



FL-10

Flow Rate Indicator

Features

- / For liquid media
- / For media viscosities up to 600 cSt
- / Pressure up to 200 bar max.
- / Mechanical flow indication
- / Weatherproof enclosure box (IP65)
- / May be installed in any position
- / Size range from 1/4" to 8"
- / Adjustable under operating conditions
- / ATEX approved Explosion-proof models available

Description:

A spring loaded stainless steel flap inside the FL-10 is rotated around a symmetrical axis due to the upcoming flow and opens therefore a variable aperture. This rotation moves the mechanically coupled pointer on the clearly visible flow scale of the FL-10 proportional to the flow. The rotary motion can be used for mechanical display only, for switching a microswitch when the adjusted setpoint is reached or even to put out a 4...20 mA analogue output. The FL-10 can easily be used within potentially explosive atmospheres thanks to its ATEX approvals for the switching unit and the output module. The unique construction of the FL-10 allows an installation in any mounting position.

Application:

The FL-10 side flow indicators with flap are among the most robust flowmeters on the market. In theory, the user can completely disassemble and reassemble the device on site without any functional restriction. The devices are durable, accurate, and versatile. There are many material combinations for a variety of liquid media and sizes from DN10 to DN200, as well as pressure levels up to 200 bar. Larger variants can be supplied for intermediate flange mounting (sandwich) on request. Various options for the electrical outputs of the indicators predestine the FL-10 series against many other sight flow indicators and offers the customer a perfect industrial product.



Technical Specification:

Materials /

AL /	aluminum
B /	bronze
CI /	cast iron
CIK /	cast iron nickel plated
S /	carbon
SS /	stainless steel
PTFE /	PTFE (only up to 4" and 7 bar max.)
PVC /	PVC (only up to 4" and 7 bar max.)

Seal material /

S1 /	NBR (-40. . .+110 °C)
S2 /	EPDM (-40. . .+150 °C)
S3 /	FKM (-20. . .+200 °C)
S4 /	PTFE (-100. . .+250 °C)
S5 /	Perlast (-15. . .+330 °C)

max. Pressure /

LP	20 bar
MP	50 bar
HP	200 bar (CI, CIK, S & SS only)

max. Media temperature / -100. . .+330 °C (depending on the material and seal material)

Mounting position any position

Electrical Specification:

Switch /

3EE /	SPDT 3 wire
Switching load:	15 A @ 125/250 or 480 VAC 0,5 A @ 125 VDC / 0,25 A - 250 VDC
3EEG /	SPDT 3 wire with gold contacts
Switching load:	on request

3EE (ATEX zone 2 / zone 3) / SPDT micro switch (ATEX zone 2 / zone 3)
Switching load: on request

6EE (ATEX zone 2) / DPDT (ATEX zone 2)
Switching load: 2 micro switch, switching in parallel
10 A @ 125 or 250 VAC
0,3 A @ 125 VDC / 0,15 - 250VDC

AIR / pneumatic switch
Switching load: on request

POT / potentiometer (specify rating)
Switching load: on request

Analog out put /

OUT / 4. . .20 mA out put
Supply: on request

Rate totaliser /

TOT / digital rate totaliser
TOTX / digital rate totaliser (ATEX)

Measuring ranges:

Full scale values				
Process connection	FML l/min	FMM m ³ / h	FMG U.S. Gallons / min	FMB imp. Gallons / min
Size small				
1/4" - 1"	4 - 70	0,24 - 4,2	1,0 - 18,5	0,88 - 15,4
Size middle				
3/4" - 2"	40 - 500	2,4 - 30	10,6 - 132	8,8 - 110
2 1/2"	50 - 800	3 - 48	13,2 - 211	11 - 176
Size large				
3"	120 - 1500	7,2 - 90	32 - 400	26,4 - 330
4"	120 - 2000	7,2 - 120	32 - 530	26,4 - 440
6"	120 - 3500	7,2 - 210	32 - 925	26,4 - 770
8"	120 - 5000	7,2 - 300	32 - 1325	26,4 - 1100

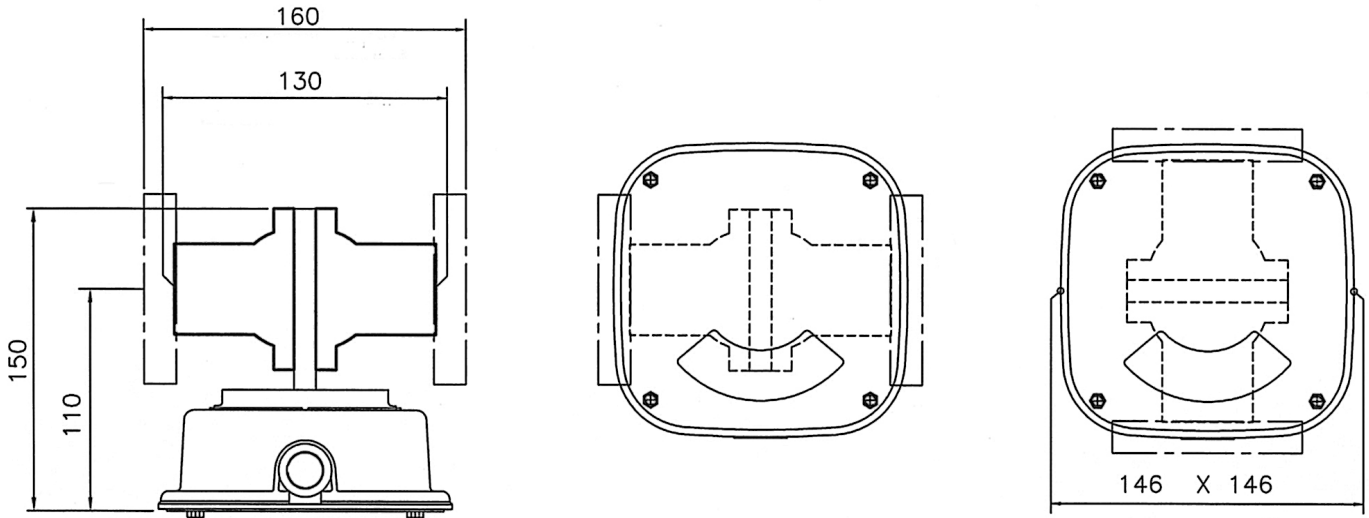
Odering Codes:

Oder number	FL-10.	FML.	K.	B.	LP.	ME.	[20.]	2.	F10.	S1.	L
FL-10 Flow Rate Indicator											
Series and flow rate /											
FMC = up to 5 l/min (low flow)											
FML = up to 5000 l/min											
FMB = up to 1100 imp. Gallons / min											
FMG = up to 1325 U.S. Gallons / min											
FMM = up to 300 m ³ /h											
Size and ranges /											
K = 1/4" to 1", ranges: 0...4 l/min bis 0...70 l/min											
M = 3/4" to 2 1/2", ranges: 0...4 l/min bis 0...500 l/min											
G = 3" to 8", ranges: 0...250 l/min bis 0...5000 l/min											
Material /											
AL = aluminum											
B = bronze											
CI = cast iron											
CIK = cast iron nickel plated											
S = carbon											
SS = stainless steel											
PTFE = PTFE (only up to 4" and 7 bar max.)											
PVC = PVC (only up to 4" and 7 bar max.)											
Pressure limit /											
LP = max. 20 bar											
MP = max. 50 bar											
HP = max. 200 bar (only CI, CIK, S & SS)											
Output signals /											
ME = mechanical display only											
3EE = micro switch											
3EEG = micro switch with gold contacts											
3EE(A2) = micro switch, ATEX zone 2											
3EE(A1) = micro switch, ATEX zone 1											
6EE(A2) = DPDT, ATEX zone 1											
AIR = pneumatic switch											
POT = potentiometer (spezify rating)											
OUT = 4...20 mA output											
TOT = digital totaliser											
TOTX = digital totaliser (ATEX)											
Media viscosity /											
1...600 = please specify viscosity of media in cSt [mm ² /s]											
Process connection size /											
2 = 1/4" (only size K)											
4 = 1/2" (only size K)											
6 = 3/4" (only size K and M)											
8 = 1" (only size K and M)											
10 = 1 1/4" (only size M)											
12 = 1 1/2" (only size M)											
16 = 2" (only size M)											
20 = 2 1/2" (only size M)											
24 = 3" (only size G)											
32 = 4" (only size G)											
48 = 6" (only size G)											
64 = 8" (only size G)											
Process connection /											
BSP = standard thread BSP (only connection size 1/4" up to 2 1/2")											
NPT = standard thread NPT (only connection size 1/4" up to 2 1/2")											
F10 = flange DIN2632-5 PN10											
F16 = flange DIN2632-5 PN16											
F25 = flange DIN2632-5 PN25											
F40 = flange DIN2632-5 PN40											
F150 = flange ANSI B16.5 150 lbs.											
F300 = flange ANSI B16.5 300 lbs.											
F600 = flange ANSI B16.5 600 lbs.											
Seal material /											
S1 = NBR (-40...+110 °C)											
S2 = EPDM (-40...+150 °C)											
S3 = FKM (-20...+200 °C)											
S4 = PTFE (-100...+250 °C)											
S5 = Perlast (-15...+330 °C)											
Flow directions /											
L = from left to right											
R = from right to left											
U = from bottom to top											
O = from top to bottom											

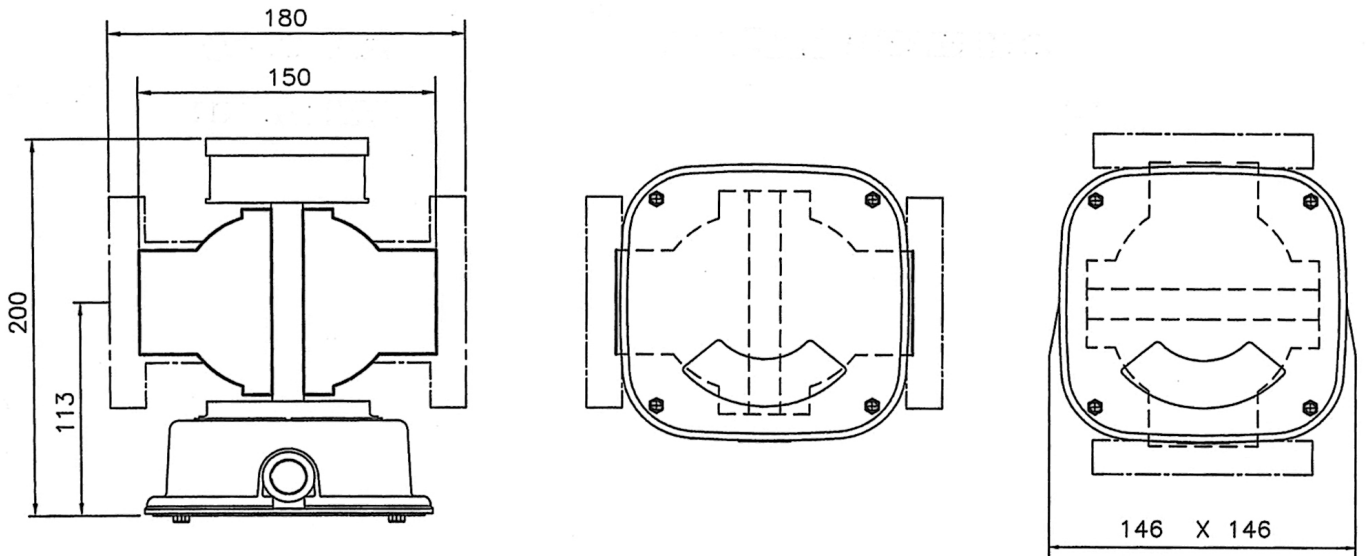


Dimensions FL-10 in mm:

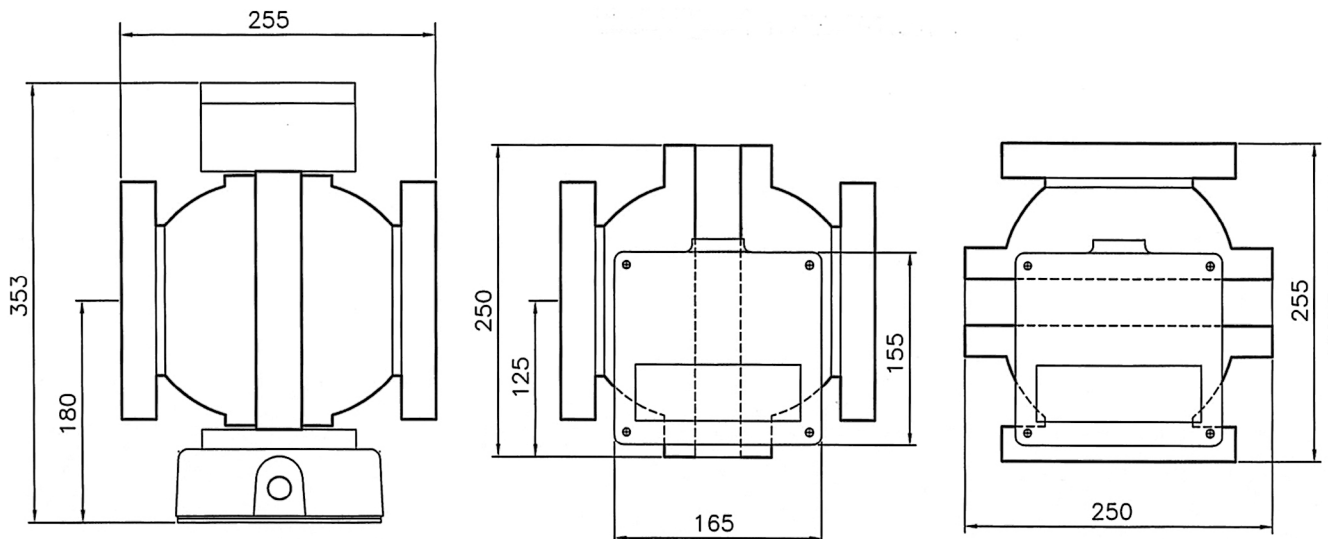
Size small (K)



Size middle (M)

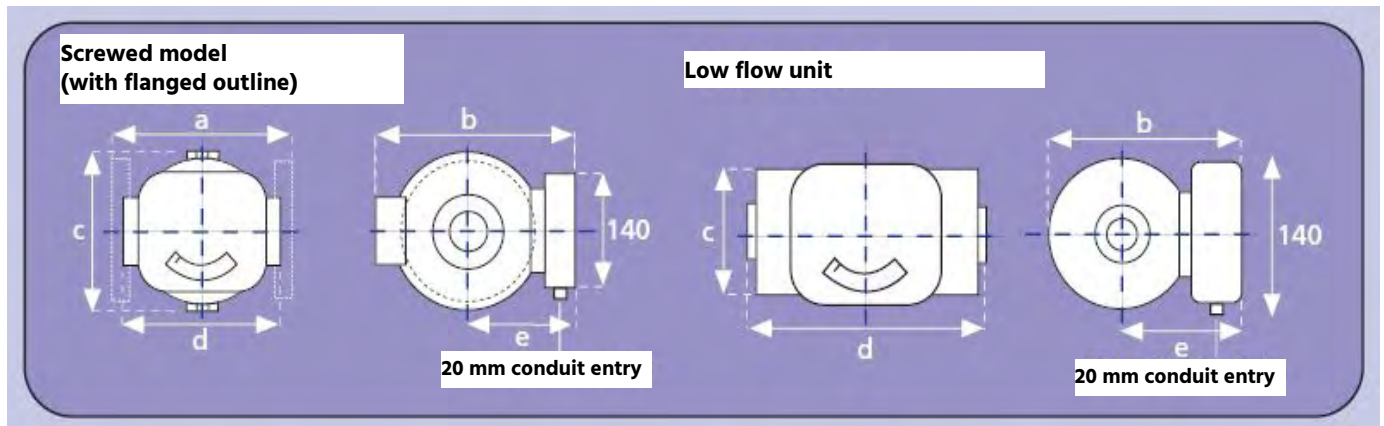


Size large (G)





Dimensions and Weight:

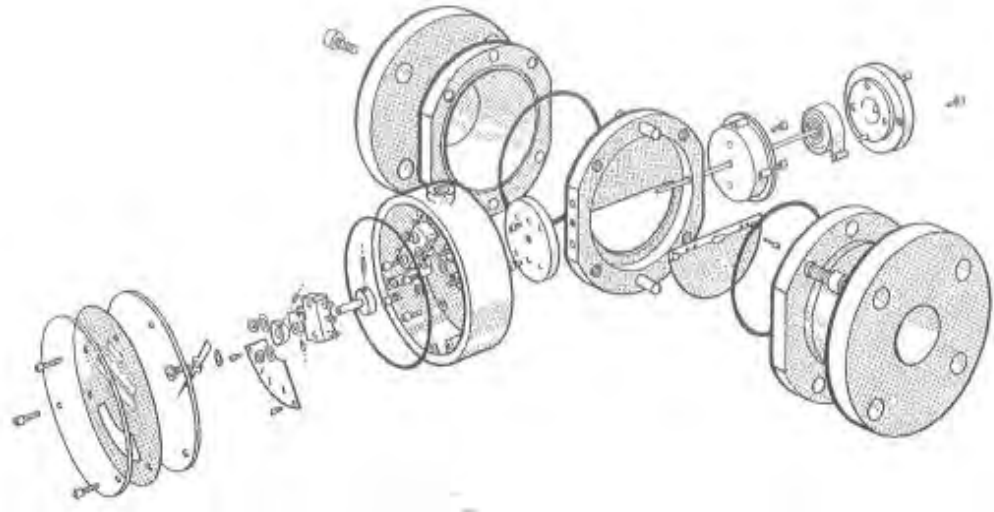


Pipe size	Overall dimension (mm)					Approximate Weight (kg)				
	a	b	c	d	e	AL	B	CI	S-SS	PVC
1/4" - 1"	n/a	155	100	188	110	3	8	-	8	3
1/4" - 1"	160	150	80	130	110	1	2	2	2	1
3/4 - 2"	180	200	120	150	115	3	7	7	7	3
2 1/2"	180	200	120	230*	115	5	10	10	10	4
3"	255	320	250	305*	160	20	54	50	54	15
4"	255	320	250	305*	160	23	60	56	60	17
6"	460	500	370	510*	280	60	200	175	200	n/a
8"	485	500	370	585*	280	68	225	200	225	n/a

* obtained by mating flanges

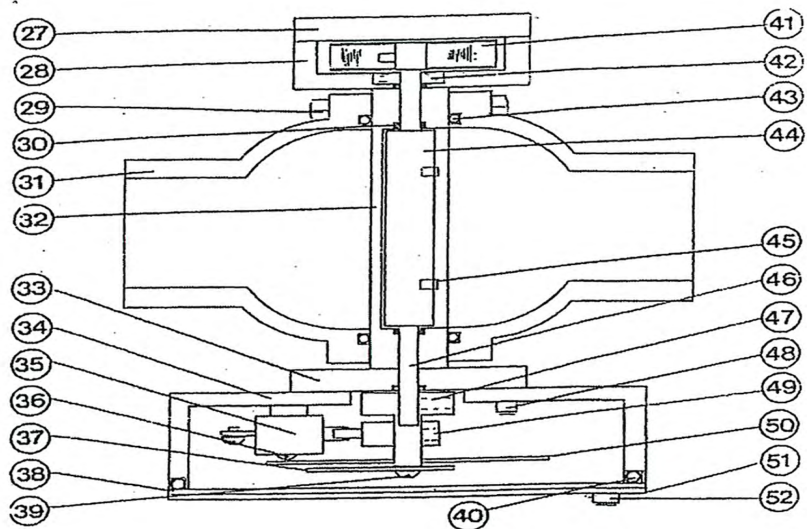


Spares Data:



Item No. Description

- 27. Spring cover
- 28. Spring housing
- 29. Stud & nuts
- 30. O-Ring (S1, S2, S3, S4)
- 31. Bowl screwed/flanged
AL, B, CI, CIK, S, SS, PVC
- 32. Centre housing
AL, B, CI, CIK, S, SS, PVC
- 33. Mounting disc
- 34. Enclosure Box
- 35. Switch
- 36. Screw
- 37. Pointer
- 38. Window
- 39. Screw
- 40. (a) Rear O-Ring
(b) Front O-Ring
- 41. Spring
- 42. Bearing
- 43. O-Ring (S1, S2, S3, S4)
- 44. Valve plate
- 45. Grub screw
- 46. Spindle
- 47. Indicator dial
- 48. Screw
- 49. Cam
- 50. Dial plate
- 51. Face plate
- 52. Screw



Spares Kit

Item	Qty
30.	2 St
35.	1 St
36.	2 St
38.	1 St
40.	1 St
43.	2 St
52.	3 St