VO-01

Low-Volume Oval Gear Flowmeter

Description:

The VO-01 low volume oval gear flowmeter measures fluids in the viscosity range of 5 to 200 cSt according to the principle of positive displacement. Two interlocked oval gear-wheels made of PEEK rotate inside the measuring chamber as a result of the flow and, effectively, defined volumes are channelled through the VO-01 proportional to the rotating speed. An externally mounted electronic element records the rotating speed of the oval gear-wheel pair by means of a non-contacting Hall effect sensor that emits a voltage impulse whenever a magnet crosses it and, through an amplifier, produces a rectangular impulse signal at the PINs of the plug connector. In the version with 2-wire output the impulse signal is readily converted internally into a power signal. In contrast to this, in the case of the 3-wire version, as also in a variant with impulse output and two additional threshold value relays, a VO-01 equipped with a "normal" impulse output can be easily converted into a flowmeter with 3-wire power output or one with a Push-Pull impulse output and threshold value relays by replacing the mating plug.

Features

/ Plastic or stainless steel housing

/ Measuring range from 8 l/h

/ Cost-effective

/ 4. . .20 mA or pulse output

/ Optionally with switching contacts

/ Intended for fluid viscosities from 5 to 200 cSt

Application:

Oval gear flowmeters of VO-01 series offer a cost-effective solution when low volume flows in the range of low to medium viscosities need to be measured and monitored. For the housing, the materials used can be polypropylene, ECTFE and stainless steel; however, the oval gear-wheels are always made of PEEK. Therefore, it is possible to design a device in a way that only plastics come into contact with the flow medium. The result is that the range of application of the VO-01 is extended to measuring even hostile fluids which, otherwise, are corrosive on metals. Typical applications for the VO-01 are, for example:

· monitoring lubrication points
· measuring consumption of fuel or lubricants
· manufacturing of paints and dyes
· processing of solvents.

Ordering Codes:

Order number	VO-01.	PP.	40.	EP.	ST.	IM.	0

VO-01 Oval Gear Flowmeter

Design /
PP = housing Polypropylen, oval gear-wheels PEEK
EC = housing ECTFE, oval gear-wheels PEEK
VA = housing st. steel, oval gear-wheels from PEEK

Operating range /
40 = 8. . .40 l/h
80 = 14. . .80 l/h

Gasket /
VI = Viton
KR = Kalrez
EP = EPDM

Electrical Connection /
ST = cubical plug EN 175301-803A
KA = 3 m cable connection

Output signal /
IM = pulses out of complementary final stage (suitable for NPN or PNP inputs)
A2 = analogue output 4. . .20 mA, 2-wire (with plug connection only)
A3 = analogue output 4. . .20 mA, 3-wire (with plug connection only)
FK = pulse output Push-Pull and two setpoints (semiconductor relays)

Options /
0 = none
AK = axis from ceramic instead of zirconium oxide
NPT= process connection 1/4"-NPT-female instead of G1/4"-female

Technical Specifications:

Operating principle /	positive displacement
Sensing system /	Hall-effect, non-contacting
Operating ranges / (start-up)	(2)8. . .40 l/h or (5)14. . .80 l/h
Accuracy /	± 2.5% full scale value
Repeatability /	< ± 0.8% full scale value
Flow direction /	in direction of arrow
Mounting position /	any (best result vertically with arrow to the bottom)
Straight inlet and outlet /	not necessary
Process connection /	2 x G1/4"-female
Operating pressure /	
PP-housing:	10 bar max.
ECTFE-housing:	10 bar max.
SS-housing:	20 bar max. (higher on request)
Burst pressure /	
PP-housing:	>18 bar
ECTFE-housing:	>18 bar
SS-housing:	>35 bar (higher on request)
Operating temp. /	0. . .80°C
Viscosity range /	5. . .200 cSt
Housing material /	Polypropylen, ECTFE or stainless steel 1.4571
Oval gear-wheels /	PEEK
Axis /	ZrO_2 (zirconium oxide), optionally ceramic Al_2O_3
Bearings /	PEEK
Magnets /	encapsulated in PEEK
O-ring /	Viton (optionally EPDM or Kalrez)

Dimensions in mm:

Range	Width	Height	Depth	Imp. per Litre*	Process connection
8. . .40 l/h	54	45	44	6000	2 x G 1/4"-female
14. . .80 l/h	54	45	44	3400	2 x G 1/4"-female

*The pulse-litre-correlation of each VO-01 is individually evaluated before shipment and can be read on the type label of each unit. A difference to the values above is possible.

Electrical Connection:

	VO-01.xx.xx.xx.xx.IM	VO-01.xx.xx.xx.xx.A2	VO-01.xx.xx.xx.xx.A3	VO-01.xx.xx.xx.xx.FK
Supply +	PIN 1	PIN 1	PIN 1	white
Signal	PIN 2	PIN 2	PIN 2	green
Ground	PIN 3		PIN 3	brown
Relay 1-A				yellow
Relay 1-B				grey
Relay 2-A				pink
Relay 2-B				blue

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Electrical Specifications:

Pulse output (VO-01.xx.xx.xx.xx.IM) /

Function:	complementary final stage (suitable for PNP- or NPN-inputs)
Supply voltage:	+4.5. . .+24 VDC
Current:	max. 11 mA at 24 VDC
El. connection:	plug connector as per EN 175301-803A (cubical-shaped) or round cable LiYY 3 x 1.4 mm^2, length 3 m
Protection:	IP65

Analogue output 2-wire (VO-01.xx.xx.xx.xx.A2) /

Supply voltage:	+15. . .+24 VDC
Current:	4. . .20 mA, 2-wire
Damping:	factory adjustable in steps of 1 sec.
El. connection:	plug connector as per EN 175301-803A (cubical-shaped)
Protection:	IP65
Ambient temp. at plug connector:	max. 55°C

Analogue output 3-wire (VO-01.xx.xx.xx.xx.A3) /

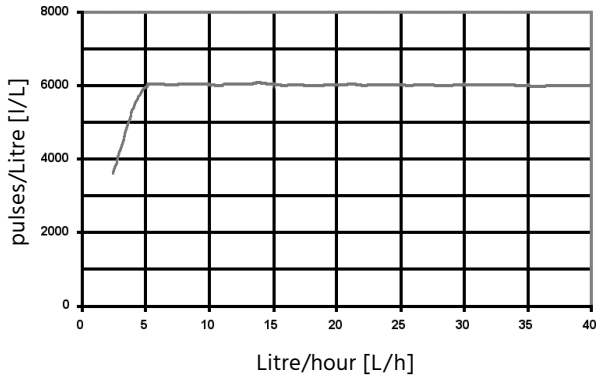
Supply voltage:	+15. . .+24 VDC
Current:	10. . .40 mA
Damping:	factory adjustable in steps of one sec.
El. connection:	plug connector as per EN 175301-803A (cubical-shaped)
Protection:	IP65
Ambient temp. at plug connector:	max. 55°C
Mounting:	The electronic modul is easily plugged between the plug connector and the mating plug of the SD-05 and transforms the pulse output into an analogue output. The correllation between analogue output and operating range is adjusted with a REED switch at the plug connector. This electronic modul can be field upgraded at any time.

Pulse output Push-Pull and two additional threshold value relays (VO-01.xx.xx.xx.xx.FK) /

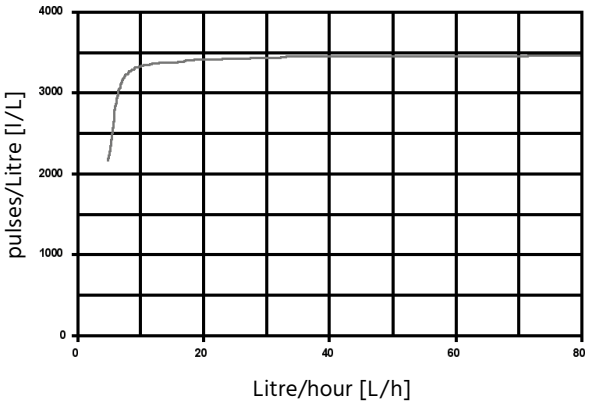
Supply voltage:	+4.5. . .+24 VDC
Current:	10. . .220 mA
Damping:	factory adjustable in steps of one second
Outputs:	1 x complementary final stage (11 mA, 24 VDC), 2 x semiconductor relays (0.1 A / 24 VDC)
El. connection:	plug connector as per EN 175301-803A (cubical-shaped) with one meter factory connected cable
Protection:	IP65
Ambient temp. at plug connector:	max. 55°C
Mounting:	The electronic modul is easily plugged between the plug connector and the mating plug of the SD-05 and transforms the pulse output into Push-Pull output (suitable for PNP and NPN inputs). Additionally two alarm outputs are provided. The correllation between analogue output and operating range and the setpoints are adjusted with a REED switch at the plug connector. This electronic modul can be field upgraded at any time.

Pulses per Litre:

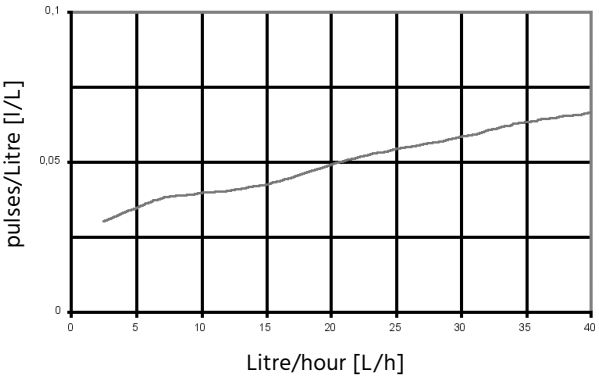
Range 8. . .40 l/h

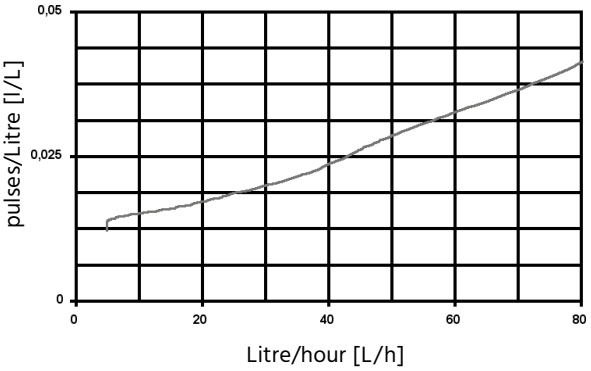


Range 14. . .80 l/h



Pressure Drop:





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