

Flow switch type 31d
Flow meter type 31az
Flow transmitter types 31afi, 31afp



These rugged and hard wearing float operated units measure and control gases and uncontaminated liquids. The units can be mounted in either horizontal or vertical pipes, DN 15 to DN 150, and are suitable for use with pressure ranges PN 10 to PN 320.

Operation

When the medium enters in the direction of flow as indicated by the arrow it displaces the float before escaping through a slot located in a cylindrical sleeve. A magnet attached to and moving with the float, transfers this movement to perform a function according to the type of unit. With the **type 31d** it operates one or more switch contacts, with the **type 31az** it operates the magnetic coupling of the indicator, and with **type 31afp** it operates the magnetic coupling of the pneumatic transformer. In the **type 31afi** the position of the float is transferred via the magnetic coupling to the rotary angle transducer type WD 20-02 and converted via the signal evaluation into the required electrical output signal.

Advantages

- Float operated units resistant to wear and tear.
- High sensitivity where it is required, e. g. in the lower range.
- Excellent set point repeatability.
- All metal units, suitable for high pressure.
- Solid plastic model for use with aggressive media.
- Explosionproof models available to several standards.
- Models available for use in maritime and tropical climates.
- Simple installation and connection.
- Units virtually maintenance free.
- Long term continuity of spares availability.

Suitability

Protection against pumps running dry. Monitoring lubricating oil, cooling water, cooling air, hydraulic circulation systems and the circulation of cooling agents in refrigeration plants. Automatic control of filling and emptying processes. Flow control on steam generating boilers and heat exchangers.

Models

<i>Type 31d</i>	Flow switch with a maximum of four fixed or two adjustable set points.
<i>Type 31d(Ex)i:</i>	Flow switch for the use in intrinsically safe circuits; also for EEx ia.
<i>Type 31d(Ex)</i>	Flow switch EEx de II CT6 according to ATEX
<i>Type 31az</i>	Flow indicator without switch contact.
<i>Type 31az(Ex)</i>	Flow indicator and switch with one switch contact: EEx de II CT 6 according to ATEX. The indicator housing is mounted on top of the units body and the switch housing is mounted below.
<i>Type 31afi</i>	Flow transmitter with analogue electrical output signal 0 - 10 V or 0/4 - 20 mA.
<i>Type 31afp</i>	Flow transmitter with analogue pneumatic output signal 0.2 - 1 bar.

Technical data types 31d; 31az

Media uncontaminated liquids and gases

Diameter of switch housing DN 15 to DN 150 = 120 mm.

Flange DN	Nom. bore/Unit sizes in mm (Nom. pressure PN 10/16)		Average height mm		
	Connection	Threaded process	Unit length mm	below centre	above centre
15		G 1/2	130	50	200
20		G 3/4	155	55	200
25		G 1	160	60	230
32		---	180	70	230
40		G 1 1/2	200	75	240
50		G 2	230	85	255
65		---	290	95	270
80		---	310	100	280
100		---	350	110	300
125		---	400	125	320
150		---	480	145	340

Standard measuring and control ranges (l/min) (PN 10/16)

DN	15	0.8 - 8.0	2.0 - 20.0	3.0 - 30.0
DN	20	1.0 - 10.0	3.0 - 30.0	5.0 - 50.0
DN	25	1.5 - 15.0	4.0 - 40.0	8.0 - 80.0
DN	32	2.0 - 20.0	6.0 - 60.0	12.0 - 120.0
DN	40	3.0 - 30.0	8.0 - 80.0	16.0 - 160.0
DN	50	4.5 - 45.0	10.0 - 100.0	25.0 - 250.0
DN	65	8.0 - 80.0	20.0 - 200.0	40.0 - 400.0
DN	80	12.0 - 120.0	30.0 - 300.0	60.0 - 600.0
DN	100	20.0 - 200.0	50.0 - 500.0	95.0 - 950.0
DN	125	40.0 - 400.0	80.0 - 800.0	150.0 - 1500.0
DN	150	80.0 - 800.0	140.0 - 1400.0	210.0 - 2100.0

Others on request.

Adjustable range of set points (types 31d; 31az)

10 to 80 % of the above ranges when calibrated for falling flow.

20 to 100 % of the above ranges when calibrated for rising flow.

Admissible deviation of actual set points:

+/- 5 % of required set point.

Repeatability:

+/- 2 % of required set point.

Hysteresis between on and off switching:

5 - 10 % of required set point.

Pressure loss:

≤ 0.2 bar, according to the maximum values of the above table.

Pressure range:

PN 10 to PN 320.

Operating temperature:

Standard model suitable for medium temperatures up to 100 °C.
Special model: suitable for medium temperatures up to 500 °C, even for (Ex)i version.

Ambient air temperature

-20 to + 50 °C, others on request.

Accuracy of indication (type 31az):

+/- 2 % of full scale.

Standard construction

Process connection either threaded or flanged PN 10/16. Body sea water resistant gun metal Rg10, grey cast iron or corrosion and acid resistant stainless steel, material no. 1.4408 (similar to AISI CF-8M) or 1.4410, other wetted parts of corrosion and acid resistant stainless steel, material no. 1.4571 (similar to AISI 316 Ti), switch housing of aluminium. The units are painted light grey according to RAL 7001 and are supplied with one S.P.C.O. switch contact. The indicator housing (type 31az) is made of stainless steel, material no. 1.4571. Direction of flow is from left to right.

Alternative materials.

The body is made of PVC or PTFE, the operating parts are made of either PTFE or PVC. The switch housing is available in stainless steel, material no. 1.4408.

Protection class of switch housing according to DIN 40050: up to IP 65

Cable entry: Pg 11 or to suit customers requirements.

Switch contacts

Metal encapsulated S.P.C.O. snap action reed contacts

- *Type GW with silver-palladium contacts.*

Capacity: 250 V AC/1 A, p = max. 250 VA, or 250 V DC/1 A, p = max. 100 W.

Type GWW with AgSnO contacts.

Capacity: 250 V AC/3 A, p = max. 750 VA, or 250 V DC/3 A p = max. 300 W.

Type GWG with gold contacts.

Capacity: 42 V AC/300 mA, p = max. 13 VA, or 42 V DC/300 mA, p = max. 13 W.

- *Type 177(Ex) GWW or GWG*

Protection class: Ex II 2 G Ex de II CT6, TÜV 03 ATEX 2163.

Capacity type 177 Ex GWW:

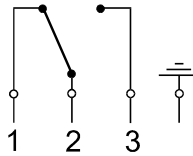
*250 V AC/2A, p = max. 300 VA or 250 V DC.
p = max. 200 W.*

Capacity type 177 Ex GWG

*42 VAC/0,3 A, p = max. 13 VA or 42 VDC/0.3A,
p = max. 13 W*

- *Inductive proximity sensor (Namur or direct switching 2- and 3-wire performance).*
- *Pneumatic contacts.*

Wiring diagram for switch contact



Technical data for flow transmitter type 31afi

- For housing dimensions, measuring ranges and materials see types 31d, 31az
- Inductive rotary angle transducer WD.20-02 and signal evaluation VM-1-4.. and signal evaluation are installed within the switch housing, mounted on top of the body. Separate signal evaluations for use with high temperatures and for use in hazardous areas are available on request.
- *Output signal* 0 - 10 V- or
0/4 -20 mA, max. load. 400 Ω
- *Repeatability of measured value* +/- 1 % full scale
- *Accuracy of linearity* Signal not linear
A calibration report for an external linearization will be supplied with the unit.
- *Power supply* 230 V 50 Hz; 24 V-
- *Pressure range* Standard PN 10/16 up to maximum PN 320
- *Operating temperature* Standard ≤ 60 °C within switch housing.
Ht (high temperature) model with separate signal evaluation up to 300 °C of the medium.
- *Ambient air temperature* Electronics: 0 - 40 °C

Note

A symmetric flow profile is not necessary because the flow is bypassed through the housing. Greater straight runs of pipe, upstream and downstream have to be provided if turbulence is likely to be experienced in the flow. Turbulence will cause an erratic output signal.

A suitable filter has to be incorporated before the unit if the medium is contaminated.