Electro-mechanical Flow Switch

HFS 2100

for Oils / Viscous Fluids

Description:

The HYDAC flow switches of the HFS 2100 series are based on a variable area float principle and are position-independent. The test medium deflects a spring-loaded float in the direction of flow, depending on the flow rate. A reed contact is fitted to the outside of the device and is therefore separate from the flow circuit. When the magnet inside the float reaches the preset position, the reed contact will switch.
To protect it from external influences, the switch is encapsulated in a casing designed to allow steplessly variable adjustment.
The instruments are designed to be capable of monitoring threshold values reliably, even when the viscosity fluctuates. The kinematic viscosity may vary between 30 and 600 cSt.
The main areas of application are:

- Central lubrication systems
- Oil circuit lubrication systems
- Transformers
- Cooling systems and circuits
- Lubrication circuits
- Hydraulic systems
- Pumps
- Welding machines and laser systems
- Chemical industry
- Research & development

Medium:

- Oils / viscous fluids

Special features:

- Accuracy ≤ ± 10 % FS
- Viscosity compensation from 30 .. 600 cSt
- Any mounting position
- High level of functional reliability
- High level of switching accuracy
- Stepless switch point setting by user
- High pressure resistance
- Threaded connection
- ATEX version also available for potentially explosive areas.

Technical data:

Input data		
Switching ranges [l/min]	Size 1	Size 2
	0.5 .. 1.6	0.5 .. 1.5
	0.8 .. 3.0	1 .. 4
	2.0 .. 7.0	2 .. 8
		3 .. 10
		5 .. 15
		8 .. 24
		10 .. 30
		15 .. 45
		20 .. 60
		30 .. 90
		35 .. 110
Operating pressure		
Brass version	300 bar	250 bar
Stainless steel version	350 bar	300 bar
Pressure drop [bar]	0.02 .. 0.2	0.02 .. 0.4
Mechanical connection	See dimensions	
Parts in contact with medium		
Brass version	Stainl. st. 1.4571; FPM [1]; Brass, (nickel-pl.); Brass; Hard ferrite	
Stainless steel version	Stainl. st. 1.4571; FPM [1]; Hard ferrite	
Output data		
Switching outputs[2]	1 or 2 reed contacts Change-over or N/O type	
Accuracy[3]	≤ ± 10 % FS	
Repeatability	2 % FS max.	
Switching capacity		
Change-over contact[4]	max.	max.
Male connection EN175301-803 (DIN 43650)	250 V / 1.5 A / 50 VA	250 V / 1.5 A / 50 VA
Male connection M12x1	125 V / 1.5 A / 50 VA	250 V / 1.5 A / 50 VA
N/O contact	max.	max.
Male connection EN175301-803 (DIN 43650)	230 V / 3 A / 60 VA	250 V / 3 A / 100 VA
Male connection M12x1	125 V / 3 A / 60 VA	250 V / 3 A / 100 VA
Environmental conditions		
Operating temperature range	-20 .. +70 °C	
Fluid temperature range		
Male connection EN175301-803 (DIN 43650)	-20 .. +120 °C (optional -20 .. +160 °C)	
Male connection M12x1	-20 .. +85 °C	
Viscosity range	30 .. 600 cSt	
CE mark	Directive 2006 / 95 / EC Directive 2004 / 108 / EC	
Protection class to IEC 60529	IP 65	
Other data		
Housing material	Brass (nickel-pl.) or stainl. steel 1.4571	
Electrical connection	Male connection EN175301-803 (DIN 43650) Male connection M12x1	

Note: **FS** (**F**ull **S**cale) = relative to the complete measuring range
[1] Other seal materials available on request
[2] The contact opens / switches when the flow falls below the pre-set switching point.
[3] 3% possible when calibrated to a certain viscosity
[4] Minimum load 3 VA

Model code:

HFS 2 1 X X – XX – XXXX–XXXX – 7 – X – X – 000

Measuring principle
2 = Variable area float

Measuring medium
1 = Oils / viscous fluids

Mechanical connection [4) 5)]
1 = 1/4 “
2 = 3/8 “
3 = 1/2 “
4 = 3/4 “
5 = 1 “

Electrical connection
5 = Male EN175301-803 (DIN 43650) 3 pole + PE, (connector supplied)
6 = Male M12x1, 4-pole (connector not supplied)

Switching contacts [6)]
1S = 1 N/O contact
2S = 2 N/O contacts
1W = 1 Change-over contact
2W = 2 Change-over contacts

Switching ranges in l/min [5)]
Oil 10 % -Size 1-
00.5-01.6; 00.8-03.0; 02.0-07.0

Oil 10 % -Size 2-
00.5-01.5; 0001-0004; 0002-0008; 0003-0010; 0005-0015; 0008-0024; 0010-0030; 0015-0045; 0020-0060; 0030-0090; 0035-0110

Accuracy
7 = ≤ ± 10.0 % FS

Housing material
B = Brass, nickel-plated
S = Stainless steel

Mechanical indicator
0 = Without indicator
1 = With indicator

Modification number
000 = Standard

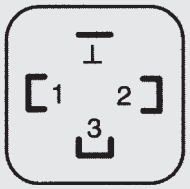
4) Mechanical connection options depend on housing type (see Dimensions)
5) Other models available on request.
6) When the model with 2 switching contacts is selected, the second contact is fitted on the side of the instrument, at 90° to the first contact.

Note:
On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Accessories:
Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

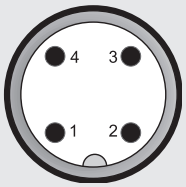
Pin connections:

EN175301-803 (DIN 43650)



Pin	HFS 21X5-XS	HFS 21X5-XW
1	Centre	Centre
2	N/O contact	N/C contact
3	n.c.	N/O contact
⊥	Housing	Housing

M12x1



Pin	HFS 21X6-XS	HFS 21X6-XW
1	Centre	Centre
2	n.c.	N/C contact
3	n.c.	n.c.
4	N/O contact	N/O contact

Notes on installation:

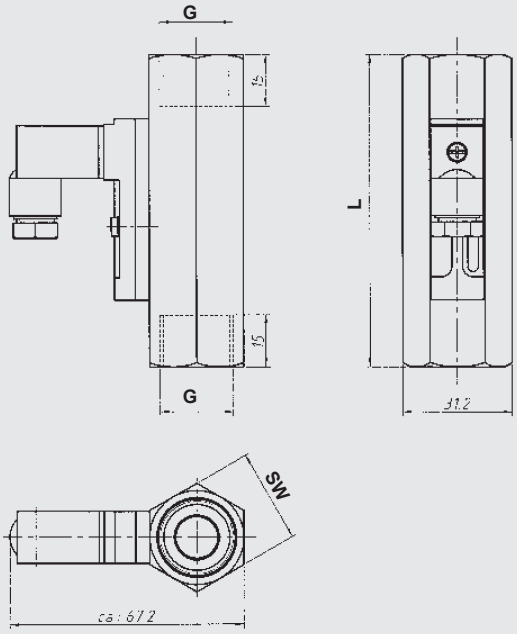
- The medium must not contain solid particles! We recommend using contamination strainers.
- External magnetic fields can affect the switching contact. Ensure sufficient distance from magnetic fields (e.g. from electric motors)!

Dimensions without indicator:

OIL -Size 1- without indicator

Type [l/min]	Installation dimensions [mm]				Weight (approx.) [g]
	DN	SW	G	L	
0.5 .. 1.6	8 10 15	24 24 27	1/4“ 3/8“ 1/2“ *)	98 108 90	400 450 350
0.8 .. 3.0	15	27	1/2“	90	350
2.0 .. 7.0					

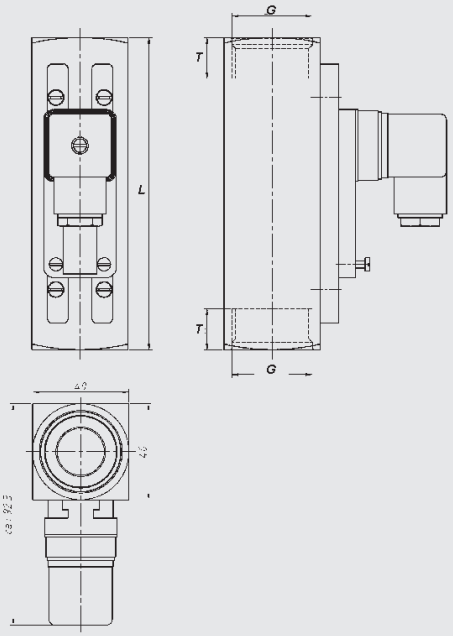
*) Standard



OIL -Size 2- without indicator

Type [l/min]	Installation dimensions [mm]					Weight (approx.) [g]
	DN	SW	G	L	T	
0.5 .. 1.5	8 15	34 34	1/4“ 1/2“	152 152	10 14	1500 1425
1 .. 4	20 25	34 40	3/4“ 1“ *)	152 130	15 17	1340 1160
2 .. 8	15	34	1/2“	152	14	1425
3 .. 10	20	34	3/4“	152	15	1340
5 .. 15	25	40	1“ *)	130	17	1160
8 .. 24						
10 .. 30	20	34	3/4“	152	15	1340
15 .. 45	25	40	1“ *)	130	17	1160
20 .. 60						
30 .. 90	25	40	1“	130	17	1160
35 .. 110						

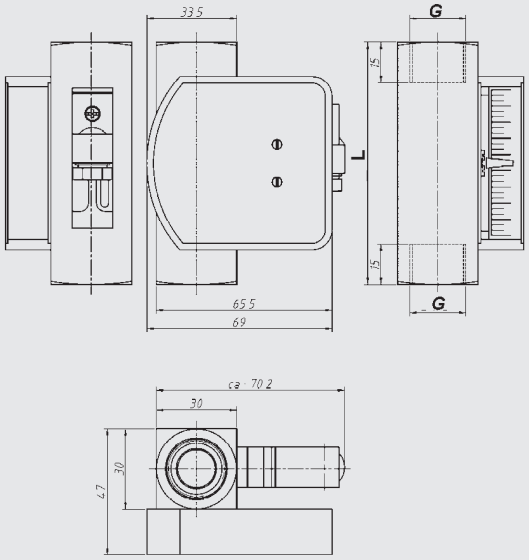
*) Standard



Dimensions with indicator:

OIL -Size 1- with indicator

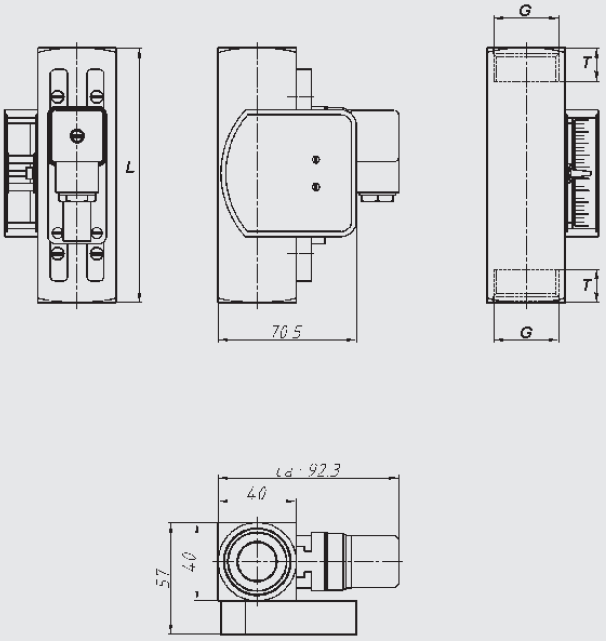
Type [l/min]		Installation dimensions [mm]			Weight (approx.) [g]
	DN	SW	G	L	
0.5 .. 1.6	15	30	1/2“	90	570
0.8 .. 3.0					
2.0 .. 7.0					



OIL -Size 2- with indicator

Type [l/min]	Installation dimensions [mm]					Weight (approx.) [g]
	DN	SW	G	L	T	
0.5 .. 1.5	8	34	1/4“	152	10	1590
	15	34	1/2“	152	14	1515
1 .. 4	20	34	3/4“	152	15	1430
	25	40	1“ *)	130	17	1250
2 .. 8	15	34	1/2“	152	14	1515
3 .. 10	20	34	3/4“	152	15	1430
5 .. 15	25	40	1“ *)	130	17	1250
8 .. 24						
10 .. 30	20	34	3/4“	152	15	1430
15 .. 45	25	40	1“ *)	130	17	1250
20 .. 60						
30 .. 90	25	40	1“	130	17	1250
35 .. 110						

*) Standard



Note:

The information in this brochure relates to the operating conditions and applications described.
For applications and operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

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