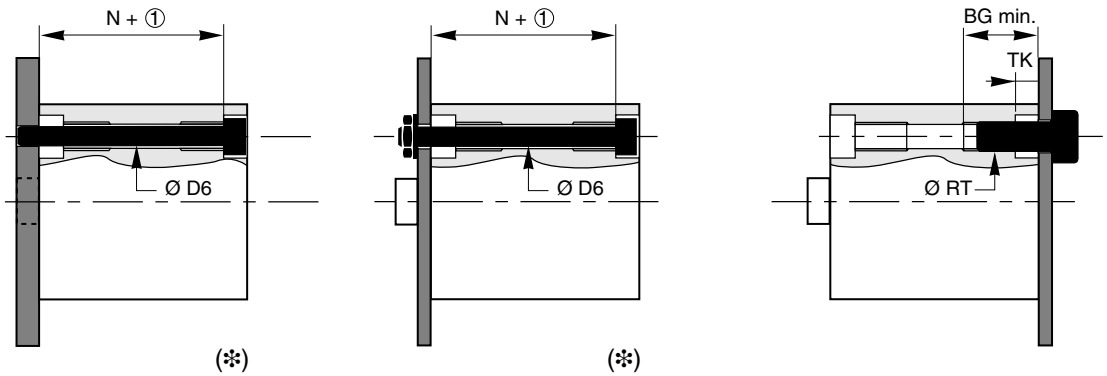
MOUNTING OPTIONS

The tapped and sunten mounting holes provide great flexibility for mounting. The tappings simplify securing the cylinders.

• Front mounting



• Rear mounting



Bore Ø (mm)	BG min.	Ø D6	Ø RT	N+	TK
20	15	M4	M5	32,3	4,7
25	15	M4	M5	34,3	4,7

(1) : + stroke. The length of stroke must be added to dimension N..
For non-standard strokes, take the next higher standard one.
(❊) Type of mounting not realizable on anti-rotation version

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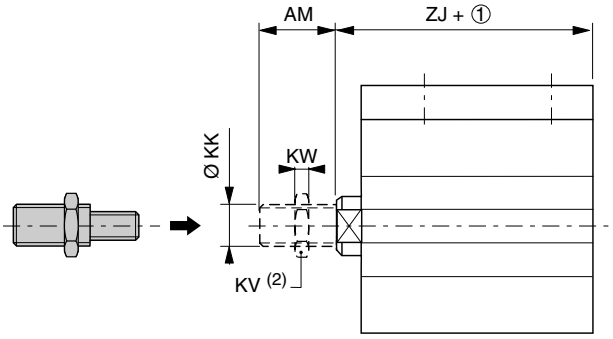
THREADED END PIECE / KN

Threaded rod endfitting for the tapped rod end of standard 20 and 25 mm bore cylinders.

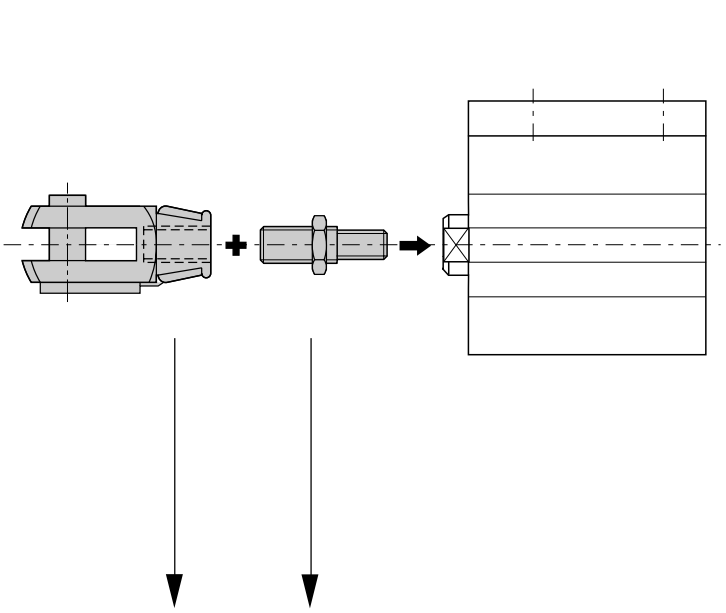


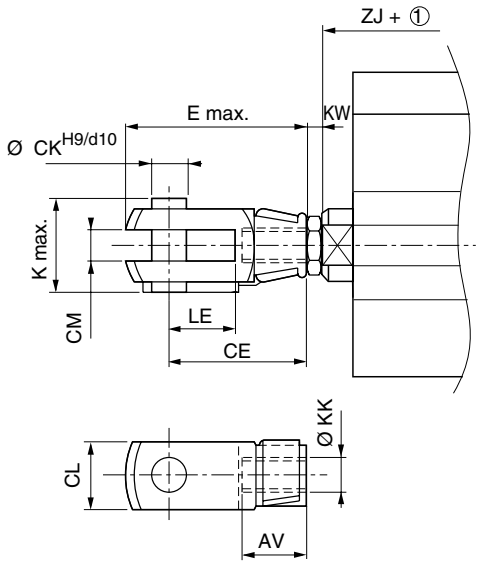
Bore Ø (mm)	CODE threaded end piece	AM	Ø KK	KV	KW	ZJ + (1)
20 25	434 00 481	20	M8x1,25	13	4	43 45

(1) Add the stroke to this value.
(2) dimensions on flats
In your order, indicate the code of the end piece, which is supplied **separately**.

2

FEMALE ROD CLEVIS - AP2 (ISO 8140)





Bore Ø (mm)	CODE female rod clevis AP2	+ CODE threaded end piece	AV	CE	Ø CK	CL	CM	E	K	Ø KK	LE	ZJ + (1)	Clevis weight (Kg)
20 25	439 00 161	434 00 481	16	32	8	16	$8^{+0,5}_{+0,15}$	45	22	M8 x 1,25	16	43 45	0,050

Please indicate the threaded and clevis end piece code in your order. These two items are supplied not installed on the cylinder.
(1) Add the stroke to this value

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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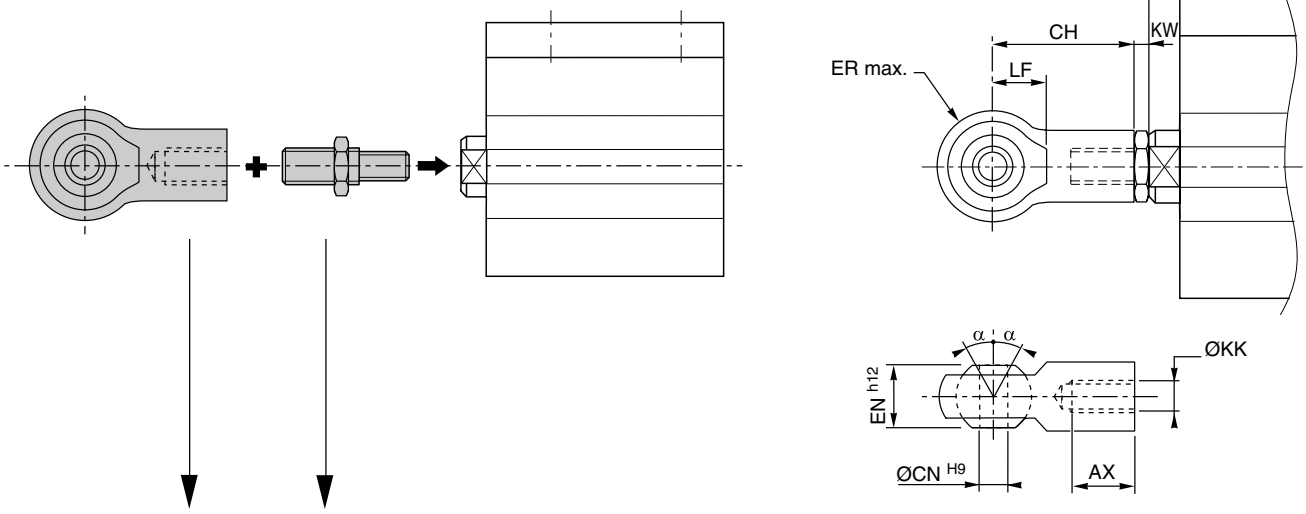
SPHERICAL BEARING ROD END - AP6 (ISO 8139)



Bore Ø (mm)	CODE spherical rod end AP6	+ CODE threaded rod end	AX	CH	CN	EN	ER	LF	Ø KK	ZJ + (1)	α	Spherical bearing weight (Kg)
20 **25**	**439 00 187**	**434 00 481**	16	36	8	12	12	13	M8 x 1,25	43 45	4°	0,050

Please indicate the threaded and spherical bearing end piece code in your order. These two items are supplied not installed on the cylinder.
(1) Add the stroke to this value

NOTA: Alignment compensator rod end, see page P227-12

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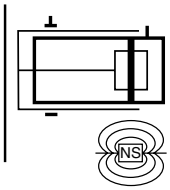
: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

Series 442
Type: **KN**-L-DM

SHORT STROKE CYLINDERS Ø 20 - 25 mm

WITH A ROTATION-PROOF DEVICE ON THE BEARING-ROD
Conforming with AFNOR NF E 49-004-2 standards
Double acting cylinder equipped for magnetic position detectors



SPECIFICATIONS

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	-20°C, +70°C
CYLINDER BORE	:	20 - 25 mm
STROKE	:	5 to 100 mm
MAX. SPEED	:	0,5 m/s

CONSTRUCTION

Body	:	aluminium alloy
Rod	:	stainless steel
Load carrying plate	:	light alloy
Guide rod	:	stainless steel
Piston	:	acetal resin (POM) or light alloy fitted with a permanent annular magnet
Piston seal	:	polyurethane (PUR)
Front and rear ends	:	aluminium alloy
Bearing	:	self lubricating
Mounting	:	front or rear with screw (not supplied)

CHOICE OF EQUIPMENT

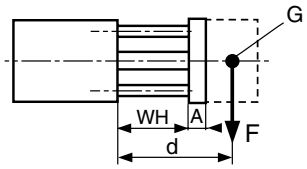
Bore Ø (mm)	CODES	REFERENCES (2)	Recommended standards strokes (mm)								Max. stroke capability (mm)	Connection Ø
			5	10	15	20	25	30	40	50		
20	**442 50 033** .... (1)	KN 20 D ... (1) L - DM	●	●	●	❊	❊	❊	❊	❊	60	M5
25	**442 50 034** .... (1)	KN 25 D ... (1) L - DM	●	●	●	●	❊	❊	❊	❊	90	M5

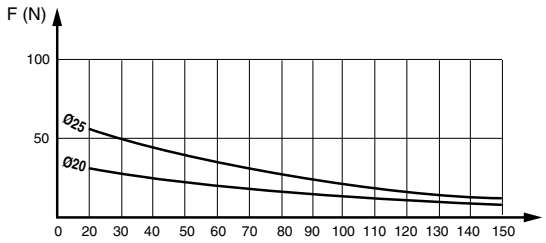
(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Do not exceed maximum possible stroke
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295) or COMPACT model, reed switch or magneto-resistive type (see P293)
Specifications for use: see installation leaflet
Tolerance on stroke length according to NF E 49-004 standards

● Recommended strokes according to NF E 49-004
❊ Other strokes available as standard

OPTION: Version non equipped for use with magnetic position detector

MAXIMUM ADMISSIBLE LOAD «F» ON THE ROD END





Projection distance "d" (en mm)

d = the projection distance (in mm) corresponding to the dimension WH + A + the stroke length + the distance from the load centre of gravity (G) to the mating surface of the cylinder flange

: The strokes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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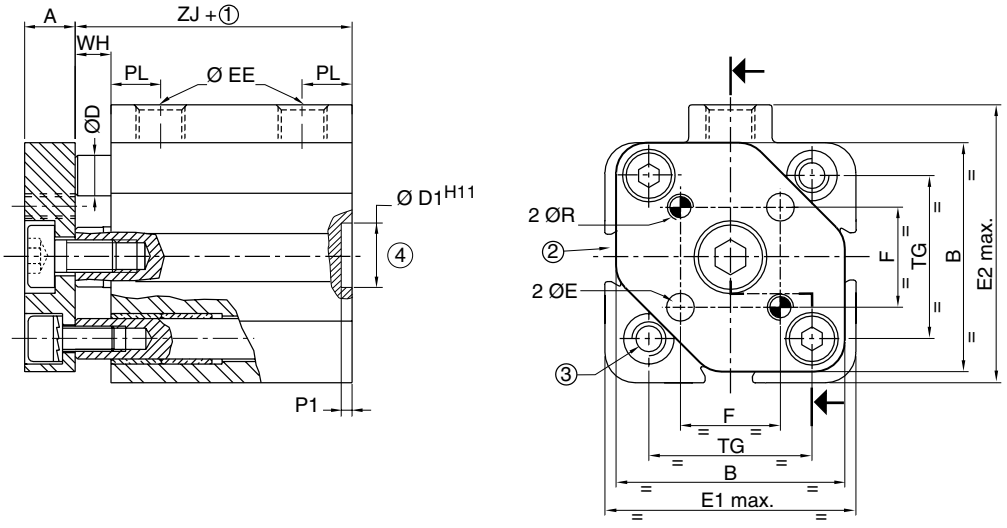
DIMENSIONS AND WEIGHTS

CYLINDERS Ø 20 to 25 mm

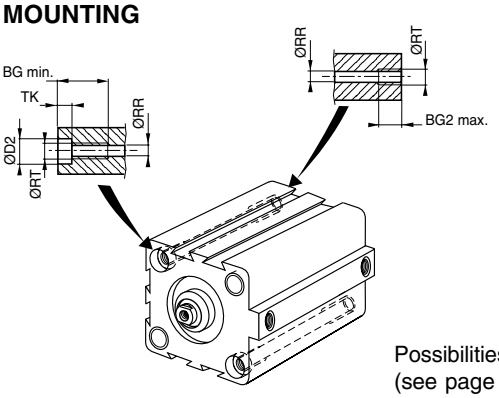


① : + stroke
② : Ø 20 - 25 mm = 1 track per face
③ : Mounting holes and counterboreds (see detailed view below and previous pages)
④ : Standard countersinking for centring at rear

Bore Ø (mm)	DIMENSIONS (mm)																			Weights (kg)	
	A	B	BG	ØD	ØD1	ØD2	ØE	ØEE	E1	E2	F	PL	P1	ØR	ØRR	ØRT	TG	TK	WH	ZJ	(5)	(6)
20	8	30,5	15	5	12	8	4,1	M5	36	44	12	7,8	2,5	M4	4,2	M5	22	4,7	6	43	0,110	0,0025
25	8	36,5	15	5	12	8	5,1	M5	40	48	15,6	9,3	2,5	M5	4,2	M5	26	4,7	6	45	0,160	0,003

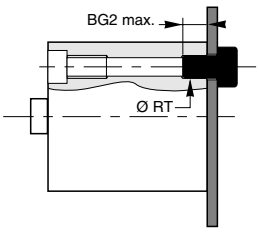
Tolerance on dimensions according to NF E 49-004 standards
(5) Cylinder weight with 0 mm stroke
(6) Weight to be added per additional mm length

MOUNTING



Possibilities front mounting
(see page P216-4)

Possibility rear mounting



Ø	BG2 max.
20	10
25	10

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

SINGLE OR DOUBLE ACTING CYLINDERS, Ø 8 to 25 mm
CONFORMING WITH ISO 6432 - CETOP - AFNOR STANDARDS

ISOCLAIR - SERIES 435 - TYPES : C-AS , CC-AS

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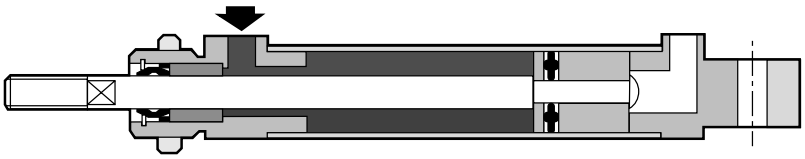
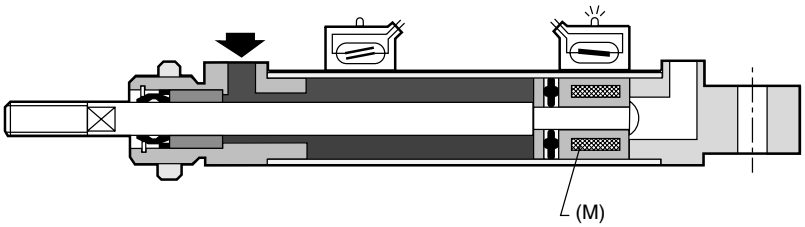
ASCO® JOUCOMATIC

OPERATIONAL DIAGRAMS

AIR CYLINDER NOT DESIGNED TO RECEIVE MAGNETIC DETECTOR



AIR CYLINDER DESIGNED TO RECEIVE MAGNETIC DETECTORS (reed switch or magneto-resistive)



Air cylinders equipped of a magnet (M) designed to operate in combination with the magnetic position detectors (DM).
These air cylinders can be equipped with one or more magnetic position detectors (without contact) attached to the tube by a clamp. They allow limit positions to be detected, as well as the intermediate piston positions.

DEFINING THE DIAMETER OF AN AIR CYLINDER - See forces defined on page P200-5

DEFINING THE PART NUMBER OF A Ø 8 to 25 mm ISOCLAIR AIR CYLINDER

C	**..**	**AS**	**...**	**SER** / **DM**

- ISOCLAIR air cylinder
- Air cylinder diameter (mm)
- Type ISOCLAIR Ø 8 to 25 mm
- Length of stroke (mm)
- For a single acting air cylinder: suffix **SER** = rod retracted when at rest, or **SES** = rod extented when at rest
- For a double acting air cylinder: no suffix
- Air cylinder designed to receive magnetic position detectors: add suffix **DM**

Note : Mountings and detectors should be ordered separately.

ORDERING

When ordering, please specify: **435 .. ...** + **... ...**

- The air cylinder standard code or part number
- The code or part number of any option(s)
- The code or codes and quantity of any mountings : **439 .. ...**
- The code and quantity of any magnetic detectors : **881 .. ...**
- The code and quantity of detector mountings : **881 .. ...**

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

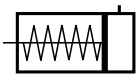
Series 435
Type : C-AS
C-AS/DM

Ø 8 - 25 mm SINGLE ACTING CYLINDERS

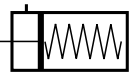
equipped or non-equipped for magnetic detectors
Conforming with ISO-CETOP-AFNOR standards

With elastic cushioning ISOCLAIR

SER



SES



2

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 2 to 10 bar
TEMPERATURE : 0°C, + 70°C
STANDARDS : **ISO 6432 - 8140 - 8139**
CETOP RP 52 P - RP 102 P - RP 103 P
AFNOR NF E 49-030

Minimum pressure to compress the spring : 2 bar (SER and SES)
The return of the piston rod must be without load
The dimensions of the single acting returned rod version (SER type) are identical to those of the double acting version
The length of the SES version is twice the nominal stroke.

CONSTRUCTION

	Cylinder non-equipped for magnetic detectors	**Cylinder equipped for magnetic detectors**	
Barrel	: stainless steel	: non-magnetic stainless steel	good resistance to corrosive elements
Rod	: stainless steel	: stainless steel	
Front and rear covers	: anodized light alloy	: anodized light alloy	
Piston	: acetal resin (POM) and light alloy	: acetal resin (POM) and light alloy equipped with permanent magnet	
Piston seals	: polyurethane (PUR)	: polyurethane (PUR)	
Neck nut	: galvanized steel	: galvanized steel	
Rod nut	: galvanized steel	: galvanized steel	
Dismounting	: cannot be dismounted	: cannot be dismounted	
Cushioning	: elastic	: elastic	

CHOICE OF EQUIPMENT

Bore in mm	Stroke in mm	**CODES** to specify on order	References to specify on order	**CODES** to specify on order	References to specify on order	Connection
STANDARD SINGLE ACTING CYLINDER			ROD RETURNED at rest		ROD OUT at rest	
8	25 50	**435 00 254** **435 00 255**	C 8 AS 25 - SER C 8 AS 50 - SER	—	—	M 5
10	25 50	**435 00 256** **435 00 257**	C 10 AS 25 - SER C 10 AS 50 - SER	—	—	M 5
12	25 50	**435 00 083** **435 00 084**	C 12 AS 25 - SER C 12 AS 50 - SER	**435 00 218** **435 00 219**	C 12 AS 25 - SES C 12 AS 50 - SES	M 5
16	25 50	**435 00 085** **435 00 086**	C 16 AS 25 - SER C 16 AS 50 - SER	**435 00 220** **435 00 221**	C 16 AS 25 - SES C 16 AS 50 - SES	M 5
20	25 50	**435 00 087** **435 00 088**	C 20 AS 25 - SER C 20 AS 50 - SER	**435 00 222** **435 00 223**	C 20 AS 25 - SES C 20 AS 50 - SES	G 1/8
25	25 50	**435 00 089** **435 00 090**	C 25 AS 25 - SER C 25 AS 50 - SER	**435 00 224** **435 00 225**	C 25 AS 25 - SES C 25 AS 50 - SES	G 1/8
SINGLE ACTING CYLINDER EQUIPPED FOR MAGNETIC DETECTORS *						
			ROD RETURNED at rest			
8	25 50	**435 00 258** **435 00 259**	C 8 AS 25 - SER/DM C 8 AS 50 - SER/DM	—	—	M 5
10	25 50	**435 00 260** **435 00 261**	C 10 AS 25 - SER/DM C 10 AS 50 - SER/DM	—	—	M 5
12	25 50	**435 00 262** **435 00 263**	C 12 AS 25 - SER/DM C 12 AS 50 - SER/DM	—	—	M 5
16	25 50	**435 00 264** **435 00 265**	C 16 AS 25 - SER/DM C 16 AS 50 - SER/DM	—	—	M 5
20	25 50	**435 00 266** **435 00 267**	C 20 AS 25 - SER/DM C 20 AS 50 - SER/DM	—	—	G 1/8
25	25 50	**435 00 268** **435 00 269**	C 25 AS 25 - SER/DM C 25 AS 50 - SER/DM	—	—	G 1/8

* **The magnetic position detectors must be ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS (Dimensions, see next pages)

Cylinder bore in mm	**CODES** to specify on order Front or rear flange **MF8**	High foot (per unit) **MS3**	Rear trunnion	Female rod clevis ISO 8140 - RP102 P **AP2**	Spherical bearing rod end ISO 8139 - RP103 P **AP6**	Nek nut **MR3**
8	**439 00 189**	**439 00 191**	**439 00 190**	**439 00 193**	**439 00 194**	**439 00 192**
10						
12	**439 00 179**	**439 00 183**	**439 00 181**	**439 00 159**	**439 00 186**	**439 00 150**
16						
20	**439 00 180**	**439 00 184**	**439 00 182**	**439 00 161**	**439 00 187**	**439 00 151**
25				**434 00 016**	**434 00 001**	

Note: Mountings are identical to those of the double acting version shown next pages
Each cylinder is delivered with a neck nut

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

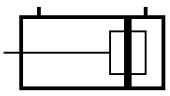
Series 435
Type : C-AS

DOUBLE ACTING CYLINDERS Ø 8 - 25 mm

Conforming with ISO-CETOP-AFNOR standards

With elastic cushioning

ISOCLAIR



SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : 0°C, + 70°C
STANDARDS : **ISO 6432 - 8140 - 8139**
CETOP RP 52 P - RP 102 P - RP 103 P
AFNOR NF E 49-030

CONSTRUCTION

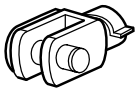
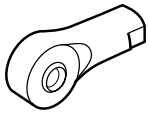
Barrel : stainless stell
Rod : stainless stell
Front and rear covers : anodized light alloy
} good resistance to external forces
Piston : acetal resin (POM) and light alloy
Piston seals : polyurethane (PUR)
Neck nut : galvanized steel
Rod nut : galvanized steel
Dismounting : cannot be dismounted
Cushioning : elastic

CHOICE OF EQUIPMENT

Bore in mm	Strokes in mm	**CODES** to specify on order	REFERENCES to specify on order	Con-nection
8	25	**435 00 271**	C 8 AS 25	M 5
	50	**435 00 272**	C 8 AS 50	
	80	**435 00 273**	C 8 AS 80	
	100	**435 00 274**	C 8 AS 100	
10	25	**435 00 277**	C 10 AS 25	M 5
	50	**435 00 278**	C 10 AS 50	
	80	**435 00 279**	C 10 AS 80	
	100	**435 00 280**	C 10 AS 100	
12	25	**435 00 066**	C 12 AS 25	M 5
	50	**435 00 067**	C 12 AS 50	
	80	**435 00 283**	C 12 AS 80	
	100	**435 00 069**	C 12 AS 100	

Bore in mm	Strokes in mm	**CODES** to specify on order	REFERENCES to specify on order	Con-nection
16	25	**435 00 070**	C 16 AS 25	M 5
	50	**435 00 071**	C 16 AS 50	
	80	**435 00 285**	C 16 AS 80	
	100	**435 00 073**	C 16 AS 100	
20	25	**435 00 074**	C 20 AS 25	G 1/8
	50	**435 00 075**	C 20 AS 50	
	80	**435 00 287**	C 20 AS 80	
	100	**435 00 077**	C 20 AS 100	
25	25	**435 00 078**	C 25 AS 25	G 1/8
	50	**435 00 079**	C 25 AS 50	
	80	**435 00 289**	C 25 AS 80	
	100	**435 00 081**	C 25 AS 100	
	160	**435 00 290**	C 25 AS 160	

MOUNTINGS

Cylinder bore in mm	**CODES** to specify on order					
	 Front or rear flange **MF8**	 High foot (per unit) **MS3**	 Rear trunnion	 Female rod clevis ISO 8140 - RP102 P **AP2**	 Spherical bearing rod end ISO 8139 - RP103 P **AP6**	 Nek nut **MR3**
8	**439 00 189**	**439 00 191**	**439 00 190**	**439 00 193**	**439 00 194**	**439 00 192**
10						
12	**439 00 179**	**439 00 183**	**439 00 181**	**439 00 159**	**439 00 186**	**439 00 150**
16						
20	**439 00 180**	**439 00 184**	**439 00 182**	**439 00 161**	**439 00 187**	**439 00 151**
25				**434 00 016**	**434 00 001**	

Each cylinder is delivered with a neck nut.

OPTIONS

- Other strokes on request
- Double crossbar for Ø 16-20-25 mm (max. stroke 300 mm)
- Barrel in stainless steel for Ø 16-20-25 mm : specify the codes of cylinders equipped for magnetic detectors (see opposite).
- Anti-corrosive version, stainless steel type CIX (see P252)

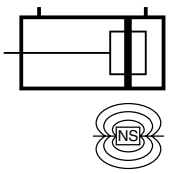
: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 435
Type : C-AS/DM

DOUBLE ACTING CYLINDERS Ø 8 - 25 mm

equipped for magnetic position detectors
Conforming with ISO-CETOP-AFNOR standards
With elastic cushioning
ISOCLAIR/DM



2

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : 0°C, + 70°C
STANDARDS : **ISO 6432 - 8140 - 8139**
CETOP RP 52 P - RP 102 P - RP 103 P
AFNOR NF E 49-030

CONSTRUCTION

Barrel : non magnetic stainless steel
Rod : stainless steel
Front and rear covers : anodized light alloy
(good resistance to corrosive elements)
Piston : acetal resin (POM) and light alloy
Piston seals : polyurethane (PUR)
Neck nut : galvanized steel
Rod nut : galvanized steel
Dismounting : cannot be dismounted
Cushioning : elastic

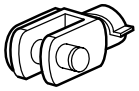
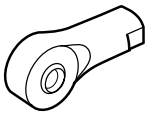
CHOICE OF EQUIPMENT

Bore in mm	Strokes in mm	**CODES** ✻ to specify on order	REFERENCES to specify on order	Con-nection
8	25	**435 00 291**	C 8 AS 25-DM	M 5
	50	**435 00 292**	C 8 AS 50-DM	
	80	**435 00 293**	C 8 AS 80-DM	
	100	**435 00 294**	C 8 AS100-DM	
10	25	**435 00 296**	C 10 AS 25-DM	M 5
	50	**435 00 297**	C 10 AS 50-DM	
	80	**435 00 298**	C 10 AS 80-DM	
	100	**435 00 299**	C 10 AS100-DM	
12	25	**435 00 301**	C 12 AS 25-DM	M 5
	50	**435 00 302**	C 12 AS 50-DM	
	80	**435 00 303**	C 12 AS 80-DM	
	100	**435 00 304**	C 12 AS100-DM	

Bore in mm	Strokes in mm	**CODES** ✻ to specify on order	REFERENCES to specify on order	Con-nection
16	25	**435 00 305**	C 16 AS 25-DM	M 5
	50	**435 00 306**	C 16 AS 50-DM	
	80	**435 00 307**	C 16 AS 80-DM	
	100	**435 00 308**	C 16 AS 100-DM	
20	25	**435 00 309**	C 20 AS 25-DM	G 1/8
	50	**435 00 310**	C 20 AS 50-DM	
	80	**435 00 311**	C 20 AS 80-DM	
	100	**435 00 312**	C 20 AS 100-DM	
25	25	**435 00 313**	C 25 AS 25-DM	G 1/8
	50	**435 00 314**	C 25 AS 50-DM	
	80	**435 00 315**	C 25 AS 80-DM	
	100	**435 00 316**	C 25 AS 100-DM	
	160	**435 00 317**	C 25 AS 160-DM	

✻ **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS

Cylinder bore in mm	**CODES** to specify on order					
	 Front or rear flange **MF8**	 High foot (per unit) **MS3**	 Rear trunnion	 Female rod clevis ISO 8140 - RP102 P **AP2**	 Spherical bearing rod end ISO 8139 - RP103 P **AP6**	 Nek nut **MR3**
8	**439 00 189**	**439 00 191**	**439 00 190**	**439 00 193**	**439 00 194**	**439 00 192**
10						
12	**439 00 179**	**439 00 183**	**439 00 181**	**439 00 159**	**439 00 186**	**439 00 150**
16						
20	**439 00 180**	**439 00 184**	**439 00 182**	**439 00 161**	**439 00 187**	**439 00 151**
25				**434 00 016**	**434 00 001**	

Each cylinder is delivered with a neck nut.

OPTIONS

- Other strokes on request
- Double crossbar Ø 16-20-25 mm (max. stroke 300 mm)

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

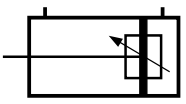
Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 435
Type : C-A
C-A/DM

DOUBLE ACTING CYLINDERS Ø 20 - 25 mm

equipped or non-equipped for magnetic detectors
Conforming with ISO-CETOP-AFNOR standards

With adjustable pneumatic cushioning ISOCLAIR



Cushioning length:
Ø 20 mm = 8 mm
Ø 25 mm = 10 mm

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : 0 °C, + 70 °C
STANDARDS : **ISO 6432 - 8140 - 8139**
CETOP RP 52 P - RP 102 P - RP 103 P
AFNOR NF E 49-030

CONSTRUCTION

	Cylinder non equipped for magnetic detectors	Cylinder equipped for magnetic detectors
Barrel	: stainless steel	: non-magnetic stainless steel
Rod	: stainless steel	: stainless steel
Front or rear covers	: anodized light alloy	: anodized light alloy
Piston	: acetal resin (POM) and light alloy	: acetal resin (POM) and light alloy equipped with permanent magnet
Piston seals	: polyurethane (PUR)	: polyurethane (PUR)
Neck nut	: galvanized steel	: galvanized steel
Rod nut	: galvanized steel	: galvanized steel
Dismounting	: cannot be dismounted	: cannot be dismounted
Cushioning	: pneumatic, adjustable from both sides	: pneumatic, adjustable from both sides

CHOICE OF EQUIPMENT

Bore in mm	Strokes in mm	CYLINDER NON EQUIPPED FOR DETECTORS		CYLINDER EQUIPPED FOR DETECTORS (-DM)		Weights (kg)	Connection
		CODES to specify on order	REFERENCES to specify on order	**CODES** * to specify on order	REFERENCES to specify on order		
20	25	**435 00 419**	C 20 A 25	**435 00 423**	C 20 A 25-DM	0,210	G 1/8
	50	**435 00 420**	C 20 A 50	**435 00 424**	C 20 A 50-DM	0,250	
	80	**435 00 421**	C 20 A 80	**435 00 425**	C 20 A 80-DM	0,300	
	100	**435 00 422**	C 20 A 100	**435 00 426**	C 20 A 100-DM	0,330	
25	25	**435 00 427**	C 25 A 25	**435 00 432**	C 25 A 25-DM	0,250	G 1/8
	50	**435 00 428**	C 25 A 50	**435 00 433**	C 25 A 50-DM	0,300	
	80	**435 00 429**	C 25 A 80	**435 00 434**	C 25 A 80-DM	0,360	
	100	**435 00 430**	C 25 A 100	**435 00 435**	C 25 A 100-DM	0,400	
	160	**435 00 431**	C 25 A 160	**435 00 436**	C 25 A 160-DM	0,520	

* **Magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS

Cylinder bore in mm	**CODES** to specify on order					
	Front or rear flange **MF8**	High foot (per unit) **MS3**	Rear trunnion	Female rod clevis ISO 8140 - RP102 P **AP2**	Spherical bearing rod end ISO 8139 - RP103 P **AP6**	Nek nut **MR3**
20	**439 00 180**	**439 00 184**	**439 00 182**	**439 00 161**	**439 00 187**	**439 00 151**
25				**434 00 016**	**434 00 001**	

Each cylinder is delivered with a neck nut.

OPTION

Other strokes on request

DIMENSIONS

Cylinders with pneumatic and elastic cushioning have the same dimensions, see following pages.

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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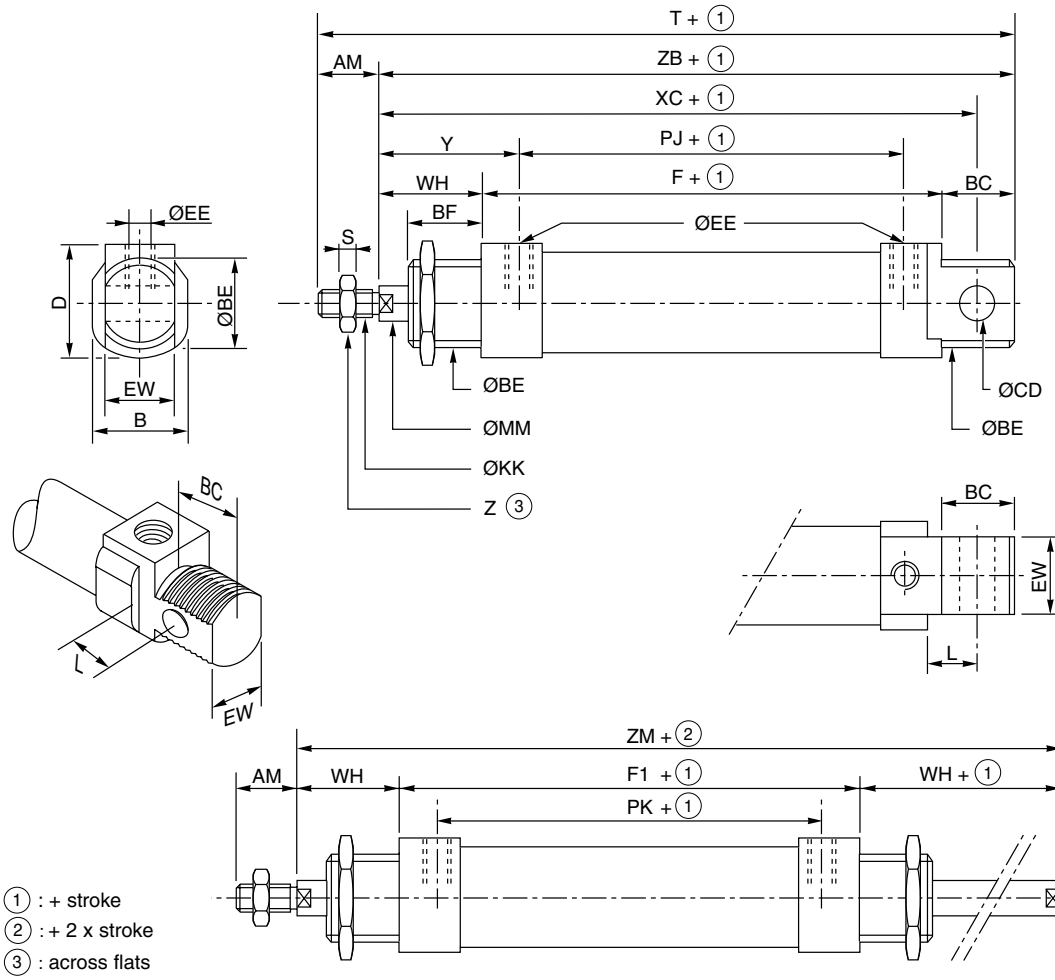
2

DIMENSIONS AND WEIGHTS

BARE CYLINDER (delivered with neck nut)



SINGLE ROD CYLINDER

DOUBLE ROD CYLINDER

(1) : + stroke
(2) : + 2 x stroke
(3) : across flats

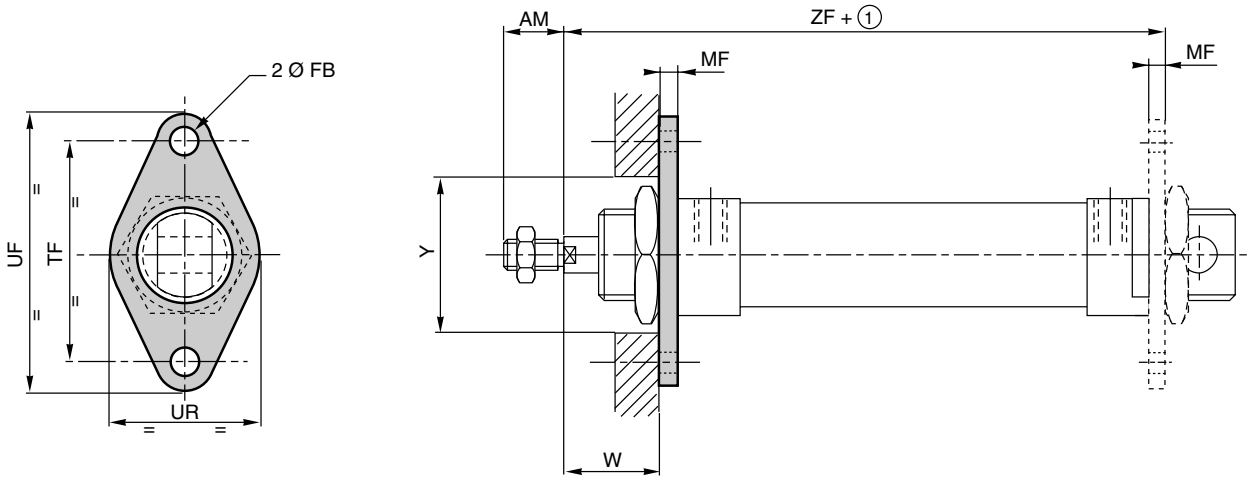
bore Ø (mm)	DIMENSIONS (mm)																		
	AM	B	BC	ØBE	BF	CD	D	EE	EW	F	F1	ØKK	L	MM	PJ	PK	S	T	WH
8	12	12	12	M12 x 1,25	12	4 H 9	18	M 5	8 d 13	46	—	M4 x 0,7	6	4	31	—	2	86	16
10	12	12	12	M12 x 1,25	12	4 H 9	18	M 5	8 d 13	46	—	M4 x 0,7	6	4	31	—	2	86	16
12	16	16	14	M16 x 1,5	14	6 H 11	20	M 5	12 d 11	48,7	48,7	M6 x 1	9	6	34,5	34,5	3	100,3	22
16	16	20	14	M16 x 1,5	14	6 H 11	21	M 5	12 d 11	55,7	52,7	M6 x 1	9	6	41,5	38,5	3	107,3	22
20	20	29	17,5	M22 x 1,5	17,5	8 H 11	29	G 1/8	16 d 11	64,2	64,2	M8 x 1,25	12	10	47,3	47,3	4	125,3	24
25	22	29	17,5	M22 x 1,5	17,5	8 H 11	30	G 1/8	16 d 11	69,5	69,5	M10 x 1,25	12	10	52,5	52,5	5	136,8	28

bore Ø (mm)	DIMENSIONS (mm)					Weights (Kg)	
	XC	Y	Z	ZB	ZM	(4)	(5)
8	64	23,5	7	74	—	0,030	0,020
10	64	23,5	7	74	—	0,030	0,040
12	75	29	10	84,5	93,4	0,070	0,090
16	81,5	29	10	91,5	97,4	0,100	0,100
20	95	32,5	13	103,5	113	0,170	0,160
25	104	36,5	17	115	126,5	0,200	0,200

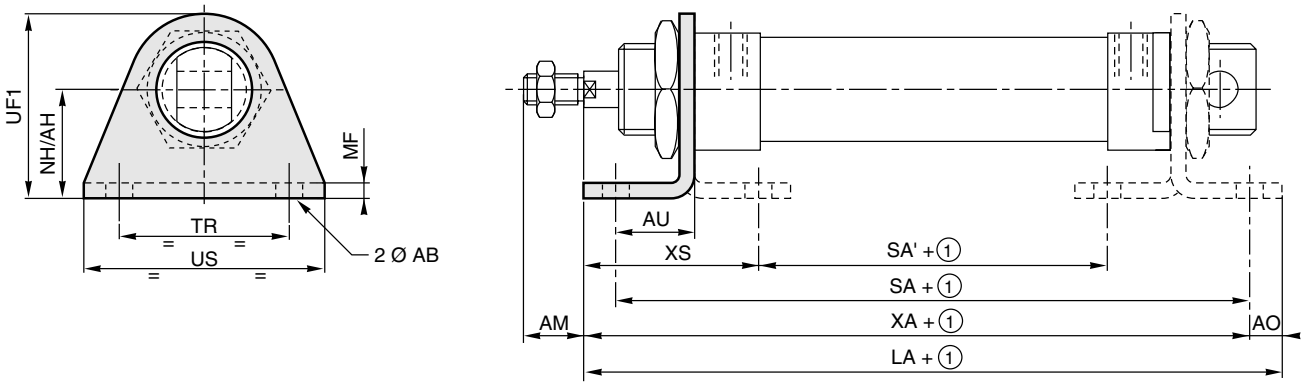
(4) Cylinder weight with 0 mm stroke.
(5) Weight to be added per additional 100 mm length.

NOTE :
- Single and double acting cylinders Ø 8 to 25 mm have the same dimensions.
- The length of the SES version is **twice** the nominal stroke.
- The mountings are always delivered separately.

DIMENSIONS
FRONT OR REAR MOUNTING FLANGE - MF8



HIGH FOOT MOUNTING - MS3
Foot mountings are supplied in single units, not in pairs.



① : + stroke

bore Ø (mm)	DIMENSIONS (mm)																			
	AM	AO	AU	ØAB ØFB	XA	LA	MF	NH AH	SA	SA'	TF	TR	UR	UF	UF1	US	W	XS	Y	ZF
8	12	5	11	4,5	72	78	3	16	68	30	30	25	22	40	26	35	13	24	22	65
10	12	5	11	4,5	72	78	3	16	68	30	30	25	22	40	26	35	13	24	22	65
12	16	6	14	5,5	84	90	4	20	76	28	40	32	30	52	32	42	18	32	22	74
16	16	6	14	5,5	90,5	96,5	4	20	82,5	34,5	40	32	30	52	32	42	18	32	22	80,5
20	20	9	17	6,6	104,5	113,5	5	25	97,5	39,5	50	40	40	64	45	54	19	36	31	92,5
25	22	9	17	6,6	113,5	122,5	5	25	102,5	44,5	50	40	40	64	45	54	23	40	31	101,5

bore Ø (mm)	WEIGHTS (kg)	
	Front or rear flange	Foot
8	0,020	0,030
10	0,020	0,030
12	0,020	0,050

bore Ø (mm)	WEIGHTS (kg)	
	Front or rear flange	Foot
16	0,020	0,050
20	0,040	0,100
25	0,040	0,100

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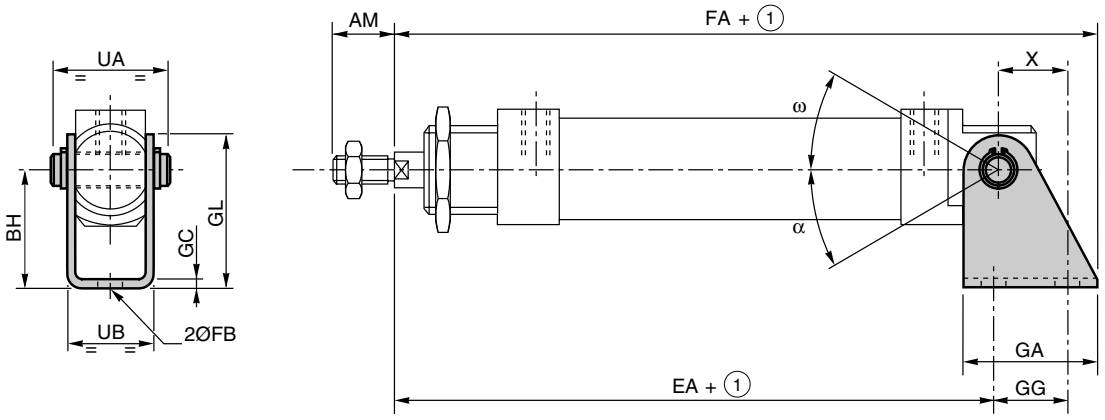
DIMENSIONS

REAR TRUNNION MOUNTING



(1) : + stroke

bore Ø (mm)	DIMENSIONS (mm)													
	AM	BH	EA	FA	FB	GA	GC	GG	GL	UA	UB	X	α	ω
8	12	24	62,7	79	4,5	20	2,5	12,5	29	18	13	11,2	7°	160°
10	12	24	62,7	79	4,5	20	2,5	12,5	29	18	13	11,2	7°	160°
12	16	27	72,5	93	5,5	25	3	16	34	25	18	13,5	50°	180°
16	16	27	79	99,5	5,5	25	3	16	34	25	18	13,5	47°	180°
20	20	30	91	117	6,6	32	4	20	40	32	24	16	8°	168°
25	22	30	100	126	6,6	32	4	20	40	32	24	16	8°	168°

bore Ø (mm)	WEIGHTS (Kg) Rear trunnion
8	0,020
10	0,020
12	0,050

bore Ø (mm)	WEIGHTS (Kg) Rear trunnion
16	0,050
20	0,080
25	0,080

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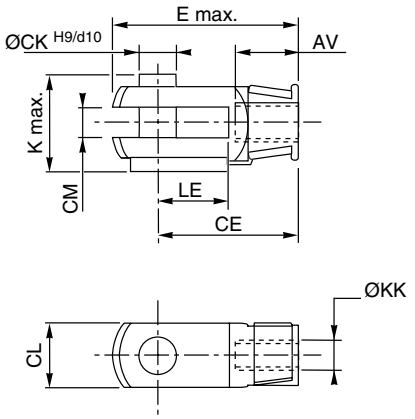
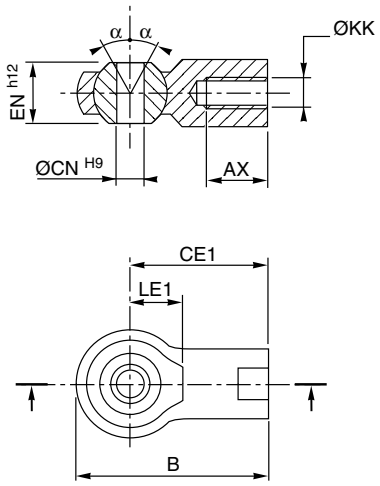
DIMENSIONS

FEMALE ROD CLEVIS - AP2
ISO 8140 - RP 102 P



SPHERICAL BEARING ROD END - AP6
ISO 8139 - RP 103 P



NECK NUT - MR3

bore Ø (mm)	DIMENSIONS (mm)																	
	AV-AX	B	ØBE	CE	CE1	ØCK	CL	CM	ØCN	E	EN	K	ØKK	KV	KW	LE	LE1	α
8	8	36	M12 x 1,25	16	27	4	8	$4^{+0,4}_{+0,1}$	5	22,5	8	11	M4 x 0,7	19	6	8	10	4°
10	8	36	M12 x 1,25	16	27	4	8	$4^{+0,4}_{+0,1}$	5	22,5	8	11	M4 x 0,7	19	6	8	10	4°
12	12	40	M16 x 1,5	24	30	6	12	$6^{+0,4}_{+0,1}$	6	33,5	9	16,5	M6 x 1	19	4	12	11	4°
16	12	40	M16 x 1,5	24	30	6	12	$6^{+0,4}_{+0,1}$	6	33,5	9	16,5	M6 x 1	19	4	12	11	4°
20	16	48	M22 x 1,5	32	36	8	16	$8^{+0,5}_{+0,15}$	8	45	12	22	M8 x 1,25	27	5	16	13	4°
25	20	57	M22 x 1,5	40	43	10	20	$10^{+0,5}_{+0,15}$	10	56	14	26	M10 x 1,25	27	5	20	15	4°

bore Ø (mm)	WEIGHTS (Kg)		
	Female clevis	Male clevis	Nut
8	0,010	0,020	0,010
10	0,010	0,020	0,010
12	0,020	0,030	0,010

bore Ø (mm)	WEIGHTS (Kg)		
	Female clevis	Male clevis	Nut
16	0,020	0,030	0,010
20	0,050	0,050	0,010
25	0,100	0,070	0,010

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SINGLE OR DOUBLE ACTING CYLINDERS, Ø 32 to 63 mm
CONFORMING WITH ISO 6431 - CETOP STANDARDS
ISOCLAIR - SERIES 438 - TYPE : CIS

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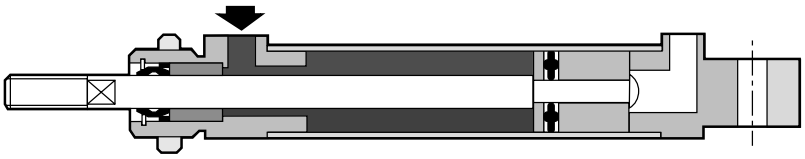
P225-GB-R2

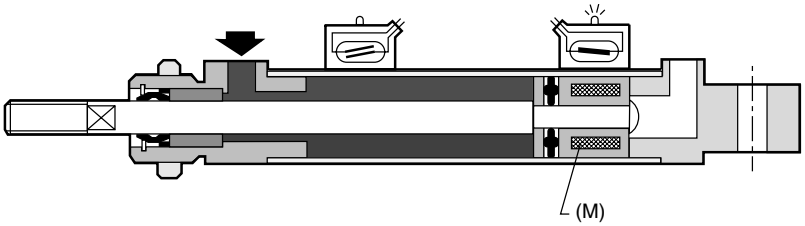
ASCO® JOUCOMATIC

OPERATIONAL DIAGRAMS

AIR CYLINDER NOT DESIGNED TO RECEIVE MAGNETIC DETECTOR
(air cylinder offered in uncushioned version with elastic cushioning)



AIR CYLINDER DESIGNED TO RECEIVE MAGNETIC DETECTORS (reed switch or magneto-resistive)



Air cylinders equipped of a magnet (M) designed to operate in combination with the magnetic position-detectors (DM).
These air cylinders can be equipped with one or more magnetic position detectors (without contact) attached to the tube by a clamp. They allow limit positions to be detected, as well as the intermediate piston positions.

DEFINING THE DIAMETER OF AN AIR CYLINDER - See forces defined, page P200-5

DEFINING THE PART NUMBER OF A Ø 32 to 63 mm ISOCLAIR AIR CYLINDER

CIS .. A/NA ... / DM

- Type ISOCLAIR Ø 32 to 63 mm
- Air cylinder diameter (mm)
- End-of-stroke adjustable pneumatic cushioning = suffix **A**
  Uncushioned (elastic cushioning) = suffix **NA**
- Length of stroke (mm)
- Air cylinder designed to receive magnetic position detectors : add suffix **DM**

Note : Mountings and detectors should be ordered separately.

ORDERING

When ordering, please specify : **438 .. ...** + **... ...**

- The air cylinder standard code or part number
- The code or part number of any option (s)
- The code or codes and quantity of any mountings : **439 .. ...**
- The code and quantity of any magnetic detectors : **881 .. ...**
- The code and quantity of detector mountings : **881 .. ...**

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Series 438
Type :
CIS-NA-SER

SINGLE ACTING CYLINDERS Ø 32 - 63 mm

equipped or non equipped for magnetic detectors
Conforming with ISO 6431-CETOP standards

With elastic cushioning ISOCLAIR

SER

2

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 2 to 10 bar
TEMPERATURE : -10 °C, + 70 °C
STANDARDS : **ISO 6431 - 8139 - 8140**
CETOP RP 43 P - RP 102 P - RP 103 P
The dimensions of the single acting cylinders (**25 mm strokes**) are identical to those of the double action.
The lengths of the single acting cylinders (**50 mm strokes**) are identical to those of the double acting version (50 + **25 mm** strokes).
FUNCTION : Single acting, returned rod version (ref. SER)
Minimum pressure to compress the spring : 2 bar
The return of the piston rod must be without load

CONSTRUCTION

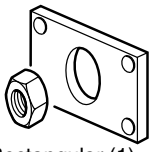
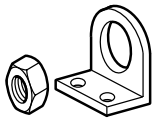
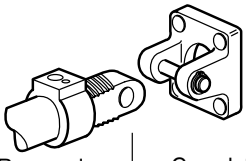
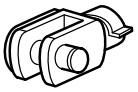
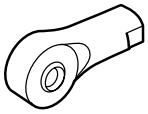
	Cylinder non equipped for magnetic detectors	Cylinder equipped for magnetic detectors
Barrel	: drawn steel	: hard anodized aluminium alloy
Rod	: hard chrome steel	: hard chrome steel
Front or rear covers	: light alloy	: light alloy
Piston	: acetal resin (POM) and steel	: acetal resinl (POM), steel, aluminium equipped with permanent magnet
Piston seals	: polyurethane (PUR)	: polyurethane (PUR)
Rod nut	: galvanized steel	: galvanized steel
Dismounting	: cannot be dismounted	: cannot be dismounted
Cushioning	: elastic	: elastic

CHOICE OF EQUIPMENT

Bore in mm	Strokes in mm	CYLINDER NON EQUIPPED FOR DETECTORS		CYLINDER EQUIPPED FOR DETECTORS (-DM) (NS)		Weights (kg)	Con-nection
		CODES to specify on order	REFERENCES to specify on order	**CODES** ✻ to specify on order	REFERENCES to specify on order		
32	25 50	**438 00 185** **438 00 186**	CIS 32 NA 25 SER CIS 32 NA 50 SER	**438 00 193** **438 00 194**	CIS 32 NA 25 SER-DM CIS 32 NA 50 SER-DM	0,390 0,450	G 1/8
40	25 50	**438 00 187** **438 00 188**	CIS 40 NA 25 SER CIS 40 NA 50 SER	**438 00 195** **438 00 196**	CIS 40 NA 25 SER-DM CIS 40 NA 50 SER-DM	0,780 0,900	G 1/4
50	25 50	**438 00 189** **438 00 190**	CIS 50 NA 25 SER CIS 50 NA 50 SER	**438 00 197** **438 00 198**	CIS 50 NA 25 SER-DM CIS 50 NA 50 SER-DM	0,170 1,300	G 1/4
63	25 50	**438 00 191** **438 00 192**	CIS 63 NA 25 SER CIS 63 NA 50 SER	**438 00 199** **438 00 200**	CIS 63 NA 25 SER-DM CIS 63 NA 50 SER-DM	1,740 1,930	G 3/8

✻ **Magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS

Cylinder bore in mm	**CODES** to specify on order						
	 Rectangular (1) front or rear flange **MF1 - MF2**	 Feet (2) **MS 1**	 Rear male trunnion **MP 4**	Complete trunnion **MP 2 + (MP 4) ✻**	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical bearing rod end ISO 8139 - RP103P **AP6**	 Neck nut **MR3**
32	**439 00 195**	**439 00 199**	Fitted to all standard cylinders	**434 00 031**	**434 00 016**	**434 00 001**	**439 00 203**
40	**439 00 196**	**439 00 200**		**434 00 032**	**434 00 017**	**434 00 002**	**439 00 204**
50	**439 00 197**	**439 00 201**		**434 00 033**	**434 00 018**	**434 00 003**	**439 00 205**
63	**439 00 198**	**439 00 202**		**434 00 034**			

(1) Flange delivered with a neck nut.
(2) Feet delivered in batches of two with 2 neck nuts.
NOTE : Mounting are indentical to those of the double acting version.
✻ MP 4 fixing being integral with the cylinder rear cover, only MP 2 mouting needs to be ordered.

OPTIONS

- Mountings performed with front or rear complete trunnions not standardised mountings : see next pages.
- Barrel in hard anodized aluminium alloy : specify the codes of cylinders equipped for magnetic detectors.
- For a single acting cylinder with rod out at rest (ref. SES), please consult us.

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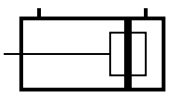
Series 438
Type : CIS-NA

DOUBLE ACTING CYLINDERS Ø 32 - 63 mm

Conforming with ISO-CETOP standards

With elastic cushioning

ISOCLAIR



SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : - 10°C, + 70°C
STANDARDS : **ISO 6431 - 8140 - 8139**
CETOP RP 43 P - RP 102 P - RP103 P

CONSTRUCTION

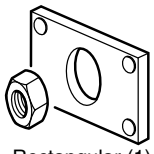
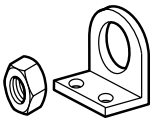
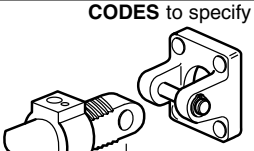
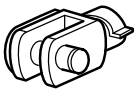
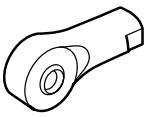
Barrel : drawn steel
Rod : hard chrome steel
Piston : acetal resin (POM) and steel
Piston seals : polyurethane (PUR)
Rod nut : galvanized steel
Dismounting : cannot be dismounted
Cushioning : elastic
Front and rear covers : light alloy

CHOICE OF EQUIPMENT

Bore in mm	Strokes in mm	**CODES** to specify on order	REFERENCES to specify on order	Con-nection
32	25	**438 00 177**	CIS 32 NA 25	G 1/8
	50	**438 00 057**	CIS 32 NA 50	
	100	**438 00 058**	CIS 32 NA 100	
	160	**438 00 059**	CIS 32 NA 160	
	200	**438 00 060**	CIS 32 NA 200	
	250	**438 00 061**	CIS 32 NA 250	
40	25	**438 00 178**	CIS 40 NA 25	G 1/4
	50	**438 00 062**	CIS 40 NA 50	
	100	**438 00 063**	CIS 40 NA 100	
	160	**438 00 064**	CIS 40 NA 160	
	200	**438 00 065**	CIS 40 NA 200	
	250	**438 00 066**	CIS 40 NA 250	
	320	**438 00 067**	CIS 40 NA 320	
	400	**438 00 068**	CIS 40 NA 400	

Bore in mm	Strokes in mm	**CODES** to specify on order	REFERENCES to specify on order	Con-nection
50	25	**438 00 179**	CIS 50 NA 25	G 1/4
	50	**438 00 069**	CIS 50 NA 50	
	100	**438 00 070**	CIS 50 NA 100	
	160	**438 00 071**	CIS 50 NA 160	
	200	**438 00 072**	CIS 50 NA 200	
	250	**438 00 073**	CIS 50 NA 250	
	320	**438 00 074**	CIS 50 NA 320	
	400	**438 00 075**	CIS 50 NA 400	
63	25	**438 00 180**	CIS 63 NA 25	G 3/8
	50	**438 00 076**	CIS 63 NA 50	
	100	**438 00 077**	CIS 63 NA 100	
	160	**438 00 078**	CIS 63 NA 160	
	200	**438 00 079**	CIS 63 NA 200	
	250	**438 00 080**	CIS 63 NA 250	
	320	**438 00 081**	CIS 63 NA 320	
	400	**438 00 082**	CIS 63 NA 400	
	500	**438 00 083**	CIS 63 NA 500	

MOUNTINGS

Cylinder bore in mm	**CODES** to specify on order						
	 Rectangular (1) front or rear flange **MF 1 - MF 2**	 Feet (2) **MS 1**	 Rear male trunnion **MP 4**	Complete trunnion **MP 2 + (MP 4)** ❊	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical bearing rod end ISO 8139 - RP103P **AP6**	 Neck nut **MR3**
32	**439 00 195**	**439 00 199**	Fitted to all standard cylinders	**434 00 031**	**434 00 016**	**434 00 001**	**439 00 203**
40	**439 00 196**	**439 00 200**		**434 00 032**	**434 00 017**	**434 00 002**	**439 00 204**
50	**439 00 197**	**439 00 201**		**434 00 033**	**434 00 018**	**434 00 003**	**439 00 205**
63	**439 00 198**	**439 00 202**		**434 00 034**			

(1) Flange delivered with a neck nut
(2) Feet delivered in batches of two with 2 neck nuts
❊ Note : MP 4 fixing being integral with the cylinder rear cover, only MP 2 mounting needs to be ordered

OPTIONS

- Other strokes on request
- Mountings with front or rear complete trunnions not standardised mountings (see next pages)
- Double crossbar (max. stroke 600 mm - Ø 63 = 595 mm)
- Stainless steel rod : specify code **995 002**
- Stainless steel rod nut : specify code **995 019**
- Barrel in hard anodized aluminium alloy : specify the codes of the cylinders equipped for magnetic detectors
- Rod in chrome steel : for higher lengths, specify code **995 003** (please consult us)
- Custom rod end (please consult us)

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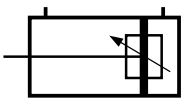
Series 438
Type : CIS-A

DOUBLE ACTING CYLINDERS Ø 32 to 63 mm

Conforming with ISO-CETOP standards

With adjustable pneumatic cushioning

ISOCLAIR



SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : - 10°C, + 70°C
STANDARDS : **ISO 6431 - 8140 - 8139**
CETOP RP 43 P - RP 102 P - RP103 P

CONSTRUCTION

Barrel : drawn steel
Rod : hard chrome steel
Piston : acetal resin (POM) and steel
Piston seals : polyurethane (PUR)
Rod nut : galvanized steel
Dismounting : Ø 32-40 : cannot be dismounted
: Ø 50-63 : can be dismounted
Cushioning : pneumatic, adjustable from both sides
Front and rear covers : light alloy

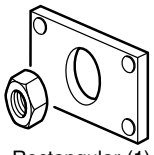
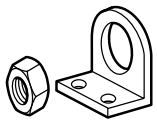
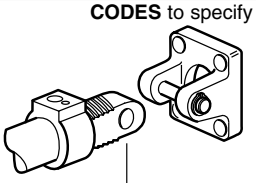
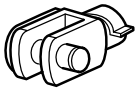
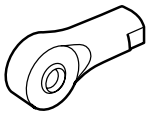
Cushioning length
Ø 32 mm = 14 mm
Ø 40 mm = 18 mm
Ø 50 mm = 18 mm
Ø 63 mm = 21 mm

CHOICE OF EQUIPMENT

Bore in mm	Strokes in mm	**CODES** to specify on order	REFERENCES to specify on order	Con-nection
32	50	**438 00 113**	CIS 32 A 50	G 1/8
	100	**438 00 114**	CIS 32 A 100	
	160	**438 00 115**	CIS 32 A 160	
	200	**438 00 116**	CIS 32 A 200	
	250	**438 00 117**	CIS 32 A 250	
40	50	**438 00 118**	CIS 40 A 50	G 1/4
	100	**438 00 119**	CIS 40 A 100	
	160	**438 00 120**	CIS 40 A 160	
	200	**438 00 121**	CIS 40 A 200	
	250	**438 00 122**	CIS 40 A 250	
	320	**438 00 123**	CIS 40 A 320	
	400	**438 00 124**	CIS 40 A 400	

Bore in mm	Strokes in mm	**CODES** to specify on order	REFERENCES to specify on order	Con-nection
50	50	**438 00 125**	CIS 50 A 50	G 1/4
	100	**438 00 126**	CIS 50 A 100	
	160	**438 00 127**	CIS 50 A 160	
	200	**438 00 128**	CIS 50 A 200	
	250	**438 00 129**	CIS 50 A 250	
	320	**438 00 130**	CIS 50 A 320	
	400	**438 00 131**	CIS 50 A 400	
63	50	**438 00132**	CIS 63 A 50	G 3/8
	100	**438 00 133**	CIS 63 A 100	
	160	**438 00 134**	CIS 63 A 160	
	200	**438 00 135**	CIS 63 A 200	
	250	**438 00 136**	CIS 63 A 250	
	320	**438 00 137**	CIS 63 A 320	
	400	**438 00 138**	CIS 63 A 400	
	500	**438 00 139**	CIS 63 A 500	

MOUNTINGS

Cylinder bore in mm	**CODES** to specify on order						
	 Rectangular (1) front or rear flange **MF 1 - MF 2**	 Feet (2) **MS 1**	 Rear male trunnion **MP 4**	Complete` trunnion **MP 2 + (MP 4) ❊**	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical bearing rod end ISO 8139 - RP103P **AP6**	 Neck nut **MR3**
32	**439 00 195**	**439 00 199**	Fitted to all standard cylinders	**434 00 031**	**434 00 016**	**434 00 001**	**439 00 203**
40	**439 00 196**	**439 00 200**		**434 00 032**	**434 00 017**	**434 00 002**	**439 00 204**
50	**439 00 197**	**439 00 201**		**434 00 033**	**434 00 018**	**434 00 003**	**439 00 205**
63	**439 00 198**	**439 00 202**		**434 00 034**			

(1) Flange delivered with a neck nut
(2) Feet delivered in batches of two with 2 neck nuts
❊ Note : MP 4 fixing being integral with the cylinder rear cover, only MP 2 mounting needs to be ordered

OPTIONS

- Others strokes on request
- Mountings with front or rear complete trunnions not standardised mountings (see next pages)
- Double crossbar (max. stroke 600 mm - Ø 63 = 595 mm)
- Stainless steel rod : specify code **995 002**
- Stainless steel rod nut : specify code **995 019**
- Barrel in hard anodized aluminium alloy : specify the codes of the cylinders equipped for magnetic detectors
- Rod in chrome steel : for higher lengths, specify code **995 003** (please consult us)
- Custom rod end (please consult us)

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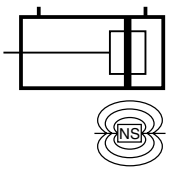
Series 438
Type : CIS-NA/DM

DOUBLE ACTING CYLINDERS Ø 32 - 63 mm

equipped for magnetic position detectors
Conforming with ISO-CETOP standards
With elastic cushioning
ISOCLAIR/DM



SPECIFICATIONS

FLUID	: air or neutral gas, filtered, lubricated or not
PRESSURE	: 10 bar max.
TEMPERATURE	: - 10°C, + 70°C
STANDARDS	: **ISO 6431 - 8140 - 8139** **CETOP RP 43 P - RP 102 P - RP103 P**

CONSTRUCTION

Barrel	: hard anodized aluminium
Rod	: hard chrome steel
Piston	: acetal resin (POM), steel, aluminium
Piston seals	: polyurethane (PUR)
Rod nut	: galvanized steel
Dismounting	: cannot be dismounted
Cushioning	: elastic
Front and rear covers	: light alloy

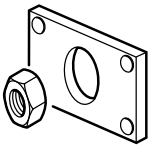
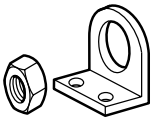
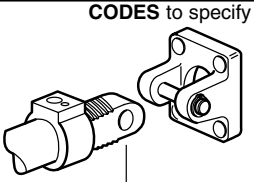
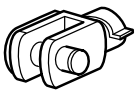
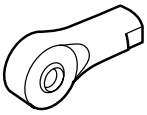
CHOICE OF EQUIPMENT

Bore in mm	Strokes in mm	**CODES** * to specify on order	REFERENCES to specify on order	Con-nection
32	25	**438 00 181**	CIS 32 NA 25-DM	G 1/8
	50	**438 00 085**	CIS 32 NA 50-DM	
	100	**438 00 086**	CIS 32 NA 100-DM	
	160	**438 00 087**	CIS 32 NA 160-DM	
	200	**438 00 088**	CIS 32 NA 200-DM	
	250	**438 00 089**	CIS 32 NA 250-DM	
40	25	**438 00 182**	CIS 40 NA 25-DM	G 1/4
	50	**438 00 090**	CIS 40 NA 50-DM	
	100	**438 00 091**	CIS 40 NA 100-DM	
	160	**438 00 092**	CIS 40 NA 160-DM	
	200	**438 00 093**	CIS 40 NA 200-DM	
	250	**438 00 094**	CIS 40 NA 250-DM	
	320	**438 00 095**	CIS 40 NA 320-DM	
	400	**438 00 096**	CIS 40 NA 400-DM	

Bore in mm	Strokes in mm	**CODES** * to specify on order	REFERENCES to specify on order	Con-nection
50	25	**438 00 183**	CIS 50 NA 25-DM	G 1/4
	50	**438 00 097**	CIS 50 NA 50-DM	
	100	**438 00 098**	CIS 50 NA 100-DM	
	160	**438 00 099**	CIS 50 NA 160-DM	
	200	**438 00 100**	CIS 50 NA 200-DM	
	250	**438 00 101**	CIS 50 NA 250-DM	
	320	**438 00 102**	CIS 50 NA 320-DM	
	400	**438 00 103**	CIS 50 NA 400-DM	
63	25	**438 00 184**	CIS 63 NA 25-DM	G 3/8
	50	**438 00 104**	CIS 63 NA 50-DM	
	100	**438 00 105**	CIS 63 NA 100-DM	
	160	**438 00 106**	CIS 63 NA 160-DM	
	200	**438 00 107**	CIS 63 NA 200-DM	
	250	**438 00 108**	CIS 63 NA 250-DM	
	320	**438 00 109**	CIS 63 NA 320-DM	
	400	**438 00 110**	CIS 63 NA 400-DM	
	500	**438 00 111**	CIS 63 NA 500-DM	

* **Magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS

Cylinder bore in mm	**CODES** to specify on order						
	 Rectangular (1) front or rear flange **MF 1 - MF 2**	 Feet (2) **MS 1**	 Rear male trunnion **MP 4**	Complete trunnion **MP 2 + (MP 4)** *	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical bearing rod end ISO 8139 - RP103P **AP6**	 Neck nut **MR3**
32	**439 00 195**	**439 00 199**	Fitted to all standard cylinders	**434 00 031**	**434 00 016**	**434 00 001**	**439 00 203**
40	**439 00 196**	**439 00 200**		**434 00 032**	**434 00 017**	**434 00 002**	**439 00 204**
50	**439 00 197**	**439 00 201**		**434 00 033**	**434 00 018**	**434 00 003**	**439 00 205**
63	**439 00 198**	**439 00 202**		**434 00 034**			

(1) Flange delivered with a neck nut
(2) Feet delivered in batches of two with 2 neck nuts
* Note : MP 4 fixing being integral with the cylinder rear cover, only MP 2 mounting needs to be ordered

OPTIONS

- Other strokes on request
- Mountings with front or rear complete trunnions not standardised mountings (see next pages)
- Double crossbar (max. stroke 600 mm - Ø 63 = 595 mm)
- Stainless steel rod : specify code **995 002**
- Stainless steel rod nut : specify code **995 019**
- Rod in chrome steel : for higher lengths, specify code **995 003** (please consult us)
- Custom rod end (please consult us)

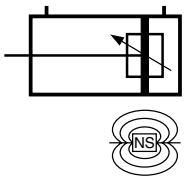
: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 438
Type : CIS-A/DM

DOUBLE ACTING CYLINDERS Ø 32 - 63 mm

equipped for magnetic position detectors
Conforming with ISO-CETOP standards
With adjustable pneumatic cushioning
ISOCLAIR/DM



SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : - 10°C, + 70°C
STANDARDS : **ISO 6431 - 8140 - 8139**
CETOP RP 43 P - RP 102 P - RP 103 P

CONSTRUCTION

Barrel : hard anodized aluminium alloy
Rod : hard chrome steel
Piston : acetal resin (POM), steel, aluminium
Piston seals : polyurethane (PUR)
Rod nut : galvanized steel
Dismounting : Ø 32-40 : cannot be dismounted
Ø 50-63 : can be dismounted
Cushioning : pneumatic, adjustable from both sides
Front and rear covers : light alloy

Cushioning length
Ø 32 mm = 14 mm
Ø 40 mm = 18 mm
Ø 50 mm = 18 mm
Ø 63 mm = 21 mm

CHOICE OF EQUIPMENT

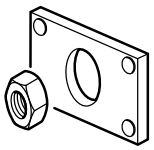
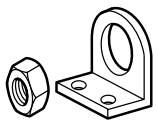
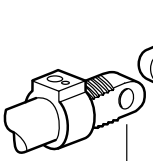
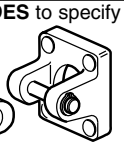
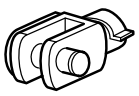
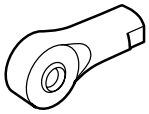
Bore in mm	Strokes in mm	**CODES** ✻ to specify on order	REFERENCES to specify on order	Con-nection
32	50	**438 00 141**	CIS 32 A 50-DM	G 1/8
	100	**438 00 142**	CIS 32 A 100-DM	
	160	**438 00 143**	CIS 32 A 160-DM	
	200	**438 00 144**	CIS 32 A 200-DM	
	250	**438 00 145**	CIS 32 A 250-DM	
40	50	**438 00 146**	CIS 40 A 50-DM	G 1/4
	100	**438 00 147**	CIS 40 A 100-DM	
	160	**438 00 148**	CIS 40 A 160-DM	
	200	**438 00 149**	CIS 40 A 200-DM	
	250	**438 00 150**	CIS 40 A 250-DM	
	320	**438 00 151**	CIS 40 A 320-DM	
	400	**438 00 152**	CIS 40 A 400-DM	

Bore in mm	Strokes in mm	**CODES** ✻ to specify on order	REFERENCES to specify on order	Con-nection
50	50	**438 00 153**	CIS 50 A 50-DM	G 1/4
	100	**438 00 154**	CIS 50 A 100-DM	
	160	**438 00 155**	CIS 50 A 160-DM	
	200	**438 00 156**	CIS 50 A 200-DM	
	250	**438 00 157**	CIS 50 A 250-DM	
	320	**438 00 158**	CIS 50 A 320-DM	
	400	**438 00 159**	CIS 50 A 400-DM	
63	50	**438 00 160**	CIS 63 A 50-DM	G 3/8
	100	**438 00 161**	CIS 63 A 100-DM	
	160	**438 00 162**	CIS 63 A 160-DM	
	200	**438 00 163**	CIS 63 A 200-DM	
	250	**438 00 164**	CIS 63 A 250-DM	
	320	**438 00 165**	CIS 63 A 320-DM	
	400	**438 00 166**	CIS 63 A 400-DM	
	500	**438 00 167**	CIS 63 A 500-DM	

✻ **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS

CODES to specify on order

Cylinder bore in mm	 Rectangular (1) front or rear flange **MF 1 - MF 2**	 Feet (2) **MS 1**	 Rear male trunnion **MP 4**	 Complete trunnion **MP 2 + (MP 4)** ❊	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical bearing rod end ISO 8139 - RP103P **AP6**	 Neck nut **MR3**
32	**439 00 195**	**439 00 199**	Fitted to all standard cylinders	**434 00 031**	**434 00 016**	**434 00 001**	**439 00 203**
40	**439 00 196**	**439 00 200**		**434 00 032**	**434 00 017**	**434 00 002**	**439 00 204**
50	**439 00 197**	**439 00 201**		**434 00 033**	**434 00 018**	**434 00 003**	**439 00 205**
63	**439 00 198**	**439 00 202**		**434 00 034**			

(1) Flange delivered with a neck nut
(2) Feet delivered in batches of two with 2 neck nuts
❊ Note : MP 4 fixing being integral with the cylinder rear cover, only MP 2 mounting needs to be ordered

OPTIONS

- Other strokes on request
- Mountings with front or rear complete trunnions not standardised mountings : (see next pages)
- Double crossbar (max. stroke 600 mm - Ø 63 = 595 mm)
- Stainless steel rod : specify code **995 002**
- Stainless steel rod nut : specify code **995 019**
- Rod in chrome steel : for higher lengths, specify code **995 003** (please consult us)
- Custom rod end (please consult us)

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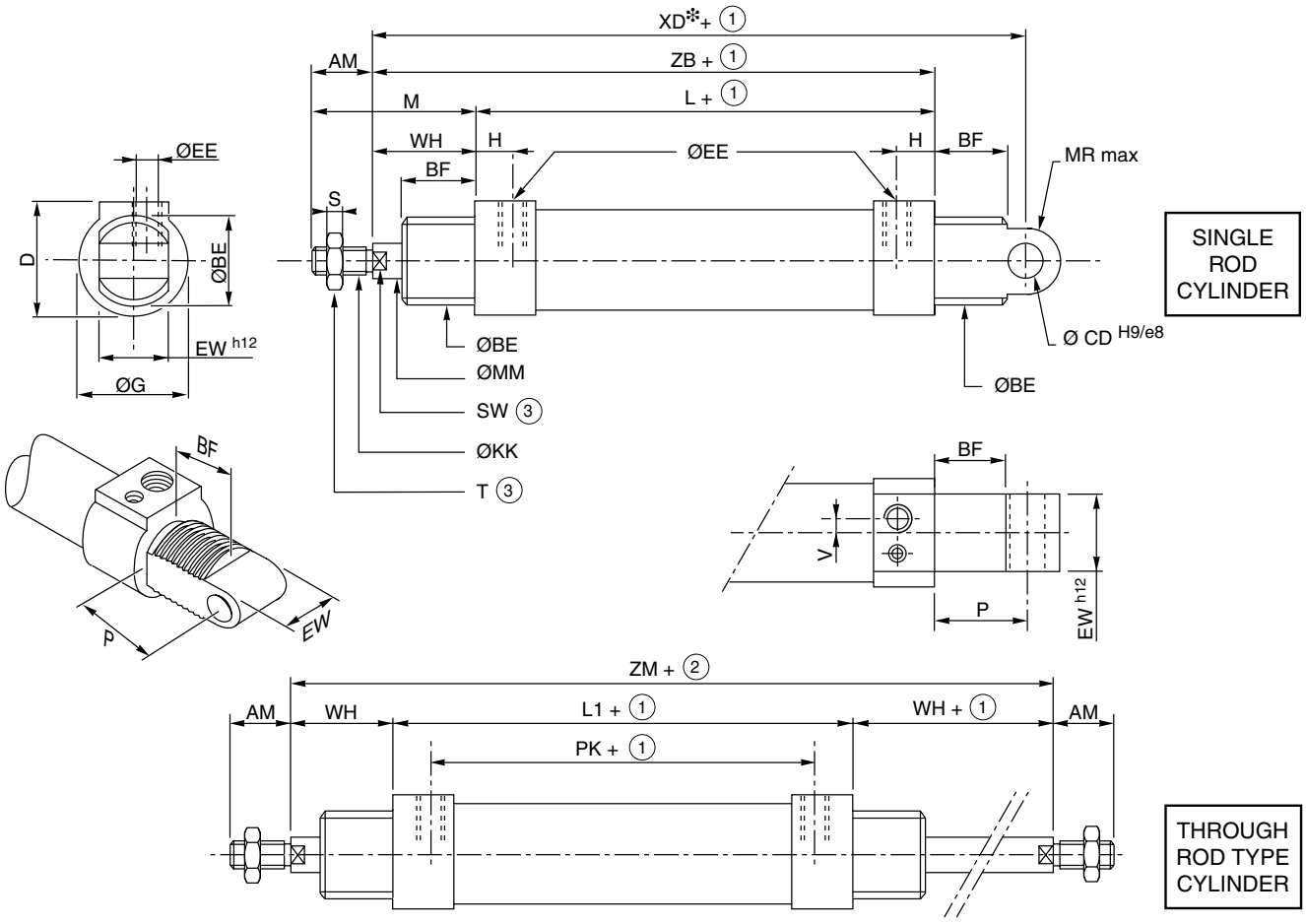
DIMENSIONS AND WEIGHTS

BARE CYLINDER (delivered without neck nut)



(1) : + stroke

(2) : + 2 strokes

(3) : across flats

Ø bore (mm)	DIMENSIONS (mm)																		
	AM	ØBE	BF	ØCD	D	ØEE	EW	ØG	H	ØKK	L	L1	M	ØMM	MR	P	PK	S	SW
32	22	M30 x 1,5	16	10	39	G 1/8	26	38	13,5	M10 x 1,25	92	102	49	12	11	24	75	5	10
40	24	M36 x 1,5	19	12	46	G 1/4	28	45	16,5	M12 x 1,25	107	126	53	18	13	24	93	6	13
50	32	M45 x 1,5	**(6)**	12	60	G 1/4	32	60	14	M16 x 1,5	110	129	67	18	13	25,5	101	8	16
63	32	M45 x 1,5	23	16	75	G 3/8	40	75,5	17	M16 x 1,5	125	143	67	22	17	31	109	8	16

Ø bore (mm)	DIMENSIONS (mm)						Weights (Kg)	
	T	V	WH	XD*	ZB*	ZM	(4)	(5)
32	16	3,5	27	143	119	156	0,280	0,260
40	18	4,7	29	160	136	184	0,600	0,400
50	24	5,2	35	170	145	199	0,950	0,450
63	24	5,5	35	191	160	213	1,400	0,700

* + 25 mm for single acting cylinders with 50 mm strokes.
(4) Cylinder weight with 0 mm stroke.
(5) Weight to be added per additional 100 mm length.
(6) BF front cover: 23,5 - BF rear cover: 18,5

Note : The mountings are always delivered separately.

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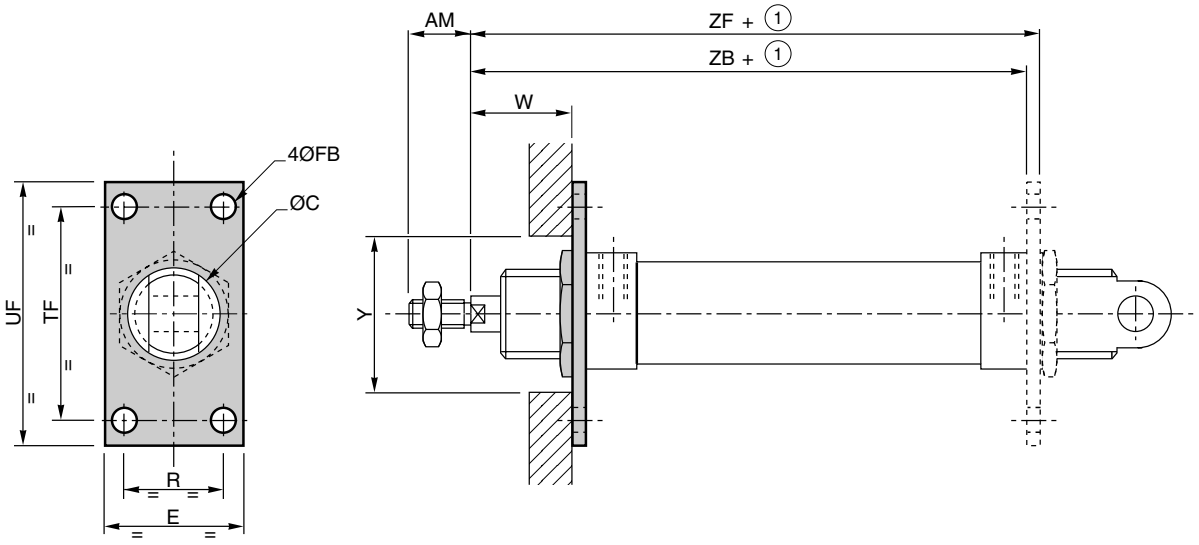
DIMENSIONS

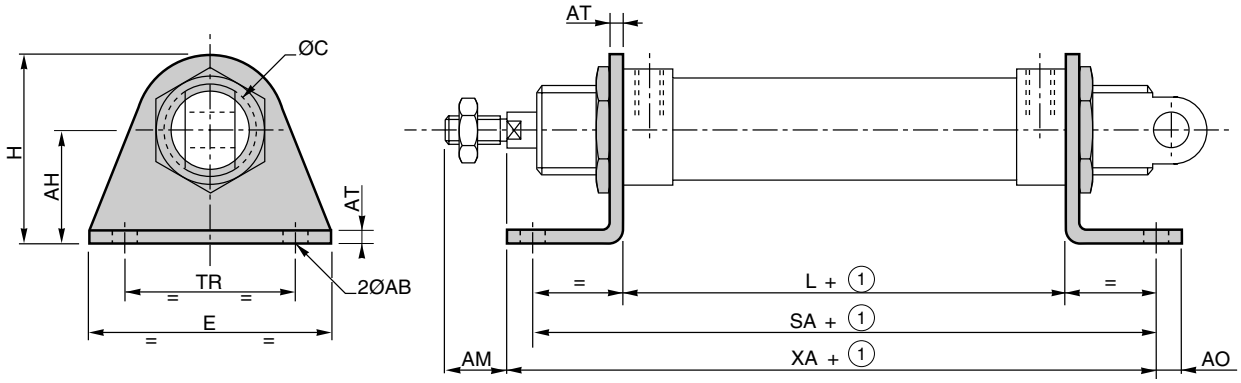
RECTANGULAR FRONT OR REAR MOUNTING FLANGE - MF1-MF2

Note : Flange delivered with a neck nut.



FOOT MOUNTING - MS1

Note : Feet mounting are supplied in batch of two with 2 neck nuts..



(1) : + stroke

Ø bore (mm)	DIMENSIONS (mm)																		
	AM	AO	ØC	E	ØAB ØFB	H	L*	AH	AT	R	SA*	TF	TR	UF	W	XA*	Y	ZB*	ZF*
32	22	6,5	30	45	7	51	92	32	3	32	142	64	32	80	16	144	45	119	130
40	24	8	36	52	9	60	107	36	3	36	161	72	36	90	20	163	53	136	145
50	32	10	45	75	9	73	110	45	4	45	170	90	45	110	25	175	70	145	155
63	32	10	45	75	9	85	125	50	4	50	185	100	50	120	25	190	70	160	170

* + 25 mm for single acting cylinders with 50 mm stroke.

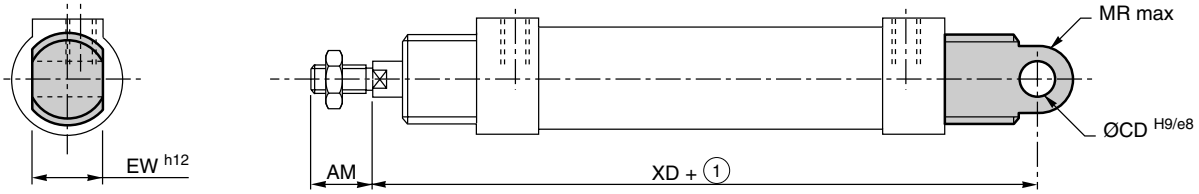
Ø bore	WEIGHTS (Kg)	
	Front or rear flange	2 feet
32	0,090	0,160
40	0,130	0,230

Ø bore	WEIGHTS (Kg)	
	Front or rear flange	2 feet
50	0,290	0,540
63	0,330	0,640

DIMENSIONS

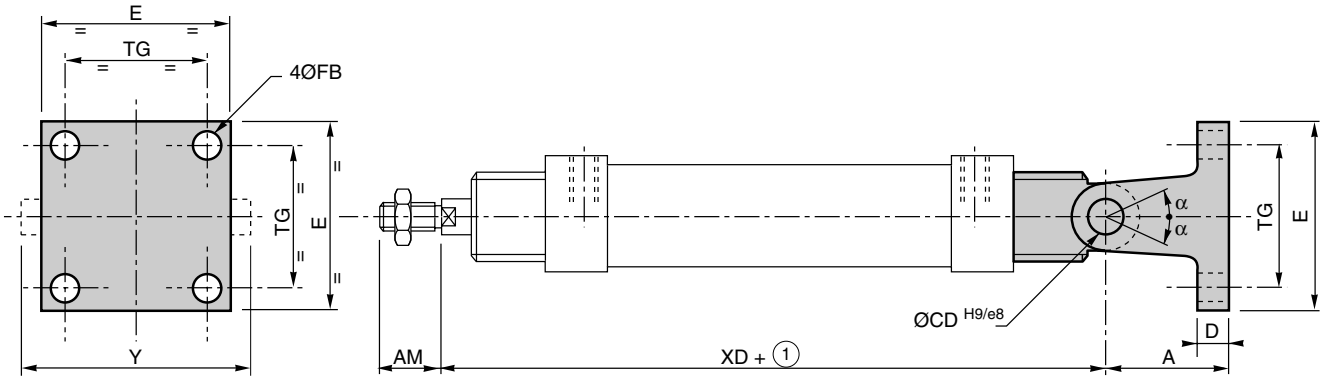
REAR MALE TRUNNION MOUNTING - MP4

Note : MP 4 mounting is built into the cylinder rear cover



COMPLETE TRUNNION MOUNTING - MP2 + MP4

Note : MP 4 fixing being integral with the cyliner rear cover, only MP 2 mounting needs to be ordered.



(1) : + stroke

Ø bore (mm)	DIMENSIONS (mm)											
	A	AM	ØCD	D	E	EW	FB	MR	TG	XD*	Y	α max
32	29	22	10	8	45	26	7	11	33	143	54	90°
40	22,5	24	12	7	52	28	7	13	40	160	62	83°
50	25,5	32	12	9	65	32	9	13	49	170	70	62°
63	30	32	16	9	75	40	9	17	59	191	80	77°

* + 25 mm for single acting cylinders with 50 mm strokes.

Ø bore	WEIGHTS (Kg) Complete trunnion
32	0,200
40	0,230

Ø bore	WEIGHTS (Kg) Complete trunnion
50	0,400
63	0,570

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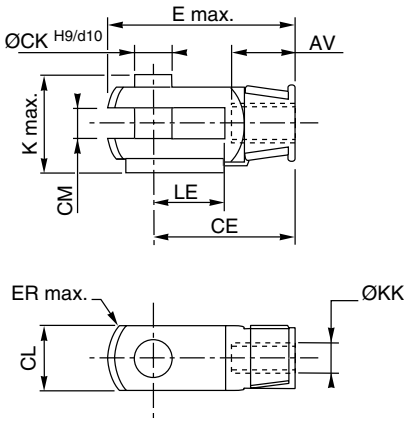
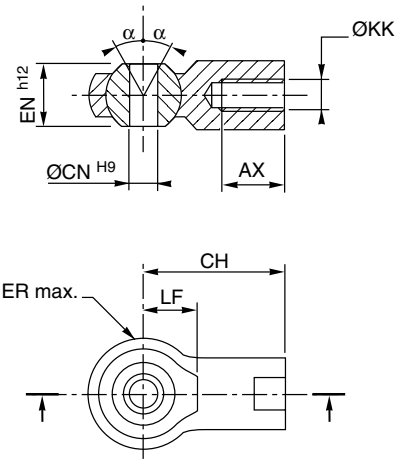
DIMENSIONS

FEMALE ROD CLEVIS - ISO 8140 - RP 102 P - AP2



SPHERICAL BEARING ROD END - ISO 8139 - RP 103 P - AP6



NECK NUT - MR3

Ø bore (mm)	DIMENSIONS (mm)																	
	AV-AX	ØB	CE	CH	ØCK	CL	CM	ØCN	E	EN	ER	K	ØKK	KV	KW	LE	LF	α max
32	20	M30 x 1,5	40	43	10	20	$10^{+0,5}_{+0,15}$	10	56	14	14	26	M10 x 1,25	35	10	20	15	4°
40	22	M36 x 1,5	48	50	12	24	$12^{+0,5}_{+0,15}$	12	67	16	16	32	M12 x 1,25	42	10	24	17	4°
50	28	M45 x 1,5	64	64	16	32	$16^{+0,5}_{+0,15}$	16	89	21	21	41	M16 x 1,5	60	12	32	22	4°
63	28	M45 x 1,5	64	64	16	32	$16^{+0,5}_{+0,15}$	16	89	21	21	41	M16 x 1,5	60	12	32	22	4°

Ø bore	WEIGHTS (Kg)		
	Rod clevis	Bearing rod end	Nut
32	0,100	0,070	0,030
40	0,150	0,120	0,040

Ø bore	WEIGHTS (Kg)		
	Rod clevis	Bearing rod end	Nut
50	0,330	0,220	0,140
63	0,330	0,220	0,140

REAR TRUNNION MOUNTING

FOR ISOCLAIR CYLINDER Ø 32 to 63 mm

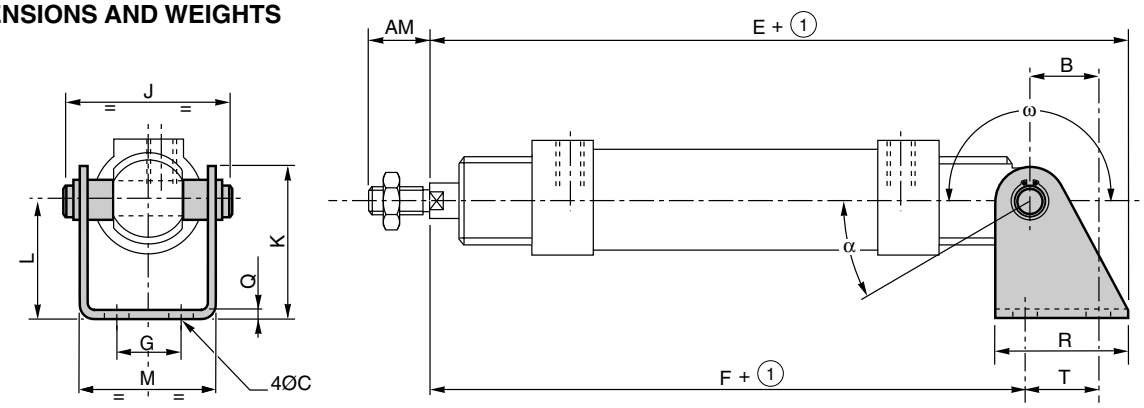
CODIFICATION

Rear trunnion mounting for ISOCLAIR cylinder (not ISO-standardized trunnion mounting)	Ø 32 mm	**439 00 206**
	Ø 40 mm	**439 00 207**
	Ø 50 mm	**439 00 208**
	Ø 63 mm	**439 00 209**

ORDER

On your order and in addition to the cylinder part number, please specify the quantity and the rear trunnion mounting code.
The rear trunnion mounting is delivered separately.

DIMENSIONS AND WEIGHTS



(1) + stroke

Ø cylinder (mm)	DIMENSIONS (mm)															Trunnion mounting weight (kg)
	AM	**B**	**C**	**E**	**F**	**G**	**J**	**K**	**L**	**M**	**Q**	**R**	**T**	α	ω	
32	22	20	7	171	139	20	52	47	35	46	4	40	24	35°	180°	0,140
40	24	27	9	197	157	28	62	53	40	56	5	50	30	30°	170°	0,250
50	32	30	9	210	166	36	75	59	45	69	6	54	34	20°	165°	0,360
63	32	38	9	243	193	42	89	66	50	82	6	65	35	20°	160°	0,520

FRONT TRUNNION MOUNTING

FOR ISOCLAIR CYLINDER Ø 32 to 63 mm

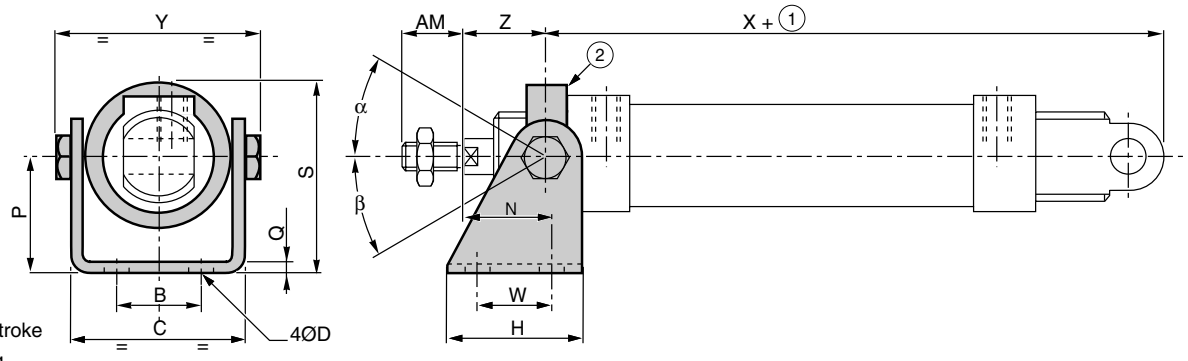
ORDER

On your order, please specify :
- The cylinder standard code or part number (see pages P225-3 to P225-7)
- The front trunnion mounting option code for ISOCLAIR cylinder (Not ISO-standardized trunnion mounting)

Ø 32 mm	**010 572**
Ø 40 mm	**010 573**
Ø 50 mm	**010 574**
Ø 63 mm	**010 575**

The cylinder and front trunnion mounting are supplied assembled

DIMENSIONS AND WEIGHTS



(1) + stroke
(2) ring

Ø cylinder (mm)	DIMENSIONS (mm)															Weight (kg)	
	AM	**B**	**C**	**D**	**H**	**N**	**P**	**Q**	**S**	**W**	**X**	**Y**	**Z**	**α**	**β**	(1)	(2)
32	22	28	56	9	50	$22^{\ 0}_{-0,5}$	40	5	63	30	$135^{+0,5}_{\ 0}$	64,5	$19^{\ 0}_{-0,5}$	30°	30°	0,540	0,260
40	24	36	69	9	54	$23,5^{\ 0}_{-0,5}$	45	6	73,5	34	$153,5^{+0,5}_{\ 0}$	77,5	$19,5^{\ 0}_{-0,5}$	30°	30°	1,050	0,400
50	32	42	82	9	65	$24^{\ 0}_{-1}$	50	6	85	35	$159,5^{+1}_{\ 0}$	90,5	$23^{\ 0}_{-1}$	30°	30°	1,600	0,450
63	32	60	106	11	80	$28,5^{\ 0}_{-1}$	65	8	110	50	$184,5^{+1}_{\ 0}$	116,5	$23,5^{\ 0}_{-1}$	30°	30°	2,300	0,700

(1) Weight of cylinder + rings and trunnion mountings for a 0 mm stroke.
(2) Weight to be added per 100 mm of additional stroke.

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

COMPACT CYLINDERS, Ø 32 to 100 mm

COMPATIBLE WITH

ISO 6431 - VDMA 24562 STANDARDS

SERIES 449 - TYPE : **PEC**

P227-GB.R3

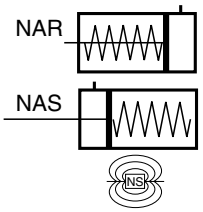
ASCO® JOUCOMATIC

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 449
Type: PEC - DM

COMPACT CYLINDERS Ø 32 to 100 mm SINGLE ACTING

Compatible with ISO-VDMA standards
equipped for magnetic position detectors



SPECIFICATIONS

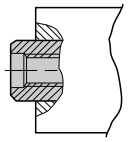
FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 2 to 10 bar max.
TEMPERATURE : -20°C, +70°C
CYLINDER BORE : 32 to 100 mm
STROKE : 5 to 25 mm
MAX. SPEED : 0,5 m/s
STANDARD : The diameters and distances between the centres of the mounting holes ensures that any fittings can be attached that comply with **ISO 6431-VDMA 24562**

Minimum pressure to compress the spring (NAR and NAS): Ø 32 - 50 = 1 bar
Ø 63 - 100 = 0,65 bar

The return of the piston rod must be without load

CONSTRUCTION

Barrel (non magnetic) : anodized aluminium alloy
Rod : hard chrome plated steel
Rod end : tapped or threaded
Piston : acetal resin (POM), or light alloy fitted with a permanent annular magnet
Piston seal : polyurethane (PUR)
Front and rear ends : aluminium alloy
Bearing : self lubricating
Cushioning : elastic



CHOICE OF EQUIPMENT (cylinder with **female threaded** rod end)

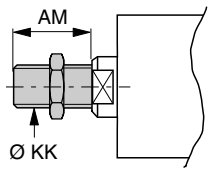
Bore Ø (mm)	Forces developed at 6 bar (daN)	Spring return force (daN)	CODES	REFERENCES (2)	Standards strokes (mm) 5	10	15	20	25	Connection Ø
SINGLE ACTING CYLINDER - **ROD RETURNED** at rest (NAR)										
32	40	3,2	**449 50 001** (1)	PEC 32 NAR (1) .... DM	●	●	●	●	●	G 1/8
40	60	4,5	**449 50 002** (1)	PEC 40 NAR (1) .... DM	●	●	●	●	●	G 1/8
50	100	4,9	**449 50 003** (1)	PEC 50 NAR (1) .... DM	●	●	●	●	●	G 1/8
63	160	7	**449 50 004** (1)	PEC 63 NAR (1) .... DM	●	●	●	●	●	G 1/8
80	270	8,9	**449 50 005** (1)	PEC 80 NAR (1) .... DM	●	●	●	●	●	G 1/8
100	430	7,4	**449 50 006** (1)	PEC 100 NAR (1) .... DM	●	●	●	●	●	G 1/4
SINGLE ACTING CYLINDER - **ROD OUT** at rest (NAS)										
32	35	3,2	**449 50 007** (1)	PEC 32 NAS (1) .... DM	●	●	●	●	●	G 1/8
40	50	4,5	**449 50 008** (1)	PEC 40 NAS (1) .... DM	●	●	●	●	●	G 1/8
50	87	4,9	**449 50 009** (1)	PEC 50 NAS (1) .... DM	●	●	●	●	●	G 1/8
63	140	7	**449 50 010** (1)	PEC 63 NAS (1) .... DM	●	●	●	●	●	G 1/8
80	245	8,9	**449 50 011** (1)	PEC 80 NAS (1) .... DM	●	●	●	●	●	G 1/8
100	390	7,4	**449 50 012** (1)	PEC 100 NAS (1) .... DM	●	●	●	●	●	G 1/4

(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Others strokes on request (min. 5, max. 25)
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)
or COMPACT model, reed switch or magneto-resistive type (see P293)
Specifications for use: see installation leaflet

CYLINDER WITH MALE THREADED ROD END

- Determine the cylinder code with the following table
- Add the threaded rod end fitting option-code

Bore Ø (mm)	OPTION - CODE	Ø KK	AM
32-40	**010 870**	M10x1,25	22
50-63	**010 871**	M12x1,25	24
80	**010 872**	M16x1,50	32
100	**010 873**	M16x1,50	32



Example: PEC single acting, rod returned, Ø 50 stroke 20 mm with male threaded rod end fitting - code = **449 50 003 0020** + **010 871**

MOUNTINGS: see following pages

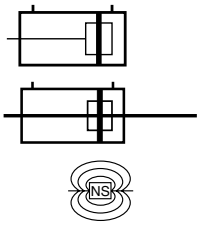
: The strokes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 449
Type: PEC-DM
PEC-DM-T2

COMPACT CYLINDERS Ø 32 to 100 mm DOUBLE ACTING

Compatible with ISO-VDMA standards
Single and through rod version
equipped for magnetic position detectors

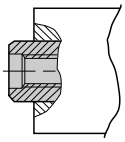


SPECIFICATIONS

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	-20°C, +70°C
CYLINDER BORE	:	32 to 100 mm
MAX. STROKE	:	400 mm
MAX. SPEED	:	0,5 m/s
STANDARD	:	The diameters and distances between the centres of the mounting holes ensures that any fittings can be attached that comply with **ISO 6431-VDMA 24562**

CONSTRUCTION

Barrel (non magnetic)	:	anodized aluminium alloy
Rod	:	hard chrome plated steel
Rod end		tapped or threaded
Piston	:	acetal resin (POM), or light alloy fitted with a permanent annular magnet
Piston seal	:	polyurethane (PUR)
Front and rear ends	:	aluminium alloy
Bearing	:	self lubricating
Cushioning	:	elastic



CHOICE OF EQUIPMENT (cylinder with **female threaded** rod end)

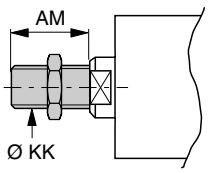
Bore Ø (mm)	CODES	REFERENCES (2)	Recommended standard stroke (mm) 5	10	15	20	25	50	80	100	125	160	200	250	320	400	Max. stroke capability (mm)	Connection Ø
SINGLE ROD CYLINDER																		
32	**449 50 013** (1)	PEC 32 NA (1) .... DM	●	●	●	●	●	●	●	●	●	●	●	●			400	G 1/8
40	**449 50 014** (1)	PEC 40 NA (1) .... DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
50	**449 50 015** (1)	PEC 50 NA (1) .... DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
63	**449 50 016** (1)	PEC 63 NA (1) .... DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
80	**449 50 017** (1)	PEC 80 NA (1) .... DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
100	**449 50 018** (1)	PEC 100 NA (1) .... DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/4
THROUGH ROD CYLINDER																		
32	**449 50 019** (1)	PEC 32 NA (1) DM-T2	●	●	●	●	●	●	●	●	●	●	●	●			400	G 1/8
40	**449 50 020** (1)	PEC 40 NA (1) DM-T2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
50	**449 50 021** (1)	PEC 50 NA (1) DM-T2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
63	**449 50 022** (1)	PEC 63 NA (1) DM-T2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
80	**449 50 023** (1)	PEC 80 NA (1) DM-T2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
100	**449 50 024** (1)	PEC 100 NA (1) DM-T2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/4

(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Do not exceed maximum possible stroke
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295) or COMPACT model, reed switch or magneto-resistive type (see P293)
Specifications for use: see installation leaflet

CYLINDER WITH MALE THREADED ROD END

- Determine the cylinder code with the following table
- Add the threaded rod end fitting option-code

Bore Ø (mm)	**OPTION - CODE** (Threaded rod end) **Single rod cylinder**	**Through rod cylinder** Male threaded end fitting on one side, female threaded rod end on other	**Through rod cylinder** Male threaded end fittings on both sides	Ø KK	AM
32-40	**010 870**	**010 870**	**010 875**	M10x1,25	22
50-63	**010 871**	**010 871**	**010 876**	M12x1,25	24
80	**010 872**	**010 872**	**010 877**	M16x1,50	32
100	**010 873**	**010 873**	**010 878**	M16x1,50	32



Exemple: PEC single acting, Ø 50 stroke 160 with male threaded rod end fitting - code = **449 50 015 0160** + **010 871**

MOUNTINGS: see following pages

OPTION: **Hollow through rod** for compact vacuum pick-up installation

: The strokes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 449
Type: PEC-FE-DM
PEC-RE-DM

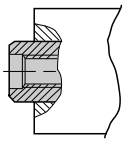
COMPACT CYLINDERS Ø 32 to 100 mm
DOUBLE ACTING WITH SUPPLIES ON THE SAME EXTREMITY
Compatible with AFNOR-ISO-VDMA
equipped for magnetic position detectors

SPECIFICATIONS

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	-20°C, +70°C
CYLINDER BORE	:	32 to 100 mm
MAX. STROKE	:	400 mm
STANDARD	:	The mounting holes diameter and the center distance of axes ensure the mounting of any standard fitting: **AFNOR NF E 49-003 - ISO 6431 - VDMA 24562**
FITTING MAXIMUM THREAD DEPTH	:	4.5 mm whatever the cylinder diameter is (see drawing below)

CONSTRUCTION

Barrel (non magnetic)	:	anodized aluminium alloy
Rod	:	hard chrome plated steel
Rod end	:	tapped or threaded
Piston	:	acetal resin (POM), or light alloy fitted with a permanent annular magnet
Piston seal	:	polyurethane (PUR)
Front and rear ends	:	aluminium alloy
Bearinge	:	self lubricating
Cushioning	:	elastic



CHOICE OF EQUIPMENT (cylinder with **female threaded** rod end) (**male threaded** rod end: see P227-2)

Bore Ø (mm)	CODES	REFERENCES (2)	Recommended standard stroke (mm) 5	10	15	20	25	50	80	100	125	160	200	250	320	400	Max. stroke capability (mm)	Connection Ø
SUPPLIES ON THE FRONT EXTREMITY																		
32	**449 50 025** (1)	PEC 32 NA (1) FE-DM	●	●	●	●	●	●	●	●	●	●	●	●			400	G 1/8
40	**449 50 026** (1)	PEC 40 NA (1) FE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
50	**449 50 027** (1)	PEC 50 NA (1) FE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
63	**449 50 028** (1)	PEC 63 NA (1) FE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
80	**449 50 029** (1)	PEC 80 NA (1) FE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
100	**449 50 030** (1)	PEC100 NA (1) FE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
SUPPLIES ON THE REAR EXTREMITY																		
32	**449 50 031** (1)	PEC 32 NA (1) RE-DM	●	●	●	●	●	●	●	●	●	●	●	●			400	G 1/8
40	**449 50 032** (1)	PEC 40 NA (1) RE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
50	**449 50 033** (1)	PEC 50 NA (1) RE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
63	**449 50 034** (1)	PEC 63 NA (1) RE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
80	**449 50 035** (1)	PEC 80 NA (1) RE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8
100	**449 50 036** (1)	PEC100 NA (1) RE-DM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	400	G 1/8

(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Do not exceed maximum possible stroke
(2) **The magnetic position detectors are ordered separately:** UNI model or COMPACT magneto-resistive or reed switch type (see P293 - P295)
Specifications for use: see installation leaflet

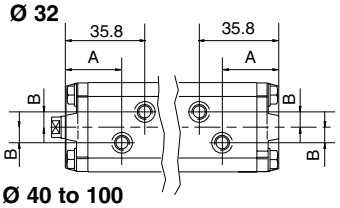
OPTION : Non equipped for magnetic position detectors (consult us)

MOUNTINGS: see following pages

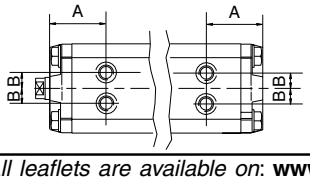
DIMENSIONS

Supply **on the front extremity** — Supply **on the rear extremity**

Ø 32



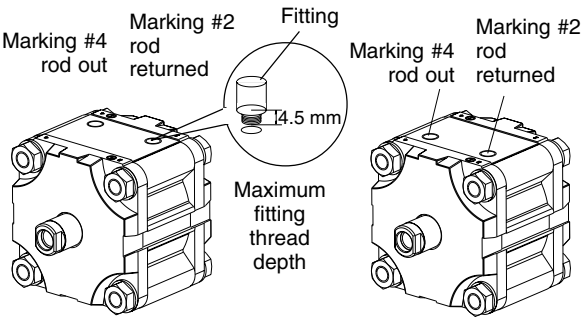
Ø 40 to 100



Ø Bore	A	B
32	25.8	6.5
40		9
50		12
63		17
80	28.3	22.5
100	31.3	28

SUPPLY PORTS

Supply **on the rear extremity** — Supply **on the front extremity**



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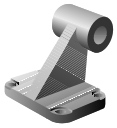
MOUNTINGS CONFORMING WITH ISO 6431 - VDMA 24562 STANDARDS

Bore Ø (mm)	**CODES** OF MOUNTINGS					
	 Low feet (2) **MS1**	 High foot (1) **MS3**	 Rectangular front or rear flange **MF1 - MF2**	 Cap, detachable clevis (3) **MP2**	 Cap, detachable eye (trunnion) **MP4**	 Angular clevis bracket **AB3**
32	**434 00 163**	**434 00 307**	**434 00 119**	**434 00 130**	**434 00 125**	**434 00 383**
40	**434 00 164**	**434 00 308**	**434 00 120**	**434 00 131**	**434 00 126**	**434 00 384**
50	**434 00 165**	**434 00 309**	**434 00 121**	**434 00 132**	**434 00 127**	**434 00 385**
63	**434 00 166**	**434 00 310**	**434 00 122**	**434 00 133**	**434 00 128**	**434 00 386**
80	**434 00 167**	**434 00 311**	**434 00 123**	**434 00 134**	**434 00 129**	**434 00 387**
100	**434 00 168**	**434 00 312**	**434 00 124**	**434 00 135**	**434 00 161**	**434 00 388**
Dimensions	page 6	page 9	page 6	page 7	page 7	page 8
Construction	Stamped sheet steel	Drawn steel	Steel	Light alloy	Light alloy	Light alloy

Bore Ø (mm)	**CODES** OF MOUNTINGS			
	 Female rod clevis ISO8140-RP102P **AP2**	 Spherical rod end ISO8139-RP103P **AP6**	 Male threaded rod end fitting	 Alignment (3) compensator
32	**434 00 016**	**434 00 001**	**434 00 482**	**434 00 242**
40	**434 00 016**	**434 00 001**	**434 00 482**	**434 00 242**
50	**434 00 017**	**434 00 002**	**434 00 483**	**434 00 243**
63	**434 00 017**	**434 00 002**	**434 00 483**	**434 00 243**
80	**434 00 018**	**434 00 003**	**434 00 484**	**434 00 244**
100	**434 00 018**	**434 00 003**	**434 00 485**	**434 00 244**
Dimensions	page 9	page 9	-	page 11
Construction	Steel	Steel	Steel	Steel

(1) High foot sold individually
(2) Corresponds to a set of 2 parts
(3) This accessorie allows accurate angular compensation adjustment spherical of 4° and radial of 0,7 mm
NOTA: The mountings are delivered separetely.
Can be mounted with rear cap and clevis spherical bearing (MP6 - AB5): see page P230-9

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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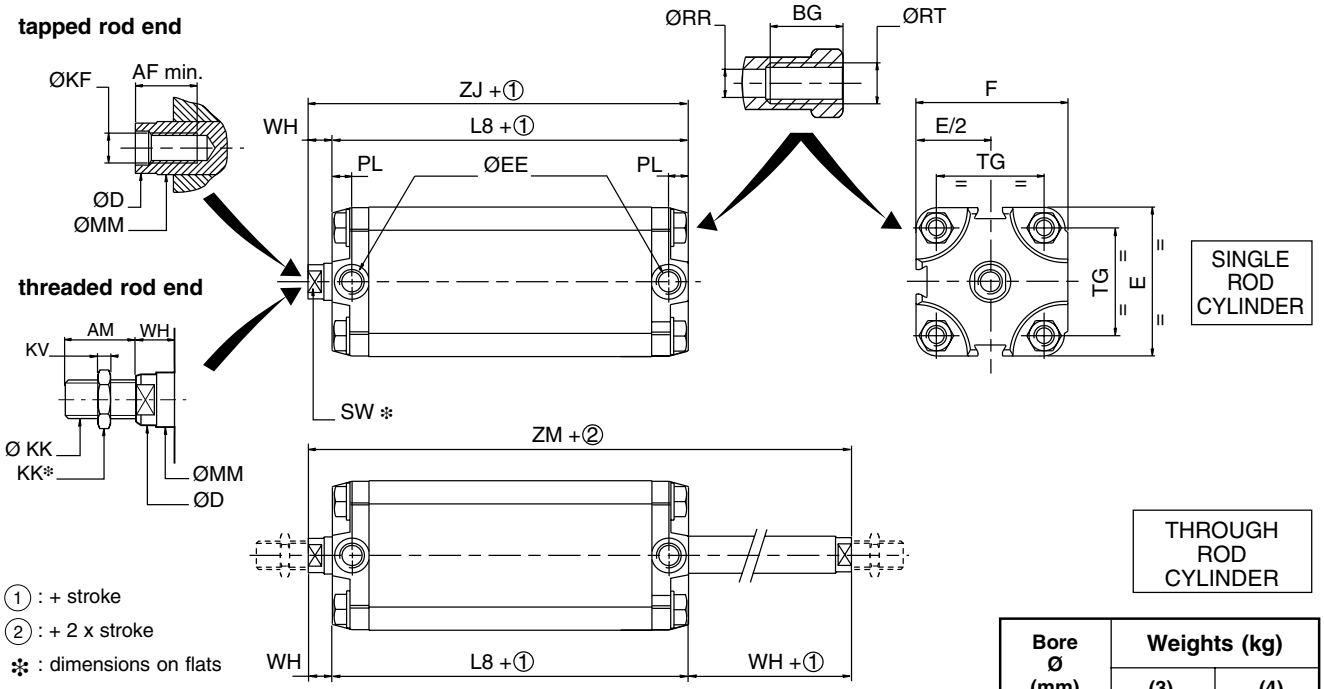
DIMENSIONS AND WEIGHTS - BARE CYLINDER



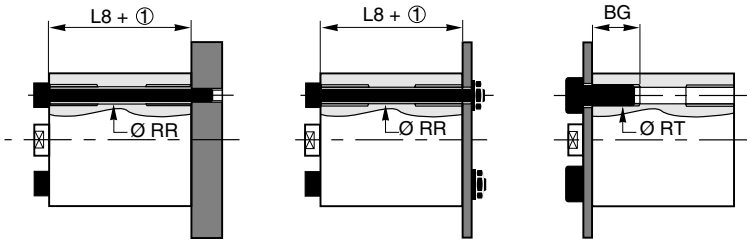
Bore Ø (mm)	Weights (kg)	
	(3)	(4)
32	0,210	0,0030
40	0,260	0,0033
50	0,390	0,0048
63	0,525	0,0055
80	0,930	0,0080
100	1,750	0,0110

Bore Ø (mm)	DIMENSIONS (mm)																		
	AF	BG	ØD	E	EE	F	ØKF	ØKK	KV	KW	L8	ØMM	PL	ØRR	ØRT	SW	TG	WH	ZJ	ZM
32	12	22	11,8	46	G1/8	47,5	M8x1,25	M10x1,25	16	5	48	12	8,5	5,1	M6	10	32,5	7	55	62
40	12	22	11,8	52	G1/8	53,5	M8x1,25	M10x1,25	16	5	48	12	8,5	5,1	M6	10	38	7	55	62
50	16	23,5	15,8	64,5	G1/8	66	M10x1,5	M12x1,25	18	6	48	16	8,5	6,7	M8	13	46,5	8	56	64
63	16	23,5	15,8	75	G1/8	76,5	M10x1,5	M12x1,25	18	6	51,5	16	8,5	6,7	M8	13	56,5	8	59,5	67,5
80	20	29,5	19,8	93	G1/8	94,5	M12x1,75	M16x1,50	24	8	56,5	20	8,9	8,5	M10	16	72	10	66,5	76,5
100	24	29,5	24,8	113	G1/4	114,5	M16x2	M16x1,50	24	8	67,5	25	11,5	8,5	M10	21	89	10	77,5	87,5

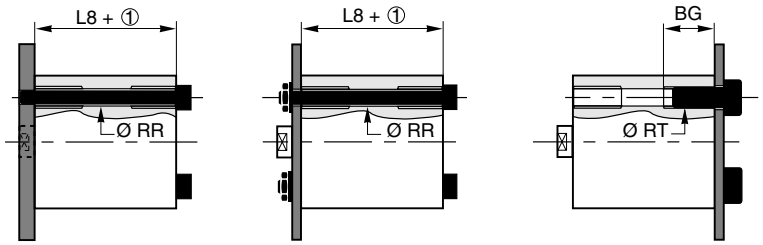
(3) Cylinder weight with 0 mm stroke.
(4) Weight to be added per additional mm length.

DIRECT MOUNTING OPTIONS (for short-stroke cylinders)
The threaded mounting holes and the four unthreaded through holes (Ø RR) ensure compatibility with a wide choice of screws and other fasteners recommended for short-stroke cylinders.

• Front mounting



• Rear mounting



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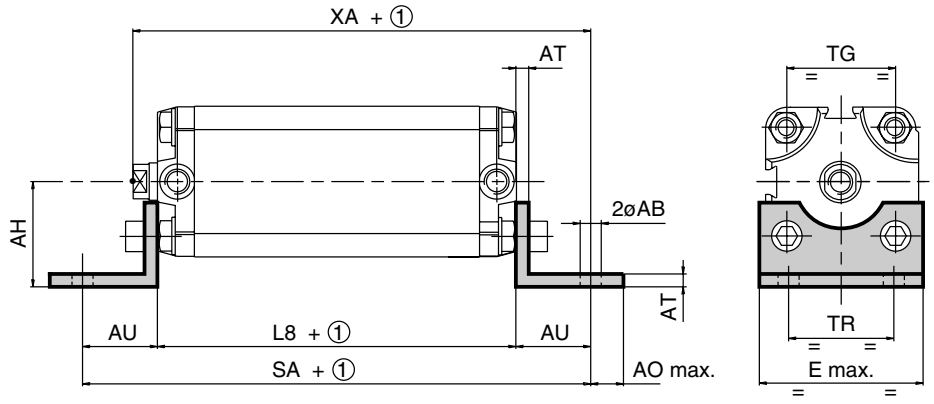
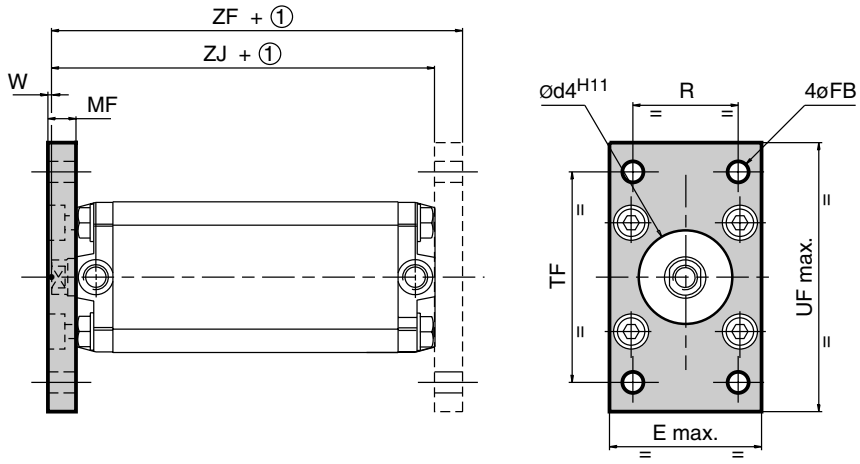
LOW FEET MOUNTING - MS1



RECTANGULAR FRONT OR REAR MOUNTING FLANGE - MF1 - MF2



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																		
	ØAB	AO	AH	AT	AU	Ød4	E	ØFB	L8	MF	R TR	SA	TF	TG	UF	W	XA	ZJ	ZF
32	7	11	32	4,5	24	30	50	7	48	10	32	96,5	64	32,5	86	3	79	55	65
40	10	15	36	4,5	28	35	58	9	48	10	36	104,5	72	38	96	3	83	55	65
50	10	15	45	5,5	32	40	70	9	48	12	45	111,5	90	46,5	115	4	87	56	67
63	10	15	50	5,5	32	45	85	9	51,5	12	50	116,5	100	56,5	130	4	91,5	59,5	71,5
80	12	20	63	6,5	41	45	105	12	56,5	16	63	139,5	126	72	165	6	107,5	66,5	82,5
100	14,5	25	71	6,5	41	55	130	14	67,5	16	75	150,5	150	89	187	6	117,5	77,5	93,5

Bore Ø (mm)	Weights (kg)	
	2 feet	Front or rear flange
32	0,150	0,240
40	0,190	0,240
50	0,395	0,500

Bore Ø (mm)	Weights (kg)	
	2 feet	Front or rear flange
63	0,445	0,580
80	0,790	1,390
100	1,400	1,630

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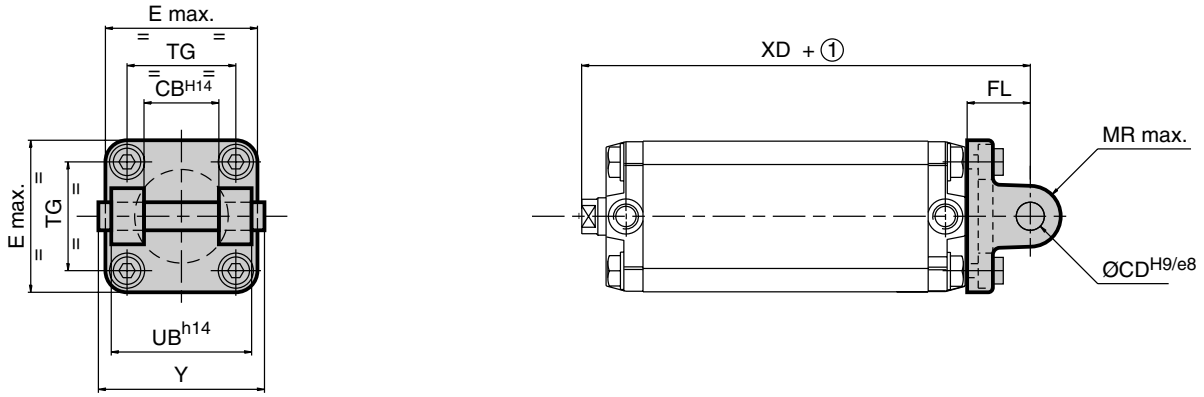
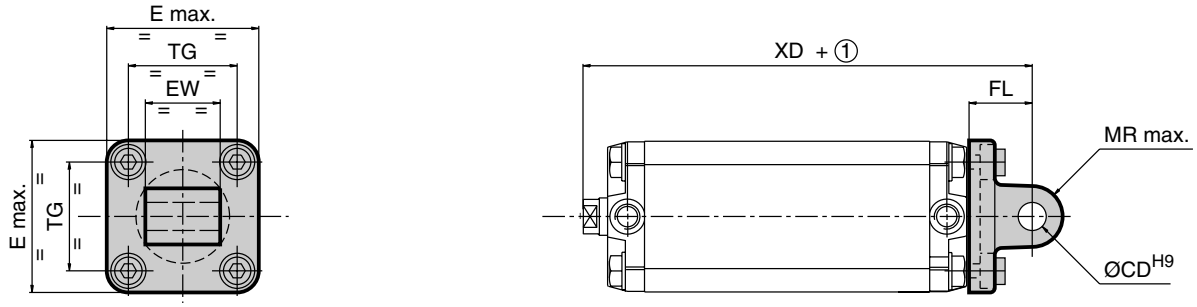
CAP, DETACHABLE CLEVIS MOUNTING - MP2



CAP, DETACHABLE EYE (TRUNNION) MOUNTING - MP4



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)									
	CB	ØCD	E	EW	FL	MR	TG	UB	XD	Y
32	26	10	50	26	22	11	32,5	45	77	56
40	28	12	58	28	25	13	38	52	80	63
50	32	12	70	32	27	13	46,5	60	83	71
63	40	16	85	40	32	17	56,5	70	91,5	81
80	50	16	105	50	36	17	72	90	102,5	101
100	60	20	130	60	41	21	89	110	118,5	128

Standard EW tolerances	
Ø 32...100 mm	- 0,2 EW - 0,6

Bore Ø (mm)	Weights (kg)	
	Cap, detachable clevis	Cap, detachable eye (trunnion)
32	0,105	0,085
40	0,150	0,092
50	0,240	0,170

Bore Ø (mm)	Weights (kg)	
	Cap, detachable clevis	Cap, detachable eye (trunnion)
63	0,370	0,250
80	0,635	0,445
100	0,990	0,755

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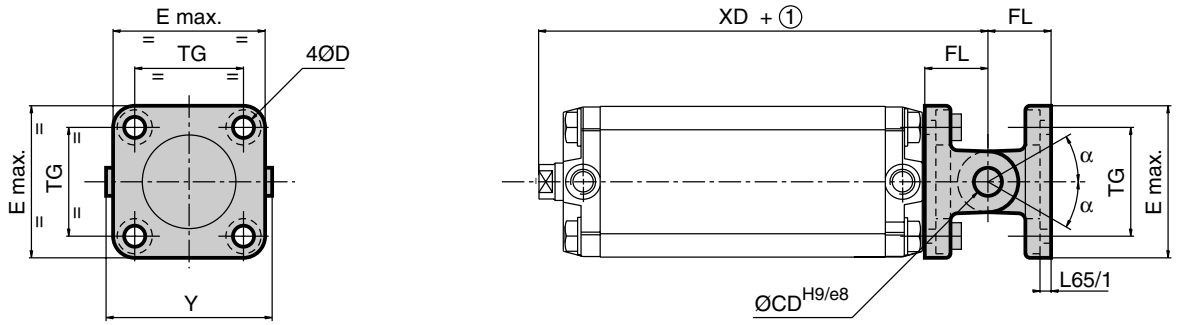
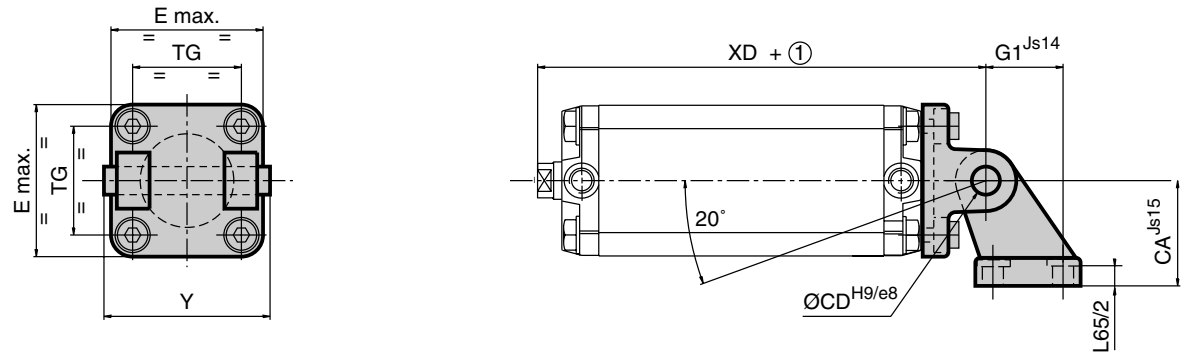
STRAIGHT COMPLETE TRUNNION MOUNTING - MP2 + MP4

To achieve the complete assembly, items MP2 and MP4 must be ordered **separately**.

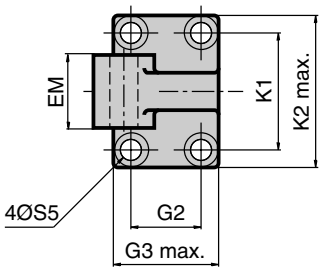


COMPLETE TRUNNION MOUNTING WITH ANGULAR CLEVIS BRACKET - MP2 + AB3

This set includes the cap, detachable clevis MP2 and the angular clevis bracket AB3.
These mountings must be ordered **separately**



Standard EM tolerances	
Ø 32...100 mm	EM $^{-0,2}_{-0,6}$



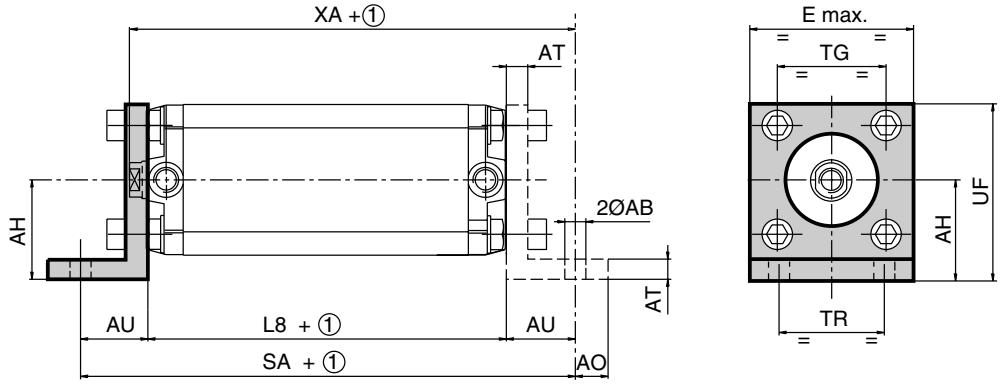
① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																	
	ØCD	ØD	ØS5	E	EM	FL	K1	K2	G1	G2	G3	CA	L65/1	L65/2	TG	XD	Y	α
32	10	6,6	6,6	50	26	22	38	51	21	18	31	32	5,5	6,5	32,5	77	56	45°
40	12	6,6	6,6	58	28	25	41	54	24	22	35	36	5,5	8,5	38	80	63	50°
50	12	9	9	70	32	27	50	65	33	30	45	45	6,5	10,5	46,5	83	71	40°
63	16	9	9	85	40	32	52	67	37	35	50	50	6,5	10,5	56,5	91,5	81	55°
80	16	11	11	105	50	36	66	86	47	40	60	63	10	11,5	72	102,5	101	45°
100	20	11	11	130	60	41	76	96	55	50	70	71	10	12,5	89	118,5	128	35°

Bore Ø (mm)	Weights (kg)	
	Straight complete trunnion	Complete trunnion with ang. clevis bracket
32	0,190	0,160
40	0,240	0,230
50	0,410	0,390

Bore Ø (mm)	Weights (kg)	
	Straight complete trunnion	Complete trunnion with ang. clevis bracket
63	0,620	0,570
80	1,080	0,950
100	1,745	1,500

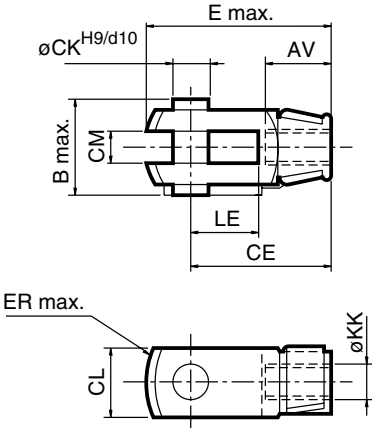
HIGH FOOT MOUNTING - MS3 (sold individually)



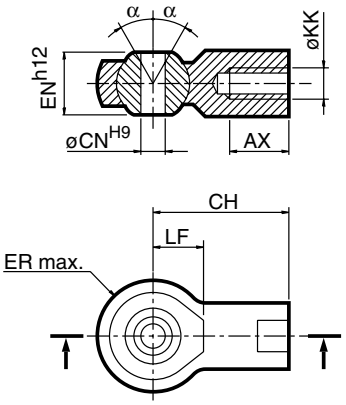
① : + Stroke

Bore Ø (mm)	CODE High foot	DIMENSIONS (mm)													Weights (kg)
		ØAB	AH	AO	AT	AU	AM	E	L8	UF	SA	TG	TR	XA	
32	**434 00 307**	7	32	11	8	24	22	50	48	54	96	32,5	32	79	0,180
40	**434 00 308**	10	36	15	8	28	24	58	48	62	104	38	36	83	0,250
50	**434 00 309**	10	45	15	10	32	32	70	48	77	112	46,5	45	88	0,470
63	**434 00 310**	10	50	15	10	32	32	85	51,5	87	115,5	56,5	50	91,5	0,595
80	**434 00 311**	12	63	20	12	41	40	105	56,5	110	138,5	72	63	107,5	1,265
100	**434 00 312**	14,5	71	25	12	41	40	130	67,5	130	149,5	89	75	118,5	-

FEMALE CLEVIS - AP2
ISO 8140 - RP 102 P



SPHERICAL BEARING ROD END - AP6
ISO 8139 - RP 103 P
α : spherical angular compensation 4°



Bore Ø (mm)	DIMENSIONS (mm)													
	AV.AX	B	CE	CH	ØCK	CL	CM	ØCN	E	EN	ER	ØKK	LE	LF
32-40	20	26	40	43	10	20	$10^{+0.5}_{+0.15}$	10	56	14	14	M10x1,25	20	15
50-63	22	32	48	50	12	24	$12^{+0.5}_{+0.15}$	12	67	16	16	M12x1,25	24	17
80-100	28	41	64	64	16	32	$16^{+0.5}_{+0.15}$	16	89	21	21	M16x1,5	32	22

Bore Ø (mm)	Weights (kg)	
	Female clevis	Spherical bearing
32-40	0,100	0,070
50-63	0,150	0,120
80-100	0,330	0,220

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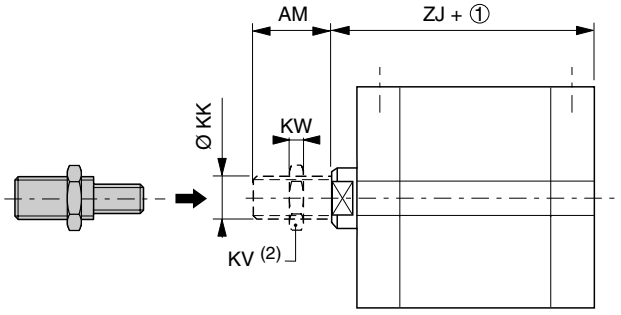
THREADED END PIECE / PEC

Threaded rod endfitting for the tapped rod end of standard 32 to 100 mm bore cylinders.

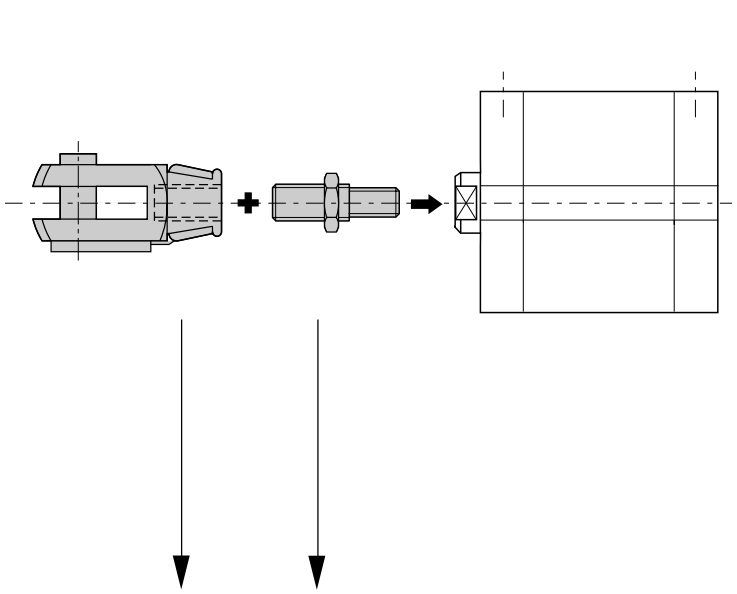


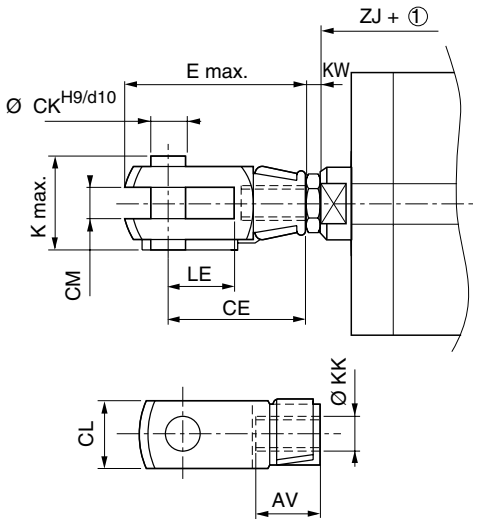
Bore Ø (mm)	CODE threaded end piece	AM	Ø KK	KV	KW	ZJ + (1)
32 40	434 00 482	22	M10x1,25	16	5	54 55
50 63	434 00 483	24	M12x1,25	18	6	56 59,5
80	434 00 484	32	M16x1,50	24	8	66,5
100	434 00 485	32				77,5

(1) Add the stroke to this value.
(2) dimensions on flats
In your order, indicate the code of the end piece, which is supplied **separately**.

2

FEMALE ROD CLEVIS - **AP2** (ISO 8140)





Bore Ø (mm)	CODE female rod clevis AP2	+ CODE threaded end piece	AV	CE	Ø CK	CL	CM	E	K	Ø KK	LE	ZJ + (1)	Clevis weight (Kg)
32 40	434 00 016	434 00 482	20	40	10	20	$10^{+0,5}_{+0,15}$	56	26	M10 x 1,25	20	54 55	0,100
50 63	434 00 017	434 00 483	22	48	12	24	$12^{+0,5}_{+0,15}$	67	32	M12 x 1,25	24	56 59,5	0,150
80 100	434 00 018	434 00 484 434 00 485	28	64	16	32	$16^{+0,5}_{+0,15}$	89	41	M16 x 1,50	32	66,5 77,5	0,330

Please indicate the threaded and clevis end piece code in your order. These two items are supplied not installed on the cylinder.
(1) Add the stroke to this value

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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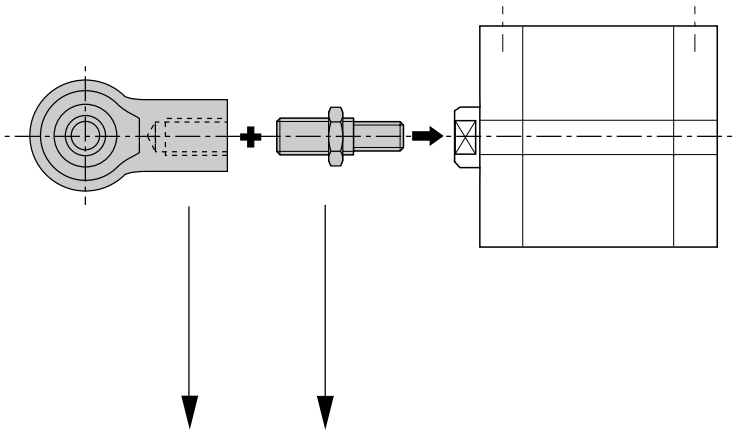
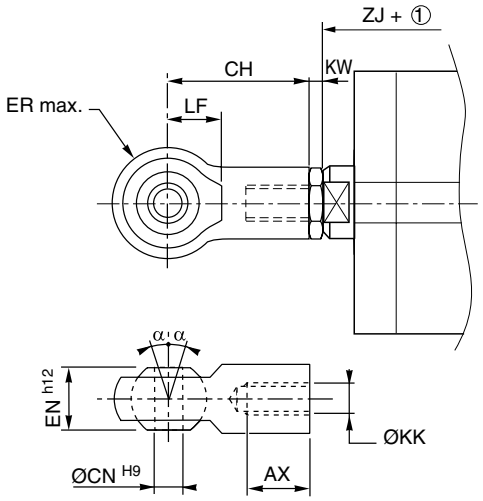
SPHERICAL BEARING ROD END - **AP6** (ISO 8139)



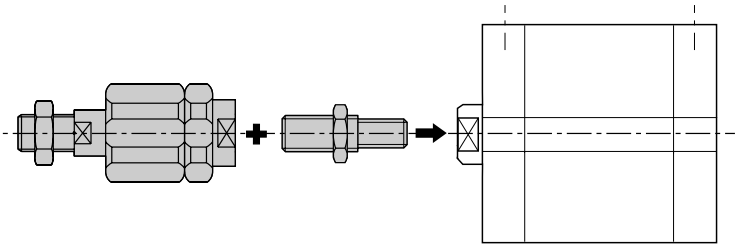


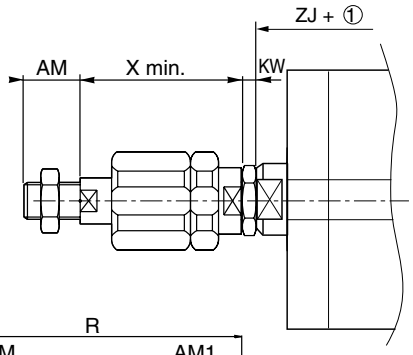
Bore Ø (mm)	CODE spherical rod end AP6	+ CODE threaded rod end	AX	CH	CN	EN	ER	LF	Ø KK	ZJ + (1)	α	Spherical bearing weight (Kg)
32 40	434 00 001	434 00 482	20	43	10	14	14	15	M10 x 1,25	54 55	4°	0,070
50 63	434 00 002	434 00 483	22	50	12	16	16	17	M12 x 1,25	56 59,5	4°	0,120
80 100	434 00 003	434 00 484 434 00 485	28	64	16	21	21	22	M16 x 1,50	66,5 77,5	4°	0,220

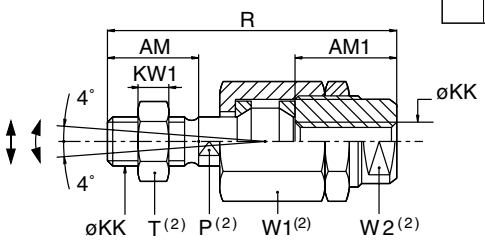
Please indicate the threaded and spherical bearing end piece code in your order. These two items are supplied not installed on the cylinder.
(1) Add the stroke to this value

ALIGNMENT COMPENSATOR ROD END/PEC

ALIGNMENT COMPENSATOR







① : + Stroke
(2) : dimensions on flats

- Radial compensation 0,7 to 1 mm (see table)
- Spherical angular compensation : 4°

Note : The compensator is preset with an axial clearance of 0,05 to 0,1 - Do not reset.

Bore Ø (mm)	CODE alignment compensator	+ CODE threaded rod end	AM	AM1	P(2)	ØKK	KW	KW1	R	T (2)	W1(2)	W2(2)	X	Radial Compensation (mm)	Weights (Kg)
32 40	434 00 242	434 00 482	22	26	12	M10x1,25	5	6	73	17	30	19	51	0,7	0,210
50 63	434 00 243	434 00 483	24	26	12	M12x1,25	6	7	77	19	30	19	53	0,7	0,210
80 100	434 00 244	434 00 484 434 00 485	32	34	19	M16x1,50	8	8	106	24	42	30	74	1	0,650

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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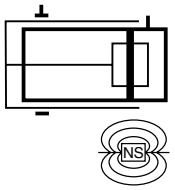
COMPACT CYLINDERS Ø 32 to 100 mm

WITH ANTI-ROTATION DEVICE ON THE BEARING ROD
Conforming with AFNOR-ISO-VDMA standards
Double acting cylinder equipped for magnetic position detectors



SPECIFICATIONS

FLUID	: Air or neutral gas, filtered, lubricated or not
PRESSURE	: max. 10 bar
TEMPERATURE	: -20°C, +70°C
CYLINDER BORE	: 32 to 100 mm
STROKE	: see table below
SPEED	: max. 0.5 m/s
STANDARD	: The diameters and distances between the centres of the mounting holes ensures that any fittings can be attached that comply with **ISO 6431-VDMA 24562**

CONSTRUCTION

Non-magnetic barrel	: anodised aluminium alloy
Rod	: chrome plated steel
Load carrying plate	: aluminium alloy
Guide rod	: chrome plated steel
Piston	: acetal resin (POM) or light alloy fitted with a permanent annular magnet
Piston seals	: polyurethane (PUR)
Front and rear ends	: aluminium alloy
Bearing rod	: self lubricating
Bearing guide rod	: bronze

CHOICE OF EQUIPMENT

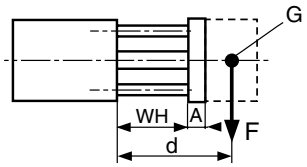
Bore dia. (mm)	CODES	REFERENCES (2)	Recommended standard strokes (mm)											Max. stroke (mm)	Port dia.
			5	10	15	20	25	30	40	50	60	80	100		
32	**449 50 073** (1)	PEC 32 NA (1) ... L-DM	●	●	●	●	●	❊	❊	❊	❊	❊	❊	200	G 1/8
40	**449 50 074** (1)	PEC 40 NA (1) ... L-DM	●	●	●	●	●	●	❊	❊	❊	❊	❊	200	G 1/8
50	**449 50 075** (1)	PEC 50 NA (1) ... L-DM	●	●	●	●	●	●	●	❊	❊	❊	❊	200	G 1/8
63	**449 50 076** (1)	PEC 63 NA (1) ... L-DM	●	●	●	●	●	●	●	●	❊	❊	❊	200	G 1/8
80	**449 50 077** (1)	PEC 80 NA (1) ... L-DM	●	●	●	●	●	●	●	●	●	❊	❊	400	G 1/8
100	**449 50 078** (1)	PEC 100 NA (1) ... L-DM	●	●	●	●	●	●	●	●	●	●	❊	400	G 1/4

(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Do not exceed maximum possible stroke.
(2) **The magnetic position detectors must be ordered separately:** COMPACT detector, reed switch or magneto-resistive type (see P293) or UNI detector, reed switch or magneto-resistive type (see P295).
(3) Max. stroke capability : as per application requirements (consult us)
Operating instructions: see Installation and Maintenance Instructions

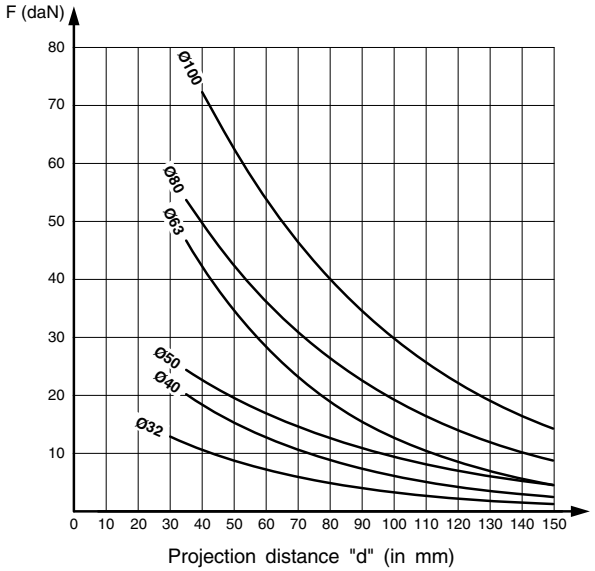
● Strokes recommended by NF E 49-003 standard.
❊ Other standard strokes on request.

OPTION: Version not equipped for use with magnetic position detectors

MAX. ADMISSIBLE LOAD "F" ON THE ROD END



d = the projection distance (in mm) corresponds to the dimensions WH + A + the stroke length + the distance from the centre of gravity (G) of the load to the front mating surface of the load carrying plate.



: The strokes in the grey shaded areas correspond to commonly used products which can be supplied rapidly.

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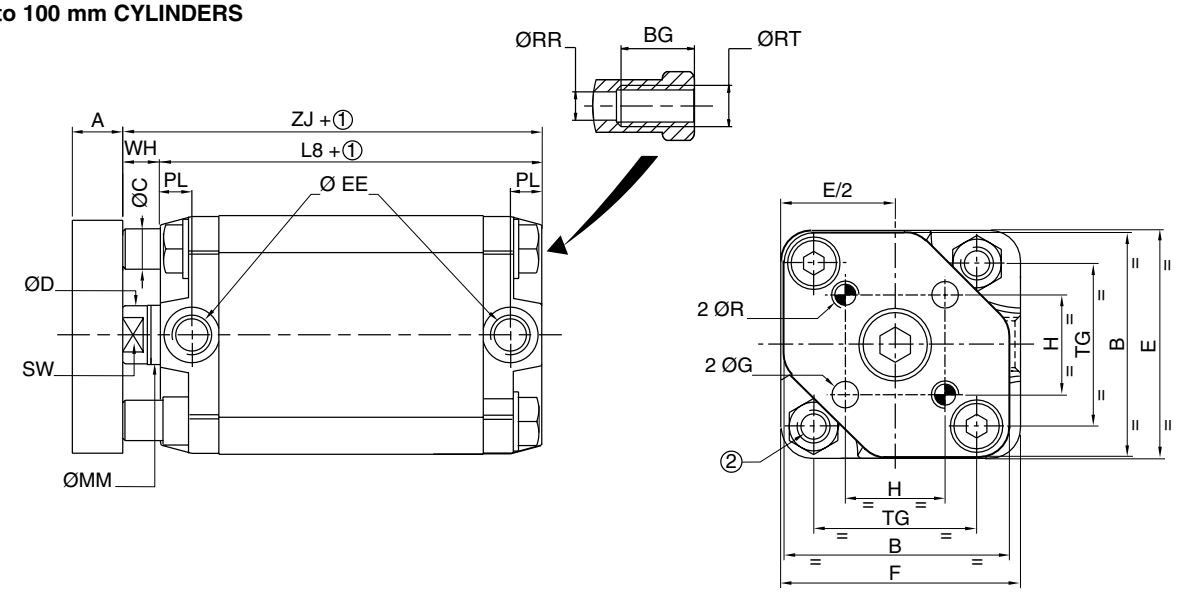
DIMENSIONS AND WEIGHTS

Ø 32 to 100 mm CYLINDERS



① : + Stroke

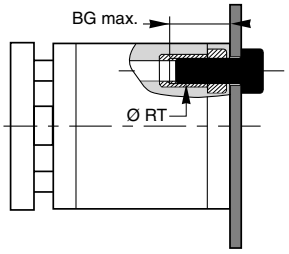
② : Mounting holes (see detail below and preceding pages)

Bore dia. (mm)	Dimensions (mm)																			
	A	B	BG	ØC	ØD	E	ØEE	F	ØG	H	L8	ØMM	PL	ØR	ØRR	ØRT	SW	TG	WH	ZJ
32	10	45,3	22	8	11,8	46	G1/8	47,5	5	19,8	48	12	8,5	M5	5,1	M6	10	32,5	7	55
40	10	51	22	8	11,8	52	G1/8	53,5	5	23,3	48	12	8,5	M5	5,1	M6	10	38	7	55
50	12	62	23,5	10	15,8	64,5	G1/8	66	6	29,7	48	16	8,5	M6	6,7	M8	13	46,5	8	56
63	12	73	23,5	10	15,8	75	G1/8	76,5	6	35,4	51,5	16	8,5	M6	6,7	M8	13	56,5	8	59,5
80	14	91	29,5	12	19,8	93	G1/8	94,5	8	46	56,5	20	8,9	M8	8,5	M10	16	72	10	66,5
100	16	111	29,5	12	24,8	113	G1/4	114,5	10	56,6	67,5	25	11,5	M10	8,5	M10	21	89	10	77,5

Bore dia. (mm)	Weights (kg)	
	(3)	(4)
32	0,280	0,0037
40	0,340	0,0040
50	0,520	0,0060
63	0,710	0,0067
80	1,270	0,0097
100	2,320	0,0127

(3) Weight of a cylinder with 0 mm stroke.
(4) Weight to be added per additional mm length.

OPTIONAL REAR MOUNTING



Ø	BG max.
32	22
40	22
50	23,5
63	23,5
80	29,5
100	29,5

Optional front mounting (see page P227-6)

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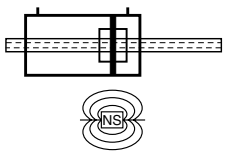
COMPACT CYLINDERS, 32-100 mm bore hollow through rod type

for vacuum pick-up systems
designed for magnetic position detectors

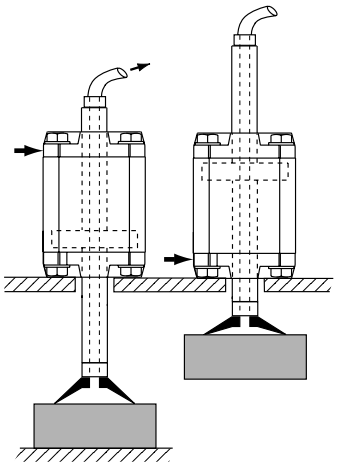


APPLICATION

The hollow through rod version enables compact installation of the vacuum pick-up system. It facilitates:

- direct attachment of the suction cup to the end of the rod on the working side,
- direct connection of the vacuum line to the other side.

A wide range of available connection sizes ensures that any type or size of suction cup can easily be fitted (see table opposite).



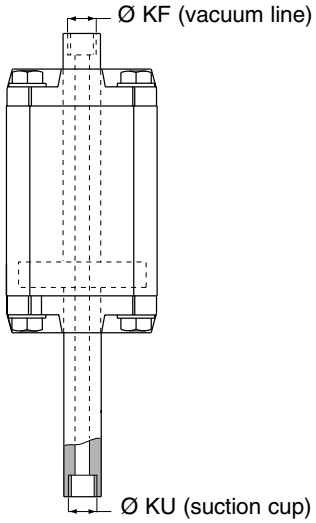
SPECIFICATIONS

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	-20°C, +70°C
BORE	:	32 to 100 mm
MAX. SPEED	:	0,5 m/s
STANDARDS	:	Hole size and spacing to fit all standard mountings. **AFNOR NF E 49-003 - ISO 6431 - VDMA 24562**

CONSTRUCTION: identical to PEC through rod compact cylinders

CHOICE OF EQUIPMENT

Bore (mm)	Max stroke (mm)	Ø KF	Ø KU suction cup size			OPTION CODE (1)
			G1/8	M10	G1/4	
32 (2)	50	M5	●			**995 060**
				●		**995 061**
40 (2)	50	M5	●			**995 062**
				●		**995 063**
50	80	G1/8	●			**995 064**
				●		**995 065**
63	80	G1/8	●			**995 066**
				●		**995 067**
80	100	G1/8	●			**995 068**
				●		**995 069**
					●	**995 070**
100	130	G1/8	●			**995 071**
				●		**995 072**
					●	**995 073**



(1) Option code to be added to code of standard T2 through rod PEC cylinder
(2) 32 and 40 mm cylinders are supplied with an adapter in the suction cup end of the rod for G1/8 or M10 connection. The adapter adds length (see dimensions overleaf)

ORDERING

In your order, indicate:

- The code or catalogue number of the standard T2 through rod double-acting PEC cylinder (see Page P227- 3)
- The code for the **hollow rod** version (see table above)
- Any mountings (identical to standard cylinder)
- Any magnetic position detectors, see pages P294 or P295

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GUIDE FOR CYLINDER OPTION CODE SELECTION TO ENSURE SUCTION CUP COMPATIBILITY

Once the required bore has been determined, this table can be used to find the option code of the version of the through rod cylinder version corresponding to the type and size of the suction cup to be fitted.

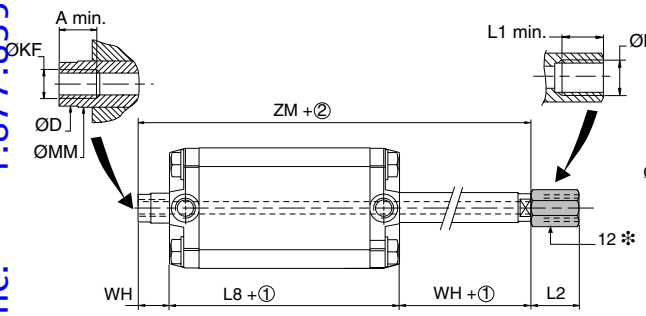
Bore (mm)	CODE OPTION	Rod end KU	Plain suction cups						Bellows-type suction cups												Oblong suction cups	
			Size (Ø) / port						Size (Ø) / port												Size (lxL) / port	
			Ø30 M10	Ø40 M10	Ø50 M10	Ø60 M10	Ø80 M10	Ø95 M10	Ø10 G1/8	Ø14 G1/8	Ø18 G1/8	Ø30 G1/4	Ø40 M10	Ø40 G1/4	Ø50 G1/4	Ø60 M10	Ø60 G1/4	Ø85 M10	Ø85 G1/4	30x65 M10	40x100 M10
32	995 060	G1/8							❍	❍	❍											
	995 061	M10	●	●	●	●	●	●					●			●		●		●	●	
40	995 062	G1/8							❍	❍	❍											
	995 063	M10	●	●	●	●	●	●					●			●		●		●	●	
50	995 064	G1/8							❍	❍	❍											
	995 065	M10	●	●	●	●	●	●					●			●		●		●	●	
63	995 066	G1/8							❍	❍	❍											
	995 067	M10	●	●	●	●	●	●					●			●		●		●	●	
80	995 068	G1/8							❍	❍	❍											
	995 069	M10	●	●	●	●	●	●					●			●		●		●	●	
	995 070	G1/4										❍		❍	❍		❍		❍			
100	995 071	G1/8							❍	❍	❍											
	995 072	M10	●	●	●	●	●	●					●			●		●		●	●	
	995 073	G1/4										❍		❍	❍		❍		❍			

❍ Suction cup with tapped port (in which case it is necessary to procure a male-male G1/8-G1/8 or G1/4-G1/4 adapter)

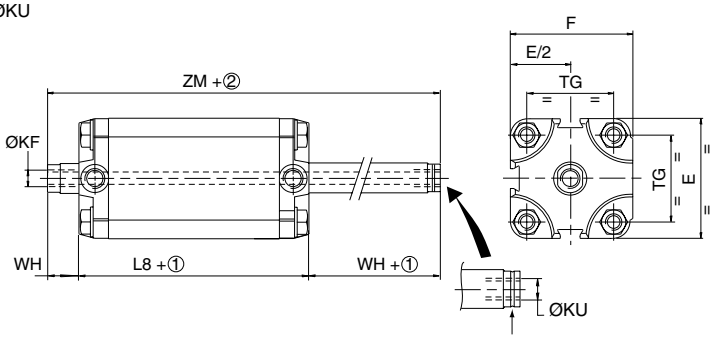
● Suction cup with threaded port (mounted directly on cylinder)

DIMENSIONS

Ø 32-40 mm



Ø 50-100 mm



① : + stroke

② : + 2 x stroke

❊ : size across flats

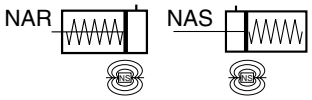
Bore (mm)	DIMENSIONS (mm)																
	A	ØD	E	F	ØKF	ØKU ❊❊ (suction cup side)			L1		L2		L8	ØMM	TG	WH	ZM
									G1/8	M10	G1/8	M10					
32	7,5	11,8	46	47,5	M5	G1/8	M10	-	7,5	22	15	30	48	12	32,5	7	62
40	7,5	11,8	52	53,5	M5	G1/8	M10	-	7,5	22	15	30	48	12	38	7	62
50	7,5	15,8	64,5	66	G1/8	G1/8	M10	-	-	-	-	-	48	16	46,5	8	64
63	7,5	15,8	75	76,5	G1/8	G1/8	M10	-	-	-	-	-	51,5	16	56,5	8	67,5
80	7,5	19,8	93	94,5	G1/8	G1/8	M10	G1/4	-	-	-	-	56,5	20	72	10	76,5
100	7,5	24,8	113	114,5	G1/8	G1/8	M10	G1/4	-	-	-	-	67,5	25	89	10	87,5

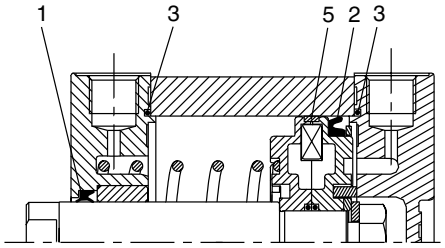
❊❊ Connection options (Ø KU) according to diameter

For other dimensions, see standard cylinder, page P227-5

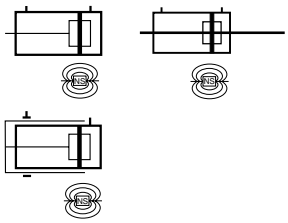
SHORT STROKE CYLINDERS TYPE PEC

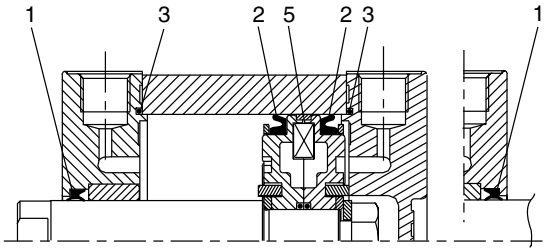
SINGLE ACTING





DOUBLE ACTING





Cylinder type	Ø bore (mm)	**CODES** rep. 1, 2, 3, 5
Single or double acting, single rod or throught rod supplies on the same extremity, anti-rotation device equipped or non-equipped for magnetic detectors	**32**	**978 02 337**
	40	**978 02 338**
	50	**978 02 339**
	63	**978 02 340**
	80	**978 02 341**
	100	**978 02 342**

NOTE: For best results, use grease supplied in each kit.
Supplementary tube available (11 cm^3) on request, code: **978 02 100**

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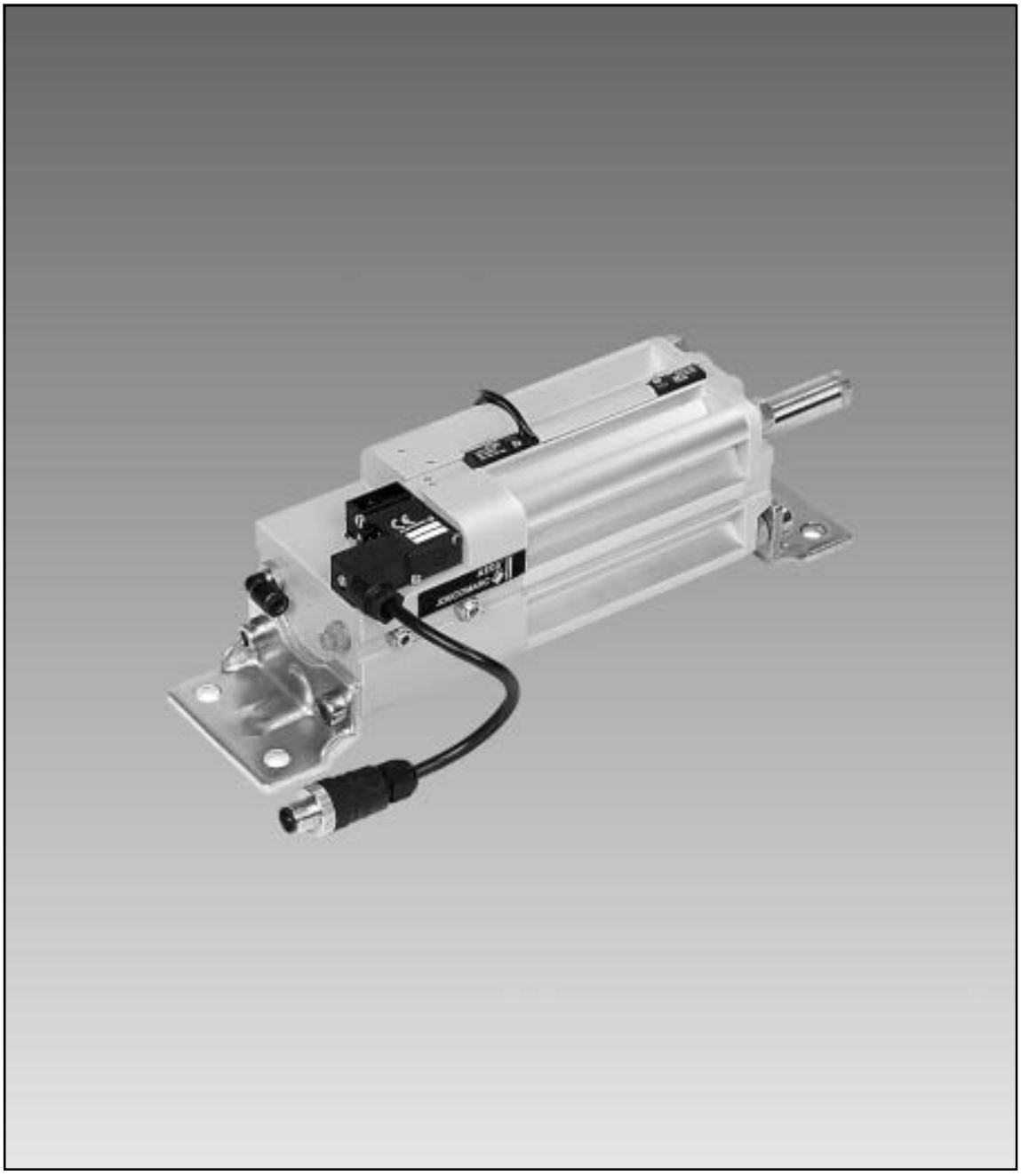
DOUBLE ACTING CYLINDERS Ø 40 to 63 mm
WITH INTEGRATED PILOT VALVES
COMPATIBLE WITH ISO 6431-VDMA STANDARDS

SERIES 449 - TYPE: **PEC**



P228.GB.R0b

ASCO® JOUCOMATIC

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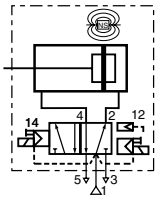
Series 449
Type: PEC-DM

DOUBLE ACTING CYLINDERS Ø 40 to 63 mm WITH INTEGRATED PILOT VALVES

Compatible with ISO/VDMA standards
designed for magnetic position detectors



ADVANTAGES

The fact that the control valve, the flow restrictor, the magnetic detector and all the electrical and pneumatic connections are integrated in the cylinder has the following advantages:
- Reduce assembly, electrical wiring and pneumatic cabling time
- No individual pneumatic connections (one single main supply pipe)
- Safe operation
- Compact, monobloc unit for easy procurement

SPECIFICATIONS

FLUID	:	lubricated or unlubricated filtered air or neutral gas
PRESSURE	:	1.5 to 8 bar
TEMPERATURE	:	+5°C to +50°C
CYLINDER BORE	:	40 to 63 mm
MAX. STROKE	:	500 mm
MAX. SPEED	:	0.5 m/s
STANDARD	:	The diameters and distances between the centres of the mounting holes enable standard fasteners to be used **ISO 6431 - VDMA 24562** cylinder complying with ISO 6431 Dimension SA requirement

CONSTRUCTION

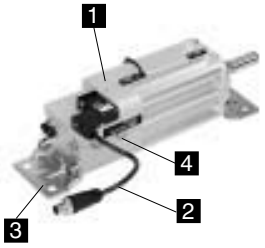
CYLINDER

Barrel (non magnetic)	anodized aluminium alloy
Rod	hard chrome-plated steel
Rod end	internally threaded (externally threaded as option)
Piston	Acetal resin (POM) or light alloy equipped with permanent annular magnet
Piston seals	polyurethane (PUR)
Front and rear ends	aluminium alloy
Bearing	self-lubricating
Cushioning	elastic

CONTROL VALVE

Body	aluminium alloy
Internal parts	aluminium alloy and acetal resin (POM)
Seals	nitrile (NBR)

Exhaust port equipped with removable poral cap (sintered bronze)



CHOICE OF EQUIPMENT

When ordering, inidicate the code of the cylinder, control valve and pilot valve assembly (1) as well as the code of the electrical connection part (2) and those of any fasteners (3) or options (4).

1 CYLINDER - CONTROL VALVE - SOLENOID PILOT VALVE

DEFINING OF CODE

449 1 . . . .

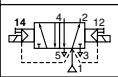
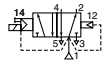
CYLINDER	
Type	Bore
3	40
4	50
5	63

(mm)

CYLINDER	
Type	Rod version
0	Rod retracted (acetal resin piston)
2	Rod retracted (light alloy piston)

Bore	AVAILABLE STROKES (mm) (recommended standard values)													
	5	10	15	20	25	50	80	100	125	160	200	250	320	400
40	●	●	●	●	●	●	●	●	●	●	●	●	●	●
50	●	●	●	●	●	●	●	●	●	●	●	●	●	●
63	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Other strokes: consult us

CONTROL VALVE		
Type	Control valve function	
1		5/2 - bistable Solenoid/air operation and return
2		5/2 - monostable Solenoid/air operation Differential return

PILOT (W/O connector)					
Pilot type	Designed for control valve		Voltage	Consumption	Manual override
0	5/2 bistable	=	24 V	1,5 W	▼
0	5/2 monostable	=	24 V	1 W	▼
1		~	24 V-115-230 - 50/60Hz	2,6 VA (2W)	
2		=	24 V	1 W	●
3		~	24 V-115-230 - 50/60Hz	2,6 VA (2W)	

● : screwdriver, latching ▼ : momentary action

The magnetic sensors are ordered separately: compact model, reed switch or magneto-resistive type (see P293) or UNI model, reed switch or magneto-resistive type (see P295).

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DEFINING THE PART NUMBER

PEC	. . .	NA	. . . .	DM	-	TR	P	-	B	-	DC	S

Type
Bore (mm)
Uncushioned (resilient snubber) = **NA**
Stroke (mm)
Designed to receive magnetic sensors = **DM**
Double acting version: **TR** = rod retracted at rest
Piston type: **P** = plastic (acetal resin)
A = aluminium
Type of control valve and pilot valve: **B** = double-acting bistable 5/2
D = double-acting differential pressure 5/2
Current type (Size 15 pilot): **DC** = direct current
AC = alternating current
Type of manual override: **S** = screwdriver
I = momentary action

ORDERING

When ordering, please specify:

- THE CYLINDER/CONTROL VALVE/SOLENOID PILOT CODE

449 1 3 0 1 0 0 1 0 0 — 24 Vcc — PEC 40 NA 100 DM-TR-P-B-DC I

40 mm cylinder = **3**
rod retracted = **0**
bistable 5/2 control valve = **1**
24 V DC momentary action = **0**
stroke **100** mm
The voltage
The part number of cylinder/control valve/solenoid
The electrical connector : **881 . . . . .**
The code or part number of any option : **. . . . . .**

- MOUNTINGS
  The code or codes and quantity of mountings : **434 . . . . .**

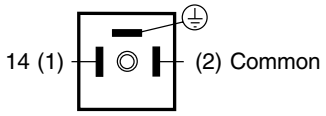
- DETECTORS
  The code and quantity of magnetic detectors : **881 . . . . .**

2 ELECTRICAL CONNECTION

SIZE 15 CONNECTORS

Type		Fits control valve	Description		Code
IP65	2 pins + earth	5/2 monostable	Standard Size 15 IP65 connector, 2 pins + earth with gland (Pg7P)		**881 43 581**
			Size 15 IP65 connector, 2 pins + earth, with built-in LED display and electrical protection with PVC cable flying lead, length:	2 m 5 m	**881 43 580** **881 43 593**
			Size 15 IP65 connector with PVC cable entry and 5-contact M12 male connector, length:	0.3 m	**881 00 674**
			Size 15 IP65 connector with PVC cable flying lead + male 5-contact M12 connector, with built-in LED display and electrical protection, length:		**881 00 676**
	3 pins + earth	5/2 bistable	Standard Size 15 IP65 connector, 3 pins + earth with gland (Pg7P)		**881 00 240**
			Size 15 IP65 connector, 3 pins + earth, with built-in LED display and electrical protection with PVC cable flying lead, length:	2 m 5 m	**881 00 446** **881 00 447**
			Size 15 IP65 connector with PVC cable entry and 5-contact M12 male connector, length:	0.3 m	**881 00 675**
			Size 15 IP65 connector with PVC cable flying lead + male 5-contact M12 connector, with built-in LED display and electrical protection, length:		**881 00 677**

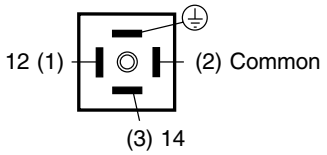
Pin assignment
for monostable 5/2 control valve
(seen from contacts/coil side)



Monostable 5/2 control valves:
14 = operator
12 = differential return

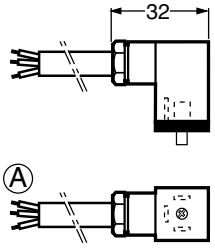
Bistable 5/2 control valve:
14 = operator
12 = return

Pin assignment
for bistable 5/2 control valve
(seen from contacts/coil side)

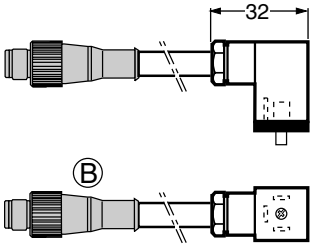


Designation of connectors with 2 pins + earth

with cable entry

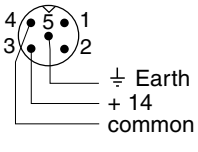


with cable entry + M12 connector



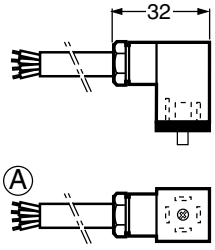
Ⓐ
Coding/connection
Terminal 1 (+14): brown wire
Terminal 2 (common): blue wire
Terminal ⏚ (earth): green/yellow wire

Ⓑ

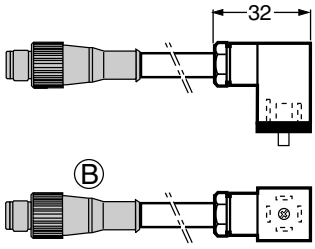


Designation of connectors with 3 pins + earth

with cable entry

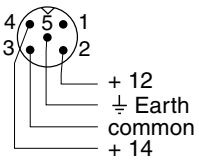


with cable entry + M12 connector



Ⓐ
Coding/connection
Terminal 1 (+12): yellow wire
Terminal 2 (common): white wire
Terminal 3 (+14): brown wire
Terminal ⏚ (earth): green wire

Ⓑ



The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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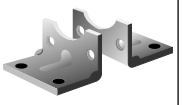
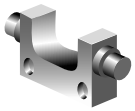
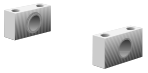
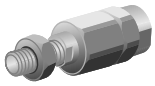
VCS CONNECTORS

Accessory	Description		Code
	Size 15 24V DC VCS connector with a maximum of **two 100 mA outputs** (connection with green cable only) (1)	with no input	**881 57 803**
		with two M8 inputs	**881 57 805**
	Size 15 24V DC VCS connector with a maximum of **two 100 mA outputs and auxiliary power supply** (connection of green and black cables) (1)	with no input	**881 57 949**
		with two M8 inputs	**881 57 951**

(1) VCS connector with earth connection (consult us)

VCS ELECTRICAL POWER SUPPLY: see leaflet P520

3 MOUNTINGS CONFORMING WITH ISO 6431 - VDMA 24562 STANDARDS

Cylinder bore (mm)	**CODES** OF MOUNTINGS					
	 Low feet (2) **MS1**	 High foot (1) **MS3**	 Rectangular front flange **MF1**	 Rear trunnion	 Trunnion mounts (2) **AT4**	 Alignment compensator (3)
40 **50** **63**	**434 00 164** **434 00 165** **434 00 166**	**434 00 308** **434 00 309** **434 00 310**	**434 00 120** **434 00 121** **434 00 122**	**434 00 488** **434 00 489** **434 00 490**	**434 00 208** **434 00 208** **434 00 209**	**434 00 242** **434 00 243** **434 00 243**
Dimensions	page 7	page 8	page 7	page 9	page 9	page 11
Construction	Stamped sheet steel	Drawn steel	Steel	Steel	Aluminium + rings	Steel

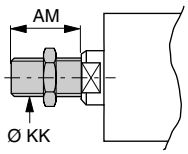
Cylinder bore (mm)	**CODES** OF MOUNTINGS		
	 Female rod clevis ISO8140-RP102P **AP2**	 Spherical rod end ISO8139-RP103P **AP6**	 Male threaded rod end fitting
40 **50** **63**	**434 00 016** **434 00 017** **434 00 017**	**434 00 001** **434 00 002** **434 00 002**	**434 00 482** **434 00 483** **434 00 483**
Dimensions	page 8	page 8	page 10
Construction	Steel	Steel	Steel

(1) High foot sold separately
(2) Corresponds to a set of two parts
(3) This accessory enables angular differences of 4° about centre and 0.7 mm radially to be accommodated
NOTE: the fasteners are supplied uninstalled

4 OPTIONS

- Stainless steel silencer - code **560 648**
- Unit supplied without poral cap- code **560 647**
- Two flow restrictors - code **010 881**
- Stainless steel rod - code **995 002**
- Extra rod length (chrome plated steel) - code **995 003**
- Extra rod length (chrome plated stainless steel) - code **995 004**
- Externally threaded end-fitting installed on cylinder

Bore (mm)	**OPTION - CODE** (Threaded rod end)
40 **50-63**	**010 870** **010 871**



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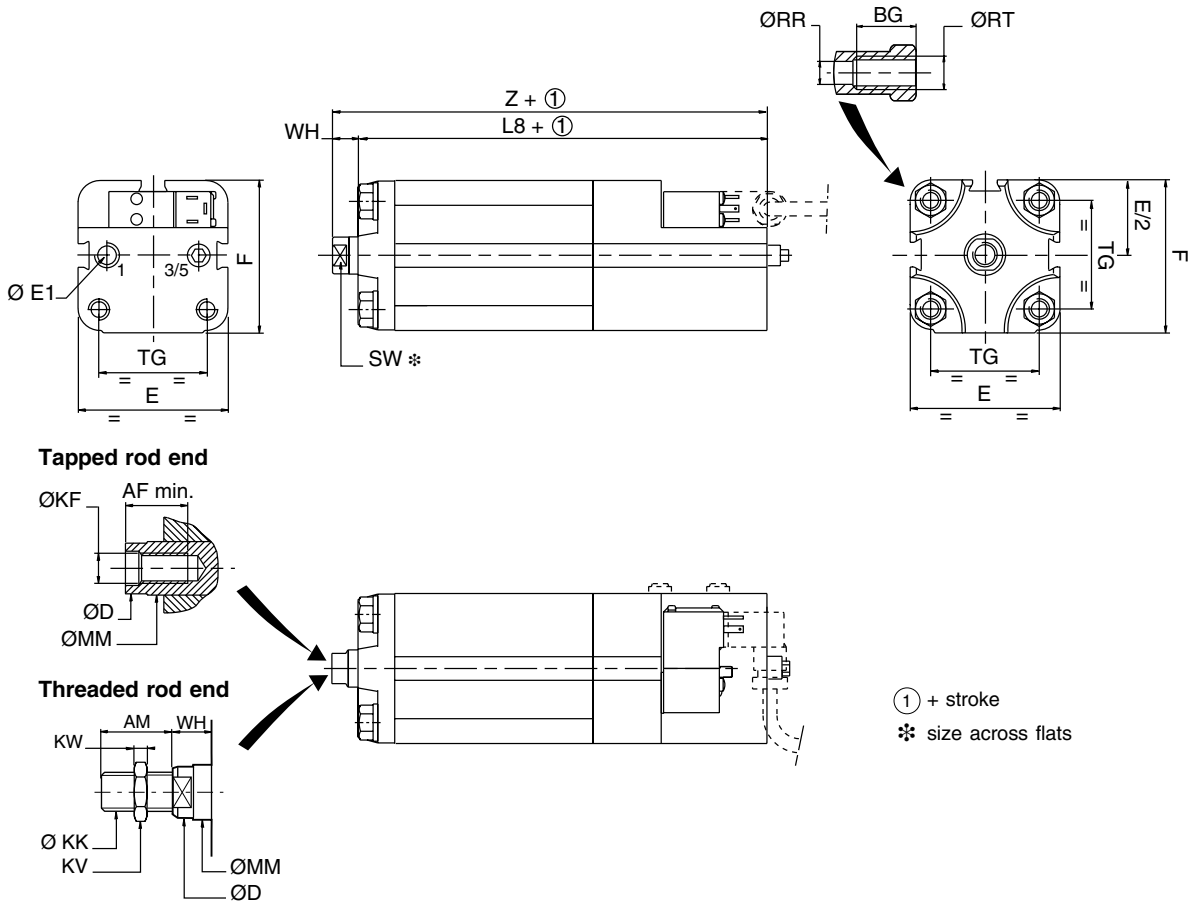
DIMENSIONS AND WEIGHTS



Bore (mm)	DIMENSIONS (mm)																	
	AF	AM	BG	ØD	E	E1	F	ØKF	ØKK	KV	KW	L8	ØMM	ØRR	ØRT	SW	TG	WH	Z
40	12	22	22	11,8	52	G1/8	53,5	M8x1,25	M10x1,25	16	5	105	12	5,1	M6	10	38	7	112
50	16	24	23,5	15,8	64,5	G1/8	66	M10x1,5	M12x1,25	18	6	106	16	6,7	M8	13	46,5	8	114
63	16	24	23,5	15,8	75	G1/8	76,5	M10x1,5	M12x1,25	18	6	121	16	6,7	M8	13	56,5	8	129

Bore (mm)	Weights (kg)	
	(3)	(4)
40	0,900	0,0033
50	1,700	0,0048
63	2,800	0,0055

(3) Weight of cylinders with stroke of 0 mm.
(4) Weight to be added per millimetre of additional length.

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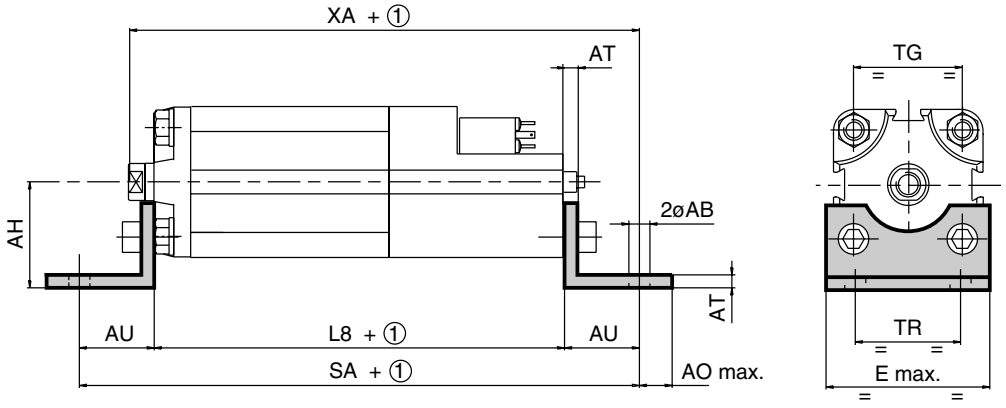
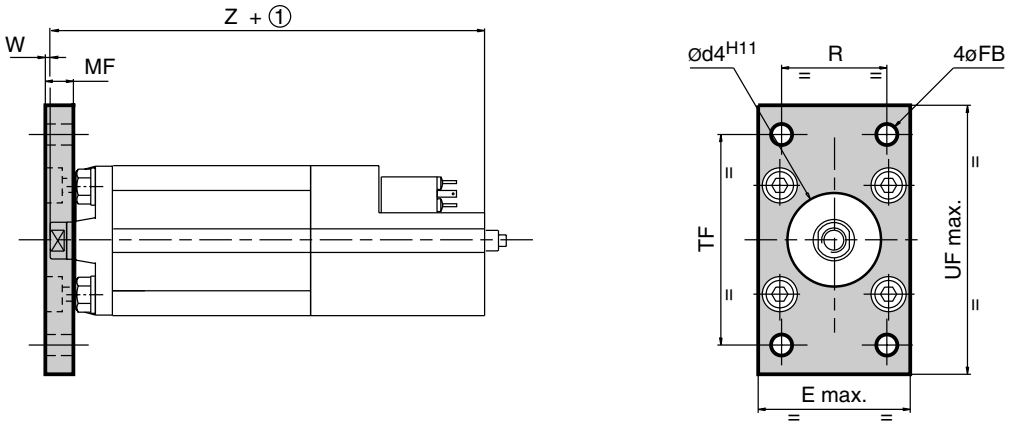
LOW FEET MOUNTING - MS1



RECTANGULAR FRONT MOUNTING FLANGE - MF1

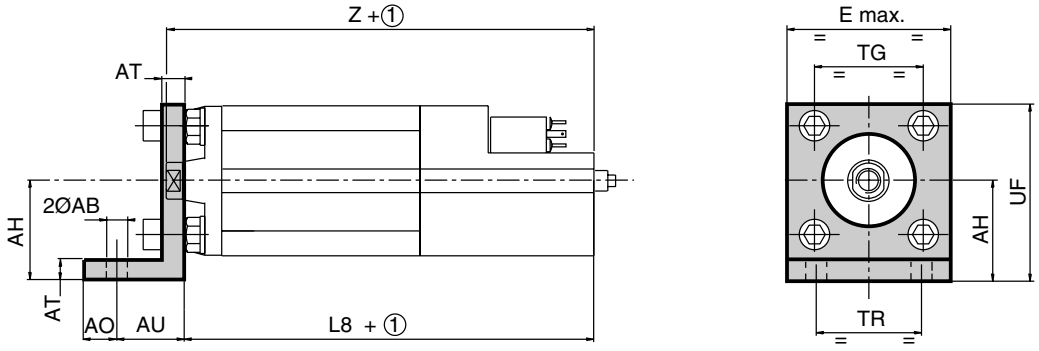


① + Stroke

Bore (mm)	DIMENSIONS (mm)																	
	ØAB	AO	AH	AT	AU	Ød4	E	ØFB	L8	MF	R TR	SA	TF	TG	UF	W	XA	Z
40	10	15	36	4,5	28	35	58	9	105	10	36	161	72	38	96	3	140	112
50	10	15	45	5,5	32	40	70	9	106	12	45	170	90	46,5	115	4	146	114
63	10	15	50	5,5	32	45	85	9	121	12	50	185	100	56,5	130	4	161	129

Bore (mm)	Weights (kg)	
	2 feet	Front flange
40	0,190	0,240
50	0,395	0,500
63	0,445	0,580

HIGH FOOT MOUNTING - MS3

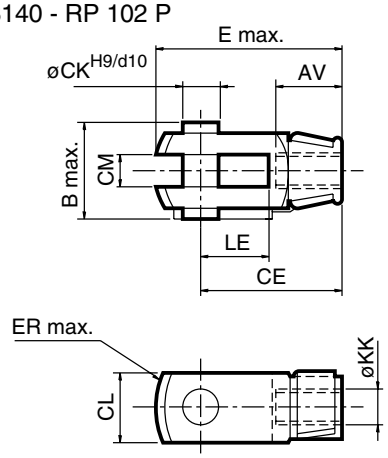


① : + Stroke

Bore (mm)	DIMENSIONS (mm)												Weights (kg)
	ØAB	AH	AO	AT	AU	AM	E	L8	UF	TG	TR	Z	
40	10	36	15	8	28	24	58	105	62	38	36	112	0.250
50	10	45	15	10	32	32	70	106	77	46.5	45	114	0.470
63	10	50	15	10	32	32	85	121	87	56.5	50	129	0.595

FEMALE CLEVIS - AP2

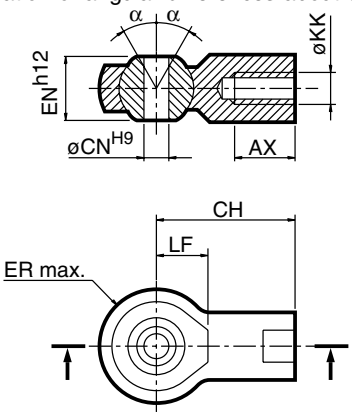
ISO 8140 - RP 102 P



SPHERICAL BEARING ROD END - AP6

ISO 8139 - RP 103 P

α: accommodation of angular differences about centre: 4°



Bore (mm)	DIMENSIONS (mm)													
	AV.AX	B	CE	CH	ØCK	CL	CM	ØCN	E	EN	ER	ØKK	LE	LF
40	20	26	40	43	10	20	$10^{+0.5}_{+0.15}$	10	56	14	14	M10x1.25	20	15
50-63	22	32	48	50	12	24	$12^{+0.5}_{+0.15}$	12	67	16	16	M12x1.25	24	17

Bore (mm)	Weights (kg)	
	Female clevis	Spherical bearing
40	0,100	0,070
50-63	0,150	0,120

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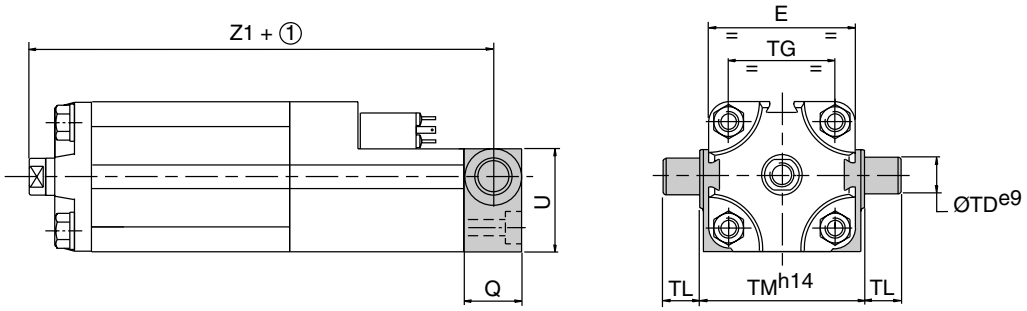
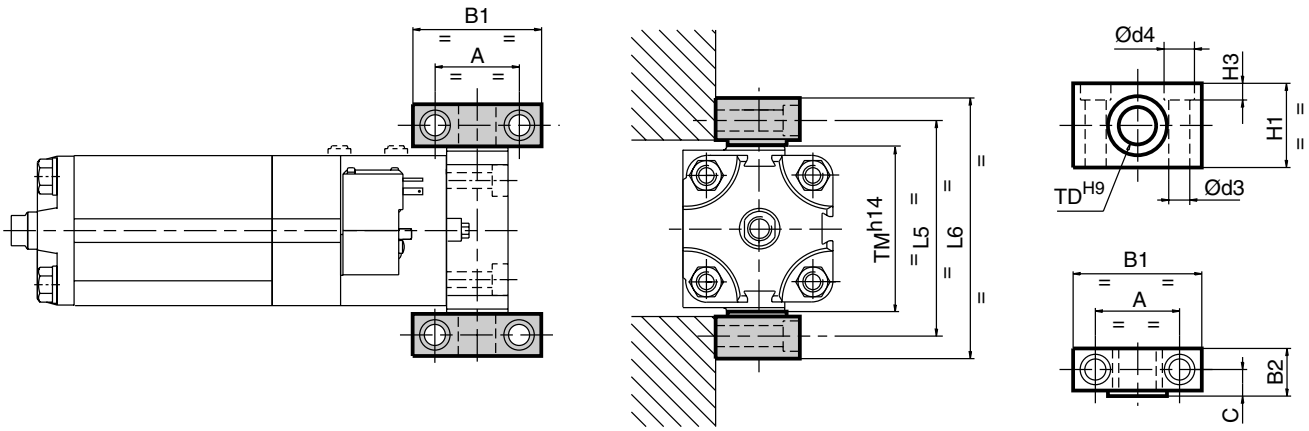
REAR TRUNNION MOUNTING



SUPPORTS FOR REAR TRUNNION - AT4

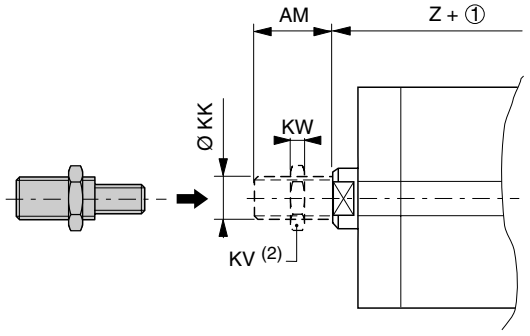


Bore (mm)	DIMENSIONS (mm)																	
	A	B1	B2	C	Ød3	Ød4	E	H1	H3	L5	L6	Q	TD	TG	TL	TM	U	Z1
40	36	55	21	12	9	15	52	36	9	87	105	28	16	38	16	63	38	126
50	36	55	21	12	9	15	64,5	36	9	99	117	28	16	46,5	16	75	45	128
63	42	65	23	13	11	18	75	40	11	116	136	35	20	56,5	20	90	56	146,5

Bore (mm)	Weights (kg)	
	Trunnion only	Supports for Trunnion
40	0,480	0,230
50	0,650	0,230
63	1,200	0,330

THREADED END PIECE / PEC

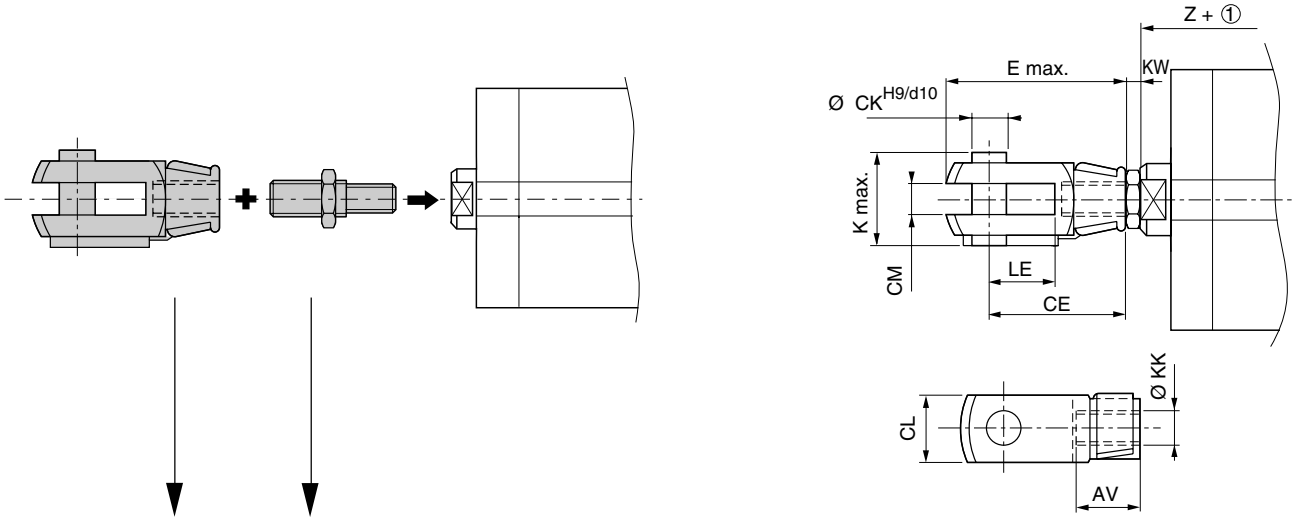
Threaded rod endfitting for the tapped rod end of standard 40 to 63 mm bore cylinders.



Bore (mm)	CODE Threaded end piece	AM	Ø KK	KV	KW	Z + (1)
40	434 00 482	22	M10x1.25	16	5	112
50 63	434 00 483	24	M12x1.25	18	6	114 129

(1) Add stroke to this dimension.
(2) Distance across flats
When ordering, indicate end piece code.
which is supplied **separately**.

FEMALE ROD CLEVIS - **AP2** (ISO 8140)



Bore (mm)	CODE female rod clevis AP2	+ CODE Threaded end piece	AV	CE	Ø CK	CL	CM	E	K	Ø KK	LE	Z + (1)	Clevis weight (kg)
40	434 00 016	434 00 482	20	40	10	20	$10^{+0.5}_{+0.15}$	56	26	M10 x 1.25	20	112	0.100
50 63	434 00 017	434 00 483	22	48	12	24	$12^{+0.5}_{+0.15}$	67	32	M12 x 1.25	24	114 129	0.150

Please indicate the threaded and clevis end piece code in your order. These two items are supplied not installed on the cylinder.
(1) Add the stroke to this value

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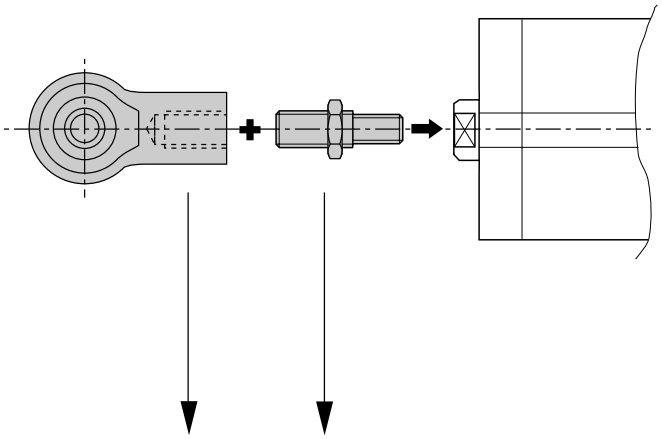
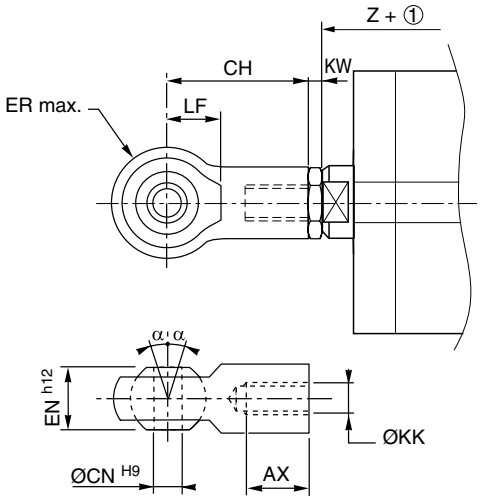


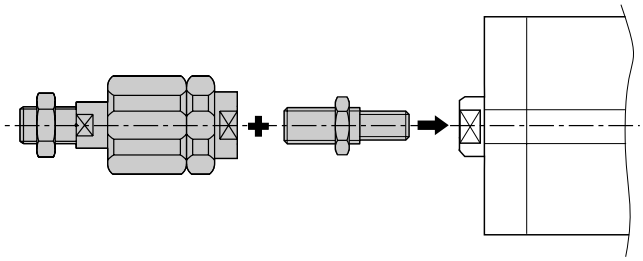


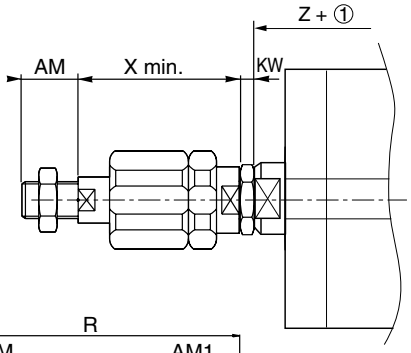
Bore (mm)	CODE Spherical rod end AP6	+ CODE Threaded rod end	AX	CH	CN	EN	ER	LF	Ø KK	Z + (1)	α	Spherical bearing weight (kg)
40	434 00 001	434 00 482	20	43	10	14	14	15	M10 x 1.25	112	4°	0,070
50 63	434 00 002	434 00 483	22	50	12	16	16	17	M12 x 1.25	114 129	4°	0,120

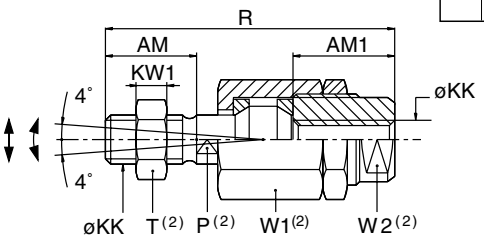
Please indicate the threaded and spherical bearing end piece code in your order. These two items are supplied not installed on the cylinder.
(1) Add the stroke to this value

ALIGNMENT COMPENSATOR ROD END/PEC

ALIGNMENT COMPENSATOR







① : + stroke
(2) : distance across flats

- Radial compensation 0.7 to 1 mm (see table)
- Angular compensation: 4°

Note: the compensator is supplied with an axial clearance of 0,05 to 0,1 - No not readjust.

Bore (mm)	CODE alignment compensator	+ CODE Threaded rod end	AM	AM1	P(2)	ØKK	KW	KW1	R	T (2)	W1(2)	W2(2)	X	Radial compen-sation (mm)	Weight (kg)
40	434 00 242	434 00 482	22	26	12	M10x1.25	5	6	73	17	30	19	51	0,7	0,210
50 63	434 00 243	434 00 483	24	26	12	M12x1.25	6	7	77	19	30	19	53	0,7	0,210

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CYLINDERS WITH INTEGRATED PILOT VALVES

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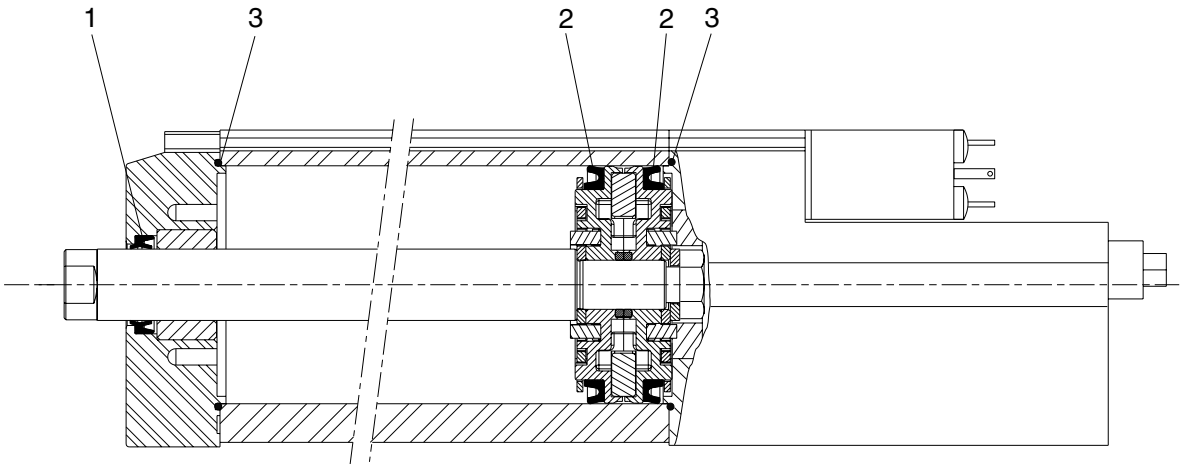

Cylinder type	Bore (mm)	**CODES** Items 1, 2 and 3
double-acting, designed for magnetic detectors	**40**	**978 02 338**
	50	**978 02 339**
	63	**978 02 340**

NOTE: For optimal operation, it is recommended to use the grease supplied in the kit. Additional tubes are available on request (11 cm^3), code: **978 02 100**

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ASCO JOUCOMATIC SA
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■ **GERMANY**
ASCO JOUCOMATIC GmbH & Co.
Otto-Hahn-Str. 5 - 75248 OLBRONN-DÜRRN
Tel.(49) 7237 9960 - Fax (49) 7237 9961
E-mail: info@ascojoucomatic.de

■ **GREAT BRITAIN**
ASCO JOUCOMATIC Ltd.
2 Pit Hey Place, West Pimbo - SKELMERSDALE - Lancashire WN8 9PG
Tel.(44) 1 / 695 71 36 00 - Fax (44) 1/ 695 71 36 33
E-mail: general@ascojoucomatic.ltd.uk

■ **HUNGARY**
ASCO/JOUCOMATIC (ASCO Kft.)
Bogancs u. 1 - 3 - 1151 BUDAPEST
Tel.(36) 1 / 306 41 00 - Fax (36) 1 / 306 09 80
E-mail: office@ascojoucomatic.hu

■ **ITALY**
ASCO JOUCOMATIC SpA
Via Zambeletti - ang. Via Ghisallo - 20021 BARANZATE di BOLLATE (MI)
Tel.(39) 02 / 35 693 1 - Fax (39) 02 / 35 693 300
E-mail: aji@ascojoucomatic.it

■ **NETHERLANDS**
ASCO/JOUCOMATIC (ASCO CONTROLS BV)
Industrielaan 21 - 3925 BD - SCHERPENZEEL
Tel.(31) 33 277 7911 - Fax (31) 33 277 7888
E-mail: info@ascojoucomatic.nl

■ **POLAND**
ASCO JOUCOMATIC Sp. z o.o.
Ul. Konstruktorska 11a
02 673 WARSAW
Tel.(48) 22 / 54 85 280 - Fax (48) 22 / 54 85 288
E-mail: asco.joucomatic@2a.pl

■ **PORTUGAL**
ASCO/JOUCOMATIC (FLUIDOCONTROL S.A.)
Rua Eng° Ferreira Dias, 938 - AZ2
4100 - 246 PORTO
Tel.(351) 22 / 619 08 57 - Fax (351) 22 / 619 08 58
E-mail: ajp@mail.telepac.pt

■ **SPAIN**
ASCO/JOUCOMATIC (FLUIDOCONTROL S.A.)
39700 CASTRO-URDIALES (Cantabria)
Tel.(34) 942 87 61 00 - Fax (34) 942 86 33 23
E-mail: fluidocontrol@ajefluido.com

■ **SWEDEN**
ASCO/JOUCOMATIC (ASCO AB)
Albanoliden 3-5 - 506 30 BORÅS
Tel.(46) 33 / 108 000 - Fax (46) 33 / 108 080
E-mail: asco@asco.se

■ **SWITZERLAND**
ASCO/JOUCOMATIC Switzerland (ASCO CONTROLS AG)
Schaftenholzweg 16 - 2557 STUDEN / BIEL-BIENNE
Tel.(41) 32 / 374 45 10 - Fax (41) 32 / 374 45 11
E-mail: asco.joucomatic@span.ch

■ **TURKEY**
ASCO/JOUCOMATIC TURKEY
Bayar Cd. Gülbahar Sk. - Perdemsaç Plaza N°17/97
81090 KOZYATAGI - ISTANBUL
Tel.(90) 216 / 464 07 70 - Fax (90) 216 / 464 07 71
E-mail: ajturkey@superonline.com

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ASCO/JOUCOMATIC (ASCOVAL ind. e. com. Ltda.)
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CEP 06465-300 BARUERI - SAO PAULO
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E-mail: ascobrbr@ascoval.com.br

■ **CANADA**
ASCO/JOUCOMATIC (ASCOVALVE Inc)
Airport Road - PO Box 160 - BRANTFORD, ONTARIO N3T 5M8
Tel.(1) 519 / 758 2700 - Fax (1) 519 / 758 5540
E-mail: ascomail@asco.on.ca

■ **MEXICO**
ASCO/JOUCOMATIC (ASCOMATICA S.A. de C.V.)
Bosques de Duraznos 65 - 1003 A
Bosques de las Lomas - 11700 MEXICO D.F.
Tel.(52)5 / 596 77 41 - Fax (52)5 / 596 77 19
E-mail: ascovalvulas@mexis.com

■ **USA**
ASCO (Valve, Inc)
50 Hanover Road - FLORHAM PARK, NJ 07932
Tel.(1) 973 / 966 2000 - Fax (1) 973 / 966 2628
E-mail: info-valve@asco.com

AFRICA & MIDDLE EAST

■ **SOUTH AFRICA**
ASCO/JOUCOMATIC (ASCOREG)
P.O. Box 737 - 3 Commerce Place
Eastgate Ext. 12, Sandton - GAUTENG
Tel. (27) 11 / 444 22 13 - Fax (27) 11 / 444 22 21
E-mail: ascoreg@mweb.co.za

■ **UNITED ARAB EMIRATES**
ASCO/JOUCOMATIC MIDEAST
PO Box 17034 - Jebel Ali free zone - DUBAI
Tel.(971) 4 / 883 44 94 - Fax (971) 4 / 883 44 95
E-mail: ascojoucomatic@emersondubai.com

ASIA & OCEANIA

■ **HONG KONG**
ASCO/JOUCOMATIC (ASCO ASIA)
Room 3904, Central Plaza, 18 Harbour Road - WANCHAI
Tel.(852) 2343 8580 - Fax (852) 2790 1771
E-mail: ascohk@emersn.com.hk

■ **INDIA**
ASCO/JOUCOMATIC (ASCO INDIA Ltd.)
147 Karapakkam village - MADRAS 600 096
Tel. (91) 44/496 0455 - Fax (91) 44/496 2270
E-mail: asco5@sanmargroup.com

■ **JAPAN**
ASCO/JOUCOMATIC (ASCO JAPAN Co. Ltd.)
1-20 Takahata-Cho Nishinomiya - HYOGO 663-8202
Tel. (81) 798 65 6361 - Fax (81) 798 63 4443
E-mail: asco@ascojp.co.jp

■ **KOREA**
ASCO/JOUCOMATIC (ASCO ASIA)
6 fl. Chunglim Bldg, 38-30 Samsung-dong
Kangnam-Ku - SEOUL 135 090
Tel.(82) 2 / 515 2485 - Fax (82) 2 / 540 3250
E-mail: asco@ascokorea.co.kr

■ **SINGAPORE**
ASCO/JOUCOMATIC (ASCO ASIA)
Blk 4008, Ang Mo Kio Ave.10 - 04-17/22, Techplace1
SINGAPORE 569 625
Tel.(65) 556 11 00 - Fax (65) 556 00 11
E-mail: valvesales@asco.com.sg

■ **TAIWAN R.O.C.**
ASCO/JOUCOMATIC (ASCO ASIA)
5th. fl, N°2 Jen Ai Road - Section 4 - TAIPEI 10650
Tel.(886) 2 / 2325 9555 - Fax (886) 2 / 2702 6009
E-mail: ascotw@ms17.hinet.net

■ **AUSTRALIA**
ASCO/JOUCOMATIC (ASCOMATION Pty. Ltd.)
Unit 12, Allambie Grove Business Park
25 Frenchs Forest Road East - FRENCHS FOREST - N.S.W. 2086
Tel.(61) 2 / 9451 7077 - Fax (61) 2 / 9451 9924 - E-mail: sales@asco.com.au

■ **NEW ZEALAND**
ASCO/JOUCOMATIC (ASCOMATION Pty. Ltd.)
3 Vega place - Mairangi Bay
PO. Box 302 441 - North Harbour - AUCKLAND
Tel.(64) 9 / 478 0192 - Fax (64) 9 / 478 0193
E-mail: gbrown@asco.com.au

ASCO/JOUCOMATIC REPRESENTATIVES (see web)

Algeria - Argentina - Austria - Bolivia - Bulgaria - Cameroon - Chile - China - Colombia - Costa Rica - Croatia - Denmark - Ecuador - Egypt - Finland - Greece - Guadeloupe - Guatemala - Honduras - Iceland - Ireland - Israël - Ivory Coast - Luxemburg - Martinique - Morocco - Nicaragua - Norway - Pakistan - Panama - Peru - Porto Rico - Reunion Island and Madagascan Rep. - Romania - Russia - El Salvador - Saudi Arabia - Senegal - Slovakia - Slovenia - Tunisia - Ukraine - Uruguay - Venezuela - F.R. Yugoslavia (all other countries, contact E-mail : export.sales@ascojoucomatic.fr)

4CV.GB-08/02

383 93 75 - 1M51002

Local distributor - Distribué par - Ihr Ansprechpartner

:

DOUBLE ACTING CYLINDERS, Ø 32 to 125 mm

conforming to

VDMA 24562 - ISO 6431 STANDARDS

SERIES 450 - TYPE : **PES (with profiled barrel)**

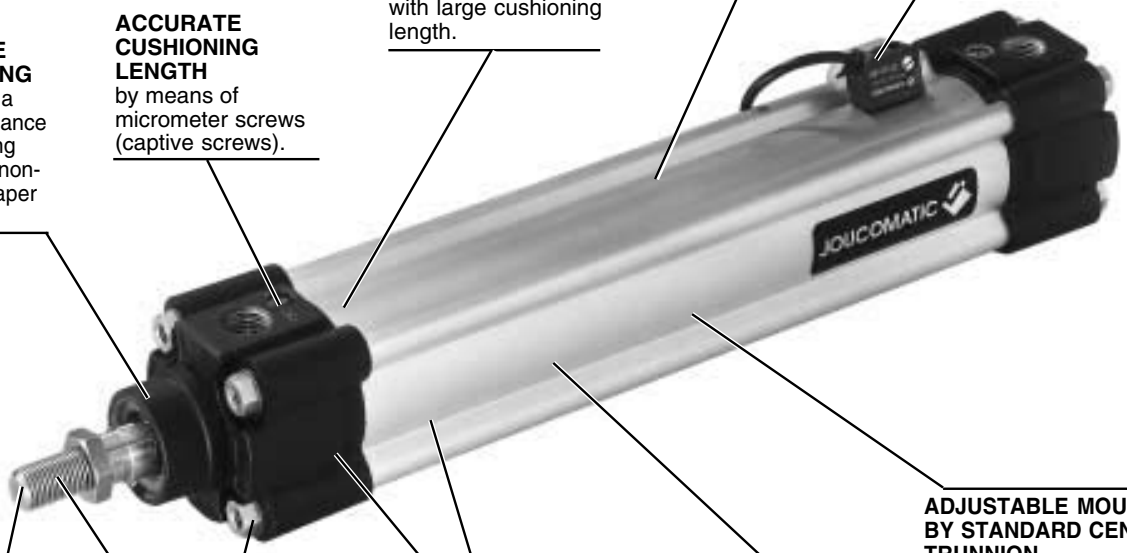
Comply with the new European standard

P230-GB.R7

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

ASCO JOUCOMATIC

DOUBLE ACTING PNEUMATIC CYLINDERS - TYPE PES **WITH PROFILED BARREL**



POSITION DETECTOR
Cylinders designed for incorporating at any position of the stroke magnetic position detectors, type:
- REED switch
- magneto resistive (MR)
- magneto-inductive (BIM)

LIGHT AND ESTHETIC DESIGN
Cylinders with **profiled barrel** in hard anodized **aluminium**.

PNEUMATIC CUSHIONING
with large cushioning length.

ACCURATE CUSHIONING LENGTH
by means of micrometer screws (captive screws).

ACCURATE ROD GUIDING
by means of a high-performance self lubricating bearing and non-abrasive scraper seal.

ADJUSTABLE MOUNTING BY STANDARD CENTRE TRUNNION
This fitting slides along the barrel and allows on-site adjustment.

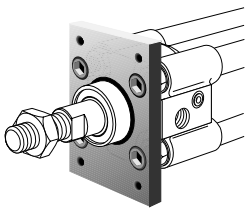
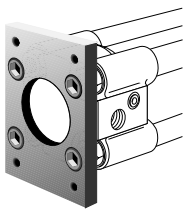
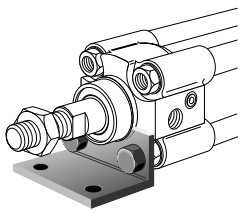
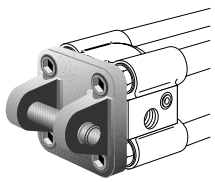
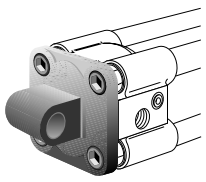
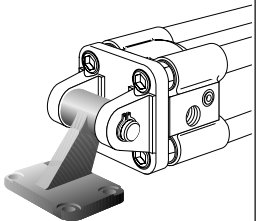
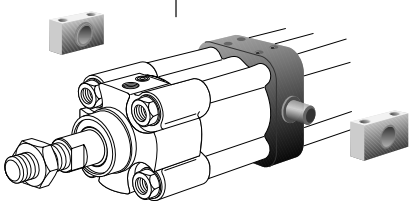
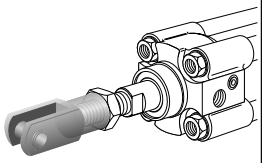
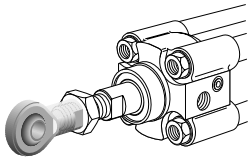
EASY MAINTENANCE
PES cylinders do not require any lubrication.

EASY CARE
Specially designed for easier outside cleaning thanks to fewer fixing points. (Ø 32 to 80 mm)

EASY FITTING
Large choice of standard fittings and rod ends (see below).

STURDY DESIGN
Rod in hard chrome steel.

RANGE OF STANDARD FITTINGS

 Front flange	 Rear flange	 Feet	 Cap, detachable clevis or with spherical eye	 Cap, detachable eye, or with spherical eye
 Angular clevis bracket or with spherical eye	 Centre trunnion / Trunnion supports	 Female rod clevis	 Spherical bearing	

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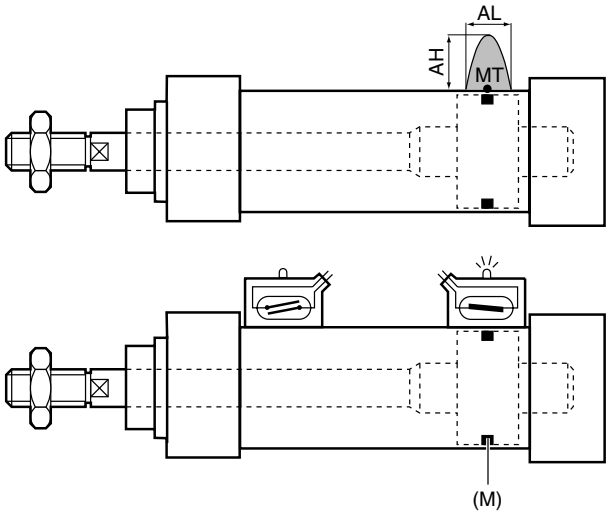
MAGNETIC DETECTION



The cylinder type PES, dia. 32 to 80 mm, onto which detectors can be mounted, has a **force line spectrum according to CNOMO E 530 52 809**. Field values: 7.5 m Tesla at point MT and a maximum of 2 m Tesla at the fringe of the force line spectrum (1 m Tesla = approx. 10 Gauss).

	Ø cylinder				
	32	**40**	**50**	**63**	**80**
AH	6	6	7	8	9
AL	8	9	10	10	11

mm

Optimal position detection is guaranteed when using our reed switch, magneto-resistive or magneto-inductive type detectors, see summary below.

Air cylinders equipped of a magnet (M) designed to operate in combination with the magnetic position detectors (DM). These air cylinders can be equipped with one or more magnetic position detectors (without contact) attached to the tube. They allow limit positions to be detected, as well as the intermediate piston positions.

2

DEFINING THE PART NUMBER OF A Ø 32 TO 125 mm VDMA/ISO AIR CYLINDER

PES .. A/NA ... – DM

- VDMA/AFNOR/ISO AIR CYLINDER: prefix PES
- Air cylinder diameter (mm)
- End-of-stroke adjustable pneumatic cushioning: suffix **A**
  Non-cushioned (elastic cushioning): suffix **NA**
- Length of stroke (mm)
- Air cylinder designed to receive magnetic position detectors = suffix **DM**

ORDERING

When ordering, please specify:

450 .. ... + ...

AIR CYLINDER
- The air cylinder standard code or part number
- The code or part number of any option(s)

MOUNTINGS
- The code or codes and quantity of any mountings : **434 .. ...**

DETECTORS
- The code and quantity of any magnetic detectors : **881 .. ...**
- The code and quantity of mountings : **881 .. ...**

CONTENTS

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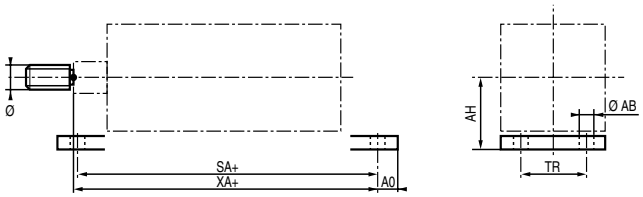
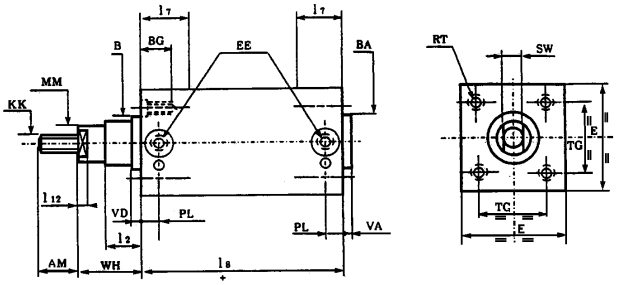
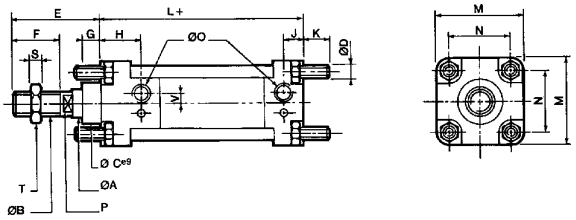
STANDARDS OF CYLINDERS Ø 32 to 320 mm	INTERCHANGEABILITY within the standard	INTERCHANGEABILITY between standards
ISO 6431 cylinders (year: 1983)		
The international standards define a cylinder unit **equipped** with its mountings without any specifications relative to the bare cylinder alone.  *JOUCOMATIC cylinder, type **PIS**, complies with the international standards*	Interchangeability between manufacturers is achieved by replacing both the cylinder **and** its mountings.	For full interchangeability with ISO 6431,VDMA-AFNOR NFE 49003 cylinder must be equipped with its mountings, and reciprocally. *(cylinder PES+mountings interchangeable with PIS cylinder).*
VDMA 24562- CNOMO/AFNOR NFE 49003 cylinders (year: 1992)		
The new standards define first all the external dimensions of a **bare** cylinder then the mountings which, when mounted, must comply with the above unit (ISO 6431 cylinder).  *JOUCOMATIC cylinder, type **PES** with profiled barrel or tie rods, complies with the new standards*	Full interchangeability between the manufacturers is achieved at every level: • bare cylinder, • each mounting, • complete unit.	No interchangeability can be achieved between CNOMO/NFE 49001 cylinder (bare or equipped) and AFNOR NFE 49003 cylinder or ISO 6431 cylinder, and reciprocally.
CNOMO 06.07.02/AFNOR NFE 49001 cylinders (year: 1968)		
The French standards define first all the external dimensions of a **bare** cylinder then the mountings.  *JOUCOMATIC cylinder, type **PCN**, complies with the French standards*	Full interchangeability between the manufacturers is possible at every level: • bare cylinder, • each mounting, • complete unit.	

Note : ISO 6432 and AFNOR NFE 49030 standards apply only to mini-cylinders Ø 8 to 25 mm.

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• THE DYNAMIC EFFORT DEVELOPED BY A CYLINDER

F = Pressure x piston area x efficiency

The efficiency of a cylinder depends on the diameter of the cylinder, on the pressure and on its mechanical construction. The graph and a chart below show the dynamic effort developed by a cylinder at the piston rod, at various supply pressures.

• LOAD FACTOR

This is the relationship expressed as a percentage between the actual load being moved by the cylinder and the dynamic effort available at the end of the piston rod.

$$\text{Load factor (in \%)} = \frac{\text{actual load}}{\text{dynamic effort}} \times 100$$

For an optimum installation of a cylinder, we recommend a cylinder with a load factor **inferior or equal to 75%**.

EXAMPLE: Calculate a cylinder to lift a load of 130 daN with a pressure of 7 bar (gauge pressure).

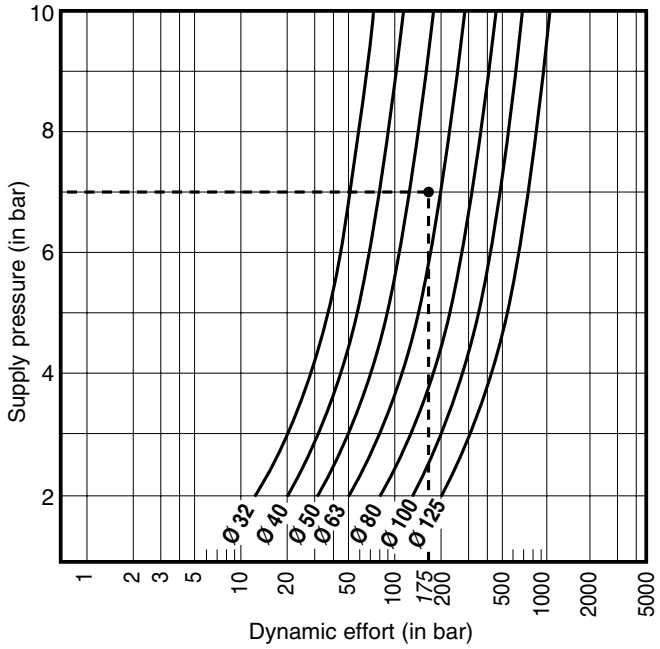
$$\text{Theoretical dynamic effort} = \frac{\text{actual load}}{\text{Load factor}} = \frac{130}{0.75} = 175 \text{ daN}$$

The graph below shows the cross over point between the dynamic effort and the supply pressure. The cylinder diameter required will be that where the curve passes this point or the cylinder giving a force immediately above that required.

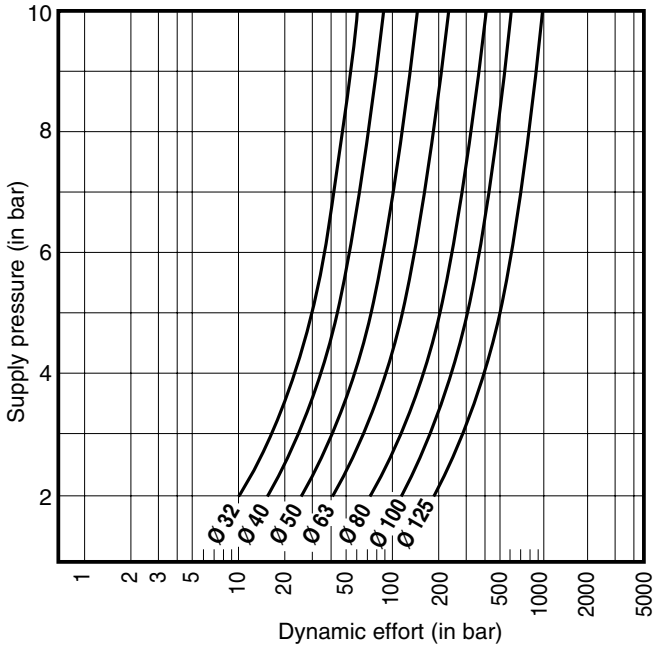
In the example above: 175 daN is between Ø 50 and Ø 63. The cylinder recommended is the Ø 63 mm which will develop a force of 200 daN at 7 bar and the actual load factor is:

$$\frac{130 \text{ daN}}{200 \text{ daN}} \times 100 = 65\%$$

EFFORTS DEVELOPED AT THE END OF THE ROD (ROD OUT)



EFFORTS DEVELOPED AT THE END OF THE ROD (ROD RETURNED)



EFFORTS DEVELOPED BY A CYLINDER (in daN)

Ø Cylinder (mm)	Ø Rod (mm)	Piston cross-section area (cm^2)		Dynamic effort developed (in daN) at various supply pressures (in bar)									
				2		4		6		8		10	
		●	○	●	○	●	○	●	○	●	○	●	○
32	12	8	6,9	13	11	30	25	46	39	62	52	77	65
40	16	12,6	10,6	21	17	46	37	70	58	95	80	122	100
50	20	19,6	16,5	33	27	70	58	110	92	150	124	190	155
63	20	31,2	28,1	53	46	110	98	170	154	230	211	290	264
80	25	50,3	45,4	88	77	185	163	285	255	385	341	480	427
100	25	78,5	73,5	135	125	290	260	440	400	600	550	750	675
125	32	123	115	210	200	460	420	700	650	925	875	1150	1100

● Efforts developed with rod out (bottom side) ○ Efforts developed with rod returned (rod side)

Note: Cylinders with double crossbar develop identical efforts in both working directions. Their values are the ones defined here-above for efforts developed with rod **returned**.

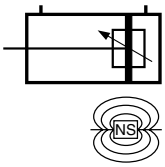
Series 450
Type: PES-DM

Comply with the new European standard

DOUBLE ACTING CYLINDERS Ø 32 to 125 mm

equipped for magnetic position detectors
Conforming with VDMA-ISO standards
With or without adjustable pneumatic cushioning

Cylinders with profiled barrel



SPECIFICATION

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	– 20° C, at + 60° C (for higher temperature, see P239)
OPTIMAL MAX. SPEED	:	≤ 1 m/s (for optimal service life)
MAX. SPEED RATE	:	2 m/s
STANDARDS	:	**VDMA 24562 - ISO 6431**

CONSTRUCTION

Barrel	:	non magnetic hard anodized aluminium alloy
Rod	:	hard chrome plated steel
Piston	:	acetal resin (POM), or light alloy fitted with a permanent annular magnet
Piston seal	:	polyurethane (PUR)
Cushioning seals	:	polyurethane (PUR)
Front and rear ends	:	aluminium alloy
Bearing	:	metal self lubricating
Rod nut	:	galvanized steel
Cushioning	:	pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT

Bore Ø (mm)	Strokes (mm)	CODES ✻✻ to specify on order: CUSHIONED CYLINDER (A)	CODES ✻✻ to specify on order: NON-CUSHIONED CYLINDER (NA)	REFERENCES ✻ to specify on order	Connection Ø	Cushioning length (mm)
32	25	**450 00 001**	**450 00 097**	PES 32 (A or NA) 25-DM	G 1/8	18
	50	**450 00 002**	**450 00 098**	PES 32 (A or NA) 50-DM		
	80	**450 01 003**	**450 01 010**	PES 32 (A or NA) 80-DM		
	100	**450 00 003**	**450 00 099**	PES 32 (A or NA) 100-DM		
	125	**450 01 017**	**450 01 024**	PES 32 (A or NA) 125-DM		
	160	**450 00 004**	**450 00 100**	PES 32 (A or NA) 160-DM		
	200	**450 00 005**	**450 00 101**	PES 32 (A or NA) 200-DM		
	250	**450 00 006**	**450 00 102**	PES 32 (A or NA) 250-DM		
	X	**450 50 193**	**450 50 202**	PES 32 (A or NA) . . . -DM		
40	25	**450 00 007**	**450 00 103**	PES 40 (A or NA) 25-DM	G 1/4	20
	50	**450 00 008**	**450 00 104**	PES 40 (A or NA) 50-DM		
	80	**450 01 004**	**450 01 011**	PES 40 (A or NA) 80-DM		
	100	**450 00 009**	**450 00 105**	PES 40 (A or NA) 100-DM		
	125	**450 01 018**	**450 01 025**	PES 40 (A or NA) 125-DM		
	160	**450 00 010**	**450 00 106**	PES 40 (A or NA) 160-DM		
	200	**450 00 011**	**450 00 107**	PES 40 (A or NA) 200-DM		
	250	**450 00 012**	**450 00 108**	PES 40 (A or NA) 250-DM		
	320	**450 00 013**	**450 00 109**	PES 40 (A or NA) 320-DM		
	400	**450 00 014**	**450 00 110**	PES 40 (A or NA) 400-DM		
	X	**450 50 194**	**450 50 203**	PES 40 (A or NA) . . . -DM		
50	25	**450 00 015**	**450 00 111**	PES 50 (A or NA) 25-DM	G 1/4	26
	50	**450 00 016**	**450 00 112**	PES 50 (A or NA) 50-DM		
	80	**450 01 005**	**450 01 012**	PES 50 (A or NA) 80-DM		
	100	**450 00 017**	**450 00 113**	PES 50 (A or NA) 100-DM		
	125	**450 01 019**	**450 01 026**	PES 50 (A or NA) 125-DM		
	160	**450 00 018**	**450 00 114**	PES 50 (A or NA) 160-DM		
	200	**450 00 019**	**450 00 115**	PES 50 (A or NA) 200-DM		
	250	**450 00 020**	**450 00 116**	PES 50 (A or NA) 250-DM		
	320	**450 00 021**	**450 00 117**	PES 50 (A or NA) 320-DM		
	400	**450 00 022**	**450 00 118**	PES 50 (A or NA) 400-DM		
	500	**450 00 023**	**450 00 119**	PES 50 (A or NA) 500-DM		
	630	**450 00 024**	**450 00 120**	PES 50 (A or NA) 630-DM		
	X	**450 50 195**	**450 50 204**	PES 50 (A or NA) . . . -DM		
63	25	**450 00 025**	**450 00 121**	PES 63 (A or NA) 25-DM	G 3/8	26
	50	**450 00 026**	**450 00 122**	PES 63 (A or NA) 50-DM		
	80	**450 01 006**	**450 01 013**	PES 63 (A or NA) 80-DM		
	100	**450 00 027**	**450 00 123**	PES 63 (A or NA) 100-DM		
	125	**450 01 020**	**450 01 027**	PES 63 (A or NA) 125-DM		
	160	**450 00 028**	**450 00 124**	PES 63 (A or NA) 160-DM		
	200	**450 00 029**	**450 00 125**	PES 63 (A or NA) 200-DM		
	250	**450 00 030**	**450 00 126**	PES 63 (A or NA) 250-DM		
	320	**450 00 031**	**450 00 127**	PES 63 (A or NA) 320-DM		
	400	**450 00 032**	**450 00 128**	PES 63 (A or NA) 400-DM		
	500	**450 00 033**	**450 00 129**	PES 63 (A or NA) 500-DM		
	630	**450 00 034**	**450 00 130**	PES 63 (A or NA) 630-DM		
	X	**450 50 196**	**450 50 205**	PES 63 (A or NA) . . . -DM		

X Other strokes on request (to specify on order within the reference)
✻ A = Cushioned, NA = Non-cushioned
✻✻ **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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Bore Ø (mm)	Strokes (mm)	CODES ✻✻ to specify on order — CUSHIONED CYLINDER (A)	CODES ✻✻ to specify on order — NON-CUSHIONED CYLINDER (NA)	REFERENCES ✻ to specify on order	Connection Ø	Cushioning length (mm)
80	25	**450 00 035**	**450 00 131**	PES 80 (A or NA) 25-DM	G 3/8	27
	50	**450 00 036**	**450 00 132**	PES 80 (A or NA) 50-DM		
	80	**450 01 007**	**450 01 014**	PES 80 (A or NA) 80-DM		
	100	**450 00 037**	**450 00 133**	PES 80 (A or NA) 100-DM		
	125	**450 01 021**	**450 01 028**	PES 80 (A or NA) 125-DM		
	160	**450 00 038**	**450 00 134**	PES 80 (A or NA) 160-DM		
	200	**450 00 039**	**450 00 135**	PES 80 (A or NA) 200-DM		
	250	**450 00 040**	**450 00 136**	PES 80 (A or NA) 250-DM		
	320	**450 00 041**	**450 00 137**	PES 80 (A or NA) 320-DM		
	400	**450 00 042**	**450 00 138**	PES 80 (A or NA) 400-DM		
	500	**450 00 043**	**450 00 139**	PES 80 (A or NA) 500-DM		
	630	**450 00 044**	**450 00 140**	PES 80 (A or NA) 630-DM		
	X	**450 50 197**	**450 50 206**	PES 80 (A or NA) . . . -DM		
100	50	**450 01 131**	**450 01 161**	PES 100 (A or NA) 50-DM	G 1/2	33
	80	**450 01 132**	**450 01 162**	PES 100 (A or NA) 80-DM		
	100	**450 01 133**	**450 01 163**	PES 100 (A or NA) 100-DM		
	125	**450 01 134**	**450 01 164**	PES 100 (A or NA) 125-DM		
	160	**450 01 135**	**450 01 165**	PES 100 (A or NA) 160-DM		
	200	**450 01 136**	**450 01 166**	PES 100 (A or NA) 200-DM		
	250	**450 01 137**	**450 01 167**	PES 100 (A or NA) 250-DM		
	320	**450 01 138**	**450 01 168**	PES 100 (A or NA) 320-DM		
	400	**450 01 139**	**450 01 169**	PES 100 (A or NA) 400-DM		
	500	**450 01 140**	**450 01 170**	PES 100 (A or NA) 500-DM		
	630	**450 01 141**	**450 01 171**	PES 100 (A or NA) 630-DM		
	700	**450 01 142**	**450 01 172**	PES 100 (A or NA) 700-DM		
	800	**450 01 143**	**450 01 173**	PES 100 (A or NA) 800-DM		
	900	**450 01 144**	**450 01 174**	PES 100 (A or NA) 900-DM		
	1000	**450 01 145**	**450 01 175**	PES 100 (A or NA) 1000-DM		
	X	**450 51 008**	**450 51 012**	PES 100 (A or NA) . . . -DM		
125	50	**450 01 146**	**450 01 176**	PES 125 (A or NA) 50-DM	G 1/2	37
	80	**450 01 147**	**450 01 177**	PES 125 (A or NA) 80-DM		
	100	**450 01 148**	**450 01 178**	PES 125 (A or NA) 100-DM		
	125	**450 01 149**	**450 01 179**	PES 125 (A or NA) 125-DM		
	160	**450 01 150**	**450 01 180**	PES 125 (A or NA) 160-DM		
	200	**450 01 151**	**450 01 181**	PES 125 (A or NA) 200-DM		
	250	**450 01 152**	**450 01 182**	PES 125 (A or NA) 250-DM		
	320	**450 01 153**	**450 01 183**	PES 125 (A or NA) 320-DM		
	400	**450 01 154**	**450 01 184**	PES 125 (A or NA) 400-DM		
	500	**450 01 155**	**450 01 185**	PES 125 (A or NA) 500-DM		
	630	**450 01 156**	**450 01 186**	PES 125 (A or NA) 630-DM		
	700	**450 01 157**	**450 01 187**	PES 125 (A or NA) 700-DM		
	800	**450 01 158**	**450 01 188**	PES 125 (A or NA) 800-DM		
	900	**450 01 159**	**450 01 189**	PES 125 (A or NA) 900-DM		
	1000	**450 01 160**	**450 01 190**	PES 125 (A or NA) 1000-DM		
	X	**450 51 009**	**450 51 013**	PES 125 (A or NA) . . . -DM		

NOTE: Ø 160 to 250 mm = PES with tie rods (see P232)

X Other strokes on request (to specify on order within the reference)
✻ A = Cushioned, NA = Non-cushioned
✻✻ **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

MOUNTINGS : see following pages

OPTIONS AND SPECIFIC VERSIONS

The PES range offers a wide variety of options and versions for specific applications (consult us).
- High temperature version (0° C to 120° C) - see P239

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Series 450
Type PES-DM-T2

THROUGH ROD TYPE DOUBLE ACTING CYLINDERS Ø 32 to 125 mm

equipped for magnetic position detectors
Conforming with VDMA-ISO standards
With adjustable pneumatic cushioning

SPÉCIFICATION

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : – 20° C, at + 60° C (for higher temperature, see P239)
OPTIMAL MAX. SPEED : ≤ 1 m/s (for optimal service life)
MAX. SPEED RATE : 2 m/s
STANDARDS : **VDMA 24562 - ISO 6431**

CONSTRUCTION

Barrel : non magnetic hard anodized aluminium alloy
Rod : hard chrome plated steel
Piston : acetal resin (POM), or light alloy fitted with a permanent annular magnet
Piston seal : polyurethane (PUR)
Cushioning seals : polyurethane (PUR)
Front and rear ends : aluminium alloy
Bearing : metal self lubricating
Rod nut : galvanized steel
Cushioning : pneumatic, adjustable from both sides with captive screws

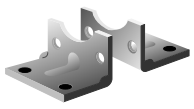
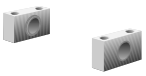
CHOICE OF EQUIPMENT

Bore Ø (mm)	PES CYLINDER WITH PROFILED BARREL THROUGH ROD TYPE CODES	RÉFÉRENCES	Max. stroke capabilty (mm)	Connection Ø	Cushioning length (mm)
32	**450 50 211** (1)**....**	PES 32 A (1) DM - T2	300	G1/8	18
40	**450 50 212** (1)**....**	PES 40 A (1) DM - T2	400	G1/4	20
50	**450 50 213** (1)**....**	PES 50 A (1) DM - T2	500	G1/4	26
63	**450 50 214** (1)**....**	PES 63 A (1) DM - T2	500	G3/8	26
80	**450 50 215** (1)**....**	PES 80 A (1) DM - T2	600	G 3/8	27
100	**450 51 010** (1)**....**	PES 100 A (1) DM - T2	600	G 3/8	33
125	**450 51 011** (1)**....**	PES 125 A (1) DM - T2	600	G 3/8	37

(1) Please specify stroke length (in mm) , compatible with the max. stroke capabilty.
The magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

DIMENSIONS (see following pages)

MOUNTINGS

		 Low feet (2) **MS1**	 High foot (1) **MS3**	 Rectangular front or rear flange **MF1 - MF2**	 Centre trunnion **MT4** (for PES cylinder with profiled barrel) supplied fixed / XV (3)	supplied loose (4)	 Supports (2) for centre trunnion **AT4**
Application	Standard duty	●	●	●	●	●	●
	Heavy duty	●	●	●	●	●	●
Construction		Stamped sheet steel	Drawn steel	Steel	Cast iron	Cast iron	Aluminium + bush
For cylinder Ø		**CODES** OF MOUNTINGS					
32		**434 00 163**	**434 00 307**	**434 00 119**	**410 521**	**410 557**	**434 00 207**
40		**434 00 164**	**434 00 308**	**434 00 120**	**410 522**	**410 558**	**434 00 208**
50		**434 00 165**	**434 00 309**	**434 00 121**	**410 523**	**410 559**	**434 00 208**
63		**434 00 166**	**434 00 310**	**434 00 122**	**410 524**	**410 560**	**434 00 209**
80		**434 00 167**	**434 00 311**	**434 00 123**	**410 525**	**410 561**	**434 00 209**
100		**434 00 168**	**434 00 312**	**434 00 124**	**410 526**	**410 562**	**434 00 210**
125		**434 00 169**	**434 00 313**	**434 00 192**	**410 527**	**410 563**	**434 00 210**
Dimensions		page 11	page 17	page 11	page 16	page 16	page 16

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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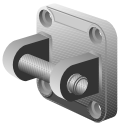
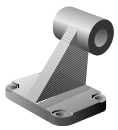
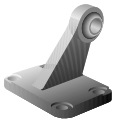
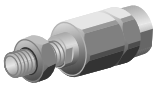
MOUNTINGS

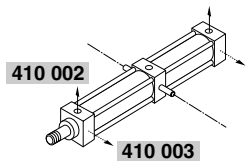
		 Cap, detachable clevis **MP2**			 Cap, detachable eye (trunnion) **MP4**			 Angular clevis bracket **AB3**		
Application	Standard duty	●	●		●	●		●	●	
	Heavy duty		●	●		●	●		●	●
Construction		Light alloy	Cast iron+steel without bush	Cast iron+steel + bush	Light alloy	Cast iron without bush	Cast iron + bush	Light alloy	Cast iron without bush	Cast iron + bush
For cylinder Ø		**CODES** OF MOUNTINGS								
32		**434 00 130**	**434 00 257**	**434 00 185**	**434 00 125**	**434 00 266**	**434 00 171**	**434 00 383**	**434 00 145**	**434 00 110**
40		**434 00 131**	**434 00 258**	**434 00 186**	**434 00 126**	**434 00 267**	**434 00 172**	**434 00 384**	**434 00 146**	**434 00 111**
50		**434 00 132**	**434 00 259**	**434 00 187**	**434 00 127**	**434 00 268**	**434 00 173**	**434 00 385**	**434 00 147**	**434 00 112**
63		**434 00 133**	**434 00 260**	**434 00 188**	**434 00 128**	**434 00 269**	**434 00 174**	**434 00 386**	**434 00 148**	**434 00 113**
80		**434 00 134**	**434 00 261**	**434 00 189**	**434 00 129**	**434 00 270**	**434 00 175**	**434 00 387**	**434 00 149**	**434 00 114**
100		**434 00 135**	**434 00 262**	**434 00 190**	**434 00 161**	**434 00 271**	**434 00 176**	**434 00 388**	**434 00 150**	**434 00 115**
125		-	**434 00 263**	**434 00 191**	-	**434 00 272**	**434 00 177**	-	**434 00 151**	**434 00 116**
Dimensions		pages 12/13			pages 12/13			page 13		

		 Cap, clevis for spherical eye or clevis bracket	 Cap, eye with spherical bearing (5) **MP6**	 Angular clevis bracket spherical eye (5) **AB5**	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical rod end ISO 8139 - RP103P **AP6**	 Alignment (6) compensator
Application	Standard duty	●	●	●	●	●	●
	Heavy duty	●	●	●	●	●	●
Construction		Forged steel	Forged steel	Forged steel	Steel	Steel	Steel
For cylinder Ø		**CODES** OF MOUNTINGS					
32		**434 00 363**	**434 00 372**	**434 00 354**	**434 00 016**	**434 00 001**	**434 00 242**
40		**434 00 364**	**434 00 373**	**434 00 355**	**434 00 017**	**434 00 002**	**434 00 243**
50		**434 00 365**	**434 00 374**	**434 00 356**	**434 00 018**	**434 00 003**	**434 00 244**
63		**434 00 366**	**434 00 375**	**434 00 357**	**434 00 018**	**434 00 003**	**434 00 244**
80		**434 00 367**	**434 00 376**	**434 00 358**	**434 00 019**	**434 00 004**	**434 00 245**
100		**434 00 368**	**434 00 377**	**434 00 359**	**434 00 019**	**434 00 004**	**434 00 245**
125		**434 00 369**	**434 00 378**	**434 00 360**	**434 00 020**	**434 00 005**	**434 00 246**
Dimensions		pages 14/15	pages 14/15	page 15	page 18	page 18	page 18

(1) High foot sold individually
(2) Corresponds to a set of 2 parts.
(3) Trunnion supplied **fixed to the barrel** at dimension XV specified when ordered:
The centre trunnion code fixed and the dimension XV along with orientation code of the trunnion with respect to the ports must be added to the cylinder code.
(example: 450 00 020 + options 410 523 / XV = 210 + 410 002)
(4) Trunnion supplied **loose** on cylinder barrel for on-site adjustment to required dimension:
The centre trunnion code loose and the dimension XV along with orientation code of the trunnion with respect to the ports must be added to the cylinder code
(5) These accessories allows accurate angular compensation adjustment spherical of 4°
(6) This accessorie allows accurate angular compensation adjustment spherical of 4° and radial of 0,7 mm
NOTE: With the exception of the centre trunnion, mountings are delivered separetely.

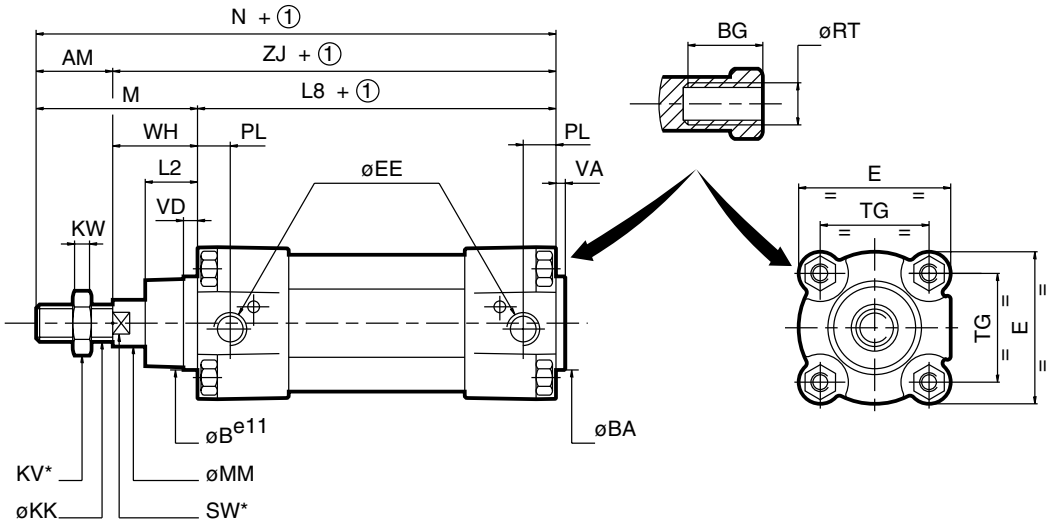
Centre trunnion orientation

- Trunnion axis is perpendicular to supply ports, code: **410 002** (standard orientation)
- other position upon request, code: **410 003**

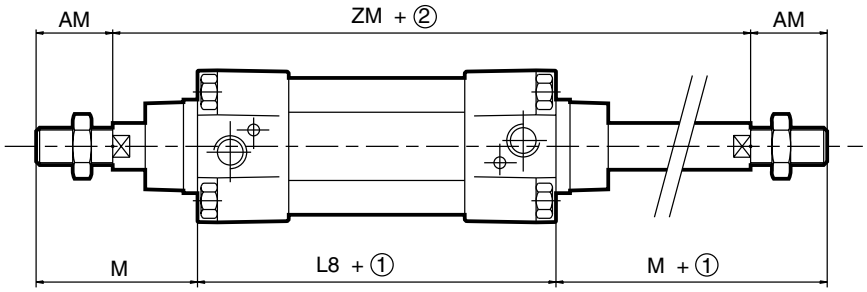


: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

DIMENSIONS AND WEIGHTS - BARE CYLINDER



SINGLE ROD CYLINDER



THROUGH ROD TYPE CYLINDER

① : + Stroke
② : + (stroke x 2)
✻ : dimensions on flats

Bore Ø (mm)	DIMENSIONS (mm)																		
	AM	ØB	ØBA	BG	E	ØEE	ØKK	KV	KW	L2	L8	M	ØMM	N	PL	ØRT	SW	TG	VA	VD min.
32	22	30	30	16	50	G1/8	M10x1,25	16	5	17	94	48	12	142	14	M6	10	32,5	4	4
40	24	35	35	16	55	G1/4	M12x1,25	18	6	19	105	54	16	159	16	M6	13	38	4	4
50	32	40	40	16	65	G1/4	M16x1,5	24	8	26	106	69	20	175	18	M8	16	46,5	4	4
63	32	45	45	16	75	G3/8	M16x1,5	24	8	26	121	69	20	190	17	M8	16	56,5	4	4
80	40	45	45	17	100	G3/8	M20x1,5	30	10	33	128	86	25	214	16,5	M10	21	72	4	4
100	40	55	55	17	120	G1/2	M20x1,5	30	10	35,5	138	91	25	229	21	M10	21	89	4	4
125	54	60	60	24	145	G1/2	M27x2	41	13,5	40	160	119	32	279	32	M12	27	110	6	6

Bore Ø (mm)	DIMENSIONS (mm)			WEIGHTS (kg)	
	WH	ZJ	ZM	(3)	(4)
32	26	120	146	0,550	0,220
40	30	135	165	0,800	0,315
50	37	143	180	1,120	0,450
63	37	158	195	1,410	0,500
80	46	174	220	2,690	0,750
100	51	189	240	3,560	0,875
125	65	225	290	6,740	1,315

(3) Cylinder weight with 0 mm stroke.
(4) Weight to be added per additional 100 mm length.

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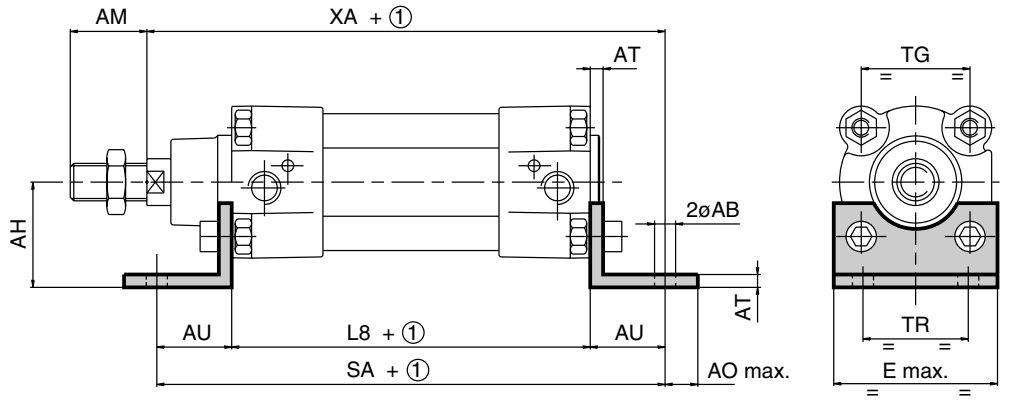
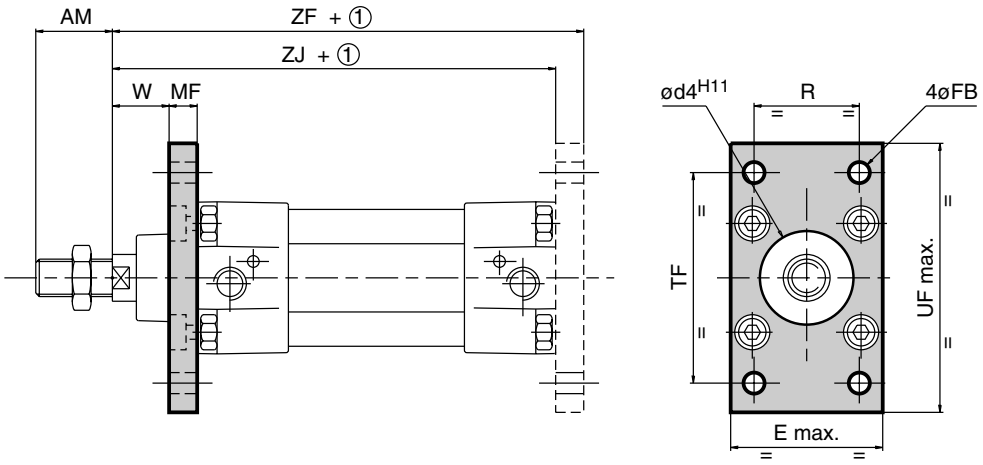
LOW FEET MOUNTING - MS1



RECTANGULAR FRONT OR REAR MOUNTING FLANGE - MF1 - MF2



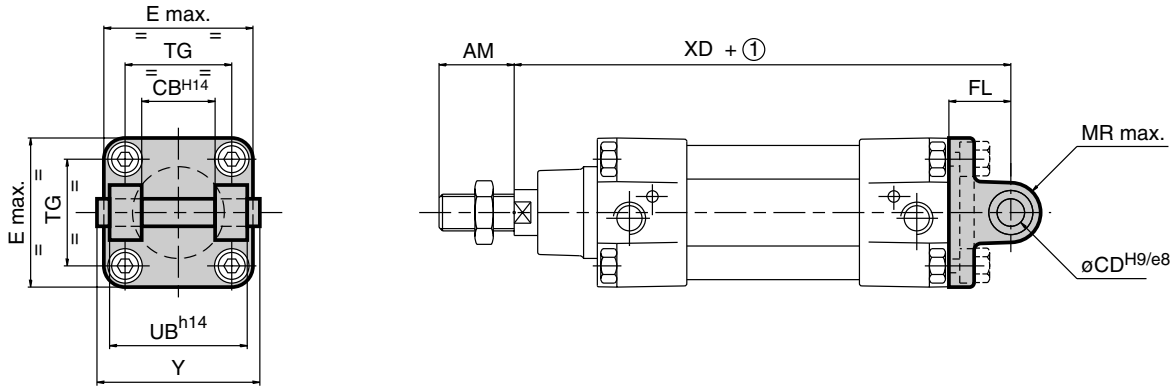
① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																			
	ØAB	AM	AO	AH	AT	AU	Ød4	E	ØFB	L8	MF	R TR	SA	TF	TG	UF	W	XA	ZJ	ZF
32	7	22	11	32	4,5	24	30	50	7	94	10	32	142	64	32,5	86	16	144	120	130
40	10	24	15	36	4,5	28	35	58	9	105	10	36	161	72	38	96	20	163	135	145
50	10	32	15	45	5,5	32	40	70	9	106	12	45	170	90	46,5	115	25	175	143	155
63	10	32	15	50	5,5	32	45	85	9	121	12	50	185	100	56,5	130	25	190	158	170
80	12	40	20	63	6,5	41	45	105	12	128	16	63	210	126	72	165	30	215	174	190
100	14,5	40	25	71	6,5	41	55	130	14	138	16	75	220	150	89	187	35	230	189	205
125	16,5	54	25	90	8	45	60	157	16	160	20	90	250	180	110	224	45	270	225	245

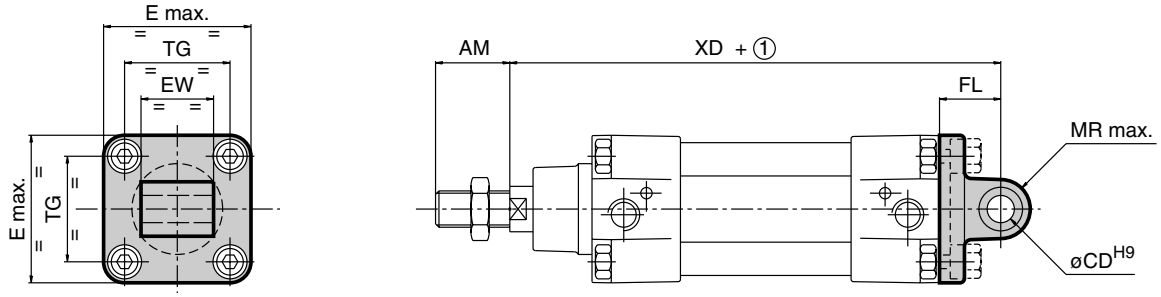
Bore Ø (mm)	Weights (kg)	
	2 feet	Front or rear flange
32	0,150	0,240
40	0,190	0,240
50	0,395	0,500
63	0,445	0,580

Bore Ø (mm)	Weights (kg)	
	2 feet	Front or rear flange
80	0,790	1,390
100	1,400	1,630
125	2,330	4,270

CAP, DETACHABLE CLEVIS MOUNTING - MP2



CAP, DETACHABLE EYE (TRUNNION) MOUNTING - MP4



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)										
	AM	CB	ØCD	E	EW	FL	MR	TG	UB	XD	Y
32	22	26	10	50	26	22	11	32,5	45	142	56
40	24	28	12	58	28	25	13	38	52	160	63
50	32	32	12	70	32	27	13	46,5	60	170	71
63	32	40	16	85	40	32	17	56,5	70	190	81
80	40	50	16	105	50	36	17	72	90	210	101
100	40	60	20	130	60	41	21	89	110	230	128
125	54	70	25	157	70	50	26	110	130	275	149

Standard EW tolerances	
Ø 32...100 mm	- 0,2 EW - 0,6
Ø 125 mm	- 0,5 EW - 1,2

Bore Ø (mm)	Weights (kg)			
	Cap, detachable clevis		Cap, detachable eye (trunnion)	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
32	0,105	0,205	0,085	0,210
40	0,150	0,305	0,092	0,230
50	0,240	0,430	0,170	0,430
63	0,370	0,685	0,250	0,620

Bore Ø (mm)	Weights (kg)			
	Cap, detachable clevis		Cap, detachable eye (trunnion)	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
80	0,635	1,375	0,445	1,110
100	0,990	2,100	0,755	1,700
125	-	3,570	-	3,100

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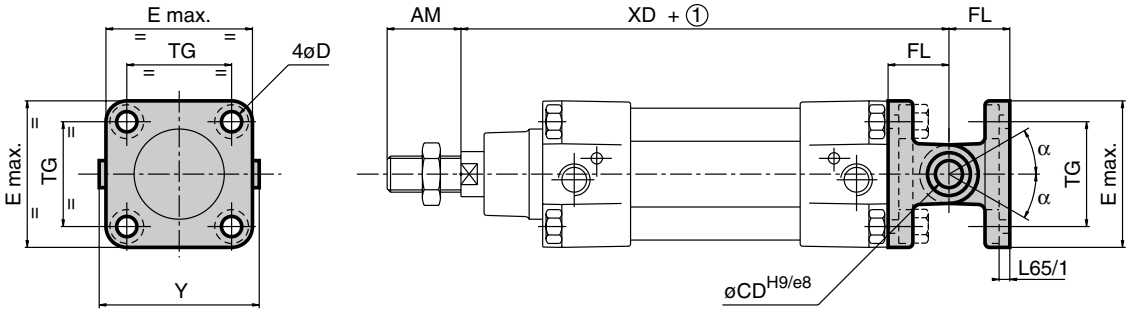
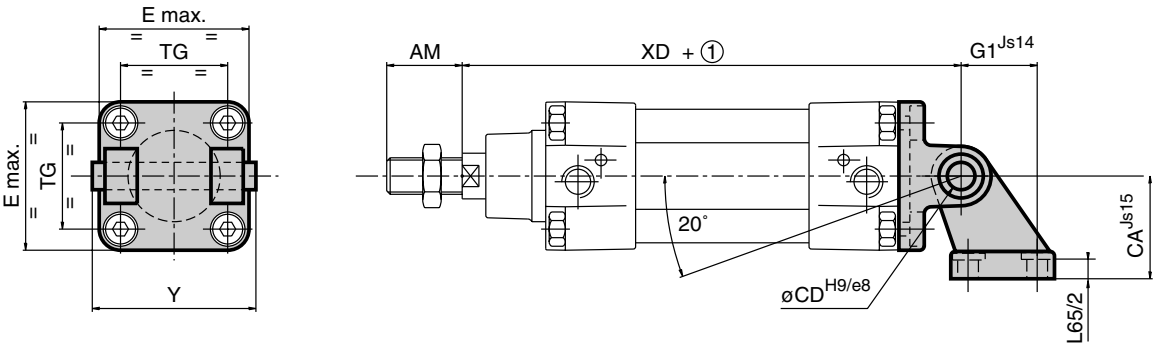
STRAIGHT COMPLETE TRUNNION MOUNTING - WITH OR WITHOUT BUSH - MP2 + MP4

To achieve the complete assembly, items MP2 and MP4 must be ordered **separately**.

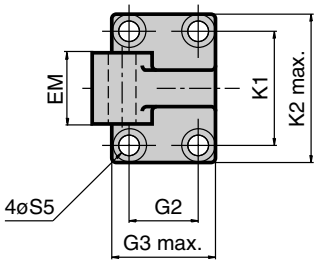


COMPLETE TRUNNION MOUNTING WITH ANGULAR CLEVIS BRACKET - WITH OR WITHOUT BUSH - MP2 + AB3

This set includes the cap, detachable clevis MP2 and the angular clevis bracket AB3, with or without bush.
These mountings must be ordered **separately**



Standard EM tolerances	
Ø 32...100 mm	- 0,2 EM - 0,6
Ø 125 mm	- 0,5 EM - 1,2



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																		
	AM	ØCD	ØD	ØS5	E	EM	FL	K1	K2	G1	G2	G3	CA	L65/1	L65/2	TG	XD	Y	α
32	22	10	6,6	6,6	50	26	22	38	51	21	18	31	32	5,5	6,5	32,5	142	56	45°
40	24	12	6,6	6,6	58	28	25	41	54	24	22	35	36	5,5	8,5	38	160	63	50°
50	32	12	9	9	70	32	27	50	65	33	30	45	45	6,5	10,5	46,5	170	71	40°
63	32	16	9	9	85	40	32	52	67	37	35	50	50	6,5	10,5	56,5	190	81	55°
80	40	16	11	11	105	50	36	66	86	47	40	60	63	10	11,5	72	210	101	45°
100	40	20	11	11	130	60	41	76	96	55	50	70	71	10	12,5	89	230	128	35°
125	54	25	13	14	157	70	50	94	124	70	60	90	90	10	16,5	110	275	149	30°

Bore Ø (mm)	Weights (kg)			
	Straight complete trunnion		Complete trunnion with ang. clevis bracket	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
32	0,190	0,415	0,160	0,340
40	0,240	0,535	0,230	0,450
50	0,410	0,860	0,390	0,790
63	0,620	1,305	0,570	1,080

Bore Ø (mm)	Weights (kg)			
	Straight complete trunnion		Complete trunnion with ang. clevis bracket	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
80	1,080	2,485	0,950	2,090
100	1,745	3,800	1,500	2,750
125	-	6,670	-	6,610

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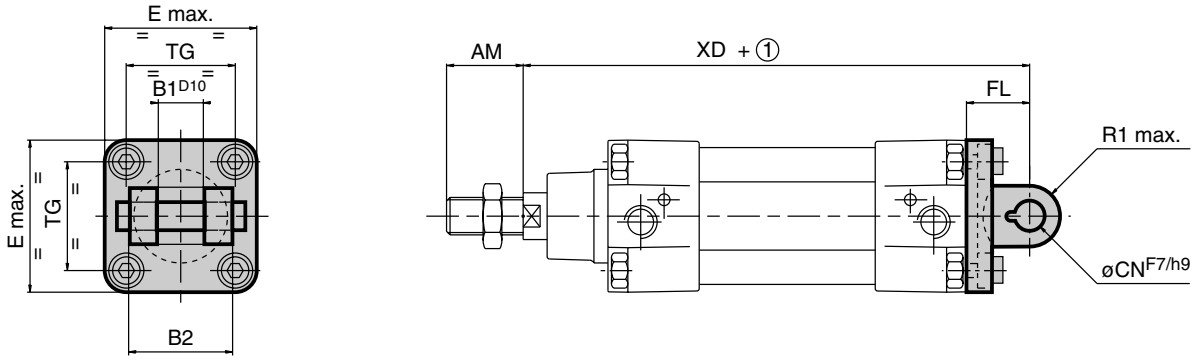
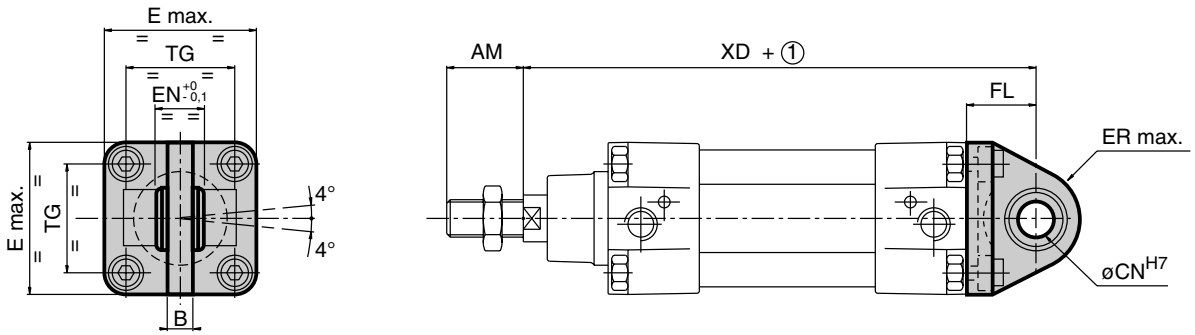
CAP, DETACHABLE CLEVIS MOUNTING - FOR SPHERICAL EYE (STRAIGHT) OR ANGULAR CLEVIS BRACKET



CAP, DETACHABLE EYE MOUNTING WITH SPHERICAL BEARING - MP6



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)											
	AM	B	B1	B2	CN	E	ER	EN	FL	R1	TG	XD
32	22	10,5	14	34	10	50	15	14	22	11	32,5	142
40	24	12	16	40	12	58	18	16	25	13	38	160
50	32	15	21	45	16	70	20	21	27	18	46,5	170
63	32	15	21	51	16	85	23	21	32	18	56,5	190
80	40	18	25	65	20	105	27	25	36	22	72	210
100	40	18	25	75	20	130	30	25	41	22	89	230
125	54	25	37	97	30	157	40	37	50	30	110	275

Standard EN tolerances	
Ø 32...125 mm	**EN** 0 - 0,1

Bore Ø (mm)	Weights (kg)	
	Cap, detachable clevis for spherical eye	Cap, detachable eye with spherical bearing
32	0,190	0,180
40	0,300	0,290
50	0,460	0,420
63	0,680	0,650

Bore Ø (mm)	Weights (kg)	
	Cap, detachable clevis for spherical eye	Cap, detachable eye with spherical bearing
80	1,460	1,210
100	2,130	1,870
125	4,240	3,640

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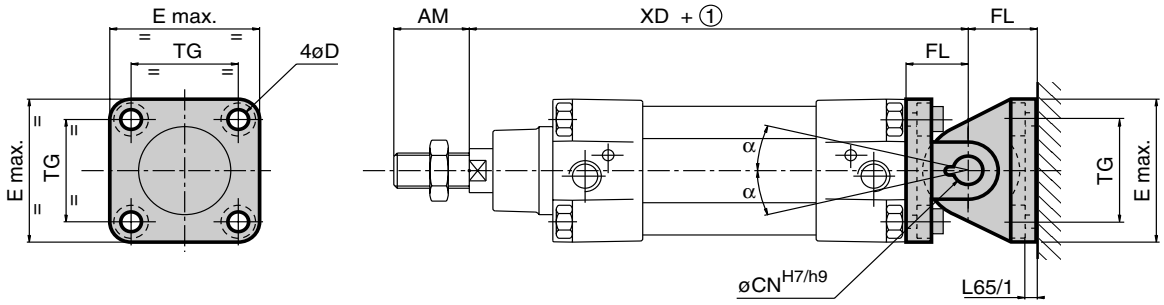
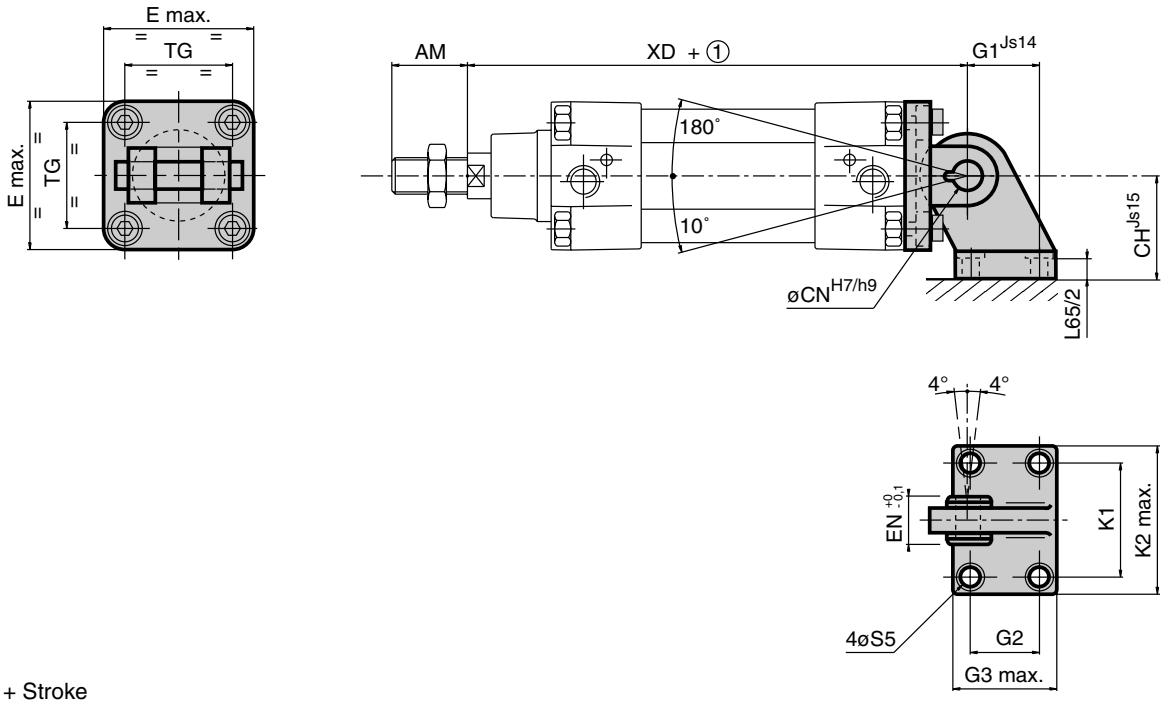
STRAIGHT COMPLETE TRUNNION MOUNTING, SPHERICAL BEARING

This set includes the cap, clevis for spherical eye and the cap, eye with spherical bearing MP6.
These mountings must be ordered **separately**



COMPLETE TRUNNION MOUNTING WITH ANGULAR CLEVIS BRACKET - SPHERICAL BEARING

This set includes the cap, detachable eye and the angular clevis bracket spherical eye AB5.
These mountings must be ordered **separately**



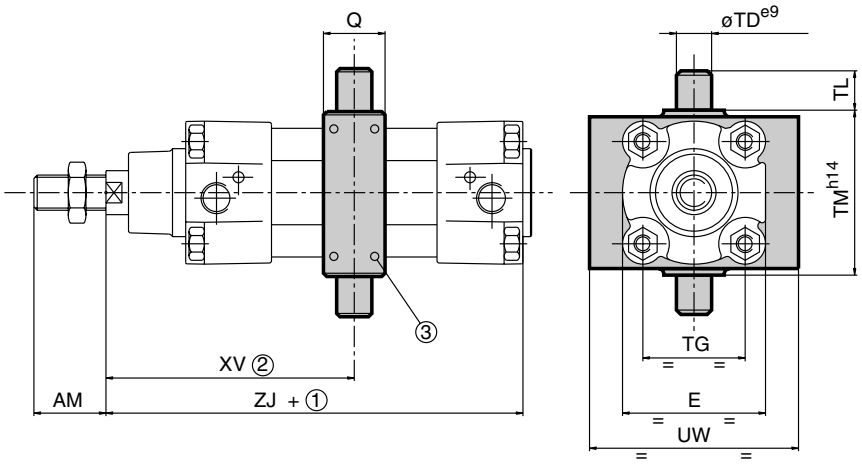
① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																	
	AM	ØCN	ØD	ØS5	E	EN	FL	K1	K2	G1	G2	G3	CH	L65/1	L65/2	TG	XD	α
32	22	10	6,6	6,6	50	14	22	38	51	21	18	31	32	5,5	8,5	32,5	142	40°
40	24	12	6,6	6,6	58	16	25	41	54	24	22	35	36	5,5	8,5	38	160	45°
50	32	16	9	9	70	21	27	50	65	33	30	45	45	6,5	10	46,5	170	35°
63	32	16	9	9	85	21	32	52	67	37	35	50	50	6,5	10	56,5	190	50°
80	40	20	11	11	105	25	36	66	86	47	40	60	63	10	11,5	72	210	40°
100	40	20	11	11	130	25	41	76	96	55	50	70	71	10	12,5	89	230	30°
125	54	30	13,5	14	157	37	50	94	124	70	60	90	90	10	16,5	110	275	25°

Bore Ø (mm)	Weights (kg)	
	Straight complete trunnion,spherical bearing	Complete trunnion with spherical bearing
32	0,370	0,370
40	0,590	0,530
50	0,880	0,910
63	1,330	1,200

Bore Ø (mm)	Weights (kg)	
	Straight complete trunnion,spherical bearing	Complete trunnion with spherical bearing
80	2,670	2,400
100	4	3,200
125	7,880	6,710

CENTRE TRUNNION MOUNTING - MT4



Ø	WITHOUT DETECTORS		WITH DETECTORS		
	XV min.	XV max.	XV min.	XV max.	① min.
32	72	74 +①	138	138 +①	130
40	83	83 +①	149	149 +①	133
50	90	90 +①	156	156 +①	132
63	93,5	101,5 +①	166	166 +①	132
80	106,5	113,5 +①	178	178 +①	131
100	114	126 +①	190	190 +①	135
125	137	155 +①	220	220 +①	137

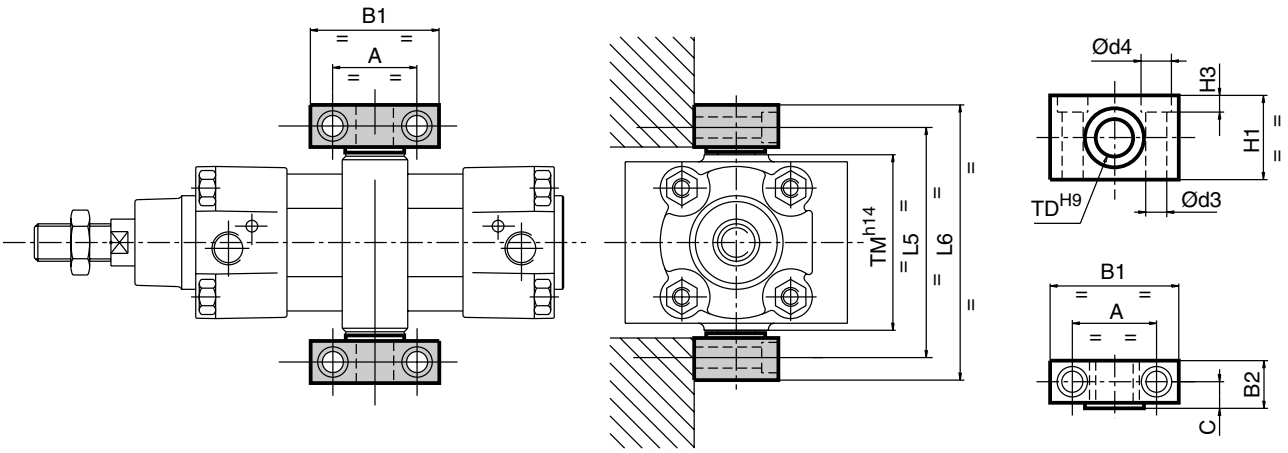
① = + Stroke

①: + Stroke

②: Except when dimension XV is specified on order, the position of the trunnion may be adjusted along the unit. Consequently, the centre trunnion is not screwed on and must be adjusted after delivery.

③: 8 locking screws

SUPPORTS FOR CENTRE TRUNNION - AT4



Bore Ø (mm)	DIMENSIONS (mm)																		
	A	AM	B1	B2	C	Ød3	Ød4	E	H1	H3	L5	L6	Q	TD	TG	TL	TM	UW	ZJ
32	32	22	46	18	10,5	6,6	11	50	30	6,8	71	86	22	12	32,5	12	50	55	120
40	36	24	55	21	12	9	15	55	36	9	87	105	28	16	38	16	63	58	135
50	36	32	55	21	12	9	15	65	36	9	99	117	28	16	46,5	16	75	68	143
63	42	32	65	23	13	11	18	75	40	11	116	136	35	20	56,5	20	90	84	158
80	42	40	65	23	13	11	18	100	40	11	136	156	35	20	72	20	110	102	174
100	50	40	75	28,5	16	13,5	20	120	50	13	164	189	40	25	89	25	132	145	189
125	50	54	75	28,5	16	13,5	20	145	50	13	192	217	40	25	110	25	160	175	225

Bore Ø (mm)	Weights (kg)	
	Centre trunnion	Supports for centre trunnion
32	0,200	0,120
40	0,400	0,230
50	0,500	0,230
63	0,900	0,330

Bore Ø (mm)	Weights (kg)	
	Centre trunnion	Supports for centre trunnion
80	1,100	0,330
100	1,860	0,580
125	2,550	0,580

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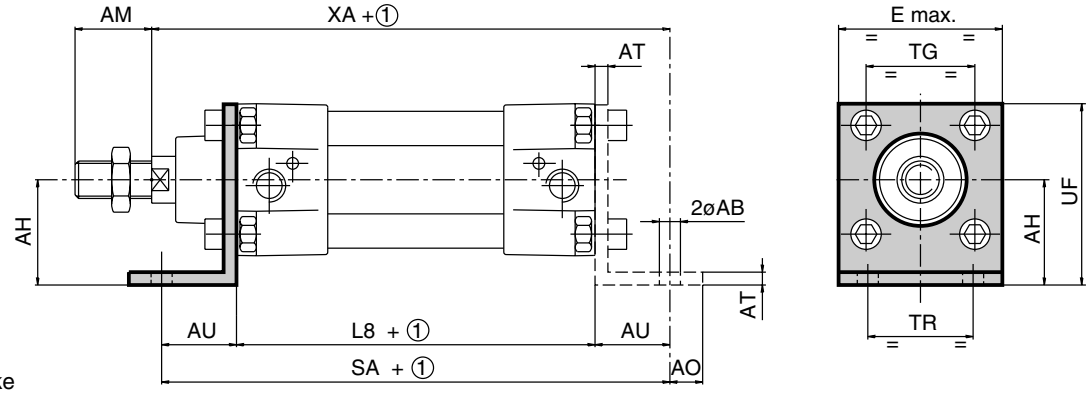
HIGH FOOT MOUNTING - MS3 (sold individually)



① : + Stroke

Bore Ø (mm)	CODE High foot	DIMENSIONS (mm)													Weights (kg)
		ØAB	AH	AO	AT	AU	AM	E	L8	UF	SA	TG	TR	XA	
32	**434 00 307**	7	32	11	8	24	22	50	94	54	142	32,5	32	144	0,180
40	**434 00 308**	10	36	15	8	28	24	58	105	62	161	38	36	163	0,250
50	**434 00 309**	10	45	15	10	32	32	70	106	77	170	46,5	45	175	0,470
63	**434 00 310**	10	50	15	10	32	32	85	121	87	185	56,5	50	190	0,595
80	**434 00 311**	12	63	20	12	41	40	105	128	110	210	72	63	215	1,265
100	**434 00 312**	14,5	71	25	12	41	40	130	138	130	220	89	75	230	-
125	**434 00 313**	16,5	90	25	16	45	54	157	160	161	250	110	90	270	-

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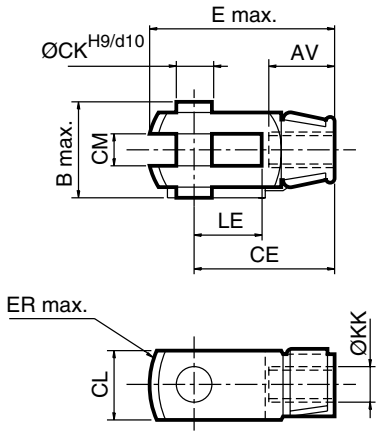
FEMALE CLEVIS - AP2

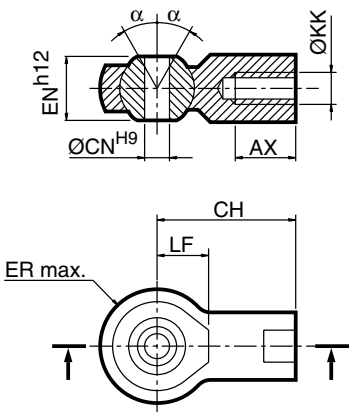
ISO 8140 - RP 102 P



SPHERICAL BEARING ROD END - AP6

ISO 8139 - RP 103 P

α : spherical angular compensation 4°

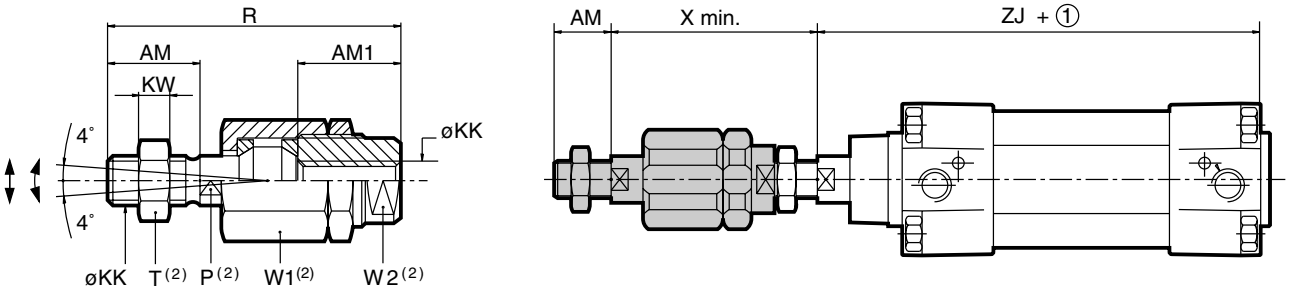


Bore Ø (mm)	DIMENSIONS (mm)													
	AV-AX	B	CE	CH	ØCK	CL	CM	ØCN	E	EN	ER	ØKK	LE	LF
32	20	26	40	43	10	20	$10^{+0.5}_{+0.15}$	10	56	14	14	M10x1,25	20	15
40	22	32	48	50	12	24	$12^{+0.5}_{+0.15}$	12	67	16	16	M12x1,25	24	17
50	28	41	64	64	16	32	$16^{+0.5}_{+0.15}$	16	89	21	21	M16x1,5	32	22
63	28	41	64	64	16	32	$16^{+0.5}_{+0.15}$	16	89	21	21	M16x1,5	32	22
80	33	48	80	77	20	40	$20^{+0.6}_{+0.15}$	20	112	25	25	M20x1,5	40	26
100	33	48	80	77	20	40	$20^{+0.6}_{+0.15}$	20	112	25	25	M20x1,5	40	26
125	51	65	110	110	30	55	$30^{+0.6}_{+0.15}$	30	155	37	35	M27x 2	54	36

Bore Ø (mm)	Weights (kg)	
	Female clevis	Spherical bearing
32	0,100	0,070
40	0,150	0,120
50	0,330	0,220
63	0,330	0,220

Bore Ø (mm)	Weights (kg)	
	Female clevis	Spherical bearing
80	0,670	0,390
100	0,670	0,390
125	1,810	1,600

ALIGNMENT COMPENSATOR



① : + stroke

(2) : dimensions on flats

Bore Ø (mm)	DIMENSIONS (mm)											Weights (kg)
	AM	AM1	P(2)	ØKK	KW	R	T(2)	W1(2)	W2(2)	X	Radiale compensation (mm)	
32	22	26	12	M10x1,25	6	73	17	30	19	58	0,7	0,210
40	24	26	12	M12x1,25	7	77	19	30	19	59	0,7	0,210
50	32	34	19	M16x1,5	8	106	24	42	30	82	1	0,650
63	32	34	19	M16x1,5	8	106	24	42	30	82	1	0,650
80	40	42	19	M20x1,5	9	122	30	42	30	92	1	0,680
100	40	42	19	M20x1,5	9	122	30	42	30	92	1	0,680
125	54	40	24	M27x2	13,5	147	41	Ø62	54	107	1	1,700

- Radial compensation 0,7 to 1 mm (see table)
- Spherical angular compensation : 4°

Note: The compensator is preset with an axial clearance of 0,05 to 0,1 - Do not reset.

OPTIONS AND SPECIAL VERSIONS OF VDMA-ISO PNEUMATIC CYLINDERS TYPE : PES

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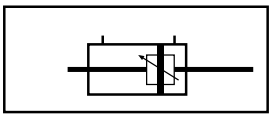
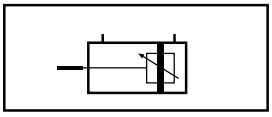
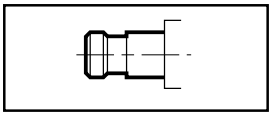


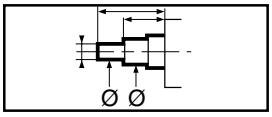
- Through rod, P/N T2



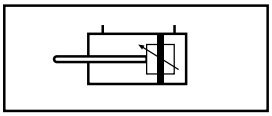
- Extented piston rod



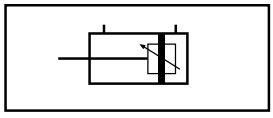
- Tenon piston rod



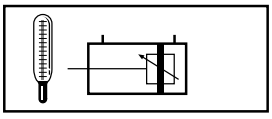
- Special machining of piston rod end



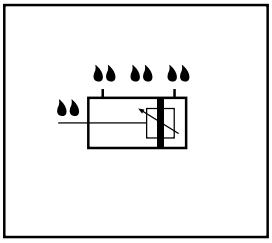
- Oversize piston rod on cylinders Ø 63 to 125 mm



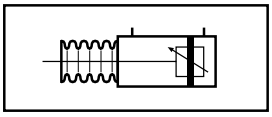
- Cylinder for inductive detector inductif (resin epoxy barrel + FV)



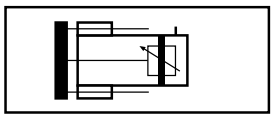
- **High temperature** version 120°C max., FPM seals (see P239) aluminium barrel, tie rods (version non-equipped for magnetic position detector)



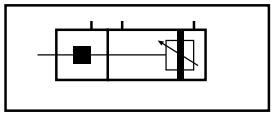
- All FPM seals
- **FPM rod seal**
- Stainless steel barrel
- Stainless steel screws and hardware
- Epoxy resin glass fiber barrel
- Anticorrosive finish on end covers and barrel



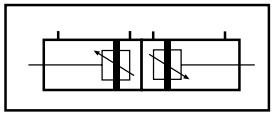
- Cylinder with piston rod gaiter



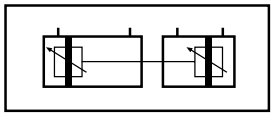
- Cylinder with U or H guiding unit slide or ball bearings (see P237)



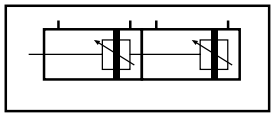
- Piston rod locking on cylinders Ø 40 to 100 mm (see P238)



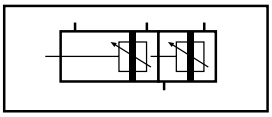
- Back to back assembly of two cylinders



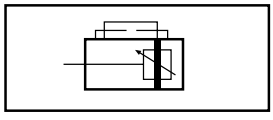
- Nose to nose assembly of two cylinders



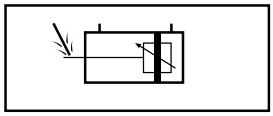
- Tandem cylinders - double acting Ø 40 to 125 mm with a common piston rod



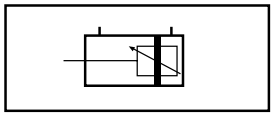
- Three position cylinders, separate piston rods



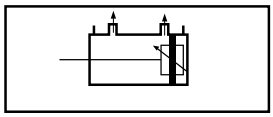
- Mounting of control valve on the cylinder
- With or without flow reducer



- Impact resistant rod



- Extented cushioning



- Cylinders with pressure outlets on barrel (stainless steel version) for exhaust pressure detection

For all these options and special versions - consult our technical staff.
For any special cylinder requirements - consult our technical staff.

PES CYLINDERS WITH PROFILED BARREL

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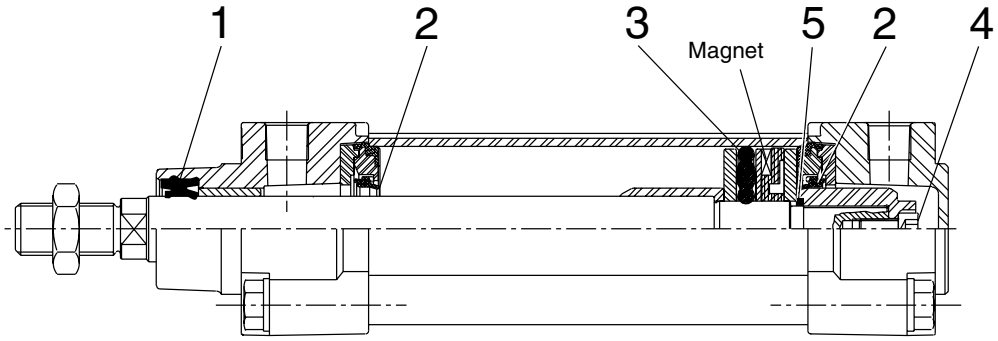
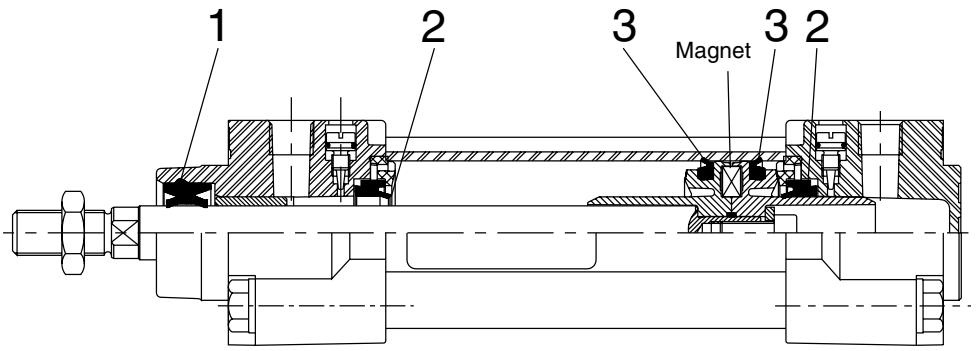
CONSTRUCTION I

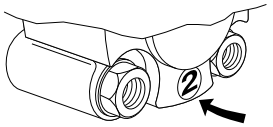


CONSTRUCTION II (PES 2)

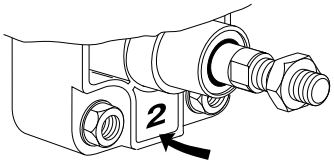


Identification of construction type 2

PES Ø 32 ... 80 mm



PES Ø 100 - 125 mm



Ø CYLINDER	Cylinder type	CODES construction I (seals: 1 to 5)	CODES construction II (seals: 1 to 3)
32	Equipped for detector	consult us	**978 02 343**
40	Equipped for detector		**978 02 344**
50	Equipped for detector		**978 02 345**
63	Equipped for detector		**978 02 346**
80	Equipped for detector		**978 02 347**
100	Equipped for detector	**978 01 661**	**978 02 259**
125	Equipped for detector	**978 01 662**	**978 02 260**

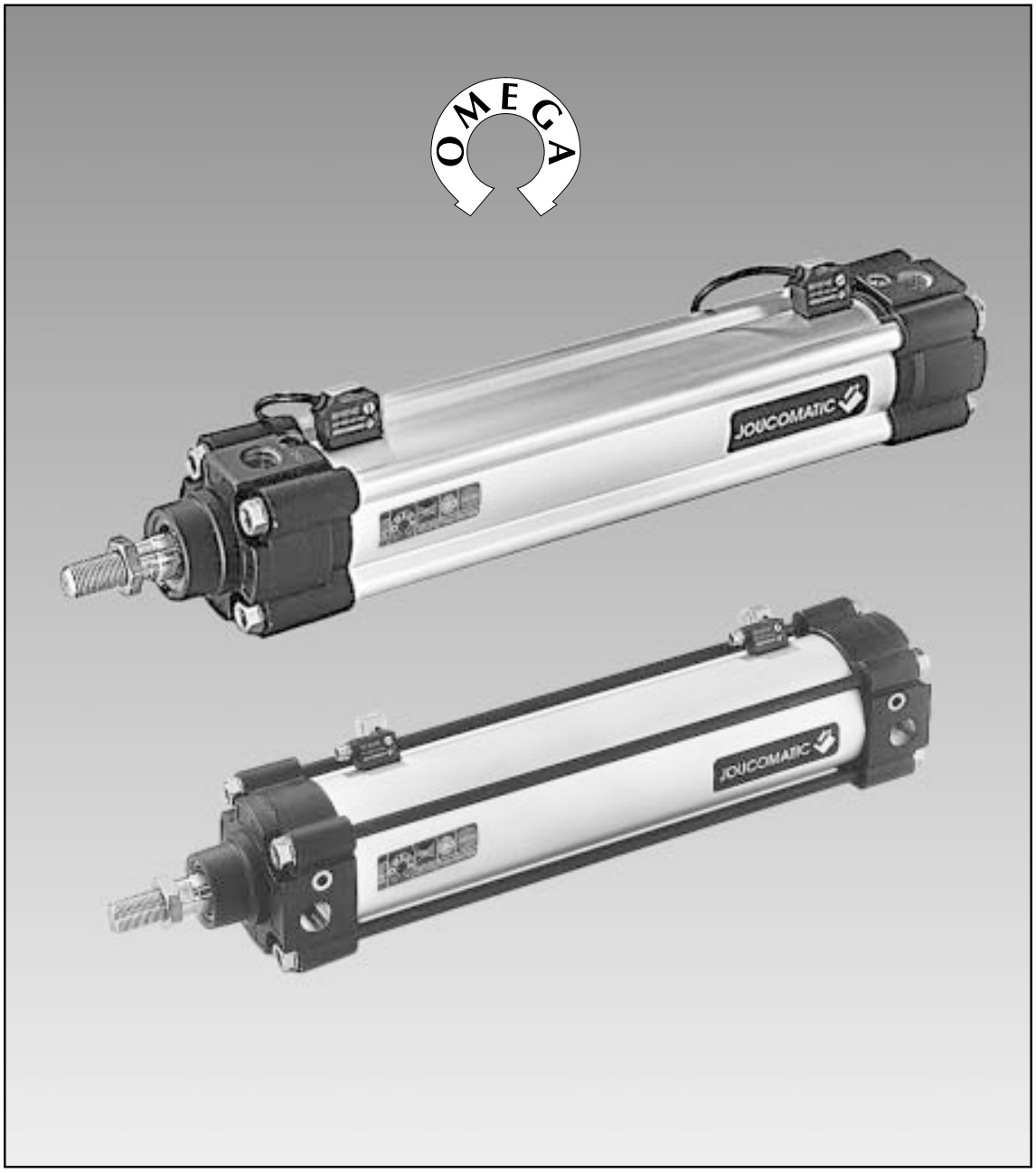
NOTE: For best results, use grease supplied in each kit. Supplementary tube available (11 cm^3) on request, code: **978 02 100**

HIGH PERFORMANCE CYLINDERS

DOUBLE ACTING, Ø 32 to 80 mm

CONFORMING TO VDMA 24562 - ISO STANDARDS

SERIES 450 - TYPE: **PES OMEGA**



P231-GB-R2

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ASCO® JOUCOMATIC

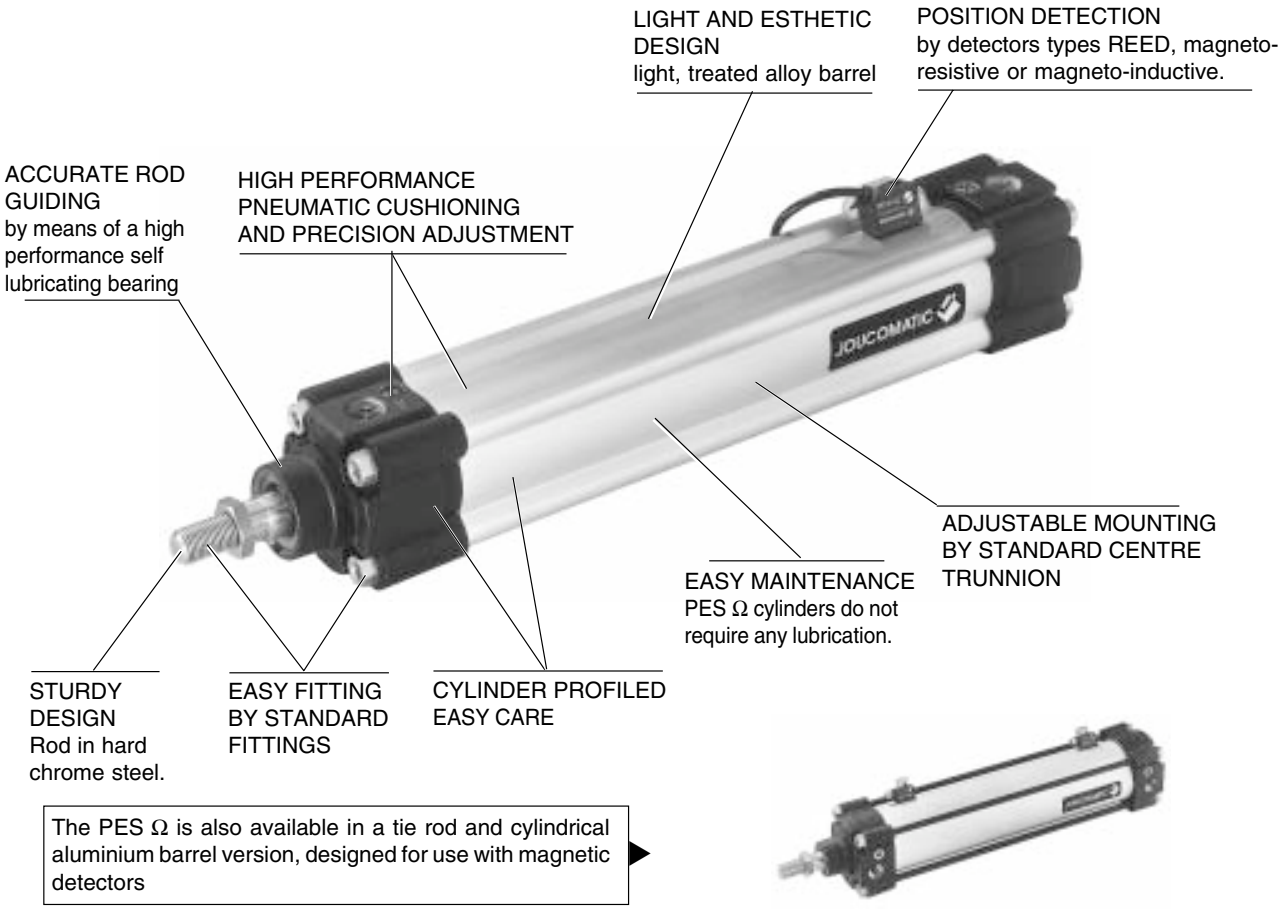
HIGH PERFORMANCE CYLINDERS: TYPE PES Ω

The new PES Ω cylinders offer remarkable performance:

- **Low break away pressure**
  - A few millibars are sufficient to set the piston rod unit in movement, the minimum pressure depending only on its weight, the effects of friction and stickslip are negligible.
- **High sensitivity**
  - Nominal travel with a very low differential pressure
  - Performance obtained by substantially-improved efficiency.
- **Perfectly adapted to very low speeds ...**
- **And also for very high speeds**
  - With this type of cylinder, 3 m/sec. is possible !
- **Long service life**
  - Service life of more than 10,000 km, representing longer endurance than required as defined in standards recommended for industrial applications.

These exceptional features are the result of extensive research conducted by JOUCOMATIC, notably involving the development of a patented sealing system (nb. 9603098) consisting of an **omega** formed piston seal.

This new technology is embodied in an VDMA-ISO 6431-AFNOR cylinder format of the PES type with an extruded barrel offering the following well-known advantages:



The PES Ω is also available in a tie rod and cylindrical aluminium barrel version, designed for use with magnetic detectors

With the advantages it offers, the new PES Ω cylinder is the obvious choice for all applications, however demanding.

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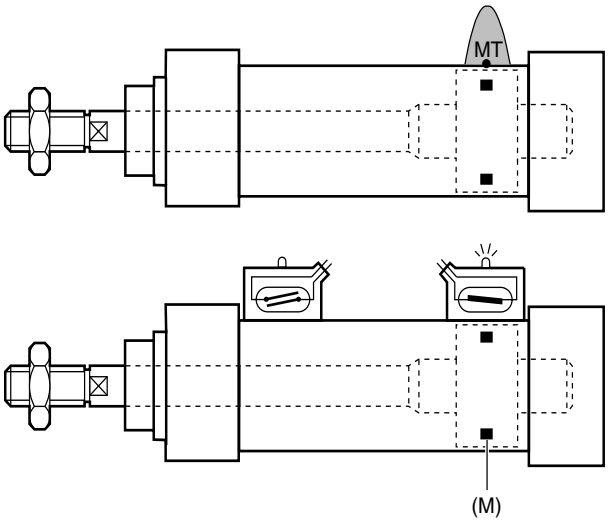
MAGNETIC DETECTION



The cylinder type PES, dia. 32 to 80 mm, onto which detectors can be mounted, has a **force line spectrum according to CNOMO E 530 52 809**.
Field values: 7.5 $^{+1,5}_{-0,7}$ mTesla at point MT and a maximum of 2 mTesla at the fringe of the force line spectrum (1 mTesla = approx. 10 Gauss).
Optimal position detection is guaranteed when using our reed switch, magneto-resistive or magneto-inductive type detectors, see summary below.

Air cylinders equipped of a magnet (M) designed to operate in combination with the magnetic position detectors (DM). These air cylinders can be equipped with one or more magnetic position detectors (without contact) attached to the tube. They allow limit positions to be detected, as well as the intermediate piston positions.

2

DEFINING THE PART NUMBER OF A Ø 32 TO 80 mm VDMA/ISO/AFNOR AIR CYLINDER

• CYLINDER WITH PROFILED BARREL : **PES Ω .. A .... – DM**

Cylinder type
Cylinder Ø (in mm)
End-of-stroke adjustable pneumatic cushioning: suffix **A**
Length of stroke (in mm)
Air cylinder designed to receive magnetic position detectors (amagnetic tube) = suffix **DM**

• CYLINDER WITH TIE RODS : **PES Ω .. A .... R – DM**

Cylinder type
Cylinder Ø (in mm)
End-of-stroke adjustable pneumatic cushioning: suffix **A**
Length of stroke (mm)
Tie rod and cylindrical barrel version: suffix **R**
Air cylinder designed to receive magnetic position detectors (amagnetic tube) = suffix **DM**

ORDERING

When ordering, please specify:

AIR CYLINDER — **450 50 9.. ....** — **PES Ω ..**
Cylinder code followed by stroke (in mm)
or the cylinder part number (see above)

MOUNTINGS
The code or codes and quantity of any mountings : **434 .. ...**

DETECTORS
The code and quantity of any magnetic detectors (if required) : **881 .. ...**
The code and quantity of mountings : **881 .. ...**

CONTENTS

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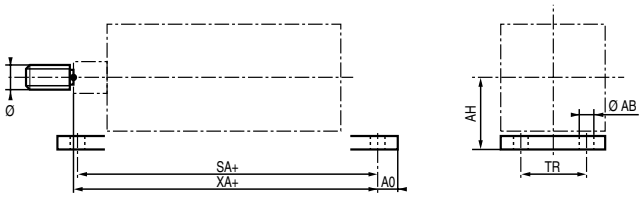
STANDARDS OF CYLINDERS Ø 32 to 320 mm	INTERCHANGEABILITY within the standard	INTERCHANGEABILITY between standards

ISO 6431 cylinders (year: 1983)

The international standards define a cylinder unit **equipped** with its mountings without any specifications relative to the bare cylinder alone.



*JOUCOMATIC cylinder, type **PIS**, complies with the international standards*

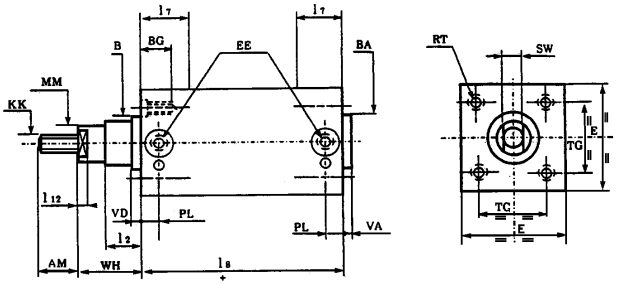
Interchangeability between manufacturers is achieved by replacing both the cylinder **and** its mountings.

For full interchangeability with ISO 6431,VDMA-AFNOR NFE 49003 cylinder must be equipped with its mountings, and reciprocally.

(cylinder PES+mountings interchangeable with PIS cylinder).

VDMA 24562- CNOMO/AFNOR NFE 49003 cylinders (year: 1992)

The new standards define first all the external dimensions of a **bare** cylinder then the mountings which, when mounted, must comply with the above unit (ISO 6431 cylinder).



*JOUCOMATIC cylinder, type **PES** with profiled barrel or tie rods, complies with the new standards*

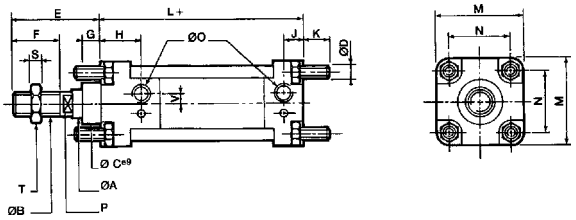
Full interchangeability between the manufacturers is achieved at every level:

- bare cylinder,
- each mounting,
- complete unit.

No interchangeability can be achieved between CNOMO/NFE 49001 cylinder (bare or equipped) and AFNOR NFE 49003 cylinder or ISO 6431 cylinder, and reciprocally.

CNOMO 06.07.02/AFNOR NFE 49001 cylinders (year: 1968)

The French standards define first all the external dimensions of a **bare** cylinder then the mountings.



*JOUCOMATIC cylinder, type **PCN**, complies with the French standards*

Full interchangeability between the manufacturers is possible at every level:

- bare cylinder,
- each mounting,
- complete unit.

Note: ISO 6432 and AFNOR NFE 49030 standards apply only to mini-cylinders Ø 8 to 25 mm.

DEFINITION OF THE DIAMETER OF AN Ω CYLINDER

• THE DYNAMIC EFFORT DEVELOPED BY A CYLINDER

F = Pressure x piston area x efficiency

The efficiency of a cylinder depends on the diameter of the cylinder, on the pressure and on its mechanical construction. The graph and a chart below show the dynamic effort developed by a cylinder at the piston rod, at various supply pressures.

• LOAD FACTOR

This is the relationship expressed as a percentage between the actual load being moved by the cylinder and the dynamic effort available at the end of the piston rod.

$$\text{Load factor (in \%)} = \frac{\text{actual load}}{\text{dynamic effort}} \times 100$$

For an optimum installation of a cylinder, we recommend a cylinder with a load factor **inferior or equal to 75%**.

EXAMPLE: Calculate a cylinder to lift a load of 150 daN with a pressure of 7 bar (gauge pressure).

$$\text{Theoretical dynamic effort} = \frac{\text{actual load}}{\text{Load factor}} = \frac{150}{0.75} = 200 \text{ daN}$$

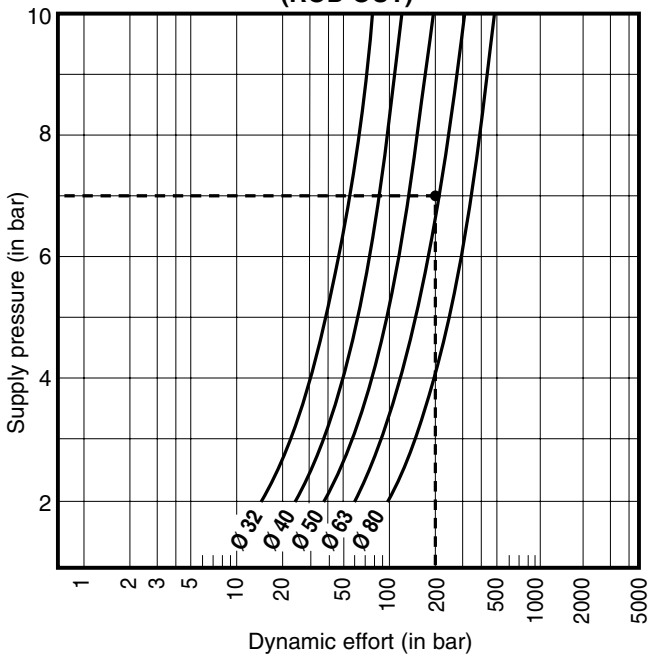
The graph below shows the cross over point between the dynamic effort and the supply pressure. The cylinder diameter required will be that where the curve passes this point or the cylinder giving a force immediately above that required.

In the example above: 200 daN is between Ø 50 and Ø 63. The cylinder recommended is the **Ø 63** mm which will develop a force of 214 daN at 7 bar and the actual load factor is:

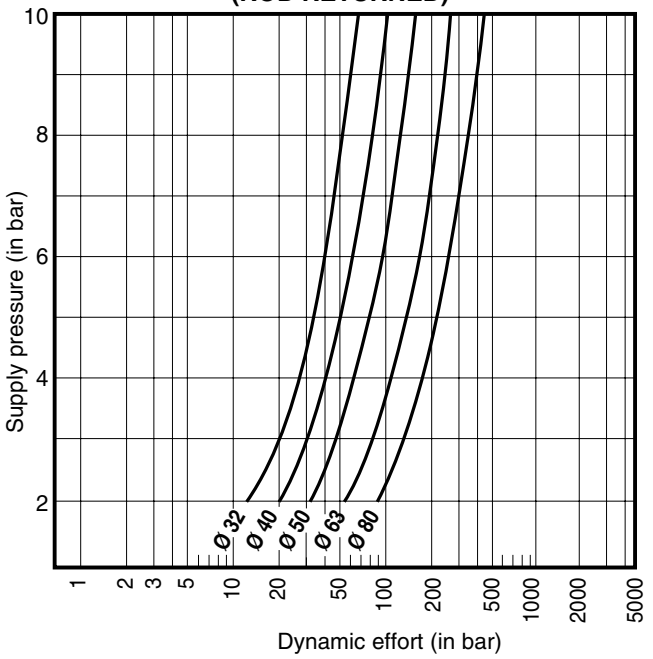
$$\frac{150 \text{ daN}}{214 \text{ daN}} \times 100 = 70\%$$

2

EFFORTS DEVELOPED AT THE END OF THE ROD (ROD OUT)



EFFORTS DEVELOPED AT THE END OF THE ROD (ROD RETURNED)



EFFORTS DEVELOPED BY AN Ω CYLINDER (in daN)

Ø Cylinder (mm)	Ø Rod (mm)	Piston cross-section area (cm^2)		Dynamic effort developed (in daN) at various supply pressures (in bar)									
				2		4		6		8		10	
		●	O	●	O	●	O	●	O	●	O	●	O
32	12	8	6,9	15	13	31	27	47	40	63	54	79	68
40	16	12,6	10,6	24	20	49	41	73	62	98	82	124	103
50	20	19,6	16,5	37	32	77	64	115	96	155	128	193	160
63	20	31,2	28,1	61	55	122	110	183	165	244	220	305	275
80	25	50,3	45,4	98	89	197	178	296	267	394	355	493	444

● Efforts developed with rod out (bottom side)

O Efforts developed with rod returned (rod side)

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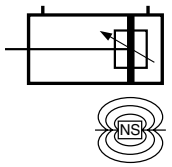
Series 450
Type:PES Ω -DM

CYLINDERS WITH PROFILED BARREL

DOUBLE ACTING CYLINDERS Ø 32 to 80 mm

equipped for magnetic position detectors
Conforming with VDMA-ISO standards
With adjustable pneumatic cushioning



SPECIFICATION

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	–25°C at +80°C (without position detectors) (for higher temperatures, consult us) –20°C at +70°C (with position detectors)
OPTIMAL MAX. SPEED	:	≤ 1 m/s (for optimal service life)
MAX. SPEED RATE	:	3 m/s (at 20°C)
STANDARDS	:	**VDMA 24562 - ISO 6431**

CONSTRUCTION

Profiled barrel	:	hard anodized aluminium alloy (non magnetic)
Rod	:	hard chrome plated steel
Piston	:	light alloy fitted with a permanent magnet
Piston seal	:	polyurethane (PUR)
Cushioning seals	:	polyurethane (PUR)
Front and rear ends	:	aluminium alloy
Bearing	:	metal self lubricating
Rod nut	:	galvanized steel
Cushioning	:	pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT

Bore Ø (mm)	**CODES** (1)	REFERENCES (1) (2)	Connection Ø	Cushioning length (mm)
32	**450 50 970** ---(1)---	PES Ω 32 A ---(1)--- - DM	G 1/8	18
40	**450 50 971** ---(1)---	PES Ω 40 A ---(1)--- - DM	G 1/4	20
50	**450 50 972** ---(1)---	PES Ω 50 A ---(1)--- - DM	G 1/4	26
63	**450 50 973** ---(1)---	PES Ω 63 A ---(1)--- - DM	G 3/8	26
80	**450 50 974** ---(1)---	PES Ω 80 A ---(1)--- - DM	G 3/8	27

(1) Indicate stroke (in mm) preferably selecting one of this standard strokes below. Do not exceed maximum possible stroke.
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

STANDARD STROKES (●: rapidly available) - MAX. STROKES

Bore Ø (mm)	Standards strokes (mm)												Max. stroke capabilty (mm)
	25	50	80	100	125	160	200	250	320	400	500	630	
32	●	●	●	●	●	●	●	●					1000
40	●	●	●	●	●	●	●	●	●	●			1500
50	●	●	●	●	●	●	●	●	●	●	●	●	1800
63	●	●	●	●	●	●	●	●	●	●	●	●	1800
80	●	●	●	●	●	●	●	●	●	●	●	●	2000

Other strokes on request

MOUNTINGS: see following pages

DIMENSIONS: see page P230-10

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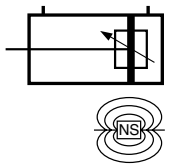
Series 450
Type: PES Ω R-DM

CYLINDERS WITH TIE RODS

DOUBLE ACTING CYLINDERS Ø 32 to 80 mm

equipped for magnetic position detectors
Conforming with VDMA-ISO standards
With adjustable pneumatic cushioning
cylinders with tie rods



SPECIFICATION

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	–25°C at +80°C (without position detectors) (for higher temperatures, consult us) –20°C at +70°C (with position detectors)
OPTIMAL MAX. SPEED	:	≤ 1 m/s (for optimal service life)
MAX. SPEED RATE	:	3 m/s (at 20°C)
STANDARDS	:	**VDMA 24562 - ISO 6431**

CONSTRUCTION

Cylindrical barrel	:	hard anodized aluminium alloy (non magnetic)
Tie rods	:	stainless steel
Rod	:	hard chrome plated steel
Piston	:	light alloy fitted with a permanent magnet
Piston seal	:	polyurethane (PUR)
Cushioning seals	:	polyurethane (PUR)
Front and rear ends	:	aluminium alloy
Bearing	:	metal self lubricating
Rod nut	:	galvanized steel
Cushioning	:	pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT (CUSHIONIED CYLINDER)

Bore Ø (mm)	**CODES** (1)	REFERENCES (1) (2)	Connection Ø	Cushioning length (mm)
32	**450 50 975** (1)___	PES 32 Ω A (1)___ R-DM	G 1/8	18
40	**450 50 976** (1)___	PES 40 Ω A (1)___ R-DM	G 1/4	20
50	**450 50 977** (1)___	PES 50 Ω A (1)___ R-DM	G 1/4	26
63	**450 50 978** (1)___	PES 63 Ω A (1)___ R-DM	G 3/8	26
80	**450 50 979** (1)___	PES 80 Ω A (1)___ R-DM	G 3/8	27

(1) Indicate stroke (in mm) preferably selecting one of this standard strokes below. Do not exceed maximum possible stroke.
(2) **The magnetic position detectors are ordered separately** UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

STANDARD STROKES (●: rapidly available) - MAX. STROKES

Bore Ø (mm)	Standards strokes (mm)												Max. stroke capabilty (mm)
	25	50	80	100	125	160	200	250	320	400	500	630	
32	●	●	●	●	●	●	●	●					1000
40	●	●	●	●	●	●	●	●	●	●			1500
50	●	●	●	●	●	●	●	●	●	●	●	●	1800
63	●	●	●	●	●	●	●	●	●	●	●	●	1800
80	●	●	●	●	●	●	●	●	●	●	●	●	2000

Other strokes on request

MOUNTINGS: see following pages

DIMENSIONS: see page P232-10

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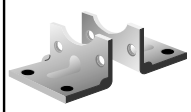
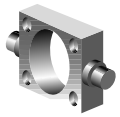
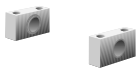
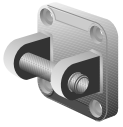
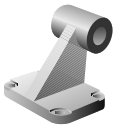
MOUNTINGS

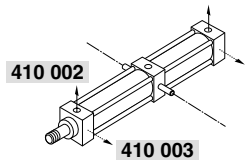
		 Low feet (2) **MS1**	 High foot (1) **MS3**	 Rectangular front or rear flange **MF1 - MF2**	 Centre trunnion **MT4** (3) for cylinder with **profiled barrel** supplied fixed/XV (3)	supplied loose (4)	 for cylinder with **tie rods** supplied fixed/XV (3)	 support (2) for centre trunnion **AT4**
Application	Standard duty	●	●	●	●	●	●	●
	Heavy duty	●	●	●	●	●	●	●
Construction		Stamped sheet steel	Drawn steel	Steel	Cast iron	Cast iron	Cast iron	Aluminium + bush
For cylinder Ø		**CODES** OF MOUNTINGS						
32		**434 00 163**	**434 00 307**	**434 00 119**	**410 521**	**410 557**	**410 548**	**434 00 207**
40		**434 00 164**	**434 00 308**	**434 00 120**	**410 522**	**410 558**	**410 549**	**434 00 208**
50		**434 00 165**	**434 00 309**	**434 00 121**	**410 523**	**410 559**	**410 550**	**434 00 208**
63		**434 00 166**	**434 00 310**	**434 00 122**	**410 524**	**410 560**	**410 551**	**434 00 209**
80		**434 00 167**	**434 00 311**	**434 00 123**	**410 525**	**410 561**	**410 552**	**434 00 209**
Dimensions		page P230-11	page P230-17	page P230-11	page P230-16	page P230-16	page P232-16	page P230-16

		 Cap, detachable clevis **MP2**			 Cap, detachable eye (trunnion) **MP4**			 Angular clevis bracket **AB3**		
Application	Standard duty	●	●		●	●		●	●	
	Heavy duty		●	●		●	●		●	●
Construction		Light alloy	Cast iron + steel without bush	Cast iron + steel + bush	Light alloy	Cast iron without bush	Cast iron + bush	Light alloy	Cast iron without bush	Cast iron + bush
For cylinder Ø		**CODES** OF MOUNTINGS								
32		**434 00 130**	**434 00 257**	**434 00 185**	**434 00 125**	**434 00 266**	**434 00 171**	**434 00 383**	**434 00 145**	**434 00 110**
40		**434 00 131**	**434 00 258**	**434 00 186**	**434 00 126**	**434 00 267**	**434 00 172**	**434 00 384**	**434 00 146**	**434 00 111**
50		**434 00 132**	**434 00 259**	**434 00 187**	**434 00 127**	**434 00 268**	**434 00 173**	**434 00 385**	**434 00 147**	**434 00 112**
63		**434 00 133**	**434 00 260**	**434 00 188**	**434 00 128**	**434 00 269**	**434 00 174**	**434 00 386**	**434 00 148**	**434 00 113**
80		**434 00 134**	**434 00 261**	**434 00 189**	**434 00 129**	**434 00 270**	**434 00 175**	**434 00 387**	**434 00 149**	**434 00 114**
Dimensions		pages P230-12/13			pages P230-12/13			page P230-13		

(1) High foot sold individually
(2) Corresponds to a set of 2 parts.
(3) Trunnion supplied **fixed to the barrel** at dimension XV specified when ordered:
The centre trunnion code fixed and the dimension XV along with orientation code of the trunnion with respect to the ports must be added to the cylinder code.
(example: 450 00 020 + options 410 523 / XV = 210 + 410 002)
(4) Trunnion supplied **loose** on cylinder barrel for on-site adjustment to required dimension:
The centre trunnion code loose and the dimension XV along with orientation code of the trunnion with respect to the ports must be added to the cylinder code
NOTE: With the exception of the centre trunnion, mountings are delivered separetely.

Centre trunnion orientation

- Trunnion axis is perpendicular to supply ports, code: **410 002** (standard orientation)
- other position upon request, code: **410 003**



: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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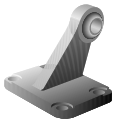
MOUNTINGS

		 Cap, clevis for spherical eye or clevis bracket	 Cap, eye with spherical bearing (5) **MP6**	 Angular clevis bracket spherical eye (5) **AB5**	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical rod end ISO 8139 - RP103P **AP6**	 Alignment (6) compensator
Application	Standard duty	●	●	●	●	●	●
	Heavy duty	●	●	●	●	●	●
Construction		Forged steel	Forged steel	Forged steel	Steel	Steel	Steel
For cylinder Ø		**CODES** OF MOUNTINGS					
32		**434 00 363**	**434 00 372**	**434 00 354**	**434 00 016**	**434 00 001**	**434 00 242**
40		**434 00 364**	**434 00 373**	**434 00 355**	**434 00 017**	**434 00 002**	**434 00 243**
50		**434 00 365**	**434 00 374**	**434 00 356**	**434 00 018**	**434 00 003**	**434 00 244**
63		**434 00 366**	**434 00 375**	**434 00 357**	**434 00 018**	**434 00 003**	**434 00 244**
80		**434 00 367**	**434 00 376**	**434 00 358**	**434 00 019**	**434 00 004**	**434 00 245**
Dimensions		pages P230-14/15	pages P230-14/15	page P230-15	page P230-18	page P230-18	page P230-18

(5) These accessories allows accurate angular compensation adjustment spherical of 4°
(6) This accessorie allows accurate angular compensation adjustment spherical of 4° and radial of 0,7 mm
NOTE: The mountings are delivered separetely.

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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PES Ω CYLINDERS WITH PROFILED BARREL AND TIE RODS

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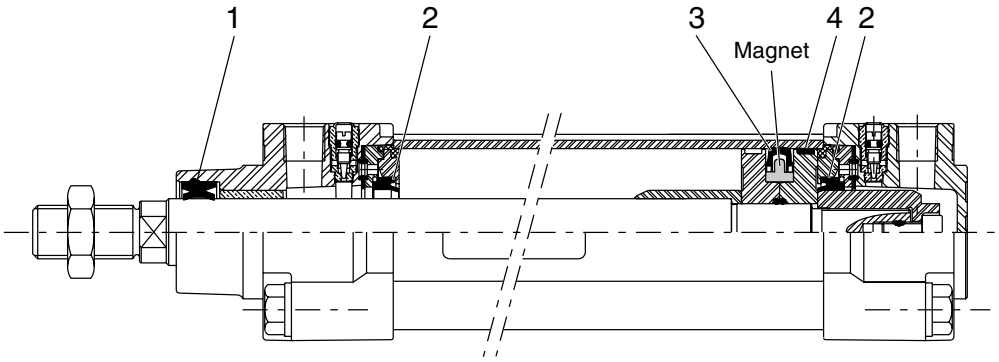

Ø Cylinder	Cylinder type	**CODES** SPARE PARTS seals: 1 to 4
32	Equipped for detector	**978 02 060**
40	Equipped for detector	**978 02 061**
50	Equipped for detector	**978 02 062**
63	Equipped for detector	**978 02 063**
80	Equipped for detector	**978 02 064**

NOTE: For best results, use grease supplied in each kit. Supplementary tube available (11 cm^3) on request, code: **978 02 100**

DOUBLE ACTING CYLINDERS, Ø 32 to 200 mm

CONFORMING TO

VDMA 24562 - ISO 6431 STANDARDS

SERIES 450 - TYPE : **PES (with tie rods)**

Comply with the new European standard

P232-GB.R7

ASCO JOUCOMATIC

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DOUBLE ACTING PNEUMATIC CYLINDERS - TYPE PES **WITH TIE RODS**

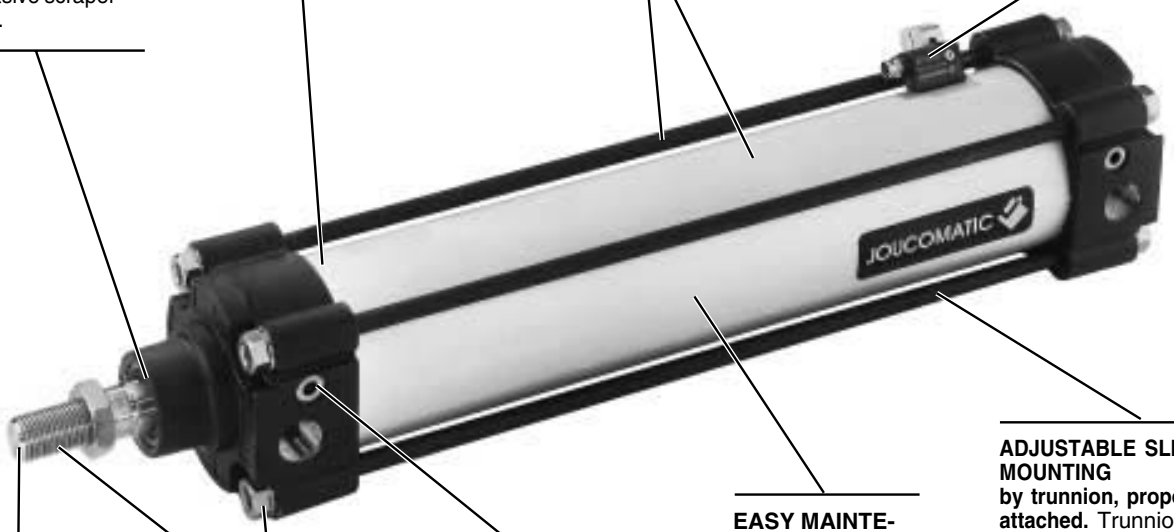
Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

ACCURATE ROD GUIDING
by means of a high-performance self lubricating bearing and non-abrasive scraper seal.

PNEUMATIC CUSHIONING
with large cushioning length.

LIGHT AND ESTHETIC DESIGN
Cylinders with tie rods not extented.
Barrel in hard anodized aluminium or steel

POSITION DETECTOR
Cylinders designed for incorporating at any position of the stroke magnetic position detectors, type:
- REED switch
- magneto resistive (MR)
- magneto-inductive (BIM)
- inductive (epoxy barrel)



ADJUSTABLE SLIDING MOUNTING
by trunnion, proposed attached. Trunnion supports upon request.

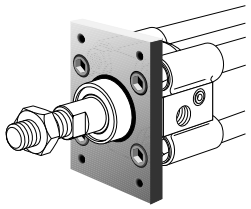
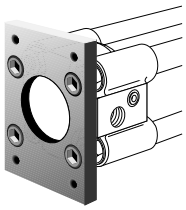
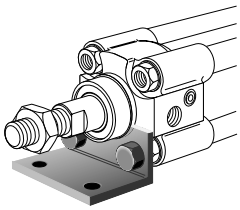
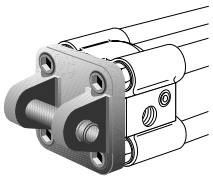
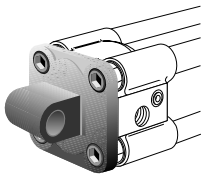
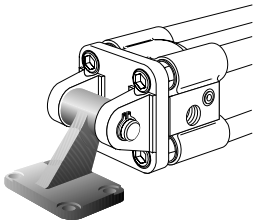
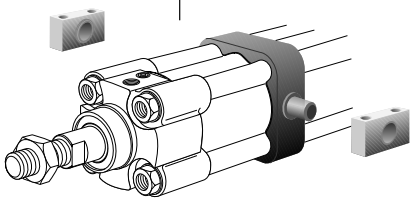
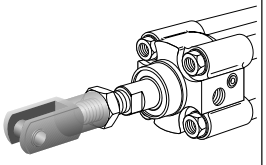
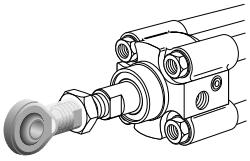
EASY MAINTE-NANCE
PES cylinders do not require any lubrication.

ACCURATE CUSHIONING LENGTH
by means of micrometer screws (captive screws).

EASY FITTING
Large choice of standard fittings and rod ends (see below).

STURDY DESIGN
Rod in hard chrome steel.

RANGE OF STANDARD FITTINGS

 Front flange	 Rear flange	 Feet	 Cap, detachable clevis or with spherical eye	 Cap, detachable eye, or with spherical eye
 Angular clevis bracket or with spherical eye	 Centre trunnion / Trunnion supports		 Female rod clevis	 Spherical bearing

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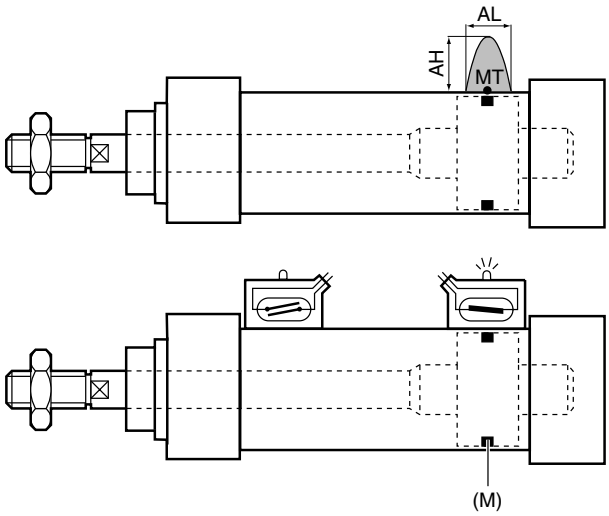
MAGNETIC DETECTION

(on **aluminium** barrel cylinder)



The cylinder type PES, dia. 32 to 80 mm, onto which detectors can be mounted, has a **force line spectrum according to CNOMO E 530 52 809**. Field values: 7.5 m Tesla at point MT and a maximum of 2 m Tesla at the fringe of the force line spectrum (1 m Tesla = approx. 10 Gauss).

	Ø cylinder				
	32	**40**	**50**	**63**	**80**
AH	6	6	7	8	9
AL	8	9	10	10	11

mm

Optimal position detection is guaranteed when using our reed switch, magneto-resistive or magneto-inductive type detectors, see summary below.

Air cylinders equipped of a magnet (M) designed to operate in combination with the magnetic position detectors (DM). These air cylinders can be equipped with one or more magnetic position detectors (without contact) attached to the tie rods. They allow limit positions to be detected, as well as the intermediate piston positions.

2

DEFINING THE REFERENCE VDMA/ISO STEEL AIR CYLINDER WITH TIE RODS (non equipped for detector)

PES .. T A ... S

- VDMA/ISO air cylinder: prefix PES
- Air cylinder diameter (mm)
- End-of-stroke adjustable pneumatic cushioning: suffix **A**
- Length of stroke (mm)
- Drawn steel barrel cylinder

DEFINING THE REFERENCE VDMA/ISO ALUMINIUM AIR CYLINDER WITH TIE RODS (equipped for detector)

PES .. T A ... R - DM

- VDMA/ISO air cylinder: prefix PES
- Air cylinder diameter (mm)
- End-of-stroke adjustable pneumatic cushioning: suffix **A**
- Length of stroke (mm)
- Air cylinder designed to receive magnetic position detectors = suffix **DM**

ORDERING - When ordering, please specify:

450 .. ... + ...

AIR CYLINDER
- The air cylinder standard code or part number
- The code or part number of any option(s)

MOUNTINGS
- The code or codes and quantity of any mountings : **434 .. ...**

DETECTORS
- The code and quantity of any magnetic detectors : **881 .. ...**
- The code and quantity of mountings : **881 .. ...**

CONTENTS

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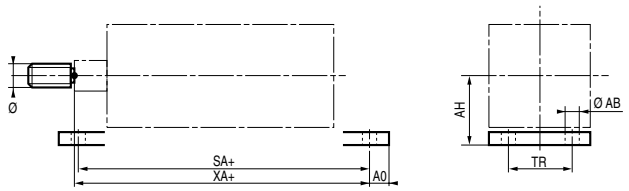
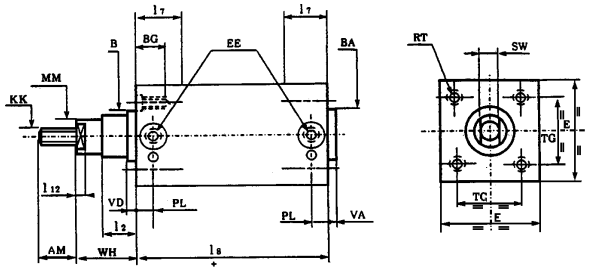
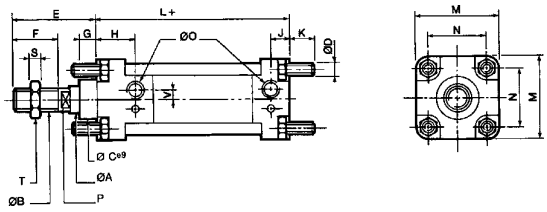
STANDARDS OF CYLINDERS Ø 32 to 320 mm	INTERCHANGEABILITY within the standard	INTERCHANGEABILITY between standards
ISO 6431 cylinders (year: 1983) The international standards define a cylinder unit **equipped** with its mountings without any specifications relative to the bare cylinder alone.  *JOUCOMATIC cylinder, type **PIS series 436**, complies with the international standards*	Interchangeability between manufacturers is achieved by replacing both the cylinder **and** its mountings.	For full interchangeability with ISO 6431,VDMA 24562-AFNOR cylinder must be equipped with its mountings, and reciprocally. *(cylinder PES+mountings interchangeable with PIS cylinder).*
VDMA 24562- AFNOR NFE 49003 cylinders (year: 1992) The new standards define first all the external dimensions of a **bare** cylinder then the mountings which, when mounted, must **comply with the above unit (ISO 6431 cylinder)**.  *JOUCOMATIC cylinder, type **PES series 450** with profiled barrel or tie rods, complies with the new standards*	Full interchangeability between the manufacturers is achieved at every level: • bare cylinder, • each mounting, • complete unit.	No interchangeability can be achieved between CNOMO/NFE 49001 cylinder (bare or equipped) and AFNOR NFE 49003 cylinder or ISO 6431 cylinder, and reciprocally.
CNOMO 06.07.02/AFNOR NFE 49001 cylinders (year: 1968) The French standards define first all the external dimensions of a **bare** cylinder then the mountings.  *JOUCOMATIC cylinder, type **PCN series 437**,complies with the French standards*	Full interchangeability between the manufacturers is possible at every level: • bare cylinder, • each mounting, • complete unit.	

Note : ISO 6432 and AFNOR NFE 49030 standards apply only to mini-cylinders Ø 8 to 25 mm.

DEFINITION OF THE DIAMETER OF A CYLINDER

• THE DYNAMIC EFFORT DEVELOPED BY A CYLINDER

F = Pressure x piston area x efficiency

The efficiency of a cylinder depends on the diameter of the cylinder, on the pressure and on its mechanical construction. The graph and a chart below show the dynamic effort developed by a cylinder at the piston rod, at various supply pressures.

• LOAD FACTOR

This is the relationship expressed as a percentage between the actual load being moved by the cylinder and the dynamic effort available at the end of the piston rod.

$$\text{Load factor (in \%)} = \frac{\text{actual load}}{\text{dynamic effort}} \times 100$$

For an optimum installation of a cylinder, we recommend a cylinder with a load factor **inferior or equal to 75%**.

EXAMPLE: Calculate a cylinder to lift a load of 130 daN with a pressure of 7 bar (gauge pressure).

$$\text{Theoretical dynamic effort} = \frac{\text{actual load}}{\text{Load factor}} = \frac{130}{0.75} = 175 \text{ daN}$$

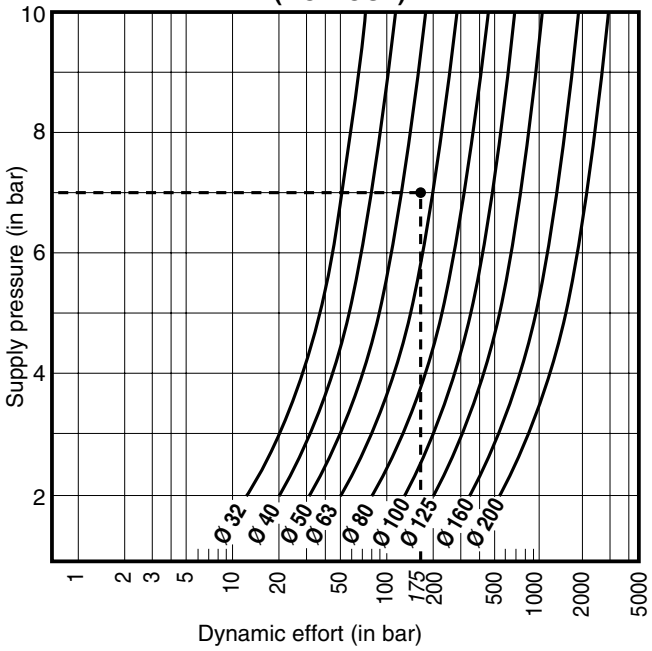
The graph below shows the cross over point between the dynamic effort and the supply pressure. The cylinder diameter required will be that where the curve passes this point or the cylinder giving a force immediately above that required.

In the example above: 175 daN is between Ø 50 and Ø 63. The cylinder recommended is the Ø 63 mm which will develop a force of 200 daN at 7 bar and the actual load factor is:

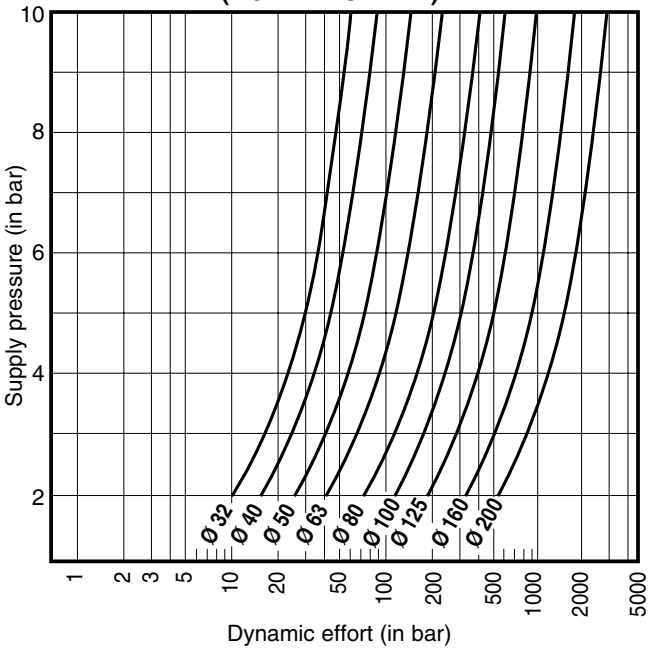
$$\frac{130 \text{ daN}}{200 \text{ daN}} \times 100 = 65\%$$

2

EFFORTS DEVELOPED AT THE END OF THE ROD (ROD OUT)



EFFORTS DEVELOPED AT THE END OF THE ROD (ROD RETURNED)



EFFORTS DEVELOPED BY A CYLINDER (in daN)

Ø Cylinder (mm)	Ø Rod (mm)	Piston cross-section area (cm^2)		Dynamic effort developed (in daN) at various supply pressures (in bar)									
				2		4		6		8		10	
		●	○	●	○	●	○	●	○	●	○	●	○
32	12	8	6,9	13	11	30	25	46	39	62	52	77	65
40	16	12,6	10,6	21	17	46	37	70	58	95	80	122	100
50	20	19,6	16,5	33	27	70	58	110	92	150	124	190	155
63	20	31,2	28,1	53	46	110	98	170	154	230	211	290	264
80	25	50,3	45,4	88	77	185	163	285	255	385	341	480	427
100	25	78,5	73,6	135	125	290	260	440	400	600	550	750	675
125	32	123	115	210	200	460	420	700	650	925	875	1150	1100
160	40	201	189	350	320	750	700	1150	1080	1550	1460	1900	1800
200	40	314	302	550	530	1150	1100	1800	1700	2400	2300	3000	2900

● Efforts developed with rod out (bottom side) ○ Efforts developed with rod returned (rod side)

Note: Cylinders with double crossbar develop identical efforts in both working directions. Their values are the ones defined here-above for efforts developed with rod **returned**.

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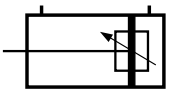
Series 450
Type : PES-T-S

STEEL AIR CYLINDERS

DOUBLE ACTING CYLINDERS Ø 32 to 200 mm

non equipped for magnetic position detectors
Conforming with VDMA-ISO standards
With adjustable pneumatic cushioning

Air cylinders with tie rods



SPECIFICATION

FLUID	:	air or neutral gas, filtered, lubricated or not
PRESSURE	:	10 bar max.
TEMPERATURE	:	– 20 °C, à + 60 °C (for higher temperature, see P239)
OPTIMAL MAX. SPEED	:	≤ 1 m/s (for optimal service life)
MAX. SPEED RATE	:	2 m/s
STANDARDS	:	**VDMA 24562 - ISO 6431**

CONSTRUCTION

Barrel	:	drawn steel
Tie rods	:	stainless steel (Ø 32-100), paint steel (Ø 125-200)
Rod	:	hard chrome plated steel with rod nut galvanized steel
Piston seal	:	polyurethane (PUR)
Front and rear ends	:	aluminium alloy
Bearing	:	metal self lubricating
Cushioning	:	pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT (cushioned version)

Bore Ø (mm)	Strokes (mm) (1)	CODES	REFERENCES	Con-nection Ø	Cushion-ing length (mm)
32	25	**450 00 493**	PES 32 T A 25 S	G 1/8	18
	50	**450 00 494**	PES 32 T A 50 S		
	80	**450 01 059**	PES 32 T A 80 S		
	100	**450 00 495**	PES 32 T A 100 S		
	125	**450 01 077**	PES 32 T A 125 S		
	160	**450 00 496**	PES 32 T A 160 S		
	200	**450 00 497**	PES 32 T A 200 S		
	250	**450 00 498**	PES 32 T A 250 S		
40	25	**450 00 499**	PES 40 T A 25 S	G 1/4	20
	50	**450 00 500**	PES 40 T A 50 S		
	80	**450 01 060**	PES 40 T A 80 S		
	100	**450 00 501**	PES 40 T A 100 S		
	125	**450 01 078**	PES 40 T A 125 S		
	160	**450 00 502**	PES 40 T A 160 S		
	200	**450 00 503**	PES 40 T A 200 S		
	250	**450 00 504**	PES 40 T A 250 S		
	320	**450 00 505**	PES 40 T A 320 S		
	400	**450 00 506**	PES 40 T A 400 S		
50	25	**450 00 507**	PES 50 T A 25 S	G 1/4	26
	50	**450 00 508**	PES 50 T A 50 S		
	80	**450 01 061**	PES 50 T A 80 S		
	100	**450 00 509**	PES 50 T A 100 S		
	125	**450 01 079**	PES 50 T A 125 S		
	160	**450 00 510**	PES 50 T A 160 S		
	200	**450 00 511**	PES 50 T A 200 S		
	250	**450 00 512**	PES 50 T A 250 S		
	320	**450 00 513**	PES 50 T A 320 S		
	400	**450 00 514**	PES 50 T A 400 S		
	500	**450 00 515**	PES 50 T A 500 S		
	630	**450 00 516**	PES 50 T A 630 S		
63	25	**450 00 517**	PES 63 T A 25 S	G 3/8	26
	50	**450 00 518**	PES 63 T A 50 S		
	80	**450 01 062**	PES 63 T A 80 S		
	100	**450 00 519**	PES 63 T A 100 S		
	125	**450 01 080**	PES 63 T A 125 S		
	160	**450 00 520**	PES 63 T A 160 S		
	200	**450 00 521**	PES 63 T A 200 S		
	250	**450 00 522**	PES 63 T A 250 S		
	320	**450 00 523**	PES 63 T A 320 S		
	400	**450 00 524**	PES 63 T A 400 S		
	500	**450 00 525**	PES 63 T A 500 S		
	630	**450 00 526**	PES 63 T A 630 S		
80	25	**450 00 527**	PES 80 T A 25 S	G 3/8	27
	50	**450 00 528**	PES 80 T A 50 S		
	80	**450 01 063**	PES 80 T A 80 S		
	100	**450 00 529**	PES 80 T A 100 S		
	125	**450 01 081**	PES 80 T A 125 S		
	160	**450 00 530**	PES 80 T A 160 S		
	200	**450 00 531**	PES 80 T A 200 S		
	250	**450 00 532**	PES 80 T A 250 S		
	320	**450 00 533**	PES 80 T A 320 S		
	400	**450 00 534**	PES 80 T A 400 S		
	500	**450 00 535**	PES 80 T A 500 S		
	630	**450 00 536**	PES 80 T A 630 S		

Bore Ø (mm)	Strokes (mm) (1)	CODES	REFERENCES	Con-nection Ø	Cushion-ing length (mm)
100	50	**450 01 313**	PES 100 T A 50 S	G 1/2	33
	80	**450 01 314**	PES 100 T A 80 S		
	100	**450 01 315**	PES 100 T A 100 S		
	125	**450 01 316**	PES 100 T A 125 S		
	160	**450 01 317**	PES 100 T A 160 S		
	200	**450 01 318**	PES 100 T A 200 S		
	250	**450 01 319**	PES 100 T A 250 S		
	320	**450 01 320**	PES 100 T A 320 S		
	400	**450 01 321**	PES 100 T A 400 S		
	500	**450 01 322**	PES 100 T A 500 S		
	630	**450 01 323**	PES 100 T A 630 S		
	700	**450 01 324**	PES 100 T A 700 S		
	800	**450 01 325**	PES 100 T A 800 S		
	900	**450 01 326**	PES 100 T A 900 S		
	1000	**450 01 327**	PES 100 T A 1000S		
125	50	**450 01 328**	PES 125 T A 50 S	G 1/2	37
	80	**450 01 329**	PES 125 T A 80 S		
	100	**450 01 330**	PES 125 T A 100 S		
	125	**450 01 331**	PES 125 T A 125 S		
	160	**450 01 332**	PES 125 T A 160 S		
	200	**450 01 333**	PES 125 T A 200 S		
	250	**450 01 334**	PES 125 T A 250 S		
	320	**450 01 335**	PES 125 T A 320 S		
	400	**450 01 336**	PES 125 T A 400 S		
	500	**450 01 337**	PES 125 T A 500 S		
	630	**450 01 338**	PES 125 T A 630 S		
	700	**450 01 339**	PES 125 T A 700 S		
	800	**450 01 340**	PES 125 T A 800 S		
	900	**450 01 341**	PES 125 T A 900 S		
	1000	**450 01 342**	PES 125 T A 1000S		
160	50	**450 01 343**	PES 160 T A 50 S	G 3/4	55
	80	**450 01 344**	PES 160 T A 80 S		
	100	**450 01 345**	PES 160 T A 100 S		
	125	**450 01 346**	PES 160 T A 125 S		
	160	**450 01 347**	PES 160 T A 160 S		
	200	**450 01 348**	PES 160 T A 200 S		
	250	**450 01 349**	PES 160 T A 250 S		
	320	**450 01 350**	PES 160 T A 320 S		
	400	**450 01 351**	PES 160 T A 400 S		
	500	**450 01 352**	PES 160 T A 500 S		
	630	**450 01 353**	PES 160 T A 630 S		
	700	**450 01 354**	PES 160 T A 700 S		
	800	**450 01 355**	PES 160 T A 800 S		
	900	**450 01 356**	PES 160 T A 900 S		
	1000	**450 01 357**	PES 160 T A 1000S		
200	50	**450 01 358**	PES 200 T A 50 S	G 3/4	55
	80	**450 01 359**	PES 200 T A 80 S		
	100	**450 01 360**	PES 200 T A 100 S		
	125	**450 01 361**	PES 200 T A 125 S		
	160	**450 01 362**	PES 200 T A 160 S		
	200	**450 01 363**	PES 200 T A 200 S		
	250	**450 01 364**	PES 200 T A 250 S		
	320	**450 01 365**	PES 200 T A 320 S		
	400	**450 01 366**	PES 200 T A 400 S		
	500	**450 01 367**	PES 200 T A 500 S		
	630	**450 01 368**	PES 200 T A 630 S		
	700	**450 01 369**	PES 200 T A 700 S		
	800	**450 01 370**	PES 200 T A 800 S		
	900	**450 01 371**	PES 200 T A 900 S		
	1000	**450 01 372**	PES 200 T A 1000S		

(1) Other strokes on request (to specify on order within the reference)

MOUNTINGS : see following pages

OPTIONS AND SPECIFIC VERSIONS

- Available non cushioned (NA) on request
- The PES range offers a wide variety of options and versions for specific applications (consult us)

Ø 250 mm : consult us

Control & Power, Inc. – 1.877.835.5274 – www.controlandpower.com

Series 450
Type: PES-T-R-DM

ALUMINIUM AIR CYLINDERS

DOUBLE ACTING CYLINDERS Ø 32 to 200 mm

equipped for magnetic position detectors
Conforming with VDMA-ISO standards
With adjustable pneumatic cushioning

Air cylinders with tie rods

2

SPECIFICATION

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : – 20° C, at + 60° C (for higher temperature, see P239)
OPTIMAL MAX. SPEED : ≤ 1 m/s (for optimal service life)
MAX. SPEED RATE : 2 m/s
STANDARDS : **VDMA 24562 - ISO 6431**

CONSTRUCTION

Barrel : non magnetic hard anodized aluminium alloy
Tie rods : stainless steel (Ø 32-100), paint steel (Ø 125-200)
Rod : hard chrome plated steel with rod nut galvanized steel
Piston seal : polyurethane (PUR)
Front and rear ends : aluminium alloy
Bearing : metal self lubricating
Cushioning : pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT (cushioned version)

Bore Ø (mm)	Strokes (mm) (1)	**CODES** (2)	REFERENCES	Con-nection Ø	Cushion-ing length (mm)
32	25	**450 00 710**	PES 32 T A 25 R-DM	G 1/8	18
	50	**450 00 711**	PES 32 T A 50 R-DM		
	80	**450 01 095**	PES 32 T A 80 R-DM		
	100	**450 00 712**	PES 32 T A 100 R-DM		
	125	**450 01 113**	PES 32 T A 125 R-DM		
	160	**450 00 713**	PES 32 T A 160 R-DM		
	200	**450 00 714**	PES 32 T A 200 R-DM		
	250	**450 00 715**	PES 32 T A 250 R-DM		
40	25	**450 00 716**	PES 40 T A 25 R-DM	G 1/4	20
	50	**450 00 717**	PES 40 T A 50 R-DM		
	80	**450 01 096**	PES 40 T A 80 R-DM		
	100	**450 00 718**	PES 40 T A 100 R-DM		
	125	**450 01 114**	PES 40 T A 125 R-DM		
	160	**450 00 719**	PES 40 T A 160 R-DM		
	200	**450 00 720**	PES 40 T A 200 R-DM		
	250	**450 00 721**	PES 40 T A 250 R-DM		
	320	**450 00 722**	PES 40 T A 320 R-DM		
	400	**450 00 723**	PES 40 T A 400 R-DM		
50	25	**450 00 724**	PES 50 T A 25 R-DM	G 1/4	26
	50	**450 00 725**	PES 50 T A 50 R-DM		
	80	**450 01 097**	PES 50 T A 80 R-DM		
	100	**450 00 726**	PES 50 T A 100 R-DM		
	125	**450 01 115**	PES 50 T A 125 R-DM		
	160	**450 00 727**	PES 50 T A 160 R-DM		
	200	**450 00 728**	PES 50 T A 200 R-DM		
	250	**450 00 729**	PES 50 T A 250 R-DM		
	320	**450 00 730**	PES 50 T A 320 R-DM		
	400	**450 00 731**	PES 50 T A 400 R-DM		
	500	**450 00 732**	PES 50 T A 500 R-DM		
	630	**450 00 733**	PES 50 T A 630 R-DM		
63	25	**450 00 734**	PES 63 T A 25 R-DM	G 3/8	26
	50	**450 00 735**	PES 63 T A 50 R-DM		
	80	**450 01 098**	PES 63 T A 80 R-DM		
	100	**450 00 736**	PES 63 T A 100 R-DM		
	125	**450 01 116**	PES 63 T A 125 R-DM		
	160	**450 00 737**	PES 63 T A 160 R-DM		
	200	**450 00 738**	PES 63 T A 200 R-DM		
	250	**450 00 739**	PES 63 T A 250 R-DM		
	320	**450 00 740**	PES 63 T A 320 R-DM		
	400	**450 00 741**	PES 63 T A 400 R-DM		
	500	**450 00 742**	PES 63 T A 500 R-DM		
	630	**450 00 743**	PES 63 T A 630 R-DM		
80	25	**450 00 744**	PES 80 T A 25 R-DM	G 3/8	27
	50	**450 00 745**	PES 80 T A 50 R-DM		
	80	**450 01 099**	PES 80 T A 80 R-DM		
	100	**450 00 746**	PES 80 T A 100 R-DM		
	125	**450 01 117**	PES 80 T A 125 R-DM		
	160	**450 00 747**	PES 80 T A 160 R-DM		
	200	**450 00 748**	PES 80 T A 200 R-DM		
	250	**450 00 749**	PES 80 T A 250 R-DM		
	320	**450 00 750**	PES 80 T A 320 R-DM		
	400	**450 00 751**	PES 80 T A 400 R-DM		
	500	**450 00 752**	PES 80 T A 500 R-DM		
	630	**450 00 753**	PES 80 T A 630 R-DM		

Bore Ø (mm)	Strokes (mm) (1)	**CODES** (2)	REFERENCES	Con-nection Ø	Cushion-ing length (mm)
100	50	**450 01 192**	PES 100 T A 50 R-DM	G 1/2	33
	80	**450 01 193**	PES 100 T A 80 R-DM		
	100	**450 01 194**	PES 100 T A 100 R-DM		
	125	**450 01 195**	PES 100 T A 125 R-DM		
	160	**450 01 196**	PES 100 T A 160 R-DM		
	200	**450 01 197**	PES 100 T A 200 R-DM		
	250	**450 01 198**	PES 100 T A 250 R-DM		
	320	**450 01 199**	PES 100 T A 320 R-DM		
	400	**450 01 200**	PES 100 T A 400 R-DM		
	500	**450 01 201**	PES 100 T A 500 R-DM		
	630	**450 01 202**	PES 100 T A 630 R-DM		
	700	**450 01 203**	PES 100 T A 700 R-DM		
	800	**450 01 204**	PES 100 T A 800 R-DM		
	900	**450 01 205**	PES 100 T A 900 R-DM		
	1000	**450 01 206**	PES 100 T A1000 R-DM		
125	50	**450 01 208**	PES 125 T A 50 R-DM	G 1/2	37
	80	**450 01 209**	PES 125 T A 80 R-DM		
	100	**450 01 210**	PES 125 T A 100 R-DM		
	125	**450 01 211**	PES 125 T A 125 R-DM		
	160	**450 01 212**	PES 125 T A 160 R-DM		
	200	**450 01 213**	PES 125 T A 200 R-DM		
	250	**450 01 214**	PES 125 T A 250 R-DM		
	320	**450 01 215**	PES 125 T A 320 R-DM		
	400	**450 01 216**	PES 125 T A 400 R-DM		
	500	**450 01 217**	PES 125 T A 500 R-DM		
	630	**450 01 218**	PES 125 T A 630 R-DM		
	700	**450 01 219**	PES 125 T A 700 R-DM		
	800	**450 01 220**	PES 125 T A 800 R-DM		
	900	**450 01 221**	PES 125 T A 900 R-DM		
	1000	**450 01 222**	PES 125 T A1000 R-DM		
160	50	**450 01 223**	PES 160 T A 50 R-DM	G 3/4	55
	80	**450 01 224**	PES 160 T A 80 R-DM		
	100	**450 01 225**	PES 160 T A 100 R-DM		
	125	**450 01 226**	PES 160 T A 125 R-DM		
	160	**450 01 227**	PES 160 T A 160 R-DM		
	200	**450 01 228**	PES 160 T A 200 R-DM		
	250	**450 01 229**	PES 160 T A 250 R-DM		
	320	**450 01 230**	PES 160 T A 320 R-DM		
	400	**450 01 231**	PES 160 T A 400 R-DM		
	500	**450 01 232**	PES 160 T A 500 R-DM		
	630	**450 01 233**	PES 160 T A 630 R-DM		
	700	**450 01 234**	PES 160 T A 700 R-DM		
	800	**450 01 235**	PES 160 T A 800 R-DM		
	900	**450 01 236**	PES 160 T A 900 R-DM		
	1000	**450 01 237**	PES 160 T A1000 R-DM		
200	50	**450 01 238**	PES 200 T A 50 R-DM	G 3/4	55
	80	**450 01 239**	PES 200 T A 80 R-DM		
	100	**450 01 240**	PES 200 T A 100 R-DM		
	125	**450 01 241**	PES 200 T A 125 R-DM		
	160	**450 01 242**	PES 200 T A 160 R-DM		
	200	**450 01 243**	PES 200 T A 200 R-DM		
	250	**450 01 244**	PES 200 T A 250 R-DM		
	320	**450 01 245**	PES 200 T A 320 R-DM		
	400	**450 01 246**	PES 200 T A 400 R-DM		
	500	**450 01 247**	PES 200 T A 500 R-DM		
	630	**450 01 248**	PES 200 T A 630 R-DM		
	700	**450 01 249**	PES 200 T A 700 R-DM		
	800	**450 01 250**	PES 200 T A 800 R-DM		
	900	**450 01 251**	PES 200 T A 900 R-DM		
	1000	**450 01 252**	PES 200 T A1000 R-DM		

(1) Other strokes on request (to specify on order within the reference)
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

Ø 250 mm : consult us

MOUNTINGS : see following pages
OPTIONS AND SPECIFIC VERSIONS (consult us)
- Available non cushioned (NA) on request.
- High temperature version (0° C to 120° C) - see P239

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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Series 450
Type PES-RDM-T2

THROUGH ROD TYPE DOUBLE ACTING CYLINDERS Ø 32 to 200 mm

equipped for magnetic position detectors
Conforming with VDMA-ISO standards
With adjustable pneumatic cushioning

SPECIFICATION

FLUID	: air or neutral gas, filtered, lubricated or not
PRESSURE	: 10 bar max.
TEMPERATURE	: – 20° C, at + 60° C (for higher temperature, see P239)
OPTIMAL MAX. SPEED	: ≤ 1 m/s (for optimal service life)
MAX. SPEED RATE	: 2 m/s
STANDARDS	: **VDMA 24562 - ISO 6431**

CONSTRUCTION

Barrel	: non magnetic hard anodized aluminium alloy
Tie rods	: stainless steel (Ø 32-100, paint stell (Ø 125-200)
Rod	: hard chrome plated steel
Piston	: acetal resin (POM), or light alloy fitted with a permanent annular magnet
Piston seal	: polyurethane (PUR)
Cushioning seals	: polyurethane (PUR)
Front and rear ends	: aluminium alloy
Bearing	: metal self lubricating
Rod nut	: galvanized steel
Cushioning	: pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT

Bore Ø (mm)	PES CYLINDER WITH TIE RODS - THROUGH ROD TYPE (Aluminium barrel) CODES	RÉFÉRENCES	Max. stroke capabilty (mm)	Connection Ø	Cushioning length (mm)
32	**450 50 784** (1)	PES 32 A (1) RDM - T2	300	G1/8	18
40	**450 50 785** (1)	PES 40 A (1) RDM - T2	400	G1/4	20
50	**450 50 786** (1)	PES 50 A (1) RDM - T2	500	G1/4	26
63	**450 50 787** (1)	PES 63 A (1) RDM - T2	500	G3/8	26
80	**450 50 788** (1)	PES 80 A (1) RDM - T2	600	G 3/8	27
100	**450 51 022** (1)	PES 100 A (1) RDM - T2	600	G 3/8	33
125	**450 51 023** (1)	PES 125 A (1) RDM - T2	600	G 3/8	37
160	**450 51 024** (1)	PES 160 A (1) RDM - T2	600	G 1/2	55
200	**450 51 025** (1)	PES 200 A (1) RDM - T2	600	G 1/2	55

(1) Please specify stroke length (in mm) , compatible with the max. stroke capabilty.
The magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

DIMENSIONS (see following pages)

MOUNTINGS

		Low feet (2) **MS1**	High foot (1) **MS3**	Rectangular front or rear flange **MF1 - MF2**	Centre trunnion (3) for PES with tie rods **MT4**	Supports (2) for centre trunnion **AT4**
Application	Standard duty	●	●	●	●	●
	Heavy duty	●	●	●	●	●
Construction		Stamped sheet steel	Drawn steel	Steel	Cast iron	Aluminium + bush
For cylinder Ø		**CODES** OF MOUNTINGS				
32		**434 00 163**	**434 00 307**	**434 00 119**	**410 548**	**434 00 207**
40		**434 00 164**	**434 00 308**	**434 00 120**	**410 549**	**434 00 208**
50		**434 00 165**	**434 00 309**	**434 00 121**	**410 550**	**434 00 208**
63		**434 00 166**	**434 00 310**	**434 00 122**	**410 551**	**434 00 209**
80		**434 00 167**	**434 00 311**	**434 00 123**	**410 552**	**434 00 209**
100		**434 00 168**	**434 00 312**	**434 00 124**	**410 553**	**434 00 210**
125		**434 00 169**	**434 00 313**	**434 00 192**	**410 554**	**434 00 210**
160		**434 00 381**	-	**434 00 342**	**410 555**	**434 00 341**
200		**434 00 382**	-	**434 00 343**	**410 556**	**434 00 341**
Dimensions		page 11	page 17	page 11	page 16	page 16

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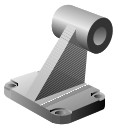
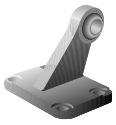
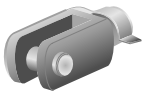
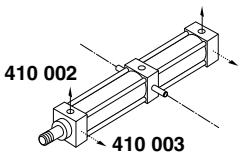
MOUNTINGS

		 Cap, detachable clevis **MP2**			 Cap, detachable eye (trunnion) **MP4**			 Angular clevis bracket **AB3**		
Application	Standard duty	●	●		●	●		●	●	
	Heavy duty		●	●		●	●		●	●
Construction		Light alloy	Cast iron + steel without bush	Cast iron + steel + bush	Light alloy	Cast iron without bush	Cast iron + bush	Light alloy	Cast iron without bush	Cast iron + bush
For cylinder Ø		**CODES** OF MOUNTINGS								
32		**434 00 130**	**434 00 257**	**434 00 185**	**434 00 125**	**434 00 266**	**434 00 171**	**434 00 383**	**434 00 145**	**434 00 110**
40		**434 00 131**	**434 00 258**	**434 00 186**	**434 00 126**	**434 00 267**	**434 00 172**	**434 00 384**	**434 00 146**	**434 00 111**
50		**434 00 132**	**434 00 259**	**434 00 187**	**434 00 127**	**434 00 268**	**434 00 173**	**434 00 385**	**434 00 147**	**434 00 112**
63		**434 00 133**	**434 00 260**	**434 00 188**	**434 00 128**	**434 00 269**	**434 00 174**	**434 00 386**	**434 00 148**	**434 00 113**
80		**434 00 134**	**434 00 261**	**434 00 189**	**434 00 129**	**434 00 270**	**434 00 175**	**434 00 387**	**434 00 149**	**434 00 114**
100		**434 00 135**	**434 00 262**	**434 00 190**	**434 00 161**	**434 00 271**	**434 00 176**	**434 00 388**	**434 00 150**	**434 00 115**
125		-	**434 00 263**	**434 00 191**	-	**434 00 272**	**434 00 177**	-	**434 00 151**	**434 00 116**
160		-	**434 00 264**	**434 00 335**	-	**434 00 273**	**434 00 337**	-	**434 00 152**	**434 00 117**
200		-	**434 00 265**	**434 00 336**	-	**434 00 274**	**434 00 338**	-	**434 00 153**	**434 00 118**
Dimensions		pages 12/13			pages 12/13			page 13		

		 Cap, clevis for spherical eye or clevis bracket	 Cap, eye with spherical bearing (4) **MP6**	 Angular clevis bracket spherical eye (4) **AB5**	 Female rod clevis ISO 8140 - RP102P **AP2**	 Spherical rod end ISO 8139 - RP103P **AP6**	 Alignment (5) compensator
Application	Standard duty	●	●	●	●	●	●
	Heavy duty	●	●	●	●	●	●
Construction		Forged steel	Forged steel	Forged steel	Steel	Steel	Steel
For cylinder Ø		**CODES** OF MOUNTINGS					
32		**434 00 363**	**434 00 372**	**434 00 354**	**434 00 016**	**434 00 001**	**434 00 242**
40		**434 00 364**	**434 00 373**	**434 00 355**	**434 00 017**	**434 00 002**	**434 00 243**
50		**434 00 365**	**434 00 374**	**434 00 356**	**434 00 018**	**434 00 003**	**434 00 244**
63		**434 00 366**	**434 00 375**	**434 00 357**	**434 00 018**	**434 00 003**	**434 00 244**
80		**434 00 367**	**434 00 376**	**434 00 358**	**434 00 019**	**434 00 004**	**434 00 245**
100		**434 00 368**	**434 00 377**	**434 00 359**	**434 00 019**	**434 00 004**	**434 00 245**
125		**434 00 369**	**434 00 378**	**434 00 360**	**434 00 020**	**434 00 005**	**434 00 246**
160		-	-	-	**434 00 021**	**434 00 006**	-
200		-	-	-	**434 00 021**	**434 00 006**	-
Dimensions		pages 14/15	pages 14/15	page 15	page 18	page 18	page 18

(1) High foot sold individually
(2) Corresponds to a set of 2 parts.
(3) The centre trunnion code and the dimension XV along with orientation code of the trunnion with respect to the ports must be added to the cylinder code.
Trunnion axis is perpendicular to supply ports: code **410 002** (standard orientation)
other position upon request : code **410 003**.
(4) These accessories allows accurate angular compensation adjustment spherical of 4°
(5) This accessorie allows accurate angular compensation adjustment spherical of 4° and radial of 0,7 mm
NOTE: With the exception of the centre trunnion, mountings are delivered separetely.



: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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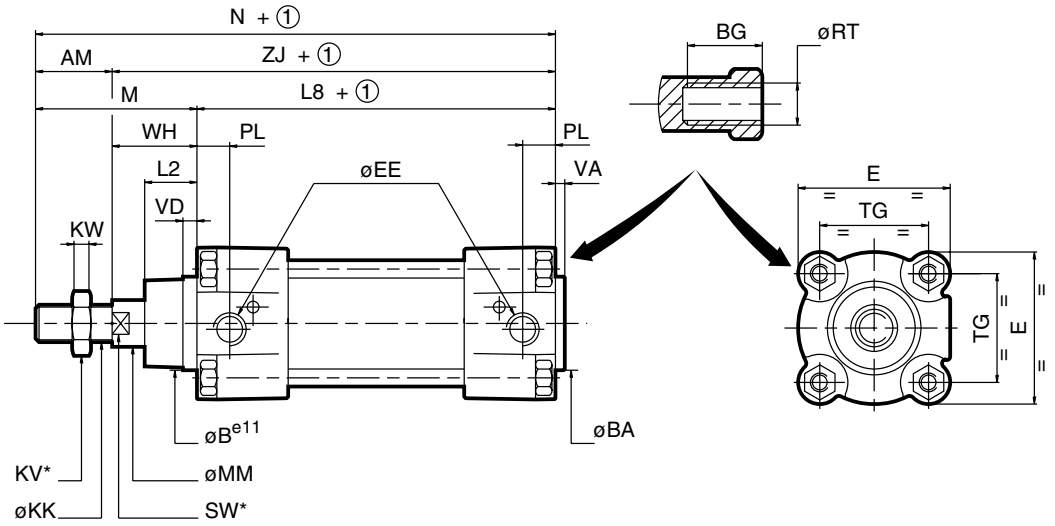
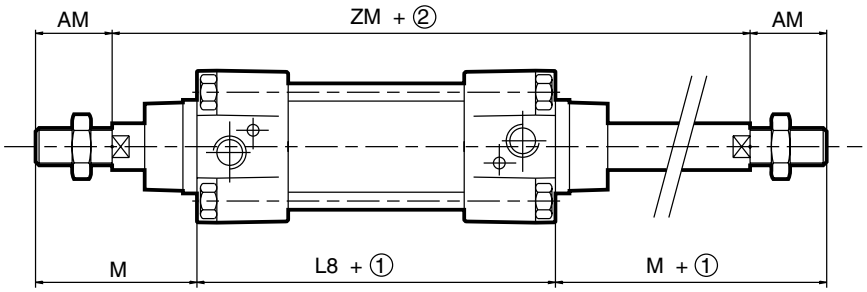
DIMENSIONS AND WEIGHTS - BARE CYLINDER



SINGLE ROD CYLINDER



THROUGH ROD TYPE CYLINDER

① : + Stroke
② : + (stroke x 2)
✻ : dimensions on flats

Bore Ø (mm)	DIMENSIONS (mm)																			
	AM	ØB	ØBA	BG	E	ØEE	ØKK	KV	KW	L2	L8	M	ØMM	N	PL	ØRT	SW	TG	VA	VD min.
32	22	30	30	16	50	G1/8	M10x1,25	16	5	17	94	48	12	142	14	M6	10	32,5	4	4
40	24	35	35	16	55	G1/4	M12x1,25	18	6	19	105	54	16	159	16	M6	13	38	4	4
50	32	40	40	16	65	G1/4	M16x1,5	24	8	26	106	69	20	175	18	M8	16	46,5	4	4
63	32	45	45	16	75	G3/8	M16x1,5	24	8	26	121	69	20	190	17	M8	16	56,5	4	4
80	40	45	45	17	100	G3/8	M20x1,5	30	10	33	128	86	25	214	16,5	M10	21	72	4	4
100	40	55	55	17	120	G1/2	M20x1,5	30	10	35,5	138	91	25	229	21	M10	21	89	4	4
125	54	60	60	24	145	G1/2	M27x2	41	13,5	40	160	119	32	279	32	M12	27	110	6	6
160	72	65	65	29,5	180	G3/4	M36x2	55	18	58	180	152	40	332	35,5	M16	36	140	6	6
200	72	75	75	29,5	220	G3/4	M36x2	55	18	58	180	167	40	347	35	M16	36	175	6	6

Bore Ø (mm)	DIMENSIONS (mm)			WEIGHTS (kg) Steel barrel		Aluminium barrel	
	WH	ZJ	ZM	(3)	(4)	(3)	(4)
32	26	120	146	0,620	0,340	0,590	0,235
40	30	135	165	0,875	0,450	0,840	0,335
50	37	143	180	1,245	0,650	1,200	0,510
63	37	158	195	1,610	0,810	1,500	0,540
80	46	174	220	3,020	1,230	2,860	0,840
100	51	189	240	4,130	1,720	3,675	1,185
125	65	225	290	7,400	2,080	6,955	1,360
160	80	260	340	13,650	3,240	12,835	2,100
200	95	275	370	18,740	4,090	17,575	2,500

(3) Cylinder weight with 0 mm stroke.
(4) Weight to be added per additional 100 mm length.

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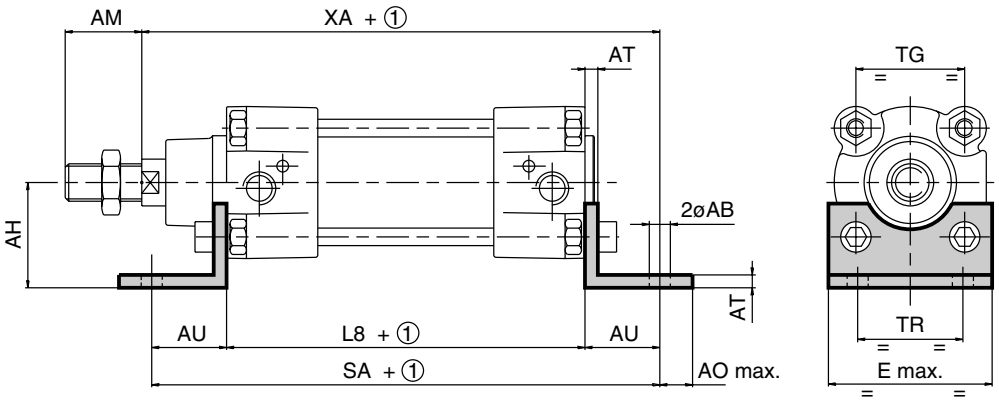
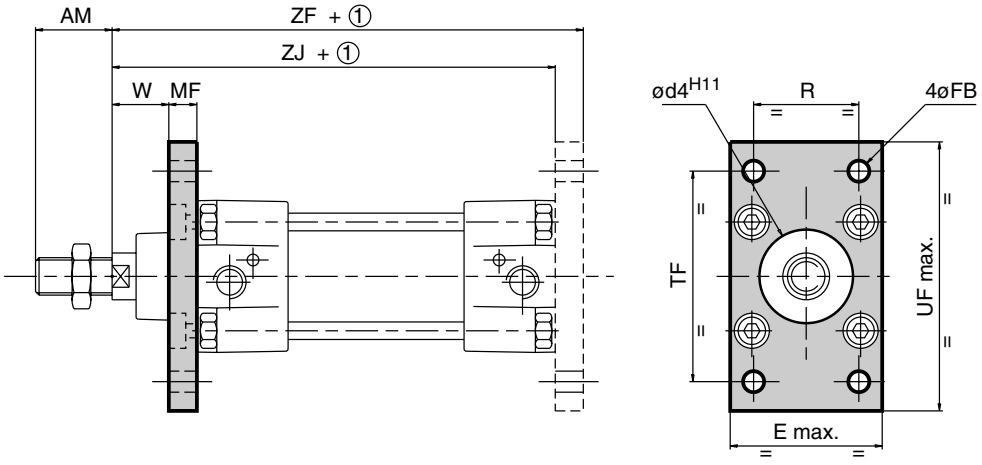
LOW FEET MOUNTING - MS1



RECTANGULAR FRONT OR REAR MOUNTING FLANGE - MF1 - MF2



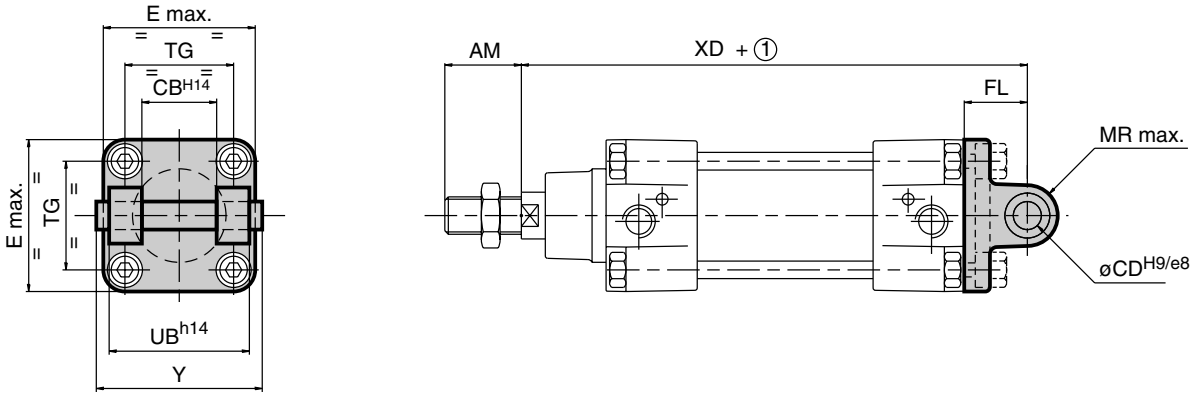
① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																			
	ØAB	AM	AO	AH	AT	AU	Ød4	E	ØFB	L8	MF	R TR	SA	TF	TG	UF	W	XA	ZJ	ZF
32	7	22	11	32	4,5	24	30	50	7	94	10	32	142	64	32,5	86	16	144	120	130
40	10	24	15	36	4,5	28	35	58	9	105	10	36	161	72	38	96	20	163	135	145
50	10	32	15	45	5,5	32	40	70	9	106	12	45	170	90	46,5	115	25	175	143	155
63	10	32	15	50	5,5	32	45	85	9	121	12	50	185	100	56,5	130	25	190	158	170
80	12	40	20	63	6,5	41	45	105	12	128	16	63	210	126	72	165	30	215	174	190
100	14,5	40	25	71	6,5	41	55	130	14	138	16	75	220	150	89	187	35	230	189	205
125	16,5	54	25	90	8	45	60	157	16	160	20	90	250	180	110	224	45	270	225	245
160	18,5	72	25	115	10	60	65	195	18	180	20	115	300	230	140	280	60	320	260	280
200	24	72	35	135	12	70	75	238	22	180	25	135	320	270	175	320	70	345	275	300

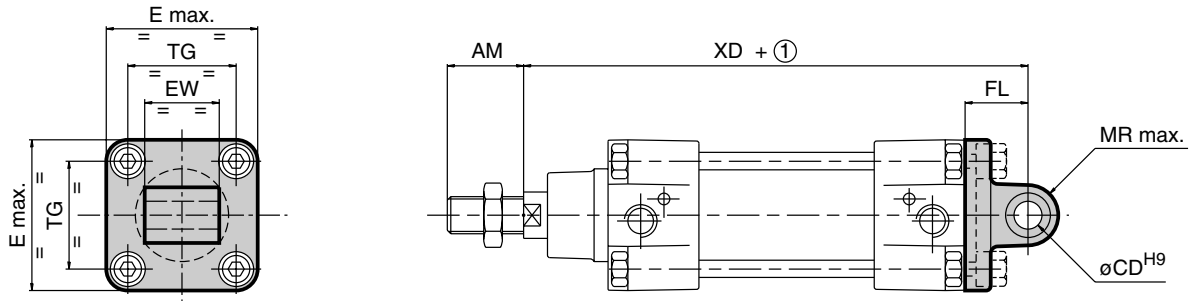
Bore Ø (mm)	Weights (kg)	
	2 feet	Front or rear flange
32	0,150	0,240
40	0,190	0,240
50	0,395	0,500
63	0,445	0,580

Bore Ø (mm)	Weights (kg)	
	2 feet	Front or rear flange
80	0,790	1,390
100	1,400	1,630
125	2,330	4,270
160	4,860	6,880
200	7,900	12,330

CAP, DETACHABLE CLEVIS MOUNTING - MP2



CAP, DETACHABLE EYE (TRUNNION) MOUNTING - MP4



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)										
	AM	CB	ØCD	E	EW	FL	MR	TG	UB	XD	Y
32	22	26	10	50	26	22	11	32,5	45	142	56
40	24	28	12	58	28	25	13	38	52	160	63
50	32	32	12	70	32	27	13	46,5	60	170	71
63	32	40	16	85	40	32	17	56,5	70	190	81
80	40	50	16	105	50	36	17	72	90	210	101
100	40	60	20	130	60	41	21	89	110	230	128
125	54	70	25	157	70	50	26	110	130	275	149
160	72	90	30	195	90	55	31	140	170	315	183
200	72	90	30	238	90	60	31	175	170	335	183

Standard EW tolerances	
Ø 32...100 mm	**EW** - 0,2 - 0,6
Ø 125...200 mm	**EW** - 0,5 - 1,2

Bore Ø (mm)	Weights (kg)			
	Cap, detachable clevis		Cap, detachable eye (trunnion)	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
32	0,105	0,205	0,085	0,210
40	0,150	0,305	0,092	0,230
50	0,240	0,430	0,170	0,430
63	0,370	0,685	0,250	0,620

Bore Ø (mm)	Weights (kg)			
	Cap, detachable clevis		Cap, detachable eye (trunnion)	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
80	0,635	1,375	0,445	1,110
100	0,990	2,100	0,755	1,700
125	-	3,570	-	3,100
160	-	6,660	-	5,220
200	-	9,890	-	7,780

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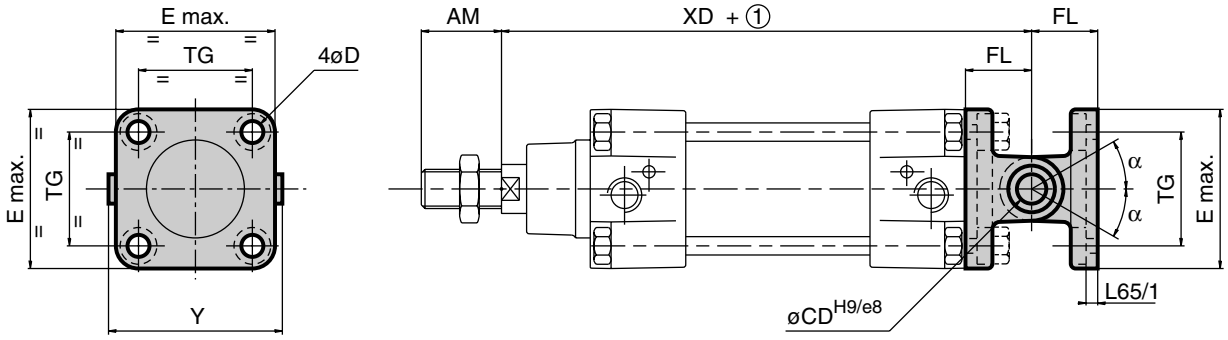
2

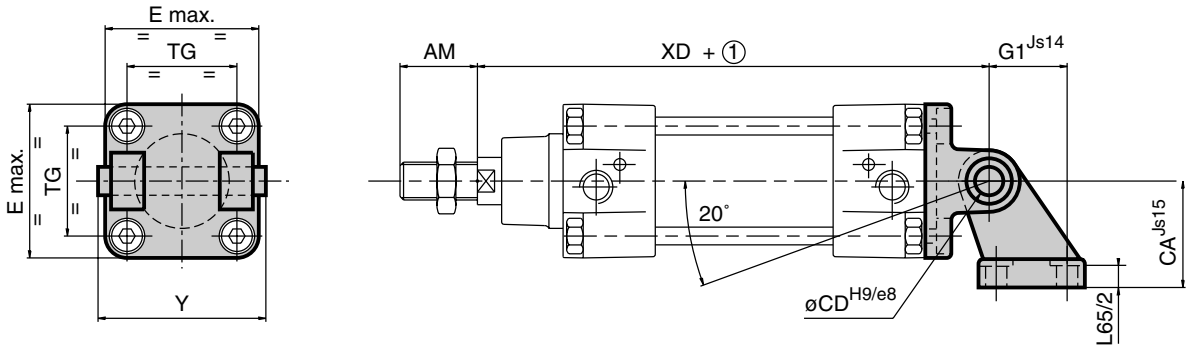
STRAIGHT COMPLETE TRUNNION MOUNTING - WITH OR WITHOUT BUSH - MP2 + MP4

To achieve the complete assembly, items MP2 and MP4 must be ordered **separately**.

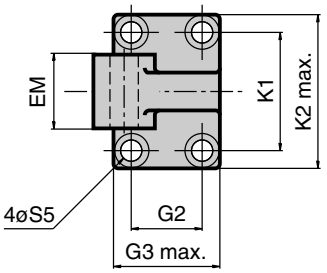


COMPLETE TRUNNION MOUNTING WITH ANGULAR CLEVIS BRACKET - WITH OR WITHOUT BUSH - MP2 + AB3

This set includes the cap, detachable clevis MP2 and the angular clevis bracket AB3, with or without bush.
These mountings must be ordered **separately**



Tolérances EM normalisées	
Ø 32...100 mm	**EM** - 0,2 - 0,6
Ø 125...200 mm	**EM** - 0,5 - 1,5



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																		
	AM	ØCD	ØD	ØS5	E	EM	FL	K1	K2	G1	G2	G3	CA	L65/1	L65/2	TG	XD	Y	α
32	22	10	6,6	6,6	50	26	22	38	51	21	18	31	32	5,5	6,5	32,5	142	56	45°
40	24	12	6,6	6,6	58	28	25	41	54	24	22	35	36	5,5	8,5	38	160	63	50°
50	32	12	9	9	70	32	27	50	65	33	30	45	45	6,5	10,5	46,5	170	71	40°
63	32	16	9	9	85	40	32	52	67	37	35	50	50	6,5	12,5	56,5	190	81	55°
80	40	16	11	11	105	50	36	66	86	47	40	60	63	10	11,5	72	210	101	45°
100	40	20	11	11	130	60	41	76	96	55	50	70	71	10	14,5	89	230	128	35°
125	54	25	13	14	157	70	50	94	124	70	60	90	90	10	16,5	110	275	149	30°
160	72	30	17	14	195	90	55	118	156	97	88	126	115	10	21	140	315	183	30°
200	72	30	17	18	238	90	60	122	162	105	90	130	135	11	26	175	335	183	30°

Bore Ø (mm)	Weights (kg)			
	Straight complete trunnion		Complete trunnion with ang. clevis bracket	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
32	0,190	0,415	0,160	0,340
40	0,240	0,535	0,230	0,450
50	0,410	0,860	0,390	0,790
63	0,620	1,305	0,570	1,080

Bore Ø (mm)	Weights (kg)			
	Straight complete trunnion		Complete trunnion with ang. clevis bracket	
	Light alloy	Cast iron+steel	Light alloy	Cast iron+steel
80	1,080	2,485	0,950	2,090
100	1,745	3,800	1,500	2,750
125	-	6,670	-	6,610
160	-	11,880	-	12,470
200	-	17,670	-	16,760

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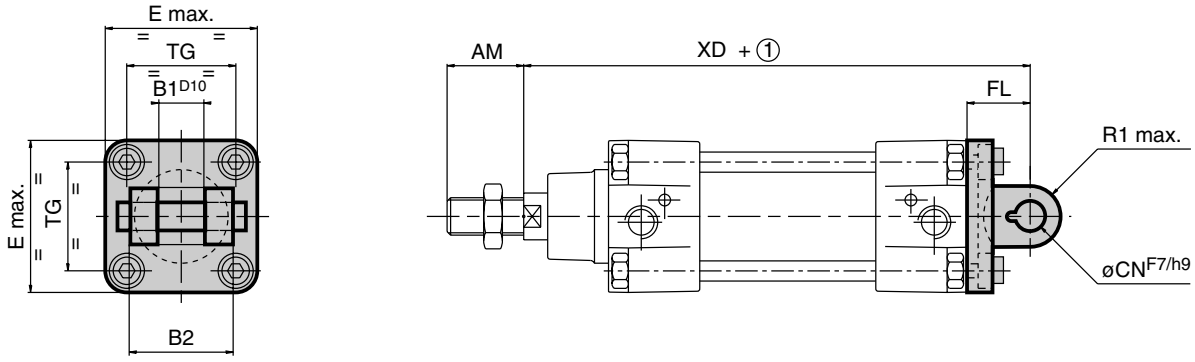
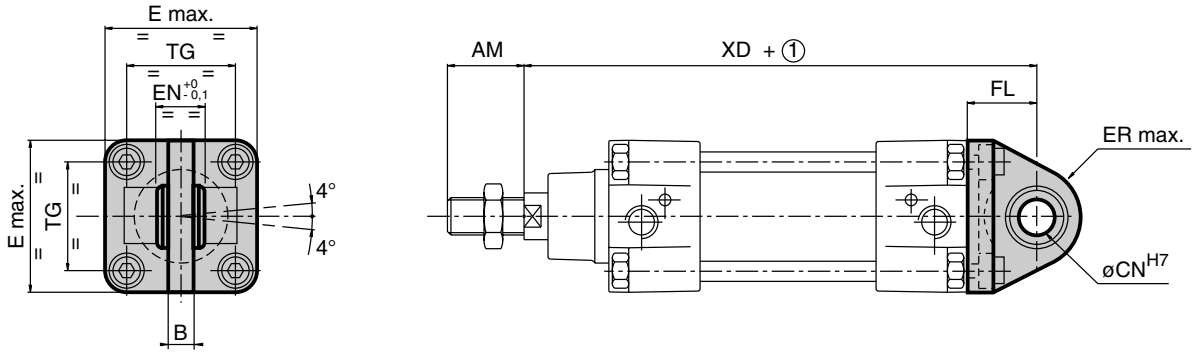
CAP, DETACHABLE CLEVIS MOUNTING - FOR SPHERICAL EYE (STRAIGHT) OR ANGULAR CLEVIS BRACKET



CAP, DETACHABLE EYE MOUNTING WITH SPHERICAL BEARING - MP6



① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)											
	AM	B	B1	B2	CN	E	ER	EN	FL	R1	TG	XD
32	22	10,5	14	34	10	50	15	14	22	11	32,5	142
40	24	12	16	40	12	58	18	16	25	13	38	160
50	32	15	21	45	16	70	20	21	27	18	46,5	170
63	32	15	21	51	16	85	23	21	32	18	56,5	190
80	40	18	25	65	20	105	27	25	36	22	72	210
100	40	18	25	75	20	130	30	25	41	22	89	230
125	54	25	37	97	30	157	40	37	50	30	110	275
160	-	-	-	-	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	-	-	-	-	-	-

Standard EN tolerances	
Ø 32...125 mm	0 **EN** - 0,1

Bore Ø (mm)	Weights (kg)	
	Cap, detachable clevis for spherical eye	Cap, detachable eye with spherical bearing
32	0,190	0,180
40	0,300	0,290
50	0,460	0,420
63	0,680	0,650

Bore Ø (mm)	Weights (kg)	
	Cap, detachable clevis for spherical eye	Cap, detachable eye with spherical bearing
80	1,460	1,210
100	2,130	1,870
125	4,240	3,640
160	-	-
200	-	-

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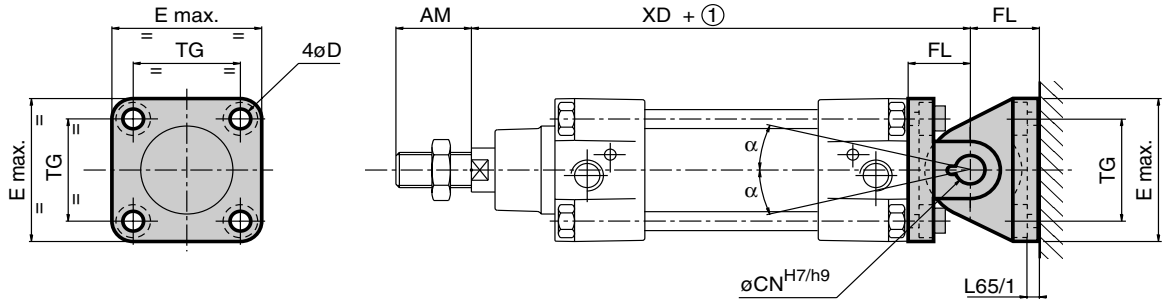
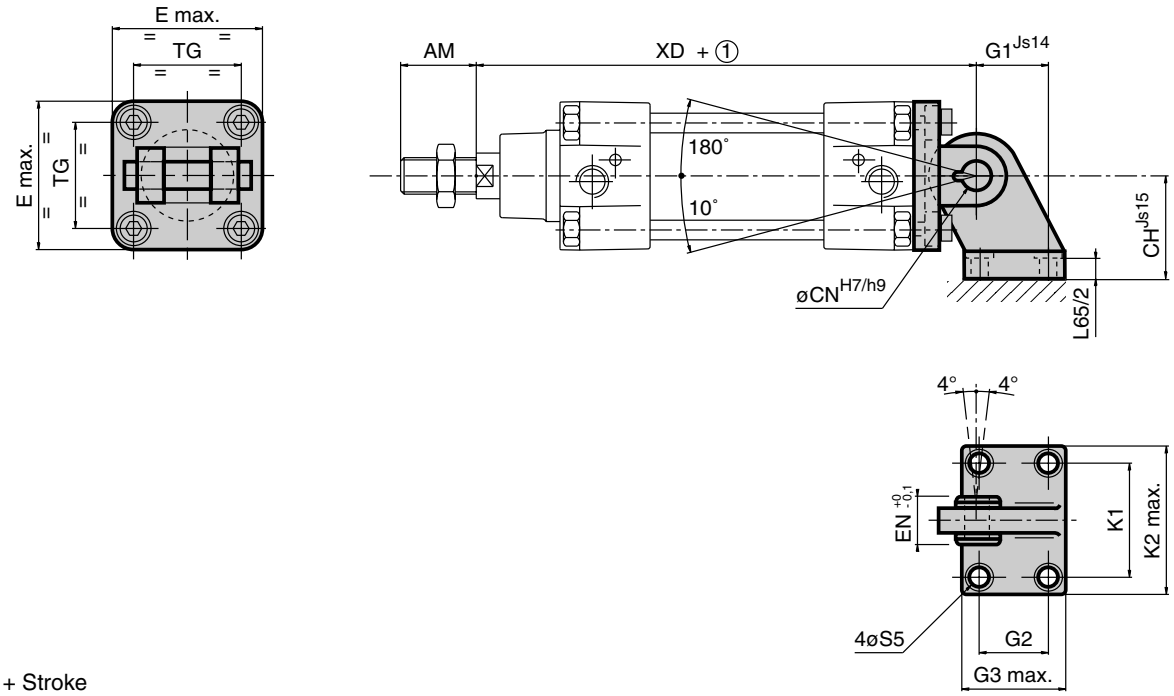
STRAIGHT COMPLETE TRUNNION MOUNTING, SPHERICAL BEARING

This set includes the cap, clevis for spherical eye and the cap, eye with spherical bearing MP6.
These mountings must be ordered **separately**



COMPLETE TRUNNION MOUNTING WITH ANGULAR CLEVIS BRACKET - SPHERICAL BEARING

This set includes the cap, detachable eye and the angular clevis bracket spherical eye AB5.
These mountings must be ordered **separately**



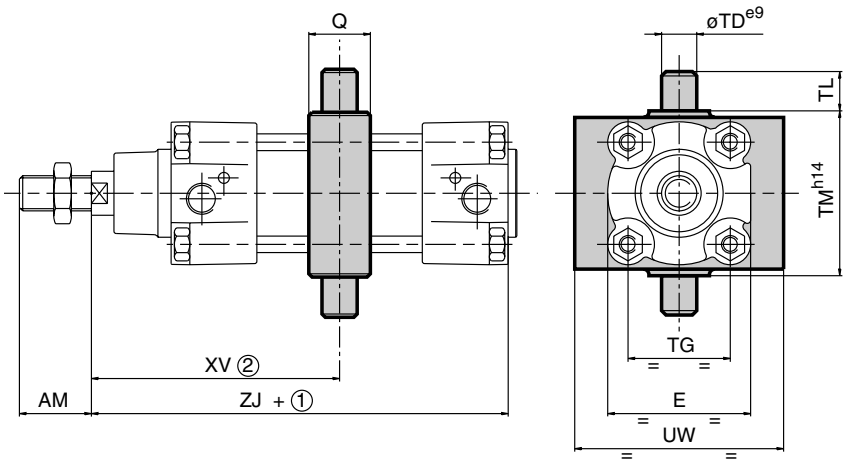
① : + Stroke

Bore Ø (mm)	DIMENSIONS (mm)																	
	AM	ØCN	ØD	ØS5	E	EN	FL	K1	K2	G1	G2	G3	CH	L65/1	L65/2	TG	XD	α
32	22	10	6,6	6,6	50	14	22	38	51	21	18	31	32	5,5	8,5	32,5	142	40°
40	24	12	6,6	6,6	58	16	25	41	54	24	22	35	36	5,5	8,5	38	160	45°
50	32	16	9	9	70	21	27	50	65	33	30	45	45	6,5	10	46,5	170	35°
63	32	16	9	9	85	21	32	52	67	37	35	50	50	6,5	10	56,5	190	50°
80	40	20	11	11	105	25	36	66	86	47	40	60	63	10	11,5	72	210	40°
100	40	20	11	11	130	25	41	76	96	55	50	70	71	10	12,5	89	230	30°
125	54	30	13,5	14	157	37	50	94	124	70	60	90	90	10	16,5	110	275	25°
160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Bore Ø (mm)	Weights (kg)	
	Straight complete trunnion,spherical bearing	Complete trunnion with spherical bearing
32	0,370	0,370
40	0,590	0,530
50	0,880	0,910
63	1,330	1,200

Bore Ø (mm)	Weights (kg)	
	Straight complete trunnion,spherical bearing	Complete trunnion with spherical bearing
80	2,670	2,400
100	4	3,200
125	7,880	6,710
160	-	-
200	-	-

CENTRE TRUNNION MOUNTING - MT4

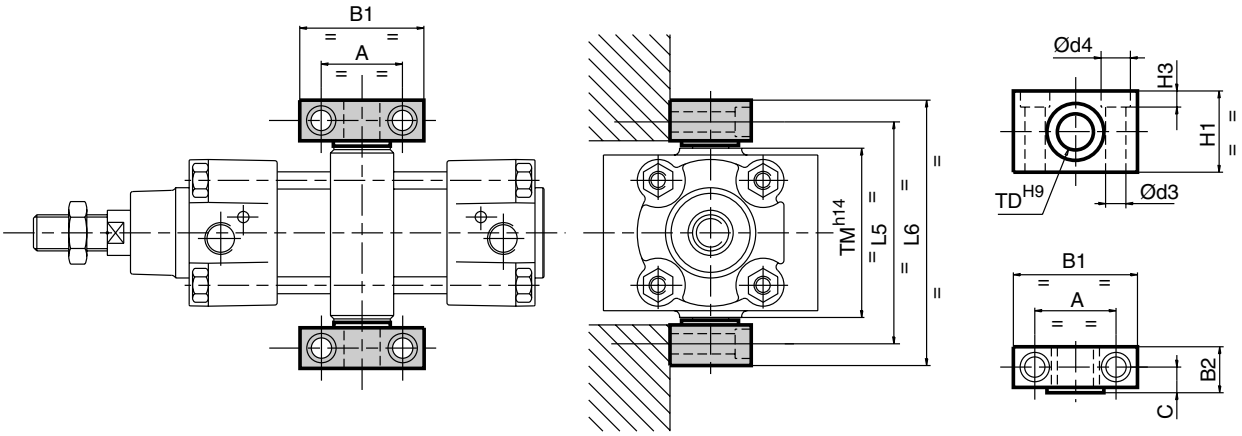


Ø	WITHOUT DETECTORS		WITH DETECTORS		
	XV min.	XV max.	XV min.	XV max.	① min.
32	72	74 +①	138	138 +①	130
40	83	83 +①	149	149 +①	133
50	90	90 +①	156	156 +①	132
63	93,5	101,5+①	166	166 +①	132
80	106,5	113,5+①	178	178 +①	131
100	114	126 +①	190	190 +①	135
125	137	155 +①	220	220 +①	137
160	159,5	180,5+①	257,5	257,5 +①	148
200	173,5	196,5+①	276,5	276,5 +①	148

① : + Stroke

① : + Stroke
② : Dimension XV is specified on order

SUPPORTS FOR CENTRE TRUNNION - AT4



Bore Ø (mm)	DIMENSIONS (mm)																		
	A	**AM**	**B1**	**B2**	**C**	**Ød3**	**Ød4**	**E**	**H1**	**H3**	**L5**	**L6**	**Q**	**TD**	**TG**	**TL**	**TM**	**UW**	**ZJ**
32	32	22	46	18	10,5	6,6	11	50	30	6,8	71	86	22	12	32,5	12	50	55	120
40	36	24	55	21	12	9	15	55	36	9	87	105	28	16	38	16	63	58	135
50	36	32	55	21	12	9	15	65	36	9	99	117	28	16	46,5	16	75	68	143
63	42	32	65	23	13	11	18	75	40	11	116	136	35	20	56,5	20	90	84	158
80	42	40	65	23	13	11	18	100	40	11	136	156	35	20	72	20	110	102	174
100	50	40	75	28,5	16	13,5	20	120	50	13	164	189	40	25	89	25	132	145	189
125	50	54	75	28,5	16	13,5	20	145	50	13	192	217	40	25	110	25	160	175	225
160	60	72	92	40	22,5	17,5	26	180	60	17,5	245	280	50	32	140	32	200	220	260
200	60	72	92	40	22,5	17,5	26	220	60	17,5	295	330	50	32	175	32	250	260	275

Bore Ø (mm)	Weights (kg)	
	Centre trunnion	Supports for centre trunnion
32	0,200	0,120
40	0,400	0,230
50	0,500	0,230
63	0,900	0,330

Bore Ø (mm)	Weights (kg)	
	Centre trunnion	Supports for centre trunnion
80	1,100	0,330
100	1,860	0,580
125	2,550	0,580
160	4,170	1,030
200	4,200	1,030

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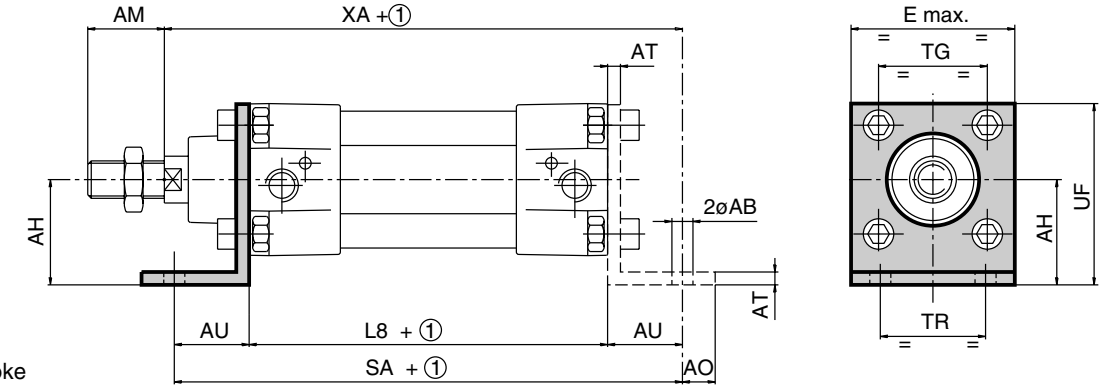
HIGH FOOT MOUNTING - MS3 (sold individually)



① : + Stroke

Bore Ø (mm)	CODE High foot	DIMENSIONS (mm)													Weights (kg)
		ØAB	AH	AO	AT	AU	AM	E	L8	UF	SA	TG	TR	XA	
32	**434 00 307**	7	32	11	8	24	22	50	94	54	142	32,5	32	144	0,180
40	**434 00 308**	10	36	15	8	28	24	58	105	62	161	38	36	163	0,250
50	**434 00 309**	10	45	15	10	32	32	70	106	77	170	46,5	45	175	0,470
63	**434 00 310**	10	50	15	10	32	32	85	121	87	185	56,5	50	190	0,595
80	**434 00 311**	12	63	20	12	41	40	105	128	110	210	72	63	215	1,265
100	**434 00 312**	14,5	71	25	12	41	40	130	138	130	220	89	75	230	-
125	**434 00 313**	16,5	90	25	16	45	54	157	160	161	250	110	90	270	-

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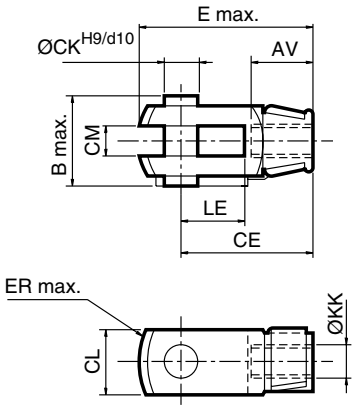
FEMALE CLEVIS - AP2

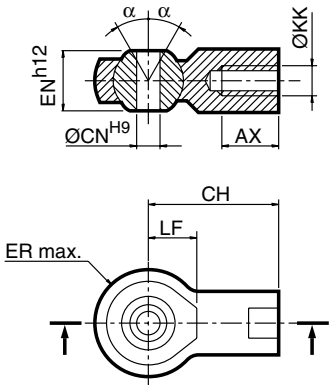
ISO 8140 - RP 102 P



SPHERICAL BEARING ROD END - AP6

ISO 8139 - RP 103 P

α : spherical angular compensation 4°

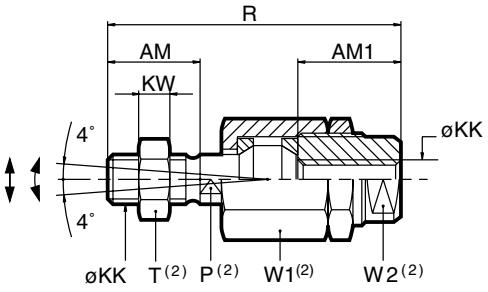


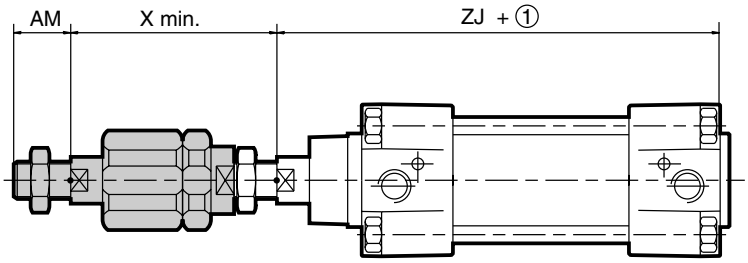
Bore Ø (mm)	DIMENSIONS (mm)													
	AV-AX	B	CE	CH	ØCK	CL	CM	ØCN	E	EN	ER	ØKK	LE	LF
32	20	26	40	43	10	20	10 $^{+0,5}_{+0,15}$	10	56	14	14	M10x1,25	20	15
40	22	32	48	50	12	24	12 $^{+0,5}_{+0,15}$	12	67	16	16	M12x1,25	24	17
50	28	41	64	64	16	32	16 $^{+0,5}_{+0,15}$	16	89	21	21	M16x1,5	32	22
63	28	41	64	64	16	32	16 $^{+0,5}_{+0,15}$	16	89	21	21	M16x1,5	32	22
80	33	48	80	77	20	40	20 $^{+0,6}_{+0,15}$	20	112	25	25	M20x1,5	40	26
100	33	48	80	77	20	40	20 $^{+0,6}_{+0,15}$	20	112	25	25	M20x1,5	40	26
125	51	65	110	110	30	55	30 $^{+0,6}_{+0,15}$	30	155	37	35	M27x 2	54	36
160	56	84	144	125	35	70	35 $^{+0,6}_{+0,15}$	35	201	43	40	M36x 2	72	41
200	56	84	144	125	35	70	35 $^{+0,6}_{+0,15}$	35	201	43	40	M36x 2	72	41

Bore Ø (mm)	Weights (kg)	
	Female clevis	Spherical bearing
32	0,100	0,070
40	0,150	0,120
50	0,330	0,220
63	0,330	0,220

Bore Ø (mm)	Weights (kg)	
	Female clevis	Spherical bearing
80	0,670	0,390
100	0,670	0,390
125	1,810	1,600
160	3,850	1,600
200	3,850	1,600

ALIGNMENT COMPENSATOR





① : + stroke

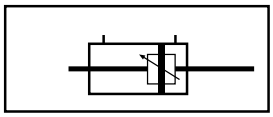
(2) : dimensions on flats

Bore Ø (mm)	DIMENSIONS (mm)											Weights (kg)
	AM	AM1	P(2)	ØKK	KW	R	T(2)	W1(2)	W2(2)	X	Radiale compensation (mm)	
32	22	26	12	M10x1,25	6	73	17	30	19	58	0,7	0,210
40	24	26	12	M12x1,25	7	77	19	30	19	59	0,7	0,210
50	32	34	19	M16x1,5	8	106	24	42	30	82	1	0,650
63	32	34	19	M16x1,5	8	106	24	42	30	82	1	0,650
80	40	42	19	M20x1,5	9	122	30	42	30	92	1	0,680
100	40	42	19	M20x1,5	9	122	30	42	30	92	1	0,680
125	54	40	24	M27x2	13,5	147	41	Ø62	54	107	1	1,700

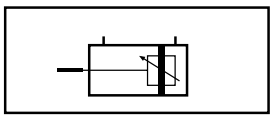
- Radial compensation 0,7 to 1 mm (see table)
- Spherical angular compensation : 4°

Note: The compensator is preset with an axial clearance of 0,05 to 0,1 - Do not reset.

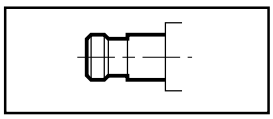
OPTIONS AND SPECIAL VERSIONS OF VDMA-ISO PNEUMATIC CYLINDERS TYPE : PES WITH TIE RODS



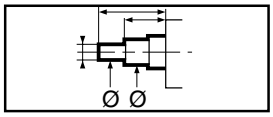
- Through rod, P/N T2



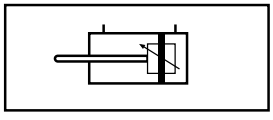
- Extented piston rod



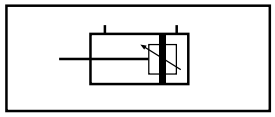
- Tenon piston rod



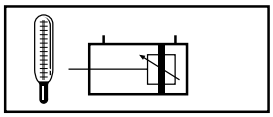
- Special machining of piston rod end



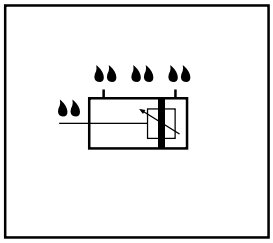
- Oversize piston rod on cylinders Ø 63 to 125 mm



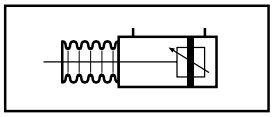
- Cylinder for inductive detector inductif (resin epoxy barrel + FV)



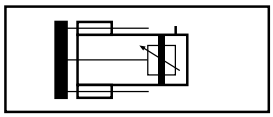
- **High temperature** version 120°C max., FPM seals (see P239) steel or aluminium barrel, tie rods (version non-equipped for magnetic position detector)



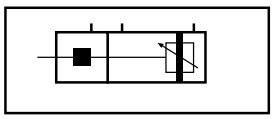
- All FPM seals
- **FPM rod seal**
- Stainless steel barrel
- Stainless steel screws and hardware
- Epoxy resin glass fiber barrel
- Anticorrosive finish on end covers and barrel



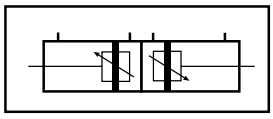
- Cylinder with piston rod gaiter



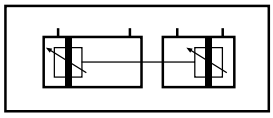
- Cylinder with U or H guiding unit slide or ball bearings (see P237)



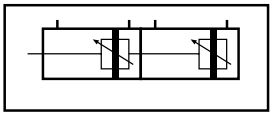
- Piston rod locking on cylinders Ø 40 to 100 mm (see P238)



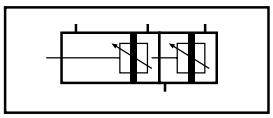
- Back to back assembly of two cylinders



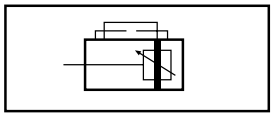
- Nose to nose assembly of two cylinders



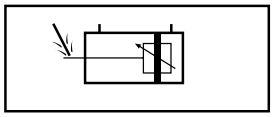
- Tandem cylinders - double acting Ø 40 to 125 mm with a common piston rod



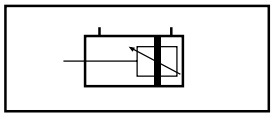
- Three position cylinders, separate piston rods



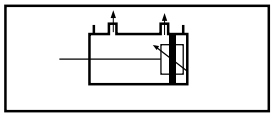
- Mounting of control valve on the cylinder
- With or without flow reducer



- Impact resistant rod



- Extented cushioning



- Cylinders with pressure outlets on barrel (stainless steel version) for exhaust pressure detection

For all these options and special versions - consult our technical staff.
For any special cylinder requirements - consult our technical staff.

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PES CYLINDERS WITH TIE RODS

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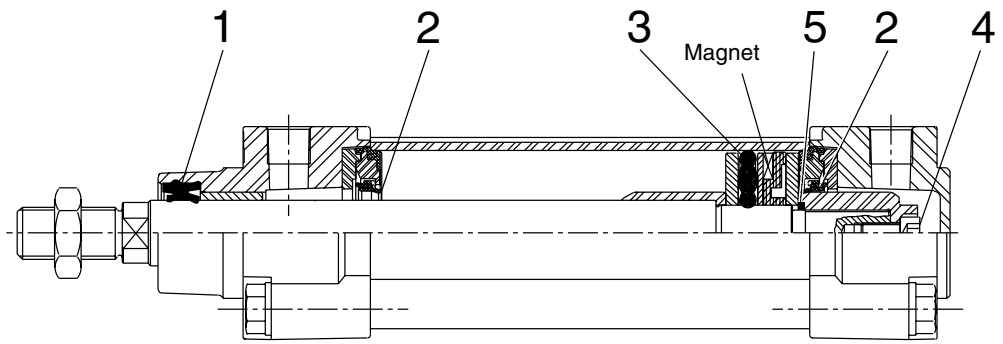
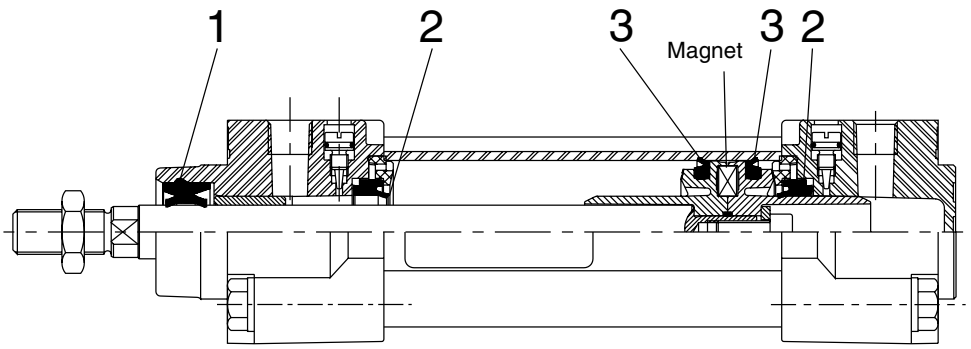
CONSTRUCTION I

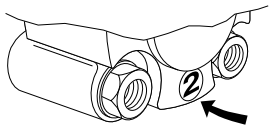


CONSTRUCTION II (PES 2)

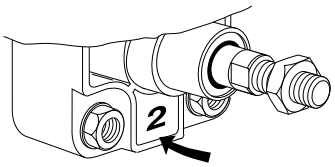


Identification of construction type 2

PES Ø 32 ... 80 mm



PES Ø 100 ... 200 mm

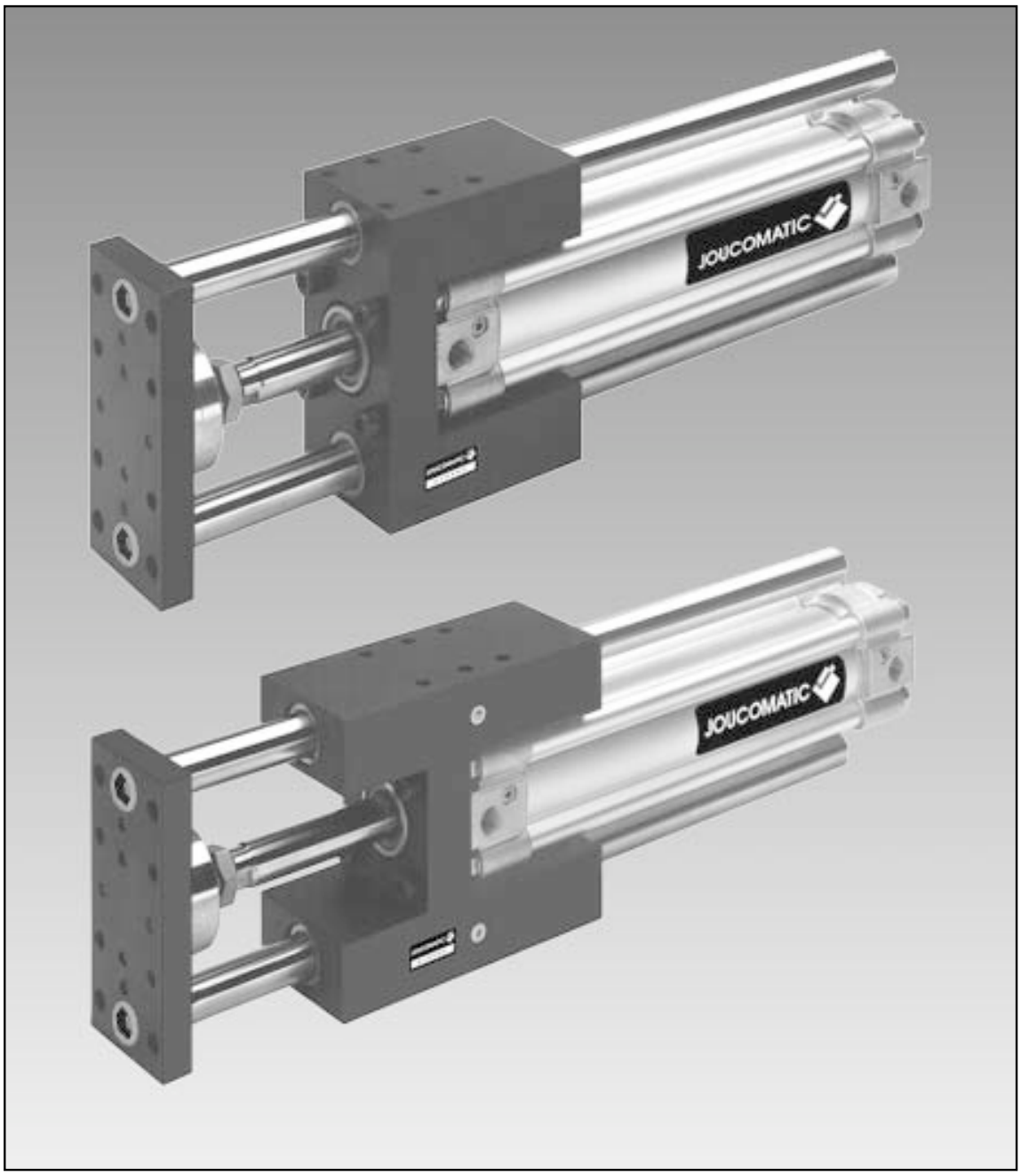


Ø CYLINDER	Cylinder type	CODES construction I (seals: 1 to 5	CODES construction II (seals: 1 to 3)
32	Equipped for detector	Consult us	**978 02 343**
40	Equipped for detector		**978 02 344**
50	Equipped for detector		**978 02 345**
63	Equipped for detector		**978 02 346**
80	Equipped for detector		**978 02 347**
100	Equipped for detector	**978 01 661**	**978 02 259**
125	Equipped for detector	**978 01 662**	**978 02 260**
160	Equipped for detector	**978 01 878**	**978 02 261**
200	Equipped for detector	**978 01 886**	**978 02 262**
250	consult us		

NOTE: For best results, use grease supplied in each kit. Supplementary tube available (11 cm^3) on request, code: **978 02 100**

"U" and "H" GUIDING UNITS

with slide or ball bearings
for VDMA - ISO air cylinders Ø 32 to 100 mm
Series 450 - type PES



P237-GB-R4

ASCO JOUCOMATIC

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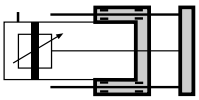
FEATURES

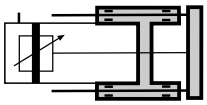
Air cylinder guiding units allow accurate linear drive and incorporate an anti-rotation device capable of withstanding high torsional loads. These guiding units come in several versions:

"U" Model



This version is fitted with:
- 4 slide bearings

"H" Model



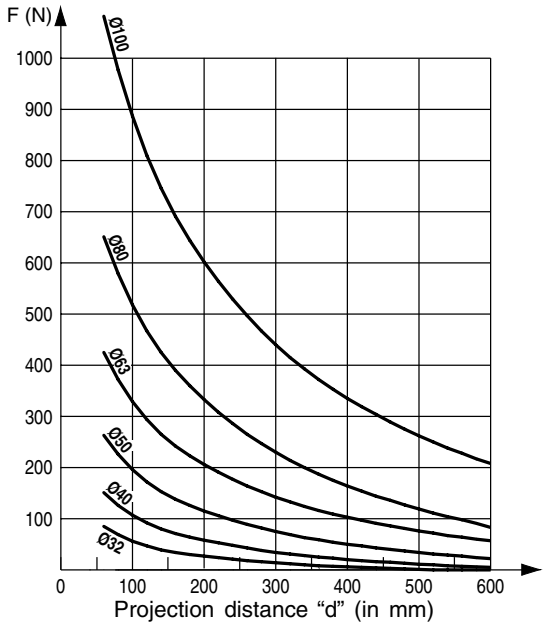
This version is fitted with either:
- 4 slide bearings
- 4 linear ball bearings

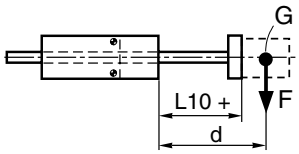
The following characteristics can be used to determine the most suitable version for the application in question.

"U" GUIDING UNIT WITH SLIDE BEARINGS

See page P237-5

- **MAXIMUM ADMISSIBLE LOAD "F" ON THE ROD END**





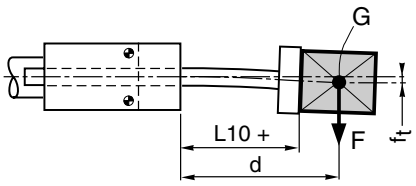
d = the projection distance (in mm) corresponding to the dimension L10 + the stroke length + the distance from the load centre of gravity (G) to the mating surface of the cylinder flange

Note:
The values in the opposite chart correspond to those in regular horizontal movement of the guiding unit with the rods in the same horizontal plane. In the case of vibration or jerky movement, **halve** the maximum allowable load values.

- **DETERMINING THE DEFLEXION**

Deflection under load as a function of projection distance "d", corresponds to the sum of no-load deflection f_0 and flection f_{10} under load, the latter being proportional to the deflection caused by 10 N.

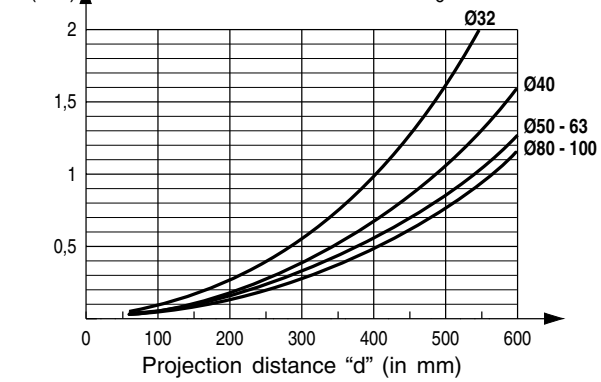
d = projection distance (in mm) as defined above.



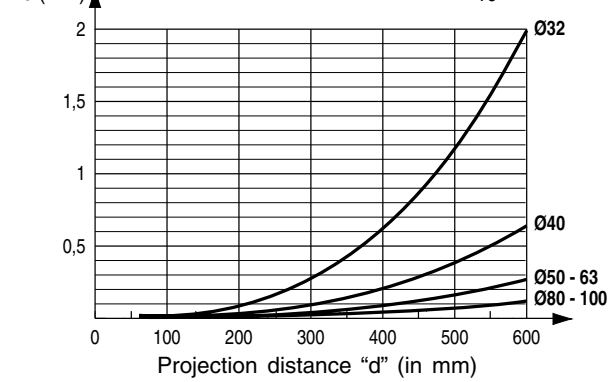
$$f_t = f_0 + (f_{10} \times \frac{F}{10})$$

f_t = Total deflexion (in mm)
f_0 = Deflexion without a load (in mm)
f_{10} = Deflexion with a load of 10 N (in mm)
F = Load on the rod ends (in N)

f0 (mm) Deflexion **without a load** f_0



f10 (mm) Deflexion **with a load of 10 N** f_{10}



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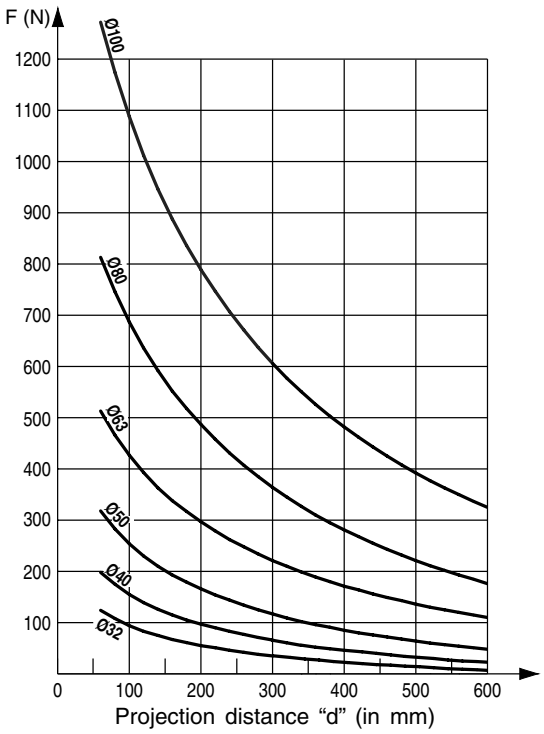
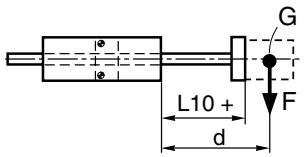
• MAXIMUM ADMISSIBLE LOAD "F" ON THE ROD END





d = the projection distance (in mm) corresponding to the dimension L10 + the stroke length + the distance from the load centre of gravity (G) to the mating surface of the cylinder flange

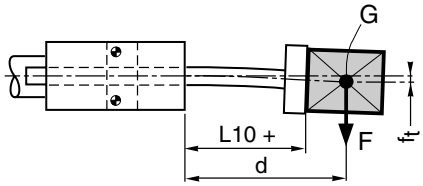
Note:

The values in the opposite chart correspond to those in regular horizontal movement of the guiding unit with the rods in the same horizontal plane. In the case of vibration or jerky movement, **halve** the maximum allowable load values.

• DETERMINING THE DEFLEXION

Deflection under load as a function of projection distance "d", corresponds to the sum of no-load deflection f_0 and flection f_{10} under load, the latter being proportional to the deflection caused by 10 N.

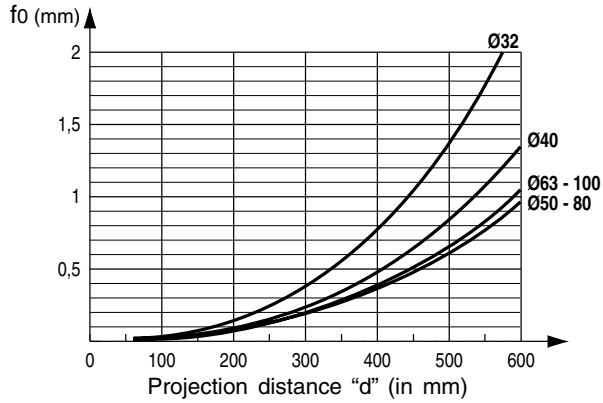
d = projection distance (in mm) as defined above.



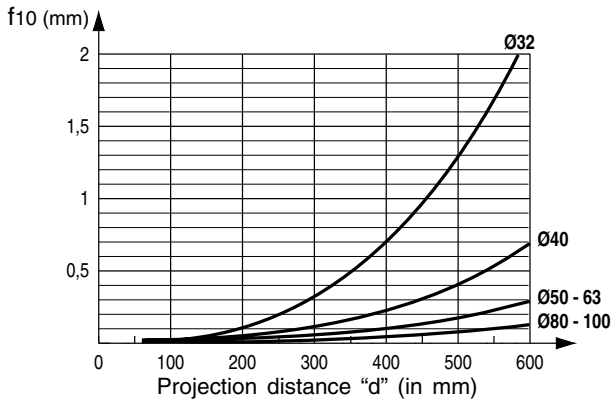
$$f_t = f_0 + (f_{10} \times \frac{F}{10})$$

f_t = Total deflexion (in mm)
f_0 = Deflexion without a load (in mm)
f_{10} = Deflexion with a load of 10 N (in mm)
F = Load on the rod ends (in N)

Deflexion **without a load** f_0

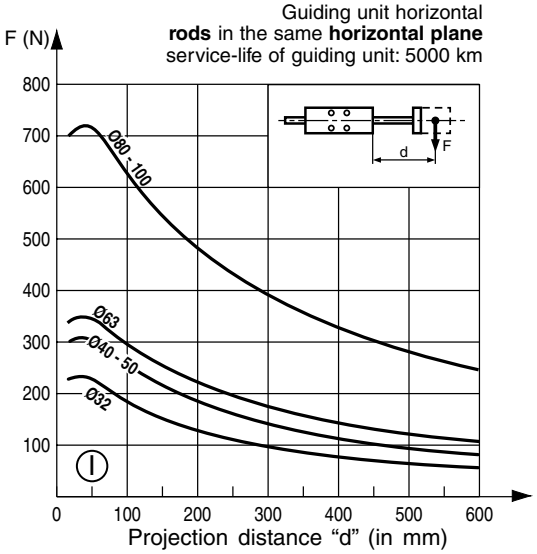


Deflection **with a load of 10 N** f_{10}

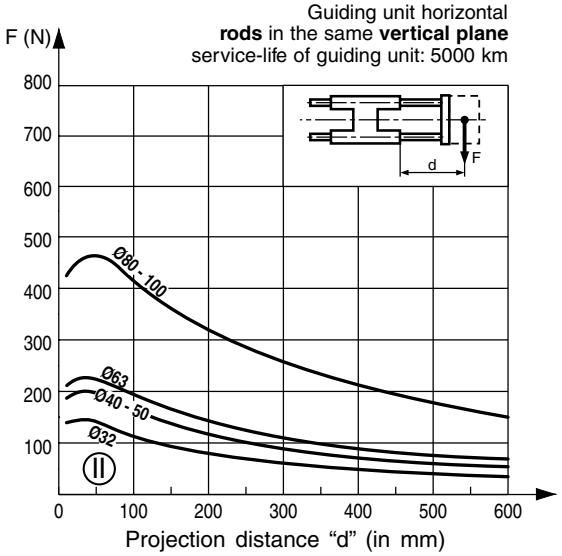


• MAXIMUM ADMISSIBLE LOAD "F" ON THE ROD END

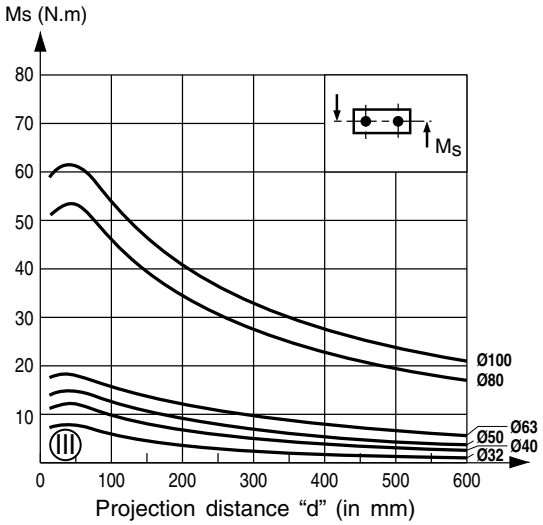
Guiding unit horizontal
rods in the same **horizontal plane**
service-life of guiding unit: 5000 km

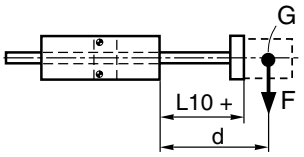


Guiding unit horizontal
rods in the same **vertical plane**
service-life of guiding unit: 5000 km



• MAXIMUM ALLOWABLE MOMENTS "Ms" AT ROD END

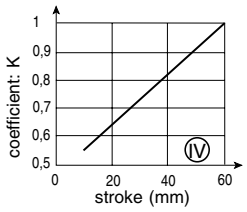




d = the projection distance (in mm) corresponding to the dimension L10 + the stroke length + the distance from the load centre of gravity (G) to the mating surface of the cylinder flange

Note: the values in charts (I), (II) and (III) correspond to those in regular horizontal movement. In the event of vibration or jerky movement, **halve** the maximum allowable values.

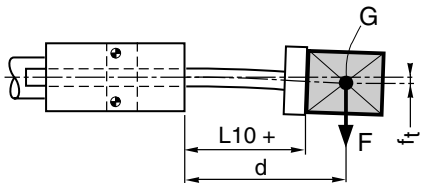
Whatever the stroke of the cylinder, its movement is only a small proportion of the travel (not more than 60 mm), it is necessary to reduce the maximum allowable torques and loads by multiplying the values taken from charts (I), (II) and (III) by coefficient K from chart (IV). For short travels which do not exceed 60 mm, the curves allow for this reduction in performance.



• DETERMINING THE DEFLEXION

Deflection under load as a function of projection distance "d", corresponds to the sum of no-load deflection f_0 and flection f_{10} under load, the latter being proportional to the deflection caused by 10 N.

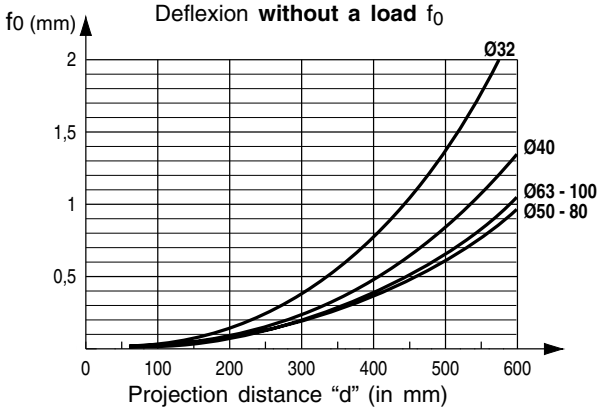
d = projection distance (in mm) as defined above.



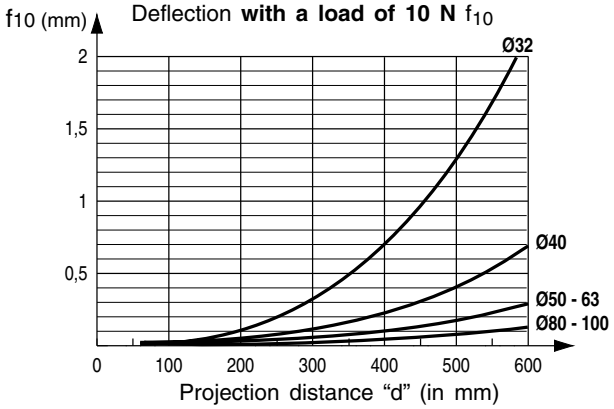
$$f_t = f_0 + (f_{10} \times \frac{F}{10})$$

f_t = Total deflexion (in mm)
f_0 = Deflexion without a load (in mm)
f_{10} = Deflexion with a load of 10 N (in mm)
F = Load on the rod ends (in N)

Deflexion **without a load** f_0



Deflexion **with a load of 10 N** f_{10}



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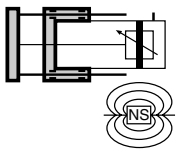
"U" GUIDING UNIT
with 4 slide bearings
suitable for VDMA-ISO air cylinders Ø 32 to 100 mm
Series 450 - Type **PES**



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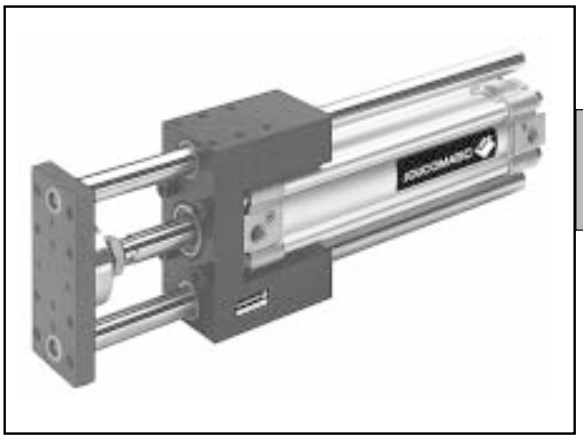
CONSTRUCTION



GUIDING UNIT
- Single block unit, metal body
- 4 bronze sintered self-lubricating roller bearings
- 2 chrome-plated steel guiding rods

High quality components with the following characteristics:
- High admissible loads
- Accurate guiding
- High overall sturdiness
- The cylinder rod is fixed to the guiding unit by means of an alignment compensation bracket

SUITABLE CYLINDERS
- Double-acting PES type - Series 450 standard VDMA 24562 / ISO 6431
- With profiled tube plate (see P230) or with tie rods (see P232)
- With or without pneumatic cushioning
- Ready to receive magnetic position detectors or not

For other characteristics, see leaflet P230 or P232

SPECIFICATIONS

FLUID	: Air or neutral gas, filtered, lubricated or NOT
PRESSURE	: 10 bar max.
TEMPERATURE	: -10°C, +60°C
MIN. STROKE (with detectors)	: 110 mm
MAX. STROKE	: 500 mm (other strokes on request)
MAX. SPEED	: 1 m/s

MOUNTINGS
- Guiding unit on frame: 3 mounting options using 4 tapped holes (on the 2 smallest sides or on one of the large sides), more 2 holes for centring.
- Load on the guiding unit: 2 options, using 4 tapped holes or using 4 spotfaced holes, more 2 holes for centring.

ORDERING When ordering, please specify:

■ CYLINDER + GUIDING UNIT
- Standard code or reference for the PES cylinder ——— **450 .. ...** (see P230 or P232)
- Optional code of the guiding unit ———

Cylinder stroke ⁎ (mm)	CODE OF THE GUIDING UNIT WITH **SLIDE BEARINGS**					
	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
50 ⁎	**010 714**	**010 722**	**010 730**	**010 738**	**010 746**	**010 754**
80 ⁎	**010 832**	**010 834**	**010 836**	**010 838**	**010 840**	**010 842**
100 ⁎	**010 715**	**010 723**	**010 731**	**010 739**	**010 747**	**010 755**
125	**010 833**	**010 835**	**010 837**	**010 839**	**010 841**	**010 843**
160	**010 716**	**010 724**	**010 732**	**010 740**	**010 748**	**010 756**
200	**010 717**	**010 725**	**010 733**	**010 741**	**010 749**	**010 757**
250	**010 718**	**010 726**	**010 734**	**010 742**	**010 750**	**010 758**
320	**010 719**	**010 727**	**010 735**	**010 743**	**010 751**	**010 759**
400	**010 720**	**010 728**	**010 736**	**010 744**	**010 752**	**010 760**
500	**010 721**	**010 729**	**010 737**	**010 745**	**010 753**	**010 761**

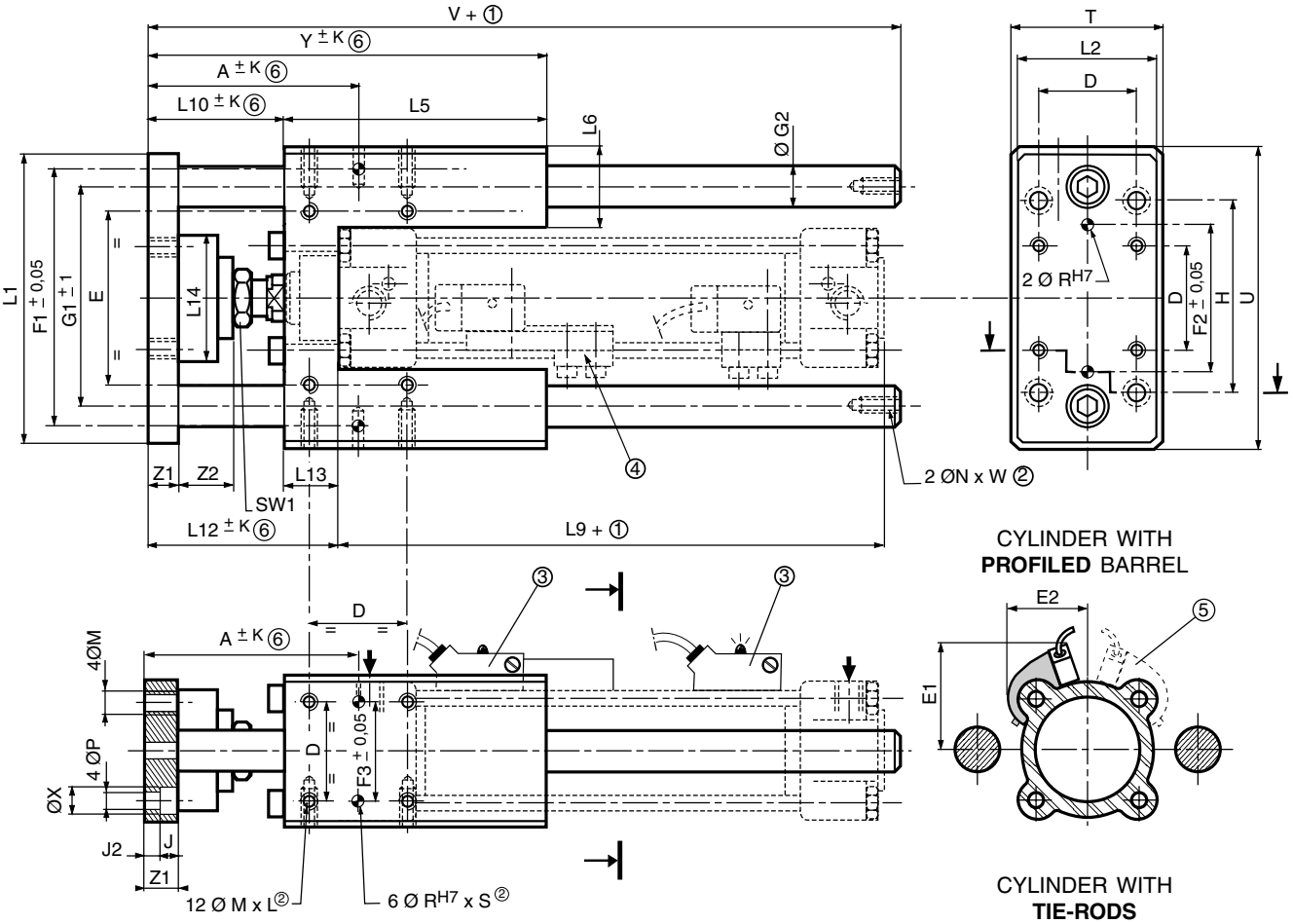
⁎ Other strokes on request min. stroke with detectors = 110 mm

■ MINIATURE MAGNETIC POSITIONS DETECTORS

The magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)
- **Front position** control (rod out): Its mounting excepted, the magnetic position detector and its electrical characteristics are identical to the detector used for the PES cylinders.
- **Rear position** control (rod in): Detector and support are identical to those used for PES cylinders.

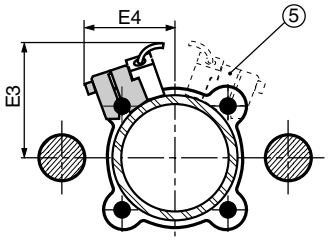
"U" GUIDING UNIT

DIMENSIONS AND WEIGHTS



CYLINDER WITH **PROFILED** BARREL

CYLINDER WITH **TIE-RODS**



(1) : + stroke
(2) : Depth
(3) : Position detector mounting
(4) : The **forward** position detector **support is specified** (longer)
The miniature detectors with integrated connector Ø M8 are not adaptable for the **front** position control
(5) : For small stroke cylinders, the standard detector for rear position control must be mounted on the profiled tube plate or tie rod opposite to the tie rod of the front position detector.
(6) : Dimension variable: ± K .End play: 0,1 mm
(7) : Total weight of guiding unit + cylinder with 0 mm stroke
(8) : Additional weight per extra 100 mm stroke (unit + cylinder)
◔ : 6 + 2 holes ØR H7 for centering pins

Ø (mm)	A	D	E	E1	E2	E3	E4	F1 ± 0,05	F2 ± 0,05	F3 ± 0,05	G1	G2	H	J	J2	K	L	L1	L2	L5	L6	L9
32	78,5	32,5	61	42	27	44	30	81	50	32,5	74	12	78	6,5	5,5	2,5	12	90	45	75	23,5	98
40	85	38	69	45	31	47	34	99	54	38	84,5	16	84	6,5	5,5	3	12	110	54	90	29,5	109
50	97	46,5	85	51	36	51	42	119	72	46,5	102	20	100	9	6	4	16	130	63	104	35	110
63	106	56,5	100	55	41	56	47	132	82	56,5	115,5	20	105	9	6	4	16	145	80	120	36	125
80	130	72	130	64	47	63	55	166	106	72	147	25	130	11	9	5	20	180	100	150	40,5	132
100	140,5	89	150	71	58	75	-	190	131	89	173	25	150	11	9	5	20	200	120	165	40,8	142

Ø (mm)	L10	L12	L13	M	N	P	R (H7)	S	SW1	T	U	V	W	X	Y	Z1	Z2	WEIGHTS (kg) CYLINDER + UNIT (7)	(8)
32	54,5	71,5	17	M6	M6	6,6	6	10	16	50	97	182	11	11	129,5	12	25	1,870	0,220
40	56	77	21	M6	M6	6,6	6	10	18	58	115	192	11	11	146	12	25	2,450	0,320
50	68	92,5	25	M8	M8	9	6	10	24	70	137	237	16	15	172	15	28	3,630	0,450
63	68	93	25	M8	M8	9	6	10	24	85	152	237	16	15	188	15	28	5,600	0,500
80	81	115	34	M10	M10	11	6	10	30	105	188	280	16	18	231	20	33	9,800	0,750
100	81,5	120,5	39	M10	M10	11	6	10	30	130	214	280	16	18	246,5	20	33	15,200	0,950

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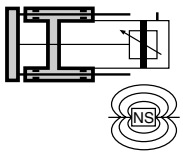
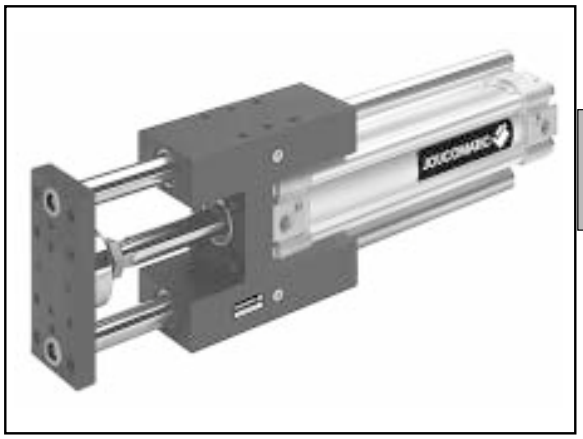
"H" GUIDING UNIT
with 4 slide or ball bearings
suitable for VDMA-ISO air cylinders Ø 32 to 100 mm
Series 450 - Type **PES**



CONSTRUCTION

GUIDING UNIT WITH **SLIDE BEARINGS**
- Single block unit, metal body
- 4 bronze sintered self-lubricating roller bearings
- 2 chrome-plated steel guiding rods

GUIDING UNIT WITH **BALL BEARINGS**
- Monolithic construction
- 4 linear ball bearings
- 2 hardened guiding rods
- Lip seals on the guiding rods
- 2 type KP2K DIN 51825 grease nipples



High quality components with the following characteristics:
- High admissible loads
- Accurate guiding
- High sturdiness
- Excellent mobility, low wear and long life with the linear ball bearings
- The cylinder rod is fixed to the guiding unit by means of an alignment compensation bracket

CYLINDER ADAPTATIONS
- Double-acting PES type-Series 450, standard VDMA 24562/ISO 6431
- With profiled tube plate (see P230) or with tie rods (see P232)
- With or without pneumatic cushioning
- Ready to receive magnetic position detectors or not

For other characteristics, see leaflet P230 or P232

SPECIFICATIONS

FLUID	: Air or neutral gas, filtered, lubricated or NOT
PRESSURE	: 10 bar max.
TEMPERATURE	: -10°C, +60°C
MIN. STROKE (with detectors)	: 110 mm
MAX. STROKE	: 500 mm (other strokes on request)
MAX. SPEED	: 1 m/s
CONSTRUCTION	: as per **CNOMO E06.28.510.N** recommendation

MOUNTINGS
- Guiding unit on frame: 3 mounting options using 4 tapped holes (on the 2 smallest sides or on one of the large sides), more 2 holes for centring.
- Load on the guiding unit: 2 options, using 4 tapped holes or using 4 countersunk holes, more 2 holes for centring.

ORDERING When ordering, please specify:

■ CYLINDER + GUIDING UNIT
- Standard code or reference for the PES cylinder ——— **450 .. ...** (see P230 or P232)
- Optional code of the guiding unit

Cylinder stroke ❊ (mm)	CODE OF THE GUIDING UNIT WITH **SLIDE BEARINGS**						CODE FOR GUIDING UNIT WITH **BALL BEARINGS**					
	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
50 ❊	**010 762**	**010 770**	**010 778**	**010 786**	**010 794**	**010 802**	**010 653**	**010 661**	**010 669**	**010 677**	**010 685**	**010 693**
80 ❊	**010 844**	**010 846**	**010 848**	**010 850**	**010 852**	**010 854**	**010 856**	**010 858**	**010 860**	**010 862**	**010 864**	**010 866**
100 ❊	**010 763**	**010 771**	**010 779**	**010 787**	**010 795**	**010 803**	**010 654**	**010 662**	**010 670**	**010 678**	**010 686**	**010 694**
125	**010 845**	**010 847**	**010 849**	**010 851**	**010 853**	**010 855**	**010 857**	**010 859**	**010 861**	**010 863**	**010 865**	**010 867**
160	**010 764**	**010 772**	**010 780**	**010 788**	**010 796**	**010 804**	**010 655**	**010 663**	**010 671**	**010 679**	**010 687**	**010 695**
200	**010 765**	**010 773**	**010 781**	**010 789**	**010 797**	**010 805**	**010 656**	**010 664**	**010 672**	**010 680**	**010 688**	**010 696**
250	**010 766**	**010 774**	**010 782**	**010 790**	**010 798**	**010 806**	**010 657**	**010 665**	**010 673**	**010 681**	**010 689**	**010 697**
320	**010 767**	**010 775**	**010 783**	**010 791**	**010 799**	**010 807**	**010 658**	**010 666**	**010 674**	**010 682**	**010 690**	**010 698**
400	**010 768**	**010 776**	**010 784**	**010 792**	**010 800**	**010 808**	**010 659**	**010 667**	**010 675**	**010 683**	**010 691**	**010 699**
500	**010 769**	**010 777**	**010 785**	**010 793**	**010 801**	**010 809**	**010 660**	**010 668**	**010 676**	**010 684**	**010 692**	**010 700**

❊ Other strokes on request min. stroke with detectors = 110 mm

■ MINIATURE MAGNETIC POSITIONS DETECTORS

The magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)
- **Front position** control (rod out): Its mounting excepted, the magnetic position detector and its electrical characteristics are identical to the detector used for the PES cylinders.
- **Rear position** control (rod in): Detector and support are identical to those used for PES cylinders.

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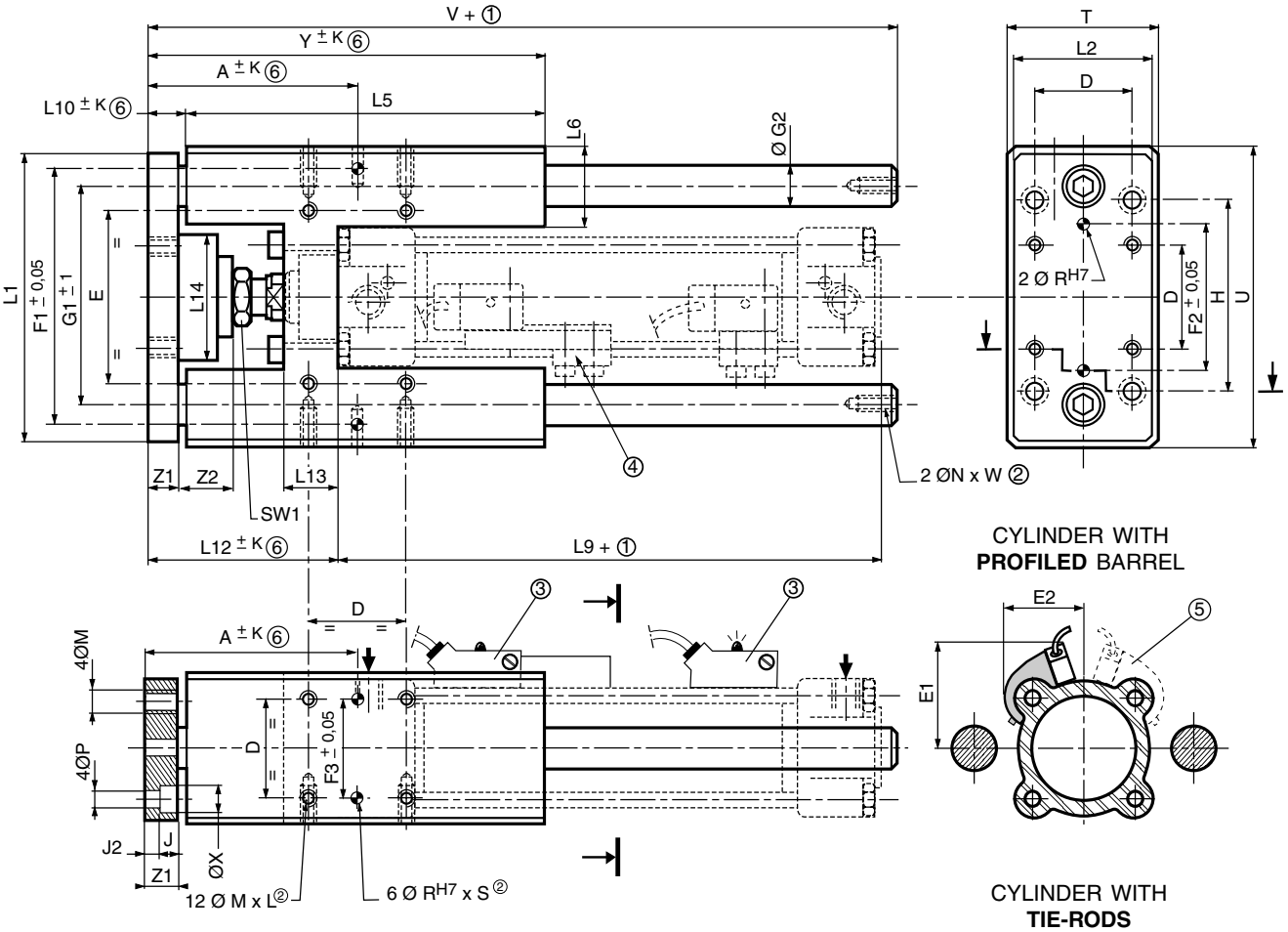
"H" GUIDING UNIT

DIMENSIONS AND WEIGHTS (Dimensions conforming with CNOMO E06.28.510.N)



(1) : + stroke
(2) : Depth
(3) : Position detector mounting
(4) : The **forward** position detector **support is specified** (longer)
The miniature detectors with integrated connector Ø M8 are not adaptable for the **front** position control
(5) : For small stroke cylinders, the standard detector for rear position control must be mounted on the profiled tube plate or tie rod opposite to the tie rod of the front position detector.
(6) : Dimension variable: ± K .End play: 0,1 mm
(7) : Total weight of guiding unit + cylinder with 0 mm stroke
(8) : Additional weight per extra 100 mm stroke (unit + cylinder)
◔ : 6 + 2 holes ØR H7 for centering pins

NOTE: The guiding units with a linear ball bearings must be lubricated every 3000 km, and more frequently if they are used in dusty surroundings

Ø (mm)	A	D	E	E1	E2	E3	E4	F1 ± 0,05	F2 ± 0,05	F3 ± 0,05	G1	G2	H	J	J2	K	L	L1	L2	L5	L6	L9
32	78,5	32,5	61	42	27	44	30	81	50	32,5	74	12	78	6,5	5,5	2,5	12	90	45	130	23,5	98
40	85	38	69	45	31	47	34	99	54	38	84,5	16	84	6,5	5,5	3	12	110	54	140	29,5	109
50	97	46,5	85	51	36	51	42	119	72	46,5	102	20	100	9	6	4	16	130	63	150	35	110
63	106	56,5	100	55	41	56	47	132	82	56,5	115,5	20	105	9	6	4	16	145	80	182	36	125
80	130	72	130	64	47	63	55	166	106	72	147	25	130	11	9	5	20	180	100	215	40,5	132
100	140,5	89	150	71	58	75	-	190	131	89	173	25	150	11	9	5	20	200	120	220	40,8	142

Ø (mm)	L10	L12	L13	L14	M	N	P	R (H7)	S	SW1	T	U	V	W	X	Y	Z1	Z2	WEIGHTS (kg) CYLINDER + UNIT (7)	(8)
32	17,5	71,5	17	45	M6	M6	6,6	6	10	16	50	97	182	11	11	147,5	12	25	1,870	0,220
40	18	77	21	46	M6	M6	6,6	6	10	18	58	115	192	11	11	158	12	25	2,450	0,320
50	22	92,5	25	55	M8	M8	9	6	10	24	70	137	237	16	15	172	15	28	3,630	0,450
63	22	93	25	68	M8	M8	9	6	10	24	85	152	237	16	15	204	15	28	5,600	0,500
80	28	115	34	90	M10	M10	11	6	10	30	105	188	280	16	18	243	20	33	9,800	0,750
100	28,5	120,5	39	90	M10	M10	11	6	10	30	130	214	280	16	18	248,5	20	33	15,200	0,950

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DOUBLE ACTING Ø 40 to 100 mm PNEUMATIC CYLINDERS,TYPE PES
WITH ROD-LOCKING DEVICE
Cylinder complies with VDMA 24562-NFE 49003-ISO 6431 standards

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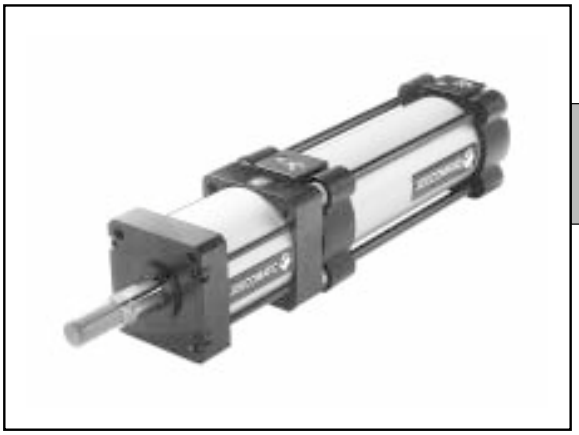
APPLICATION PRINCIPLE

This rod locking device which is fitted to the series 450 cylinder type PES **with tie rods** is designed to stop and hold the rod of the cylinder under load in case of a power or pneumatic air supply failure. The rod lock is an elastic mechanical device acting on brake pads. It is released on pressurisation.



Benefits

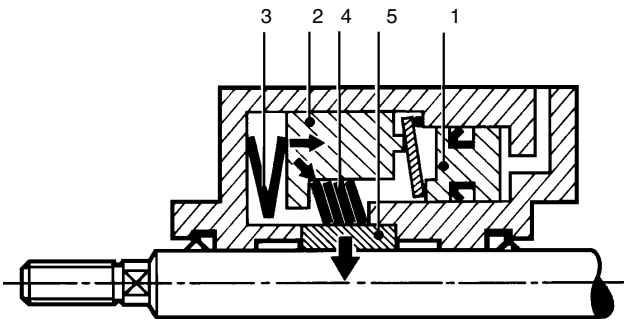
- Stops and holds the piston rod at any point of its stroke.
- Holds maximum allowable cylinder load without slipping.
- **Locks in case of absence of air.**
- Two-directional action.
- Cast iron brake pads, **concentric on the rod, ensure the system's long service life without damaging the piston rod.**
- **Easy to install. Compact rod locking device with dimensions approximately equal to those of the standard cylinder.**
- Any fitting position.
- Reduced weight (light metal alloy body).
- Possibility of mounting to cylinders complying with VDMA-AFNOR-ISO standards (longer rod, without front bushing).

The following options and versions cannot be fitted to this cylinder with rod-locking device:

- Stainless steel piston rod
- Reinforced piston rod
- High temperature version
- Barrel in glass-fibre reinforced epoxy resin
- U and H guiding units

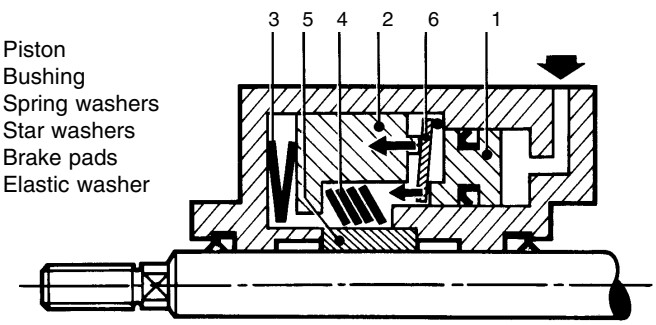
OPERATING PRINCIPLE

NO PRESSURE: rod locked



1 - Piston
2 - Bushing
3 - Spring washers
4 - Star washers
5 - Brake pads
6 - Elastic washer

UNDER PRESSURE: rod released



PISTON ROD LOCK IN ABSENCE OF PRESSURE

No force is transmitted to the pneumatic piston (1). The two spring washers (3) apply an axial force to the bushing (2) which transmits it to the star washers (4). The star washers apply a radial force to the brake pads (5) which lock the piston rod.

PISTON ROD LOCK UNDER PRESSURE (min. 4 bar, max. 8 bar)

The pressure exerts a force on the pneumatic piston (1) which transmits it to the elastic washer (6). This acts as a lever and gears down the force on the bushing (2). The bushing compresses the spring washers (3), all restraint is removed from the star washers (4) and brake pads (5). The rod is released.

Note : Position control for rod-locking device on request: consult us.

DYNAMIC RESTRAINT

The cylinder should be locked only occasionally in the event of an emergency shutdown or an unexpected problem.
The rod-locking device can, however, be activated in every cycle as soon as the cylinder has come to a stop (hold function).
The stopping precision of the cylinder depends on:

- the cylinder's fitting position (horizontal or vertical);
- the load being moved by the cylinder;
- the rate of speed at which the load is moved;
- the response time of the downstream pneumatically or electrically operated valves;
- the air volume and opening area between the locking device's control valve and its supply port.

DYNAMIC LOCKING CAPACITY: **Maximum load between 80 and 590 kg** according to speed and cylinder diameter.

STATIC HOLDING CAPACITY: **Maximum force between 1000 and 6300 N** according to cylinder diameter (see overleaf).

PES CYLINDER + ROD-LOCKING DEVICE

GENERAL SPECIFICATIONS

ASSEMBLY : Rod lock incorporated into cylinder, fitted in line, centered on the piston rod (cylinder without front bushing).

CYLINDER TYPE : Series 450 cylinder type PES with tie rods conforming to VDMA 24562-AFNOR NFE 49003- ISO 6431 standards, aluminium barrel, designed for Reed switches, magneto-resistant or magneto-inductive position detectors.

CYLINDER BORE DIAMETERS : Ø 40-50-63-80-100 mm.

STANDARD CYLINDER STROKES : 50 to 600 mm (or more, to order).

AMBIENT TEMPERATURE : - 20°C to + 70°C

FITTING POSITION : Any, see assembly recommendations below.

MOUNTINGS : All standard mountings for PES cylinders with tie rods (see P232). Centre trunnion (consult us).

PNEUMATIC CHARACTERISTICS

FLUID : Air or neutral gas, filtered, lubricated or dry.

RELEASE PRESSURE : 4 bar (min.), 8 bar (max.)

MAX. SYSTEM PRESSURE : 8 bar

MECHANICAL CHARACTERISTICS

HOLDING FORCE (static) Ø 40 mm : 1000 N Ø 63 mm : 2500 N Ø 100 mm : 6300 N
Ø 50 mm : 1600 N Ø 80 mm : 4000 N

RESTRAINING CAPACITY : **Maximum load, in kg,** that can be stopped dynamically over a distance of 50 mm in relation to the rate of speed of the rod (the cylinder must be in a vertical fitting position).

V(mm/s)	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
500	80	130	200	320	500
200	90	145	225	360	590

MAX. ALLOWABLE SPEED : 500 mm/s

NUMBER OF CYCLES : 1.5×10^6 (at 20° C, **at a balanced stop,** in hold function, cycle = 1 Hz)

CHOICE OF EQUIPMENT

Ø	CODES CYLINDER (PES/tie rods) **+** ROD LOCK
40	**450 55 556** (1)
50	**450 55 557** (1)
63	**450 55 558** (1)
80	**450 55 559** (1)
100	**450 55 562** (1)

(1) Please specify the cylinder stroke in mm

ORDERING INFORMATION

When ordering, please specify:

- The code for the **unit** consisting of the PES cylinder with tie rods **+** rod-locking device (see above).
- The length of stroke in mm (Max. 600 mm. Consult us for longer strokes).
- MOUNTINGS: The code(s) for the mounting(s) and quantity (see P232) - Consult us for the trunnion.
- DETECTORS: The codes for the requested magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive (see P297)

MOUNTING AND OPERATING RECOMMENDATIONS

Precautions should be taken when installing a cylinder fitted with a rod-locking device. It is important to clearly define the type of layout that is required and the operating conditions of the cylinder.

The cylinder should be locked only occasionally in the event of an emergency shutdown or an unexpected problem such as:

- failure in electric supply;
- failure in pneumatic supply;
- drop in pressure.

The rod locking device can, however, be activated in every cycle as soon as the cylinder has come to a stop (hold function).

The cylinder may be fitted horizontally or vertically, with the rod either upward or downward. It may also be tilted, with the rod either upward or downward.

A specific layout corresponds to each application. The specimen layouts on the opposite page show the principles to be observed and the stops caused by interruption of the power supply or removal of the pressure by means of electropneumatic valves.

In the case of a vertical movement of the load, the force on the piston which is generated by pressure - and which operates in the same direction as the load - must not exceed the locking capacity of the device when it is combined to the force of the load (see table above).

The rate of speed of the rod must be less than 500 mm/sec.

After any emergency locking operation, make sure that the chambers of the cylinder are filled before the signal to unlock the device is given.

The rod-locking device is fitted with 2 wiper seals made of PUR. It is recommended to grease the rod lightly at regular intervals with a non-detergent class ISO VG 32 oil without aggressive additives (commonly used in pneumatic circuits). Do not let the rod come into contact with any other oils or products which might damage the wiper seals made of PUR.

It is recommended to check the correct operation of the rod-locking devices at regular intervals.

Note: Position control for rod-locking device on request : consult us

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HORIZONTAL MOUNTING

The cylinder is controlled by a 5/3 valve (ISO size 1 for diameters 40 and 50 mm, size 2 for diameters 63, 80 and 100 mm), with centre open on the central port (type W2 - fig.1), or centre open on the exhaust port (type W3 - fig.2), and supplied by exhaust ports 3 and 5. In both solutions, the pressure is maintained on both sides of the cylinder piston and the forces exerted on it are balanced. This prevents any accidental movement of the rod on its release. Type W2 is recommended for its simpler wiring. Do not use a 5/3 valve with closed centre (type W1), since this will unbalance the piston in case one of the components in the circuit leaks.
NOTE: The cylinder rod may move out slowly after release of the system as a result of the “rod effect”.
One-directional flow reducers must be used to control the rate of speed of the rod.
The rod lock must be activated by a 3/2 NC, G1/4 solenoid valve, with a minimum passage diameter of 8 mm, to ensure fast braking of the cylinder rod. Locking by absence of air.

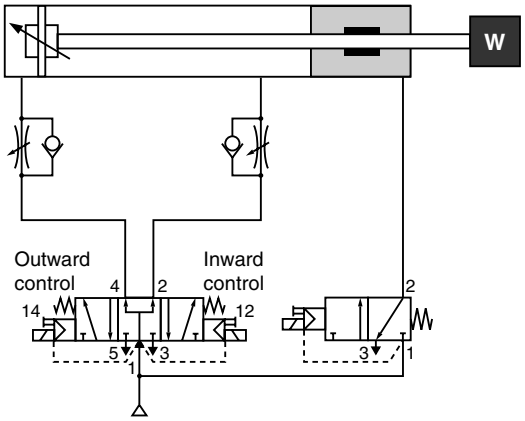


Fig. 1 - Cylinder control with a 5/3 valve, centre open on central port (type W2).

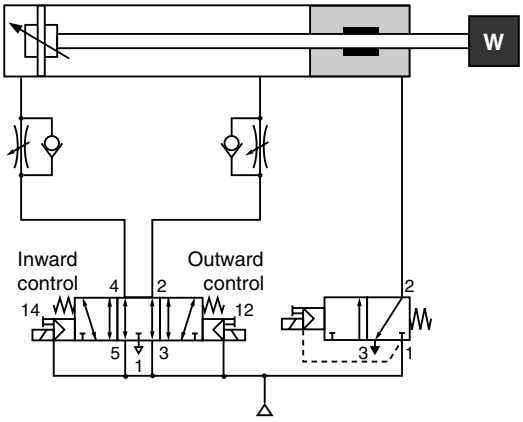


Fig. 2 - Cylinder control with a 5/3 valve, centre open on exhaust port (type W3).

VERTICAL MOUNTING

The cylinder is controlled by a 5/3 valve (ISO size 1 for diameters 40 and 50 mm, size 2 for diameters 63, 80 and 100 mm), with centre open on exhaust port (type W3), and supplied by the exhaust ports. To ensure that the lock functions properly, the force on the piston which is generated by pressure - and which operates in the same direction as the load - must not exceed the locking capacity of the device when it is combined to the force of the load (see table on opposite page).
Do not use a 5/3 valve with closed centre (type W1) since this will unbalance the piston in case one of the components in the circuit leaks. This could be hazardous when the rod is released.
Use of a 5/3 (type W3) valve provides a braking effect and ensures that the rod is held in a given position. The stopping precision depends on the rate of speed of the rod and the loads in motion.
One-directional flow reducers must be used to control the rate of speed of the rod.
The rod lock must be activated by a 3/2 NC, G1/4 solenoid valve, with a minimum passage diameter of 8 mm, to ensure fast braking of the cylinder rod. Locking by absence of air.

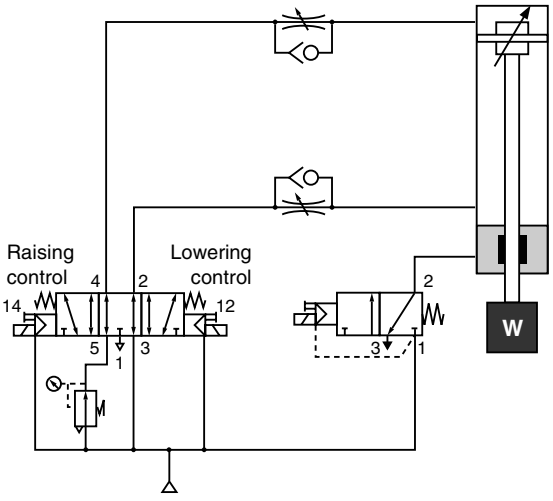


Fig. 3 - Load **beneath** cylinder

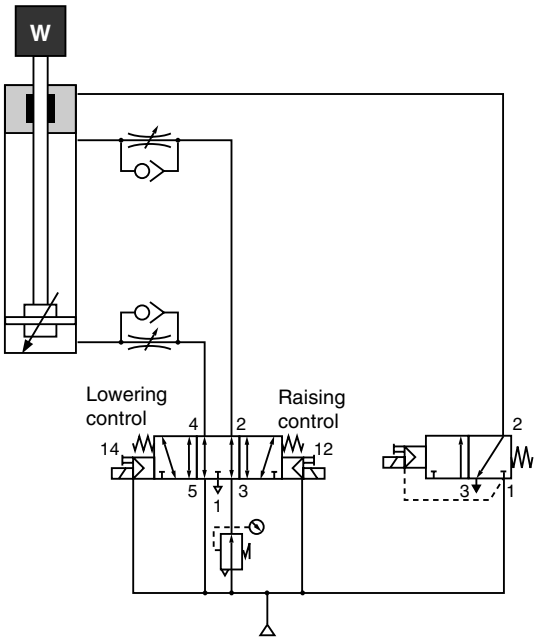
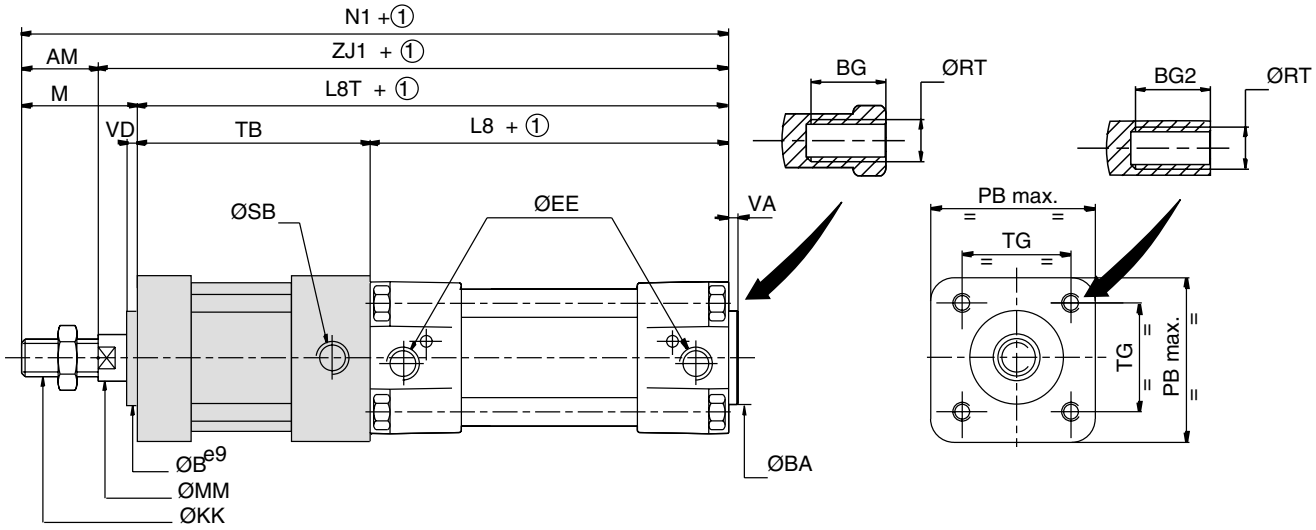


Fig. 4 - Load **on top** of cylinder

DIMENSIONS AND WEIGHTS

Weight of locking device alone : Ø 40 = 1.3 kg
(light alloy body) Ø 50 = 1.5 kg
Ø 63 = 3.1 kg
Ø 80 = 3.5 kg
Ø 100 = 5.6 kg



① : + stroke

Ø Cylinders (mm)	DIMENSIONS (mm)																			
	AM	**ØB**	**ØBA**	**BG**	**BG2**	**ØRT**	**ØEE**	**ØKK**	**L8**	**L8T**	**M**	**ØMM**	**N1**	**PB**	**ØSB**	**TB**	**TG**	**VA**	**VD**	**ZJ1**
40	24	35	35	16	9	M6	G1/4	M12x1,25	105	200	54	16	254	70	G1/8	95	38	4	4	230
50	32	40	40	16	12	M8	G1/4	M16x1,5	106	218	69	20	287	75	G1/4	112	46,5	4	4	255
63	32	45	45	16	12	M8	G3/8	M16x1,5	121	241	69	20	310	95	G1/4	120	56,5	4	4	278
80	40	45	45	17	14	M10	G3/8	M20x1,5	128	268	86	25	354	95	G1/4	140	72	4	4	314
100	40	55	55	17	15	M10	G1/2	M20x1,5	138	288	91	25	379	120	G1/4	150	89	4	4	339

NOTE : The locking device is mounted in line and centered on the piston rod. Its outside dimensions are approximately equal to the standardized dimensions of the cylinder. The lengths of the versions equipped with the locking device correspond to the standardized lengths of the cylinders (see standard products) to which dimension TB is added.

Dimensions of mountings: see P232

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OPTIONS AND SPECIAL VERSIONS
OF PNEUMATIC CYLINDERS
VDMA 24 562 - ISO 6431

SERIES 450 - TYPE: **PES**

P239-GB-R1a

ASCO® JOUCOMATIC

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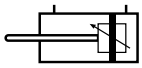
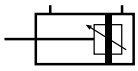
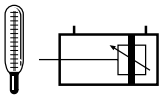
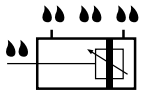
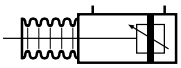
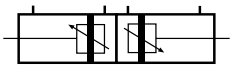
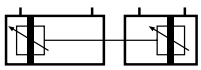
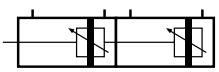
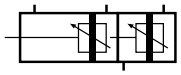
The PES range of pneumatic cylinders - Series 450 as per standards VDMA 24 562 and ISO 6431, are suitable for all compressed air automation applications.

- **Standard range** (for typical applications)
  - PES 32 to 125 mm bore non tie-rod cylinders
  - PES 32 to 200 mm bore tie-rod cylinders with steel or aluminium barrels
  - Cylinders with and without adjustable pneumatic cushioning, designed or not designed to receive magnetic position detectors of the reed switch, magneto-resistive or magneto-inductive types
- **The specialised versions and options** shown in this document can be used to to meet the requirements of specific applications in difficult environments.

CONTENTS

SPECIAL VERSIONS	Ø BORE (mm)	APPLICATIONS	SERIES	SYMBOLS	PAGES N°
Oversize piston rod 	63 ... 125	PES cylinders can be fitted with a larger diameter piston rod than standard.	**450**		P239-6
Designed for use with electronic inductive detector 	32 ... 80	Special model for use with inductive solid state sensors	**450**		P239-7
High temperature 	32 ... 200	Model designed for use at high temperatures (120°C)	**450**		P239-8
All seals FPM or rod seal FPM 	32 ... 200	Model equipped with rod seal or all seals of FPM for aggressive environments	**450**		P239-10
With bellows 	32 ... 200	PES cylinders equipped with rod protective bellows for use in polluted atmospheres.	**450**		P239-11
Back-to-back 	32 . . . 200	Assembly of 2 cylinders mounted back to back and assembled with support or 4 tie rods. This arrangement allows 3 or 4 different positions depending on whether cylinders have the same stroke or different strokes	**450**		P239-12
Front-to-front 	32 . . . 200	Set of two cylinders mounted front-to-front on a common piston rod. This arrangement allows 3 or 4 different positions depending on whether cylinders have the same stroke or different strokes	**450**		P239-13
Double acting tandem 	32 . . . 80	A tandem cylinder with linked piston rod develops double the force of a standard cylinder of the same diameter. Avantage: compact size cylinder.	**450**		P239-14
3 positions 	32 . . . 200	This 3 positions cylinder is an assembly comprising 2 PES cylinders bodies in line, with 2 different stroke lengths, and with piston rods **not** linked.	**450**		P239-15

Other options or specialised versions: see overleaf ➤➤

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OTHER OPTIONS AND SPECIALISED VERSIONS OF PNEUMATIC CYLINDERS TO VDMA - ISO STANDARDS OF TYPE PES

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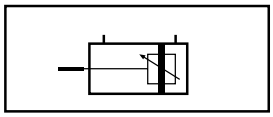
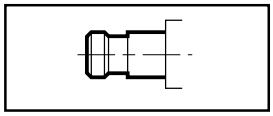
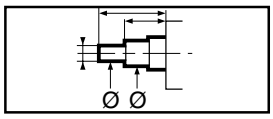


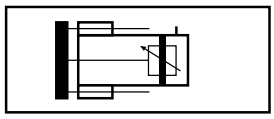
- Extended piston rod



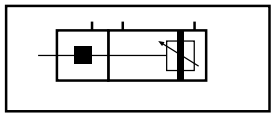
- Eye rod



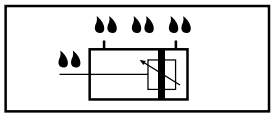
- Special machining of piston rod end



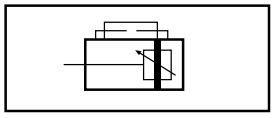
- Cylinder with “U” or “H” guiding unit slide or ball bearings (see P237)



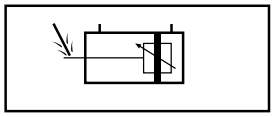
- Piston rod locking on cylinders 40 to 100 mm diameter (see P238)



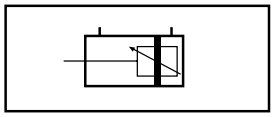
- Stainless steel rod
- Stainless steel barrel
- Stainless steel screws and hardware
- Epoxy resin glass fiber barrel
- Anticorrosive finish on end covers and barrel



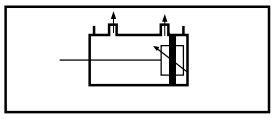
- Mounting of control valve on the cylinder
- With or without flow reducer



- Impact-resistant rod



- Extented cushioning



- Cylinders with pressure outlets on barrel (stainless steel version) for exhaust pressure detection

PES cylinder with U-type slide bearings
(see P237)

PES cylinder with H-type guide unit
with slide or ball bearings
(see P237)

PES cylinder with rod lock
locking in absence of air
(see P238)

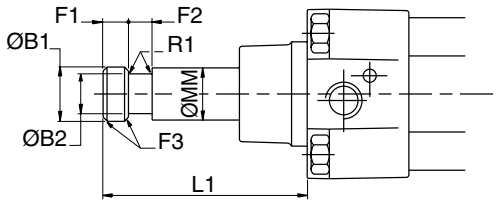
For all these options and special versions - consult us
For any special cylinder requirements - consult us

EYE ROD

All types of 32 to 200 mm bore PES cylinders can be supplied with eye rod ends.
Dimensions available on request (consult us)

APPLICATION

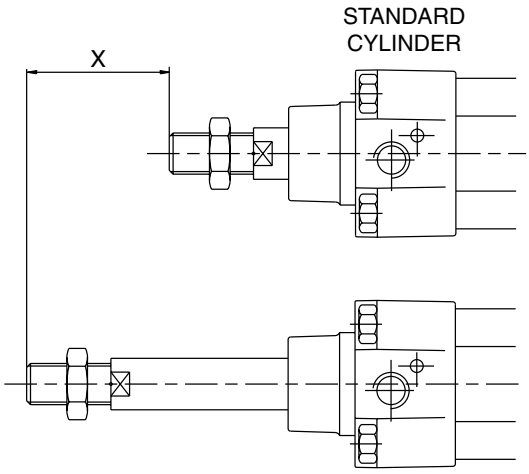
This eye rod end:
- Facilitates connection,
- Enables stress-free joints to be made,
- Enables **rapid** replacement **without adjustment** of the cylinder with the mechancial part driven.



EXTRA ROD LENGTH

All types of 32 to 200 mm PES cylinders can be supplied with extra rod length as per VDMA 24562.

Extra length “X” provided on request

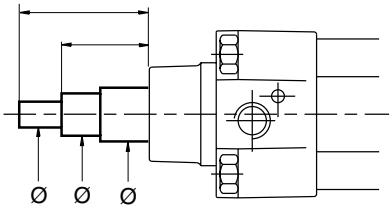


CYLINDER WITH EXTRA LONG ROD
Cylinders shown with rod retracted

SPECIALLY-MACHINED ROD END

All types of 32 to 200 mm bore PES cylinders can be supplied with customised rod ends.

Consult us



PES cylinder with oversized rod: see overleaf

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DOUBLE ACTING PNEUMATIC CYLINDER - Ø 63 to 125 mm

Cylinder complies with VDMA 24 562 - ISO 6431 standards

WITH OVERSIZE PISTON RODS

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SPECIFICATIONS

PES cylinders with Ø 63 to 125 mm can be fitted with a larger diameter piston rod than standard.

Bore Ø	rod Ø (ØMM) standard	rod Ø (ØMM) **oversize**	rod end thread Ø (ØKK) standard	rod end thread Ø (ØKK) **oversize**
63	20	**25**	M16x1,5	**M20x1,5**
80	25	**30**	M20x1,5	**M27x2**
100	25	**32**	M20x1,5	**M27x2**
125	32	**40**	M27x2	**M36x2**

Fluid : air or neutral gas filtered, lubricated or not
Pressure : 10 bar max.
Temperature : -20°C, +60°C
Cushioning : In this version, pneumatic cushioning is **only at rear**

Oversize rod not possbile for cylinders with:
- Rod boot
- Rod lock
- Anti-rotation piston rod

ORDERING

In your order, indicate

- Cylinder description:

PES cylinder with non-tie rod barrel or with tie rods and aluminium or steel barrel, cylinder designed or not designed to receive magnetic position sensors

- Model code plus stroke indication:

Bore Ø (mm)	PES equipped for detectors (2) Cylinder with **profiled barrel**	PES equipped for detectors (2) Cylinder **with tie rods** aluminium barrel	Cylinder non equipped for detectors Cylinder **with tie rods** steel barrel
63	**450 51 047 ...** (1)	**450 51 043 ...** (1)	**450 51 039 ...** (1)
80	**450 51 048 ...** (1)	**450 51 044 ...** (1)	**450 51 040 ...** (1)
100	**450 51 049 ...** (1)	**450 51 045 ...** (1)	**450 51 041 ...** (1)
125	**450 51 050 ...** (1)	**450 51 046 ...** (1)	**450 51 042 ...** (1)

(1) Indicate the stroke (in mm), preferably choosing standard values (see standard equipment)
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295) or BIM model, magneto-inductive type (see P297)

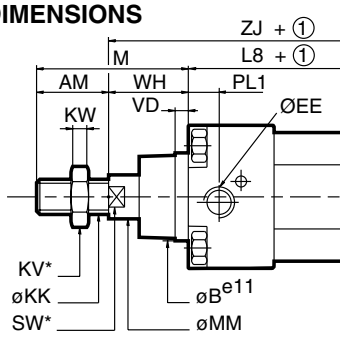
ACCESSORY

- Rod end clevis code (if applicable):

The following table shows all the clevises and self-aligning eyes that fit oversize rod ends with allowance for the rod end thread diameter difference.

Bore Ø	CODES Female rod clevis ISO 8140	CODES Spherical rod end ISO 8139
63	**434 00 019**	**434 00 004**
80	**434 00 020**	**434 00 005**
100	**434 00 020**	**434 00 005**
125	**434 00 021**	**434 00 006**

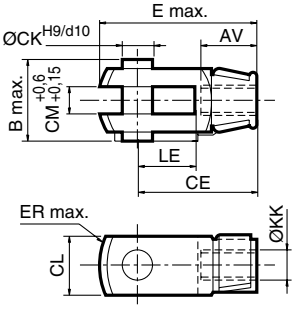
DIMENSIONS



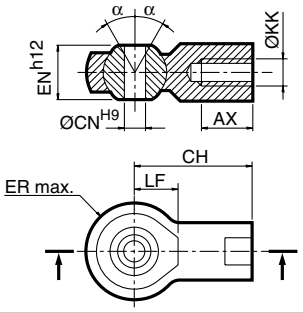
Bore Ø	DIMENSIONS AM	ØB	ØEE	ØKK	KV	KW	L8	M	ØMM	PL1	SW	VD	WH	ZJ
63	40	45	G3/8	M20x1,5	30	10	121	86	25	26	21	6	46	167
80	54	45	G3/8	M27x2	41	13,5	128	119	30	24	27	6	65	193
100	54	55	G1/2	M27x2	41	13,5	138	119	32	25	27	6	65	203
125	72	60	G1/2	M36x2	55	18	160	152	40	32	36	10	80	240

① : + stroke
❊ : size across flats

FEMALE ROD CLEVIS AP2-ISO 8140



SPHERICAL ROD END AP6-ISO 8139



Bore Ø	DIMENSIONS AV	AX	B	CE	CH	ØCK	CL	CM
63	33	33	48	80	40	20	40	20
80	51	51	65	110	110	30	55	30
100	51	51	65	110	110	30	55	30
125	56	56	84	144	125	35	70	35

Bore Ø	DIMENSIONS ØCN	E	EN	ER	ØKK	LE	LF	α
63	20	112	25	25	M20x1,5	40	26	4°
80	30	155	37	35	M27x2	54	36	4°
100	30	155	37	35	M27x2	54	36	4°
125	35	201	43	40	M36x2	72	41	4°

DOUBLE ACTING PNEUMATIC CYLINDER - Ø 32 to 80 mm

Cylinder complies with VDMA 24 562 - ISO 6431 standards

WITH EPOXY BARREL DESIGNED FOR INDUCTIVE DETECTORS

APPLICATION

Properties of epoxy barrel:
- Being amagnetic, inductive solid state sensors can be used on special models (with steel ring + piston)
- Can be used with lubricated and unlubricated air
- Low weight

SPECIFICATIONS

Fluid	: air or neutral gas, filtered, lubricated or not
Pressure	: 10 bar max.
Temperature	: -20°C, +60°C
Cushioning	: pneumatic, adjustable at both ends by means of captive screws

Bore Ø (mm)	32	40	50	63	80
Max. stroke (mm)	300	400	500	500	700
Maximum tie rod torque load (m.daN)	**0,15**	**0,30**	**0,40**	**0,50**	**0,80**

Recommendation: In view of the low heat dissipation coefficient of an epoxy barrel, this type of cylinder is not suitable for heavy duty cycles.

ORDERING

In your order, indicate

- Description: tie rod PES epoxy barrel cylinder with cushioning, designed for inductive detectors
- The inductive detector cylinder code plus the stroke indication (in mm)

Bore Ø (mm)	EPOXY BARREL CYLINDER FOR INDUCTIVE DETECTOR ✻	
	CODE	REFERENCE
32	**450 51 034 (1)...**	PES 32 LA (1) RDI
40	**450 51 035 (1)...**	PES 40 LA (1) RDI
50	**450 51 036 (1)...**	PES 50 LA (1) RDI
63	**450 51 037 (1)...**	PES 63 LA (1) RDI
80	**450 51 038 (1)...**	PES 80 LA (1) RDI

(1) Indicate the stroke (in mm), preferably choosing standard values (see standard equipment P232). Maximum stroke: see above

✻ These cylinders are designed to receive inductive sensors supplied by others. Supports can be supplied for **square** detectors (consult us)

NOTE: On request, this type of cylinder can be equipped with piston rods, tie rods and threaded fasteners of stainless steel and corrosion-resistant ends.

MOUNTINGS: same as those of standard cylinders (see P232)

DIMENSIONS: same as those of standard cylinders (see P232)

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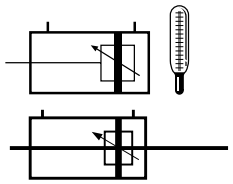
Series 450
Type: PES-SHT
PES-SHT-T2

Steel
air cylinder (S)

DOUBLE ACTING CYLINDER Ø 32 to 200 mm FOR HIGH TEMPERATURE

Conforming with VDMA-ISO standards
Single and through rod versions
With adjustable pneumatic cushioning



SPECIFICATIONS

FLUID : air or neutral gas filtered, lubricated or dry
PRESSURE : 10 bar max.
TEMPERATURE : 0°C, at + **120°C**
MAX. SPEED : 1 m/s
STANDARDS : **VDMA 24562 - ISO 6431**

CONSTRUCTION

Barrel : steel
Tie rods : stainless steel (Ø 32-100), paint steel (Ø 125-200)
Rod : hard chrome plated steel
Piston : aluminium
Piston seals : fluorelastomer (FPM)
Cushioning seals : fluorelastomer (FPM)
Front and rear ends : aluminium alloy
Bearing : metal self lubricating
Rod nut : galvanized steel
Cushioning : pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT

SINGLE ROD CYLINDER

Bore Ø (mm)	CODES (1)	REFERENCES (1)	RECOMMENDED STANDARD STROKE (mm) 25	50	80	100	125	160	200	250	320	400	500	630	700	800	900	1000	Max. stroke capability (mm)	Connection Ø
32	**450 50 980** (1)...	PES 32 TA (1) SHT	●	●	●	●	●	●	●	●									1000	G 1/8
40	**450 50 981** (1)...	PES 40 TA (1) SHT	●	●	●	●	●	●	●	●	●	●							1500	G 1/4
50	**450 50 982** (1)...	PES 50 TA (1) SHT	●	●	●	●	●	●	●	●	●	●	●	●					1800	G 1/4
63	**450 50 983** (1)...	PES 63 TA (1) SHT	●	●	●	●	●	●	●	●	●	●	●	●					1800	G 3/8
80	**450 50 984** (1)...	PES 80 TA (1) SHT	●	●	●	●	●	●	●	●	●	●	●	●					2000	G 3/8
100	**450 50 985** (1)...	PES 100 TA (1) SHT	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	2500	G 1/2
125	**450 50 986** (1)...	PES 125 TA (1) SHT	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	2500	G 1/2
160	**450 50 987** (1)...	PES 160 TA (1) SHT	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	2500	G 3/4
200	**450 50 988** (1)...	PES 200 TA (1) SHT	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	2500	G 3/4

THROUGH ROD CYLINDER

Bore Ø (mm)	CODES (1)	REFERENCES (1)	RECOMMENDED STANDARD STROKE (mm) 25	50	80	100	125	160	200	250	320	400	500	Max. stroke capability (mm)	Connection Ø
32	**450 50 989** (1)...	PES 32 TA (1) SHT-T2	●	●	●	●	●	●	●	●				300	G 1/8
40	**450 50 990** (1)...	PES 40 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●		400	G 1/4
50	**450 50 991** (1)...	PES 50 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●	●	500	G 1/4
63	**450 50 992** (1)...	PES 63 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●	●	500	G 3/8
80	**450 50 993** (1)...	PES 80 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●	●	600	G 3/8
100	**450 50 994** (1)...	PES 100 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●	●	600	G 1/2
125	**450 50 995** (1)...	PES 125 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●	●	600	G 1/2
160	**450 50 996** (1)...	PES 160 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●	●	600	G 3/4
200	**450 50 997** (1)...	PES 200 TA (1) SHT-T2	●	●	●	●	●	●	●	●	●	●	●	600	G 3/4

(1) Indicate stroke (in mm) preferably by selecting one of the standard strokes above. Do not exceed maximum possible stroke

MOUNTINGS: same as those of standard cylinders (see P232)

DIMENSIONS: same as those of standard cylinders (see P232)

DETECTORS: No position detectors may be used when operating this type of cylinder at high temperature.

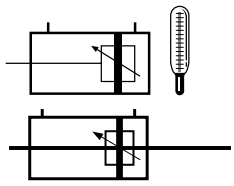
Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 450
Type: PES-RHT
PES-RHT-T2

Aluminium
air cylinder (R)

DOUBLE ACTING CYLINDER Ø 32 to 80 mm FOR HIGH TEMPERATURE

Conforming with VDMA-ISO standards
Single and through rod versions
With adjustable pneumatic cushioning



SPECIFICATIONS

FLUID : air or neutral gas filtered, lubricated or dry
PRESSURE : 10 bar max.
TEMPERATURE : 0°C, at + **120°C**
MAX. SPEED : 1 m/s
STANDARDS : **VDMA 24562 - ISO 6431**

CONSTRUCTION

Barrel : hard anodized aluminium alloy
Tie rods : stainless steel
Rod : hard chrome plated steel
Piston : aluminium
Piston seals : fluorelastomer (FPM)
Cushioning sealst : fluorelastomer (FPM)
Front and rear ends : aluminium alloy
Bearing : metal self lubricating
Rod nut : galvanized steel
Cushioning : pneumatic, adjustable from both sides with captive screws

CHOICE OF EQUIPMENT

SINGLE ROD CYLINDER

Bore Ø (mm)	CODES (1)	REFERENCES (1)	RECOMMENDED STANDARD STROKE (mm) 25	50	80	100	125	160	200	250	320	400	500	630	Max. stroke capability (mm)	Connection Ø
32	**450 50 998 ....** (1)	PES 32 TA .... (1) RHT	●	●	●	●	●	●	●	●					1000	G 1/8
40	**450 50 999 ....** (1)	PES 40 TA .... (1) RHT	●	●	●	●	●	●	●	●	●	●			1500	G 1/4
50	**450 51 000 ....** (1)	PES 50 TA .... (1) RHT	●	●	●	●	●	●	●	●	●	●	●	●	1800	G 1/4
63	**450 51 001 ....** (1)	PES 63 TA .... (1) RHT	●	●	●	●	●	●	●	●	●	●	●	●	1800	G 3/8
80	**450 51 002 ....** (1)	PES 80 TA .... (1) RHT	●	●	●	●	●	●	●	●	●	●	●	●	2000	G 3/8

TROUGH ROD CYLINDER

Bore Ø (mm)	CODES (1)	REFERENCES (1)	RECOMMENDED STANDARD STROKE (mm) 25	50	80	100	125	160	200	250	320	400	500	Max. stroke capability (mm)	Connection Ø
32	**450 51 003 ....** (1)	PES 32 TA .... (1) RHT-T2	●	●	●	●	●	●	●	●				300	G 1/8
40	**450 51 004 ....** (1)	PES 40 TA .... (1) RHT-T2	●	●	●	●	●	●	●	●	●	●		400	G 1/4
50	**450 51 005 ....** (1)	PES 50 TA .... (1) RHT-T2	●	●	●	●	●	●	●	●	●	●	●	500	G 1/4
63	**450 51 006 ....** (1)	PES 63 TA .... (1) RHT-T2	●	●	●	●	●	●	●	●	●	●	●	500	G 3/8
80	**450 51 007 ....** (1)	PES 80 TA .... (1) RHT-T2	●	●	●	●	●	●	●	●	●	●	●	600	G 3/8

(1) Indicate stroke (in mm) preferably by selecting one of the standard strokes above. Do not exceed maximum possible stroke

MOUNTINGS: same as those of standard cylinders (see P232)

DIMENSIONS: same as those of standard cylinders (see P232)

DETECTORS: No position detectors may be used when operating this type of cylinder at high temperature.

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

DOUBLE ACTING PNEUMATIC CYLINDER - Ø 32 to 200 mm

Cylinder complies with VDMA 24 562 - ISO 6431 standards

WITH FPM SEALS FOR AGGRESSIVE ENVIRONMENTS

APPLICATION

PES cylinder equipped with seals (piston rod seal + all internal seals) of FPM for use in aggressive environments, subject to compatibility with standard construction materials (see below). On request, this type of cylinder can be equipped with stainless steel piston rods, tie rods and threaded fasteners and corrosion-resistant ends.

SPECIFICATIONS

Fluid	: air or neutral gas filtered, lubricated or not
Pressure	: 10 bar
Temperature	: 0°C, +60°C
Cushioning	: pneumatic, adjustable at both ends by captive screws

CONSTRUCTION

Barrel	: hard-anodized aluminium or painted steel
Tie rods	: stainless steel (Ø32 to 100 mm) painted steel (Ø125 to 200 mm)
Piston rod/nut	: hard chrome plated steel, nut zinc-plated steel
Front and rear ends	: aluminium alloy
Threaded fasteners	: zinc-plated steel

ORDERING

In your order, indicate

- Cylinder description: Type **PES FPM seals**, tie rods or profiled barrel, aluminium or steel barrel, single or through rod, cushioned or not cushioned, equipped or non equipped to receive magnetic position detectors.
- Model code plus stroke indication:

Bore Ø (mm)	PES Ø 32 to 125 mm **PROFILED BARREL** CYLINDERS **equipped** for magnetic detectors (2)		PES Ø 32 to 200 mm **TIE-ROD** CYLINDERS **equipped** for magnetic detectors (2)		**non equipped** for magnetic detectors
	with **single rod**	with **through rod**	with **single rod** aluminium barrel	with **through rod** aluminium barrel	with **single rod** steel barrel
32	**450 52 017** (1)	**450 52 024** (1)	**450 51 081** (1)	**450 51 090** (1)	**450 52 008** (1)
40	**450 52 018** (1)	**450 52 025** (1)	**450 51 082** (1)	**450 51 091** (1)	**450 52 009** (1)
50	**450 52 019** (1)	**450 52 026** (1)	**450 51 083** (1)	**450 51 092** (1)	**450 52 010** (1)
63	**450 52 020** (1)	**450 52 027** (1)	**450 51 084** (1)	**450 51 093** (1)	**450 52 011** (1)
80	**450 52 021** (1)	**450 52 028** (1)	**450 51 085** (1)	**450 51 094** (1)	**450 52 012** (1)
100	**450 52 022** (1)	**450 52 029** (1)	**450 51 086** (1)	**450 51 095** (1)	**450 52 013** (1)
125	**450 52 023** (1)	**450 52 030** (1)	**450 51 087** (1)	**450 51 096** (1)	**450 52 014** (1)
160	-	-	**450 51 088** (1)	**450 51 097** (1)	**450 52 015** (1)
200	-	-	**450 51 089** (1)	**450 51 098** (1)	**450 52 016** (1)

(1) Indicate the stroke (in mm), preferably choosing standard values (see standard equipment: P230-P232)
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS: Fastener codes and quantities (see standard equipment)
DIMENSIONS: same as standard cylinders (see P230-P232)

DOUBLE ACTING PNEUMATIC CYLINDER - Ø 32 to 200 mm

WITH ROD SEAL ONLY OF FPM

APPLICATION

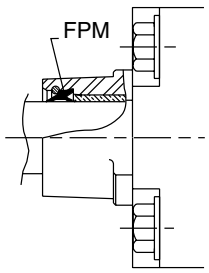
Only the piston rod seal of FPM, affords better corrosion resistance than the standard PUR one, to protect the interior of the seal in the event of use in damp and slightly aggressive environments. On request, this type of cylinder can be equipped with stainless steel piston rods, tie rods and threaded fasteners and corrosion-resistant ends.

ORDERING

In your order, indicate

- Cylinder description: Type **PES with FPM seals**, tie rod or profiled barrel, aluminium or steel barrel, single or through rod, cushioned or not cushioned, equipped or non equipped to receive magnetic position detectors.
- Code of standard cylinder plus stroke indication: 450 .. ...
- FPM rod seal option code:

Bore Ø (mm)	CODES with **single rod**	CODES with **through rod**
32	**510 550**	**510 556**
40	**510 551**	**510 557**
50-63	**510 552**	**510 558**
80-100	**510 553**	**510 559**
125	**510 554**	**510 560**
160-200	**510 555**	**510 561**



MOUNTINGS: Fastener codes and quantities (see standard equipment)

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

DOUBLE ACTING PNEUMATIC CYLINDER - Ø 32 to 200 mm

Cylinder complies with VDMA 24 562 - ISO 6431 standards

WITH PISTON ROD PROTECTION BOOT

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

APPLICATION

PES cylinder equipped with protective boot of nitrile (NBR)

SPECIFICATIONS

Fluid : air or neutral gas filtered, lubricated or not
Pressure : 10 bar max.
Temperature : -20°C, +60°C
Maximum stroke :

Bore Ø (mm)	Max. stroke (mm) PES **profiled barrel**	PES **tie rods**
32	250	250
40	500	500
50	750	750
63-125	1000	1000
160-200	-	1000

CONSTRUCTION

Nitrile boot (NBR)
Retaining ring of light alloy and acetal resin (POM)
Other parts: same as those of standard PES cylinders

ORDERING

In your order, indicate
CYLINDER:
- Code or part number of standard PES
- Rod boot option code:

The following versions and mountings do not fit and cannot be adapted for this specialized cylinder:
- Hinge
- Anti-rotation piston rod
- High temperature version
- Rod lock
- Oversize rod

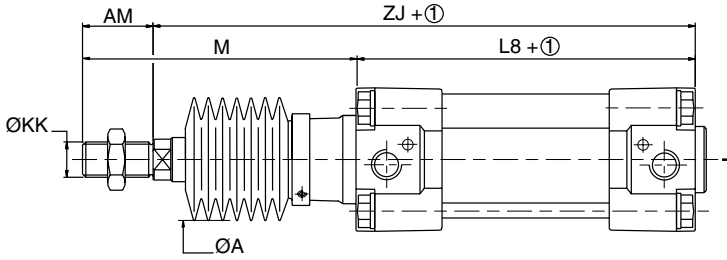
	Bore Ø (mm)	32	40	50	63	80	100	125	160	200
CODES	Single rod	**911 503**	**911 504**	**911 505**	**911 506**	**911 507**	**911 508**	**911 509**	**911 510**	**911 511**
	Through rod	**911 512**	**911 513**	**911 514**	**911 515**	**911 516**	**911 517**	**911 518**	**911 519**	**911 520**

The magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS: Fastener codes and quantities (see standard equipment and remarks below)
The front flange or top brackets are supplied installed on the cylinder

DIMENSIONS

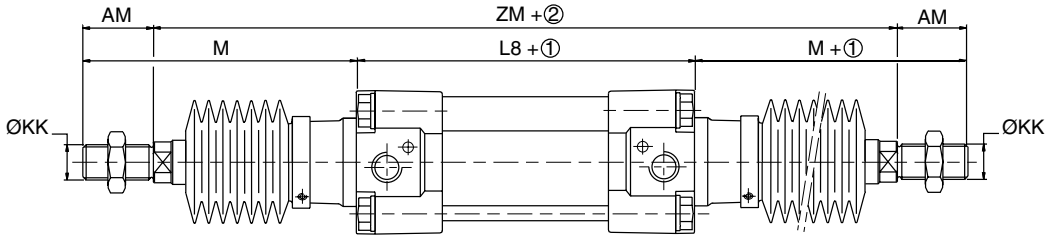
Cylinder single rod



Version with **profiled barrel**
Ø 32 to 125 mm

Version **with tie rods**
Ø 32 to 200 mm

Cylinder with through rod



① : + stroke
② : + 2 x stroke

Bore Ø (mm)	ØA	AM	ØKK	L8	**M** as a function of stroke: (mm) 0-75	76-150	151-250	251-500	501-750	751-1000	**ZJ** as a function of stroke: (mm) 0-75	76-150	151-250	251-500	501-750	751-1000	**ZM** as a function of stroke: (mm) 0-75	76-150	151-250	251-500	501-750	751-1000
32	41	22	M10x1,25	94	81	107	127	-	-	-	153	179	199	-	-	-	212	264	304	-	-	-
40	41	24	M12x1,25	105	138	138	138	218	-	-	219	219	219	299	-	-	333	333	333	493	-	-
50	60	32	M16x1,5	106	153	153	153	233	313	-	227	227	227	307	387	-	348	348	348	508	668	-
63	60	32	M16x1,5	121	153	153	153	233	313	394	242	242	242	322	402	483	363	363	363	523	683	845
80	60	40	M20x1,5	128	170	170	170	250	330	411	258	258	258	338	418	499	388	388	388	548	708	870
100	60	40	M20x1,5	138	160	160	160	220	280	340	258	258	258	318	378	438	378	378	378	498	618	738
125	88	54	M27x2	160	188	188	188	248	308	368	294	294	294	354	414	474	428	428	428	548	668	788
160	88	72	M36x2	180	222	222	222	266	311	386	330	330	330	374	419	494	480	480	480	568	658	808
200	88	72	M36x2	180	237	237	237	281	326	401	345	345	345	389	434	509	510	510	510	598	688	838

DOUBLE ACTING PNEUMATIC CYLINDER - Ø 32 to 200 mm

Cylinder complies with VDMA 24 562 - ISO 6431 standards

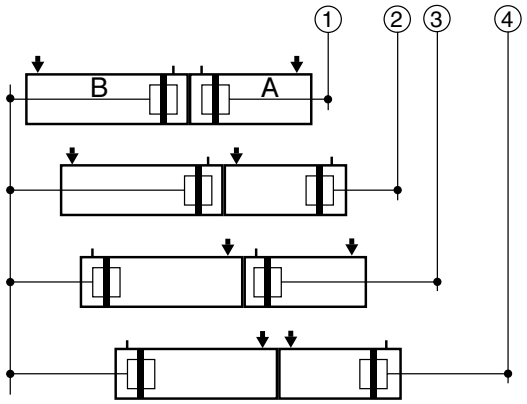
MOUNTED BACK-TO-BACK

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

APPLICATION

System consisiting of two standard cylinders mounted back-to-back and connected by a support or four tie rods. This arrangement provides:

- three positions if the two cylinders have the same stroke
- four positions if the two cylinders have different strokes



The following mountings do not fit back-to-back cylinders:

- Straight complete trunnion
- complete trunnion with angular clevis bracket
- Rear flange

SPECIFICATIONS

Fluid : air or neutral gas, filtered, lubricated or not
Pressure : 10 bar max.
Temperature : -20°C, +60°C
Max stroke of the two cylinders = 1 metre
Control : see above

ORDERING In your order, indicate:

- Description of system : Set of two PES cylinders with tie rods or profiled barrels mounted **back-to-back**
- Cylinders designated "A" **and** "B" : PES .(1). A/NA .(2). - DM (for profiled barrel version)
  PES .(1). T A .(2). S/R - DM (for tie rod version)
  (1) : Bore
  (2) : stroke of cylinder **(max. total stroke of the two cylinders = 1 metre)**
  A/NA : A = cushioned - NA = not cushioned
  S/R : S = steel barrel - R = aluminium barrel
  DM : cylinder equipped or non equipped for magnetic position detectors
  The features A/NA, DM or not can be combined on both cylinder versions A and B.
- Back-to-back mounting option code :

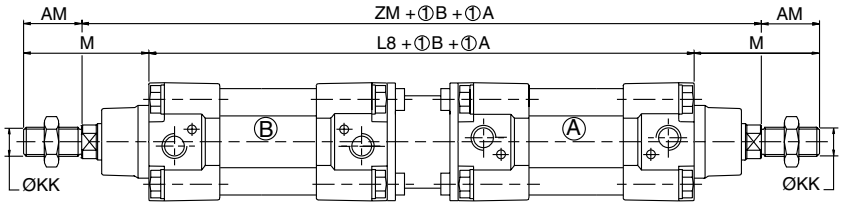
	Bore Ø (mm)	32	40	50	63	80	100	125	160	200
CODES	Profiled barrel type	**560 620**	**560 621**	**560 622**	**560 623**	**560 624**	**560 625**	**560 626**	-	-
	Tie rods barrel type	**560 611**	**560 612**	**560 613**	**560 614**	**560 615**	**560 616**	**560 617**	**560 618**	**560 619**

The magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295)

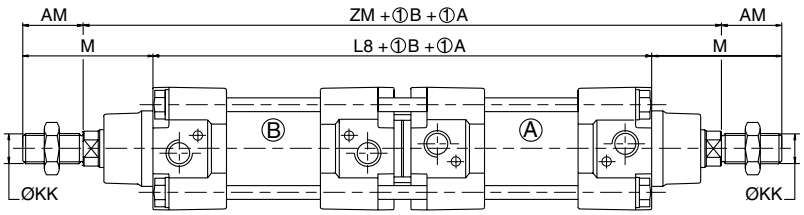
MOUNTINGS: Fastener codes and quantities (see standard equipment and remarks below)

DIMENSIONS

CYLINDER WITH **PROFILED BARREL** 32 to 125 mm bore



CYLINDER WITH **TIE RODS** 32 to 200 mm bore



Bore Ø (mm)	AM	ØKK	M	Cylinder with profiled barrel L8	Cylinder with profiled barrel ZM	Cylinder with tie rods L8	Cylinder with tie rods ZM
32	22	M10x1,25	48	222	274	197	249
40	24	M12x1,25	54	244	304	219	279
50	32	M16x1,5	69	249	323	221	295
63	32	M16x1,5	69	279	353	251	325
80	40	M20x1,5	86	302	394	265	357
100	40	M20x1,5	91	322	424	285	387
125	54	M27x2	119	375	505	332	462
160	72	M36x2	152	-	-	372	532
200	72	M36x2	167	-	-	372	562

① : + stroke

DOUBLE ACTING PNEUMATIC CYLINDER - Ø 32 to 200 mm

Cylinder complies with VDMA 24 562 - ISO 6431 standards

MOUNTED NOSE TO NOSE

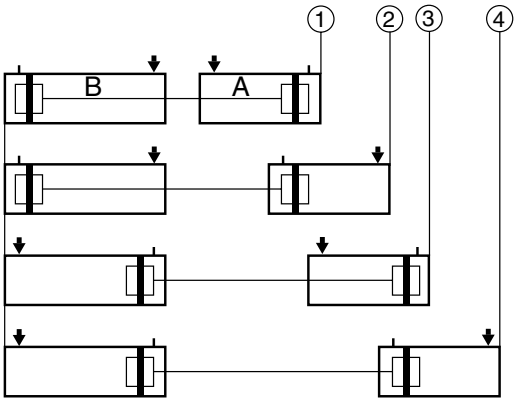
Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

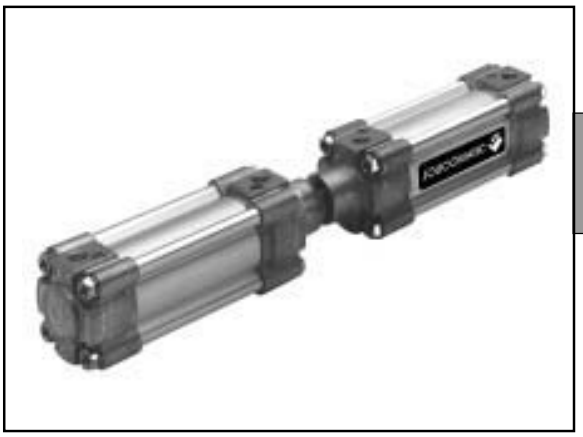
APPLICATION

Set of two cylinders connected by a common piston rod. As in the case of cylinders mounted back-to-back, this affords:

- three positions if the two cylinders have the same stroke
- four positions if the two cylinders have different strokes

The choice between front-to-front and back-to-back mounting is made on the basis of the possiblities of installing and mounting the cylinders





The following mountings do not fit front-to-front cylinders:

- Female rod clevis
- Spherical rod end
- Front flange

SPECIFICATIONS

Fluid : air or neutral gas filtered, lubricated or not
Pressure : 10 bar max.
Temperature : -20°C, +60°C
Max stroke of the two cylinders = 1 metre
Control : see above

ORDERING

In your order, indicate:

- Description of system : Set of two PES cylinders with tie rods or profiled barrels mounted **nose to nose**
- Cylinders designated "A" **and** "B" : PES (1). A/NA (2). - DM (for profiled barrel version)

  PES (1). T A (2). S/R - DM (for tie rods version)

  (1) : bore
  (2) : stroke of cylinder **(max. total stroke of the two cylinders = 1 metre)**
  A/NA : A = cushioned - NA = not cushioned
  S/R : S = steel barrel - R = aluminium barrel
  DM : cylinder equipped or non equipped for magnetic position detectors
  The features A/NA, DM or not can be combined on both cylinder versions A and B.
- Nose to nose mounting option code :

	Bore Ø (mm)	32	40	50	63	80	100	125	160	200
CODES	Profiled barrel type	**560 638**	**560 639**	**560 640**	**560 641**	**560 642**	**560 643**	**560 644**	-	-
	Tie rods barrel type	**560 629**	**560 630**	**560 631**	**560 632**	**560 633**	**560 634**	**560 635**	**560 636**	**560 637**

The magnetic position detectors are ordered separately: UNI model, reed switch or magneto-resistive type (see P295)

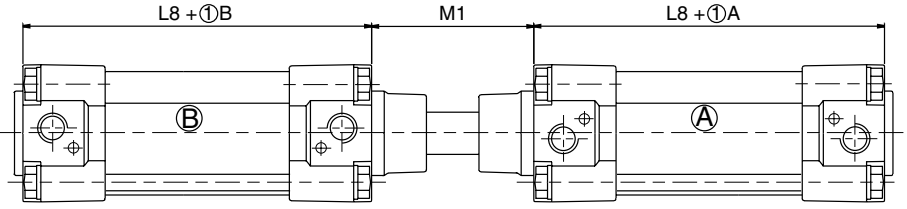
MOUNTINGS: Fastener codes and quantities (see standard equipment and remarks below)

DIMENSIONS

Bore Ø (mm)	L8	M1❊ min.
32	94	42
40	105	46
50	106	60
63	121	62
80	128	76
100	138	81
125	160	95
160	180	131
200	180	131

Cylinder **with profiled barrel** 32 to 125 mm bore

Version **with tie rods** 32 to 200 mm bore



① : + stroke

❊ Larger sizes available on request

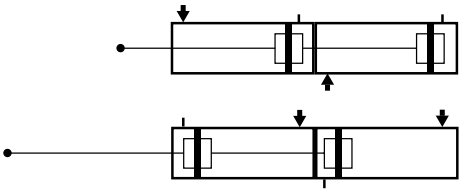
DOUBLE FORCE TANDEM PNEUMATIC CYLINDER - Ø 32 to 200 mm
LINKED PISTON RODS

Cylinder complies with VDMA 24 562 - ISO 6431 standards

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

APPLICATION

Tandem-mounted cylinders with connected rods develop twice the force of a standard cylinder of the same diameter.
This arrangement offers the advantage of providing a given force with a smaller frontal area than a standard cylinder developing the same force.



Note: Operation by a single 5/2 control valve is possible

FORCE DEVELOPED

Bore Ø (mm)	Dynamic force developed (daN) as a function of pressure (bar)									
	● 2	○	● 4	○	● 6	○	● 8	○	● 10	○
32	24	22	55	50	85	78	114	104	142	130
40	38	34	83	74	128	116	175	160	222	200
50	60	54	128	116	202	184	274	248	345	310
63	99	92	208	196	324	308	441	422	554	528
80	165	154	348	326	540	510	726	682	907	854

● Force developed on extension of the piston rod
○ Force developed in retraction of the piston rod

SPECIFICATIONS

Fluid : air or neutral gas, filtered, lubricated or not
Pressure : 10 bar max.
Temperature : -20°C, +60°C
Cushioning : pneumatic, adjustable at both ends by captive screws
Maximum stroke : see below
Control : see above

ORDERING

In your order, indicate
CYLINDER:

- Cylinder description : PES cylinder of **tandem**, **double force** type, with connected piston rods
- Code for PES with **tie rods** with pneumatic cushioning :

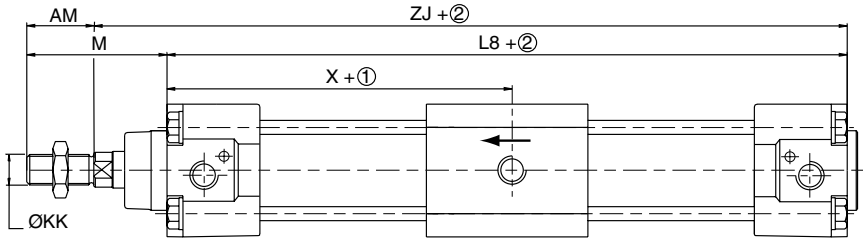
Bore Ø (mm)	CODES		Maximum nominale stroke (mm)
	PES with aluminium barrel (equipped for magnetic detectors) (2)	**PES with steel barrel** (non equipped for detector)	
32	**450 52 049** (1) ...	**450 52 064** (1) ...	160
40	**450 51 075** (1) ...	**450 52 065** (1) ...	250
50	**450 51 076** (1) ...	**450 52 066** (1) ...	300
63	**450 51 077** (1) ...	**450 52 067** (1) ...	300
80	**450 51 078** (1) ...	**450 52 068** (1) ...	400

100 to 200 mm bore: consult us

(1) Indicate stroke (in mm) - maximum stroke : see above
(2) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

MOUNTINGS: Fastener codes and quantities (see standard equipment)

DIMENSIONS



Bore Ø (mm)	AM	ØKK	L8	M	ZJ	X
32	22	M10x1,25	180	48	206	92
40	24	M12x1,25	198,5	54	228,5	100,5
50	32	M16x1,5	205	69	242	102,5
63	32	M16x1,5	233	69	270	116,5
80	40	M20x1,5	251,5	86	297,5	125,5

① : + stroke
② : + 2 x stroke

NOTE: The two ports on the intermediate block are at 180°

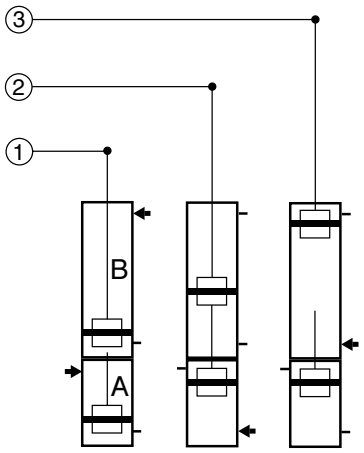
DOUBLE-ACTING PNEUMATIC CYLINDER - Ø 32 to 200 mm

Cylinder complies with VDMA 24 562 - ISO 6431 standards

WITH THREE POSITIONS, RODS **NOT** CONNECTED

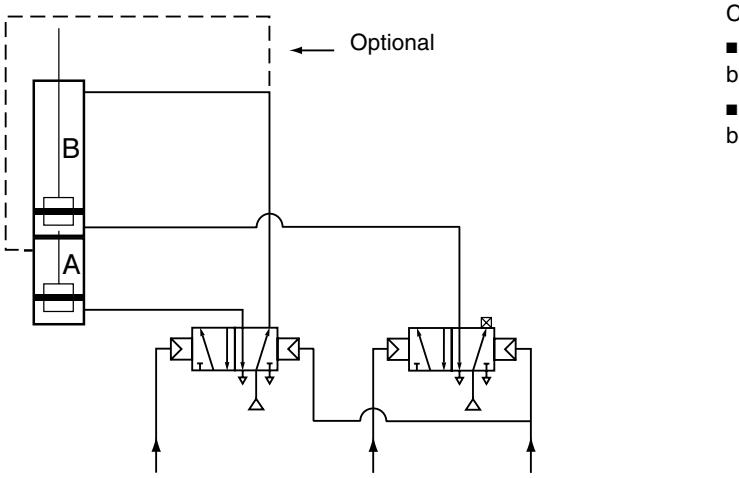
APPLICATION

The three-position cylinder is a monolithic assembly consisting of two PES valve bodies in tandem, generally with different strokes, whose piston rods are **not** connected together



The main applications of three-position cylinders are for pressing and raising loads with two different positions. The following recommendations are made concerning use:

- An opposing force is necessary during extension
- To reach the second position with sufficient accuracy, extension of the rod of cylinder “A” must not be too fast.
- The operating cycle is necessarily as follows: 1⟶ 2 ⟶ 3, then direct return to 1. See pneumatic control diagram below.



SPECIFICATIONS

Fluid : air or neutral gas, filtered, lubricated or not
Pressure : 10 bar max.
Temperature : -20°C, +60°C
Cushioning : pneumatic, adjustable at both ends by captive screws
Maximum stroke :

Bore Ø (mm)	Strokes A + B
32	320
40	500
50-63	600
80-100	800
125-200	1000

Control : see below

■ Determination of stroke of cylinder “A”: Distance between Positions 1 and 2 (in mm)

■ Determination of stroke of cylinder “B”: Distance between Positions 1 and 3 (in mm)

ORDERING

In your order, indicate
CYLINDER:

■ Cylinder description: PES cylinder **with tie rods**, **3 positions**, piston rods **not** connected together

■ Cylinder **A** description: Cylinder “A”, Ø, stroke, cushioned, steel or aluminium barrel
cylinder equipped or not equipped for magnetic position detectors (1)

■ Cylinder **B** description: Cylinder “B”, Ø, stroke, cushioned, steel or aluminium barrel
cylinder equipped or not equipped for magnetic position detectors (1)

MOUNTINGS: Fastener codes and quantities (see standard equipment - P232)

(1) **The magnetic position detectors are ordered separately:** UNI model, reed switch or magneto-resistive type (see P295)

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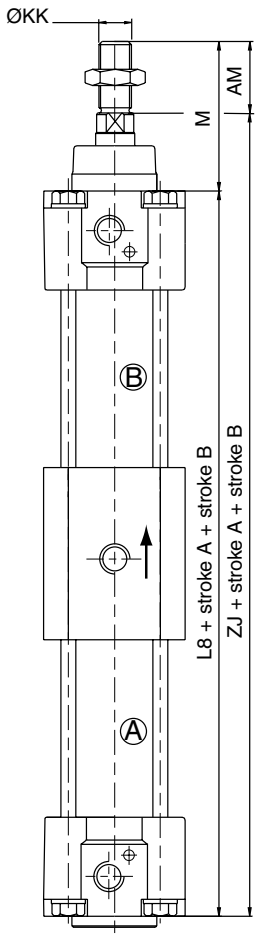
DIMENSIONS



N.B.: The supply ports to the intermediate block are offset x 180°.

Bore Ø (mm)	AM	ØKK	L8	M	ZJ
32	22	M10x1,25	180	48	206
40	24	M12x1,25	198,5	54	228,5
50	32	M16x1,5	205	69	242
63	32	M16x1,5	233	69	270
80	40	M20x1,5	251,5	86	297,5
100	40	M20x1,5	243	91	294
125	54	M27x2	278	119	343
160	72	M36x2	303	152	383
200	72	M36x2	303	167	398

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To cater for special customer requests, ASCO/JOUCOMATIC set up its own PRODUCT SUPPORT DIVISION, the basic role of which is to design and manufacture special products tailored to particular requirements.

ASCO/JOUCOMATIC has devoted its entire experience and know-how to manufacturing these items, which exhibit the same qualities of innovation and reliability for which its standard air cylinders are reputed.

Here are a few examples of such specially-manufactured items:

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ADDITIONAL PRODUCTS

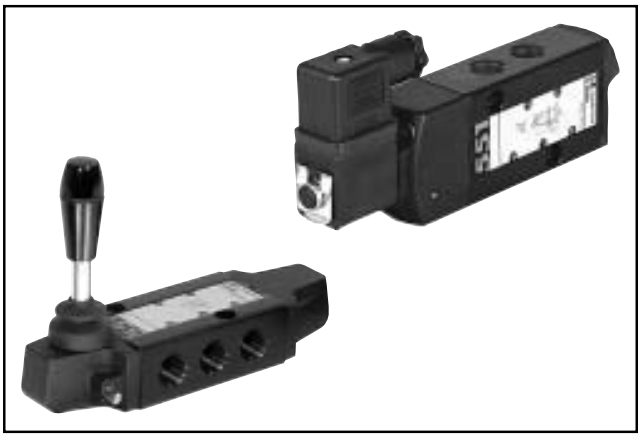
In addition to cylinders, Asco-Joucomatic produces and sells a wide range of pneumatic components for making complete compressed air automation installations:

- Spool and poppet type control valves, pad mounting (to ISO, VDMA, CNOMO standards) and with threaded ports of sizes M5 to G 1 1/2. (1) (2)
- Pilot solenoid valves with CNOMO mounting surface and interface.
- Compact control-valve islands connected by multicore cable and Sub-D connectors (Multipol) or controlled by a fieldbus (Buslink) compatible with the main standardized protocols (3)
- Sentronic, Pulstronic and Servotronic proportional pneumatic servocontrolled control valves (4)
- M5 to B1 line accessories: flow reducers, exhaust regulators, cylinder lock connectors, silencers, quick-exhaust fittings , circuit selectors, check valves, pressure indicators etc. (6)
- Air treatment systems: filter - regulator - lubricator systems (5)
- Manually and mechanically controlled pneumatic sensors (microvalves).
- Pneumatic automation components including register-sequencers, logic cells and time delay units.

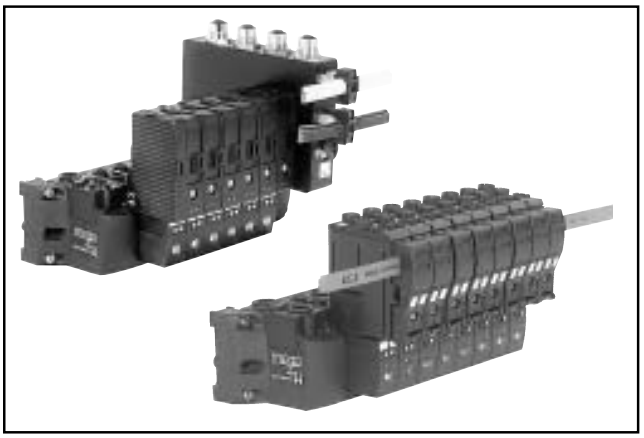
Like the cylinders, all these products can be used with lubricated and unlubricated air.

Asco-Joucomatic can also provided the services of its Systems and Automation Division, to further facilitate your installation problems by supplying custom-made equipment that is pre-assembled and pre-wired, in enclosures, racks and consoles.

1



2



3

4

5

6

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Thanks to the long experience and the solid know-how of its engineers and technicians, ASCO-JOUCOMATIC has become a world leader in fluid system technology. In the fields of both pneumatic components and valves for all fluids, the name of the company is well-known throughout the world. It symbolizes quality and competetiveness.

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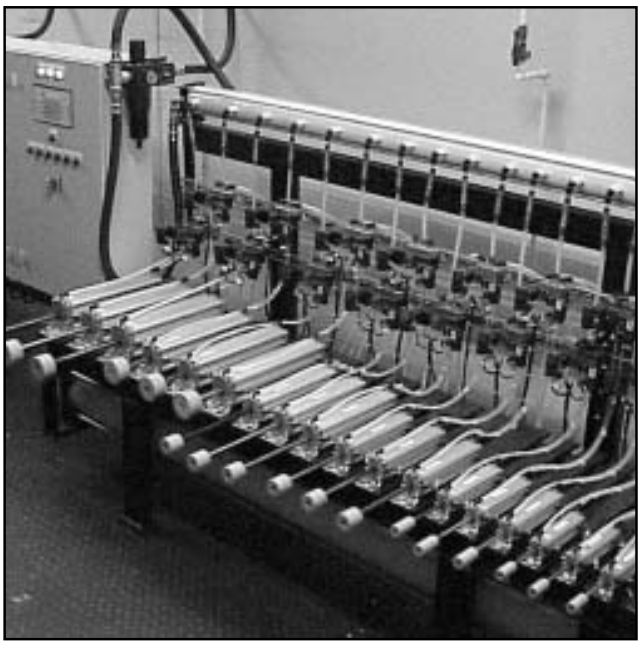
1 - Product design using CAD techniques
2 - Cylinders undergoing endurance tests
3 - Machining center with palletization
4 - Cylinder assembly and testing line

1



2

3

4

Series 435
Type : CIX

ANTI-CORROSIVE CYLINDERS

Double acting - Ø 12 to 25 mm
Conforming with ISO-CETOP-AFNOR standards
With elastic cushioning

ISOCLAIR / DM

GENERAL

These cylinders are designed for use in corrosive environments :
- chemical, salty or humid atmospheres,
- food processing industry (dairy and meat industries) : high resistance to lactic acid and bactericidal sprays.

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : – 10°C, + 70°C
STANDARDS : **ISO 6432**
CETOP RP 52 P
AFNOR NF E 49030

CONSTRUCTION

Barel	: stainless steel AISI 304 L
Rod	: stainless steel AISI 304 L
Front or rear covers	: stainless steel AISI 304 L
Neck nut	: stainless steel AISI 304 L
Rod nut	: stainless steel AISI 304 L
Piston	: brass, acetal resin (POM) and light alloy
Piston seal	: nitrile (NBR)
Head seal	: fluorelastomer (FPM)
Bearing	: acetal resin lubricated
Dismounting	: cannot be dismounted
Cushioning	: elastic
Position detection	: cylinders equiped for magnetic detectors (consult us)

CHOICE OF EQUIPMENT

Ø bore (mm)	Strokes in (mm)	**CODES** to specify on order	REFERENCES to specify on order	Con-nection
12	25	**435 00 574**	CIX 12 NA 25-DM	M5
	50	**435 00 575**	CIX 12 NA 50-DM	
	80	**435 00 576**	CIX 12 NA 80-DM	
	100	**435 00 577**	CIX 12 NA 100-DM	
16	25	**435 00 578**	CIX 16 NA 25-DM	M5
	50	**435 00 579**	CIX 16 NA 50-DM	
	80	**435 00 580**	CIX 16 NA 80-DM	
	100	**435 00 581**	CIX 16 NA 100-DM	
20	25	**435 00 582**	CIX 20 NA 25-DM	G 1/8
	50	**435 00 583**	CIX 20 NA 50-DM	
	80	**435 00 584**	CIX 20 NA 80-DM	
	100	**435 00 585**	CIX 20 NA 100-DM	
25	25	**435 00 586**	CIX 25 NA 25-DM	G 1/8
	50	**435 00 587**	CIX 25 NA 50-DM	
	80	**435 00 588**	CIX 25 NA 80-DM	
	100	**435 00 589**	CIX 25 NA 100-DM	
	160	**435 00 590**	CIX 25 NA 160-DM	

MOUNTINGS

Ø bore (mm)	**CODES** to specify on order Front or rear flange	Feet MS 3 (per unit)	Rear trunnion	Female rod clevis ISO 8140 RP 102 P	Neck nut
12	**439 00 246**	**439 00 248**	**439 00 250**	**439 00 252**	**439 00 255**
16					
20	**439 00 247**	**439 00 249**	**439 00 251**	**439 00 253**	**439 00 256**
25				**439 00 254**	

Each cylinder is delivered with a rod nut and neck nut.

OPTIONS

Others strokes on request
Double crossbar for Ø 16-20-25 mm (stroke max. 300 mm)

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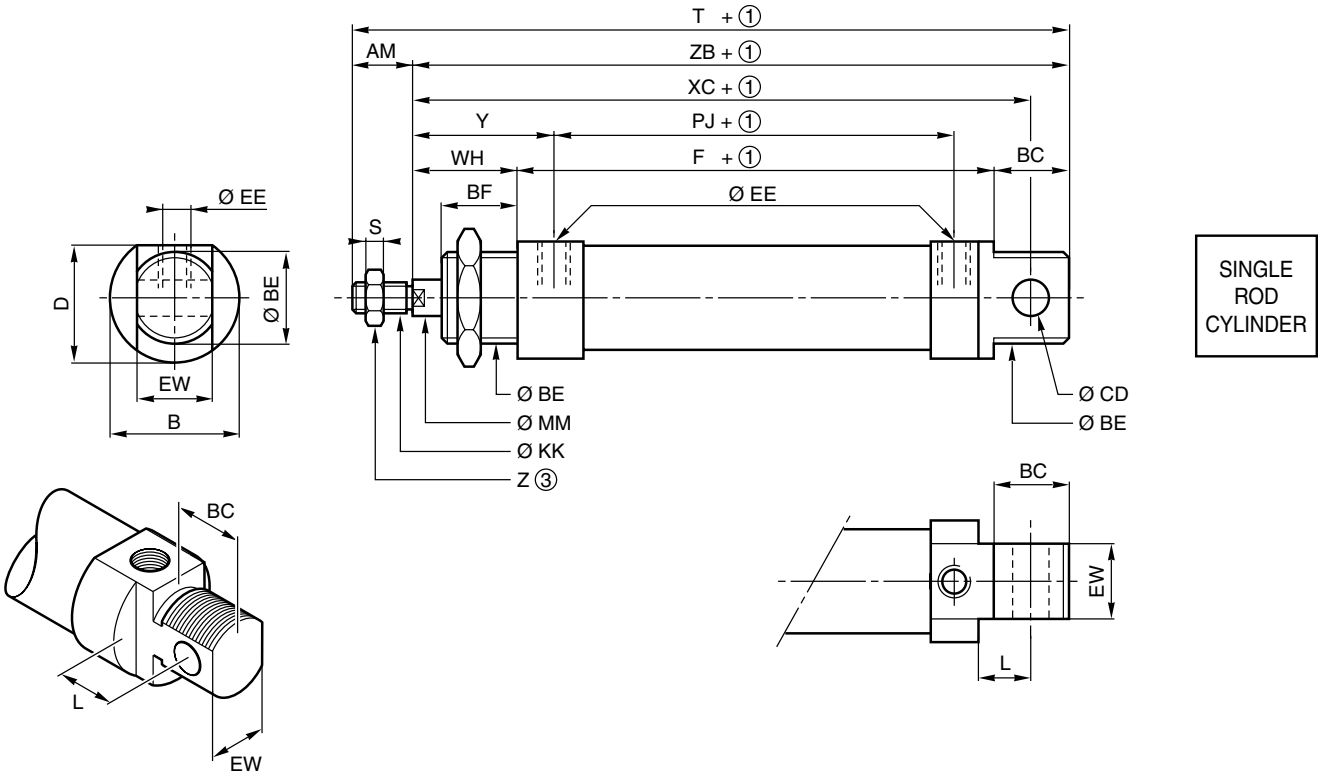
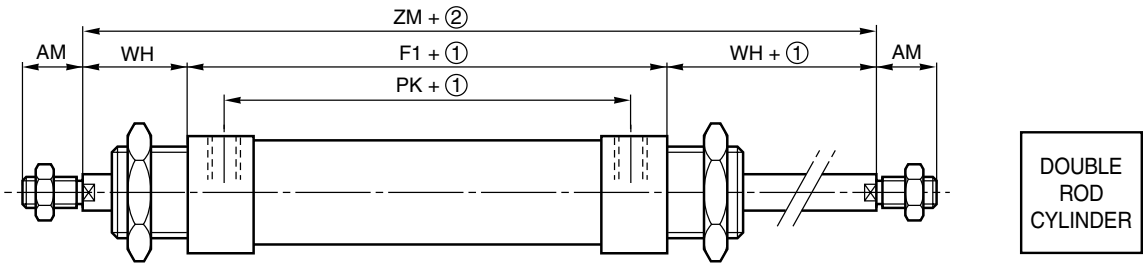
DIMENSIONS AND WEIGHTS

BARE CYLINDER (delivered with neck nut).





Ø bore (mm)	DIMENSIONS (mm)																		
	AM	B	BC	Ø BE	BF	CD	D	EE	EW	F	F1	Ø KK	L	MM	PJ	PK	S	T	WH
12	16	22	14	M16 x 1,5	14	6 H11	20,5	M5	12 d11	48	–	M6 x 1	9	6	34	–	3	100	22
16	16	22	14	M16 x 1,5	14	6 H11	20,5	M5	12 d11	54,5	55,5	M6 x 1	9	6	40,5	41	3	106,5	22
20	20	31	17,5	M22 x 1,5	17,5	8 H11	29	G1/8	16 d11	63,5	68	M8 x 1,25	12	10	46,5	51	4	125	24
25	22	31	17,5	M22 x 1,5	17,5	8 H11	29	G1/8	16 d11	68,5	68,5	M10 x 1,25	12	10	51,5	51,5	5	136	28

Ø bore (mm)	DIMENSIONS (mm)					Weights (kg)	
	XC	Y	Z	ZB	ZM	④	⑤
12	75	29	10	84	–	0,150	0,090
16	81,5	29	10	90,5	99,5	0,200	0,100
20	95	32,5	13	105	116	0,300	0,160
25	104	36,5	17	114	124,5	0,400	0,200

① + Stroke
② + 2 x stroke
③ Across flats
④ Cylinder weight with 0 mm stroke
⑤ Weight to be added per additional 100 mm length

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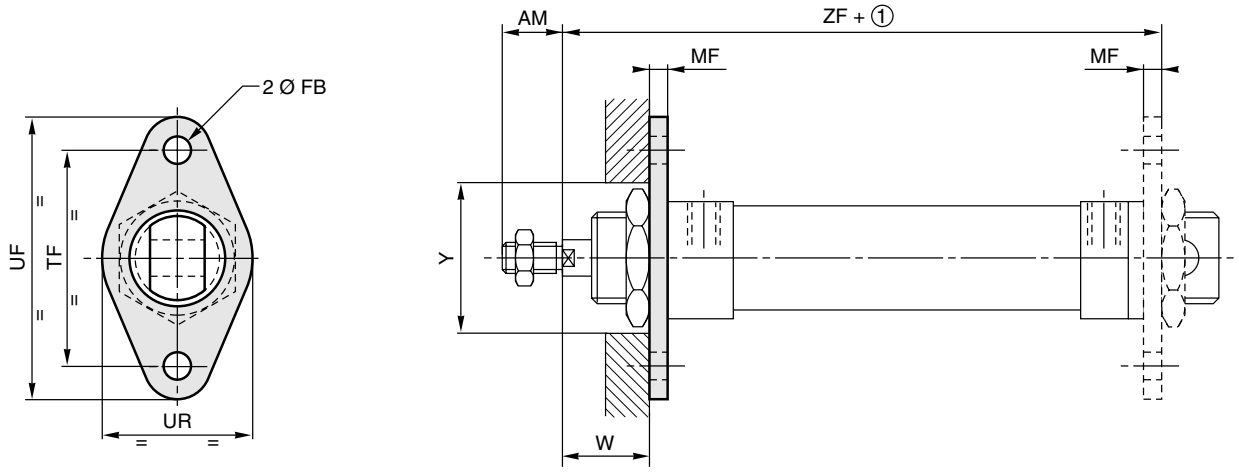
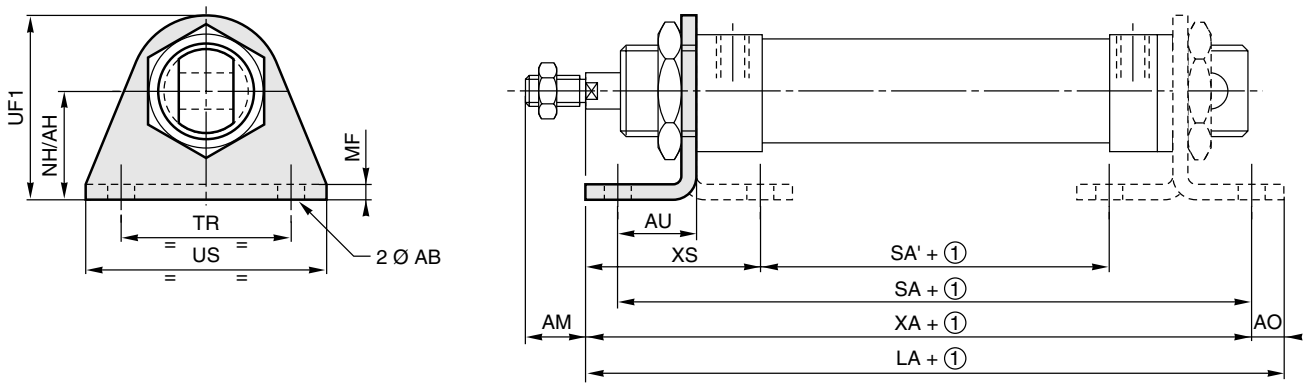
DIMENSIONS

FRONT OR REAR MOUNTING FLANGE



FOOT(S) MOUNTING - MS3

Foot(s) mounting are supplied in single units, not in pairs.

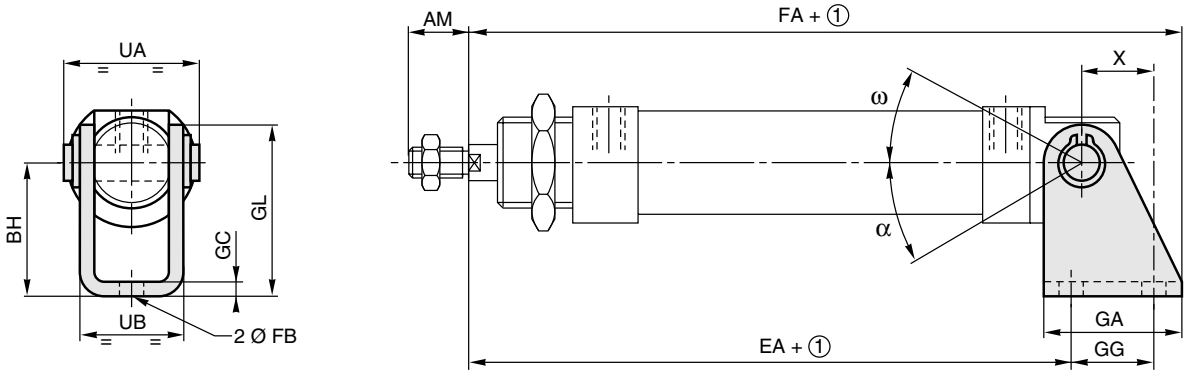


① + Stroke

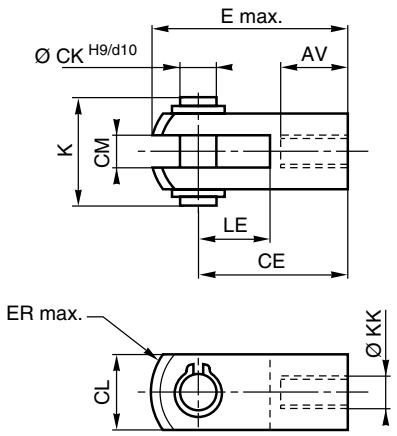
Ø bore (mm)	DIMENSIONS (mm)																			
	AM	AO	AU	ØAB ØFB	XA	LA	MF	NH AH	SA	SA'	TF	TR	UR	UF	UF1	US	W	XS	Y	ZF
12	16	6	14	5,5	84	90	4	20	76	28	40	32	30	52	32	44	18	32	22	74
16	16	6	14	5,5	90,5	96,5	4	20	82,5	34,5	40	32	30	52	32	44	18	32	22	80,5
20	20	9	17	6,6	104,5	113,5	5	25	97,5	39,5	50	40	40	66	45	54	19	36	31	92,5
25	22	9	17	6,6	113,5	122,5	5	25	102,5	44,5	50	40	40	66	45	54	23	40	31	101,5

Ø bore (mm)	WEIGHTS (kg)	
	Front or rear flange	Foot
12	0,020	0,050
16	0,020	0,050
20	0,040	0,100
25	0,040	0,100

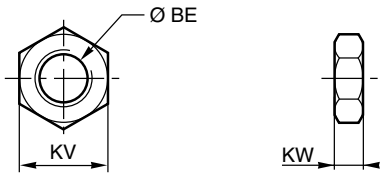
DIMENSIONS
REAR TRUNNION MOUNTING



FEMALE ROD CLEVIS - ISO 8140 - RP 102P



NECK NUT



① + Stroke

Ø bore (mm)	DIMENSIONS (mm)																										
	AM	AV	ØBE	BH	CE	ØCK	CL	CM	E	EA	ER	FA	FB	GA	GC	GG	GL	K	ØKK	KV	KW	LE	UA	UB	X	α	ω
12	16	12	M16 x 1,5	27	24	6	12	$6^{+0,4}_{+0,1}$	33,5	72,5	9,5	93	5,5	25	3	16	34	16,5	M6 x 1	19	4	12	25	18	13,5	50°	180°
16	16	12	M16 x 1,5	27	24	6	12	$6^{+0,4}_{+0,1}$	33,5	79	9,5	99,5	5,5	25	3	16	34	16,5	M6 x 1	19	4	12	25	18	13,5	47°	180°
20	20	16	M22 x 1,5	30	32	8	16	$8^{+0,5}_{+0,15}$	45	91	13	117	6,6	32	4	20	40	22	M8 x 1,25	27	5	16	32	24	16	8°	168°
25	22	20	M22 x 1,5	30	40	10	20	$10^{+0,5}_{+0,15}$	56	100	16	126	6,6	32	4	20	40	26	M10 x 1,25	27	5	20	32	24	16	8°	168°

Ø bore (mm)	WEIGHTS (kg)		
	Rear trunnion	Female clevis	Nut
12	0,050	0,020	0,010
16	0,050	0,020	0,010
20	0,080	0,050	0,010
25	0,080	0,100	0,010

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DOUBLE ACTING ANTI-CORROSIVE CYLINDERS, Ø 32 to 80 mm
CONFORMING WITH ISO 6431 - CETOP STANDARDS

SERIES 435 - TYPE: CIX

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P258-GB-R0

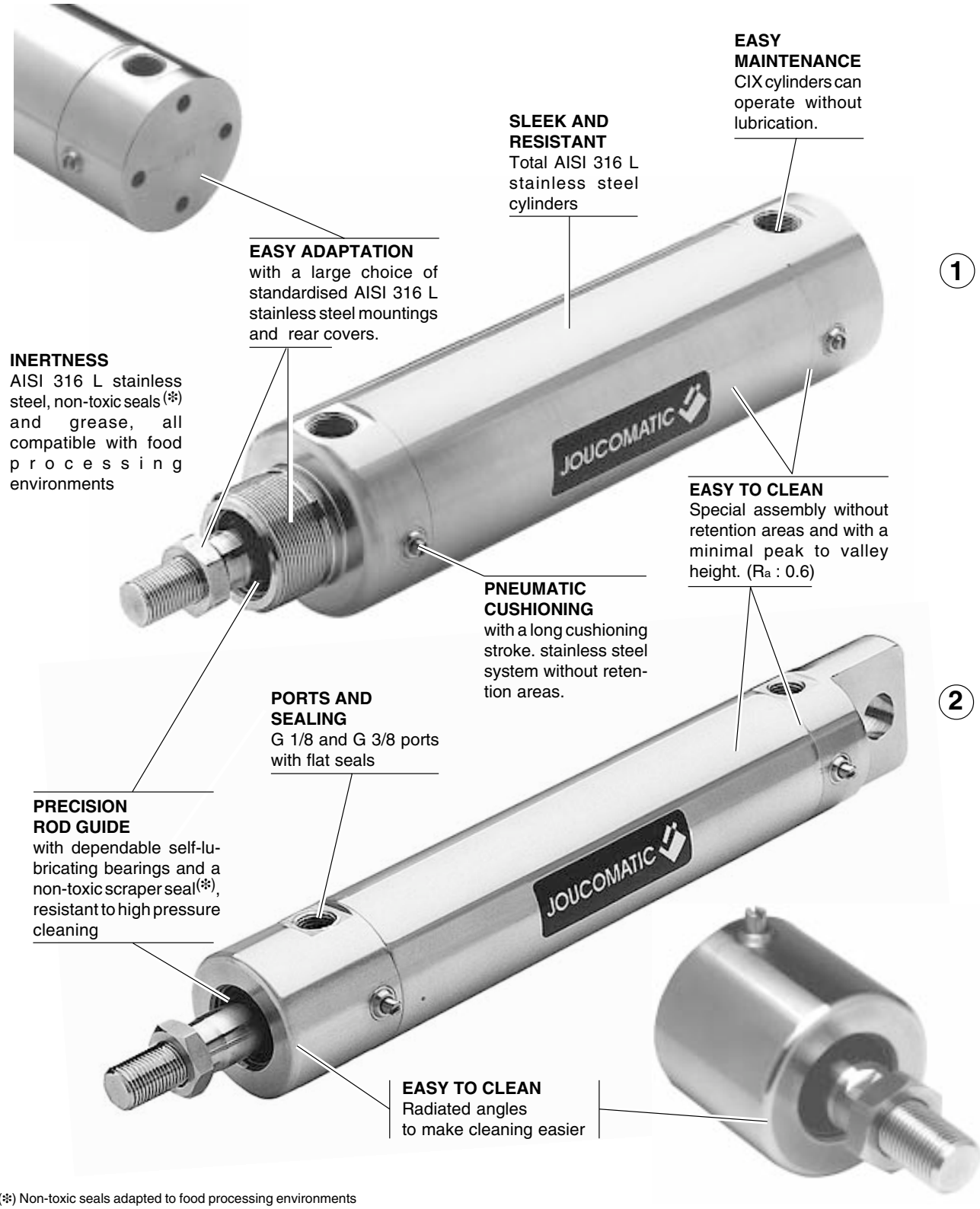
ASCO® JOUCOMATIC

ASCO JOUCOMATIC

ANTI-CORROSIVE CYLINDERS Ø 32 to 80 mm - Type CIX

The anti-corrosive cylinders are designed for use in corrosive environments:
- chemical, salty and humid atmospheres
- food processing industry (dairy and meat industries): total resistance to lactic acid and high pressure bactericidal sprays.

These cylinders, standardised ISO 6431, are available in 2 versions:
- with detachable mountings (brackets, joints, etc...) (1)
- with integral MP3 rear eye (2)



(*) Non-toxic seals adapted to food processing environments

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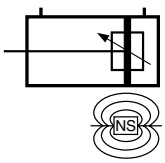
Series 435
Type: CIX

ANTI-CORROSIVE CYLINDERS

double effect - Ø 32 to 80 mm (Ø 100-125 mm, consult us)
Conforming with ISO 6431 standards
With detachable mountings



GENERAL

The cylinders are designed for use in corrosive environments:
- chemical, salty and humid atmospheres
- food processing industry (dairy and meat industries): high resistance to lactic acid and bactericidal sprays.

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : –10°C, +80°C
STANDARDS : **ISO 6431**

CONSTRUCTION

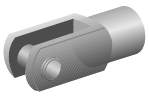
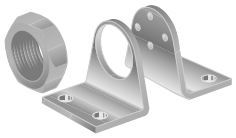
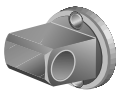
Barrel : stainless steel AISI 316 L
Rod : stainless steel AISI 316 L
Front and rear covers : stainless steel AISI 316 L
Rod nut : stainless steel AISI 316 L
Piston : light alloy
Piston seal : nitrile (NBR)
Rod seal : fluorelastomer (FPM)
Bearing : composite material
Dismounting : dismountable cylinders
Cushioning : adjustable pneumatic
Position detection : cylinders equipped for magnetic detectors (2)

CHOICE OF EQUIPMENT

Ø Bore (mm)	**CODES** (1)	REFERENCES (1) (2)	RECOMMENDED STANDARD STROKE (mm)											Max. possible stroke (mm)
			25	50	80	100	125	160	200	250	320	400	500	630	
32	**435 50 603 ...(1)**	CIX 32 A ...(1) - DM	●	●	●	●	●	●	●	●					800
40	**435 50 604 ...(1)**	CIX 40 A ...(1) - DM	●	●	●	●	●	●	●	●	●	●			800
50	**435 50 605 ...(1)**	CIX 50 A ...(1) - DM	●	●	●	●	●	●	●	●	●	●	●	●	1000
63	**435 50 606 ...(1)**	CIX 63 A ...(1) - DM	●	●	●	●	●	●	●	●	●	●	●	●	1000
80	**435 50 607 ...(1)**	CIX 80 A ...(1) - DM	●	●	●	●	●	●	●	●	●	●	●	●	1000

For 100-125 mm bores, consult us
(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Do not exceed maximum possible stroke.
(2) Detector not included

MOUNTINGS

Ø Bore (mm)	**CODES**						
	 Female rod clevis ISO 8140 **AP2**	 Spherical rod end ISO 8139 (4) **AP6**	 Front neck nut **MR3**	 Feet (3) **MS1**	 Cap, detachable eye (trunnion) **MP4**	 Cap, eye with spherical bearing (4) **MP6**	 Cap, clevis for spherical eye
32	**434 00 392**	**434 00 397**	**434 00 423**	**434 00 416**	**434 00 402**	**434 00 409**	**434 00 430**
40	**434 00 393**	**434 00 398**	**434 00 424**	**434 00 417**	**434 00 403**	**434 00 410**	**434 00 431**
50	**434 00 394**	**434 00 399**	**434 00 425**	**434 00 418**	**434 00 404**	**434 00 411**	**434 00 432**
63	**434 00 394**	**434 00 399**	**434 00 425**	**434 00 419**	**434 00 405**	**434 00 412**	**434 00 433**
80	**434 00 395**	**434 00 400**	**434 00 426**	**434 00 420**	**434 00 406**	**434 00 413**	**434 00 434**

All mountings are of stainless steel AISI 316 L (eye AP6 of AISI 304)
All rods are supplied with rod nuts
Additional rod nut of stainless steel AISI 316 L, on request
(3) Corresponds to a two feet + front neck nut set
(4) These accessories can provide 4° solid angle compensation

OPTION: PTFE rod seal

Ø bore	**CODE**
32	**510 536**
40	**510 537**
50-63	**510 538**
80	**510 539**

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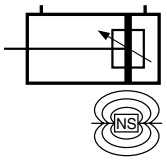
ASCO JOUCOMATIC

Series 435
Type: CIX

ANTI-CORROSIVE CYLINDERS

double effect - Ø 32 to 80 mm (Ø 100-125 mm, consult us)
Conforming with ISO 6431 standards
With integral rear eye



GENERAL

The cylinders are designed for use in corrosive environments:
- chemical, salty and humid atmospheres
- food processing industry (dairy and meat industries): high resistance to lactic acid and bactericidal sprays.

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or not
PRESSURE : 10 bar max.
TEMPERATURE : –10°C, +80°C
STANDARDS : **ISO 6431**

CONSTRUCTION

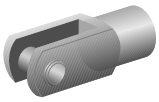
Barrel : stainless steel AISI 316 L
Rod : stainless steel AISI 316 L
Front and rear covers : stainless steel AISI 316 L
Rod nut : stainless steel AISI 316 L
Piston : light alloy
Piston seal : nitrile (NBR)
Rod seal : fluorelastomer (FPM)
Bearing : composite material
Dismounting : dismountable cylinders
Cushioning : adjustable pneumatic
Position detection : cylinders equipped for magnetic detectors (2)

CHOICE OF EQUIPMENT

Ø Bore (mm)	**CODES** (1)	REFERENCES (1) (2)	RECOMMENDED STANDARD STROKE (mm)												Max. possible stroke (mm)
			25	50	80	100	125	160	200	250	320	400	500	630	
32	**435 50 610** .(1)..	CIX 32 A .(1).. - DM	●	●	●	●	●	●	●	●					800
40	**435 50 611** .(1)..	CIX 40 A .(1).. - DM	●	●	●	●	●	●	●	●	●	●			800
50	**435 50 612** .(1)..	CIX 50 A .(1).. - DM	●	●	●	●	●	●	●	●	●	●	●	●	1000
63	**435 50 613** .(1)..	CIX 63 A .(1).. - DM	●	●	●	●	●	●	●	●	●	●	●	●	1000
80	**435 50 614** .(1)..	CIX 80 A .(1).. - DM	●	●	●	●	●	●	●	●	●	●	●	●	1000

For 100-125 mm bores, consult us
(1) Indicate stroke (in mm) preferably selecting one of the standard strokes above. Do not exceed maximum possible stroke.
(2) Detector not included

MOUNTINGS

Ø Bore (mm)	**CODES**	
	 Female rod clevis ISO 8140 **AP2**	 Spherical rod end ISO 8139 (3) **AP6**
32	**434 00 392**	**434 00 397**
40	**434 00 393**	**434 00 398**
50	**434 00 394**	**434 00 399**
63	**434 00 394**	**434 00 399**
80	**434 00 395**	**434 00 400**

Mountings are of stainless steel - Clevis AP2 of AISI 316L
- Eye AP6 of AISI 304
All rods are supplied with rod nuts
Additional rod nut of stainless steel AISI 316 L, on request
(3) These accessories can provide 4° solid angle compensation

OPTION: PTFE rod seal

Ø bore	**CODE**
32	**510 536**
40	**510 537**
50-63	**510 538**
80	**510 539**

Option code to be added to standard cylinder code

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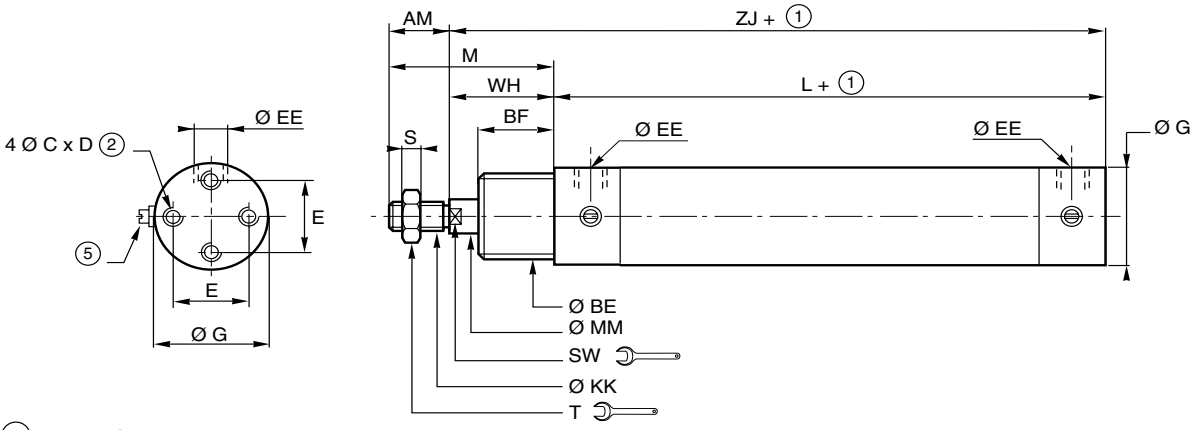
DIMENSIONS AND WEIGHTS

CYLINDER FOR DETACHABLE REAR MOUNTING

(supplied with front cover nut)

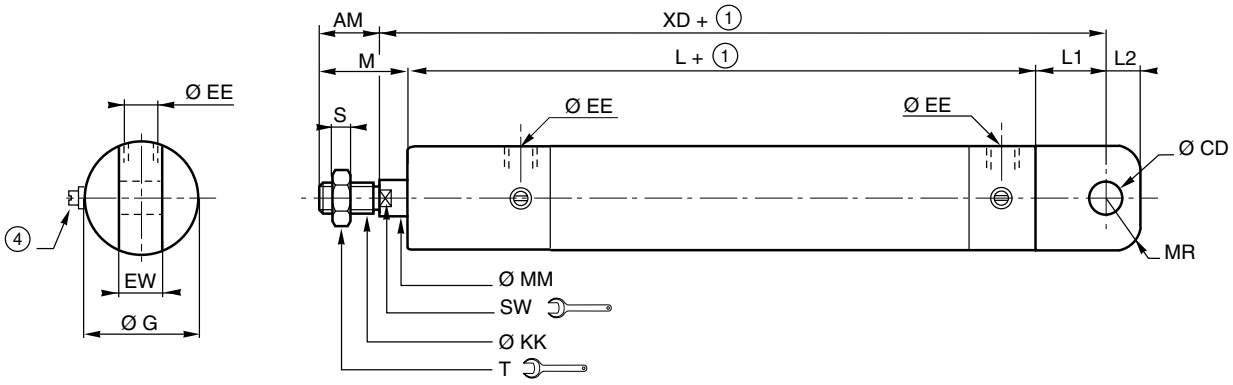


① : + stroke
② : depth

Ø Bore (mm)	DIMENSIONS (mm)																	Weights (kg)	
	AM	ØBE	BF	C	D	E	ØEE	L	ØG	ØKK	M	MM	S	SW	T	WH	ZJ	(3)	(4)
32	22	M30x1,5	22	M5	7	25	G1/8	92,5	36	M10x1,25	53	12	5	10	17	31	123,5	0,600	0,260
40	24	M35x1,5	25	M6	8	30	G1/4	107	44	M12x1,25	58	16	6	13	19	34	141	1,200	0,360
50	32	M42x1,5	28	M6	8	39	G1/4	107	54	M16x1,5	73	20	8	17	24	41	148	1,680	0,500
63	32	M42x1,5	28	M8	8	49	G3/8	123	68	M16x1,5	73	20	8	17	24	41	164	2,870	0,650
80	40	M50x2	28	M10	8,5	64	G3/8	136	86	M20x1,5	83,5	25	10	21	30	43,5	179,5	4,700	1

(3) Weight of cylinder with 0 mm stroke
(4) Weight to be added per additional 100 mm length
(5) Cushioning adjustment screw

CYLINDER WITH INTEGRAL REAR EYE - MP3



① : + stroke

Ø Bore (mm)	DIMENSIONS (mm)																Weights (kg)	
	AM	CD	ØEE	EW	L	ØG	ØKK	L1	L2	M	MR	MM	S	SW	T	XD	(2)	(3)
32	22	10	G1/8	10	109	36	M10 x 1,25	24	10	31	20	12	5	10	17	142	0,710	0,260
40	24	12	G1/4	12	127	44	M12 x 1,25	24	12	33	25	16	6	13	19	160	1,400	0,360
50	32	16	G1/4	16	132	54	M16 x 1,5	27	16	45	30	20	8	17	24	172	2,060	0,500
63	32	16	G3/8	16	150	68	M16 x 1,5	27	16	45	35	20	8	17	24	190	3,680	0,650
80	40	20	G3/8	20	158,5	86	M20 x 1,5	36	20	56	45	25	10	21	30	210	6	1

(2) Weight of cylinder with 0 mm stroke
(3) Weight to be added per additional 100 mm length
(4) Cushioning adjustment screw

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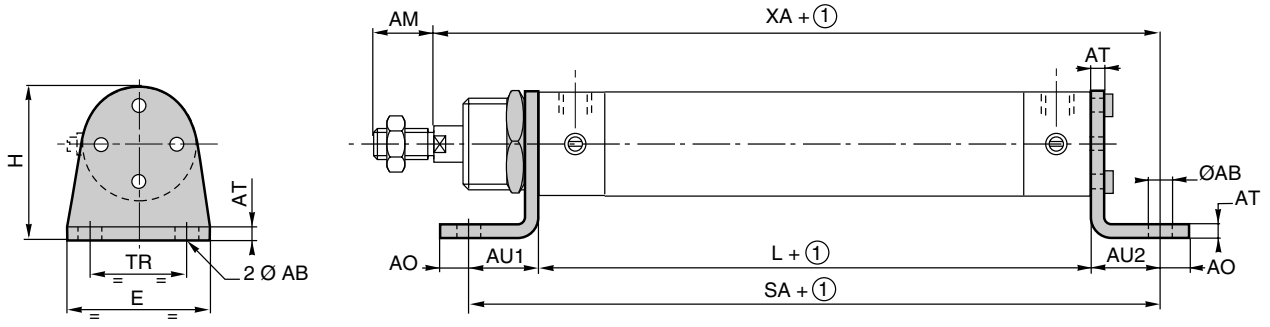
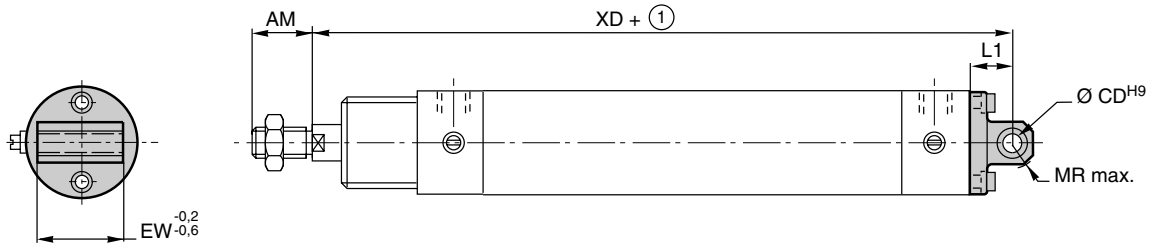
DIMENSIONS AND WEIGHTS

LOW FEET MOUNTING - MS1



CAP, DETACHABLE EYE (TRUNNION) MOUNTING - MP4



① : + Stroke

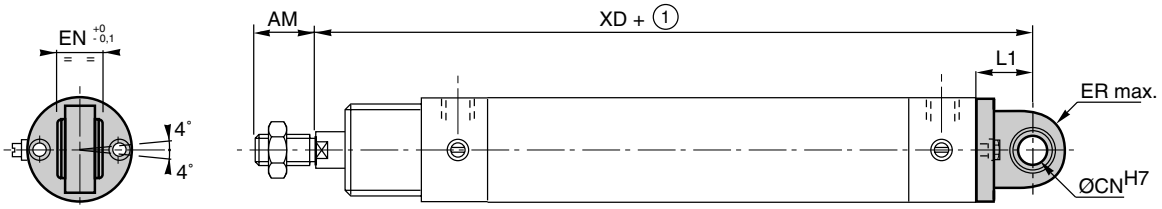
Ø bore (mm)	DIMENSIONS (mm)																	
	AB	AH	AM	AO	AT	AU1	AU2	CD	E	EW	H	L	L1	MR	SA	TR	XA	XD
32	7	32	22	9	3	28,5	20,5	10	45	26	51	92,5	18,5	11	142	32	144	142
40	9	36	24	9	3	32	22	12	52	28	59	107	19	13	161	36	163	160
50	9	45	32	9	4	36	27	12	62	32	74	107	22	13	170	45	175	170
63	9	50	32	9	4	36	26	16	72	40	86	123	26	17	185	50	190	190
80	12	63	40	15	5	38,5	35,5	16	90	50	108	136	30,5	17	210	63	215	210

Ø bore (mm)	Weights (kg)	
	2 feet	Cap, detachable eye (trunnion)
32	0,130	0,080
40	0,180	0,100
50	0,340	0,170

Ø bore (mm)	Weights (kg)	
	2 feet	Cap, detachable eye (trunnion)
63	0,450	0,320
80	0,900	0,580

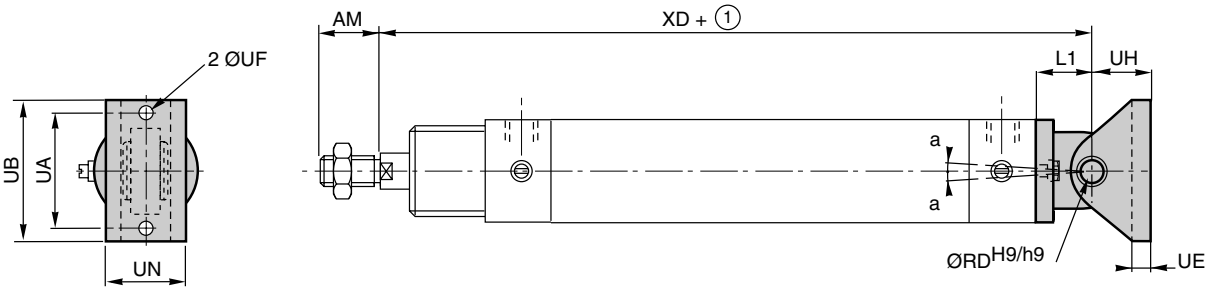
DIMENSIONS AND WEIGHTS

CAP, DETACHABLE EYE MOUNTING WITH SPHERICAL BEARING - MP6



STRAIGHT COMPLETE TRUNNION MOUNTING, SPHERICAL BEARING

The assembly consists of a cap, clevis for spherical eye and cap, eye with spherical bearing MP6.
These 2 parts are to be ordered separately.



① : + Stroke

Ø bore (mm)	DIMENSIONS (mm)													
	AM	CN	EN	ER	L	RD	UA	UB	UE	UF	UH	UN	XD	α
32	22	10	14	15	18,5	10	30	45	3	7	24	21	142	50°
40	24	12	16	18	19	12	38	55	3	9	27	23	160	50°
50	32	12	16	22	22	12	46	64	4	9	30	30	170	50°
63	32	16	21	22	26	16	58	79	4	12	36	30	190	50°
80	40	16	21	25	30,5	16	70	94	5	14	40	36	210	50°

Ø bore (mm)	Weights (kg)	
	Cap, detachable eye with spherical bearing	Complete trunnion with spherical bearing
32	0,090	0,170
40	0,140	0,230
50	0,220	0,400

Ø bore (mm)	Weights (kg)	
	Cap, detachable eye with spherical bearing	Complete trunnion with spherical bearing
63	0,340	0,610
80	0,600	1,010

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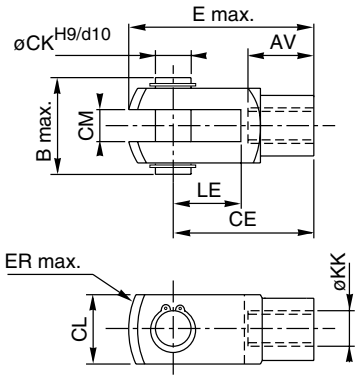
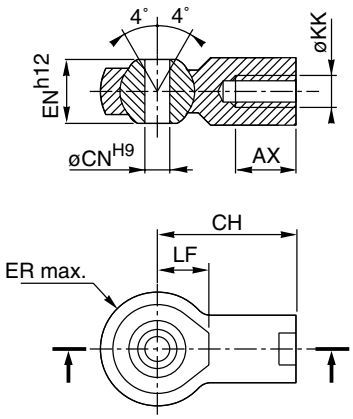
DIMENSIONS AND WEIGHTS

FEMALE ROD CLEVIS - ISO 8140



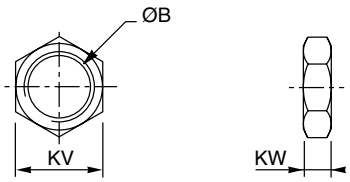
Ø bore (mm)	DIMENSIONS (mm)									
	AV	B	CE	CK	CL	CM	E	ER	KK	LE
32	20	26	40	10	20	10	52	13	M10 x 1,25	20
40	23	31	48	12	24	12	62	15	M12 x 1,25	24
50	34	39	64	16	32	16	83	20	M16 x 1,50	32
63	34	39	64	16	32	16	83	20	M16 x 1,50	32
80	40	48	80	20	40	20	105	25	M20 x 1,50	40

SPHERICAL ROD END - ISO 8139



Ø bore (mm)	DIMENSIONS (mm)						
	AX	CH	CN	EN	ER	LF	KK
32	20	43	10	14	13	14	M10 x 1,25
40	23	50	12	16	15	16	M12 x 1,25
50	34	64	16	21	20	22	M16 x 1,50
63	34	64	16	21	20	22	M16 x 1,50
80	40	77	20	25	25	26	M20 x 1,50

NECK NUT - MR3



Ø Bore (mm)	DIMENSIONS (mm)		
	Ø B	KV	KW
32	M30 x 1,5	36	10
40	M35 x 1,5	41	10
50	M42 x 1,5	50	12
63	M42 x 1,5	50	12
80	M50 x 2	65	12

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ANTI-CORROSIVE CYLINDERS Ø 32 to 80 mm - Type CIX

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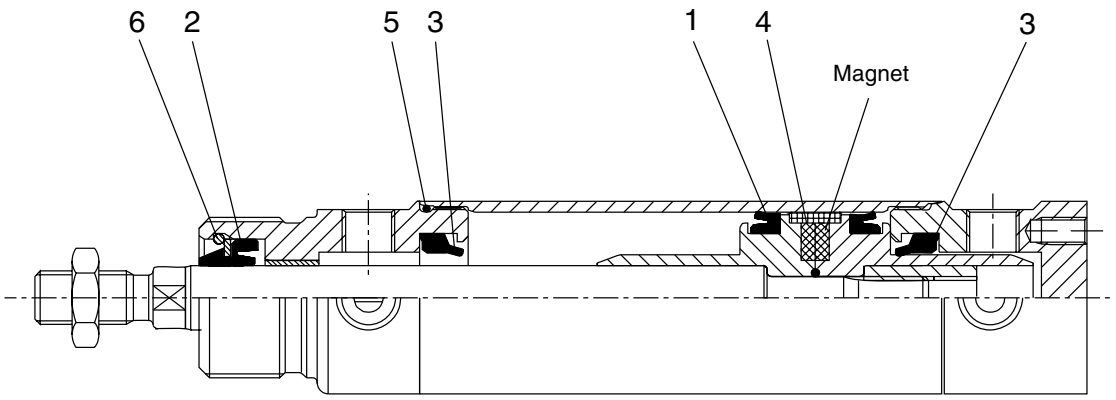

Ø CYLINDER BORE	Cylinder type	CODES	
		(Items 1 to 6)	(Items 2,5,6)
32	Designed for detector	**978 02 130**	**978 02 184**
40	Designed for detector	**978 02 131**	**978 02 185**
50	Designed for detector	**978 02 132**	**978 02 186**
63	Designed for detector	**978 02 133**	**978 02 187**
80	Designed for detector	**978 02 134**	**978 02 188**

NOTE: For optimal operation in a food processing environment, grease Polylub GA 352P is recommended.

RODLESS CYLINDERS, Ø 6 to 40 mm
WITH MAGNETIC COUPLING
SERIES 445 - TYPES : STN - STG

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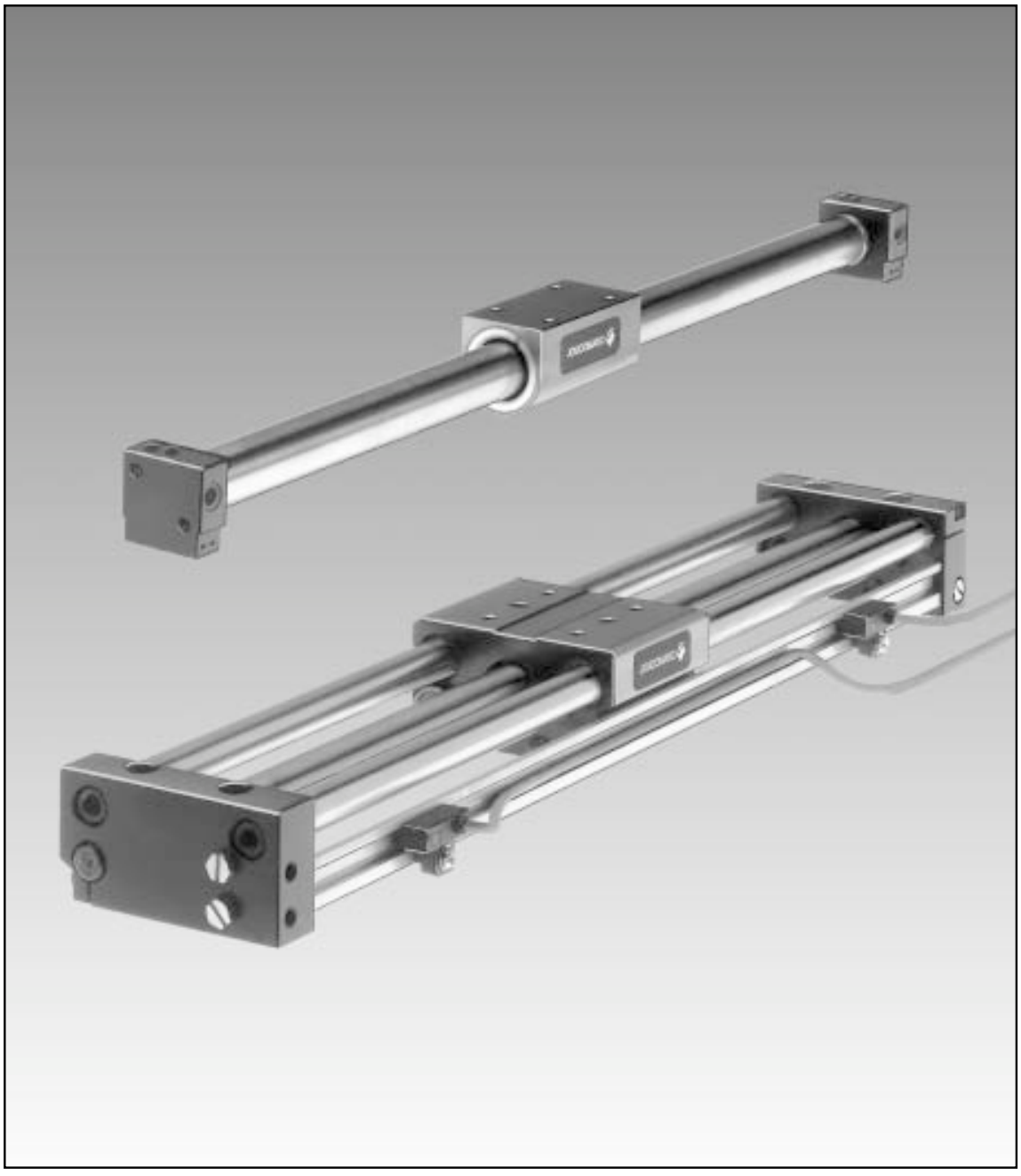

P260-GB.R2

ASCO® JOUCOMATIC

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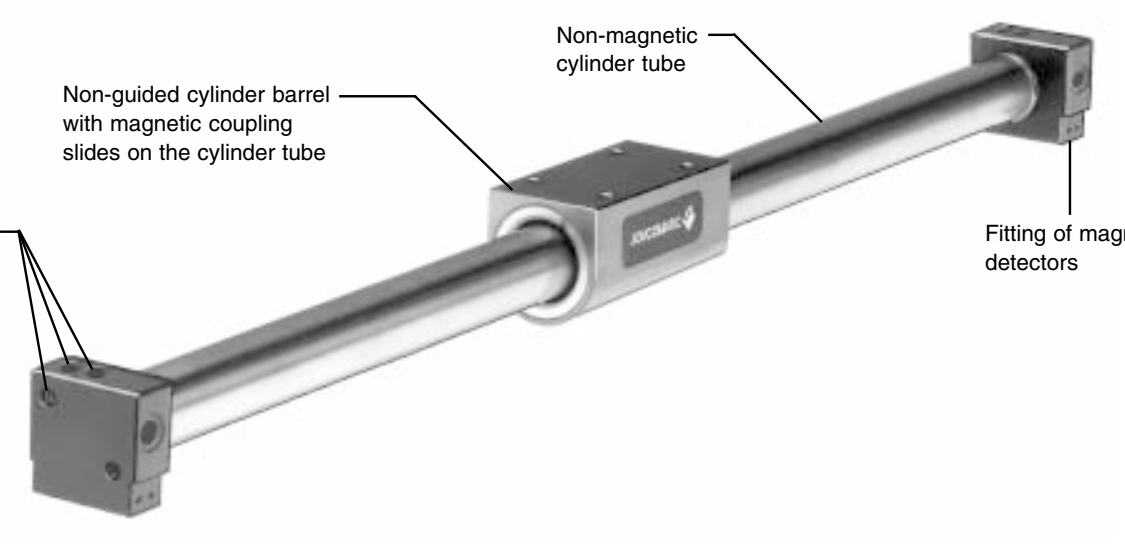
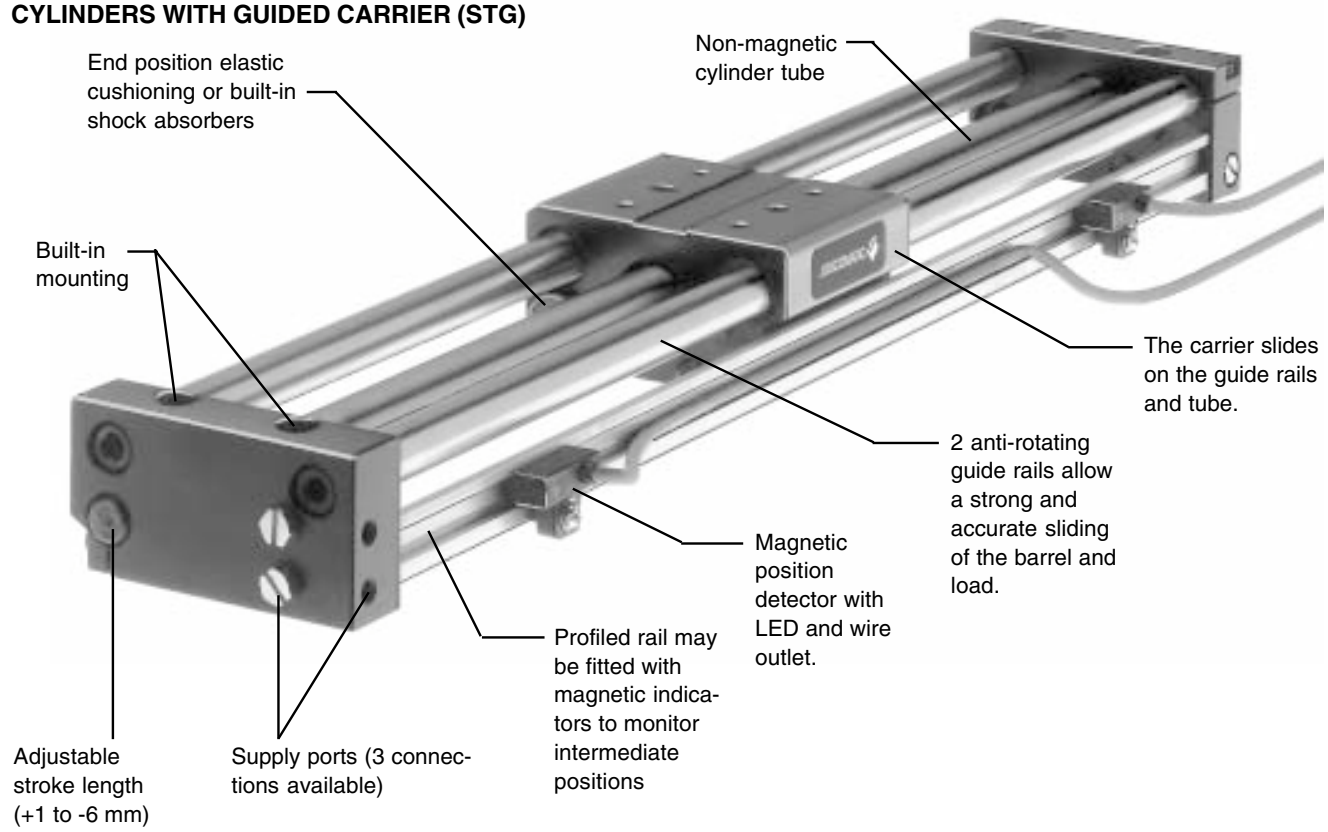
CYLINDERS WITH NON-GUIDED CARRIER (STN)



CYLINDERS WITH GUIDED CARRIER (STG)



SUMMARY

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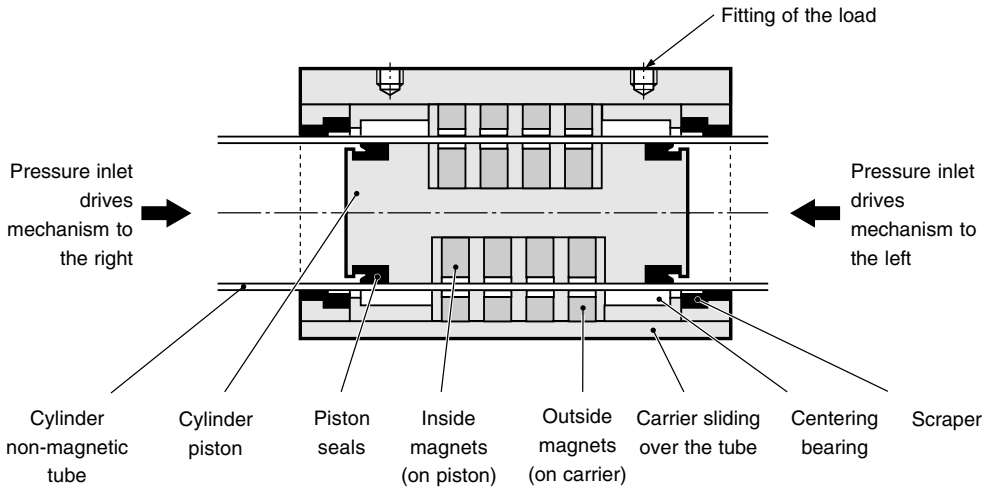
OPERATING SYSTEM

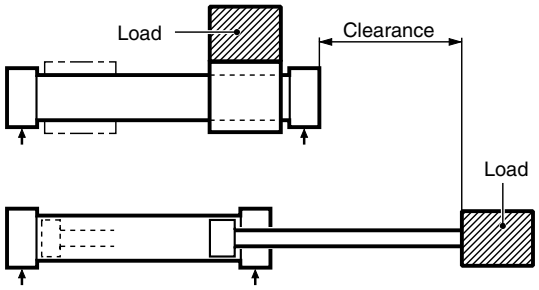
The air-operated cylinder slides within the non-magnetic tube. The cylinder activates the carrier via the magnetic coupling by means of powerful permanent magnets.



CHARACTERISTICS

Rodless cylinders with magnetic coupling offer many advantages :

- **REDUCED DIMENSIONS**
  Unlike the traditional pneumatic cylinders, the linear drive cylinders with magnetic coupling are rodless, with reduced dimensions, an easier sliding of the cylinder within the mechanism and a different positioning of the load to move. This type of cylinder is compact.
- **EASY MOUNTING**
  Cylinders are drilled for easier mounting and reduced dimensions.
- **LONG LASTING EQUIPMENT**
  Due to absence of piston rod and mechanical movement, the cylinder with magnetic coupling is hermetically closed : it is thus leakage- and dust-free.
- **NON LUBRICATED AIR**
  These products of advanced technology operate with lubricated or non-lubricated air.



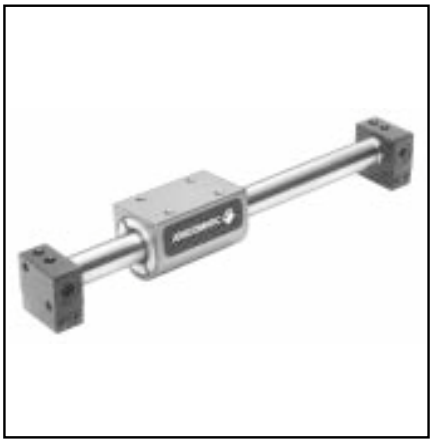
- **MECANICAL PROTECTION**
  The linear drive is performed by magnetic coupling. In case the holding limit is exceeded, a magnetic breakaway occurs, thus offering an additional protection of the machinery and their environment. The magnetic coupling is restored when the piston and carrier align once again.
- **POSITION CONTROL**
  All the cylinders are originally designed to be equipped with magnetic position detectors with ILS, LED and wire outlet.

APPLICATIONS

Whenever space is limited or large linear drives are required such as : door opening, sliding carriers, material handling, loading and feeding, transmission over conveyors, workpieces lift (or hoist), sliding of spraying guns or cutting tools etc...

Series 445
Type STN

DOUBLE ACTING RODLESS CYLINDERS,
Linear drive with magnetic coupling
with non-guided carrier
Equipped for magnetic detectors



SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or **NOT**
PRESSURE : 7 bar maxi
TEMPERATURE : 0°C, + 60°C

STROKES (in mm):

Cylinder bore in mm	6	10	16	20	25	32	40
mini	-	50	50	50	50	50	50
maxi	300	500	1000	1500	2000	2000	2000

FORCE OF THE MAGNETIC COUPLING

Cylinder bore in mm	6	10	16	20	25	32	40
Force (N)	21	60	160	300	460	730	1170

MAX. ALLOWABLE LOAD : The maximum allowable load is defined by its positioning and by the cylinder specifications (see Mechanical properties).
MAX. SPEED OF CARRIER : 0.4 m/s (this upper limit avoids magnetic breakaway).
CUSHIONING : Elastic cushioning with nitrile (NBR) rings.
DETECTORS : The cylinders are equipped for magnetic detectors of end stroke positions (except Ø6).

CONSTRUCTION

Cylinder tube : Stainless steel.
Front and rear covers : Anodized light alloy.
Carrier : Light alloy with nitrile wear rings and seals.
Piston : Stainless steel and light alloy.
Piston seals : Nitrile (NBR).
Magnets : Rare earths, a highly performing magnetic material.

CHOICE OF EQUIPMENT

Cylinder bore in mm	CYLINDER WITH ELASTIC CUSHIONING CODES NON-CUSHIONED	REFERENCES	Connector Ø
6	**445 50 001***	**STN 6 NA ***	M 5
10	**445 50 002***	**STN 10 NA * -DM**	M 5
16	**445 50 003***	**STN 16 NA * -DM**	M 5
20	**445 50 004***	**STN 20 NA * -DM**	G 1/8
25	**445 50 005***	**STN 25 NA * -DM**	G 1/8
32	**445 50 006***	**STN 32 NA * -DM**	G 1/8
40	**445 50 007***	**STN 40 NA * -DM**	G 1/4

* Please specify stroke length (in mm)

ACCESSORY

ALIGNMENT COMPENSATION BRACKET

Cylinder bore (in mm)	Ø 6	Ø 10	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40
CODE	**881 44 501**	**881 44 502**	**881 44 503**	**881 44 504**	**881 44 505**	**881 44 506**	**881 44 507**

MAGNETIC POSITION DETECTOR : see next pages

SPECIFYING THE REFERENCE OF A RODLESS CYLINDER WITH NON-GUIDED CARRIER

STN **10** **NA** **· · ·** – **DM**

Type of rodless cylinder with non-guided carrier
Cylinder bore (in mm)
With elastic cushioning : use **NA** suffix
Stroke length (in mm)
Cylinder equipped for magnetic position detectors : use **DM** suffix

ORDERING INFORMATION

On your order please specify : **445 50 002** + stroke : 200 mm **STN 10 NA 200-DM**

Cylinder code followed by stroke length (in mm)
or cylinder reference followed by stroke length (in mm)
Note : Accessories and detectors must be ordered separately.
ACCESSORY - Accessory code **881 44 ---**
DETECTOR - Detector code and quantity **881 44 513**

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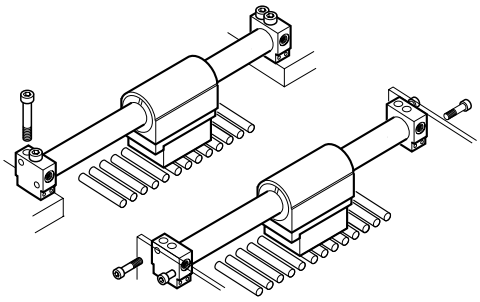
AVAILABLE MOUNTINGS

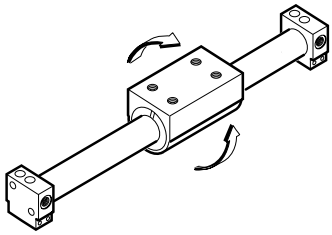


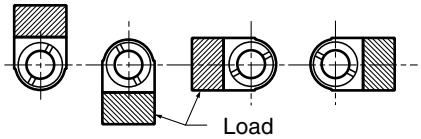
●ADJUSTABLE MOUNTING

Front and rear covers allow axial or radial mounting

●CHOICE OF ADAPTATIONS FOR SYSTEMS

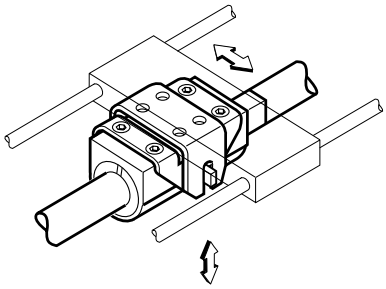
The carrier is rotatable up to 360° around the tube axis. The load thus may be fitted whatever the position angle. (For cylinders with magnetic position detector, see recommendations below).
The user must often fit an anti-rotating device. This type of cylinder is thus particularly recommended for the linear drive of guided loads.





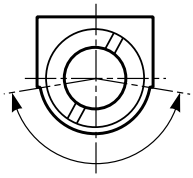
●ALIGNMENT COMPENSATION BRACKET

Specially designed for loads guided externally, this additional bracket (see accessories) suppresses interfering moments and frictional losses due to the misalignment of the guiding mechanism and cylinder axes.



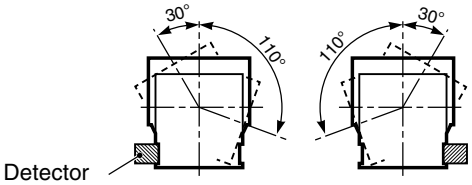
●STROKE END MAGNETIC DETECTORS

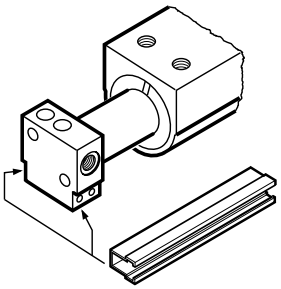
The cylinder is equipped for magnetic position detectors. The magnetic field of the detector coincides with the round part of the carrier.
Each detector is delivered with a mounting rail and a fitting device.
Each rail is fastened on the cylinder covers , with front or rear mounting available.
End position sensing only.



Magnetic field of the detector

Possibilities of carrier adjusting according to the detector position on the cylinder end :

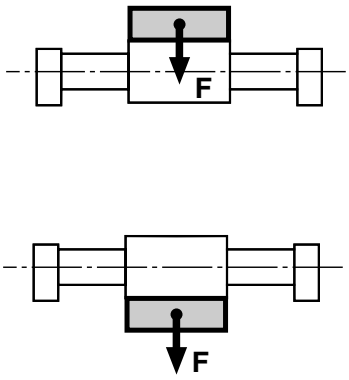




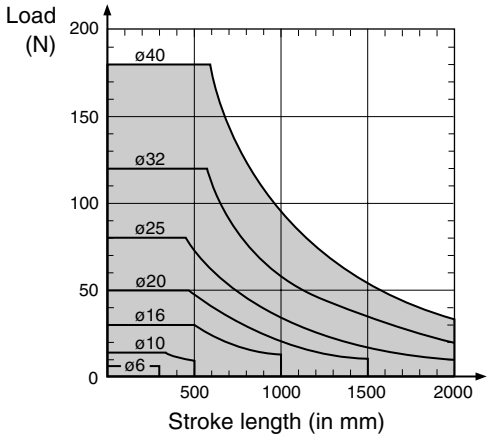
Front or rear mounting of the mounting rail

CYLINDER WITH NON-GUIDED CARRIER
Mechanical properties

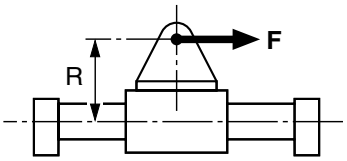
The rodless cylinder is essentially recommended for sliding loads over long strokes. The load may be positioned directly over / under the cylinder while conforming to the maximums defined according to the cylinder stroke.



Cylinder bore (in mm)	Max. load (N)
6	4
10	12
16	30
20	50
25	80
32	120
40	180



SLIDING EXTERNAL SLIDE UNITS (HORIZINTAL MOUNTING)



M = F x R

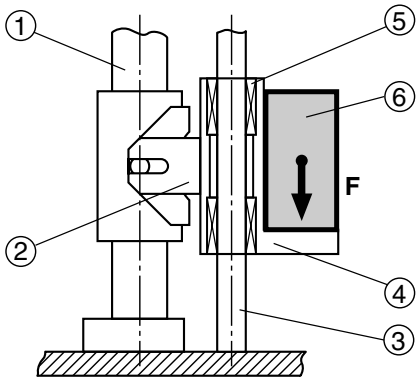
Cylinder bore (in mm)	Max. moment M (Nm)	Max. F * (N)
6	0,1	13
10	0,3	36
16	1,2	100
20	2,5	180
25	4	280
32	9	438
40	14	702

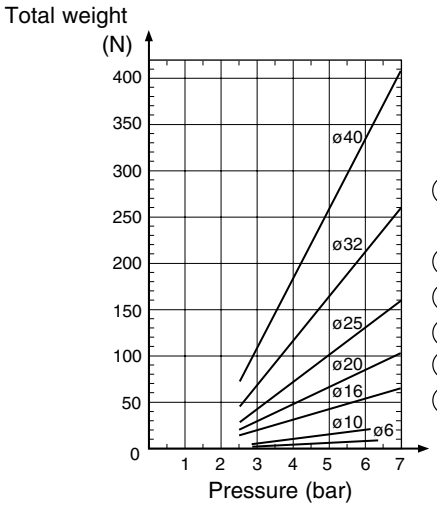
* up to 7 bar

Due to linear drive and load positioning over the rodless cylinder, an effort results from sliding the load. Depending on the maximum values of moments and efforts shown in table opposite, determine the diameter of the appropriate cylinder.

SLIDING EXTERNAL SLIDE UNITS (VERTICAL MOUNTING)

In a vertical mounting, the load must be guided externally. The ratio between the total load to slide and the driving pressure is defined by the diagram below.





① - Rodless cylinder with non-guided carrier
② - Alignment compensation bracket
③ - External guide device
④ - Carrier
⑤ - External guide bearing
⑥ - Load

Total weight to slide = Carrier weight + Load weight

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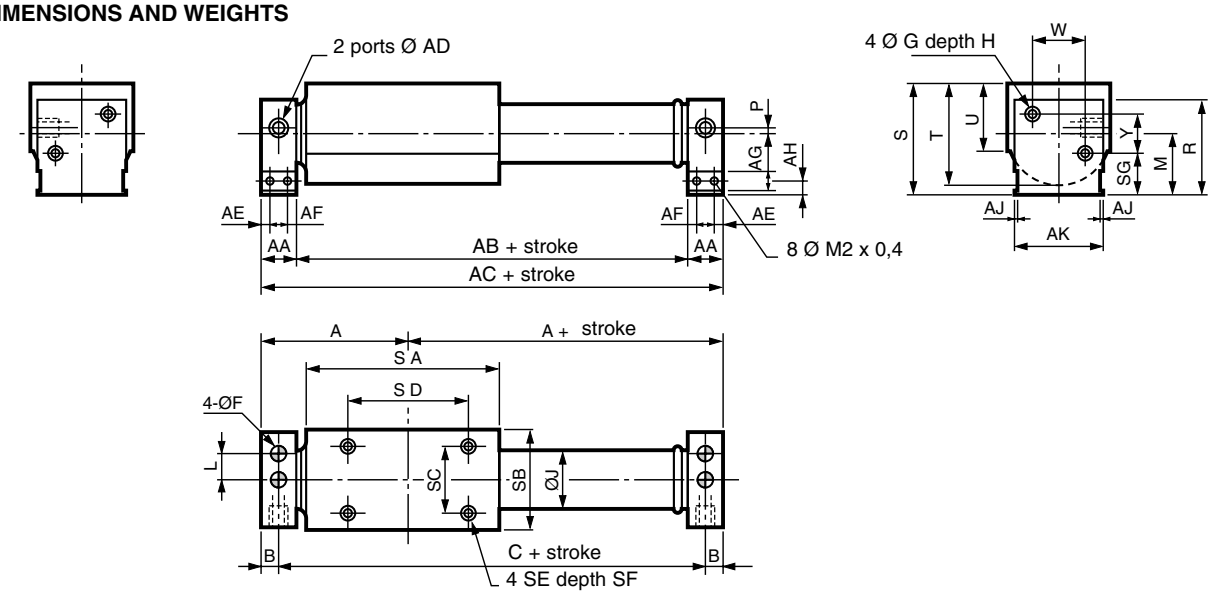
DIMENSIONS AND WEIGHTS

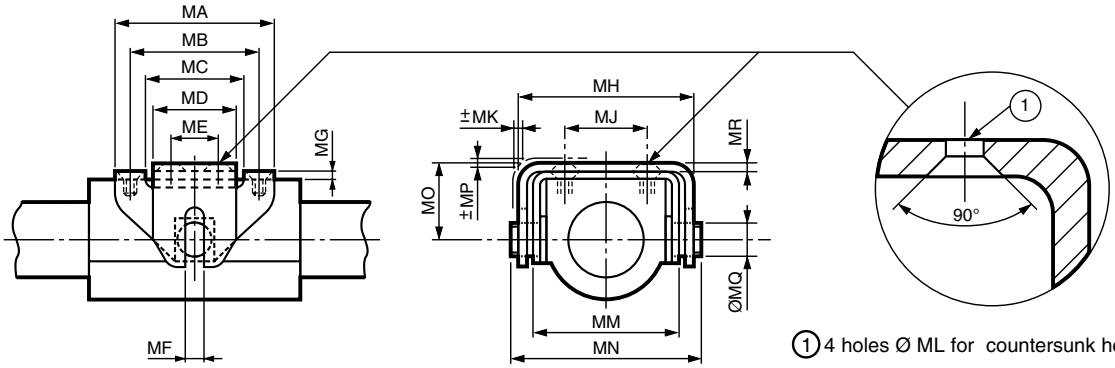


Ø (mm)	A	B	C	F	G	H	J	L	M	P	R	S	T	U	W	Y	AA	AB	AC
6	32,5	5	55	3,4	M3 x 0,5	5	6,8	4	10	0	14	18,5	17	11	8	0	10	45	65
10	33,5	5,5	56	3,4	M3 x 0,5	6	11	6,5	14	1	22	26,5	25	16	13	9	11	45	67
16	43	5,5	75	4,5	M4 x 0,7	6	17,4	8	17	0	27	32	30	20	16	12	11	64	86
20	53	8	90	4,5	M4 x 0,7	9	21,4	11	21	0	33	39	36	24	22	16	16	74	106
25	56	8	96	5,5	M5 x 0,8	9	26,4	12	23	0	38	44	42	28	24	20	16	80	112
32	64	8	112	6,6	M6 x 1	9	33,6	16	30	0	48	56	52	35	32	24	16	96	128
40	76	10	132	6,6	M6 x 1	12	41,6	18	37	0	60	69	64	43	36	28	20	112	152

Ø (mm)	AD	AE	AF	AG	AH	AJ	AK	SA	SB	SC	SD	SE	SF	SG	WEIGHTS (Kg) 1	WEIGHTS (Kg) 2
6	M5 x 0,8	—	—	—	—	—	14	41	17	10	25	M3 x 0,5	4	5	0,050	0,006
10	M5 x 0,8	2,5	6	6	3,7	0,5	22	41	25	16	22	M3 x 0,5	6	9,5	0,110	0,013
16	M5 x 0,8	2,5	6	6	4	1	27	59	30	20	35	M4 x 0,7	6	11	0,210	0,028
20	G 1/8	2,5	11	6	6	1	32	68	36	26	40	M4 x 0,7	9	13	0,410	0,035
25	G 1/8	2,5	11	6	5	1	36	74	42	30	42	M5 x 0,8	9	13	0,550	0,047
32	G 1/8	2,5	11	6	8	2	46	87	52	38	55	M6 x 1	9	18	1,030	0,065
40	G 1/4	2,5	15	6	9	1	50	102	64	50	65	M6 x 1	15	23	1,830	0,080

1 - Cylinders weight with stroke 0
2 - Weight to add per 100 mm stroke

WITH ALIGNMENT COMPENSATION BRACKET (ACCESSORY)



(1) 4 holes Ø ML for countersunk head screw F90

Mounting this bracket allows to compensate alignment errors between load guiding and cylinder axis : ± MK (↔) and ± MP (↕).

Head screws F90 must be fitted with LOCTITE 241 on the carrier as well as on the load.

Ø (mm)	MA	MB	MC	MD	ME	MF	MG	MH	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	WEIGHTS (Kg)
6	32	25	18	16	9	2	2	29	0	1	3,5	23	32	13	2	3	2	0,027
10	29	22	15	14	7	2,5	2	37	16	1	3,5	31	40	17	2	4	2	0,032
16	45	35	24	20	10	4	2,5	45	20	1	4,5	38	50	20	2	6	2,6	0,074
20	52	40	30	26	16	5	2,5	51,2	26	1	4,5	44	54	23	2	8	2,6	0,100
25	57	42	31	29	17	6	3,2	61,8	30	1,5	5,5	52,4	66	27	2	10	3,2	0,175
32	73	55	39	37	20	8	4,5	79	38	2	6,6	66	84	34	2,5	12	4,5	0,370
40	83	65	49	46	30	10	4,5	91	50	2	6,6	78	96	40	2,5	16	4,5	0,525

MAGNETIC POSITION DETECTOR
for rodless cylinder with non-guided carrier - STN

OPERATING SYSTEM

A permanent magnet mounted on the rodless cylinder carrier operates on stroke end a reed switch (ILS) mounted on the cylinder cover. The detector is fitted with a warning lamp which lights when the contact is closed.

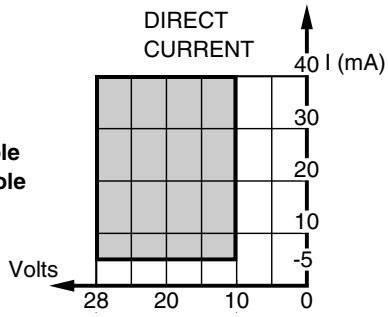
ELECTRICAL CHARACTERISTICS

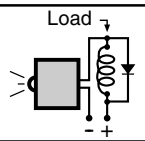
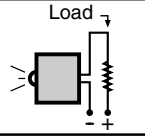
SWITCHING POWER	
max. DC current	: 1.12 W
SWITCHING VOLTAGE	: 10 to 28 VDC (1)
MAX. SWITCHING CURRENT	: 40 mA
CONTACT RESISTANCE	: 100 mΩ
INSULATION RESISTANCE	: 100 MΩ
WITHSTAND VOLTAGE	: 1000 V
RESPONSE TIME opening	: 0.05 ms
closing	: 0.4 ms
REPEATABILITY	: ± 0.1 mm
LIFE	: 5 X 10^6 operations
AMBIENT TEMPERATURE	: 0°C, + 60°C
ELECTRICAL PROTECTION	: see below
HOUSING	: brass
NF C20010 PROTECTION	: IP66
CONNECTION	: 1 Ø 3 mm cable, 1.5 m long, 2 conductors 0.15 mm2
INDICATOR LAMP	: Red diode (LED) which lights when the contact is closed

(1) The indicator lamp gives a voltage drop approx. 2.5 V.

Note : The operating point must be within the shaded zone. Any overvoltage or overintensity may damage the detector.

Polarity to be respected for DC application :
Black wire ⟶ - Pole
White wire ⟶ + Pole



INDUCTIVE LOAD		100 V/1A Diode
RESISTIVE LOAD		Protection not necessary

The user is responsible for supply and assembly of the diode.

PARTICULAR APPLICATIONS

1 - Detectors used for direct control of incandescent lamps : The power specified on the lamp is based on its resistance when hot, the resistance is very low when turned on with the lamp cold and the amperage can become very great and may exceed the ILS rating, allowance should therefore be made for the actual wattage of the bulb when cold.

2 - With wiring longer than 10 m, a 1000 Ω resistor must be fitted in series with the detector to reduce the capacitance effect caused by the wiring.

DETECTOR CODE

DESCRIPTION	CODE
Magnetic position detector with reed switch (ILS) and wire outlet for rodless cylinder with **non-guided** carrier - type **STN**	**881 44 513**

The detector is supplied with a securing collar adapted to the cylinder diameter.

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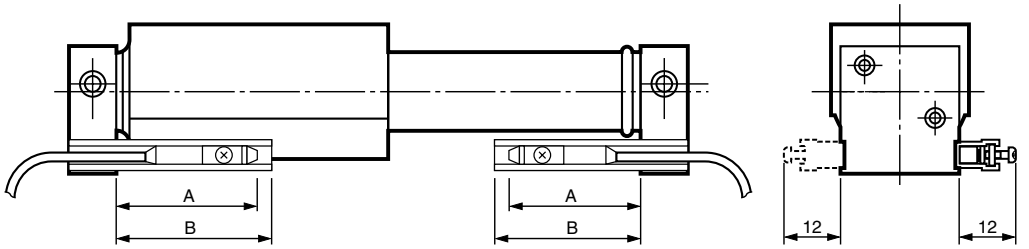
DIMENSIONS WITH DETECTOR

The detector must be mounted according to dimension A below. The detector position may be adjusted allowing a 1 mm overlap.

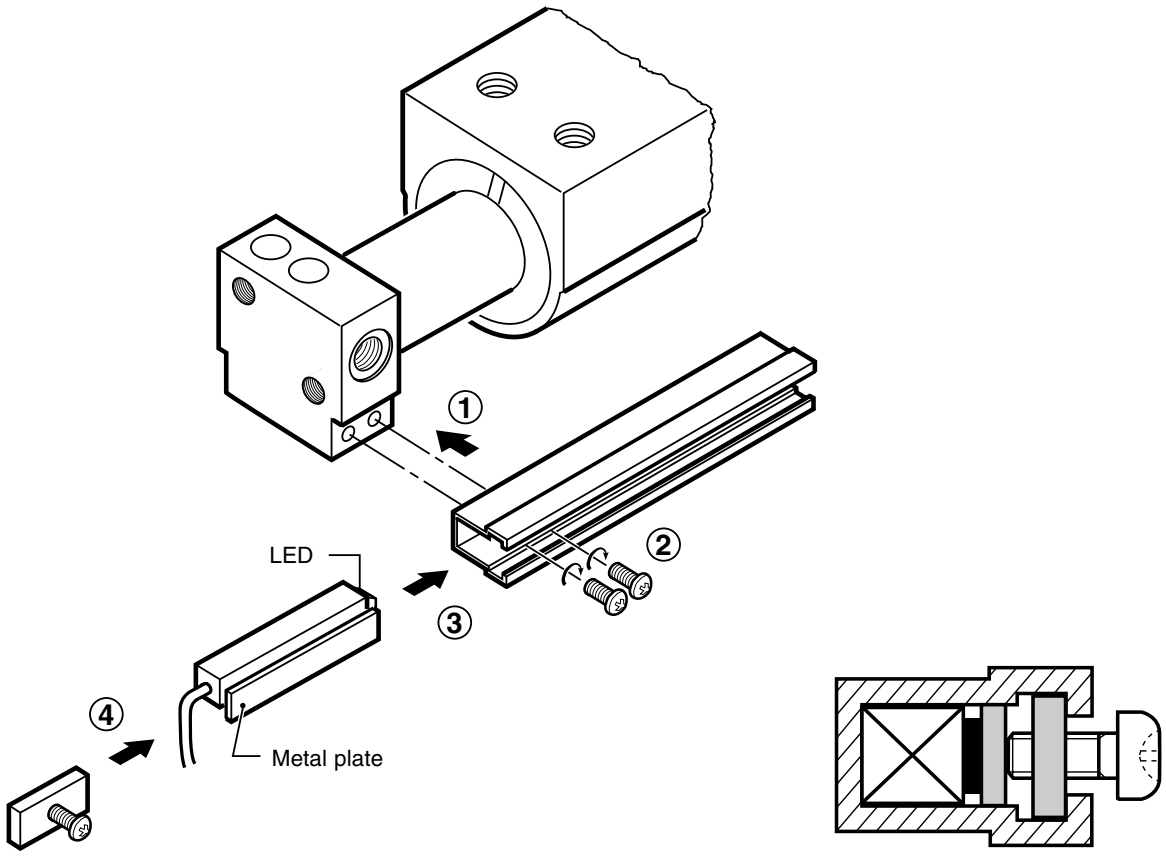


Cylinder bore (in mm)	A	B
10	28	49,5
16	33	49,5
20	36	43,5
25	39	43,5
32	43,5	43,5
40	49	39,5

2

MOUNTING THE DETECTOR

- Fit the rail either on front or rear cylinder cover.
- Respect the directional mounting of detector with LED **inwards** and mounting instructions of parts.
- The detector is screwed into the rail by means of the locking screw. Max. screwing torque : < 0.2 Nm.



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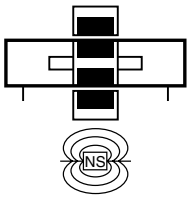
Series 445
Type STG

DOUBLE ACTING RODLESS CYLINDERS

Linear drivewith magnetic coupling
With guided carrier
With or without shock absorber
Equipped for magnetic detectors



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SPÉCIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or **NOT**
PRESSURE : 7 bar maxi
TEMPERATURE : 0°C, + 60°C
STROKES (in mm) :

Cylinder bore in mm		6	10	16	20	25	32	40
min.	without absorber	50	50	50	50	50	50	50
	with absorber	100	100	100	100	100	150	150
max.		300	500	750	1000	1500	1500	1500

FORCE OF THE MAGNETIC COUPLING :

Cylinder bore in mm	6	10	16	20	25	32	40
Force (N)	21	60	160	300	460	730	1170

MAX. ALLOWABLE LOAD : The maximum allowable load is defined by its positioning and by the cylinder specifications (see Mechanical properties).

MAX. SPEED OF CARRIER : 0.5 m/s (this upper limit avoids magnetic breakaway).
CUSHIONING : Elastic cushioning with or without shock absorber, not adjustable.
DETECTORS : The cylinders are equipped for magnetic position detectors.

CONSTRUCTION

Cylinder tube : Stainless steel.
Front and rear covers : Anodized light alloy.
Slide unit : Light alloy with nitrile wear rings and seals.
Piston : Stainless steel and light alloy.
Piston seals : Nitrile (NBR).
Magnets : Rare earths, a highly performing magnetic material.
Guide rings : Teflon.

CHOICE OF EQUIPMENT

Cylinder bore in mm	CYLINDER WITH ELASTIC CUSHIONING CODE	CYLINDER WITH ELASTIC CUSHIONING REFERENCES	CYLINDER WITH SHOCK ABSORBER CODE	CYLINDER WITH SHOCK ABSORBER REFERENCES	Connection Ø
6	**445 50 008***	**STG 6 NA ⏢* -DM**	**445 50 015***	**STG 6 A ⏢* -DM**	M 5
10	**445 50 009***	**STG 10 NA ⏢* -DM**	**445 50 016***	**STG 10 A ⏢* -DM**	M 5
16	**445 50 010***	**STG 16 NA ⏢* -DM**	**445 50 017***	**STG 16 A ⏢* -DM**	M 5
20	**445 50 011***	**STG 20 NA ⏢* -DM**	**445 50 018***	**STG 20 A ⏢* -DM**	G 1/8
25	**445 50 012***	**STG 25 NA ⏢* -DM**	**445 50 019***	**STG 25 A ⏢* -DM**	G 1/8
32	**445 50 013***	**STG 32 NA ⏢* -DM**	**445 50 020***	**STG 32 A ⏢* -DM**	G 1/8
40	**445 50 014***	**STG 40 NA ⏢* -DM**	**445 50 021***	**STG 40 A ⏢* -DM**	G 1/4

***** Please specify stroke length (in mm)

MAGNETIC POSITION DETECTOR : see next pages

SPECIFYING THE REFERENCE OF A RODLESS CYLINDER WITH GUIDED CARRIER

STG **10** **NA/A** **· · ·** – **DM**

Type of rodless cylinder with guided carrier
Cylinder bore (in mm)
With elastic cushioning : use **NA** suffix
With shock absorber = suffixe **A**
Stroke length (in mm)
Cylinder equipped for magnetic position detectors : use **DM** suffix

ORDERING INFORMATION

On your order please specify : **445 50 009** + course : 200 mm **STG 10 NA 200-DM**

Cylinder code followed by stroke length (in mm)
or cylinder reference followed by stroke length (in mm)
NOTE : Detectors must be ordered separately
DETECTOR - Detector code and quantity **881 44 . . .**

ASCO JOUCOMATIC

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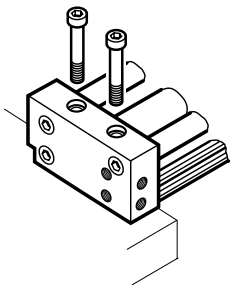
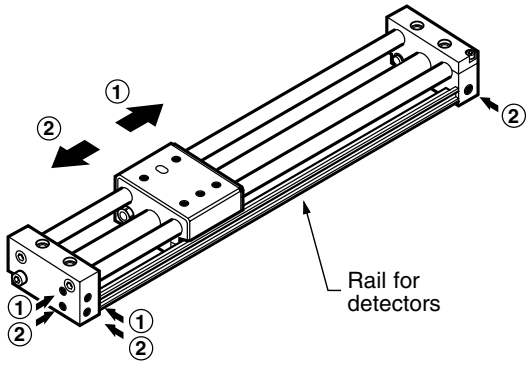
AVAILABLE MOUNTINGS

• ADJUSTABLE MOUNTING

The front and rear covers are rectangular and allow a screwed radial mounting (no additional accessory).



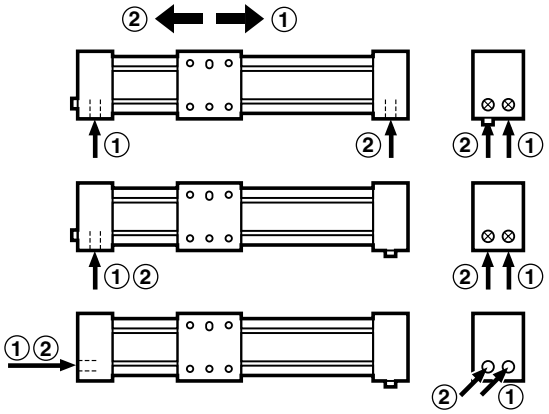


• SEVERAL CONNECTIONS AVAILABLE

The rodless cylinder with guided carrier is always equipped with a rail for magnetic position detectors. This specially designed rail includes a pressure supply pipe from one head cover to the other, the left one fitted with various ports. This mounting allows 3 axial or radial connections.
Note: Supplying pressure through both ports of a same head cover, mainly for large wiring, offers many advantages :

- reduced wiring
- positioning of the control valve close to the 2 ports
- less damage on piping due to mechanical movements
- reduced dimensions

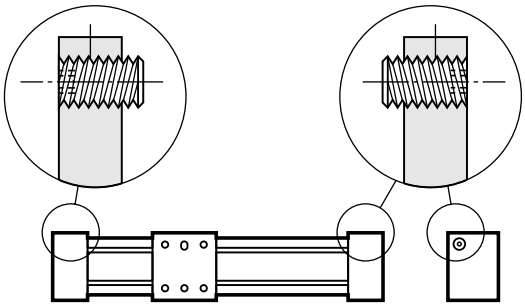
Close unused ports



• ADJUSTABLE STROKE

The stroke of the rodless cylinder with guided carrier may be adjusted from + 1 mm to - 6 mm screwing up/down the side stops of stroke end :

- Down to - 3 mm, adjusting stroke length from one side or both sides.
- Down to - 3 mm to - 6 mm or up to + 1 mm from both sides.



• CUSHIONING

The rodless cylinders with guided carrier are available in two versions :

- with elastic cushioning with polyurethane dampers
- with built-in, not adjustable shock absorber, acting on both stroke ends.

With elastic cushioning

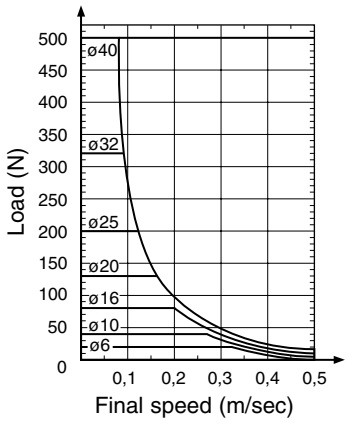
With shock absorber

• MAGNETIC POSITION DETECTORS

The cylinder is equipped for sensors detecting stroke end and/or intermediate positions. These reed detectors are directly fitted on the rail and are operated by a permanent magnet within the carrier.

• REDUCED MAINTENANCE

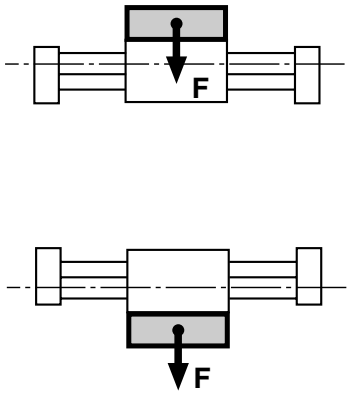
The slide bearings with teflon rings protected by scrapers allow the cylinder tube and side guide rails to operate without lubrication.



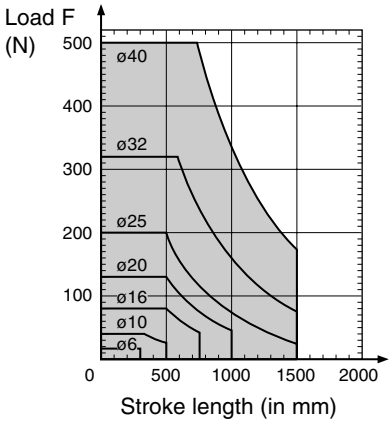
LOAD/SPEED DIAGRAMM
Diagram opposite indicates the max. performances of the STG cylinders. If the intersection point of the final speed and load is beyond the curves, it is necessary to select a cylinder equipped with shock absorber (see specifie features on the following pages).

CYLINDER WITH GUIDED CARRIER
Mechanical properties

The rodless cylinder is essentially recommended for sliding loads over long strokes. The load may be positioned directly over / under the cylinder while conforming to the maximums defined according to the cylinder stroke.

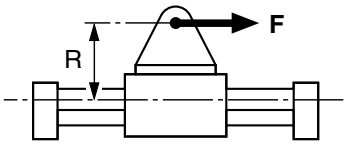


Cylinder bore (in mm)	Max. load F (N)
6	15
10	40
16	80
20	130
25	200
32	320
40	500



HORIZONTALLY OPERATING SLIDE UNITS

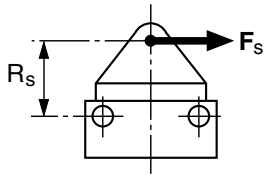
Due to linear drive and load positioning over the rodless cylinder, an effort results from sliding the load. Depending on the maximum values of moments and efforts shown in tables below, determine the diameter of the appropriate cylinder.



$M = F \times R$

Cylinder bore (in mm)	Max. moment M (N.m)	Max F* (N)
6	0,3	13
10	1	36
16	2,5	100
20	5,5	180
25	10	280
32	16	438
40	25	702

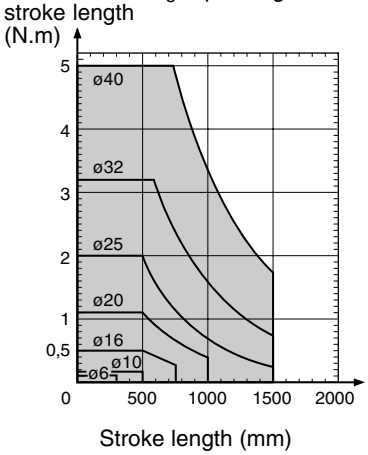
* up to 7 bar

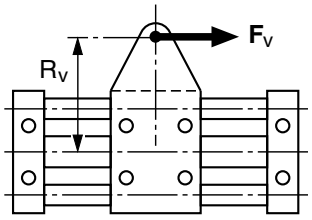


$M_s = F_s \times R_s$

Cylinder bore (in mm)	Max. moment M_s (N.m)
6	0,06
10	0,2
16	0,5
20	1,1
25	2
32	3,2
40	

Max. moment M_s depending on the stroke length





$M_v = F_v \times R_v$

Cylinder bore (in mm)	Max. moment M_v (N.m)	Max. F_v* (N)
6	0,3	13
10	1	36
16	2,5	100
20	5,5	180
25	10	280
32	16	438
40	25	702

* up to 7 bar

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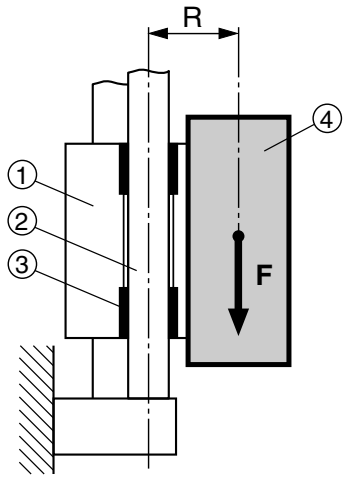
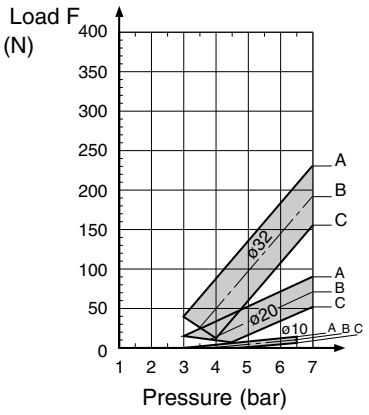
VERTICALLY OPERATING SLIDE UNITS

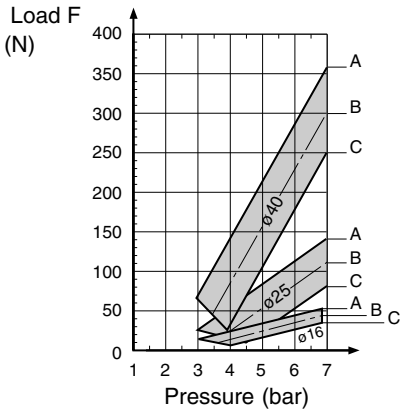
For vertically operating slide units, please refer to the diagram below to determine the relation between the load, the torsional moment M and the supply pressure.



Torsional moment :
M = F x R

1 - Rodless carrier with guided carrier
2 - Cylinder guide rods
3 - Guide bearings
4 - Load





Ⓐ - Curves with moment M = 0
Ⓑ - Curves with moment M = see (B) above
Ⓒ - Curves with moment M = see (C) above

Cylinder bore (in mm)	Ⓑ Max. moment M/2 (N.m)	Ⓒ Max. moment M (N.m)
6	0,15	0,3
10	0,5	1
16	1,25	2,5
20	2,75	5,5
25	5	10
32	8	16
40	12,5	25

SHOCK ABSORBERS CHARACTERISTICS

- Double acting, non adjustable
- Max. final speed ; 0,5 m/s

Ø Cylinder (mm)	**6**	**10**	**16**	**20**	**25**	**32**	**40**
Max. inertial force W3 (J)	0,5	1	2,5	4	6	13,5	27
Absorber stroke (mm)	6	8	10	10	12	15	18

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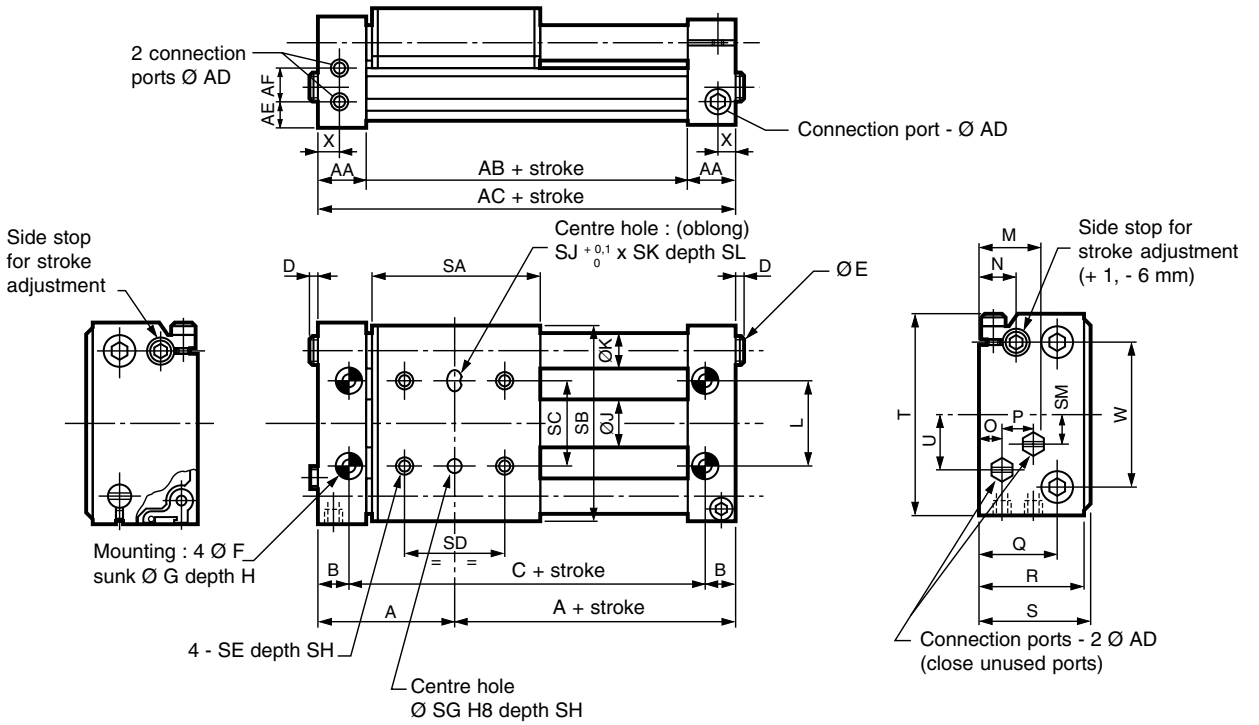
DIMENSIONS AND WEIGHTS



Ø (mm)	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T
6	34	9	50	4	M8 x 1,25	3,4	6,5	3,3	6,8	6	16	14,5	10	6	8,5	22	26	27	50
10	37,5	9	57	3	M10 x 1,5	4,5	8	4,5	11	10	20	18	12	6	11,5	26	33	34	60
16	48	11	74	4	M10 x 1,5	5,5	9,5	5	17,4	12	30	20	12	7	12	27	36	38	70
20	52,5	13	79	3	M12 x 1,75	5,5	9,5	5,5	21,4	14	35	24	15	8	14,5	33	44	46	84
25	57	14	86	4	M14 x 2	6,6	11	6,5	26,4	16	40	26	16	8,5	16,5	36	48	50	94
32	68,5	16	105	2	M18 x 2,5	9	14	8,5	33,6	20	50	31	20	10	20	44	58	60	116
40	76,5	19	115	4	M20 x 2,5	9	14	8,5	41,6	25	65	37,5	24	12	24	52	70	72	140

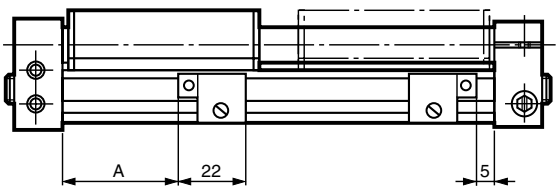
Ø (mm)	U	W	X	AA	AB	AC	AD	AE	AF	SA	SB	SC	SD	SE	SF	SG	SH	SJ
6	11	32	5	13	42	68	M5 x 0,8	6	10,5	40	48	20	20	M4 x 0,7	7	4	4	4
10	16	44	5	14	47	75	M5 x 0,8	6	11,5	45	59	25	25	M4 x 0,7	7	4	4	4
16	18	50	5,5	17	62	96	M5 x 0,8	7	12	60	68	30	35	M5 x 0,8	8	5	5	5
20	23	60	7,5	19	67	105	G 1/8	8	14,5	65	82	36	38	M5 x 0,8	9	5	5	5
25	23	68	7,5	21	72	114	G 1/8	8,5	16,5	70	92	42	40	M6 x 1	10	6	6	6
32	32	85	8	25	87	137	G 1/8	10	20	85	114	52	50	M8 x 1,25	14	8	8	8
40	41	102	10	28	97	153	G 1/4	12	24	95	138	62	55	M8 x 1,25	16	8	8	8

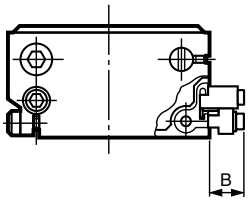
Ø (mm)	SK	SL	SM	Weights (Kg) 1	Weights (Kg) 2
6	6	4	0	0,260	0,070
10	6	4	16	0,470	0,160
16	7	5	18	0,770	0,230
20	7	5	23	1,270	0,320
25	8	6	23	1,670	0,400
32	10	8	32	3,110	0,600
40	10	8	41	5,200	0,900

1 - Weight of cylinders with stroke 0

2 - Weight to be added per 100 mm length

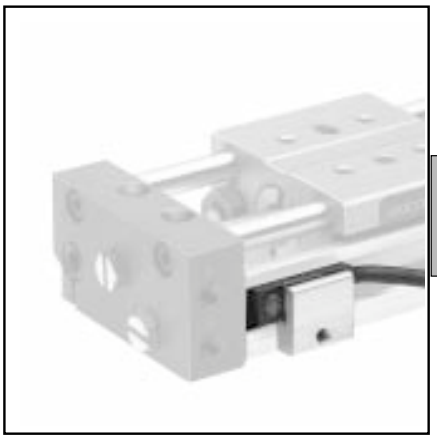
DIMENSIONS WITH DETECTORS





Cylinder bore (in mm)	A min.	B
6	16	6
10	21	6
16	35	6
20	40	0
25	45	0
32	60	0
40	70	0

MAGNETIC POSITION DETECTOR
for rodless cylinder with guided carrier - STG



OPERATING SYSTEM

A permanent magnet mounted on the rodless cylinder carrier operates on stroke end a reed switch (ILS) mounted on the cylinder cover. The detector is fitted with a warning lamp which lights when the contact is closed.

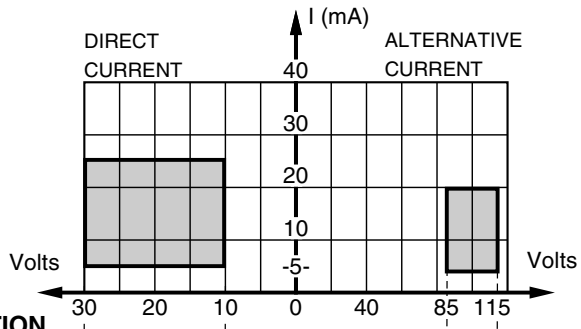
ELECTRICAL CHARACTERISTICS

MAX. SWITCHING POWER	
AC current	: 3.45 VA
DC current	: 0.75 W
SWITCHING VOLTAGE	: 10 to 30 VDC - 85 to VAC (1)
MAX. SWITCHING CURRENT	: 25 mA VDC - 20 mA VAC
CONTACT RESISTANCE	: 100 mΩ
INSULATION RESISTANCE	: 100 MΩ
WITHSTAND VOLTAGE	: 500 V
RESPONSE TIME opening	: 0.05 ms
closing	: 0.4 ms
REPEATABLITY	: ± 0.1 mm
LIFE	: 5 X 10 6 operations
AMBIENT TEMPERATURE	: 0°C to + 60°C
ELECTRICAL PROTECTION	: see below
HOUSING	: plastic PBT
NF C20010 PROTECTION	: IP42
CONNECTION	: 1 Ø 3 mm cable, 1.5 m long, 2 conductors 0.15 mm2
INDICATOR LAMP	: Red diode (LED) which lights when the contact is closed

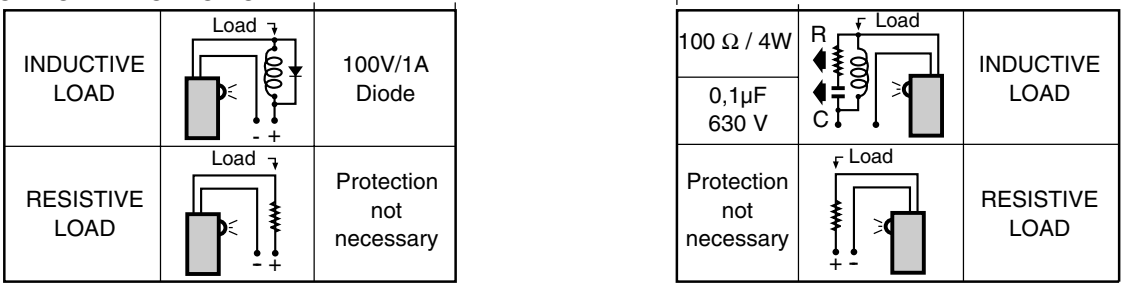
(1) The indicator lamp gives a voltage drop approx. 2.5 V.

NOTE : The operating point must be within the shaded zone. Any overvoltage or overintensity may damage the detector.

Polarity to be respected for DC application :
Black wire ⟶ - Pole
White wire ⟶ + Pole



ELECTRICAL PROTECTION



R = 4 W Resistor= Standard CCTU Resistors, code RP 59
C = Paper, polycarbonate or metalized mylar capacitor.
The user is responsible for supply and assembly of Resistors, Capacitors or Diodes.

DETECTOR CODE

DESCRIPTION	Ø Cylinder (mm)	CODE
Magnetic position detector with reed switch (ILS) and wire outlet for rodless cylinder with **guided** carrier - type **STG**	6-10-16	**881 44 525**
	20-25-32-40	**881 44 526**

The detector is supplied with a securing collar adapted to the cylinder diameter.

PARTICULAR APPLICATIONS

1 - Detectors used for direct control of incandescent lamps :
The power specified on the lamp is based on its resistance when hot, the resistance is very low when turned on with the lamp cold and the amperage can become very great and may exceed the ILS rating, allowance should therefore be made for the actual wattage of the bulb when cold.

2 - With wiring longer than 10 m, a 1000 Ω resistor must be fitted in series with the detector to reduce the capacitance effect caused by the wiring.

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RODLESS BAND CYLINDERS
WITH GUIDED and UNGUIDED CARRIER BRACKETS
Ø 16 to 63 mm
SERIES 446 - TYPES : STBN - STB

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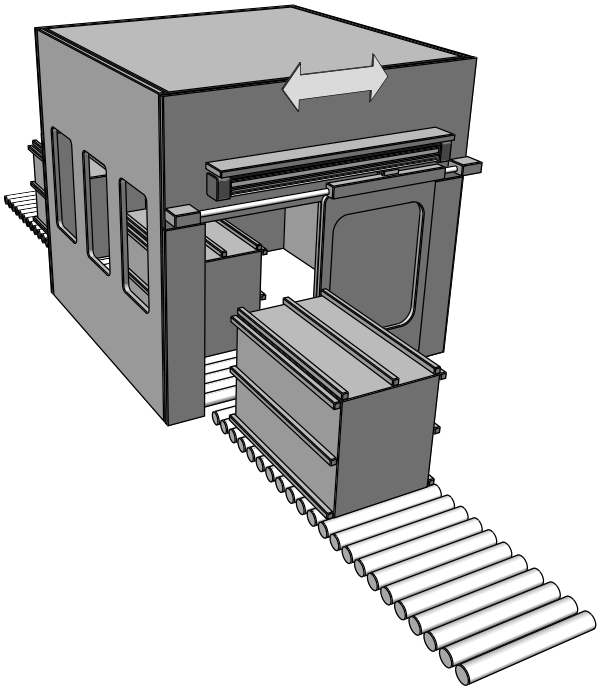
P265-GB-R4

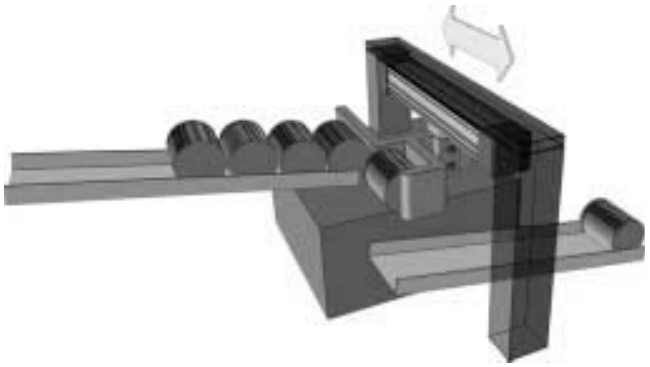
ASCO® JOUCOMATIC

WITH UNGUIDED CARRIER - Type STBN
16 and 25 mm bore

APPLICATIONS

Rodless band cylinders are particularly suitable for applications where substantial linear movement is required (long strokes). The version with an unguided carrier bracket is specially recommended for the movement of **separately-guided loads**, such as in the operation of sliding casings or doors, lateral movement on conveyor belts etc.

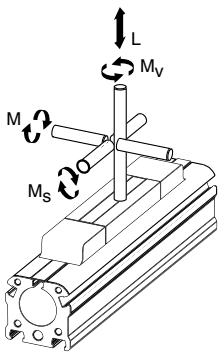




SPECIFICATION

- Maximum strokes of standard versions
  16 mm bore = 3500 mm
  25 mm bore = 3500 mm
  For longer strokes, consult us

- Bending / twisting moments and maximum loads



Bore (mm)	Bending moments (N.m)			Load (N)
	M	**M_S**	**M_V**	**L**
16	3,95	0,34	0,56	135
25	14,91	1,02	3,05	290

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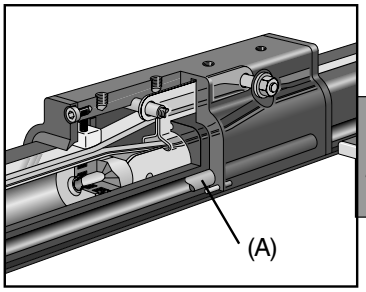
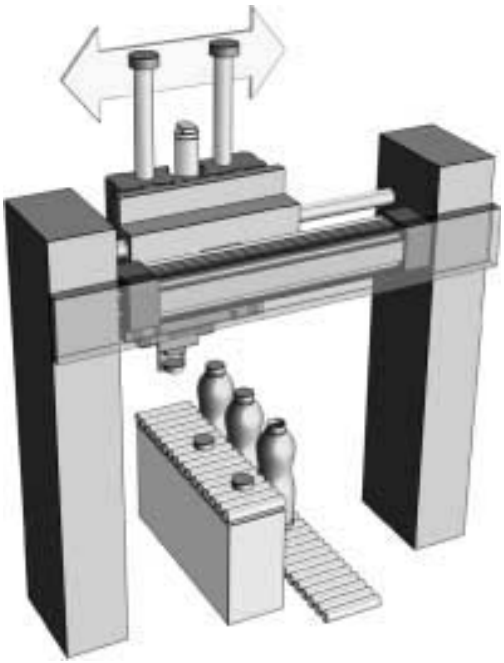
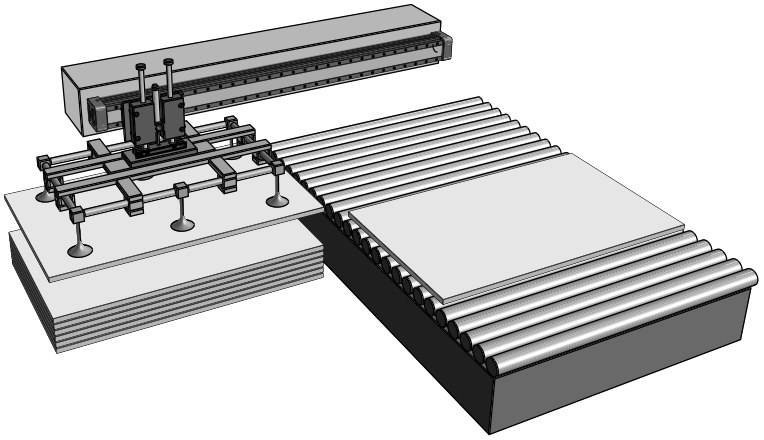
GUIDED CARRIER BRACKET - Type STB
25, 32, 40, 50 and 63 mm bore

APPLICATIONS

The wrap-around carrier bracket with two guide rods (A) of strong, self-lubricating material enables lateral movement of **unguided loads** with high twisting moments, as indicated in the table below.



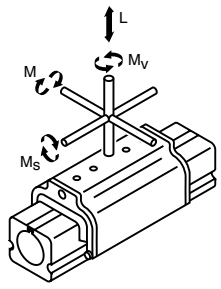




SPECIFICATION

- Maximum strokes of standard versions
  25 and 32 mmbore = 3800 mm
  40 mm bore = 3750 mm
  50 mm bore = 3400 mm
  63 mm bore = 3300 mm
  For longer strokes, consult us

- Bending / twisting moments and maximum loads



Bore (mm)	Bending moments (N.m)			Load (N)
	M	**M_S**	**M_V**	**L**
25	11	6	3,5	270
32	33	8,5	15	540
40	56	31	23	820
50	125	34	37	1360
63	200	51	45	1820

Higher performance levels are possible with the **twin carrier bracket** version (consult us)

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To select a rodless band cylinder with the appropriate bore for your application, it is necessary to know:
- the stroke,
- the force necessary to move the load,
- the weight of the load,
- the position of the load (the load must be guided separately),
- the final or average velocity.

Selection process
Chart (I) shows the theoretical thrust as a function of supply pressure. For optimal use of the cylinder, it is recommended that a load factor of 70% be applied: the force necessary to move the load thus corresponds to approximately 70% of the theoretical thrust.
After having established the bore of the cylinder, check that it is appropriate as concerns its cushioning capacity and performance with offset loads.

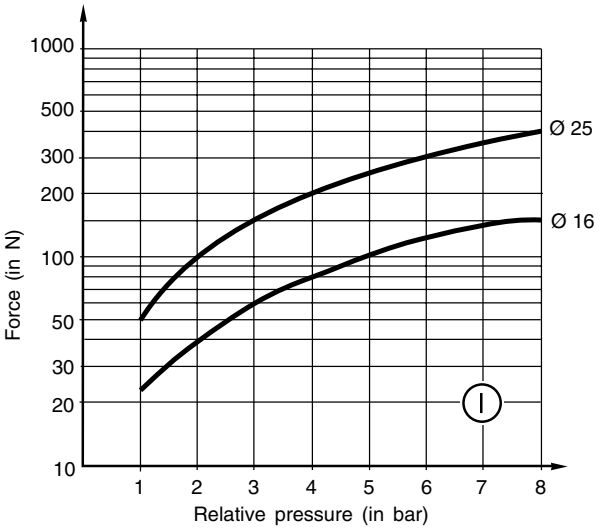
Maximum bending moments
If the load is offset, a bending moment is created (see maximum capacity below).

Cushioning capacity
Graph (II) is used to determine the type of cushioning necessary. If the point at which the final speed and the load intersect is located below the curves, the standard internal pneumatic cushioning is adequate. Otherwise, it is necessary to select a cylinder with a larger bore or to fit the cylinder with shock absorbers available as accessories.
In the case of use close to the limits of the pneumatic cushioning **and** at high cycling rates, it is recommended, for a longer service life, that the cylinder be equipped with shock absorbers.

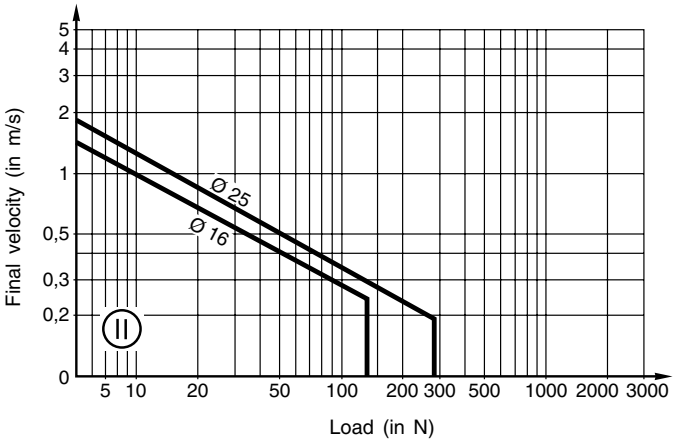
ACCESSORIES:

- **Determine when the application requires the use of tube supports** as a function of the weight of the load and the stroke (see chart in previous chapter).
- **Floating carrier bracket** to compensate for any parallelism error, with an independently supported guided load.
- Reed type and Hall effect magnetic sensors for position monitoring.

THEORETICAL THRUST



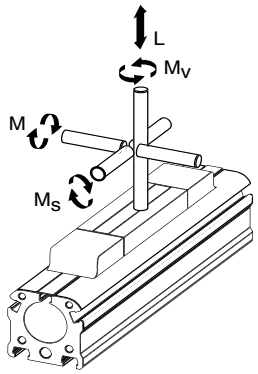
DAMPING CAPACITY



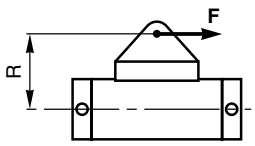
The velocities indicated in Chart (II) are **final velocities**. To correctly determine the kinetic energy to be dissipated, it is important to allow for the **final velocity**.
If this cannot be calculated directly, a reasonable estimate can be obtained as follows:

Final velocity V = 2 x average velocity

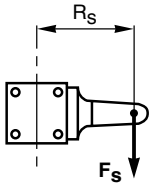
MAXIMUM BENDING/TWISTING MOMENTS



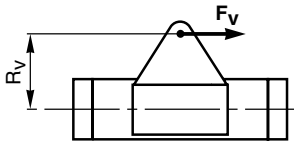
Bore (mm)	Bending moments (N.m)			Load (N)
	M	**M_s**	**M_v**	**L**
16	3,95	0,34	0,56	135
25	14,91	1,02	3,05	290



$M = F \times R$



$M_s = F_s \times R_s$

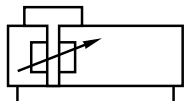


$M_v = F_v \times R_v$

Series 446
Type: STBN

RODLESS BAND CYLINDERS WITH UNGUIDED CARRIER BRACKETS

double acting - 16 and 25 mm bore
Equipped for magnetic detectors



SPECIFICATIONS

FLUID	: air or neutral gas,filtered, lubricated or **not**
PRESSURE	: 8 bar max.
TEMPERATURE	: -10°C, +65°C
STROKE min.	: 100 mm (for sensors)
max. standard	: see below (consult us for longer strokes)
MAX. VELOCITY	: 2 m/s

CONSTRUCTION

Tube	: Anodised aluminium alloy
Ends	: Anodised aluminium alloy
Carrier bracket	: Anodised aluminium alloy
Piston	: Polyamide/light alloy
Piston seals	: Nitrile (NBR)
Piston bracket	: High strength steel pressing
Bands	: Stainless steel with elastomer strips
Magnet	: Internal, within the piston
Cushioning	: With air, adjustable

CHOICE OF EQUIPMENT

Ø cylinder (mm)	CYLINDER EQUIPPED FOR DETECTOR CODE(2)	REFERENCE	Max. possible stroke (mm)	Pipe size (3)	Cushioning length (mm)
16	**446 50 021**(1)	STBN 16 A _(1)_ - DM	3500	M5	12
25	**446 50 022**(1)	STBN 25 A _(1)_ - DM	3500	G 1/8	19

For other strokes and bores, consult us

(1) Specify stroke (in mm)
(2) Position detectors are to be ordered separately (see page P265-21 and 22)
(3) 3 types of pneumatic connection: front, rear or side

MOUNTINGS

Bore (mm)	CODE Brackets (4)
16	**434 00 477**
25	**434 00 478**

Supplied with a set of two blocks or two brackets with screws for securing to cylinder.
Mountings are supplied loose.
(4) The lugs for 25 mm bore cylinders allow height adjustment.

ACCESSORIES

- **Floating carrier bracket, for alignment compensation** (necessary for this type of cylinder suitable for moving separately guided loads) - (see page P265-9)
- **Tube support** (recommended to avoid buckling, depending on the stroke and load) - (see page P265-8)
- Shock absorbers (see page P265-11)
- Magnetic detectors: reed type (ILS) or Hall effect (see pages P265-21 and 22)

OPTION (consult us)

- Connection of all ports at one end (25 mm bore version only) - **code: 535 067** (see page P265-9)

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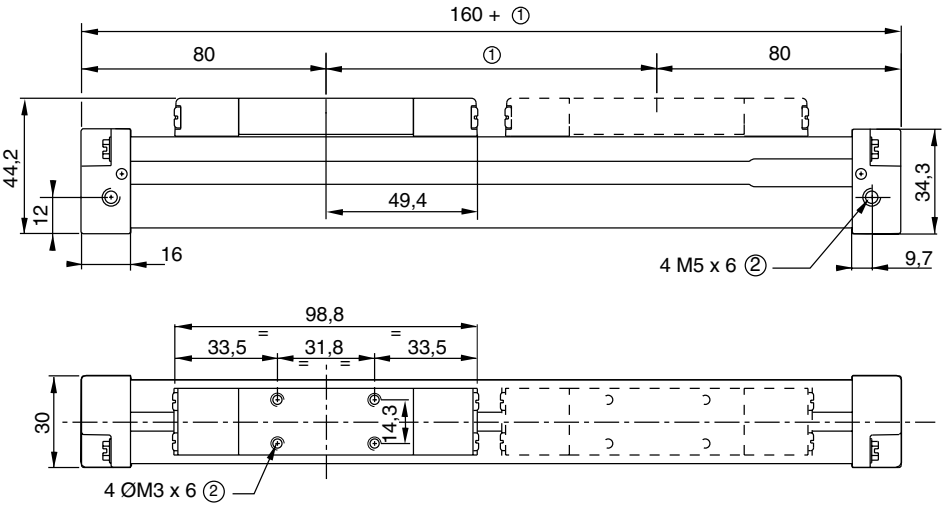
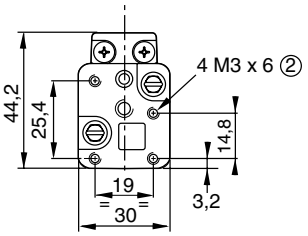
DIMENSIONS AND WEIGHTS
BARE CYLINDERS

16 mm bore

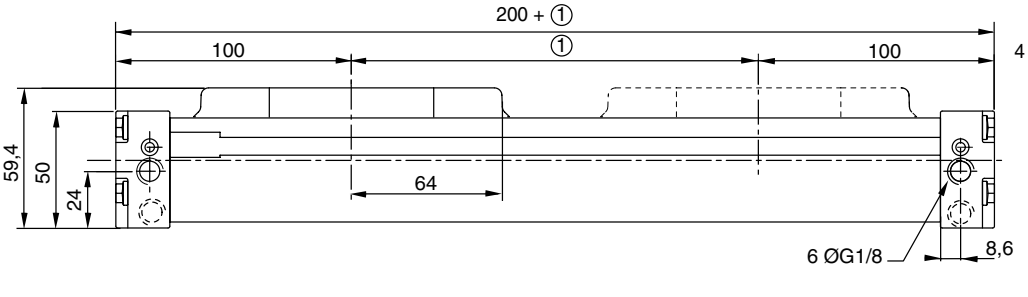


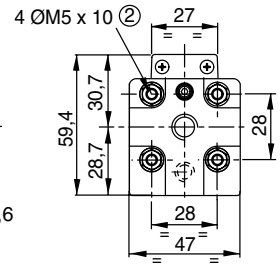


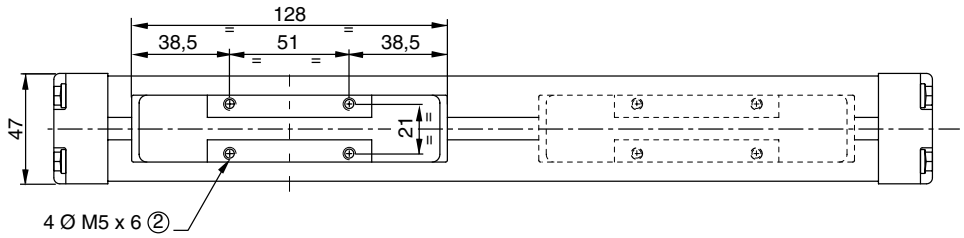
Weights (kg)	
stroke 0	+100 mm
0,310	0,110

① : + stroke
② : Tapping depth

25 mm bore







Weights (kg)	
stroke 0	+100 mm
1,070	0,300

① : + stroke
② : Tapping depth

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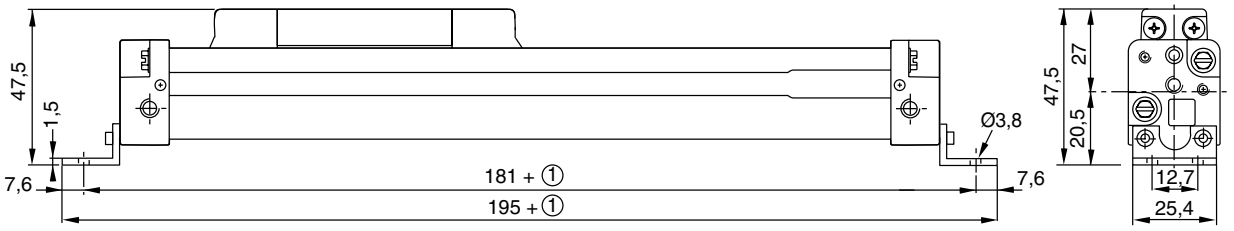
DIMENSIONS AND WEIGHTS

CYLINDERS WITH MOUNTING **FITTINGS**

Weight of brackets: 0.020 kg

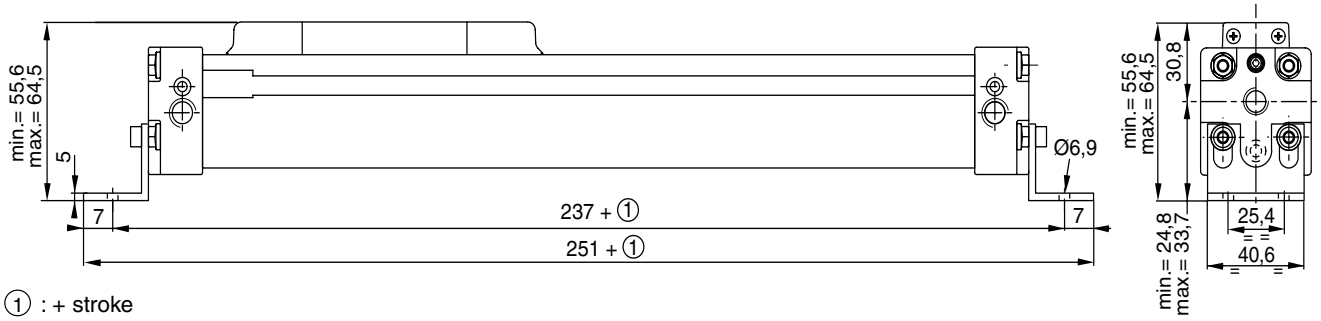
16 mm bore



① : + stroke

Weight of brackets: 0.100 kg

25 mm bore



① : + stroke

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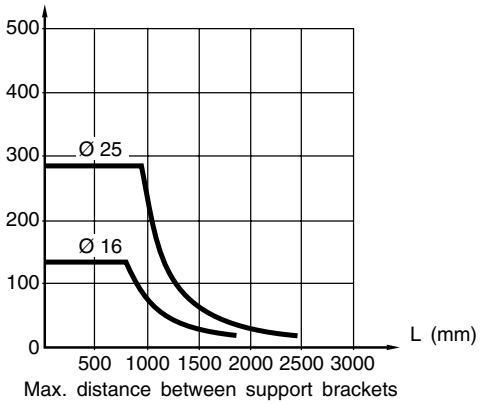
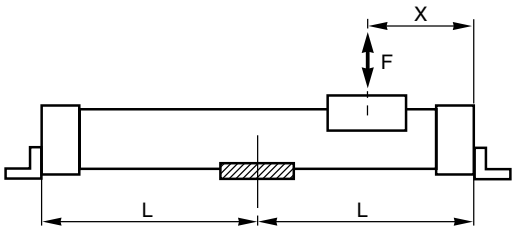
TUBE SUPPORT BRACKETS FOR STBN CYLINDERS

With certain load and stroke combinations, it is necessary to provide the tube with intermediate supports. The following chart can be used to determine the maximum possible length between two attachment points as a function of the load, and hence the number of support brackets necessary. The support brackets, which are made of specially-treated light alloy, slide in the grooves in the tube.

F load (in N)



Max. distance between support brackets



Number of support brackets necessary (n) assuming the cylinders to be secured at the ends.

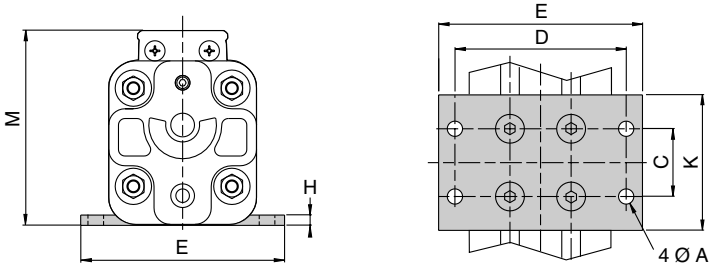
$$n = \left(\frac{\text{Stroke} + 2\ X}{L}\right) - 1$$

n = whole number, rounded up.
X = value in mm, within the overall dimensions of the cylinder.
16 mm dia. = 80 mm
25 mm dia. = 100 mm
L = maximum distance read from the chart above.

CODES, DIMENSIONS AND WEIGHTS

Tube support brackets are fitted into the grooves in the bottom of the tube before installation of the cylinder, as shown in the sketch below. Cut-outs are provided in the grooves for introducing the set screws.

Bottom view



Bore (mm)	CODE	DIMENSIONS (mm)							Weights (kg) for 1 support bracket
		A	C	D	E	H	K	M	
16	**434 00 473**	3,9	38,1	34,9	42,9	3,2	50,8	45,5	0,025
25	**434 00 474**	5,8	25,4	57,1	69,8	4,8	44,4	61,8	0,065

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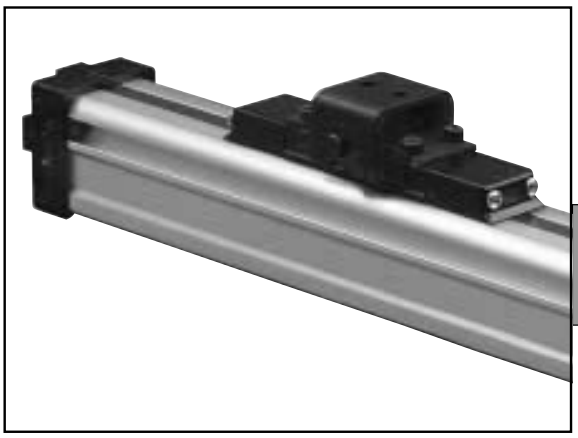
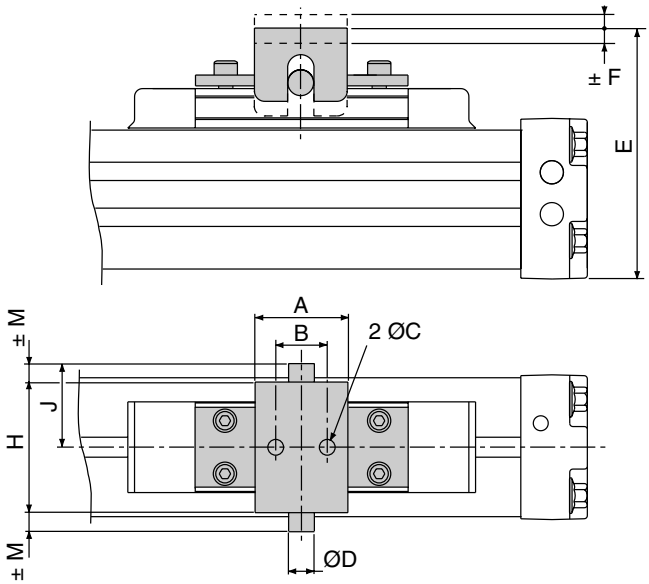
ALIGNMENT COMPENSATION FLOATING CARRIER BRACKET (FOR STBN)

In applications where a rodless band cylinder moves an separately-guided load, this floating carrier bracket is necessary to eliminate undesirable moments and friction losses caused by any parallelism error between the cylinder and the separately-guided part.



Alignment compensation : ± F
: ± M



Bore (mm)	BRACKET CODE	DIMENSIONS (mm)									Weights Bracket (kg)
		A	B	C	D	E	± F	H	J	± M	
16	**434 00 469**	23	12,7	4,3	6,4	55,2	4,2	32,3	20,6	4,6	0,060
25	**434 00 470**	32	16	5,3	9,7	85,5	4,2	41,7	25,4	4,6	0,125

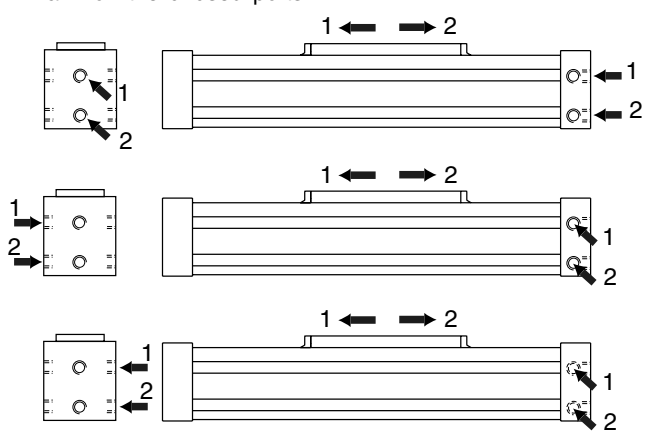
The screws for securing the bracket to the cylinder are supplied.
The screws used for connection to the carrier and to the load must be secured with LOCTITE 241.

CONNECTION OPTIONS (25 mm bore)

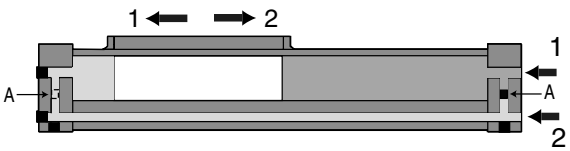
The possibility of grouping the ports at one end of the cylinder can be particularly advantageous in long stroke applications:
- simplification of pipework,
- control valve close to connection ports,
- less risk of pipe damage,
- reduced overall dimensions.

This option 535 067 (available with 25 mm bore) enables connections to be made from the front, rear or side. The ports are located on the right-hand end.

- **Choice of connection** (front, rear, side)
  Blank off the unused ports



- **Operating principle**



Note: The connections can be made at the left-hand end by moving blank A from the right-hand end.

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SHOCK ABSORBERS FOR STBN CYLINDERS

Rodless band cylinders are supplied as standard with pneumatic cushioning. However, if the kinetic energy generated by the load and the speed of operation exceeds the capacity of the pneumatic cushioning, it is necessary to use shock absorbers. These can be installed directly on the cylinder and can increase the service life of the cylinder and of the mechanism as a whole.

Selecting the necessary absorber:

1- Establish the following values:
- The weight of the load to be moved (in N).
- The **final** velocity (in m/s).
- The number of cycles per hour.

2- Establish the type of shock absorber for the cylinder bore chosen using the chart opposite.
The point at which the final velocity and the weight of the load intersect indicates which type of absorber is suitable: type 1 or type 2.

3- Complete the selection process by taking the cycling rate of the application into consideration. Shock absorbers convert kinetic energy into heat, it is therefore important not to exceed the cycling rates indicated opposite.

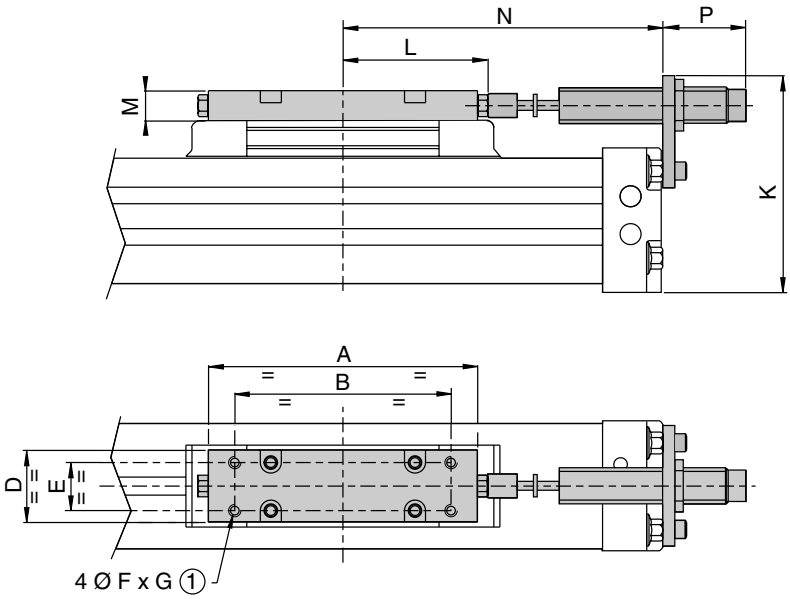
MAXIMUM CYCLE PER HOUR CAPACITY	
Models	Cycles per hour
Shock absorbers for 16 mm bore cylinder	2000
Shock absorbers for 25 mm bore cylinder	2000

CODES

DESIGNATION	CODES (1) Type 1 absorbers	CODES (1) Type 2 absorbers
Set of two shock absorbers **supplied installed** on 16 mm bore cylinder	**560 597**	**560 598**
Set of two shock absorbers **supplied installed** on 25 mm bore cylinder	**560 599**	**560 600**

(1) Code to be added to the standard cylinder code

DIMENSIONS AND WEIGHTS



①: Tapping depth

Do not adjust shock absorber position

Cylinder bore (mm)	DIMENSIONS (mm) A	B	D	E	F	G	K	L	M	N	P	Weights (kg) 2 absorbers + mountings type 1	type 2
16	99	57,2	28,6	12,7	M5	6	47	43,6	11	80	35	0,170	0,170
25	102	76,2	38	19	M5	6	77	55,4	12,7	100	63	0,570	0,440

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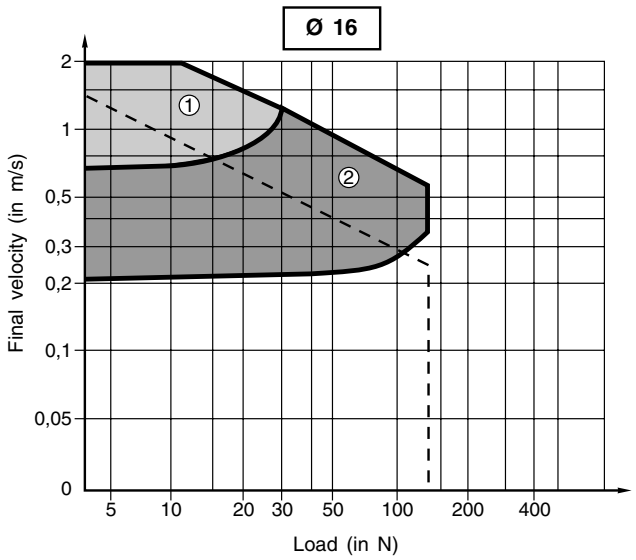

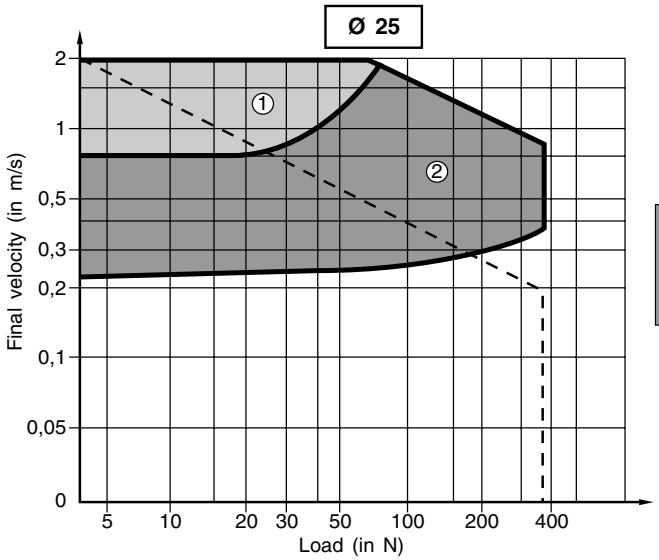

2

① Zone using type 1 absorber

② Zone using type 2 absorber

To properly determine the inertial forces for cushioning, it is important to know the final velocity. If the final velocity cannot be calculateddirectly, a reasonable guideline is:

Final velocity = 2 x average velocity

For each cylinder diameter, the intersection of the final speed and the load weight indicates which type of absorber to use. The dotted line represents the limit between choosing the air cushions or shock absorbers. If you have determined that the internal cushions would be used near their maximum capacity **and** there is highly intense movement,it would be wise to use the optional shock absorbers.
The above graphs were established for cylinders working on a horizontal plane and at 6 bar.
For applications exceeding cycle capability, please consult us.

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CONSTRUCTION

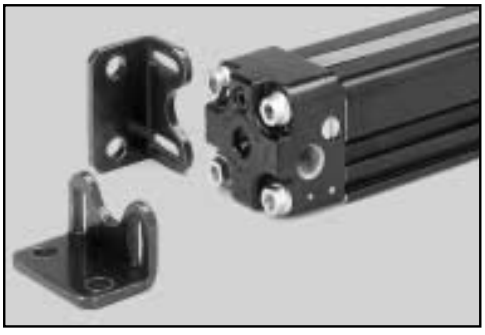
① Profiled tube with slot

② Piston + connecting bracket

③ Guide unit

④ Guide adjustment. For heavy duty use, we recommend regularily checking the bracket adjustment

⑤ Carrier with floating mount bracket, alignment compensation for external guided load movement



⑥ Mounting with foot brackets

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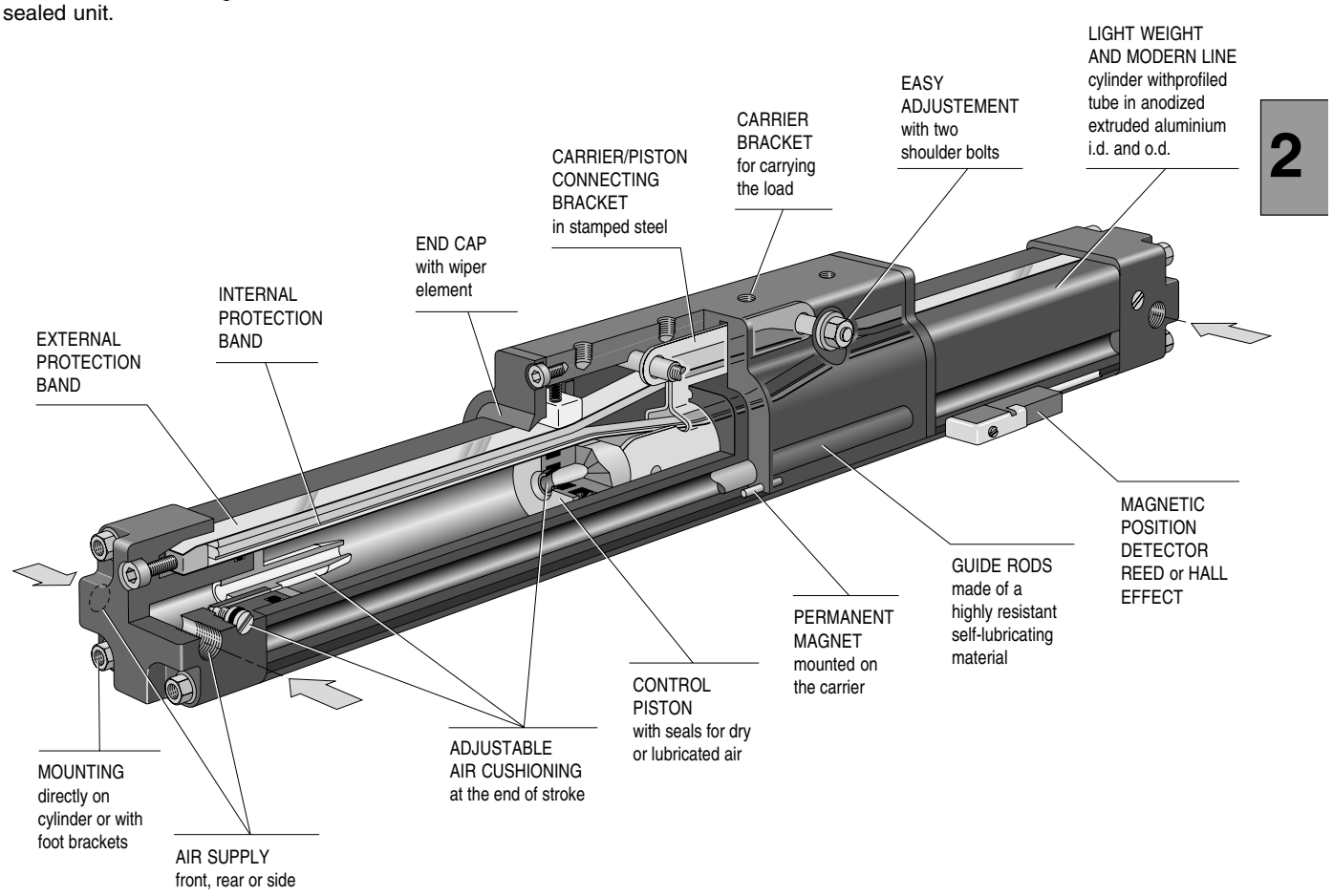
OPERATING PRINCIPLE

Set in motion with pneumatic energy, the piston moves in an extruded alumunium tube containing a slot running the length of the cylinder.(1) In order to provide a tight seal over the slot length. there are two bands. A stamped steel piston bracket connects the cylinder piston to the carrier bracket. (2) This piston bracket contains special band ramps which unseat and reseat the bands in the slot, providing a sealed unit.



ADVANTAGES

Built in Europe under the TOL-O-MATIC licence, JOUCOMATIC's rodless band cylinder offers several advantages :

- **COMPACT INSTALLATIONS**
  As this cylinder is rodless, installation space is cut by almost one half compared to a standard cylinder containing a rod.
- **LONG STROKE APPLICATION**
  The rodless band cylinder is perfectly adapted to applications requiring long linear movement, such as : handling devices, lifting devices, door opening and closing, etc...
- **EXCEPTIONAL SERVICE LIFE AND PERFORMANCE**
  The unique carrier bracket form, including two highly resistant, self-lubricated rods, offer smooth load movement and allow high torsion moments. These rods transfer the load directly to the cylinder tube, therefore isolating the piston from the load (3)
- **QUICK AND EASY ADJUSTMENT**
  The carrier bracket can be easily adjusted without having to take it apart. Patented device (*) (4)
  For heavy duty use, we recommend regularly checking the bracket adjustment.
- **LESS MAINTENANCE**
  These cylinders operate without lubrication.
- **ADAPTATION POSSIBILITIES**
  - Mounting choices : Mounting directly on the cylinder ends or with foot brackets (6)
  - **Load movement choices** : The load can be mounted directly on the carrier bracket, or with a floating mount bracket, for applications where the cylinder is moving an externally guided and supperted load, and when there is a need to compensate for non-parallelism between the cylinder and the load (5)
  - **Air supply** : Front, rear or side.
- **PERFORMANCE AND SECURITY**
  Adjustable air cushioning allows for smooth end of stroke and rapid start up. In case of very large and intense movement, the cylinder can be furnished with shock absorbers.
- **SEALING AND PROTECTION FOR USE IN DUSTY ENVIRONMENTS**
  Two stainless steel bands provide sealing and protection. They are held in place by a patented band retention method (**) using a T-shaped seals. Plastic carrier end caps, also acting as wipers, protect the internal parts from the outside.
- **LARGE RANGE**
  The rodless band cylinders are available in Ø 25-32-40-50 and 63 mm. All strokes are available upon request, as well as the option of magnetic detector.

(*/**) European patents : 234633 (*) - 1478O3 (**).

SELECTING YOUR STB BAND CYLINDER

Selecting the appropriate Band Cylinder is simple. The information you need includes:
- the stroke,
- the force required for moving the load,
- the weight of the load,
- the position of the load (centered on the carrier or elsewhere),
- the final or average velocity.

How to select

Graph Ⓘ represents the theoretical force at various pressures. For the most efficient use of a cylinder, it is recommended to use a load rate of 70 %: the force needed to move the load therefore corresponds to 70% of the theoretical force.

After defining the cylinder diameter, you must determine if the cylinder's internal cushions may be used.

Allowable Bending Moments

If the load is not centered on the carrier, there will be bending moment. (see bending moment data below).

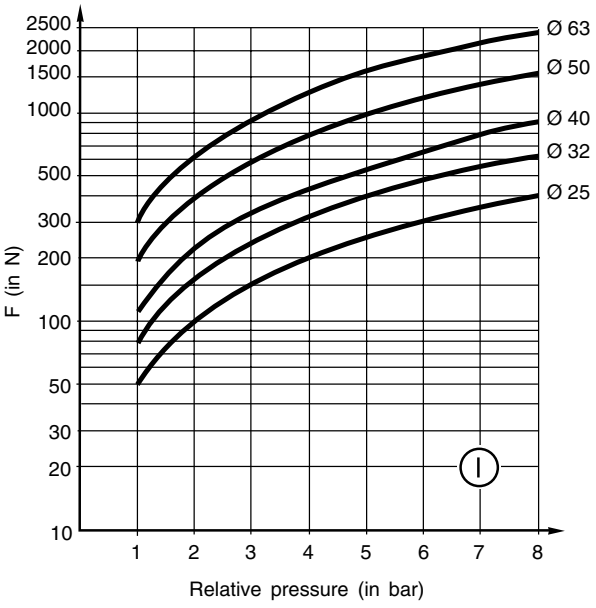
Cushioning capacity

Graphe Ⓘⓘ is used to determine the type of cushioning needed. If the intersection point of the final velocity and the load falls below the curves, the internal cushions are adequate. If this is not the case, you must either choose a larger cylinder with greater cushion capacity, or use the shock absorbers which are offerd as accessories. If you have determined that the internal cushions would be used near their maximum capacity **and** there is highly intense movement, it would be wise to use the optional shock absorbers.

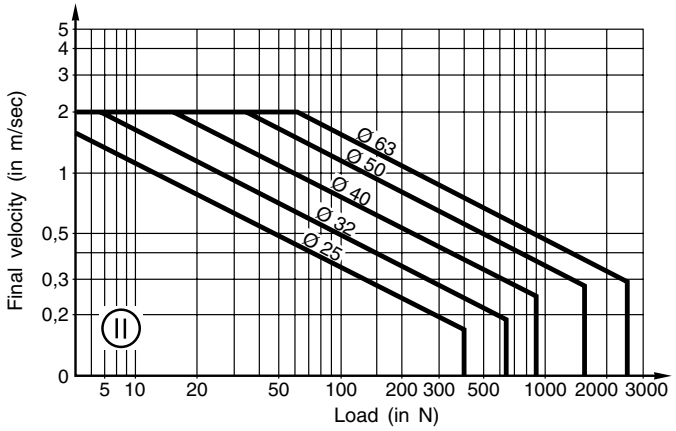
OTHER ACCESSORIES :

- Tube support brackets: **You must determine if intermediate tube support brackets are required**, depending on the weight of the charge and the stroke. (see chart on tube support sheet)
- **Floating mount bracket**: for use when there is a lack of parallelism between the cylinder and a guided and supported load.
- Reed switch or Hall Effect magnetic detectors for position control.

THEORETICAL FORCE AT VARIOUS PRESSURES



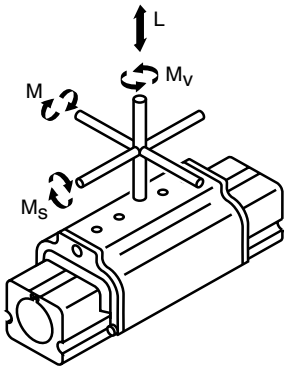
CUSHION DATA



The velocities indicated in graph Ⓘⓘ represent final velocities.
To properly determine the inertial forces for cushioning, it is important to know the **final velocity**.
If final (or impact) velocity cannot be calculated directly, a reasonable guideline is :

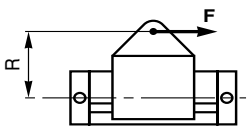
final V = 2 x average velocity

ALLOWABLE BENDING MOMENTS

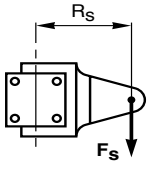


Ø Cylinders (mm)	Bending moments (in N.m)			Load (in N)
	M	**M_s**	**M_v**	**L**
25	11	6	3.5	270
32	33	8.5	15	540
40	56	31	23	820
50	125	34	37	1360
63	200	51	45	1820

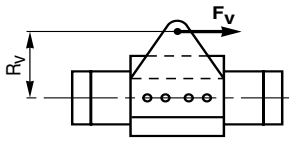
Greater performances possible with the **double carrier bracket** version (consult us)



$M = F \times R$



$M_S = F_S \times R_S$



$M_V = F_V \times R_V$

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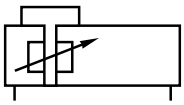
RODLESS BAND CYLINDERS

WITH CARRIER BRACKET - double acting - Ø 25 to 63 mm

Equipped or non equipped for magnetic detectors



SPECIFICATIONS

FLUID	: air or neutral gas, filtered, lubricated or **NOT**
PRESSURE	: 8 bar max
TEMPERATURE	: - 10°C, + 65°C
STROKE min.	: 100 mm (for detectors)
max. standard	: 3500 mm (Ø 25 mm)
	: 3400 mm (Ø 32 to 50 mm)
	: 3300 mm (Ø 63 mm)
	(consult us for longer strokes)
MAXIMUM VELOCITY	: 2 m/sec

CONSTRUCTION

Tube	: Anodized aluminum alloy
Ends	: Anodized aluminum alloy
Carrier bracket	: Anodized aluminum alloy
Piston	: Polyamide/light alloy
Piston seals	: Nitrile (NBR)
Piston bracket	: High resistance stamped steel
Bandes	: Stainless steel with elastomer strips
Magnet	: Placed outside the cylinder, on the carrier
Guide rods	: Self-lubricating NYLATRON
Cushioning	: with air, adjustable

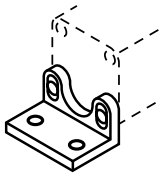
Cushioning length :	Ø 25 mm = 17 mm Ø 32 mm = 28 mm Ø 40 mm = 32 mm Ø 50 mm = 34 mm Ø 63 mm = 50 mm

CHOICE OF EQUIPMENT

Ø Cylinder (mm)	CYLINDER NON EQUIPPED FOR DETECTOR		CYLINDER EQUIPPED FOR DETECTOR			Ø Connection (4)
	CODE	REFERENCE	with Reed switch CODE(3)	with Hall effect CODE(3)	REFERENCE	
25	**446 50 001**(1)	STB 25 A _(1)_	**446 50 006**(1)	**446 50 011**(1)	STB 25 A _(1)_ - DM (A/H)(2)	G 1/8
32	**446 50 002**(1)	STB 32 A _(1)_	**446 50 007**(1)	**446 50 012**(1)	STB 32 A _(1)_ - DM (A/H)(2)	G 1/4
40	**446 50 003**(1)	STB 40 A _(1)_	**446 50 008**(1)	**446 50 013**(1)	STB 40 A _(1)_ - DM (A/H)(2)	G 1/4
50	**446 50 004**(1)	STB 50 A _(1)_	**446 50 009**(1)	**446 50 014**(1)	STB 50 A _(1)_ - DM (A/H)(2)	G 3/8
63	**446 50 005**(1)	STB 63 A _(1)_	**446 50 010**(1)	**446 50 015**(1)	STB 63 A _(1)_ - DM (A/H)(2)	G 3/8

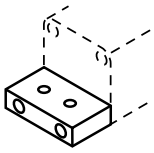
(1) Specify the stroke (in mm)
(2) Cylinder equipped for Reed switch = suffix **DMA**, for Hall effect = suffix **DMH**
(3) Position detectors are to be ordered separately
(4) 3 types of pneumatic connection : front, rear or side

MOUNTINGS



Foot brackets(5)

Ø Cylinder (mm)	CODE
25	**434 00 237**
32	**434 00 238**



Mounting brackets

Ø Cylinder (mm)	CODE
40	**434 00 239**
50	**434 00 240**
63	**434 00 241**

Delivered with two (2) brackets plus cylinder mounting screws
The mountings are delivered non assembled
(5) Foot brackets for cylinders Ø 25 and 32 allows upward adjustment

ACCESSORIES

- **Tube support** (recommended to avoid buckling, depending on the stroke and load) - (see page P265-17)
- Shock absorbers (see page P265-18)
- Floating mount bracket, alignment compensation (for guided load movement only) - (see page P265-20)
- Magnetic detectors: Reed switch (ILS) or Hall effect (see pages P265-21-22)

OPTIONS (consult us)

- Stroke limiting device adaptable on cylinder (adustable stoppers equipped with shock absorbers)
- Double carrier bracket version (for loads and bending moments higher than standard values)

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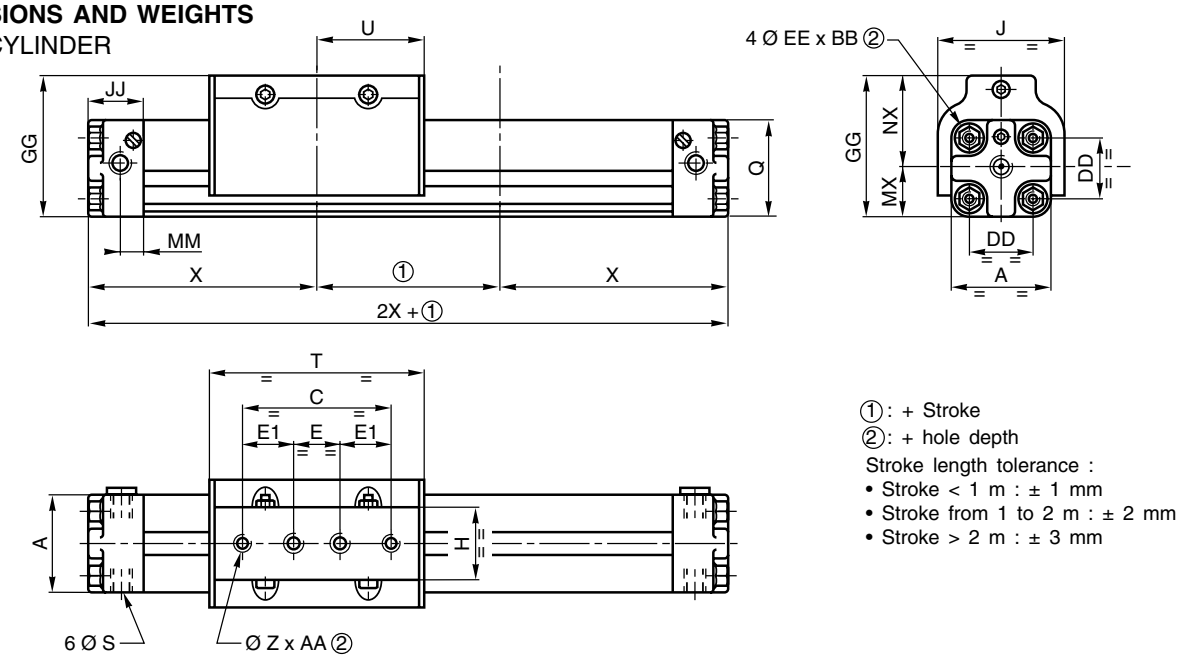
DIMENSIONS AND WEIGHTS

BARE CYLINDER

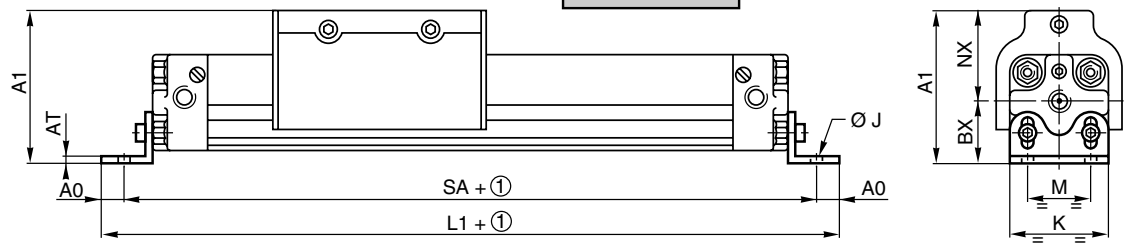


①: + Stroke
②: + hole depth
Stroke length tolerance :
- Stroke < 1 m : ± 1 mm
- Stroke from 1 to 2 m : ± 2 mm
- Stroke > 2 m : ± 3 mm

Ø Cylinder (mm)	DIMENSIONS (mm)																					Weight (kg)	
	A	AA	BB	C	DD	E	E1	EE	GG	H	J	JJ	MM	MX	NX	Q	S	T	U	X	Z	stroke 0	+100mm
25	40	6	11	80	28	25,4	27,2	M5	58,4	33	55,5	25,5	14	20,3	38,1	41	G 1/8	120	60	100	M6	1,030	0,240
32	55,5	7	12	81,4	36	25,4	28	M6	77,7	40	71,5	25,5	8,5	29,4	48,3	57	G 1/4	118	59	124,5	M8	2,100	0,370
40	72,5	10	12	107,7	46	25,4	41,1	M6	90,7	46	89	38	12,7	33,4	57,3	66	G 1/4	150	75	150	M8	3,700	0,600
50	82,5	11	25	127	57	63,5	31,7	M8	112,8	58	113	36,5	17,5	39,7	73,1	86	G 3/8	187	93,5	160	M10	6,400	0,950
63	108	12	25	152,4	73	76,2	38,1	M8	139,7	65	143	52,5	25,4	50,5	89,2	108	G 3/8	225	112,5	215	M10	14,500	1,800

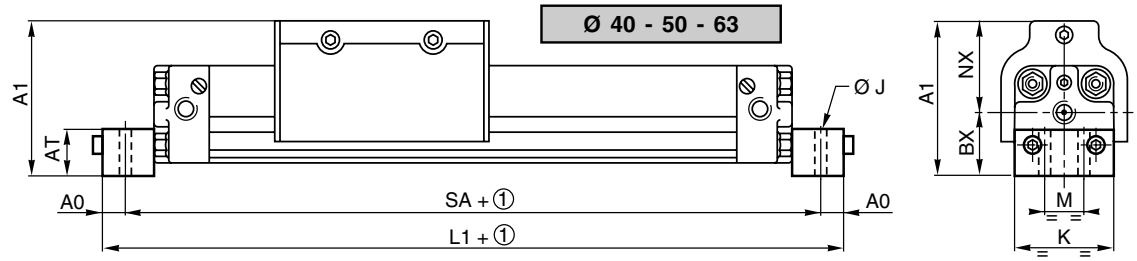
CYLINDERS WITH MOUNTING **BRACKETS**

Ø 25 - 32



Ø Cylinder (mm)	DIMENSIONS (mm)												Weight (kg) Mounting
	A1 min.	A1 max.	A0	AT	BX min.	BX max.	J	K	L1	M	NX	SA	
25	59,7	69,3	9,5	3	21,6	31,2	6,6	41	251	27	38,1	231,8	0,090
32	81,5	94,2	9	3	33,2	46	8,3	53	292	36	48,3	273,8	0,130

Ø 40 - 50 - 63



Ø Cylinder (mm)	DIMENSIONS (mm)										Weight (kg) Mounting
	A1	A0	AT	BX	J	K	L1	M	NX	SA	
40	92	12,7	25	34,7	8,3	72	351	30	57,3	325,5	0,270
50	115	12,7	22	42	9,9	83	371	31,8	73,1	345,5	0,270
63	143,5	15	25	54,3	11	108	490	48	89,2	460	0,400

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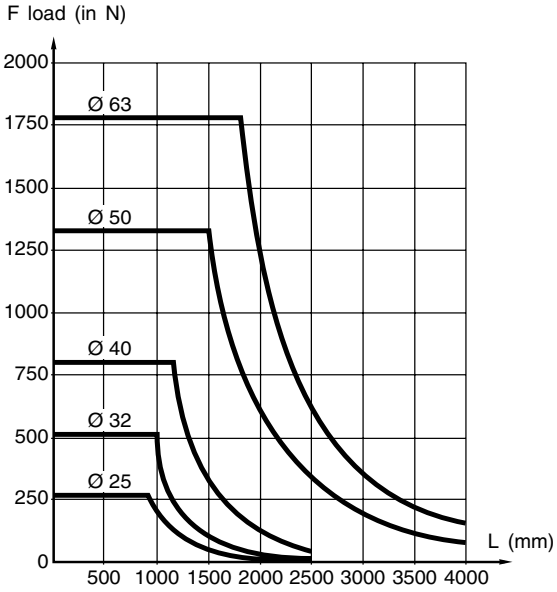
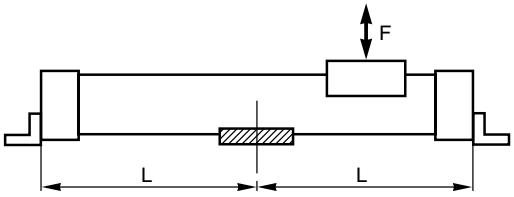
For certain strokes and loads, it is necessary to use tube support brackets for intermediate support. The graph below is used to determine the maximum allowable length. The number of tube support brackets required and their placement, depends on the overall length of the cylinder and the load weight being moved and supported.
These brackets are made of black-anodized aluminum and are desinged to fit into dovetail grooves which run the length of the cylinder tube. They are **delivered mounted** on the cylinder; therefore, **they must be ordered with the cylinder**
Note : These support brackets cannot be mounted in the same place as the magnetic detector, as they use the same grooves.



Max. allowable distance between 2 support brackets

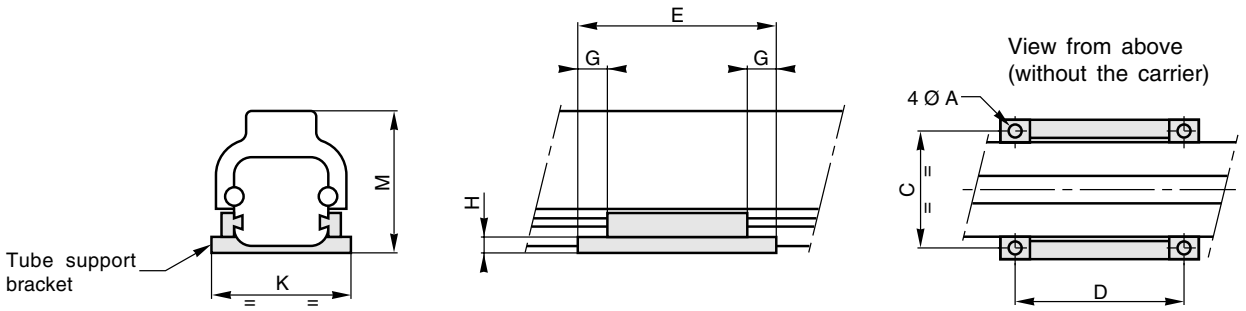


Number of supports needed (n) given that the cylinder is fixed on the ends.

$$n = \left(\frac{\text{Stroke} + 2\ X}{L}\right) - 1$$

n = whole number, rounded up.
X = value in mm, mentionned with general cylinder dimensions
L = max. distance defined in the graph below.

CODES - DIMENSIONS AND WEIGHTS



Ø Cylinder (mm)	CODE (1)				DIMENSIONS (mm)								Weight (kg) for 1 support bracket
	1 support bracket	2 support brackets	3 support brackets	4 support brackets	A	C	D	E	G	H	K	M	
25	**410 528**	**410 529**	**410 530**	**410 531**	5,6	51	76,2	90	13	6,5	60	62	0,180
32	**410 532**	**410 533**	**410 534**	**410 535**	6,7	66,7	114,3	127	13	10	79	82	0,220
40	**410 536**	**410 537**	**410 538**	**410 539**	6,7	76,2	114,3	127	13	8	89	92	0,220
50	**410 540**	**410 541**	**410 542**	**410 543**	10,5	95,3	146	162	17,5	9,5	113	115	0,350
63	**410 544**	**410 545**	**410 546**	**410 547**	10,7	130	197	216	19	11	152,5	143,5	0,600

(1) These codes are added to the cylinder codes

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SHOCK ABSORBERS FOR STB CYLINDER

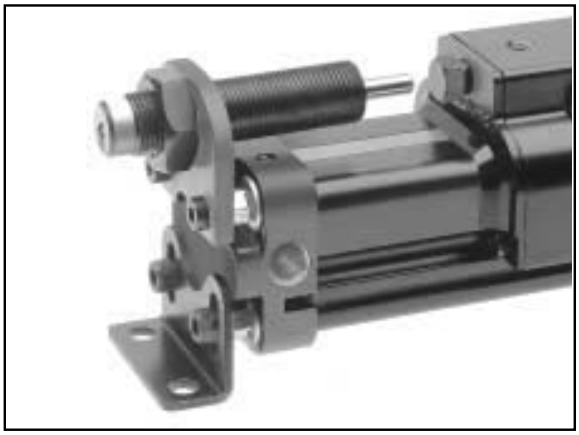
The standard rodless band cylinder cushion is an effective method for load deceleration. However, the band cylinder can bear heavier loads at higher velocities than that of which the cylinder cushion can absorb. Shock absorbers are used to increase the cylinder's service life and broaden the aplication range for the chosen cylinder. Shock absorbers can be mounted directly on the cylinder.

Selecting the neccessary absorber :

1- Define the following values:
- Weight of load being moved (in N).
- Final **velocity** (in m/sec).
- Cycles per hour.

2- In the graph below, determine the type of absorber in relation to the diameter of the cylinder chosen.
Cross reference the intersection of final velocity and load weight to determine which shock absorber is required : type 1 or type 2.

3- To complete the shock absorber selection, you must consider the cycles per hour for your application. Since shock absorbers convert kinetic energy of a load into heat, it is important not to exceed the maximum allowable cycles listed in the adjacent table.



MAXIMUM CYCLE PER HOUR CAPACITY

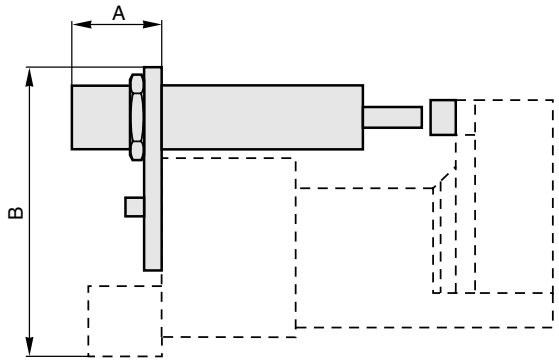
Models	Cycles per hour
Absorbers for cylinder Ø 25	1200
Absorbers for cylinder Ø 32	1000
Absorbers for cylinder Ø 40	1000
Absorbers for cylinder Ø 50	800
Absorbers for cylinder Ø 63	800

CODES

DESIGNATION		CODES (1) Absorbers **type 1**	CODES (1) Absorbers **type 2**
Set of two (2) shock absorbers	Ø 25 mm	**560 569**	**560 572**
(delivered **mounted on** the cylinder)	Ø 32 mm	**560 570**	**560 573**
	Ø 40 mm	**560 577**	**560 579**
	Ø 50 mm	**560 571**	**560 574**
	Ø 63 mm	**560 578**	**560 580**

(1) Code to be added to the standard cylinder code

SIZE AND DIMENSIONS



Ø Cylinder (mm)	A	B min.	B max.	Weight (kg) 2 absorbers + mountings
25	40,5	64	73,5	0,200
32	29,5	90	102,5	0,430
40	28	104		0,570
50	58,5	123,5		0,780
63	24,5	162,5		0,920

You must not adjust the position of the absorbers

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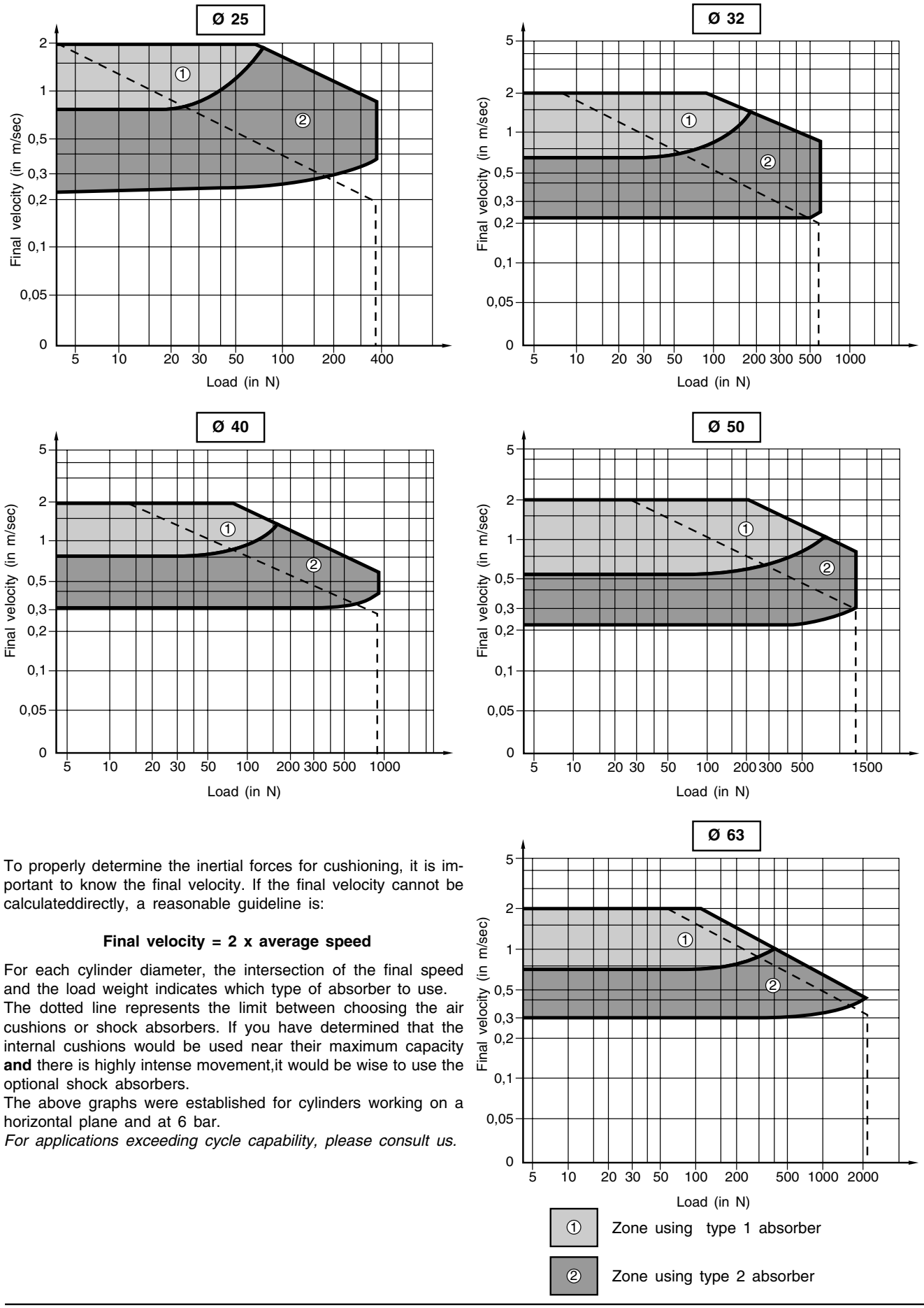


To properly determine the inertial forces for cushioning, it is important to know the final velocity. If the final velocity cannot be calculateddirectly, a reasonable guideline is:

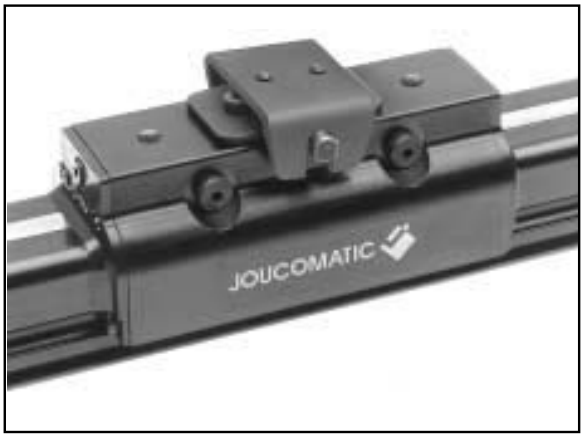
Final velocity = 2 x average speed

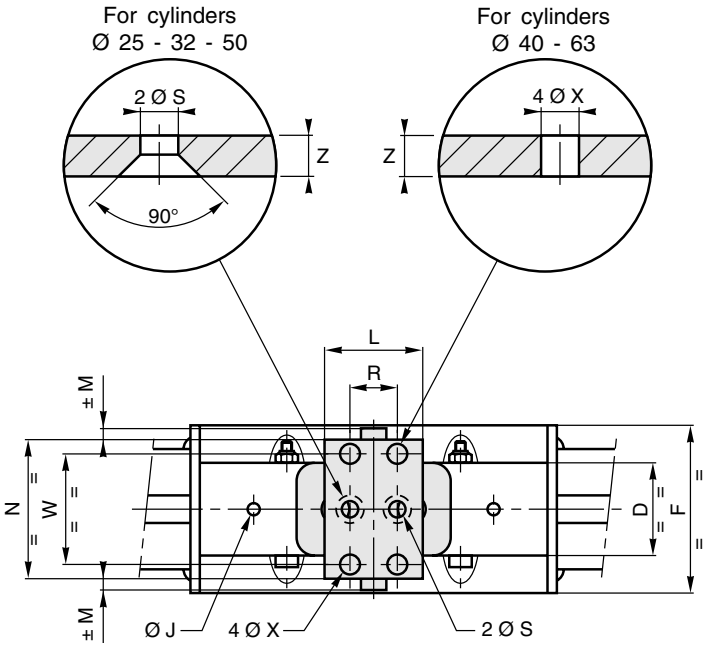
For each cylinder diameter, the intersection of the final speed and the load weight indicates which type of absorber to use.
The dotted line represents the limit between choosing the air cushions or shock absorbers. If you have determined that the internal cushions would be used near their maximum capacity **and** there is highly intense movement,it would be wise to use the optional shock absorbers.
The above graphs were established for cylinders working on a horizontal plane and at 6 bar.
For applications exceeding cycle capability, please consult us.

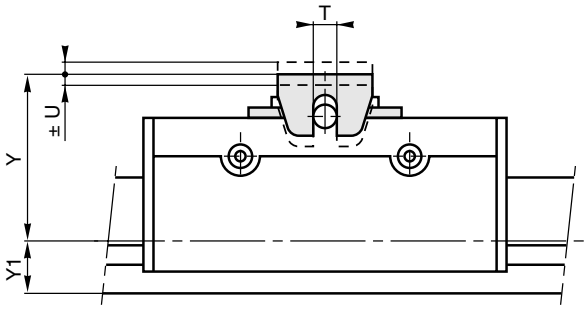
FLOATING MOUNT BRACKET - ALIGNMENT COMPENSATION FOR STB

For applications where a band cylinder moves a load that is externally guided and supported , a floating mount bracket is necessary to compensate for non-parallelism between the cylinder and the independent guiding member.

Alignment of compensation : **± U**
: ± M







Ø Cylinder (mm)	MOUNT BRACKET CODE	DIMENSIONS (mm)															Weights Mount Bracket (kg)
		D	F	Ø J	L	± M	N	R	Ø S	T	± U	W	4 Ø X	Y	Y1	Z	
25	**434 00 232**	33	55,5	M6	32	3,3	46	15,7	5,6	8	3,8	–	–	50,5	20,5	3	0,110
32	**434 00 233**	40	71,5	M8	70	4	56	50	7	8	4	–	–	66	28,5	4	0,250
40	**434 00 234**	46	89	M8	90	7	75	75	–	11	6	55	7	75	33	7	0,540
50	**434 00 235**	58	113	M10	100	7	82	80	8,6	16	6,4	–	–	96	43	5	0,610
63	**434 00 236**	65	143	M10	120	12	98	100	–	16	7	70	8,6	102	54	5	0,730

Floating mount bracket mounting screws are supplied.
You must use LOCTITE 241 for the carrier bracket mounting screws.

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MAGNETIC POSITION DETECTOR REED SWITCH

for rodless band cylinders, type STB - STBN

Direct current

OPERATION

A permanent magnet mounted on the piston (type STBN) or the carriage (type STB) passes in the vicinity of the reed switch and operates it without contact. One or more detectors can be mounted on the cylinder to detect the end of stroke position is reached. Reed switches are engaged in the longitudinal dovetail groove in the cylinder body. They are equipped with an indicator light which illuminates when contact is broken.

Passing an intermediate position by the piston can be detected with a solid-state sensor, see overleaf

ELECTRICAL CHARACTERISTICS

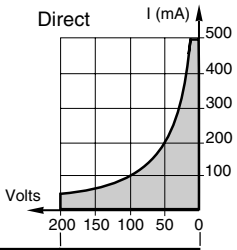
SWITCHING POWER	: 10 W max.
SWITCHING VOLTAGE	: 3 to 200 Vdc (1) (2)
SWITCHING CURRENT	: 500 mA
CONTACT RESISTANCE	: 100 mΩ
WITHSTAND VOLTAGE	: 200 V
REPONSE TIME	: < 0,6 ms
SERVICE LIFE	: until $2x10^8$ operations (depending on the load)
TEMPERATURE	: -40° C to + 70° C
ELECTRICAL PROTECTION	: See chart
HOUSING	: polyamide
CONNECTION	: One Ø 4 mm cable - 5 m long - 2 conductors 0.30 mm^2
INDICATOR LAMP	: Red diode (LED) which lights up when the contact is closed (I min.: 4mA)

(1) The indicator lamp gives a voltage drop of approx. 3 V.

Nota : The operating point must be in the shaded zone. Exceeding the voltage or amperage levels can destroy the switches

PROTECTION

Polarity for DC :
Brown wire = pôle +
Blue wire = pôle -

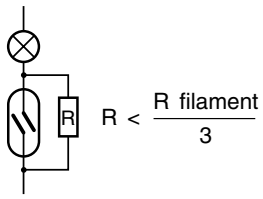


INDUCTIVE CHARGE	Load	Diode 400 V / 1 A
OHMIC CHARGE	Load	Protection unnecessary

The user is responsible for supplying and assembling diode.

PARTICULAR CASE

Detectors used for direct control of incandescent lamps:
The power indicated in the lamp is based on its resistance when hot. The resistance is very low when turned on with the lamp cold and the amperage can become very high and may exceed the ILS rating. Allowance should therefore be made for the actual wattage of the bulb when cold. (see diagram)



CODES FOR REED SWITCH

CODES (2 codes to specify : detector + fastening kit)			
REED SWITCH DETECTOR with wire outlet, 5m long	Ø cylinder	**STB** cylinder FASTENING KIT	**STBN** cylinder FASTENING KIT
881 44 658	16	-	**881 44 665**
	25	**881 44 662**	**881 44 666**
	32	**881 44 663**	-
	40	**881 44 664**	-
	50	**881 44 664**	-
	63	**881 44 663**	-

(2) Detector for alternating current (120 V and 3 W max., without reed): consult us

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ELECTRONIC POSITION DETECTOR HALL EFFECT

for rodless band cylinders, type STB - STBN

OPERATION

Solid-state sensors are magnetically-operated devices which open and close DC circuits and, having no moving parts, have theoretically unlimited service lives. Solid state sensors are engaged in the cylinder body groove and can be used to detect reaching end-of-stroke positions or any intermediate ones.

ELECTRICAL CHARACTERISTICS

SWITCHING VOLTAGE	:	5 to 25 Vdc
MAX. SWITCHING CURRENT	:	200 mA
WITHSTAND VOLTAGE	:	300 V
SATURATION	:	5 V max.
REPONSE TIME	:	2 µs
SENSITIVITY	:	20 to 135 gauss max.
TEMPERATURE	:	- 18° C to + 66° C
HOUSING	:	polyamide
CONNECTION	:	One Ø 4 mm cable - 5 m long - 3 conductors 0.30 mm^2
INDICATOR	:	Red diode (LED) which lights up during switching
ELECTRIC PROTECTION	:	Detector polarized, unprotected against short circuits and over voltage. Protection on inductive circuit : Use of a 600 V/1 A diode is recommended, to be mounted parallel to the load.

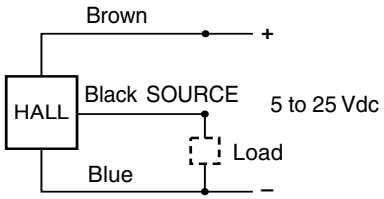
CONNECTION

• **SOURCING** (switching positive potential of the charge)

Max. Power : 0.2 A under 25 Vdc.

The detector is conceived to supply a signal to equipment such as a PLC. (relay not recommended).

SOURCING function detector



CODES FOR HALL EFFECT SWITCHES

CODES (2 codes to specify : detector + fastening kit)			
HALL EFFECT DETECTOR with outlet wire, 5m long SOURCING function	Ø cylinder	**STB** cylinder FASTENING KIT	**STBN** cylinder FASTENING KIT
881 44 659	16	-	**881 44 665**
	25	**881 44 662**	**881 44 666**
	32	**881 44 663**	-
	40	**881 44 664**	-
	50	**881 44 664**	-
	63	**881 44 663**	-

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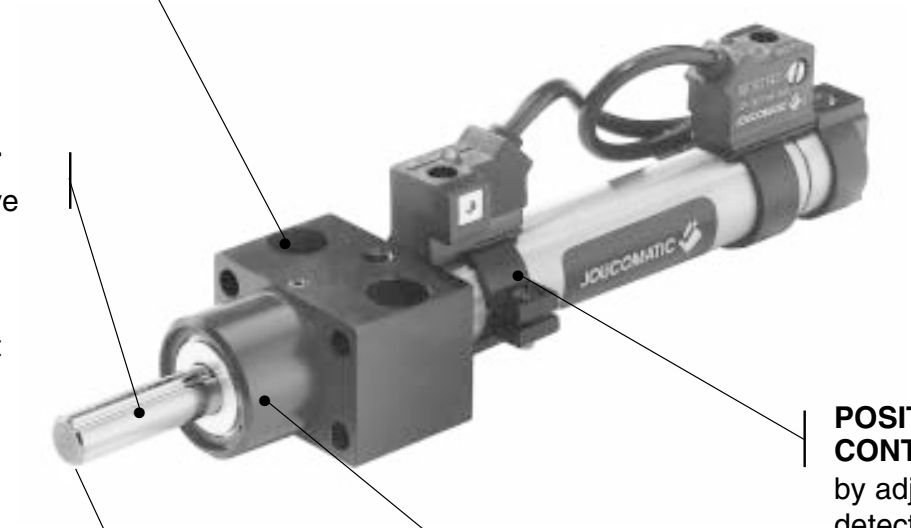
ISOCLAIR AIR CYLINDERS WITH LINEAR BALL BEARINGS

Type : CIB

- **ANTI-ROTATION BY LINEAR GUIDING OF ROD**
  which has grooves (see opposite page)
  Rotation less than 0.2°
- **REDUCED SIZE**

EASY MOUNTING
front face with rectangular profile and mounting holes

ROBUST
rod groove rectified and high hardness treatment



POSITION CONTROL
by adjustable detectors on tube

COUPLING
by flange adaptable at end of rod

PRECISE AND COMPACT
linear guiding within end of cylinder

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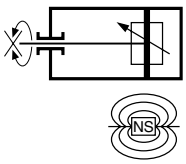
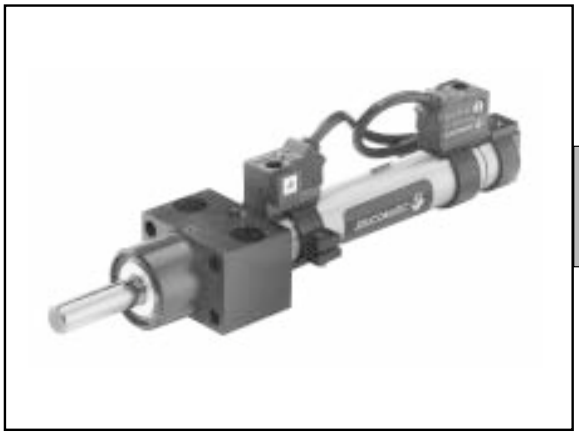
NON ROTATING - LINEAR BEARING CYLINDER

Double acting - Ø 12 - 40 mm
equipped for magnetic position detectors

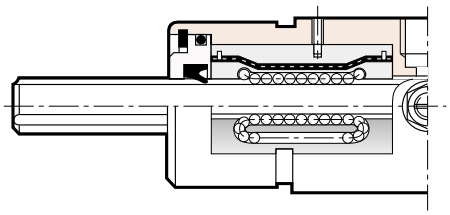


SPECIFICATIONS

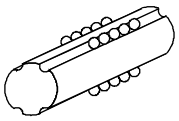
FLUID : air or neutral gas, filtered, lubricated or NOT
PRESSURE
Ø 12 - 16 : 1 to 7 bar
Ø 20 to 40 : 1 to 10 bar
TEMPERATURE : + 5 °C, + 60 °C
MAXIMUM SPEED : 0,5 m/s
POSITION CONTROL : with Reed switches or magneto-resistive
CUSHIONING Ø 12 - 16 : non-cushioned (NA)
Ø 20 to 40 : pneumatic, adjustable (A)



PRINCIPLE OF OPERATION



The precision ground rod has accurately machined grooves, each groove fitted with preloaded linear ball bearings.
This provides smooth, accurate and non rotating movement of the rod.
Maximum rotation of rod < 0,2°



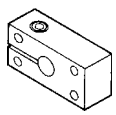
CHOICE OF EQUIPEMENT

Bore Ø (mm)	Strokes (mm)	CODES ❇ to specify on order	REFERENCES to specify on order	Con-nection
12	25	447 00 001	CIB 12 NA 25-DM	M5
	50	447 00 002	CIB 12 NA 50-DM	
	80	447 00 003	CIB 12 NA 80-DM	
	100	447 00 004	CIB 12 NA 100-DM	
16	25	447 00 005	CIB 16 NA 25-DM	M5
	50	447 00 006	CIB 16 NA 50-DM	
	80	447 00 007	CIB 16 NA 80-DM	
	100	447 00 008	CIB 16 NA 100-DM	
20	25	447 00 009	CIB 20 A 25-DM	G 1/8
	50	447 00 010	CIB 20 A 50-DM	
	80	447 00 011	CIB 20 A 80-DM	
	100	447 00 012	CIB 20 A 100-DM	
25	25	447 00 013	CIB 25 A 25-DM	G 1/8
	50	447 00 014	CIB 25 A 50-DM	
	80	447 00 015	CIB 25 A 80-DM	
	100	447 00 016	CIB 25 A 100-DM	
	160	447 00 017	CIB 25 A 160-DM	

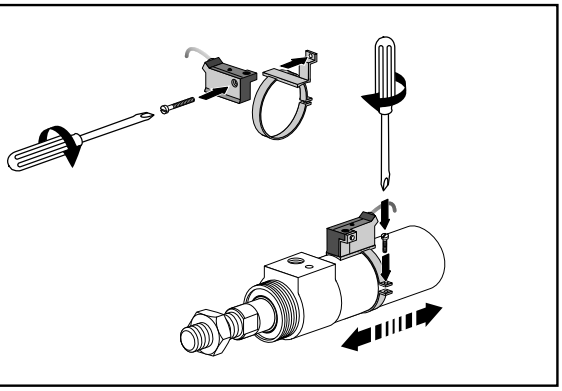
Bore Ø (mm)	Strokes (mm)	CODES ❇ to specify on order	REFERENCES to specify on order	Con-nection
32	25	447 00 018	CIB 32 A 25-DM	G 1/8
	50	447 00 019	CIB 32 A 50-DM	
	80	447 00 020	CIB 32 A 80-DM	
	100	447 00 021	CIB 32 A 100-DM	
	160	447 00 022	CIB 32 A 160-DM	
	200	447 00 023	CIB 32 A 200-DM	
	250	447 00 024	CIB 32 A 250-DM	
40	25	447 00 025	CIB 40 A 25-DM	G 1/4
	50	447 00 026	CIB 40 A 50-DM	
	80	447 00 027	CIB 40 A 80-DM	
	100	447 00 028	CIB 40 A 100-DM	
	160	447 00 029	CIB 40 A 160-DM	
	200	447 00 030	CIB 40 A 200-DM	
	250	447 00 031	CIB 40 A 250-DM	

Other strokes on request. Max. strokes capabilty: **Ø 12-16 : 100 mm, Ø 20 : 270 mm, Ø 25 -32 : 420 mm, Ø 40 : 570 mm**
❇ **The magnetic position detectors must be ordered separately** (see page P275-35)

ACCESSORIES

Bore Ø (mm)	CODES to specify on order  Flange rod end
12	439 00 234
16	439 00 235
20	439 00 236
25 - 32	439 00 237
40	439 00 238

MOUNTING DETECTORS ON CIB



: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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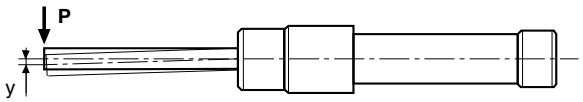
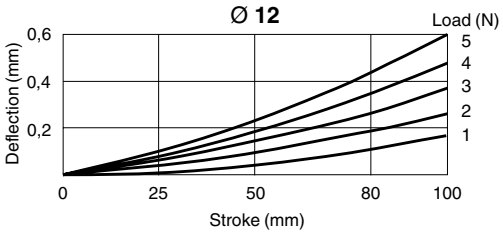
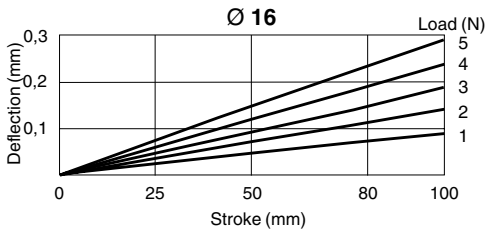
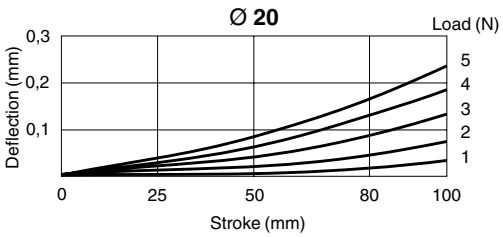
DEFLECTION BY EXTERNAL BENDING FORCE

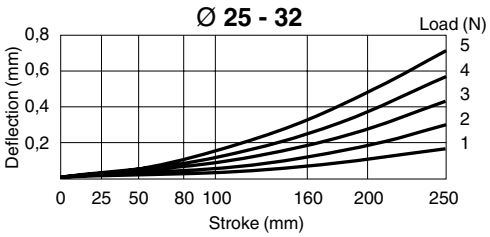


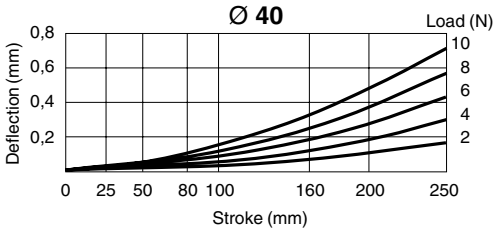
P = External load
y = Deflection by vertical load P





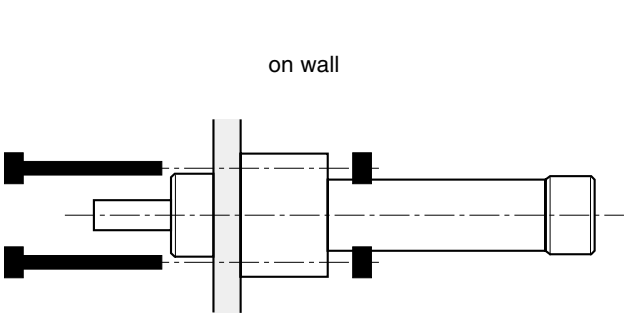


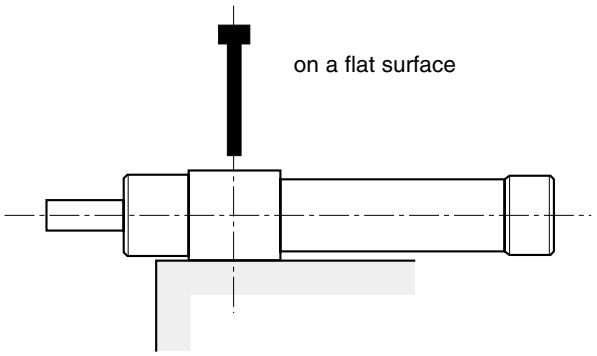




ROTATING ANGLE BY EXTERNAL MOMENT		
Ø alésage (mm)	Ms	(N.m)
12	2,2	
16	3,4	
20	6,6	
25 - 32	10,5	
40	23	

MOUNTING POSSIBILITIES





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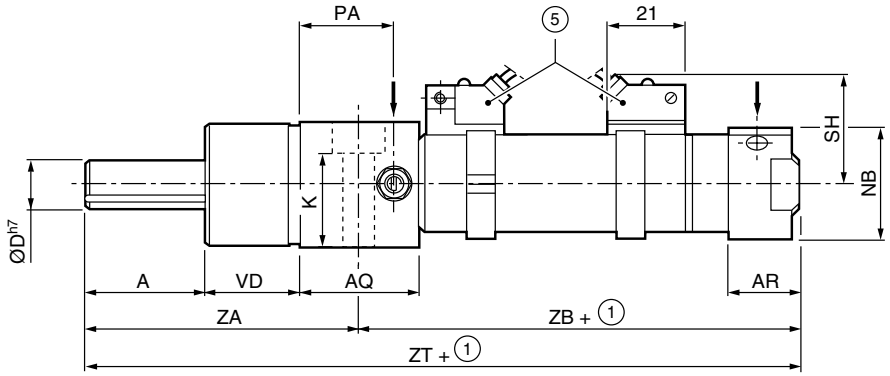
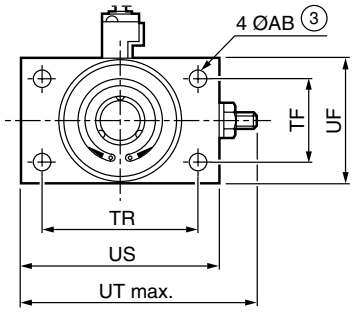
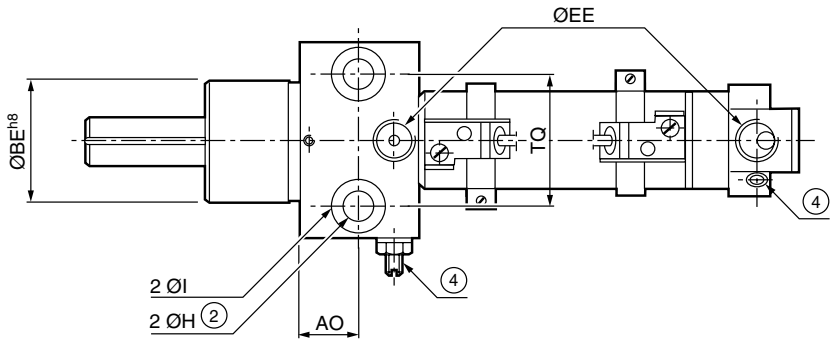
DIMENSIONS



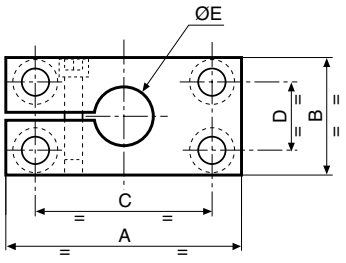


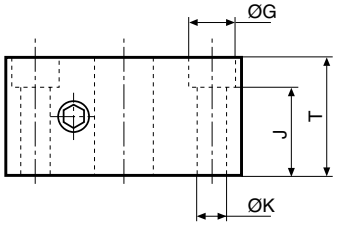


① : + stroke
② : Side mounting (opened holes)
③ : Front mounting (opened holes)
④ : Adjustment screw for pneumatic cushioning (except Ø 12 and 16)
⑤ : Reed switches or magneto-resistive, with connector or wires, adjustable on tube

Bore Ø (mm)	DIMENSIONS (mm)																						
	A	ØAB	AO	AQ	AR	ØBE	D	ØEE	ØH	I	K	NB	PA	SH	TF	TQ	TR	UF	US	UT	VD	ZA	ZB	ZT
12	25	4,5	13	24	12	21	6	M5	5,5	10	16	20	19	30	14	23	26	22	34	-	16,5	54,5	56	110,5
16	26	4,5	13	24	12	23	8	M5	5,5	10	18	21	19	32	16	24	27	24	35	-	16,5	55,5	60	115,5
20	28	5,5	15,5	31	18	30	10	G1/8	6,6	12,2	24	30	24	34	22	30	34	32	44	59	22,5	66	64,5	130,5
25	32	6,6	16	32	18	34	13	G1/8	9	15,4	26	30	25	36	24	36	41	36	53	68	25	73	65	138
32	32	6,6	16	32	37	34	13	G1/8	9	15,4	29	39	25	41	27	36	41	39	53	68	25	73	76	149
40	34	9	22,5	45	44	42	16	G1/4	11	19	39	45,5	35	46	36	46	51	52	67	82	32	88,5	108,5	197

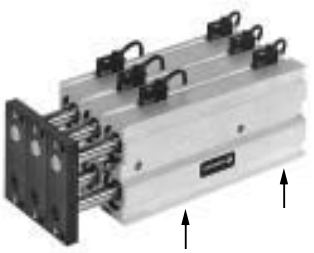
FLANGE ROD END





Bore Ø (mm)	CODES to specify on order	DIMENSIONS (mm)								
		A	B	C	D	E	G	J	K	T
12	439 00 234	30	17	21	10	6	5,9	11	3,4	15
16	439 00 235	30	17	23	10	8	5,9	11	3,4	15
20	439 00 236	40	20	30	12	10	7,6	15	4,5	20
25 - 32	439 00 237	50	25	38	14	13	9,2	14	5,5	20
40	439 00 238	60	30	46	17	16	12,2	18	6,6	25

TWIN ROD / TWIN PISTON AIR CYLINDERS WITH PLAIN OR BALL BEARINGS LINEAR GUIDE
Types: P2L and P2B



- **INTEGRAL LINEAR AND ANTI-ROTATION GUIDES**
- **EASY MOUNTING**
  compact design, narrow body, stackable, ambidextrous, standard detector mountable in any position, adjustable stroke

POSITION MONITORING
by standard reed switch or electronic magnetic detectors "UNI" or "COMPACT" types (common to all cylinders)

SMALL SIZE
narrow stackable body

SAFE AND COMPACT DESIGN
firm and direct mounting by through body

DETECTOR
Mounted directly on side or top

HIGH PRECISION
with ball bearing linear guide version

PNEUMATIC CONNECTION
2 ports at side

RUGGED ANTI-ROTATION SYSTEM
by two integral rods in actuator, precision-machined

EASE OF INSTALLATION
integral flange with calibrated holes for precise adaptation load

QUIET AND USER FRIENDLY
adjustable stop with elastic cushioning reducing noise, adjustable stroke

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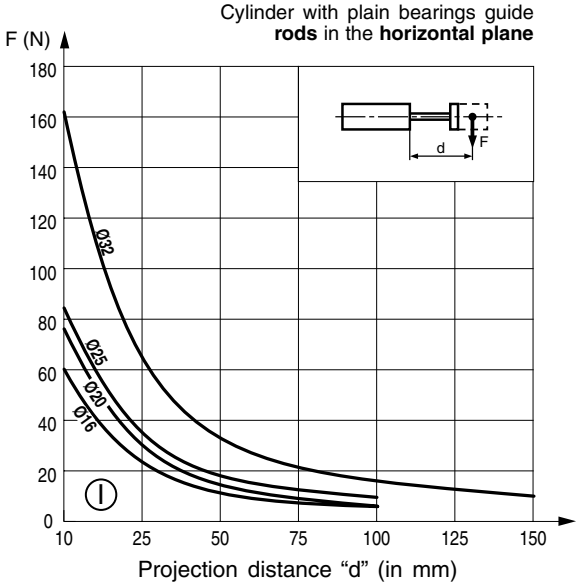
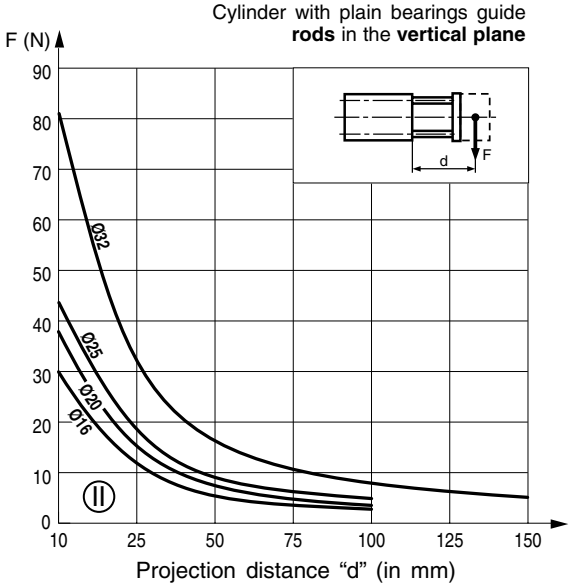
CYLINDERS WITH PLAIN BEARINGS GUIDE (type P2L)

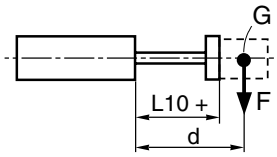
- **MAXIMUM ADMISSIBLE LOAD “F” ON THE ROD END**

Cylinder with plain bearings guide **rods** in the **horizontal plane**

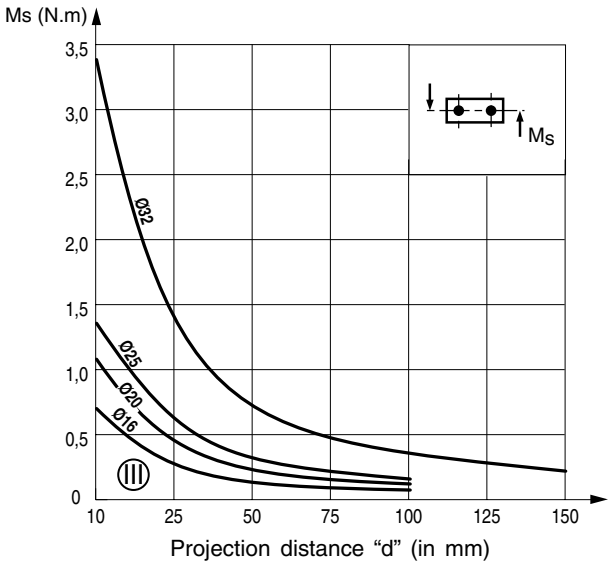


Cylinder with plain bearings guide **rods** in the **vertical plane**





- **MAXIMUM ALLOWABLE MOMENTS "Ms" AT ROD END**



d = the projection distance (in mm) corresponding to the dimension L10 + the stroke length + the distance from the load centre of gravity (G) to the mating surface of the cylinder flange
Note: the values in charts (I), (II) and (III) correspond to those in regular horizontal movement. In the event of vibration or jerky movement, **halve** the maximum allowable values.

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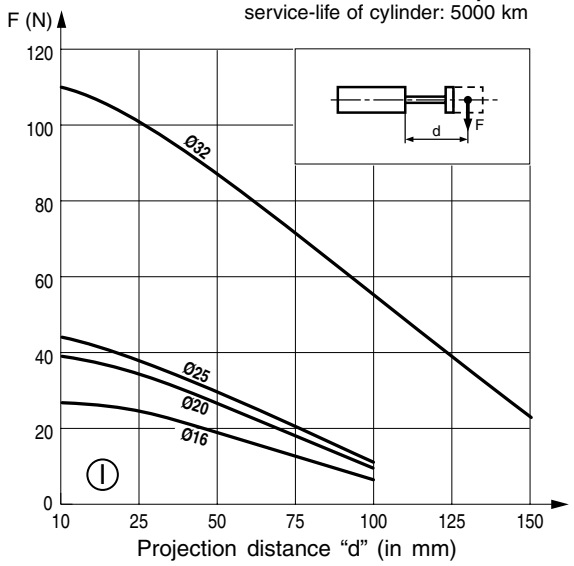
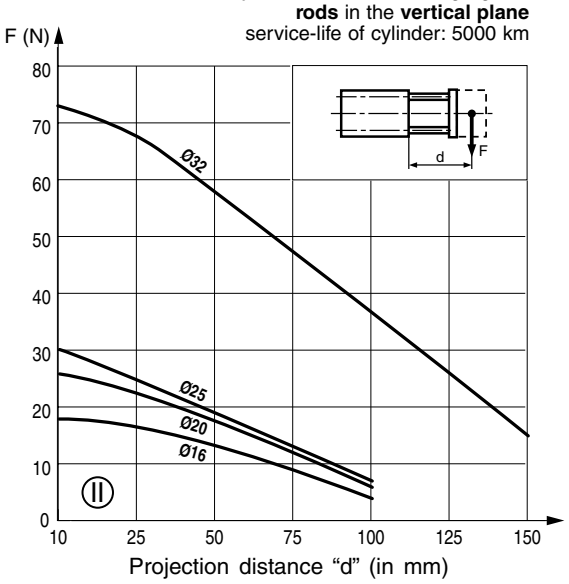
CYLINDERS WITH BALL BEARINGS GUIDE (type P2B)

• MAXIMUM ADMISSIBLE LOAD "F" ON THE ROD END

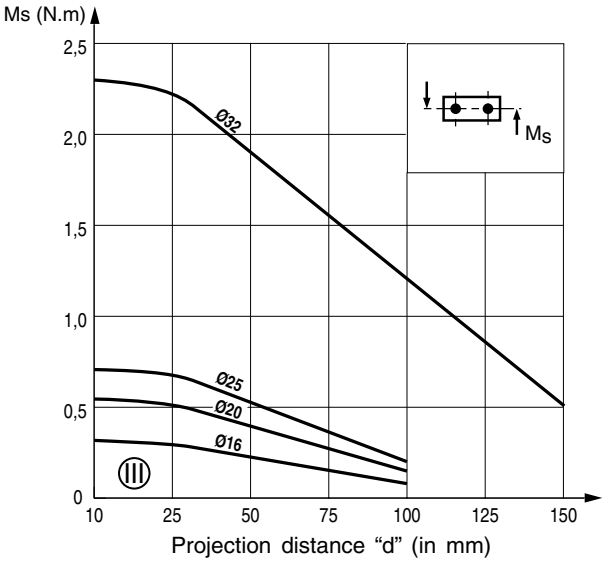
Cylinder with ball bearings guide **rods** in the **horizontal plane** service-life of cylinder: 5000 km

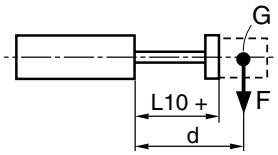


Cylinder with ball bearings guide **rods** in the **vertical plane** service-life of cylinder: 5000 km



• MAXIMUM ALLOWABLE MOMENTS "Ms" AT ROD END





d = the projection distance (in mm) corresponding to the dimension L10 + the stroke length + the distance from the load centre of gravity (G) to the mating surface of the cylinder flange

Note: the values in charts (I), (II) and (III) correspond to those in regular horizontal movement. In the event of vibration or jerky movement, **halve** the maximum allowable values.

Whatever the stroke of the cylinder, its movement is only a small proportion of the travel (not more than 30 mm), it is necessary to reduce the maximum allowable torques and loads by multiplying the values taken from charts (I), (II) and (III) by coefficient 0.6. The curves allow for this reduction in performance.

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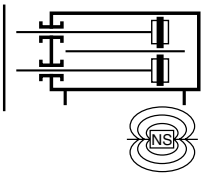
Series 447
Type : P2L

CYLINDERS WITH PLAIN BEARINGS GUIDE

twin piston

16 to 32 mm bore - 10 to 160 mm strokes



SPECIFICATION

TYPE OF CYLINDER	: double acting, double piston
FLUID	: air or neutral gas, filtered, lubricated or not
PRESSURE	: 2 to 7 bar
AMBIENT TEMPERATURE	: + 5 °C, + 60 °C
CUSHIONING	: elastic
MAXIMUM SPEED	: 0,5 m/s
MAX. STROKE	: 100 mm (Ø16 ... 25) - 160 (Ø32)
STROKE ADJUST RANGE	: nominal stroke +0 to –5 mm (retracted rods)
POSITIONS CONTROL	: with Reed switches or electronic (magnetoresistant) detectors

FORCE DEVELOPED BY CYLINDER

Bore Ø (mm)	Rod Ø (mm)	Piston cross-section (cm^2)		Dynamic force developed (daN) as a function of input pressure (bar)							
				1		3		5		7	
		●	○	●	○	●	○	●	○	●	○
16	8	4	3	3,4	2,5	11,3	8	16,7	13,6	26,4	18,6
20	10	6,3	4,7	5,6	4,3	18,2	13,8	27	23	40,8	32,3
25	12	9,8	7,55	8,5	6,5	27	20,9	45,1	36,4	66,6	50,4
32	16	16,1	12,1	13,1	10	45,2	32,8	77	58,2	109	79,5

● Force developed with rod out (rod extending)
○ Force developed with rod returned (rod retracting)

CHOICE OF EQUIPMENT

Bore Ø (mm)	**CODES** (1)	RÉFÉRENCES (1) (2)	Standard stroke (mm)								Ø Connection
			10	25	40	50	80	100	125	160	
16	**447 50 034** (1) ----	P2L 16 NA (1) ---- - DM	●	●	●	●	●	●			M5
20	**447 50 035** (1) ----	P2L 20 NA (1) ---- - DM	●	●	●	●	●	●			M5
25	**447 50 036** (1) ----	P2L 25 NA (1) ---- - DM	●	●	●	●	●	●			M5
32	**447 50 037** (1) ----	P2L 32 NA (1) ---- - DM	●	●	●	●	●	●	●	●	G 1/8

(1) State the stroke (in mm) preferably selecting the above standard strokes.
Other strokes on request. Max. strokes capabilty: **Ø 16-20-25: 100 mm, Ø 32 : 160 mm**
(2) **Magnetic detectors are to be ordered separately (see page P275-35 and P293)**

MOUNTING DETECTORS ON P2L (see opposite)

: The strokes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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Series 447
Type : P2B

CYLINDERS WITH BALL BEARINGS LINEAR GUIDE

twin piston

16 to 32 mm bore - 10 to 160 mm strokes

SPECIFICATION

TYPE OF CYLINDER	: double acting, double piston
FLUID	: air or neutral gas, filtered, lubricated or not
PRESSURE	: 2 to 7 bar
AMBIENT TEMPERATURE	: + 5 °C, + 60 °C
CUSHIONING	: elastic
MAXIMUM SPEED	: 0,5 m/s
MAX. STROKE	: 100 mm (Ø16 ... 25) - 160 (Ø32)
STROKE ADJUST RANGE	: nominal stroke +0 to –5 mm (retracted rods)
POSITIONS CONTROL	: with Reed switches or electronic (magnetoresistant) detectors

FORCE DEVELOPED BY CYLINDER

Bore Ø (mm)	Rod Ø (mm)	Piston cross-section (cm^2)		Dynamic force developed (daN) as a function of input pressure (bar)							
				1		3		5		7	
		●	○	●	○	●	○	●	○	●	○
16	8	4	3	3,4	2,5	11,3	8	16,7	13,6	26,4	18,6
20	10	6,3	4,7	5,6	4,3	18,2	13,8	27	23	40,8	32,3
25	12	9,8	7,55	8,5	6,5	27	20,9	45,1	36,4	66,6	50,4
32	16	16,1	12,1	13,1	10	45,2	32,8	77	58,2	109	79,5

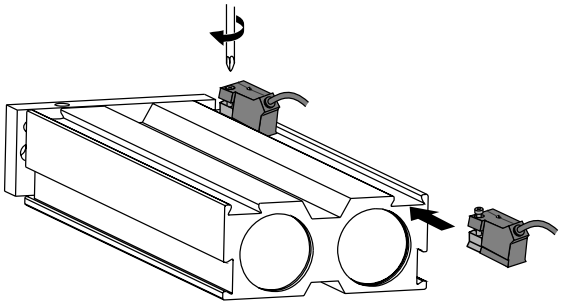
● Force developed with rod out (rod extending)
○ Force developed with rod returned (rod retracting)

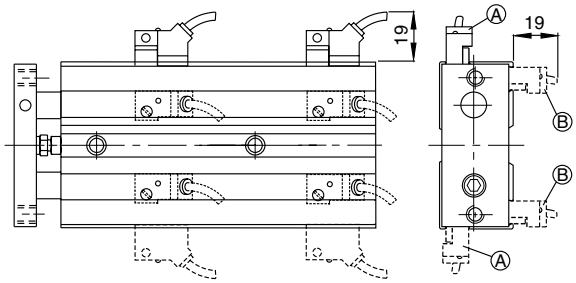
CHOICE OF EQUIPMENT

Bore Ø (mm)	**CODES** (1)	RÉFÉRENCES (1) (2)	Standard stroke (mm)								Ø Connection
			10	25	40	50	80	100	125	160	
16	**447 50 030** (1) ----	P2B 16 NA -(1)- - DM	●	●	●	●	●	●			M5
20	**447 50 031** (1) ----	P2B 20 NA -(1)- - DM	●	●	●	●	●	●			M5
25	**447 50 032** (1) ----	P2B 25 NA -(1)- - DM	●	●	●	●	●	●			M5
32	**447 50 033** (1) ----	P2B 32 NA -(1)- - DM	●	●	●	●	●	●	●	●	G 1/8

(1) State the stroke (in mm) preferably selecting the above standard strokes.
Other strokes on request. Max. strokes capabilty: **Ø 16-20-25: 100 mm, Ø 32 : 160 mm**
(2) **Magnetic detectors are to be ordered separately (see page P275-35 and P293)**

MOUNTING DETECTORS ON P2L - P2B





Ⓐ - Detectors mounted on side
Ⓑ - Detectors mounted on top

Mounting recommendations (reed switch and solid state types)
- Detectors with flying leads:
  - stroke ≤ 25 mm: mount one detector on the side (A) and one on the top (B)
  - stroke > 25 mm: mount the 2 detectors as desired, side (A) and/or top (B)
- Detectors with integral connectors:
  Mount one detector on the side (A) and the other on the top (B)

: The strokes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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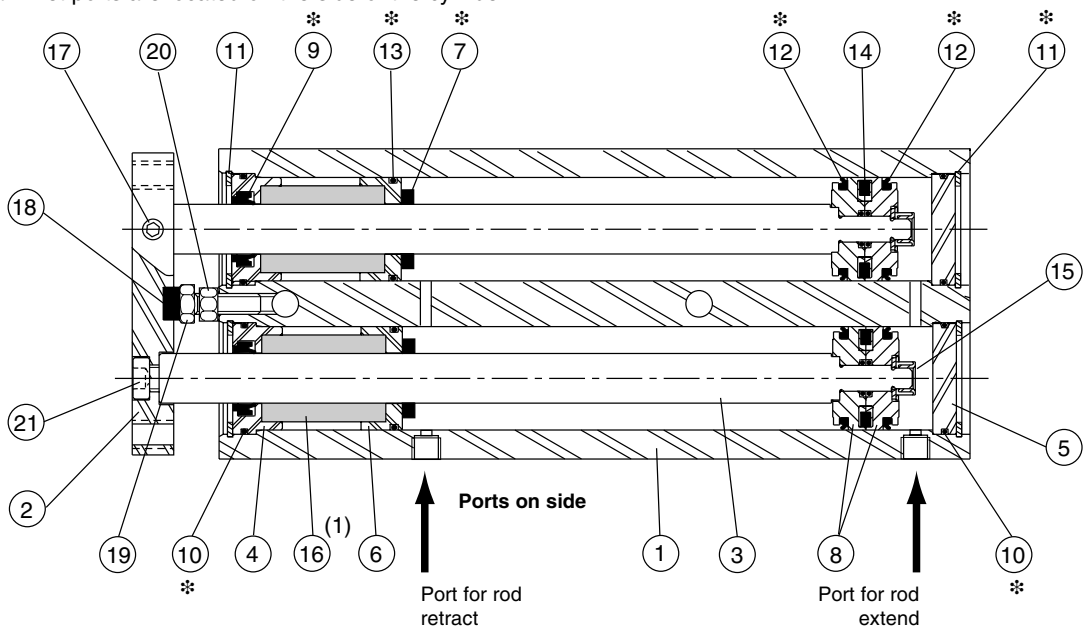
CONSTRUCTION - LOCATION OF AIR INLET PORTS

• The air inlet ports are located on the side of the cylinder



Item	Description	Material
1	Body	Aluminium alloy
2	Plate	Aluminium alloy
3	Piston rod	Bearing steel hard chrome
4	Inner guide support	Aluminium alloy
5	End plug	Aluminium alloy
6	Inner guide support	Aluminium alloy
7	Elastic stop	Hytrel (TPE)
8	Piston	Acetal resin (POM)
9	Rod seal	Polyurethane (PUR)
10	O-ring	Nitrile (NBR)
11	Circlip	Steel

Item	Description	Material
12	Piston seal	Polyurethane (PUR)
13	O-ring	Nitrile (NBR)
14	Magnet	Ferrite
15	Nut	Steel
16 (1)	Linear motion guide	Steel (balls) / bronze (bush)
17	Hexsocket head screw	Steel
18	Elastic stop	Nitrile (NBR)
19	Adjustable stop	Steel
20	Back-nut	Steel
21	Hexsocket head screw	Steel

(1) Plain bearing (**P2L**) or ball bearing (**P2B**) linear motion guides

SPARE PARTS KITS

CYLINDER BORE	Cylinder type P2B - P2L	**CODES** (items marked with a ❊: 7 and 9 to 13)
16	Designed for detector	**978 02 175**
20	Designed for detector	**978 02 176**
25	Designed for detector	**978 02 177**
32	Designed for detector	**978 02 178**

NOTE: For best results, use grease supplied in each kit. Supplementary tube available (11 cm^3) on request, code: **978 02 100**

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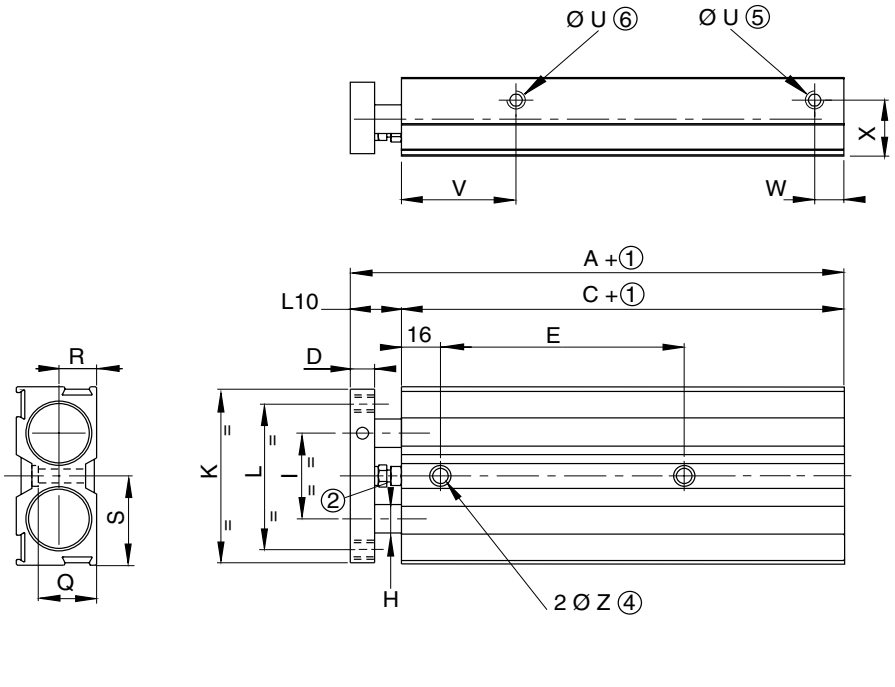
DIMENSIONS



① : + 1 stroke (rod retracted)
+ 2 strokes (rod extended)

② : Stroke adjustment

③ : Through hole

④ : Through hole
- counterbore dia./depth (16 mm dia.)

⑤ : Ports for extension

⑥ : Ports for retraction

◔ : 2 holes Ø 4 H8 for centering pins

Mounting of position detectors:
see below

(mm)

bore (mm)	DIMENSIONS (mm)														
	A (depending on stroke)	C (depending on stroke)	D	E (depending on stroke) ❊❊								F	H	I	J	K	L
				10	25	40	50	80	100	125	160						
16	85,7	67,2	8	34,5	34,5	42	47	75	85	-	-	6	8	24	52	50	42
20	96,2	77,2	8	51	38,5	46	51	81	91	-	-	7,5	10	30	63	61	52
25	101	80	10	57	44,5	52	57	90	100	-	-	9	12	36	75	73	64
32	116,9	92,1	12	60	75	90	100	130	150	175	210	11	16	44	98	88	72

bore (mm)	L10	M	N	O	P	Q	R	S	U	V	W	X	Y	Z (4)	Screws recommended for the cylinder installation
16	18,5	1	10,5	19	24,5	16,5	10,5	26	M5	37,5	10	17	M5	Ø 5 - Ø7,5 / 3,5	M4 x 25
20	19	1	13	24	28	20,5	12,5	31,5	M5	46	13	18,5	M5	Ø 5,4	M5 x 25
25	21	1	16	30	33	26,5	15,5	37,5	M5	47	11	23,5	M6	Ø 5,4	M5 x 35
32	24,8	1	20	38	40	33,5	19,5	49	G1/8	56,5	13	30	M6	Ø 6,4	M6 x 45

❊❊ Dimensions for P2L/P2B with non-standard strokes.

bore (mm)	E (depending on stroke)				
	(0...11)	(12...24)	(26...79)	(81...99)	(101...159)
16	34,5	47	22 + (8)	35 + (8)	-
20	38,5	51	26 + (8)	41 +(8)	-
25	44,5	57	32 + (8)	50 + (8)	-
32	50 + (9)	50 + (9)	50 + (9)	50 + (9)	50 + (9)

(8) : + 1/2 stroke
(9) : + stroke

WEIGHTS

(kg)

bore (mm)	STROKE (mm)							
	10	25	40	50	80	100	125	160
16	0,280	0,320	0,360	0,380	0,460	0,510	-	-
20	0,440	0,490	0,540	0,580	0,690	0,760	-	-
25	0,660	0,740	0,810	0,860	1,020	1,120	-	-
32	1,160	1,280	1,400	1,480	1,720	1,880	2,080	2,360

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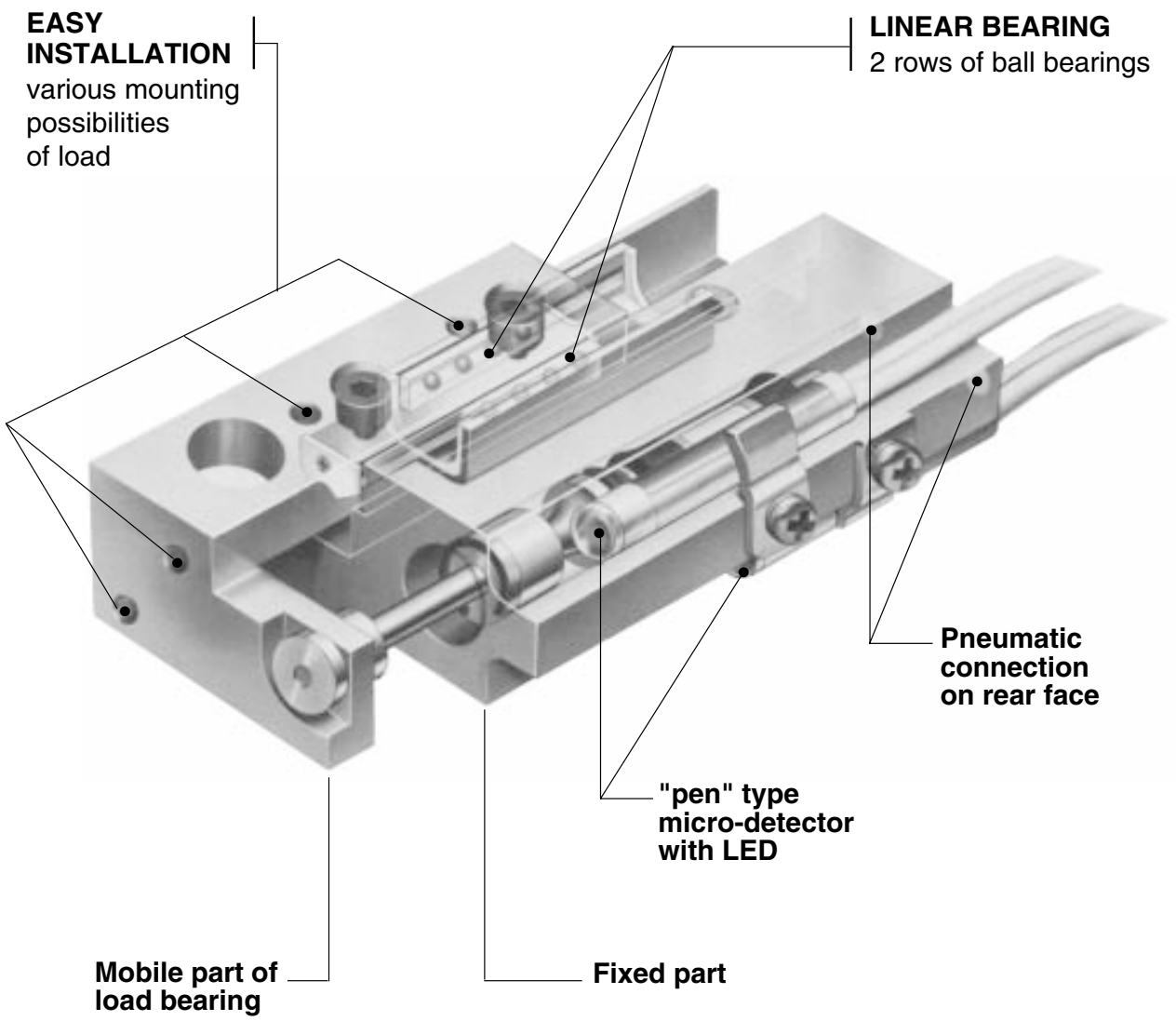
MICRO SLIDE TABLES WITH BALL BEARINGS

Type : TMB

- **VERY COMPACT AND PRECISE TABLES**
  for all available air cylinders
  Particularly well adapted to micromechanics
- **LESS THAN 0.05 mm**
  between axes of fixed and mobile elements during stroke



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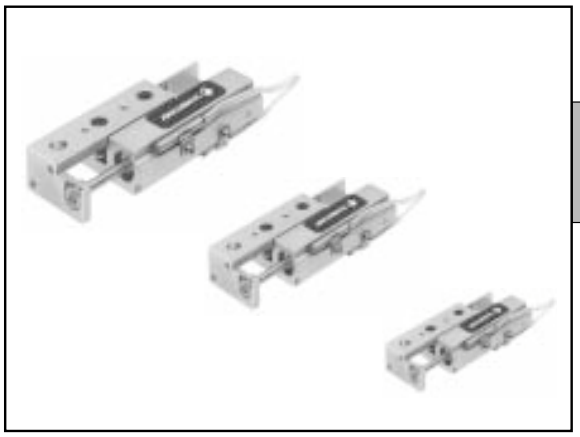
Series 447
Type : TMB

MICRO TABLE

Double acting - Ø 6 - 10 mm
equipped for magnetic position detectors

SPECIFICATIONS

FLUID	: air or neutral gas, filtered, lubricated or NOT
PRESSURE	: 2 to 7 bar
AMBIENT TEMPERATURE	: + 5 °C, + 60 °C
MAXIMUM STROCKE	: 30 mm
MAXIMUM SPEED	: 0,5 m/s
POSITIONS CONTROL	: with miniature Reed switches
CUSHIONING	: without



THEORETICAL THRUST

(N)

Bore Ø (mm)	Direc-tion	Pressure (bar) 2	3	4	5	6	7
6	push	5,6	8,5	11,3	14,1	17,0	19,8
	pull	4,2	6,3	8,5	10,6	12,7	14,8
10	push	15,7	23,5	31,4	39,2	47,1	55,9
	pull	13,2	19,8	26,3	33,0	39,6	46,2

This table shows theoretical thrust.

Cylinder output force is recommended to be calculated so that thrust efficiency is less than 50%

For higher performances, see type TLB tables.

CHOICE OF EQUIPMENT

Ø bore (mm)	Strokes (mm)	CODES ❇ to specify on order	REFERENCES to specify on order	Ø connection
6	10	**447 00 205**	TMB 6 NA 10-DM	M3
	20	**447 00 206**	TMB 6 NA 20-DM	
	30	**447 00 207**	TMB 6 NA 30-DM	
10	10	**447 00 208**	TMB 10 NA 10-DM	M3
	20	**447 00 209**	TMB 10 NA 20-DM	
	30	**447 00 210**	TMB 10 NA 30-DM	

❇ **The magnetic position detectors must be ordered separately** (see chapter detectors).

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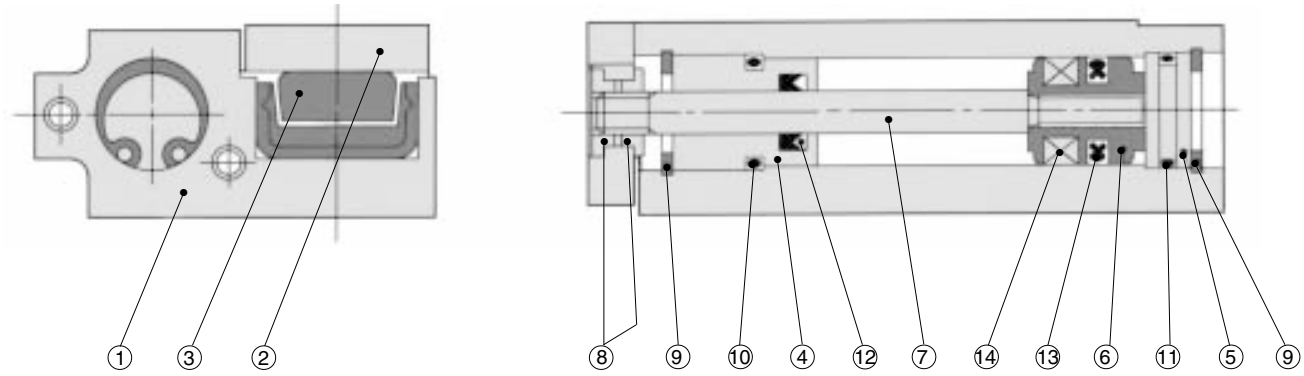
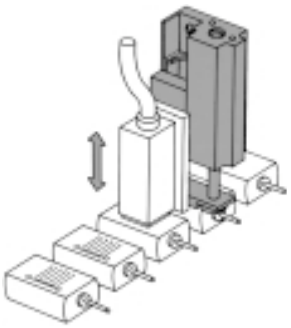
CONSTRUCTION



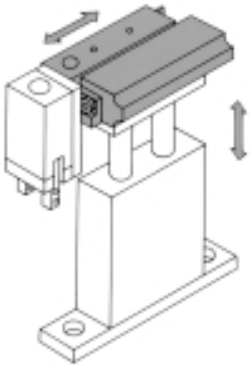
No.	Description	Material
1	Body	Aluminum alloy
2	Table	Aluminum alloy
3	Miniature linear guide	Stainless steel
4	Rod cover	Aluminum bearing-alloy
5	End cover	Aluminum alloy
6	Piston	Brass
7	Rod	Stainless steel

No	Description	Material
8	Connecting nuts	Stainless steel
9	Snap ring	Steel
10	O-ring	NBR
11	O-ring	NBR
12	Rod seal	NBR
13	Piston seal	NBR
14	Magnet	

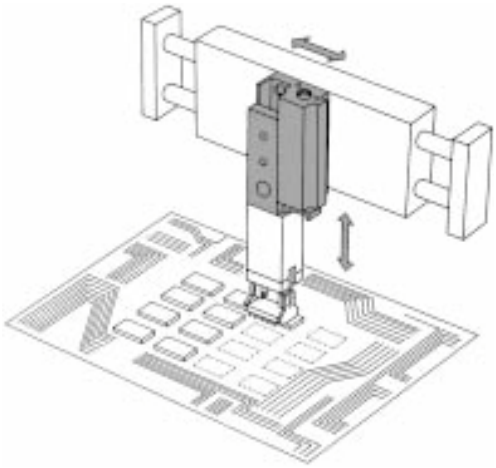
APPLICATIONS EXAMPLES



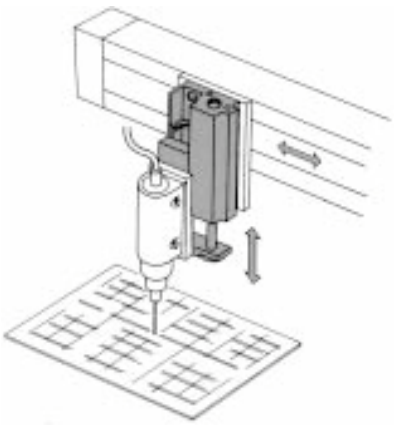
Marking



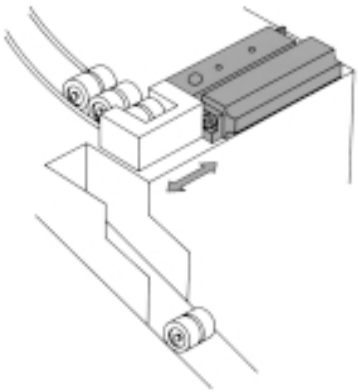
Compact pick and place



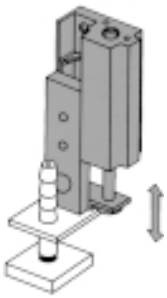
Insertion of Parts



Dispenser



Parts feeder in a limited space



Precision vacuum chucking

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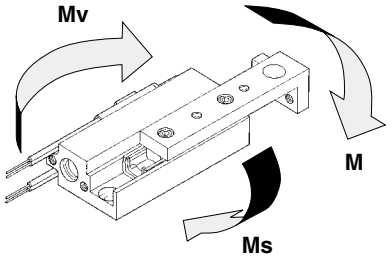
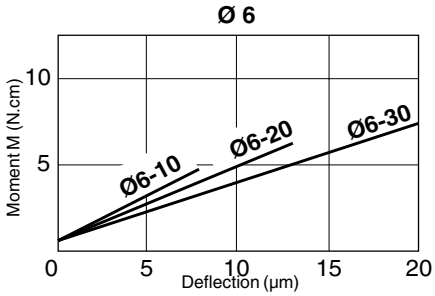
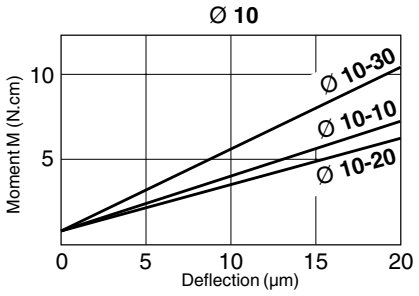
DEFLECTION AT THE TABLE END BY EXTERNAL MOMENT

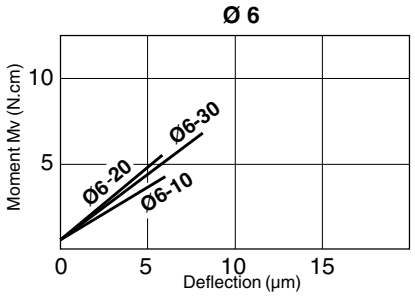


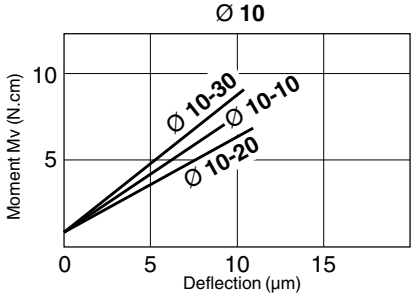
• Moment **M**



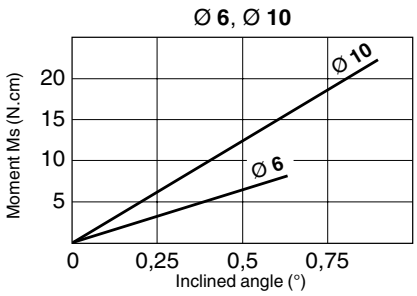


• Moment **Mv**





• Moment **Ms**



ALLOWABLE MOMENT

(N.cm)

Bore Ø (mm)	Stroke (mm)	M	Mv	Ms
6	10 20 30	4,7 6,2 7,8	4,1 5,4 6,8	5,0 6,3 7,6
10	10 20 30	8,1 8,1 10,5	7,0 7,0 9,1	17,2 17,2 21,7

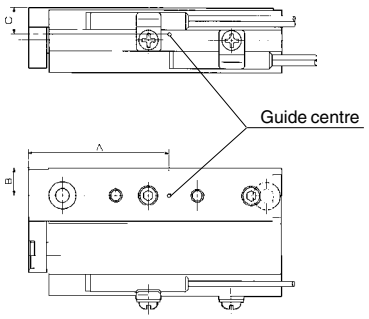
ALLOWABLE LOAD

Bore Ø (mm)	Allowable (N)
6	1
10	2

POSITION OF GUIDE CENTRE

(mm)

Bore Ø (mm)	Stroke (mm)	A'	A"	B	C
6	10 20 30	26,5 33,5 40,5	31,5 43,5 55,5	6,5	6,3
10	10 20 30	33,5 36,5 44,5	38,5 46,5 59,5	9	7,5

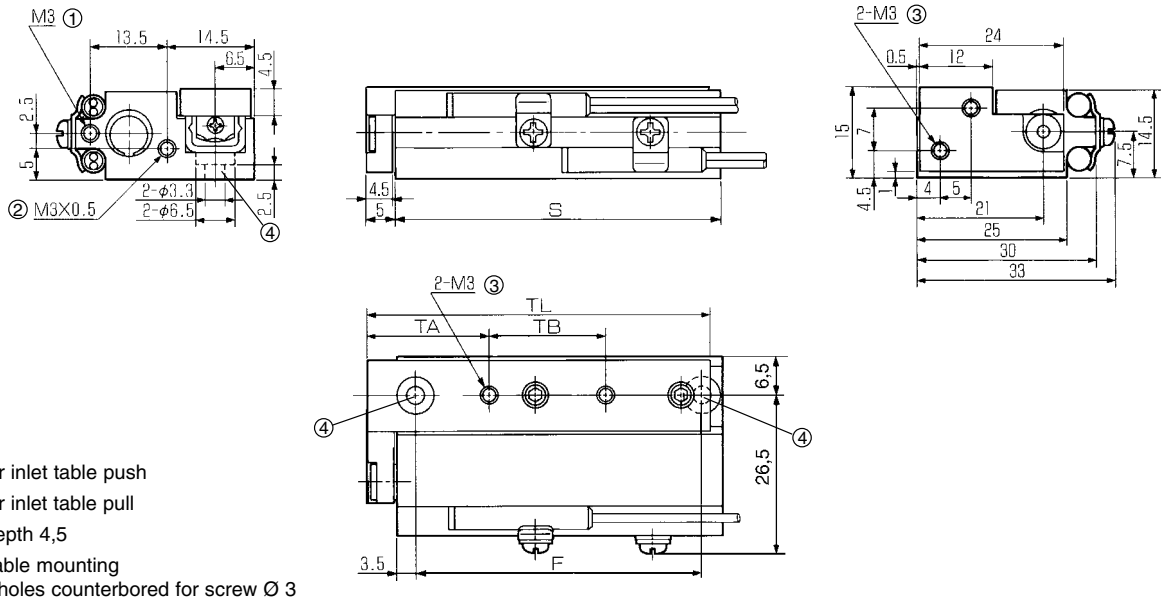


A' at 0 stroke
A" at stroke end

To minimize moment generated by external load, it is recommanded to mount the load as close as possible to the guide centre.

DIMENSIONS AND WEIGHTS

Ø 6



① : Air inlet table push
② : Air inlet table pull
③ : Depth 4,5
④ : Table mounting
2 holes counterbored for screw Ø 3

Stroke	F	S	TA	TB	TL	WEIGHT (g)
10	39	46	15	15	41	50
20	49	56	19	20	55	60
30	59	66	23	25	69	70

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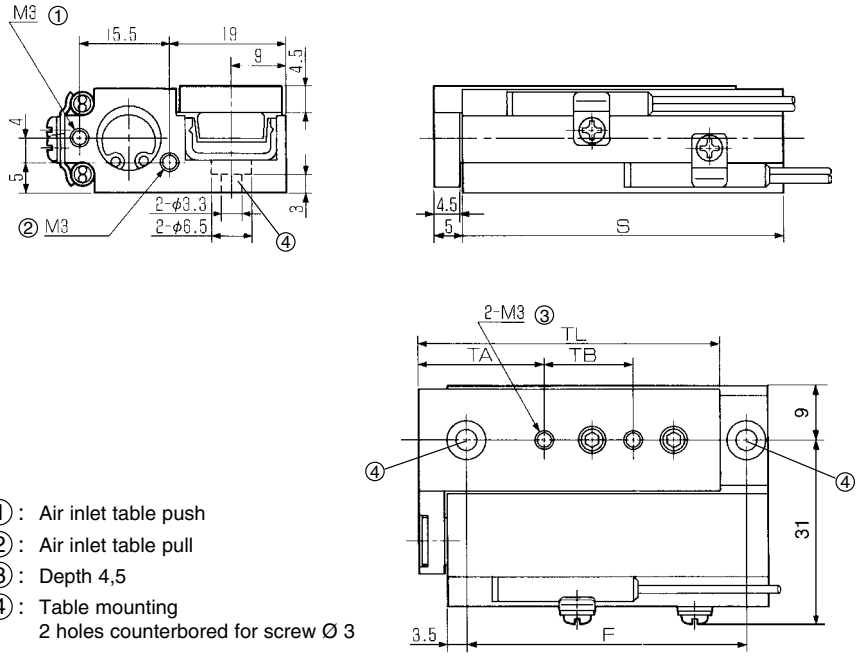
DIMENSIONS AND WEIGHTS

Ø 10

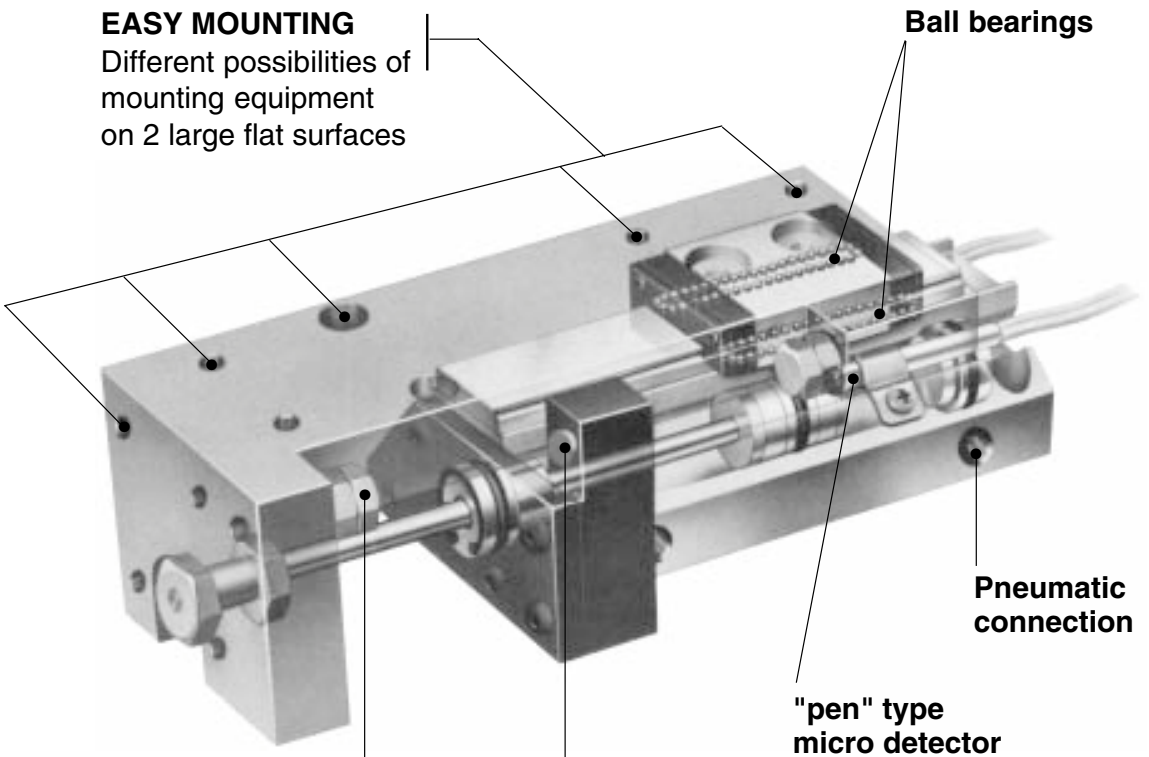


① : Air inlet table push
② : Air inlet table pull
③ : Depth 4,5
④ : Table mounting
2 holes counterbored for screw Ø 3

Stroke	F	S	TA	TB	TL	WEIGHT (g)
10	48	55	16	20	55	90
20	58	65	22	20	61	100
30	68	75	28	25	77	110

SLIDE TABLES
WITH BALL BEARINGS
Type : TLB

- **COMPACT SET**
  integrating 3 elements :
  cylinder + table + ball linear bearing
- **HIGH RIGIDITY**
- **ADJUSTABLE STROKES**



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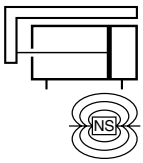
Series 447
Type : TLB

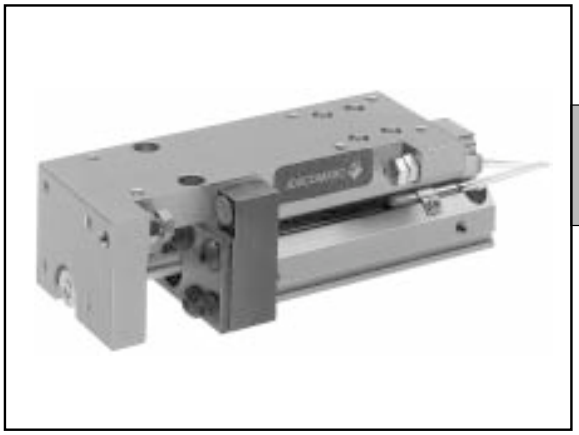
LINEAR TABLE

Double acting - Ø 10 - 16 - 25 mm equipped for magnetic position detectors



SPECIFICATIONS

FLUID	: air or neutral gas, filtered, lubricated or NOT
PRESSURE	: 2 to 10 bar
AMBIENT TEMPERATURE	: + 5 °C, + 60 °C
MAXIMUM STROKE	: 100 mm
STROKE ADJUST RANGE	: nominal stroke + 0 to –10 mm (– 5 mm at both ends)
MAXIMUM SPEED	: 0,5 m/s
POSITIONS CONTROL	: with miniature Reed switches detectors
CUSHIONING	: without



THEORETICAL THRUST

(N)

Bore Ø (mm)	Rod Ø (mm)	Pressure (bar) 2	4	6	8	10
10	4	13	26	40	53	66
16	6	35	69	104	138	172
25	10	82	165	247	330	412

This table shows theoretical thrust.

Cylinder output force is recommended to be calculated so that thrust efficiency is less than 50 %.

CHOICE OF EQUIPMENT

Ø bore (mm)	Stroke (mm)	**CODES ❇** to specify on order	**REFERENCES** to specify on order	Ø connection
10	15	**447 00 192**	TLB 10 NA 15-DM	M5
	30	**447 00 193**	TLB 10 NA 30-DM	
	45	**447 00 194**	TLB 10 NA 45-DM	
	60	**447 00 195**	TLB 10 NA 60-DM	
16	15	**447 00 196**	TLB 16 NA 15-DM	M5
	30	**447 00 197**	TLB 16 NA 30-DM	
	45	**447 00 198**	TLB 16 NA 45-DM	
	60	**447 00 199**	TLB 16 NA 60-DM	
25	30	**447 00 200**	TLB 25 NA 30-DM	M5
	45	**447 00 201**	TLB 25 NA 45-DM	
	60	**447 00 202**	TLB 25 NA 60-DM	
	80	**447 00 203**	TLB 25 NA 80-DM	
	100	**447 00 204**	TLB 25 NA 100-DM	

❇ **The magnetic positions detectors must be ordered separately** (see page P275-35)

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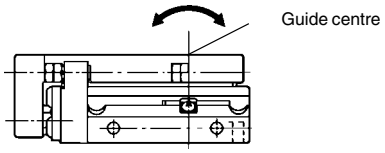
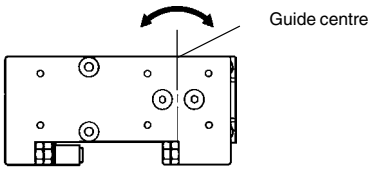
DEFLECTION AT THE TABLE END BY EXTERNAL MOMENT

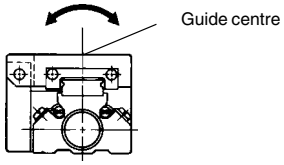
• Moment **M**



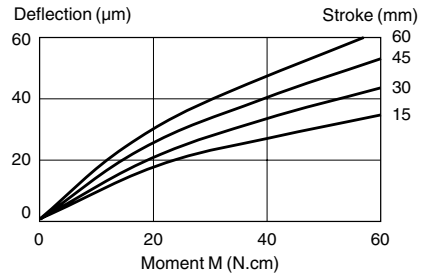
• Moment **Mv**

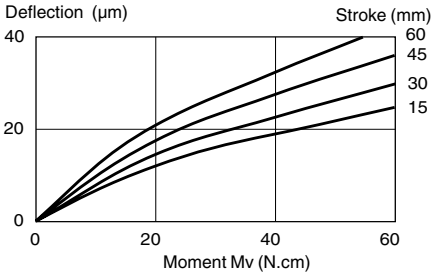


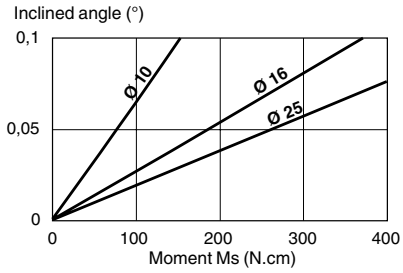
• Moment **Ms**



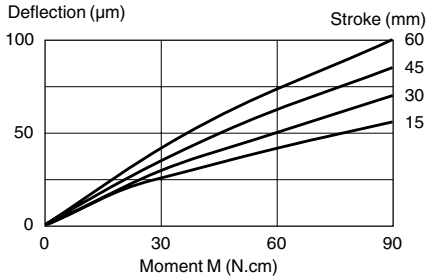
Ø 10

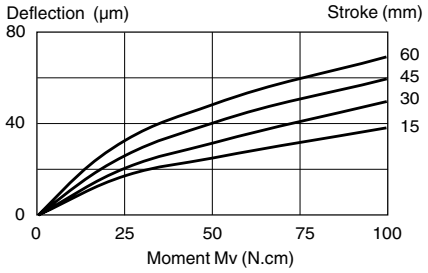




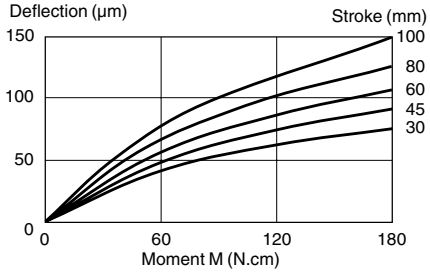


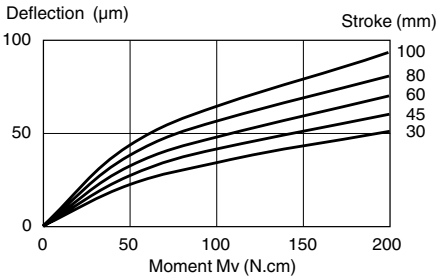
Ø 16



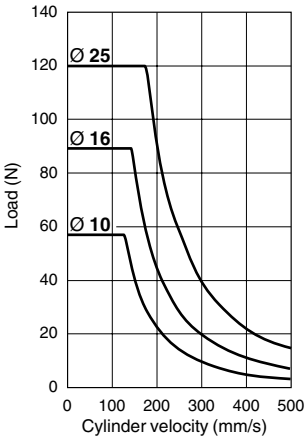


Ø 25





AVAILABLE LOAD vs CYLINDER VELOCITY

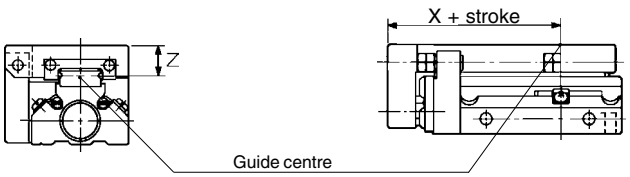


ALLOWABLE MOMENT

(N.cm)

Bore Ø (mm)	Moment **M** (N.cm)	Moment **Mv** (N.cm)	Moment **Ms** (N.cm)
10	55	55	150
16	89	97	230
25	175	190	400

POSITION OF GUIDE CENTRE



Bore Ø (mm)	X	Z
10	34,5	9,5
16	41	10
25	44	13

To minimize moment generated by external load, it is recommanded to mount the load as close as possible to the guide centre.

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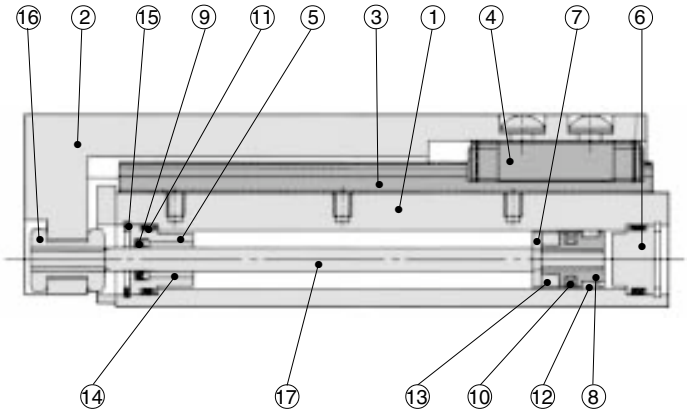
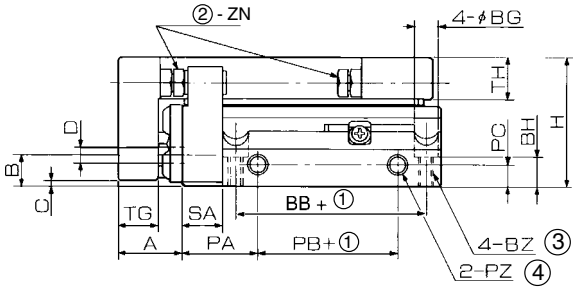
CONSTRUCTION



No	Description	Material
1	Body	Aluminium alloy
2	Table	Aluminium alloy
3	Guide rail	Stainless steel
4	Guide block	Stainless steel
5	Rod cover	Aluminium alloy
6	Head cover	Aluminium alloy
7	Washer	Carbon steel
8	Piston	Aluminium alloy
9	Rod seal	NBR
10	Piston seal	NBR
11	O-ring	NBR
12	Wear ring	Resin
13	Magnet	
14	Bearing-bush	Bearing-alloy
15	Snap ring	Carbon steel
16	Connecting nut	Carbon steel
17	Rod	Stainless steel

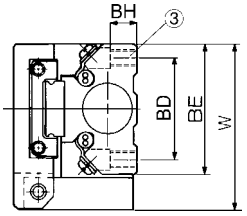
DIMENSIONS AND WEIGHTS

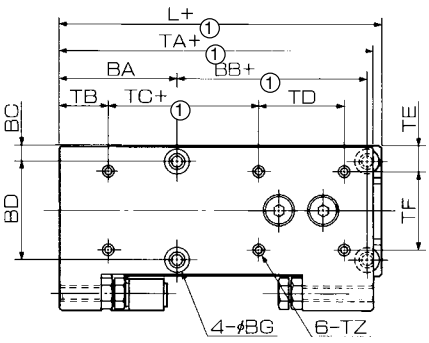
Bore Ø (mm)	Stroke (mm)	Weight (kg)
10	15	0,250
	30	0,290
	45	0,330
	60	0,370
16	15	0,430
	30	0,490
	45	0,550
	60	0,610
25	30	0,820
	45	0,980
	60	1,140
	80	1,340
	100	1,540

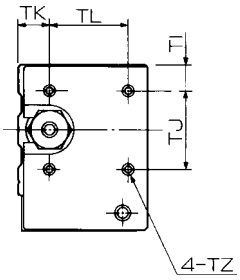


① : + Stroke
② : 2 stroke adjustment screws
③ : Slide table mounting:
- Frontal mounting: 4 screw Ø (BZ-1mm)
- Bottom mounting: 4 screw Ø BZ

④ : 2 air inlet ports Ø PZ







Bore Ø (mm)	DIMENSIONS (mm)																		
	A	**B**	**C**	**D**	**H**	**L**	**W**	**BA**	**BB**	**BC**	**BD**	**BE**	**BF**	**BG**	**BH**	**BZ**	**PA**	**PB**	**PC**
10	17	8	1,5	4	33	56	42	31 (30)	21 (22)	4	25	33	16,5	6,5	7,5	M4	20	7,5	5,5
16	20	10,5	4	6	42	63	49,5	34 (32)	24 (26)	5,5	28	39	19,5	8	11	M5	21,5	8,5	9,5
25	20	15,5	2,5	10	54	70	65	37	27	6	40	52	26	9,5	11,5	M6	26	10	11,5

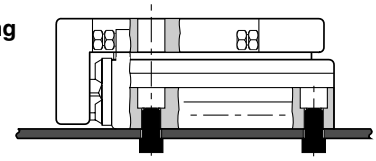
Bore Ø (mm)	DIMENSIONS (mm)														
	PZ	**SA**	**TA**	**TB**	**TC**	**TD**	**TE**	**TF**	**TG**	**TH**	**TI**	**TJ**	**TK**	**TL**	**TZ✻**	**ZN**
10	M5 x 0,8	10,5	54	13	10	23	6,5	20	10,5	10,5	6,5	20	8	20	M3-4,5	M4 x 14
16	M5 x 0,8	16	62	16	10	30	5,5	28	11,5	11,5	5,5	28	12	24	M4-4,5	M5 x 16
25	M5 x 0,8	17,5	69	16	13	30	6	40	11,5	15	6	40	18	28	M5-5	M6 x 16

✻ Diameter - Depth

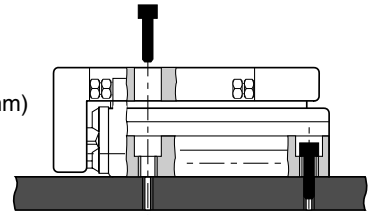
( ) : Slide tables Ø 10 and 16, the dimensions for BA and BB given in parentheses are only valid for 15 mm strokes.

MOUNTING OPTIONS

Bottom mounting
(4 screws Ø BZ)



Frontal mounting
(4 screws Ø BZ-1mm)



SLIDE UNIT
WITH LINEAR BALL BEARING GUIDE
Type : TUB

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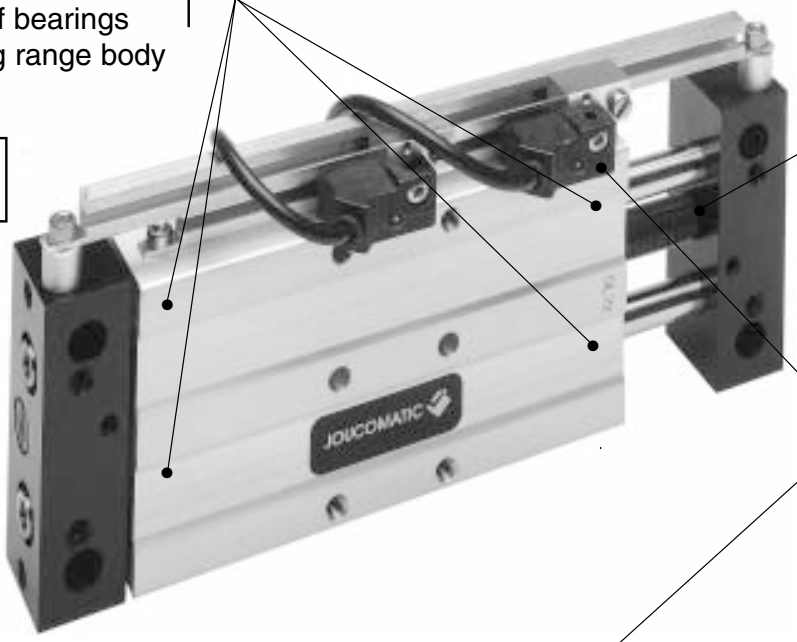
EASY INSTALLATION :

- **2 versions offered, with mobile or fixed carrier**
- **Various mounting possibilities**
- **Choice of connecting mode**

PRECISE BEARING
4 sets of bearings
and long range body

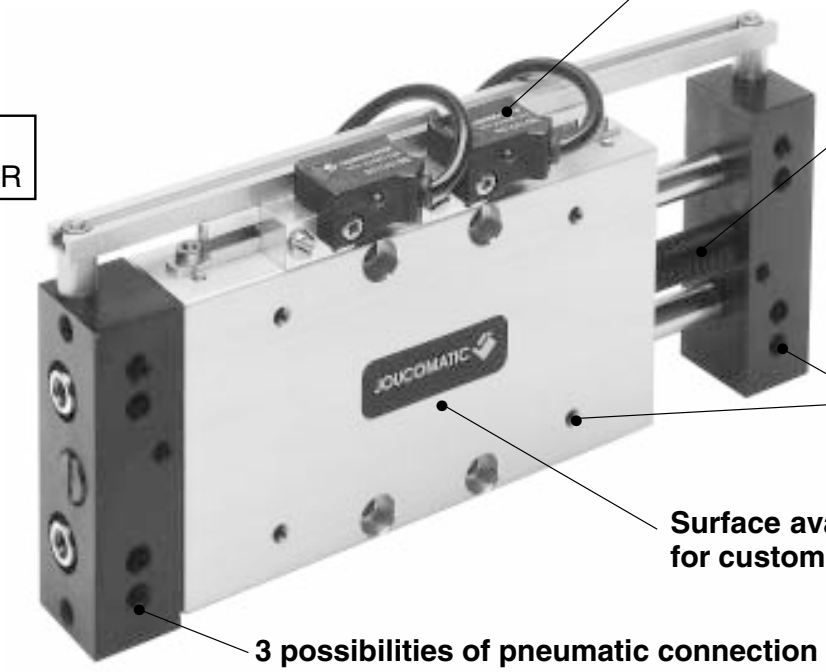
MOBILE CARRIER



ROBUST AND HIGH PERFORMANCE
(adjustable shock absorbers)

MAGNETIC DETECTOR
(mounting adapted to each version)

FIXED CARRIER



CONVENIENT
adjustable stroke
with 2 end stops
(0 to – 10 mm)

EASY MOUNTING
several mounting
possibilities

Surface available for custom mounting

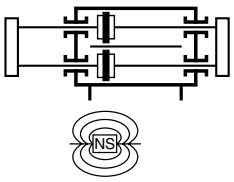
3 possibilities of pneumatic connection

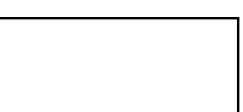
ASCO® JOUCOMATIC

Series 447
Type : TUB

SLIDE UNIT WITH LINEAR BALL BEARINGS

Ø 10 - 25 mm - Strokes 25 - 200 mm





SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or NOT
PRESSURE : 2 to 10 bar
TEMPERATURE : + 5 °C, + 60 °C
CUSHIONING : with shock absorbers (option)
STROKE ADJUST RANGE : nominal stroke + 0 to – 10 mm (– 5 mm at both ends)

MAXIMUM SPEED
- without cushioning : 0,2 m/s
- shock absorber : 0,5 m/s

POSITIONS CONTROL : unit for Reed switches or electronic (magnetoresistant) detectors

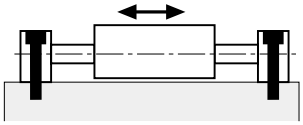
MAX. LOAD (N)

Bore Ø (mm)	10	16	20	25
Mobile body	15	40	70	100
Fixed body	7	20	35	50

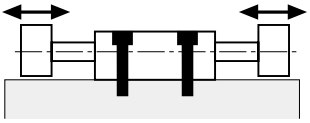
ADAPTATION

Unit exists in two different versions : fixed carrier or mobile carrier.
It offers 2 ways of functionning, depending on adaptation type :

• Mobile carrier with 2 fixed flanges



• Fixed carrier with two mobiles flanges



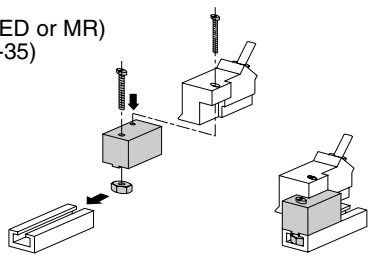
CHOICE OF EQUIPMENT

Bore Ø (mm)	Stroke (mm)	UNIT FOR DETECTORS MOBILE CARRIER (M) CODES	MOBILE CARRIER (M) REFERENCES	FIXED CARRIER (F) CODES	FIXED CARRIER (F) REFERENCES
10	25	**447 00 170**	TUB 10 NA 25-DMM	**447 00 148**	TUB 10 NA 25-DMF
	50	**447 00 171**	TUB 10 NA 50-DMM	**447 00 149**	TUB 10 NA 50-DMF
	80	**447 00 172**	TUB 10 NA 80-DMM	**447 00 150**	TUB 10 NA 80-DMF
	100	**447 00 173**	TUB 10 NA 100-DMM	**447 00 151**	TUB 10 NA 100-DMF
16	25	**447 00 174**	TUB 16 NA 25-DMM	**447 00 152**	TUB 16 NA 25-DMF
	50	**447 00 175**	TUB 16 NA 50-DMM	**447 00 153**	TUB 16 NA 50-DMF
	80	**447 00 176**	TUB 16 NA 80-DMM	**447 00 154**	TUB 16 NA 80-DMF
	100	**447 00 177**	TUB 16 NA 100-DMM	**447 00 155**	TUB 16 NA 100-DMF
	160	**447 00 178**	TUB 16 NA 160-DMM	**447 00 156**	TUB 16 NA 160-DMF
	200	**447 00 179**	TUB 16 NA 200-DMM	**447 00 157**	TUB 16 NA 200-DMF
20	25	**447 00 180**	TUB 20 NA 25-DMM	**447 00 158**	TUB 20 NA 25-DMF
	50	**447 00 181**	TUB 20 NA 50-DMM	**447 00 159**	TUB 20 NA 50-DMF
	80	**447 00 182**	TUB 20 NA 80-DMM	**447 00 160**	TUB 20 NA 80-DMF
	100	**447 00 183**	TUB 20 NA 100-DMM	**447 00 161**	TUB 20 NA 100-DMF
	160	**447 00 184**	TUB 20 NA 160-DMM	**447 00 162**	TUB 20 NA 160-DMF
	200	**447 00 185**	TUB 20 NA 200-DMM	**447 00 163**	TUB 20 NA 200-DMF
25	25	**447 00 186**	TUB 25 NA 25-DMM	**447 00 164**	TUB 25 NA 25-DMF
	50	**447 00 187**	TUB 25 NA 50-DMM	**447 00 165**	TUB 25 NA 50-DMF
	80	**447 00 188**	TUB 25 NA 80-DMM	**447 00 166**	TUB 25 NA 80-DMF
	100	**447 00 189**	TUB 25 NA 100-DMM	**447 00 167**	TUB 25 NA 100-DMF
	160	**447 00 190**	TUB 25 NA 160-DMM	**447 00 168**	TUB 25 NA 160-DMF
	200	**447 00 191**	TUB 25 NA 200-DMM	**447 00 169**	TUB 25 NA 200-DMF

Other strokes on request (**max. strokes capabilty: Ø 10:100 mm , Ø 16 to 25: 200 mm**).

POSITION DETECTORS

UNI type magnetic position detectors (REED or MR) to be ordered separately (see page P275-35)



(1) **Mini. stroke with 2 detectors**
- Flying lead detectors :
  - Reed switch : mini. stroke, 20 mm
  - MR : mini. stroke, 30 mm
- Integral connector detectors :
  - Reed switch : mini. stroke, 90 mm
  - MR : mini. stroke, 100 mm

Mounting: see following pages

ACCESSORIES

Shock absorbers (see next pages).

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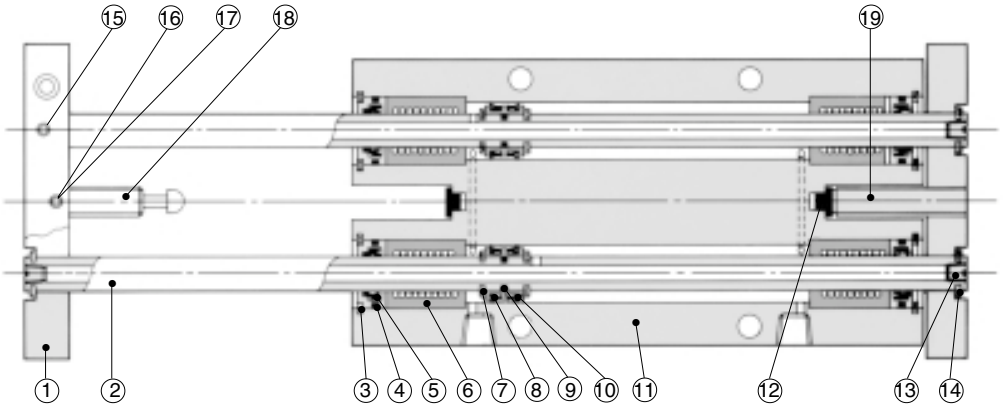
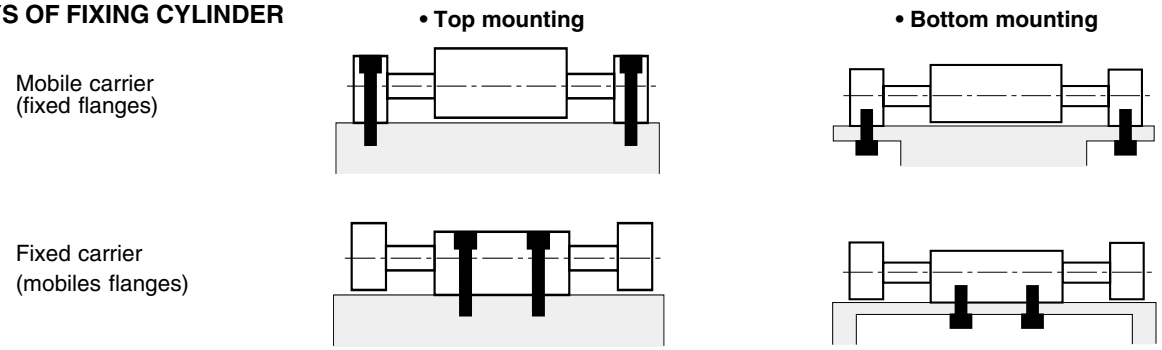
CONSTRUCTION



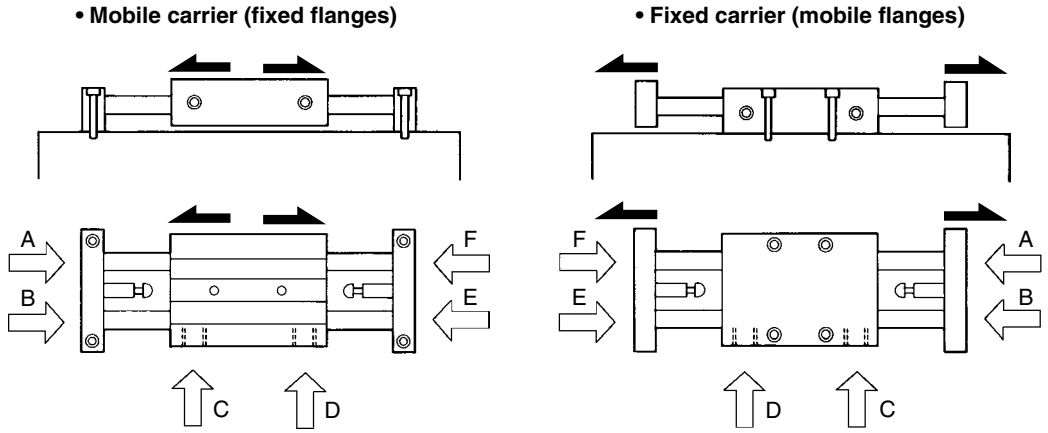
No.	Description	Material
1	Plate	Aluminum alloy
2	Piston rod	Bearing steel
3	Snap ring	Carbon steel
4	O-ring	Nitrile
5	Rod seal	Nitrile
6	Linear bearing	Steel
7	Snap ring	Carbon steel
8	Piston seal	Nitrile
9	O-ring	Nitrile
10	Piston	Aluminum alloy

No.	Description	Material
11	Carrier	Aluminum alloy
12	Stopper receiver	Carbon steel
13	Plug	Carbon steel
14	Snap ring	Carbon steel
15	Fixing screw	Carbon steel
16	Fixing screw	Carbon steel
17	Shim	Aluminum alloy
18	Shock absorber	–
19	Stroke adjuster	Carbon steel

WAYS OF FIXING CYLINDER



DIRECTIONS OF MOVEMENT DEPENDING ON AIR INLET



Mounting type	Air supply port :	A	B	C	D	E	F
Mobile carrier	Carrier moving direction :	←	→	←	→	→	←
Fixed carrier	Flanges moving direction :	←	→	←	→	→	←

← : movement to the left → : movement to the right

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THEORETICAL THRUST (N)

Bore Ø (mm)	PRESSURE (bar)							
	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90
16	50	76	101	126	152	177	202	228
20	80	121	161	201	241	281	322	362
25	116	174	232	290	348	406	464	522

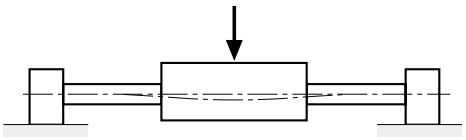
ALLOWABLE LOAD (N)

Bore Ø (mm)	**10**	**16**	**20**	**25**
Mobile carrier	15	40	70	100
Fixed carrier	7	20	35	50

2

DEFLECTION BY EXTERNAL BENDING FORCE

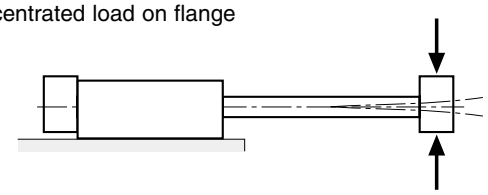
• Concentrated load on carrier centre



(Deflection mm)

Bore Ø (mm)	Load (N)	Stroke (mm)	
		100	200
10	15	0,03	–
16	40	–	0,1
20	70	–	0,06
25	100	–	0,05

• Concentrated load on flange

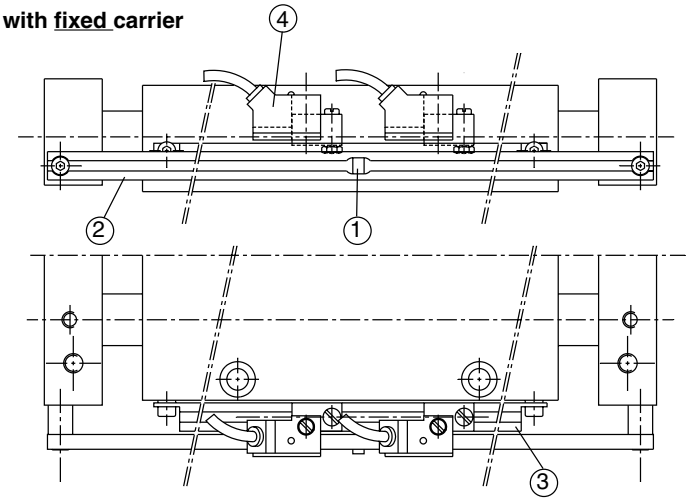


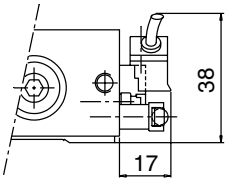
(Deflection mm)

Bore Ø (mm)	Load (N)	Stroke (mm)			
		50	100	150	200
10	3	0,08	0,26	–	-
16	5	0,06	0,19	0,41	0,74
20	10	0,03	0,10	0,24	0,38
25	15	0,02	0,07	0,13	0,21

ADAPTATION DETECTORS

• **TUB with fixed carrier**

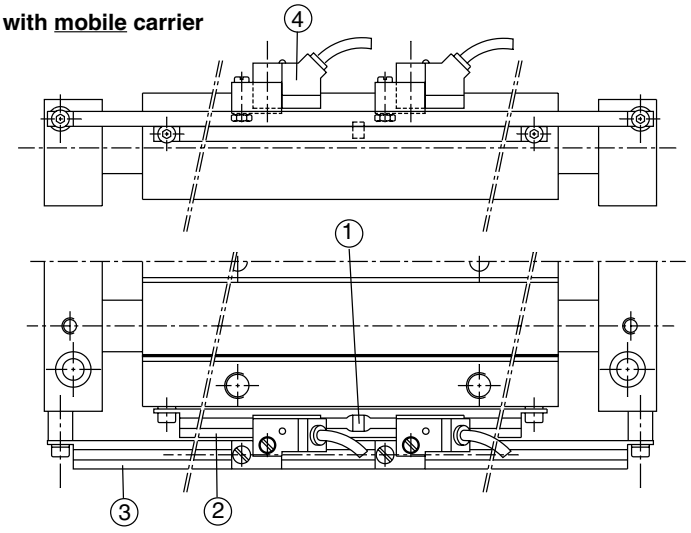


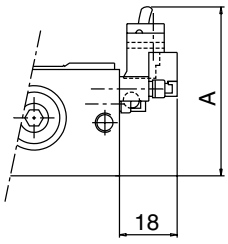


① : Magnet
② : Rail for magnet
③ : Rail for switch
④ : Switch

Mounting recommendations
Mount detectors as indicated opposite.

• **TUB with mobile carrier**



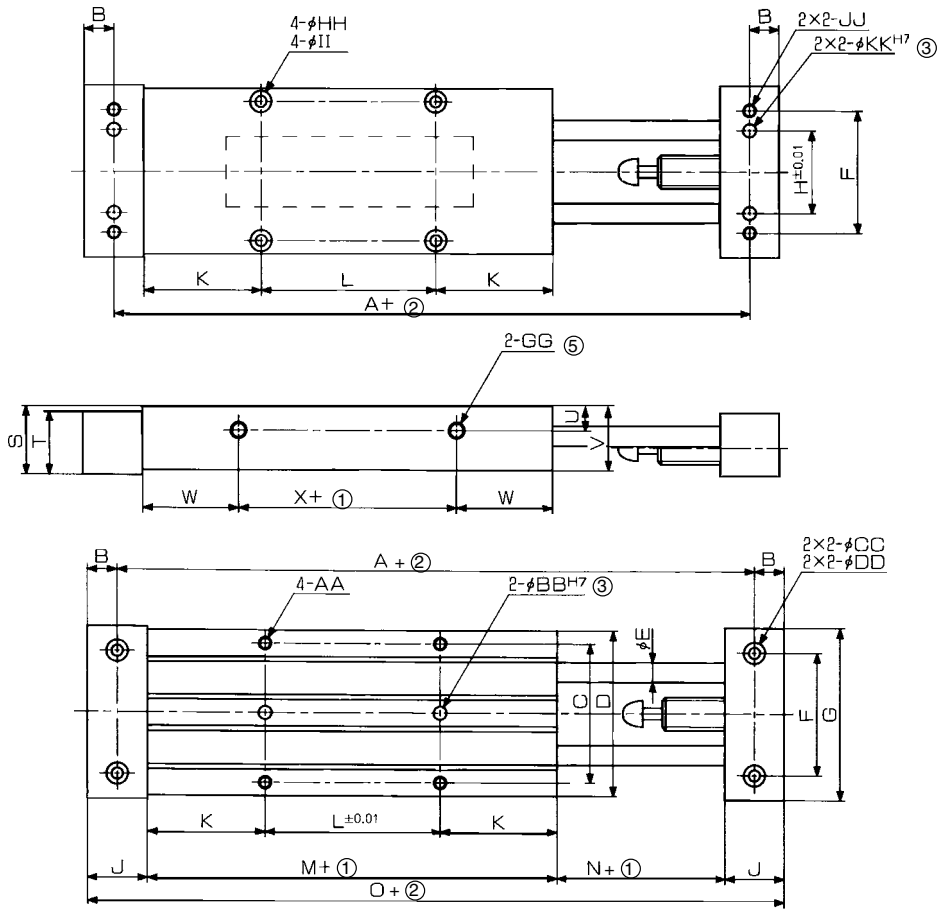


Ø	A
10	39
16	42
20	43
25	53

DIMENSIONS

Area for other custom mounting (consult us).

① : + 1 stroke
② : + 2 strokes
③ : **Holes for centering**
④ : Air ports on flange
⑤ : Air ports on body



Bore Ø (mm)	DIMENSIONS (mm)																			
	A	AA✻	B	BB✻	C	CC	D	DD✻✻	E	EE✻	F	FF	G	GG	H	HH	I	II✻	J	JJ✻
10	99	M4-8	9	4-5	42	3,4	50	6,5-3,3	6	M4-8	37	M3	52	M5	25	3,4	46	6,5-3,3	18	M4-8
16	106	M5-10	9	5-6	53	4,4	62	8-4,4	8	M5-10	45	M3	64	M5	30	4,4	56	8-4,4	18	M5-10
20	117	M6-12	9	6-6	63	5,4	74	9,5-5,4	12	M6-12	54	G1/8	76	G1/8	34	5,4	67	9,5-5,4	18	M6-12
25	140	M8-16	9	6-6	77	6,7	90	11-6,5	16	M6-12	67	G1/8	93	G1/8	40	6,7	84	11-6,5	18	M8-16

Bore Ø (mm)	K (stroke)					KK✻	L (stroke)						M	N	O	P	Q	R	S	T	U	V	W	X
	25-50	80	100	160	200		25	50	80	100	160	200												
10	40	42,5	52,5	-	-	4-5	25	50	75	75	-	-	80	1	117	8,5	9,5	12	20,5	19	7	19	33	14
16	43,5	46	56	73,5	73,5	5-6	25	50	75	75	100	140	87	1	124	8,5	11	12,5	23,5	22	10	22	36,5	14
20	49	51,5	61,5	79	79	6-6	25	50	75	75	100	140	98	1	135	9	13	14,5	28	26	13	26	39	20
25	60,5	63	73	90,5	90,5	6-6	25	50	75	75	100	140	121	1	158	9	16,5	18	35	33	16,5	33	49,5	22

✻ Diameter - Depth ✻✻ Diameter - Counterbore depth

Note : Make sure the carrier does not reach the end flanges.

For the dimensions of switch version, refer page overleaf

TUB dimensions K and L with non standard stroke: see below

(mm)

Bore Ø (mm)	K (stroke)	L (stroke)					
	(25...200)	(25..49)	(50..79)	(80..100)	(101..159)	(160..199)	200
10	(80 + (1) - L) x 0,5)	25	50	75	-	-	-
16	(87 + (1) - L) x 0,5)	25	50	75	75	100	140
20	(98 + (1) - L) x 0,5)	25	50	75	75	100	140
25	(121 + (1) - L) x 0,5)	25	50	75	75	100	140

(1) + stroke

WEIGHTS (kg)

Bore Ø (mm)	STROKES (mm)					
	25	50	80	100	160	200
10	0,35	0,42	0,50	0,56	-	-
16	0,55	0,65	0,80	0,85	1,10	1,25
20	0,85	1,00	1,20	1,30	1,65	1,90
25	1,65	1,90	2,20	2,40	2,95	3,35

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SHOCK ABSORBER
FOR SLIDE UNIT TYPE TUB

SPECIFICATIONS

STROKE : 6mm
TEMPERATURE : +5°C, +60°C

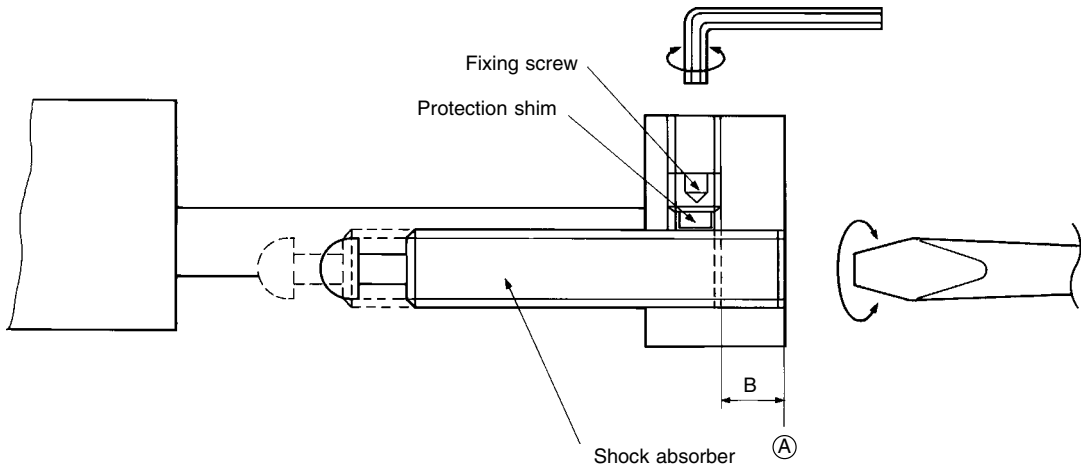
UNIT SIZE	Ø 10 - 16	Ø 20 - 25
ENERGY TO ABSORB :		
- max. (J)	3	2,5
- max./mn (J)	180	150
MAXIMUM FINAL VELOCITY (m/s)	0,5	0,5
WEIGHT (g)	20	20

CODIFICATION

DESCRIPTION		CODES
Set of 2 shock absorbers mounted on unit :	Ø 10 - 16 mm	**560 575 ***
	Ø 20 - 25 mm	**560 576 ***
One single shock absorber for unit:	Ø 10 - 16 mm	**881 44 701**
	Ø 20 - 25 mm	**881 44 702**

* Code to add to translation unit code.

STROKE ADJUSTMENT



LOOSEN SCREW

ADJUST STROKE

FASTEN SCREW

Adjustment, B maxi : Ⓐ – 5 mm

NOTE
1. The screw must never be fastened without shim (moderate fastening).
2 . Shock absobers must not extend beyond face Ⓐ
3 . Stroke adjustment : 0 to – 5 mm at each end.

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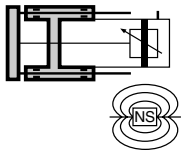
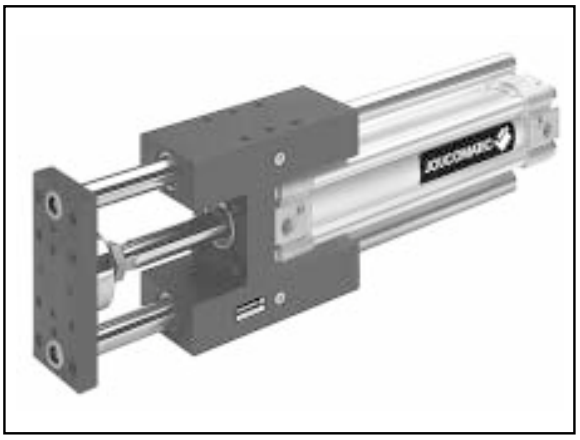
"H" GUIDING UNIT
with 4 slide or ball bearings
suitable for VDMA-ISO-AFNOR air cylinders
32 to 100 mm - Series 450 - Type **PES**



CONSTRUCTION

GUIDING UNIT WITH **SLIDE BEARINGS**
- Single block unit, metal body
- 4 bronze sintered self-lubricating roller bearings
- 2 chrome-plated steel guiding rods

GUIDING UNIT WITH **BALL BEARINGS**
- Monolithic construction
- 4 linear ball bearings
- 2 hardened guiding rods
- Lip seals on the guiding rods
- 2 type KP2K DIN 51825 grease nipples



High quality components with the following characteristics:
- High admissible loads
- Accurate guiding
- High sturdiness
- Excellent mobility, low wear and long life with the linear ball bearings
- The cylinder rod is fixed to the guiding unit by means of an alignment compensation bracket

CYLINDER ADAPTATIONS
- Double-acting PES type-Series 450, standard VDMA 24562/ISO 6431
- With profiled tube plate (see P230) or with tie rods (see P232)
- With or without pneumatic cushioning
- Ready to receive magnetic position detectors or not

For other characteristics, see leaflet P230 or P232

SPECIFICATIONS

FLUID	: Air or neutral gas, filtered, lubricated or NOT
PRESSURE	: 10 bar max.
TEMPERATURE	: -10°C, +60°C
MIN. STROKE (with detectors)	: 110 mm
MAX. STROKE	: 500 mm (other strokes on request)
MAX. SPEED	: 1 m/s
CONSTRUCTION	: as per **CNOMO E06.28.510.N** recommendation

MOUNTINGS
- Guiding unit on frame: 3 mounting options using 4 tapped holes (on the 2 smallest sides or on one of the large sides), more 2 holes for centring.
- Load on the guiding unit: 2 options, using 4 tapped holes or using 4 countersunk holes, more 2 holes for centring.

MAGNETIC POSITION DETECTORS (codes: see above)
- **Front position** control (rod out): Its mounting excepted, the magnetic position detector and its electrical characteristics are identical to the detector used for the PES cylinders. See corresponding sheet.
- **Rear position** control (rod in): Detector and support are identical to those used for PES cylinders.

ORDERING When ordering, please specify:

■ CYLINDER + GUIDING UNIT
- Standard code or reference for the PES cylinder ——— **450 .. ...** (see P230 or P232)
- Optional code of the guiding unit ———

Cylinder stroke ✻ (mm)	CODE OF THE GUIDING UNIT WITH **SLIDE BEARINGS**						CODE FOR GUIDING UNIT WITH **BALL BEARINGS**					
	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
50 ✻	**010 762**	**010 770**	**010 778**	**010 786**	**010 794**	**010 802**	**010 653**	**010 661**	**010 669**	**010 677**	**010 685**	**010 693**
80 ✻	**010 844**	**010 846**	**010 848**	**010 850**	**010 852**	**010 854**	**010 856**	**010 858**	**010 860**	**010 862**	**010 864**	**010 866**
100 ✻	**010 763**	**010 771**	**010 779**	**010 787**	**010 795**	**010 803**	**010 654**	**010 662**	**010 670**	**010 678**	**010 686**	**010 694**
125	**010 845**	**010 847**	**010 849**	**010 851**	**010 853**	**010 855**	**010 857**	**010 859**	**010 861**	**010 863**	**010 865**	**010 867**
160	**010 764**	**010 772**	**010 780**	**010 788**	**010 796**	**010 804**	**010 655**	**010 663**	**010 671**	**010 679**	**010 687**	**010 695**
200	**010 765**	**010 773**	**010 781**	**010 789**	**010 797**	**010 805**	**010 656**	**010 664**	**010 672**	**010 680**	**010 688**	**010 696**
250	**010 766**	**010 774**	**010 782**	**010 790**	**010 798**	**010 806**	**010 657**	**010 665**	**010 673**	**010 681**	**010 689**	**010 697**
320	**010 767**	**010 775**	**010 783**	**010 791**	**010 799**	**010 807**	**010 658**	**010 666**	**010 674**	**010 682**	**010 690**	**010 698**
400	**010 768**	**010 776**	**010 784**	**010 792**	**010 800**	**010 808**	**010 659**	**010 667**	**010 675**	**010 683**	**010 691**	**010 699**
500	**010 769**	**010 777**	**010 785**	**010 793**	**010 801**	**010 809**	**010 660**	**010 668**	**010 676**	**010 684**	**010 692**	**010 700**

✻ Other strokes on request min. stroke with detectors = 110 mm

■ MINIATURE MAGNETIC POSITION DETECTORS (REED SWITCH or MAGNETO-RESISTIVE) :
- Please specify the quantity and code of miniature detectors
- Please specify the quantity and code fastening kit on the cylinder

(2) Mounting - by flange : Ø 32 to 80 mm
- by collar : Ø 100 mm

CODE MINIATURE DETECTORS		
Connection	Reed switch	Magneto-resistive
Integrated (1) connector Ø M8	**881 00 140**	**881 00 141**
wire exit long. 2 m	**881 00 142**	**881 00 143**
wire exit long. 5 m	**881 00 144**	**881 00 145**
lead 0.8 m + connector Ø 8	**881 00 146**	**881 00 147**
lead 0.8 m + connector Ø M12	**881 00 148**	**881 00 149**

CODE FASTENING KIT				
Ø cylinder (mm)	ON PES CYLINDER **PROFILED**		ON PES CYLINDER **WITH TIE-RODS** (2)	
	Front position control	**Rear** position control	**Front** position control	**Rear** position control
32 - 40	**881 00 182**	**881 00 153**	**881 00 179**	**881 00 150**
50 - 63	**881 00 183**	**881 00 154**	**881 00 180**	**881 00 151**
80	**881 00 184**	**881 00 155**	**881 00 181**	**881 00 152**
100	**881 00 184**	**881 00 155**	**881 00 157**	**881 00 157**

(1) The miniature detectors with integrated connector Ø M8 are not adaptable for the FRONT position control.
N.B. BIM type magnetic position detectors can be fitted on all this cylinders (see P297)

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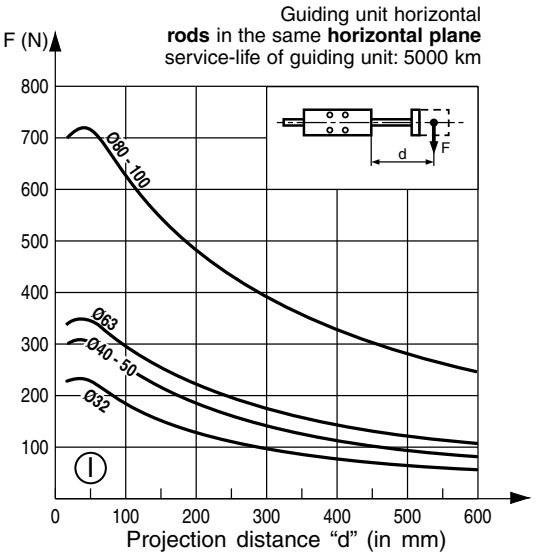
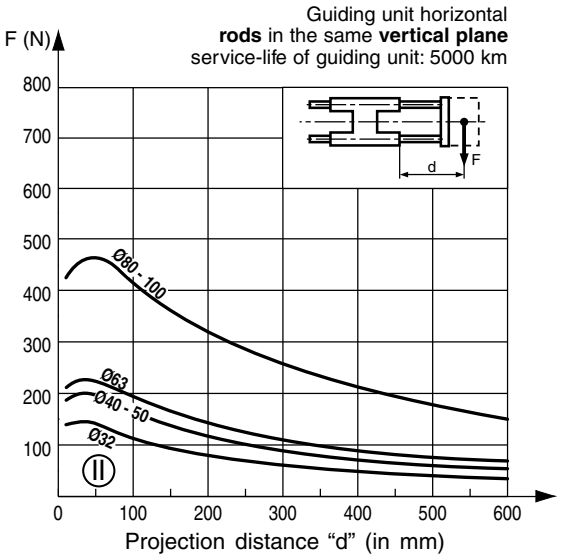
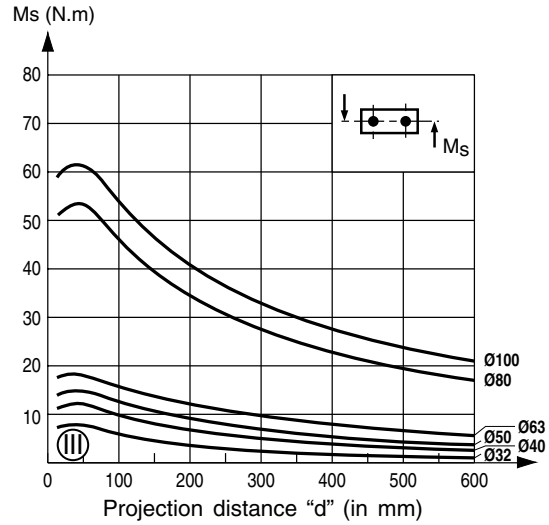
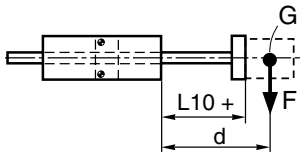
• MAXIMUM ADMISSIBLE LOAD "F" ON THE ROD END





• MAXIMUM ALLOWABLE MOMENTS "Ms" AT ROD END

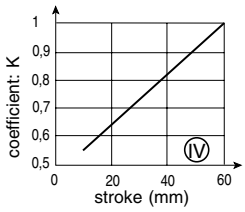




d = the projection distance (in mm) corresponding to the dimension L10 + the stroke length + the distance from the load centre of gravity (G) to the mating surface of the cylinder flange

Note: the values in charts (I), (II) and (III) correspond to those in regular horizontal movement. In the event of vibration or jerky movement, **halve** the maximum allowable values.

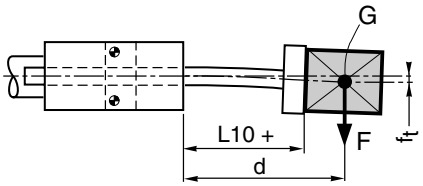
Whatever the stroke of the cylinder, its movement is only a small proportion of the travel (not more than 60 mm), it is necessary to reduce the maximum allowable torques and loads by multiplying the values taken from charts (I), (II) and (III) by coefficient K from chart (IV). For short travels which do not exceed 60 mm, the curves allow for this reduction in performance.



• DETERMINING THE DEFLEXION

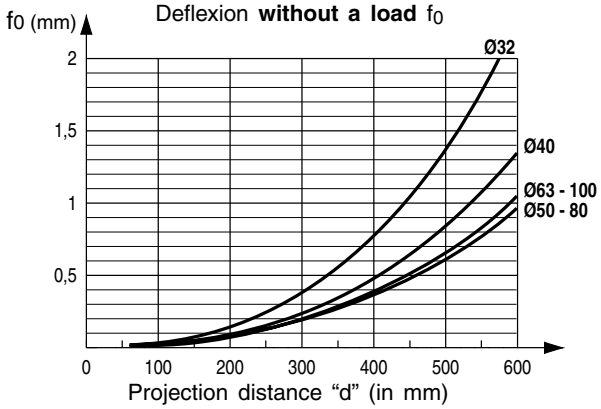
Deflection under load as a function of projection distance "d", corresponds to the sum of no-load deflection f_0 and flection f_{10} under load, the latter being proportional to the deflection caused by 10 N.

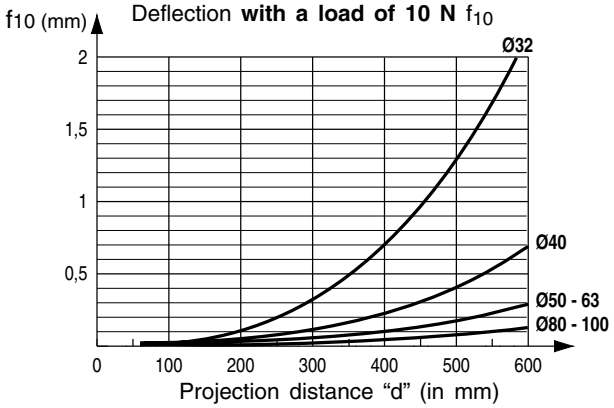
d = projection distance (in mm) as defined above.



$$f_t = f_0 + (f_{10} \times \frac{F}{10})$$

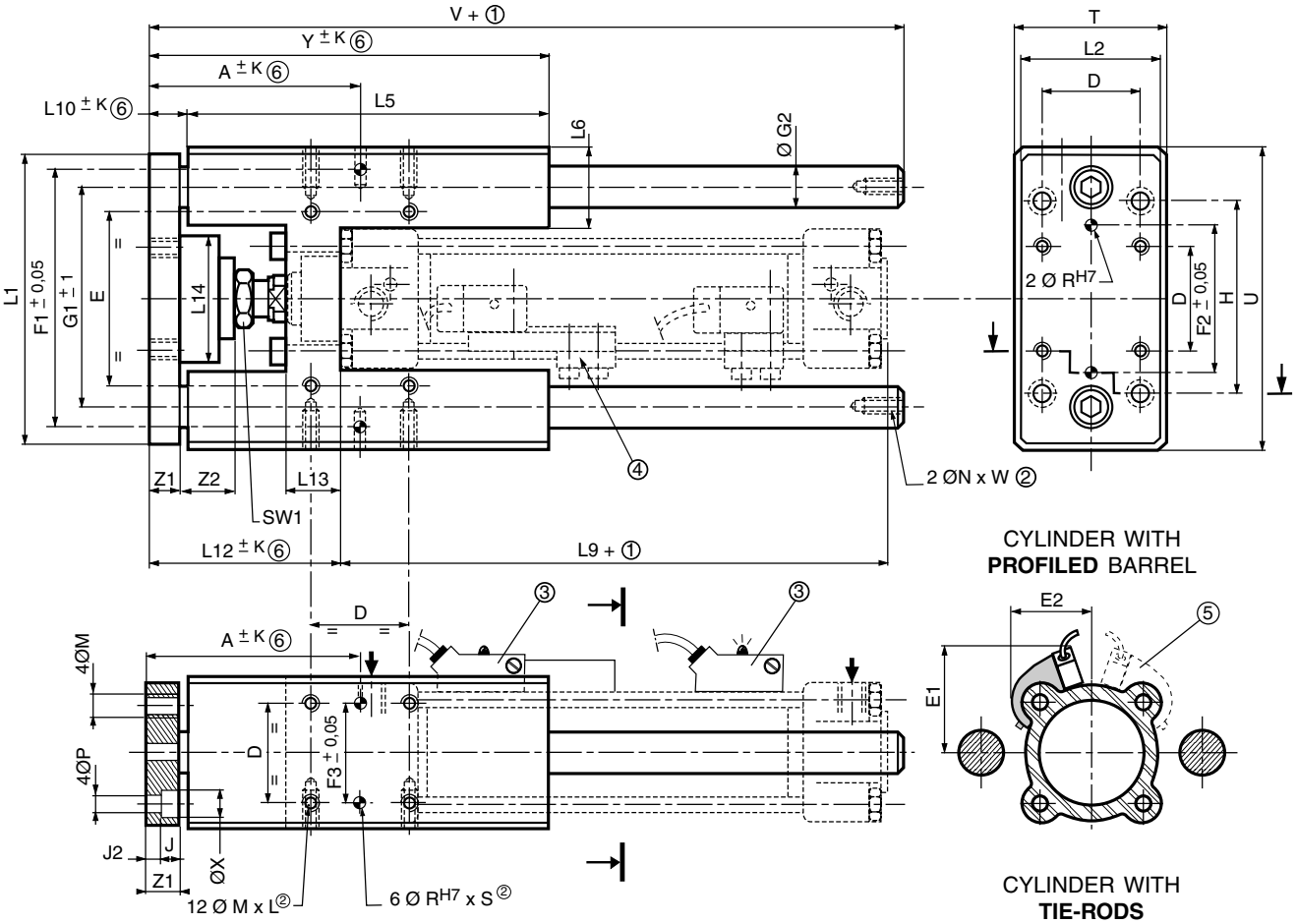
f_t = Total deflexion (in mm)
f_0 = Deflexion without a load (in mm)
f_{10} = Deflexion with a load of 10 N (in mm)
F = Load on the rod ends (in N)





"H" GUIDING UNIT

DIMENSIONS AND WEIGHTS (Dimensions conforming with CNOMO E06.28.510.N)



(1) : + stroke
(2) : Depth
(3) : Position detector mounting
(4) : The **forward** position detector **support is specified** (longer)
The miniature detectors with integrated connector Ø M8 are not adaptable for the **front** position control
(5) : For small stroke cylinders, the standard detector for rear position control must be mounted on the profiled tube plate or tie rod opposite to the tie rod of the front position detector.
(6) : Dimension variable: ± K .End play: 0,1 mm
(7) : Total weight of guiding unit + cylinder with 0 mm stroke
(8) : Additional weight per extra 100 mm stroke (unit + cylinder)
: 6 + 2 holes ØR H7 for centering pins

NOTE: The guiding units with a linear ball bearings must be lubricated every 3000 km, and more frequently if they are used in dusty surroundings

Ø (mm)	A	D	E	E1	E2	E3	E4	F1 ± 0,05	F2 ± 0,05	F3 ± 0,05	G1	G2	H	J	J2	K	L	L1	L2	L5	L6	L9
32	78,5	32,5	61	42	27	44	30	81	50	32,5	74	12	78	6,5	5,5	2,5	12	90	45	130	23,5	98
40	85	38	69	45	31	47	34	99	54	38	84,5	16	84	6,5	5,5	3	12	110	54	140	29,5	109
50	97	46,5	85	51	36	51	42	119	72	46,5	102	20	100	9	6	4	16	130	63	150	35	110
63	106	56,5	100	55	41	56	47	132	82	56,5	115,5	20	105	9	6	4	16	145	80	182	36	125
80	130	72	130	64	47	63	55	166	106	72	147	25	130	11	9	5	20	180	100	215	40,5	132
100	140,5	89	150	71	58	75	-	190	131	89	173	25	150	11	9	5	20	200	120	220	40,8	142

Ø (mm)	L10	L12	L13	L14	M	N	P	R (H7)	S	SW1	T	U	V	W	X	Y	Z1	Z2	WEIGHTS (kg) CYLINDER + UNIT (7)	(8)
32	17,5	71,5	17	45	M6	M6	6,6	6	10	16	50	97	182	11	11	147,5	12	25	1,870	0,220
40	18	77	21	46	M6	M6	6,6	6	10	18	58	115	192	11	11	158	12	25	2,450	0,320
50	22	92,5	25	55	M8	M8	9	6	10	24	70	137	237	16	15	172	15	28	3,630	0,450
63	22	93	25	68	M8	M8	9	6	10	24	85	152	237	16	15	204	15	28	5,600	0,500
80	28	115	34	90	M10	M10	11	6	10	30	105	188	280	16	18	243	20	33	9,800	0,750
100	28,5	120,5	39	90	M10	M10	11	6	10	30	130	214	280	16	18	248,5	20	33	15,200	0,950

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REED SWITCH OR MAGNETO-RESISTIVE POSITION DETECTORS FOR CYLINDERS

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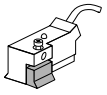
Cylinder type	Bore Ø cylinder (mm)	**CODES** Fastening kit	**CODES** MINIATURE DETECTORS			Electrical characteristics (see page) :
			Connectique	Détecteurs ILS	Détecteurs magnéto résistif	
CIB	12 16 20 25 32 40	**881 00 163** **881 00 164** **881 00 165** **881 00 166** **881 00 167** **881 00 168**	Connection (1) integrated connector Ø M8	**881 00 140**	**881 00 141**	P295
			wire exit long. 2 m	**881 00 142**	**881 00 143**	
			wire exit long. 5 m	**881 00 144**	**881 00145**	
TUB	10 ... 25	**881 44 704**	lead 0,8 m + connector Ø8	**881 00 146**	**881 00 147**	
			lead 5 m + connector M8	**881 00 594**	**881 00 595**	
Guiding Unit **H + PES** (1)	32 ... 100	see P295	lead 0,8 m + connector M12	**881 00 148**	**881 00 149**	
P2L **P2B**	16 20 25 32	Detector supplied with mounting support (screw + nut profiled) can be used directly with P2L-P2B cylinders 	Connection (1) integrated connector Ø M8	**881 00 185**	**881 00 192**	P295
			wire exit long. 2 m	**881 00 186**	**881 00 193**	
			wire exit long. 5 m	**881 00 189**	**881 00194**	
			lead 0,8 m + connector Ø8	**881 00 190**	**881 00 195**	
			lead 5 m + connector M8	**881 00 592**	**881 00 593**	
			lead 0,8 m + connector M12	**881 00 191**	**881 00 196**	
TMB	6 - 10	-	lead wire long. 1 m	**881 44 703**	-	P275-36
TLB	10 - 16 - 25	-				

(1) The miniature detectors with integrated connector Ø M8 are not adaptable for the FRONT position control (guiding unit)

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

Series 881

MICRO-DETECTOR POSITION
REED SWITCH TYPE
for TMB and TLB tables

SPECIFICATIONS

MAX. SWITCHING VOLTAGE	: 24 Vcc (1)
SWITCHING CURRENT	: 3 to 15 mA
CONTACT RESISTANCE	: 100 Ω
RESPONSE TIME	: - 1 ms
AMBIENT TEMPERATURE	: + 5 °C, + 60 °C
PROTECTION	: IP66
CONNECTION	: cable 1 m long - 2 wires - code : white "+", white/black "–"
INDICATOR LAMP	: iode (LED) which lights up when then contact is closed.

(1) The indicator lamp gives a voltage drop approx. 2 V.

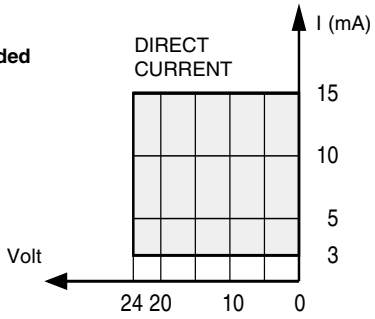
FUNCTIONING PRINCIPLE

A permanent magnet mounted on the piston of the cylinder operates a reed switch which is mounted outside the cylinder unit. The detector is mounted on the body of the cylinder. One or more magnetic detectors can be fitted to check the end of stroke or any intermediate position.

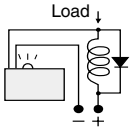
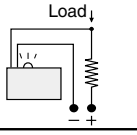
MAXIMUM ELECTRICAL CHARACTERISTICS AND PROTECTION OF MAGNETIC DETECTORS

Note : the working point must remain within the limits of shaded zone. Any over voltage or over intensity may deteriorate the detector.

Polarity to be respected for DC application :
Black wire = + pôle
Black/white wire = - pôle



The user is responsible for supply and assembly of diodes.

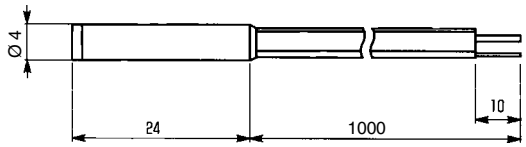
INDUCTIVE LOAD		100V/1A Diode
RESISTIVE LOAD		Protection not necessary

Note : see particular cases the box below.

PARTICULAR APPLICATIONS

- Detectors used for direct control of incandescent lamps :
  The power specified on the lamp is based on its resistance when hot, the resistance is very low when turned on with the lamp cold and the current can become very great and may exceed the reed rating, allowance should therefore be made for the actual wattage of the bulb when cold.
- With wiring longer than 10 m :
  A resistor must be fitted in series with the detector to reduce the capacitance effect caused by the wiring : R = 1000 Ω.

DIMENSIONS (mm)



CODE OF DETECTOR

DESCRIPTION	CODE
Micro Reed switch cable for unit type TLB or TMB	**881 44 703**

The detector is supplied with its clip for mounting on the table.

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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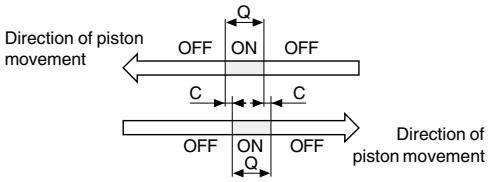
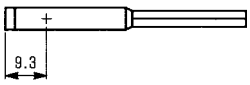
ASCO® JOUCOMATIC

DETECTION POSITION

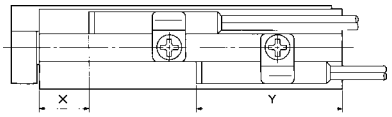
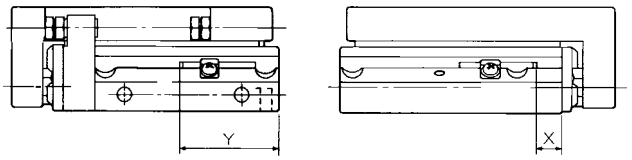


Most sensitive position



ON hold distance : Q
Distance between switching ON to OFF when a piston moves in one direction.

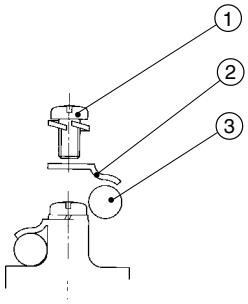
Hysteresis : C
Deviation of the positions between switching ON when a piston moves in a direction, and OFF when the piston moves back in the opposite direction.

Type	Ø table (mm)	X* (mm)	Y* (mm)	Q (mm)	C (mm)	
TMB	6	13,5	22,5	10	1	
	10	10,5	34,5	10	1	
TLB	10	8	32	10	1	
	16	11	33	10	1	
	25	18	42	10	1	

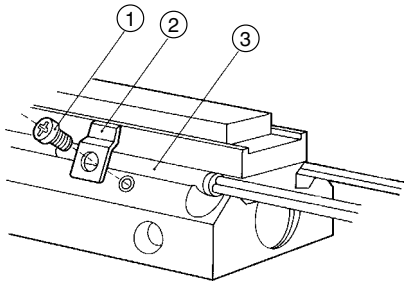
* Recommended switch position

INSTALLATION OF SWITCH

• Type TMB



• Type TLB



For both types :

A - Set detector ③ along the table maintaining it wihout fastening with square ② and screw ① .

B - Adjust the longitudinal position of the detector.

C - Block the detector by moderately fastening the screw.

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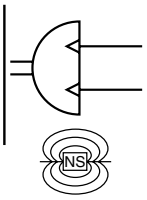
Series 429
Type : R

ROTATABLE CYLINDERS WITH 2 POSITIONS (90°-180°)

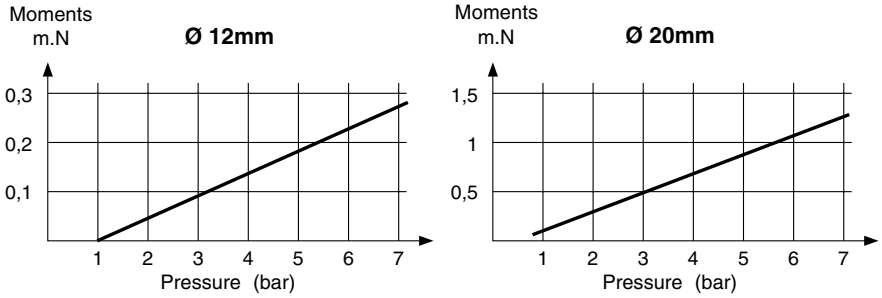
double acting, equipped for magnetic position detectors
Ø 12 - 20 mm



SPECIFICATION

FLUID	:	Air or neutral gas, filtered, lubricated or **NOT**
PRESSURE	:	1 - 7 bar
TEMPERATURE	:	+ 5° C to + 60°C
CYLINDER BORE Ø	:	12 - 20 mm
ROTATION	:	x 90° - x 180° (± 5°)
CUSHIONING	:	Non cushioned
CHECKING	:	Equipped for magnetic positions detectors with reed switch or magneto-resistive (MR)
MECHANICAL OUTLET	:	Single rod

MOMENTS DEVELOPPED



For an optimum installation of a cylinder, we recommend a cylinder with the necessary moment equal to 70% of the developed moment

MAXIMUM ALLOWABLE MOMENTUM

Maximum allowable momentum **Ø12 = 4 x 10-3J**
Ø20 = 1x10-2J

In case of heavy load and high speed rotation, momentum at stroke end may exceed the above limits and damage the rotatable cylinder. To limit momentum, reduce the rotation speed with flow regulators (as close to the cylinder as possible).

CONSTRUCTION

- Body aluminium
- Stop steel
- Rod steel
- Seals nitrile (NBR)

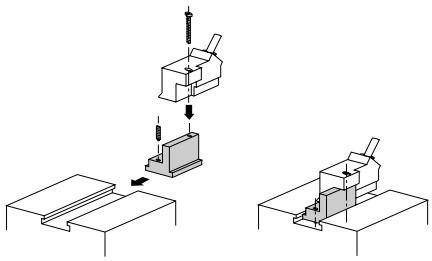
CHOICE OF EQUIPMENT

SINGLE ROD CYLINDER

Bore Ø (mm)	Rotation	**CODES** to specify on order	**REFERENCES** to specify on order	Weights (kg)
Ø 12	90° 180°	**429 00 042** **429 00 043**	R12 D 90-M R12 D 180-M	0.130
Ø 20	90° 180°	**429 00 046** **429 00 047**	R20 D 90-M R20 D 180-M	0.250 0.320

POSITION DETECTORS

UNI type magnetic position detectors (REED or MR) to be ordered separately (see P295).



: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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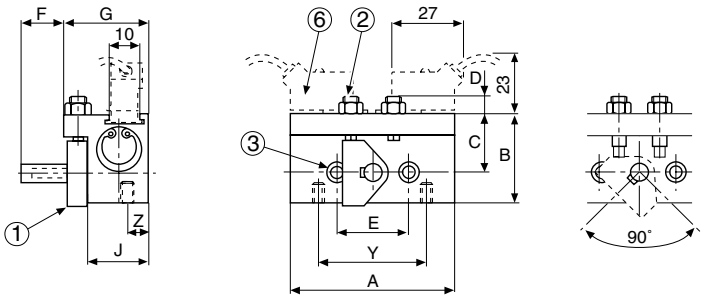
DIMENSIONS

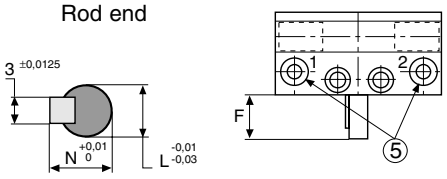
Rotatable 180° **Rotatable 90°**



Bore Ø (mm)	DIMENSIONS (mm) A 90°	A 180°	B	C	D	E	F	G
12	55	55	30	20	6	24	15	28
20	53	72	42	30	10	35	20	35

Ø		J		L	N	P	Y	Z
12		20		6	7,2	16,5	34	8
20		25,5		8	9,2	21	43	12

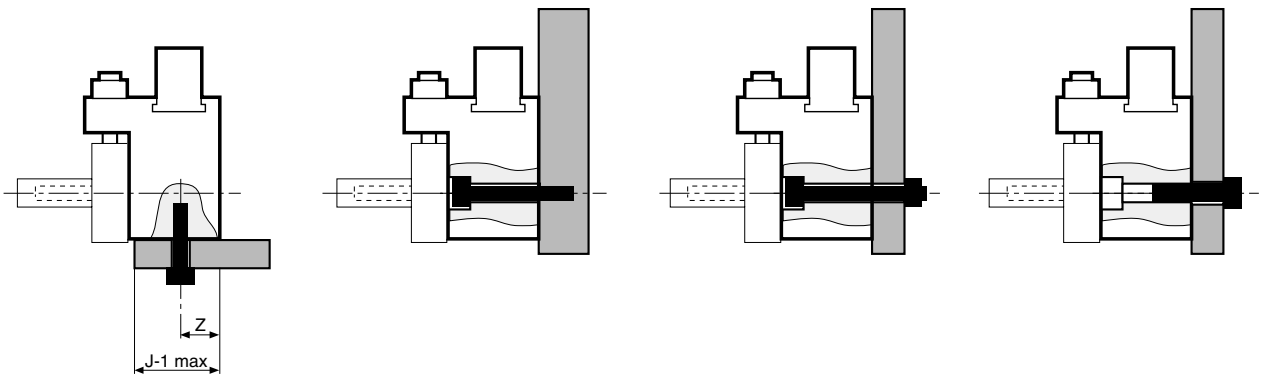
Rod end



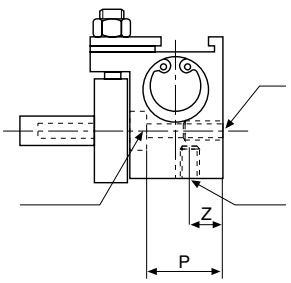
① : Stop boss
② : Rotation adjusting screw ± 5°
③ : Front mounting (see possible mountings below)
⑤ : Two Ø M5 supply ports
Port 1 : clockwise, rod side with pin
Port 2 : counterclockwise, rod side with pin
⑥ : Reed or MR magnetic position detectors
Installation recommendation:
detectors must be installed with the flying leads or connectors orientated outwards

POSSIBILITIES MOUNTINGS

• Bottom mounting **• Front mounting** **• Front mounting** **• Rear mounting**

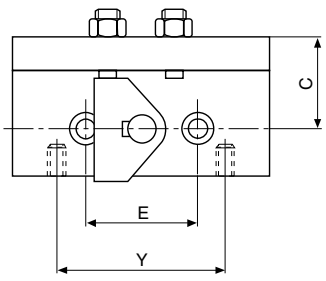


Front mounting
Ø 12 : 2 x Ø 3,3 counterbored Ø 6,5 depth 3,5
Ø 20 : 2 x Ø 4,2 counterbored Ø 8 depth 4,5



Rear side mounting
Ø 12 : 2 Ø M4 depth 8
Ø 20 : 2 Ø M5 prof. 10

Bottom mounting
Ø 12 : 2 Ø M4 depth 7
Ø 20 : 2 Ø M5 depth 8



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ROTATABLE CYLINDERS – 2 - 3 AND 4 POSITIONS

double acting, equipped for magnetic position detectors

Ø 16 - 18 - 22 mm

SPECIFICATIONS

FLUID : air or neutral gas, filtered, lubricated or NOT
PRESSURE : 2 to 7 bar
AMBIENT TEMPERATURE : + 5 °C, + 60 °C
CYLINDER BORE Ø : 16 - 18 - 22 mm

ROTATION

Position number	Rotation possibilities	Total rotation
2	90°	90°
2	180°	180°
3	90° + 90°	180°
4	2α + β	180°

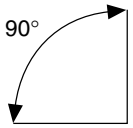
Adjustment of angular movement on extreme 2 positions (see below).

CUSHIONING
- 2 position models : adjustable pneumatic cushioning
- 3 and 4 position models : no cushioning

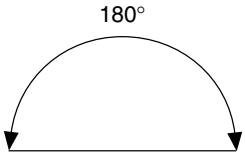
POSITION CONTROL : Equipped for magnetic positions detectors with reed switch or magneto-resistive (MR)

ANGULAR MOVEMENT

2 position model

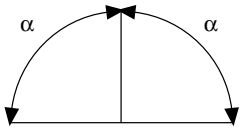


Adjustment range* : 70° — 95°

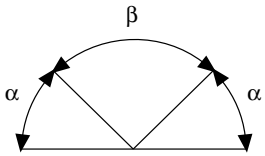


Adjustment range* : 160° — 185°

3 and 4 position model



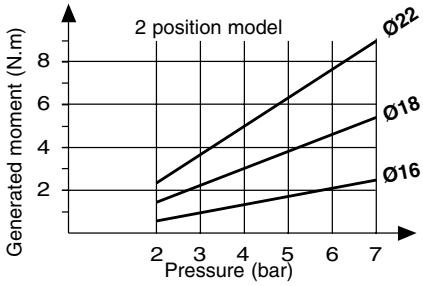
α - 90°
Adjustment range* : 120° — 185°

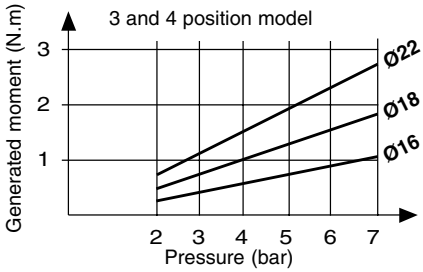


2 α + β
Adjustment range* : 120° — 185°
Any values α and β, 2 α + β having to be equal to 180°.

* Movement limits to be distributed to both ends.

MOMENTS DEVELOPED





For an optimum use, it is recommanded to define a rotatable cylinder whose moment is 70 % of the developed moment.

CHOICE OF EQUIPMENT

Position number	Rotation angle	Piston Ø (mm)	CODES to specify on order	REFERENCES to specify on order	Connection
2	90°	16	**429 00 052**	RS16 A2. 90 /M	M5
		18	**429 00 056**	RS18 A2. 90 /M	
		22	**429 00 060**	RS22 A2. 90 /M	
	180°	16	**429 00 053**	RS16 A2. 180 /M	M5
		18	**429 00 057**	RS18 A2. 180 /M	
		22	**429 00 061**	RS22 A2. 180 /M	
3	90° + 90°	16	**429 00 054**	RS16 NA3. 90+90 /M	M5
		18	**429 00 058**	RS18 NA3. 90+90 /M	
		22	**429 00 062**	RS22 NA3. 90+90 /M	
4	α + β + α	16	**429 00 055***	RS16 NA4. α + β /M*	M5
		18	**429 00 059***	RS18 NA4. α + β /M*	
		22	**429 00 063***	RS22 NA4. α + β /M*	

* Define angles α + β (2 α + β = 180°).

UNI type magnetic position detectors (REED or MR) to be ordered separately (see P295)

2, 3 positions rotary unit detector mounting kit code: **881 00 275**

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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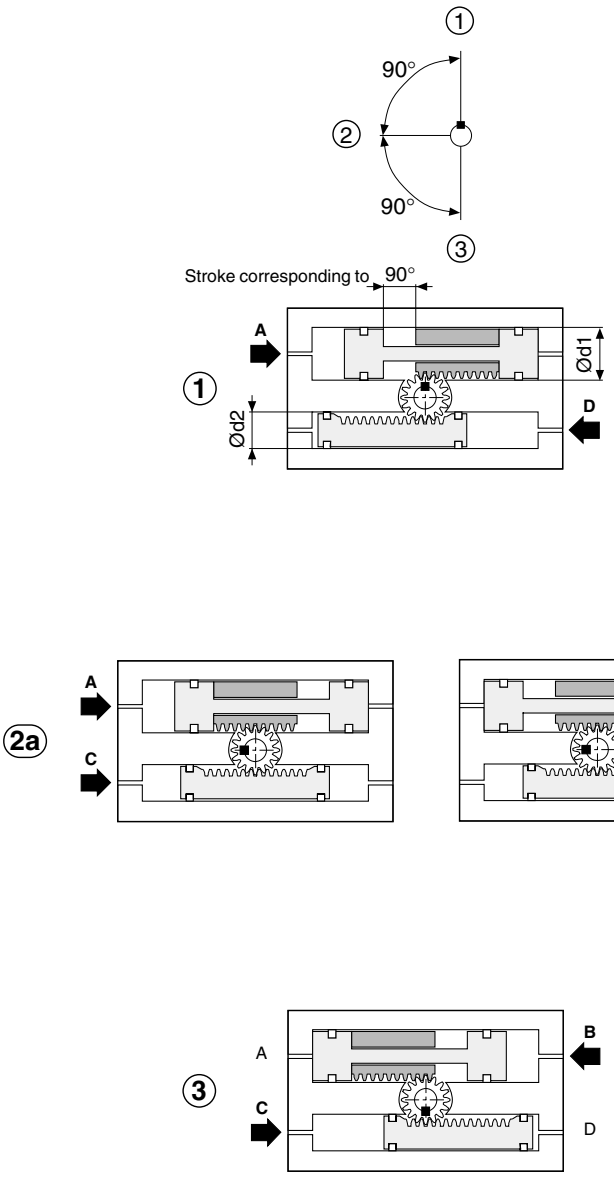
FUNCTIONING PRINCIPLE

3 position model

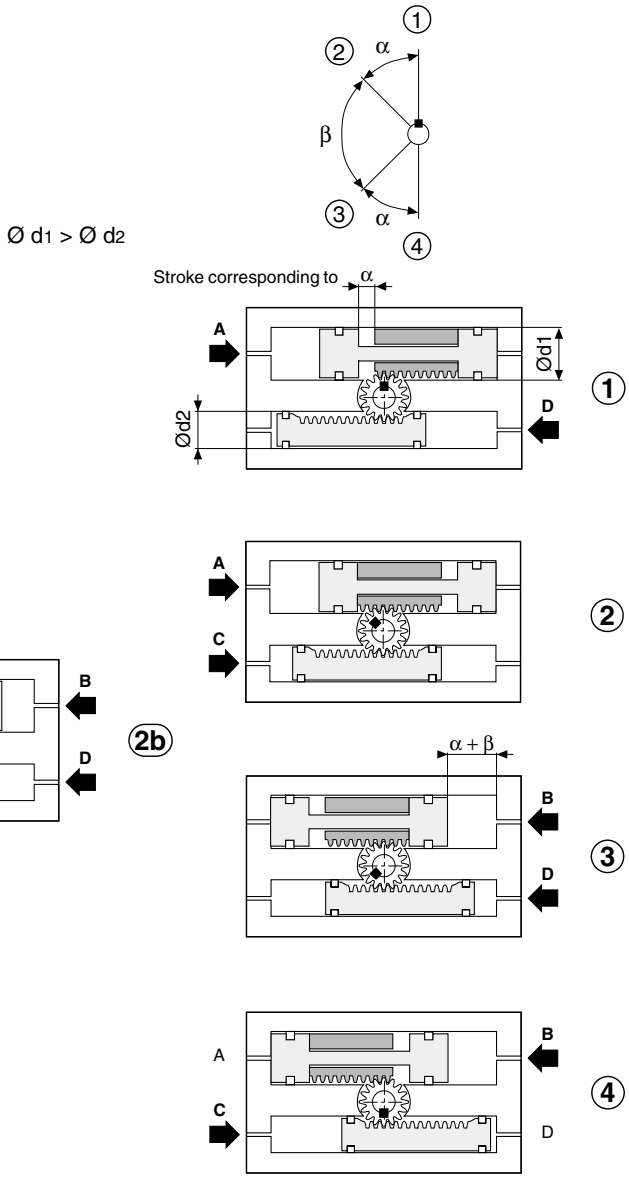


Two choices, to obtain position 2 (2a or 2b). From a given position, the rotatable cylinder may be placed on any other 2 positions.

Pneumatic command table

Outlet	Positions 1	2a	2b	3
A	—	—		
B			—	—
C		—		—
D	—		—	

4 position model



From a given position, the rotatable cylinder may be placed on any other 2 positions.

Pneumatic command table

Outlet	Positions 1	2	3	4
A	—	—		
B			—	—
C		—		—
D	—		—	

Ø d1 > Ø d2

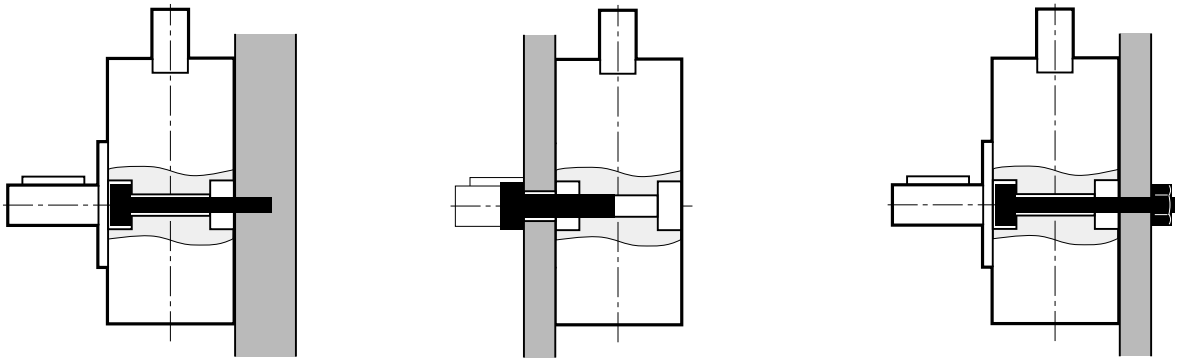
Model		Ø 16			Ø 18			Ø 22		
Position number		2		3-4	2		3-4	2		3-4
Ø bores (mm)	Ø d_1	24			26			30		
	Ø d_2	16			18			22		
Crossrod Ø	(mm)	Ø 10^{h7}			Ø 12^{h7}			Ø 15^{h7}		
Moment developed	N.m	see chart			see chart			see chart		
Rotation angle	(°)	90°	180°	180°	90°	180°	180°	90°	180°	180°
Adjustable angle	(°)	70—95	160—185	120—185	70—95	160—185	120—185	70—95	160—185	120—185
Pneumatic cushioning		yes	yes	no	yes	yes	no	yes	yes	no
Cushioning angle	(°)	60	60	—	40	40	—	40	40	—
Maximum momentum	J	$14x10^{-2}$	$14x10^{-2}$	$3,5x10^{-2}$	$28x10^{-2}$	$28x10^{-2}$	$7x10^{-2}$	$42x10^{-2}$	$42x10^{-2}$	$11x10^{-2}$

If the momentum generated by the application exceeds the above defined maximum values, rotation speed must be reduced with flow regulators (to be placed at closest to the cylinder) or with shock absorbers.

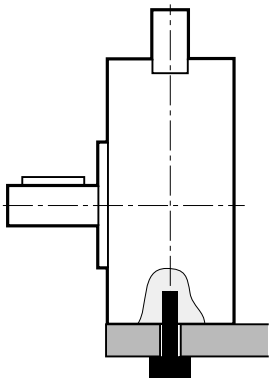
2

POSSIBLE MOUNTING OF ROTATABLE CYLINDERS

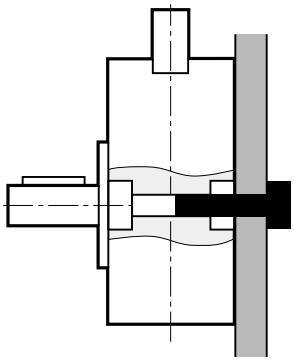
• Front mounting



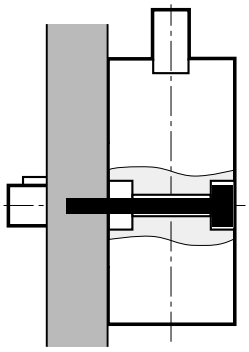
• Bottom mounting



• Rear mounting



• Rear mounting



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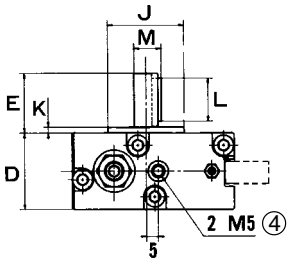
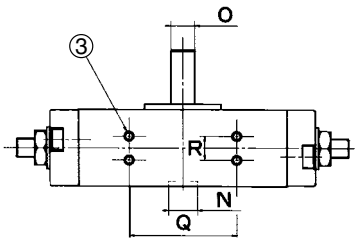
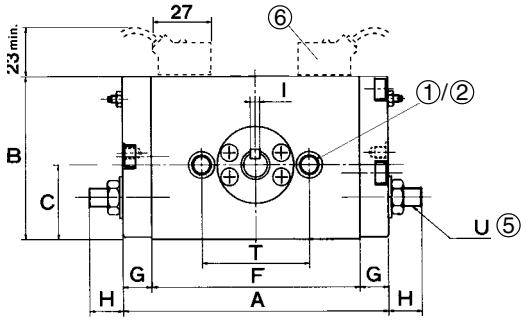
DIMENSIONS AND WEIGHTS

2 POSITION MODEL







① : Front mounting :
2 - Ø S_1, counterbore Ø S_2, depth S_3

② : Rear mounting :
2 - Ø S_4

③ : Bottom mounting :
4 - Ø P_1, depth P_2,

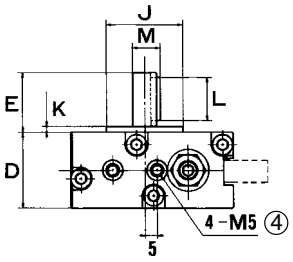
④ : 2 pneumatic supply ports Ø M5

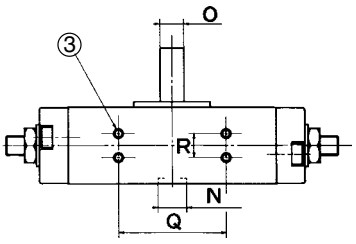
⑤ : 2 angle movement adjustment screws

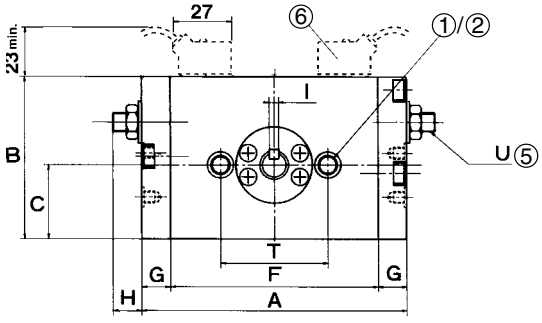
⑥ : Reed or MR magnetic position detectors
Installation recommendation: detectors must be installed with the flying leads or connectors orientated outwards

	WEIGHTS (kg)		
	Ø 16	**Ø 18**	**Ø 22**
90°	0,7	1,0	1,6
180°	0,8	1,2	1,8

3 or 4 POSITION MODEL







① : Front mounting :
2 - Ø S_1, counterbore Ø S_2, depth S_3

② : Rear mounting :
2 - Ø S_4

③ : Bottom monting :
4 - Ø P_1, depth P_2,

④ : 4 pneumatic supply ports Ø M5

⑤ : 2 angle movement adjustment screws

⑥ : Reed or MR magnetic position detectors
Installation recommendation: detectors must be installed with the flying leads or connectors orientated outwards

	WEIGHTS (kg)		
	Ø 16	**Ø 18**	**Ø 22**
180°	0,8	1,2	1,8

DIMENSIONS (mm)

BORE Ø (mm)	A			B	C	D	E	F			G	H			I
	2 positions		3-4 pos.					2 positions		3-4 pos.		2 positions		3-4 pos.	
	90°	**180°**	**180°**					**90°**	**180°**	**180°**		**90°**	**180°**	**180°**	
16	98	111	111	68	31	32	25	74	87	87	12	14	14	12	$4^{\ 0}_{-0,03}$
18	103	135	135	75	34,5	34	30	79	111	111	12	13	14	15	$4^{\ 0}_{-0,03}$
22	115	158	158	87,5	41	39	35	87	130	130	14	15	15	15	$5^{\ 0}_{-0,03}$

Ø	Ø J	K	L	M	Ø N $^{+0,05}_{0}$	Ø O	Ø P_1	P_2	Q	R	Ø S_1	Ø S_2	S_3	Ø S_4	T	U
16	$32^{\ 0}_{-0,05}$	2,5	18	11,5	12 ❊ 2	10^{h7}	M4x0,7	6	45	10	6,5	11	6,5	M8x1,25	45	M8x1,25
18	$37^{\ 0}_{-0,05}$	3	18	13,5	14 ❊ 1,8	12^{h7}	M5x0,8	7	52	12	8,5	14	8,5	M10x1,50	52	M10x1,50
22	$44^{\ 0}_{-0,05}$	3	20	17	17 ❊ 2	15^{h7}	M6x1	8	60	14	8,5	14	8,5	M10x1,50	60	M10x1,50

❊ : depth

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CHOICE OF MODEL

Choose a model so that the necessary moment is 70 % of the developed moment.

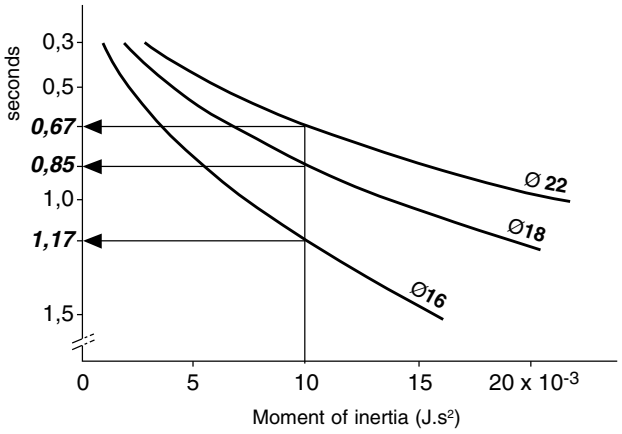
ROTATION TIME

HOW TO READ DIAGRAMS

Rotation time with respect to moment of inertia

Example : With a 10 x 10^{-3} J.s² moment, rotation time must be greater than :

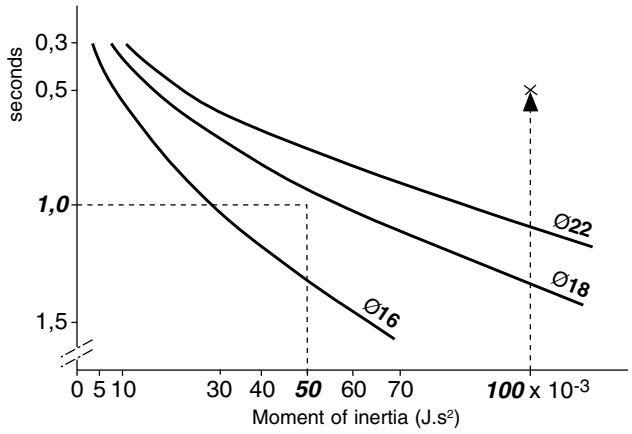
- 1.17 s for model Ø 16,
- 0.85 s for model Ø 18,
- 0.67 s for model Ø 22.



Maximum momentum

Example : With a momentum of 50 x 10^{-3} J.s² and a rotation time of 1 s/180°, model Ø 18 may be used with end stroke pneumatic cushioning, since the intersection point is below the maximum momentum.

Example : With a momentum of 100 x 10^{-3} J.s² and a rotation time of 0,5 s/180°, no model is satisfactory since the intersection point is above all maximum momentums.



CALCULATION OF MOMENTUM

Momentum is calculated according to the following equation :

$$E = 1/2\ I\ \omega^2$$

E = momentum, in Joules
I = moment of inertia, in kg.m²
ω = axis angular speed of rod at boss stop, in radians / second (ω = θ / t rad/s)
θ = rotation angle in radians (180° = 3,14 rad)
t = rotation time, in seconds

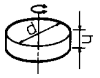
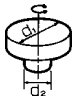
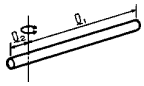
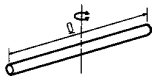
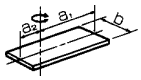
If the actual momentum is greater than the admissible maximum values, rotation speed must be reduced or shock absorbers must be installed.

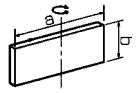
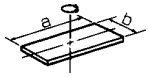
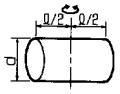
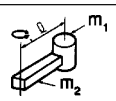
LOAD ON AXIS

Avoid applying the load directly on the axis, by using a bearing or a stop.
If it cannot be avoided, it must be limited as follows.

Type of cylinder	Cylinder Ø (mm)	Maximum radial load (N)	Maximum axial load (N)
R	12	3	1,5
	20	5	2,5
RS	16	20	10
	18	40	20
	22	60	30

DEFINITION OF MOMENT OF INERTIA

	$I = \frac{m.d^2}{8}$
	$I = \frac{1}{8}(m_1.d_1^2+m_2.d_2^2)$
	$I = \frac{1}{3}(m_1.Q_1^2+m_2.Q_2^2)$
	$I = \frac{m.Q^2}{12}$
	$I = \frac{1}{12}\{m_1.(4a_1^2+b^2)+m_2.(4a_2^2+b^2)\}$

	$I = \frac{m.a^2}{12}$
	$I = \frac{m.(a^2+b^2)}{12}$
	$I = \frac{m}{12}.(\frac{d^2}{3}+\frac{Q^2}{4})$
	$I = \frac{m.d^2}{16}$
	$I = \{m_1.(Q^2+\frac{d^2}{2})+\frac{m_2.Q^2}{3}\}$

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"COMPACT" POSITION DETECTORS
REED SWITCH AND MAGNETO-RESISTIVE TYPES

for pneumatic cylinders with dovetail grooves

Isoclair cylinders and PES-PCN with tie rods

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P293-GB-R1

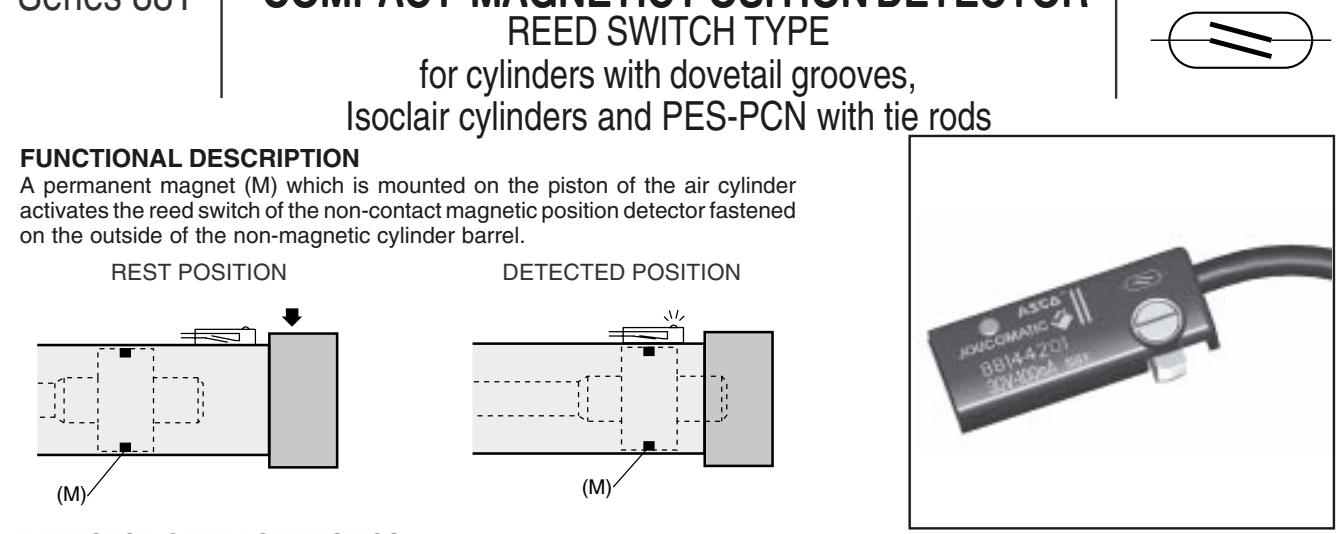
ASCO® JOUCOMATIC

Series 881

"COMPACT"MAGNETIC POSITION DETECTOR

REED SWITCH TYPE

for cylinders with dovetail grooves,
Isoclair cylinders and PES-PCN with tie rods



FUNCTIONAL DESCRIPTION

A permanent magnet (M) which is mounted on the piston of the air cylinder activates the reed switch of the non-contact magnetic position detector fastened on the outside of the non-magnetic cylinder barrel.

REST POSITION

DETECTED POSITION

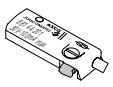
DETECTOR CHARACTERISTICS

MAX. SWITCHING POWER	DC = 3 W / AC =10 VA				
SWITCHING VOLTAGE	12 to 30 VDC and AC				
MAX. SWITCHING CURRENT	100 mA				
VOLTAGE DROP (EN 60.947-5-2)	< 2,6 volt (I = 100mA)				
CONTACT RESISTANCE	max. 0,1 ohm				
INSULATION RESISTANCE	$2x10^6$ ohm at 500 V				
WITHSTAND VOLTAGE	140 V AC and DC				
SENSITIVITY	min. 2 mTesla (20 Gauss)				
RESPONSE TIME opening	0,2 ms				
closing	0,5 ms				
REPEATABILITY	± 0,5 mm				
LIFE	$2x10^7$ operations				
WORKING TEMPERATURE	- 25°C , + 70°C				
HOUSING	Thermoplastic housing (PA-FV) with polyamide resin encapsulated printed circuit				
DEGREE OF PROTECTION (CE I 529)	IP67				
SIGNAL INDICATION	Yellow diode (LED) which lights up when the contact is established				
CONNECTION (4 possibilities / 5 types at choice)	PVC lead, 2 or 5 m long, 2 wires 0.14 mm^2, stripped ends		0.8 m PVC lead + 3-pin plug-in male connector and Ø M8	0,8 m PVC lead + 3-pin screw-type male connector, Ø M8 (2)	0.8 m PUR (3) lead + 3-pin screw-type male connector, Ø M12
	2 metres	5 metres			
Weight (g)	23	54	14	61	24

30 V max.

Compatible cylinders	Description	CODES				
K KN PEC P2L - P2B	Reed switch type COMPACT detector **+ mounting kit** (1) (for direct mounting on cylinders with swallow tail grooves)	**881 44 201**	**881 44 202**	**881 44 203**	**881 44 209**	**881 44 204**

(1) Detector supplied with mounting kit (special nut + screw) for direct fitting to cylinder grooves



(2) Connectable to the inputs of VCS connectors (Valve Connection System)
(3) PUR cable resistant to cutting fluids

ACCESSORIES AND OTHER ELECTRICAL CHARACTERISTICS: see following page

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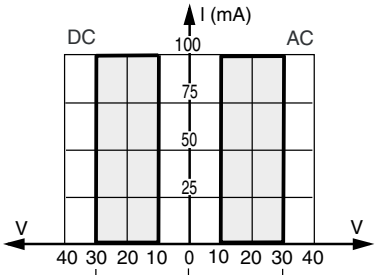
MAXIMUM ELECTRICAL CHARACTERISTICS AND PROTECTION OF MAGNETIC DETECTOR (REED SWITCH)

Note: The switching point must remain within the limits of the shaded area. Any excess voltage or power may damage the detector.



INDUCTIVE LOAD	LOAD R C	100 Ω 4 W 0,1 µF 250 V	100 Ω 4 W 0,1 µF 250 V
RESISTIVE LOAD	LOAD	Protection not necessary	

PARTICULAR APPLICATIONS (valid for all models)

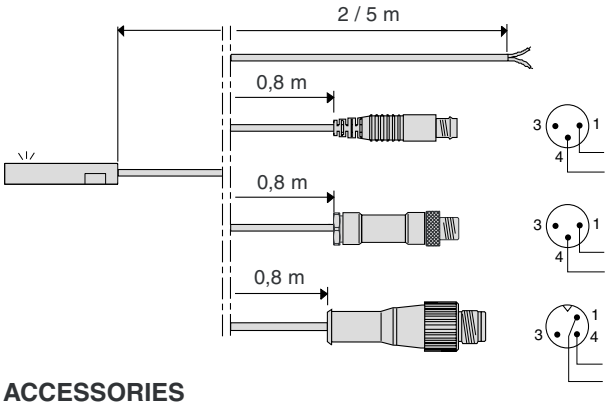
- Detectors used for direct control of incandescent lamps: The capacity specified on the lamp is based on its resistance when hot. When switched on, the resistance of the cold lamp is very low. Therefore, the current rises quickly and may exceed the reed switch rating. Allowance should therefore be made for the real power of the cold lamp.
- With leads longer than 10 m, a 1000 Ω resistor must be fitted in series with the detector to reduce the capacitive effect caused by the wiring.

R = 4 W resistor. Standard CCTU resistors code RP 59,
C = paper, polycarbonate or metallized mylar capacitor.
The user is responsible for supplying and assembling of components.

REED SWITCH CONNECTION : 4 possibilities

View from male contact side of connector

The detectors reed switch are not polarized



PVC lead outlet Ø 3 mm with stripped ends, 2 wires 0.14 mm²

PVC lead outlet Ø 3 mm with 3-pin plug-in male connector + screw Ø 8 mm (2 pins connected)

PVC lead outlet Ø 3 mm with 3-pin screw-type male connector, Ø M8, VCS compatible (2 pins connected)

PUR lead outlet Ø 3 mm resistant to cutting fluids, with 3-pin screw-type male connector, Ø M12 (2 pins connected)

ACCESSORIES

Description	CODE
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M8** connector (other end plain) (1) (2)	**881 00 239**
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M12** connector (other end plain) (2)	**881 00 238**
Straiht 3-pin female connector Ø M8, IP67	**881 00 202**
Right angle 3-pin female connector Ø M8, orientable 90° x 90°, IP67	**881 00 203**
Cable cover and holder (sold by the metre - minimum length = 1 m)	**881 44 212** (3)

(1) Extension for M8 connector detectors.
(2) Detector connection: **brown and black wires (detector is unpolarised)**, blue wire not used
(3) For your order please add the requested length (in metres) to the order code - example: 2 m = 881 44 212 2

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Series 881 | **"COMPACT" MAGNETIC POSITION DETECTOR**
MAGNETO-RESISTIVE TYPE **(MR)**
for cylinders with dovetail grooves,
Isoclair cylinders and PES-PCN with tie rods

PRINCIPLE
Static non-contact proximity switch on air cylinders equipped with built-in permanent magnets.

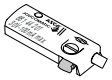
FUNCTIONAL DESCRIPTION
When the permanent magnet which is mounted on the piston approaches the detector the magnetic field it generates causes the semiconductors' resistors to change. This current variation increases the resistance and a switching signal is generated.

DETECTOR CHARACTERISTICS

MAX. SWITCHING POWER	3 W
SWITCHING VOLTAGE	10 to 30 VDC
MAX. SWITCHING CURRENT	100 mA
CONNECTION	PNP
VOLTAGE DROP (EN 60.947-5-2)	< 1,1 volt (I = 50 mA)
VOLTAGE DROP (EN 60.947-5-2)	< 1,2 volt (I = 100 mA)
MAX: LEAKAGE CURRENT	10 µA
MAX. ALLOWABLE OVERVOLTAGE	max. 40 volt (10 seconds)
INSULATION RESISTANCE (500V)	$20x10^6$ ohm
SENSITIVITY	min. 2 mTesla (20 Gauss)
RESPONSE TIME opening	0,2 ms
RESPONSE TIME closing	0,1 ms
REPEATABILITY	± 0,1 mm
LIFE	$5x10^7$ operations
WORKING TEMPERATURE	- 25°C , + 70°C
ELECTRICAL PROTECTION	Polarized detector, protectec against short-circuits and overloads (see opposite)
HOUSING	Thermoplastic housing (PA-FV) with polyamide resin encapsulated printed circuit
DEGREE OF PROTECTION (CE I 529)	IP67
SIGNAL INDICATION	Yellow diode (LED) which lights up during switching

CONNECTION (4 possibilities / 5 types at choice)	PVC lead, 2 or 5 m long, 3 wires 0.14 mm², stripped ends		0,8 m PVC lead + 3-pin plug-in male connector and Ø M8	0,8 m PVC lead + 3-pin screw-type male connector, Ø M8 (2)	0,8 m PUR (3) lead + 3-pin screw-type male connector, Ø M12
					 (3)
	2 metres	5 metres			
Weight (g)	23	54	14	61	24
Compatible cylinders / Description	CODES				
K, KN, PEC, P2L - P2B — Magneto-resistive type COMPACT detector **+ mounting kit** (1) (for direct mounting on cylinders with swallow tail grooves)	**881 44 205**	**881 44 206**	**881 44 207**	**881 44 210**	**881 44 208**

(1) Detector supplied with mounting kit (special nut + screw) for direct fitting to cylinder grooves
(2) Connectable to the inputs of VCS connectors (Valve Connection System)
(3) PUR cable resistant to cutting fluids



ACCESSORIES AND OTHER ELECTRICAL CHARACTERISTICS: see following page

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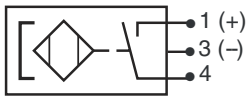
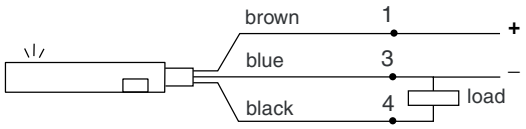
ELECTRICAL PROTECTION

- Output protected against short-circuit as long as the output current is restricted to 0.1 A.
- Improper wire connection may prevent the detector from operating or even destroy it.
- It is recommended to install a protection diode (mounted in parallel) on an inductive load in spite of the internal protection.

CONNECTION (PNP)

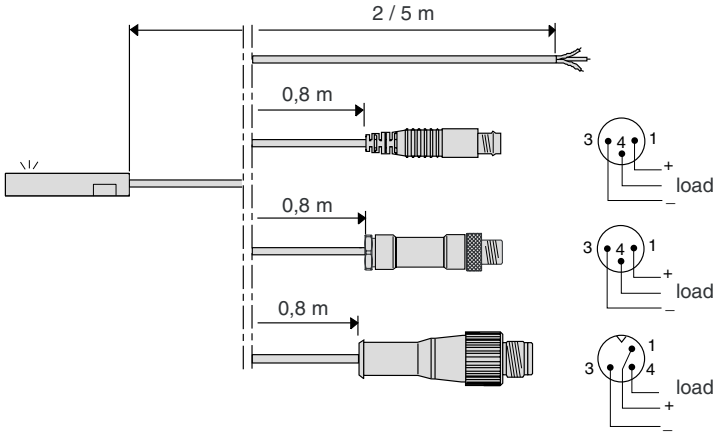




Polarities to be observed

CONNECTION OF MAGNETO-RESISTIVE DETECTORS: 4 possibilities

View from male contact side of connector



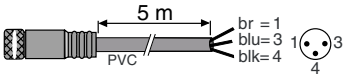
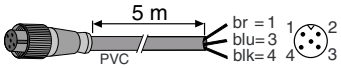
PVC lead outlet Ø 3 mm, stripped ends
3 wires 0.14 mm² - Brown wire : +
Blue wire : -
Black wire : load

PVC lead outlet Ø 3 mm with 3-pin plug-in male connector + screw Ø M8

PVC lead outlet Ø 3 mm with 3-pin screw-type male connector Ø M8, VCS compatible

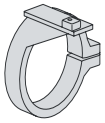
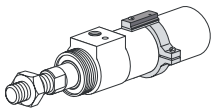
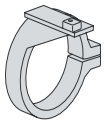
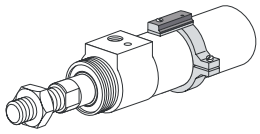
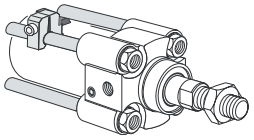
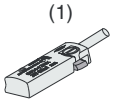
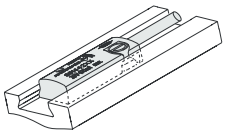
PUR lead outlet Ø 3 mm resistant to cutting fluids, with 3-pin screw-type male connector Ø M12

ACCESSORIES

Description	CODE
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M8** connector (other end plain) (1) (2) 	**881 00 239**
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M12** connector (other end plain) (2) 	**881 00 238**
Straiht 3-pin female connector Ø M8, IP67 	**881 00 202**
Right angle 3-pin female connector Ø M8, orientable 90° x 90°, IP67 	**881 00 203**
Cable cover and holder (sold by the metre - minimum length = 1 m) 	**881 44 212** (3)

(1) Extension for M8 connector detectors.
(2) **Detector connection, brown wire = +, blue wire = -, black wire = load**
(3) For your order please add the requested length (in metres) to the order code - example: 2 m = 881 44 212 2

"COMPACT" DETECTOR MOUNTING KITS FOR ASCO/JOUCOMATIC CYLINDERS

CYLINDERS Type	CYLINDERS Series	Leaflet	cylinder Ø	**CODE FASTENING KIT**	ILLUSTRATION Fastening kit	ILLUSTRATION Adaptation
ISOCLAIR - **C.AS** - **CC.AS** - **CIB**	 435 435 447	 P220 P220-11 P275-4	8 10 12 16 20 25	**881 00 657** **881 00 658** **881 00 659** **881 00 660** **881 00 661** **881 00 662**		
ISOCLAIR - **CIS** - **CIB**	 438 447	 P225 P275-4	32 40 50 63	**881 00 663** **881 00 664** **881 00 665** **881 00 666**		
- **PES 450** - **PES Ω** - **PCN** (CNOMO) (tie rods)	450 450 437	P232 P231 P245	(25) 32-40 50-63 80-100	**881 00 667** **881 00 668** **881 00 669**		
- **K** - **KN** - **PEC** - **P2L - P2B** - **PES 453**	441 442 449 447 453	P215 P216 P227 P275 P229	8 ... 16 20 ... 100 32 ... 100 16 ... 32 32 ... 100	(1)	(1) 	

(1) Fastening mini-kit (special nut + screw) supplied **with** detectors

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"COMPACT" DETECTOR MOUNTING KITS FOR ASCO/JOUCOMATIC CYLINDERS

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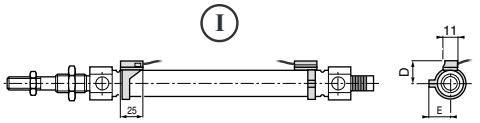
Dimensions

It is possible to mount magnetic detectors for **intermediate** position indication :

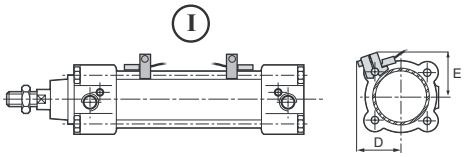
ISOCLAIR cylinders Ø 8 - 63 mm : mounting by collar



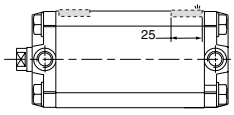
Ø vérin	8	10	12	16	20	25	32	40	50	63
D	11,3	12,3	13,3	15,3	17,3	19,8	23,3	27,3	32,3	38,8
E	12	13,2	14,4	16,5	18,7	21,4	26,1	30,7	35,8	42,2

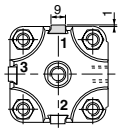
Ø 25 to 100 mm

The detectors can be mounted on any one of the 4 bosses.



Ø vérin	25	32	40	50	63	80	100
D	26	29	32	40	45	52	61
E	29	32	34	42	47	51	60





The magnetic detector fits directly into the grooves in the cylinder body.
Detection of very small movements or very short strokes means that more than one groove will have to be used.

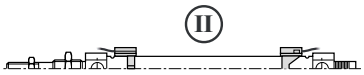
NOTE: PEC cylinders Ø 32 - 100 mm: 3 grooves in 1,2 and 3
KN cylinders Ø 20 - 25 mm : 3 grooves in 1,2 and 3
Ø 32 - 100 mm: 6 grooves in 1,2 and 3
K cylinders Ø 8 - 12 mm : 2 grooves in 1 and 2
Ø 16 - 100 mm: 3 grooves in 1,2 and 3
PES 453 cylinders Ø 32 mm : 1 «T» grooves - 3 dovetail grooves
Ø 40 - 63 mm : 2 «T» grooves - 3 dovetail grooves
Ø 80 - 100 mm: 2 «T» grooves - 7 dovetail grooves

Mounting recommendations

I On all diameters, it is possible to mount the detector with its electrical outlet facing towards the cylinder **barrel** (in order to be able to control the max. end of travel of the cylinder).

II In order to fasten the detector on cylinder diameters 25 to 63 with its electrical outlet facing towards the cylinder ends, rotate the detector + collar **unit** by 180°.

ISOCLAIR cylinder:
Ø8-20: any position.
Ø25-63: cable oriented towards the cylinder ends.



I It is possible to fasten the detector with its electric outlet to **the centre** of the cylinder (in order to be able to control the max. end of travel of the cylinder)

II In order to fasten the detector with its electric outlet to the rear, rotate **the unit** detector + collar by 180°

In order to control **the max. end** of cylinder stroke, the detectors
must be mounted in the following direction:

K cylinder:
Ø8-10-12: cable oriented towards the middle of the cylinder
Ø16 front cover: any position
Ø16 rear cover: cable oriented towards the middle of the cylinder

KN-P2B/P2L cylinders: any position

PEC cylinder:
Ø32-40: cable oriented towards the middle of the cylinder
Ø50-100: any position

PES 453 cylinder:
Ø32-40: cable oriented towards the middle of the cylinder
Ø50-100: any position

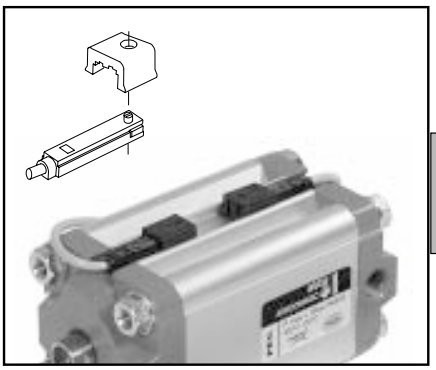
MINIATURE MAGNETIC POSITION DETECTORS "T"- SHAPED, REED SWITCH TYPE

for cylinders with dovetail grooves, types KN - PEC

(Hall effect version: see page 3)

OPERATING SYSTEM

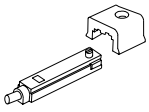
A permanent magnet mounted in the piston of the cylinder operates a reed switch which is mounted outside the cylinder unit. This switch (detector) is mounted in one of the longitudinal tracks in the body of the cylinder. One or more magnetic detectors can be fitted to check the end of stroke position or any intermediate position (stroke < 5 mm undetectable with this REED type detector).



DETECTOR CHARACTERISTICS

MAX. SWITCHING POWER	6 W / 6 VA	
SWITCHING VOLTAGE	3 to 30 V dc and ac	
MAX. SWITCHING CURRENT	100 mA	
CONTACT RESISTANCE	0,15 ohm max.	
SENSITIVITY opening	60 Gauss	
closing	110 Gauss	
RESPONSE TIME opening	0,1 ms	
closing	0,5 ms	
LIFE	10^7 operations	
WORKING TEMPERATURE	- 20°C , + 80°C	
HOUSING	Polyamide resin	
DEGREE OF PROTECTION (CEI 529)	IP67	
SIGNAL INDICATION	Yellow diode (LED) which lights up when the contact is established	
CONNECTION (2 possibilities / 2 types at option)	PVC lead, 2 m long, 2 wires 0.14 mm^2, stripped ends	1 m PVC lead + 3-pin screw-type male connector, Ø M8
Weight (g)	26	15
CODE DETECTOR + SUPPORT (1)	**881 00 508**	**881 00 509**

(1) Detector supplied with mounting kit (screw and nut + «SL4» plastic guide) to be set in KN (see P216) or PEC (see P227) cylinders grooves



(SL4)

ACCESSORY

Description	CODE
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm^2 with 1 screw-on **femal M8** connector (other end plain) (2) (3)	**881 00 239**

(2) Extension for M8 connector detectors.

(3) **Detector connection: brown wire = + , black wire = -**, blue wire not used

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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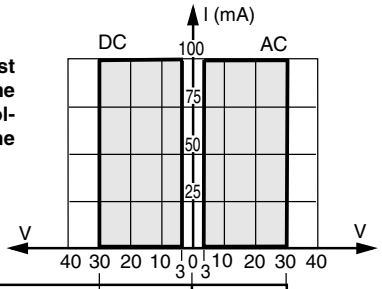
MAXIMUM ELECTRICAL CHARACTERISTICS AND PROTECTION OF MAGNETIC DETECTOR (REED SWITCH)

Note: The switching point must remain within the limits of the shaded area. Any excess voltage or power may damage the detector.



INDUCTIVE LOAD	LOAD R C	100 Ω 4 W 0,1 µF 250 V	100 Ω 4 W 0,1 µF 250 V
RESISTIVE LOAD	LOAD	Protection not necessary	

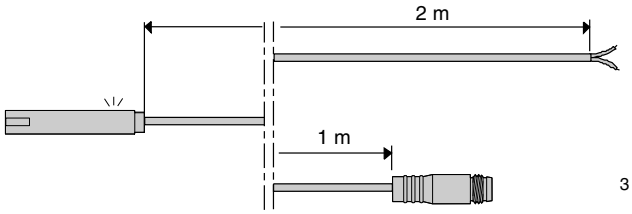
PARTICULAR APPLICATIONS

- Detectors used for direct control of incandescent lamps: The capacity specified on the lamp is based on its resistance when hot. When switched on, the resistance of the cold lamp is very low. Therefore, the current rises quickly and may exceed the reed switch rating. Allowance should therefore be made for the real power of the cold lamp.
- With leads longer than 10 m, a 1000 Ω resistor must be fitted in series with the detector to reduce the capacitive effect caused by the wiring.

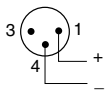
R = 4 W resistor. Standard CCTU resistors code RP 59, C = paper, polycarbonate or metallized mylar capacitor.
The user is responsible for supplying and assembling of components.

REED SWITCH CONNECTION : 2 possibilities

The reed switches are polarized



PVC lead outlet Ø 3 mm with stripped ends,
2 wires 0.14 mm² . brown wire = +
blue wire = -

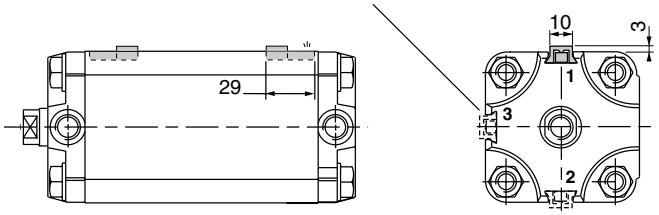


PVC lead outlet Ø 3 mm with 3-pin screw-type male connector, Ø M8 (2 pins connected)

View from male contact side of connector

DIMENSIONS

The magnetic detector fits directly into the grooves in the cylinder body. Detection of very small movements or very short strokes means that more than one groove will have to be used.
(stroke < 5 mm undetectable with this type)
NOTE : PEC cylinders Ø 32 - 100 mm : 3 grooves in 1,2 and 3
KN cylinders Ø 20 - 25 mm : 3 grooves in 1,2 and 3
KN cylinders Ø 32 - 100 mm : 6 grooves in 1,2 and 3



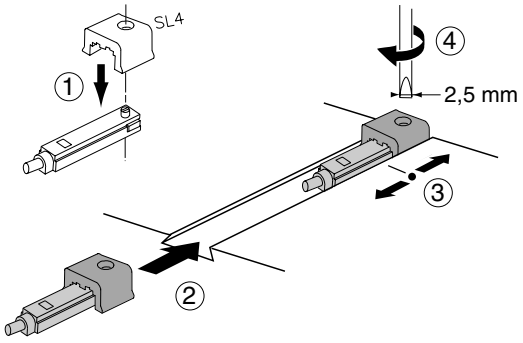
INSTALLATION RECOMMENDATION

In order to control **the max. end** of cylinder stroke, the detectors must be mounted in the following direction :

Reed switch/KN cylinder : with the cable in any position
Reed switch/PEC cylinder : with the cable facing outwards

DETECTOR INSTALLATION

The detectors are fitted into one of the grooves of the cylinder, with an «SL4»plastic guide. Mainting is achieved with an adjusting screw after the detector is placed in position.



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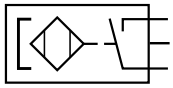
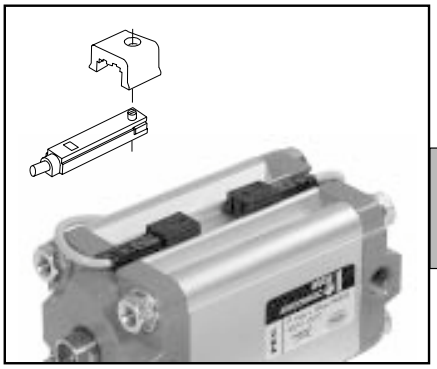
MINIATURE MAGNETIC POSITION DETECTORS "T" - SHAPED, HALL EFFECT

for cylinders with dovetail grooves, types KN - PEC

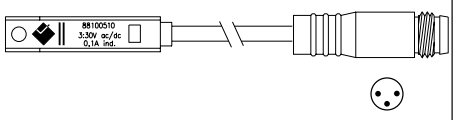
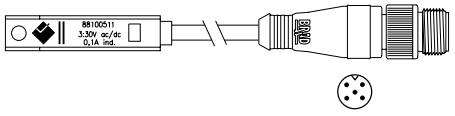


OPERATING SYSTEM

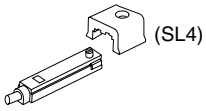
An integrated circuit electronically detects the presence of a magnetic field produced by magnet which is permanently mounted on the piston and transmits a signal to a amplifier. This switch (detector) is mounted in one of the longitudinal tracks in the body of the cylinder. One or more magnetic detectors can be fitted to check the end of stroke position or any intermediate position.
There are no moving parts, thus improving the service life (10^9 operations)



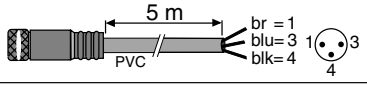
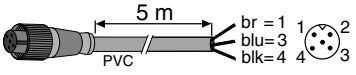
DETECTOR CHARACTERISTICS

MAX. SWITCHING POWER	6 W	
MAX. SWITCHING VOLTAGE	6 to 30 V dc	
MAX. SWITCHING CURRENT	200 mA	
CONNECTION	**PNP**	
SENSITIVITY opening	50 Gauss	
closing	90 Gauss	
RESPONSE TIME opening	0,3 µs	
closing	0,8 µs	
ENDURANCE	10^9 operations	
WORKING TEMPERATURE	- 20°C , + 80°C	
ELECTRICAL PROTECTION	Polarized detector, protected against polarity inversion and overvoltage	
HOUSING	Polyamide resin	
DEGREE OF PROTECTION (CEI 529)	IP67	
SIGNAL INDICATION	Yellow diode (LED) which lights up during switching	
CONNECTION (2 possibilities / 2 types at option)	1 m PVC lead + 3-pin screw-type male connector, Ø **M8** 	1 m PVC lead + 5-pin screw-type male connector, Ø **M12** 
Weight (g)	15	22
CODE DETECTOR + SUPPORT (1)	**881 00 510**	**881 00 511**

(1) Detector supplied with mounting kit (screw and nut + «SL4» plastic guide) to be set in KN (see P216) or PEC (see P227) cylinders grooves



ACCESSORY

Désignation	CODE
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M8** connector (other end plain) (2) (3) 	**881 00 239**
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M12** connector (other end plain) (3) 	**881 00 238**

(2) Extension for M8 connector detectors.
(3) **Detector connection, brown wire = +, blue wire = -, black wire = load**

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

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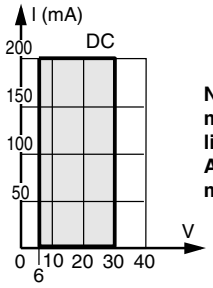
ELECTRICAL PROTECTION

- Output protected against polarity inversion and overvoltage
- It is recommended to install a protection diode (mounted in parallel) on an inductive load in spite of the internal protection.

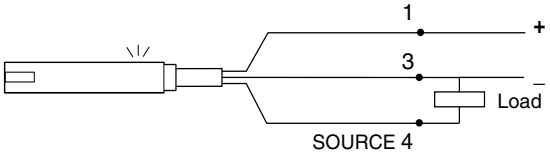


Note: The switching point must remain within the limits of the shaded area. Any excess voltage or power may damage the detector.

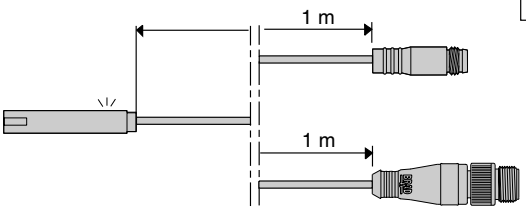
CONNECTION

SOURCING (PNP) - switching positive potential of the charge
Max. Power : 0,2 A under 30 Vcc
The detector is conceived to supply a signal to equipment such as a PLC. (relay not recommended).

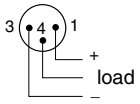
SOURCING (PNP) function detector
(Polarities to be observed)



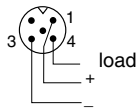
CONNECTION OF HALL EFFECT DETECTORS: 2 possibilities



View from male contact side of connector



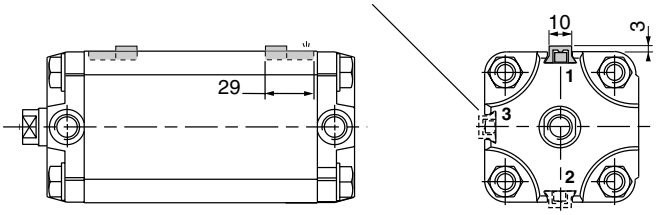
PVC lead outlet Ø 3 mm with 3-pin screw-type male connector Ø M8



PVC lead outlet Ø 3 mm with 5-pin screw-type male connector Ø M12 (3 pins connected)

DIMENSIONS

The magnetic detector fits directly into the grooves in the cylinder body. Detection of very small movements or very short strokes means that more than one groove will have to be used.
NOTE : PEC cylinders Ø 32 - 100 mm : 3 grooves in 1,2 and 3
KN cylinders Ø 20 - 25 mm : 3 grooves in 1,2 and 3
KN cylinders Ø 32 - 100 mm : 6 grooves in 1,2 and 3



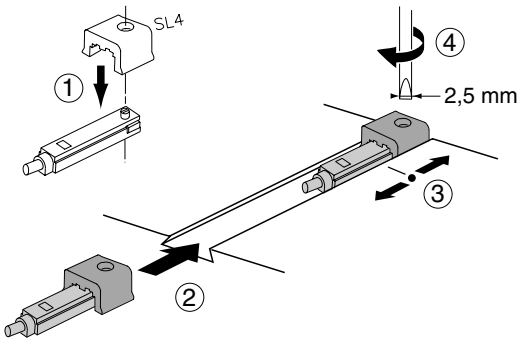
INSTALLATION RECOMMENDATION

In order to control **the max. end** of cylinder stroke, the detectors must be mounted in the following direction :

Hall effect/KN cylinder : with the cable facing outwards
Hall effect/PEC cylinder : with the cable facing outwards

DETECTOR INSTALLATION

The detectors are fitted into one of the grooves of the cylinder, with an «SL4»plastic guide. Mainting is achieved with an adjusting screw after the detector is placed in position.



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"UNI" MINIATURE POSITION DETECTORS
REED SWITCH AND MAGNETO-RESISTIVE TYPES

for pneumatic cylinders

2

P295-GB-R1

ASCO® JOUCOMATIC

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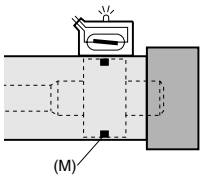
GENERAL

Magnetic detectors are electrical switches which react in the presence of a magnetic field. In pneumatic automation, they are used as non-contact position detectors on pneumatic cylinders designed to receive them.

When installed on the amagnetic barrel of a cylinder, the position detector detects the presence of the magnetic field created by the permanent magnet (M) in the piston. This causes the state of the detector to change.

The UNI detector range consists of two types: reed switch and magneto-resistive.

DETECTED POSITION



■ REED SWITCH DETECTOR

Under the effect of the magnetic field, the two contact blades in the glass envelope make the electrical circuit.

Features:

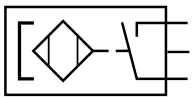
- This type of detector operates with AC and DC
- Voltage range 10 to 60 V (230 V on request)
- Max. switching power = 10 W / 12 VA
- Service life of mechanical function 10^7 cycles

■ MAGNETO-RESISTIVE DETECTOR

When the permanent magnetic field of the magnet in the piston approaches the detector, the resistance of the semi-conductors changes. The lines of current are distorted, resulting in an increase in resistance which generates a switching signal.

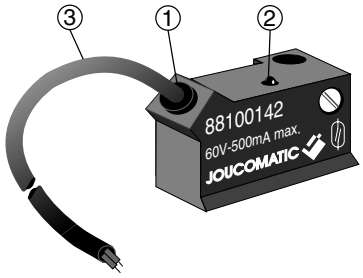
Features:

- This type of detector operates with DC only (10 to 30 V DC).
- Max. switching power = 6 W
- Solid state device with no moving parts with a virtually unlimited service life (10^{10} cycles).
- Protection against shorting
- Polarised, PNP version



"UNI" MINIATURE DETECTOR KEY FEATURES

- **Easy to install and connect**
- **45° cable outlet facilitating wiring up (1)**
- **Compact**
- **State change indicator LED (2)**
- **Wide range of connection options**
- **A choice of 5 connections (3), see below:**



Integrated connector	45° lead outlet protected by feed-through sleeve			
3-pin screw-type male connector, **Ø M8**	**PVC lead, 2 or 5 m long,** 3 wires 0.14 mm², stripped ends	0.8 m PVC lead + 3-pin **plug-in** male connector, **Ø 8**	5 m PVC lead + 3-pin screw-type male connector, **Ø M8** ❊	0.8 m PVC lead + 3-pin screw-type male connector, **Ø M12**
				

❊ Adaptable on inputs VCS connectors (Valve Connection systeme)

- **A range of mounting kits for installing UNI detectors on most cylinder types and sizes**

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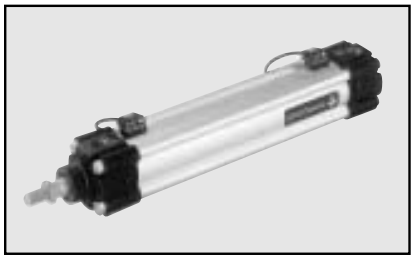
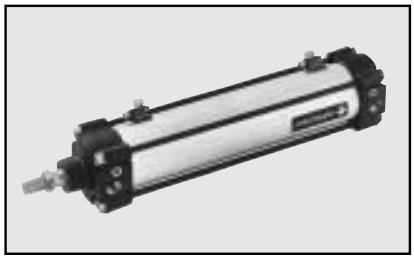
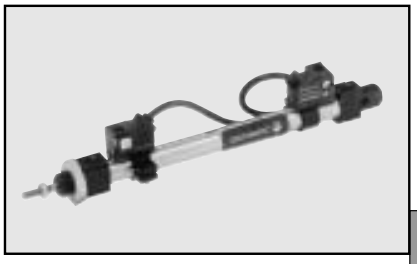


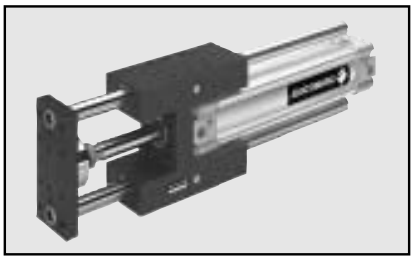
Cylinder to ISO 6431 - VDMA 24562
profiled barrel - type: **PES**, series: 450



Cylinder to ISO 6431 - VDMA 24562
tie rods - type: **PES**, series: 450



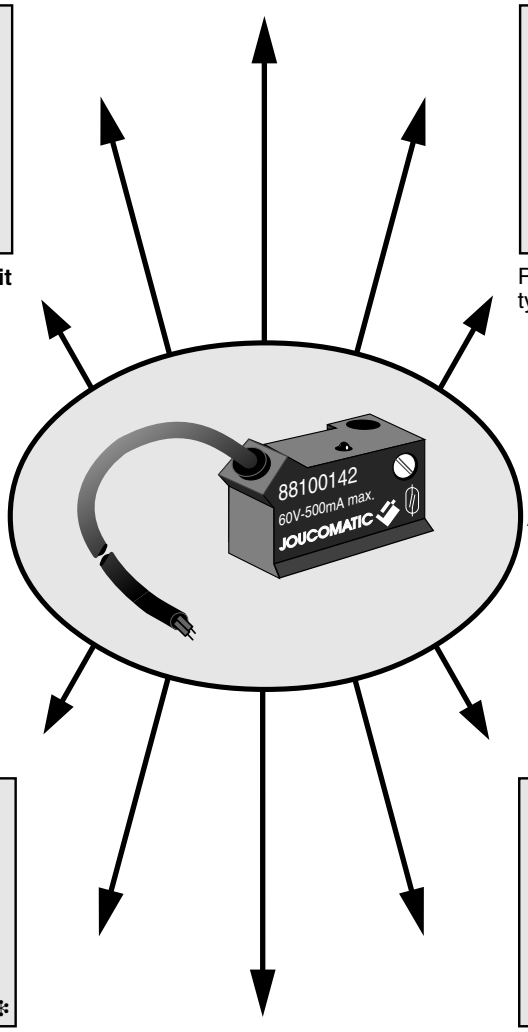
Round cylinder to ISO 6432 - CETOP
types: **C.AS - CIB**, series: 435 - 447



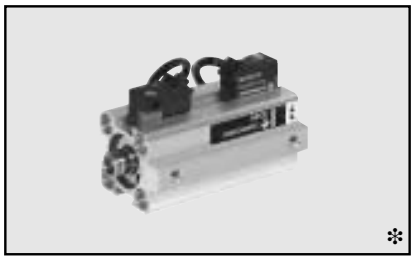
PES cylinder with **U and H guiding unit**

Round cylinder to ISO 6431 - CETOP
type: **CIS**, series: 438

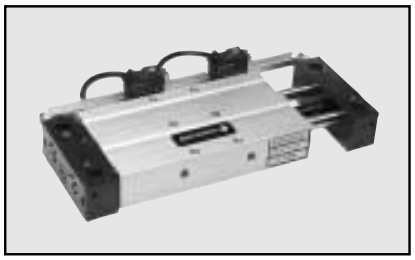
The same "UNI" detector
(reed switch
or magneto-resistive)



fits all ASCO JOUCOMATIC cylinders

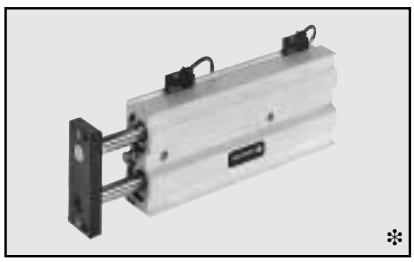


Short stroke cylinders
types: **K - KN - PEC**, series: 441-442-449

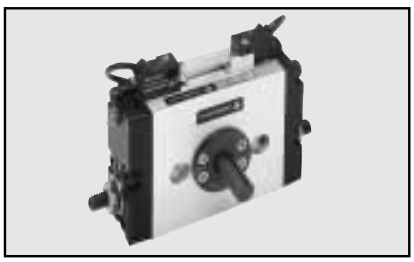


Slide unit with ball bearings
type: **TUB**, series: 447

Compact cylinder, ISO 6431-VDMA
compatible - type: **PEC**, series: 449



Double-rod anti-rotation cylinders
types: **P2L - P2B**, series: 447



2 and 3 position rotatable cylinders
types: **R - RS**, series: 429

❊ UNI detector supplied with mounting kit (special nut + screw) for direct fitting to cylinder grooves

Series 881 | "UNI" MINIATURE MAGNETIC POSITION DETECTORS
REED SWITCH TYPE
for pneumatic cylinder

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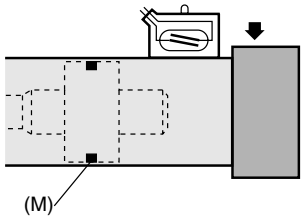
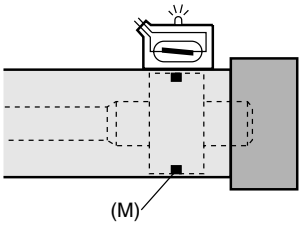
FUNCTIONAL DESCRIPTION

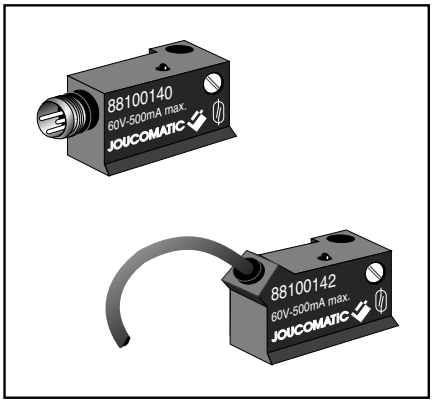
A permanent magnet (M) which is mounted on the piston of the air cylinder activates the reed switch of the non-contact magnetic position detector fastened on the outside of the non-magnetic cylinder barrel.

REST POSITION



DETECTED POSITION





DETECTOR CHARACTERISTICS

MAX. SWITCHING POWER	DC = 10 W / AC =1 2 VA
SWITCHING VOLTAGE	10 to 60 V DC and AC — **60 V max.** (1)
MAX. SWITCHING CURRENT	500 mA
VOLTAGE DROP (EN 60.947-5-2)	< 2.7 volt (I = 200mA)
	< 2.9 volt (I = 500mA)
CONTACT RESISTANCE	max. 0.1 ohm
INSULATION RESISTANCE	10^{10} ohm
WITHSTAND VOLTAGE	DC = 470 V - AC = 600 V
SENSITIVITY	min. 3 mTesla (30 Gauss)
RESPONSE TIME opening	0.2 ms
closing	0.6 ms
REPEATABILITY	± 0.1 mm
LIFE	10^7 operations
WORKING TEMPERATURE	-20 °C , +70 °C
HOUSING	Thermoplastic housing (PPS) with expoxy resin encapsulated printed circuit
DEGREE OF PROTECTION (CE I 529)	IP67
SIGNAL INDICATION	Green diode (LED) which lights up when the contact is established

Recommendation for application
For cylinder + detector applications with long travels and large movements you must use the mini-detector with **M8 connector integrated** in the housing and lead outlets with cable (2- or 3- wire) **type class 6** especially intented for this purpose (specific accessory: consult us)

CONNECTION (5 possibilities / 6 types at option)	Integrated connector	45° lead outlet protected by feed-through sleeve				
	3-pin screw-type male connector, Ø M8	PVC lead, 2 or 5 m long, 2 wires 0.14 mm², stripped ends		0.8 m PVC lead + 3-pin plug-in male connector, Ø 8	5 m PVC lead + 3-pin screw-type male connector, Ø M8	0.8 m PVC lead + 3-pin screw-type male connector, Ø M12
						
		2 metres	5 metres			
Weight (g)	6	30	70	22	86	35
Compatible cylinders / Description	**CODES**					
CAS - CIS CIB PES PES Ω TUB R - RS Reed switch type UNI detector **only** the mounting kit for each cylinder is ordered **separately** (see following pages)	**881 00 140**	**881 00 142**	**881 00 144**	**881 00 146**	**881 00 594**	**881 00 148**
K KN PEC P2L - P2B Reed switch type UNI detector **+ mounting kit** (❄) (for direct mounting on cylinders with swallow tail grooves)	**881 00 185**	**881 00 186**	**881 00 189**	**881 00 190**	**881 00 592**	**881 00 191**

❄ UNI detector supplied with mounting kit (special nut + screw) for direct fitting to cylinder grooves

(1) Version for 230 V AC/DC max. (50 mA - 11.5 VA), on request, with 2 m PUR cable, detector **only**, code: **881 00 418**
detector + **mini mounting kit** (❄), code: **881 00 417**

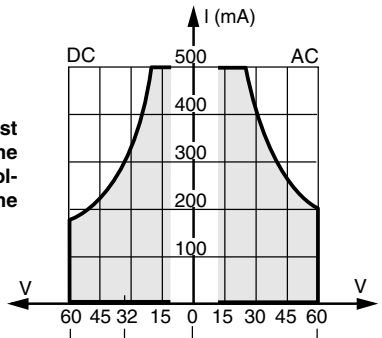
ACCESSORIES AND OTHER ELECTRICAL CHARACTERISTICS: see opposite
MOUNTING KITS, INSTALLATION ON CYLINDERS: see following pages

ASCO JOUCOMATIC

MAXIMUM ELECTRICAL CHARACTERISTICS AND PROTECTION OF MAGNETIC DETECTOR (REED SWITCH)

60 V max. models

Note: The switching point must remain within the limits of the shaded area. Any excess voltage or power may damage the detector.

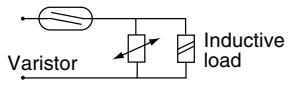


INDUCTIVE LOAD	LOAD, R, C	220 Ω 4 W / 100 Ω 4 W	100 Ω 4 W
		0,1 µF/250 V	0,1 µF 250 V
RESISTIVE LOAD	LOAD	Protection not necessary	

230 V max. (AC/DC) model

Max. power = 11,5 VA (50 mA max.)
Life = 10^6 operations

To obtain the maximum service life, there should be no arcing betwen contacts. The voltage and current values indicated must therefore not be exceeded.
In the case of electrical circuits with induction coils, protection devices should be used to absorb cut-off overvoltage. The ideal protection component is the varistor (507K250).



PARTICULAR APPLICATIONS (valid for all models)

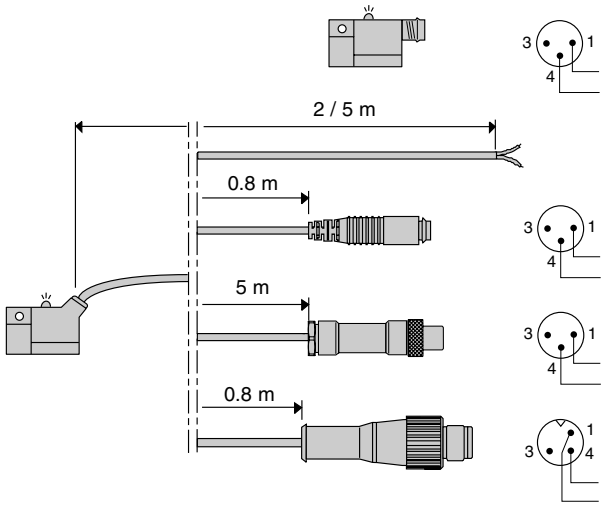
- Detectors used for direct control of incandescent lamps: The capacity specified on the lamp is based on its resistance when hot. When switched on, the resistance of the cold lamp is very low. Therefore, the current rises quickly and may exceed the reed switch rating. Allowance should therefore be made for the real power of the cold lamp.
- With leads longer than 10 m, a 1000 Ω resistor must be fitted in series with the detector to reduce the capacitive effect caused by the wiring.

R = 4 W resistor. Standard CCTU resistors code RP 59, C = paper, polycarbonate or metallized mylar capacitor.
The user is responsible for supplying and assembling of components.

REED SWITCH CONNECTION : 5 possibilities

View from male contact side of connector

The UNI detectors reed switch are not polarized



3-pin screw-type male connector Ø M8 (2 pins connected)

Lead outlet Ø 3 mm with stripped ends, 2 wires 0.14 mm²

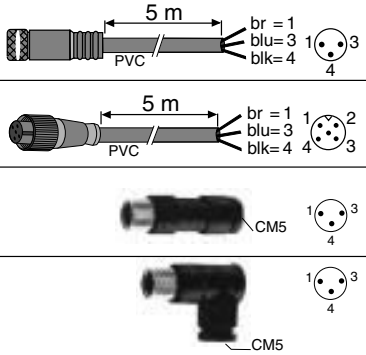
Lead outlet Ø 3 mm with 3-pin plug-in male connector, Ø 8 mm (2 pins connected)

Lead outlet Ø 3 mm with 3-pin screw-type male connector, Ø M8 (2 pins connected) (adaptable on inputs VCS connectors)

Lead outlet Ø 3 mm with 3-pin screw-type male connector, Ø M12 (2 pins connected)

ACCESSORIES

Description	CODE
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M8** connector (other end plain) (1) (2)	**881 00 239**
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M12** connector (other end plain) (2)	**881 00 238**
Straiht 3-pin female connector Ø M8, IP67	**881 00 202**
Right angle 3-pin female connector Ø M8, orientable 90° x 90°, IP67	**881 00 203**



(1) Extension for integral M8 connector detectors. Coupling to snap-on Ø 8 male connectors is **not advised**.
(2) Detector connection: **brown and black wires (detector is unpolarised)**, blue wire not used

Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

Series 881 | "UNI"MINIATURE MAGNETIC POSITION DETECTORS
MAGNETO-RESISTIVE TYPE **(MR)**
for pneumatic cylinder

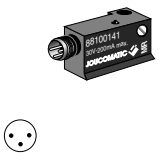
Control & Power, Inc. - 1.877.835.5274 - www.controlandpower.com

PRINCIPLE
Static non-contact proximity switch on air cylinders equipped with built-in permanent magnets.

FUNCTIONAL DESCRIPTION
When the permanent magnet which is mounted on the piston approaches the detector the magnetic field it generates causes the semiconductors' resistors to change. This current variation increases the resistance and a switching signal is generated.

DETECTOR CHARACTERISTICS

MAX. SWITCHING POWER	6 W
SWITCHING VOLTAGE	10 to 30 V DC
MAX. SWITCHING CURRENT	200 mA
CONNECTION	PNP
VOLTAGE DROP	< 1.1 Volt (I = 50 mA) < 1.4 Volt (I = 200 mA)
MAX: LEAKAGE CURRENT	10 µA
MAX. ALLOWABLE OVERVOLTAGE	50 Volt (10 seconds)
INSULATION RESISTANCE	10^{10} ohm
SENSITIVITY	min. 3 mTesla (30 Gauss)
RESPONSE TIME opening	0.2 ms
closing	0.1 ms
REPEATABILITY	± 0.1 mm
WORKING TEMPERATURE	-20°C , +70°C
ELECTRICAL PROTECTION	Polarized detector, protectec against short-circuits and overloads (see opposite) and incorporated recovery diode
HOUSING	Thermoplastic housing (PPS) with epoxy resin encapsulated printed circuit
DEGREE OF PROTECTION (CEI 529)	IP67
SIGNAL INDICATION	Green diode (LED) which lights up during switching

CONNECTION (5 possibilities / 6 types at option)	Integrated connector	45° lead outlet protected by feed-through sleeve				
	3-pin screw-type male connector, Ø M8	PVC lead, 2 or 5 m long, 3 wires 0.14 mm², stripped ends		0.8 m PVC lead + 3-pin plug-in male connector, Ø 8	5 m PVC lead + 3-pin screw-type male connector, Ø M8	0.8 m PVC lead + 3-pin screw-type male connector, Ø M12
						
		2 metres	5 metres			
Weight (g)	6	30	70	22	86	35

Recommendation for application
For cylinder + detector applications with long travels and large movements you must use the mini-detector with **M8 connector integrated** in the housing and lead outlets with cable (3- wire) **type class 6** especially intented for this purpose
(specific accessory: consult us)

Compatible cylinders	Description	CODES					
CAS - CIS CIB PES PES Ω TUB R - RS	Magneto-resistive type UNI detector **only** the mounting kit for each cylinder is ordered separately (see following pages)	**881 00 141**	**881 00 143**	**881 00 145**	**881 00 147**	**881 00 595**	**881 00 149**
K KN PEC P2L - P2B	Magneto-resistive type UNI detector **+ mounting kit** (❄) (for direct mounting on cylinders with swallow tail grooves)	**881 00 192**	**881 00 193**	**881 00 194**	**881 00 195**	**881 00 593**	**881 00 196**

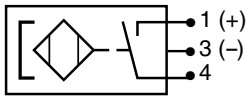
❄ Detector supplied with mounting kit (special nut + screw) for direct fitting to cylinder grooves

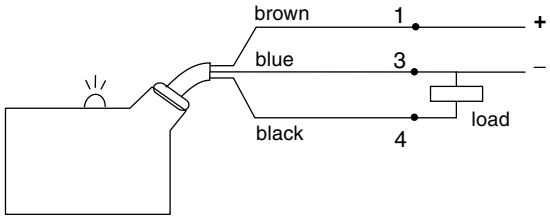
ACCESSORIES AND OTHER ELECTRICAL CHARACTERISTICS: see opposite
MOUNTING KITS, INSTALLATION ON CYLINDERS: see following pages

ELECTRICAL PROTECTION

- Output protected against short-circuit as long as the output current is restricted to 0.2 A.
- Improper wire connection may prevent the detector from operating or even destroy it.
- It is recommended to install a protection diode (mounted in parallel) on an inductive load in spite of the internal protection.

CONNECTION (PNP)

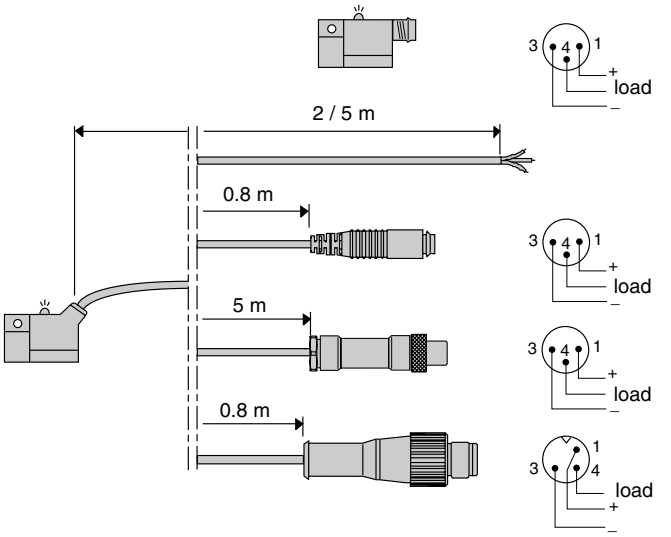




Polarities to be observed

CONNECTION OF MAGNETO-RESISTIVE DETECTORS: 5 possibilities

View from male contact side of connector



3-pin screw-type male connector Ø M8 - 3 pins

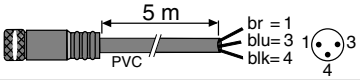
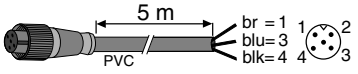
Lead outlet Ø 3 mm, stripped ends
3 wires 0.14 mm² - Brown wire : +
Blue wire : -
Black wire : load

Lead outlet Ø 3 mm with 3-pin plug-in male connector Ø 8 mm

Lead outlet Ø 3 mm with 3-pin screw-type male connector Ø M8
(adaptable on inputs VCS connectors)

Lead outlet Ø 3 mm with 3-pin screw-type male connector Ø M12

ACCESSORIES

Description		CODE
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M8** connector (other end plain) (1) (2)		**881 00 239**
Extension consisting of PVC, length 5 m, 3 wire conductors 0.25 mm² with 1 screw-on **femal M12** connector (other end plain) (2)		**881 00 238**
Straiht 3-pin female connector Ø M8, IP67		**881 00 202**
Right angle 3-pin female connector Ø M8, orientable 90° x 90°, IP67		**881 00 203**

(1) Extension for integral M8 connector detectors. Coupling to snap-on Ø 8 male connectors is **not advised**.
(2) **Detector connection, brown wire = +, blue wire = -, black wire = load**

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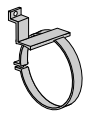
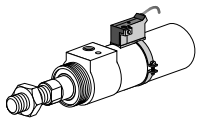
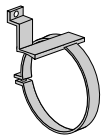
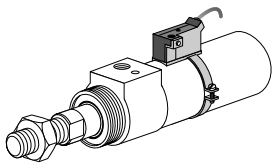
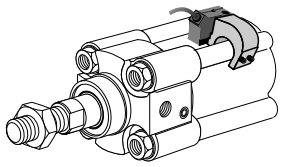
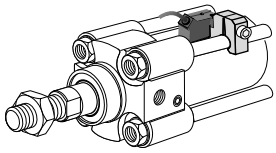
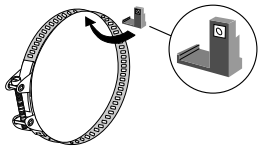
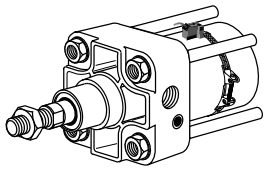
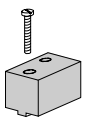
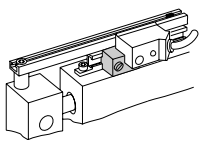
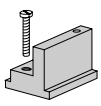
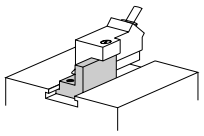
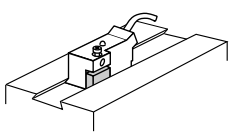
"**UNI**" DETECTOR MOUNTING KITS FOR ASCO/JOUCOMATIC CYLINDERS

CYLINDERS Type	Series	Leaflet	cylinder Ø	**CODE FASTENING KIT**	ILLUSTRATION Fastening kit	Adaptation
ISOCLAIR - **C.AS** - **CC.AS** - **CIB**	 435 435 447	 P220 P220-11 P275-4	8 10 12 16 20 25	**881 00 161** **881 00 162** **881 00 163** **881 00 164** **881 00 165** **881 00 166**		
ISOCLAIR - **CIS** - **CIB**	 438 447	 P225 P275-4	32 40 50 63	**881 00 167** **881 00 168** **881 00 169** **881 00 170**		
- **PES** - **PES Ω** (profiled barrel)	450 450	P230 P231	32-40 50-63 80-100 125	**881 00 153** **881 00 154** **881 00 155** **881 00 156**		
- **PES** - **PES Ω** (tie rods)	450 450	P232 P231	32-40 50-63 80	**881 00 150** **881 00 151** **881 00 152**		
			100 125 160 200	**881 00 157** **881 00 158** **881 00 159** **881 00 160**		
PES with **U and H guiding** unit	450	P237	32 ... 100	Kit specific for front or rear positions (see page 10)		
- **TUB**	447	P275	10 ... 25	**881 44 704**		
ROTATABLE - **R** - **RS**	429	P285	10 ... 25	**881 00 275**		
- **K** - **KN** - **PEC** - **P2L - P2B**	441 442 449 447	P215 P216 P227 P275	8 ... 16 20 ... 100 32 ... 100 16 ... 32	(1)	 (1)	

(1) Fastening mini-kit (special nut + screw) supplied **with** detectors

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"**UNI**" DETECTOR INSTALLATION ON ASCO/JOUCOMATIC CYLINDERS

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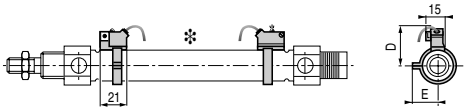
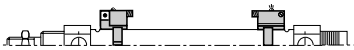
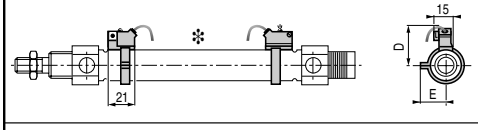
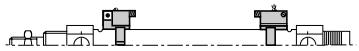
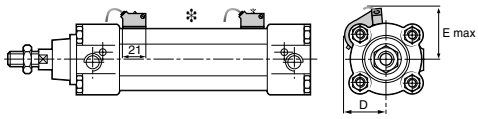
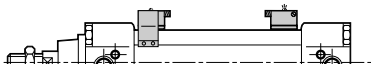
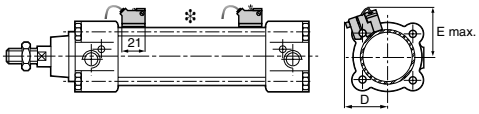
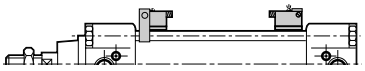
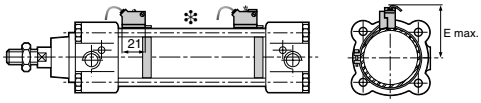
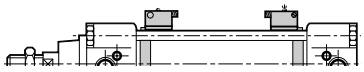
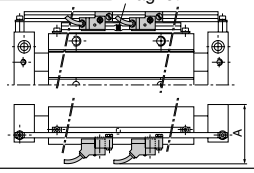
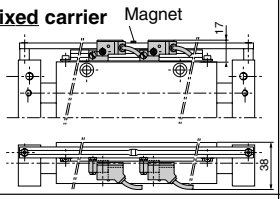
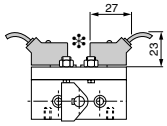
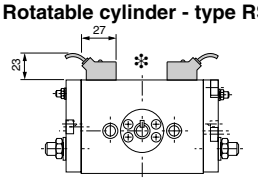
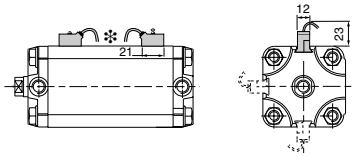
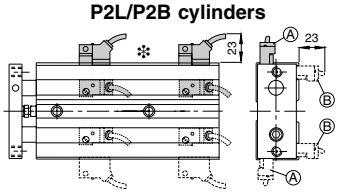
Dimensions	Mounting recommendations
In order to fasten the detector with its electric outlet to the rear rotate the detector + collar by 180°  ❊ Ø cylinder: 8 / 10 / 12 / 16 / 20 / 25 D: 28 / 29 / 30 / 32 / 34 / 36 E: 13 / 14 / 15 / 17 / 19 / 21	In order to be able to control the max. end of travel of the cylinder, the detectors with **integrated male connectors** must be mounted with the connectors **facing towards the centre of the cylinder** as shown below: 
In order to fasten the detector with its electric outlet to the rear rotate the detector + collar by 180°  ❊ Ø cylinder: 32 / 40 / 50 / 63 D: 41 / 46 / 51 / 57 E: 26 / 31 / 36 / 42	In order to be able to control the max. end of travel of the cylinder, the detectors with **integrated male connectors** must be mounted with the connectors **facing towards the centre of the cylinder** as shown below: 
The detectors can be mounted on any one of the 4 bosses.  ❊ Ø cylinder: 32 / 40 / 50 / 63 / 80 / 100 / 125 D: 27 / 31 / 36 / 41 / 47 / 58 / 69 E: 42 / 45 / 51 / 55 / 64 / 71 / 82	In order to be able to control the max. end of travel of the cylinder, the detectors with **integrated male connectors** must be mounted with the connectors **facing towards the centre of the cylinder** as shown below: 
Ø 25 to 80 mm The detectors can be mounted on any one of the 4 tie rods.  ❊ Ø cylinder: 25 / 32 / 40 / 50 / 63 / 80 D: 26 / 30 / 34 / 42 / 47 / 55 E: 36 / 44 / 47 / 51 / 56 / 63	In order to be able to control the max. end of travel of the cylinder, the detectors with **integrated male connectors** must be mounted with the connectors **facing towards the centre of the cylinder** as shown below: 
Ø 100 à 200 mm (mounting by collar)  ❊ Ø cylinder: 100 / 125 / 160 / 200 E: 75 / 88 / 106 / 127	In order to be able to control the max. end of travel of the cylinder, the detectors with **integrated male connectors** must be mounted with the connectors **facing towards the centre of the cylinder** as shown below: 
See page 10	
TUB with mobile carrier Magnet  **TUB with fixed carrier** Magnet  Ø: 10 / 16 / 20 / 25 A: 39 / 42 / 43 / 53	**Mounting recommendations** Mount detectors as indicated opposite. **Mini. stroke cylinder with 2 detectors** • Flying lead : - Reed switch : mini. stroke, 20 mm - MR : mini. stroke,30 mm • Integral connector: - Reed switch : mini. stroke,90 mm - MR : mini. stroke,100 mm
Rotatable cylinder - type R  **Rotatable cylinder - type RS** 	Detectors must be installed with the flying leads or connectors **orientated outwards**
K-KN-PEC types cylinders  **P2L/P2B cylinders**  A - Detectors mounted on **side** B - Detectors mounted on **top**	**Mounting recommendations** (reed switch or MR type) • **P2L / P2B** - Detectors with flying leads: stroke ≤ 25 mm: mount one detector on the side (A) and one on the top (B) stroke > 25 mm: mount the 2 detectors as desired, side (A) and/or top (B) - Detectors with integral connectors: Mount one detector on the side (A) and the other on the top (B) • **K - KN - PEC** Stroke < 5 mm undetectable with reed switch type.

❊ It is possible to install magnetic detectors for monitoring **intermediate** positions.

INSTALLATION OF REED SWITCH AND MAGNETO-RESISTIVE "UNI" MINIATURE DETECTORS
ON PES type CYLINDERS WITH U and H GUIDING UNIT

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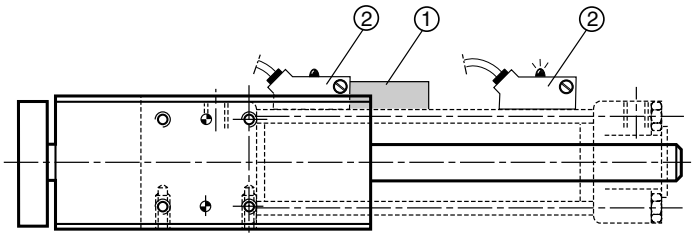
FASTENING KIT

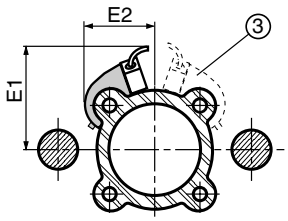
CODE FASTENING KIT				
Ø cylinder (mm)	ON PES CYLINDER **PROFILED**		ON PES CYLINDER **WITH TIE-RODS** (2)	
	Front position control (1)	**Rear** position control	**Front** position control (1)	**Rear** position control
32 - 40	**881 00 182**	**881 00 153**	**881 00 179**	**881 00 150**
50 - 63	**881 00 183**	**881 00 154**	**881 00 180**	**881 00 151**
80	**881 00 184**	**881 00 155**	**881 00 181**	**881 00 152**
100	**881 00 184**	**881 00 155**	**881 00 157**	**881 00 157**

(1) The **forward** position detector **support is specified** (longer)
(2) Mounting by flange : Ø 32 to 80 mm
by collar : Ø 100 mm
NOTE: **The miniature detectors with integrated connector Ø M8 are not adaptable for the FRONT position control.**

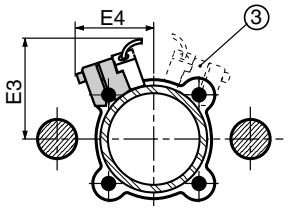
ADAPTATION



CYLINDER WITH **PROFILED** BARREL



CYLINDER WITH **TIE-RODS**



(1): The **forward** position detector **support is specified** (longer)
The miniature detectors with integrated connector Ø M8 are not adaptable for the **front** position control
(2): Position detector mounting
(3): For small stroke cylinders, the standard detector for rear position control must be mounted on the profiled tube plate or tie rod opposite to the tie rod of the front position detector.

Ø cylinder (mm)	E1	E2	E3	E4
32	42	27	44	30
40	45	31	47	34
50	51	36	51	42
63	55	41	56	47
80	64	47	63	55
100	71	58	75	-

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

MAGNETO-INDUCTIVE DETECTOR

magnetic operated
for pneumatic cylinders Ø 32 to 200 mm

APPLICATION

This **two-wire** proximity sensor will monitor stroke end and intermediate positions of pneumatic cylinders equipped with built-in permanent magnets.
Do not use near welding areas.

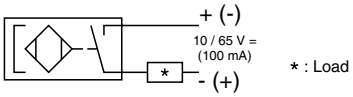
OPERATING SYSTEM

The permanent magnet is mounted in the piston head. On getting closer, its own magnetic field generates variations of the current within the detector oscillator. An amplifier converts them into switch signals.

GENERAL CHARACTERISTICS

Function	: closing
Switching voltage	: 10 to 65 V DC
Residual ripple	: < 10%
Residual current (opening)	: < 0.8 mA
Max. switching current	: 100 mA
Min. switching current	: 3 mA
I_L max. voltage drop	: < 5 V
Hysteresis	: < 1 mm
Ambient temperature	: -10°C ; +70°C
Housing	: circuit protected by an aluminium box
External protection	: IP65
Electrical protection	: **non-polarised** detector protected against short circuits and overcharges
Connection (three possibilities)	: • 0.8 m cable + four-pin male connector Ø 12 mm, CNOMO E03.62.520.N • 2 m cable with stripped ends • integrated male connector Ø 12 mm (for different extension cords available, see overleaf)
Indicator lamp	: diode (LED) which lights up when the contact is closed - yellow: car industry - red: standard applications
Mounting direction	: any way - **Do not use near welding areas**
Mounting on cylinder	: • VDMA 24562 - AFNOR NFE 49003 - ISO 6431, type PES series 450 Ø 32 to 200 mm with tie rods and Ø 32 to 125 mm with profiled barrel. • ISO 6431 Ø 32 to 200 mm with tie rods, type TRINORM PIS series 436 • CNOMO 06.07.02/03 - NFE 49001/002 Ø 32 to 200 mm with tie rods, type TRINORM PCN series 437

CONNECTION DIAGRAM
No serial connection can be performed with several detectors.

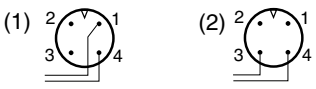


CHOICE OF EQUIPMENT

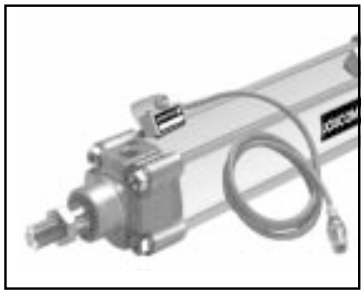
DESCRIPTION	Can be mounted on cylinders	CODE of one detector with bracket	CODE of one detector on its own	APPLICATIONS
Inductive magnetic position detector, with wire **0.8 m** long and four-pin male **connector** Ø 12 mm type conprox (1) to CNOMO E03.40.150.N and E03.62.520.N, CNOMO cutting oil resistant wire, delivered with mounting bracket for cylinders:	with tie rods Ø 32 to 100 mm	**881 43 676**	**881 43 672**	Car industry
	with tie rods Ø 125 to 200 mm	**881 43 678**		
Inductive magnetic position detector, with wire **2 m** long, stripped ends without connector, **CNOMO cutting oil resistant wire**, delivered with mounting bracket for cylinders:	with tie rods Ø 32 to 100 mm	**881 43 677**	**881 43 673**	
	with tie rods Ø 125 to 200 mm	**881 43 679**		
Inductive magnetic position detector, with integrated four-pin male connector Ø 12 mm (2) type conprox, **delivered** with mounting bracket for cylinders:	with tie rods Ø 32 to 100 mm	**881 43 617**	**881 43 616**	Standard applications
	with tie rods Ø 125 to 200 mm	**881 43 680**		
	with profiled barrel Ø 32 to 125 mm	**881 43 618**		

(1) Wires connected to pins 1 and 4 of the connector (car industry applications)
(2) Wires connected to pins 3 and 4 of the connector

Marking male connectors view from contact side



Mounting on U or H guiding units:
The forward position detector **support is specified** (consult us)


Detector with wire


Detector with integrated connector


Extension cord (see Accessories overleaf)

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ACCESSORIES-MOUNTINGS

	DESCRIPTION		CODE	APPLICATIONS
EXTENDING CORDS	CNOMO extension cord, cutting oil resistant 5 wire conductors, 0.5 mm² with 1 five-pin **straight socket connector** Ø 12 mm, CNOMO E03.62.520.N (1) (other end of wire stripped)	4 m long	**881 43 675**	Car industry
	Standard PVC extension cord, 2 wire conductors, 0.5 mm² with 1 four-pin **straight socket connector** Ø 12 mm (2) (other end of wire stripped)	4 m long	**881 43 619**	Standard applications
	Standard PVC extension cord, 2 wire conductors, 0.5 mm² with 1 four-pin **curved socket connector** Ø 12 mm (2) (other end of wire stripped)	4 m long	**881 43 620**	
MOUNTING DEVICES	Mounting device type KLI 1 for cylinders with tie rods Ø 32 to 100 mm		**881 43 625**	Any applications
	Mounting device type KLI 3 for cylinders with tie rods Ø 125 to 200 mm		**881 43 674**	
	Mounting device type KLI 2 for cylinders with profiled barrels Ø 32 to 125 mm		**881 43 626**	

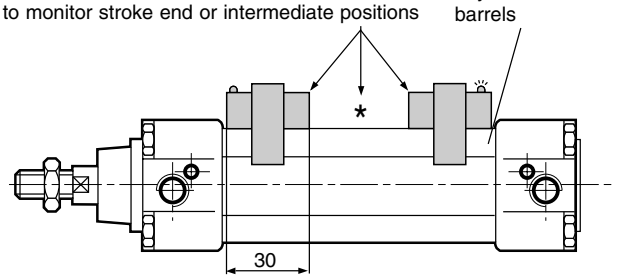
(1) Wires connected to pins 1 (brown) and 4 (black) of the connector (car industry applications)
(2) Wires connected to pins 3 and 4 of the connector

: The codes in the grey shaded areas correspond to commonly used products which can be supplied rapidly

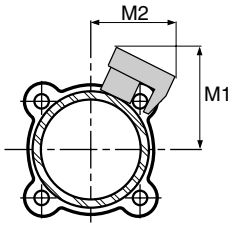
DIMENSIONS AND WEIGHTS

It is possible to install magnetic detectors to monitor stroke end or intermediate positions

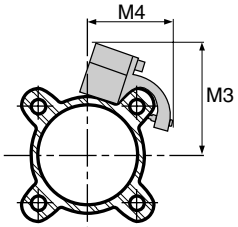
Detectors may be mounted on any of the 4 tie rods or profiled barrels



MOUNTING ON CYLINDER WITH TIE RODS



MOUNTING ON CYLINDER WITH PROFILED BARREL

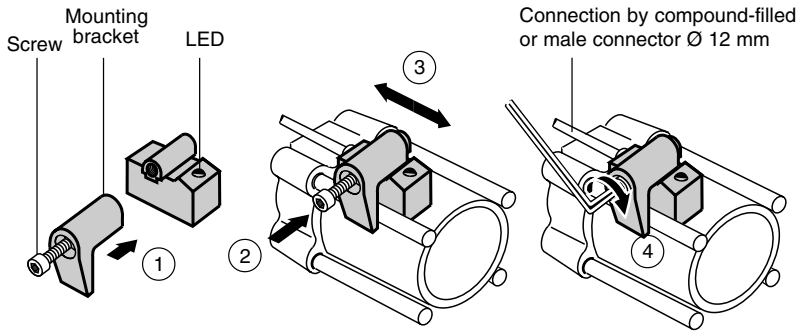


Dimensions (mm)	cylinder Ø (mm) 32	40	50	63	80	100	125	160	200	Weight* (in g)
M1	46	50	54	58	65	72	84	97	111	67
M2	39	41	48	52	60	68	78	96	110	
M3	46	50	55	60	67	75	88	-	-	
M4	38	42	46	50	56	65	76	-	-	

* Weight of detector + bracket

MOUNTING ON CYLINDERS

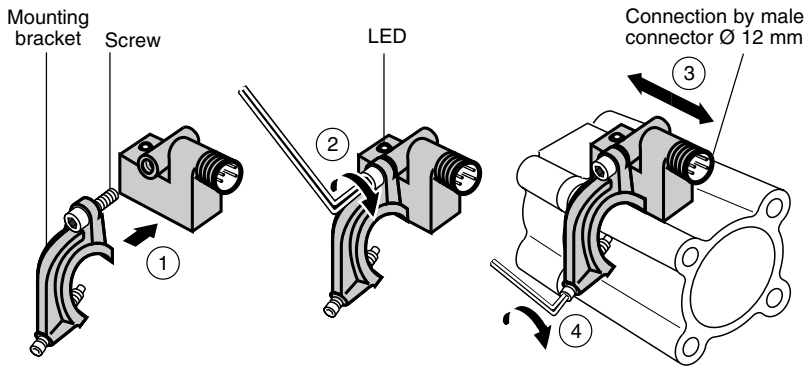
MOUNTING ON CYLINDERS WITH TIE RODS Ø 32 TO 200 mm



Mounting instructions

1. - Install mounting bracket on detector
2. - Start screwing in the detector
3. - Position at measuring point
4. - Check that the detector is in contact with the tube and tighten on cylinder, screwing down moderately with key (2.5 mm hexagonal)

MOUNTING ON CYLINDERS WITH PROFILED BARREL Ø 32 TO 125 mm



Mounting instructions

1. - Install mounting bracket on detector
2. - Start screwing bracket on detector
3. - Position at measuring point
4. - Check that the detector is in contact with the tube and tighten on cylinder, screwing down moderately with key (2.5 hexagonal)

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