

# KDG

## Eletta Liquid Flow Monitors

Data sheet  
IP325



### 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

### 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.

The range consists of:

- |           |                                     |
|-----------|-------------------------------------|
| V Series  | Flow switches                       |
| S Series  | Flow switches with large indicators |
| R Series: | Flow transmitters                   |

### Applications

- ▶ Cooling circuits
- ▶ Lubrication systems
- ▶ Pump protection
- ▶ Dosing systems
- ▶ Treatment plants
- ▶ 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 (ISO5167/AGA3).

This system offers many advantages where flow alarms and control are required, because of its simplicity and reliability.

Tappings from either side of the orifice plate lead to the diaphragm. The diaphragm lever actuates the switch and pointer mechanism.

When the pressure difference (flowrate) exceeds or falls below the target value, the switch operates. On the S Series, the indicator will also show the actual rate of flow and on the R Series the transmitter will provide a 4-20mA proportional to flow rate.

**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/transmitter housing, which is either V Series, S Series or R Series

**V Series** is the basic model with a single micro-switch with an adjustable set point for flow rate alarm (V Series do not have local indicator)

**S Series** have a large clear local indication of flow rate (130mm dial) and an option of two micro-switches with independent adjustable set points for flow rate alarm. (e.g. Lo, Hi or Hi and Hi Hi.)

**R Series** provides an electronic output proportional to flow in the form of a 4-20mA or frequency output.

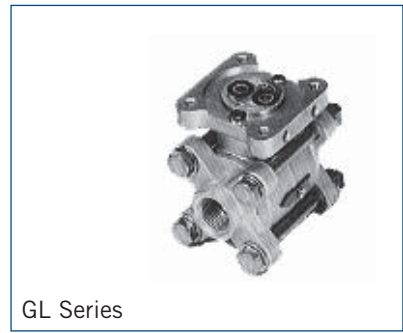
**The GL series** is intended for threaded connection and has female threads 1/2" - 1 1/2" B.S.P. The pipe fitting is made of corrosion - resistant copper alloy with orifice flange and spacer rings of stainless steel.

**The GSS series** is intended for threaded connection and has female threads 1/2" - 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. it is inserted into the pipework between flanges and clamped in place by through bolts. The FA series has shut-off cocks allowing the supply to the diaphragm housing to 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 for sizes 50mm to 400mm, and of corrosion-resistant copper alloy for sizes 15mm to 40mm. 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 existing 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

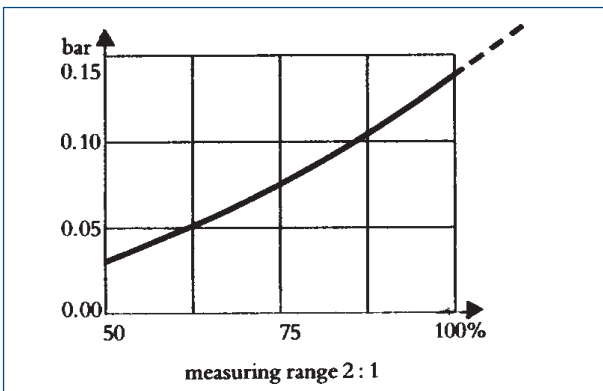


FA Series

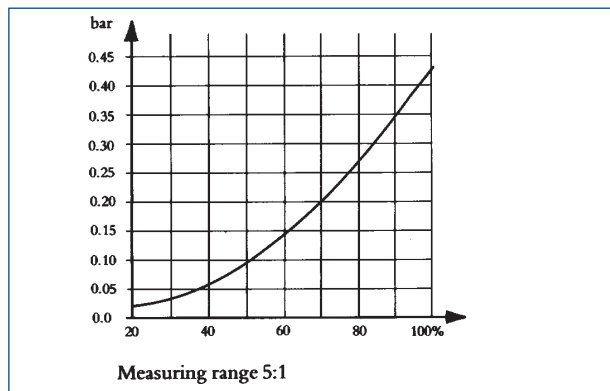


FSS Series

**Permanent Pressure Drop Graph (V1, R2 and S2)**



**Permanent pressure drop graph (V15, R5 and S25)**



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

## Measuring ranges and nominal size

### V1, S02, R2 (50-100%)

Nominal size	Pipe section	Flow range Litres/min	MCx(S2)		
<b>15</b> 1/2" DN 15	GL, GSS, FA, FSS	0.4 - 0.8	0.1		
		0.6 - 1.2	0.15		
		1 - 2	0.25		
		1.6 - 3.2	0.4		
		2 - 4	0.5		
		2.4 - 4.8	0.6		
		3.2 - 6.4	0.8		
		4 - 8	1		
		6 - 12	1.5		
		8 - 16	2		
		10 - 20	2.5		
		12 - 24	3		
16 - 32	4				
<b>20</b> 3/4" DN 20	GL, GSS, FA, FSS	4 - 8	1		
		6 - 12	1.5		
		8 - 16	2		
		10 - 20	2.5		
		12 - 24	3		
		16 - 32	4		
<b>25</b> 1" DN 25	GL, GSS, FA, FSS	8 - 16	2		
		10 - 20	2.5		
		12 - 24	3		
		16 - 32	4		
		24 - 48	6		
		36 - 72	9		
		40 - 80	10		
		50 - 100	12.5		
		<b>32</b> 1 1/4" DN 32	FA, FSS	20 - 40	5
				28 - 56	7
40 - 80	10				
60 - 120	15				
80 - 160	20				
<b>40</b> 1 1/2" DN 40	GL, FA, FSS FA, FSS	20 - 40	5		
		28 - 56	7		
		40 - 80	10		
		60 - 120	15		
		80 - 160	20		
<b>50</b> 2" DN 50	FA, FSS	40 - 80	10		
		60 - 120	15		
		80 - 160	20		
		120 - 240	30		
		160 - 320	40		
<b>65</b> 2 1/2" DN 65	FA, FSS	60 - 120	15		
		80 - 160	20		
		120 - 240	30		
		160 - 320	40		
		240 - 480	60		
<b>80</b> 3" DN 80	FA, FSS	120 - 240	30		
		160 - 320	40		
		240 - 480	60		
		320 - 640	80		
		400 - 800	100		
<b>100</b> 4" DN 100	FA, FSS	160 - 320	40		
		280 - 560	70		
		400 - 800	100		
		600 - 1200	150		
		700 - 1400	175		
<b>125</b> 5" DN125	FA, FSS	400 - 800	100		
		600 - 1200	150		
		800 - 1600	200		
		1000- 2000	250		
<b>150</b> 6" DN 150	FA, FSS	600 - 1200	150		
		800 - 1600	200		
		1200- 2400	300		
		1400- 2800	350		
		1500- 3000	375		
<b>200</b> 8" DN 200	FA, FSS	800 - 1600	200		
		1200- 2400	300		
		1600- 3200	400		
		2400- 4800	600		
		2500- 5000	625		
<b>250</b> 10" DN 250	FA, FSS	1600- 3200	400		
		2000- 4000	500		
		3200- 6400	800		
		4000- 8000	1000		

### V15, S05, S25, R5 20-100%

Nominal size	Pipe section	Flow range Litres/Min	MCx(S25)		
<b>1/2"</b> DN 15	GL, GSS, FA, FSS	0.4 - 2	0.4		
		1 - 5	1		
		2 - 10	2		
		4 - 20	4		
		6 - 30	6		
		8 - 40	8		
		<b>3/4"</b> DN 20	GL, GSS, FA, FSS	4 - 20	4
				6 - 30	6
8 - 40	8				
15 - 75	15				
<b>1"</b> DN 25	GL, GSS, FA, FSS	6 - 30	6		
		12 - 60	12		
		16 - 80	16		
		24 - 120	24		
<b>1 1/4"</b> DN 32	FA, FSS	30 - 150	30		
		8 - 40	8		
<b>1 1/2"</b> DN 40	GL, FA, FSS	20 - 100	20		
		40 - 200	40		
		8 - 40	8		
		20 - 100	20		
		40 - 200	40		
<b>2"</b> DN 80	FA, FSS	60 - 300	60		
		20 - 100	20		
		40 - 200	40		
		70 - 350	70		
<b>2 1/2"</b> DN 65	FA, FSS	100 - 500	100		
		20 - 100	20		
		50 - 250	50		
<b>3"</b> DN 80	FA, FSS	160 - 800	160		
		40 - 200	40		
		80 - 400	80		
		160 - 800	160		
		240 - 1200	240		
<b>4"</b> DN 100	FA, FSS	400 - 2000	400		
		80 - 400	80		
		160 - 800	160		
		250 - 1250	250		
<b>5"</b> DN 125	FA, FSS	400 - 2000	400		
		100 - 500	100		
		200 - 1000	200		
		600 - 3000	600		
<b>6"</b> DN 150	FA, FSS	600 - 3000	600		
		200 - 1000	200		
		400 - 2000	400		
		600 - 3000	600		
		900 - 4500	900		
<b>8"</b> DN 200	FA, FSS	600 - 3000	600		
		400 - 2000	400		
		1000- 5000	1000		
		1500- 7500	1500		
		2400- 12000	2400		
<b>10"</b> DN 250	FA, FSS	600- 3000	600		
		1000- 5000	1000		
		1600- 8000	1600		
		2400- 12000	2400		

The above tables show the maximum flow range achievable in each pipe size. However, it is possible to order a lower flow range indicated above.

MC = Measuring constant

## Specification

Flow range	0.4 - 25.000 l/min (liquid)
Wetted materials	Copper alloy (GL), epoxy painted cast iron (FA)
Seals	Nitrile (HNBR), EPDM and fluorinated rubber (FPM)
Max. pressure	16 bar (232 PSI)
Temperature	
Control unit	V & S srs: 0 to 90°C std (120°C opt.) R srs: 0 to 65°C
Pipe section	GL and FA 120°C max GSS and FSS: 250°C max
Enclosure	V & S srs: IP43 (NEMA3R) std IP65 (NEMA4) option R srs: IP65 (NEMA4)
Flow indication	S srs only: Large 130mm diameter with linear flow scale
Process connection	DN 15-40, BSP/NPT thread DN15-500 DIN/ANSI flange (wafer)
Alarm	V srs 1 microswitch S srs 2 microswitches independently adjustable within the ordered flow range
Accuracy	< +/-5% FS within 20-80% of flow range < +/-10% FS within 100% of flow range
Repeatability	< 2% actual
Viscosity	500 cST maximum

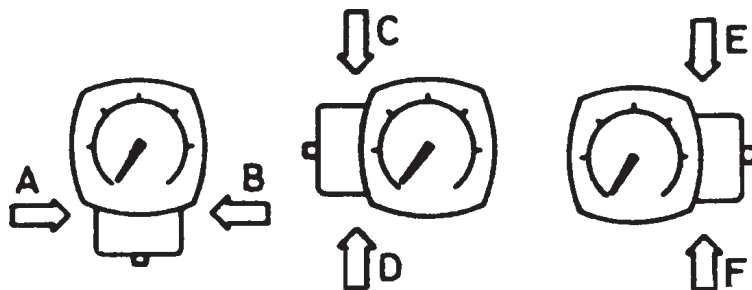
Micro switch spec.	Contact surfaces silver plated std. Type: SPDT Hystereses 10% Voltage max 460V ac Current max 15A Inductive load 15A at 380V ac 0,03A at 230V ac 5V at 30V dc For intrinsically safe applications, use gold plated contacts, suited to voltage and current limitations
Transmitter (R srs only)	
Power supply	24V dc +/- 10%
Output	4 to 20mA isolated load 1000 ohm max. or 200 to 1000 Hz isolated frequency (0 to 10V dc or open collector 24V max)
Accuracy	+/- 3% Full scale
Repeatability	< 2% Actual
Current consumption	50mA
CE Approvals	Eletta flow monitors conform to EU directive for low voltage no.72/23/EEC (EN60 2041 Pt 1) & electromagnetic compatibility according to the directive 89/336/EEC (EN 50081-1 & 50082-2). Complies with applicable parts in PE Directive 97/23/EG

## Ordering code

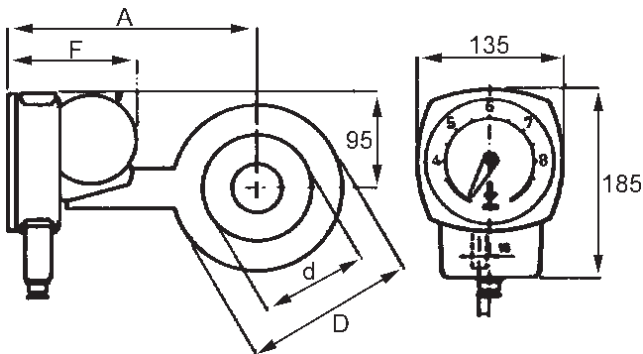
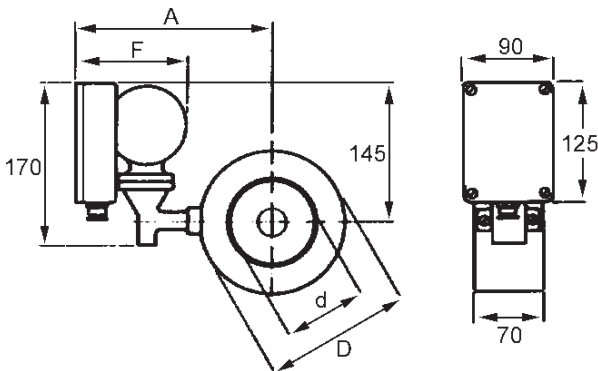
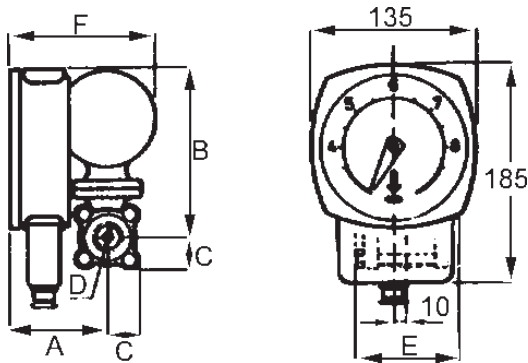
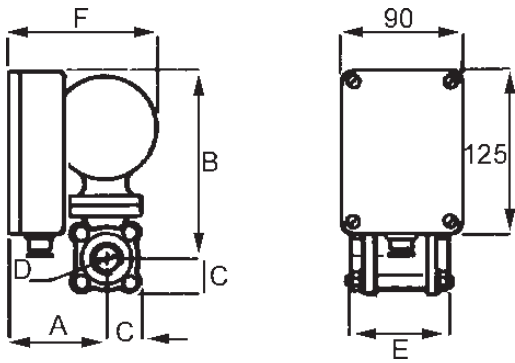
Code	Outputs and flow range
V1	Single switch 50 to 100% range IP43
V15	Single switch 20 to 100% range IP43
S2	Double switch 130mm flow indicator 50 to 100% range IP43
S25	Double switch 130mm flow indicator 20 to 100% range IP43
R2	Analogue output 50 to 100% range IP65
R5	Analogue output 20 to 100% range IP43
S02	130mm flow indicator 50 to 100% range IP43
S02	130mm flow indicator 50 to 100% range IP43
Code	Pipe fitting
GL	Brass body, screwed BSP female connection 15 to 40mm (½ to 1½")
FA	Epoxy painted cast iron (50 to 400mm) wafer fitting between flanges Bronze body (15 to 40mm)
GSS	Stainless steel 316 body, BSP female connections 15 to 40mm (½ to 1")
FSS	Stainless steel 316 15 to 400mm wafer fitting between flanges
Code	Nominal Bore (mm)
XX	Select nominal bore size from table 1
Code	Flow Range
aa-bb	Flow range from table 1 in IP325 (min to max) Litres per minute
Code	Flow Direction
X	From table 2 in IP325
Code	Options
00	None
01	Special switch to 120°C for V1, V15
02	Special switch to 120°C for S2, S25
03	IP65 protection for V or S series

S	GSS	25	12	60	A	00
---	-----	----	----	----	---	----



**Dimensions** All dimensions in mm



Screwed models

Type No.	A	B	C	D	E	F	Weight
<b>V/R - GL</b> 15	75	150	30	1/2"	80	115	3.2
20	75	150	30	3/4"	80	115	3.1
25	75	150	30	1"	80	115	3.1
40	85	155	40	1 1/2"	90	115	4.0
<b>V/R - GSS</b> 15	100	130	35	1/2"	53	120	2.7
20	100	130	35	3/4"	53	120	2.7
25	100	130	35	1"	53	120	2.7
<b>S - GL</b> 15	85	150	30	1/2"	80	125	3.8
20	85	150	30	3/4"	80	125	3.7
25	85	150	30	1"	80	125	3.7
40	95	160	40	1 1/2"	90	125	4.5
<b>S - GSS</b> 15	110	130	35	1/2"	53	130	3.3
20	110	130	35	3/4"	53	130	3.3
25	110	130	35	1"	53	130	3.3

Wafer models

Type No.	A	d	D	F	Weight
<b>V/R - FA</b> 50	180	55 (2")	109	115	5.5
65	190	70 (2 1/2")	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
<b>V/R - FS</b> 40	190	43 (1 1/2")	94	120	3.0
50	210	55 (2")	109	120	3.2
65	220	70 (2 1/2")	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
<b>S - FA</b> 50	190	55 (2")	109	125	6.0
65	200	70 (2 1/2")	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
<b>S - FSS</b> 40	205	43 (1 1/2")	94	130	3.5
50	220	55 (2")	109	130	3.7
65	230	70 (2 1/2")	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

**Solartron Mobrey Limited**

158 Edinburgh Avenue Slough Berks UK SL1 4UE  
 Tel: 01753 756600 Fax: 01753 823589  
 e-mail: sales@solartron.com www.solartronmobrey.com

Solartron Mobrey GmbH  
 Solartron Mobrey Ltd  
 Solartron Mobrey sp z o o  
 Solartron Mobrey AB  
 Mobrey SA  
 Solartron Mobrey SA-NV  
 Solartron Mobrey

Deutschland tel: 0211/99 808-0  
 China tel: 021 6353 5652  
 Polska tel: 022 871 7865  
 Sverige tel: 08-725 01 00  
 France tel: 01.30.17.40.80  
 Belgium tel: 02/465 3879  
 USA tel: (281) 398 7890



a Roxboro Group Company



The right is reserved to amend details given in this publication without notice