

KDG

Eletta Liquid Flow Monitors

Data sheet
IP325



Description

The Eletta range of liquid flow monitors have been reliably used for over 25 years in a variety of industrial applications.

They are designed and manufactured to the highest standards and now form a useful extension to Solartron Mobrey's Control and Instrumentation capability.

Applications for the Eletta range include cooling circuits, lubrication systems, pump protection, dosing systems, treatment plants or any process flow where reliable monitoring and alarm indication is required.

Operation

The monitors work on the well established principle of differential pressure measurement. An orifice plate installed in the flow line creates a pressure difference which when measured can be used to determine flow rate. This system offers many advantages where flow alarms and control are required, because of its simplicity and reliability. Ducts from either side of the orifice plate lead to the diaphragm. The diaphragm is coupled to a jointed level which actuates the switch and pointer mechanism. On the S2 indicator model, the switch is directly actuated, not by the movement of the indicator. When pressure difference (flowrate) exceeds or falls below the target value, the switch operates. On the S2, the indicator will also show the actual rate of flow.

Features

- High quality
- Long term reliability
- Economic
- Easy to install
- Fail safe
- Easy to maintain
- Simply re-ranged
- Variety of sizes, materials and flow ranges

Specification

Working Pressure 16 bar

Working Temp. -20 to +90°C (120°C optional)

Hysteresis, i.e. change of flow rate in relation to maximum value required to cause switch to change over approx 10%

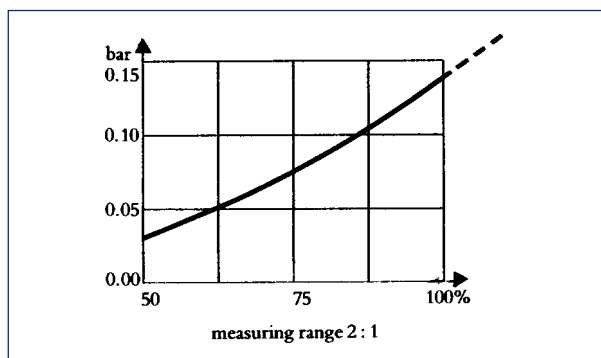
Accuracy of measurement approx $\pm 10\%$ of max. value (applies to water)

Repeatability of switch point approx $\pm 5\%$ of set point

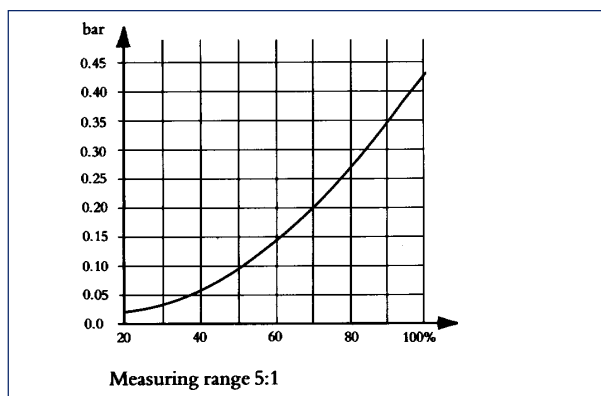
Viscosity 500 cSt maximum

Pressure Drop Graph (V1 and S2)

The curve indicates the approximate remaining pressure loss at different flow velocities within the measuring range.



Remaining pressure drop graph (V15 and S25)



Construction

Each unit comprises three basic sections.

- 1) The orifice housing, which is the pipe section containing the orifice plate and the pressure tapping. This section has either screwed fittings or is of wafer construction. There are 4 version GL, FA, GSS, FSS.
- 2) The diaphragm housing containing the differential pressure gauge.
- 3) The switch casing which contains either a switch on the V series or two switches and an indicator on the S series.

Materials

Switch Casing

Aluminium Alloy treated with alodine and epoxy compound.

Indicator Glass

Acrylic Plastic

Diaphragm Housing

Corrosion resistant copper alloy or stainless steel.

Diaphragm

Viton (textile reinforced fluorinated rubber) other wetted pressure gauge parts stainless steel.

Orifice Plates

Stainless steel (incl. spacer rings)

Orifice Housing

GL - Corrosion resistant copper alloy

GSS - Stainless Steel

FA - Epoxy plasticised cast iron.
Optional - Copper alloy

FSS - Stainless Steel

Protection

Standard - IP43 Optional - IP65

Switches

Single Pole 2 - way make and break.

Fully adjustable for individual setting of target value.

Contact Rating -

38v 10A

Breaking Currents at -

380v a.c. - 6A 250v a.c. - 10A

110v a.c. - 0.5A 24v a.c. - 2.5A

Options

VI Standard single switch 2 : 1 range

S2 Standard 2 switches Indicator
2 : 1 range

V15 } As standard but
S25 } flow range 5 : 1

Optional IP65 Protection on request

The GL series is intended for threaded connection and has internal threads ½" - 1½" B.S.P. The pipe fitting is made of corrosion - resistant copper alloy with orifice flange and spacer rings of stainless steel.

The GSS series is intended for threaded connection and has internal threads ½" - 1" B.S.P. The material is stainless steel throughout. O-ring seals of fluorinated rubber (viton).

The FA series is of the wafer type, i.e. the tubular section is inserted into the pipework between flanges and clamped in place by through bolts. The FA series has shut-off cocks by means of which the supply to the diaphragm housing can be shut-off so that the diaphragm can be removed for service, even during full scale operation. The pipe fitting is made of epoxy-plasticized cast iron as standard, but is also available in a special version made of corrosion-resistant copper alloy. The orifice plate and spacer rings are made of stainless steel.

The FSS series has no pipe fitting and consists only of an orifice plate which is clamped in between existent flanges in the pipework. The orifice plate has a neck to which the diaphragm housing is attached. The material is stainless steel throughout.

Note : The metal parts which come into contact with the liquid and which are not made of stainless steel are available with a coating of epoxy plastic or nickel plating (the latter by means of the canigen process).

GL Series



GSS Series



FA Series



FSS Series



Measuring Ranges V15 - S25	1 - 5 Range l/min	Constant	Measuring Ranges V15 - S25	1 - 5 Range l/min	Constant
GL15 d = 16	0.4 - 2	0.4	FA65 d = 70	20 - 100	20
	1 - 5	1		50 - 250	50
	2 - 10	2		100 - 500	100
	4 - 20	4		160 - 800	160
	6 - 30	6			
GL20 d = 21	8 - 40	8	FA80 d = 82	40 - 200	40
	6 - 30	6		80 - 400	80
	8 - 40	8		160 - 800	160
	15 - 75	15		240 - 1200	240
GL25 d = 27	6 - 30	6	FA100 d = 107	80 - 400	80
	12 - 60	12		160 - 800	160
	16 - 80	16		250 - 1250	250
GL40 d = 41	24 - 120	24	FA125 d = 132	400 - 2000	400
	8 - 40	8		100 - 500	100
	20 - 100	20		200 - 1000	200
FA50 d = 70	40 - 200	40	FA150 d = 159	400 - 1000	400
	60 - 300	60		200 - 1000	200
	20 - 100	20		400 - 2000	400
	40 - 200	40		600 - 3000	600
	70 - 350	70		900 - 4500	900
100 - 500	100	100	FA200 d = 207	400 - 2000	400
				600 - 3000	600
				1000 - 5000	1000
			1500 - 7500	1500	

Measuring Ranges

Types V1, and S2, 2 : 1 Flow range.

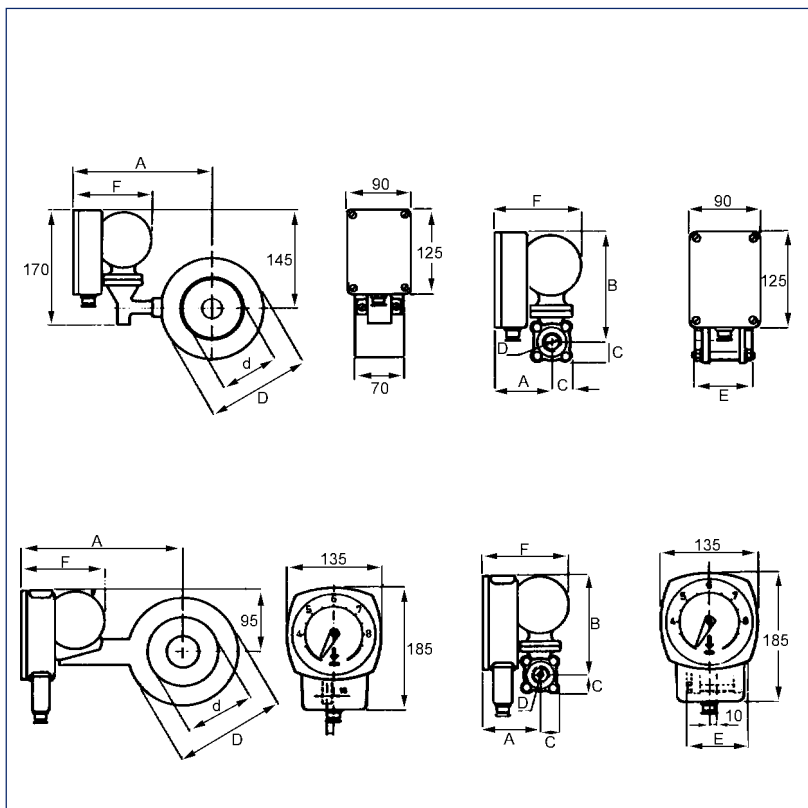
However flow can exceed maximum without damage.

Flow Range	½"	¾"	1"	1½"	2"	2½"	3"	4"	5"	6"	8"	Measuring Constant (S2)
0.4 - 0.8	x											0.1
0.6 - 11.2	x											0.15
1 - 2	x											0.25
1.6 - 3.2	x											0.4
2 - 4	x											0.5
2.4 - 4.8	x											0.6
3.2 - 6.4	x	x										0.8
4 - 8	x	x										1
6 - 12	x	x										1.5
8 - 16	x	x	x									2
10 - 20	x	x	x									2.5
12 - 24		x	x									3
16 - 32		x	x									4
20 - 40		x		x								5
24 - 48			x									6
28 - 56				x								7
36 - 72					x							9
40 - 80						x						10
60 - 120				x	x	x						15
80 - 160				x	x	x						20
120 - 240					x	x	x					30
160 - 320					x	x	x	x				40
240 - 480						x	x					60
280 - 560							x					70
320 - 640								x				80
400 - 800								x	x	x		100
600 - 1200									x	x	x	150
800 - 1600										x	x	200
1000 - 2000											x	250
1200 - 2400											x	300
1400 - 2800												350
1600 - 3200												400
2400 - 4800												600
GL	15	20	25	40	-	-	-	-	-	-	-	Screwed
GSS	15	20	25	-	-	-	-	-	-	-	-	Screwed
FA	15	20	25	40	50	65	80	100	125	150	200	Wafer
FSS	15	20	25	40	50	65	80	100	125	150	200	Wafer

Ordering information

- 1) Type No. -Switch case + orifice e.g. V1 - GL20
- 2) Measuring range (litres/min) e.g. 20 - 20
- 3) Flow direction (see installation) e.g. C
- 4) Details of liquid and conditions

Dimensional Drawings



Dimensions

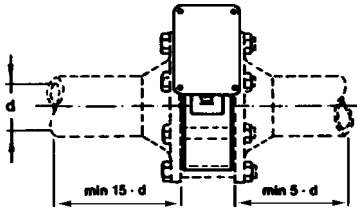
Screwed models

Type No.	A	B	C	D	E	F	Weight	
V1 - GL	15	75	150	30	½"	80	115	3.2
	20	75	150	30	¾"	80	115	3.1
	25	75	150	30	1"	80	115	3.1
	40	85	155	40	1½"	90	115	4.0
V1 - GSS	15	100	130	35	½"	53	120	2.7
	20	100	130	35	¾"	53	120	2.7
	25	100	130	35	1"	53	120	2.7
S2 - GL	15	85	150	30	½"	80	125	3.8
	20	85	150	30	¾"	80	125	3.7
	25	85	150	30	1"	80	125	3.7
	40	95	160	40	1½"	90	125	4.5
S2 - GSS	15	110	130	35	½"	53	130	3.3
	20	110	130	35	¾"	53	130	3.3
	25	110	130	35	1"	53	130	3.3

Wafer models

Type No.	A	d	D	F	Weight	
V1 - FA	50	180	55 (2")	109	115	5.5
	65	190	70 (2½")	129	115	6.5
	80	197	82 (3")	144	115	7.5
	100	207	107 (4")	164	115	8.0
	125	222	132 (5")	194	115	10.5
	150	235	159 (6")	221	115	12.0
	200	263	207 (8")	276	115	14.0
V1 - FS	40	190	43 (1½")	94	120	3.0
	50	210	55 (2")	109	120	3.2
	65	220	70 (2½")	129	120	3.5
	80	228	82 (3")	144	120	3.7
	100	238	107 (4")	164	120	4.0
	125	253	132 (5")	194	120	4.6
	150	266	160 (6")	221	120	5.1
	200	293	207 (8")	276	120	6.5
S2 - FA	50	190	55 (2")	109	125	6.0
	65	200	70 (2½")	129	125	7.0
	80	207	82 (3")	144	125	8.0
	100	217	100 (4")	164	125	8.5
	125	232	132 (5")	194	125	11.0
	150	245	159 (6")	221	125	12.5
	200	273	207 (8")	276	125	14.5
S2 - FSS	40	205	43 (1½")	94	130	3.5
	50	220	55 (2")	109	130	3.7
	65	230	70 (2½")	129	130	4.0
	80	238	82 (3")	144	130	4.2
	100	248	107 (4")	164	130	4.5
	125	263	132 (5")	194	130	5.1
	150	276	160 (6")	221	130	5.6
	200	303	207 (8")	276	130	7.0

Installation and Maintenance



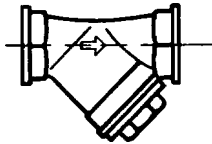
Instructions

In order to obtain a smooth flow through the instrument, the pipe run should be straight and should not contain any valves. A free pipe run of about 15 times the pipe bore upstream and 5 times downstream of the monitor is recommended. Hose connection with area reducing hose nipples should be done only after this run.

Pipe fittings in the GL and GSS series are sized for threaded connection to pipe as per SMS 326 (ISO R 65).

Pipe fittings from the FA and FSS series are sized for flange connection as per SMS 2033 (ISO 2084 NP 16).

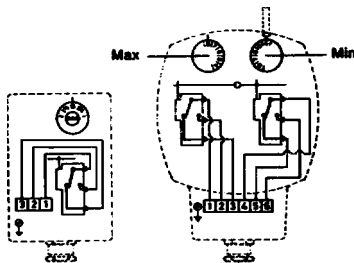
Gaskets for FA and FSS are included in the delivery.



Filter

The monitor can be installed in any position, but should not be installed with the diaphragm housing facing downwards, since the housing may then function as a collection point for impurities in the liquid may contain impurities which are larger than the opening in the orifice flange for the measuring range in question, a filter must be installed in the system upstream of the monitor. KDG can supply such a filter by special order. Examples of orifices for small measuring ranges where a filter is recommended :-

4 - 8 = 6, 7 mm Ø. 2 - 4 = 4, 7mm Ø
1 - 2 = 8.3 mm Ø. 0.4 - 0.8 = 2 mm Ø

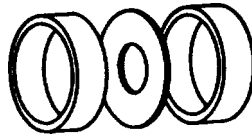


Setting of target value

Unless otherwise specified on ordering, V1 is delivered with the switch adjusted so that it changes over at the average value for the measuring range (adjusting dial setting 1.5). The adjusting dial on model V1 is marked 1, 1.25, 1.5, 1.75, 2. The figure directly opposite the index marking multiplied by the min. value for the monitor (stamped on the data plate) = actual flow. On S2, the switches are set to change over at min. (min. adjusting dial 4) and max. (max. adjusting dial 8). These values can be reset as follows : Undo the 2 screws which retain the cover on the top of the S2 casing. This renders the adjusting dials accessible. On the inside of the cover is a key to guide the adjustment. The S2's adjusting dials are marked in the same way as the indicator dial face and should be turned so that the figure for the desired value is directly opposite the index marking for the adjusting dial in question.

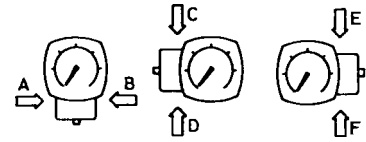
If both dials are to set to the same value, both switches will switch at the same time. The flow rate is obtained by multiplying the pointer reading by the measuring constant attached to the pointer dial face.

The wiring diagram illustrates the switching function when the flow is zero.



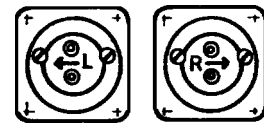
Change of measuring range

Undo the through bolts which clamp the monitor between the flanges in the pipework. (Do not unscrew the threaded flanges on the GL monitors). Remove enough bolts so that the monitor can be withdrawn. Remove one of the spacer rings which hold the orifice flange in place. On the FA monitor, the orifice flange is fixed by means of 2 screws. Replace the orifice flange with a new flange with another measuring range, make sure to replace the data plate as well with a new one stamped with the new measuring range. Data plates are delivered with each separately ordered orifice flange. On S2, the measuring constant on the indicator dial face must also be changed. See the table on measuring ranges.



Changing the Installation Orientation

Unless otherwise specified upon ordering, the monitors are delivered for installation A. If the installation orientation is to be changed, proceed as follows : Remove the protective glass. Push the pointer in towards the dial face and upwards in the direction of the slot. Lift, and pass the round hole in the pointer over the centre of the pointer hub. Undo two screws which hold the dial face in position, turn the dial face 90° in the desired direction and screw in place. Replace the pointer. The pointer can therefore be mounted in four different positions. Make sure the correct position is chosen. When the monitor is stationary, the point tip should point towards the beginning of the red sector = 0 position. Make sure that the pointer is pushed by the spring so that it is engaged by the pointer hub. If the installation orientation of the monitor is changed, the flow direction selector may have to be replaced.



Changing the flow direction

Undo the four hexagonal-head screws which attach the diaphragm housing to the pipe fitting. The flow direction selector is then accessible and can be replaced by undoing the two screws which hold it in place. Make sure that all four O-rings are in place when the screws are refitted. Do not forget to turn the outer red arrow 180° when the flow direction is changed.

Flow direction selector R is used for installation orientations A, C, F (S2 monitor).

Flow direction selector L is used for installation orientations B, D, E (S2 monitor).

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