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PROZESSMESSTECHNIK

Flow
Level
Temperature

CATALOG

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DG02

Rotor-Type Flow Indicator

- **Sturdy, robust design**
- **Available in red bronze or stainless steel**
- **Resistant to high heat**

Description:

The DG02 mechanical flow indicator is used for visual verification of liquid flow. The rotational speed of the rotor is proportional to the liquid flow rate. The domed sight glass allows the rotor to be easily seen at any time. These devices are made of high-quality materials, allowing them to be used with a great variety of liquids.

Typical Applications:

DG02 mechanical flow indicators are used to monitor the flow of liquids of low to medium viscosity in pipe systems.

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Models:

Materials: Red bronze or stainless steel

Flow Rates:

NPT / G	Pmax. (psi / bar)	Qmax GPM / l/min water	Rotor Start l/min water
1/4"	232 / 16	7.9 / 30	0.18 / 0.7
3/8"	232 / 16	10.5 / 40	0.21 / 0.8
1/2"	232 / 16	14.5 / 55	0.26 / 1.0
3/4"	232 / 16	24 / 90	0.32 / 1.2
1"	232 / 16	37 / 140	0.40 / 1.5

Model Key:

Order Number: **DG02. | R. | 10. | 0**

Rotor-Type Flow Indicator

Materials:
R = Red bronze
E = Stainless steel

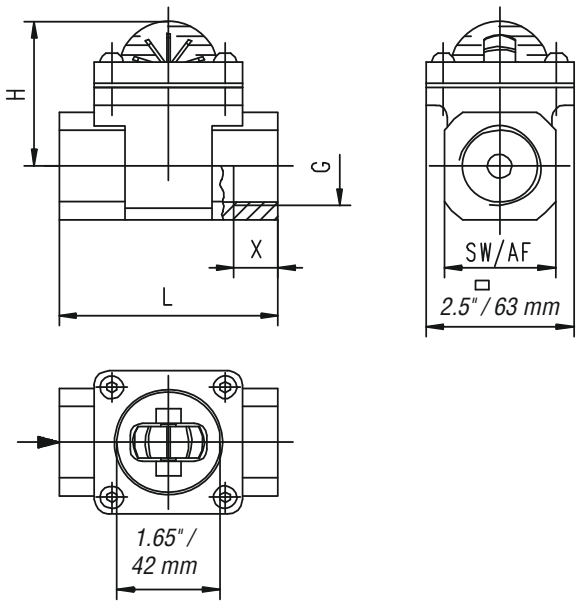
Connections:

08N = 1/4" NPT	08 = G 1/4
10N = 3/8" NPT	10 = G 3/8
15N =1/2" NPT	15 = G 1/2
20N = 3/4" NPT	20 = G 3/4
25N = 1" NPT	25 = G 1

Special features:
0 = None
1 = Please specify in writing.

Dimensions:

NPT / G	L in inch / mm	H in inch / mm	X in inch / mm	Weight in lbs / kg
1/4"	3 / 76	2 / 53	0.47 / 12	1.54 / 0.70
3/8"	3 / 76	2 / 53	0.63 / 16	1.43 / 0.65
1/2"	3 / 76	2 / 53	0.55 / 14	1.43 / 0.65
3/4"	3.5 / 89	2.6 / 66	0.71 / 18	2.75 / 1.25
1"	3.5 / 89	2.6 / 66	0.71 / 18	2.64 / 1.20



Technical Specifications:

Max. pressure: 232 psi / 16 bar
Pressure loss: 0.73 psi / 0.05 bar at Qmax.
Max. temperature: 392 °F / 200 °C

Materials:

DG02.R:
Housing: Red bronze
Housing cover: Brass
Sight glass: Borosilicate glass
Pins: Stainless steel
Rotor: PPS
Gasket: Klingersil C-4400

DG02.E:
Housing: Stainless steel
Housing cover: Stainless steel
Sight glass: Borosilicate glass
Pins: Stainless steel
Rotor: PPS
Gasket: Klingersil C-4400

Installation position:

This device is only of limited suitability for downward vertical flows; otherwise, it may be installed in any position.

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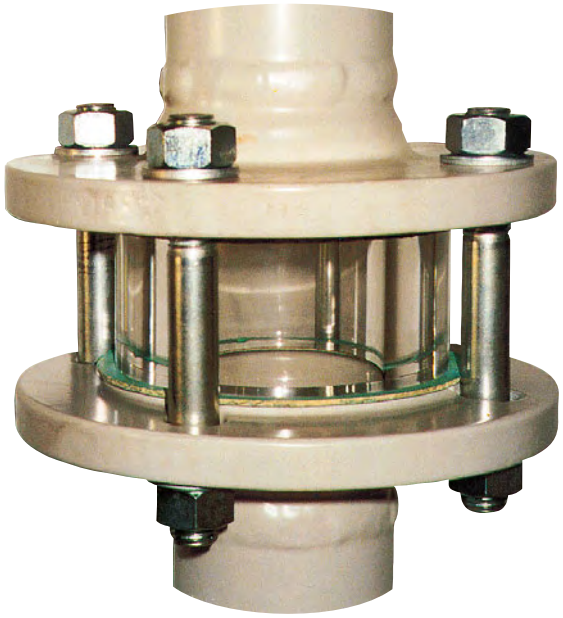
DG04

Flow sight glass for installation between two flanges



- **Easy installation between two DIN or ANSI flanges**
- **Economical acrylic cylinder**
- **Available in borosilicate glass for caustic/corrosive liquids**
- **Insensitive to contamination**
- **Maximum rated pressure of 232 psi / 16 bar**
- **For liquid temperatures up to 572 °F / 300 °C**

Description:

Model series DG04 sight glasses are distinguished by their rugged construction and wide range of applications. They feature 0.94", 1.18", or 1.97" / 24, 30, or 50 mm long transparent cylinders made of acrylic, soda-lime or borosilicate glass with very high wall thickness. These cylinders are intended to be clamped between two existing flanges. Their dimensions match those of the sealing face on the raised area of the flange. This sizing makes support from a separate metal housing unnecessary. In addition, this design allows the flow to be viewed and monitored from any direction. The flange bolts also offer additional protection against mechanical damage.

The borosilicate glass version can be installed in devices used with very caustic/corrosive liquids. They are insensitive to contamination because the inner surface is constantly being rinsed by the flowing liquid. In particular, the larger nominal sizes are very cost effective solutions since they only require the transparent cylinder and no metal housing with flanges.

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Designs:

DG04.A:
- Material: acrylic
- Max. temperature 176 °F / 80 °C
- Economical design

DG04.N:
- Material: soda-lime glass
- Max. temperature 300 °F / 150 °C
- High resistance to chemicals

DG04.B:
- Material: borosilicate
- Max. temperature 572 °F / 300 °C
- For caustic / corrosive liquids and high temperatures

Dimensions:

Nominal size	DG04 for DIN flanges Diameter (inch / mm)		DG04 for ANSI flanges Diameter (mm)		Permitted process pressure
	Outside	Inside	Outside	Inside	
Sight-glass length: DG04.A... / DG04.B...: 1.18" / 30 mm DG04.N...: 0.94" / 24 mm					
3/8" / DN 10	1.57 / 40	0.55 / 14	–	–	232 / 16
1/2" / DN 15	1.77 / 45	0.71 / 18	1.38 / 35	0.63 / 16	232 / 16
3/4" / DN 20	2.28 / 58	0.91 / 23	1.69 / 42	0.83 / 21	232 / 16
1" / DN 25	2.68 / 68	1.14 / 29	1.97 / 50	1.06 / 27	232 / 16
Sight-glass length: DG04.A... / DG04.B...: 1.97" / 50 mm DG04.N...: 0.94" / 24 mm					
1 1/4" / DN 32	3.11 / 79	1.50 / 38	2.48 / 63	1.38 / 35	232 / 16
1 1/2" / DN 40	3.47 / 88	1.73 / 44	2.87 / 73	1.61 / 41	232 / 16
2" / DN 50	4.02 / 102	2.17 / 55	3.62 / 92	2.09 / 53	232 / 16
2 1/2" / DN 65	4.80 / 122	2.80 / 71	4.13 / 105	2.48 / 63	232 / 16
3" / DN 80	5.43 / 138	3.27 / 83	5.00 / 127	3.07 / 78	232 / 16
4" / DN 100	6.22 / 158	4.25 / 108	6.18 / 157	4.02 / 102	232 / 16
5" / DN 125	7.40 / 188	5.20 / 132	7.32 / 186	5.04 / 128	232 / 16
6" / DN 150	8.35 / 212	6.30 / 160	8.50 / 216	6.06 / 154	232 / 16
8" / DN 200	10.55 / 268	8.19 / 208	10.63 / 270	8.00 / 203	145 / 10
10" / DN 250	12.60 / 320	10.28 / 261	12.75 / 324	10.04 / 255	145 / 10
12" / DN 300	14.57 / 370	12.20 / 310	15.00 / 381	12.00 / 305	145 / 10

The pressure values apply to borosilicate glass exposed to liquid temperatures up to 150°C. If higher liquid temperatures are anticipated in the application, please consult us first.

Model coding:

Order number: **DG04. A. D. 025. 0**

Flow sight glass for installation between two flanges

Design:
A = Acrylic
N = Soda-lime glass
B = Borosilicate glass

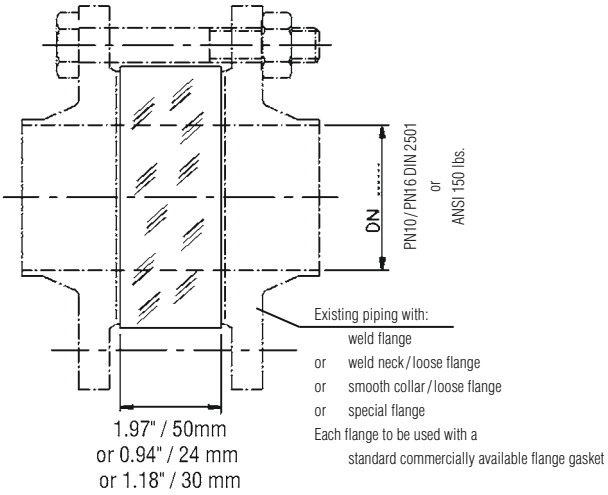
Connection:
D = for flange PN 10/16 as per DIN 2501
A = for ANSI flange, RF, 150 lbs
S = for special flanges

Nominal size:
010...300 = Nominal size as per “Dimensions” table

Special versions:
0 = None
1 = Please specify in writing

Assembly

Design DG04.A, N or B



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DG06

Sight Flow Indicator with Flap and Scale

- robust design
- red bronze, cast steel or stainless steel materials
- for 1/4" to 2" pipe, with threaded fitting or flange
- available with PN 16 or PN 40 pressure ratings
- externally attached numerical scale indicates approximate flow volume

Description:

The DG06 flow indicator allows visual and quantitative monitoring of liquid flows. The device has two large glass panes – one on each side – and each with a scale attached. A stainless steel flap mounted in the flow chamber is lifted when there is flow and the current flow rate is displayed on the scale. The flap is mounted on a stainless steel shaft; it is raised by flow and lowered by gravity. The DG06 can be installed both horizontally and vertically (with flow from bottom to top) and deployed in a wide variety of applications – not least because it is not adversely affected by high temperatures.

Typical Applications:

This flow indicator provides visual and quantitative monitoring of liquids. There is potential for a myriad of applications in the fields of industrial machinery and process control, as well as basic monitoring of cooling units etc.

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Models:

All devices have a flap made of AISI 316 stainless steel and PTFE seals.

DG06.R: enclosure made of red bronze CuSn5Zn5Pb5-C-GS
DG06.S: enclosure made of cast steel ASTM-A-216-2000-GR-WCB
DG06.E: enclosure made of stainless steel AISI 316

Borosilicate (PN16) or soda-lime (PN40) sight glass panes are available. We supply type G or NPT threaded fittings or DIN or ANSI flanges as process couplings.

Flow rates:

Pipe size	Approx. flow rates (l/min)*					
	2	4	6	8	10	Max.
DN08 / 1/4"	2.5	3.5	4.5	7	22	100
DN10 / 3/8"	2.5	4	4.5	7	24	150
DN15 / 1/2"	3	4.5	6	8,5	20	250
DN20 / 3/4"	3	5	6	9	20	250
DN25 / 1"	3.5	6	8	10	25	250
DN32 / 1 1/4"	7	11	14	24	40	550
DN40 / 1 1/2"	8	12	15	25	50	600
DN50 / 2"	9	15	28	50	75	1,000

* The quoted flow rates for flap positions 2–10 are approximate values only; they may vary considerably, depending on installation position and process conditions. The “Max.” value is the maximum flow volume at which the flow indicators can operate (regardless of head loss) without being damaged.

Dimensions:

Pipe size	Length (mm)		Width (mm)	Height (mm)	Weight (kg)	
	G	F			G	F
DN08 / 1/4"	95	140	89	66	1.9	3.7
DN10 / 3/8"	95	140	89	66	1.9	3.8
DN15 / 1/2"	95	140	89	66	1.85	3.9
DN20 / 3/4"	95	140	89	66	1.85	3.9
DN25 / 1"	95	140	89	66	1.8	3.9
DN32 / 1 1/4"	120	180	120	89	4	7.1
DN40 / 1 1/2"	120	180	120	89	3.9	7
DN50 / 2"	150	220	170	110	9	14.5

*) G = threaded, F = flanged

Order Code:

Bestellnummer: **DG06. | S. | B. | G. | 15. | 0**

Flow indicator with flap and scale

Materials:
R = red bronze
S = cast steel
E = stainless steel

Glass / pressure rating:
B = borosilicate / PN16
N = soda-lime glass / PN40

Process connection
G = female thread G
N = female thread NPT
F1 = DIN flange PN16
F4 = DIN flange PN40 (with soda-lime glass only)
A1 = ANSI flange, 150 lbs., RF
A3 = ANSI flange, 300 lbs., RF (with soda-lime glass only)

Pipe size:
08 = 1/4" / DN08
10 = 3/8" / DN10
15 = 1/2" / DN15
20 = 3/4" / DN20
25 = 1" / DN25
32 = 1 1/4" / DN32
40 = 1 1/2" / DN40
50 = 2" / DN50

Options:
0 = none
9 = please specify in writing

Specifications:

Max. pressure: 16/40 bar, depending on type of glass and process connection
Max. temperature: 150 °C
Materials
Enclosure: bronze, steel casting or stainless steel
Glass: borosilicate or lime-soda
Flap: stainless steel
Gasket: PTFE
Scale: polycarbonate
Installation position: horizontal or vertical (only with upward flow)

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DG08

Ball-Type Flow Indicator

- **Sturdy, robust design**
- **Available in red bronze or stainless steel**
- **Resistant to high heat**
- **Domed sight glass for easy view of ball**

Description:

The DG08 mechanical flow indicator is used for visual verification of the flow of liquids or gases. The liquid or gas being monitored lifts the PTFE ball from its valve seat.
As the flow increases, the ball in the domed sight glass becomes increasingly visible. These devices are made of high-quality materials, allowing them to be used with a great variety of liquids or gases.

Typical Applications:

DG08 mechanical flow indicators are used to monitor the flow of liquid or gaseous media. These devices are especially suited for use in industrial systems and for process monitoring as well as for basic monitoring of compressors, ventilators, fans and many other types of similar equipment.

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Models:

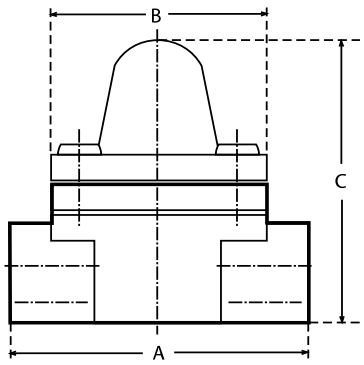
Materials: Red bronze or stainless steel

Flow Rates:

	Water GPM / l/min	
NPT / G	Ball/ initial movement	Ball/ fully visible
1/4"	0.03 / 0.1	0.26 / 1.0
3/8"	0.03 / 0.1	0.26 / 1.0
1/2"	0.03 / 0.1	0.26 / 1.0
3 /4"	0.63 / 2.4	1.37 / 5.2
1"	0.71 / 2.7	1.45 / 5.5
1 1/4"	2.90 / 11	4.23 / 16
1 1/2"	4.23 / 16	5.55 / 21

Dimensions:

NPT / G	A in inch / mm	B in inch / mm	C in inch / mm	Weight in lbs. / kg
1/4"	3.00 / 76	2.48 / 63	3.10 / 79	1.60 / 0.72
3/8"	3.00 / 76	2.48 / 63	3.10 / 79	1.50 / 0.69
1/2"	3.00 / 76	2.48 / 63	3.10 / 79	1.43 / 0,65
3 /4"	3.50 / 89	2.48 / 63	3.75 / 95	2.86 / 1.30
1"	3.50 / 89	2.48 / 63	3.75 / 95	2.75 / 1.25
1 1/4"	4.60 / 117	2.95 / 75	4.90 / 125	5.50 / 2.50
1 1/2"	4.60 / 117	2.95 / 75	4.90 / 125	5.18 / 2.35



Model Key:

Order Number: **DG08. E. 10. 0**

Ball-Type Flow Indicator

Materials:
R = Red bronze
E = Stainless steel

Connections:

08N = 1/4" NPT	08 = G 1/4
10N = 3/8" NPT	10 = G 3/8
15N = 1/2" NPT	15 = G 1/2
20N = 3/4" NPT	20 = G 3/4
25N = 1" NPT	25 = G 1
32N = 1 1/4" NPT	32 = G 1 1/4
40N = 1 1/2" NPT	40 = G 1 1/2

Special Features:
0 = None
1 = Please specify in writing.

Technical Specifications:

Max. pressure: 232 psi / 16 bar
Max. temperature: 392 °F / 200 °C

Materials:

DG08.R:

Housing: Red bronze
Sight glass: Borosilicate glass
Pins: Stainless steel
Indicator ball: PTFE
Gasket: Klingersil C-4400

DG08.E:

Housing: Stainless steel
Sight glass: Borosilicate glass
Pins: Stainless steel
Indicator ball: PTFE
Gasket: Klingersil C-4400

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DG10

Flow Sight Glass with Threaded Connections

- **Standard models with fully clear bore or drip tube, flap or rotor optionally available**
- **Materials: Cast iron, cast steel or stainless steel**
- **For pipe sizes from 1/4” to 2”**
- **For liquid temperatures up to 300 °F / 150 °C, higher ratings up to 536 °F / 280 °C optionally available**
- **Pressure rating: 232 psi / 16 bar, higher ratings optionally available**
- **Process connection available with NPT or G thread**

Description:

DG10 sight glasses are used to visually monitor the flow of liquids in pipe systems.
Depending on the type of liquid and flow volume, these devices are used with a fully clear bore or with a flap or rotor (for transparent liquids).
DG10 sight glasses permit reliable monitoring of the function and performance of single devices or entire systems.

Typical Applications:

Because they are available in a variety of materials and designs, DG10 sight glasses can be used in almost any kind of pipe system.

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Models:

DG10.S: Standard model with fully clear bore, sizes 1-1/4" and above with drip tube (can be installed in any position)

DG10.K: with flap (can only be installed horizontally or for upward vertical flows)

DG10.RK with rotor made of POM (Tmax. 248 °F / 120 °C, can be installed in any position)

DG10.RP with rotor made of PTFE (Tmax. 500 °F / 260 °C, can be installed in any position)

Housing Materials (having contact with monitored liquid):

DG10.x.G: Cast iron A48-40B / GG 25 (EN-GJL-250)

DG10.x.S: Cast steel A216 Gr. WCC / GS-C 25 (WN 1.0619)

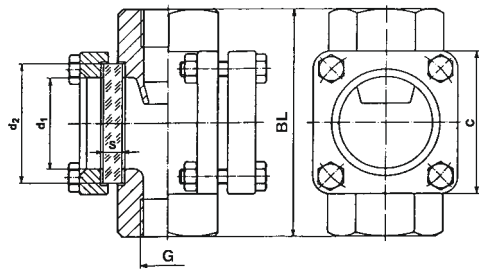
DG10.x.E: Stainless steel AISI 316 / WN 1.4408

Sight Glass Materials:

DG10.x.x.N: Soda-lime glass (Tmax. 300 °F / 150 °C)

DG10.x.x.B: Borosilicate glass (Tmax. 536 °F / 280 °C)

Dimensions:



Cast iron (DG10.x.G)					
Connection (female thread)	**BL (inch / mm)**	**d1 (inch / mm)**	**d2 (inch / mm)**	**S (inch / mm) 232 psi / 16 bar**	**C (inch / mm)**
1/4" 1/2"	3.94 / 100	1.26 / 32	1.77 / 45	0.39 / 10	2.76 / 70
3/4" 1"	4.72 / 120	1.89 / 48	2.48 / 63	0.39 / 10	3.45 / 85
1-1/4" 1-1/2"	6.30 / 160	2.56 / 65	3.15 / 80	0.47 / 12	4.57 / 116
2"	7.09 / 180	3.15 / 80	3.94 / 100	0.59 / 15	4.72 / 120

Cast steel (DG10.x.S) or stainless steel (DG10.x.E)							
Con-nection	**BL (inch / mm)**	**d1 (inch / mm)**	**d2 (inch / mm)**	**S (inch/mm) 232 psi / 16 bar**	**S (inch/mm) 363 psi / 25 bar**	**S (inch/mm) 580 psi / 40 bar**	**C (inch / mm)**
1/4" 3/8" 1/2" 3/4"	3.94 / 100	1.89 / 48	2.48 / 63	0.39 / 10	0.47 / 12	0.59 / 15	2.76 / 70 3.54 / 90 2.76 / 70
1" 1-1/4"	5.12 / 130 6.30 / 160	2.56 / 65	3.15 / 80	0.47 / 12	0.59 / 15	0.79 / 20	3.35 / 85 4.57 / 116
1-1/2"	6.30 / 160	2.56 / 65	3.15 / 80	0.47 / 12	0.59 / 15	0.79 / 20	4.57 / 116
2"	9.06 / 130	3.15 / 80	3.94 / 100	0.59 / 15	0.79 / 20	0.98 / 25	4.72 / 120

Model Coding:

Order Number: DG10. RK. E. B. 25. 16. 0. 0

Flow Sight Glass with Threaded Connections (Female)

Models:
S = Standard design with fully clear bore(sizes 1-1/4" and above with drip tube)
K = with flap
RK = with plastic rotor (POM)
RP = with plastic rotor (PTFE)

Housing Materials:
G = Cast iron
S = Cast steel
E = Stainless steel

Sight Glass Materials:
N = Soda-lime glass
B = Borosilicate glass

Process connection:

08N = 1/4" NPTF	08 = G 1/4 female thread
10N = 3/8" NPTF	10 = G 3/8 female thread
15N = 1/2" NPTF	15 = G 1/2 female thread
20N = 3/4" NPTF	20 = G 3/4 female thread
25N = 1" NPTF	25 = G 1 female thread
32N = 1-1/4" NPTF	32 = G 1-1/4 female thread
40N = 1-1/2" NPTF	40 = G 1-1/2 female thread
50N = 2" NPTF	50 = G 2 female thread

Pressure Rating:
16 = 232 psi / 16 bar (Standard)
25 = 363 psi / 25 bar (in cast steel or stainl. steel only)
40 = 580 psi / 40 bar (in cast steel or stainl. steel only)

Options:
0 = None
9 = Please specify in writing

Special Models:
0 = None
9 = Please specify in writing

Technical Specifications:

Materials: Housing and Sight Glass: see description, gaskets: graphite (other gasket materials available upon request)

max. pressure: 232 psi / 16 bar Standard
363 psi / 25 bar and 580 psi / 40 bar optional

max. temperature:

DG10.S/K...: 300 °F / 150 °C (536 °F / 280 °C with borosilicate glass)

DG10.RK...: 248 °F / 120 °C

DG10.RP...: 300 °F / 150 °C (500 °F / 260 °C with borosilicate glass)

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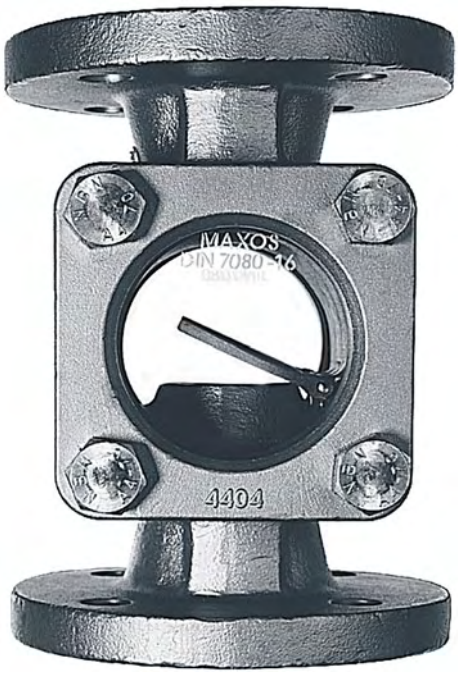
DG11

Sight Flow Indicator

- **Available with DIN or ANSI flanges**
- **Standard with drip tube, flap or rotor optionally available**
- **Materials: Cast iron, cast steel or stainless steel**
- **For pipes from 1/2" / DN15 to 10" / DN250**
- **For liquid temperatures up to 300 °F / 150 °C, higher ratings up to 546 °F / 280 °C optionally available**
- **Pressure rating: 232 or 145 psi / PN16 or PN10, higher ratings optionally available**



Description:

DG11 sight glasses are used to visually monitor the flow of liquids in pipe systems.
Depending on the type of liquid and flow volume, these devices are used with a fully clear bore or with a flap or rotor (for transparent liquids).
DG11 sight flow indicator permits reliable monitoring of the function and performance of single devices or entire systems.

Applications:

Because they are available in a variety of materials and designs, DG11 sight glasses can be used in almost any kind of pipe system.

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Models

DG11.S: Standard model with drip tube (can be installed in any position)

DG11.K: with flap (can only be installed horizontally or for upward vertical flows)

DG11.RK with rotor made of POM (Tmax. 248 °F / 120 °C, can be installed in any position)

DG11.RP with rotor made of PTFE (Tmax. 500 °F / 260 °C, can be installed in any position)

Housing Materials (contacting monitored liquid):

DG11.x.G: Cast iron A48-40B / GG 25 (EN-GJL-250)

DG11.x.S: Cast steel A216 Gr. WCC / GS-C 25 (WN 1.0619)

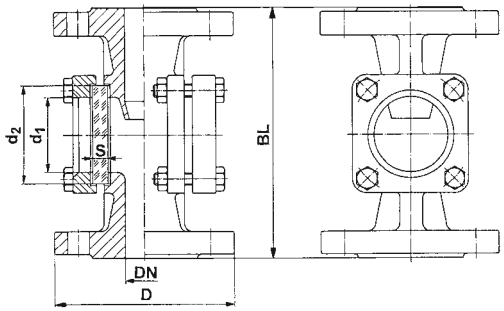
DG11.x.E: Stainless steel (AISI 316 / WN 1.4408)

Sight Glass Materials:

DG11.x.x.P: Soda-lime glass (Tmax. 300 °F / 150 °C)

DG11.x.x.B: Borosilicate glass (Tmax. 536 °F / 280 °C)

Dimensions:



Connection (DN / ANSI)	D (inch / mm)	BL (inch / mm)	d1 (inch / mm)	d2 (inch / mm)	S (inch / mm) 16 bar
15 / 1/2"	3.74 / 95	5.12 / 130	1.26 / 32	1.77 / 45	0.39 / 10
20 / 3/4"	4.13 / 105	5.91 / 150	1.26 / 32	1.77 / 45	0.39 / 10
25 / 1"	4.53 / 115	6.30 / 160	1.89 / 48	2.48 / 63	0.39 / 10
32 / 1 1/4"	5.51 / 140	7.09 / 180	2.56 / 65	3.15 / 80	0.47 / 12
40 / 1 1/2"	5.91 / 150	7.87 / 200	2.56 / 65	3.15 / 80	0.47 / 12
50 / 2"	6.50 / 165	9.06 / 230	3.15 / 80	3.94 / 100	0.59 / 15
65 / 2 1/2"	7.28 / 185	11.42 / 290	3.15 / 80	3.94 / 100	0.59 / 15
80 / 3"	7.87 / 200	12.20 / 310	3.94 / 100	4.92 / 125	0.79 / 20
100 / 4" ***	8.66 / 220	13.78 / 350	4.92 / 125	5.91 / 150	0.98 / 25
125 / 5" ***	9.84 / 250	15.75 / 400	5.91 / 150	6.89 / 175	0.98 / 25
150 / 6"	11.22 / 285	18.90 / 480	6.89 / 175	7.87 / 200	1.18 / 30*
200 / 8" ***	13.39 / 340	23.62 / 600	6.89 / 175	7.87 / 200	1.18 / 30**
250 / 10" ***	15.94 / 405	28.74 / 730	6.89 / 175	7.87 / 200	1.18 / 30**

*) Pmax 145 psi / 10 bar with soda-lime glass, Pmax. 232 psi / 16 bar with borosilicate glass

**) with DIN flanges: PN 10 or PN 16 (PN 16 with borosilicate glass only)

***) ANSI flanges not available in cast iron

Dimension "D" indicated for DIN flanges, may be different with ANSI flanges

Ordering Code:

Order Number: **DG11. | RK. | E. | B. | 25. | D16. | 0. | 0**

Sight Flow Indicator

Models
S = Standard model (with drip tube)
K = With flap
RK = With plastic rotor (POM)
RP = With plastic rotor (PTFE)

Housing Materials:
G = Cast iron
S = Cast steel
E = Stainless steel

Sight Glass Materials:
N = Soda-lime glass
B = Borosilicate glass

Process Connections:
15 to 250 = ANSI 1/2" to ANSI 10" / DN 15 to DN250
See "Dimensions" table

Connection Flanges:
A = ANSI, 150 lbs
D16 = DIN PN16 (DN200 with borosilicate glass only)
D10 = DIN PN10
S = Special models for higher pressure levels

Options:
0 = None
9 = Please specify in writing

Special Models:
0 = None
9 = Please specify in writing

Technical Specifications:

Materials: Housing and sight glass: see description
Gaskets: graphite (other gasket materials available upon request)

Max. pressure: 232 psi / 10/16 bar (higher pressure ratings optionally available)

Max. temperature:

DG11.S/K...: 300 °F / 150 °C (536 °F / 280 °C with borosilicate glass)
DG11.RK...: 248 °F / 120 °C
DG11.RP...: 300 °F / 150 °C (500 °F / 260 °C with borosilicate glass)

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DS01

Miniature Variable Area Flowmeter And Switch

- small mounting dimensions
- materials brass or stainless steel
- scales for water and air
- universal mounting position
- high switching accuracy
- very small switch hysteresis

Description:
The flowmeter and switch model DS01 works according to a modified variable area principle.
The float is guided in a cylindrical measuring glass by means of a spring. The flowing medium moves the float in the flow direction. The upper edge of the float shows the momentary flow via a burnt-in scale on the measuring glass.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.
The Reed contact is adjustable over the full switching range of the meter.

Application:
The variable area flowmeter and switch model DS01 is used for measuring and monitoring the flow of low viscosity liquids and gases, i. e. in cooling cicuits of welding machines and laser systems, for pump monitoring, compressors and many other applications.

Switching hysteresis:
By careful selection of the Reed contacts the switching hysteresis could be reduced to only 0.02" - 0.06" / 0.5 - 1.5 mm float movement.

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Measuring Ranges:

Water: 0.08 - 0.95 GPH ... 16 - 40 GPM
5 - 60 ml/min ... 60 -150 l/min
Air: 0.4 - 2.75 SCFH ... 7.0 - 22.0 SCFM
0.2 -1.3 Nl/min ... 200 - 625 Nl/min
(at 14.7 psia / 1.013 bar abs. and 68 °F / 20 °C)

Materials:

brass or stainless steel

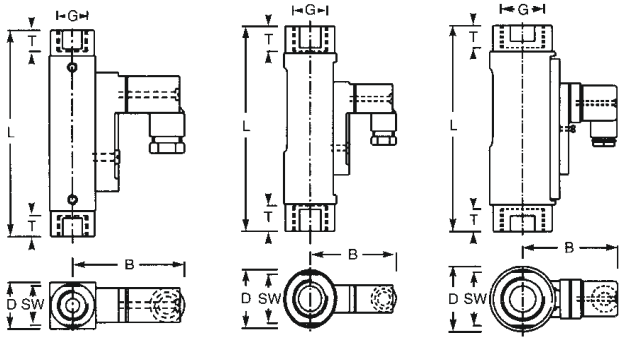
Contacts:

Contact function	DS01.1	DS01.2	DS01.3 / DS01.4 DS01.5
N/O	200V, 1A, 20VA	230 V, 3A, 60 VA	250 V, 3 A, 100 VA
SPDT	200 V, 1A, 20VA	250 V, 1.5A, 50 VA	250 V, 1.5 A, 50 VA
N/O*			250 V, 2A, 60VA
SPDT*			250 V, 1A, 30VA

* according to Atex 100a Ex II 2 G, EEx m II T6

Dimensions:

Model	Mounting dimensions in inch / mm						Weight (lbs / g)
	SW	D	B	NPT / G	T	L	
DS01.1	0.67 / 17	0.79 / 20	1.93 / 49	1/4	0.39 / 10	3.54 / 90	0.31 / 140
DS01.2	1.06 / 27	1.26 / 32	2.09 / 53	1/2	0.55 / 14	4.89 / 114	0.66 / 300
DS01.3	1.61 / 41	1.97 / 50	3.03 / 77	3/4	0.67 / 17	5.47 / 139	1.98 / 900
DS01.4	1.61 / 41	1.97 / 50	3.03 / 77	1	0.67 / 17	6.22 / 158	1.98 / 900
DS01.5	1.61 / 41	1.97 / 50	3.03 / 77	1 1/4	0.67 / 17	6.54 / 166	2.03 / 920



DS01.1 **DS01.2** **DS01.3 / DS01.4**

Electrical connection

Technical Specifications:

max. pressure: DS01.1: 230 psi / 16 bar
DS01.2 / DS01.3 / DS01.4: 145 psi / 10 bar
pressure drop: DS01.1: 0.29-2.9 psi / 0.02-0.2 bar
DS01.2: 0.29-4.35 psi / 0.02-0.3 bar
DS01.3 / DS01.4: 0.29-5.8 psi / 0.02-0.4 bar
max. temperature: 212 °F / 100 °C (optionally 320 °F / 160 °C) for liquids, 194 °F / 90 °C for gases
materials: measuring glass: Duran 50
housing: anodized alumin
O-rings: Buna, (optionally: Viton,EPDM)
electr. connection: plug acc. to DIN 43650 (optionally: 1 m cable connection for DS01.1, N/O only)
accuracy: ± 10% f.s.
analog output: see model DSxx-A in section "accessory"

Ordering Code:

Order number: **DS01. | 1. | 1. | 1. | W13. | 1. | 1. | 0**

Miniature variable area flowmeter and switch

Connection:

1N = 1/4" NPTF	1 = G 1/4 female
2N = 1/2" NPTF	2 = G 1/2 female
3N = 3/4" NPTF	3 = G 3/4 female
4N = 1" NPTF	4 = G 1 female
5N = 1 1/4" NPTF	5 = G 11/4 female

Material:
1 = brass, spring of st. steel 304 / 1.4310
2 = all stainless steel 316 TI / 1.4571

Scale:
1 = for water
2 = for air (14.7 psia / 1.013 bar abs. and 68 °F / 20 °C)

Measuring ranges:

DS01.1 only:

Water:	WU101 = 0.08-0.95 GPH	W101 = 5-60 ml/min
	WU102 = 0.4-2.0 GPH	W102 = 20-140 ml/min
	WU106 = 1.6-9.5 GPH	W106 = 0.1-0.6 l/min
	WU11 = 3-19 GPH	W11 = 0.2-1.2 l/min
	WU12 = 0.1-0.5 GPM	W12 = 0.4-2 l/min
	WU13 = 0.13-0.8 GPM	W13 = 0.5-3 l/min
	WU15 = 0.25-1.3 GPM	W15 = 1.0-5 l/min
Air:	LU1001 = 0.4-2.75 SCFH	L1001 = 0.2 -1.3 Nl/min
	LU1002 = 1.05-4.25 SCFH	L1002 = 0.5-2.0 Nl/min
	LU1003 = 1.7-6.4 SCFH	L1003 = 0.8-3 Nl/min
	LU1005 = 3.5-10.5 SCFH	L1005 = 1.5-5.0 Nl/min
	LU1008 = 4.5-17.0 SCFH	L1008 = 2-8 Nl/min
	LU1012 = 6.5-25.0 SCFH	L1012 = 3-12 Nl/min
	LU1014 = 7.5-29.5 SCFH	L1014 = 3.5-14 Nl/min
	LU1020 = 12-42 SCFH	L1020 = 5.5-20 Nl/min
	LU1024 = 15-50 SCFH	L1024 = 7-24 Nl/min
	LU1035 = 21-74 SCFH	L1035 = 10-35 Nl/min
	LU1042 = 21-89 SCFH	L1042 = 10-42 Nl/min

DS01.2 only:

Water:	WU205 = 1.6-8 GPH	W205 = 0.1-0.5 l/min
	WU21 = 3.2-16 GPH	W21 = 0.2-1 l/min
	WU22 = 0.1-0.4 GPM	W22 = 0.4-1.6 l/min
	WU24 = 0.25-1.0 GPM	W24 = 1-4 l/min
	WU28 = 0.55-2.0 GPM	W28 = 2-8 l/min
	WU215 = 1.1-4.0 GPM	W215 = 4-15 l/min
	WU220 = 1.5-5.5 GPM	W220 = 5-22 l/min
	WU228 = 1.5-7.5 GPM	W228 = 6-28 l/min
Air:	LU2012 = 6,5-25,0 SCFH	L2012 = 3-12 Nl/min
	LU2030 = 15-64 SCFH	L2030 = 7-30 Nl/min
	LU2040 = 25-85 SCFH	L2040 = 12-40 Nl/min
	LU2125 = 1.0-4.4 SCFM	L2125 = 28-125 Nl/min
	LU2200 = 1.8-7.0 SCFM	L2200 = 50-200 Nl/min
	LU2420 = 3.5-14.8 SCFM	L2420 = 100-420 Nl/min
	LU2480 = 4.2-17 SCFM	L2480 = 120-480 Nl/min

DS01.3, DS01.4 and DS01.5:

Water:	WU3030 = 2.1-8.0 GPM	W3030 = 8 - 30 l/min
	WU3045 = 4.0-12.0 GPM	W3045 = 15-45 l/min
	WU3090 = 8.0-24.0 GPM	W3090 = 30-90 l/min
Air:	LU30080 = 48-170 SCFH	L30080 = 22.5-80 Nl/min
	LU30130 = 105-275 SCFH	L30130 = 50-130 Nl/min
	LU30420 = 4.6-14.8 SCFM	L30420 = 130-420 Nl/min
	LU30625 = 7.0-22.0 SCFM	L30625 = 200-625 Nl/min

DS01.4 or DS01.5:

Water:	WU3150 = 16-40 GPM	W3150 = 60-150 l/min

No. of contacts:
1 = 1 contact
2 = 2 contacts

Contact function:
1 = N/O
2 = SPDT
3S = Ex-N/O (EEx m II T6), DS01.3, DS01.4, DS01.5 only
3U = Ex-SPDT (EEx m II T6), DS01.3, DS01.4, DS01.5 only

Options:
0 = without
1 = please indicate

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DS02

Miniature Variable Area Flow Switch

- small mounting dimensions
- materials brass or stainless steel
- scales for water and air
- universal mounting position
- high switching accuracy
- very small switch hysteresis

Description:
The flow switch model DS02 works according to a modified variable area principle.
The float is guided in a cylindrical measuring tube by means of a spring. The flowing medium moves the float in the flow direction.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.
The Reed contact is adjustable over the full switching range of the meter.

Application:
The variable area flow switch model DS02 is used for monitoring the flow of low viscosity liquids and gases, i e. in cooling cicuits of welding machines and laser systems, for pump monitoring, compressors and many other applications.

Switching hysteresis:
By careful selection of the Reed contacts the swiching hysteresis could be reduced to only 0.02" - 0.06" / 0.5 - 1.5 mm float movement.

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Measuring Ranges:

Water: 0.08 - 0.95 GPH … 16 - 40 GPM
5 - 60 ml/min … 60 -150 l/min
Air: 0.4 - 2.75 SCFH … 7.0 - 22.0 SCFM
0.6 -2.2 Nl/min … 200 - 650 Nl/min
(at 14.7 psia / 1.013 bar abs. and 68 °F / 20 °C)

Materials:
brass or stainless steel

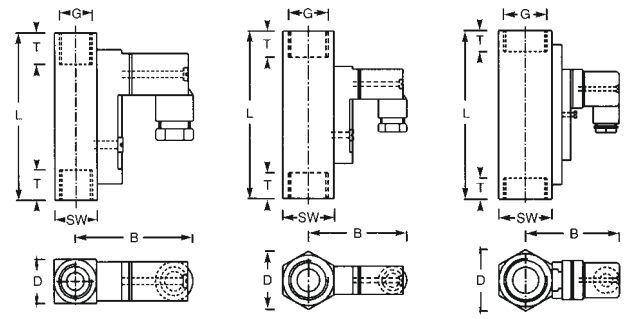
Contacts:

Contact function	DS02.1	DS02.2	DS02.3 / DS02.4
N/O	200 V, 1A, 20 VA	230 V, 3A, 60 VA	250 V, 3 A, 100 VA
SPDT	200 V, 1A, 20 VA	250 V, 1.5 A, 50 VA	250 V, 1.5 A, 50 VA
N/O*			250 V, 2A, 60VA
Ex-SPDT*			250 V, 1A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6

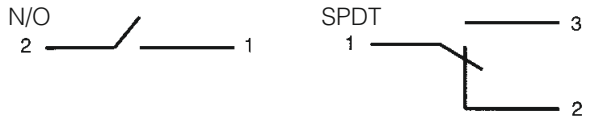
Dimensions:

Model	Mounting dimensions in inch / mm						Weight
	SW	D	B	NPT / G	T	L	(lbs / g)
DS02.1	0.67 / 17	0.67 / 17	1.85 / 47	1/4	0.39 / 10	2.56 / 65	0.31 / 140
DS02.2	1.06 / 27	1.22 / 31	2.05 / 52	1/2	0.55 / 14	3.53 / 90	0.77 / 350
DS02.3	1.61 / 41	1.85 / 47	2.99 / 76	3/4	0.83 / 21	5.98 / 152	2.43/1100
DS02.4	1.61 / 41	1.85 / 47	2.99 / 76	1	0.67 / 17	5.12 / 130	2.65/1200



DS02.1 **DS02.2** **DS02.3 / DS02.4**

Electrical connection



Technical Specifications:

max. pressure: DS02.1/2 4350 psi / 300 bar (brass), 5000 psi / 350 bar (stainless steel) DS02.3/4 3600 psi / 250 bar (brass), 4350 psi / 300 bar (stainless steel)

pressure drop: DS02.1: 0.29-2.9 psi / 0.02-0.2 bar DS02.2: 0.29-4.35 psi / 0.02-0.3 bar DS02.3/4: 0.29-5.8 psi / 0.02-0.8 bar

max. temperature: 212 °F / 100 °C (optionally 320 °F / 160 °C) for liquids, 194 °F / 90 °C for gases

materials:
brass version: housing: nickel plated brass
st. steel version: stainless steel: 316 Ti / 1.4571

electr. connection: plug acc. to DIN 43650 (optionally: 1m cable connection for DS02.1, N/O only)

accuracy: ± 10% f.s.

analog output: see model DSxx-A in section “accessory”

Ordering Code:

Order number: DS02. | 1. | 1. | 1. | W13 | 1. | 1. | 0

Miniature variable area flow switch

Connection:
2N = 1/2" NPTF
3N = 3/4" NPTF
1 = G 1/4 female
2 = G 1/2 female
3 = G 3/4 female
4 = G 1 female

Material:
1 = brass, spring of st. steel 304 / 1.4310
2 = all stainless steel 316 Ti / 1.4571

Scale:
1 = for water
2 = for air (14.7 psia / 1.013 bar abs. and 68 °F / 20 °C)

Measuring ranges:

DS02.1 only:

Water:	WU101	= 0.08-0.95 GPH	W101	= 5-60 ml/min
	WU102	= 0.65-2.05 GPH	W102	= 40-130 ml/min
	WU106	= 1.6-9.5 GPH	W106	= 0.1-0.6 l/min
	WU11	= 3-19 GPH	W11	= 0.2-1.2 l/min
	WU12	= 6.5-41.5 GPH	W12	= 0.4-2 l/min
	WU13	= 8.0-48.0 GPH	W13	= 0.5-3 l/min
	WU15	= 16.0-80.0 GPH	W15	= 1.0-5 l/min
Air:	LU1002	= 1.30-4.70 SCFH	L1002	= 0.6-2.2 Nl/min
	LU1006	= 3.50-12.70 SCFH	L1006	= 1.7-6.0 Nl/min
	LU1008	= 5.3-17.0 SCFH	L1008	= 2.5-8.0 Nl/min
	LU1012	= 6.5-25.5 SCFH	L1012	= 3-12 Nl/min
	LU1022	= 6.0-47.0 SCFH	L1022	= 3-22 Nl/min
	LU1024	= 15.0-51.0 SCFH	L1024	= 7-24 Nl/min
	LU1034	= 25.0-72.0 SCFH	L1034	= 12-34 Nl/min
	LU1056	= 34-119 SCFH	L1056	= 16-56 Nl/min
	LU1080	= 42-170 SCFH	L1080	= 20-80 Nl/min

DS02.2 only:

Water:	WU202	= 0.30-3.35 GPH	W202	= 0.02-0.2 l/min
	WU206	= 3.20-9.50 GPH	W206	= 0.2-0.6 l/min
	WU21	= 6.5-28.5 GPH	W21	= 0.4-1.8 l/min
	WU23	= 13.0-51.0 GPH	W23	= 0.8-3.2 l/min
	WU27	= 32.0-111 GPH	W27	= 2-7 l/min
	WU213	= 48.0-205 GPH	W213	= 3-13 l/min
	WU220	= 65.0-315 GPH	W220	= 4-20 l/min
	WU230	= 130-480 GPH	W230	= 8-30 l/min
Air:	LLU2010	= 5.5-21.0 SCFH	L2010	= 2.5-10 Nl/min
	LU2020	= 12.0-42.0 SCFH	L2020	= 5.5-20 Nl/min
	LU2030	= 17.0-64.0 SCFH	L2030	= 8-30 Nl/min
	LU2035	= 21.0-74.0 SCFH	L2035	= 10-35 Nl/min
	LU2090	= 50.0-190 SCFH	L2090	= 24-90 Nl/min
	LU2220	= 115-465 SCFH	L2220	= 55-220 Nl/min
	LU2240	= 140-510 SCFH	L2240	= 65-240 Nl/min
	LU2300	= 170-640 SCFH	L2300	= 80-300 Nl/min
	LU2525	= 5.00-18.50 SCFM	L2525	= 140-525 Nl/min

DS02.3 or DS02.4:

Water:	WU3030	= 160-480 GPH	W3030	= 11-30 l/min
	WU3045	= 240-710 GPH	W3045	= 15-45 l/min
	WU3060	= 320-950 GPH	W3060	= 20-60 l/min
	WU3090	= 8.00-24.0 GPM	W3090	= 30-90 l/min
Air:	LU30180	= 125-380 SCFH	L30180	= 60-180 Nl/min
	LU30300	= 210-635 SCFH	L30300	= 100-300 Nl/min
	LU30650	= 7.00-23.0 SCFM	L30650	= 200-650 Nl/min

DS02.4 only:

Water:	WU3150	= 16.0-40.0 GPM	W3150	= 60-150 l/min

No. of contacts:
1 = 1 contact
2 = 2 contacts

Contact function:
1 = N/O
2 = SPDT
3S = Ex-N/O (EEx m II T6), DS02.3, DS02.4 only
3U = Ex-SPDT (EEx m II T6), DS02.3, DS02.4 only

Options:
0 = without
1 = please indicate

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DS03

Variable Area Flowmeter And Switch

- small mounting dimensions
- materials brass or stainless steel
- scales for water and air
- high switching accuracy
- very small switch hysteresis
- measuring glass with burnt-in scale

Description:
The flowmeter and switch model DS03 works according to a modified variable area principle.
The float is guided in a cylindrical measuring glass. The flowing medium moves the float in the flow direction. The upper edge of the float shows the momentary flow via a burnt-in scale on the measuring glass.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.
The Reed contact is adjustable over the full measuring range of the meter.

Application:
The variable area flowmeter and switch model DS03 is used for measuring and monitoring the flow of low viscosity liquids and gases, i. e. in cooling cicuits of welding machines and laser systems, for pump monitoring, compressors and many other applications.

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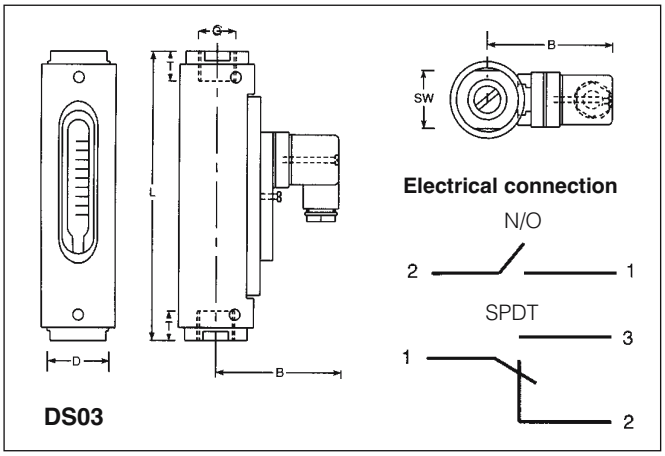
Measuring Ranges:

Water:	1.6-23.8 GPH…60…790 GPH 0.1-1.5 l/min … 4-50 l/min
Air:	6.5-63.5 SCFH…7-56.5 SCFM 3-30 Nl/min … 200-1600 Nl/min at 14.7 psia / 1.013 bar abs. and 68 °F / 20 °C
Materials:	brass or stainless steel
Contacts:	
N/O:	250 V, 3 A, 100 VA
SPDT:	250 V, 1.5 A, 50 VA
Ex- N/O*:	250 V, 2 A, 60 VA
Ex-SPDT*:	250 V, 1 A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6

Dimensions:

Model	Mounting dimensions in inch / mm						Weight
	SW	D	B	NPT / G	T	L	lbs / g
DS03.1.x.x.x	1.26 / 32	1.69 / 43	2.87 / 73	1/4	0.55 / 14	5.20 / 132	1.38 / 625
DS03.2.x.x.x	1.26 / 32	1.69 / 43	2.87 / 73	1/2	0.59 / 15	5.31 / 13	1.38 / 625
DS03.2.x.x.05	1.26 / 32	1.69 / 43	2.87 / 73	1/2	0.59 / 15	6.42 / 163	1.43 / 650
DS03.3.x.x.05	1.26 / 32	1.69 / 43	2.87 / 73	3/4	0.63 / 16	6.57 / 167	1.43 / 650
DS03.3.x.x.06/07	1.61 / 41	1.97 / 50	2.99 / 76	3/4	0.71 / 18	6.46 / 164	2.21 / 1000
DS03.4.x.x.06/07	1.61 / 41	1.97 / 50	2.99 / 76	1	0.75 / 19	7.24 / 184	2.21 / 1000
DS03.4.x.x.08	1.61 / 41	1.97 / 50	2.99 / 76	1	0.79 / 20	7.87 / 200	2.43 / 1100



DS03

Technical Specifications:

max. pressure:	145 psi / 10 bar
pressure drop:	0.15-2.9 psi / 0.01-0.2 bar
max. temperature:	212 °F / 100 °C (320 °F / 160 °C optionally) for liquids, 194 °F / 90 °F for gases
materials:	Measuring glass: Duran 50 Housing: anodized aluminium O-rings: Buna, (optionally: Viton, EPDM)
electrical connections:	plug acc. to DIN 43650 (optionally: 1 m cable connection)
accuracy:	± 5% f. s.
ananlog output:	see model DSxx-A in section “accessory”

Ordering Code:

Order number: **DS03. 3. 1. 1. WA06. 1. 1. 0**

Variable area flowmeter and switch

Connection:

1N = 1/4" NPT female	1 = G 1/4 female
2N = 1/2" NPT female	2 = G 1/2 female
3N = 3/4" NPT female	3 = G 3/4 female
4N = 1" NPT female	4 = G 1 female

Material:
1 = brass
2 = all st. steel 316 Ti / 1.4571

Scale:
1 = for Water
2 = for air (at 14.7 psia / 1.013 bar abs., 68 °F / 20 °C)

Measuring ranges:

DS03.1 and DS03.2:

Water	WU01 = 1.6 - 23.8 GPH	WA01 = 0.1 - 1.5 l/min
	WU02 = 3.2 - 47.5 GPH	WA02 = 0.2 - 3 l/min
	WU03 = 5.0 - 127 GPH	WA03 = 0.3 - 8 l/min
	WU04 = 16 - 190 GPH	WA04 = 1 - 12 l/min
Air	LU01 = 6.5 - 63.5 SCFH	LA01 = 3 - 30 Nl/min
	LU02 = 13 - 127 SCFH	LA02 = 6 - 60 Nl/min
	LU03 = 13 - 340 SCFH	LA03 = 6 - 160 Nl/min
	LU04 = 42 - 465 SCFH	LA04 = 20 - 220 Nl/min

DS03.2 and DS03.3:

Water	WU05 = 32 - 285 GPH	WA05 = 2 - 18 l/min
Air	LU05 = 85 - 760 SCFH	LA05 = 40 - 360 Nl/min

DS03.3 and DS03.4:

Water	WU06 = 48 - 550 GPH	WA06 = 3 - 35 l/min
	WU07 = 60 - 790 GPH	WA07 = 4 - 50 l/min
Air	LU06 = 2.1 - 24.7 SCFM	LA06 = 60 - 700 Nl/min
	LU07 = 2,0 - 29,0 SCFM	LA07 = 60 - 825 Nl/min

DS03.4 only:

Water	LU08 = 7 - 56.5 SCFM	LA08 = 200 - 1600 Nl/min

No. of contacts:
0 = without contact
1 = 1 contact
2 = 2 contacts

Contact function:
0 = without contact
1 = N/O
2 = SPDT
3S = Ex-N/O (EEx m II T6)
3U = Ex-SPDT (EEx m II T6)

Options:
0 = without
1 = please indicate

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DS04

Variable Area Flowmeter And Switch For High Pressure Applications

- small mounting dimensions
- materials brass or stainless steel
- scales for water and air
- high switching accuracy
- very small switch hysteresis
- robust design without glass measuring tube
- suitable for pressures up to 4350 psi / 300 bar

Description:
The flowmeter and switch model DS04 works according to a modified variable area principle.
The float is guided in a cylindrical measuring tube by means of a slotted nozzle. The flowing medium moves the float in the flow direction. An externally mounted pointer indicator is magnetically coupled to the float and thus, following the float position, indicates the flow rate on a scale.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time. The Reed contact is adjustable over the full measuring and switching range of the meter.

Application:
The variable area flowmeter and switch model DS04 is used for measuring and monitoring the flow of low viscosity liquids and gases, i. e. in cooling cicuits of welding machines and laser systems, for pump monitoring, compressors and many other applications.

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Versions:

- flow switch only with Reed contact
- optionally as flow meter and switch with external pointer indicator and contact

Measuring Ranges:

Water: 1.5-23.8 GPH … 65-790 GPH
Air: 2-59 SCFH … 7-51 SCFM
(at 14.7 psia / 1.013 bar abs. and 68 °F / 20 °C)

Materials: brass or stainless steel

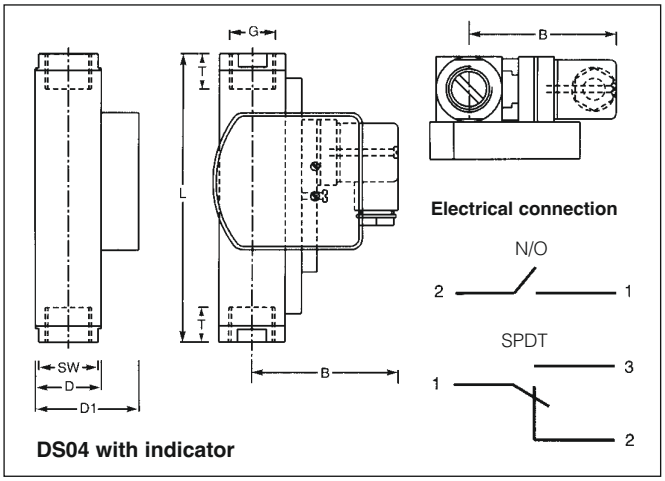
Contacts:

N/O: 250 V, 3 A, 100 VA
SPDT: 250 V, 1.5 A, 30 VA
Ex- N/O*: 250 V, 2 A, 60 VA
Ex-SPDT*: 250 V, 1 A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6

Dimensions:

Model	Mounting dimensions in inch / mm							Weight (lbs / g)	
	SW	D	D1	B	NPT / G	T	L	without	with indication
DS04.1.x.x.x	1.06 / 27	1.18 / 30	1.85 / 47	2.80 / 71	1/4"	0.55 / 14	5.12 / 130	1.76 / 800	1.87 / 850
DS04.2.x.x.x	1.06 / 27	1.18 / 30	1.85 / 47	2.80 / 71	1/2"	0.59 / 15	5.12 / 130	1.76 / 800	1.87 / 850
DS04.2.x.x.05	1.06 / 27	1.18 / 30	1.85 / 47	2.80 / 71	1/2"	0.59 / 15	5.83 / 148	1.87 / 850	1.98 / 900
DS04.3.x.x.x	1.34 / 34	1.57 / 40	2.24 / 57	2.80 / 71	3/4"	0.71 / 18	5.98 / 152	2.97 / 1350	3.08 / 1400
DS04.4.x.x.06/07	1.42 / 36	1.42 / 36	2.09 / 53	2.99 / 76	1"	0.75 / 19	6.14 / 156	2.31 / 1050	2.42 / 1100
DS04.4.x.x.08	1.97 / 50	1.97 / 50	2.64 / 67	2.99 / 76	1"	0.79 / 20	7.87 / 200	6.06 / 2750	6.17 / 2800



DS04 with indicator

Technical Specifications:

max. pressure: brass version: 2900 psi / 200 bar
st. steel version: 4350 psi / 300 bar

pressure drop: 0.29-5.8 psi / 0.02-0.4 bar

max. temperature: 212 °F / 100 °C (320 °F / 160 °C on request) for liquids, 194 °F / 90 °C for gases

materials:
wetted parts:
brass version: nickel plated brass
st. steel version: st. steel 316 Ti / 1.4571

O-rings: Buna (optionally: Viton, EPDM)

electrical connection: plug acc. to DIN 43650 (optionally: 1m cable connection)

accuracy: ± 5% f. s. for water, ± 10% f. s. for air

analog output: see model DSxx-A in section "accessories"

Ordering Code:

Order number: DS04. 4. 1. 1. WA06. 1. 1. 1. 0

Variable area flowmeter and switch

Connection:

1N = 1/4" NPT female	1 = G 1/4 female
2N = 1/2" NPT female	2 = G 1/2 female
3N = 3/4" NPT female	3 = G 3/4 female
4N = 1" NPT female	4 = G 1 female

Material:
1 = brass
2 = all st. steel AISI 316 Ti / 1.4571

Scale:
1 = for water
2 = for air (at 14.7 psia / 1.013 bar abs. and 68 °F / 20 °C)

Measuring ranges:

DS04.1 and DS04.2:

Water	WU01 = 1.5 – 23.8 GPH	WA01 = 0.1 - 1.5 l/min
	WU02 = 3.0 – 47.5 GPH	WA02 = 0.2 - 3 l/min
	WU03 = 1.0 – 127 GPH	WA03 = 0.3 - 8 l/min
	WU04 = 16 – 190 GPH	WA04 = 1 - 12 l/min
Air	LU01 = 2 – 59 SCFH	LA01 = 1 - 28 Nl/min
	LU02 = 8 – 127 SCFH	LA02 = 4 - 60 Nl/min
	LU03 = 15 – 340 SCFH	LA03 = 6 - 160 Nl/min
	LU04 = 40 – 510 SCFH	LA04 = 20 - 240 Nl/min

DS04.2 and DS04.3:

Water	WU05 = 32 – 285 GPH	WA05 = 2 - 18 l/min
Air	LU05 = 80 – 760 SCFH	LA05 = 40 - 360 Nl/min

DS04.3 and DS04.4:

Water	WU06 = 50 – 555 GPH	WA06 = 3 - 35 l/min
	WU07 = 65 – 790 GPH	WA07 = 4 - 50 l/min
Air		LA06 = 60 - 700 Nl/min
	LU07 = 2 – 24.5 SCFM	LA07 = 80 - 1000 Nl/min

DS04.4 only:

Air	LU08 = 7 – 51 SCFM	LA08 = 200 - 1400 Nl/min

Version:
0 = switch only, without flow rate indication
1 = flow meter and switch, with side indicator

No. of contacts:
0 = without contact
1 = 1 contact
2 = 2 contacts

Contact function:
0 = without contact
1 = N/O
2 = SPDT
3S = Ex-N/O (EEx m II T6)
3U = Ex-SPDT (EEx m II T6)

Options:
0 = without
1 = please indicate

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DS05

Variable Area Flowmeter And Switch, Mounting Independent

- any mounting position without recalibration
- small mounting dimensions
- materials brass or stainless steel
- high switching accuracy
- very small switch hysteresis
- measuring glass with burnt-in scale

Description:
The flowmeter and switch model DS05 works according to a modified variable area principle.
The float is guided in a cylindrical measuring glass by means of a spring. The flowing medium moves the float in the flow direction. The upper edge of the float shows the momentary flow via a burnt-in scale on the measuring glass.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.
The Reed contact is adjustable over the full switching range of the meter.

Mounting Position and Reliability:
The built-in spring and the magnetic float guarantee an absolute reliability of the meter. This spring, which pushes the float back towards its zero position against the flow makes it possible to use the meter in any mounting position. The spring is artificially aged, thus eliminating the need for recalibration to the different mounting positions.

Application:
The variable area flowmeter and switch model DS05 is used for measuring and monitoring the flow of low viscosity liquids, i. e. in cooling cicuits of welding machines and laser systems, for pump monitoring, compressors and many other applications.

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Measuring Ranges:

3.0-63 GPH ... 9.0-66 GPM water
0.2 - 4 l/min ... 35 - 250 l/min water

Materials: brass or stainless steel

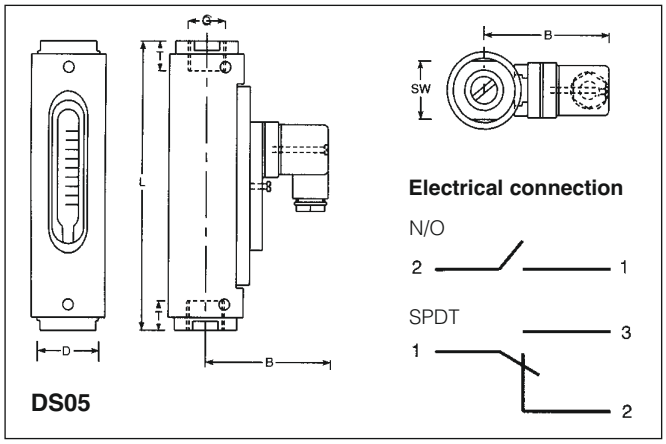
Contacts:

N/O:	250 V, 3 A, 100 VA
SPDT :	250 V, 1.5 A, 30 VA
Ex-N/O* :	250 V, 2 A, 60 VA
Ex-SPDT*:	250 V, 1 A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6

Dimensions:

Model	Mounting dimensions in inch / mm						Weight
	SW	D	B	NPT / G	T	L	(lbs / g)
DS05.1.x.x.x	1.26 / 32	1.69 / 43	2.87 / 73	1/4"	0.55 / 14	5.20 / 132	1.38 / 625
DS05.2.x.x.x	1.26 / 32	1.69 / 43	2.87 / 73	1/2"	0.59 / 15	5.31 / 135	1.38 / 625
DS05.2.x.x.05	1.26 / 32	1.69 / 43	2.87 / 73	1/2"	0.59 / 15	6.42 / 163	1.43 / 650
DS05.3.x.x.06	1.26 / 32	1.69 / 43	2.87 / 73	3/4"	0.71 / 18	6.57 / 167	1.87 / 850
DS05.3.x.x.07	1.61 / 41	1.97 / 50	2.99 / 76	3/4"	0.71 / 18	5.98 / 152	2.20 / 1000
DS05.4.x.x.07	1.61 / 41	1.97 / 50	2.99 / 76	1"	0.75 / 19	6.14 / 156	2.20 / 1000
DS05.4.x.x.08/09	1.61 / 41	1.97 / 50	2.99 / 76	1"	0.75 / 19	7.48 / 190	2.20 / 1000
DS05.5.x.x.10	1.81 / 46	2.36 / 60	3.19 / 81	1 1/4"	0.83 / 21	8.27 / 210	3.08 / 1400
DS05.5.x.x.11	1.81 / 46	2.17 / 55	3.11 / 79	1 1/4"	0.83 / 21	8.74 / 222	3.08 / 1400



DS05

Technical Specifications:

max. pressure: 145 psi / 10 bar

pressure drop: 0.15-11.6 psi / 0.01-0.8 bar

max. temperature: 212 °F / 100 °C
(320 °F / 160 °C on request)

materials: Measuring glass: Duran 50
Housing: anodized aluminium
O-rings: Buna
(optionally: Viton, EPDM)

electr. connection: plug acc. to DIN 43650
(optionally: 1 m cable connection)

accuracy: ± 5% f. s.

analog output: see model DSxx-A
in section "accessory"

Ordering Code:

Order number: DS05. 3. 1. 1. 06. 1. 1. 0

Variable area flowmeter and switch

Connection:

1N = 1/4" NPT female	1 = G 1/4 female
2N = 1/2" NPT female	2 = G 1/2 female
3N = 3/4" NPT female	3 = G 3/4 female
4N = 1" NPT female	4 = G 1 female
5N = 1 1/4" NPT female	5 = G 1 1/4 female

Material:
1 = brass, spring of steel 1.4310
2 = all st. steel 1.4571

Scale:
1 = for water

Measuring ranges (water):

DS05.1 and DS05.2:

01U = 3.0 - 63 GPH	01 = 0.2 - 4 l/min
02U = 8.0 - 95 GPH	02 = 0.5 - 6 l/min
03U = 8.0 - 127 GPH	03 = 0.5 - 8 l/min
04U = 8.0 - 222 GPH	04 = 0.5 - 14 l/min

DS05.2 only:

05AU = 32 - 350 GPH	05A = 2 - 22 l/min
05U = 16 - 444 GPH	05 = 1 - 28 l/min

DS05.3 only:

06U = 40 - 710 GPH	06 = 2 - 45 l/min

DS05.3 and DS05.4:

07U = 0.5 - 21 GPM	07 = 2 - 80 l/min
07AU = 1.6 - 23.8 GPM	07A = 6 - 90 l/min.

DS05.4 only:

08U = 1.6 - 29 GPM	08 = 6 - 110 l/min

DS05.5 only:

09U = 4 - 39.5 GPM	09 = 15 - 150 l/min
10U = 8 - 58 GPM	10 = 30 - 220 l/min
11U = 9 - 66 GPM	11 = 35 - 250 l/min

No. of contacts:
0 = without contact
1 = 1 contact
2 = 2 contacts

Contact function:
0 = without contact
1 = N/O
2X = SPDT for SPS application
3S = Ex-N/O (EEx m II T6)
3U = Ex-SPDT (EEx m II T6)

Options:
0 = without
1 = please indicate

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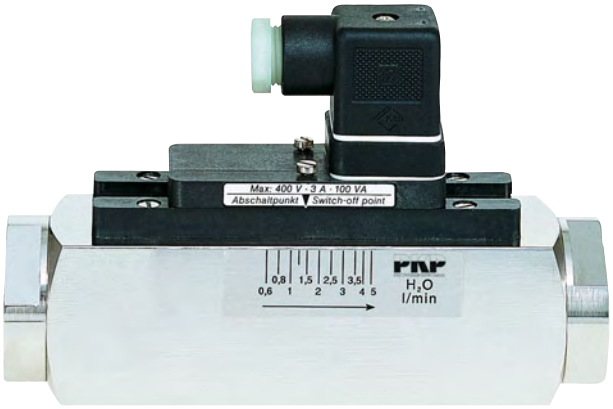
DS06

Variable Area Flowmeter And Switch For High Pressure Applications, Mounting Independent



- any mounting position without recalibration
- small mounting dimensions
- materials brass or stainless steel
- high switching accuracy
- very small switch hysteresis
- robust design without glass measuring tube
- suitable for pressures up to 4350 psi / 300 bar

Description:
The flowmeter and switch model DS06 works according to a modified variable area principle.
The float is guided in a cylindrical measuring tube by means of a slotted nozzle. The flowing medium moves the float in the flow direction. An externally mounted pointer indicator is magnetically coupled to the float and thus, following the float position, indicates the flow rate on a scale.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.
The Reed contact is adjustable over the full switching range of the meter.

Mounting Position and Reliability:
The built-in spring and the magnetic float guarantee an absolute reliability of the meter. This spring, which pushes the float back towards its zero position against the flow makes it possible to use the meter in any mounting position. The spring is artificially aged, thus eliminating the need for recalibration to the different mounting positions.

Application:
The variable area flowmeter and switch model DS06 is used for measuring and monitoring the flow of low viscosity liquids and gases, i. e. in cooling cicuits of welding machines and laser systems, for pump monitoring, compressors and many other applications.

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Versions:

- flow switch only with Reed contact
- optionally as flow meter and switch with external pointer indicator and contact

Measuring ranges:
3.0 - 63.5 GPH ... 9 - 66 GPM
0.2 - 4 l/min ... 35 - 250 l/min

Materials: brass or stainless steel

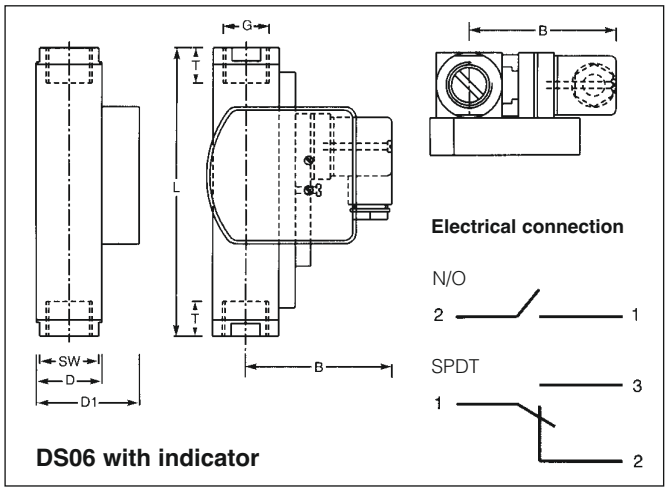
Contacts:

N/O:	250 V, 3 A, 100 VA
SPDT:	250 V, 1.5 A, 50 VA
Ex-N/O*:	250 V, 2 A, 60 VA
Ex-SPDT*:	250 V, 1 A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6

Dimensions:

Model	Mounting dimensions in inch / mm							Weight (lbs / g)	
	SW	D	D1	B	G	T	L	without indication	with indication
DS06.1.x.x.x	1.06 / 27	1.18 / 30	1.85 / 47	2.80 / 71	1/4"	0.55 / 14	5.12 / 130	1.67 / 800	1.87 / 850
DS06.2.x.x.x	1.06 / 27	1.18 / 30	1.85 / 47	2.80 / 71	1/2"	0.55 / 14	5.12 / 130	1.87 / 850	1.98 / 900
DS06.2.x.x.07/08	1.06 / 27	1.18 / 30	1.85 / 47	2.80 / 71	3/4"	0.63 / 16	5.83 / 148	1.98 / 900	2.09 / 950
DS06.3.x.x.x	1.34 / 34	1.57 / 40	2.24 / 57	2.99 / 76	3/4"	0.71 / 18	5.98 / 152	3.08 / 1400	3.19 / 1450
DS06.4.x.x.9-11	1.42 / 36	1.42 / 36	2.09 / 53	2.99 / 76	1"	0.75 / 19	6.14 / 156	2.42 / 1100	2.53 / 1150
DS06.5.x.x.x	1.97 / 50	1.97 / 50	2.64 / 67	2.95 / 75	1 1/4"	0.83 / 21	7.87 / 200	6.61 / 3000	6.72 / 3050
DS06.6.x.x.x	2.17 / 55	2.17 / 55	2.83 / 72	3.07 / 78	1 1/2"	0.94 / 24	7.87 / 200	8.37 / 3800	8.48 / 3850



DS06 with indicator

Technical Specifications:

max. pressure:

brass version:	2900 psi / 200 bar
st. steel version:	4350 psi / 300 bar
pressure drop:	0.29-11.6 psi / 0.02-0.8 bar
max. temperature:	212 °F / 100 °C, (320 °F / 160 °C on request)

materials:

wetted parts:	
brass:	nickel plated brass
st. steel:	st. steel 316 Ti / 1.4571
O-rings:	Buna (opt. Viton, EPDM)

electr. connection: plug acc. DIN 43650 (optionally: 1m cable connection)

accuracy: ± 5% f. s.

analog output: see model DSxx-A in section "accessories"

Ordering Code:

Order number **DS06. | 3. | 1. | 1. | 09. | 1. | 1. | 1. | 0**

Variable area flowmeter and switch

Connection:

1N = 1/4" NPT female	1 = G 1/4 female
2N = 1/2" NPT female	2 = G 1/2 female
3N = 3/4" NPT female	3 = G 3/4 female
4N = 1" NPT female	4 = G 1 female
	5 = G 1 1/4 female
	6 = G 1 1/2 female

Material:
1 = brass, spring st. steel 304 / 1.4310
2 = all st. steel 316 Ti / 1.4571

Scale:
1 = for water

Measuring ranges:

DS06.1 and DS06.2:	
01U = 3.0 – 63.5 GPH	01 = 0.2 - 4 l/min water
	02 = 0.4 - 4.5 l/min water
03U = 9.5 – 79 GPH	03 = 0.6 - 5 l/min water
04U = 8 – 127 GPH	04 = 0.5 - 8 l/min water
05U = 15 – 222 GPH	05 = 1 - 14 l/min water
06U = 15 – 445 GPH	06 = 1 - 28 l/min water
DS06.2 and DS06.3:	**DS06.2 and DS06.3:**
07U = 30 – 635 GPH	07 = 2 - 40 l/min water
08U = 60 – 870 GPH	08 = 4 - 55 l/min water
DS06.3 and DS06.4:	**DS06.3 and DS06.4:**
09U = 0.30 – 18.5 GPM	09 = 1 - 70 l/min water
10U = 2.1 – 23.8 GPM	10 = 8 - 90 l/min water
11U = 1.3 – 29 GPM	11 = 5 - 110 l/min water
DS06.5 only:	**DS06.5 only:**
12U = 2.6 – 39.5 GPM	12 = 10 - 150 l/min water
DS06.5 and DS06.6:	**DS06.5 and DS06.6:**
13U = 9 – 58 GPM	13 = 35 - 220 l/min water
14U = 9 – 66 GPM	14 = 35 - 250 l/min water

Version:
0 = switch only, without flow rate indication
1 = flow meter and switch, with side indicator

No. of contacts:
0 = without contact
1 = 1 contact
2 = 2 contacts

Contact function:
0 = without contact
1 = N/O
2X = SPDT for SPS application
3S = Ex-N/O (EEx m II T6)
3U = Ex-SPDT(EEx m II T6)

Options:
0 = without
1 = please indicate

attention: please indicate flow-direction and mounting position.

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DS07

Viscosity Compensated Variable Area Flowmeter And Switch, Mounting Independent

- for viscous media up to 600 cSt
- mounts in any position without recalibration
- compact design
- materials brass or stainless steel
- high switching accuracy
- very small switch hysteresis
- measuring glass with burnt-in scale

Description:
The flowmeter and switch model DS07 works according to a modified variable area principle.
The float is guided in a cylindrical measuring glass by means of a spring. The flowing medium moves the float in the flow direction. The upper edge of the float shows the momentary flow via a burnt-in scale on the measuring glass.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.
The Reed contact is adjustable over the full measuring range of the meter.

Viscosity compensation, mounting position and reliability:
The built-in spring and the magnetic float guarantee an absolute reliability of the meter. This spring, which pushes the float back towards its zero position against the flow makes it possible to use the meter in any mounting position. The spring is artificially aged, thus eliminating the need for recalibration to the different mounting positions.
The strong spring and an orifice in the float work together to limit the effects of viscosity changes to an absolute minimum compared to regular variable area flowmeters.

Application:
The variable area flowmeter and switch model DS07 is used for measuring and monitoring the flow of viscous liquids, i. e. in central lubricating systems, any other lubricating circuitry, hydraulics, transformer oils etc.

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Measuring Ranges:

8-27 GPH … 8-24 GPM
0.2 - 0.8 l/min … 30 - 90 l/min
for viscosities up to max. 600 cSt

Materials: brass or stainless steel

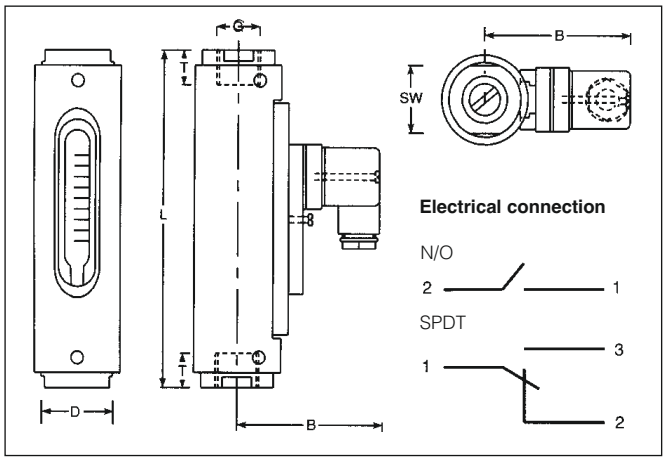
Contacts:

N/O:	250 V, 3 A, 100 VA**
SPDT:	250 V, 1.5 A, 50 VA***
Ex-N/O*:	250 V, 2 A, 60 VA
Ex-SPDT*:	250 V, 1 A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6 and II 2D IP67 T80 °C
** for DS07.S.2/3/4...(230V, 1 A, 50 VA)
*** 250V, 1A, 50 VA (TYPE:2X)

Dimensions:

Model	Mounting dimensions in inch / mm						Weight
	SW	D	B	NPT / G	T	L	(lbs / g)
DS07.S.1	1.61 / 41	1.97 / 50	3.03 / 77	1/4"	0.67 / 17	5.71 / 145	1.87 / 850
DS07.S.2	1.61 / 41	1.97 / 50	3.03 / 77	1/2"	0.67 / 17	5.71 / 145	1.87 / 850
DS07.M.1	1.06 / 27		2.07 / 53	1/2"	0.55 / 14	4.49 / 114	0.66 / 300
DS07.S.3	1.61 / 41	1.97 / 50	3.03 / 77	3/4"	0.67 / 17	5.47 / 139	1.87 / 850
DS07.S.4	1.61 / 41	1.97 / 50	3.03 / 77	1"	0.67 / 17	6.22 / 158	1.87 / 850



Technical Specifications:

max. pressure: 232 psi / 16 bar (DS07.M)
145 psi / 10 bar (DS07.S)

pressure drop: 0.29 - 2.9 psi / 0.02 - 0.2 bar (DS07.M)
0.29 - 5.8 psi / 0.02 - 0.4 bar (DS07.S)

max. temperature: 248 °F / 120 °C
(320 °F / 160 °C on request)

materials: Measuring glass: Duran 50
Housing: anodized aluminium
O-rings: Perbunan
(optionally: Viton, EPDM)

elektr. connection: plug acc. to DIN 43650
(optionally: 1m cable connection)

accuracy: ± 10% f. s.

analog output: see model DSxx-A
in section "accessory"

Ordering Code:

Order number: DS07. M. 2. 1. 1. 05. 1. 1. 0

Viscosity compensated variable area flowmeter and switch

Size:
M = miniature
S = standard

Connection:

1N = 1/4" NPT female	1 = G 1/4 female
2N = 1/2" female	2 = G 1/2 female
3N = 3/4" female	3 = G 3/4 female
4N = 1" female	4 = G 1 female

Material:
1 = brass, spring st. steel 1.4310
2 = all st. steel 1.4571

Scale:
1 = for viscous media

Measuring ranges:

DS07.M 1/2" only:

01U = –	01 = 0.2 - 0.8 l/min
02U = 3.2 - 15.9 GPH	02 = 0.2 - 1 l/min
03U = 8 -27 GPH	03 = 0.5 - 1.7 l/min
04U = 21 - 63 GPH	04 = 1.3 - 4 l/min
05U = 40 - 127 GPH	05 = 2.5 - 8 l/min

DS07.S 1/4" only:

06AU = 1.6 - 12.7 GPH	06 A = 0.1 - 0.8 l/min
07AU = 8 - 24 GPH	07 A = 0.5 - 1.5 l/min
08AU = 16 - 63 GPH	08 A = 1 - 4 l/min

DS07.S 1/2", 3/4", 1":

06U = 1.6 - 12.7 GPH	06 = 0.1 - 0.8 l/min
07U = 8 - 24 GPH	07 = 0.5 - 1.5 l/min
08U = 16 - 63 GPH	08 = 1 - 4 l/min
09U = 32 - 127 GPH	09 = 2 - 8 l/min
10U = 48 - 159 GPH	10 = 3 - 10 l/min
11U = 80 - 240 GPH	11 = 5 - 15 l/min
12U = 125 - 380 GPH	12 = 8 - 24 l/min

DS07.S 3/4", 1":

13U = 160 - 475 GPH	13 = 10 - 30 l/min
14U = 240 - 710 GPH	14 = 15 - 45 l/min
15U = 320 - 950 GPH	15 = 20 - 60 l/min
16U = 8 - 24 GPM	16 = 30 - 90 l/min

No. of contacts:
0 = without contact
1 = 1 contact
2 = 2 contacts

Contact function:
0 = without contact
1 = N/O
2 = SPDT
3S = Ex-N/O, not available for DS07.M (EEx m II T6)
3U = Ex-SPDT, not available for DS07.M (EEx m II T6)

Options:
0 = without
1 = please indicate

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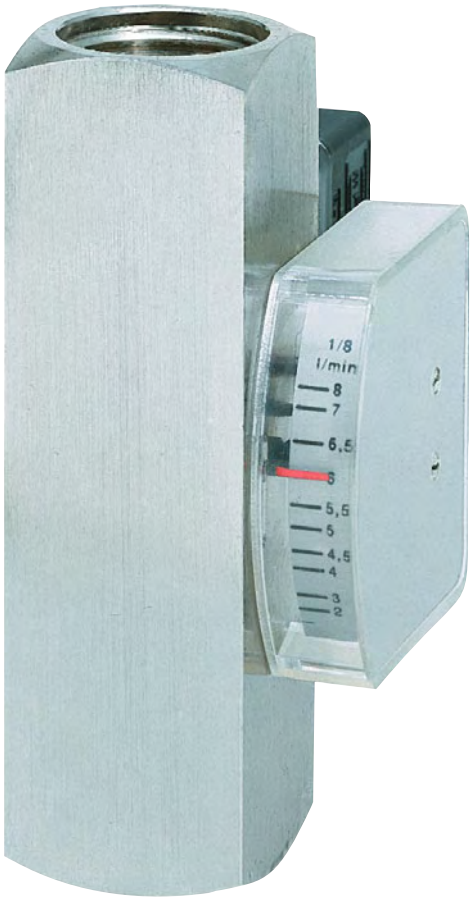
DS08

Viscosity Compensated Variable Area Flowmeter And Switch For High Pressure Applications, Mounting Independent



- for viscous media up to 600 cSt
- mounts in any position without recalibration
- small mounting dimensions
- materials brass or stainless steel
- high switching accuracy
- very small switch hysteresis
- robust design without glass measuring tube
- suitable for pressures up to 5000 psi / 350 bar

Description:
The flowmeter and switch model DS08 works according to a modified variable area principle.
The float is guided in a cylindrical measuring tube by means of a spring. The flowing medium moves the float in the flow direction. An externally mounted pointer indicator is magnetically coupled to the float and thus, following the float position, indicates the flow rate on a scale.
A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.
The Reed contact is adjustable over the full switching range of the meter.

Viscosity compensation, mounting position and reliability:
The built-in spring and the magnetic float guarantee an absolute reliability of the meter. This spring, which pushes the float back towards its zero position against the flow makes it possible to use the meter in any mounting position. The spring is artificially aged, thus eliminating the need for recalibration to the different mounting positions.
The strong spring and an orifice in the float work together to limit the effects of viscosity changes to an absolute minimum compared to regular variable area flowmeters.

Application:
The variable area flowmeter and switch model DS08 is used for measuring and monitoring the flow of viscous liquids, i. e. in central lubricating systems, any other lubricating circuitry, hydraulics, transformer oils etc.

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Versions:

- flow switch only with Reed contact
- optionally as flow meter and switch with external pointer indicator and contact

Measuring ranges: 1.6-12.7 GPH ... 9.5-29 GPM
0.1-0.8 l/min ... 35-110 l/min
for viscosities up to 600 cSt

Materials: brass or st. Steel

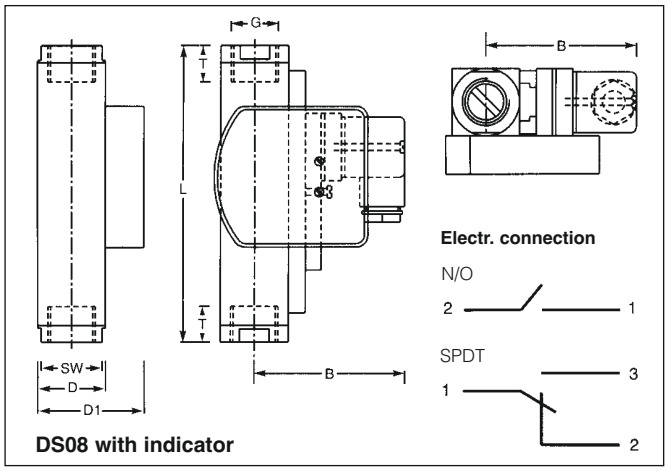
Contacts:

N/O:	250 V, 3 A, 100 VA**
SPDT:	250 V, 1.5 A, 50 VA***
Ex-N/O* :	250 V, 2 A, 60 VA
Ex-SPDT*:	250 V, 1 A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6 and II 2D IP67 T80 °C
** for DS08.S...(230V, 1 A, 50 VA) ***250V, 1A, 50 VA (TYPE:2X)

Dimensions:

Model	Mounting dimensions in inch / mm							Weight (lbs / g)	
	SW	D	D1	B	NPT/G	T	L	without	with indication
DS08.M	1.06 / 27	1.22 / 31	1.89 / 48	1.89 / 48	1/2"	0.55 / 14	3.54 / 90	0.77 / 350	–
DS08.S	1.57 / 40	1.57 / 40	2.24 / 57	2.68 / 68	1"	0.67 / 17	5.12 / 130	2.20 / 1000	2.31 / 1050
Special connection									
DS08.M					1/4"	0.55 / 14	3.86 / 98	0.88 / 400	–
					3/8"	0.55 / 14	4.25 / 108	0.99 / 450	–
DS08.S					1/4"	0.83 / 21	5.98 / 152	2.42 / 1100	2.53 / 1150
					1/2"	0.83 / 21	5.98 / 152	2.42 / 1100	2.53 / 1150
					3/4"	0.83 / 21	5.98 / 152	2.42 / 1100	2.53 / 1150



DS08 with indicator

Technical Specifications:

max pressure:
brass version: 4350 psi / 300 bar (DS08.M),
3600 psi / 250 bar (DS08.S)
st. steel version: 5000 psi / 350 bar (DS08.M),
4350 psi / 300 bar (DS08.S)

pressure drop: 0.29-5.8 psi / 0.02-0.4 bar (DS08.M),
0.29-2.9 psi / 0.02-0.2 bar (DS08.S)

max. temp.: 248 °F / 120 °C, 320 °F / 160 °C optionally

materials: wetted parts:
brass version: nickel plated brass
st. steel version: stainless steel 316 Ti / 1.4571
O-rings (for DS08.-.xR… only):
DS08.x.x 1: Buna, optionally: EPDM, Viton
DS08.x.x.2: Viton, optionally: EPDM, Buna

electrical connection: plug acc.to DIN 43650 (optionally: 1m cable connection) (optionally: circular plug M 12x1 to EN 50044

accuracy: ± 10% f. s.

analog output: see model DSxx-A in section “accessory”

Ordering Code:

Order number: DS08. S. 4. 1. 1. 06. 1. 1. 1. 0

All metal viscosity compensated variable area flowmeter and switch

Size:
M = miniature
S = standard

Connection:
1RN = reduction to 1/4" NPT female
2RN = reduction to 1/2" NPT female, for DS08.S only
3RN = reduction to 3/4" NPT female, for DS08.S only
1R = reduction to G 1/4 female
2R = reduction to G 1/2 female
2 = G 1/2 female
3R = reduction to G 3/4 female
4 = G 1 female

Material:
1 = brass, spring st. steel 304 / 1.4310
2 = all st. steel 316 Ti / 1.4571

Scale:
1 = for viscous media up to 600 cST

Measuring ranges:
DS08.M. only

01U = 1.6-12.7 GPH	01 = 0.1 - 0.8 l/min
03U = 8.0-25.5 GPH	03 = 0.5 - 1.6 l/min
04U = 13-48 GPH	04 = 0.8 - 3 l/min
05U = 32-111 GPH	05 = 2 - 7 l/min

DS08.S. only

06U = 1.6-12.7 GPH	06 = 0.1 - 0.8 l/min
07U = 8-24 GPH	07 = 0.5 - 1.5 l/min
08U = 16-63 GPH	08 = 1 - 4 l/min
09U = 32-127 GPH	09 = 2 - 8 l/min
10U = 48-160 GPH	10 = 3 - 10 l/min
11U = 80-240 GPH	11 = 5 - 15 l/min
12U = 125-380 GPH	12 = 8 - 24 l/min
12AU = 15-320 GPH	12A = 1 - 20 l/min
13U = 160-480 GPH	13 = 10 - 30 l/min
13AU = 60-630 GPH	13A = 4 - 40 l/min
14U = 240-710 GPH	14 = 15 - 45 l/min
14AU = 80-790 GPH	14A = 5 - 50 l/min
15U = 320-950 GPH	15 = 20 - 60 l/min
15AU = 130-950 GPH	15A = 8 - 60 l/min
16U = 8.0-24.0 GPM	16 = 30 - 90 l/min
16AU = 3.2-18.5 GPM	16A = 12 - 70 l/min
17U = 9.5-29.0 GPM	17 = 35 - 110 l/min
17AU = 4.0-21.1 GPM	17A = 15 - 80 l/min

Version:
0 = switch only, without flow rate indication
1 = flow meter and switch, with side indicator (for DS08.S only)

No. of contacts:
0 = without contact (for flowmeters with indicator only)
1 = 1 contact
2 = 2 contacts

Contact function:
0 = without contact (for flowmeters with indicator only)
1 = N/O
2 = SPDT
3U = Ex-N/O, not available for DS08.M (EEx m II T6)
3S = Ex-SPDT, not available for DS08.M (EEx m II T6)

Options:
0 = without
1 = please indicate

attention: Please indicate flow-direction and mounting position.
Analog output 4-20 mA for DS08.S on request.

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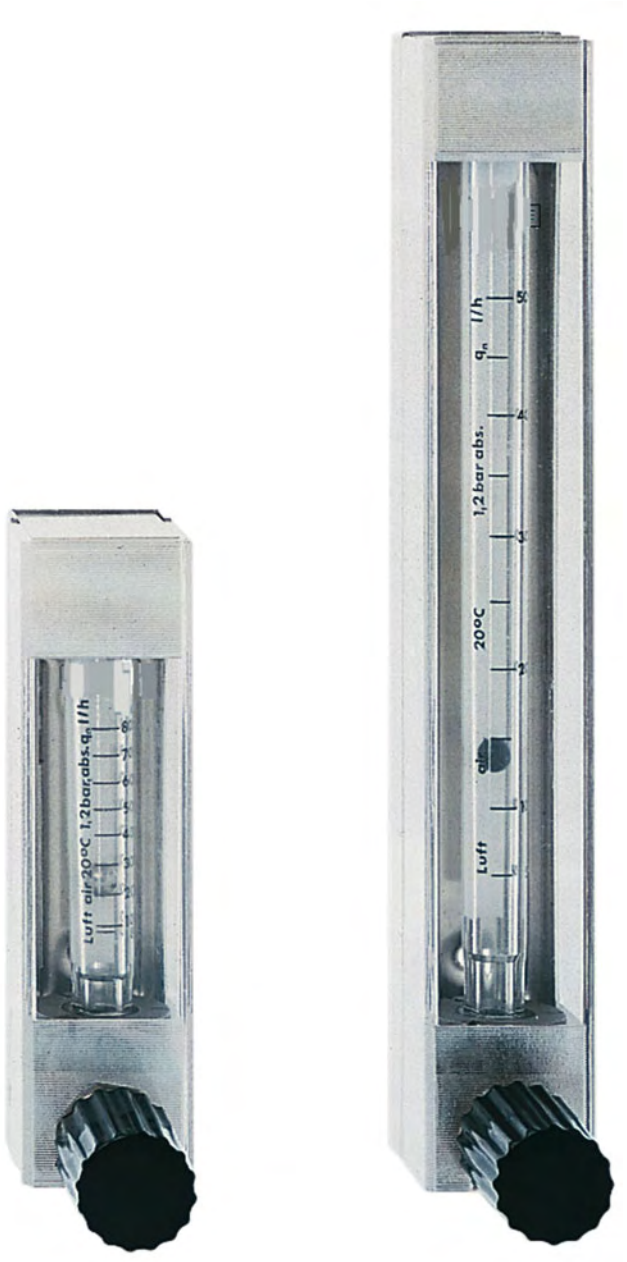
DS10

Variable Area Flowmeter For Low Flows With Glass Measuring Tube

- for liquids and gases
- body brass or st. steel
- with integrated needle valve
- limit switch optionally
- accuracy class 2.5 or 4.0



Description:
The flowmeters DS10 operate according to the proven variable area principle. The flowing media moves a float upwards against gravity in a conical measuring tube.
The height of the float indicates the flow rate and may be read off a burnt-in scale on the measuring tube.
Optional inductiv contacts, which are mounted on the measuring tube, may be used for flow rate limit detection.
All meters are equipped with an integrated needle valve for exactly regulating the flow rate.

Applications:
Variable area flowmeters model DS10 are mainly used for measuring and monitoring the flow rate of low- viscous liquid and gaseous media.
Scales for water or air at standard operating conditions have already been defined. For other media or different process conditions special scales are available.

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4/08

Versions:

DS10.1: Miniature version, height 111 mm
accuracy class 4

DS10.2: Standard version, height 146 mm
accuracy class 2,5

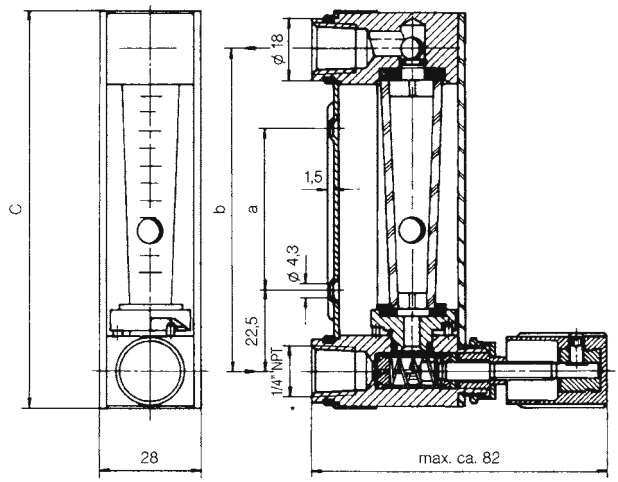
Ranges:

Range no.	Range Nl/h air, 20°C, 1.2 bar abs.	Contact-version	DS10.1 Miniature	DS10.2 Standard
01	0,5...5	A	x	x
02	0,8...8	A	x	x
03	1,6...16	A	x	x
04	4...40	A	x	x
05	6...60	A	x	x
06	10...100	B	x	x
07	25...250	B	x	x
08	50...500	B	x	x
09	80...800	B	x	x
10	100...1000	B	-	x
11	180...1800	B	-	x
12	240...2400	B	-	x
13	300...3000	B (min.)	-	x
14A	400...4000	B (min.)	-	x
15A	500...5000	B (min.)	-	x
	l/h water			
16	0,25...2,5	A	x	x
17	0,5...5	B	x	x
18	1,2...12	B	x	x
19	2,5...25	B	x	x
20	4...40	B	x	x
21	6...60	B	x	x
22	10...100	B (min.)	x	x
23	12...120	B (min.)	x	x
24	16...160	B (min.)	x	x

x = available - = unavailable

Contacts: The contact version is defined by the measuring range.
(min.) = Contact only available for minimum monitoring

Dimensions:



Version	a (mm)	b (mm)	c (mm)
DS10.1	45	90	111
DS10.2	80	125	146

Ordering code:

Order no: DS10. 2. 2. 1. 1. 06. 1. 1. 0

Variable area flowmeter with glass measuring tube

Version
1 = Miniature
2 = Standard

Process connection
1 = G 1/4 female on back
2 = 1/4“ NPT on back

Material
1 = brass
2 = st. steel

O-rings
1 = Viton (standard)
2 = PTFE / FFKM

Ranges
01...24 = according to table
99 = special range

Valve
0 = without
1 = valve on inlet side (Standard)
2 = valve on outlet side

Limit switch
0 = without
1 = 1 contact (version A)
2 = 2 contacts (version A)
3 = 1 contact (version B)
4 = 2 contacts (version B)

Options (multiple selection possible)
0 = without
1 = panel mounting set
2 = cable connector housing
for meters with contact

Special process connections (hose connectors, SWAGELOK, ERMETO or others) on request.

For operation of the limit switches transmitter relays model KFA...SR2-Ex1.W for 1 contact or KFA...SR2-Ex2.W for 2 contacts are available. Technical specifications and prices on request.

Technical Specifications:

max. pressure: 10 bar

max. temperatur: 100 °C (80 °C with contact)

materials: Armature and valve brass or st. steel, float st. steel, O-rings Viton or PTFE / FFKM, glass Borosilikate

Accuracy class: DS10.1: Klasse 4
DS10.2: Klasse 2,5

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DS15

Plastic Variable Area Flowmeter

- for industrial applications
- for liquid and gaseous media
- simple and robust construction with high reliability
- measuring tubes in PVC, PA, PS or PVDF
- low pressure loss
- simple mounting
- scale with high resolution
- alarm contacts or analog output optionally

Description

The flowmeters model DS15 works according to the proven variable area principle. The float is moved upward by the flowing medium and its upper edge indicates the flow rate by means of a scale affixed onto the measuring tube.
By using a float with an integrated magnet optional alarm contacts or an analog output transducer may be operated.
All flowmeters have a male thread on the measuring tube and are additionally equipped with PVC glue-in connectors. Also possible are connectors with female thread (bsp) made of PVC, PP, PVDF, brass or st. steel.

Applications

The variety of different materials used and the simple to exchange measuring scales make these meters universally suitable for most liquid and gaseous media.
Main applications are in the water treatment industry, in waste water applications, chemical and food industry and many more.

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Materials

Measuring tube	PVC-U transparent, Polyamide, Polysulfone or PVDF (with alarm contacts or analog output transducer only)
Float	PVDF, optionally st. steel AISI 304 and PVDF with integrated magnet
O-rings	EPDM, optionally Viton
Pipe connections	PVC, optionally PP, PVDF, brass (cap-nuts galvanized steel), st. steel

Technical Specifications

max. pressure	10 bar at 20 °C
max. temperature:	
without connectors:	
PVC:	60 °C
Polyamid:	75 °C
Polysulfon:	100 °C
PVDF:	110 °C
with connectors made of:	
PVC:	60 °C
PP:	according to the temperature limits of the measuring tube, however max. 80 °C
PVDF, brass, st. steel:	according to the temperature limits of the measuring tube
mounting position:	vertically, flow from bottom to top
mounting:	with straight pipe, 5-7 x pipe dia. in front and behind meter
measuring accuracy:	class 4 acc. to VDI/VDE 3513, Bl. 2 (+/- 4% f.s.)

Accessories

alarm contacts	bistable, N/C or N/O contact function
analog output	transducer with output 4-20 mA, RS-232 interface

Attention: alarm contacts or analog output transducer only operate if a float with integrated magnet is used.

Order Code

Order No.: DS15. | 2. | 1. | 202. | 102. | 1. | 0

Plastic Variable Area Flowmeter

material of measuring tube:
1 = PVC-U (scales for water only)
2 = Polyamid
3 = Polysulfon
4 = PVDF

Scale:
1 = water
2 = air (0 bar g)
3 = air (1 bar g)
4 = air (2 bar g)
5 = air (3 bar g)
9 = special scale

Measuring ranges:
101... 612 = acc. to table 1

Process connections:
acc. to table 2

Floats:
1 = PVDF (Standard)
2 = st. steel AISI 304
3 = PVDF with integrated magnet (for meters with alarm contacts or analog output only)

Options:
00 = without
11 = 1 alarm contact (N/C)
21 = 2 alarm contacts (N/C)
12 = 1 alarm contact (N/O)
22 = 2 alarm contacts (N/O)
50 = analog output transducer, 4...20 mA

Scales

Water scales (in LPH) and air scales (in Nm^3/h) referenced to 0, 1, 2, or 3 bar g and 20 °C are standard.

For other media, i.e. gases with higher pressures, HCL (30%), NaOH (30%) as well as other units of measurement (m^3/h, l/sec, USGPM or IGPM) special scales may be supplied.

These special scales may be easily affixed later on the meter, thus making the unit suitable for changed operating conditions or other media.

Also special scales for other media and operating conditions may be calculated if the following data are known:

– medium
– operating pressure
– operating temperature
– operating density
– operating viscosity

Table 1 – Measuring Ranges

Measuring tube	Range no.	Measuring range				
		Water (l/h)	Air at 20 °C (Nm³/h) not for PVC measuring tubes			
			0 bar rel.	1 bar rel.	2 bar rel.	3 bar rel.
1	101	3-24	0.2-1	0.2-1.2	0.25-1.55	0.3-1.75
	102	5-60	0.2-2.5	0.4-3.2	0.2-3.8	0.3-4.4
	103	10-100	0.6-3.6	0.6-5.0	0.75-6.0	0.8-7.0
	104	25-250	0.5-9.0	1.0-13.0	1.0-16.0	1.5-19.5
2	201	5-50	0.4-2.8	0.2-3.2	0.4-3.6	0.3-4.0
	202	15-150	0.8-6.2	1.0-9.0	1.0-11.0	1.5-12.0
	203	25-250	0.9-9.5	1.0-13.0	1.0-16.0	2.0-20.0
	204	40-400	2.0-15.0	2.0-20.0	3.0-26.0	3.0-30.0
3	301	15-150	0.5-5.5	1.0-9.0	1.0-11.0	1.0-10.5
	302	40-400	2.0-14.0	2.0-20.0	3.0-26.0	3.0-30.0
	303	60-600	2.5-22.0	4.0-31.0	4.0-38.0	5.0-45.0
	304	100-1000	4.0-34.0	5.0-45.0	6.0-58.0	7.5-67.5
4	401	25-250	1.0-8.0	1.5-13.0	1.5-16.0	1.5-19.5
	402	40-400	2.0-14.0	2.0-20.0	3.0-26.0	3.0-30.0
	403	100-1000	4.0-34.0	5.0-45.0	5.0-55.0	6.0-66.0
	404	150-1500	5.0-50.0	6.0-70.0	7.5-86.0	7.5-98.0
5	501	15-150	0.7-5.0	1-7.5	1-9	1.6-10
	502	60-600	2.5-20	3.5-28	4-35	5-40
	503	100-1000	4-34	5-50	8-60	8-70
	504	200-2000	8-70	12-90	10-120	15-130
	505	300-3000	10-90	15-140	20-160	20-190
	506	600-6000	22-190	30-260	40-380	40-400
	507	1000-10000	35-300	50-420	60-510	70-600
	508	2500-25000	80-720	115-1050	140-1240	166-1400
	509	10000-50000	400-1500	500-2100	600-2500	700-2900
6	601	15-150	0.7-5.5	1-7.5	1-9	1.6-10
	602	30-300	1-10	1.5-14	2-18	2.8-20
	603	60-600	2.5-20	3.5-28	4-35	5-40
	604	100-1000	4-34	5-50	8-60	8-70
	605	150-1500	5-50	7.5-67	9.5-83	11-96
	606	250-2500	8.5-76	10-115	14-131	17-152
	607	400-4000	14-125	10-170	24-210	28-245
	608	600-6000	22-190	30-260	40-380	40-400

Alarm Contacts

version:	Reed contact, bistable
contact function:	N/O or N/C with rising flow
mounting:	adjustable on measuring tube
contact rating:	max. 220 VAC, max. 0,5 A, max. 10 A / 10 VA
operating temperature:	0...+55 °C
hysteresis:	3 mm of float height
electrical connection:	2-wire, independent of polarity

Analog Output Transducer

The optional analog output transducer is mounted onto the measuring tube of the DS15 flowmeter and registers the height of the float by means of an analog Hall sensor. The integrated electronic converts this signal to a 4-20 mA output.

To utilize the analog output transducer, the standard float must be exchanged against a float with integrated magnet.

The transducer is equipped with an EPROM which is programmed especially for the application. Therefore it is not possible to change the transducers without consulting the manufacturer.

Features:

– 2-wire system
– ananlog output 4...20mA
– supply votage 8...28VDC
– programmed individually to DS15
– 11 point calibration
– non volatile storage of parameters
– 0-push button for compensation of environmental magnetic influences.
– factory set low-cutoff value (0-99%)
– factory set low-pass-filter (0,1....2,5s)
– accuracy better than 0,5 % f.s.

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Table 2 – Process Connections

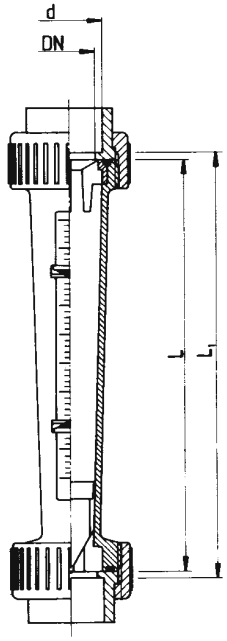
Measuring tube no. (L in mm)	Range no.	Male thread (R)	Connectors						Connection no.
			Standard glue-in connection (mm)	Female thread (G)					
				PVC	PP		Brass	St. steel	
				material no.					
		0	1	2	3		5	6	
1 (165)	101 102 103 104	3/4“	d : 16 DN: 10 L1:171	3/8					**01**
2 (170)	201 202 203 204	1“	d : 20 DN: 15 L1:176	1/2					**02**
3 (185)	301 302 303 304	1 1/4“	d : 25 DN: 20 L1:191	3/4					**03**
4 (200)	401 402 403 404	1 1/2“	d : 32 DN: 25 L1:206	1					**04**
5 (335)	501 502 503	1 1/2“	d : 32 DN: 25 L1:341	1					**05**
	504 505	2 1/4“	d : 50 DN: 40 L1:341	1 1/2					**06**
	506 507	2 3/4“	d : 63 DN: 50 L1:341	2					**07**
	508 509	3 1/2“	d : 75 DN: 65 L1:341	2 1/2 measuring range 610...612 screw G 2 1/2 female in cast iron and st. steel only					**08**
6 (350)	601 602 603 604	1 1/2“	d : 32 DN: 25 L1:356	1					**09**
	605 606	2“	d : 40 DN: 32 L1:356	1 1/4					**10**
	607 608 609	2 3/4“	d : 63 DN: 50 L1:356	2					**11**
	610 611 612	3 1/2“	d : 75 DN: 65 L1:356	2 1/2 measuring range: 610...612 screw G2 1/2 female in cast iron and st. steel only					**12**

Attention: PVDF has measuring tube as different dimensions L and L1.

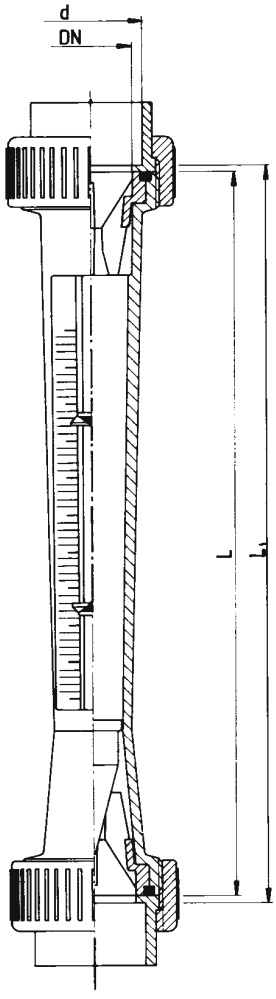
The connection code consists of the no. for the material and the connector no.

Example: PVC female thread G1 for measuring tube no. 5: material no: 2, connector no. 05, connetion code 205

Measuring tubes no 1 - 4



Measuring tubes no. 5 - 6



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DS20

Float-Type Flow Meter
For low flow volumes
Compact construction

- For liquids and gases
- Maximum process pressure: 160 bar, Maximum operating temperature: 200°C
- Scales for all operating conditions designed as required
- Local display, min./max. contacts or analog output
- Measuring tube completely of stainless steel 1.4571
- Optionally available with valve

Description

Model series DS20 flow meters work according to the suspended-float principle of measurement. The device has a cone-shaped float that moves within a cylindrical measuring tube. The flowing gas or liquid moves the float in the direction of flow. The movement of the float is transmitted magnetically to a dial indicator mounted outside the measuring tube. The indicator is fitted with a scale appropriate for the operating range encountered. If necessary, the indicator can also be fitted with contacts or an analog output.

Applications

Model series DS20 flow meters are intended to measure and monitor gases or low-viscosity liquids, such as those found in applications like cooling systems for welding machines, laser and tube systems, pump monitoring, compressors, etc. Since all parts coming in contact with the medium being monitored are made of high-quality stainless steel 1.4571, this device is also suitable for use with caustic/corrosive media.

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Versions

- Flow meter with local dial indicator display
- Dial indicator display, 1 MIN contact
- Dial indicator display, 1 MAX contact
- Dial indicator display, 1 MIN contact, 1 MAX contact
- Dial indicator display, analog output: 4 to 20 mA

Process connections

Version without needle valve (connection at top/bottom):
All threaded connections as per model coding, PN 100 (standard) or PN 160, all flange connections

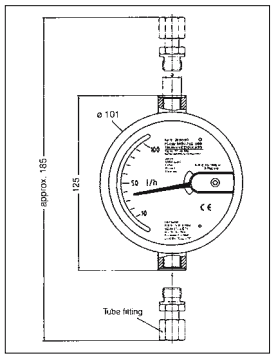
Version with needle valve (connection at back):
All threaded connections as per model coding, PN 40 (standard) or PN 100, flange connections not possible

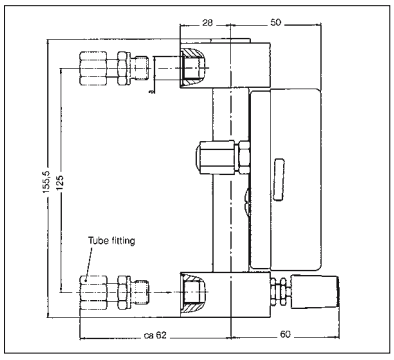
Measuring Ranges and Process Connection

Measuring Range Number	Water, 20°C (l/h)	Air, 0°C, 1,013 bar abs. (Nl/h)	Pressure loss (mbar)
1	0.1...1	4...40	6
2	0.16...1.6	6...60	6
3	0.25...2.5	10...100	6
4	0.4...4	15...150	6
5	0.6...6	20...200	6
6	1...10	32.5...325	8
7	1.6...16	50...500	8
8	2.5...25	80...800	8
9	4...40	140...1400	11
10	6...60	200...2000	11
11	10...100	325...3250	11
12	16...160	500...5000	13
13	25...250	800...8000	13

Caution: On versions without valve, measuring ranges 12 and 13 come with 3/8" threaded connections (Code 42...)

Dimensions





Technical Details

Materials:
Parts coming in contact with media are made of stainless steel 1.4571, Housing made of stainless steel 1.4301

Maximum pressure:
20 mA (???)
PN 100 (standard), PN 10, 40, 160 as per model coding

Maximum temperature:

Local display:	-80°C to + 200°C (+150°C with valve)
With contacts:	-40°C to +150°C
With analog output:	-40°C to +150°C

Protection type: IP 65

Accuracy: ± 4% of measured range value

Model coding

Order number: **DS20. | 41G4. | 6. | 0. | 1. | 0**

Float-type flow meter

Process connection:
41G4 = G 1/4 female thread, PN40
41G6 = G 1/4 female thread, PN100
41G7 = G 1/4 female thread, PN160
41T4 = 1/4" NPT female thread, PN40
41T6 = 1/4" NPT female thread, PN100
41T7 = 1/4" NPT female thread, PN160
53C4 = Tube fitting, 6 mm, PN40
53C6 = Tube fitting, 6 mm, PN100
53C7 = Tube fitting, 6 mm, PN160
53P1 = Hose nipple, 6 mm, PN10
54C4 = Tube fitting, 8 mm, PN40
54C6 = Tube fitting, 8 mm, PN100
54C7 = Tube fitting, 8 mm, PN160
54P1 = Hose nipple, 8 mm, PN10
55C4 = Tube fitting, 10 mm, PN40
55C6 = Tube fitting, 10 mm, PN100
55C7 = Tube fitting, 10 mm, PN160
56C4 = Tube fitting, 12 mm, PN40
56C6 = Tube fitting, 12 mm, PN100
56C7 = Tube fitting, 12 mm, PN160
01D4 = Flanges, DN15, PN40
02D4 = Flanges, DN25, PN40
01A1 = Flanges, ANSI 1/2", 150 lbs RF
02A1 = Flanges, ANSI 1", 150 lbs RF
01A2 = Flanges, ANSI 1/2", 300 lbs RF
02A2 = Flanges, ANSI 1", 300 lbs RF

Measuring range:
1 to 13 = According to table
99 = Special measuring range

Valve:
0 = None
1 = Valve on input side, silver valve seat
2 = Valve on input side, PCTFE valve seat
3 = Valve on output side, silver valve seat
4 = Valve on output side, PCTFE valve seat

Display:
1 = Local dial indicator display
2 = Local dial indicator display, 1 MIN contact
3 = Local dial indicator display, 1 MAX contact
4 = Local dial indicator display, 1 MIN contact, 1 MAX contact
5 = Local dial indicator display, analog output 4 to 20 mA

Options:
0 = None
9 = Please specify in writing

Contacts

Type:	Inductive (NAMUR as defined per EN 50227)
Nominal voltage:	8 VDC Recommended for operating the contacts: isolation and switch unit SKF (see data sheet SKF)

Analog output

Power supply:	13.5…30 VDC
Output:	4…20 mA
Load impedance:	(U-13.5V)/20 mA
Electrical connection:	QUIKON quick connects

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DS25

Variable Area Flowmeter With Flange Connection, Insensitive To Viscosity Changes

- for liquids and gases
- operating pressure PN40 and PN100 bar standard, higher pressures up to 320 bar on request
- operating temperatures up to 370 °C
- individual calibration for all operating conditions
- local indication, min. - max. alarms, anologue output
- measuring tube completely stainless steel 1,4404
- PTFE coating for wetted parts optionally

Description:

The flow meters model DS25 work according to the proven variable area principle.The float is guided in a conical measuring tube and is nearlyindependent of the viscosity of the medium. The flowingmedium moves the float in the flow direction. An externallymounted pointer indicator is magnetically coupled to thefloat and thus, following the float position, indicates the flow rate on a scale.This indicator assembly is equipped with a scale calibrated to the operating conditions in the system and additionallymay contain alarm contacts or an ananlog output.

Application:

The variable area flowmeter model DS25 is used formeasuring and monitoring the flow of all kinds of liquids orgases. By using only stainless steel 1,4571 for the wetted parts the meter is especially suited for agressive media or for use in food and drink applications (with Tri-Clamp or other hygienic process connections)

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Meter selection procedure:

1. **Define materials of wetted parts**
2. **Select process connection (table 2)**
3. **Select measuring range**
4. **Select indicator and output signals**
5. **Select options**

1. Material version (wetted parts):

The flow meters model DS25 may be supplied either completely in stainless steel 1.4571 (DS25.1) or with PTFE-coating (DS25.2)

Other materials like Monel, Hastelloy or Tantal on request (DS25.9)

2. process connection:

Nom. bore (NB)	process connection	Meas. tube No.	Conn. Code No.	Length L (mm)
15 (1/2")	Flanges DN15 PN40	1	101	250
	Flanges ANSI 1/2" 150 lbs.	1	102	250
	Flanges ANSI 1/2" 300 lbs.	1	103	250
	G 1/2 IG	1	104	295
	1/2" NPT IG	1	105	295
	Flanges DN15 PN40	2	206	250
	Flanges ANSI 1/2" 150 lbs.	2	207	250
	Flanges ANSI 1/2" 300 lbs.	2	208	250
20 (3/4")	Flanges DN20 PN40	1	111	250
	Flanges ANSI 3/4" 150 lbs.	1	112	250
	Flanges ANSI 3/4" 300 lbs.	1	113	250
	Flanges DN20 PN40	2	216	250
	Flanges ANSI 3/4", 150 lbs.	2	217	250
	Flanges ANSI 3/4", 300 lbs.	2	218	250
	G 3/4 IG	2	219	250
	3/4" NPT IG	2	220	250
25 (1")	Flanges DN25 PN40	1	121	250
	Flanges ANSI 1" 150 lbs.	1	122	250
	Flanges ANSI 1" 300 lbs.	1	123	250
	threaded conn. DN25 PN40 (IG) to DIN 11851	1	126	275
	Tri-Clamp DN25 / 1"	1	127	250
	Flanges DN25 PN40	2	228	250
	Flanges ANSI 1" 150 lbs.	2	229	250
	Flanges ANSI 1" 300 lbs.	2	230	250
	threaded conn. DN25 PN40 (IG) to DIN 11851*	2	233	275
	Tri-Clamp DN25 / 1"	2	234	250
	Flanges DN25 PN40	3	335	250
	Flanges ANSI 1", 150 lbs.	3	336	250
	Flanges ANSI 1", 300 lbs.	3	337	250
	G 1 IG	2	338	250
	1" NPT IG	2	339	250

Nom. bore (NB)	process connection	Meas. tube No.	Conn. Code No.	Length L (mm)
32 (1 1/4")	Flanges DN32 PN40	1	140	250
	Tri-Clamp DN32	1	141	250
	Flanges DN32 PN40	2	242	250
	Flanges ANSI 1 1/4" 150 lbs.	2	243	250
	Flanges ANSI 1 1/4" 300 lbs.	2	244	250
	Tri-Clamp DN32	2	245	250
	Flanges DN32 PN40	3	346	250
	Flanges ANSI 1 1/4", 150 lbs.	3	347	250
	Flanges ANSI 1 1/4", 300 lbs.	3	348	250
	G 1 14 IG	3	349	250
	1 1/4" NPT IG	3	350	250
40 (1 1/2")	Tri-Clamp DN40 / 1 1/2"	1	151	250
	Tri-Clamp DN40 / 1 1/2"	2	252	250
	Flanges DN40 PN40	3	353	250
	Flanges ANSI 1 1/2", 150 lbs.	3	354	250
	Flanges ANSI 1 1/2" 300 lbs.	3	355	250
	G 1 1/2 IG	3	364	250
	1 1/2" NPT IG	3	365	250
50 (2")	Flanges DN50 PN40	3	356	250
	Flanges ANSI 2" 150 lbs.	3	357	250
	Flanges ANSI 2" 300 lbs.	3	358	250
	Gewindestutzen DN50 PN25 (IG) to DIN 11851	3	359	275
	Tri-Clamp DN50 / 2"	3	360	250
	Flanges DN50 PN40	4	461	250
	Flanges ANSI 2" 150 lbs.	4	462	250
	Flanges ANSI 2" 300 lbs.	4	463	250
65 (2 1/2")	threaded conn. DN65 PN25 (IG) to DIN 11851	4	466	275
	G 2 1/2 IG	4	467	250
	2 1/2" NPT IG	4	468	250
80	threaded conn. DN80 PN25 (IG) to DIN 11851	4	469	275
	Tri-Clamp DN80 / 3"	4	470	300
	Flanges DN80 PN40	5	571	250
	Flanges ANSI 3", 150 lbs.	5	572	250
	Flanges ANSI 3", 300 lbs.	5	573	260
100 (4")	threaded conn. DN100 PN25 (IG) to DIN 11851	5	574	300
	Tri-Clamp DN100 / 4"	5	575	250
	Flanges DN100 PN16	6	676	250
	Flanges DN100 PN40	6	677	250
	Flanges ANSI 4", 150 lbs.	6	678	250

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3. Measuring ranges:

Reference conditions: Water, 20°C
Air, 20 °C, 1,013 bar abs.

a) DS25.1 - stainless steel version

Meas. tube No.	Range code	Water / Liquids					Air / Gases			
		Range (m^3/h)	Meas.-cone No.	Float No.	pressure loss (mbar)	max. viscosity (mPas)	Range (Nm^3/h)	Meas.-cone No.	Float No.	press. loss (mbar)
1	101	**0.0025-0.026**	43	S0	40	2.9	**0.075-0.75**	43	S0	45
	102	**0.004-0.04**	44	S0	40	4.5	**0.12-1.2**	44	S0	45
	103	**0.0063-0.063**	47	S0	40	6.4	**0.18-1.8**	47	S0	45
	104	**0.01-0.1**	51	S0	40	9.2	**0.3-3**	51	S0	45
	105	0.01-0.1	53	L1	6	5.1	-	-	-	-
2	206	0.01-0.1	53	L1	6	5.1	**0.55-5.5**	53	M1	20
	207	**0.016-0.16**	53	M1	15	8.2	**0.4-4**	53	L1	11
	208	0.016-0.16	54	L1	6	7.1	**0.65-6.5**	54	L1	11
	209	**0.025-0.25**	53	S1	40	13	0.75-7.5	53	S1	45
	210	0.025-0.25	57	L1	6	8.8	**1-10**	57	L1	11
	211	**0.04-0.4**	54	S1	40	18	1.3-13	54	S1	45
	212	0.04-0.4	61	L1	6	10	**1.6-16**	61	L1	11
	213	**0.063-0.63**	57	S1	40	23	2-20	57	S1	45
	214	0.063-0.63	61	M1	15	17	**2.5-25**	62	L1	11
	215	**0.1-1**	61	S1	40	27	3-30	61	S1	45
	216	0.1-1	62	M1	15	19	**3.5-35**	62	M1	20
	217	**0.16-1.6**	62	S1	40	31	-	-	-	-
	218	**0.23-2.3**	62	V1	45	-	-	-	-	-
3	319	0.1-1	63	L2	7	17	**4-40**	63	L2	12
	320	0.16-1.6	64	L2	7	20	5-50	63	M2	22
	321	**0.25-2.5**	63	S2	41	44	**7-70**	64	L2	12
	322	0.25-2.5	64	M2	16	16	**9-90**	64	M2	22
	323	**0.4-4**	64	S2	41	50	**13-130**	64	S2	47
	324	**0.6-6**	64	V2	43	-	-	-	-	-
4	425	0.25-2.5	67	L5	8	29	**10-100**	67	L5	14
	426	0.4-4	71	L5	8	33	13-130	67	M5	25
	427	**0.63-6.3**	67	S5	47	72	**16-160**	71	L5	14
	428	0.63-6.3	72	L5	8	37	**20-200**	71	M5	25
	429	**1-10**	71	S5	47	82	20-200	67	S5	54
	430	1-10	72	M5	19	58	**28-280**	72	L5	14
	431	1.6-16	72	S5	47	92	36-360	72	M5	25
	432	**2.3-23**	72	V5	63	-	50-500	72	S5	54
5	533	**2.5-25**	73	V8	60	-	**50-500**	73	L8	30
	534	**4-40**	74	V8	60	-	75-750	73	V8	65
	535	**6-60**	77	V8	60	-	**85-850**	74	L8	30
	536	-	-	-	-	-	120-1200	74	V8	65
	537	-	-	-	-	-	180-1800	77	V8	65
6	638	**10-100**	81	11	70	-	-	-	-	-
	639	**15-130**	81	12	-	-	-	-	-	-

Whenever possible select highlighted ranges

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b) DS25.2 – wetted parts PTFE coated

Meas. tube No.	Range code	Water / Liquids				Air / Gases			
		Range (m^3/h)	Meas.-cone No.	Float No.	pressure loss (mbar)	Range (Nm^3/h)	Meas.-cone No.	Float No.	press. loss (mbar)
2	250	0.01 - 0.1	51	A1	16	0.35 - 3.5	51	A1	20
	251	0.016 - 0.16	52	A1	16	0.5 - 5	52	A1	20
	252	0.025 - 0.25	53	A1	16	0.85 - 8.5	53	A1	20
	253	0.04 - 0.4	54	A1	16	1.3 - 13	54	A1	20
	254	0.063 - 0.63	57	A1	16	2 - 20	57	A1	20
	255	0.1 - 1	61	V1	18	3.4 - 34	61	V1	22
3	356	0.16 - 1.6	62	A2	20	5 - 50	62	A2	25
	357	0.25 - 2.5	63	A2	20	8.5 - 85	63	A2	25
	358	0.4 - 4	63	V2	22	-	-	-	-
4	459	0.4 - 4	64	A5	20	13 - 130	64	A5	25
	460	0.63 - 6.3	67	A5	20	20 - 200	67	A5	25
	461	1 - 10	71	A5	20	35 - 350	71	A5	25
	462	1.6 - 16	71	V5	22	-	-	-	-
5	563	1.6 - 16	72	V8	25	50 - 500	72	27	12
	564	2.5 - 25	73	V8	25	85 - 850	73	27	22
	565	4 - 40	74	V8	25	-	-	-	-
6	666	6.3 - 63	77	10	30	-	-	-	-

Technical specifications (measuring tube):

measurable media: liquids and gases

ranges: see tables 3a and 3b

turndown ratio: 10 : 1

accuracy:
DS25.1: 1.6% f.s.
DS25.2: 2.5% f.s.

process connection: see Table 2

max. pressure: see Table 2

media temperature:
DS25.1: -180°C...370°C
DS25.2: -80°C... 130°C
(the actual operating temperature also depends on the max. permissible temperatures for the indicator and the options utilized in the unit)

materials:
DS25.1: all wetted parts stainless steel (AISI 316 L)
DS25.2: all wetted parts stainless steel AISI 316 L with PTFE coating

mounting: vertical

flow direction: from bottom to top

mounting length: see table “process connection”

straight pipe runs:
DN 15-65 none
DN 80-100 min. 5D

electrical protection: IP 65

4. Indicator:

The indicator part of the DS25 consists of n aluminium orpolyamide housing with a pointer assembly magnetically coupled to the float. The scale may be calibrated in flow units or in percent. Additionally, transducers and alarm contacts may bemounted in the indicator housing.

4a. Housing versions

Material:	Code No.
Polyamid	1
Aluminium	2

4b. Alarm contacts

Contact version:	Code No.
without	0
1 min contact	1
1 max contact	2
1 min. and 1 max. contact	3
2 max. contacts	5

4c. Ananlog output signals

Typ:	Code No.
without	0
electrical transducer	1
electrical transducer (Ex)	2
pneumatic transducer	3

4d. Supply voltage and output signals

Typ:	Code No.
without	00
115 VAC, 0...20 mA, 4-wire	01
115 VAC, 4...20 mA, 4-wire	02
230 VAC, 0...20 mA, 4-wire	03
230 VAC, 4...20 mA, 4-wire	04
24 VDC, 0...20 mA, 3-wire	07
24 VDC, 4...20 mA, 2-wire	08
24 VDC, 4...20 mA, 3-wire	09
24 VDC, 0...20 mA, 4-wire	10
24 VDC, 4...20 mA, 4-wire	11
pneumatic 0,2...1,0 bar	12
pneumatic 3...15 psi	13

Technical specifications (indicator assembly):

Mecanical indicator assembly

Umgebungstemperatur:
PA-housing (Code 1): -25°C ...100°C
Al-housing (Code 2): -25°C ...130°C
(for higher or lower operating temperatures use option “temperature isolation (DS25.A)” on next page)

Alarm contacts

model: inductive proximity switch, SJ3,5-N acc. to DIN 19234 (NAMUR)

ambient temperature:
-25°C ...100°C (for higher or lower operating temperatures use option “temperature isolation”)

rated voltage:
8 VDC (Ri = 1 kOhm)

output signal:
≤1 mA = 0, ≥3mA = 1

explosion protection:
EEx ia IIC T6, set II category 2G (on request)

dust explosion protection:
EEx iaD 20 T 108°C, set II category 1D

recommended accessories:
contact protection relaymodel SE01
(see “Options” on next page)

Electronic transducer

output signal: 0...20 mA, 4 - 20 mA
indication: LCD display, 8 digits
(programmable for indication of flow rate or as non-resettable totalizer)
supply voltage: see table 4d
max. load: 4-wire: ≥500 Ohm
2/3-wire: $\frac{(U-13.5\ V)}{20\ mA}$
operating temperature: 0°C...100°C
(for higher or lower operating temperatures use option “temperature isolation (DS25.A)” on next page)
electrical connection: M16 X 1,5 or 1/2" NPT

Intrinsically safe electronic transducer

Technical specifications as standard unit, however:
output signal: 4...20 mA, 2-wire
operating temperature: -25°C...70°C
(for higher or lower operating temperatures use option "temperature isolation (DS25.A)" on next page)

Ex-protection:
EEx ia IIC T6, set II category 2G (on request)

dust explosion protection:
EEx II 3D; set II; category 3D, max;
surface temperature: 80 °C

recommended accessories:
intrinsically safe power supply
(see "Options" on next page)

Intrinsically safe electronic transducer

on request

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5. Options

5a. Temperature isolation (DS25.A)

For media temperatures outside the limits given in the technical specifications for the indicator assembly themeasuring tube and the indicator assembly may be temperature isolated by mounting the indicator at a distance of 60 mm apart from the measuring tube.This ensures that the unit may be operated at media temperatures as high as stated in the specifications for the measuring tube.

5b. Damping (DS25.D):

A float damping is recommended for gas applications to prevent erratic up and down movement (only for DS25.1).

5c. Heating:

Heating assemblies (steam jackets) are used to keep themedium in the measuring tube at a reqired temperature.Steam jackets are available with three different processconnections:

Connection:	Code:
DIN flanges DN15 PN40	DS25.H.1
DIN flanges DN 25 PN 40	DS25.H.2
threaded conn. R 1/4":	DS25.H.3

5d. Oxygene applications (DS25.F):

For use with oxygene the meters may be supplied oil- and greese-free.

5e. Certificates

on request

5f. Tags:

Stainless steel tags with customer specified text are optionally available

5g. Contact protection relays (model SKF): SKF…

material version:
according to DIN 19234

supply voltage
according data specification SKF

breaking capacity
max. 250 VAC, max. 2 A

control circuit
intrinsically safe (EEx ia) IIC:

5h. Power supply for intrinsically safetransducer (model SE11):

Output signal:
0 / 4...20 mA, galvanically separated

Supply voltage:
SE11.1: 230 VAC
SE11.2: 24 V AC/DC

max. load:
750 Ohm

control circuit:
intrinsically safe [EEx ia] IIC

Ordering Code

Order no.:	DS25.	1.	121.	1.	321.	1.	0.	104.

Variable area flowmeter

Material version:
1 = stainless steel
2 = wetted parts PTFE coated

Process connection:
101...678 = according to table 2
999 = special connection

Medium:
1 = water / liquids
2 = air / gases

Measuring range:
101...666 = according to table 3a or 3b
999 = special range

Indicator housing:
1...2 = according to table 4a

Alarm contacts:
0...5 = according to table 4b

Ananlog output and supply voltage:
1st digit:
0...3 = ananlog output according to table 4c
2nd and 3rd digit:
00...13 = supply voltage and output signal according to table 4d

Options: please indicate in writing

Ordering Information:

Important: for complete identification of. the meter the following information must be specified:

- order no. according to table above
- name of medium
- temperature (operational, max.)
- pressure (operational, max.)
- viscosity (for liquids only)
- specific gravity of medium
- for gases only: reference conditions
- options: model no. ac. to tables 5a. to 5h.
- additional customer specific information

Dimensions:

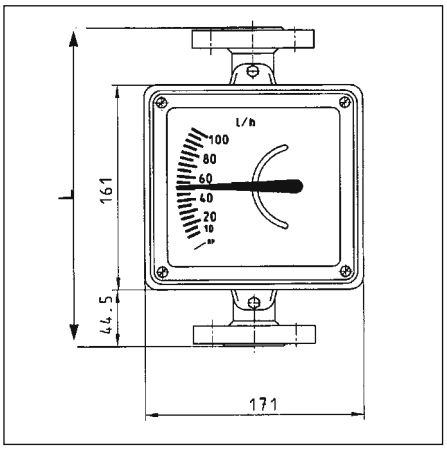

Fig. 1: front view

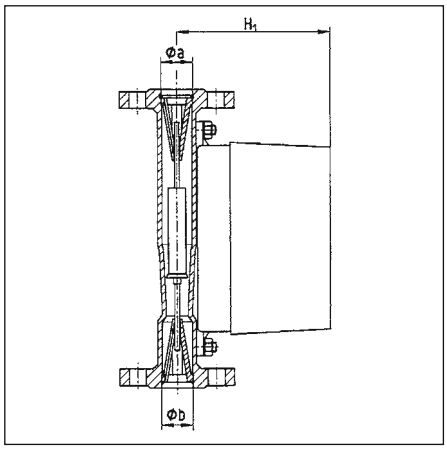

Fig. 2: stainless steel measuring tube

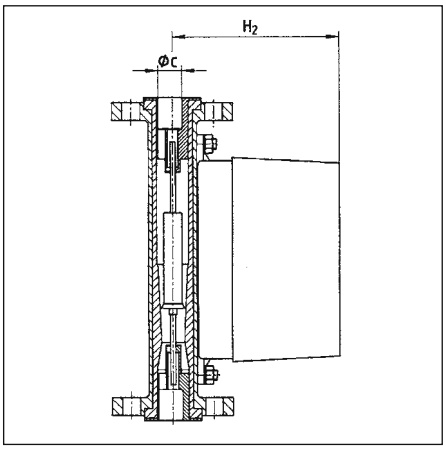

Fig. 3: measuring tube PTFE coated

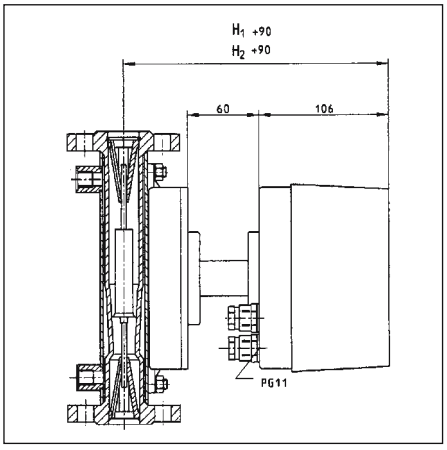

Fig. 4: Option DS25.H... (steam jacket and DS25.A (temperature isolation)

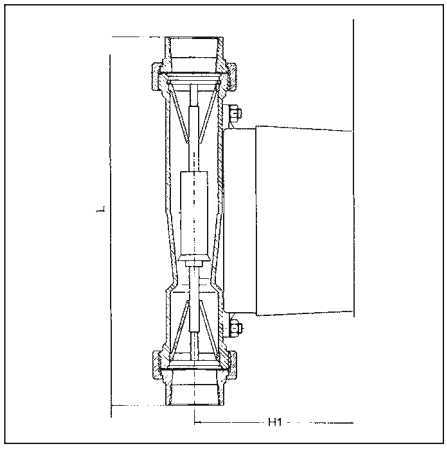

Fig. 5: measuring tube with threaded connection (R or NPT)

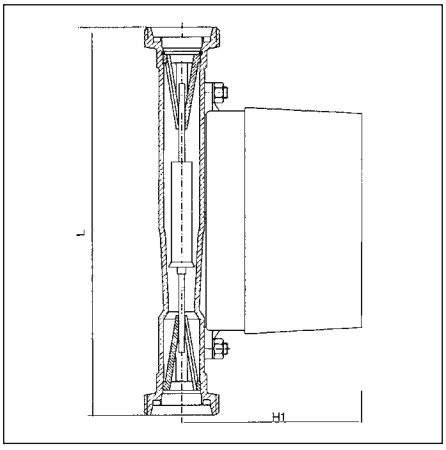

Fig. 6: measuring tube with hygienic connection acc. to DIN 11851

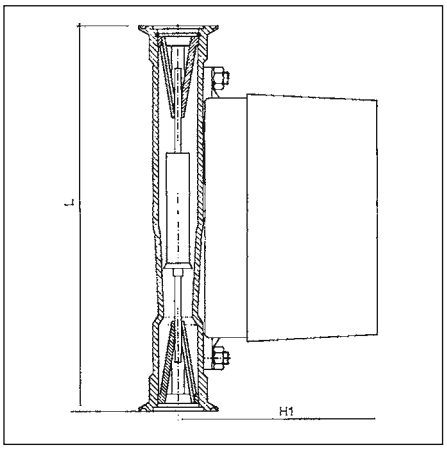

Fig. 7: measuring tube with Tri-Clamp connection

Measuring tube No.	H1 (mm)	H2 (mm)	Weight (kg)
1	122	122	5
2	123	127	5
3	131	136	6,5
4	147	152	11
5	161	168	16
6	170	176	20

Dimension “L”: see table 2 (process connections)

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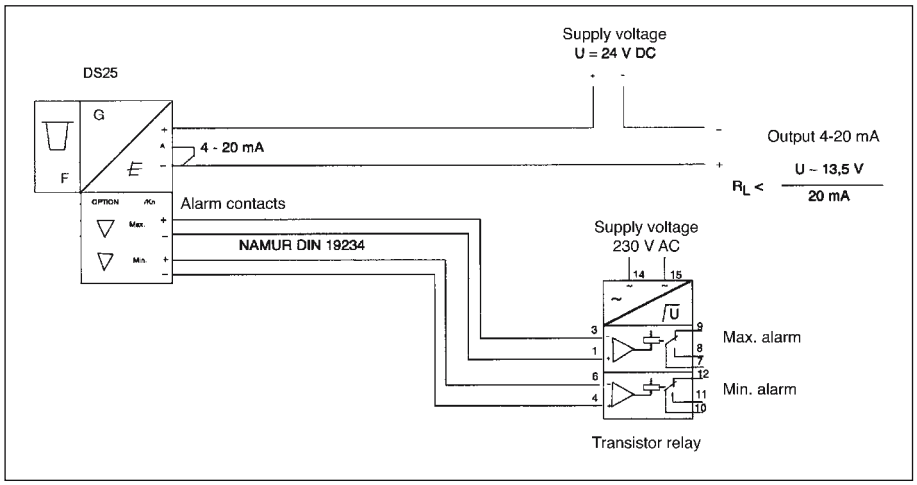
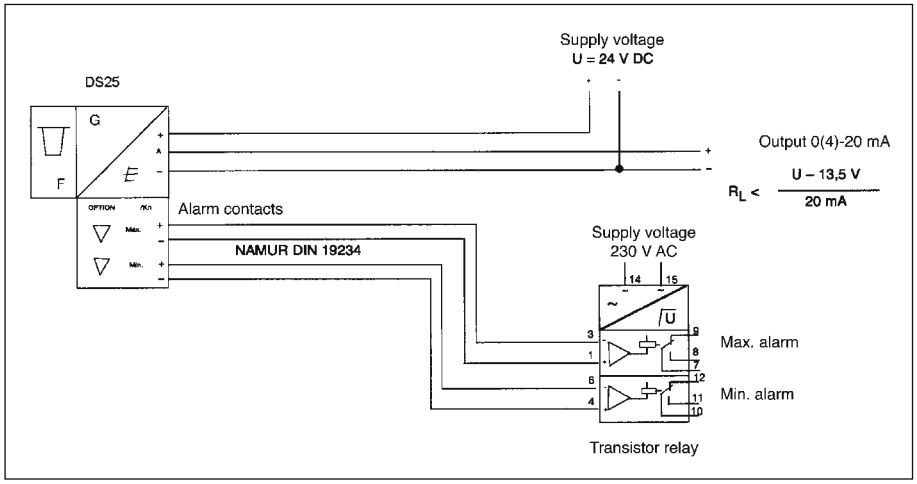
Electrical connections:



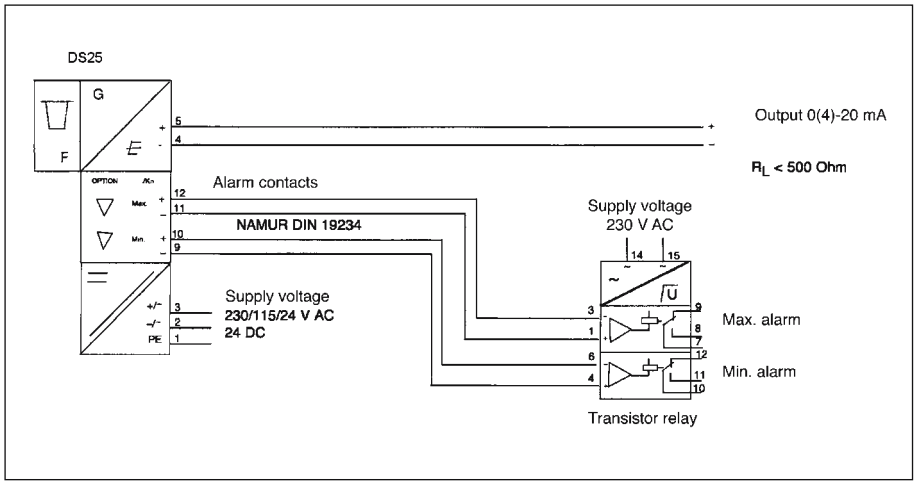
electronic transducer, 2-wire

2 alarm contacts with contact protection relay



electronic transducer, 3-wire

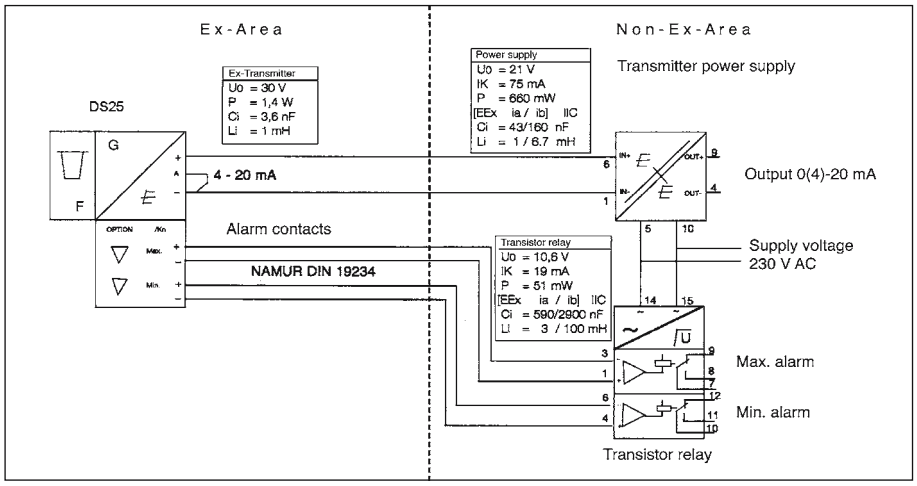
2 alarm contacts with contact protection relay



electronic transducer, 4-wire

2 alarm contacts with contact protection relay

EEx application:



electronic transducer [EEx], 2-wire

2 alarm contacts with contact protection relay

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DV08

Screw-spindle-type volumetric flow meter for highly viscous liquids

- **rugged, heavy-duty design, aluminum housing, max. 160 or 350 bar**
- **for 1" to 2½" pipe**
- **unaffected by the viscosity, density or conductivity of the product being monitored**
- **outputs: pulse signals, field programmable frequency output, 4–20 mA, 0–10 V, limit switch**
- **max. product temperature 80 °C, optionally up to 150 °C**

Description:

The DV08 flow meter is fitted with twin helical screws, which rotate in opposite directions due to the flow of product being monitored. The rotational speed is proportional to the flow rate. The rotary motion of the screws is detected by a sensor which emits two pulses per revolution. Each pulse signal represents a pre-defined volume of product.
The flowmeter doesn't have to be taken out of the pipe system for changing the pick-up system because the pick-up is hermetically sealed from the medium. The viscosity of the product has virtually no effect on the DV08 due to the volumetrical measurement technique used.

Typical Applications:

The DV08 can be used for flow measurement, monitoring and totalizing of liquid, viscous and self-lubricating products up to 40,000 mPas. The device is suitable for use in hydraulic systems, and for lubricant monitoring, metering soaps, pastes and emulsions – to name but a few of its application areas.

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Models:

DV08.A… aluminum 6082 housing, carbon steel 1.4460 screw-type spindles and bearings, Viton gaskets, process connections: aluminum (160 bar) or carbon steel (350 bar)

Measuring ranges:

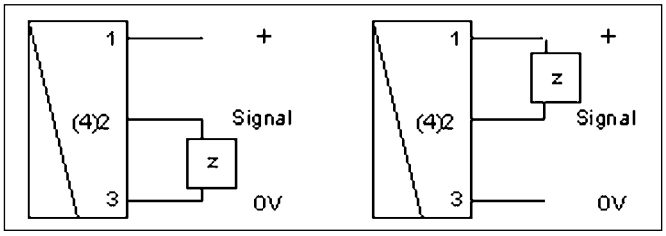
Measuring range *)	Process connection	
	Aluminum female threaded connection "G", Pmax. 160 bar	SAE flange with carbon steel female threaded connection, Pmax. 350 bar
1,4...140 l/min	GA25	SAE25
3,5...350 l/min	GA32	SAE32
8...800 l/min	GA40	SAE40
15...1500 l/min	GA50	SAE50
25...2500 l/min	GA65	SAE65

*) Maximum measuring ranges are listed. The upper range value may be smaller for higher product viscosities due to the greater pressure differential.

Electrical Connection:

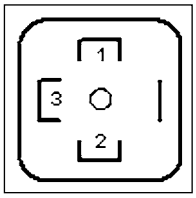
Pulse output, push/pull

PNP **NPN**

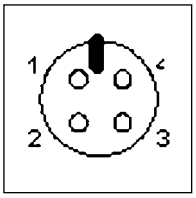


Pin assignment:

5-pin DIN connector **M12x1 connector**



1 = power supply 20–30 VDC
2 = output (5-pin DIN connector)
4 = output (M12x1 connector)
3 = 0 V



Please refer to the "Operating Instructions" for pin assignments for models with electronics modules M5, M6, M7.

Model Coding:

Order Number: **DV08. | A. | V. | GA25. | IW. | 0**

Screw-type spindle flow meter

Materials:
A = Aluminium / carbon steel
S = Special order version

Gaskets:
V = Viton (standard)
S = Special-order gaskets

Measuring range / process connection:
GA25 … SAE65 see “Measuring ranges” table
99 = Special-order connection / special-order measuring range

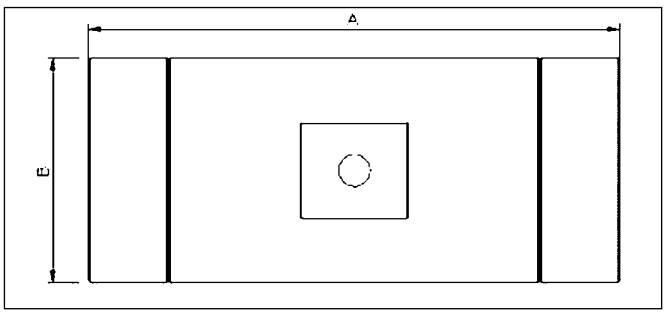
Output (configurable on site):
IW = pulse output (push/pull), 5-pin DIN connector
IR = pulse output (push/pull), M12x1 round plug
M5 = frequency converter (field programmable, 0–2 kHz)
M6 = switched output (limit value, field programmable)
M7I = with F/I converter (4–20 mA output)
M7U = with F/U converter (0–10 V output)

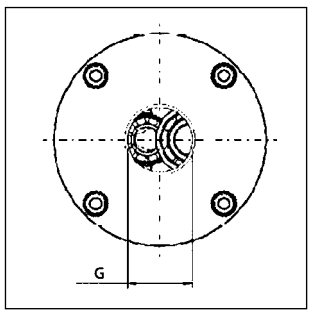
Options:
0 = None
1 = High-temperature device rated up to 150°C, separate electronics at 30 cm clearance from device (with IR output only)
2 = M12 x 1 matching plug, 4-pin, with 2 m cable
9 = Please specify in writing

Technical Specifications:

Max. pressure:	
with threaded fitting (AL)	160 bar
with SAE flange	350 bar
Product temperature:	–25...+80 °C (option: up to 150 °C)
Measurement uncertainty:	± 1% of measured valued
Repeatability:	± 0,25%
Products:	oil or other, non-corrosive, self-lubricating products
Power supply:	10–30 VDC
Protection type rating:	IP65

Dimensions:





Con-nec-tion	A	A (with SAE)	B	Pulses/ L
1"	200	288	85	76,3
1 ¼"	270	358	100	34,5
1 ½"	340	442	135	13,9
2"	430	570	180	7,5
2 ½"	478	628	210	4,2

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DK10

Flap Flow Meters

- robust design, can be installed in any position, insensitive to dirty/ contaminated liquids
- suitable for 1/4" to 2" pipes with threaded fittings, and – as a wafer version – for 3" to 8" pipes
- many different material combinations for practically all types of process liquids
- max. pressure = 200 bar, max. temperature = 330 °C
- for viscosities up to 600 cSt
- mechanical flow indication
- electrical outputs: 4 - 20 mA, 1 or 2 microswitches

Description:

The DK10 series flap flow meter comprises a spring-loaded flap mounted in a hemispherical chamber. The flap is deflected by the flow in the line. The deflection is directly proportional to the flow rate. The movement of the flap is transmitted via a shaft – that is sealed off from the process – to a mechanical pointer and the flow is displayed on a scale. One or two microswitches for flow monitoring or an analog output module can be installed in the display enclosure (optional). Each flow meter is calibrated for the liquid being monitored based on customer specifications. The devices are available with G or NPT threads for 1/4" to 2" pipes and as a wafer for mounting between two DIN or ANSI flanges on DN80 (3") to DN200 (8") pipe sizes.

Typical Applications:

Due to their robust design, their resistance to dirty or contaminated liquids and the variety of material combinations available, the DK10 flap flow meters are suitable for use as control and monitoring devices for practically all process liquids.

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Models:

DK10… Flap flow meter with a directly coupled mechanical pointer

Materials:

Flaps and shafts are made of stainless steel for all device materials. Shafts made of titanium or Hastelloy, as well as plastic flaps, are available for aggressive/caustic liquids and for plastic models.

A	Aluminum (low-cost for oils), Tmax = 200 °C
B	Bronze (e.g. for sea water), Tmax = 250 °C
C	Cast iron (for general-purpose applications), Tmax = 200 °C
CN	Cast iron, nickel-plated (corrosion proof), Tmax = 200 °C
S	Cast steel, Tmax = 250 °C
V	Stainless steel, Tmax = 330 °C
PT	PTFE, Pmax = 7 bar, Tmax = 150 °C
PV	PVC, Pmax = 7 bar, Tmax = 60 °

Gaskets:

The choice of sealing material depends on the liquid being monitored and the expected temperatures.

B	Buna (Perbunan, -40 to +110 °C)
E	EPDM (-40 to +150 °C)
V	Viton (-20 to +200 °C)
PT	PTFE (-100 to +250 °C)
PF	Perlast (Perfluorelastomer, -15 to +330 °C)

Measurement ranges:

The quoted measurement ranges serve as a rough guide only. The exact measurement ranges for a given device are calculated during manufacture based on the exact pipe diameter and calibrated in the devices.

Process connection (G or NPT)	Measurement range No.	Measurement ranges			
		L/min (…LM)	M³/h (…MH)	GPM (…GM)	GPH (…GH)
Housing size S					
1/4"	1	4 - 15	0.24 - 0.9	1.0…4.0	60 - 240
1/2"	2	4 - 30	0.24 - 1.8	1.0…8.0	60 - 480
3/4"	3	4 - 50	0.24 - 3.0	1.0…13.2	60 - 800
1"	4	4 - 70	0.24 - 4.2	1.0…18.5	60 - 1,100
Housing size M					
3/4"	5	40 - 100	2.4 - 6.0	10 - 26.4	600-1,600
1"	6	40 - 150	2.4 - 9.0	10 - 40.0	600-2,400
1 1/4"	7	40 - 220	2.4 - 13.2	10 - 58.0	600-3,500
1 1/2"	8	40 - 350	2.4 - 21.0	10 - 92.5	600-5,500
2"	9	40 - 500	2.4 - 30.0	10 -132	600-8,000
Housing size L (wafer)					
DN80 / 3"	10	120 - 1,500	7.2 - 90	32 - 400	1,900-23,700
DN100 / 4"	11	120 - 2,000	7.2 - 120	32 - 530	1,900-31,700
DN150 / 6"	12	120 - 3,500	7.2 - 210	32 - 925	1,900-55,500
DN200 / 8"	13	120 - 5,000	7.2 - 300	32 - 1320	1,900-79,200

Ordering Code:

Order number: **DK10. B. B. G2LM. MP. 1. M. R**

Flap flow meter

Enclosure material:
A = Aluminum
B = Bronze
C = Cast iron
CN = Cast iron, nickel-plated
S = Steel casting
V = Stainless steel
PT = PTFE
PV = PVC
9 = custom material

Sealing material:
B = Buna
E = EPDM
V = Viton
PT = PTFE
PF = Perlast
9 = custom gasket

Measuring ranges and process connections
(please append to range code LM / MH / GM / GH for unit of measure):
G1…G9 = range 1-9, G ¼ female G2
N1…N9 = range 1-9, ¼" NPT female - 2" NPT female
D10…D13 = range 10-13, for flanges to DIN, DN 80-DN200
A10…A13 = range 10-13, for flanges to ANSI, 3"-8"
9 = custom range

Pressure rating:
LP = max. 20 bar / 300 psi
MP = max. 50 bar / 750 psi
HP = max. 200 bar / 3000 psi
9 = custom design

Viscosity of process liquid:
1 - 600 = please specify viscosity of liquid at operating temperature in cSt (mm²/s)

Outputs:
M = none, mechanical flow indication only
S1 = 1 x microswitch, 3-pin changeover contact
S2 = 2 x microswitches, 3-pin changeover contact
SG1 = 1 x microswitch, gold-plated contacts, 3-pin changeover contact
SG2 = 2 x microswitches, gold-plated contacts, 3-pin changeover contact
A2 = analog output 4 - 20 mA, 2-wire, 8 - 28 VDC
A3 = analog output 4 - 20 mA, 3-wire, 8 - 28 VDC

Direction of flow:
L = from left to right
R = from right to left
U = up
O = down

Pressure Rating:

LP	max. 20 bar / 300 psi
MP	max. 50 bar / 750 psi
HP	max. 200 bar / 3000 psi (for cast iron, cast steel or stainless steel enclosures only)

Specifications (mechanical):

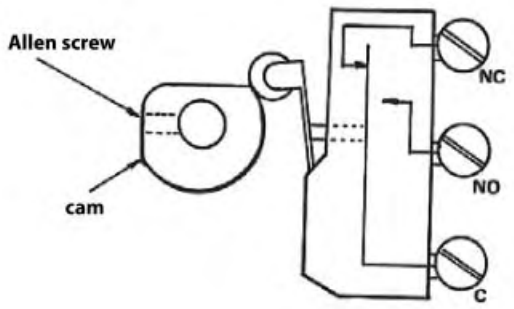
Max. pressure:	20 / 50 / 200 bar 300 / 750 / 3000 psi plastic enclosure max. 7 bar / 100 psi
Liquid-temperature:	-100 to +330 °C (depending on device materials and sealing material)
Measurement uncertainty:	+/- 3% of end value
Max. flow:	min. 2 x end value
Installation position:	any

Limit contacts:

One or two electromechanical limit switches - that can be adjusted over the entire measurement range - can be fitted to DK10 flow meters.

Models S1/S2:	One or two microswitches as 3-pin changeover contact
Switching capacity:	15 A, 250 V 0.5 A, 125 VDV / 0.25 A, 250 VDC
Models SG1/SG2:	as for S1/S2, but with gold-plated contacts
Factory set switch point:	available upon request

Electrical Connection:

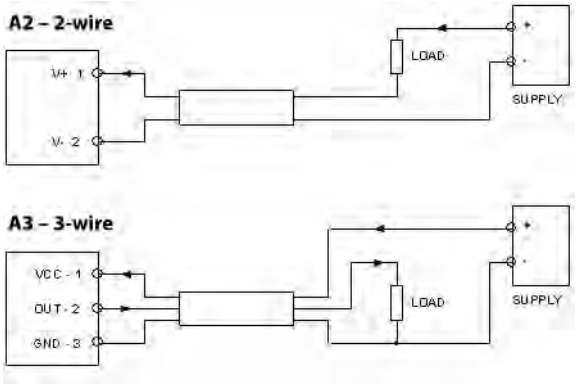


Analog output:

The optional analog output on the DK10 meter is available as a 2- or 3-wire circuit. It provides a 4 - 20 mA signal that corresponds with the calibrated measurement range.

Models:	
A2:	2-wire circuitV
A3:	3-wire circuit
Output range:	4...20 mA = 0 - end value (± 5%)
Linearity:	± 1%
Repeatability:	< 0,2%
Supply:	8 - 28 VDC, 50 mA max.
Overvoltage protection:	max. 30 V
Max. load impedance:	
A2:	R < (U-8V)/0.02mA
A3:	R < (U-3V)/0.02mA
Operating temperature:	-40 to +85 °C

Electrical Connection:



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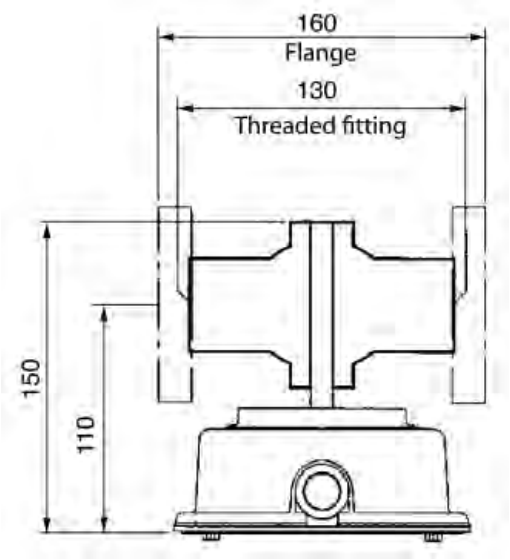
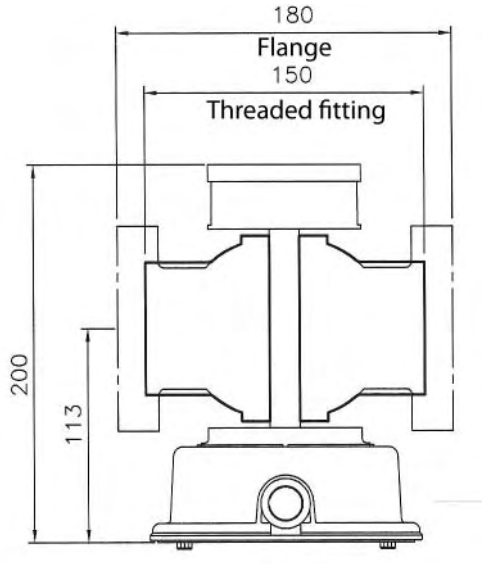
Dimensions:

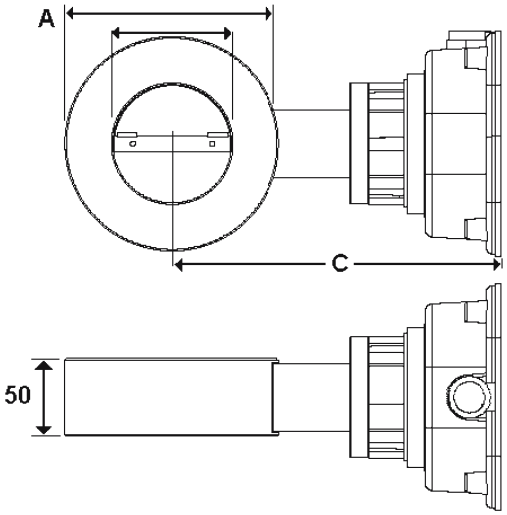
Chamber S:



Chamber M:



Chamber L (wafer):



DN	A (mm)	C (mm)	ANSI	A (mm)	C (mm)
80	138	216	3"	127	210
100	158	226	4"	157	217
150	218	264	6"	216	263
200	278	291	8"	270	287

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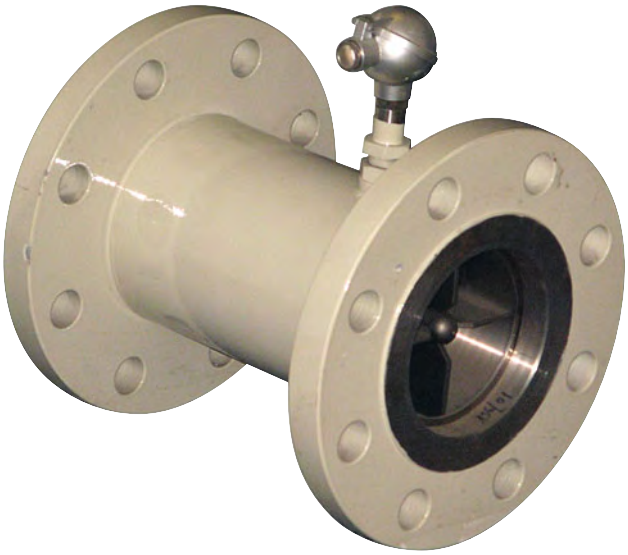
DR12

Precision Turbine Flowmeter for Thin, Non-Viscous Liquids



- **Wetted parts made completely of stainless steel**
- **Measuring accuracy: ± 0.5% to ± 1% of measured value**
- **Nominal diameters: 3/8" to 16" / DN10 to DN400 for flows up to 17600 GPM / 4,000 m³/h**
- **Available for pressures up to 5800 psi / 400 bar and temperatures up to 300 °F / 150°C**
- **Available with threaded or flange connection**

Description:

Model DR12 flowmeters are sturdy turbine-type flow sensors suitable for mobile or permanent installation. A turbine wheel set in motion by a flow parallel to its axis rotates at a speed proportional to the average speed of flow in the piping system. The movement of the turbine wheel is detected by a contactless pickup (coil). The resulting output frequency is a reliable indicator of the flow volume. The turbine body and the measuring unit are made of stainless steel: The bearing is made either of tungsten carbide or teflon. These flow sensors are available with male threaded (max. 2") or flanged connections (max. 16" / DN400).

Typical Applications:

Model DR12 turbine flowmeters are primarily used to detect and measure the flow of thin, non-viscous liquids. The high-quality materials used in the their construction, their ability to withstand high pressures as well as the broad selection of measuring ranges make these devices ideal for use in the greatest variety of applications, including but by no means limited to, engineering, machinery construction and in the chemical, pharmaceutical as well as the food and beverage industries.

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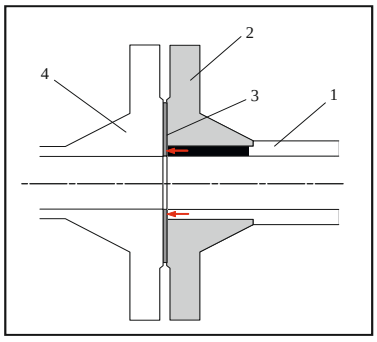
Models:

Model DR12 turbine flowmeters come standard with a housing of stainless steel AISI 321 / 1.4541.

For sizes up to 3" / DN80, the rotor is made of stainless steel AISI 420 / 1.4034. For larger sizes, the rotor is made of stainless steel AISI 321 / 1.4541.

The standard bearings are made of tungsten carbide. PTFE bearings are optionally available.

Sensors with flange connections come standard with flanges made of steel grade AISI 5LX / 1.1106. Flanges made of stainless steel AISI 321 / 1.4541 are optionally available.



The flanges are welded to the sensor body in a manner that ensures that they do not come in contact with the liquid being monitored.

1 = DR12 stainless steel housing
2 = Steel flange
3 = Gasket
4 = Mating flange

Sensor Systems

The following sensor systems are available for the DR12:

- Coil (self-excited),
  Output: Sinusoidal signal, 2-wire, 40 to 400 mV_{eff}
- Coil with preamplifier
  Output: Rectangular pulse signal, 3-wire
  PNP open collector, short-circuit-proof
  Power supply: 10 to 30 VDC
- Coil with preamplifier (as per NAMUR)
  Output: Pulse signals, 2-wire
  Power supply: 8 VDC

If desired, these devices can be fitted with different types of electrical connectors.

- Plug connector (Hirschmann)
  T_{max} = -40 to +230 °F / -40 to +110°C
- Plug connector (Cannon)
  T_{max} = -58 to +300 °F / -50 to +150°C
- Connection head with terminal block
  T_{max} = -58 to +300 °F / -50°C to +150°C

Output Signal

DR12 flowmeters provide an output frequency proportional to the flow rate. This output frequency is converted into a typical pulse/liter figure for each measuring range (see "Measuring Ranges" table).

Due to the production tolerances, the final pulse/liter ratings for identical ranges may vary by up to 10% among individual units. For this reason, every turbine is individually calibrated before delivery and provided with its own pulse/liter rating.

Application Information

To ensure problem-free function, there are several factors to keep in mind when using DR12 turbine flow sensors:

Chemical Resistance:

DR12 flow sensors can be used in all types of liquids that will not corrode the stainless steels used in their construction or the materials used in their turbine bearings.

Viscosity:

In general, the operation of turbine-type flow sensors is affected by liquid viscosity. However, their design will provide problem-free service with liquids having a viscosity of at most 15 cSt. Any additional output errors resulting from use in higher-viscosity liquids will be less than 0.5%

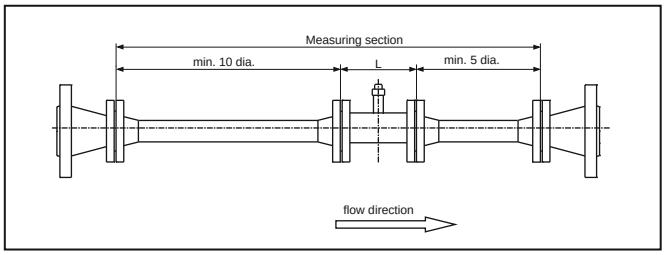
Gas Cavities:

Gas cavities (cavitation) in the liquids being monitored should be absolutely prevented from occurring. Such cavities can result in (additional) measurement errors. These measurement errors will correspond approximately to the volume of the gas bubbles being transported in the liquid.

Contamination:

The amount of solid materials in the liquid being monitored may be at most 50 g/m3 without affecting the measurement accuracy or the service life of the device. 80% of this solid materials should have a particles size no larger than 50µ; the remaining 20% should be no larger than 500 µ. Filament-shaped ("stringy") contamination in the liquid must be absolutely prevented from occurring since this type of material can accumulate and cause the rotor to lock up.

Installation Information:



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Measuring Ranges:

Code	Measuring-range (water) GPM	Measuring-range (water) m³/h	ID (inch / mm)	Pulses per Liter (psi / bar)	Pressure-loss	Signal-level (coil) mV_{eff}
1	0.25-1.25	0,055…0,275	0.24 / 6	17000	5.8 / 0.4	40
2	0.5-2.5	0,11…0,55	0.24 / 6	8500	5.8 / 0.4	40
3	1-5	0,22…1,1	0.47 / 12	4090	5.1 / 0.35	60
4	2-10	0,44…2,2	0.59 / 15	1960	5.1 / 0.35	80
5	3.5-17.5	0,8…4	0.59 / 15	1080	5.1 / 0.35	80
6	7-35	1,6…8	0.71 / 18	562	5.1 / 0.35	200
7	14-70	3,2…16	0.98 / 25	259	4.4 / 0.3	200
8	30-150	6,8…34	1.46 / 37	95,3	4.4 / 0.3	250
9	60-300	13,6…68	1.97 / 50	60,88	4.4 / 0.3	300
10	120-600	27…135	2.95 / 75	16	4.4 / 0.3	400
11	240-1200	54…270	3.94 / 100	12	3.6 / 0.25	200
12	480-2400	110…550	5.91 / 150	5,236	3.6 / 0.25	200
13	960-4800	220…1100	7.87 / 200	3,109	3.6 / 0.25	200
14	1670-8350	380…1900	9.84 / 250	1,8	3.6 / 0.25	200
15	2380-11900	540…2700	11.81 / 300	1,267	3.6 / 0.25	200
16	3500-17500	800…4000	15.75 / 400	0,9	3.6 / 0.25	200

Process Connection:

ID (inch / mm)	Type of Connection		
	Male thread NPT or G	Flange connection	
		ANSI	DIN
0.24 / 6	3/8"	3/8" RF	DN10
0.47 / 12	1/2"	1/2" RF	DN15
0.59 / 15	5/8"	1/2" RF	DN15
0.71 / 18	3/4"	3/4" RF	DN20
0.98 / 25	1"	1" RF	DN25
1.46 / 37	1 1/2"	1 1/2" RF	DN40
1.97 / 50	2"	2" RF	DN50
2.95 / 75	-	3" RF	DN80
3.94 / 100	-	4" RF	DN100
5.91 / 150	-	6" RF	DN150
7.87 / 200	-	8" RF	DN200
9.84 / 250	-	10" RF	DN250
11.81 / 300	-	12" RF	DN300
15.75 / 400	-	16" RF	DN400

Pressure Rating:

Nominal size	Pressure rating (bar)		
	Thread NPT or G	DIN Flange (PN)	ANSI Flange (lbs.)
DN10 / 3/8" - DN15 / 5/8"	3600 / 250 (2300 / 160 for 5/8")	40 / 160 / 250 150 / 300 320 / 400	150 / 300 / 600 / 900 / 1500 / 2500
DN20 / 3/4"	1450 / 100	40	150 / 300
DN25 1" - DN40 / 1 1/2"	1450 / 100 / 250 / 320 / 400	40 / 160 / 600 / 900	150 / 300 / 1500 / 2500
DN50 / 2"	1450 / 100 / 100 / 160 / 250 / 320 / 400	40 / 64 / 600 / 900 / 1500 / 2500	150 / 300
DN80 / 3"	– / 64 / 100 / 160 / 250 / 320 / 400	10 / 40 / 600 / 900 / 1500 / 2500	150 / 300
DN100 / 4"	– / 64 / 100 / 160 / 250	16 / 40 / 600 / 900 / 1500 / 2500	150 / 300
DN150 / 6"	– / 64 / 100 / 160	16 / 40 / 600 / 900 / 1500	150 / 300
DN200 / 8" - DN400 / 16"	– / 64	16 / 40 / 600 / 900	150 / 300

Ordering Code:

Order Number: DR12. | V. | 09. | 050D40. | H. | V. | 0

Precision Turbine Flow Sensor

Models:
R = Stainless steel housing, threaded
S = Stainless steel housing, steel flanges
V = Stainless steel housing, stainless steel flanges

Measuring range:
01 to 16 = see “Measuring Range” table

Process connection:
See separate “Process Connection” ordering code below

Bearing:
H = Tungsten-carbide bearing (not for measuring ranges 01 + 02)
P = PTFE bearing

Sensor system with plug connector (Hirschmann):
S = coil, self-exciting, no preamplifier
V = coil with preamplifier, 3-wire, 10 to 30 VDC
N = coil with preamplifier as per NAMUR, 8 VDC

Options:
0 = None
C = Plug connector (Cannon), -58 to +300 °F / -50 to +150°C
B = Connection head with terminal block, -58 to +300 °F / -50 to +150°C
9 = Please specify in writing.

Ordering Code for Process Connections

Connection code: 50 | D | 40

Nominal size:
010 = 3/8” / DN10
015 = 1/2” / DN15
018 = 5/8” / DN15
020 = 3/4” / DN20
025 = 1” / DN25
040 = 1 1/2” / DN40
050 = 2” / DN50
080 = 3” / DN80
100 = 4” / DN100
150 = 6” / DN150
200 = 8” / DN200
250 = 10” / DN250
300 = 12” / DN300
400 = 16” / DN400

Type of connection (see “Process Connection” table):
G = male thread, G
N = male thread, NPT
D = DIN flange
A = ANSI flange
S = Special connection

Pressure rating (see “Pressure Rating” table):
10 to 250 = 10 to 250 bar (for DIN flanges only)
150 to 2500 = 150 to 2500 lbs. (for ANSI flanges only)
320 = Special model rated at 320 bar (only with “S” metric high pressure (S) threaded connection for measuring ranges 01 to 07)

PKP PROCESS INSTRUMENTS

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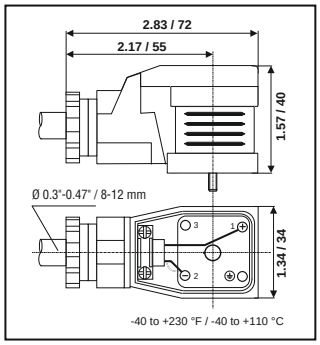
Technical Specifications:

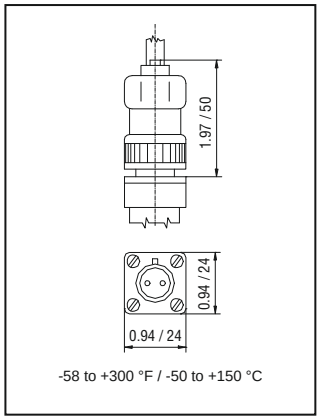
Materials:

Housing:	stainless steel AISI 321 / 1.4541
Rotor:	up to DN80: stainless steel AISI 420 / 1.4034 from DN100: stainless steel AISI 321 / 1.4541
Bearing:	tungsten carbide, PTFE optional
Flanges:	steel AISI 5LX / 1.1106, stainless steel AISI 321 / 1.4541 optional
Max. pressure:	as per “Pressure Rating” table and model coding
Liquid temperature:	-58 to +300 °F / -50 to +150°C (-40 to +230 °F / -40 to +110°C with Hirschman plug connection)
Ambient temperature:	-40 to +140 °F / -40 to +60°C
Accuracy:	
DR12.-.01 to 03:	± 1% of measured value
DR12.-.04 to 16:	± 0.5% of measured value
Supply voltage:	
DR12...S:	coil without preamplifier, self-exciting
DR12...V:	coil with preamplifier: 10 to 30 VDC
DR12...N:	coil with preamplifier (as per NAMUR) 8 VDC

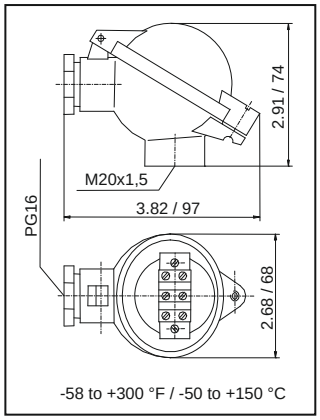
Electrical Connection:



Plug connection (Hirschmann)

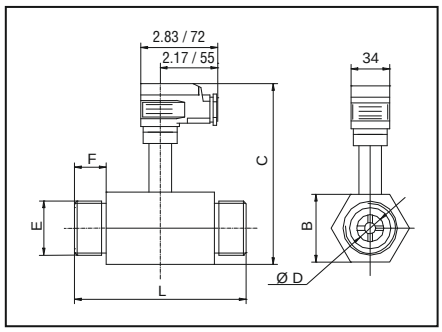


Plug connection (Cannon)



Terminal connector housing

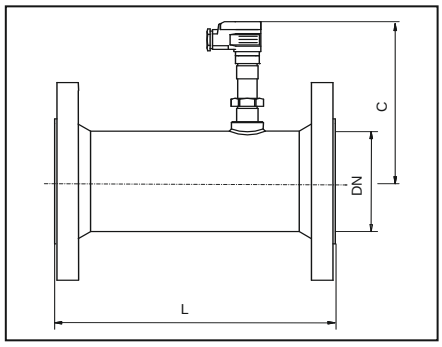
Dimensions:



Threaded connection:

Inner diameter ØD (inch / mm)	B (inch / mm)	C (inch / mm)	L (inch / mm)	E (male thread, NPT or G)	F (inch / mm)
0.24 / 6	0.98 / 25	3.23 / 82	2.00 / 50.8	3/8"	0.50 / 12.7
0.47 / 12	0.98 / 25	3.39 / 86	2.50 / 63.5	1/2"	0.75 / 19
0.59 / 15	0.98 / 25	3.43 / 87	2.50 / 63.5	5/8"	0.75 / 19
0.71 / 18	1.50 / 38	3.50 / 89	3.25 / 82.6	3/4"	0.87 / 22
0.98 / 25	1.50 / 38	3.62 / 92	3.50 / 89.0	1"	0.90 / 23
1.46 / 37	2.20 / 56	3.90 / 99	4.50 / 114	1 1/2"	1.10 / 28
1.97 / 50	2.75 / 70	4.10 / 104	5.25 / 133	2"	1.16 / 29.5

Dimensions for metric high-pressure (S) threaded connections available on request.



Flange connection

Inner diameter ØD (inch / mm)	C (inch / mm)	L (inch / mm)	Inner diameter ØD (inch / mm)	C (inch / mm)	L (inch / mm)
0.24 / 6	3.74 / 95	4.50 / 114	3.15 / 80	5.51 / 140	9.00 / 228
0.47 / 12	4.02 / 102	5.00 / 127	3.94 / 100	6.06 / 154	14.00 / 355
0.59 / 15	4.53 / 115	5.00 / 127	5.91 / 150	7.09 / 180	14.50 / 368
0.71 / 18	4.53 / 115	5.55 / 141	7.87 / 200	9.30 / 236	18.00 / 458
0.98 / 25	4.96 / 126	6.00 / 153	9.84 / 250	10.43 / 265	18.00 / 458
1.46 / 37	4.96 / 126	7.00 / 179	11.81 / 300	11.42 / 290	18.00 / 458
1.97 / 50	5.20 / 132	7.80 / 198	15.75 / 400	13.58 / 345	24.00 / 610

Dimensions apply to DIN flanges.
Dimensions for ANSI flanges may be slightly different.

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DR15

Turbine flow meter, counter and batching unit

- for low viscosity liquids
- materials: wetted materials made of PP, PVDF and alloy 59
- 2 calibrated measuring ranges, 10-60 l/min, 20-120 l/min
- 3 additional user-defined measuring ranges
- accuracy: ± 2.5% of full scale, ‘ reproducibility < 0.5% of full scale
- LCD display for flow rate and totalalizing, control output for dosing, pulse output proportional to flow rate
- power supply: battery or 24 VDC

Description:

A turbine mounted in the flow tube is rotated by the flowing liquid. The rotary motion is sensed by two reed relays via a magnetical coupling, and transmitted to an electronic in the form of a frequency proportional to the flow. The electronics module calculates the flow rate and the total quantity and operates a transistor contact, which is available to energize a pump or a valve when a programmable total quantity has been counted.

Typical Applications:

Model DR15 flow meters and dosers are used to monitor, measure and dose low-viscosity liquids such as water, diesel oil, sodium hydroxide solution and the like. Applications are to be found in coolant monitoring, filling processes and in the chemical industry, to mention but a few.

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Models:

DR15.PO…	measuring tube made of POM (available on request)
DR15.PP…	measuring tube made of PP
DR15.PV…	measuring tube made of PVDF (available on request)

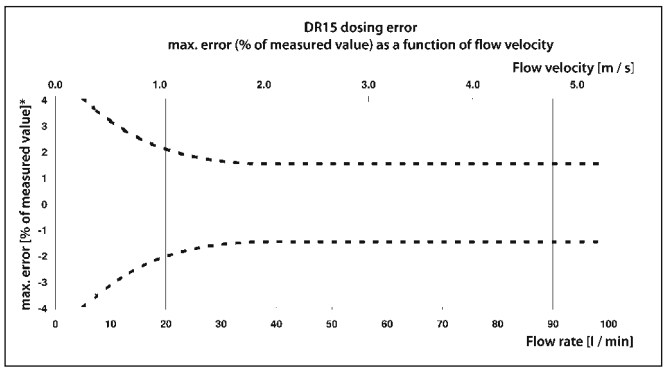
Measuring ranges:

DR15.x.1…	10–60 l/min
DR15.x.2…	20–120 l/min

Electronics options:

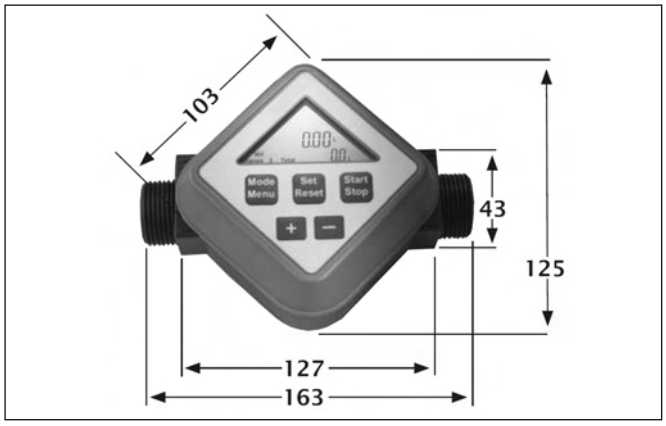
DR15…EB	battery operated
DR15…E24	24 VDC power supply
DR15…0	no output signals
DR15…I	with pulsed output (40 ml/pulse, NPN o/c, 2-channel)
DR15…K	with switched transistor output for dosing (NPN o/c)
DR15…KI	with switched and pulsed output

Measuring accuracy:



*) under reference conditions (process liquid: water; ambient and water temperature: 20 °C; with minimum required inlet and outlet pipe sections and matching inside pipe diameters)

Dimensions:



Model Coding:

Order Number: **DR15. | S. | PP. | 1 | EB. | K. | 0**

Turbine flow meter, counter and doser

Process connection:
S = G 1 male thread

Material:
PP = polypropylene

Measuring ranges:
1 = 10-60 l/min
2 = 20-120 l/min

Power supply:
EB = battery (with electronics 0 or K only)
E24 = 24 VDC

Electronics options:
0 = no output signal (flow meter and counter only)
I = pulsed output (flow meter and counter only)
K = switched output (flow meter, counter, doser)
IK = pulsed and switched output (flow meter, counter, doser)

Options:
0 = none
9 = please specify in writing

Other models like 1" NPT process connection, device tube made of POM or PVDF available upon request.

Technical Specifications:

Max. pressure:
- **at 20 °C** 10 bar
- **at 40 °C:** 8 bar (PVDF), 7 bar (POM, PP)
- **at 60 °C:** 6 bar (PVDF), 4 bar (POM), 3 bar (PP)

Max. temperature: 60 °C

Process connection: G 1 male thread, (NPT on request)

Materials:
- **Measuring tube:** PP (POM or PVDF on request)
- **Turbine:** PVDF
- **Axle shaft:** NiCroFer 2.4605 (alloy 59)
- **Gasket:** Viton

Electronics enclosure: plastic

Mounting position: preferably horizontal with display on top

Accuracy: ± 2.5% f.s. for flow rate, ± 1.5% of set quantity for dosing (<20 l/min: ± 3%)

Resolution: 0,05 L

Display: LCD, 2 x 6 digits

Operation: keypad with 5 buttons

Outputs:
- **Pulses:** NPN open collector
- **Switched output:** NPN open collector

Power supply: 9-32 VDC or lithium battery type AA, 3.6 V, 2300 mAh

Weight: approx. 300 g

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DOZ01

Flow sensor with oval rotor assembly for small flow volumes

- **Unaffected by viscosity**
- **Compact design, no inlet piping required**
- **Materials: PP, ECTFE or stainless steel**
- **Output signals: pulses, 4 to 20 mA or 2 limit-value relays**

Description:

The model DOZ01 flow sensor with oval rotor assembly measures the flow of liquids, ranging from water to those with a maximum viscosity of 200 cSt, regardless of the actual viscosity of the liquid. In this type of sensor, the flowing liquid sets two toothed oval wheels within a measuring chamber in rotary motion. The rotary motion is detected by a Hall sensor and output as a series of pulses. The output frequency of these pulses is directly proportional to the flow rate. Alternatively, the pulsed output can be converted into an analog signal (4 to 20 mA) or into two limit contacts by optional downstream electronics. The flow sensor housing is available in different material combinations such as PP, ECTFE or stainless steel with the oval wheels made of PEEK. The availability of different oval-wheel axle shafts and gaskets allows the DOZ01 to be compatible with the widest varieties of liquids. The device offers two measuring ranges (2 to 10 GPH / 8 to 40 l/h and 3.7 to 21 GPH / 14 to 80 l/h)

Typical Applications:

Model DOZ01 flow sensors are used wherever the flow of liquids having different viscosities must be reliably and economically measured, such as in the following cases:

– Central lubrication systems
– Transformer oils
– Aggressive/caustic liquids in the chemical industry,

and many more.

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Models:

DOZ01.P: Standard model
Housing of PP, oval wheels of PEEK
Axles of zirconium dioxide (ceramics optional)
Viton gaskets (EPDM or Kalrez optional)

DOZ01.E: Model for aggressive/caustic liquids
Housing of ECTFE, oval wheels of PEEK
Axles of zirconium dioxide (ceramics optional)
Viton gaskets (EPDM or Kalrez optional)

DOZ01.V: Made of stainless steel for higher system pressures (up to 290 psi / 20 bar)
Housing of stainless steel AISI 316 / 1.4401, oval wheels of PEEK
Axles of zirconium dioxide (ceramics optional)
Viton gaskets (EPDM or Kalrez optional)

Measuring ranges:

Meas.-range (GPH / l/h	Con-nection (female NPT or G)	Start-up (GPH / l/h)	Width (inch / mm)	Height w/o con-nector (inch / mm)	Depth (inch / mm)	Pulses / L approx.*)
2-10 / 8-40	1/4"	0.5 / 2	2.13 / 54	1.77 / 45	1.77 / 45	6000
3.7-21 / 14-80	1/4"	1.3 / 5	2.13 / 54	1.77 / 45	1.77 / 45	3400

*) Due to manufacturing tolerances, the pulse/liter rating may vary by approx. ± 3%. However, each device is individually checked before delivery and provided with its own exact pulse/liter rating.

Output signals:

DOZ01...P: Pulse output,
rectangular pulse signal

DOZ01...A: Analog output,
4 to 20 mA, 2-wire

DOZ01...S: Switched output
2 limit-value relays (0.1A at 24 VDC)
Programmable, pulse output

Electrical Connection:

	DOZ01P	DOZ01S	DOZ01A
Power supply	Pin 1		white
Signal	Pin 2		green
Ground	Pin 3		brown
Relais 1			yellow
Relais 1			grey
Relais 2			pink
Relais 2			blue
4...20mA Signal +		Pin 1	
4...20mA Signal -		Pin 2	

Options:

- Gaskets of EPDM or Kalrez
- Ceramic axle shafts

Model Coding:

Order Number: DOZ01 | P. | V. | 1. | P. | 0.

Flow sensor with oval rotor assembly for small flow volumes

Models:
P = PP housing, PEEK oval wheels
E = ECTFE housing, PEEK oval wheels
V = Stainless steel housing, PEEK oval wheels

Gasket:
V= Viton (standard)
E = EPDM
K = Ceramic

Measuring range:
1 = 2-10 GPH / 8-40 l/h
2 = 3.7-21 GPH / 14-80 l/h

Output signals:
P = Pulse output
A = Analog output, 4 to 20 mA
S = 2 limit-value relays and pulse output

Options:
0 = None
1 = Ceramic axle shafts
N = 1/4" NPT process connection
G = G 1/4 process connection
9 = Please specify in writing.

Technical Specifications:

Max. pressure:
PP: 145 psi / 10 bar
ECTFE: 145 psi / 10 bar
Stainless steel: 290 psi / 20 bar

Liquid temperature: 32 to 176 °F / 0 to 80 °C

Measuring error:
5 to 200 cSt: ± 2,5% of end value
<5 cSt: ± 4%

Process connection: 1/4" female thread, NPT or G

Installation position: Any

Voltage supply:
Pulse output: 4.5 to 24 VDC
Analog output: 15 to 24 VDC
Limit-value relay: 15 to 24 VDC

Electrical connection:
Pulse and analog output: 5-pin plug connection as per EN 175301-803A
Limit-value relay: female cable connector with matching plug fitted with 1 meter of cable

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DV01

Gear-Wheel Flow Sensor for Viscous Liquids, for OEM-Applications

- for media viscosities between 20 - 4000 cSt
- low price
- Aluminium housing, gearwheels steel
- low pressure drop
- max. pressure up to 200 bar
- small mounting dimensions

Description:

The DV01 measuring system consists of a pair of gear-wheels which, accordind to the gear wheel pump principle are rotated by the flowing liquid. The gear wheel bearings a re constructed as radial and axialplain bearings (in the case of the DV01.1 and DV01.3, the DV01.2 uses ball bearings). A magnetoresistive measuring system hermetically sealed from the measuring chamber seses the rotation of the gear wheels and converts it into apulse train.The gear wheel flow meter DV01 causes a very lowpressure drop and emitts especially little noise.

Applications:

The gear wheel flow meters DV01 are mainly used for consumption measurement, the control of dosing applications and for monitoring lubricating points.Because of their small dimensions and their low price theyare especially suited for all kinds of OEM applications.

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Versions and measuring ranges

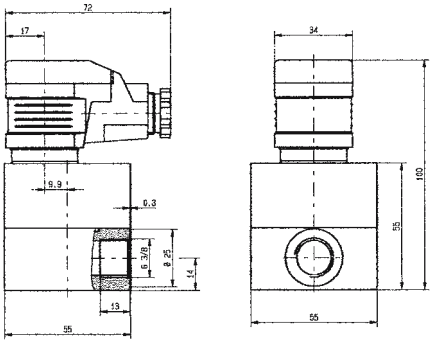
Model	Meas.-range (l/min)	Viskosity-range (cSt)	Con-nection	Meas.-volume (ml/puls)	Resolution (pulse/l)
DV01.0	0.02- 4	20...4000	G 3/8 i	0.04	25,000
DV01.1	0.25...10	20...4000	G 3/8 i	0.2	5,000
DV01.2	0.16...16	20...3000	G 3/8 i	0.25	4,082
DV01.3	1...65	20...4000	G 3/4 i	2	500
DV01.4	1...200	20...4000	G 1 i	5.2	191.5

Materials

Model	Housing	Gear wheels	Bearings
DV01.0A	Aluminium	Stainless steel 1.4462	Ball bearings
DV01.0E	Stainless steel 1.4404	Stainless steel 1.4462	Ball bearings
DV01.1A	Aluminium	Steel	Plain bearings
DV01.1E	Stainless steel 1.4404	Stainless steel 1.4462	Plain bearings
DV01.2A	Aluminium	Steel	Ball bearings
DV01.3A	Aluminium	Steel	multi-layer lightweight floating bearing
DV01.4A	Aluminium	Steel	Ball bearings

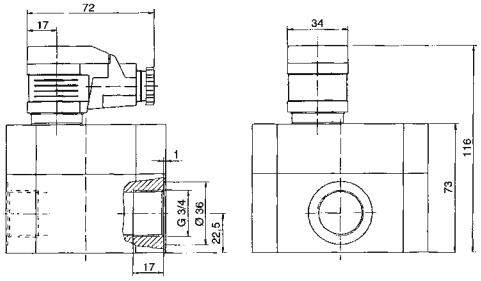
Dimensions:

DV01.0A / DV01.0E and DV01.1A and DV01.1E



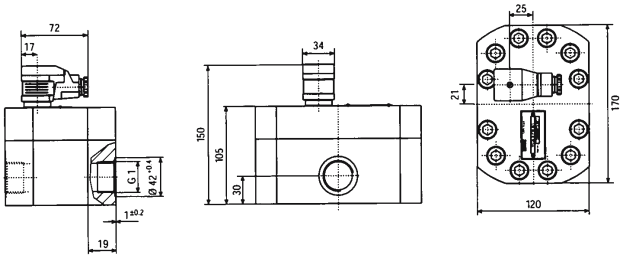
DV01.2A: as DV01.1A, but housing 55 x 65 mm, height 108 mm

DV01.3A



Width x depth: 90 x 100 mm

DV01.4A



Ordering code:

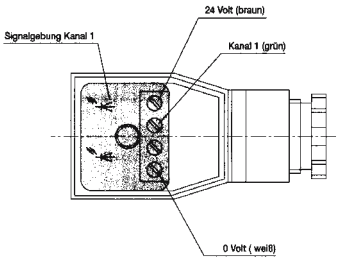
Model number: **DV01. 1A**

Gear wheel flow meter

Measuring range:

0A = 0.02…4 l/min, aluminium
0E = 0.02…4l/min, stainless steel
1A = 0.25…10 l/min, aluminium
1E = 0.25...10 l/min, stainless steel
2A = 0.16…16 l/min,aluminium
3A = 1…65 l/min, aluminium
4A = 1…200 l/min, aluminium

Electrical connection:



Techncal specifications:

max. pressure:

DV01.0A:	200 bar
DV01.0E:	160 bar
DV01.1A and DV01.1E:	160 bar
DV01.2A:	160 bar
DV01.3A:	160 bar
DV01.4A:	80 bar

Temperature range: -10°C … +80°C

Measuring accuracy:

DV01.0A and DV01.0E:	+/- 2%
DV01.1A and DV01.1E:	+/- 3%
DV01.2A:	+/- 0,3%
DV01.3A:	+/- 2,5%
DV01.4A:	+/- 1%

Weight:

DV01.0A and DV01.0E:	0,5 kg
DV01.1A and DV01.1E:	0,5 kg
DV01.2A:	0,7 kg
DV01.3A:	1,9 kg
DV01.4A:	6 kg

Supply voltage: 12...30 VDC, protected polarity

Output signal: square wave pulses, min. 0,8*U_B, duty cycle 1:1 (+/- 15%)

Electrical protection: IP 65

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DV04

High-precision Gearwheel flow meter for viscous liquids

- **For fluids with viscosities of at least 20 cSt**
- **Very cost effective**
- **Cast iron or stainless steel designs available**
- **Accuracy better than 0.3% of measured value**
- **High resolution**
- **Pressure-proof construction withstands up to 400 bar**
- **Small installation dimensions**

Description:

The measuring mechanism in the DV04 flow meter consists of a pair of gearwheels that are driven by the fluid stream, much like a gearwheel pump. The measuring mechanism is supported by sleeve bearings or ball bearings. Two anti-magnetic sensors, with a relative phase offset of 90° and hermetically isolated from the measuring chamber, sense the movement of the gear wheels. This two-channel sensing system used with appropriate electronics permits a higher measurement resolution as well as detection of flow direction. All flow meters are optionally available in a explosion-proof design with a separate switching amplifier. The DV04 gearwheel flow meter features very low resistance to flow and particularly low sound pressure levels.

Applications:

Their outstanding measuring accuracy and high resolution make these devices particularly suitable for use in test stands when measuring small and very small flow volumes.

Other areas of application:
- Measuring consumption rates
- Controlling and regulating filling processes
- Dosing of oils and chemicals
- Flow measurement of paints and varnishes
- Controlling the ratio of polyalcohol/polyhydroxy alcohol and isocyanate

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Designs (table 1)

Depending on application and medium properties, the DV04 is available in 8 different model ranges:

Series	Material	Minimum viskosity (mm^2/s)	Accuracy (% of measured value)	Medium properties	
				Viskosity	Lubricity
1	GGG40	20	+/- 0.3	low	good
2	GGG40	50	+/- 0.5	average	good
3	GGG40	100	+/- 1.0	high	good
4	GGG40	100	+/- 0.5	average	low
5	stainless steel 1.4404	100	+/- 0.5 DV04.2: +/- 3	average	low
6	stainless steel 1.4404	20	+/- 0.3	low	good
7	GGG40	20	+/- 1	low	low
8	stainless steel 1.4404	20	+/- 1	low	low

Process connection (table 2)

Baureihe	1	2	3	4	5	6	7	8
bearing / Type	ball-bearing	ball-bearing	bronze sleeve-bearing	Hard alloy sleeve-bearing	Hard alloy sleeve-bearing	ball-bearing	Hybrid-ball bearing	Hybrid-ball bearing
DV04.2	G 3/8	-	-	-	G 1/8	G 1/8	G 3/8	G 1/8
DV04.3	G 3/8	-	-	-	-	G 1/4	G 3/8	G 1/4
DV04.4	G 3/8	G 3/8	-	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8
DV04.5	G 1/2 or G 3/4	-	-	G 1/2 or G 3/4	-	-	-	-
DV04.6	G 1/2 or G 3/4	G 1/2 or G 3/4	G 1/2 or G 3/4	G 1/2 or G 3/4	G 1/2	G 1/2	G 1/2 or G 3/4	G 1/2
DV04.7	G 1	G 1	-	G 1	G 1	G 1	-	-
DV04.8	G 1	G 1	G 1	G 1	G 1	G 1	-	-
DV04.9	G 1 1/2	-	-	-	-	-	-	-
DV04.10	G 1 1/2	-	-	-	-	-	-	-

Measuring ranges in l/min (table 3)

Model	Range							
	1	2	3	4	5	6	7	8
DV04.2	0,008-2	-	-	-	0,02 - 2	0,008-2	0,008-2	0,008-2
DV04.3	0,02-4	-	-	-	-	0,02-4	0,02-4	0,02-4
DV04.4	0,16-16	0,16-16	-	0,16-16	0,16-16	0,16-16	0,16-16	0,16-16
DV04.5	0,2-40	-	-	0,2-30	-	-	-	-
DV04.6	0,4-80	0,4-80	0,6-40	0,3-60	0,3-60	0,4-80	0,4-80	0,4-80
DV04.7	0,6-160	0,6-160	-	0,6-100	0,6-100	0,6-160	-	-
DV04.8	1-250	1-250	1,2-80	1-160	1-160	1-250	-	-
DV04.9	2-600	-	-	-	-	-	-	-
DV04.10	3-700	-	-	-	-	-	-	-

Parameters (table 4)

Model	Maximum pressure (bar)	Peak pressure (bar)	Sound pressure level (dB(A))	Resolution impulses / l
DV04.2	400	480	< 60	40.000
DV04.3	400	480	< 60	25.000
DV04.4	400	480	< 60	4.081,63
DV04.5	400	480	< 70	2.500
DV04.6	400	480	< 70	965,25
DV04.7	315	350	< 70	333,33
DV04.8	315	350	< 72	191,5
DV04.9	400	480	< 80	83,33
DV04.10	400	480	< 80	62,5

Model coding:

Order number: DV04 | 3. | 1. | F. | PS.. | 3. | S. | 0

Gearwheel flow meter

Measuring ranges:
2…9 = as per table 3

Series:
1…8 = as per table 1

Seal:
F = Viton
E = EPDM
P = PTFE / Kalrez

Connection:
PS = with mounting plate, connection at the side
PU = with mounting plate, connection at bottom
R = without mounting plate, connection at the side (model ranges 5, 6, 8 only)

Process connection:
04 = G 1/8 IG
05 = G 1/4 IG
10 = G 3/8 IG
15 = G 1/2 IG
20 = G 3/4 IG
25 = G 1 IG
40 = SAE flange, d = 38mm

Electronics:
S = Standard
H1 = High-temperature-design up to 150 °C
H2 = High-temperature-design up to 220°C (FEP-Gasket and clamp-connection)
X = Intrinsically safe with separate switching amplifier (EEx ia IIC)

Special features:
0 = None
1 = Please specify in writing

Technical details:

Viscosity range: 20 to 100000 mm^2/s
Pressure loss: depends on viscosity and load on the device (exact values available upon request)

Temperature range:
Standard design: -30... +120 °C
High-temperature design: -30...+150 °C

Materials:
Series 1-4, 7: housing GGG 40, GGG60 (DV04.9, DV04.10)
Measuring mechanism 1.7139
Series 5, 6, 8: housing stainless steel 1.4404
Measuring mechanism stainless steel 1.4462

Electronics:
Standard: 2 sensors, 90° phase offset
Ex-design: with separate switching amplifier

Supply voltage: 12…30 VDC, Protected against polarity reversal

Output signal: Square-wave pulse, minimum 0.8*UB, Scanning ratio 1:1 (+/- 15%)

Protection type: IP 65

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DM01

Compact Magnetic Inductive Flowmeter

- **independend of viscosity, density, pressure or temperature of medium**
- **maintenance free**
- **practically no pressure drop**
- **high measurement accuracy**
- **turndown ration 1:50**
- **smallest dimensions**

Description

The compact magnetic inductive flowmeter DM01 works without moving parts. It is designed especially for low flow rates and tight mounting conditions.
Ranges from 0.1 l/min to 200 l/min are available.

Advantages

- no moving parts, therefore no maintenance and no wear and tear.
- no parts obstructing the flow in the measuring pipe.
- under normal operating conditions no influence of temperature, viscosity, concentration or pressure changes.
- the high turndown ratio makes the unit universally suitable.
- particles in the medium and viscous or polluted media may be measured without problems.
- the compact design and the low price allows the use for OEM applications.

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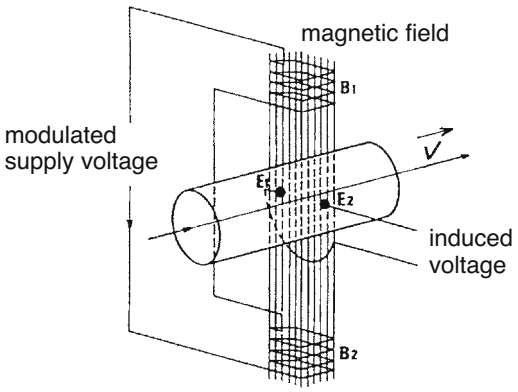
Operating principle:

The magnetic inductive flow meter works according to Faradays law of induction. The liquid to be measured (which must be electrically conductive) flows perpendicular to a magnetic field.
This induces a voltage in the liquid. This voltage is picked up by means of two electrodes located in the measuring tube and fed into an electronic which converts it into a flow proportional output frequency.



Order Code:

Order no.	DM01.	1.	D.	01	0

Compact Magnetic Inductive Flowmeter

power supply:
1= 24 VDC
2 = 12 VDC

Materials:
D = st. steel / Delrin
P = st. steel / PVDF

Ranges:
01 = 0.1...5 l/min
02 = 1...20 l/min
03 = 2...50 l/min
04 = 5...100 l/min
05 = 10...200 l/min

special version:
0 = without
1 = please describe

Versions:

DM01.D: wetted parts:
measuring tube and electrodes:
st. steel 1.4435
process connections: Delrin

DM01.P: wetted parts:
measuring tube and electrodes:
st. steel 1.4435
process connections: PVDF

Ranges and Dimensions

measuring range (lpm)	width x height (mm)	diameter of measuring tube (mm)	process connection	K-factor (pulses per litre)
0.1...5	84,5 x 123	8	G 1/2 AG	1000
1...20	84,5 x 123	8	G 1/2 AG	800
2...50	90 x 123	14	G 3/4 AG	160
5...100	90 x 123	18	G 1 AG	160
10...200	90 x 123	18	G 1 AG	80

technical specifications:

max. pressure: 6 bar

medium temperature: -10...+40 °C

wetted parts: st. steel, Delrin®
st. steel, PVDF

max. inaccuracy: ± 1,5% of actual value
for range 0.1…5 l/min ± 10%
to 1l/min, ±1,5% ex 1l/min

min. conductivity: 20 µS/cm

supply voltage: 24 VDC +/- 10%
12 VDC +/- 10%

max. current consumption: max. 50 mA

output signal: flow proportional frequency, square wave

electrical protection: IP 65

response time: 50ms

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DTH08

Low-volume calorimetric flow sensor

- **Measuring ranges: 0.16 – 32 GPH, 0.4 – 80 GPH and 0.8 – 160 GPH (0.01 – 2 l/min, 0.025 – 5 l/min and 0.05 – 10 l/min)**
- **Wetted parts made of stainless steel 1.4571**
- **No moving parts**
- **Very low pressure drop**
- **Easy handling**

Description:

The model DTH08 calorimetric flow sensor measures and monitors liquid flow. It's compact design makes it suitable for a wide variety of applications. Depending on the model, the device can be fitted with an analog output (4 – 20 mA or 0 – 10 V) and a switched or frequency output. The sensor measures the flow rate and temperature of the liquid. Both these parameters can be assigned to the analog output or the switched output (see table 1).

Typical Applications:

The DTH08 sensors are designed to economically measure and monitor the flow rates of aqueous liquids. They are a very good alternative to conventional flow sensors as they have very low flow resistance and are not adversely affected by contamination or soiling by solids.

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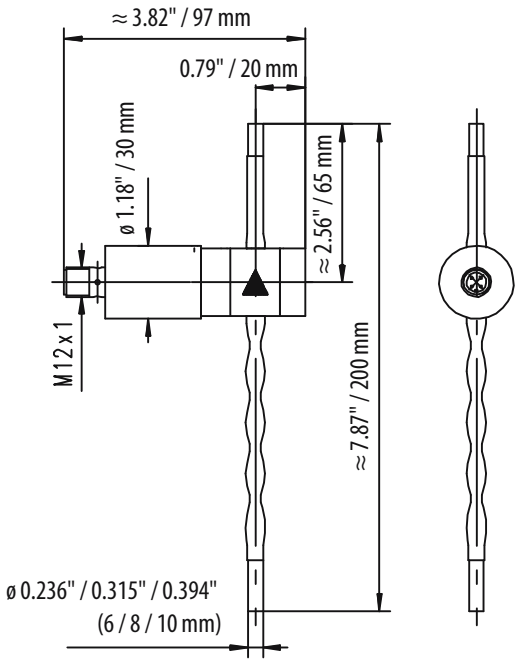
Output combinations, Table 1

No.	Flow rate		Temperature	
	Analog	Switched output/ Frequency output	Analog	Switched output/ Frequency output
1	x			
2		x		
3	x	x		
4	x			x
5		x	x	

Dimensions:



Electrical Specifications:

Voltage supply:	24 VDC ± 10 %
Power consumption:	max. 100 mA
Switched output:	Push-pull transistor output (short-circuit proofed and reverse polarity protected) I_{out} = 100 mA max.
Switching hysteresis:	Flow rate: 1% f.s. Temperature approx.: 1 °C
Analog output:	4 – 20 mA / ohmic resistance 500 Ohm max. or 0 – 10V / load min. 1 K Ohm

Typenschlüssel:

Order Number: **DTH08** | **1.** | **1.** | **1.** | **0**

Calorimetric flow sensor

Measuring ranges:

1 = 0.01 – 2 l/min
2 = 0.025 – 5 l/min
3 = 0.05 – 10 l/min
S = Special measuring range
1U = 0.16 – 32 GPH
2U = 0.4 – 80 GPH
3U = 0.8 – 160 GPH

Analog or switched output combinations (see table 1)::

1 = Analog output for flow rate
2 = Switched output or frequency output for flow rate
3 = Analog and switched output or frequency output for flow rate
4 = Analog output for flow rate and switched output or frequency output for temperature
5 = Switched output or frequency output for flow rate and analog output for temperature

Analog output:

1 = 4 – 20 mA standard
2 = 4 – 20 mA inverted
3 = 0 – 10 V standard
4 = 0 – 10 V inverted

Switching signal:

0 = no switched output
1 = minimum switch point
2 = maximum switch point
3 = frequency output, max. 2000 Hz

Technical Specifications:

Process connection:	pipe connection, dia. = 0.236"/ 0.315"/ 0.394" (6/8/10 mm)
max. pressure:	150 psi / 10 bar (other pressures available on request)
Medium temperature:	32 – 158 °F / 0 – 70 °C
Temperature gradient:	8 °F / 4 °C per second
Accuracy:	± 5 % of measured value
Linearity:	± 2 %
Pressure drop:	max. 4.35 psi / 0.3 bar at maximum flow rate
Electrical connection:	plug connector, M12x1, 4-pin to DIN
Ingress protection:	IP 40

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DB40

Thermal mass flow meters and counters for compressed air and non-aggressive gases

- **insertion model**
- **available for DN25 (1") to DN600 (24") pipe sizes**
- **for flow velocities: 0–92.7m/s, 0–185 m/s and 0–224 m/s**
- **optional local LCD display for flow rate and total**
- **output signals: 4 to 20 mA for flow rate, pulses for totalization**

Description:

Model DB40 thermal mass flow meters and counters report and measure mass flow rates and totals of non-aggressive gases, regardless of gas pressure and temperature. Process gas flows around a heated temperature sensor that is encapsulated in glass. As a result, the sensor dissipates heat which an electronics module returns to the sensor to maintain it at a constant temperature. The dissipated heat energy is proportional to the mass flow rate of the gas and is output as a 4 to 20 mA signal by the electronic utilizing calibration curves and process parameters stored in the instrument. The 4 to 20 mA signal is routed to secondary evaluation devices and provides the flow rate information. An additional pulse output with a pre-defined pulse value is used for totalizing purposes. Mass flow rate and total may also be displayed on an integrated back-lit display if required. The instruments are supplied with a ½" thread compression fitting and can be installed and disassembled under pressurized conditions.

Typical Applications:

Model DB40 thermal mass flow meters and counters provide flow measurement of non-aggressive gases in DN25 to DN600 pipe systems. Their rugged, heavy-duty design and easy handling and operation make them the right choice for measuring and monitoring compressed air consumption levels. They also provide measurements of other suitable gases such as: nitrogen oxygen, argon, helium and carbon dioxide.

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Models:

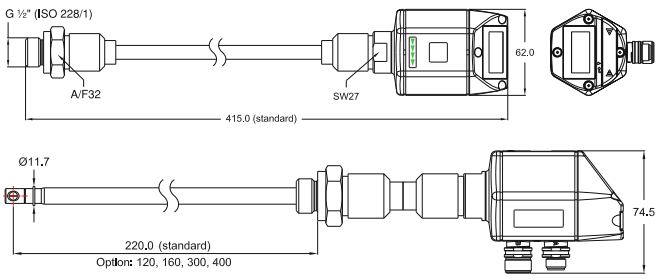
DB40.S...	standard model, mass flow rate 0–92.7 m/s, ½" male thread
DB40.H1...	mass flow rate 0–185 m/s ½" male thread
DB40.H2...	mass flow rate 0–224 m/s ½" male thread

Measuring ranges:

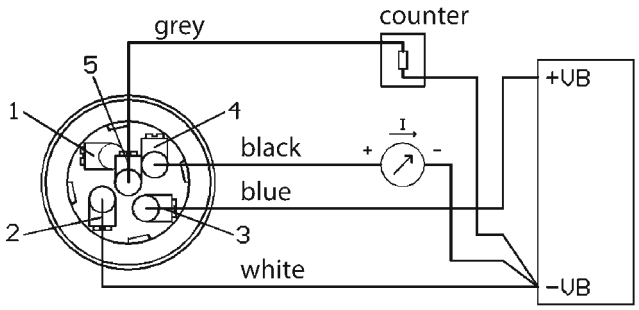
The quoted measuring ranges are a rough guide only. The exact measuring ranges are calculated taking the actual inside diameter of the given pipe into account and are used during production to calibrate the instruments.

Process connection (DN) and pipe ID (mm)	Upper end value (20 mA) in Nm³/h			Recommended probe length (mm)
	DB40.S 0–92,7 m/s	DB40.H1 0–185 m/s	DB40.H2 0–224 m/s	
25 (1")	122	244	295	120
32 (1 ¼")	219	437	529	
40 (1 ½")	333	640	775	160
50 (2")	530	1,060	1,280	
65 (2 ½")	915	1,820	2,200	
80 (3")	1,390	2,780	3,365	
100 (4")	2,185	4,360	5,275	220
125 (5")	3,425	6,825	8,260	
150 (6")	4,940	9,840	11,910	
200 (8")	8,820	17,530	21,230	
250 (10")	13,740	27,430	33,210	300
300 (12")	19,840	39,540	47,880	
400 (16")	33,320	70,300	85,120	
500 (20")	55,100	109,850	133,000	600
400 (24")	79,350	158,180	191,520	

Dimensions:



Electrical Connection:



Ordering Code:

Order Number:	DB40.	G.	15.	L.	0

Thermal mass flow meters and counters for gases – insertion model

Measuring ranges (see table):
S = 0 to 92.7 m/s (standard)
H1 = 0 to 185 m/s
H2 = 0 to 224 m/s

Probe lengths:
12 = 120 mm
16 = 160 mm
22 = 220 mm (standard)
30 = 300 mm
40 = 400 mm

Process gas:
L = air
N = nitrogen
A = argon
H = helium
C = carbon dioxide
S = oxygen

Options:
0 = none
D = with LCD-display
9 = please specify in writing

Other information: inside pipe diameter in mm (please specify when placing your order, is needed to calculate the exact measuring range.)

Accessories:

DB40-Z.M	installation kit, containing a weld-on fitting and ½" ball valve made of stainless steel
DB40-Z.L5	5 m cable with matching plug
DB40-Z.L10	10 m cable with matching plug
DB40-Z.N1	Wall mounted power supply, 100-240 VAC, 10 VA on 24 VDC, 0.35 A
DB40-Z.N2	plug-in power supply unit, 100-240 VAC on 24 VDC, 0.35 A, with 2 m cable
DB40-Z.K5	factory calibration, 5 points

Technische Daten:

max. pressure:	50 bar
Process gas temperature:	-30 to +110 °C
Measurement uncertainty:	± 4% of measured value (± 3% with factory calibration)
Probe length:	refer to "Measuring ranges" table
Mounting position:	any
Voltage supply:	12–30 VDC
Outputs :	4 to 20 mA (max. load 500 ohm), pulses (1 pulse/m³), other pulse values available on request
Display (option D):	LCD, for flow rate in Nm³/h, for total in Nm³ (other units available on request)
Electrical protection:	IP65

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DB41

Compact thermal mass flow meter and counter for compressed air and non-aggressive gases

- integrated upstream and downstream pipe runs for high levels of accuracy
- removable sensor system for easy maintenance and cleaning
- available for ¼" to 2" pipe sizes
- measuring ranges: 0.8–90 Nl/min to 2–900 Nm³/h
- local LCD display for flow rate and total
- output signals: 4 to 20 mA for flow rate, pulses for totalization

Description:

Model DB41 thermal mass flow meters and counters report and measure mass flow rates and totals of non-aggressive gases, regardless of gas pressure and temperature. Process gas flows around a heated temperature sensor that is encapsulated in glass. As a result, the sensor dissipates heat which an electronics module returns to the sensor to maintain it at a constant temperature. The dissipated heat energy is proportional to the mass flow rate of the gas and is displayed by the electronic analyzer utilizing calibration curves and process parameters stored in the instrument. A 4 to 20 mA signal outputs the flow rate to secondary evaluation devices and a pulse output with a predefined pulse value provides a totalizing function. High levels of accuracy are obtained by means of upstream and downstream pipe runs integrated in the instrument which ensure that the flow stream is laminar.

Typical Applications:

Series DB41 thermal mass flow meters and counters provide flow measurement of non-aggressive gases in ¼" to 1 ½" pipe systems. Their rugged, heavy-duty design and easy handling and operation make them the right choice for measuring and monitoring compressed air consumption. They also provide measurements of other suitable gases such as: nitrogen oxygen, argon, helium and carbon dioxide.

Service friedly through removable sensor system:

For cleaning, maintenance, or recalibration the sensor head may be removed from the pipe run without taking the flow conditioner pipe itself out of the system. This eliminates the need for a bypass pipe and ensures that the gas supply system may continue to operate even with the meter taken out.

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Models:

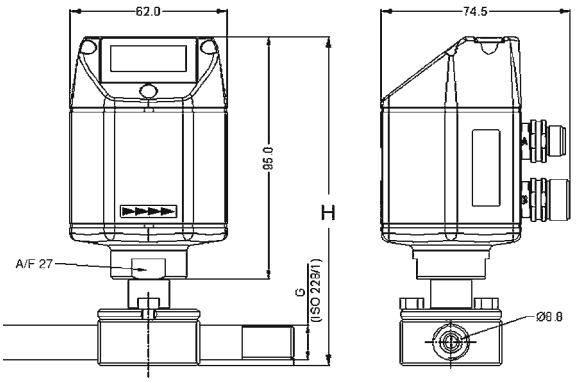
DB41...: Thermal mass flow meters and counters for gases with integrated upstream and downstream pipe runs made of stainless steel 1.4301

Measuring ranges:

Process connection (G or NPT)	Pipe ID (mm)	Measuring range	Length of device pipe section (mm)
1/4"	8.8	0.8 to 90 Nl/min	194**
1/2"	16.1	0.2 to 90 Nm³/h	300
3/4"	21.7	0.3 to 170 Nm³/h	475
1"	27.3	0.5 to 290 Nm³/h	475
1 1/2"	41.8	1 to 550 Nm³/h	475*
2"	53.1	2 to 900 Nm³/h	475*

*) Shortened upstream pipe run, for best measurement results a total upstream pipe run of 10 x pipe dia. is recommended.
**) Sensor head not removable.

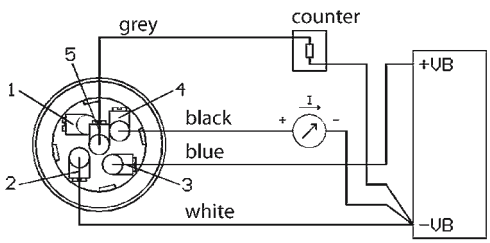
Dimensions:



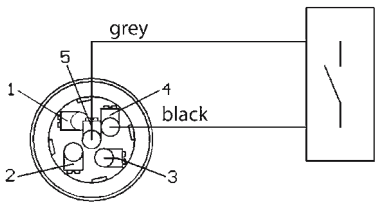
Pipe size (D)	1/4"	1/2"	3/4"	1"	1 1/2"	2"
Height (H) (mm)	129	176.4	179.2	182.6	189.9	195.9

Electrical Connection:

Plug connector A (M12)



Plug connector B (M12)
(pulse output galvanically separated)



Ordering Code:

Order Number:	DB41.	G.	15.	L.	0

Thermal mass flow meters and counters for gases with integral upstream and downstream pipe runs

Model:
G = G male thread
N = NPT male thread

Measuring range and pipe size:
08 = 0.8 to 90 Nl/min, 1/4"
15 = 0.2 to 90 Nm³/h, 1/2"
20 = 0.3 to 170 Nm³/h, 3/4"
25 = 0.5 to 290 Nm³/h, 1"
40 = 1 to 550 Nm³/h, 1 ½"
50 = 2 to 900 Nm³/h, 2"

Process gas:
L = air
N = nitrogen
A = argon
H = helium
C = carbon dioxide
S = oxygen
G = nitrous oxide

Options:
0 = none
9 = please specify in writing

Accessories :

DB41-Z.L5	5 m of cable with matching plug for analog output and supply voltage
DB41-Z.L10	10 m of cable with matching plug for analog output and supply voltage
DB41-Z.N1	wall mounted power supply, 100-240 VAC, 10 VA on 24 VDC, 0.35 A
DB41-Z.N2	plug-in power supply, 100-240 VAC on 24 VDC, 0.35 A, with 2 m cable
DB41-Z.K5	factory calibration, 5 measuring points
DB41-Z.V	cover lid for flow conditioner pipe

Technical Specifications:

max. pressure:	16 bar
Process gas temperature:	-30 to +80 °C
Accuracy:	± 1.5% of measured value plus ± 0.05 % of end value
Measuring ranges and nominal sizes:	refer to "Ordering Code" section
Mounting position:	any
Voltage supply:	12 to 30 VDC
Outputs:	4 to 20 mA (max. load 500 ohm), pulses (1 pulse/L for DB41...08 or 1 pulse/m³ for DB41...15 to 50, other pulse values available on request)
Display :	LCD, for flow rate and total (Nl/min. for DB41...08 or Nm³/h for DB41...15 to 50, other units available on request)
Electrical protection:	IP65

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FS00

Float Level Switch

- low cost version
- simple installation
- vertical or horizontal mounting
- hight switch rating, 10 (8) A, 250 VAC
- N/O, N/C or SPDT versions available
- different cable materials, dependend on medium

Description:
The float level switches FS00 work according to the lift principle.
A hollow float is raised by the rising liquid until it reaches an angle of 45 ° from horizontal when switching takes place. The mercury free float switch can be mounted to the tank or container via a through hole such as a 1/2" cable gland or from the tank top.
The switch point is defined by manipulating placement of an optional ballast weight on the connecting cable or by inserting cable through a tube of the desired length.
The FS00 level switch consists of a polypropylene housing with an integrated watertight and position dependend electromechanical microswitch. Cable connections from different materials and in different lenghts may be chosen to suit the medium and tank dimensions.

Applications:
The FS00 float level switches are compatible to virtually all liquid media which do not affect the materials of the switch or cable. The unit is absolutely independent from the pollution of the medium.
The FS00 may be used as MIN, MAX monitor, to control valves or pumps or as an alarm swich.

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Materials and contact ratings

Materials: housing from PP, mirror welded, capnut PG11 from PA
connection cable according to ordering code

Contact function
based on rising level

- FS00.S... N/O, 10 (8) A, 250 VAC
  colour: red
- FS00.O... N/C, 10 (8) A, 250 VAC
  colour: yellow
- FS00.W... SPDT, 6 (4) A, 250 VAC
  colour: orange

Connection cable

3-wire for N/O and N/C versions, 4-wire for SPDT

Cable material:

- Neoprene black
  standard cable for general use
- Polyurethane yellow
  for mineral oil and gasoline
- LAPP-Therm olive
  for bio oil and grease and chemicals
- special cable material
  upon reqest

Electrical connection

- FS00.S...
  brown = common
  blue = signal, switched through with full tank
  green / yellow = protective ground
- FS00.O...
  brown = common
  blue = signal, switched through with empty tank
  green / yellow = protective ground
- FS00.W...
  brown = common
  blue = signal, switched through with full tank
  black = signal, switched through with empty tank
  green / yellow = protective ground

Ballastweight

Material: cast iron, plastic coated (Levasit)
Dimensions: 30x30x190 mm

Ordering code:

Order number:	FS00.	S.	N.	5.	1.	0

Float level switch

Contact function
S = N/O
O = N/C
W = SPDT

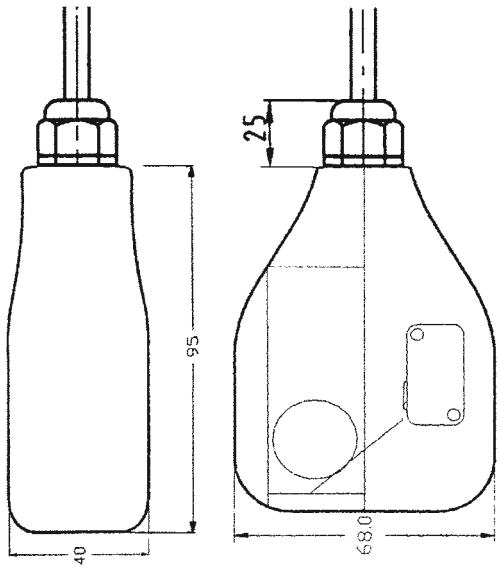
Cable material
N = Neoprene
P = polyurethane
L = LAPP-Therm
S = special material

cable length
5 = 5 m
10 = 10 m
20 = 20 m
99 = other length

Ballast weight
0 = without
1 = with

Options
0 = without
9 = please specify

Dimensions



Specifications

Operating temperature: max. 140 °F / 60 °C, with LAPP-Therm cable up to 200 °F / 95 °C
Storage temperature: max. 200 °F / 95 °C
max. pressure: 29 psi / 2 bar
Switching angle: +/- 45°
Electrical protection: IP68
Weight:
Float: 0.24 lbs / 110 g
Ballast: approx. 1.54 lbs / 700 g

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FS10

Vertically-Mounted Magnetic Float Level Sensor

- reliable and robust, heavy-duty technology
- mounting thread, tank fitting or flange
- installation at top or bottom of vessel
- plastic, brass or stainless steel models
- NC, NO or changeover contacts available

Description:

The FS10 level sensor is based on a float with magnetic transmission technology. The sensor is comprised of a guide tube with embedded Reed contacts, one or more floats with fitted ring magnets and a process connection module. The float is raised by the rising liquid in the tank and operates a Reed contact through the guide tube wall by means of the magnetic field produced by permanent magnets located in the float. This Reed contact can be designed as a NO, NC or changeover function.

Typical Applications:

FS10 magnetic float level sensors are suitable for monitoring the level of practically all liquids, e.g. as a full or empty tank sensor, for controlling valves and pumps and for alarm function. The potential free Reed contacts fitted in the level sensor make it an ideal control element when coupled with PLC controllers.

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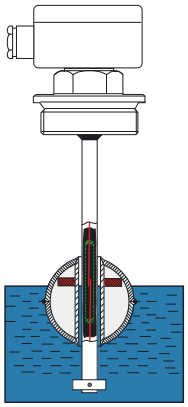
Function:



A ring magnet installed in the float operates Reed contacts, which are embedded at defined positions in the guide tube, via its magnetic field through the walls of the guide tube. Float stops mounted on the guide tube prevent the float from passing the contact – this assures bistable switching. Consequently, a maximum of 2 contacts per float can be operated. If more contacts are fitted, more floats must be used.

Versions:

Materials:

Standard: brass or stainless steel, PVC, PP or PVDF

Food / hygienic: stainless steel with Tri-Clamp or dairy pipe fitting

Each magnetic float level sensor consists of the three key modules below, which, depending on requirements, are available in different models:

- guide tube
- float
- process connection

Secondary instrumentation like contact protection relays complete the measuring system.

Guide tube:

The guide tube is the key component in the level sensor: it houses the reed contacts and can be supplied in a variety of materials and diameters.

Materials and diameters:

- brass (ø 0.31" / 8 mm, 0.47" / 12 mm, 0.55" / 14 mm, 0.71" / 18 mm)
- stainl. steel (ø 0.31" / 8 mm, 0.47" / 12 mm, 0.55" / 14 mm, 0.71" / 18 mm)
- PVC (ø 0.31" / 8 mm, 0.47" / 12 mm, 0.63" / 16 mm, 0.79" / 20 mm)
- PP (ø 0.31" / 8 mm, 0.47" / 12 mm, 0.63" / 16 mm, 0.79" / 20 mm)
- PVDF (ø 0.47" / 12 mm, 0.63" / 16 mm, 0.79" / 20 mm)

Guide tube Ø	Max. number of contacts	
	NO contact / NC contact	Changeover contact
0.31" / 8 mm	3	1
0.47" / 12 mm	4	4
0.55" / 14 mm	4	4
0.63" / 16 mm	5	6
0.71" / 18 mm	8	8
0.79" / 20 mm	8	8

Float:

The choice of float is based on the liquid being monitored (corrosion, density), the process parameters (pressure, temperature) and the guide tube materials and diameters. The available float models are listed in the following table.

Float models and dimensions (table 1):

Model	Material	Shape	Ø ID/AD (inch / mm	Min. density (kg/m³)	Max. pressure (psi / bar)	Max. temp. (°F/ °C)
E1027	stainless steel	cylinder	0.39-1.06 / 10-27	800	87 / 6	392 / 200
E1544			0.59-1.73 / 15-44	800	363 / 25	392 / 200
T1444	titanium		0.55-1.73 / 14-44	750	218 / 15	302 / 150
A1544	alloy		0.59-1.73 / 15-44	1000	653 / 45	392 / 200
B0925	Buna		0.35-0.98 / 9-25	800	87 / 6	176 / 80
B1540			0.59-1.57 / 15-40	700	87 / 6	176 / 80
PV1444	PVC		0.55-1.73 / 14-44	800	14 / 1	140 / 60
PV2255			0.87-2.17 / 22-55	750	14 / 1	140 / 60
PV2580			0.98-3.15 / 25-80	600	14 / 1	140 / 60
PP2155	PP		0.83-2.17 / 21-55	600	14 / 1	176 / 80
PP2480			0.94-3.15 / 24-80	500	14 / 1	176 / 80
PF2155	PVDF		0.83-2.17 / 21-55	800	14 / 1	212 / 100
PF2480			0.94-3.15 / 24-80	700	14 / 1	176 / 80
E0942	stainless steel	sphere	0.37-1.65 / 9,4-42	650	218 / 15	392 / 200
E1552			0.59-2.05 / 15-52	700	580 / 40	392 / 200
E1562			0.59-2.44 / 15-62	600	363 / 25	392 / 200
E1572			0.59-2.83 / 15-72	460	363 / 25	392 / 200
E2398			0.91-3.86 / 23-98	560	363 / 25	392 / 200
T1244	titanium		0.47-1.73 / 12-44	780	1450 / 100	572 / 300
T1552			0.83-2.17 / 15-52	750	2175 / 150	572 / 300
T2480			0.83-2.17 / 24-80	600	232 / 16	302 / 150

Special-order floats (ECTFE coated) are available on request

Process connection:

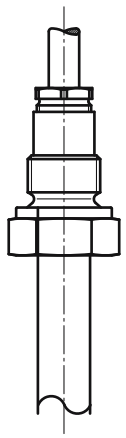
Typically, the magnetic float level sensors are screwed in the top of the vessel from inside with a male-threaded fitting (NPT or G, 1/8" to 2"). When installed in this fashion, the devices are supplied with a PVC or silicone-jacket connection cable. To mount the float level sensor from outside through the top of the vessel the device must be fitted with a tank fitting (NPT or G, 1", 1 1/2", or 2" male thread) or with flanges. The diameter of the tank fitting or flange must be large enough to allow the float to pass through the opening in the top of vessel.

Min. pipe sizes for process connection (table 2):

Float model	Minimum pipe size	
	Tank fitting (NPT/G)	Flange (ANSI / DIN)
E1027	1"	1 1/2" / DN40
E1544	1 1/2"	2" / DN50
T1444	1 1/2"	2" / DN50
A1544	1 1/2"	2" / DN50
B0925	1"	1" / DN25
B1540	1 1/2"	2" / DN50
PV1444	1 1/2"	2" / DN50
PV2255	2"	2 1/2" / DN65
PV2580	---	3" / DN80
PP2155	2"	2 ?" / DN65
PP2480	---	3" / DN80
PF2155	2"	2 1/2" / DN65
PF2480	---	3" / DN80
E0942	1 1/2"	2" / DN50
E1552	2"	2 1/2" / DN65
E1562	---	2 1/2" / DN65
E1572	---	3" / DN80
E2398	---	4" / DN100
T1244	1 1/2"	2" / DN50
T1552	2"	2 1/2" / DN65
T2480	---	4" / DN100

Technical specifications for process connections:

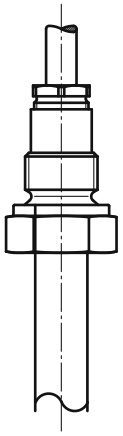
Mounting thread on top, cable connection (table 3)



Brass or stainless steel
male-threaded fitting G or NPT
1/8" to 2" (code G or N)
max. pressure: see "Float" table
max. temperature: see "Float" table

Connection	Material	Code G... N...	Guide tube Ø (inch / mm)	Max. length (inch / mm)
1/8"	Brass	...06	0.31 / 8	40 / 1000
	st.steel			40 / 1000
3/8"	Brass	...10	0.31-0.47-0.55 / 8-12-14	40 / 1000
	st.steel			200 / 5000
1/2"	Brass	...15	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.steel			200 / 5000
1"	Brass	...25	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.steel			200 / 5000
1 1/2"	Brass	...40	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.steel			200 / 5000
2"	Brass	...50	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.steel			200 / 5000

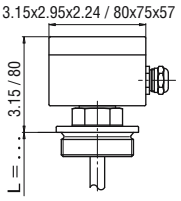
Mounting thread on top, cable connection (table 4)



PVC, PP or PVDF
male-threaded fitting G or NPT
1/8" to 2" (code G or N)
max. pressure: 14.5 psi / 1 bar
max. temperature: see "Float" table

Connection	Material	Code G... N...	Guide tube Ø (inch / mm)	Max. length (inch / mm)
1/8"	PVC/PP	...06	0.31-0.47 / 8-12	40 / 1000
	PVDF	---	---	---
3/8"	PP	...10	0.31-0.47 / 8-12	40 / 1000
	PVDF	...10	0.47 / 12	200 / 5000
1/2"	PVC/PP	...15	0.63-0.79 / 16-20	40 / 1000
	PVDF			200 / 5000
1"	PVC/PP	...25	0.63-0.79 / 16-20	40 / 1000
	PVDF			200 / 5000
1 1/2"	PVC/PP	...40	0.63-0.79 / 16-20	40 / 1000
	PVDF			200 / 5000
2"	PVC/PP	...50	0.63-0.79 / 16-20	40 / 1000
	PVDF			200 / 5000

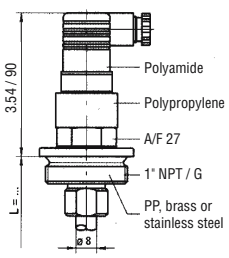
Tank fitting with connection box (table 5)



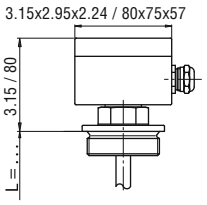
Brass or stainless steel
male-threaded fitting G or NPT,
1" to 2"
with connection box: code TG or TN
with plug: code TSG or TSN
max. pressure: 40 bar
max. temperature: see "Float" table

Connection	Material	Code TG... TN... TSG... TSN...	Guide tube Ø (inch / mm)	Max. length (inch / mm)
1"	Brass	...25	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.steel			200 / 5000
1 1/2"	Brass	...40	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.steel			200 / 5000
2"	Brass	...50	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.steel			200 / 5000

Tank fitting with plug connector made of ABS as per EN 175301-803, Form A (table 6)



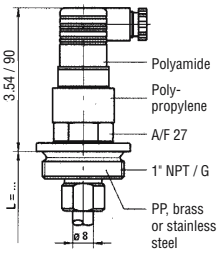
Tank fitting with polyester connection box (table 7)



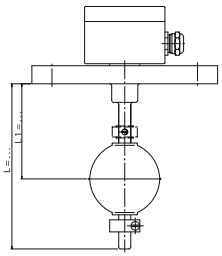
PVC, PP or PVDF
male-threaded fitting G or NPT
1" to 2"
with connection box: code TG or TN
with plug: code TSG or TSN
max. pressure: 1 bar
max. temperature: see "Float" table

Connection	Material	Code TG... TN... TSG... TSN...	Guide tube Ø (inch / mm)	Max. length (inch / mm)
1"	PVC	...25	0.31-0.47-0.63-0.79 / 8-12-16-20	31.5/800
				158/4000
	PP			31.5/800
				158/4000
	PVDF			20/500
				129/3000
1 1/2"	PVC	...40	0.31-0.47-0.63-0.79 / 8-12-16-20	31.5/800
				158/4000
	PP			31.5/800
				158/4000
	PVDF			20/500
				129/3000
2"	PVC	...50	0.31-0.47-0.63-0.79 / 8-12-16-20	31.5/800
				158/4000
	PP			31.5/800
				158/4000
	PVDF			20/500
				129/3000

Tank fitting with plug connector made of ABS as per EN 175301-803, Form A (table 8)



Flange connection with connection box (table 9)



Carbon steel or stainless steel
flanges as per ANSI or DIN
1" (DN25 to 4" (DN100)
ANSI 150 lbs., RF: code FA150...
ANSI 300 lbs., RF: code FA300...
DIN PN 16: code FD16...
DIN PN 40: code FD40...
max. pressure: see "Float" table
(please observe flange pressure rating)
max. temperature: see "Float" table

Connection	Material	Code FD16... FD40... FA150.. FA300..	Guide tube Ø (inch / mm)	Max. length (inch / mm)
1"	Steel	...25	0.31-0.47-0.55-0.71 / 8-12-14-18	40 / 1000
	st.Steel			200 / 5000
1 1/2"	Steel	...40		40 / 1000
	st.Steel			200 / 5000
2"	Steel	...50		40 / 1000
	st.Steel			200 / 5000
2 1/2"	Steel	...65		40 / 1000
	st.Steel			200 / 5000
3"	Steel	...80		40 / 1000
	st.Steel			200 / 5000
4"	Steel	...100		40 / 1000
	st.Steel			200 / 5000

Special-order versions:

– dairy pipe fitting as per DIN 11851 with aluminum connection box

– Tri-Clamp connection as per DIN 32676 with plug made of ABS as per EN 175301-803, Form A

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Model Coding:

Order Number: FS10. 1. 1. 1. G06. 1. 1. 0. E1027. XXX

Magnetic float level sensor

Guide tube material:
1 = brass
2 = stainless steel
3 = PVC
4 = PP
5 = PVDF
6 = PA
9 = special-order

Guide tube diameter:
1 = 0.31" / 8 mm
2 = 0.47" / 12 mm
3 = 0.55" / 14 mm
4 = 0.63" / 16 mm
5 = 0.71" / 18 mm
6 = 0.79" / 20 mm
9 = special-order

Process connection material:
1 = brass
2 = carbon steel
3 = stainless steel
4 = PVC
5 = PP
6 = PVDF
9 = special-order

Connection code: (see tables 3 to 9)
G06 to FA300
9 = special-order

Electrical connection:
1 = aluminum connection box
2 = stainless steel connection box
3 = ABS connection box
4 = plug connector
(max. 1 switch contact)
5 = plug connector with PA flange
(max. 1 switch contact)
6 = 1 m connection cable *
9 = special-order

Contacts (from top to bottom):**
1 = N/O contact for rising level
2 = N/C contact for rising level
3 = changeover contact for rising level

Temperature contact at end of guide tube:
0 = none
1 = N/O contact for rising temperature***
2 = N/C contact for rising temperature***
9 = special-order

Float model:
E1027-T2480
(see table 1)

Approvals and options:
0 = none
xx = see "Approvals and options" table

* standard PVC, optionally silicone jacket, PUR, FEP screened or oil-resistant; (please specify material and other cable lengths)
** please specify distance of contacts measured from sealing edge of process connection for each contact
*** please specify setpoint temperature

Model Coding (process connections):

Mounting thread above sealing edge of process connection with cable connection — G | 10

G = male-threaded fitting G
N = male-threaded fitting NPT

06 = 1/8"
10 = 3/8"
15 = 1/2"
25 = 1"
40 = 1 1/2"
50 = 2"

Tank fitting: — TG | 25

TG = with connection box, male-threaded fitting G
TN = with connection box, male-threaded fitting NPT
TSG = with plug connector, male-threaded fitting G
TSN = with plug connector, male-threaded fitting NPT

25 = 1"
40 = 1 1/2"
50 = 2"

Flange connection with connection box: — FD16 | -40

FD16 = DIN flange, PN16
FD40 = DIN flange, PN40
FA150 = ANSI flange, 150 lbs., RF
FA300 = ANSI flange, 300 lbs., RF
FS = special-order flange

25 = 1" / DN25
40 = 1 1/2" / DN40
50 = 2" / DN50
65 = 2 1/2" / DN65
80 = 3" / DN80
100 = 4" / DN100

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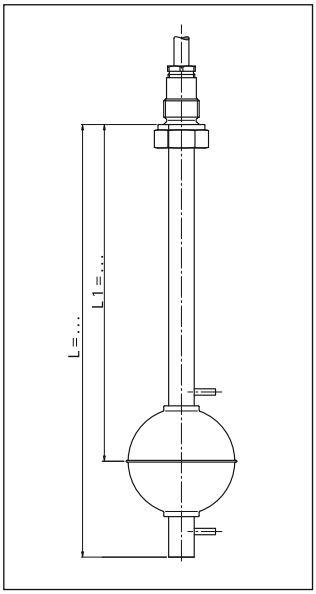
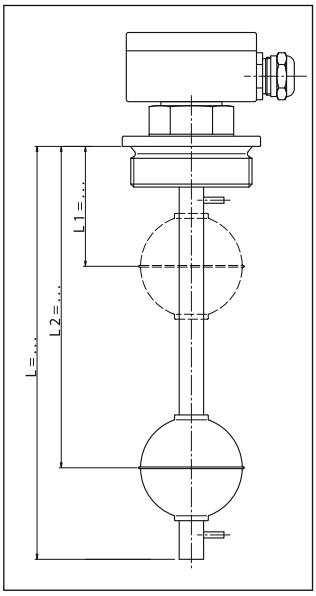
Float level switch made of brass or stainless steel

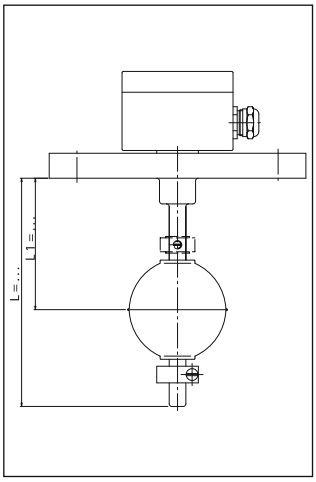
with male-threaded fitting and cable connector



with tank fitting and connection box



with flange and connection box



Models and technical specifications

Guide tube material: brass or stainless steel 316 Ti / 1.4571

Guide tube diameter: brass: 0.31"-0.47"-0.55" / 8-12-14 mm
stainless steel: 0.31"-0.47"-0.55"-0.71" / 8-12-14-18 mm

Length of guide tube: Ø 0.31" / 8 mm: max. 40" / 1m
Ø 0.47" / 12 mm, Ø 0.55" / 14 mm: max. 118" / 3 m
Ø 0.71" / 18 mm: max. 236" / 6 m

Float:

Guide tube diameter			
0.31" / 8 mm	0.47" / 12 mm	0.55" / 14 mm	0.71" / 18 mm
E1027	E1544	E1544	E2398
B0925	T1444	A1544	T2480
E0942	A1544	B1540	
T1244	B1540	E1552	
	PV1444	E1562	
	E1552	E1572	
	E1562	T1552	
	E1572		
	T1552		

Process connection: mounting thread made of brass or stainless steel, see table 3
tank fittings made of brass or stainless steel, see tables 5 or 6
flanges made of carbon steel or stainless steel, see table 9
special-order versions: Tri-Clamp, dairy pipe on request

Max. pressure: depending on float
(see table 1 – Float models)

Max. temperature: (process connection: male-threaded fitting with cable)
cable material:
PVC: 176 °F / 80 °C
silicone: 356 °F / 180 °C
PUR: 176 °F / 80 °C
FEP: 392 °F / 200 °C
other materials available on request
(please observe max. temperature of float)

max. temperature: (process connection: tank fitting or flange)
depending on float
(see table 1 - float models),
however max. 302 °F / 150 °C for brass and 392 °F / 200 °C for stainless steel guide tube.
special-order versions for higher temperatures available on request

Other details: function and location of contacts, measured from sealing edge of connection, and overall length of guide tube,
temperature switchpoint

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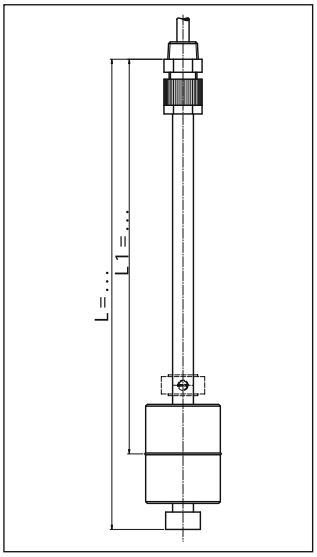
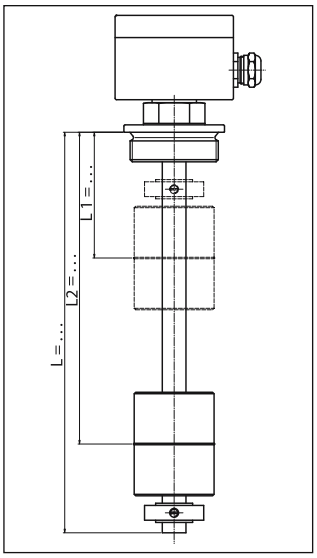
Float sensor made of PVC, PP or PVDF

with male-threaded fitting and cable connector



with tank fitting and ABS connection box



Models and technical specifications

Guide tube materia: PVC, PP or PVDF

Guide tube diameter: 0.31" / 8 mm, 0.47" / 12 mm, 0.63" / 16 mm, 0.79" / 20 mm

Length of guide tube: 0.31" / 8 mm, 0.47" / 12 mm: max. 118" / 3 m
0.63" / 16 mm, 0.79" / 20 mm: max. 157" / 4 m

Float:

Guide tube diameter			
0.31" / 8 mm	0.47" / 12 mm	0.63" / 16 mm	0.79" / 20 mm
B0925 PV1444	B1540 PF2155	PP2155 PV2580 PP2480 PF2480	PV2255

Process connection: mounting thread made of PVC, PP or PVDF, see table 4
tank fittings made of PVC, PP or PVDF, see tables 7 or 8

Max. pressure: 1 bar

max. temperature: PVC: 140 °F / 60 °C, PP, PVDF: 176 °F / 80 °C (please observe max. temperature of float)

Other details: function and location of contacts, measured from sealing edge of connection, and overall length of guide tube,
temperature switchpoint

Switch rating of Reed contacts

Switch function	Guide tube diameter				
	0.31" / 8 mm	0.47" / 12 mm	0.55" / 14 mm	0.63" / 16 mm	0.79" / 20 mm
N/O contact	150 V, 0,5 A, 10 VA	230 V, 0,5 A, 40 VA			
NC contact	150 V, 0,5 A, 10 VA	230 V, 0,5 A, 40 VA			
SPDT contact	150 V, 0,5 A, 10 VA	230 V, 0,5 A, 40 VA			

Contacts with higher switch rating and with load resistor for connection to a PLC are available on request

Approvals and options

Description	Code	for model
intrinsically safe model as per Eex ia / Exx ib	E1	Please inquire as required
intrinsically safe model as per Eex ia with dust-Ex	E2	
Water Resources Act	WH	
German Lloyd	GL	
Bureau Veritas	BV	
Registrato Italiano Navale	RIN	
with test function	T	
vertically adjustable model	HA	
PT100 temperature sensor, 3-wire in bottom of guide tube (pl. specify measuring range)	P	
20 mA-transmitter in connection box for devices with PT100 temperature sensor	PM	

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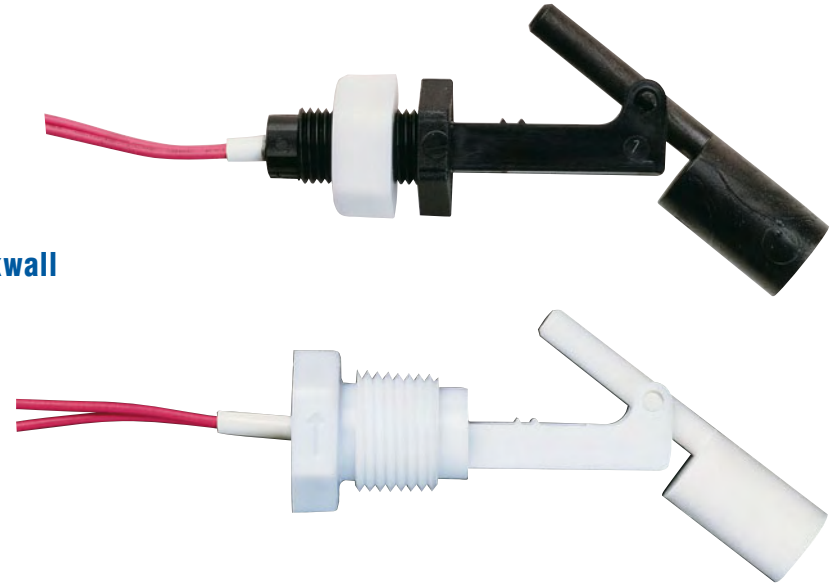
FS14

Miniature Plastic Float Level Switch For Horizontal Mounting

- compact design
- only one mechanically moveable component
- mounts horizontally into tankwall
- PP or Nylon version available



Description

The level switches model FS14 work according to the magnetic float principle. The float is lifted upwards by the rising liquid level in the tank until the magnetic field of the integrated permanent magnetactivates a Reed contact. Depending on the way the level switch is mounted this contact may work as a N/O or a N/C switch.

Applications

The float level switches FS14 are designed to monitor the level of nearly all liquids which do not affect the used materials, for example as HIGH- or LOW-alarms or for controlling valves and pumps.

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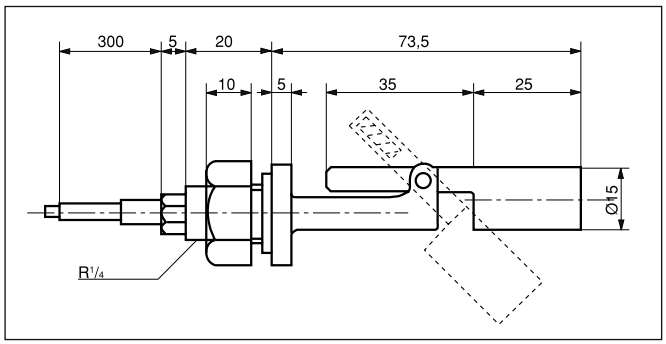
Versions

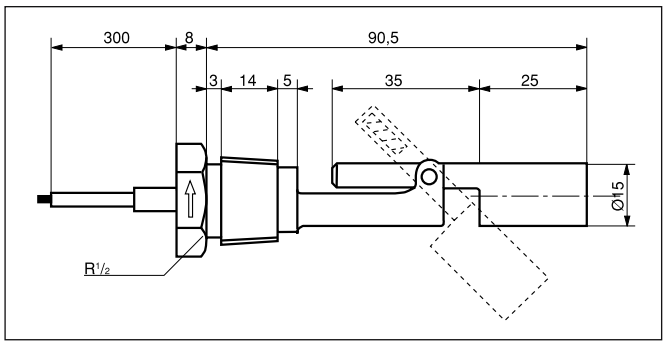
- Low-cost level switch made from PP or Nylon
- Threaded connection R 1/4" or 1/2" NPT

Dimensions

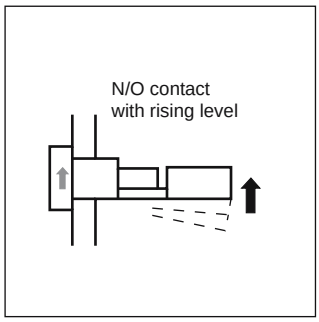
FS14.1

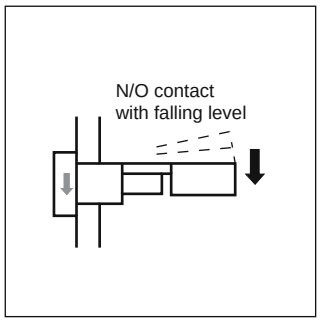


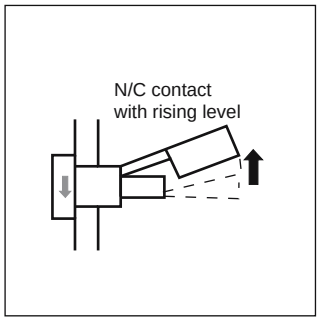
FS14.2

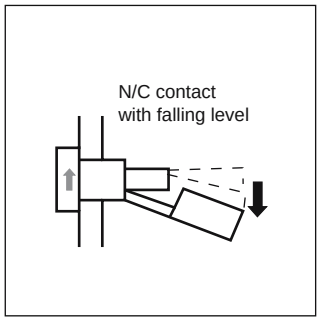


Mounting and contact functions









Ordering Code

Order No. **FS14. 1. 1. 2.**

Miniature float level switch

Connection:

1 = R 1/4" male thread

2 = 1/2" NPT male thread

Material:

1 = Polypropylen

2 = Nylon

Contact rating:

2 = 300 V DC/AC, 0.5 A, 50 VA

Technical Specifications

Connection cable:	0.3 m of PE wire
Threaded connection:	
FS14.1:	R 1/4" male with nut
FS14.2:	1/2" NPT male
Material:	
FS14.x.1:	PP
FS14.x.2:	6-Nylon
Contact function:	N/C or N/O (300V, 0,5A, 50VA) with rising level, depending on mounting
max. pressure:	atmospheric
max temperature:	
FS14.x.1:	-10 … +80°C
FS14.x.2:	-10 … +110°C
min. S.G. of medium:	0.7 kg/l

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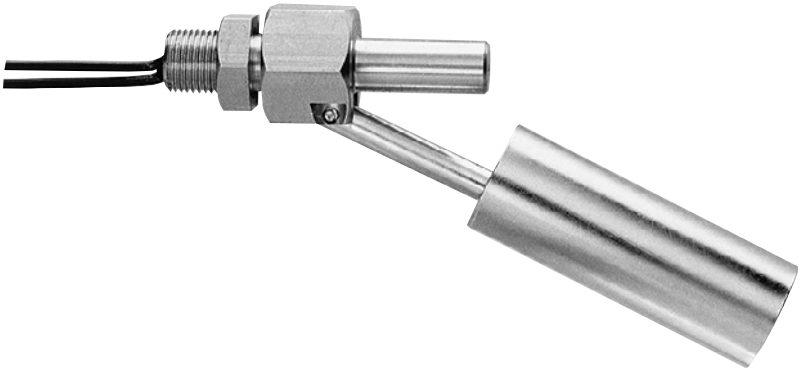
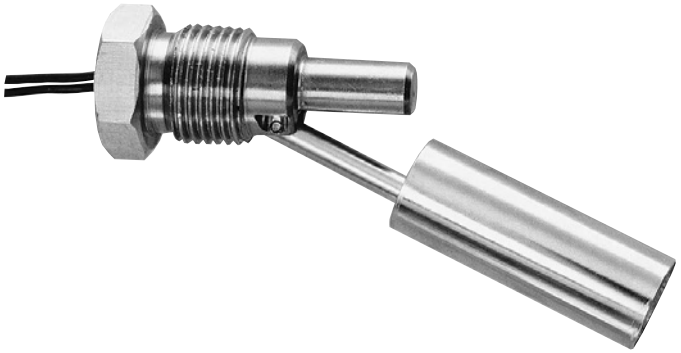
FS15

Miniature Level Switch for horizontal mounting



- compact design
- only one mechanically moveable part
- mounts horizontally into a tank wall
- complete of stainless steel



Description:

The level switch model FS15 works according to the magnetic float principle. The float is liftet upwards by the rising liquid level in the tank until the magnetic field of the integrated permanent magnet activates a Reed contact. Depending on the way the level switch is mounted this contact may work as a N/O or a N/C switch.

Applications:

The float level switch FS15 is designed to monitor the level of nearly all liquids. FS15 may be used as MIN, MAX monitor, to control valves or pumps or as an alarm switch. By the use of potential-free reed contacts the FS15 level switches are the ideally switches for SPS-Contols

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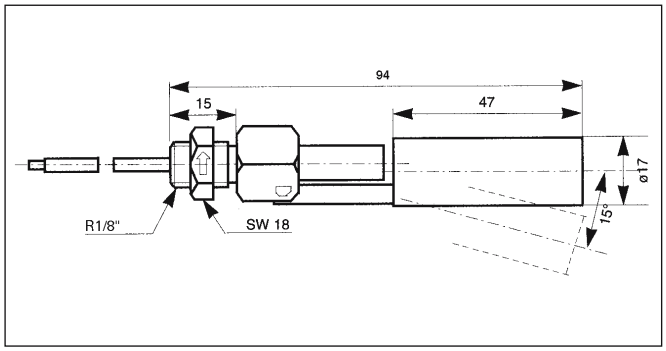
Design:

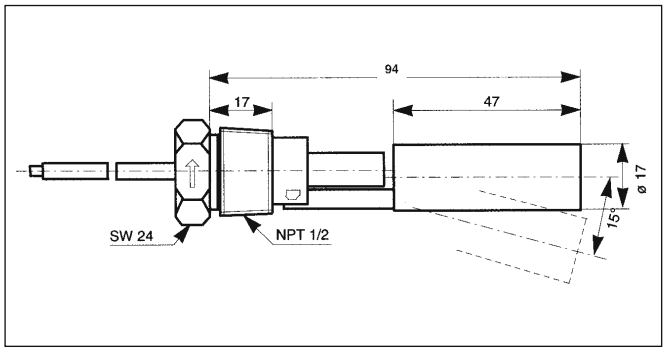
- Level switch for general applications made of st. steel
- Male thread G 1/8 or 1/2" NPT

Dimensions:

FS15.1



FS15.2



Ordering Code:

Order No.	**FS15.**	**1.**

Miniature level switch for horizontal mounting

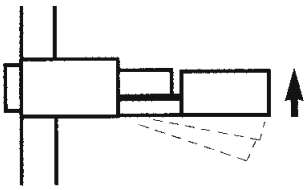
Connection:
1 = G 1/8 male
2 = 1/2" NPT male

Technical Specifications:

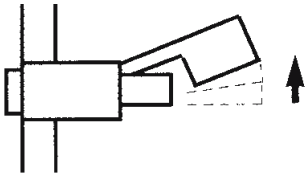
Connection cable:	0.5 m FEP-wire
Threaded connection:	G 1/8 male or 1/2" NPT male
Material:	completly stainless steel 1.4301
Contact function:	N/C or N/O, depending on mounting
Contact rating:	50 VA, 250V, 0.5 A
Max. pressure:	5 bar
Max. temperature:	120°C
Min. density of medium:	0.7 kg/l

Mounting and contact functions:

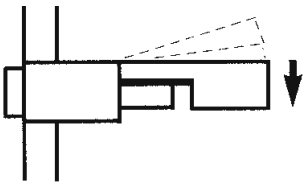
N/O contact with rising level



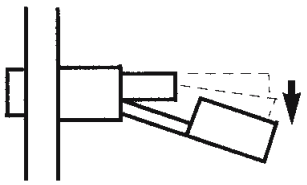
N/C contact with rising level



N/O contact with falling level



N/C contact with falling level



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FK10

Conductive Level Switch

- **Easy installation**
- **Sturdy, heavy-duty plastic or stainless steel housing**
- **Process connection of plastic or stainless steel**
- **Electrode stems made of stainless steel, titanium, Hastelloy B or C**
- **Single or multiple electrodes (up to 5 switching points)**
- **Low-cost OEM model available**
- **Electrode relay for limit values, pump control or pump control with overflow and dry-running protection (see FK01 / FKE data sheet)**

Description:

Model series FK10 conductive level switches are intended to be used with the FKE electrode relay for detecting the level of conductive fluids. An A.C. voltage is applied to an electrode insulated from the tank. When the electrode is wetted by the process fluid, a low current flows from the electrode through the fluid to the tank wall (in the case of plastic tanks, the current flows to a ground electrode). This current flow is detected by the electrode relay and output as a switching signal.

Typical Applications:

- To detect the fill limit in tanks containing conductive fluids
- To report whether the tank is empty or full
- To switch over between two filling heights
- To provide overflow protection
- To provide dry-running protection

Benefits:

- No moving parts
- Not influenced by specific gravity of fluid

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Models:

FK10.1: Single/multiple-electrode designs with mounting thread at plastic housing

Stainless steel housing with plastic or stainless steel mounting thread

FK10.2: OEM design with plastic (Delrin) housing as a one- or two-electrode sensor probe, process connection (1/2“ or 1”), and stainless steel electrode(s) with permanently attached connection cable (3 m PUR)

Technical Specifications:

Max. pressure: 10 bar (plastic);
20 bar (stainless steel)

Max. temperature: -20°C…90°C (plastic);
-20°C…100°C (stainless steel)

Protection type: IP65 (FK10.1)
IP68 (FK10.2)

Materials:

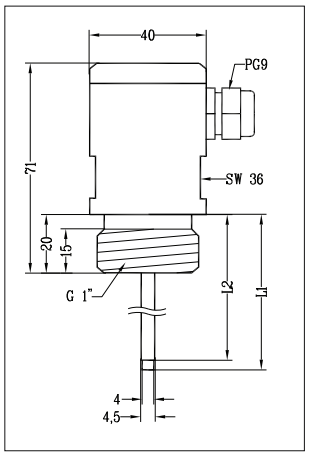
Housing: Delrin, polypropylene, PTFE, stainless steel 1.4571

Process connection: Delrin, polypropylene, PTFE, stainless steel 1.4571

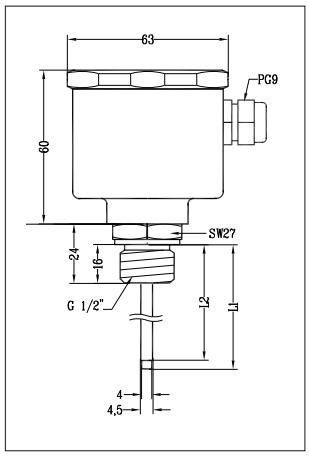
Sensor stem: Stainless steel 1.4404, Hastelloy B,Hastelloy C, titanium

Coating: Polyamide, Halar (PTFE)

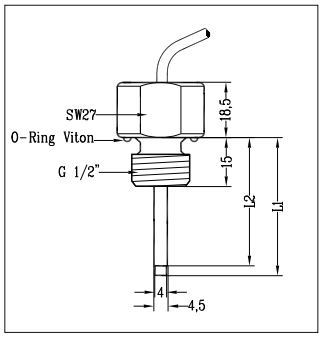
Dimensions:



FK10.1.1.15.1… (plastic)



FK10.1.6 .15.1… (stainless steel)



Model Coding:

Order Number:	FK10.	1.	1.	15.	1.	1.	1.	1.	LA

Conductive Level Switch

Model:
1 = Standard
2 = OEM design
(minimum order: 20 units; available upon request)

Materials for connector housing / Process connection:
0 = Delrin (OEM-design only)
1 = Delrin (standard)
2 = Delrin / stainless steel 1.4571
3 = Polypropylene, small
4 = Polypropylene, small / stainless steel 1.4571
5 = Polypropylene, large
6 = Polypropylene, small / stainless steel 1.4571
7 = PTFE, small
8 = PTFE, small / stainless steel 1.4571
9 = PTFE, large
10 = PTFE, large / stainless steel 1.4571
11 = Stainless steel 1.4571 / stainless steel 1.457

Process connection:
15 = G1/2 thread (max. 1 electrode)
25 = G1 thread* (max. 3 elctrodes)
32 = G1 1/4 (stainless steel connection only, max. 4 electrodes)
40 = G1 1/2 thread (max. 5 electrodes)
50 = G2 thread
F50 = DIN DN50 flange

Number of electrodes:
1…5

Electrode material:
1 = Stainless steel 1.4404 (standard)
2 = Hastelloy B (4 mm diameter only)**
3 = Hastelloy C (4 mm diameter only)**
4 = Titanium (4, 8, 10 mm diameters only)**

Electrode diameter:
1 = 4 mm (standard)
2 = 6 mm
3 = 8 mm
4 = 10 mm

Electrode insulation:
1 = Polyamid (standard)
2 = Halar (PTFE)

Electrode length (from edge of seat)
LA = length 500 mm
LB = length 1,000 mm
LS = Special order
Example of ordering notation: $L_1$300 / $L_2$400 / $L_3$500, etc.

* max. two electrodes with stainless steel thread

** with electrode isolation from Halar only

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FUS10

Ultrasonic Level Sensor

- **Rugged, heavy-duty device housed in a plastic enclosure**
- **Operating ranges from 60–500 to 600–6000 mm**
- **2 NPN or PNP contacts, can be programmable via TEACH-IN method**
- **Power supply 12–30 VDC**

Description:

Ultrasonic level sensors monitor the distance between a liquid level and the sensor's transmission surface using the echo time measurement of an ultrasonic signal. MIN or MAX limit values can be signaled or pump control can be implemented with two programmable transistor outputs. For operating ranges up to 2m, the sensors are available in an M18 enclosure incl. two lock nuts that is easy to install. For an operating range up to 3.5m, we offer an M30 enclosure. The sensor with 6m operating range has an enclosure with square flange and an extra large transmission surface.

Typical Applications:

FUS10 ultrasonic level sensors are suitable for applications where liquid levels in non-pressurized vessels are monitored or regulated.

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Models:

FUS10…S: electrical connection M12 industrial plug

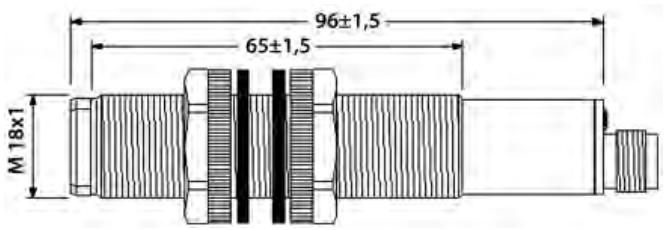
FUS10…K: with cable connector

Operating ranges:

Typ	Schaltbereich	Schalt-frequenz	Schutzart
FUS10.K.05…	60–500 mm	5 s	IP67
FUS10.K.08…	100–800 mm	5 s	IP67
FUS10.K.20…	200–2,000 mm	2 s	IP67
FUS10.K.35…	350–3,500 mm	1 s	IP67
FUS10.K.60…	600–6,000 mm	0.5 s	IP65

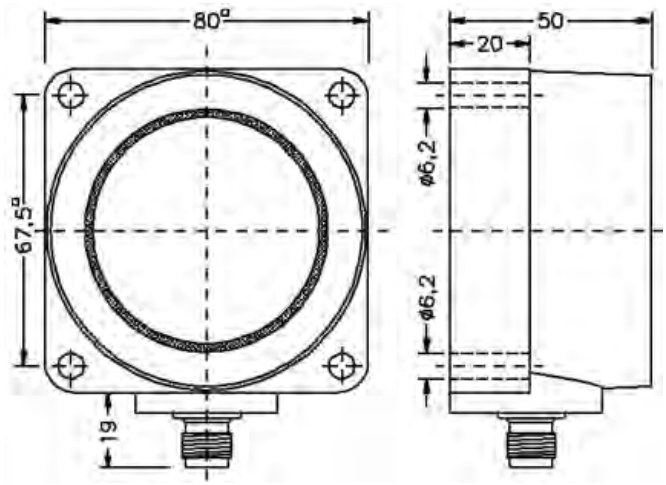
Dimensions:

FUS10.K.5… to FUS10.K.20…



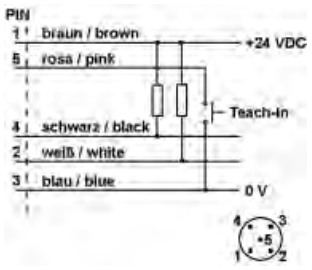
FUS10.K.35: enclosure M30 x 1.5, length 125 mm

FUS10.K.60…

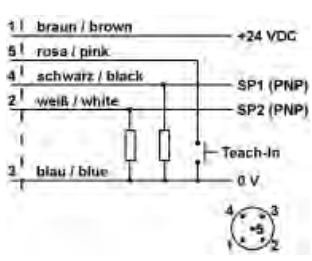


Electrical Connection:

NPN (FUS10.-.-.N…)



PNP (FUS10.-.-.P…)



Model Coding:

Order number: **FUS10. | K. | 20. | P. | S. | 0**

Ultrasonic level sensor

Material:
K = plastic enclosure
S = special-order device

Operating range:
05 = 60–500 mm
08 = 100–800 mm
20 = 200–2,000 mm
35 = 350–3,500 mm
60 = 600–6,000 mm

Output type:
P = 2 x PNP
N = 2 x NPN

Electrical connection:
S = plug M12 x 1, 5-pin
K = cable, 5-core, 2m (not for FUS10.K.60)

Options:
0 = none
1 = matching plug, 5-pin, with 2 m cable
2 = matching plug, 5-pin, with 2 m cable, right-angled
9 = please specify in writing

Specifications:

Materials: enclosure made of PET / PBT, sonic converter made of glass / ceramic, potting compound is epoxy resin

Supply voltage: 12 to 30 VDC

Electrical connection: plug M12 x 1 or 2 m cable

Process-connection:

FUS10.K.05…20: threaded M18 incl. 2 lock nuts

FUS10.K.35: threaded M30 incl. 2 lock nuts

FUS10.K.60: 4-hole square flange 67.5 x 67.5 mm

Outputs: 2 x NPN or PNP switched output

Switching hysteresis: 1 %

Indicator: 3, LED, echo, operating points P1, P2

Repeat accuracy:

FUS10.K.05…35: ± 0,2 % ± 1 mm

FUS10.K.60: ± 0,2 % ± 2 mm

max. pressure: atmospheric

Temperature range: -15 to +70 °C, compensated

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FN04

Liquid level sensor with continuous detection

- **Level measurement unaffected by foam formation, conductivity, pressure or temperature**
- **Remote indication over very long distances**
- **Easy installation, with only one calibration required during initial startup**
- **Detects interfaces between liquids with different densities**
- **Semi-flexible sensor also allows installation in tight, cramped spaces**
- **Sensor also available in 3A-compliant design for use in the food industry**

Description:

Model FN04 liquid level measuring sensors utilize a float fitted with permanent magnets to directly transmit information about changes in the liquid level. The sensor float is raised or lowered with the liquid level. The magnetic field exerted by the float magnets operates a reed contact / resistance measuring chain in the guide tube. The output signal is a voltage value proportional to the fluid level.

Typical Applications:

Model FN04 liquid level sensors are suitable for measuring and monitoring the level of almost all types of fluids that will not corrode or damage the sensor materials. They may be used in containers up to six meters high.

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Function

The sensor float contains a ring magnet. The magnetic field exerted by this magnet penetrates the wall of the guide tube and operates very small reed contacts that continuously pick up a measured voltage from a resistance measuring chain (voltage divider). This voltage is proportional to the liquid level. The resistance measuring chain, which is made up of very small chips soldered to a circuit board, is correspondingly very finely graduated (very fine spacing between chips). This construction means that the measured voltage is essentially continuous.
Depending on the design of the measuring sensor, the chip spacing (distance from chip to chip) can be from 5 to 15 mm.

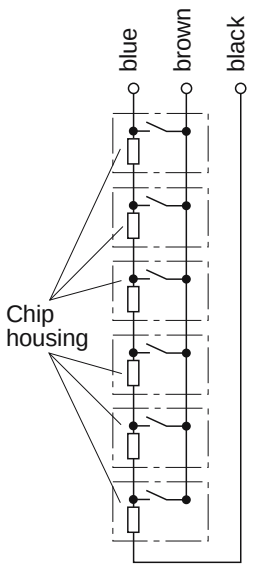


Diagram of internal circuit in the fluid level sensor

Measuring accuracy

The principle of operation for the liquid level sensor means that the measuring accuracy cannot be indicated as a constant factor. Instead, the accuracy depends on the measuring length and the chip spacing on the resistance measuring chain.
The maximum measuring error can be calculated with the following formula:

$$\frac{\text{Spacing}}{\text{Measuring length in mm}} \times 100 \quad \text{Example:} \quad \frac{12.7\ \text{mm}}{2{,}000\ \text{mm}} \times 100 = 0.635\%$$

Models

Every liquid level sensor consists of the following three main components. Different versions of these components are available to meet the technical needs of the specific application:

- Guide tube
- Float
- Process connection

There are also secondary components such as transducers, limit contact sensors, displays and isolating transformers (Zener barriers) that complete the measuring system.

Guide tube

The guide tube is the heart of the liquid level measuring sensor. It contains the measuring chain and is available in a selection of materials, diameters and resistance-chain chip spacings.
Materials and diameters:

- Brass (Ø 0.47" / 12 mm)
- Stainless steel (Ø 0.47" / 12 mm, 0.55" / 14 mm, 0.71" / 18 mm)
- PVC (Ø 0.63" / 16 mm, 0.79" / 20 mm)
- PP (Ø 0.63" / 16 mm, 0.79" / 20 mm)
- PVDF (Ø 0.63" / 16 mm, 0.79" / 20 mm)

Guide tubes made of PP with a Ø 0.63" / 16 mm are also available with semi-flexible, bendable stems for installation in tight, cramped locations.

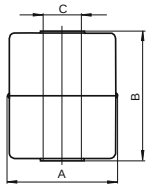
Spacing distance:

Depending on the guide tube diameters, measuring length and design (materials), the following chip spacings are available: 0.2" / 5 mm, 0.4" / 10 mm, 0.5" / 12.7 mm, 0.5" / 15 mm

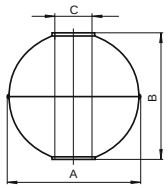
Floats

The selection of the float depends on the properties of the fluid to be monitored (corrosive/caustic properties, density), the process parameters (pressure, temperature) as well as the guide tube material and diameter.
The following float types are available:

Type	Material	Form	Ø (inch / mm)	min. density (kg/m³)	max. pressure (psi / bar)	max. temp. (°F / °C)
1	Buna rubber	Cylinder	1.18 / 30	700	87 / 6	176 / 80
2	PVC		2.17 / 55	750	14 / 1	140 / 60
3			3.15 / 80	600		
4	PP		2.17 / 55			176 / 80
5			3.15 / 80	500		
6	PVDF		2.17 / 55	800		212 / 100
7			3.17 / 80	700		
8	Stainless steel 316 TI / 1.4571		1.73 / 44	800	360 / 25	392 / 200
9		Sphere	2.05 / 52	720	580 / 40	
10			3.27 / 83	450	360 / 25	
11			3.15 / 80	600		
12			3.15 / 80	750		



Model	Ø A (inch / mm)	Ø B (inch / mm)	Ø C (inch / mm)
1	1.18 / 30	1.77 / 45	0.52 / 13
2	2.17 / 55	2.13 / 54	0.87 / 22
3	3.15 / 80	3.11 / 79	0.94 / 25
4	2.17 / 55	2.13 / 54	0.87 / 22
5	3.15 / 80	3.11 / 79	0.94 / 25
6	2.17 / 55	2.72 / 69	0.87 / 22
7	3.17 / 80	3.11 / 79	0.94 / 25
8	1.73 / 44	2.05 / 52	0.59 / 15



Model	Ø A (inch / mm)	Ø B (inch / mm)	Ø C (inch / mm)
1	2.05 / 52	2.05 / 52	0.59 / 15
2	3.23 / 82	3.19 / 81	0.59 / 15
3	3.15 / 80	2.95 / 75	0.91 / 23
4	3.15 / 80	2.87 / 73	0.91 / 23

Special-order floats (titanium, ECTFE-coated) are available upon request.

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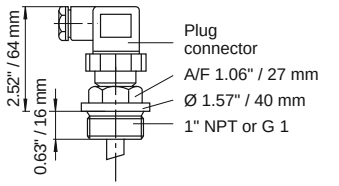
Process connection

These liquid level measuring sensors are usually attached to the inside of a container cover with a male threaded fitting (3/8",1/2", 1"). In such case, the sensor comes with a three-wire connection cable (PVC or silicone jacket) of up to 2,000 meters in length.
However, if the sensor is to be mounted from the outside of a container and inserted through the container cover, then the sensor must either come with a male threaded fitting that is compatible with the existing tank thread (1", 1-1/2", 2") or be mounted with flanges. The diameter of the tank mounting thread or the mounting flange should be sized so that the sensor float can pass through the opening in the container cover.

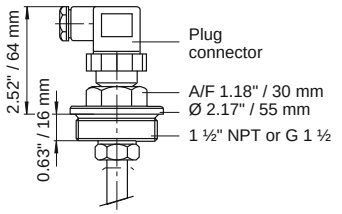
Float type	min. size of tank fitting	min. nominal size of flange
1	1"	1 1/4" / DN 32
2	2"	2 1/2" / DN 65
3	—-	3" / DN 80
4	2"	2 1/2" / DN 65
5	—-	3" / DN 80
6	2"	2 1/2" / DN 65
7	—-	3" / DN 80
8	1 1/2"	2" / DN 50
9	2"	2 1/2" / DN 65
10	—-	4" / DN 100
11	—-	3" / DN 80
12	—-	3" / DN 80

In addition, the material used for the process connection should be compatible with the materials used for the float and the guide tube.

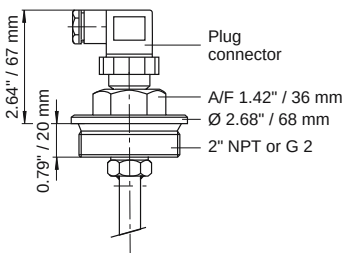
Dimensions of tank fittings and flange connections



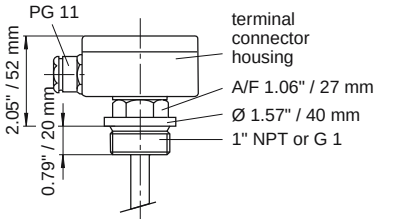
1" thread
stainless steel with ABS plug connection as per DIN 43650



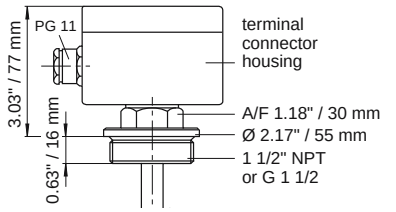
1 1/2" thread
PP, brass, steel, or stainless steel with ABS plug connection as per DIN 43650



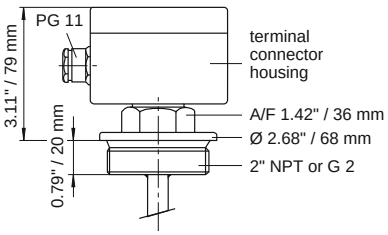
2" thread
PP, brass, steel, or stainless steel with ABS plug connection as per DIN 43650



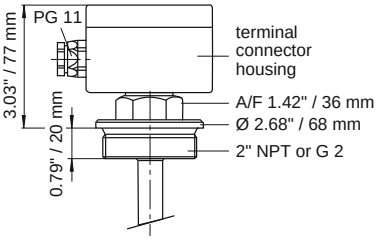
1" thread
stainless steel with aluminum terminal connector housing
2.52" x 2.28" x 1.34"
64 x 58 x 34 mm



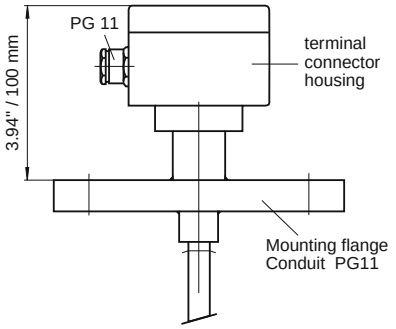
1 1/2" thread
PP, brass, steel, or stainless steel with aluminum terminal connector housing
3.15" x 2.95" x 2.24"
80 x 75 x 57 mm



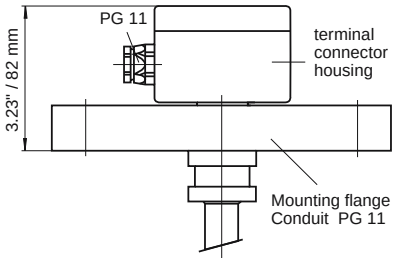
2" thread
PP, brass, steel, or stainless steel with aluminum terminal connector housing
3.15" x 2.95" x 2.24"
80 x 75 x 57 mm



2" thread
PVC, PP, PVDF with polyester terminal connector housing
3.15" x 2.95" x 2.24"
80 x 75 x 57 mm



Flange connection
ANSI 2" to ANSI 6", 150 lbs. to 600 lbs. RF / DN 50 to DN 150, PN 6 to PN 64
Steel or stainless steel with aluminum terminal connector housing
3.15" x 2.95" x 2.24"
80 x 75 x 57 mm



Flange connection
ANSI 3" to ANSI 4", 150 lbs., RF / DN 80 to DN 100, PN 10
PVC, PP, or stainless steel with PTFE plating, polyester terminal connector housing
3.15" x 2.95" x 2.24"
80 x 75 x 57 mm

Connection sizes for 3A-compliant sensors:

ANSI: 1", 1 1/2", 2"
DIN: DN 25, DN 40, DN 50

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Ordering Code (general)

Order number	FN04.	1.	1.	1.	01.	1001.	1.	0

Liquid level measuring sensor

Guide tube material:

1 = Brass
2 = Stainless steel 316 Ti / 1.4571
3 = PVC
4 = PP
5= PP, semi-flexible
6 = PVDF
9 = Special order

Guide tube diameter:

1 = 0.47" / 12mm
2 = 0.55" / 14 mm
3 = 0.63" / 16 mm
4 = 0.71" / 18 mm
5 = 0.79" / 20 mm
9 = Special order

Resolution (Chip spacing) of resistance measuring chain:

1 = 0.20" / 5 mm
3 = 0.39" / 10 mm
4 = 0.50" / 12.7 mm
5 = 0.59" / 15 mm
9 = Special order

Float type:

01…12 = see table in "Floats" section

Process connection:

1001…9999 = see "Process Connections" table on this page

Electrical connection.

1 = 40" / 1 m PVC cable
2 = 40" / 1 m silicone cable
3 = Plug connection as per DIN 43650
5 = Polyester connection socket, 3.15" x 2.95" x 2.24" / 80 x 75 x 57 mm
6 = Aluminum connection socket, 2.52" x 2.28" x 1.34" / 64 x 58 x 34 mm
7 = Aluminum connection socket, 3.15" x 2.95" x 2.24" / 80 x 75 x 57 mm

Options:

Type of resistance measuring chain:

0 = Standard
1 = High-temperature design for up to 300 °F / 150°C

Ordering Code (process connections)

Order number	x	y	y	y

Process connection

1 = Male thread
2 = Tank connector
3 = Flange connection

x = 1: Male thread — 1 0 0 1

001N = 3/8" NPT male, brass	001 = G 3/8 male, brass
002N = 3/8" NPT male, stainless steel 316 Ti / 1.4571	002 = G 3/8 male, stainless steel 316 Ti / 1.4571
003N = 1/2" NPT male, stainless steel 316 Ti / 1.4571	003 = G 1/2 male, stainless steel 316 Ti / 1.4571
004N = 1" NPT male, PVC	004 = G 1 male, PVC
005N = 1" NPT male, PP	005 = G 1 male, PP
006N = 1" NPT male, PVDF	006 = G 1 male, PVDF
999 = Special order	999 = Special order

x = 2: Tank connector — 2 0 1 1

002N = 1" NPT, stainless steel 316 Ti / 1.4571	002 = G 1, stainless steel 316 Ti / 1.4571
003N = 1 1/2" NPT, brass	003 = 1 1/2" NPT, brass
004N = 1 1/2" NPT, steel	004 = 1 1/2" NPT, steel
005N = 1 1/2" NPT, stainless steel 316 Ti / 1.4571	005 = 1 1/2" NPT, stainless steel 316 Ti / 1.4571
007N = 1 1/2" NPT, PP	007 = 1 1/2" NPT, PP
009N = 2" NPT, brass	009 = 2" NPT, brass
010N = 2" NPT, steel	010 = 2" NPT, steel
011N = 2" NPT, stainless steel 316 Ti / 1,4571	011 = 2" NPT, stainless steel 316 Ti / 1,4571
012N = 2" NPT, PVC	012 = 2" NPT, PVC
013N = 2" NPT, PP	013 = 2" NPT, PP
014N = 2" NPT, PVDF	014 = 2" NPT, PVDF
999 = Special order	

x = 3: Flange connection — 3 2 4 3

Material:

1 = Steel
2 = Stainless steel 316 Ti / 1.4571
3 = PVC
4 = PP
5 = Stainless steel with PTFE liner
999 = Special order

Nominal size:

1A = ANSI 2", RF	1 = DN50
2A = ANSI 2 ?", RF	2 = DN65
3A = ANSI 3", RF	3 = DN80
4A = ANSI 4", RF	4 = DN100
5A = ANSI 5", RF	5 = DN125
6 = ANSI 6", RF	6 = DN150
9 = Special order	

Pressure rating

	1 = PN6
	2 = PN10
3A =150 lbs.	3 = PN16
5A = 300 lbs.	5 = PN40
6A = 600 lbs.	6 = PN64
9 = Special order	

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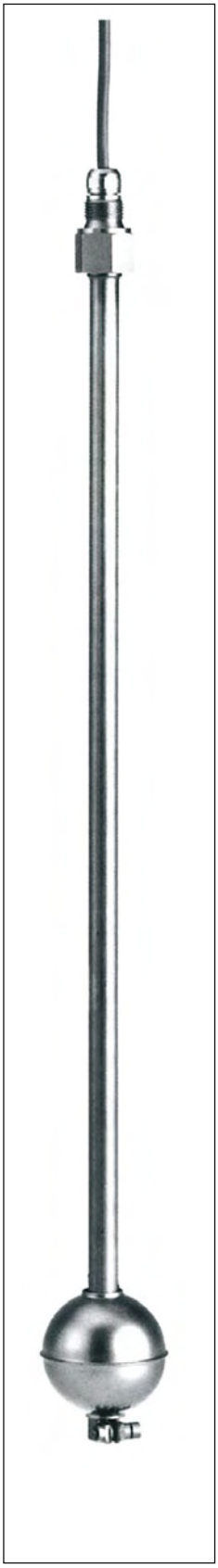
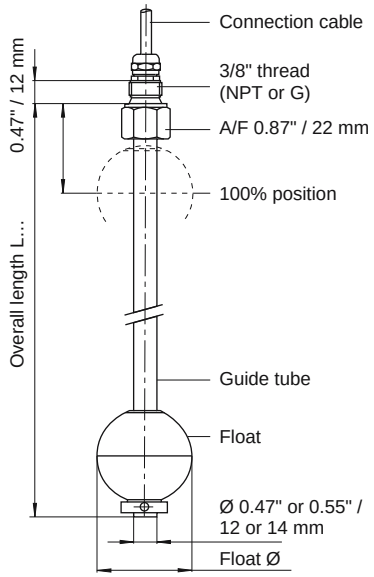
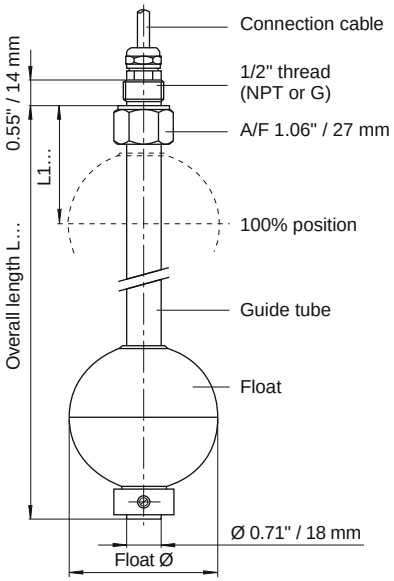
Standard level sensor of brass or stainless steel







Versions and Technical Data

Guide tube material	**Brass**	**Stainless steel**
Guide tube diameter	0.47" / 12 mm	0.47", 0.55", 0.71" / 12 mm, 14 mm, 18 mm
Guide tube length	max 120" max. 3 m	ø0.47", 0.55" / ø12, ø14 mm: max. 120" / 3 m ø 0.71" / ø18 mm: max. 240" / 6 m
Max. pressure	Depends on float used (see table in "Floats" section)	
Max. temperature	**Float and process connection of metal:** 250°F / 120°C (194°F / 90°C with PVC cable), high-temperature design 480°F / 250°C (with resolution of 0.2", 0.39", 0.59" / 5, 10, 15 mm only) **Float and/or process connection of plastic:** As per specification for float or process connection	
Resolution	0.2" / 5 mm 0.39" / 10 mm 0.5" / 12.7 mm 0.59" / 15 mm	0.2" / 5 mm (ø 0.55"and ø 0.71" / ø14 and ø18 mm only) 0.39" / 10 mm 0.5" / 12.7 mm 0.59" / 15 mm
Float	No. 1, 8, 9,	1, 8, 9, 10, 11
Total resistance of measuring chain	**Standard:** Depends on length and chip spacing **When connected to safety barrier:** approx. 40 kOhm	
Cable length (for sensors with male thread only)	PVC or silicone cable, max. 6,500 ft. / 2,000 m, 3-wire	
Process connection	**Male thread**	
	3/8"	3/8", 1/2"
	Tank connectors with terminal connection housing Polypropylene, 1 1/2", 2" with ABS plug connection or polyester terminal connection housing	
		Stainless steel, 1" with ABS plug connection or aluminum connection housing
	Brass, 1 1/2", 2", with aluminum connection housing	Steel or stainless steel, 1 1/2", 2", with aluminum connection housing
	Flange connection	
	Steel or Stainless steel ANSI 2"-6" / DN 50-DN 150, 150 lbs.-600 lbs. / PN 6-PN 64 with aluminum connection housing	Steel or stainless steel ANSI 2"-6" / DN 50-DN 150, 150 lbs.-600 lbs. / PN 6-PN 64 with aluminum connection housing
Model designation:	As per ordering code	
Other specifications	Overall length L media, density, max. pressure max. temperature, special features	

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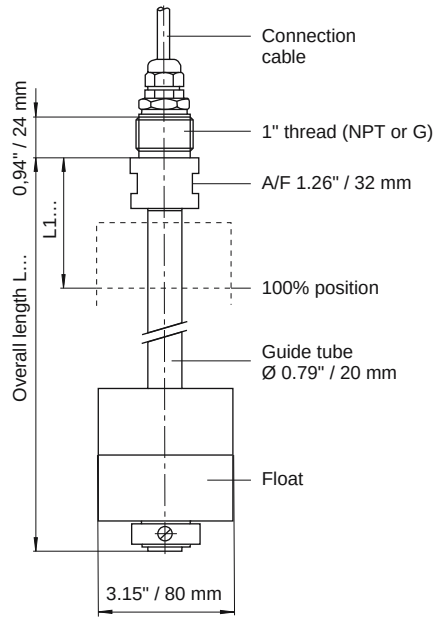
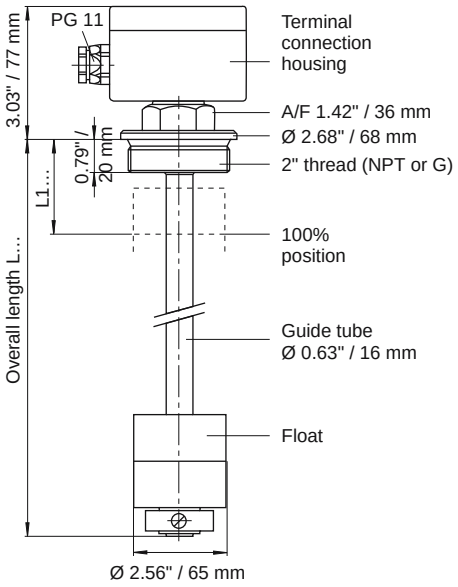
Standard level sensor of PVC, PP or PVDF





Versions and Technical Data

Guide tube material	**PVC**	**PP**	**PVDF**
Guide tube diameter	0.63" or 0.79" / 16 mm or 20 mm		
Guide tube length	max. 160" / 4 m		
Max. pressure	45 psi / 3 bar		
Max. temperature	140 °F / 60 °C	176°F / 80°C	212°F / 100°C
Resolution	0.2" / 5 mm 0.39" / 10 mm 0.5" / 12.7 mm 0.59" / 15 mm		
Float:	ø16: No. 2 ø18: No. 3	ø16: No. 4 ø18: No. 5	ø16: No. 6 ø18: No. 7
Total resistance of measuring chain	Depends on length and resolution		
Cable length (for sensors with male thread only):	PVC or silicon cable, max. 6500 ft. / 2000 m, 3-wire		
Process connection:	**Male thread**		
	1"		
	Tank threads and connection housing		
	2", PVC	2", PP	2", PVDF With polyester connection housing
	Flange connection		
	PVC	PP	Stainless steel with PTFE spacer With polyester connection housing
Model designation:	As per ordering code		
Other specifications	Overall length L… media, density, max. pressure max. temperature, special features		

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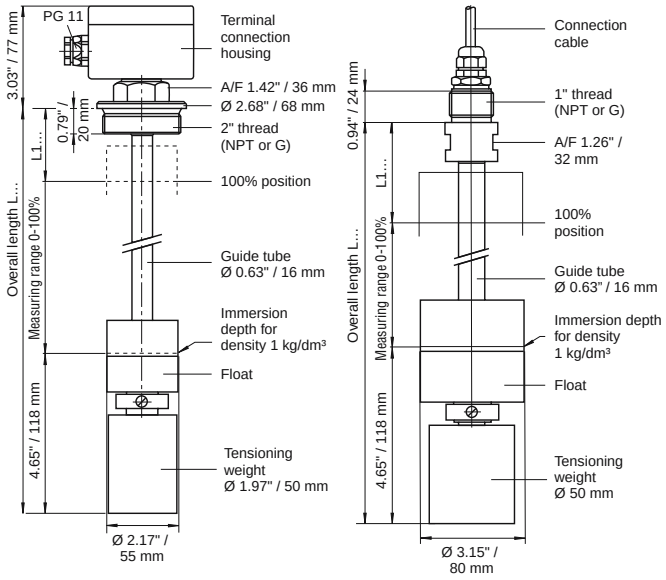
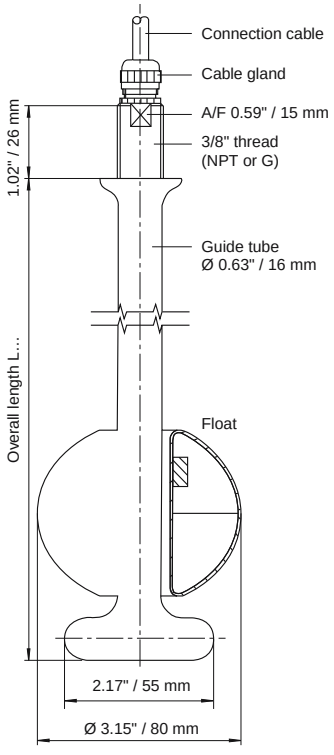
Semi-flexible sensors of PP



Semi-flexible sensors are used in cases when the available installation space will not permit use of a rigid unit, such as in tight, cramped spaces where the top edge of the container is close to the ceiling. The sensors have a minimum bending radius of 40" / 1,000, allowing them to be inserted into the container even in close quarters.

3A-compliant sensors for sanitary applications in the food and beverage industry



Our 3A-compliant level sensors meet all of the requirements set forth in the 3-A-Sanitary Standards for Liquid Pressure and Level Sensing Devices from the International Association of Milk, Food and Environmental Sanitarians, US Public Health Service and from The Dairy Industry Committee.
These sensors can be sterilized with saturated steam or water.

Versions and Technical Data

Guide tube material	**PP**
Guide tube diameter	0.63" / 16 mm
Guide tube length	max. 160" / 4 m
Max. pressure	45 psi / 3 bar
Max. temperature	176 °F / 80 °C
Resolution	0.5" / 12.7 mm
Float	With 2" tank connector: no. 4, with 1" male thread or flange: no. 5
Total resistance of measuring chain	Depends on length
Cable length (for sensors with male thread only)	PVC or silicon cable, max. 6500 ft. / 2000 m, 3-wire
Process connection	**Male thread**
	1", PP
	Tank connectors with connection housing
	2", PP, with polyester connection housing
	Flange connection (other flange types available upon request)
	PVC or PP ANSI 3" or ANSI 4", 150 lbs., RF / DN 80 or DN 100, PN10 with polyester connection housing
Tensioning weight	ø 1.97" x 3.15" / 50 x 80 mm
Model designation	As per ordering code
Other specifications	Overall length L... media, density, max. pressure max. temperature, special features

Guide tube material	**Stainless steel 316 Ti / 1.4435**
Guide tube diameter	Ø 0.63" / 16 mm
Guide tube length	max. 200" / 5 m
Max. pressure	650 psi / 45 bar
Max. temperature	194 °F / 90 °C with standard measuring chain, 356°F / 180°C with high-temp. measuring chain
Resolution	0.5" / 12. 7 mm (up to 194 °F / 90 °C) 0.2", 0.39", 0.59" / 5, 10, 15 mm (up to 356 °F / 180 °C, high-temp measuring chain)
Float	No. 12
Total resistance of measuring chain	Depends on length and resolution
Cable length (for sensors with male thread only)	PVC or silicon cable, max. 6500 ft. / 2,000 m, 3-wire
Process connection	**Male thread**
	ISO 228/1, 3/8" or 4" Tri-clamp
Model designation	As per ordering code
weitere Angaben:	Overall length L... media, density, max. pressure max. temperature, special features

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Transmitter for Resistance Measuring Chains

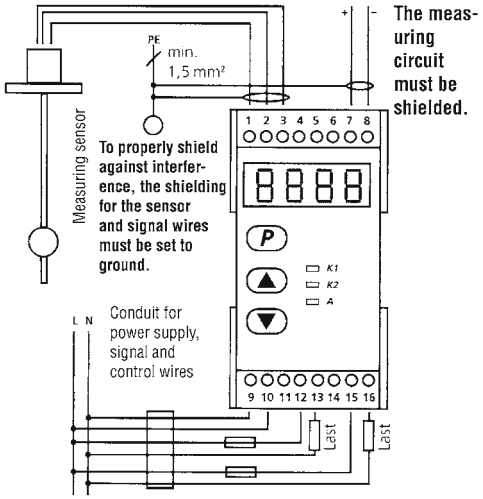
Description:

Model MULD transmitters can be connected to the resistance measuring chains in FN04 level sensors or FB01/FB04 bypass level sensors.

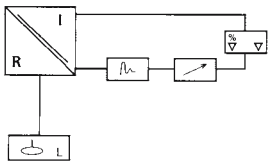
These transmitters convert the signal from the resistance-type sensor to a standard output signal (0 or 4 to 20 mA).

In addition, MULD transmitters have two programmable alarm contacts and a programmable, 4-digit LED display to represent the liquid level numerically.

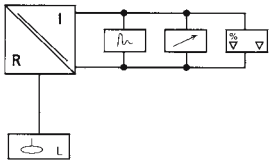
Elektrischer Anschluss



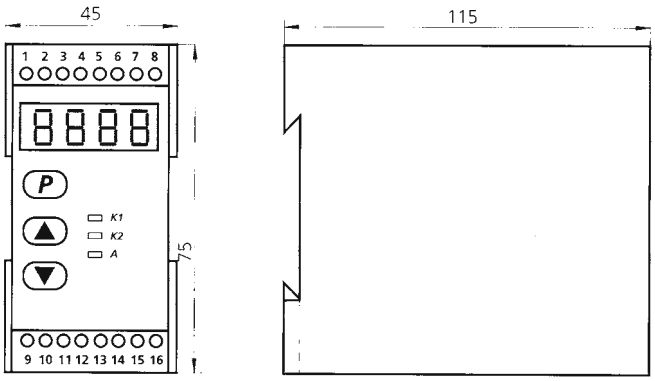
Current signal



Voltage signal



Dimensions



Ordering Code

Order number	MULD.	1.	4.

Transducer

Supply voltage

1 = 24 VDC, electrically isolated

2 = 24 VAC, 50/60 Hz

3 = 115 VAC, 50/60 Hz

4 = 230 VAC, 50/60 Hz

Output signal:

0 = 0-20 mA

4 = 4-20 mA

Technical Data

Power supply:	24 / 115 / 230 VAC, 48 to 62 Hz available or 24 VDC with electrical isolation of auxiliary power, measuring and output circuits
Power consumption:	4 VA
Input:	
Measuring circuit:	Resistance sensors, 3-wire
Meas. resistance:	1 to 100 kOhm
Output:	0/4 to 20 mA
Contact output:	2 limit-value relays, programmable as N/O or N/C, programmable hysteresis, switching capacity 500 VA, 230 VAC
Display:	Red, 4-digit LED display programmable from –999 to +9999, programmable decimal point
Housing:	Macrolone Snap-on rail mounting, as per DIN EN 50022
Protection type:	IP40, terminals IP20
Operating temperature:	32 to 122 °F / 0 to 50 °C

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FT01

Hydrostatic Submersible Sensor

- **Compact design**
- **Measuring cell highly pressure resistant**
- **Current or voltage output**
- **Corrosion–resistant stainless steel construction**
- **Electrical protection IP 68 (to a depth of 1000 ft. / 300 m)**

Description:

Hydrostatic level sensors measure fluid height and thus its level by means of the hydrostatic pressure applied by the water column directly above the sensor.
A measuring cell at the bottom of the sensor registers this pressure so that the sensor's internal electronics can generate a 4-20 mA or a 0-10 VDC signal proportional to the detected fluid level.
Because all parts of the pressure sensor coming in contact with the liquid being measured are made of stainless steel, this sensor is suitable for unrestricted use in the food industry.
For measurements of caustic/corrosive liquids, a design featuring a teflon-jacketed connetction cable is also available.

Typical Applications:

The FT01 level sensor is used in measuring applications that require provision of a precise, stable and reliable output signal even under extreme operating conditions.
The high electrical protection rating (IP 68) and its high resistance to corrosion make the FT01 level sensor suitable for use in a vast variety of containers, basins, shafts and tanks.
With its large diaphragm surface area, the FT01 has proven to be especially suitable for monitoring wastewater systems.

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Electrical Specifications:

Supply voltage: 12 to 30 VDC with current output
17 to 30 VDC with voltage output

Power consumption max: P = 1 Watt

Output: Current output load:
(UB-10V) / 0.02 A
Voltage output load: 100 kOhm

Protection type: IP68 as per EN 60 529 / IEC 529

Electrical protection: Reverse-polarity, overvoltage, short-circuit protection

Technical Specifications:

Materials:
Housing: Stainless steel AISI 316 / 1.4401

Pressure connection: Stainless steel AISI 316 / 1.4401

Protective cap: PA

Process connection
Ballast weight: G 1/2 B

Overload limits: 29 psi / 2 bar up to measuring range R69
58 psi / 4 bar for measuring range R70
188 psi / 13 bar for measuring ranges R72-R74
464 psi / 32 bar for measuring range R75-R78

Max. medium temperature: 14-158 °F / -10 to +70 °C

Max. storage temperature: -22-176 °F / -30 to +80 °C

Compensated range: 32- 158 °F / 0 to +70 °C

Accuracy: Linearity + hysteresis + repeatability
< 0.3% of full scale

Response time: < 10 ms

Cable: Polyurethane, with pressure equalization tube and strain relief connection, jacket made of thermoplastic elastomer (TPE)

Lightening protection: as per IEC 801-5

Model Coding:

Order Number: FT01. | 1. | 1. | R72. | 01. | 0.

Hydrostatic submersible sensor

Output signals:
1 = 4-20 mA, 2 wire
2 = 0 to 10 VDC, 3-wire

Accuracy class:
1 = 0,3 %

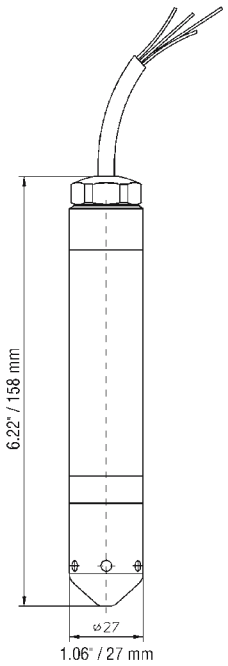
Measuring Ranges:
R63 = 0 to 0.1 bar / 0 to 1.45 psi)
R64 = 0 to 0.16 bar / 0 to 2.32 psi)
R65 = 0 to 0.25 bar / 0 to 3.63 psi)
R66 = 0 to 0.4 bar / 0.5.8 psi)
R67 = 0 to 0.6 bar / 0 to 8.7 psi)
R69 = 0 to 1 bar / 0 to 14.5 psi)
R70 = 0 to 1.6 bar / 0 to 23.2 psi)
R72 = 0 to 2.5 bar / 0 to 36.3 psi)
R73 = 0 to 4 bar / 0 to 58.0 psi)
R74 = 0 to 6 bar / 0 to 87 psi
R75 = 0 to 10 bar / 0 to 145 psi
R76 = 0 t0 16 bar / 0 to 232 psi
R78 = 0 to 25 bar / 0 to 363 psi
9 = Special measuring range: please specify in writing

Cable Length:
01 = Measuring range + 1.5 ft. / 0.5 m
xx = Special length, please specify in writing

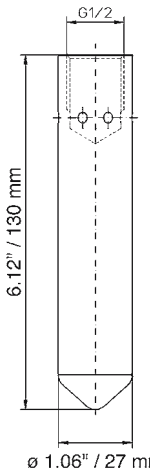
Options and accessories (more than one may be selected)
0 = None
1 = Protective cap of stainless steel
2 = Suspended mount for level sensor
3 = Additional weight of stainless steel 1.4571
4 = Test Certificate

Dimensions:

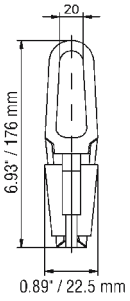
Sensor



Ballast weight



Suspended mounting



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TSA06

Temperature sensor with switch and analog outputs

- easy to install
- stainless steel housing
- with 2 PNP switched outputs or 1 switched output and 1 analog output 4 - 20 mA
- measuring range: -328 °F to 1112 °F / -200 °C to +600 °C
- programmable switching points

Description:

Series TSA06 temperature sensors indicate measured temperatures and provide control signals and analog output signals. Temperature switching points and reset values for the switching functions – which can be separately programmed – along with a wide measuring range yield very wide device working ranges. Installation data such as process connection, length and diameter of shaft protection tube can be adapted to suit the prevailing service conditions.

Typical Applications:

The TSA06 temperature probe is very versatile and can be deployed in a whole raft of applications such as cooling and heating circuits, installations and plants, compressors and engines.

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Models:

TSA06.A: temperature probe with 2 x PNP switched output

TSA06.B: temperature probe with 1 x PNP switched output and analog output (4 - 20 mA)

Technical Specifications:

Measuring range: -58 °F to 392 °F / -50 °C to 200 °C (without neck extension)
-58 °F to 752 °F / -50 °C to 400 °C (with 50 mm neck extension)
-58 °F to 1112 °F / -50 °C to 600 °C (with 50 mm neck extension)
-328 °F to 1112 °F / -200 °C to 600 °C (with 50 mm neck extension)

Process connection: 1/2" NPT / G1/2" A (other connections on request)

Thermowell:
Diameter and length: 0.12"/0.24"/0.31" x 1.97"/3.94"/6.30"/7.87" 3/6/8 x 50/100/160/200 mm

Ambient temperature: -13 °F to 158 °F / -25 °C to 70 °C

Storage temperature: -22 °F to 176 °F / -30 °C to 80 °C

Materials:

Housing: plastic / stainless steel AISI 316 Ti / 1.4571

process connection: stainless steel AISI 316 Ti / 1.4571

Thermowell: stainless steel AISI 316 Ti / 1.4571

Electrical Specifications:

Power supply: 12 - 30 VDC

Connection: M12 x 1, 4-pole plug with gold-plated contacts

Output signal: 4 - 20 mA (700 ohm at 24 VDC)
0 - 10 V DC (5 k ohm), DC NPN, DC PNP

Switching function: NO contact / NC contact programmable

Current carrying capacity: 100 mA (250 mA upon request)

Display: 4-digit, 8-segment LED display, red, height 0.3" / 7.6 mm, protected with foil

Polarized / overload proof: yes

Power consumption: < 65 mA

Setting range: in 0.1 ° steps for ranges up to 392 °F / 200 °C
in 1° steps for Ranges > 392 °F / 200 °C

Switching point: -57 °F to 1112 °F / -49 °C to 600 °C

Reset point: -58 °F to 1110 °F / -50 °C to 599 °C

Units: °C oder °F

Accuracy:

switched output: ± (PT100 accuracy as per IEC 751, Class B) + 0.2 K

analog output: ± (PT100 accuracy as per IEC 751, Class B) + 0.2 K + 0.2 % of full scale

display: ± (PT100 accuracy as per IEC 751, Class B) + 1/2 digit

Resolution

switched output: 0.1 ° (1° for ranges above 312 °F / 200 °C)

analog output: 0.1 °C (1° for ranges above 312 °F / 200 °C)

display: 0.1 °C (1° for ranges above 312 °F / 200 °C)

Temperature effect: 0.1 K per 10 K

Measuring/display cycle: 1 / sec

Sensor: 1x PT100 / 2-wire, Class B as per IEC 751 (standard), PT100 or PT100 in 2-/3- or 4-wire Class B or A as per IEC 751 (available on request)

Resistance of insulation: >100 Mohm / 500 V DC

Protection type: IP65

EMC: EMC as per IEC / EN 61326

Ordering Code:

Order Number:	TSA06.	A.	1.	1.	6.	0

Temperature probes with switched and analog outputs

Output signal:
A = 2 x PNP switched output
B = 1 x PNP switched output and 1 x analog output (4 - 20 mA)

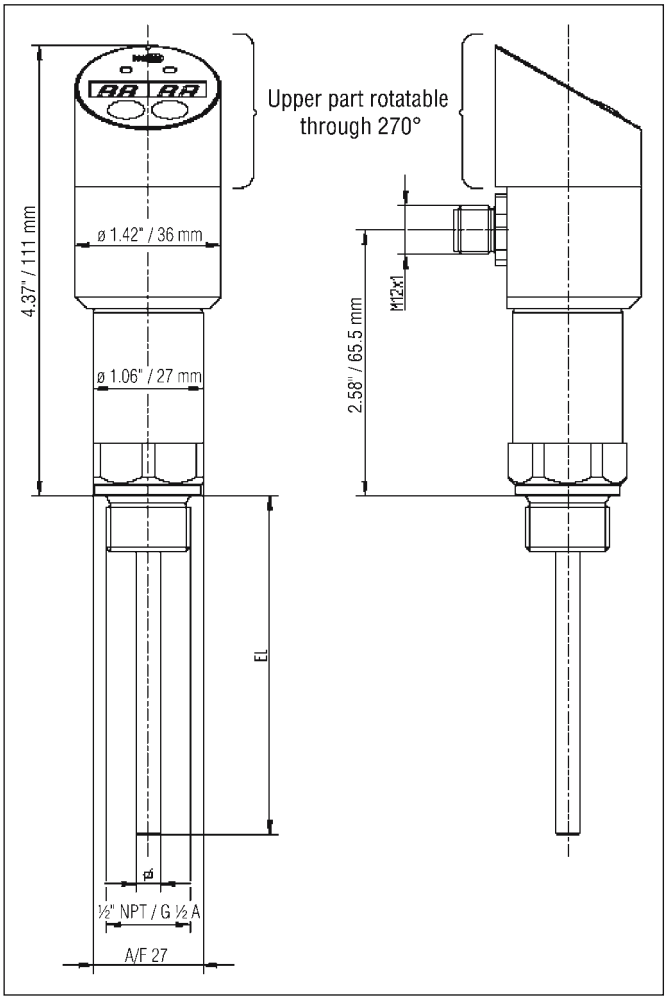
Measuring range:
1 = -58 °F to 392 °F / -50 °C to 200 °
2 = -58 °F to 752 °F / -50 °C to 400 °C
3 = -58 °F to 1112 °F / -50 °C to 600 °C
4 = -328 °F to 1112 °F / -200 °C to 600 °C

Installation length:
1 = 1.97" / 50 mm
2 = 3.94" / 100 mm
3 = 6.30" / 160 mm
4 = 7.87" / 200 mm
S = special-order lengths available on request

Diameter of protective tube:
3 = 0.12" / 3 mm tapered tip (Pmax = 12 bar)
6 = 0.24" / 6 mm standard (Pmax= 40 bar)
8 = 0.31" / 8 mm (Pmax= 100 bar)

Options:
0 = None
1 = Please specify in writing

Dimensions:



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TFK01

Compact Resistance Thermometer

- With angle connector as per DIN EN 175301-803
- Compact design
- Replaceable measuring insert
- Integral transmitter
- Resistance-current and voltage output
- Parts in contact with liquids/gases are made of stainless steel
- -200°C...600°C
- Short response times
- Very easy to service

Description:

The TFK01 features a temperature-dependent electrical resistor integrated in a protective stainless steel tube. The resistance value changes as a function of the liquid temperature. In the model with an integral transmitter, this resistance value is transformed into a current signal (4…20 mA) or a voltage signal (0…10 V). The respective signal is then output at the 5-pin plug connection. In the model with no transmitter, the unconverted resistance value can be picked up directly at the plug connection. For short response times, there is also a version available with a tapered immersion shank. However, the best performance will be obtained when using an angle connector (DIN EN 175301-803).

Typical Applications:

The resistance thermometer and thermocouples (DIN 43650) are very well suited for general use in industrial machinery and systems, plants, tanks and piping as well as in applications in the chemical industry, process engineering and food processing, where they are preferred for measuring the temperatures of liquids and gases. Their compact design make them especially suitable for installation in restricted locations and confined spaces.

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Models:

TFK01.xPx:	Pt100 output, 2-, 3 or 4-wire Single or dual element
TFK01.A04:	4…20 mA output, 2-wire
TFK01.V10:	0…10 V output, 3-wire

Technical Specifications:

Sensor: Pt100 as per DIN IEC 75, Class B

Electrical connection: Angle connector (DIN EN 175301-803 Form A), IP65

Protective tube:

Diameter: 6 or 8 mm

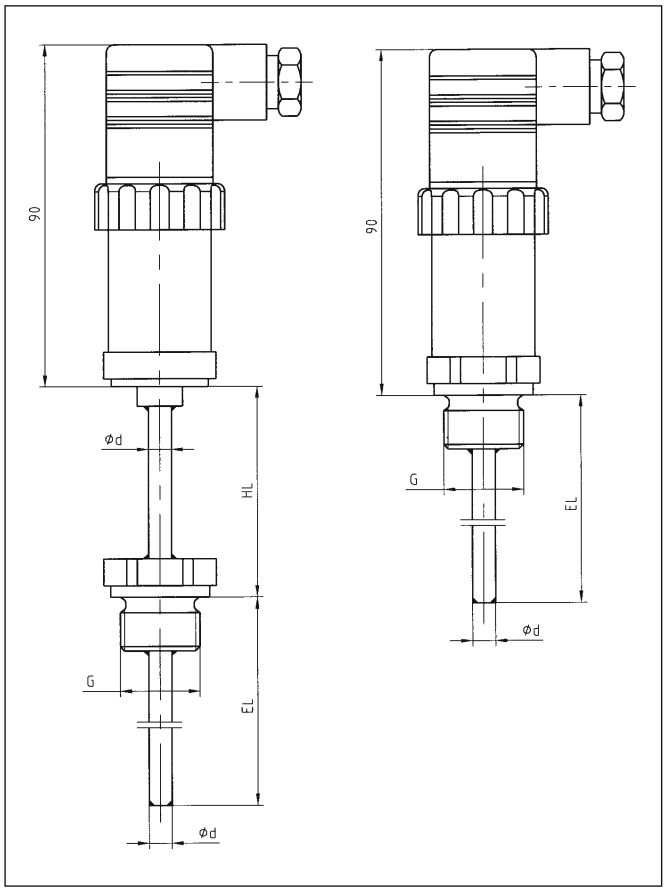
Materials: Stainless steel 1.4571

Process Connections: Fixed or sliding compression fitting

Max. pressure at 20°C: Diameter of protective tube: 6 mm: 40 bar
Diameter of protective tube: 8 mm: 100 bar

Transmitter: Supply voltage: 12…30 VDC
Output: 4…20 mA, 2-wire
0…10 V, 3-wire
Min. measuring range: 50 Kelvin
Max. measuring range: 800 Kelvin

Dimensions:



Model Coding:

Order Number: TFK01. | 1P2. | 6. | 08F. | 0050. | 200. | 0

Compact Resistance Thermometer

Sensor:
1P2 = 1 x Pt100, 2-wire
1P3 = 1 x Pt100, 3 wire
1P4 = 1 x Pt100, 4 wire
2P2 = 2 x Pt100, 2-wire
A04 = 4-20 mA (please specify measuring range desired)*
V10 = 0-10 V (please specify measuring range desired)*
* preferably 0…50°C, 0…100°C, 0…120°C

Diameter of immersion shank:
6 = 6 mm
8 = 8 mm (not for compression fitting)

Process Connections:
08F = G 1/4 A, fixed
10F = G 3/8 A fixed
15F = G 1/2 A, fixed
2NF = 1/2 NPT fixed
08V = G 1/4, sliding
10V = G 3/8, sliding
15V = G 1/2, sliding
1NV = 1/4" NPT sliding
2NV = 1/2" NPT sliding

Installation length: (from edge of seat)
0050 = 50 mm
0075 = 75 mm
0100 = 100 mm
0160 = 160 mm
0200 = 200 mm
0300 = 300 mm
0400 = 400 mm
0500 = 500 mm
xxxx = as specified by the customer

Temperature range:
200 = - 50…200°C, without protective tube
400 = -200…400°C, with protective tube: 50 mm
600 = -200…600°C, with protective tube
a) without transmitter: 50 mm
b) with transmitter: 100 mm, as well as fixed measuring insert

Options:
0 = None
VR = Tapered protective tube (for description, see “Options” section)

Options:

For faster response times, a protective tube tapered down to 3 mm diameter may be used. This arrangement is only intended for models with fixed threaded connection and a protective tube with a diameter of 6 mm. With installation lengths greater than 100 mm, the device is fitted with a reinforced tube with a diameter of 8 mm.

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TF04

Temperature probes with installation fitting as per DIN 43770

- resistance thermometers or thermocouples
- with replaceable measuring insert
- protective tube with threaded or weld-on connection, or with sliding flange
- measuring ranges: resistance thermometer –328 °F to 1112 °F / -200 °C to +600 °C
- thermocouples -40 °F to 2012 °F / -40 °C to +1100 °C
- with optional transmitter output 4(0) - 20 mA, 0 - 10 V

Description:

The resistance thermometers and thermocouples are manufactured to DIN 43770 and are made of a sturdy, heavy-duty stainless steel protective tube, a replaceable measuring insert and a connecting head. The standard protective tubes are available with a male-threaded fitting, sliding flange or for welding on. Other options are available with fixed flange, sanitary flange or clamp connection. Apart from the Form B connecting head, other designs like Form A, stainless steel field housing etc., are available. The measuring insert is a Pt 100 sensor, Class B (optional Class A) or a model K (NiCr-Ni) thermocouple. Alternatively, other resistance sensors or thermocouples can be supplied. As an option, these temperature probes can be fitted with a transmitter, which can be set at the factory to customer specification for a specific measuring range.

Typical Applications:

Resistance thermometers and thermocouples as per DIN 43770 are very suitable for use in heavy industrial machinery and systems, installations and plants, tanks and piping systems, in the chemical industry and in food applications and are the devices of choice for measuring temperature in liquids and gases.

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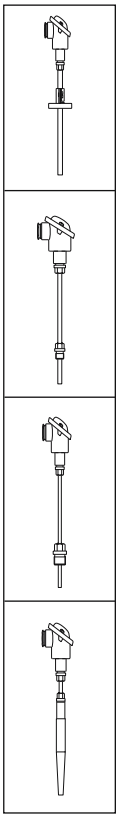
Models:



with sliding flange **TF04-A...**
protective tube Form A as per DIN 43763

with 1/2" male-threaded fitting **TF04.B...**
protective tube Form B as per DIN 43765

with 1" male-threaded fitting **TF04.C...**
protective tube Form C as per DIN 43766

with weld-on connection **TF04.D...**
protective tube Form D as per DIN 43767

Technical Specifications:

Connecting head: Form B as per DIN 43729 made of aluminum metric conduit (0.63" / 16mm), others available on request
Protection type: IP 54 as per EN 60529
Terminal block: ceramics (without transmitter)
Protective tube: stainless steel AISI 316 Ti / 1.4571, others available on request

Resistance thermometer:

Meas. element: 1x Pt 100, 3-wire, Class A as per DIN IEC 751, +/- 1.5 °C, max. 2 mA, others available on request
Insert tube: stainless steel 316 Ti / 1.4571
Temp. range: -328 °F to 1112 °F / -200 °C to +600 °C

Thermocouple:

Meas. element: 1x thermocouple model K
NiCr-Ni as per DIN IEC 584
Class 1, +/- 1.5°C
others available on request
Temp. range: -40 °F to 2012 °F / -40 °C to +1100 °C

Transmitter:

Housing: plastic
Electrical conn.: terminals
Input signals: Pt 100, 3-wire
NiCr-Ni (K), Fe-CuNi (J), Pt-RhPt (S)
Storage temp.: -40 °F to 212 °F / -40°C to +100°C
Operating temp.: -4 °F to 185 °F / -20°C to + 85°C
Supply voltage: 12 - 30 VDC
Output: 4 - 20 mA, 2-wire
other transmitters available on request

Ordering Code:

Order Number: **TF04. | B. | P. | B0120. | 00. | 0**

Temperature probes with installation fitting

Model:
A = sliding flange
B = G 1/2 male thread BN = 1/2" NPT male thread
C = G 1 male thread CN = 1" NPT male thread
D = weld-on protective tube

Measuring element:
P = resistance thermometer 1x Pt 100
K = thermocouple 1x type K

Model and installation length:
A0200 - C1870 = see table 1
D1065 - D6125 = see table 2
S = special-order versions available on request

Transmitter: (please specify measuring range) see below
0 = none
1 = output 4 - 20 mA, 2-wire

Options:
0 = none
xx = see "Options" table

Options:

Description:	Code
double measuring element	1
without protective tube, TF04.B(C)... only	2
shortened neck extension (1.18", 2.36" or 3.54" / 30, 60 or 90 mm), TF04.B(C) only	3
terminal connector head Form A	4
terminal connector head field housing, aluminum, IP 68	5
terminal connector head field housing, stainless steel, IP 68	6
terminal connector head with screwed cover Form GT	7
resistance element Pt 500, 3-wire	8
resistance element Pt 1000, 3-wire	9
resistance element 4-wire	10
thermocouple Fe-CuNi, model J	11
thermocouple Pt13Rh-Pt, model R	12
thermocouple Pt-RhPt, model S	13
flange DIN 43734, DN 15 for protective tube Form A	14
fixed flange DN 15 - 50, describe in writing	15
sanitary flange, describe in writing	16
Clamp flange, describe in writing	17
protective tube reduced in diameter to 6 mm at the bottom, 60 mm long	18
protective tube perforated for liquids	19
protective tube perforated for gases	20
connecting head with HAN-7-D plug	21

Setting range for transmitter:

(factory preset to specified measuring range)

Resistance thermometer Pt100:

measuring range selection: minimum 32-122 °F / 0-50 °C up to 32-932 °F / 0…500 °C in steps of 122 °F / 50 °C
all quoted measuring ranges can be altered by ±10%, e.g. -10 to 90°

additional zero setting -58 to 122 °F / -50 to 50 °C
e.g. -50 to 100 °C

Thermocouple model K:

measuring range: 32-475 °F / 0-246 °C min. to 32-2250 °F / 0-1232 °C max.
zero setting: ±10% of measuring range e.g. -50 to 500 °C

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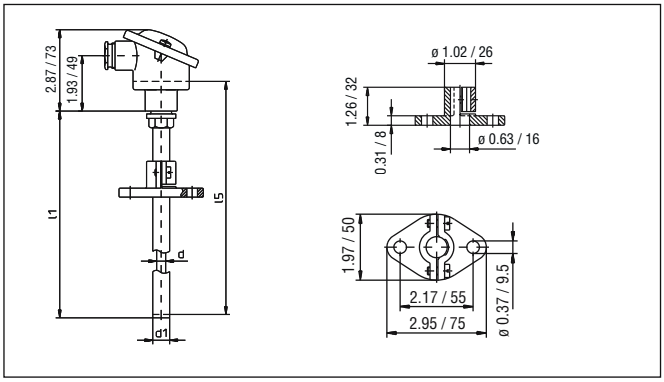
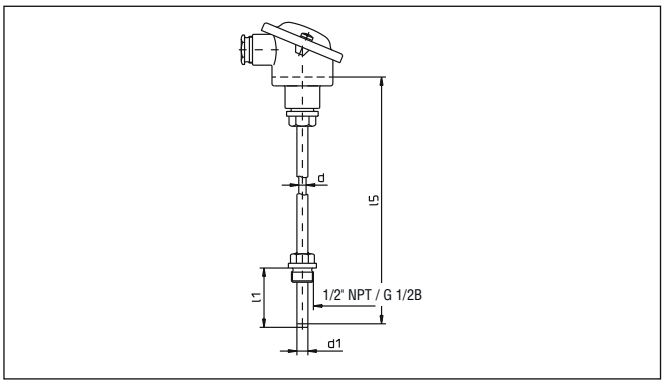
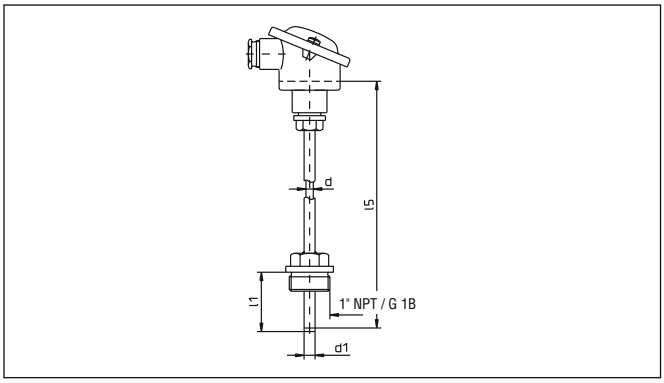
Dimensions:



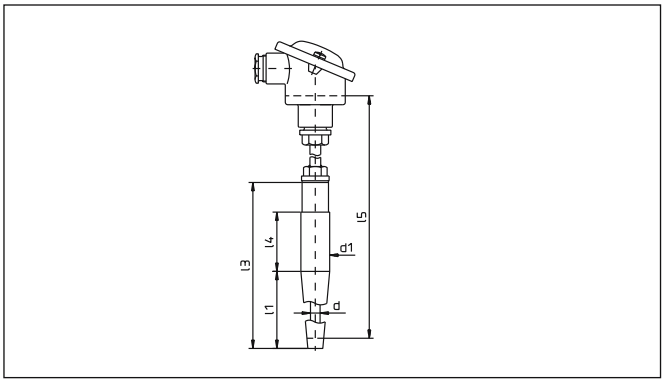
Protective tube Form A as per DIN 43764



Protective tube Form B as per DIN 43764
(with neck extension, length 4.72” / 120 mm)



Protective tube Form C as per DIN 43766
(with neck extension, length 4.72” / 120 mm)



Protective tube Form D as per DIN 43767
(with neck extension, length 4.72” / 120 mm)

Table 1:

Form A			Form B and C				Meas. insert
L1	d	d1	L1	L1	d	d1	L5
inch/mm			inch/mm				
-	0.31 / 8	0.59 / 15	B0065	C0065	0.24 / 6	Form B9 Form C 11	8.66 / 220
A0200*			B0070	C0070			8.86 / 225
A0250			B0120	C0120			10.83 / 275
A0290			B0160	C0160			12.40 / 315
A0350			B0220	C0220			14.76 / 375
A0380			B0250	C0250			15.94 / 405
-			B0275	C0275			16.93 / 430
A0410			B0280	C0280			17.13 / 435
A0500			B0370	C0370			20.67 / 525
A0530			B0400	C0400			21.85 / 555
A0630			B0500	C0500			25.79 / 655
A0710			B0580	C0580			28.94 / 735
A0800			B0670	C0670			32.48 / 825
A1000			B0870	C0870	0.31 / 8	Form B11 Form C14	40.35 / 1025
A1250			B1120	C1120			50.20 / 1275
A1400			B1270	C1270			56.10 / 1425
A1600			B1470	C1470			63.98 / 1625
A1800			B1670	C1670			71.85 / 1825
A2000			B1870	C1870			79.24 / 2025

* Example: A0200 = design A, L1 = 7.87” / 200 mm

Table 2:

Form D					Meas. insert
L1	L3	L4	d	d1	L5
inch / mm					
D1065**	5.51 / 140	1.97 / 50	0.24 / 6	0.94 / 24	12.40 / 315
D2125	7.87 / 200	1.97 / 50			14.76 / 375
D4065	7.87 / 200	4.33 / 110			14.76 / 375
D5125	10.24 / 260	4.33 / 110			17.13 / 435
D3125	7.87 / 200	1.97 / 50	0.31 / 8	1.18 / 30	14.76 / 375
D6125	10.04 / 255	4.13 / 105			16.93 / 430

** Example: D1065 = design D, L1 = 2.56" / 65 mm

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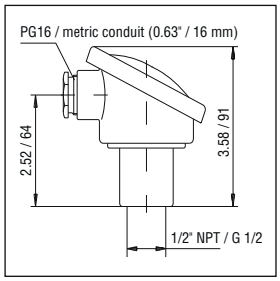
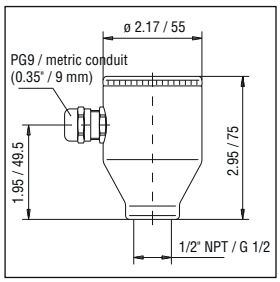
8/08

Models:

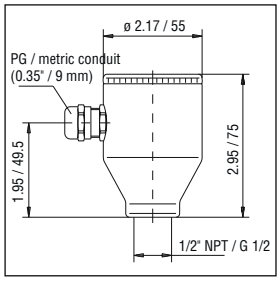
Connecting heads with screw plug



Form: DIN 43729 / Form A
Material: aluminium
Protection type: IP 54

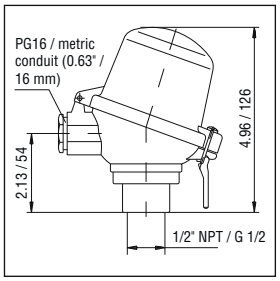


Form: field housing
Material: aluminium
Protection type: IP 68

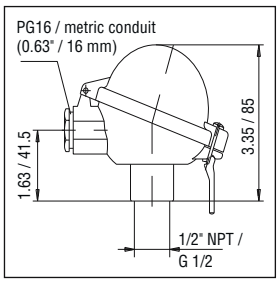


Form: field housing
Material: stainless steel AISI 304 / 1.4301
Protection type: IP 68

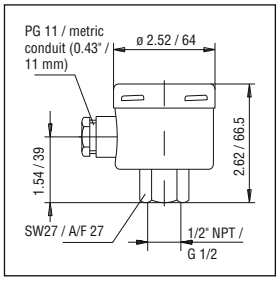
Connecting heads with quick-release connection



Form: Form DANW
Material: aluminium
Protection type: IP 65

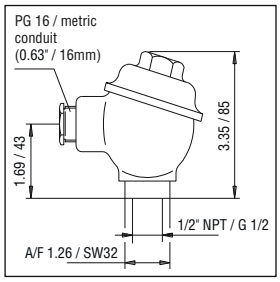


Form: DAN
Material: aluminium
Protection type: IP 65

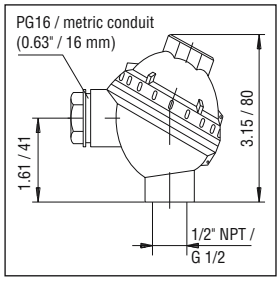


Form: Form C
Material: stainless steel AISI 304 and 316 Ti / 1.4301 and 1.4571
Protection type: IP 65

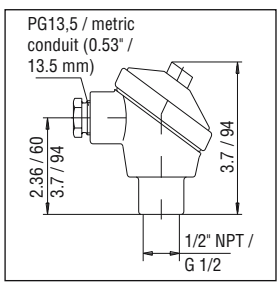
Connecting heads with screw cap



Form: Form GT
Material: cast iron
Protection type: IP 54



Form: Form NS
Material: ITAMID / NORYL
Protection type: IP 45



Form: Form D
Material: aluminium
Protection type: IP 65

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