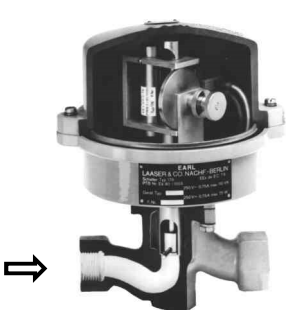
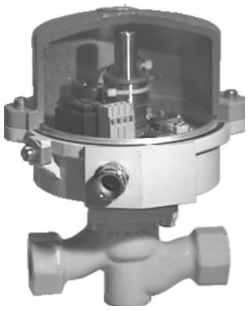
EARL Flow switch type 31d
EARL Flow meter type 31az

Application

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,

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.

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.

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Models

Type 31d Flow switch with a maximum of four fixed or two adjustable set points.

Type 31(Ex)ib simple electrical equipment acc. EN 60079-11/5.7
Type 31(Ex) Ex de II CT&
Type 31(Ex)ia II ½ G Ex c ia T85°c IP65
Type 31(Ex)de II ½ G Ex c de T85°c IP65

Type 31az Flow indicator without switch contact.
Type 31daz Flow indicator and switch with one switch contact:.

Technical data types 31d; 31az

Media uncontaminated liquids and gases

Diameter of switch housing PN 40 / 300# or class 800

Unit sizes in mm ***(Nom. pressure PN 40 / 300#)***

	Connection				
Flange DN	**thread**	**length flange connection mm / DIN**	**length flange connection mm / ANSI**	**length threaded connection mm / DIN**	**length threaded connection mm / ANSI**
15	G ½	130	152,4	130	81
20	G ¾	150	177,8	150	88
25	G 1	160	203,2	160	110
32	G 1 ¼	180		180	128
40	G 1 ½	200	228,6	200	154
50	G 2	230	266,7	230	170
80		310		310	

Standard measuring and control ranges for liquids **(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

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Technical data:

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 temp. up to 100 °C. Special model suitable for medium temp. up to 500 °C.
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 40. Body sea water resistant gun metal Rg10, grey cast iron or corrosion and acid resistant stainless steel, material no. 1.4408 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; painted light grey acc. RAL 7001 and are supplied with one S.P.D.T. switch contact. The indicator housing (type 31az) is made of stainless steel, material 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	stainless steel, material no. 1.4408.
Protection class of switch housing	according to DIN EN 60529 IP 65
Cable entry:	M20 x 1,5 or to suit customers requirements

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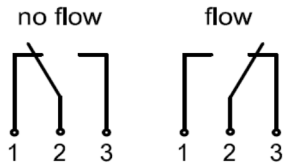
Magnetic switch contact (S.P.D.T.)

Typ	Contact-material	U max	I max	P max
GWW / GWW ht	AgSnO	250 V AC/DC	3:00 AM	450 VA / 300 W
GWG / GWG ht	Gold	42 V AC/DC	300 mA	13 VA / 13 W
177 GWW	AgSnO	250 V AC/DC	2:00 AM	450 VA / 300 W
177 GWG	Gold	42 V AC/DC	300 mA	13 VA / 13 W

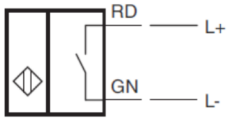
Inductive proximity switch (S.P.S.T.)

Ui = 16V; Ii = 25 mA; Pi = 64 mW

Wiring diagram for magnetic switch contact



Wiring diagram for inductive proximity switch (NO)



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.