

# DZ01

## Oil Flow Totalisator

- Installation on pressure or suction side
- Space-saving, flexible installation
- Unaffected by media temperature
- Unaffected by media viscosity




### Description:


Model DZ01 volumetric flow meters are piston flowmeters that do not require an auxiliary electrical power source. A cylindrical housing contains a hollow, slotted cylinder, which is called an annular piston and which – due to the guide slot – is set in oscillating motion as soon as the medium being measured flows through the measuring chamber. The movement of the piston is transmitted magnetically (non-contact) to an incremental drum counter mechanism which totals the volumetric flow rate over time. If necessary, the meter can be fitted with a Reed-contact or inductive-contact remote value sensor that transmits an electrical impulse for each defined volume.

### Typical Applications:

Piston-type flowmeters are used wherever the flow of oil or other liquid fuel needs to be detected in a simple, very accurate manner without the need for an auxiliary electric power source. Typical applications are in the bunker piping in ships or for measuring consumption rates in the fuel supply and return circuit sides of Diesel engines. When fitted with special materials, such as Teflon or stainless steel pistons or a stainless steel chamber, the DZ01 can also control simple dosing processes in which even corrosive media are being measured. A major advantage of this volumetric flow meter is that its readings are independent of media temperature and viscosity. In many applications, this is a critical benefit compared to rotameters (float-type flow meters) or turbine flow meters.



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## Models:

### DZ01 Oil Flow Totalisator

**Sizes:** See "Table of Sizes"

**Max. temperature:** With meter sizes 04M, 04 and 08, the media temperature must not exceed 60 °C. With sizes 15 to 50, media temperature must not exceed 130 °C. A high-temperature version capable of handling media temperatures up to 180 °C is optionally available.

**Process connection:** For sizes 04M, 04 and 08, the DZ01 is available with only threaded connections as shown in the "Table of Sizes". For sizes 15 to 50, both threaded and flange connections are available.

**Nominal pressure:** For threaded connections, the nominal pressure is PN 16; for flanged connections, nominal pressure ratings between PN 25 and PN 40 are available.

**Impulse transmitter:** The selection of the impulse transmitter is made based on the specifications listed in the "Table of Sizes".

## Electrical Specifications:

**Switching element:** RE, RV = Reed switch with grounding contact  
IN = Slotted inductive proximity switch as per DIN 19234

**Switching voltage:** RE, RV = max. 48 V AC/DC  
IN = 5 to 15 VDC

**Switching current:** RE, RV = max. 50mA  
( $R_i = 47 \text{ Ohm}/0.5 \text{ W}$ )  
IN = >3 mA at 8V DC/1 kOhm

**Standby (quiescent) current:** RE, RV = open contact  
IN = < 1 mA at 8V DC/1 kOhm

**Switching load (breaking capacity):** RE = max. 3VA, RV = max. 2W

**Switch-on time:** RE = 30 to 70 % (pulse value 1 / 0.1 / 0.01 l/pulse) = 40 to 55% (pulse value 0.00125 / 0.00311 l/Imp.)  
RV = 50 % ± 10 %  
IN = 50 % ± 10 %

**Ambient temperature:** RE = -10 °C to +60 °C  
RV = -10 °C to +70 °C  
IN = -10 °C to +70 °C

**Protection type:** RE = IP 65 (IEC144)  
RV = IP 65 (IEC144)  
RE = IP 65 (IEC144)

**Connection:** RE = Cable plug connector  
2 x 0.35 mm<sup>2</sup>  
RV = Fixed cable length of 3 meters  
2 x 0.14 mm<sup>2</sup>  
IN = Cable plug connector  
2 x 0.35 mm<sup>2</sup>

**Ex approval:** IN = EEx ia IIC T6

## Model Coding:

**Order Number:** DZ01. 15. 2. 2. 1. 2.

### Oil Flow Totalisator

#### Sizes:

04M = 40 l/h (with incremental counter, without pulse output)  
04 = 80 l/h  
08 = 200 l/h  
15 = 600 l/h  
20 = 1,500 l/h  
25 = 3,000 l/h  
40 = 9,000 l/h  
50 = 30,000 l/h

#### Maximum temperature in °C:

1 = 60 °C for 04M, 04 and 08 only  
2 = 130 °C for 15 to 50  
3 = 180 °C for 15 to 50

#### Process connection:

1 = Threaded  
2 = Flanged

#### Nominal pressure:

0 = PN 25 or PN 16 for threaded version  
1 = PN 25 for flanged version  
2 = PN 40 for flanged version  
(for high-temperature version rated up to 180 °C only)

#### Pulse transmitter (xx = flow in L/pulse):

0 = None  
RExx = RE pulse transmitter  
RVxx = RV pulse transmitter  
INxx = IN pulse transmitter

Please specify pulse rate in writing.

## Technische Daten:

**Materials:** Aluminum piston, steel housing (brass for sizes 04M-08)  
Measuring chamber of brass (special-order materials such as hard rubber and Teflon available upon request)

**Counter mechanism:** Roller counter in liters

**Connection:** Flanged or threaded connection

**Compatible media:** Fuel oil/heating oil (extra light, light, middle and heavy viscosity), naphtha, Bunker C, Diesel fuel, gasoline and other self-lubricating media

**Options:** Display in US gallons (1 gallon = 3.785 liters), special calibration (dual/paired calibration for differential measurements), approval of German Lloyd

**Max. viscosity:** 500 mPas, self-lubricating

**Max. pressure drop:** Dependant on flow rate and viscosity; max. 1.2 bar at max. flow rate and 500 mPas

## Table of Sizes:

Type:	unit	DZ01.04M	DZ01.04	DZ01.08	DZ01.15	DZ01.20	DZ01.25	DZ01.40	DZ01.50	
Diameter	inch	0.125	0.125	0.25	0.5	0.75	1	1.5	2	
Process connection		1/8" female thread	1/8" female thread	1/4" female thread	3/4" male thread or flange DN15	1" male thread or flange DN20	1 1/4" male thread or flange DN25	2" male thread or flange DN40	flange DN50	
Nominal pressure for threaded connection	bar	25	25	25	16	16	16	16	16	
Nominal pressure for flanged connection	bar	–	–	–	25/40*	25/40*	25/40*	25/40*	25/40*	
Max. temperature	°C Max.	60	60	60	130/180*	130/180*	130/180*	130/180*	130/180*	
Max. flow rate	l/h	40	80	200	600	1500	3000	9000	30000	
Continuous flow rate	l/h	25	50	135	400	1000	2000	6000	20000	
Min. flow rate	l/h	0.5	1	4	10	30	75	225	750	
Start-up at approx	l/h	0.3	0.4	1.6	4	12	30	90	300	
Measuring error limit		± 1% of measuring range end value								
Repeatability		± 0.2 %								
Smallest readable volume	l	0.001	0.001	0.01	0.01	0.1	0.1	0.1	1	
Recording ability	m <sup>3</sup>	100	100	1000	1000	10000	10000	10000	100000	
Recording period	h	4000	2000	7400	2500	10000	5000	1667	5000	
Mesh size for safety filter	mm	0.125	0.125	0.15	0.4	0.4	0.4	0.8	0.8	
Mesh size for dirt trap/strainer	mm	0.08	0.08	0.1	0.25	0.4	0.4	0.6	0.6	
Measuring chamber volumes	ccm	5	5	12.5	12	36	100	330	1200	
Housing surface coating		Red plastic				Red painted Ral 3013				
Weight without threaded fitting	kg	0.65	0.65	0.75	–	–	–	–	–	
Weight with threaded fitting	kg	–	–	–	2.2	2.5	4.2	17.3	–	
Weight with flange PN 25	kg	–	–	–	3.8	4.5	7.5	20.3	41	
Weight with flange PN 40	kg	–	–	–	4.4	5.5	7.8	20.5	42	
REED pulse transmitter										
RE 1	l/Imp	–	–	1	–	–	–	–	–	
RE 0.1	l/Imp	–	0.1	0.1	–	–	–	–	–	
RE 0.01	l/Imp	–	0.01	–	–	–	–	–	–	
RE 0.00125	l/Imp	–	0.00125	–	–	–	–	–	–	
RE 0.00311	l/Imp	–	–	0.00311	–	–	–	–	–	
IN inductive DIN 19234	l/Imp	–	–	–	0.01	0.01	0.1	0.1	1	
RV RE	l/Imp	–	–	–	0.1	1	1	1	10	
RV RE	l/Imp	–	–	–	1	–	–	10	100	

Nominal pressure for flanged connection      25/40\*      selectable  
 max. Temperatur                      130/180\*      selectable



## Table of Dimensions:

Sizes	Length	Width	Height	Connection	fitting Height for 130 °C Design without transmitter	fitting Height for 130 °C Design with RV	fitting Height for 130 °C Design with IN	fitting Height for 180 °C Design without Geber	fitting Height for 180 °C Design with RV	fitting Height for 180 °C Design with IN
DZ01.04M	65	65	79	bottom						
DZ01.04	65	65	79	bottom						
DZ01.08	65	65	79	bottom						
DZ01.15	165	105		on side	106	130	185	147	171	225
DZ01.20	165	105		on side	115	139	194	156	180	234
DZ01.25	190	130		on side	142	166	221	183	207	261
DZ01.40	300	210		on side	235	259	273	235	259	313
DZ01.50	350	280		on side	291	315	329	291	315	369