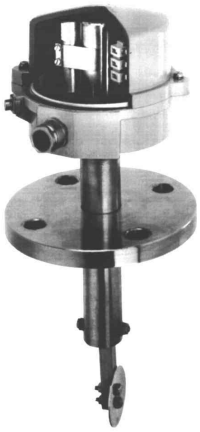
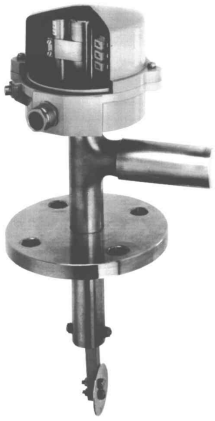
EARL Flow switch with pendulum
Series 107 weighted pendulum
Series 107hv with spring supported pendulum

Application

The construction of these pendulum units has been developed over more than 30 years operational usage. These reliable units are virtually maintenance free and are suited to the protection of high-value installations and machines. The units control the flow of liquids and gases in either horizontal or vertical pipes ≥ DN 15 with pressure ranges PN 10 to PN 320. The units are mounted either to horizontal pipes or vertical pipes by a flanged boss installed at 90° to the pipeline (provided by the installer), or by suitable T-piece, (available on request).





Operation

Series 107 with weighted pendulum

When the medium enters in the direction of flow indicated by the arrow it moves the pendulum with target disc and weight against the force of the weight, in the direction of flow. A permanent magnet is situated at the upper end of the lever which operates either one or two switch contacts, these are located adjacent to the system tube. The set point is fixed. For adjustable set points see type *107hve.*

Series 107hv with spring supported pendulum

Similar in principle to the 107 above but utilising a spring in place of a weight as the opposing force of the flow. This allows higher set points to be achieved, and by altering the spring tension the adjustment of the set point.

Advantages

- Works on highly reliable pendulum principle.
- Resistant to wear and tear.
- Suitable for use with media containing impurities.
- Various explosionproof ratings available.
- Materials for aggressive media.
- Low pressure loss (Type 107vS).
- Models available for use in maritime and humid tropical climates.
- Simple installation and connection.

Techn. Stand 03-2021

Suitability

Guards against pumps running dry, monitors lubricating oil-, cooling water-; cooling air- and hydraulic-circulation systems as well as the circulation of cooling agents in refrigeration plants. Boiler feed water control, burst pipe control; overflow control;. Control of the direction of flow in water supply networks, fire alarm in offshore-sprinkler systems; minimum gas flow control in the steel producing industry; record of pipe breakage.
Flow control on steam generating boilers and heat exchangers with required SIL calculation.

Possible contact type:

Type 107v

As inline unit DN 15 to DN 32 with T-piece and as online units from DN 40 to DN 1000 with flanged connection DN .... PN .... according to DIN and ANSI. One S.P.D.T. magnetic contact.
Set point fixed according to customers' requirements. Set points see general technical data.

Type 107m

Same as type 107v but with micro switch. Available with flange from DN 40.

Type 107ind

Same as type 107v but with inductive switch according to Namur. Available with flange from DN 40

Optional extras and type key for type 107:

- Option **vG**

Unit with threaded process .

- Option **hv**

Unit with spring supported pendulum for set points ≥ 0,35 m/sOption **e**

- Option **hve**

Same as option **hv**, but with adjustable set point in the range 1 : 2, z B. 0.35 to 0.7 or1.0 to 2.0 m/s. The set point is adjustable at jobsite.

- Option **S** (hinged target disc)

For low set points, with hinged target disc, low pressure loss with high flow velocities

- Option **ht**

For media temperatures to 300 resp. to 500°C. **Not to be combined with Ex-model!**

- Typ 107__(Ex*i*)

Typ 107v(Ex)ib	simple electrical equipment EN 60079-11/5.7
Typ 107v(Ex)	Ex-class /Ex de II CT6
Typ 107ind (Ex)ia	Ex-class /II 1/2 G Ex c ia T85°C IP65
Typ 107v(Ex)de	Ex-class /II 1/2 G Ex c de T85°C IP65

Type 107A F/G

Unit with threaded process G1 or flanged connection DN 50 PN11.With spring supported pendulum disc and magnet operated switches. Models in brass and stainless steel available.

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Further models

Additional bellows

For applications with contaminated or aggressive media an additional bellows made of PTFE or stainless steel can be installed to protect the bearing and guarantee the unrestricted movement of the pendulum.

General technical data

Media: Liquids or gas.

Pipe diameter: ≥ DN 15.

Set points (for liquids)

Typ 107v	Minimum	Maximum
Connection flange DN 40/50	0,15 m/s	0,35 m/s
Connection flange DN .80	0,10 m/s	0,50 m/s
Connection flange DN 100	0,08 m/s	0,70 m/s
Typ 107 vhv / vhve		
Connection flange DN 40…DN 100	0,30 m/s	10,0 m/s

Admissible deviation of actual set point: +/- 5 % of required set point.

Repeatability of adjusted set point: +/- 2 % of switching value.

Hysteresis: between on and off switching: 5 - 15 % of switching value of max. flow (from DN 50).

Pressure range: PN 10 to PN 320, higher values on request.

Operating temperature: Standard up to 100 °C temperature of the medium.
(Ex)-model up to 80 °C temperature of the medium.
Special model Ht up to 300 °C temperature of the medium also for intrinsically safe circuits (Ex)i.

For temperatures exceeding 100 °C the switch contact is encapsulated

Pressure loss: < 0.2 bar, from DN 100 negligible with max. flow velocities up to 2.5 m/s.

Required steadying distance upstream and downstream: according to DIN 1952.

Overload protection: Due to the rugged construction the unit will not be destroyed if flow velocities of 10 m/s and more arise.

Dimension x (Centre of pipe to upper edge of connecting flange): see dimensional drawing (send on request)

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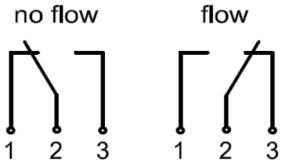
Materials

Standard	Flange and other wetted parts of corrosion and acid resistant stainless steel, material no. 1.4571 (similar AISI 316Ti); switch housing of aluminium.
Alternative materials	Wetted parts of either: Bronze, Monel; SMO; Hastelloy C; PVC; PVDF and/or PTFE. Switch housing of stainless steel 1.4408 or gun metal
Protection class of switch housing:	according to DIN EN 60529, IP 65.
Cable entry:	M20 x 1,5 or according to customers' requirements.

Switch contacts (S.P.D.T)

Typ	Kontakt-material	U max	I max	P max
GWW / GWW ht	AgSnO	250 V AC/DC	3 A	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 A	450 VA / 300 W
177 GWG	Gold	42 V AC/DC	300 mA	13 VA / 13 W
Mikroswitch	--	250 V AC	10 (4) A	

Wiring diagram Magnetic contact and micro switch



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

(Namur or direct switching 2- performance).
Ui = 16V; Ii = 25 mA; Pi = 64 mW

Wiring diagram Inductive proximity switch (NO)