Oval Gear
Industrial Oval Gear Flow Meters

Industrial OG meter series IOG

Inline and flanged oval gear meter

DESCRIPTION

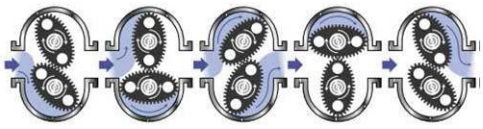
The industrial OG meter is a modular flow meter design, economical yet highly accurate and rugged. Due to the rugged nature of this particular flow measurement technology, the industrial OG meter can be used in a number of applications where conventional meters are not acceptable.

ADVANTAGES

- Highest quality, made in Germany
- Cost effective and commercially competitive product due to the most up to date automated production techniques
- Wide range of sizes, materials, displays and component options
- Most items ex stock for fast delivery, benefit from low shipping cost
- Local support, worldwide

OPERATION PRINCIPLE

Fluid enters the inlet port and then passes through the metering chamber. Inside the chamber, fluid forces the internal gears to rotate before exiting through the outlet port. Each rotation of the gears displaces a specific volume of fluid. As the gears rotate, a magnet on each end of the gear pass a reed switch in the top-mounted register's circuit board. The reed switches send pulses to the microprocessor in the register to change the LED display segments. The oval gear meter can be used in conjunction with a variety of industrial registers.



FEATURES

- High accuracy and repeatability
- Insensitive to viscosity change – Maintains accuracy
- Not affected by pulsating flows
- Can be mounted in tight pipework and any orientation
- Most industrial communications and outputs available
- Custom options available
- ATEX approval, FDA conformity

APPLICATIONS

Whether the liquid being measured is very viscous or highly corrosive, the oval gear meter can handle it. The industrial oval gear is designed for a variety of chemical applications including petroleum based fluids, water solutions, and any other liquid compatible with the materials of construction.

PROCESS CONNECTIONS

Port size	Housing material	NPT/BSP (bar)	ANSI 150# (bar)	ANSI 300# (bar)	DIN (bar)	Tri-Clamp® (bar)
1/4"	PVDF	16	—	—	—	—
	Stainless	100				
	Aluminum	65	20	n/a	16	16
1/2"	Stainless	210				—
	Aluminum	140				
3/4"	PVDF	16	—	—	—	—
	Stainless	210	20	55	16	16
	Aluminum	140	—	n/a	—	—
1"	Stainless	210	20	55	16	16
	Aluminum	140		n/a		
1" HF	PVDF	16	—	—	—	—
	Stainless	210	20	55	16	16
	Aluminum	140	—	n/a	—	—
1 1/2"	Stainless	50	20	50	16	16
	Aluminum	50		n/a		—
2"	Stainless	40	20	40	16	10
	Aluminum	40		n/a		—
3"	Stainless	25	20	25	16	10
	Aluminum	25		n/a		—

High pressure ratings on request.

Badger Meter

Data sheet

TECHNICAL DATA

Housing & connection by size		
Sizes	1/4", 1/2“, 3/4“, 1“, 1“HF, 1 ½“, 2“ and 3“	
Aluminum	NPT, BSP, 150# flange, DIN flange EN 1092-1/05	
Stainless	NPT, BSP, 150# or 300#, DIN flange Tri-Clamp®	
PVDF	BSP, NPT	
Operating temperature	**Housing**	**Oval gears**
Stainless steel	-30 °C to +120 °C (-22 °F to +240 °F)	-30 °C to +120 °C
Plastic (PPS/LCP)	-30 °C to +80 °C (-22 °F to +176 °F)	-30 °C to +80 °C
Aluminum	-30 °C to +120 °C (-22 °F to +240 °F)	
PVDF	-10 °C to +60 °C	
Storage temperature for all units	-55 °C / +125 °C	
Viscosity		
Max 1000 mPas with standard rotors / 500000 mPas* with high viscosity rotors		

FLOW RANGE

Port size	l/min	GPM	Fluid viscosity	Accuracy (%)	Accuracy PVDF (%)	Repeatability (%)
1/4" LF*	0,04 – 1,6	0,01 – 0,4	>5,0 cP	±1,0	±1,5	±0,03
	0,09 – 1,6	0,02 – 0,4	<5,0 cP	±1,5	±2,5	±0,03
1/4"*	0,25 – 8,3	0,067 – 2,2	>5,0 cP	±1,0	±1,5	±0,03
	0,44 – 8,3	0,11 – 2,2	<5,0 cP	±1,5	±2,5	±0,03
1/2“	1 – 30	0,25 – 8,0	>5,0 cP	±0,5	-	±0,03
	2 – 25	0,5 – 6,6	<5,0 cP	±1,5	-	±0,03
3/4“	2 – 60	0,5 – 16	>5,0 cP	±0,5	±1,5	±0,03
	4,5 – 53	1,2 – 14	<5,0 cP	±1,5	±2,5	±0,03
1“	2,3 – 68	0,6 – 18	>5,0 cP	±0,5	±1,5	±0,03
	5,3 – 60	1,4 - 16	<5,0 cP	±1,5	±2,5	±0,03
1“ HF	5,7 – 170	1,5 – 45	>5,0 cP	±0,5	-	±0,03
	9,5 - 150	2,6 - 40	<5,0 cP	±1,5	-	±0,03
	5,7 – 120	1,5 – 31	>5,0 cP	-	±1,5	±0,03
	9,5 – 120	2,6 – 31	<5,0 cP	-	±2,5	±0,03
1 ½“	9,5 – 245	2,5 – 65	>5,0 cP	±0,5	-	±0,03
	15 – 227	4,0 – 60	<5,0 cP	±1,5	-	±0,03
2“	15 – 380	4,0 – 100	>5,0 cP	±0,5	-	±0,03
	23– 380	6,0 – 100	<5,0 cP	±1,0	-	±0,03
3“	20 – 700	5,0 – 185	>5,0 cP	±0,5	-	±0,03
	38 – 700	10 – 185	<5,0 cP	±1,0	-	±0,03

*Special calibration with the following viscosities is possible for the 1/8” and 1/4" meters.

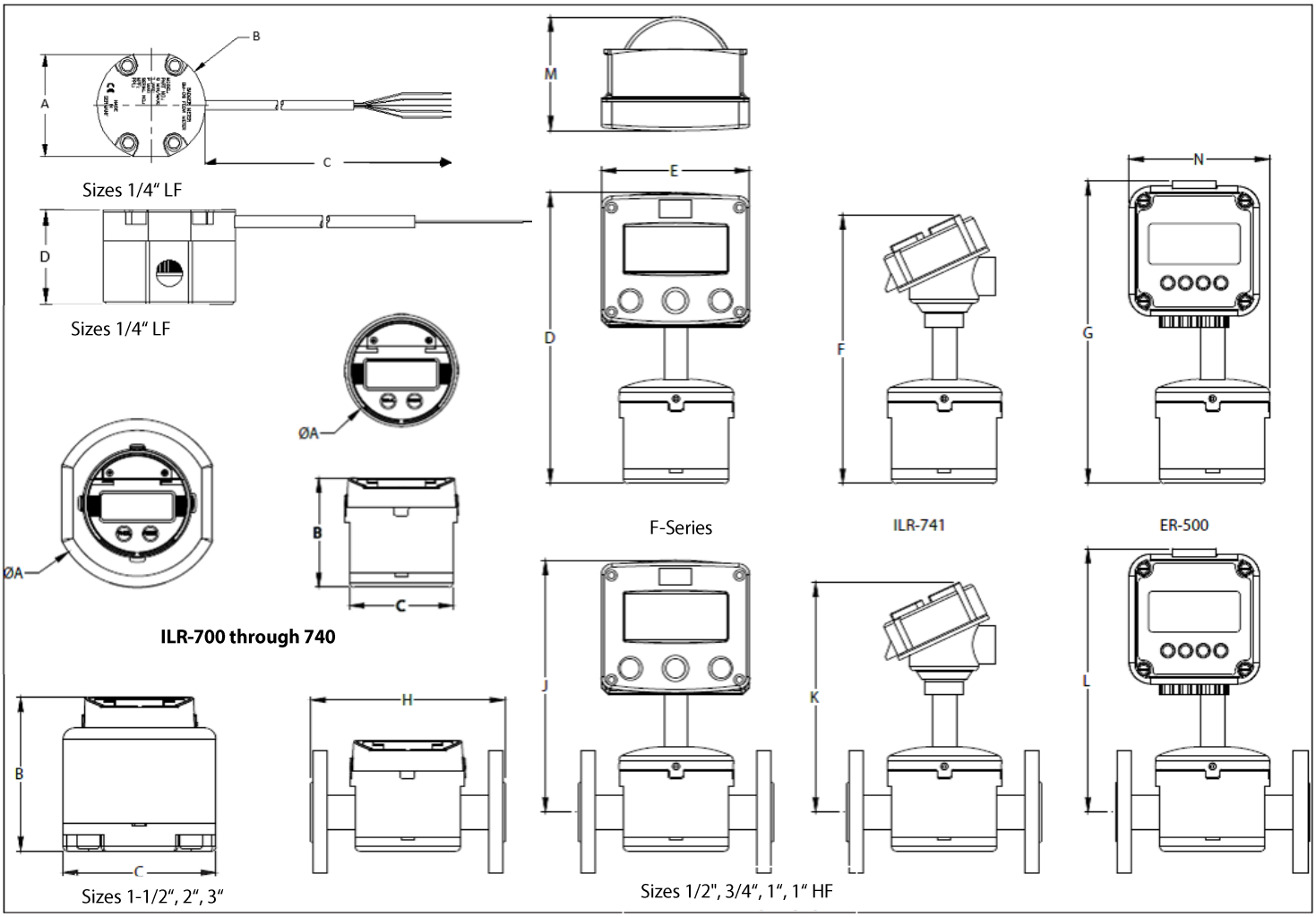
Part #	Medium	Viscosity	Accuracy (%)
CAL 1	ISO VG 2	2,7 cP (3,3 mm^2/sec)	±1,0
CAL 2	ISO VG 5	6,4 cP (7,6 mm^2/sec)	±0,8
CAL 3	ISO VG 10	18 cP (20,5 mm^2/sec)	±0,6
CAL 4	ISO VG 32	75 cP (87 mm^2/sec)	±0,4
CAL 5	ISO VG 100	290 cP (330 mm^2/sec)	±0,3

MATERIAL OF CONSTRUCTION

Port size	Housing	Cover	Spindle	Gears	Bearings	O-Ring	Bolts
1/4"	316 SS	316 SS	316 SS	316 SS	Graphite	Viton Aflas EPDM Kalrez	316 SS
	606 Al	6061 Al		PPS			
1/2"	316 SS	316 SS		316 SS	Graphite		
	6061 Al	6061 Al		LCP or PPS			
3/4"	316 SS	316 SS		316 SS	Graphite		
	6061 Al	6061 Al		LCP or PPS			
1"	316 SS	316 SS		316 SS	Graphite		
	6061 Al	6061 Al		LCP or PPS			
1" HF	316 SS	316 SS		316 SS	Graphite		
	6061 Al	6061 Al		PPS			
1 ½"	316 SS	316 SS		316 SS	Graphite		
	6061 Al	6061 Al		PPS			
2"	316 SS	316 SS		316 SS	Graphite		
	6061 Al	6061 Al		PPS			
3"	316 SS	316 SS		316 SS	Graphite		
	6061 Al	6061 Al		PPS			

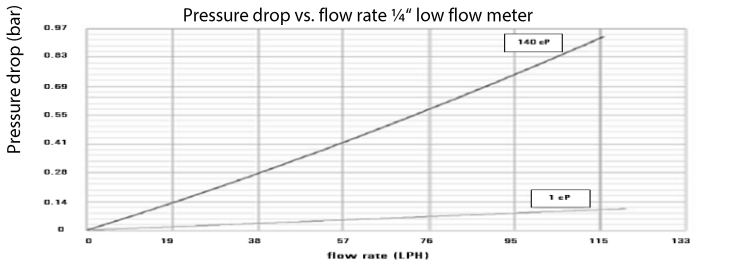
NOTE: All PVDF devices are supplied with Hastelloy-C spindles.

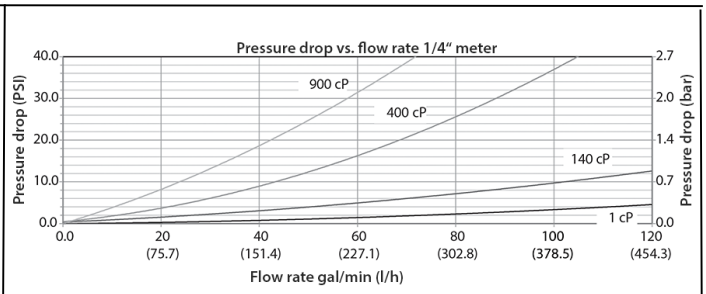
DIMENSIONS

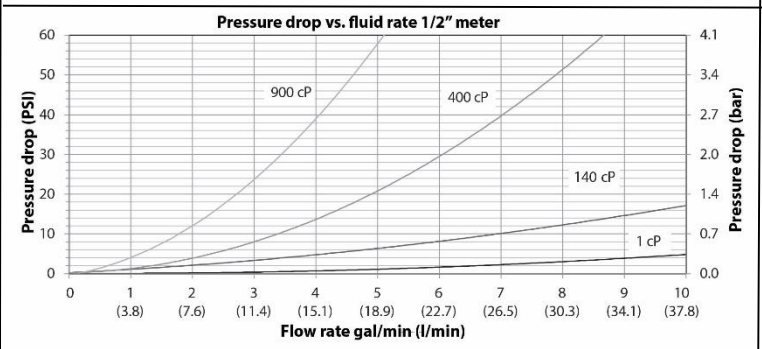


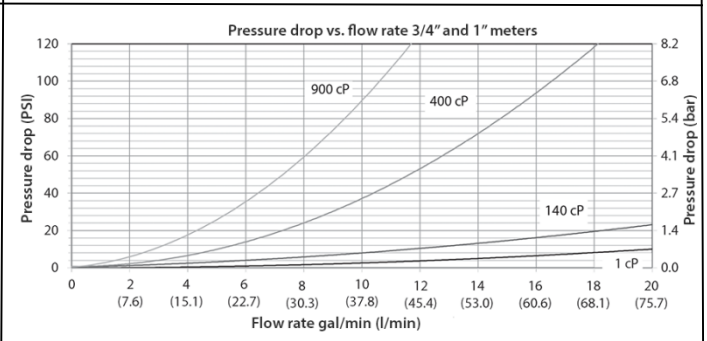
PORT SIZES - INCH (MM)

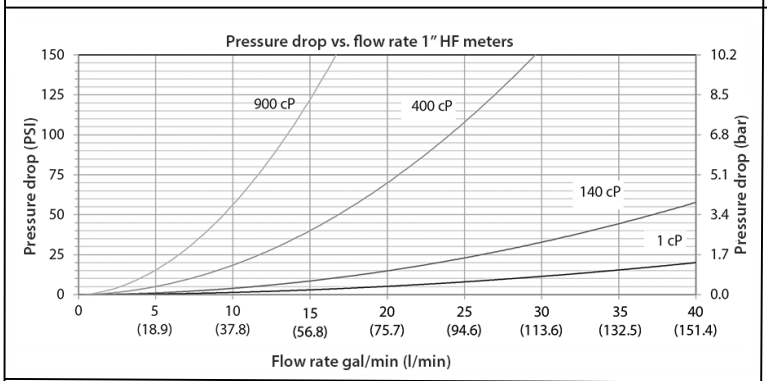
Port size	A	B	C	D	E	F	G	H	J	K	L	M	N
1/4″ LF	2,05″ (52 mm)	2,17″ (55 mm)	118″ (3000 mm)	1,54″ (39 mm)	—	—	—	—	—	—	—	—	—
1/4″	2,05″ (52 mm)	2,17″ (55 mm)	118″ (3000 mm)	1,54″ (39 mm)	—	—	—	—	—	—	—	—	—
1/2″	3,94″ (100 mm)	3,44″ (87,5 mm)	3,62″ (92 mm)	9,70″ (246,4 mm)	5,12″ (130 mm)	8,93″ (227 mm)	10,10″ (257 mm)	6,69″ (170 mm)	8,45″ (214,6 mm)	7,68″ (195,1 mm)	8,89″ (225,8 mm)	3,94″ (100,2 mm)	4,84″ (122,9 mm)
3/4"	3,94″ (100 mm)	3,84″ (98 mm)	3,62″ (92 mm)	10,10″ (257 mm)	5,12″ (130 mm)	9,33″ (237 mm)	10,50″ (267 mm)	6,69″ (170 mm)	8,70″ (221 mm)	7,93″ (202 mm)	9,14″ (232 mm)	3,94″ (100 mm)	4,84″ (123 mm)
1″	3,94″ (100 mm)	3,84″ (98 mm)	3,62″ (92 mm)	10,10″ (257 mm)	5,12″ (130 mm)	9,33″ (237 mm)	10,50″ (267 mm)	6,69″ (170 mm)	8,70″ (221 mm)	7,93″ (202 mm)	9,14″ (232 mm)	3,94″ (100 mm)	4,84″ (123 mm)
1″ HF	3,94″ (100 mm)	3,89″ (99 mm)	3,62″ (92 mm)	10,15″ (258 mm)	5,12″ (130 mm)	9,38″ (238 mm)	10,55″ (268 mm)	6,69″ (170 mm)	8,60″ (218 mm)	7,83″ (199 mm)	9,04″ (230 mm)	3,94″ (100 mm)	4,84″ (123 mm)
1-1/2″	5,51″ (140 mm)	4,93″ (125 mm)	4,92″ (125 mm)	11,15″ (283 mm)	5,12″ (130 mm)	10,38″ (268 mm)	11,51″ (293 mm)	8,35″ (212 mm)	8,90″ (226 mm)	8,13″ (207 mm)	9,31″ (237 mm)	N/A	N/A
2″	5,91″ (150 mm)	5,34″ (136 mm)	5,28″ (134 mm)	11,60″ (295 mm)	5,12″ (130 mm)	10,83″ (275 mm)	11,96″ (304 mm)	10,39″ (264 mm)	9,16″ (233 mm)	8,39″ (213 mm)	9,57″ (243 mm)	N/A	N/A
3″	8,27″ (210 mm)	6,35″ (162 mm)	7,09″ (180 mm)	12,57″ (320 mm)	5,12″ (130 mm)	11,80″ (300 mm)	12,93″ (329 mm)	13,54″ (344 mm)	9,58″ (244 mm)	8,81″ (224 mm)	9,99″ (254 mm)	N/A	N/A

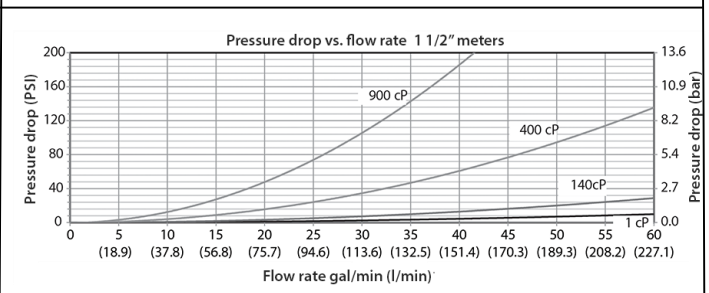

Pressure drop vs. flow rate ¼" low flow meter
Pressure drop (bar)
0.97
0.83
0.69
0.55
0.41
0.28
0.14
0
140 cP
1 cP
0
19
38
57
76
95
115
133
flow rate (LPH)

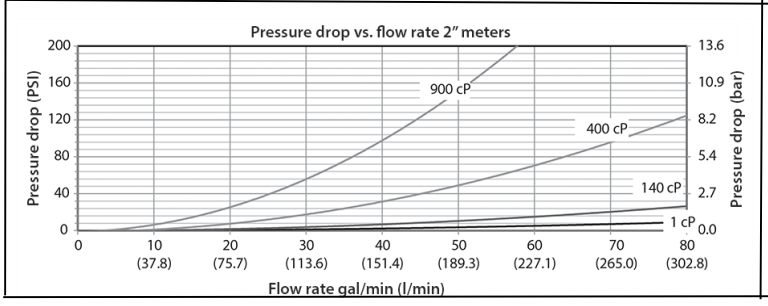

Pressure drop vs. flow rate 1/4" meter
Pressure drop (PSI)
40.0
30.0
20.0
10.0
0.0
2.7
2.0
1.4
0.7
0.0
Pressure drop (bar)
900 cP
400 cP
140 cP
1 cP
0.0
(75.7)
20
(151.4)
40
(227.1)
60
(302.8)
80
(378.5)
100
120
(454.3)
Flow rate gal/min (l/h)

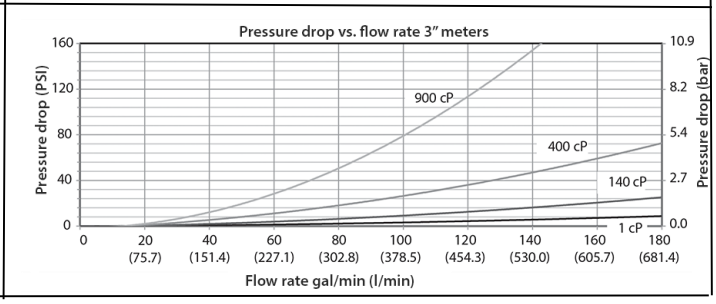

Pressure drop vs. fluid rate 1/2" meter
Pressure drop (PSI)
60
50
40
30
20
10
0
4.1
3.4
2.7
2.0
1.4
0.7
0.0
Pressure drop (bar)
900 cP
400 cP
140 cP
1 cP
0
1
(3.8)
2
(7.6)
3
(11.4)
4
(15.1)
5
(18.9)
6
(22.7)
7
(26.5)
8
(30.3)
9
(34.1)
10
(37.8)
Flow rate gal/min (l/min)


Pressure drop vs. flow rate 3/4" and 1" meters
Pressure drop (PSI)
120
100
80
60
40
20
0
8.2
6.8
5.4
4.1
2.7
1.4
0.0
Pressure drop (bar)
900 cP
400 cP
140 cP
1 cP
0
2
(7.6)
4
(15.1)
6
(22.7)
8
(30.3)
10
(37.8)
12
(45.4)
14
(53.0)
16
(60.6)
18
(68.1)
20
(75.7)
Flow rate gal/min (l/min)


Pressure drop vs. flow rate 1" HF meters
Pressure drop (PSI)
150
125
100
75
50
25
0
10.2
8.5
6.8
5.1
3.4
1.7
0.0
Pressure drop (bar)
900 cP
400 cP
140 cP
1 cP
0
5
(18.9)
10
(37.8)
15
(56.8)
20
(75.7)
25
(94.6)
30
(113.6)
35
(132.5)
40
(151.4)
Flow rate gal/min (l/min)


Pressure drop vs. flow rate 1 1/2" meters
Pressure drop (PSI)
200
160
120
80
40
0
13.6
10.9
8.2
5.4
2.7
0.0
Pressure drop (bar)
900 cP
400 cP
140cP
1 cP
0
5
(18.9)
10
(37.8)
15
(56.8)
20
(75.7)
25
(94.6)
30
(113.6)
35
(132.5)
40
(151.4)
45
(170.3)
50
(189.3)
55
(208.2)
60
(227.1)
Flow rate gal/min (l/min)


Pressure drop vs. flow rate 2" meters
Pressure drop (PSI)
200
160
120
80
40
0
13.6
10.9
8.2
5.4
2.7
0.0
Pressure drop (bar)
900 cP
400 cP
140 cP
1 cP
0
10
(37.8)
20
(75.7)
30
(113.6)
40
(151.4)
50
(189.3)
60
(227.1)
70
(265.0)
80
(302.8)
Flow rate gal/min (l/min)


Pressure drop vs. flow rate 3" meters
Pressure drop (PSI)
160
120
80
40
0
10.9
8.2
5.4
2.7
0.0
Pressure drop (bar)
900 cP
400 cP
140 cP
1 cP
0
20
(75.7)
40
(151.4)
60
(227.1)
80
(302.8)
100
(378.5)
120
(454.3)
140
(530.0)
160
(605.7)
180
(681.4)
Flow rate gal/min (l/min)

INDUSTRIAL LINE REGISTERS

TYPE ILR 700, 701, 740, 750

DESCRIPTION

The electronic register module contains a microprocessor board powered by a lithium battery. It can be programmed to batch in liters, pints, quarts, or gallons and will totalize in liters or gallons. A calibration factor and unit of measure are programmed during factory test. Unlike mechanical registers, these units can be electronically recalibrated in the field when necessary. A 6-digit LC display, accurate to three decimal places, shows the exact amount of fluid that has passed through the meter. The entire register module is protected from normal wear and tear by a rugged, shock resistant housing.
If the total dispensed exceeds 999.999 then the display will shift and only 2 digits will be displayed after the decimal point, 9999.99 and will continue to shift to the maximum value of 999999. After reaching 999999 the batch totalizer will rollover to 0.000. The batch totalizer is reset to zero when the reset button is depressed.
The register also has a resettable totalizer that requires that the total and reset button both be depressed to reset (hold the "Total" button, then press the "Reset" button to reset this totalizer while resettable totalize is displayed). This would be used for multiple batch totalization purposes.
The register´s life time totalizer is 11 digits and will either be in gallons or liters based on the unit of measure selected. Pushing and holding the total button while the life time totalizer is displayed will display the full 11-digit life time totalizer value.

OPERATION

Industrial oval gear meter has magnets on the gears that cause the reed switches to send pulses to the register as they rotate.

The register is in a sleep mode until it detects these pulses caused by fluid going through the meter. The micro-processor in the register then measures the flow and will display either the batch totalization or the flow rate of the fluid going through the meter on the 6-digit display.

The registers batch totalizer is a 6-digit display with three places of resolution after the decimal point.

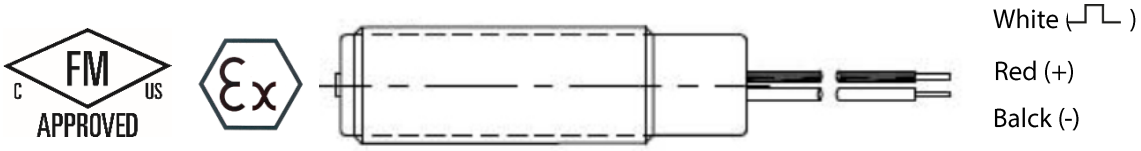
FEATURES

- Large six digit LCD display
- Display in liters, pints, quarts or gallons, freely programmable
- 11 digits, non-resettable lifetime totalizer and 6 digits, resettable totalizer
- ILR series: -20 °C to +80 °C (-4 °F to +140 °F)
- Replaceable long life battery
- Calibration factor saved in non-volatile memory
- 9 point linearization (ILR 750, ILR 701). Test medium is water – please con-tact your sales representative for calibrations with other liquids
- Scalable pulse output (ILR 750)
- 4-20 mA output (ILR 750)
- Protection class IP65

Register model	Register features
ILR 700 standard register	Flow rate or totalizer display selectable in the programming menu Selectable unit of measure
ILR 701	9 point linearization
ILR 750 pulse output + 4-20 mA output	Scalable pulse output Ability to set pulse output length Analog 4-20 mA output representing the flow rate of the meter Minimum and maximum values can be set for analog output 9 point linearization
Note: The ILR 701 and 750 all have the standard features of the ILR 700.	
ILR 740 transmitter	Transmitter (reed switch)

ATEX SENSOR

NPN / PNP



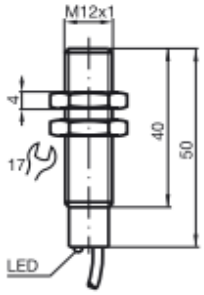
TECHNICAL DATA

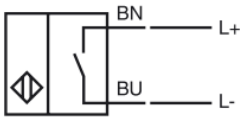
Switching function	Open collector
Output type	NPN or PNP 3-wire (2 versions available)
Supply voltage	5-30 VDC (I ≤ 15 mA)
Supply current	100 mA max (Pmax = 0,66 watt)
Effective internal inductivity	Ci ≤ 12 nF
Effective internal inductance	Li ≤ 0 µH
Cable length	3 meters
Material	Stainless steel 1.4404 (316L)
Protection class	IP66 / IP67

MARKING

USA	Intrinsically safe Class I, II, III, Division 1 GROUP ABCDEFG T6 to T5 Class I, Zone 0, AEx ia IIC T6 to T5
Canada	Intrinsically safe Class I, Division 1 GROUP ABCD T6 to T5 Class I, Zone 0, Ex ia IIC T6 to T5
ATEX	Ex II 1G Ex ia IIC T6 to T4 Ga
IIECEx	Ex ia IIC T6 to T4 Ga

NAMUR SENSOR





TECHNICAL DATA

Switching function	Normally open (NO)
Output type	NAMUR 2-wire
Nominal voltage	Uo 8,2 V (Ri ca. 1 kΩ)
Effective internal inductivity	Ci ≤ 15 nF; a cable length of 10m is considered
Effective internal inductance	Li ≤ 35 µH; a cable length of 10m is considered
Switch state indicator	LED (yellow)
Ambient temperature	-25 to 70°C (-13 to 158°F)
Cable length	2 meters (PVC)
Core cross-section	0,34 mm²
Material	Stainless steel 1.4404 (316L)
Protection class	IP66 / IP67

MARKING

Namur	CE 0102 / Ex II2G Ex ib IIC T6 Gb

REED AND HALL BOARD

DESCRIPTION

Using the reed or hall board, unscaled pulses can be transmitted from the meter to an evaluation instrument like a SPS or a flow computer. The size of the meter can be selected by the slide switch on the circuit board, so all meter sizes

½" - 3" are covered with only one circuit board. Further slide switches on the hall board enable various settings, as pulse doubling, pull-up resistance or signal invertion. As well both outputs can be used with only one or two separated power supplies.

PULSE FACTORS FOR ILR740, REED AND HALL BOARD

Size	Pulse per gallon	Pulse per liter
¼" LF *		Approx. 2170
¼" *		Approx. 390
½"	378,5	100
¾"	249,8	66
1"	249,8	66
1" HF	162,8	43
1 ½"	64,4	17
2"	34,1	9
3"	11,4	3

* 2 pulse outputs: 1 reed, 1 hall, standard for all ¼" meters.

FEATURES

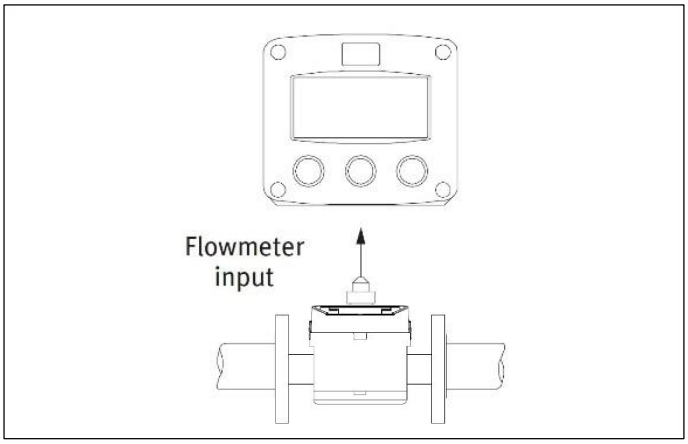
- One reed or hall board for all meter sizes (1/2"- 3")
- Meter size can be selected on the cicuit board
- Available in stainless steel 316, aluminium and POM (for PVDF version)

F-SERIES (F012, F018, F110, F131)

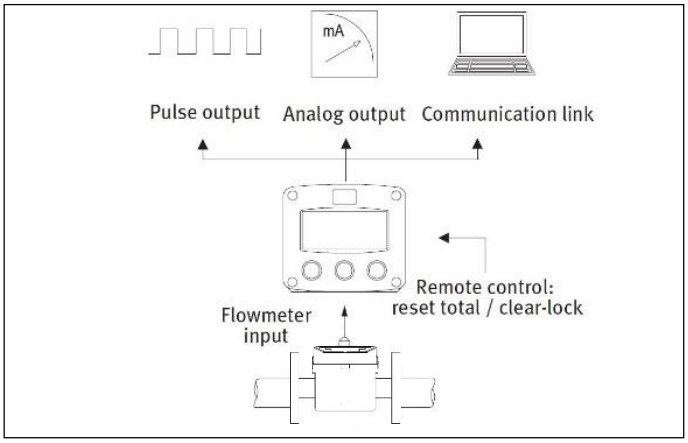
FEATURES

- With the F-series the following signals types can be processed: Turbine sine wave (coil) pick-ups, reed switches, hall-effect sensors and other active or passive.
- Analog output (0)4 – 20 mA or 0 – 10 V DC
- Modbus via RS232, RS485 or TTL interface
- Scaled pulse output
- HART 7.0 option
- Meter control
- ATEX markings for gas and dust applications are:
  II 1 G Ex ia IIC T4
  II 1 D Ex iaD 20 IP 65/67 T 100 °C.

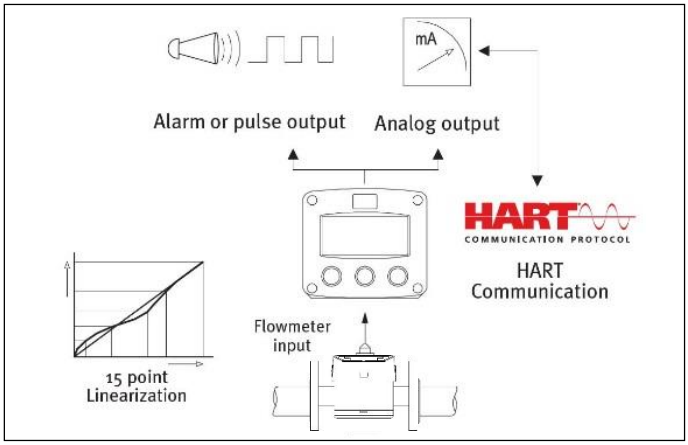
OVERVIEW APPLICATION F012



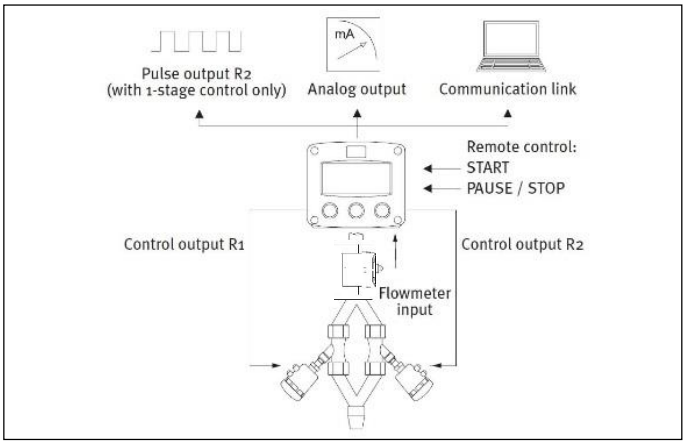
OVERVIEW APPLICATION F110



OVERVIEW APPLICATION F018



OVERVIEW APPLICATION F131



FLOW MONITOR ER-500

INPUT

Frequency range	1 to 3500 Hz
Frequency accuracy	±0,1 %
Over voltage protection	28 V DC

OUTPUTS

Analog:	4-20 mA

TOTALIZING PULSE

Optoisolated (ISO) open collector transistor, non-isolated open drain FET.

STATUS ALARMS

Open collector transistor, adjustable flow rate with programmable dead band and phase.

MODBUS

Modbus RTU over RS485, 127 addressable units / 2-wire network, 9600 baud, long integer and single precision IEEE754 formats; retrieve: flow rate, job totalizer, grand totalizer, alarm status and battery level; write: reset job totalizer, reset grand totalizer.

PROTECTION CLASS

NEMA 4X/IP 66

More information you get in the data sheet “Flow monitor ER-500”.

FEATURES

- Compact size.
- High accuracy and repeatability (0,05 %)
- Flexibility of installation options.
- Robust alarm parameters provide faster warning when something changes in the process or pipeline.
- Advanced connectivity options allow you to connect meters to your network for remote monitoring and process automation capabilities.
- Flexible power options include battery and 4-20mA loop power, providing a number of benefits including: The ability to install in remote location and be up and running immediately.
- Maintains readings and settings in the event of a power loss, and pro-long the life of the batteries for up to 6 years.
- An updated display and enhanced totalization options provide more flow information at your fingertips, including display of rate and total at the same time and standard, batch and grand totals.

Model	Size	Housing	Oval gear	Display	Connection	O-ring	High viscosity version*	Food type
	1/8"	SS316 **S**	SS316 **S**	**Reed / Hall**	BSP **1**	Viton **V**	**HV**	**FDA**
	¼"LF	Aluminum **A**	PPS **R**	**ILR701**	NPT **2**	Aflas **A**		
	¼"	PVDF **K**		**ILT750**		Kalrez **K**		
				FXXX		EPDM **J**		
				ER500				
Sample:								
IND-OG	**¼"LF**	**S**	**S**	**Reed/Hall**	**1**	**V**		

All 1/8" and ¼" meters are furnished with each 1 reed switch and 1 hall signal output in the cover. All displays (ILRXXX or FXXX) are supplied as remote version (cable length 2,5 meter).

*Oval gears in high viscosity version are used at fluid viscosity over 1000 mPas. Not available for sizes **1/8"** and **¼" LF**.

Model	Size	Housing	Oval gear	Display	Connection	O-ring	High viscosity version*	Remote version**	Food type
	½"	SS316 **S**	SS316 **S**	**ILRXXX**	BSP **1**	Viton **V**	**HV**	**R**	**FDA**
	¾"	Aluminum **A**	Vectra **Vec**	**FXXX**	NPT **2**	Aflas **A**		**RXX**	
	1"	PVDF **K**	PPS **R**	**Namur**	Flange ANSI 150 lbs **3**	Kalrez **K**			
				PNP	Flange DIN PN16 **4**	EPDM **J**			
				NPN	Tri-Clamp® **5**				
				ER500	Flange ANSI 300 lbs **6**				
Sample:									
IND-OG	**½"**	**A**	**Vec**	**F110**	**2**	**K**			

* Oval gears in high viscosity version are used at fluid viscosity over 1000 mPas.

** Remote version type R with 2.5 meters cable length, for longer cables use type **RXX** ("XX" in meter, for 5 meters **R5**)

Model	Size	Housing	Oval gear	Display	Connection	O-ring	High viscosity version*	Remote version**	Food type
	1"HF	SS316 **S**	SS316 **S**	**ILRXXX**	BSP **1**	Viton **V**	**HV**	**R**	**FDA**
	1 ½"	Aluminum **A**	PPS **R**	**FXXX**	NPT **2**	Aflas **A**		**RXX**	
	2"	PVDF **K**		**Namur**	Flange ANSI 150 lbs **3**	Kalrez **K**			
	3"			**PNP**	Flange DIN PN16 **4**	EPDM **J**			
				NPN	Tri-Clamp® **5**				
				ER500	Flange ANSI 300 lbs **6**				
Sample:									
IND-OG	**1"HF**	**S**	**R**	**ILR700**	**4**	**J**	**HV**		

* Oval gears in high viscosity version are used at fluid viscosity over 1000 mPas.

** Remote version type R with 2.5 meters cable length, for longer cables use type **RXX** ("XX" in meter, for 5 meters **R5**)