

Internally Powered Block Thrusters

Economy Version: See Page **3.72**

SEE DLK SECTION

Accessory Mounting Holes are not available on this Version.

Compact design:

This design is used for short strokes in limited space applications. Internal piston design reduces overall length.

Lift table:

The block thruster can be used as a power lift table by attaching an optional mounting flange.

DIRECTCONNECT mounting patterns:

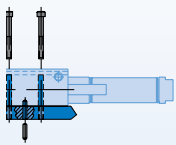
These slides have DIRECTCONNECT mounting patterns that connect to other slides without the need for adapter plates.

DLT SERIES

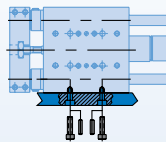
4.34

Mounting Information:

Mounts and operates in any orientation



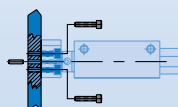
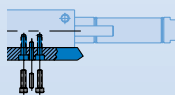
Payload attaches to tooling plate with screws and locates using slip fit dowel pin holes.



Body can be back mounted using DIRECTCONNECT mounting from the back or front of the thruster.



Body can end mount on end using optional mounting flange.



Body mounts with screws and locate with slip fit dowel pin holes on side or bottom using DIRECTCONNECT mounting patterns.

Technical Specifications:

Pneumatic Specifications

Pressure Operating Range*
Cylinder Type
Dynamic Seals
Valve Required to Operate

Imperial
40-100 psi
Metric
3-7 bar
Double Acting
Internally Lubricated Buna-N
4-way, 2-position

Air Quality Requirements

Air Filtration
Air Lubrication
Air Humidity

40 Micron or Better
Not Necessary**
Low Moisture Content (dry)

Temperature Operating Range

Buna-N Seals (standard)
Viton® Seals (optional)

-30°~180° F
-20°~300° F
-35°~80° C
-30°~150° C

Maintenance Specifications†

Expected Life
Normal Application
w/ Preventative Maintenance
Field Repairable
Seal Repair Kits Available

5 million cycles
10+ million cycles†
No
No

Application Restrictions

Flow controls, shock absorbers and urethane bumpers recommended for nearly all applications.
Use composite bushing in dirty or gritty environments.
Never use silicone based lubricants with composite bushings.

*Higher pressure possible. Consult factory with application details.

**Addition of lubrication will greatly increase service life

† See Maintenance Section

Product Features

Misalignment Coupling

Reduces cylinder wear and increases useful life of cylinder

Urethane Bumpers & Clamp Collars

Precision Ground Shafting

Case hardened to RC60-65. Corrosion resistant optional

Modular Telescoping Airlines

Eliminates flexing air lines. Patented self aligning air tube design extends useful seal life. (2) user air ports per module

Aircraft Quality Aluminum

Slot mounted sensor with threaded quick disconnect

Sensors Grooves

For mounting Hall Effect Sensors

Sensor Magnet

Standard in piston

Universal Mounting Kit

Contains Mounting Bracket, Hardened Steel Target, and hardware.

Allows the mounting of Shocks and adjustable Hard Stops. Dual stop & shock capable

Shock Absorbers

with built-in hard stop

Bearing Options

Preloaded linear ball bushings or composite bushings

Inductive Proximity Sensors

8mm diameter, threaded body with quick disconnect

Seal Option

Viton® or self-lubricating Buna-N dynamic seals

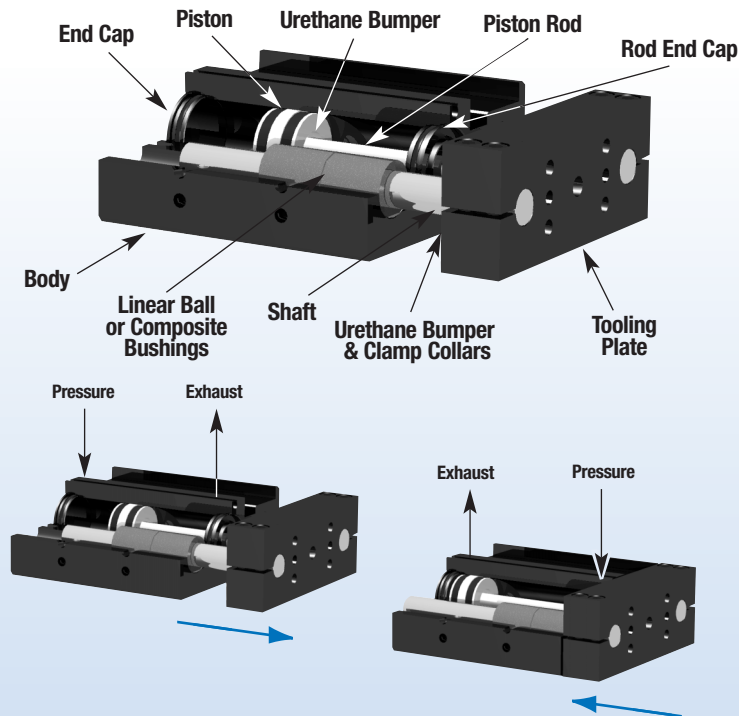
Base Flange Kit

Converts thruster into a flange mounted lift table

DIRECTCONNECT Mounting Patterns

Main bodies have tapped and counterbored through holes including slip fit dowel holes on DIRECTCONNECT mounting surface

Operating Principle



- A double acting internal cylinder located within the body drives a piston rod that connects to the tooling plate with a misalignment coupling.
- The tooling is attached to two hardened steel shafts which are supported by and move in four linear bushings located in the body.

Designed and manufactured in the USA

Style-B Block Thruster

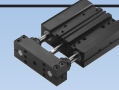
Size **-06M**



See Page **4.24**

Style-B Block Thruster

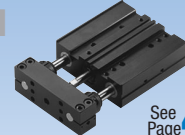
Size **-08M**



See Page **4.24**

Style-B Block Thruster

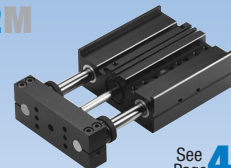
Size **-10M**



See Page **4.38**

Style-B Block Thruster

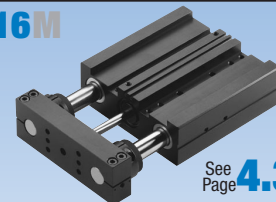
Size **-12M**



See Page **4.38**

Style-B Block Thruster

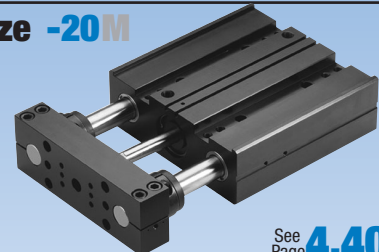
Size **-16M**



See Page **4.38**

Style-B Block Thruster

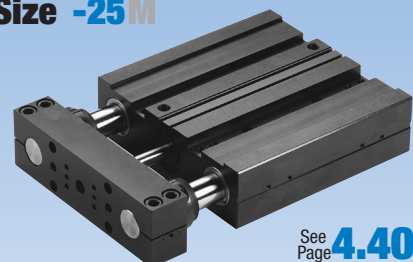
Size **-20M**



See Page **4.40**

Style-B Block Thruster

Size **-25M**



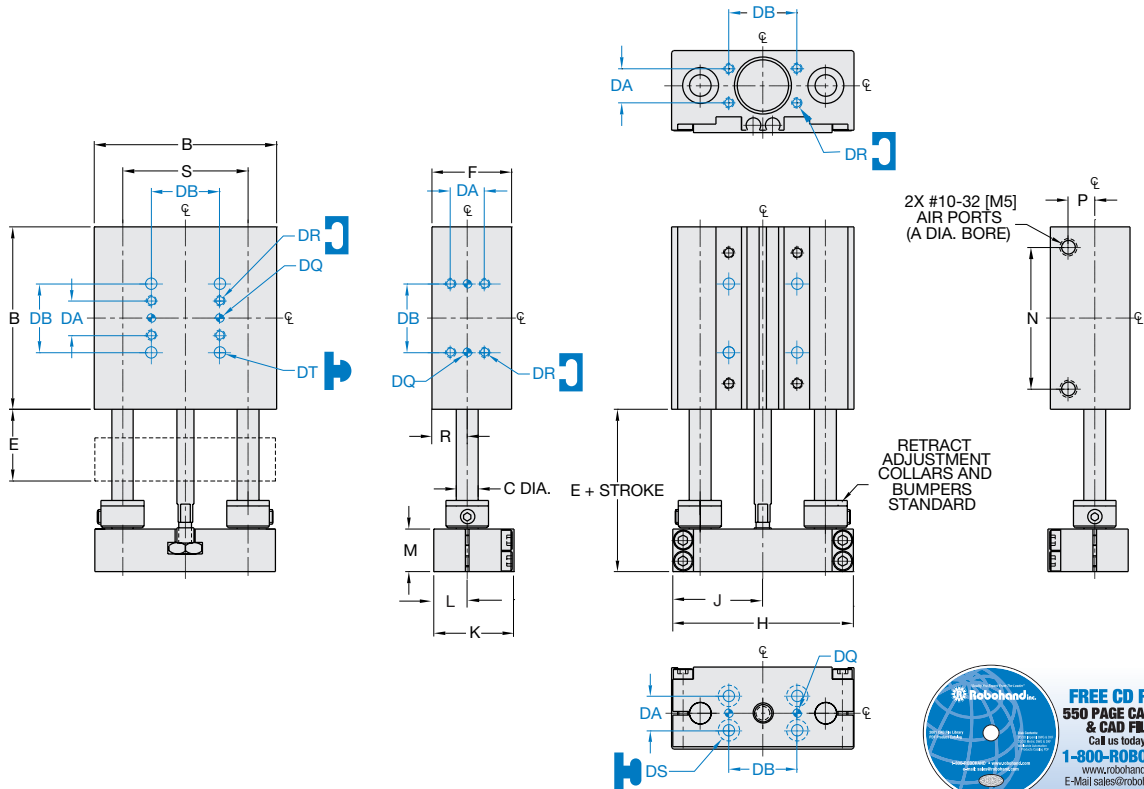
See Page **4.40**

BLOCK THRUSTER DLT -06M, 08M -B BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

4.36



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

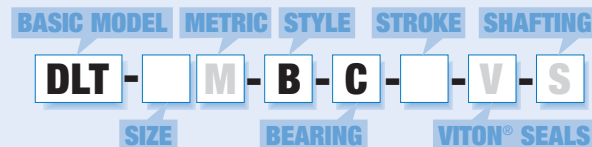
	Imperial in.	Metric [mm]
± 0.00	± 0.01	$[0.] = \pm .25$
± 0.000	± 0.005	$[0.0] = \pm .13$
± 0.0000	± 0.0005	$[0.00] = \pm .013$

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.									
	A	B	C	E	F	H	J	K	L	M	N	P	R	S
DLT-06	0.563	2.00	0.236	0.783	0.88	1.980	.990	0.875	.365	0.470	1.55	0.29	.390	1.375
DLT-08	0.563	2.50	0.315	0.783	0.88	2.470	1.235	0.875	.365	0.470	2.05	0.29	.390	1.750
DLT-06M	14	50.8	6.0	19.9	22.4	50.3	25.1	22.2	9.3	11.9	39.4	7.4	9.9	34.93
DLT-08M	14	63.5	8.0	19.9	22.4	62.7	31.0	22.2	9.3	11.9	52.1	7.4	9.9	44.45

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DQ	.0940 x .078 DP	3H7 x 2 DP
DR	#4-40 x .25 DP	M3 x 6 DP
DS	Clearance for #4	Clearance for M3
DT	Clearance for #4	Clearance for M3

How to Order: Basic Unit



SIZE 06, 08

METRIC M

STYLE B Block thruster with built-in repairable cylinder

BEARING C Composite bushings

STROKE (inches)
DLT-06 .25, .5, 1, 1.25
DLT-08 .25, .5, 1, 1.5, 1.75

STROKE (mm)
DLT-06M 6, 12, 25, 30
DLT-08M 6, 12, 25, 30, 40, 44

VITON® V Viton® seals

SHAFTING S Corrosion resistant shafting

SAMPLE ORDER: DLT-06-B-C-1.5-V

Ex: Thruster, Size 06, Block Style, Composite Bushings, 1.5 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock, Stop or Sensor)
Shock Absorber*
Adjustable Hard Stop*

	DLT-06M	DLT-08M	QTY/THRUSTER
OSAK-069	OSAK-070		1 or 2
SHOK-030	SHOK-030		1 or 2
DLT-623	DLT-623		1 or 2

INDUCTIVE SENSOR ACCESSORIES †

Inductive Sensor Mounting Kit
Inductive Sensor PNP Qk. Disconnect †
Inductive Sensor NPN Qk. Disconnect †
Quick Disconnect 2 M Cable Length
Quick Disconnect 5 M Cable Length

	OSMK-076	OSMK-077	1
OISP-014	OISP-014		1
OISN-014	OISN-014		1
CABL-010	CABL-010		1
CABL-013	CABL-013		1

MAGNETIC SENSOR ACCESSORIES ** †

Hall Effect Sensor PNP Qk. Disconnect
Hall Effect Sensor NPN Qk. Disconnect
Quick Disconnect 2 M Cable Length
Quick Disconnect 5 M Cable Length

	OHSP-006	OHSP-006	1 or 2
OHSN-006	OHSN-006		1 or 2
CABL-010	CABL-010		1 or 2
CABL-013	CABL-013		1 or 2

PNEUMATIC ACCESSORIES

#10-32 Adjustable Flow Control
M5 Adjustable Flow Control
Cylinder Seal Repair Kit
Viton® Seal Repair Kit

	VLVF-007	VLVF-007	1 or 2
VLVF-008	VLVF-008		1 or 2
SLKT-108	SLKT-108		1
108V	108V		1

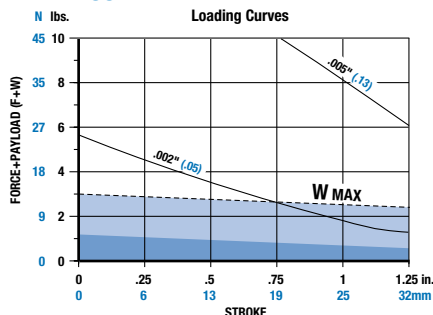
MOUNTING ACCESSORIES

Base Flange Kit (Imperial)

	ODLT-015	ODLT-016	1
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*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

DLT-06M -B

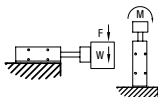


F=Externally applied force (lbs. or N)

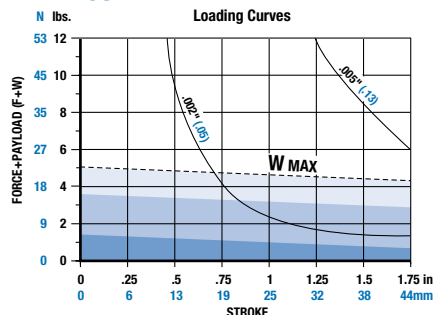
W=Weight of payload (lbs. or N)

F+W=Total deflection force (lbs. or N)

M=Maximum moment (in.-lb. or N-m)



DLT-08M -B



Shock Absorbers and Flow Controls are recommended for nearly all applications

Use **Double Shocks** in both directions

Use **Single Shock** in both directions

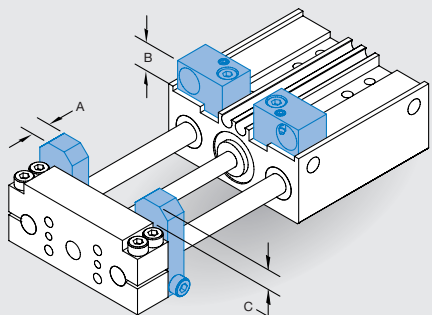
Use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-06	DLT-06M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	0.34 lbs.	.15 kg
Cylinder Bore Diameter	0.563"	14.3 mm
Shaft Diameter	0.236"	6 mm
Max (M) Vertical Motion	5 in.-lbs.	0.6 N-m

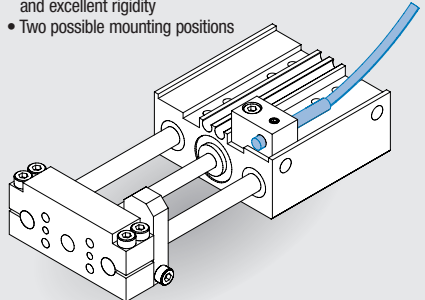
Specifications	DLT-08	DLT-08M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	.65 lbs.	.30 kg
Cylinder Bore Diameter	.563"	14.3 mm
Shaft Diameter	.315"	8 mm
Max (M) Vertical Motion	10 in.-lbs.	1.3 N-m

Accessory Mounting Technical Data



Universal Mounting Kit

- Kit mounts (1) Shock Absorber or (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Two possible mounting positions

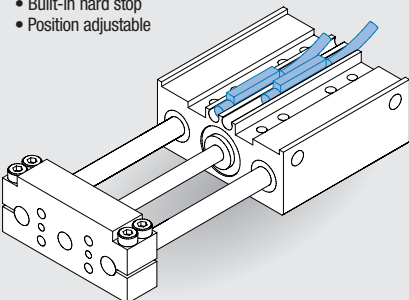


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable



Inductive Proximity Sensors

- 4 mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cables

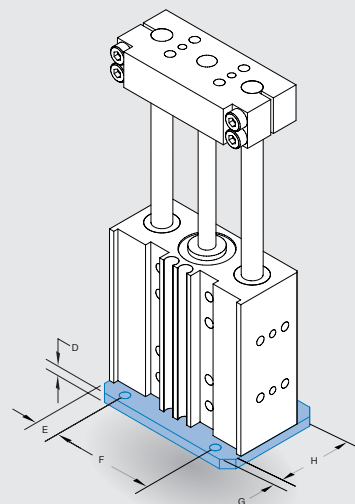
- Quick disconnect 2M cable Length
- Quick disconnect 5M cable Length

Hall Effect Sensors

- No mounting kit required (slot mounted)
- Built-in LED output
- PNP and NPN available
- Hard wired 2 meter cable length
- Low profile

Quick Disconnect Cables

- Quick disconnect 2M cable Length
- Quick disconnect 5M cable Length



Base Flange Kit

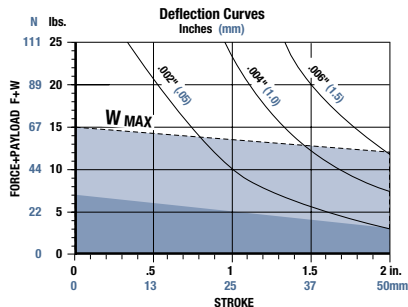
- Convert Thruster unit into a Flange mounted Lift Table
- Provides a **DIRECT CONNECT** mounting pattern on the bottom surface

Flow Controls for Cylinders

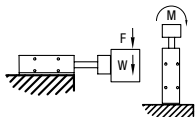
- Thumb screw adjust with locking nut for adjusting cylinder speed
- #10-32 or M5 pipe threads

	A	B	C	D	E	F	G	H
DLT-06	.250"	.310	.270	.125	.313	1.376	.125	1.125
DLT-08	.250"	.310	.270	.125	.563	1.376	.125	1.125
DLT-06M	6.4 mm	7.9	6.7	3.2	8.0	35	3.2	28.6
DLT-08M	6.4 mm	7.9	6.7	3.2	14.3	35	3.2	28.6

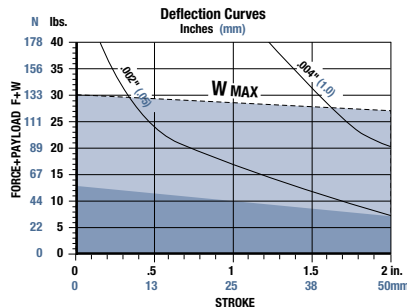
DLT-10M-B



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



DLT-12M-B



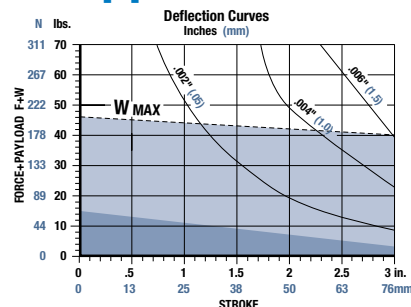
Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in retract direction

(W) in this range use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

DLT-16[M]-B

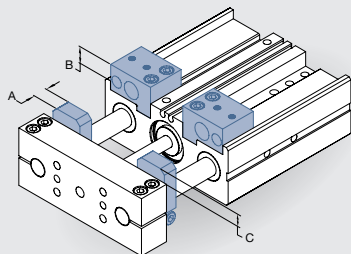


Specifications	DLT-10	DLT-10M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	.35 lbs.	155 N
Weight (Basic Unit)	1.81 lbs.	.82 kg
Cylinder Bore Diameter	.3/4"	19mm
Shaft Diameter	.375"	9.5mm
Max (M) Vertical Motion	.25 in.-lbs.	2.8N-m

Specifications	DLT-12	DLT-12M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	.62 lbs.	275 N
Weight (Basic Unit)	2.88 lbs.	1.31 kg
Cylinder Bore Diameter	.1"	25mm
Shaft Diameter	.472"	12mm
Max (M) Vertical Motion	.50 in.-lbs.	5.6N-m

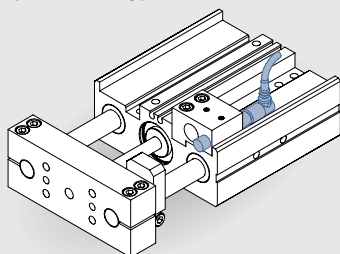
Specifications	DLT-16	DLT-16M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	.62 lbs.	275 N
Weight (Basic Unit)	4.38 lbs.	1.99 kg
Cylinder Bore Diameter	.1"	25mm
Shaft Diameter	.630"	16mm
Max (M) Vertical Motion	.100 in.-lbs.	11.3N-m

Accessory Mounting Technical Data



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Two possible mounting positions

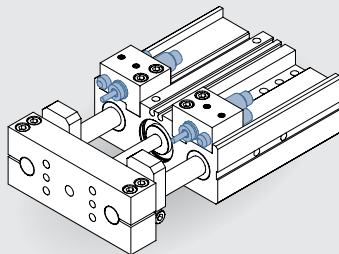


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

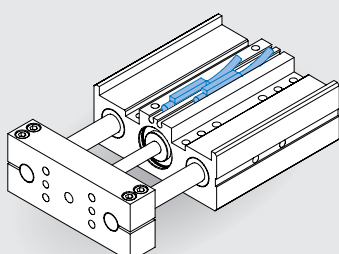


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Allen wrench adjustable

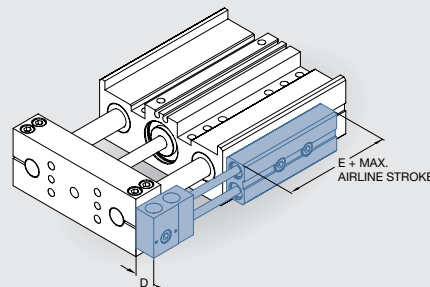


Hall Effect Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

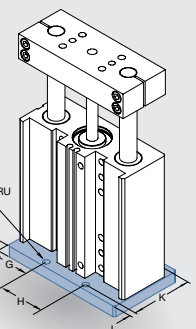
Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module



Flow Controls for Cylinders

- Thumb screw adjust with locking nut for adjusting cylinder speed
- #10-32 or M5 pipe threads

Base Flange Kit

- Convert Thruster unit into a Flange mounted Lift Table
- Provides a **DIRECT CONNECT** mounting pattern on the bottom surface

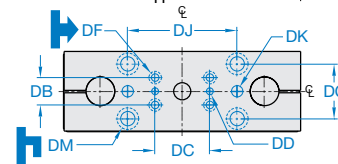
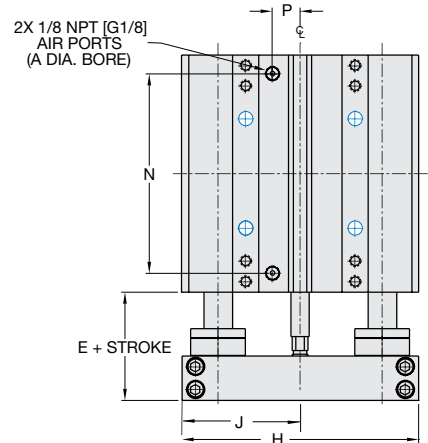
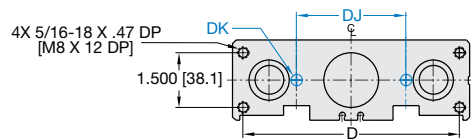
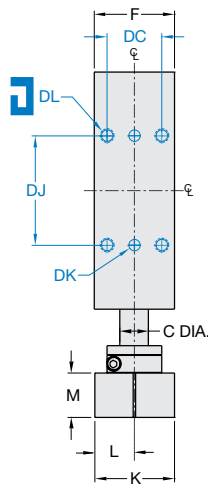
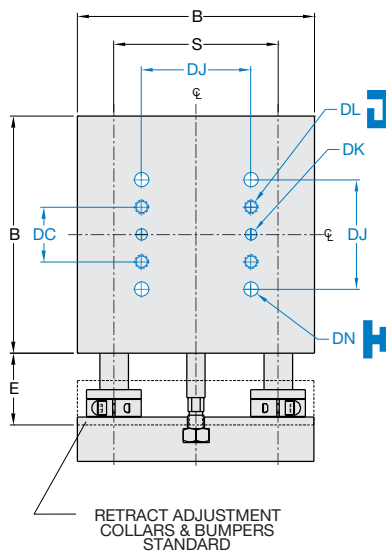
	A	B	C	D	E	F	G	H	J	K
DLT-10	.375"	.480	.320	.577	2.0	.355	1.00	1.500	.188	1.500
DLT-12	.357"	.450	.230	.577	2.0	.355	1.281	1.500	.188	2.000
DLT-16	.437"	.450	.340	.577	2.0	.355	1.656	1.500	.188	2.000
DLT-10M	9.5mm	12.2	8.1	14.7	50.8	9.0	25.4	38.1	4.8	38.1
DLT-12M	9.5mm	11.4	5.8	14.7	50.8	9.0	32.5	38.1	4.8	50.8
DLT-16M	11.1mm	11.4	8.6	14.7	50.8	9.0	42.1	38.1	4.8	50.8

BLOCK THRUSTER DLT -20M, 25M -B BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

4.40



FREE CD ROM
550 PAGE CATALOG
& CAD FILES



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www.robohand.com
E-Mail sales@robohand.com

UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

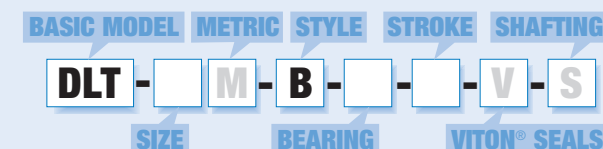
	Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = ±.25 [0.0] = ±.13 [0.00] = ±.013
Third Angle Projection		
All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or (±.013mm)		
Metric Threads Course Pitch		

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25DP	5mm H7 x 6DP
DF	Clearance for #10	Clearance for M5
DJ	3.000	76.2
DK	.3130 x .37 DP	8mm H7 x 9.4 DP
DL	3/8 - 16 x .56 DP	M10 x 14.2 DP
DM	Clearance for 3/8	Clearance for M10
DN	Clearance for 3/8	Clearance for M10

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.		BASIC UNIT DIMENSIONS							
	A	B	C	D	E	F	H	J	K	L	M	N	P	S
DLT-20	1½	6.50	.787	5.938	1.960	2.20	6.480	3.230	2.180	1.080	1.210	5.47	0.77	4.500
DLT-25	1½	7.50	.984	6.938	2.170	2.20	7.480	3.730	2.180	1.080	1.420	6.47	0.77	5.250
DLT-20M	38	165.1	20	150.8	49.8	55.9	164.6	82.0	55.4	27.4	30.7	138.9	19.5	114.30
DLT-25M	38	190.5	25	176.2	55.1	55.9	190.0	94.7	55.4	27.4	36.1	164.3	19.5	133.35

How to Order: Basic Unit



SIZE 20, 25

METRIC M

STYLE B Block thruster with built-in repairable cylinder

BEARING B Linear ball bearings
C Composite bushings

STROKE (inches)
DLT-20 .5-4 @ .5" increments
DLT-25 .5-5 @ .5" increments

Custom strokes available.
Please consult factory.

STROKE (mm)
DLT-20M 12, 25, 40, 50, 65, 75, 85, 100
DLT-25M 12, 25, 40, 50, 65, 75, 85, 100, 115, 125

VITON® V Viton® seals

SHAFTING S Corrosion resistant shafting

SAMPLE ORDER: DLT-20-B-C-2.5-V

Ex: Thruster, Size 20, Block Style, Composite Bushings, 2.5 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

Universal Mounting Kit

(Shock, Stop or Sensor)

Shock Absorber (adjustable dampening)*

Adjustable Hard Stop*

OSAK-061	OSAK-063	1 or 2
SHOK-029	SHOK-029	1 or 2
DLT-1023	DLT-1023	1 or 2

INDUCTIVE SENSOR ACCESSORIES†

Inductive Sensor PNP Qk. Disconnect*

Inductive Sensor NPN Qk. Disconnect*

Quick Disconnect 2 M Cable Length

Quick Disconnect 5 M Cable Length

OISP-011	OISP-011	1
OISN-011	OISN-011	1
CABL-010	CABL-010	1
CABL-013	CABL-013	1

MAGNETIC SENSOR ACCESSORIES**†

Hall Effect Sensor PNP Qk. Disconnect

Hall Effect Sensor NPN Qk. Disconnect

Quick Disconnect 2 M Cable Length

Quick Disconnect 5 M Cable Length

OHSP-006	OHSP-006	1 or 2
OHSN-006	OHSN-006	1 or 2
CABL-010	CABL-010	1
CABL-013	CABL-013	1

PNEUMATIC ACCESSORIES

1/8 NPT Telescopic Airlines (up to 4")

1/8 NPT Telescopic Airlines (up to 5")

1/8 NPT Adjustable Flow Control

G1/8 Telescopic Airlines (up to 100mm)

G1/8 Telescopic Airlines (up to 125mm)

G1/8 Adjustable Flow Control

Cylinder Seal Repair Kit

Viton® Cylinder Seal Repair Kit

OTAL-049	OTAL-049	1, 2, 3 or 4
OTAL-050	OTAL-050	1, 2, 3 or 4
VLVF-004	VLVF-004	1 or 2
OTAL-051	OTAL-051	1, 2, 3 or 4
OTAL-052	OTAL-052	1, 2, 3 or 4
VLVF-005	VLVF-005	1 or 2
SLKT-104	SLKT-104	1
SLKT-104V	SLKT-104V	1

MOUNTING ACCESSORIES

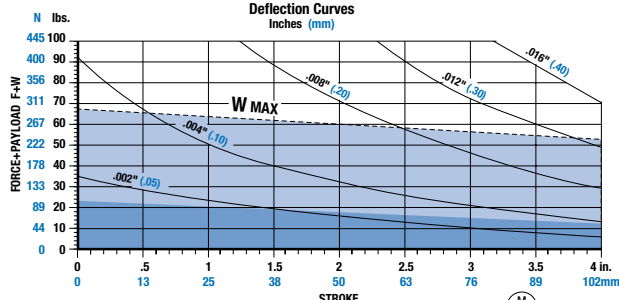
Base Flange Kit (Imperial)

Base Flange Kit (Metric)

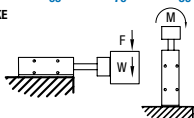
ODLT-011	ODLT-013	1
ODLT-012	ODLT-014	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

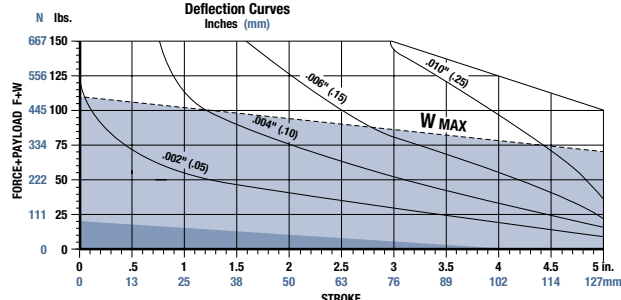
DLT-20M-B



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



DLT-25M-B



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in retract direction

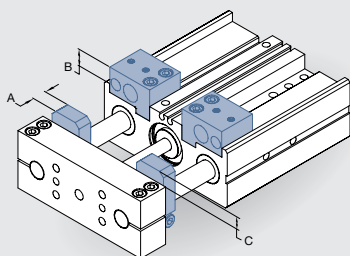
(W) in this range use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-20	DLT-20M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar.....	140 lbs.	622 N
Weight (Basic Unit).....	11.2 lbs.	5.1 kg
Cylinder Bore Diameter.....	1-1/2"	38mm
Shaft Diameter.....	.787"	20mm
Max (M) Vertical Motion.....	250 in.-lbs.	28.2N-m

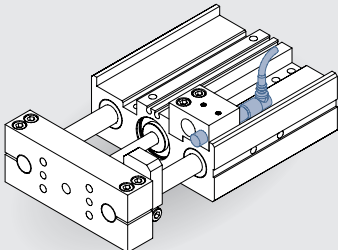
Specifications	DLT-25	DLT-25M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar.....	140 lbs.	622 N
Weight (Basic Unit).....	15.7 lbs.	7.2 kg
Cylinder Bore Diameter.....	1-1/2"	38mm
Shaft Diameter.....	.984"	25mm
Max (M) Vertical Motion.....	500 in.-lbs.	56.4N-m

Accessory Mounting Technical Data



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Two possible mounting positions

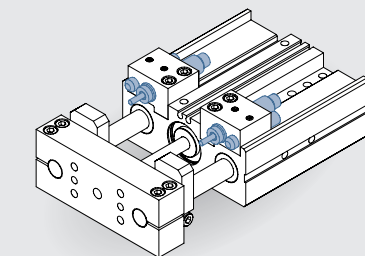


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

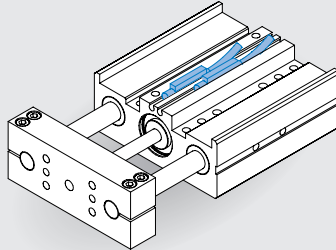


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable
- Adjustable dampening

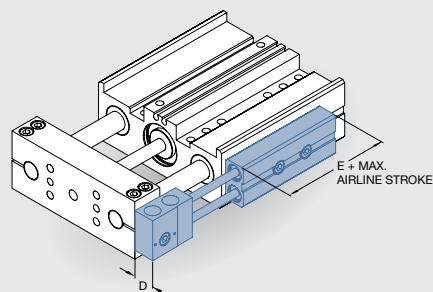


Hall Effect Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

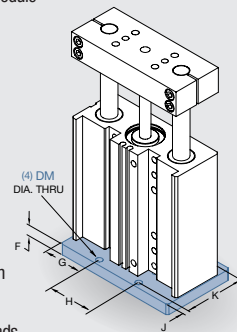
Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module



Flow Controls for Cylinders

- Thumb screw adjust with locking nut for adjusting cylinder speed
- #10-32 or M5 pipe threads

Base Flange Kit

- Convert Thruster unit into a Flange mounted Lift Table
- Provides a **DIRECT CONNECT** mounting pattern on the bottom surface

	A	B	C	D	E	F	G	H	J	K
DLT-20	.500"	.92	.67	.577	2.0	.480	1.750	3.000	.375	3.000
DLT-25	.500"	.92	.67	.577	2.0	.480	2.250	3.000	.375	3.000
DLT-20M	12.7mm	23.4	17.0	14.7	50.8	12.2	44.5	76.2	9.5	76.2
DLT-25M	12.7mm	23.4	17.0	14.7	50.8	12.2	57.2	76.2	9.5	76.2

Internally Powered Thruster Slide

DLT SERIES

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Compact design:

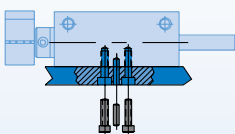
This design is used for short & medium length strokes in limited space applications. Internal air cylinder design reduces overall length to a minimum.

DIRECTCONNECT mounting patterns:

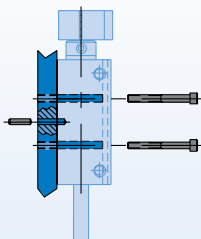
These slides have DIRECTCONNECT mounting patterns that connect to other slides without the need for adapter plates.

Mounting Information:

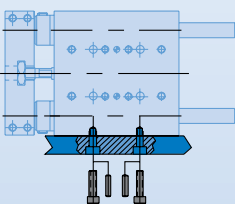
Mounts and operates in any orientation



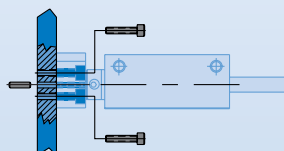
Body can be mounted from the back using the directconnect pattern of threaded mounting and dowel pin holes



Body back mounts with screws from the front using the clearance and counterbored DIRECTCONNECT pattern and located with dowel holes.



Body mounts with screws and locate with slip fit dowel pin holes on side using DIRECTCONNECT mounting patterns.



Payload attaches to tooling plate directconnect mounting pattern with screws and locates using slip fit dowel pin holes.

Technical Specifications:

Pneumatic Specifications

Pressure Operating Range*
Cylinder Type
Dynamic Seals
Valve Required to Operate

Imperial
40-100 psi
Metric
3-7 bar
Double Acting
Internally Lubricated Buna-N
4-way, 2-position

Air Quality Requirements

Air Filtration
Air Lubrication
Air Humidity

40 Micron or Better
Not Necessary**
Low Moisture Content (dry)

Temperature Operating Range

Buna-N Seals (standard)
Viton® Seals (optional)

-30°~180° F
-20°~300° F
-35°~80° C
-30°~150° C

Maintenance Specifications†

Expected Life
Normal Application
w/ Preventative Maintenance
Field Repairable
Seal Repair Kits Available

5 million cycles
10+ million cycles†
No
No

Application Restrictions

Flow controls, shock absorbers and urethane bumpers recommended for nearly all applications.
Use composite bushing in dirty or gritty environments.
Never use silicone based lubricants with composite bushings.

*Higher pressure possible. Consult factory with application details.

**Addition of lubrication will greatly increase service life

†See Maintenance Section

Product Features

DIRECTCONNECT Mounting Patterns

Main bodies have tapped and counterbored through holes including slip fit dowel holes on DIRECTCONNECT mounting surface

Universal Mounting Kit

Contains Mounting Bracket, Hardened Steel Target, and hardware. Allows the mounting of Shocks and adjustable Hard Stops

Sensor Magnet
Standard in piston

Hall Effect Sensors
Slot mounted sensor with threaded quick disconnect.

Inductive Proximity Sensors
8mm diameter, threaded body with quick disconnect

Urethane Bumpers & Clamp Collars

Sensors Grooves
For mounting Hall Effect Sensors

Shock Absorbers
with built-in hard stop. Dual shock capable

Oil Wick
Supplies constant bearing lubrication

Misalignment Coupling
Increases service life

Adjustable Hard Stops

For precision (+/- .001") hard stop end point positioning. Allows for stop adjustment independent of shock absorber hard stop. Dual stop capable

Bearing Options

Preloaded linear ball bushings or composite bushings

Modular Telescoping Airlines

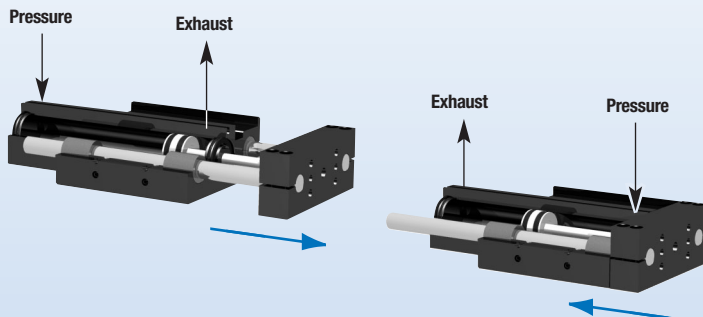
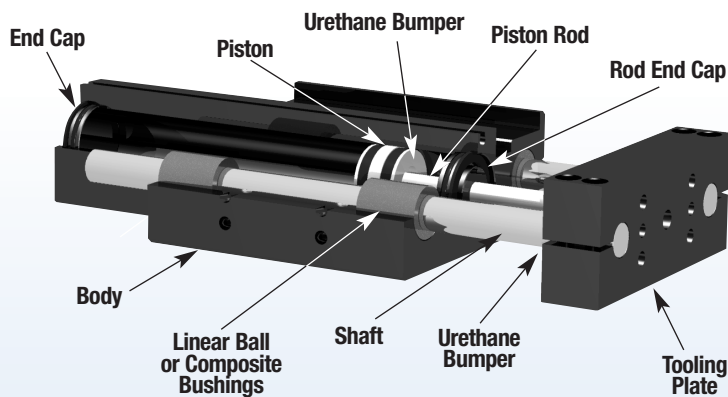
Eliminates flexing air lines. Patented self aligning air tube design extends useful seal life. (2) user air ports per module

Aircraft Quality Aluminum

Seal Option
Viton® or self-lubricating Buna-N dynamic seals

Precision Ground Shafting
Case hardened to RC60-65. Corrosion resistant optional

Operating Principle



- A double acting internal cylinder located within the body drives a piston rod that connects to the tooling plate with a misalignment coupling.
- The tooling is attached to two hardened steel shafts which are supported by and move in four linear bushings located in the body.

Designed and manufactured in the USA

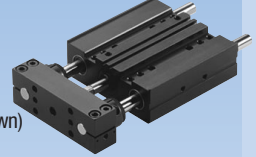
Style-E Short Body Thruster

Size **-06M**
-08M

See Page **4.44**

-10M (shown)
-12M
-16M

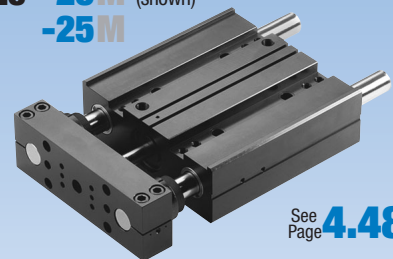
See Page **4.46**



Style-E Short Body Thruster

Size **-20M** (shown)
-25M

See Page **4.48**



DLT SERIES

4.43

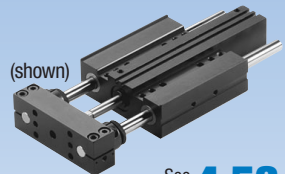
Style-L Long Body Thruster

Size **-06M**
-08M

See Page **4.50**

-10M (shown)
-12M
-16M

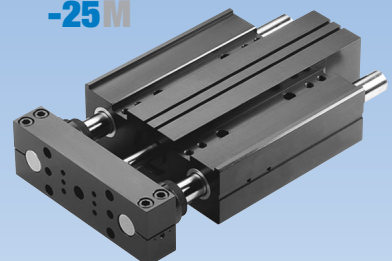
See Page **4.52**



Style-L Long Body Thruster

Size **-20M** (shown)
-25M

See Page **4.54**

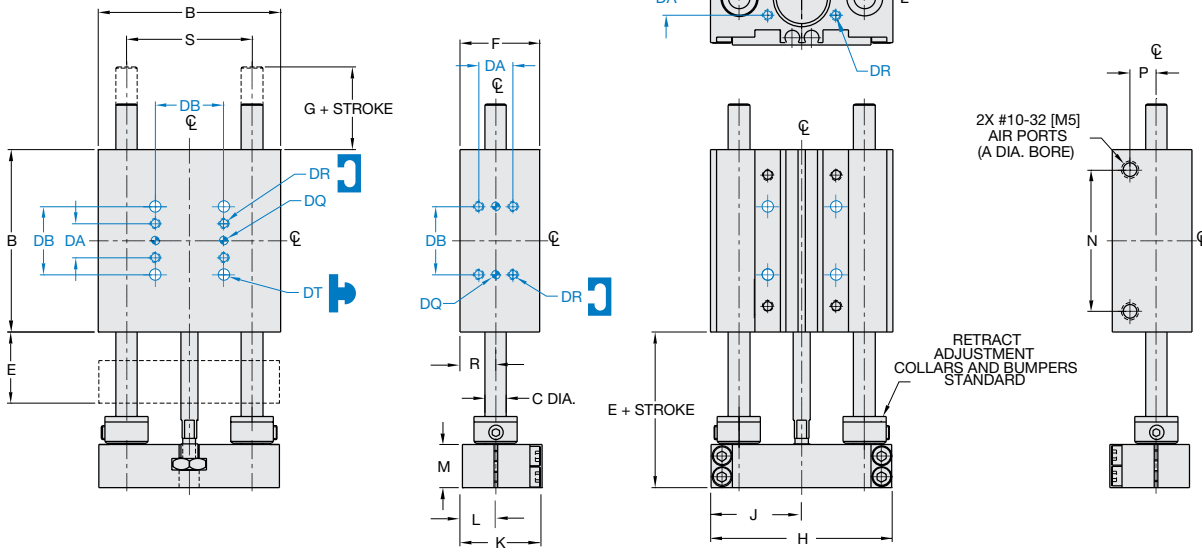


SHORT BODY THRUSTER DLT-06M, 08M -E BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

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UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

	Dimensions are symmetrical about centerline		Third Angle Projection		All Dowel Holes are SF (Slip Fit). Locational Tolerance $\pm .0005$ " or $(\pm .013\text{mm})$
	Metric Threads Course Pitch		Imperial in.		Metric [mm]
			0.00 = $\pm .01$		[0.] = $(\pm .25)$
			0.000 = $\pm .005$		[0.0] = $(\pm .13)$
			0.0000 = $\pm .0005$		[0.00] = $(\pm .013)$



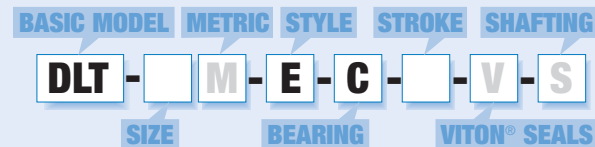
FREE CD ROM
550 PAGE CATALOG
& CAD FILES
Call us today at:
1-800-ROBOHAND
www.roboband.com
E-Mail: sales@roboband.com

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DQ	.0940 x .078 DP	3H7 x 2 DP
DR	#4-40 x .25 DP	M3 x 6 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3
DT	Clr & C'bore for #4	Clr & C'bore for M3

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.											BASIC UNIT DIMENSIONS									
	A	B	C	E	F	G	H	J	K	L	M	N	P	R	S										
DLT-06	0.563	2.00	0.236	0.783	0.88	0.66	1.980	.990	0.875	.365	0.470	1.55	0.29	.390	1.375										
DLT-08	0.563	2.50	0.315	0.783	0.88	0.41	2.470	1.235	0.875	.365	0.470	2.05	0.29	.390	1.750										
DLT-06M	14	50.8	6.0	19.9	22.4	16.8	50.3	25.1	22.2	9.3	11.9	39.4	7.4	9.9	34.93										
DLT-08M	14	63.5	8.0	19.9	22.4	10.4	62.7	31.0	22.2	9.3	11.9	52.1	7.4	9.9	44.95										

How to Order: Basic Unit



SIZE 06, 08

METRIC M

STYLE E Short body thruster with built-in repairable cylinder

BEARING C Composite bushings

STROKE (inches)
DLT-06 .25, .5, 1, 1.25
DLT-08 .25, .5, 1, 1.5, 1.75

STROKE (mm)
DLT-06M 6, 12, 25, 30
DLT-08M 6, 12, 25, 40, 44

VITON® V Viton® seals

SHAFTING S Corrosion resistant shafting

Custom strokes available.
Please consult factory.

SAMPLE ORDER: DLT-06-E-C-1.5-V

Ex: Thruster, Size 06, Short Body Style, Composite Bushings, 1.5 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock or Stop)	OSAK-069	OSAK-070	1, 2, 3, or 4
Shock Absorber (2 Max. on -06)*	SHOK-030	SHOK-030	1, 2, 3, or 4
Adjustable Hard Stop*	DLT-0623	DLT-0623	1, 2, 3, or 4
Urethane Bumper/Stop Collar Kit	OSAK-067	OSAK-068	1

INDUCTIVE SENSOR ACCESSORIES†

Inductive Sensor Mounting Kit	OSMK-076	OSMK-077	1 or 2
Inductive Sensor PNP Qk. Disconnect †	OISP-014	OISP-014	1 or 2
Inductive Sensor NPN Qk. Disconnect †	OISN-014	OISN-014	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES**

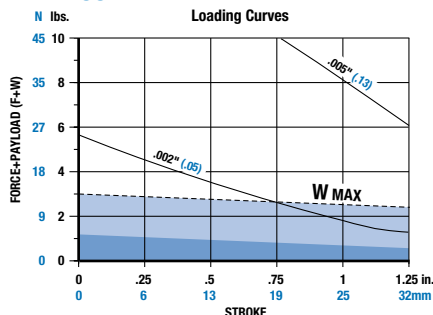
Hall Effect Sensor PNP Qk. Disconnect †	OHSP-006	OHSP-006	1 or 2
Hall Effect Sensor NPN Qk. Disconnect †	OHSN-006	OHSN-006	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

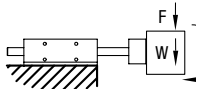
#10-32 Adjustable Flow Control (Imperial)	VLVF-007	VLVF-007	1 or 2
M5 Adjustable Flow Control (Metric)	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-108	SLKT-108	1
Viton® Cylinder Seal Repair Kit	SLKT-108V	SLKT-108V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

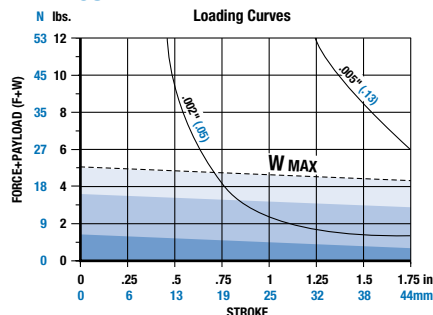
DLT-06M-E



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



DLT-08M-E



Shock Absorbers and Flow Controls are recommended for nearly all applications

Use **Double Shocks** in both directions

Use **Single Shock** in both directions

Use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

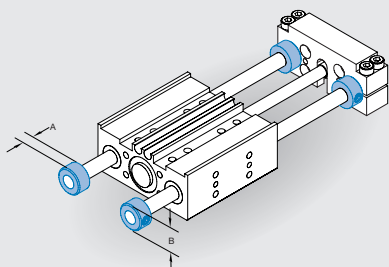
Specifications	DLT-06	DLT-06M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5 bar.....	20 lbs.	84 N
Weight (Basic Unit).....	.34 lbs.	.15 kg
Cylinder Bore Diameter.....	.563"	14.3 mm
Shaft Diameter.....	.236"	6 mm
Max (M) Vertical Motion.....	5 in.-lbs.	.6 N-m

Specifications	DLT-08	DLT-08M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5 bar.....	20 lbs.	89 N
Weight (Basic Unit).....	.65 lbs.	.30 kg
Cylinder Bore Diameter.....	.563"	14.3 mm
Shaft Diameter.....	.315"	8 mm
Max (M) Vertical Motion.....	10 in.-lbs.	1.3 N-m

DLT SERIES

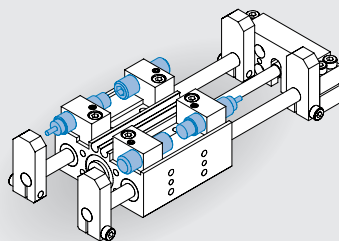
4.45

Accessory Mounting Technical Data



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

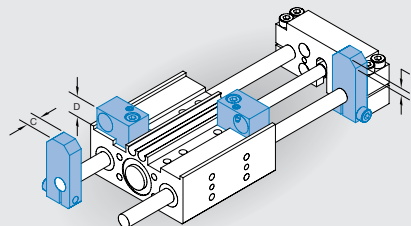


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

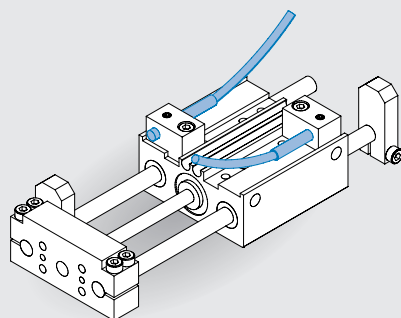
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable



Universal Mounting Kit

- Kit mounts (1) Shock Absorber or (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

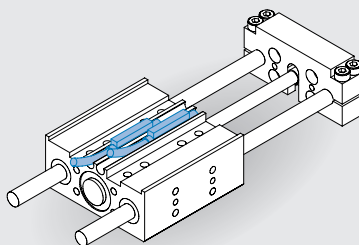


Inductive Proximity Sensors

- 4 mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Hall Effect Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

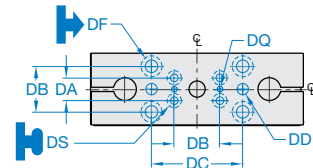
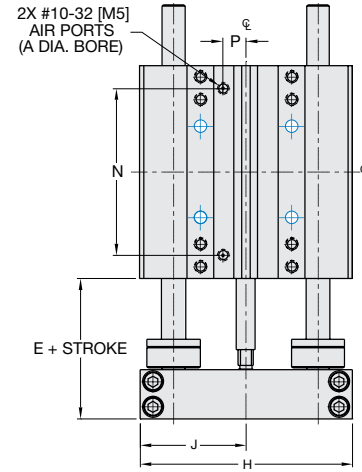
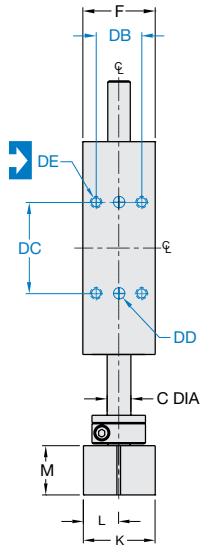
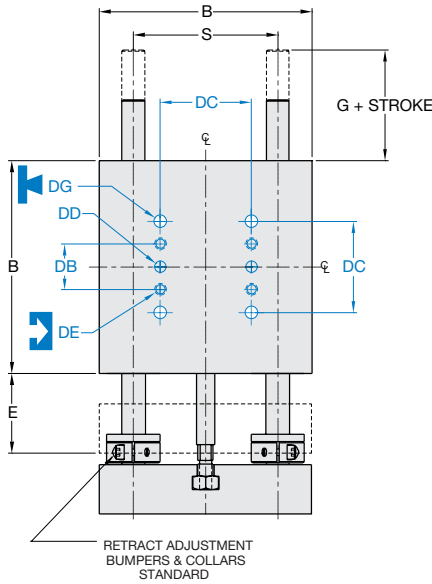
	A	B	C	D	E
DLT-06	.236"	.470	.250	.310	.270
DLT-08	.236"	.630	.250	.310	.270
DLT-06M	6mm	12.0	6.4	7.9	6.9
DLT-08M	6mm	16.0	6.4	7.9	6.9

SHORT BODY THRUSTER DLT -10M, 12M, 16M -E BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

4.46



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

Dimensions are symmetrical about centerline Third Angle Projection All Dowel Holes are SF (Slip Fit). Locational Tolerance $\pm .0005$ " or $\pm .013$ mm	Imperial in. 0.00 = $\pm .01$ 0.000 = $\pm .005$ 0.0000 = $\pm .0005$	Metric [mm] [0.] = $\pm .25$ [0.0] = $\pm .13$ [0.00] = $\pm .013$
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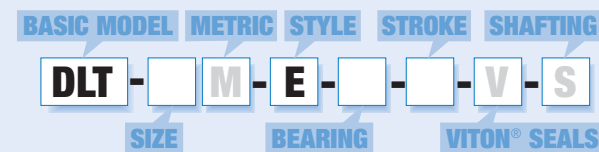
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MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.													BASIC UNIT DIMENSIONS												
	A	B	C	E	F	G	H	J	K	L	M	N	P	S	A	B	C	E	F	G	H	J	K	L	M	N	P	S		
DLT-10	3/4	3.50	.375	1.313	1.19	.82	3.490	1.740	1.178	.584	.813	2.75	.37	2.375																
DLT-12	1	4.00	.472	1.313	1.63	.82	3.985	1.985	1.615	.802	.813	3.28	.37	2.750																
DLT-16	1	4.75	.630	1.375	1.63	.76	4.735	2.360	1.615	.802	.813	4.03	.37	3.250																
DLT-10M	19	88.9	9.5	33.4	30.2	20.8	88.6	44.2	29.9	14.8	20.7	69.7	9.4	60.33																
DLT-12M	25	101.6	12.0	33.4	41.4	20.8	101.2	50.4	41.0	20.4	20.7	83.3	9.4	69.85																
DLT-16M	25	120.7	16.0	34.9	41.4	19.3	120.3	59.9	41.0	20.4	20.7	102.4	9.4	82.55																

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25 DP	5mm H7 x 6 DP
DE	#10-32 x .34 DP	M5 x 8.5 DP
DF	Clearance for #10	Clearance for M5
DG	Clearance for #10	Clearance for M5
DQ	.0940 x .078 DP	3H7 x 2 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3

How to Order: Basic Unit



SIZE	10, 12, 16
METRIC	M
STYLE	E Short body thruster with built-in repairable cylinder
BEARING	B Linear ball bearings C Composite bushings
STROKE	(inches) DLT-10 1-2 @ 1" increments DLT-12 1-2 @ 1" increments DLT-16 1-3 @ 1" increments
STROKE	(mm) DLT-10M 25, 50 DLT-12M 25, 50 DLT-16M 25, 50, 75
VITON®	V Viton® seals
SHAFTING	S Corrosion resistant shafting

Custom strokes available.
Please consult factory.

SAMPLE ORDER: DLT-10-E-C-1-V

Ex: Thruster, Size 10, Short Body Style, Composite Bushings, 1 inch Stroke, Viton® Seals

Accessories: (Order Separately) DLT-10M DLT-12M DLT-16M QTY/THRUSTER

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-055	OSAK-057	OSAK-059	1,2,3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-056	OSAK-058	OSAK-060	1
Urethane Bumper/Clamp Collar Kit (-10M)	OSAK-065			1
Urethane Bumper/Clamp Collar Kit (-12M)		OSAK-066		1
Shock Absorber*	SHOK-028	SHOK-010	SHOK-010	1,2,3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	DLT-1023	1,2,3 or 4

INDUCTIVE SENSOR ACCESSORIES*

Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	OISN-011	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES**†

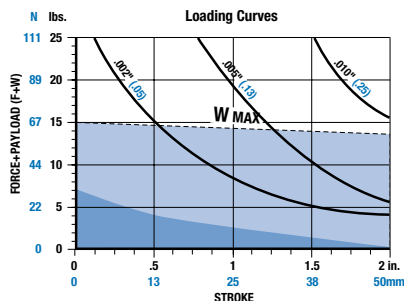
Hall Effect Sensor PNP Qk. Disconnect	OHSP-006	OHSP-006	OHSP-006	1 or 2
Hall Effect Sensor NPN Qk. Disconnect	OHSN-006	OHSN-006	OHSN-006	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

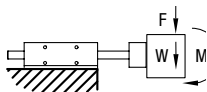
1/8 NPT Telescopic Airlines (up to 2")	OTAL-037	OTAL-037	OTAL-037	1,2,3 or 4
1/8 NPT Telescopic Airlines (up to 3")	OTAL-038	OTAL-038	OTAL-038	1,2,3 or 4
#10-32 Adjustable Flow Control	VLVF-007	VLVF-007	VLVF-007	1 or 2
G1/8 Telescopic Airlines (up to 50mm)	OTAL-043	OTAL-043	OTAL-043	1,2,3 or 4
G1/8 Telescopic Airlines (up to 80mm)	OTAL-044	OTAL-044	OTAL-044	1,2,3 or 4
M5 Adjustable Flow Control	VLVF-008	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-100	SLKT-102	SLKT-102	1
Viton® Cylinder Seal Repair Kit	SLKT-100V	SLKT-102V	SLKT-102V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

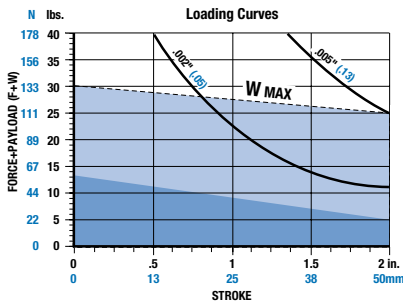
DLT-10M-E



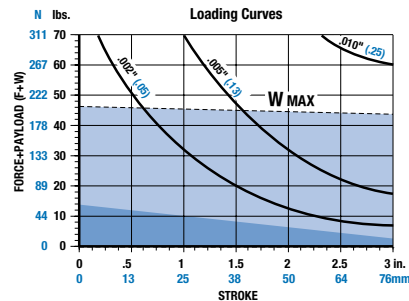
F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total force (lbs. or N)



DLT-12M-E



DLT-16M-E



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in both directions

W in this range use **Urethane Bumpers**

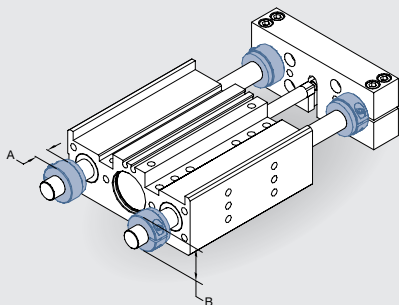
Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-10	DLT-10M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	.35 lbs.	155 N
Weight (Basic Unit)	1.87 lbs.	.84 kg
Additional Weight per Stroke	.08 lbs./in.	1.5g/mm
Cylinder Bore Diameter	.375"	19mm
Shaft Diameter	.375"	9.5mm

Specifications	DLT-12	DLT-12M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	.62 lbs.	275 N
Weight (Basic Unit)	2.98 lbs.	1.35 kg
Additional Weight per Stroke	.12 lbs./in.	2.2g/mm
Cylinder Bore Diameter	.5"	25mm
Shaft Diameter	.472"	12mm

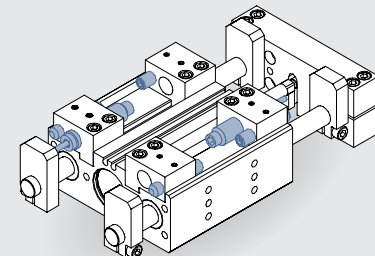
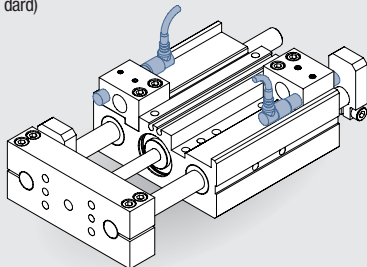
Specifications	DLT-16	DLT-16M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	.62 lbs.	275 N
Weight (Basic Unit)	4.56 lbs.	2.07 kg
Additional Weight per Stroke	.20 lbs./in.	3.5g/mm
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	.630"	16mm

Accessory Mounting Technical Data



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

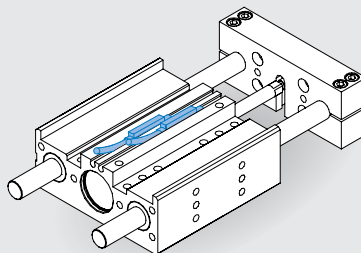


Adjustable Hard Stops

- For precision (+/- .001") end point positioning
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Allen wrench adjustable

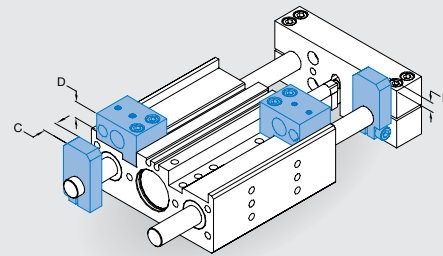


Hall Effect Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

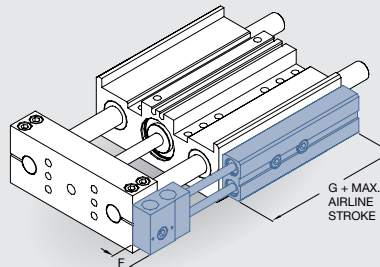
Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited stroke adjustment. Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

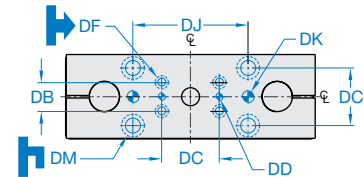
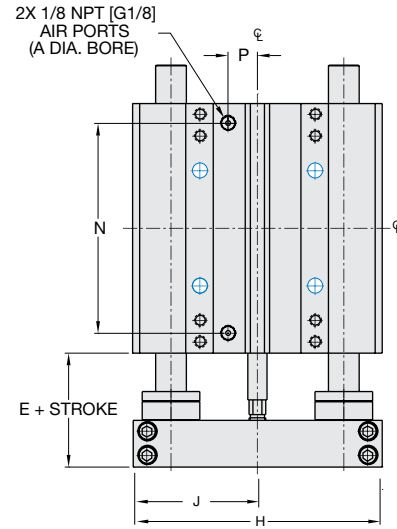
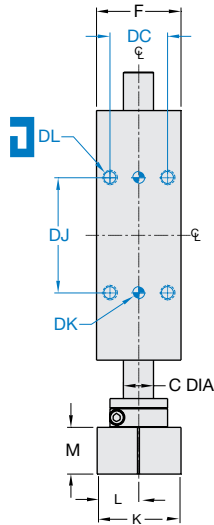
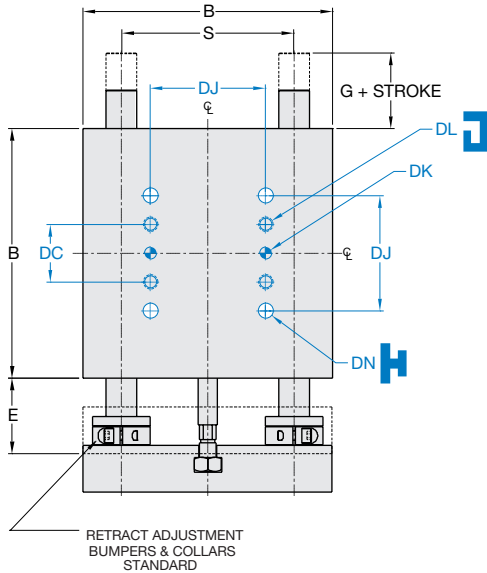
	A	B	C	D	E	F	G
DLT-10	.343"	.87	.375	.480	.320	.577	3.60
DLT-12	.375"	.94	.375	.450	.230	.577	3.60
DLT-16	.437"	1.31	.437	.450	.340	.577	3.60
DLT-10M	8.7mm	22.1	9.5	12.2	8.1	14.7	91.4
DLT-12M	9.5mm	23.9	9.5	11.4	5.8	14.7	91.4
DLT-16M	11.1mm	33.3	11.1	11.4	8.6	14.7	91.4

SHORT BODY THRUSTER DLT -20M, 25M -E BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

4.48



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

	Dimensions are symmetrical about centerline		Third Angle Projection		All Dowel Holes are SF (Slip Fit). Locational Tolerance $\pm .0005"$ or $(\pm .013\text{mm})$
	Metric Threads Course Pitch	Imperial in.	Metric [mm]		
		0.00 = $\pm .01$	[0.] = $(\pm .25)$		
		0.000 = $\pm .005$	[0.0] = $(\pm .13)$		
		0.0000 = $\pm .0005$	[0.00] = $(\pm .013)$		



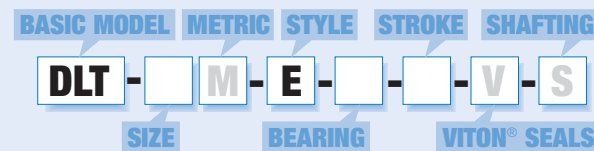
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DIRECT CONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25DP	5mm H7 x 6DP
DF	Clearance for #10	Clearance for M5
DJ	3.000	76.2
DK	.3130 x .37 DP	8mm H7 x 9.4 DP
DL	3/8 - 16 x .56 DP	M10 x 14.2 DP
DM	Clearance for 3/8	Clearance for M10
DN	Clearance for 3/8	Clearance for M10

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.										BASIC UNIT DIMENSIONS									
	A	B	C	E	F	G	H	J	K	L	M	N	P	S	G	H	J	K	L	M	N	P	S	
DLT-20	1½	6.50	.787	1.960	2.20	.960	6.480	3.230	2.180	1.080	1.210	5.47	.77	4.300										
DLT-25	1½	7.50	.984	2.170	2.20	1.170	7.480	3.730	2.180	1.080	1.420	6.47	.77	5.250										
DLT-20M	38	165.1	20	49.8	55.9	24.4	164.6	82.0	55.4	27.4	30.7	138.9	19.5	114.30										
DLT-25M	38	190.5	25	55.1	55.9	29.7	190.0	94.7	55.4	27.4	36.1	164.3	19.5	133.35										

How to Order: Basic Unit



SIZE 20, 25

METRIC M

STYLE E Short body thruster with built-in repairable cylinder

BEARING B Linear ball bearings
C Composite bushings

STROKE (inches)
DLT-20 1-4 @ 1" increments
DLT-25 1-5 @ 1" increments
Custom strokes available. Please consult factory.

STROKE (mm)
DLT-20M 25, 50, 75, 100
DLT-25M 25, 50, 75, 100, 125

VITON® V Viton® seals

SAMPLE ORDER: DLT-20-E-B-4-V

Ex: Thruster, Size 20, Short Body Style, Linear Ball Bushings, 4 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-061	OSAK-063	1, 2, 3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-062	OSAK-064	1
Shock Absorber (adjustable dampening)*	SHOK-029	SHOK-029	1, 2, 3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	1, 2, 3 or 4

INDUCTIVE SENSOR ACCESSORIES†

Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES***

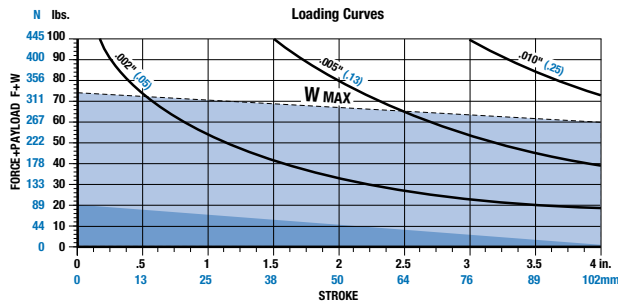
Hall Effect Sensor PNP Qk. Disconnect	OHSP-006	OHSP-006	1 or 2
Hall Effect Sensor NPN Qk. Disconnect	OHSN-006	OHSN-006	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

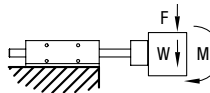
1/8 NPT Telescopic Airlines (up to 4")	OTAL-049	OTAL-049	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 5")	OTAL-050	OTAL-050	1, 2, 3 or 4
1/8 NPT Adjustable Flow Control	VLVF-004	VLVF-004	1 or 2
G1/8 Telescopic Airlines (up to 100mm)	OTAL-051	OTAL-051	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 125mm)	OTAL-052	OTAL-052	1, 2, 3 or 4
G1/8 Adjustable Flow Control	VLVF-005	VLVF-005	1 or 2
Cylinder Seal Repair Kit	SLKT-104	SLKT-104	1
Viton® Cylinder Seal Repair Kit	SLKT-104V	SLKT-104V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately ***Piston magnet standard

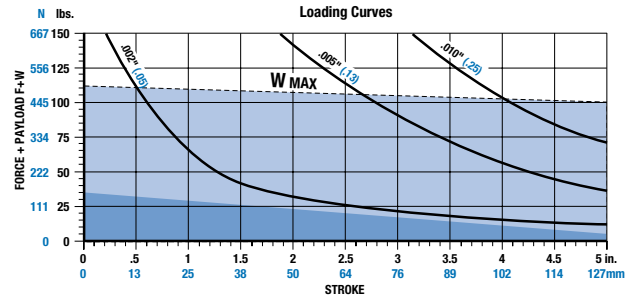
DLT-20M-E



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total force (lbs. or N)



DLT-25M-E



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in both directions

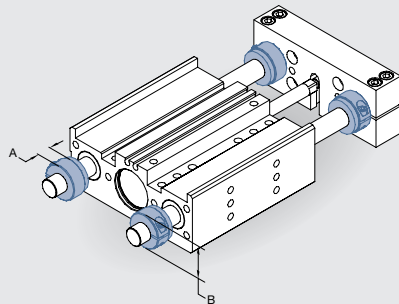
(W) in this range use **Urethane Bumpers**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-20	DLT-20M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	11.6 lbs.	5.2 kg
Additional Weight per Stroke	.31 lbs./in.	5.5g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	.787"	20mm

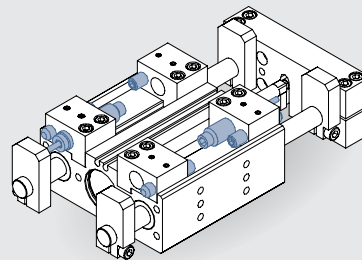
Specifications	DLT-25	DLT-25M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	16.4 lbs.	7.42 kg
Additional Weight per Stroke	.47 lbs./in.	8.4g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	.984"	25mm

Accessory Mounting Technical Data (For detailed information refer to option specification pages at end of catalog)



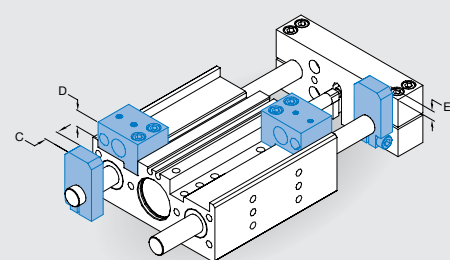
Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)



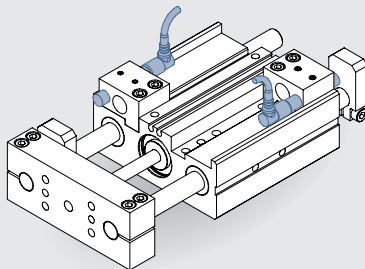
Adjustable Hard Stops

- For precision (+/- .001") end point positioning
 - Allows for end stop position adjustment independent of shock absorber hard stop
 - Allen wrench adjustable
- ### Shock Absorbers
- Full stroking piston rod
 - Built-in hard stop
 - Position adjustable
 - Adjustable dampening



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited stroke adjustment. Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

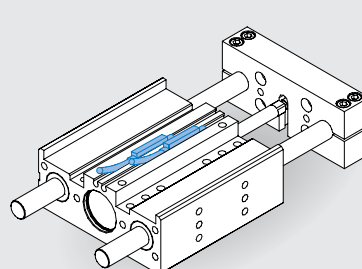


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

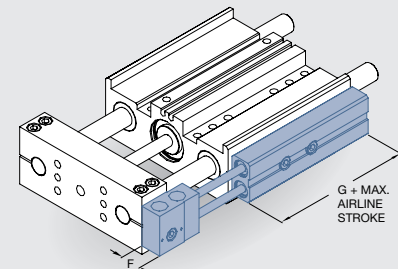
Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length



Hall Effect Sensors

- No mounting kit required (slot mounted)
- Built-in LED output
- PNP and NPN available
- Quick disconnect cable
- Low profile



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

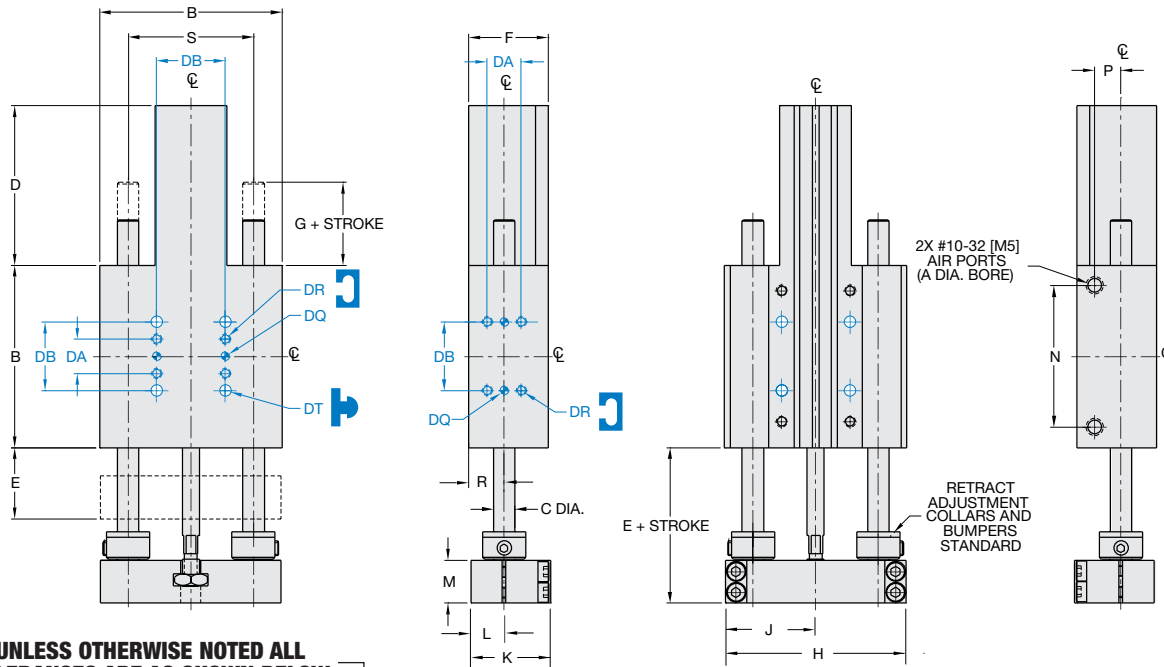
	A	B	C	D	E	F	G
DLT-20	.500"	1.50	.500	.92	.67	.577	3.60
DLT-25	.500"	1.75	.500	.92	.67	.577	3.60
DLT-20M	12.7mm	38.1	12.7	22.4	17.0	14.7	91.4
DLT-25M	12.7mm	44.5	12.7	22.4	17.0	14.7	91.4

LONG BODY THRUSTER DLT -06M, 08M -L BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

4.50



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

	Dimensions are symmetrical about centerline		Third Angle Projection		All Dowel Holes are SF (Slip Fit). Locational Tolerance $\pm 0.005"$ or $\pm 0.13\text{mm}$
	Metric Threads Course Pitch	Imperial in.	Metric [mm]		
		0.00 = $\pm .01$	0.00 = $\pm .25$		
		0.000 = $\pm .005$	[0.0] = $\pm .13$		
		0.0000 = $\pm .0005$	[0.00] = $\pm .013$		



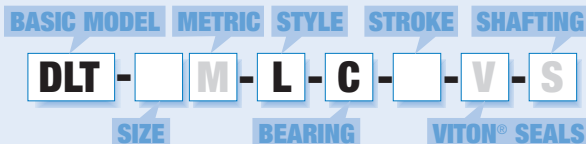
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MODEL #	BORE DIA.			BASIC UNIT DIMENSIONS															
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S			
DLT-06	0.563	2.00	0.236	1.75	0.783	0.88	0.66	1.980	.990	0.875	.365	0.470	1.55	0.29	.390	1.375			
DLT-08	0.563	2.50	0.315	1.75	0.783	0.88	0.41	2.470	1.235	0.875	.365	0.470	2.05	0.29	.390	1.750			
DLT-06M	14	50.8	6.0	44.4	19.9	22.4	16.8	50.3	25.1	22.2	9.3	11.9	39.4	7.4	9.9	34.93			
DLT-08M	14	63.5	8.0	44.4	19.9	22.4	10.4	62.7	31.0	22.2	9.3	11.9	52.1	7.4	9.9	44.45			

DIRECT CONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DQ	.0940 x .078 DP	3H7 x 2 DP
DR	#4-40 x .25 DP	M3 x 6 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3
DT	Clr & C'bore for #4	Clr & C'bore for M3

How to Order: Basic Unit



SIZE 06, 08

METRIC M

STYLE L Long body thruster with built-in repairable cylinder

BEARING C Composite bushings

STROKE (inches)

DLT-06 .5, 1, 1.5, 2, 2.5, 3,

DLT-08 .5, 1, 1.5, 2, 2.5, 3, 3.5

STROKE (mm)

DLT-06M 12, 25, 40, 50, 65, 75

DLT-08M 12, 25, 40, 50, 65, 75, 85

VITON® V Viton® seals

SHAFTING S Corrosion resistant shafting

Custom strokes available.
Please consult factory.

SAMPLE ORDER: DLT-06-M-L-C-50-V

Ex: Thruster, Size 06, Metric, Long Body Style, Composite Bushings, 50mm Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock or Stop)

Shock Absorber (2 Max. on -06)*

Adjustable Hard Stop*

Urethane Bumper/Stop Collar Kit

	DLT-06M	DLT-08M	QTY/THRUSTER
Universal Mounting Kit (Shock or Stop)	OSAK-069	OSAK-070	1, 2, 3, or 4
Shock Absorber (2 Max. on -06)*	SHOK-030	SHOK-030	1, 2, 3, or 4
Adjustable Hard Stop*	DLT-0623	DLT-0623	1, 2, 3, or 4
Urethane Bumper/Stop Collar Kit	OSAK-067	OSAK-068	1

INDUCTIVE SENSOR ACCESSORIES†

Inductive Sensor Mounting Kit

Inductive Sensor PNP Qk. Disconnect**

Inductive Sensor NPN Qk. Disconnect**

Quick Disconnect 2M Cable Length †

Quick Disconnect 5M Cable Length †

	OSMK-076	OSMK-077	1 or 2
Inductive Sensor Mounting Kit	OISP-014	OISP-014	1 or 2
Inductive Sensor PNP Qk. Disconnect**	OISN-014	OISN-014	1 or 2
Inductive Sensor NPN Qk. Disconnect**	CABL-010	CABL-010	1 or 2
Quick Disconnect 2M Cable Length †	CABL-013	CABL-013	1 or 2
Quick Disconnect 5M Cable Length †			

MAGNETIC SENSOR ACCESSORIES**†

Hall Effect Sensor PNP Qk. Disconnect†

Hall Effect Sensor NPN Qk. Disconnect†

Quick Disconnect 2M Cable Length †

Quick Disconnect 5M Cable Length †

OHSP-006	OHSP-006	1 or 2
OHSN-006	OHSN-006	1 or 2
CABL-010	CABL-010	1 or 2
CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

#10-32 Adjustable Flow Control (Imperial)

M5 Adjustable Flow Control (Metric)

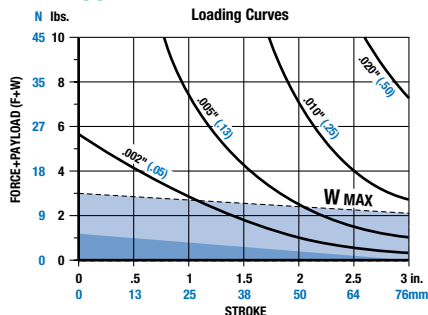
Cylinder Seal Repair Kit

Viton® Cylinder Seal Repair Kit

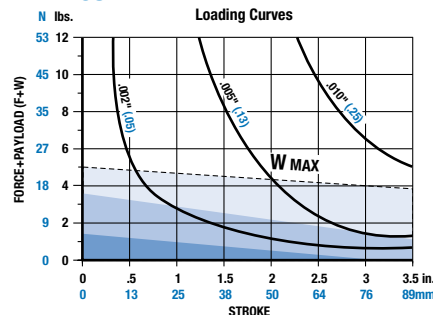
a) VLVF-007	VLVF-007	1 or 2
VLVF-008	VLVF-008	1 or 2
SLKT-108	SLKT-108	1
SLKT-108V	SLKT-108V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

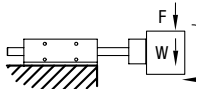
DLT-06M-L



DLT-08M-L



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



Shock Absorbers and Flow Controls are recommended for nearly all applications

Use **Double Shocks** in both directions

Use **Single Shock** in both directions

Use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

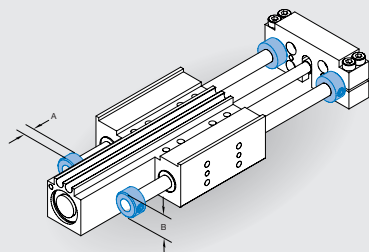
Specifications	DLT-06	DLT-06M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	.61 lbs.	.28 kg
Cylinder Bore Diameter	.563"	14.29 mm
Shaft Diameter	.236"	6 mm
Max (M) Vertical Motion	5 in.-lbs.	.6 N-m

Specifications	DLT-08	DLT-08M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	.96 lbs.	.44 kg
Cylinder Bore Diameter	.563"	14.29 mm
Shaft Diameter	.315"	8.0 mm
Max (M) Vertical Motion	10 in.-lbs.	1.3 N-m

DLT SERIES

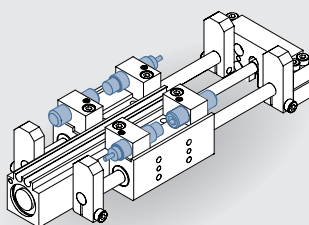
4.51

Accessory Mounting Technical Data



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

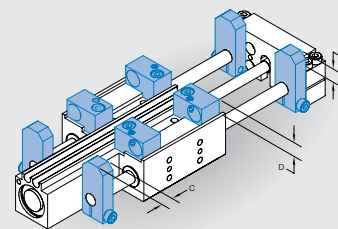


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

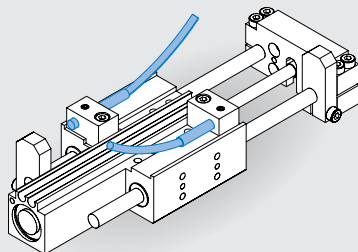
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable
- Adjustable dampening



Universal Mounting Kit

- Kit mounts (1) Shock Absorber or (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

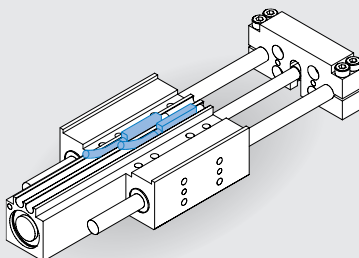


Inductive Proximity Sensors

- 4mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Hall Effect Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

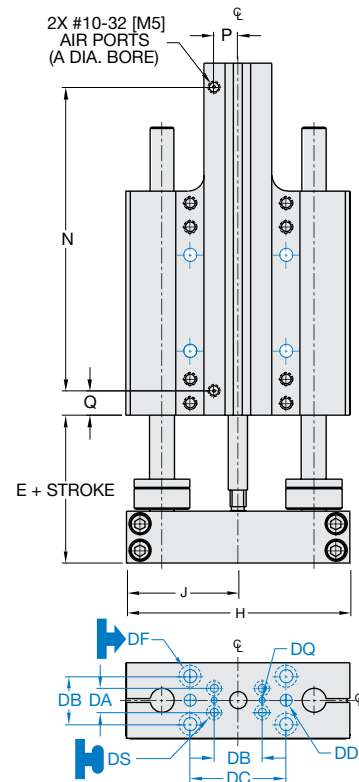
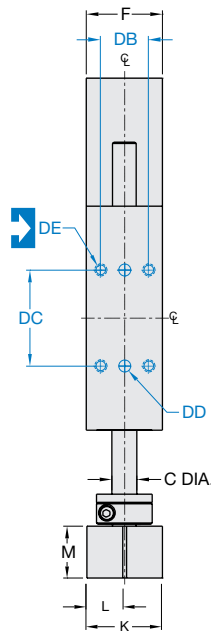
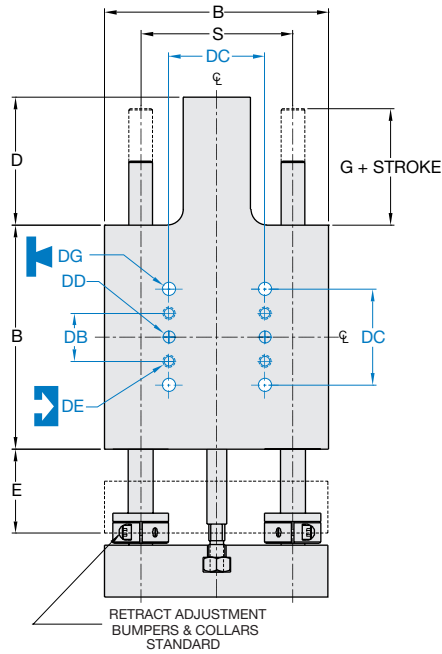
	A	B	C	D	E
DLT-06	.236"	.47	.250	.31	.27
DLT-08	.236"	.63	.250	.31	.27
DLT-06M	6.0 mm	12.0	6.4	7.9	6.9
DLT-08M	6.0 mm	16.0	6.4	7.9	6.9

LONG BODY THRUSTER DLT -10M, 12M, 16M -L BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

4.52



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

	Third Angle Projection		All Dowel Holes are SF (Slip Fit). Locational Tolerance $\pm .0005"$ or $(\pm .013\text{mm})$
	Metric Threads Course Pitch	Imperial in.	Metric [mm]
		0.00 = $\pm .01$	[0.] = $(\pm .25)$
		0.000 = $\pm .005$	[0.0] = $(\pm .13)$
		0.0000 = $\pm .0005$	[0.00] = $(\pm .013)$

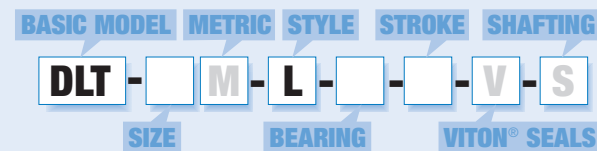


MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.		BASIC UNIT DIMENSIONS														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	S					
DLT-10	.75	3.50	.375	2.00	1.313	1.19	0.82	3.490	1.740	1.178	.584	.813	4.75	0.38	0.38	2.375					
DLT-12	1	4.00	.472	2.50	1.313	1.63	0.82	3.985	1.985	1.615	.802	.813	5.78	0.37	0.36	2.750					
DLT-16	1	4.75	.630	2.75	1.375	1.63	0.76	4.735	2.360	1.615	.802	.813	6.78	0.37	0.36	3.250					
DLT-10M	19	88.9	9.5	50.8	33.4	30.2	20.8	88.6	44.2	29.9	14.8	20.7	120.7	9.6	9.6	60.33					
DLT-12M	25	101.6	12.0	63.5	33.4	41.4	20.8	101.2	50.4	41.0	20.4	20.7	146.8	9.4	9.1	69.85					
DLT-16M	25	120.7	16.0	69.9	34.9	41.4	19.3	120.3	59.9	41.0	20.4	20.7	172.2	9.4	9.1	82.55					

DIRECT CONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25 DP	5mm H7 x 6 DP
DE	#10-32 x .34 DP	M5 x 8.5 DP
DF	Clearance for #10	Clearance for M5
DG	Clearance for #10	Clearance for M5
DQ	.0940 x .078 DP	3H7 x 2 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3

How to Order: Basic Unit



SIZE	10, 12, 16
METRIC	M
STYLE	L Long body thruster with built-in repairable cylinder
BEARING	B Linear ball bearings C Composite bushings
STROKE	(inches) DLT-10 1-4 @ 1" increments DLT-12 1-5 @ 1" increments DLT-16 1-6 @ 1" increments
STROKE	(mm) DLT-10M 25, 50, 80, 100 DLT-12M 25, 50, 80, 100, 125 DLT-16M 25, 50, 80, 100, 125, 150
VITON®	V Viton® seals
SHAFTING	S Corrosion resistant shafting

Custom strokes available.
Please consult factory.

SAMPLE ORDER: DLT-10M-L-C-25-V

Ex: Thruster, Size 10 Metric, Long Body Style, Composite Bushings, 25mm Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-055	OSAK-057	OSAK-059	1, 2, 3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-056	OSAK-058	OSAK-060	1
Urethane Bumper/Clamp Collar Kit (-10M)	OSAK-065			1
Urethane Bumper/Clamp Collar Kit (-12M)		OSAK-066		1
Shock Absorber*	SHOK-028	SHOK-010	SHOK-010	1, 2, 3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	DLT-1023	1, 2, 3 or 4

INDUCTIVE SENSOR ACCESSORIES*

Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	OISN-011	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES**

Hall Effect Sensor PNP Qk. Disconnect	OHSP-006	OHSP-006	OHSP-006	1 or 2
Hall Effect Sensor NPN Qk. Disconnect	OHSN-006	OHSN-006	OHSN-006	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

1/8 NPT Telescopic Airlines (up to 3")	OTAL-038	OTAL-038	OTAL-038	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 6")	OTAL-039	OTAL-039	OTAL-039	1, 2, 3 or 4
#10-32 Adjustable Flow Control	VLVF-007	VLVF-007	VLVF-007	1 or 2
G1/8 Telescopic Airlines (up to 80mm)	OTAL-044	OTAL-044	OTAL-044	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 160mm)	OTAL-045	OTAL-045	OTAL-045	1, 2, 3 or 4
M5 Adjustable Flow Control	VLVF-008	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-100	SLKT-102	SLKT-102	1
Viton® Cylinder Seal Repair Kit	SLKT-100V	SLKT-102V	SLKT-102V	1

*Requires Universal Mounting Kit **Sensor and cable sold separately **Piston magnet standard



Loading Curves

The graph plots Force-Payload (F-W) in N lbs. on the y-axis (0 to 111) against Stroke in inches (0 to 4) and millimeters (0 to 102mm) on the x-axis. Four curves represent different load capacities: 100% (1.0), 90% (1.1), 80% (1.25), and 70% (1.43). A horizontal dashed line at F-W = 15 is labeled 'W MAX'. The area under the curves is shaded blue.

The diagram shows a mechanical system. On the left, a horizontal bar is fixed to a wall. A weight W is suspended from the center of the bar. A force F is applied downwards at the right end of the bar. A drum of radius R is attached to the right end of the bar. A torque M is applied to the drum, causing it to rotate.

Loading Curves

The graph plots Force-Payload (F+W) in lbs. on the Y-axis (0 to 178) against Stroke in inches on the X-axis (0 to 5 in.). Four curves are shown for different angles: 002° (1.00), 005° (1.25), 010° (1.50), and 030° (1.75). A shaded region between the 010° and 030° curves is labeled 'W MAX'.

(W) in this range use **Single Shock** in both directions

(W) in this range use **Urethane Bumpers**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Loading Curves

The graph plots Force + Payload (F+W) in lbs. on the Y-axis (0 to 311) against Stroke in inches on the X-axis (0 to 6 in.). Four curves are shown for different angles:

- 100° (1.25)
- 100° (1.39)
- 101° (1.58)
- 103° (1.75)

A horizontal dashed line indicates the **W MAX** value at approximately 188 lbs. The area under the curves is shaded blue.

Specifications	DLT-16	DLT-16M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	.62 lbs.	275 N
Weight (Basic Unit)	4.81 lbs.	2.18 kg
Additional Weight per Stroke	.20 lbs./in.	3.5g/mm
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	.630"	16mm

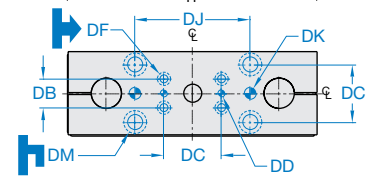
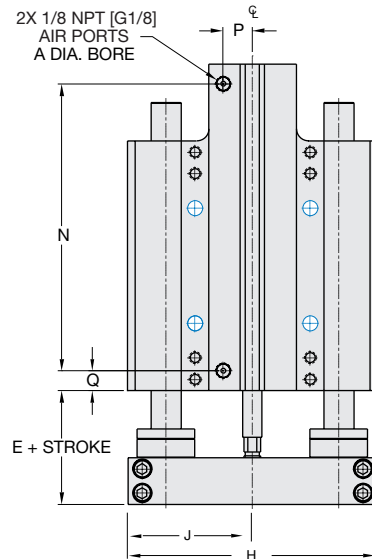
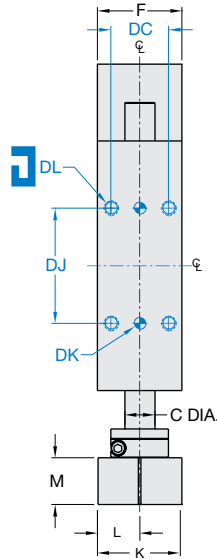
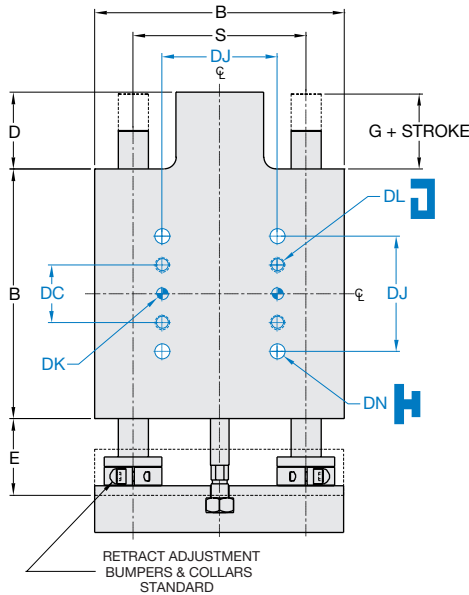
- | | A | B | C | D | E | F | G |
|---------|--------|------|------|------|------|------|------|
| DLT-10 | .343" | .87 | .375 | .480 | .320 | .577 | 3.60 |
| DLT-12 | .375" | .95 | .375 | .450 | .230 | .577 | 3.60 |
| DLT-16 | .437" | 1.31 | .437 | .450 | .340 | .577 | 3.60 |
| DLT-10M | 8.7mm | 22.1 | 9.5 | 12.2 | 8.1 | 14.7 | 91.4 |
| DLT-12M | 9.5mm | 23.9 | 9.5 | 11.4 | 5.8 | 14.7 | 91.4 |
| DLT-16M | 11.1mm | 33.3 | 11.1 | 11.4 | 8.6 | 14.7 | 91.4 |

LONG BODY THRUSTER DLT -20M, 25M -L BUILT-IN REPAIRABLE CYLINDER



DLT SERIES

4.54



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or (±.013mm)
	Metric Threads Course Pitch	
Imperial in.	Metric [mm]	
0.00 = ±.01	[0.] = [±.25]	
0.000 = ±.005	[0.0] = [±.13]	
0.0000 = ±.0005	[0.00] = [±.013]	



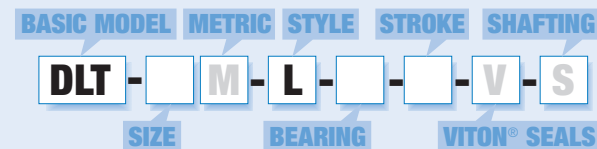
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DIRECT CONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25DP	5mm H7 x 6DP
DF	Clearance for #10	Clearance for M5
DJ	3.000	76.2
DK	.3130 x .37 DP	8mm H7 x 9.4 DP
DL	3/8 -16 x .56 DP	M10 x 14.2 DP
DM	Clearance for 3/8	Clearance for M10
DN	Clearance for 3/8	Clearance for M10

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.												
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	S	
DLT-20	1½	6.50	.787	2.00	1.960	2.20	.960	6.480	3.230	2.180	1.080	1.210	7.469	.77	.52	4.500	
DLT-25	1½	7.50	.984	2.00	2.170	2.20	1.170	7.480	3.730	2.180	1.080	1.420	8.468	.77	.52	5.250	
DLT-20M	38	165.1	20	50.8	49.8	55.9	24.4	164.6	82.0	55.4	27.4	30.7	189.7	19.4	13.1	114.30	
DLT-25M	38	190.5	25	50.8	55.1	55.9	29.7	190.0	94.7	55.4	27.4	36.1	215.1	19.4	13.1	133.35	

How to Order: Basic Unit



SIZE	20, 25
METRIC	M
STYLE	L Long body thruster with built-in repairable cylinder
BEARING	B Linear ball bearings C Composite bushings
STROKE (inches)	DLT-20 1-6 @ 1" increments DLT-25 1-7 @ 1" increments
STROKE (mm)	DLT-20M 25, 50, 75, 100, 125, 160 DLT-25M 25, 50, 75, 100, 125, 160, 175
VITON®	V Viton® seals
SHAFTING	S Corrosion resistant shafting

SAMPLE ORDER: DLT-20-L-B-2-V

Ex: Thruster, Size 20, Long Body Style, Linear Ball Bushings, 2 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-061	OSAK-063	1, 2, 3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-062	OSAK-064	1
Shock Absorber (adjustable dampening)*	SHOK-029	SHOK-029	1, 2, 3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	1, 2, 3 or 4

INDUCTIVE SENSOR ACCESSORIES*

Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES**

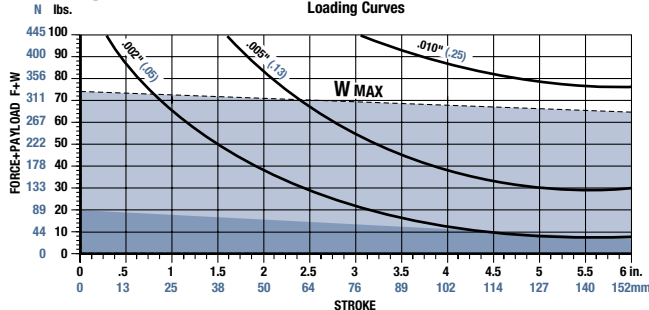
Hall Effect Sensor PNP Qk. Disconnect	OHSP-006	OHSP-006	1 or 2
Hall Effect Sensor NPN Qk. Disconnect	OHSN-006	OHSN-006	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

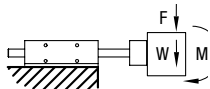
1/8 NPT Telescopic Airlines (up to 6")	OTAL-039	OTAL-039	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 12")	OTAL-040	OTAL-040	1, 2, 3 or 4
1/8 NPT Adjustable Flow Control	VLVF-004	VLVF-004	1 or 2
G1/8 Telescopic Airlines (up to 160mm)	OTAL-045	OTAL-045	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 300mm)	OTAL-046	OTAL-046	1, 2, 3 or 4
G1/8 Adjustable Flow Control	VLVF-005	VLVF-005	1 or 2
Cylinder Seal Repair Kit	SLKT-104	SLKT-104	1
Viton® Cylinder Seal Repair Kit	SLKT-104V	SLKT-104V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

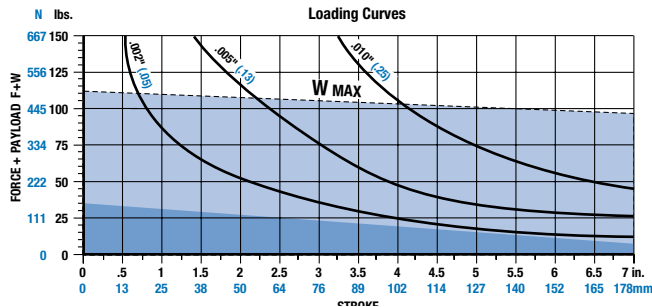
DLT-20M-L



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total force (lbs. or N)



DLT-25M-L



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in both directions

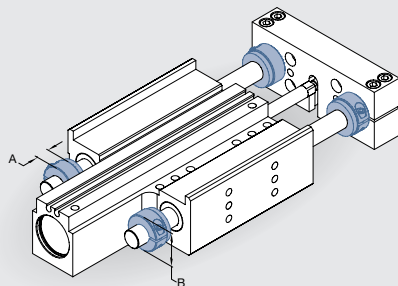
(W) in this range use **Urethane Bumpers**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-20	DLT-20M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	12.0 lbs.	5.5 kg
Additional Weight per Stroke	.31 lbs./in.	5.5g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	.787"	20mm

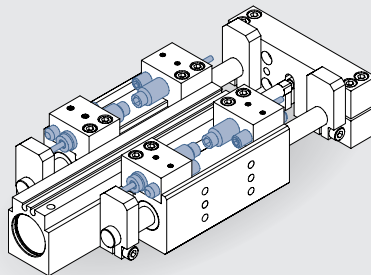
Specifications	DLT-25	DLT-25M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	17.4 lbs.	7.9 kg
Additional Weight per Stroke	.47 lbs./in.	8.4g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	.984"	25mm

Accessory Mounting Technical Data



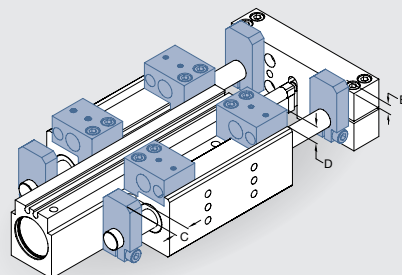
Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for retract (kit for extend standard)



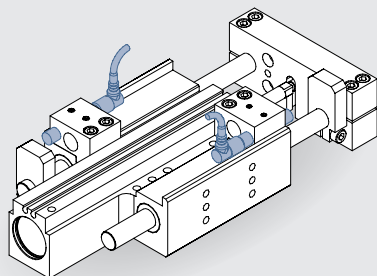
Adjustable Hard Stops

- For precision (+/- .001") end point positioning
 - Allows for end stop position adjustment independent of shock absorber hard stop
 - Allen wrench adjustable
- ### Shock Absorbers
- Full stroking piston rod
 - Built-in hard stop
 - Position adjustable
 - Adjustable dampening



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes Mounting Bracket, Hardened Tool Steel Target and Hardware
- Target allows for unlimited stroke adjustment. Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

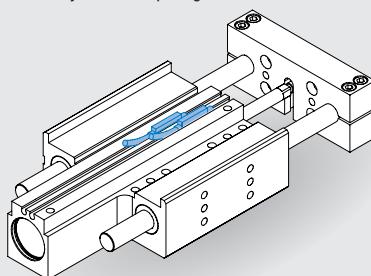


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

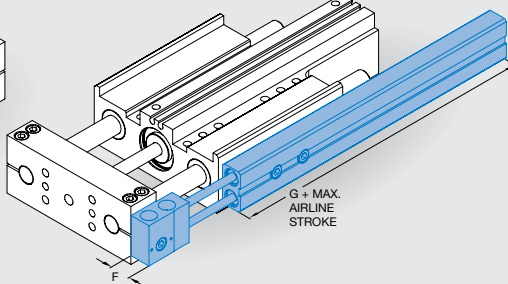


Hall Effect Sensors

- No mounting kit required
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

	A	B	C	D	E	F	G
DLT-20	.500"	1.50	.500	.92	.67	.577	3.60
DLT-25	.500"	1.75	.500	.92	.67	.577	3.60
DLT-20M	12.7mm	38.1	12.7	23.4	17.0	14.7	91.4
DLT-25M	12.7mm	44.5	12.7	23.4	17.0	14.7	91.4