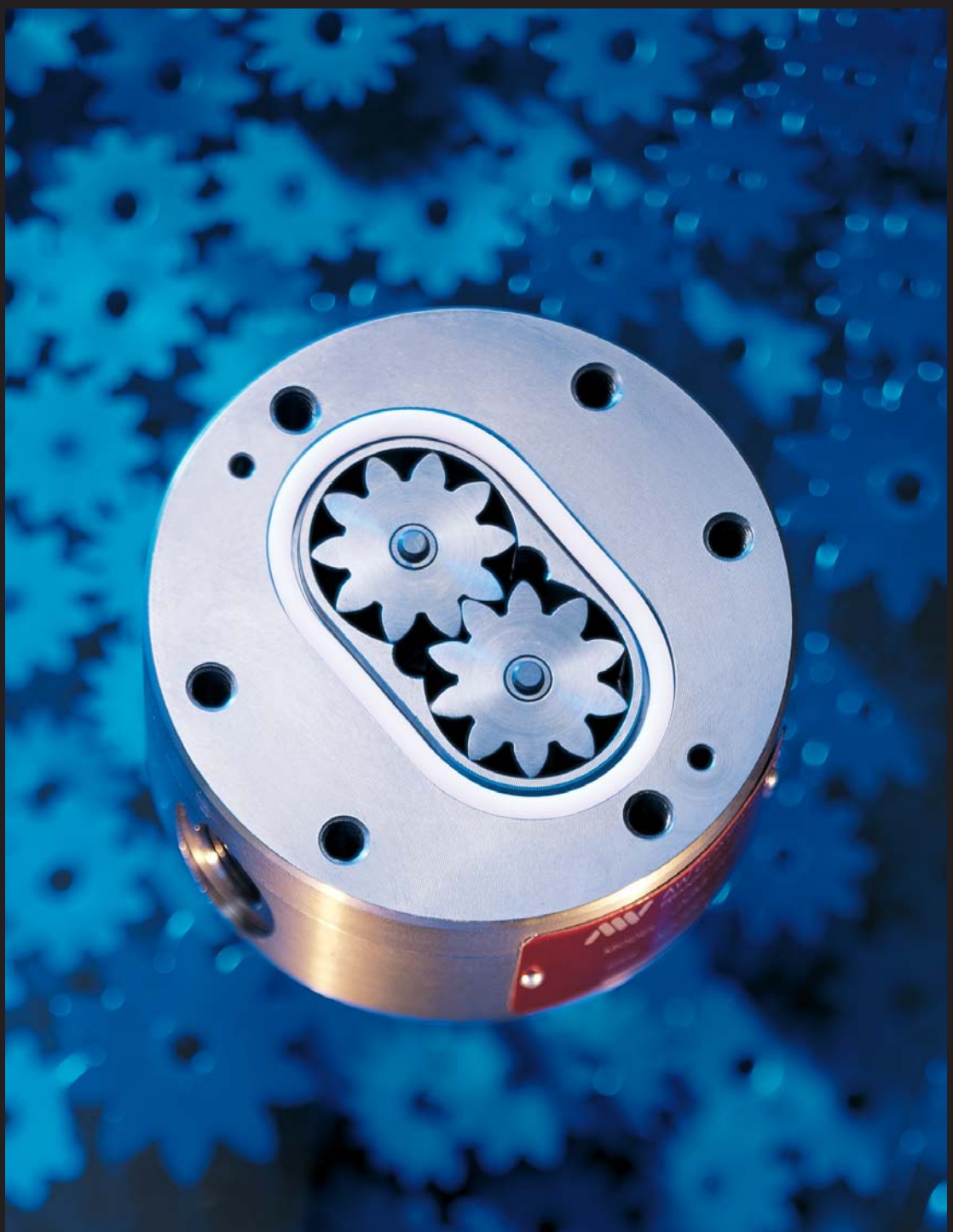
AW FLOW METERS

Flow meters, monitors and controllers



AW FLOW METERS

JV-KG Series
Positive Displacement Flow Meter

Technical Specifications:

- Flow ranges 0.003 to 120.0 GPM
- Accuracy ± 0.5% of reading
- Pressure rating up to 5,000 PSI
- Bi-Directional flow capabilities
- Six Flow Ranges available
- Aluminum, 303 and 316 SS bodies
- Pulse, mA and Voltage Sensors available
- Economical cost

What is a JV-KG Meter?

The JV-KG Series represents a positive displacement meter that is affordable and accurate. One primary feature is the ability to maintain consistent accuracy despite changing viscosity conditions. This reliability, coupled with a large turndown range, offers an affordable replacement for older turbine technology. The meter's solid construction and excellent dynamic response are well suited to the measurement of oil, grease, fuel, solvents, polyurethanes, brake fluid, skydrol as well as other nonabrasive lubricating fluids.

Since there is no need for straight run piping upstream or downstream of the flow meter, the JV-KG flow meters are simple to use and to install. The meters produce good resolution and high accuracy at low flow rates. Flow may be bi-directional, such as for cylinder position measurements, without damage to internal parts. Non-intrusive sensors, panel displays and electronic modules can be added to complete this superior value package.

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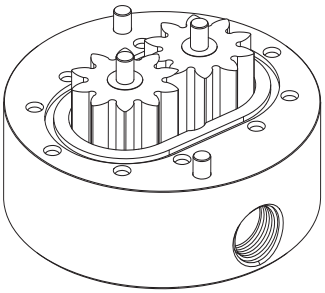
AW FLOW METERS

JV-KG Series
Positive Displacement Flow Meter



Meter Technical Data

Materials of Construction:
Body: JVA - Aluminum
JVM - 303 Stainless Steel
JVS - 316 Stainless Steel
Gear: Stainless Steel
O-Ring: Teflon / Viton optional

Bearings: Stainless Steel
Accuracy: ± 0.5% over 10:1 turndown with 30cP fluid
Repeatability: ± 0.1%
Max Fluid Temperature:
Meter 185° F Aluminum Body
Meter 400° F Stainless Body

Meter Type	Range Gal/Min	Impulse/ Gallon	Impulse/ cc	Dia (in)	HGT (in)	Ports	Filtration (micron)	Pressure Rating (PSI)
JV#-12KG	0.003-0.8	53,000	14	3.0	2.2	1/4" **	30	5,000
JV#-20KG	0.01-2.0	15,900	4.2	3.3	2.2	1/4" **	30	5,000
JV#-30KG	0.03-7.0	6,600	1.7	3.3	2.6	1/2" **	30	5,000
JV#-60KG	0.05-20	1,800	0.47	4.9	4.25	3/4" **	30	5,000
JV#-80KL	0.5-60	1,600~	0.42	8.4	5.5	1-1/4" *	200	5,000
JV#-90KL	1.0-120	800~	0.21	8.4	7.0	1-1/4" *	200	5,000

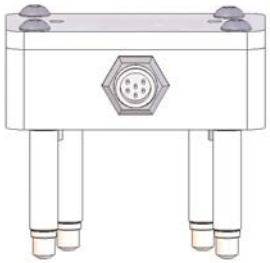
Complete part # by selecting body material as follows: JVA=AL, JVM=303SS, JVS=316SS
** NPT is standard, BSPP is available
* Through hole for 1-1/4" Code 62 flange connections
~ Configured for x4 sensor output

Model	Sensor Types	Sensor Features
HEF-xx	Single Sensor - standard	Frequency output
DH-xx	Dual Sensor with x2 resolution	Single or quadrature frequency output
MAG-xx	Hall Effect Single Sensor	Frequency output, with conduit connection
FIP-xxx	Meter Mounted Analog Output Sensor	3 wire analog output, current or voltage
CAPM-xx	Single Sensor	Frequency output
CAPM-15	High Temp Sensor to 400°F for Stainless Steel	Separated pickup & amplifier module
QUAD-4	Quad Sensor with x4 Resolution	Single or quadrature frequency, -80KL & -90KL

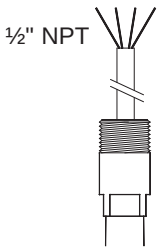
XX = Consult factory or see price list for complete part number

Products may be subject to change without notice – Contact factory for current information

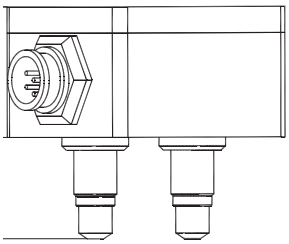
Quad-4



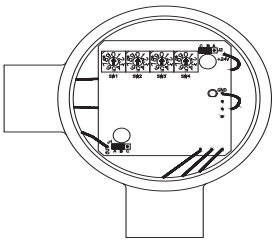
Mag-xx



DH Sensor



FIP-Analog Output Pickup



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AW FLOW METERS

JVHS Series – High Pressure Positive Displacement Flow Meter

Technical Specifications:

- 316 SS bodies
- Flow ranges 0.003 to 7 GPM
- 15,000 PSI working pressure
- ATEX approved, non-sparking
- Xylan coated bolts
- Accuracy ± 0.5%
- Bi-Directional flow capabilities
- Medium pressure Autoclave connections

What is a JVHS Meter?

The JVHS series of positive displacement flow meters are designed for high pressure systems requiring flow meters rated up to 15,000 psi (1035 bar) working pressure. The JVHS meters are equipped with medium pressure autoclave connections, 316 SS bodies and xylan coated bolts. The flow meters are bi-directional and can be hydrotested to 1.5X the working pressure rating. A complete line of explosion proof sensors and displays are available for the JVHS meters.

Typical applications include high pressure hydraulic and fuel systems and off shore chemical injection systems ranging from methanol, corrosion and wax inhibitors, and water treatment chemicals. ATEX certificates for non-sparking devices and material certificates 2.2 and 3.1.b are available.

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AW FLOW METERS

JVHS Series – High Pressure Positive Displacement Flow Meter

Part Number Configuration

JVHS - _____ - _____

Flow Range (GPM)
12 = 0.003 - 0.8
20 = 0.01 - 2.0
30 = 0.03 - 7.0

Options
KG = Standard Unit
KG-Ex = Explosion Proof

Example:
JVHS-12KG-Ex Has a flow range of 0.003 to 0.8 GPM, and is modified to accept an explosion proof sensor.

Meter Technical Data

Materials of Construction:
Body: 316 Stainless Steel
Gear: Stainless Steel
O-Ring: Teflon
Bearings: Stainless Steel
Accuracy: ± 0.5% over 10:1 turndown with 30 cP fluid
Repeatability: ± 0.1%
Max Fluid Temperature:
Meter 400° F Stainless Body

NOTE: Meter can be hydrotested to 1.5x working pressure.

Meter Type	Range Gal/Min	Impulse/ Gallon	Impulse/ cc	Dia (in)	Height (in)	Porting Medium Pressure Auto Clave	Filtration (micron)	Pressure Rating (PSI)
JVHS-12KG	0.003-0.8	53,000	14	3.75	2.5	3/8”	30	15,000
JVHS-20KG	0.01-2.0	15,900	4.2	3.75	2.5	3/8”	30	15,000
JVHS-30KG	0.03-7.0	6,600	1.7	3.75	3.0	3/8”	30	15,000

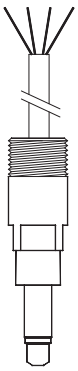
Model	Sensor Types	Sensor Features
HUB-30-Ex	Pulse Output Single Sensor	Frequency output, with conduit connection
FIP-xx	Meter Mounted Analog Output Sensor	3 wire analog output, current or voltage
HEF-B	Single Sensor – Standard pick-up	Frequency output
RT-Ex15-xx	Digital Meter Mounted Sensor	4-20 mA loop powered output and scaled pulse output
MAG-xx	Hall Effect Single Sensor	Frequency output with conduit connection

XX = Consult factory or see price list for complete part number

Products may be subject to change without notice – Contact factory for current information

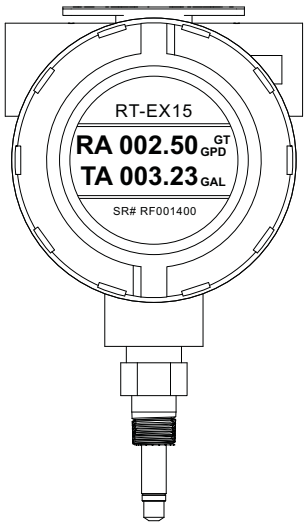
Mag-xx

½" NPT



HUB-30-Ex

RT-Ex15-Ex



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AW FLOW METERS

JVM Series
Positive Displacement Flow Meter

Technical Specifications:

- Flow ranges 0.001 to 20 GPM
- Accuracy ± 0.5% of reading
- Pressure rating up to 5000 PSI
- Economical cost
- 6 Flow ranges available
- Stainless Steel construction
- Pulse, mA and Voltage Sensors available
- Bi-directional flow capabilities

What is a JVM Meter?

The JVM Series flow meters are economical and reliable positive displacement flow meters suitable for a wide variety of paints and industrial fluids. The principal of operation is that of a gear pump, but in reverse; instead of the gears driving the medium, the medium drives the gears. A non-intrusive sensor detects the movement of the gears and produces a square wave pulse for each gear tooth. The resulting pulse train is proportional to the actual flow rate and provides a highly accurate representation of the fluid flow.

The body and gears are manufactured from stainless steel with tungsten carbide shafts and tungsten carbide bearings. The JVM meters are recommended for non-lubricating fluids such as paints, adhesives, sealants and resins. Sensors available include frequency output, analog output, fiber optic and intrinsically safe models.

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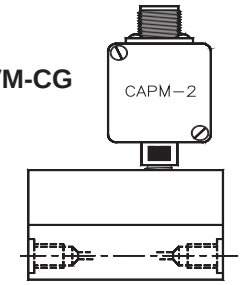
AW FLOW METERS

JVM Series
Positive Displacement Flow Meter

JVM-CG



Meter Technical Data

Materials of Construction:

Body:	JVM - 303 SS
Gear:	Stainless Steel
O-Ring:	Teflon / Viton optional
Bearings:	Tungsten Carbide
Shafts:	Tungsten Carbide

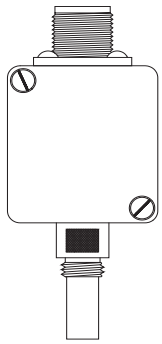
Accuracy:	± 0.5% over 10:1 turndown with 30 cP fluid
Repeatability:	± 0.1%
Temperature:	180° C / 350° F
Ports:	NPT, BSPP available Specify upon ordering

Meter Type	Range Gal/Min	Impulse/ Gallon	Impulse/ cc	Dia (in)	Ports	Filtration (micron)	Wt (lbs)	Pressure Rating (PSI)
JVM-01CG	0.001 to 0.25	155,000	41	3.0	1/4”	120	3.0	5,000
JVM-10CG	0.003 to 0.5	100,300	26.5	3.0	1/4”	120	2.9	5,000
JVM-15CG	0.01 to 1.0	31,000	8.2	3.3	1/4”	120	4.5	5,000
JVM-20CG	0.02 to 2.0	15,900	4.2	3.3	1/4”	120	4.9	5,000
JVM-30CG	0.1 to 7.0	6,600	1.7	3.3	1/2”	120	6.3	5,000
JVM-60CG	0.1 to 20	1,800	0.47	4.9	3/4”	175	20.0	5,000

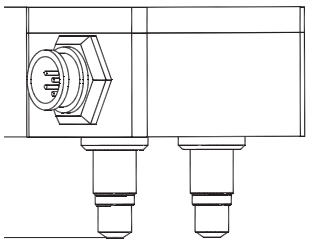
Model	Sensor Types	Sensor Features
HEF-xx	Single Sensor - standard	Frequency output
DH-xx	Dual Sensor with x2 resolution	Single or quadrature frequency output
MAG-xx	Hall Effect Single Sensor	Frequency output, with conduit connection
FIP-xxx	Meter Mounted Analog Output Sensor	3 wire analog output, current or voltage
CAPM-xx	Single Sensor	Frequency output
CAPM-15	High Temp Sensor to 400°F for Stainless Steel	Separated pickup & amplifier module
FOP-20	Fiber Optic Sensor	Fully isolated optical signal

Products may be subject to change without notice – Contact factory for current information

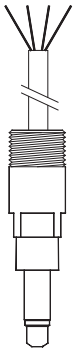
CAPM-2o



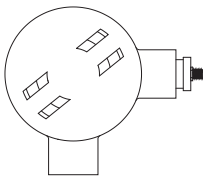
DH-Sensor



Mag-xx



FOP-20 Fiber Optic



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AW FLOW METERS

JVS / HPM-SLG Series
Positive Displacement Flow Meter

Techncial Specifications:

- Flow ranges 0.003 to 2.0 GPM
- Accuracy ± 0.5% of reading
- Pressure rating up to 2000 PSI
- Special Titanium coated gears available upon request
- Compact for tight spaces
- 303 and 316 SS bodies
- Manifold Mount or Threaded Port
- Fiber Optic or Pulse Sensors

What is a JVS / HPM - SLG Meter?

Automotive paint systems place extreme demands on their components. For over 15 years, AW brand flow meters have met these demands, and more. The JVS-SLG and HPM-SLG Positive Displacement Flow Meters feature smaller, lighter bodies than traditional flow meters, making them easier to install on robotic arms and in tight spaces. These meters also feature a revolutionary body with virtually no dead space, allowing for extremely efficient flush cycles and color changes. Available in 303 or 316 stainless steel and with a variety of sensor options including fiber optic and intrinsically-safe designs for electrostatic applications, these meters are the industry standard for water-based and solvent-based paints and coatings.

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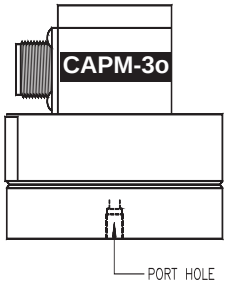
AW FLOW METERS

JVS / HPM-SLG Series
Positive Displacement Flow Meter



Meter Technical Data

Materials of Construction:
Body: HPM 303 SS
JVS 316 SS
Gear: DIN 1.4122
Seal: JVS:Teflon Oring
HPM: Teflon gasket
Bearings: Tungsten Carbide

Accuracy: ± 0.5% over 10:1 turndown with 30 cP fluid
Repeatability: ± 0.1%
Temperature: 180° C / 350° F
Filtration: Not Provided - See recommendation
****Porting** BSPP, NPT adapters available

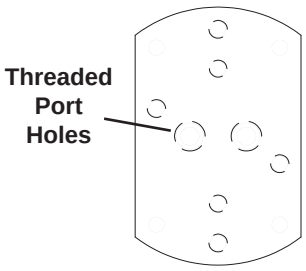
Meter Type	Range Gal/Min	Impulse/ Gallon	Impulse/ cc	Ports	Filtration (micron)	Wt (lbs)	Pressure Rating (PSI)
JVS-10SLGS	0.003-0.5	100,300	26.5	1/8" BSPP	120	2.75	2,000
JVS-10SLGFS	0.003-0.5	100,300	26.5	6 mm	120	2.75	2,000
JVS-15SLGS	0.01 -1.0	31,000	8.2	1/8" BSPP	120	2.75	2,000
JVS-15SLGFS	0.01-1.0	31,000	8.2	6 mm	120	2.75	2,000
JVS-20SLGS	0.02-2.0	15,900	4.2	1/8" BSPP	120	3.00	2,000
JVS-20SLGFS	0.02-2.0	15,900	4.2	6 mm	120	3.00	2,000
HPM-15SLGF*	0.01-0.5	31,000	8.2	6 mm	120	2.50	500
HPM-15SLG*	0.01-0.5	31,000	8.2	1/8" BSPP	120	2.50	500
HPM-20SLGF*	0.02-2.0	15,900	4.2	6 mm	120	3.00	500
HPM-20SLG*	0.02-2.0	15,900	4.2	1/8" BSPP	120	3.00	500

* = **Titanium coated gears available for water based fluids**

Model	Sensor Types	Sensor Features
CAPM-3o	Single Sensor - UL Approved	Intrinsically safe, frequency output when used with a barrier
Fiber Optic System FOP 30/S includes:		
FOP-30	Fiber Optic Sensor	Fully isolated optical signal
OPTV-20	Light to Frequency Converter	Converts optical output to frequency output
Fiber Optic Cable	Standard Heavy Duty Fiber Optic Cable	Available in 30, 40, 60 & 100 foot lengths

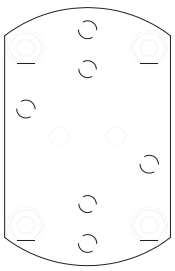
Products may be subject to change without notice – Contact factory for current information

JVS-XX SLGS or HPM-XX SLG



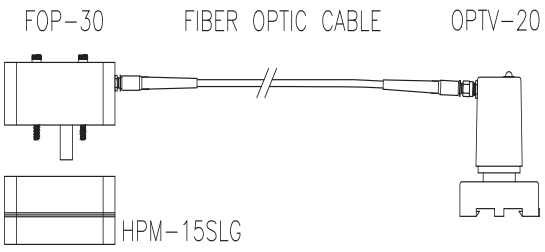
- Standard corner bolts
- Port Threads

JVS-XX SLGFS or HPM-XX SLGF



- Unthreaded corners with long bolts
- No Port Threads

Fiber Optic System FOP 30/S



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AW FLOW METERS

ZHM Series
Positive Displacement Flow Meter

Technical Specifications:

- Flow ranges 0.001 to 265 GPM
- Accuracy ± 0.5% of reading
- Pressure rating up to 9000 PSI
- Great for multi-viscosity fluids
- 303 SS or 316Ti bodies
- Long operating life

What is a ZHM Meter?

The ZHM series positive displacement flow meters are ideally suited for multi-viscosity fluid measurement. Manufactured of stainless steel and tungsten carbide, the ZHM meter can be used with abrasive fluids as well as those fluids under high pressure. The ZHM measures a small volume of liquid as each gear tooth passes the sensor. The uncompromised manufacturing tolerances prevents slippage of fluid even at the lowest flow while the robust design ensures a long operating life.

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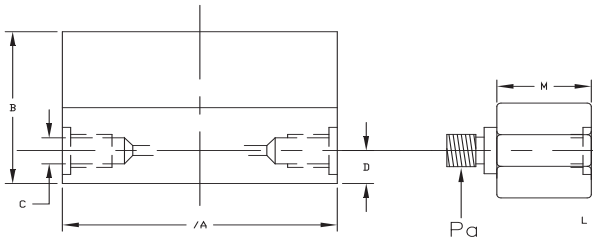
AW FLOW METERS

ZHM Series Positive Displacement Flow Meter



Meter Technical Data

Materials of Construction:
Body: Stainless Steel
Gear: Stainless Steel
O-Ring: Teflon / Viton Optional
Bearings: Tungsten Carbide
Accuracy: ± 0.5% of actual reading
Repeatability: ± 0.1%
Temperature: max 180° C / 350° F
Filtration: Not Provided **-** See recommendation

Model	GPM Range	Impulses / Gallon	Impulses / CC	A in	B in	C	Adaptor Pb	Filtration (Micron)	Pressure Rating (PSI	Weight (lb)
ZHM-01	0.001 - 0.25	155,000	41.00	2.90	1.61	M12 x 1.5	1/4” NPT	120	9,000	3
ZHM-01/1	0.003 - 0.5	100,300	26.50	2.99	1.61	M12 x 1.5	1/4” NPT	120	9,000	3
ZHM-02/1	0.01 - 0.5	31,000	8.80	3.33	2.00	M12 x 1.5	1/4” NPT	120	9,000	5
ZHM-02	0.02 - 2.0	15,900	4.40	3.33	2.16	M12 x 1.5	1/4” NPT	120	9,000	5
ZHM-03	0.1 - 7	6,600	1.74	3.33	2.63	M12 x 1.5	1/4” NPT	120	9,000	6
ZHM-04	0.1 - 20	1,800	0.47	4.92	3.78	M20 x 1.5	3/4” NPT	200	8,000	20
ZHM-05	1.0 - 40	500	0.13	6.88	5.24	M33 x 2	1” NPT	200	6,000	50
ZHM-06/1KL	1.0 - 66	400	0.10	7.40	5.51	SAE 1-1/4” Flange	Flange	300	6,000	70
ZHM-06KL	5 -132	200	0.05	7.40	7.09	SAE 1-1/4” Flange	Flange	300	6,000	70
ZHM-07KL	13 -265	90	0.02	9.13	7.87	SAE 1-1/2” Flange	Flange	300	6,000	114

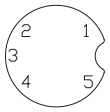
Products may be subject to change without notice – Contact factory for current information

Sensor Options

Carrier-Frequency Sensor
with single pick-up

VTER/P for ZHM-01
VTEK/P for ZHM-02-04
VTEL/P for ZHM-05-07
Supply Voltage: 7-29 VDC
Temperature: 248° F short version
Temperature: 302° F (long version)
Output Signal: Frequency, max 3 KHz

5-Pin Amphenal Plug

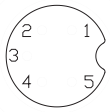


1 = +U
2 = Signal push pull
3 = O V
4 = Open collector signal (collector)
5 = Open collector signal (emitter)

Carrier-Frequency Sensor
with Dual Pick-up

TD-01 for ZHM-01
TD-11 for ZHM-01/1
TD-21 for ZHM-02/1
TD-02 for ZHM-02
TD-03 for ZHM-03
TD-04 for ZHM-04
Supply Voltage: 8-30 VDC
Temperature: 176° F
Output Signal: Push-Pull, NPN open collector passive

5-Pin Amphenal Plug



1 = +U 8-30 VDC
2 = Signal out- push pull/open collector
3 = O V
4 = Signal out- push pull/open collector
5 = Common emitter for pins 2 & 4
Open collector outputs

All sensors: Pulse High = Supply -1.2V High temperature sensors are available up to 180°C / 350° F

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AW FLOW METERS

SRZ Series
Helical Gear Flow Meter

Technical Specifications:

- Flow ranges 0.003 to 105 GPM
- Turn down ratio of over 1:100
- Pressure rating up to 6000 PSI
- Great for highly filled & abrasive fluids
- 5 Flow ranges available
- 303/316 stainless steel construction
- Lower pressure loss
- High resolution

What is a SRZ Helical Gear Flow Meter?

The SRZ series represents a helical gear flow meter that is constructed of two highly accurate cycloid shaped screw spindles that mesh and rotate inside the cylindrical housing with two overlapping holes in the form of a figure 8, which forms the measuring chamber. The medium flows in an axial direction rotating the spindles without pulsation.

The SRZ helical gear flow meter is highly accurate with wider measuring ranges, and is largely independent of your fluid viscosity. The lower pressure drop compared with other flow metering types makes this meter perfect for measuring polyurethanes and polymer, glues and sealing materials and heavy fuel oils.

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AW FLOW METERS

SRZ Series
Helical Gear Flow Meter

Meter Technical Data

Materials of Construction:

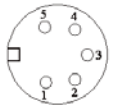
Body: 303 SS or 316 SS
O-Ring: Teflon / Viton Optional
Accuracy: ± 0.5% of actual reading
Repeatability: ± 0.1%
Temperature: 150° C / 300° F (higher temperature meters available upon request)
****Porting:** BSPP, NPT adapters available

Meter Type	Range Gal/Min	Impulse/ Gallon	Dia (in)	Length (in)	Port size BSPP	Wt (lbs)	Pressure Rating (PSI)
SRZ-10	0.003 to 1	62,500	2.3	4.0	1/4”	5.0	6,000
SRZ-20	0.01 to 4	34,500	3.0	4.9	1/2”	9.0	6,000
SRZ-40	0.1 to 11	13,300	3.4	6.1	3/4”	14.0	6,000
SRZ-100	0.25 to 26	3,230	4.4	8.7	1”	32.0	6,000
SRZ-400	1 to 105	810	5.25	12.5	1-1/2”	70.0	6,000

Products may be subject to change without notice – Contact factory for current information

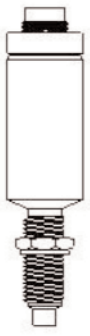
Model	Works with	Sensor Features
VTER/P	SRZ-10, SRZ-20, SRZ-40	Frequency output - 5-pin screw on connector
VTEK/P	SRZ-100, SRZ-400	Frequency output - 5-pin screw on connector

Pin Connections

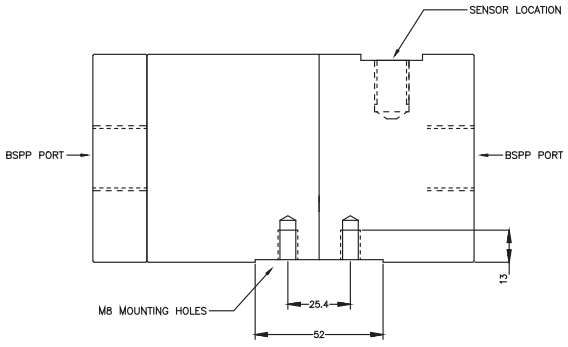


5 = E] OC
4 = C]
3 = 0V (gnd)
2 = OUT ⎍ (signal)
1 = +Ub (supply)

VTER/P or VTEK/P



Mounting Holes - available only on the SRZ-40 shown



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AW FLOW METERS

ACM Series
Mass Coriolis Flow Meter

Technical Specifications:

- Aggressive or contaminated fluids
- Maximum temperature 250° F
- Pressure rating up to 5000 PSI
- Registered with 3A Sanitary Standards
- Accuracy of ±0.25% of reading
- Excellent purging & sterilization
- Three analog outputs
- BSPP, Flange or Tri-Clamp connections

What is a ACM Mass Coriolis Meter?

Utilizing the Coriolis principle, the ACM series of flow meters are superior process control tools that allow real-time measurement of density and flow in liquids, slurries and gases. The ACM line features excellent accuracy and large turndowns in single or dual tube designs. The meters feature no moving parts and smooth flow tubes of 316 stainless steel resulting in a design that is easy-to-clean and maintain. As material flows through the meter, the flow tube is vibrated and the resulting Coriolis forces are measured to determine mass flow rate and density. This principle has virtually universal applications, from industrial paints to sanitary beverages and from non-Newtonian fluids to particle-filled materials. In addition to mass flow and density, the ACM meters provide measurements of temperature and volumetric flow. A wide range of analog or pulse output and local or remote display options are available.

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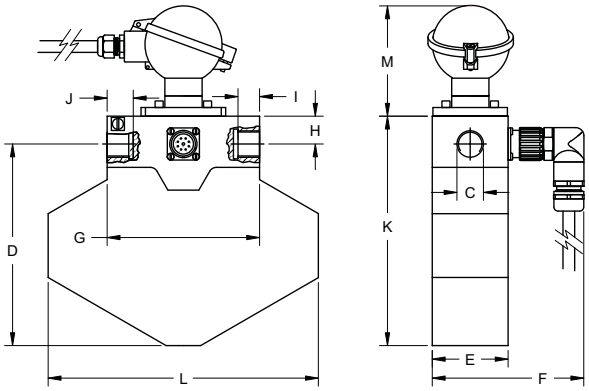
AW FLOW METERS

ACM Series
Mass Coriolis Flow Meter

Meter Technical Data

Materials of Construction:
Body: Stainless Steel DIN 1.4571 (AISI 316Ti)
Temperature: -20°F to 250° F
Pressure: 5000 PSI Max.
Electrical Connection: 9-Pin contact connector
Porting: 1/2" BSPP standard
1-1/2" Tri-Clamp ends (ACM300,1500 & 3000)
Adapters Available: Flange
Maximum Cable Length: 65 Feet between transducer & transmitter
Ingress Protection: IP67
Accuracy: ± 0.5% of reading



Note: *ACM-300, -600, -1500, & -3000 flow meters supplied previous to 9-07 have an electrical connector. Meters supplied after 9-07 have a terminal junction box instead of connector.*

Model Number	Flow Range KG / Hour	Flow Range Grams / Minute	Internal Diameter
ACM 300*	5 to 300	83 to 5,000	4 mm
ACM 600	9 to 600	150 to 10,000	4 mm
ACM 1500*	25 to 1,500	416 to 25,000	8 mm
ACM 3000*	50 to 3,000	833 to 50,000	8 mm

*Available with 3-A certification

Additional sizes available - contact your AWL rep for more info.

Dimension in inches	ACM300	ACM600	ACM1500 ACM3000
C	1/2" BSPP	1/2" BSPP	1/2" BSPP
D	6-1/4	6-1/4	10-3/16
E	2-3/8	2-3/8	2-5/16
F	4-3/4	4-3/4	4-11/16
G	4-5/16	3-7/16	5-1/2
H	7/8	7/8	7/8
I	9/16	9/16	11/16
J	3/4	3/4	7/8
K	7-3/16	7-3/16	11-1/16
L	8-7/16	8-7/16	13-3/4
M	3-7/16	3-7/16	3-7/16

Transmitter Technical Data

1 Analog Output: 4-20mA active, 2 wire galvanically separated, free programmable for mass, density, temperature and total

2 Analog Outputs: 0-5V (30 mA) free programmable for mass density, temperature and total

Interface: RS 485

1 Pulse output: Free adjustable for mass flow, open collector V_{CE} <30V, I_{CE}<100 mA

Switch output: Open collector with batch function V_{CE} <30V, I_{CE}<100 mA

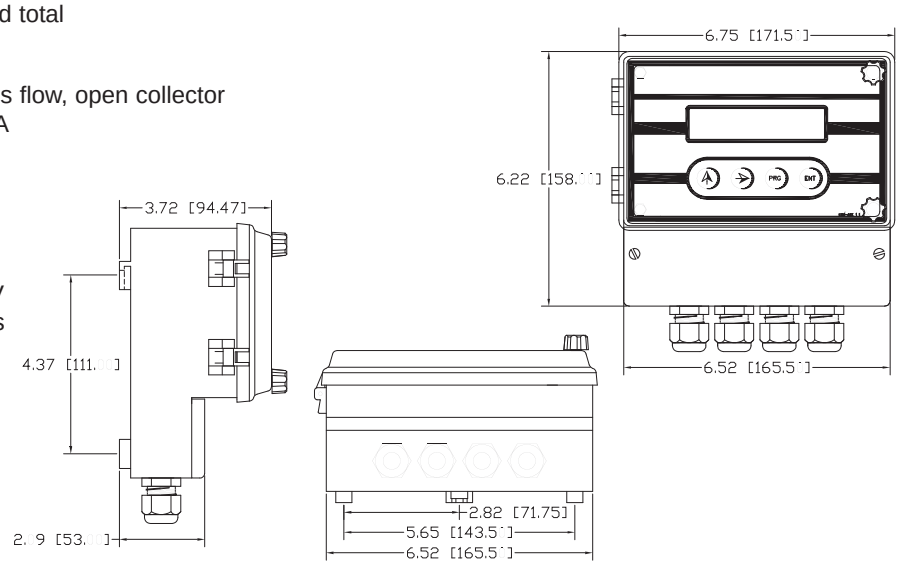
2 Switch Inputs: Passive on >4V, off <1V programmable functions

Display: 2 line alpha numerical display

Supply Voltage: 14-26 VDC, 100 mA

Temperature: 0 up to 122° F

Housing: Wall-mounted housing



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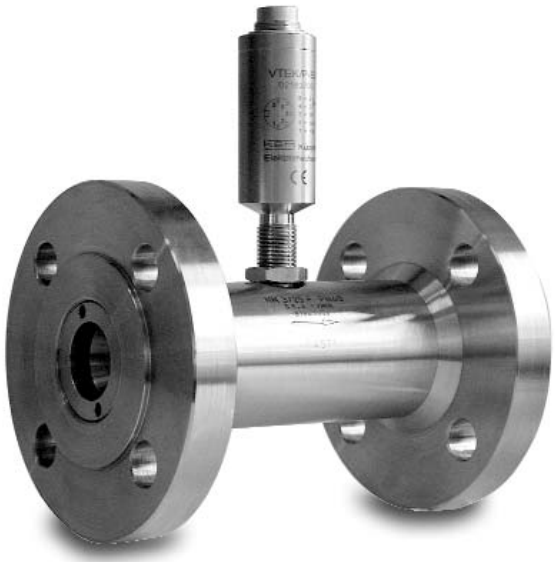
AW FLOW METERS

HM...F
Turbine Flow Meters

Application

Turbine flow meters are used for the precise measurement of instantaneous flow rates and flow quantities of low-viscosity fluids such as:

- Fuel oil
- Tap and demineralised water
- Fuels
- Liquefied gases
- Solvents



HM...F turbines are equipped with flanges as per DIN or ANSI.

Advantages

Fast response time and high resolution

The turbinewheel's low moment of inertia allows a fast acceleration from standstill up to full

number of revolutions within 5 to 50 msec. For that reason dynamic measurements can be done. The resolution can amount to as much as 35,000 pulses per litre (cf. technical data, page 2)

Wide temperature range from –273 up to 350°C

- Standard turbine flow meters: –20 up to +120°C.
- Special models for cryogenic liquids: –273°C
- Special models with high-temperature pickups: up to +350°C

Low contamination risk

The spacing of the turbinewheel and bearing mount is wide enough to protect against particles in fluid jamming the turbinewheel. Furthermore, the twist of flow in this area has a self-cleaning effect for the bearing.

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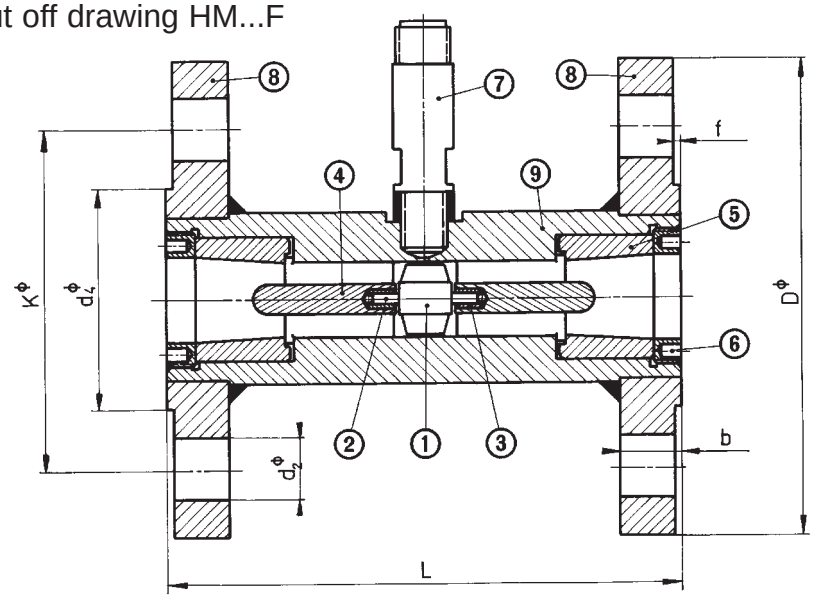
AW FLOW METERS

Meter Technical Data

Type dia	Measuring range ltr./min	Average K-factor* pulses/ltr.		Frequency* in Hz. 0 up to max		Output signal mVss
HM 9 EP	0.03 to 0.8	139,000		1,970		0.5 to 5
HM 3/1.5	0.3 to 1.5	32,000	32,500	1,000	1,000	0.5 to 5
HM 3/4	0.5 to 4	24,000	19,000	1,250	1,250	0.5 to 5
HM 5/6	0.8 to 6	17,800	17,800	1,740	1,780	1.0 to 10
HM 5/10	1.2 to 10	11,000	11,000	1,750	1,750	1.0 to 10
HM 7	2.0 to 20	5,200	5,200	1,800	1,800	1.5 to 15
HM 9	3.3 to 33	1,900	4,200	1,080	2,200	1.7 to 17
HM 11	6.0 to 60	1,300	2,730	1,350	2,700	2.0 to 20
HM 13	8.5 to 85	900	1,900	1,300	2,600	2.5 to 25
HM 17	12 to 120	380	840	800	1,650	2.7 to 27
HM 19	15 to 150	310	650	925	1,600	2.9 to 30
HM 22	20 to 200	217	450	800	1,600	3.1 to 31
HM 24	25 to 250	170	362	800	2,000	3.8 to 40
HM 28	30 to 360	155	320	960	2,000	4.0 to 42
HM 30	35 to 400	130	270	860	1,850	4.1 to 45
HM 36	40 to 500	60	135	600	1,200	4.3 to 48
HM 40	50 to 750	105	110	1320	1,400	4.5 to 52
HM 50	70 to 1,200	65		1400		6.0 to 64
HM 65	100 to 2,000	25		850		10 to 80
HM 80	160 to 3,200	11		615		15 to 100
HM 100	250 to 5,000	7		560		20 to 120
		pulses/m³				
HM 125	300 to 6,600	4,500		495		30 to 125
HM 150	350 to 10,000	3,400		420		35 to 140
HM 200	430 to 13,400	415		134		40 to 150
HM 250	830 to 25,000	266		150		45 to 160
HM 300	1,600 to 48,000	135		110		50 to 180

* The wheel's axial pitch is halved for viscosities from 8 mm²/s onwards, therefore pulse rates will double.
All K-factors and output signals are average values. Exact specifications can be taken from individual calibration cords.

Cut off drawing HM...F



1...4 = measuring kit
1 = turbine wheel
2 = shaft
3 = bearing bush
4 = flow rectifier

5 = inlet cone
6 = ring nut
7 = pickup
8 = flange
9 = body

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AW FLOW METERS

HM...TC-AC/S Turbine Flow Meters for High Pressure Applications

This turbine series has special process connections for pressures up to 15,000 PSI. It is made from stainless steel using the following materials:

- Housing: DIN 1.4571/AISI 316 Ti or DIN 1.3980 (X8NiCr17-10)
- Internal parts: DIN 1.4571/AISI 316 Ti
- Wheel: DIN 1.4460/AISI 329
- Bearings: tungsten carbide

General information like measuring principle may be taken from the datasheet »HM series«.

Grayloc® flange end connections are availableupon request.

Meter Technical Data

Meter Type	Flow Range Gal / Min	Impulses / Gallon	Frequency (0-max. Hz)	Pressure Rating (PSI)
HM 003/TC-AC/S	0.08 to 0.4	123,000	800	15,000
HM 004/TC-AC/S	0.13 to 1.05	94,600	1,650	15,000
HM 005/TC-AC/S	0.2 to 1.6	67,400	1,750	15,000
HM 006/TC-AC/S	0.3 to 2.6	39,000	1,750	15,000
HM 007/TC-AC/S	0.5 to 5	19,000	1,650	15,000
HM 009/TC-AC/S	0.9 to 9	19,000	2,750	15,000
HM 011/TC-AC/S	1.6 to 16	9,000	2,400	10,000

Average figures, the exact figures can be taken from the calibration record supplied with each flow meter.
Linearity: ±1.0 % of actual flow, HM 009: ±1.5 % of actual flow at 1 cSt

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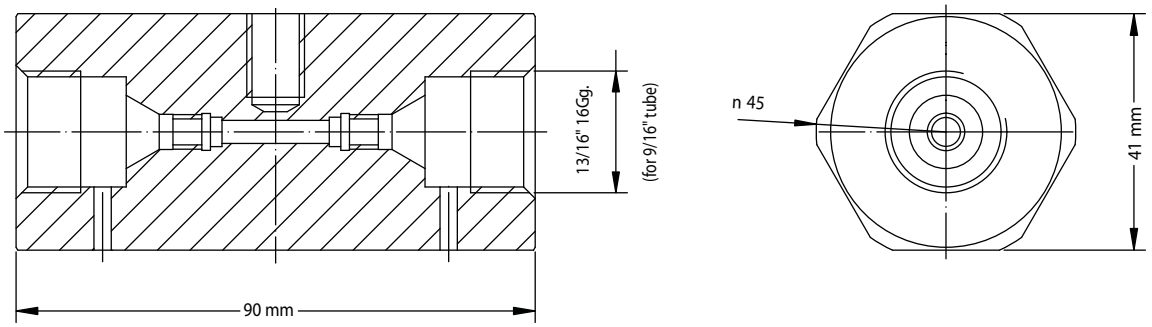
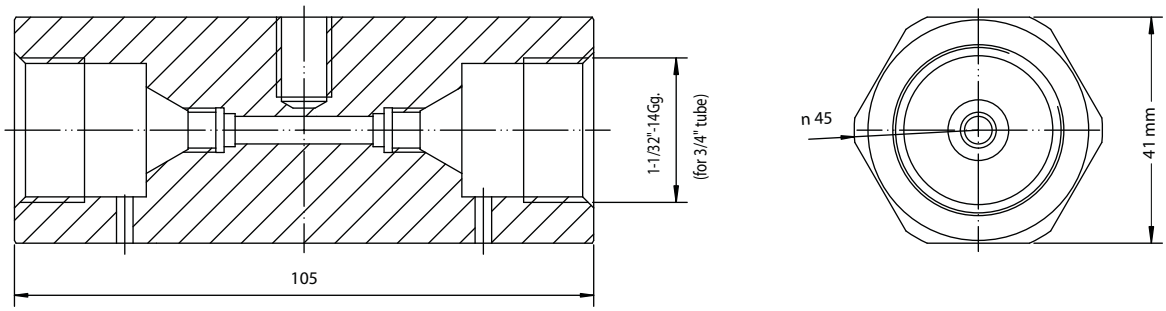
AW FLOW METERS

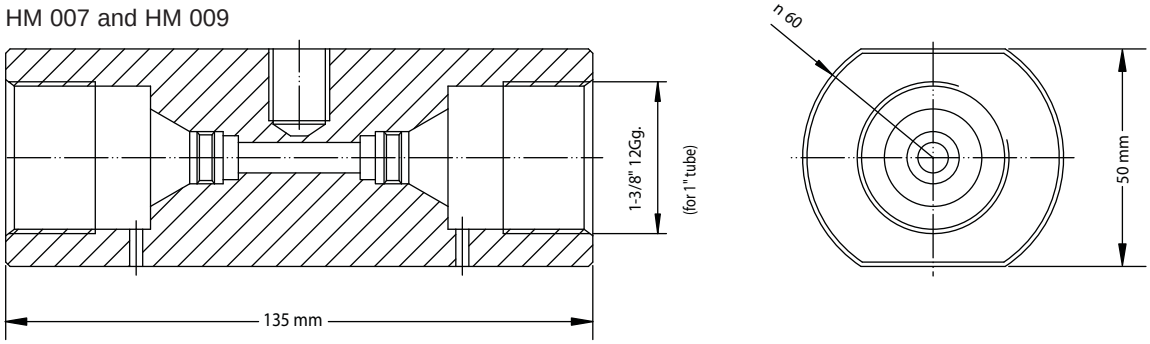
HM 003 and HM 004



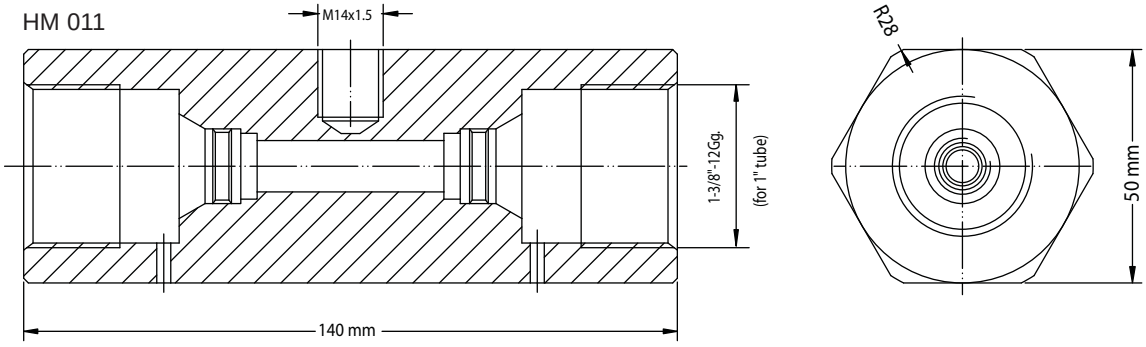
HM 005 and HM 006



HM 007 and HM 009



HM 011



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AW FLOW METERS

TRG-1100 Series
Turbine Flow Meter

Technical Specifications:

- Flow ranges 0.08 to 5,000 GPM
- Accuracy ± 1% of actual flow
- Pressure rating up to 5,000 PSI
- Economical Cost
- Fourteen flow ranges available
- 316 Stainless Steel body
- Stainless Steel rotor
- Easy maintenance design

What is a TRG-1100 Turbine flow meter?

The TRG-1100 series turbine flow meter is designed and constructed of 316 stainless steel with connections available in threaded or flanged ends, for an economical and reliable flow measurement of water, solvents and other lower viscocity fluids. The tungsten carbide bearing design provides accurate and repeatable measurements.

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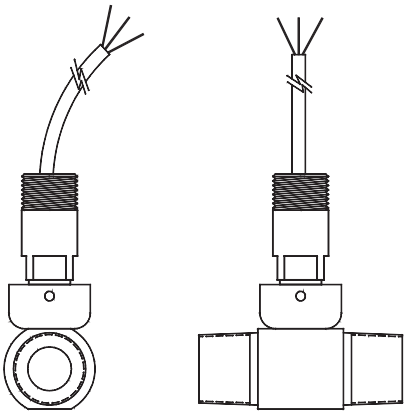
AW FLOW METERS

TRG-1100 Series
Turbine Flow Meter



Meter Technical Data

Materials of Construction:

Body:	316 Stainless Steel
Rotor:	Stainless Steel
Rotor Shaft:	Tungsten Carbide
Rotor Support:	316 Stainless Steel
Accuracy:	± 1% of actual reading
Turn Down Ratio:	10:1
Repeatability:	± 0.1%
Temperature:	-150° F to 450° F

(Temperature rating is flow meter only)

Part Number	Flow Range - GPM	K-Factor Pulses Per Gallon	End Connections	Filtration (Microns)	Pressure Rating (PSI)
TRG-11.250-5	0.08 to 0.4	125,000	1/2” Male NPT	100	5,000
TRG-11.375-5	0.3 to 3	48,000	1/2” Male NPT	100	5,000
TRG-11.500-5	0.9 to 9	15,000	1/2” Male NPT	100	5,000
TRG-11.750-5	1.6 to 16	10,500	1/2” Male NPT	300	5,000
TRG-11.750	1.6 to 16	10,500	1” Male NPT	300	5,000
TRG-11.875	3.2 to 32	1,450	1” Male NPT	300	5,000
TRG-1110	5.3 to 53	800	1-1/2” Male NPT	300	5,000
TRG-1120L	13 to 200	400	2” Male NPT	300	5,000
TR-1130	60 to 600	57	Grooved End 3”	200	800
TR-1140	100 to 1,200	29	Grooved End 4”	200	800
TR-1160	200 to 2,500	7	Grooved End 6”	4,750	800
TR-1180	250 to 3,500	3	Grooved End 8”	4,750	800
TR-1100	500 to 5,000	2	Grooved End 10”	4,750	800

Products may be subject to change without notice - Contact factory for current information

Model	Sensor Types	Meter Compatability
MAG-P	Pulse Sensor - No Amplifier Required	TRG Turbine Flow Meters
MG-300	Magnetic Pick-up *	TR Turbine Flow Meters Only
JV-400/E or /EX	Meter Mounted Amplifier	TR Turbine Flow Meters Only
FIP	Meter Mounted Analog Output Sensor	TRG Turbine Flow Meters Only
RT-Ex 10x	Battery-Powered Meter Mounted Flow Indicator	TR and TRG Turbine Flow Meters
RT-Ex 15x	15-24 VDC Powered Meter Mounted Flow Indicator	TR and TRG Turbine Flow Meters

*** For models TR-1130 to TR-1100 the display used with the sensor must detect an input signal down to 30 mVolts or amplification will be needed. In such cases we recommend the following amplifier options: JV-400/AW Signal Amplifier Module or use JV-400/E or JV-400/EX meter mounted amplifier.**

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AW FLOW METERS

TA-3 Series
Sanitary Turbine Flowmeter

Technical Specifications:

- Sanitary clamp end connections
- Accuracy ± 1% of reading
- Pressure rating up to 1000 PSI
- NEMA 6 Connector
- Nine flow ranges available
- 316L Stainless Steel bodies
- Flow ranges 0.6 to 400 GPM
- Amplified pulse output

What is a TA-3 Turbine flow meter?

The TA-3 series of turbine flow meters are designed to meet the exacting demands of the food, biotechnology, pharmaceutical and other sanitary industries. Featuring a 316 stainless steel body and highly polished internal components, TA-3 flow meters are rugged, accurate and reliable to provide years of excellent service. Each meter is fitted with a NEMA-6 sensor that produces an amplified pulse output. The sensor and molded cable withstand repeated washdowns and provide long-term protection from moisture. Options include analog outputs and local indication of flow rate and flow total.

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AW FLOW METERS

TA-3 Series
Sanitary Turbine Flowmeter

Meter Technical Data

Materials of Construction:
Body: 316L Stainless Steel
Rotor: Nickel Plated Stainless Steel
Rotor Shaft: 316L Stainless Steel
Bushings: Nickel Bindery Tungsten Carbide

Technical Specifications:

Accuracy:	± 1% of actual reading
Turndown Ratio:	10:1
Repeatability:	± 0.1%
Operating Temperature:	350° F max.
Pressure Rating:	up to 1000 psi - based on Tri-Clamp sanitary connections

Part Number	Flow Range - GPM	Pulses per Gallon	Meter Size	Clamp Size
TA3-75-375	0.6 to 3	20,000	3/8”	3/4”
TA3-75-500	0.75 to 7.5	13,000	1/2”	3/4”
TA3-75-750	2 to 15	2,750	1/2”	3/4”
TA3-150-500	0.75 to 7.5	13,000	1/2”	1-1/2”
TA3-150-750	2 to 15	2,750	1/2”	1-1/2”
TA3-150-875	3 to 30	2,600	7/8”	1-1/2”
TA3-150-100	5 to 50	870	1”	1-1/2”
TA3-150-150	15 to 180	330	1-1/2”	1-1/2”
TA-250-200	40 to 400	50	2”	2-1/2”

Sanitary Clamp Rated at 250 PSI at 300° F

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AW FLOW METERS

FEM-03
Flow Monitor

Technical Specifications:

- Single or dual channel
- RS-232 communication
- Easy to read graphic display
- Monitor/Display
- Rate, flow, limit or ratio monitor
- Two programmable Form C Relay outputs
- Assignable 4-20 mA output
- Multiple display modes

What is a FEM-03 Flow Monitor?

The FEM-03 is available as a simple, compact easy to use flow monitor. A large, backlighted LCD graphic display provides easy to read indication of flow rate, totals or ratios. Two Form C relay outputs can be programmed to perform limit, warning or alarm functions. Remote programming or monitoring is available via the RS-232 serial communications port. The FEM-03A model has a 4-20mA output to track data remotely. The FEM-03A2 model is equipped with 2 channels to monitor dual flows and display them separately or as a sum (as in total material use) or as a difference (as in fuel consumption) or as a ratio of A/B. This unit can also be configured to monitor and detect bi-directional flow when “A” and “B” channel (90° phase shifted) signals are available from a single flow meter.

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AW FLOW METERS

FEM-03 Flow Monitor

Monitor Technical Data

Power Supply:
16 VAC/500mA with supplied
110 VAC Transformer
OR
24 VDC/200mA (customer supplied)

Flow Sensor Power Supplies:
(2) @ 15 VDC/20 mA each

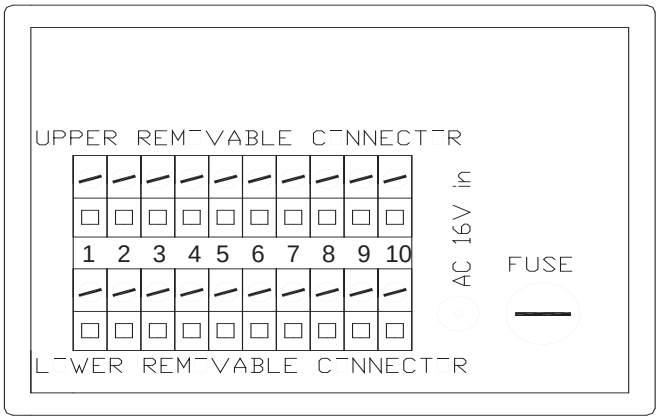
Frequency Inputs:
0-4 KHz, Sine, Square or Saw-tooth
2 Volts minimum amplitude,
10 Kohm impedance

4-20 mA Analog Output:
Self powered loop output into a
maximum 400 ohm load impedance.

Relay Contact Ratings:
Maximum Switch Voltage: 220V DC, 250 VAC
Maximum Switch Current: 2A

Maximum Switched Power
Resistive Load: DC 60W / AC 125 VA
Inductive Load: DC 30W / AC 60 VA

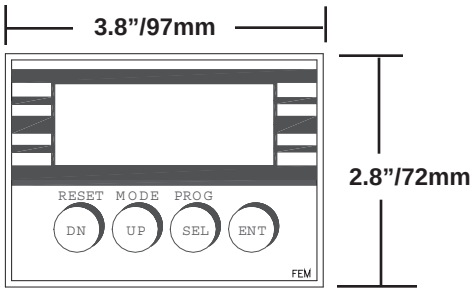
Rated Load
Resistive Load: DC 30V, 2A / AC 110V 0.5A
Inductive Load: DC 30V, 1A / AC 110V 0.3A

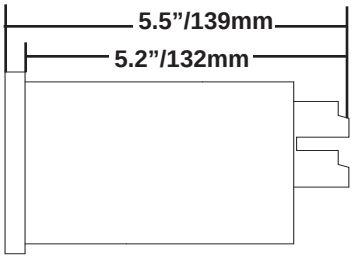


Terminal	Upper Connector	Terminal	Lower Connector
#1	+15 VDC Out	#1	+15 VDC Out
#2	DC Common	#2	DC Common
#3	Freq. A Input	#3	Freq B Input
#4	Not Used	#4	RS232 TX Output
#5	Not Used	#5	RS232 RX Output
#6	+mA Output	#6	Reset Total
#7	-mA Output	#7	DC Common
#8	Limit 2 Common	#8	Limit 1 Common
#9	Limit 2 N.C.	#9	Limit 1 N.C.
#10	Limit 2 N.O.	#10	Limit 1 N.O.

Ordering Information:

Single Channel Rate/Totalizer
Two Form C Limit Relay Outputs
RS-232 Communications
FEM-03 **A**
With a 4-20 Milliamp Output
Dual Channel Rate/Totalizer **2**
With Bi-directional Flow Indication
Dual Channel Ratio Monitor **X**





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AW FLOW METERS

FEM-03 Flow Monitor
Industrial Enclosure Options

Technical Specifications:

- Flow rate monitor
- Ratio monitor w/alarm
- Warning lights available
- Pre-wired enclosure - install and use
- Flow totalizer monitor
- One or two flowmeter input
- Limit relay available
- 110 VAC input

What is a FEM-03 Flow Monitor in an Enclosure?

The FEM-03 is a versatile flow monitor designed to receive single or dual flowmeter inputs, with the ability to monitor a range of functions including flow rate, totalization and two component ratio with an alarm. To provide easy setup and installation, AW Company offers the FEM-03 flow monitor in three pre-wired enclosures with many standard features. Optional features are available and include warning lights, alarm annuciators, on/off switch, limit relays, 4-20 mA outputs and pump shut off relays. Remote programming and monitoring is available by adding the optional RS-232 serial output connector to the FEM-03RT-E and the FEM-03AX-E.

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AW FLOW METERS

FEM-03 Flow Monitor
Industrial Enclosure Options

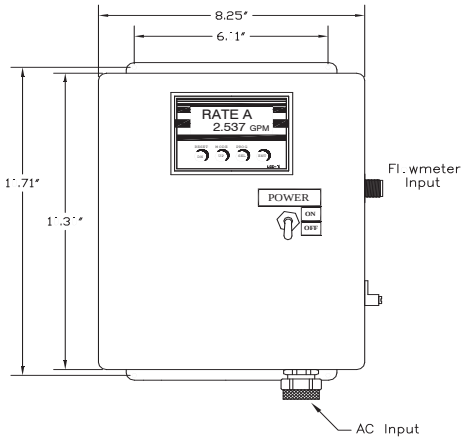
FEM-03E Flow Rate Monitor

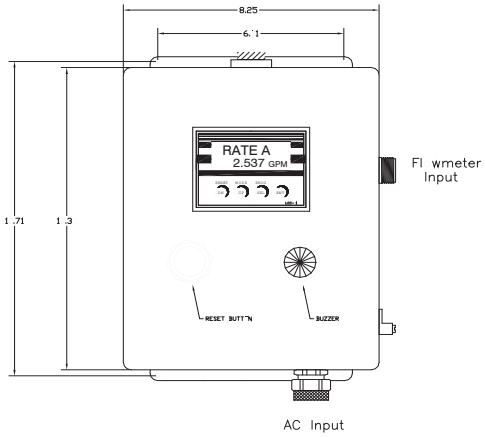
BASE UNIT

* One flowmeter input
* 110 VAC Input
* One FEM-03 Single Channel Unit
* On/Off switch

ADDITIONAL OPTIONS

* 2nd Flowmeter input
* Intrinsic Barrier(s)
* FEM-03A2 (Dual Channel unit)
* Customized Label





FEM-03RT-E Flow Totalizer Monitor

BASE UNIT

* One Flowmeter Input
* 110 VAC Input
* One FEM-03 Single Channel Unit
* One Red Limit Light
* One Reset Button
* One Buzzer

ADDITIONAL OPTIONS

* On/Off Switch
* 2nd Flowmeter Input
* Intrinsic Barrier(s)
* FEM-03A (Single Channel w/Analog output)
* FEM-03A2 (Dual Channel Unit)
* Customized Label
* Analog Output Connection
* Limit Output Connection
* 2nd Limit Light
* Customized Lights (Tower Lights, etc)
* Fiber Optic Signal Input(s)
* Serial Output Connector (RS-232 Comm)

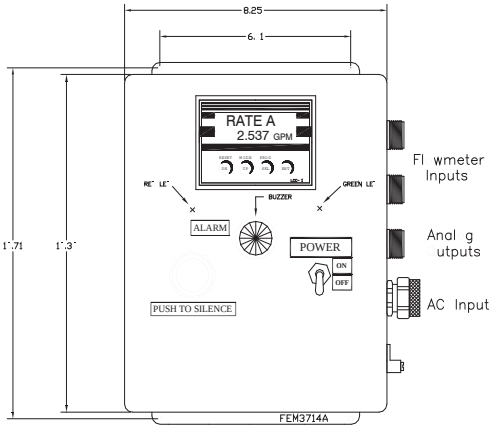
FEM-03AX-E Ratio Monitor with Alarm

BASE UNIT

* Two Flowmeter Input
* 110 VAC Input
* One FEM-03A Ratio Unit
* Off Ratio Red LED
* Silencer Push Button
* One Buzzer
* On/Off Switch w/LED

ADDITIONAL OPTIONS

* External Reset Connection
* Gun Trigger Input
* Intrinsic Barrier(s)
* Analog Output Connection
* Customized Lights (Tower Lights, etc)
* Customized Label
* Limit Output Connection
* 2nd Limit Output Connection
* 2nd Ratio Light (Warning Light)
* Serial Output Connector (RS-232 Comm)



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AW FLOW METERS

RT-Ex10
Meter Mounted Flow Monitor

Technical Specifications:

- Portable, meter mounted flow monitor
- 6 digit LCD display
- 4-20 mA loop power output
- Flow rate, total, real time clock
- Gate time function
- Sleep Mode for battery conservation
- All functions can be magnetically operated
- Battery life indicator, estimated 4 year life

What is a RT-Ex10 meter mounted flow monitor?

The RT-Ex10 is a portable, meter mounted flow monitor that is compatible with AW Company's JV and HPM series of positive displacement meters and TRG and TA turbine meters. The RT-Ex10 is used in a wide variety of applications where ease of operation and flexibility is required. A NEMA 4x enclosure houses a large 6 digit LCD display screen where either flow rate or total is continuously displayed in the customers selected & programmed engineering units. The selection of rate, total, reset of the total, programmable sleep mode and the real time clock can be done via a magnet – without opening the enclosure. A long life field replaceable battery provides power for a period of 4 years – depending on RT-Ex10 options enabled.

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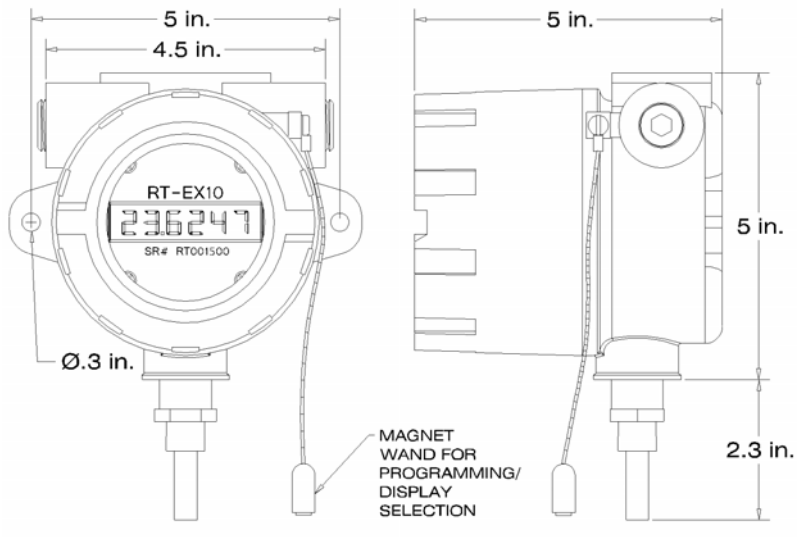
AW FLOW METERS

RT-Ex10
Meter Mounted Flow Monitor



RT-Ex10 is not compatible with the JVHS, JV-01, JV-10 & JV-12

Monitor Technical Data

Flow Meter Compatability:
Positive Displacement: JV & HPM Series
Turbine: TR, TRG & TA Series
(linear flow range may vary)

Power:
Internal 3.6V "C" Cell Battery - field replaceable
4 Year Battery Power - estimated average life
(depending on RT-Ex10 options enabled)

Sensor/Monitor Frequency Range:
3,000 Hz max.

Temperature Rating:
-20° to 60°C (-4° to 140° F) Ambient
80° C (175° F) Maximum Fluid Temperature

Output Options:
4-20 mA, loop powered
Pulse output scaleable to 100 Hz.

Enclosure Certifications:
Class I, Groups A, B, C, D
Class II, Groups E, F, G
Class III
Atex: EExd IIC, IP68
NEMA 4X
FM Class No. 3615
CSA Ex'd' approval pending

RT-Ex10 Options available

Part #	Standard Nose	Fiber Optic Input*	Hub Nose	TR Nose	Battery Power	4-20 mA Loop	Fiber Optic Output**
RT-Ex10A	X				X		
RT-Ex10C	X				X	X	
RT-Ex10H	X				X		X
RT-Ex10D		X			X		
RT-Ex10F		X			X	X	
RT-Ex10L		X			X		X
RT-Ex10J			X		X		
RT-Ex10N			X		X	X	
RT-Ex10P			X		X		X
RT-Ex10R				X	X		
RT-Ex10T				X	X	X	
RT-Ex10U				X	X		X

*** All fiber optic input RT-Ex10's require the FOP Pick-up**

**** All fiber optic output RT-Ex10's require the OPTV converter**

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AW FLOW METERS

RT-Ex15
Meter Mounted Flow Monitor
with HART Communication Protocol

Technical Specifications:

- Digital meter mounted flow monitor
- Flow rate / total screens
- 4-20mA rate output and scaled pulse output
- Gate time function
- HART communication protocol
- Test Point for external frequency input
- Programmable outputs
- Magnetically select any key functions

What is a RT-Ex15 meter mounted flow monitor?

The RT-Ex15 is a meter mounted digital flow monitor housed in a Class I Hazardous Location rated enclosure that features HART communication protocol. A large, back-lighted LCD graphic display provides an easy to read indication of flow rate or total in user programmable engineering units. To change any key functions, simply use the magnet that is attached. No opening of the enclosure is required. To prevent the magnet from entering the programming mode inadvertently, an on board jumper controls ability to allow programming via external magnet. An isolated input also allows for remote reset of the totalizer. Programmable opto-isolated open-collector outputs provide flow rate limit indication or a pulsed total output for remote monitoring and recording of totals. A 4-20 mA rate output with user programmable filtering and scaling is also provided for remote indication.

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AW FLOW METERS

RT-Ex15
Meter Mounted Flow Monitor
with HART communication protocol

Monitor Technical Data

Power Requirement:
15-24 VDC/150mA. (customer supplied)

Analog Output 4-20 mA:
16-bit D/A Converter
3 wire or 2 wire plus seperate supply
Max. Load Impedance: 500 ohm.

Enclosure Certifications:

Class I, Groups A, B, C, D	NEMA 4X
Class II, Groups E, F, G	FM Class No. 3615
Class III	FM & CSA approval pending
Atex: EEx d IIC, IP68	Copper Free Standards

Sensor/Monitor Frequency Range:
0-4000 Hz

Temperature Ratings:
-20 to 60ºC (-4 to 140ºF) Ambient

Connection:
¾" NPT Conduit Provisions

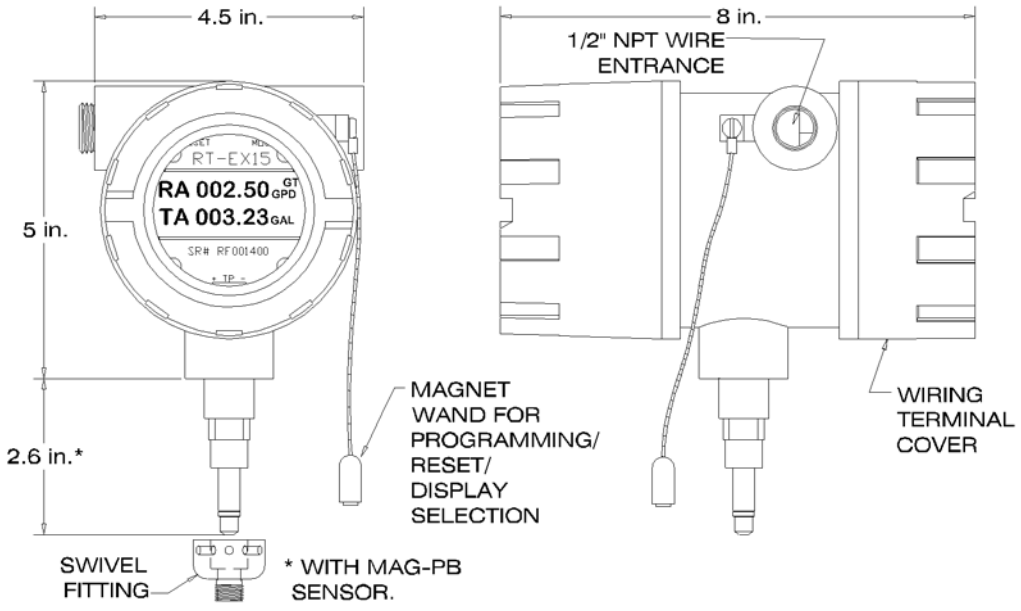
Two Opto-Isolated Open-Collector Outputs:
5-30 VDC Rating, 50 mA Max. (Minimum Load Impedance Required, 600 Ohm @ 30 VDC)

Opto-Isolated Reset Input:
5-30 VDC Input, 3.3Kohm Impedance

Part Number Configuration

RT-Ex15 Part Number	Option
RT-Ex15A	Standard Unit
RT-Ex15B	Infrared (JVK Only)
RT-Ex15C	High-Temperature Pick-up
RT-Ex15D	TR Nose (Turbine Only)

NOTE: All RT-Ex15 meter mounted flow meters are available with HART communication protocol. Contact the factory for HART communications protocol part availablility and part numbering information.



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AW FLOW METERS

LLC-BA
Batch Controller

Technical Specifications:

- Nine programmable batch amounts
- Batch counter & totalizer
- 4-20 mA batch progess output
- Ability to count up or to count down
- Din panel mount enclosure
- Two relays for solenoid valve control
- Batch error compensator
- Good for small to medium sized systems

What is a LLC-BA Batch Controller?

The LLC-BA is a compact, easy to use batch controller designed as a central controller for small to medium sized fluid batching systems. Nine different batch amounts can be pre-programmed into long term memory and selected by the operator. Two relays provide control for either single or dual stage valve operation. Two totalizers are available, one acts as a batch totalizer and the other totals continuously with reset protection. The batch counter has a user selectable option to either count up from zero or count down to the batch amount. The unit's smart programming automatically compensates for variations from the selected batch amount. Inputs provide operator remote control for batch selection, start, stop and reset.

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AW FLOW METERS

LLC-BA Batch Controller

Controller Technical Data

Sensor Input:
Voltage triggered, 2.00 Vp-p, 0-4 Khz,
10 Kohm imp.

Enclosure:
Din# 4370016 panel mount, plastic, dust-proof, LEXAN front panel

Power Supply:
Supplied: 110 VAC wall plug unit - 12 VAC 500 mA output

Main Board:
87C51FB Microprocessor, EEPROM memory

Display:
16 Character alpha numeric LCD display
0.35 inch character height

Supply Output:
Approx. 20mA at 15 VDC

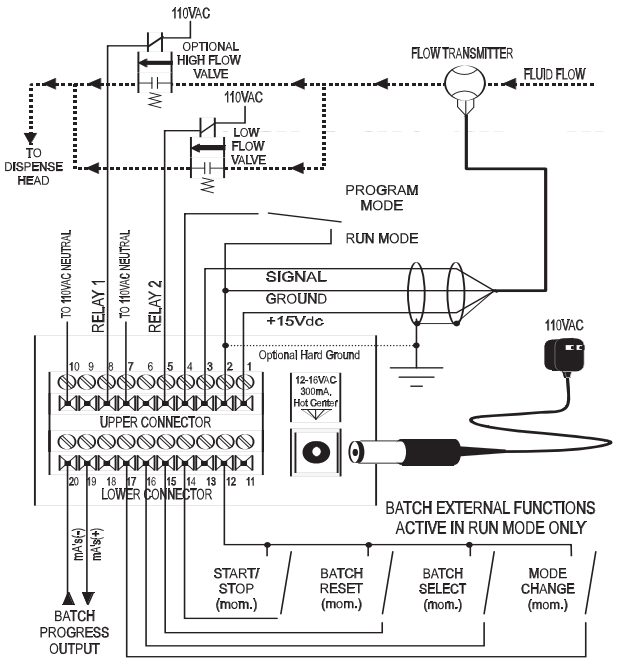
Two Form C Relay Outputs:

Relay Contact Ratings:
Maximum Switch Voltage: 220V DC, 250 VAC
Maximum Switch Current: 2A

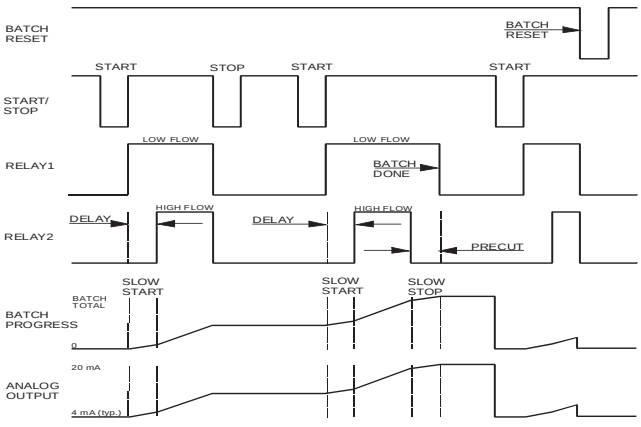
Maximum Switched Power
Resistive Load: DC 60W / AC 125 VA
Inductive Load: DC 30W / AC 60 VA

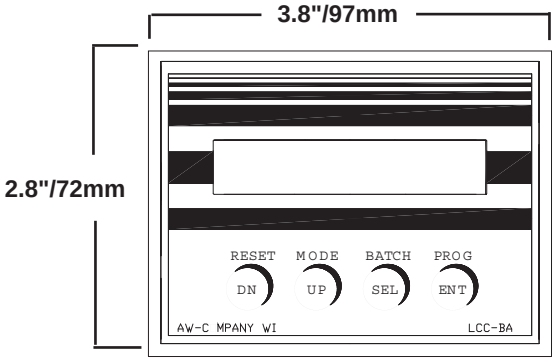
Rated Load
Resistive Load: DC 30V, 2A / AC 110V 0.5A
Inductive Load: DC 30V, 1A / AC 110V 0.3A

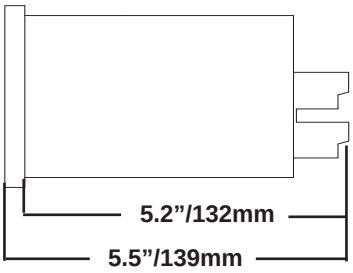
Typical Batch Application



Batch Function Timing Diagram







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AW FLOW METERS

LLC-E-BA
Batch Controller in an Industrial Enclosure

Technical Specifications:

- Nine programmable batch amounts
- 4-20 mA batch fill indicator
- NEMA 12 & 13 enclosure
- Ability to count up or to count down
- Batch counter & totalizer
- Two relays for solenoid valve control
- Batch error compensator
- Good for small to medium sized systems

What is a LLC-E-BA Batch Controller?

Mounted in a prewired NEMA 12 industrial enclosure, the LLC-E-BA is an easy to use batch controller designed as a central controller for small to medium sized fluid batching systems. Nine different batch amounts can be pre-programmed into long term memory and selected by the operator. Two relays provide control for either single or dual stage valve operation. Two totalizers are provided, one acts as the batch totalizer and the other totalizes continuously with reset protection. The batch counter has a user selectable option to either count up from zero or count down from the batch amount. The unit's smart programming automatically compensates for variations from the selected batch amount. Inputs provide operator remote control for batch selection, start, stop and reset.

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AW FLOW METERS

LLC-E-BA

Batch Controller in an Industrial Enclosure

Controller Technical Data

Power Supply:
110 VAC

Sensor Input:
Voltage triggered, 2.00 Vp-p min.
0-4 KHz, 10 Kohm imp.

Main Board:
87C51FB processor, EEPROM memory

Sensor Supply Output:
Approx. 20 mA at 15 VDC

Display:
LCD, 16 Character alpha-numeric
0.35 inch character height

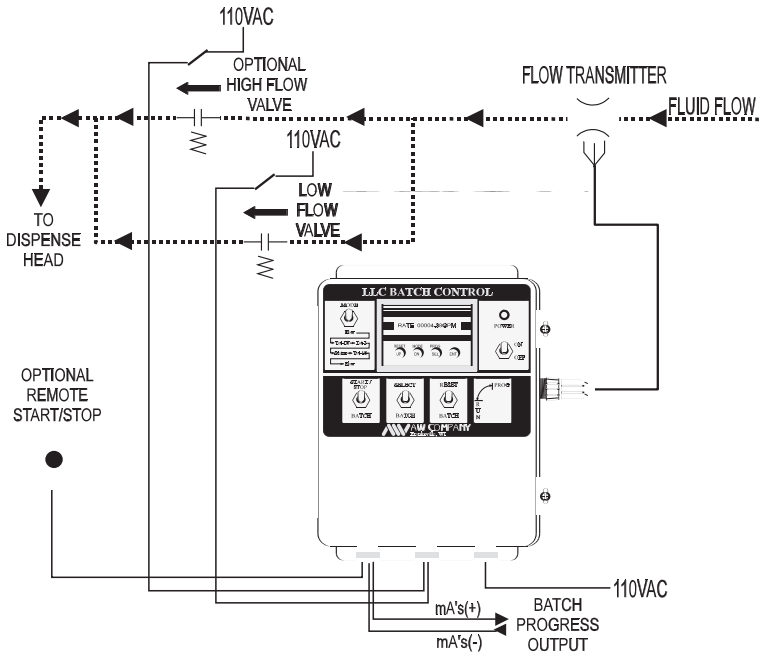
Enclosure:
NEMA 12 & 13

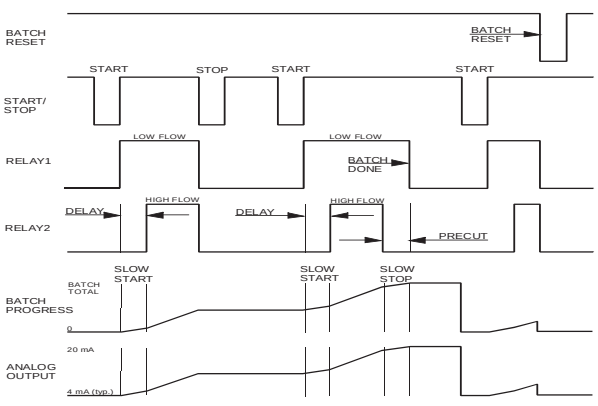
Two Form C Relay Outputs:

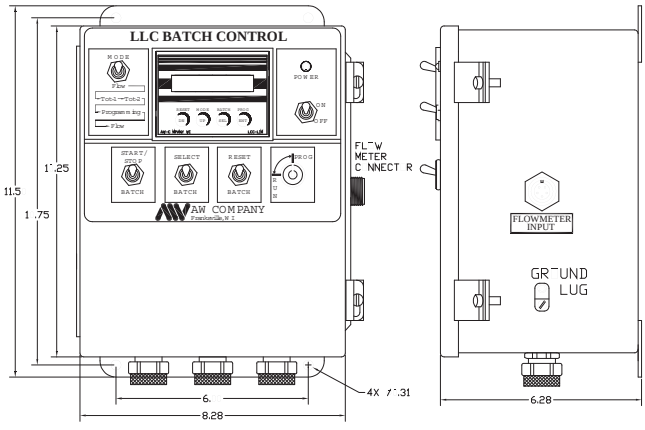
Relay Contact Ratings:
Maximum Switch Voltage: 220V DC, 250 VAC
Maximum Switch Current: 2A

Maximum Switched Power
Resistive Load: DC 60W / AC 125 VA
Inductive Load: DC 30W / AC 60 VA

Rated Load
Resistive Load: DC 30V, 2A / AC 110V 0.5A
Inductive Load: DC 30V, 1A / AC 110V 0.3A







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AW FLOW METERS

DVV System
Dispensing Volume Verification System

Technical Specifications:

- Fully automatic
- No external logic or wiring required
- Multiple display modes
- Improves process control
- NEMA 12 & 13 rating
- Qualifies dispensed volume
- Audible alarm for outside limit results
- Monitors dispense operation

What is a DVV System?

The Dispense Volume Verification system is a fully automatic dispense monitor. It compares the dispensed volume to a programmed minimum and maximum volume limit providing a pass or fail indication via a highly visible tower light and audible alarm. The DVV requires only the flowmeter signal to operate and does not require any external logic or additional wiring. The DVV senses the start of a dispense cycle by detecting flow and continues to totalize until flow has completely stopped for a user specified time. At this time the total is compared to the programmed limits. The DVV then indicates whether the dispensed volume falls within, below, or above the specified limits with a green, yellow or red light respectively. An audible alarm will sound for a result outside the limits. After a user specified time, the indicators clear and the system resets and waits for the flow to start again. A large, backlighted LCD graphic display provides easy to read indication of the dispensed total or flow rate in user programmable engineered units.

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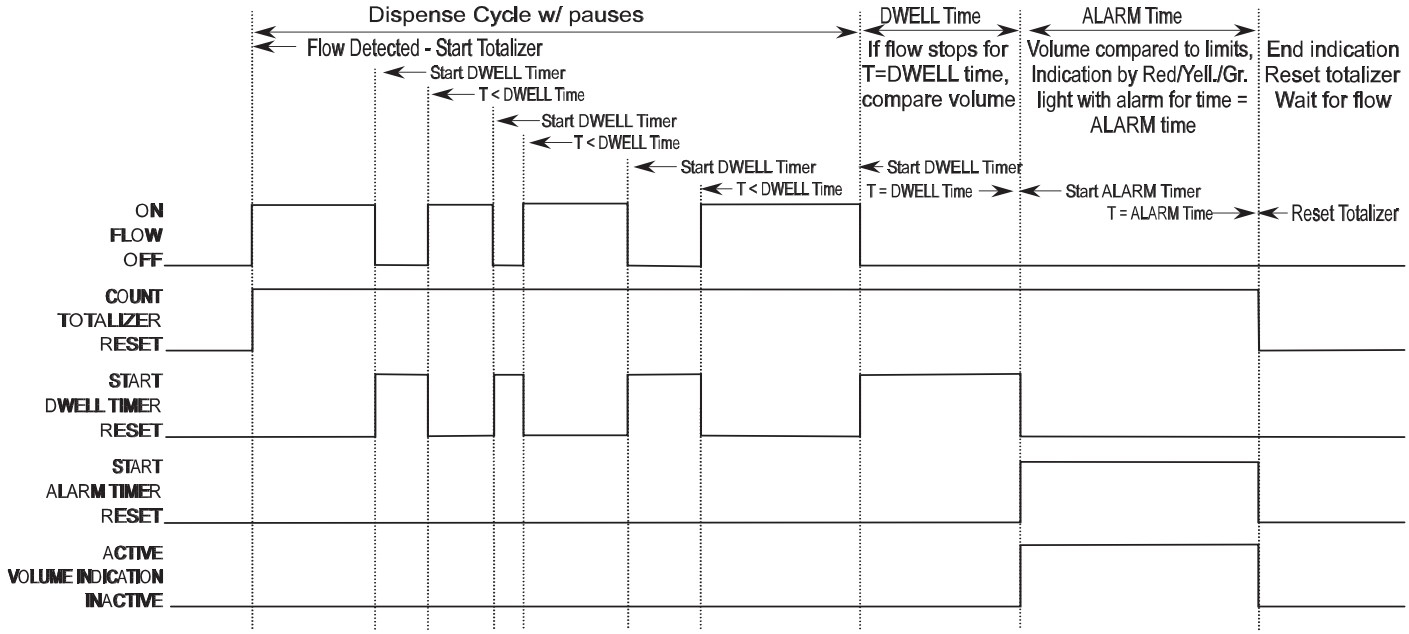
AW FLOW METERS

DVV System

Dispensing Volume Verification System

Typical Timing Diagram



Specifications

System Timers:
DWELL Time: 0-99 Seconds Adjustable
Alarm Time: 0-99 Seconds Adjustable

Flowmeter Signal Input:
Frequency Input: 0-4 KHz, Sine, Square or Saw Tooth, 5 Volts minimum amplitude

Input Impedance: 10 Kohm

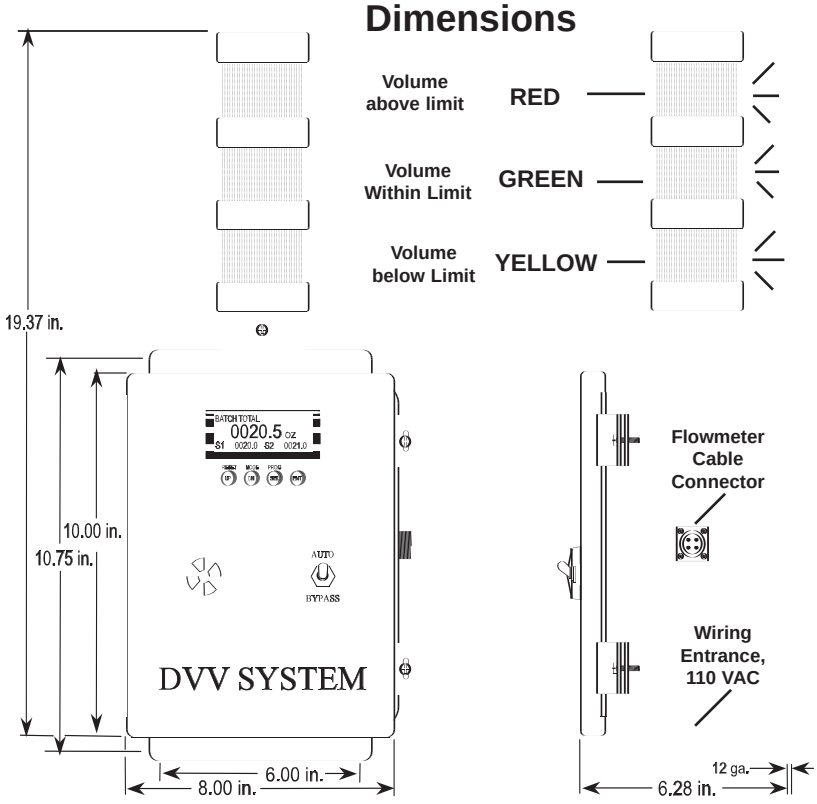
Flow Sensor Power Supply:
15 VDC, 40 mA
(Compatible with all AW Company Flowmeters)

Power Requirements:
Supply Voltage: 110-130 VAC, 2 Amps

Physical:
Operating Temperature Range:
32-158°F (0-70°C)

Enclosure: NEMA 12&13
IP 52 & 54

Dimensions



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AW FLOW METERS

EMO-500
Two Component Ratio Monitor

Technical Specifications:

- Two signal component ratio monitor
- RS-232 or RS-485 serial communication
- Nine programmable units of measure
- Seven totalizers for reporting
- Display flow rate, total or ratio
- Net consumption display

What is an EMO-500 Monitor?

The EMO-500 is a two signal component ratio monitor designed for use in steady or pulsing flow streams. Signals from two flow meters can be displayed as independant flow rates or totals, or as an A/B, A + B or A - B relationship. In ratio mode, a programmable ideal ratio is compared to the actual ratio, and off ratio conditions are indicated via one of the four limit relays. These relays can be used to operate audible or visual alarms, or to terminate pump operation. The EMO-500 has seven different totalizers for reporting and record keeping. Other features include job resets, RS-232/485 Serial Communication and a 4-20 mA output.

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AW FLOW METERS

EMO-500 – Two Component Ratio Monitor

Key Programming Features:

Ideal Ratio: User defined, compared to actual ratio
Gate Time: Time before the flow rate display updates
Sample Size: Number of pulses counted before ratio updates
Limits: Ratio, Flow Rate and Total
Units of Measure: Liter, CC, Gal, Oz, gr, kg, Lb, RPM, Hz

Display Information:

Ratio: Ideal	Flow Rate A	Job Total A	Grand Total
Ratio: Actual	Flow Rate B	Job Total B	Grand Total B
Limit Settings	Flow Rate A+B	Job Total A+B	Grand Total A+B
Limit Status	Flow Rate A-B	Job Total A-B	

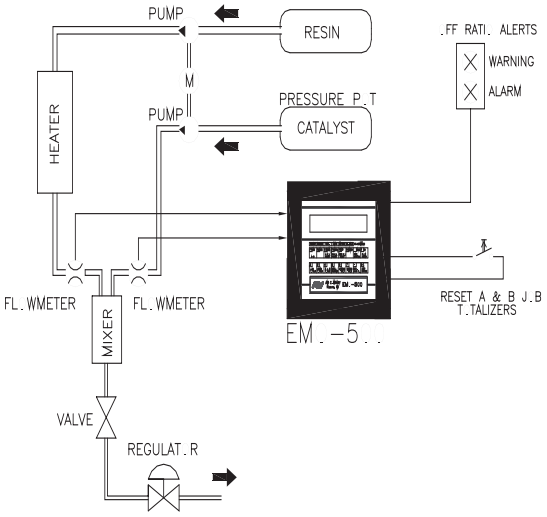
Technical Information:

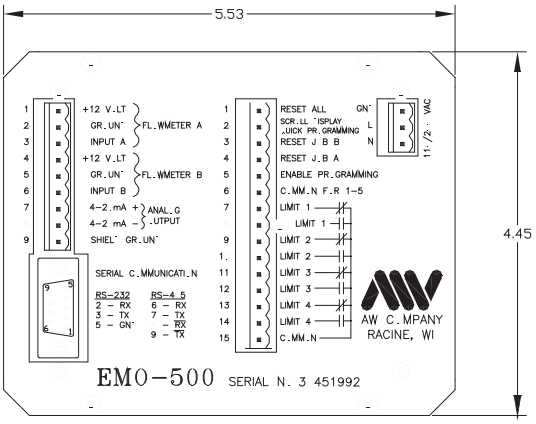
Power Supply Input: 110 VAC or 220 VAC
Consumption: 4 Watts

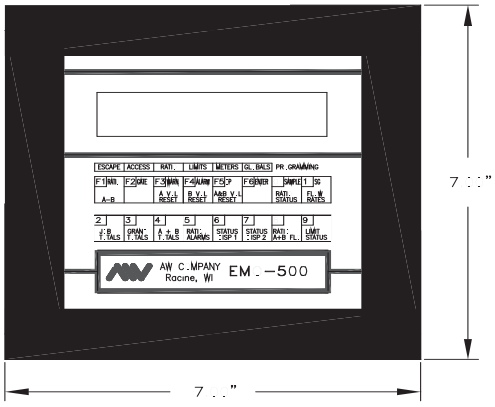
Communication: Type: RS-232 & RS-485
Protocol Type Similar to OPTO 323

Environmental: Storage: -40° C to 85°C
Operating: 0° C to 50° C
Humidity: 10 to 90% Noncondensing

Limits: 10 Amp, 110 V dry contact relays





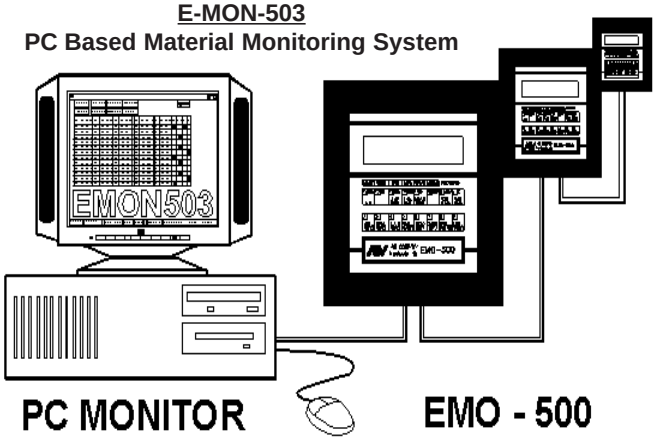


EMO-500/E Industrial Enclosure

- Dual Flow Meter Support
- Warning and Alarm Lights
- Alarm Siren and Silencer
- External Reset
- RS-232/485 Communications
- NEMA 12 Enclosure
- Industrial Push Button Control
- Pre-wired, ready to go

E-MON-503

PC Based Material Monitoring System



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AW FLOW METERS

EMO-3000
Multi-Channel Flow Computer

Technical Specifications:

- Standard 4 channels - expandable to 12
- 10 point linearization per channel
- RS-232 or RS-485 serial I/O interface
- Maintain a steady flow rate
- Thirty engineering units selectable
- Ratio - Flow A, Flow B or Flow A/B
- 4-20 mA or 0-5 V Output
- Program channel for 4 alarm limits

What is an EMO-3000 Multi-Channel Flow Computer?

The standard EMO-3000 offers one to four channels, but is expandable to up to 12 channels. Each channel can be configured as a flow monitor or as a closed loop controller. Four alarm limits can be programmed for each channel indicating rate, total, or ratio conditions. The ratio function allows the display of flow rate A, flow rate B and ratio A/B up to 12 channels. The DM-3000 is a backlighted digital display that can show 12 channels simultaneously. The display values can be programmed in over 30 different selectable engineering units. The RS-232 or RS-485 Serial I/O interface allows for remote data collection, programming and PLC interface, allowing for multi-unit interfacing. Any channel card can be configured to provide closed loop feedback flow control. This is important in automatic systems where flow rate deviations can rapidly result in major rework, labor and material costs. The self teaching memory function remembers previous “learned” control values.

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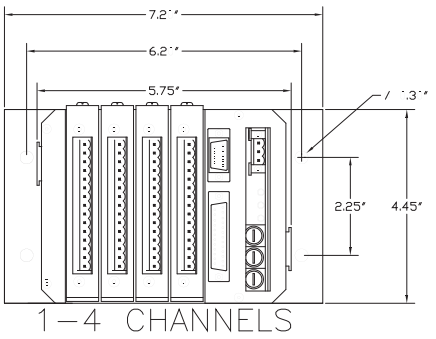
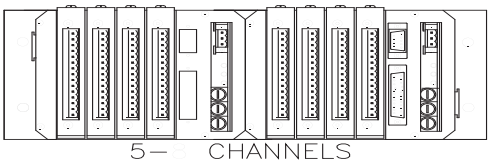
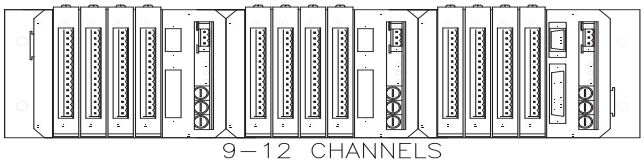
Multi-Channel Flow Computer







DM-3000 Display Screen Options

Display Screens

F1 *Action Display
F2 *Single Channel PID
F3 Single Channel Ratio
1 *Action Ratio
2 Quick Programming
F4 Full Programming
F5 Search Feature
F6 Utility Feature

***Featured Displays**

Single Channel Display 1-PID Mode

```
P I D MODE  DSP 01      CHANNEL=03
RATE=000235.ccm       FLUID NBR=00
SET =000235.ccm       mA OUTPUT=11.81
TRANSPARENT--> OFF
HOLD ANALOG--> OFF
HOLD TOTAL --> OFF
SET REACHED--> ON
F1=ESC F2=CHNL UP F3=CHNL DOWN  F5=D+
```

Action Ratio Display

CHA	RATE_A	RATE_B	RATIO
01	023.7ccm	021.2ccm	01.12
02	045.4ccm	035.2ccm	01.41
03	000.0ccm	000.0ccm	01.00
04	000.0ccm	000.0ccm	01.00
05			
06			

F1=ESC F2=CH-SWAP F3=D+ F4=RESET TOT

Flow Rate Display

CHN	RATE	CHN	RATE
01	562.8ccm	07	498.7ccm
02	459.2ccm	08	000.0ccm
03	487.2ccm	09	000.0ccm
04	523.8ccm	10	482.4ccm
05	631.4ccm	11	607.4ccm
06	524.5ccm	12	000.0ccm

F1=ESC F2=RATE F3=TOTAL F4=GRAND TOTAL

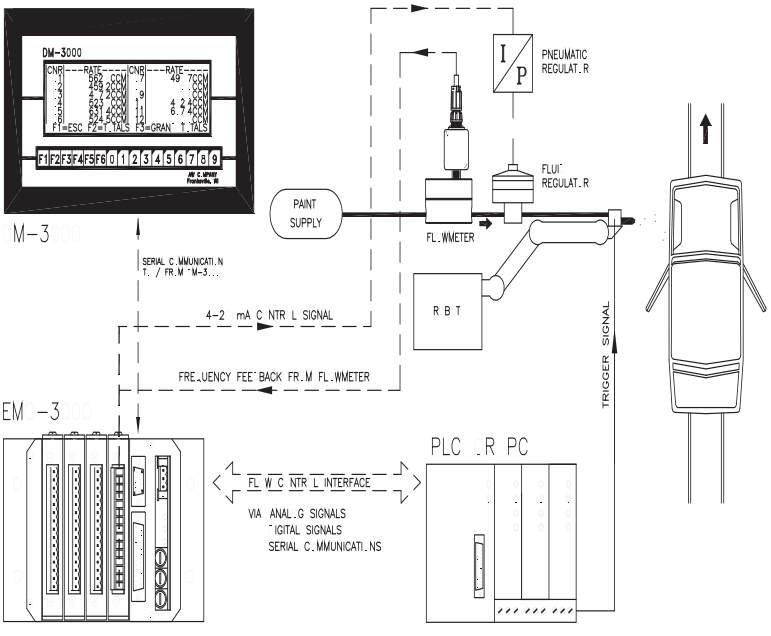
CLOSED LOOP CONTROL SYSTEM FOR PAINTS AND COATINGS

Objective: #1 Maintain a precise flow
#2 Monitor material quantities used
#3 Improve quality and reduce waste

Equipment: EMO-3000 or DM-3000
AW brand positive displacement meter

The PLC transmits fluid flow instructions to the EMO-3000 unit, which in turn controls an air-operated fluid regulator by regulating pneumatic pressure. The AW flow meter measures the flow to the paint nozzle by converting flow to a proportional pulse rate, which is then compared with the set value furnished by the PLC*. An error between the set value and the actual flow rate results in a corrective signal to the AW I/P convertor. An internal memory feature records flow values from earlier cycles which are continuously modified as new conditions occur. The EMO-3000 builds these adaptive data tables for up to 30 fluids or colors, ensuring a fast but highly precise response for a wide variety of fluids and conditions.

*Potentiometer and DM-3000 programmed set points are acceptable.



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AW FLOW METERS

EMO-3000 PID Series
Multi Channel Flow Computer

Technical Specifications:

- 1, 2, 3 or 4 Channels available
- Each channel is independent
- Wall mountable NEMA 12 enclosure
- Serial Interface for software
- Parameter storage in EEPROM
- Analog inputs for set point
- Includes I/P Converters
- 110 Volts AC

What is a EMO 3000 PID Multi Channel Flow Computer?

Precise, reliable control of fluid flow in industrial applications can result in significant material savings and a superior end product. But a sophisticated fluid control system can also be extremely complex and difficult to implement. The sales and engineering staff at AW Company has provided easy-to-use, cost-effective systems to the closed-loop fluid control industry for over 20 years. The EMO-3000/PID Controller provides an out-of-the-box flow control solution that allows you to control as many as 4 lines without the need for a PLC or other complicated system integration. The EMO-3000/PID features a micro-processor based controller, rheostat knobs for flow control, I/P converters for control of air pressure and a software package that allows you to control every parameter in the PID loop. The system is able to update the closed-loop control as often as 5 times per second. The EMO-3000/PID comes in a wall-mountable NEMA-12 industrial enclosure that features soft touch interface keys on the controller, setpoint knobs for the flow and switches for flush cycles.

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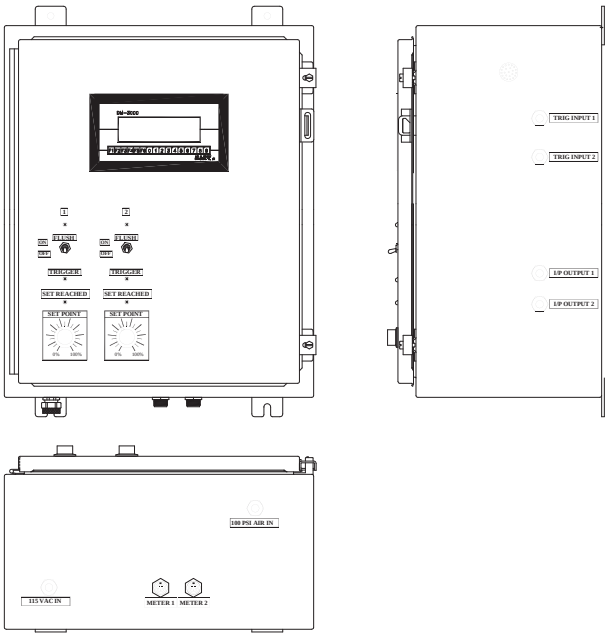
AW FLOW METERS

EMO-3000 PID Series
Multi Channel Flow Computer



PID Technical Data

EMO 3000/1/PID
1 Channel Closed Loop Controller in an enclosure with trigger pressure switch, lights, manual set point knob, manual flush switch, 1 I/P Converter, Heavy Duty Power Supply, Intrinsically Safe Barrier Card and a 2 AMP Fused Power Inlet

EMO 3000/2/PID
2 Channel Closed Loop Controller in an enclosure with trigger pressure switches, lights, manual set point knob, manual flush switches, 2 I/P Converters, Heavy Duty Power Supply, 2 Intrinsically Safe Barrier Cards and 2 AMP Fused Power Inlet

EMO 3000/3/PID
3 Channel Closed Loop Controller in an enclosure with trigger pressure switches, lights, manual set point knob, manual flush switches, 3 I/P Converters, Heavy Duty Power Supply, 3 Intrinsically Safe Barrier Cards and a 2 AMP Fused Power Inlet

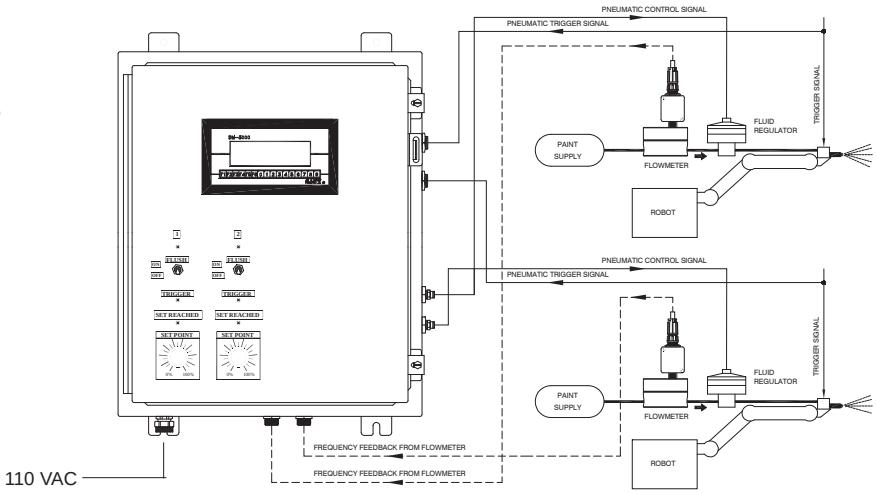
EMO 3000/4/PID
4 Channel Closed Loop Controller in an enclosure with trigger pressure switches, lights, manual set point knob, manual flush switches, 4 I/P Converters, Heavy Duty Power Supply, 4 Intrinsically Safe Barrier Cards and 2 AMP Fused Power Inlet

Optional Software Package:
The GR-3000 Flow Control Software will allow the user to upload and download PID parameters directly to the EMO-3000, format color tables and graph flow rates and trigger times.

Typical EMO 3000 PID Application

The diagram at right shows a typical 2 channel closed loop control scheme with the EMO-3000/2/PID. Each flow loop includes a paint supply line, flow meter, fluid regulator and spray gun.

The EMO-3000/2/PID receives a signal from each flow meter and, with its self-contained I/P converter, controls the fluid regulator to precisely and accurately deliver paint, air or other fluid.



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AW FLOW METERS

Frequency to Analog Converters

Technical Specifications:

- Panel, Din Rail or Meter Mount models
- Linearity ± 0.01%
- Six output options available
- User adjustable frequency span
- Input frequency 5,000 Hz Maximum

What is a Frequency to Analog converter?

AW Flow Meter's frequency to analog converters are compact, rugged and easy to install with panel, din rail or meter mounted models. Input frequencies up to 5,000 Hz are accepted in sine, saw tooth or square wave form. Output signals are available in six types to meet preferred voltage, mA and zero offset choices. All models are microprocessor based to provide a fast and linear response.

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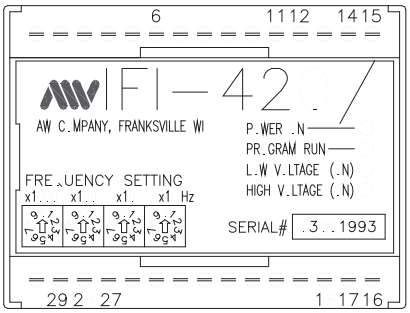
AW FLOW METERS

Frequency to Analog Converters

IFI-420

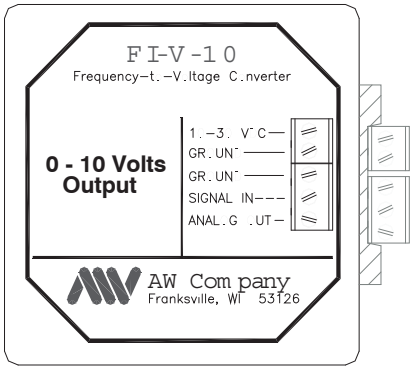


* **State of the art, microprocessor based converter**
* **User adjustable frequency span**
* **AC or DC Power**
* **Built in power supply to sensor or another device**
* **Din Rail or panel mount**
* **User selectable output signal**

Technical Specifications:

Supply Voltage:	AC: 110/220 VAC DC: 15-28 V	**Input:**	0.25 Hz to 5 KHz
		Amplitude:	500mVp-p to 40 Vp-p
Update Time:	1/F + 40 msec	**Output:**	0-20 mA, 0-5 V, 0-10 V,
Linearity:	±0.01% of reading		4-20 mA, 1-5 V, 2-10V

FI-V & FI-A



* **Economical microprocessor based converter**
* **User adjustable frequency span**
* **DC Power**
* **Six output options - factory set**
* **Din Rail or panel mount**

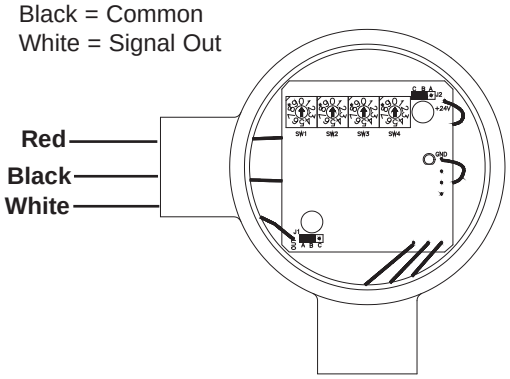
Technical Specifications:

Supply Voltage:	10-30 VDC*	**Input:**	0.25 Hz to 5 KHz
Update Time:	1/F + 25 msec	**Amplitude:**	1 Vp-p to 40 Vp-p
Linearity:	±0.01% of reading	**Output:**	0-20 mA, 0-5 V, 0-10 V, 4-20 mA, 1-5 V, 2-10V

***Note: for supply voltage below 24V consult factory for maximum load recommendations**

FIP

Red = 10-30 VDC
Black = Common
White = Signal Out



* **Meter mounted, microprocessor based converter**
* **User adjustable frequency span**
* **DC Power**
* **Six output options - factory set**
* **3 pin electrical plug connector or 1/2" NPT conduit connection**

Technical Specifications:

Supply Voltage:	10-30 VDC*	**Input:**	0.25 Hz to 5 KHz
Update Time:	1/F + 25 msec	**Amplitude:**	1 Vp-p to 40 Vp-p
Linearity:	±0.01% of reading	**Output:**	0-20 mA, 0-5 V, 0-10 V, 4-20 mA, 1-5 V, 2-10V

***Note: for supply voltage below 24V consult factory for maximum load recommendations**

Enclosure Certifications:

NEC Class I Groups C, D; Class II Groups E, F,G
UL Standard 886 - CSA Standard C22.2 No. 30

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AW FLOW METERS

DSV-100
I/P Converter

Technical Specifications:

- Digital processing
- Programmable set-up
- Pressure rating up to 100 PSI
- Din Rail or Panel Mount
- Integral LED display modes
- Lightweight compact design
- Multiple input modes
- Front touch key control

What is a DSV-100 I/P Converter?

The DSV-100 I/P Converter is a compact high performance digital servo pressure control valve. Accepting either current, voltage or touch key input, the I/P Converter precisely regulates air pressure for directing process control valves and air or fluid regulators. The microprocessor-based converter delivers high accuracy pressure regulation with extremely low dynamic response times for improved process control and high product quality. A highly visible integral LED display eliminates the need to any additional display components, providing a display of actual pressure, set point pressure or the actual pressure deviation from set point. Additional diagnostic test modes measure the system response time or checks for line leaks providing actual real-time data invaluable in commissioning, monitoring or troubleshooting an installation. User set-up of output pressure range and input voltage or current-span is accomplished quickly and easily via the two touch keys and display. The lightweight design and compact DIN rail mount package maximizes panel component density while the push-in type 1/4” pneumatic hose connectors and 5 pin style electrical connection with molded cable assemblies minimize installation time and cost.

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AW FLOW METERS

DSV-100 Series I/P Converter

Converter Technical Data

Power Requirements:

Supply Voltage	10 - 24 VDC
Supply Current	85 mA. @ 15 VDC

Signal Output:

Pressure Signal	0-5 VDC

(Actual pressure, 0 to 100% of programmed output range)

Signal Inputs:

Voltage Input	0-5, 0-10 or 1-5 VDC
Voltage Input Impedance	10 Kohm
Current Input	0-20 mA, 4-20 mA
Current Input Impedance	250 ohm

Specifications:

Pressure Range	0-100 psig
Output Pressure	0-100% (programmable)
Flow Rate, 100 psig @ Inlet	0.6 SCFM max
Recommended Filtration	20 Micron
Min. Closed End Volume	2.13 cu. in. (35 ml)
Linearity (typical)	±0.1% F.S.
Hysteresis (typical)	±0.1% F.S.
Repeatability (typical)	±0.2% F.S.
Accuracy (typical)	±0.3% F.S.

Wetted Parts:

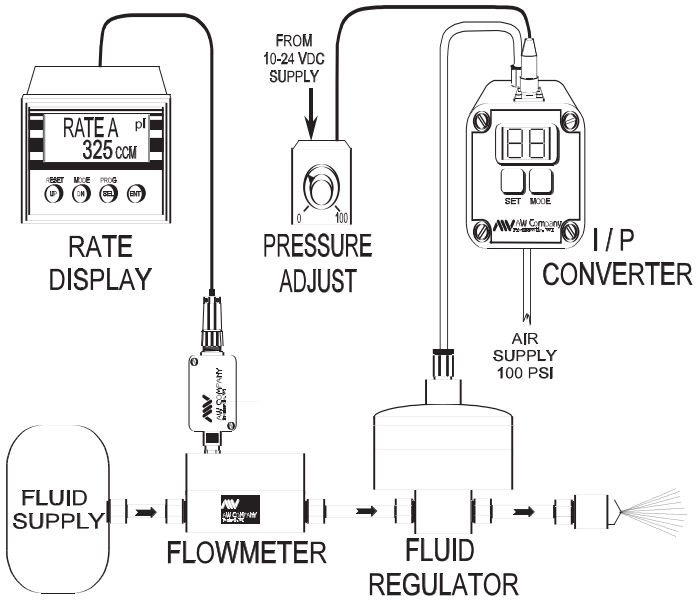
Elastomers	RTV, Glass
Manifold	Aluminum
Valves	Nickel Plated Brass
Press. Transducer	RTV, Aluminum, Plastic

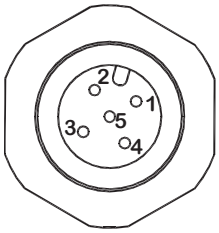
Physical:

Operating Temp. Range	32-158°F (0-70°C)
Weight	1.0 lb (.45 Kg.)
Housing	Polycarbonate
Protection Rating	NEMA 12 (IP55)

Dynamic Response:

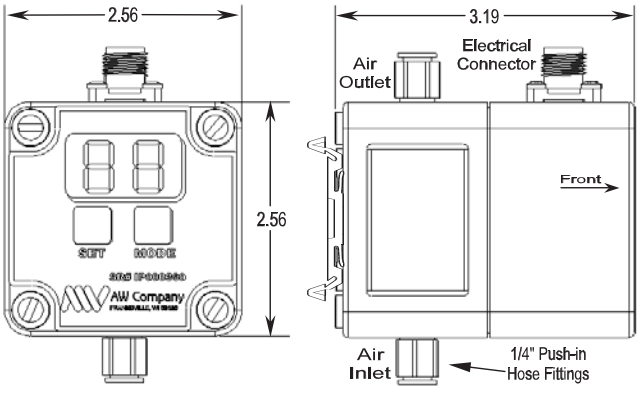
10 - 90% F.S. Rated Output	180 ms.
Response Test Volume	0.76 cu. in. (12.5 ml)

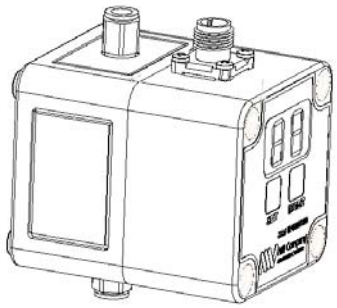




Electrical Connection for Voltage Input	Connector Pin
10-24 VDC Supply	1-Supply
Supply/Signal Common	2-Ground
Control Voltage Signal	3- +M/mA In
Not used	4-Not used
Analog Pressure Output	5-Analog Output 0-5V

Electrical Connection for Voltage Input	Connector Pin
10-24 VDC Supply	1-Supply
Supply Common	2-Ground
+ mA Control Signal	3- +V/mA In
-mA Control Signal	4- -mA
Analog Pressure Output	5-Analog Output 0-5V





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AW FLOW METERS

ProScan™
In-Line Process Sensor

Technical Specifications:

- Monitors turbidity and product concentration
- 4-20 mA output
- Detects phase transitions
- Registered with 3-A Sanitary Standards
- NEMA 6/ IP67 enclosure
- Sanitary clamp connections
- 316L Stainless steel construction
- Sapphire lens

What is a ProScan In-line Process Sensor?

ProScan is an in-line optical sensor that uses NIR technology to accurately and instantly detect product transitions, monitor turbidity and measure product concentrations at all stages of your liquid process. Utilizing advanced optical technology, ProScan sends a beam of light into the process and measures the backscatter. The intensity of this scatter is proportional to solids concentration. ProScan's internal microprocessor converts this scatter to a linearized 4-20 mA output which can easily link to a PLC, DCS or data logger. ProScan acts as an eye in your process to allow real-time process control and help improve product quality, improve automation, reduce BOD charges, reduce shrinkage and reduce water and utility charges. ProScan has a history of successful use with over 100 leading companies in North America, including applications in dairy, brewing, meat and juice processing. ProScan is registered with 3-A Sanitary Standards and features a sapphire lens and 316 stainless steel body.

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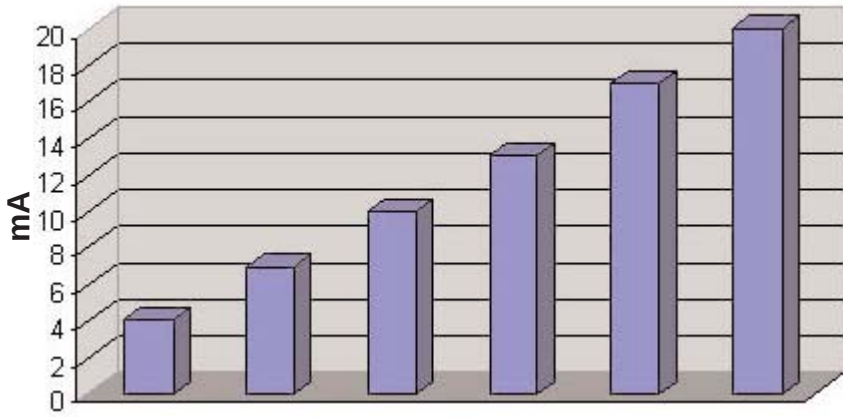
AW FLOW METERS

ProScan™
In-Line Process Sensor

Sensor Technical Data

Body & Connector:	316L Stainless Steel
Optical Lens:	Sapphire
Lens Seal:	FDA approved silcone rubber
Process Connections:	1 1/2", 2", 2 1/2" or 3" Sanitary Clamp
Output:	4-20 mA
Power Consumption:	0.45 Watts
Supply Voltage:	15-24 VDC
Temperature Rating:	32 ° to 212° F Constant 32 ° to 300° F Intermittent
Enclosure Protection:	NEMA 6/ IP67

Typical ProScan Response with Fluid Milk Products



Utilizing advanced optical and microprocessor technology, ProScan produces a linearized 4-20 mA output that can be tailored to a virtually limitless range of applications. The sensor attaches directly to the process line and allows real-time, in-line analysis of fluid streams. The sapphire lens and 316 stainless steel construction will withstand the high temperatures, rapid temperature fluctuations and chemical agents typical in food and pharmaceutical processes. The simple design allows plant personnel to install, tune and maintain it with ease.

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Don't Let Your Profits Go Down The Drain

ProScan acts as an eye in your process to provide critical information for process control. ProScan can be installed virtually anywhere in the production or waste stream where it is important to detect process interfaces, monitor turbidity or measure product concentrations. In pasteurizer lines, a popular installation site is downstream of the HTST. The ProScan signal can be used to switch valves and direct the liquid stream to the filler, recirculate it or divert to drain. ProScan is also a valuable tool to control CIP prerinse cycles and maximize product recovery. The simple NIR sensor helps processors recover as much product as possible before initiating cleaning and helps to ensure expensive chemicals are added at the appropriate time. Further, by monitoring the solids level and turbidity of the process, ProScan can help determine if the fluid should be added to product recovery tanks or sent to the drain. In addition, ProScan can act as an excellent monitor of BOD loading on waste lines. From receiving lines to pasteurizing lines to filling lines to waste lines, ProScan offers an economical solution to your process control needs.

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