CONTOIL®
Fuel oil meters

DMS METERING SOLUTIONS

Applications

- Flow measurement of mineral oils such as heating or propellant fuels
- In burners, on board ships, land vehicles and fixed installations
- Marine and metrological type approvals (optional)

Features

- The complete range of products offering the best solutions for the measurement of oil consumption
- State-of-the-art design with electronic counter, flow indication, analogue and digital output signals and limiting value switch
- Mounting on the pressure or suction side of a pump, with no straight inlets or outlets required
- Independent of viscosity and temperature
- High vibration resistance
- Classical version with mechanical display

Your benefits

- The reliable solution with everything from a single supplier
- Reliable monitoring and flexible control of the system. Simplifies burner settings and optimising consumption
- Highly flexible mounting with very small space requirements
- Accurate measurements
- Maximum safety in the shipbuilding and automobile industries
- Cost-effective metering point

VD.4-411.e.06.2010

VZO 15 … 50

Technical data [1]

- Volume display on roller counter, in litres
- fuel oil meter with threaded or flanged ends
- for horizontal, vertical or inclined mounting

Option: Reed pulser or RV / IN pulser

Versions available on request:
- different flange drillings, such as ANSI, JIS
- meters in US gallons [2] (option)

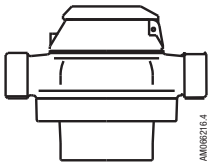
Type			**VZO 15**	**VZO 20**	**VZO 25**	**VZO 40**	**VZO 50**
Nominal diameter	**DN**	**mm**	**15**	**20**	**25**	**40**	**50**
		inch	1/2	3/4	1	1 1/2	2
Installation length		mm	165	165	190	300	350
Nominal pressure with threaded ends	PN	bar	16				
with flanges	PN	bar	25, 40				
Maximum temperature	T_{max}	° C	130, 180				
Maximum flow rate	Q_{max} [3]	l/h	600	1 500	3 000	9 000	30 000
Nominal flow rate	**Q_{cont} [3]**	**l/h**	**400**	**1 000**	**2 000**	**6 000**	**20 000**
Minimal flow rate	Q_{min}	l/h	10 [4]	30	75	225	750
Approx. starting flow rate		l/h	4	12	30	90	300
Max. permissible error			±1 % of actual value				
Repeatability			±0.2 %				
Safety filter mesh size		mm	0.400	0.400	0.400	0.800	0.800
Dirt filter mesh size		**mm**	**0.250**	**0.400**	**0.400**	**0.600**	**0.600**
Volume of the measuring chamber		approx. cm^3	12	36	100	330	1 200
Housing finish			enamelled red RAL 3013				
Weight with threaded ends [5]		approx. kg	2.2	2.5	4.2	17.3	–
with flanges PN 25		approx. kg	3.8	4.5	7.5	20.3	41.0
with flanges PN 40		approx. kg	4.4	5.5	7.8	20.5	42.0
Smallest readable amount		l	0.01	0.1	0.1	0.1	1
Registration capacity		m^3	1 000	10 000	10 000	10 000	100 000
Registration time at Q_{cont} until overrunning to zero		h	2500	10 000	5000	1 667	5 000
Pulse values of pulsers:							
IN inductive according to IEC 60947-5-6		l/pulse	0.01	0.01	0.1	0.1	1
RV Reed		l/pulse	0.1	1	1	1	10
RV Reed		l/pulse	1	–	–	10	100
Pulse frequency IN	at Q_{max}	Hz	16.667	41.667	8.333	25.000	8.333
	at Q_{min}	Hz	0.278	0.833	0.208	0.625	0.208

1) Manufacturer's specification, valid for the reference conditions as specified under "APPENDIX: Meter data".
2) 1 US gallon corresponds to 3.785 litres
3) For burners and engines or motors, the meter must be selected on the basis of the permanent flow rate. For higher viscosities, or if the meter is installed on the suction side, the pressure drop and any reduction in the measuring range must also be taken into consideration.
4) Min. flow rate VZO 15 with IN-pulser: 15 l/h
5) Weight without couplings.

Pressure drop curves

See "APPENDIX: Meter data"

Dimensions

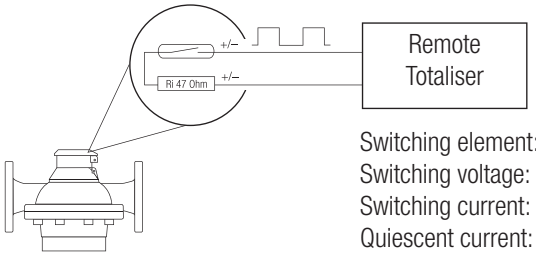
Type	mm	VZO 15	VZO 20	VZO 25	VZO 40	VZO 50
	Length	165	165	190	300	350
	Width	105	105	130	210	280
	Typ ... 130 °C					
	Height	106	115	142	235	291
	Height -RV	130	139	166	259	315
	Height -IN	185	194	221	273	329
	Typ ... 180 °C					
	Height	147	156	183	235	291
	Height -RV	171	180	207	259	315
	Height -IN	225	234	261	313	369

AM06R216.4

Detailed dimensional diagrams in "APPENDIX: Meter data".

RV Pulsers

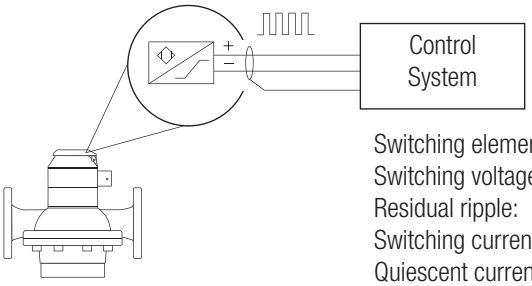
This type of pulser is integrated into the roller counter and thus is especially appropriate for remote totalisation. For other applications the IN inductive pulser is preferable.



Switching element:	• Reed switch with dry contact (inert gas)
Switching voltage:	• max. 48 VAC/DC, Protection class III (SELV)
Switching current:	• max. 50 mA (Ri = 47 Ω/0.5 W)
Quiescent current:	• Open Contact
Switching power:	• max. 2 W
ON-time:	• 50 % ±10 %
Temperature:	• Ambient -10...+70 °C
Protection class:	• IP 65 (IEC 60529) against dust and water-jets
Connections:	• Cast-in cable, length 3 m
Cable cross section:	• 2 x 0.14 mm²

IN Pulsers

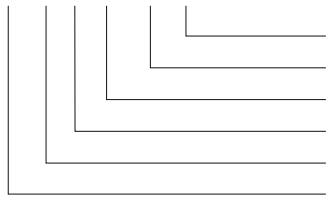
Pulser for industrial applications. Supplied with plug-in pulser sensor.



Switching element:	• Inductiv slot initiator according to IEC 60947-5-6
Switching voltage:	• 5...15 VDC
Residual ripple:	• max. 5 %
Switching current:	• >3 mA at 8 VDC / 1 kΩ
Quiescent current:	• <1 mA at 8 VDC / 1 kΩ
ON-time:	• 50 % ± 10 %
Ambient temperature:	• -10...+70 ° C
Protection class:	• IP 65 (IEC 60529) against dust and water-jets
Connections:	• Pulser supplied with special plug. Required cable min. 2 x 0.35 mm² and 4...6 mm external diameter or the cable is already mounted if the option "Order No. 80019" is chosen.
Option:	• Cable mounted, 2 x 0.5 mm², PVC black, length 3 m (Order No. 80019)

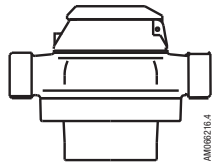
Type designation key

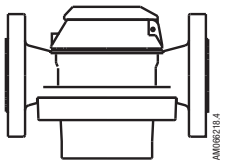
VZO 25 FL 130/25-IN 0.1

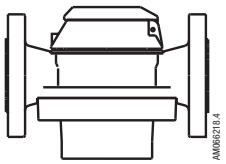


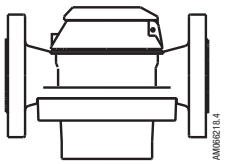
Pulser IN or RV and pulse value
Nominal pressure (bar)
Temperature (°C)
Connection (RC = Threaded ends, FL = Flanges)
Nominal diameter (mm)
Meter type

Ordering specifications

Threaded ends, PN 16	Type **130 °C**	Order No.	Type **130 °C**	Order No.
	VZO 15 RC 130/16	92041	VZO 25 RC 130/16	92057
	VZO 15 RC 130/16-RV 0.1	92042	VZO 25 RC 130/16-RV 1	92058
	VZO 15 RC 130/16-RV 1	92043	VZO 25 RC 130/16-IN 0.1	91913
	VZO 15 RC 130/16-IN 0.01	91900		
	VZO 20 RC 130/16	92047	VZO 40 RC 130/16	92004
	VZO 20 RC 130/16-RV 1	92048	VZO 40 RC 130/16-RV 1	92018
	VZO 20 RC 130/16-IN 0.01	91902	VZO 40 RC 130/16-IN 0.1	91906

Flanges, PN 25	Type **130 °C**	Order No.	Type **130 °C**	Order No.
	VZO 15 FL 130/25	92044	VZO 40 FL 130/25	92005
	VZO 15 FL 130/25-RV 0.1	92045	VZO 40 FL 130/25-RV 1	92020
	VZO 15 FL 130/25-RV 1	92046	VZO 40 FL 130/25-IN 0.1	91907
	VZO 15 FL 130/25-IN 0.01	91910		
	VZO 20 FL 130/25	92049	VZO 50 FL 130/25	92007
	VZO 20 FL 130/25-RV 1	92050	VZO 50 FL 130/25-RV 10	92024
	VZO 20 FL 130/25-IN 0.01	91903	VZO 50 FL 130/25-IN 1	91909
	VZO 25 FL 130/25	92059		
	VZO 25 FL 130/25-RV 1	92060		
	VZO 25 FL 130/25-IN 0.1	91914		

Flanges, PN 25	Type **180 °C**	Order No.	Type **180 °C**	Order No.
	VZO 15 FL 180/25	92250	VZO 40 FL 180/25	92274
	VZO 15 FL 180/25-RV 0.1	92251	VZO 40 FL 180/25-RV 1	92275
	VZO 15 FL 180/25-RV 1	92252	VZO 40 FL 180/25-IN 0.1	92276
	VZO 15 FL 180/25-IN 0.01	92253		
	VZO 20 FL 180/25	92258	VZO 50 FL 180/25	92280
	VZO 20 FL 180/25-RV 1	92259	VZO 50 FL 180/25-RV 10	92281
	VZO 20 FL 180/25-IN 0.01	92260	VZO 50 FL 180/25-IN 1	92282
	VZO 25 FL 180/25	92264		
	VZO 25 FL 180/25-RV 1	92265		
	VZO 25 FL 180/25-IN 0.1	92266		

Flanges, PN 40	Type **180 °C**	Order No.	Type **180 °C**	Order No.
	VZO 15 FL 180/40	92254	VZO 40 FL 180/40	92277
	VZO 15 FL 180/40-RV 0.1	92255	VZO 40 FL 180/40-RV 1	92278
	VZO 15 FL 180/40-RV 1	92256	VZO 40 FL 180/40-IN 0.1	92279
	VZO 15 FL 180/40-IN 0.01	92257		
	VZO 20 FL 180/40	92261	VZO 50 FL 180/40	92283
	VZO 20 FL 180/40-RV 1	92262	VZO 50 FL 180/40-RV 10	92284
	VZO 20 FL 180/40-IN 0.01	92263	VZO 50 FL 180/40-IN 1	92285
	VZO 25 FL 180/40	92267		
	VZO 25 FL 180/40-RV 1	92268		
	VZO 25 FL 180/40-IN 0.1	92269		

DN 15 only when the plant has a dirt filter with a max. 0.1 mm mesh size.

Modification VZO	For marine type approval (e.g. GL, LRS, DNV)	96295
Option / Accessory	Cable mounted on IN	80019

Technical data [1]

- Versions for optimal results from differential measurement or for fiscal or commercial transactions
- VZFA with electronic display of total volume, resettable volume and flow rate; units of measurement: litres, US gallons [2]) or m^3.
- VZOA with display of total volume on roller counter; units of measurement: litres. Optional versions with counter in US gallons.
- VZOA option: with RV reed or IN inductive pulser
- threaded or flanged connections available
- mounting in horizontal or vertical positions possible (for calibrated meters horizontally only).
- VZFA: User-friendly, interactive parameter input. Easy integration into control systems.

Further Versions available on request:

- different flange drillings, such as ANSI, JIS

Type			**VZFA/VZOA**				
Nominal diameter	**DN**	**mm**	**15**	**20**	**25**	**40**	**50**
		inch	1/2	3/4	1	1 1/2	2
Installation length		mm	165	165	190	300	350
Nominal pressure with threaded ends	PN	bar	16				
with flanges	PN	bar	25				
Maximum temperature	T_{max}	° C	130, 180				
Maximum flow rate	Q_{max} [3]	l/h	600	1 500	3 000	9 000	30 000
Nominal flow rate	**Q_{cont} [3]**	**l/h**	**400**	**1 000**	**2 000**	**6 000**	**20 000**
Minimal flow rate	Q_{min}	l/h	10 [4]	30	75	225	750
Approx. starting flow rate		l/h	4	12	30	90	300
Max. permissible error			<0.5 % of actual value				
Repeatability			±0.1 %				
Safety filter mesh size		mm	0.400	0.400	0.400	0.800	0.800
Dirt filter mesh size		**mm**	**0.100**	**0.100**	**0.250**	**0.250**	**0.250**
Volume of the measuring chamber		approx. cm^3	12	36	100	330	1 200
Housing finish			enamelled red RAL 3013				
Weight with threaded ends [5]		approx. kg	2.2	2.5	4.2	17.3	–
with flanges PN 25		approx. kg	3.8	4.5	7.5	20.3	41.0
VZFA							
Smallest readable amount:							
Total volume		l, m^3	No decimals				
Resettable volume		l, m^3	1 decimal place				
Digital flow rate display		l/h	1 decimal place				
Registration capacity		l, m^3	8 digits				
Registration time at Q_{cont} until overrunning to zero		h	128 000	100 000	50 000	16 667	5 000
Outputs [6]							
Pulse value for totalisor	V/Imp		pulse value and width parameterisable				
Current 4..20 mA for flow rate	I_4 / Q_1, I_{20} / Q_2		flow rates to 4 and 20 mA parameterisable				
Frequency for flow rate	f_1 / Q_1, f_2 / Q_2		frequency and flowrate parameterisable				
Limiting value switch	Q_{min}, Q_{max}		minimum, maximum and hysteresis parameterisable				
VZOA							
Smallest readable amount		l	0.01	0.1	0.1	0.1	1
Registration capacity		m^3	1 000	10 000	10 000	10 000	100 000
Registration time at Q_{cont} until overrunning to zero		h	2 500	10 000	5 000	1667	5 000
Pulse values of pulsers:							
IN inductive according to IEC 60947-5-6		l/pulse	0.01	0.01	0.1	0.1	1
RV Reed		l/pulse	0.1	1	1	1	10
RV Reed		l/pulse	1	–	–	10	100

1) Manufacturer's specification, valid for the reference conditions as specified under "APPENDIX: Meter data".
2) 1 US gallon corresponds to 3.785 litres
3) For burners and engines or motors, the meter must be selected on the basis of the permanent flow rate. For higher viscosities, or if the meter is installed on the suction side, the pressure drop and any reduction in the measuring range must also be taken into consideration.
4) Min. flow rate VZO 15 with IN-pulser: 15 l/h
5) Weight without couplings.
6) Two freely selectable outputs are available, totally independent of each other.

Technical data for VZOA with PTB certification: 5.232 / 04.37 Class 1

Type			VZOA 15	VZOA 20	VZOA 25	VZOA 40	VZOA 50
Temperature max.	T_{max}	° C	130				
Maximum flow rate	Q_{max} 1)	l/h	400	1000	2000	6000	20000
Nominal flow rate	**Q_{cont} 1)**	**l/h**	**400**	**1000**	**2000**	**6000**	**20000**
Minimal flow rate	Q_{min}	l/h	40	100	200	600	2000
Accuracy class				1	1	1	1 1
Max. permissible error	±% of actual value		0.5	0.5	0.5	0.5	0.5

Technical data for VZOA with EEC legal verification: D 04 / 5.232.14

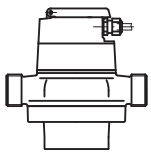
Type			VZOA 15	VZOA 20	VZOA 25	VZOA 40	VZOA 50
Temperature max.	T_{max}	° C	50				
Maximum flow rate	Q_{max} 1)	l/h	400	1000	2000	6000	20000
Nominal flow rate	**Q_{cont} 1)**	**l/h**	**400**	**1000**	**2000**	**6000**	**20000**
Minimal flow rate	Q_{min}	l/h	40	100	200	600	2000
Accuracy class			0.5	0.5	0.5	0.5	0.5
Max. permissible error	±% of actual value		0.3	0.3	0.3	0.3	0.3

Two items are required when ordering: the VZOA meter and EEC legal verification, Order No. 96026.

1) For burners and engines or motors, the meter must be selected on the basis of the permanent flow rate. For higher viscosities, or if the meter is installed on the suction side, the pressure drop and any reduction in the measuring range must also be taken into consideration.

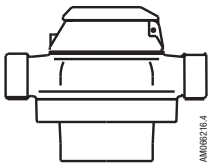
Electronic display and Outputs VZFA: see page 6
RV Pulsers and IN Pulsers: see page 15
Pressure drop curves: See “APPENDIX: Meter data”

Dimensions VZFA



Type	mm	VZFA 15	VZFA 20	VZFA 25	VZFA 40	VZFA 50
	Length	165	165	190	300	350
	Width	105	105	130	210	280
	Height	155	164	191	243	299

Dimensions VZOA



Type	mm	VZOA 15	VZOA 20	VZOA 25	VZOA 40	VZOA 50
	Length	165	165	190	300	350
	Width	105	105	130	210	280
	Typ ... 130 °C					
	Height	106	115	142	235	291
	Height -RV	130	139	166	259	315
	Height -IN	185	194	221	273	329
	Typ ... 180 °C					
	Height	147	156	183	235	291
	Height -RV	171	180	207	259	315
	Height -IN	225	234	261	313	369

Detailed dimensional diagrams in “APPENDIX: Meter data”

Type designation key

VZOA 25 FL 130/25-IN 0.1

- Pulser IN or RV and pulse value
- Nominal pressure (bar)
- Temperature (°C)
- Connection (RC = Threaded ends, FL = Flanges)
- Nominal diameter (mm)
- Meter type

Information required to process orders

When the order is placed, information is required on the plant operating conditions (as stated at the beginning of this section). For fiscal and commercial transactions only VZOA type meters may be used.

Example for differential measurement:

Application:		Differential measurement diesel, supply 200 l/h, return 120...190 l/h
2 Units	Order No. 93758	CONTOIL® fuel oil meter, type VZFA 20 RC 130/16
2 Units	Order No. 96112	Modification for differential measurement

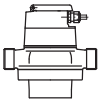
Example for fiscal or commercial transactions:

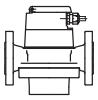
Application:		Commercial transactions in Germany, extra light heating oil, flow rate 200...400 l/h, temperature approximately 20 °C
1 Unit	Order No. 92290	CONTOIL®, fuel oil meter, type VZOA 20 RC 130/16
1 Unit	Order No. 96026	Modification with EC official verification

Example for standard applications without options:

Application:		Measurement of Diesel fuel on testing facility, flow rate 200...400 l/h, temperature 20...50 °C
1 Unit	Order No. 93758	CONTOIL®, fuel oil meter, type VZFA 20 RC 130/16

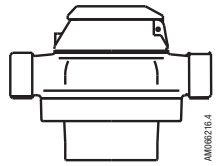
Ordering details for VZFA (meters with electronic counters and parameterisable outputs)

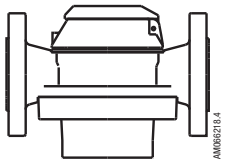
Threaded ends, PN 16	Type **130 °C**	Order No.
	VZFA 15 RC 130/16	93755
	VZFA 20 RC 130/16	93758
	VZFA 25 RC 130/16	93763
	VZFA 40 RC 130/16	93768

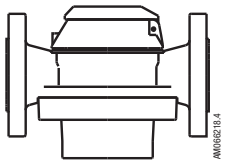
Flanges, PN 25	Type **130 °C**	Order No.	Type **180 °C**	Order No.
	VZFA 15 FL 130/25	93756	VZFA 15 FL 180/25	93757
	VZFA 20 FL 130/25	93759	VZFA 20 FL 180/25	93760
	VZFA 25 FL 130/25	93764	VZFA 25 FL 180/25	93765
	VZFA 40 FL 130/25	93769	VZFA 40 FL 180/25	93770
	VZFA 50 FL 130/25	93773	VZFA 50 FL 180/25	93774

Modifications		
	Paired for differential measurement	96112
	Type approval for ships (e.g. GL, LRS, DNV)	96295

Ordering details for VZOA (meter with roller counter)

Threaded ends, PN 16	Type **130° C**	Order No.	Type **130° C**	Order No.
	VZOA 15 RC 130/16	92286	VZOA 25 RC 130/16	92293
	VZOA 15 RC 130/16-RV 0.1	92287	VZOA 25 RC 130/16-RV 1	92294
	VZOA 15 RC 130/16-RV 1	92288	VZOA 25 RC 130/16-IN 0.1	92295
	VZOA 15 RC 130/16-IN 0.01	92289		
	VZOA 20 RC 130/16	92290	VZOA 40 RC 130/16	92296
	VZOA 20 RC 130/16-RV 1	92291	VZOA 40 RC 130/16-RV 1	92297
	VZOA 20 RC 130/16-IN 0.01	92292	VZOA 40 RC 130/16-IN 0.1	92298

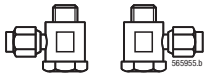
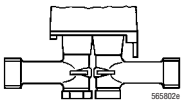
Flanges, PN 25	Type **130° C**	Order No.	Type **130° C**	Order No.
	VZOA 15 FL 130/25	92299	VZOA 40 FL 130/25	92309
	VZOA 15 FL 130/25-RV 0.1	92300	VZOA 40 FL 130/25-RV 1	92310
	VZOA 15 FL 130/25-RV 1	92301	VZOA 40 FL 130/25-IN 0.1	92311
	VZOA 15 FL 130/25-IN 0.01	92302		
	VZOA 20 FL 130/25	92303	VZOA 50 FL 130/25	92312
	VZOA 20 FL 130/25-RV 1	92304	VZOA 50 FL 130/25-RV 10	92313
	VZOA 20 FL 130/25-IN 0.01	92305	VZOA 50 FL 130/25-IN 1	92314
	VZOA 25 FL 130/25	92306		
	VZOA 25 FL 130/25-RV 1	92307		
	VZOA 25 FL 130/25-IN 0.1	92308		

Flanges, PN 25	Type **180° C**	Order No.	Type **180° C**	Order No.
	VZOA 15 FL 180/25	92315	VZOA 40 FL 180/25	92325
	VZOA 15 FL 180/25-RV 0.1	92316	VZOA 40 FL 180/25-RV 1	92326
	VZOA 15 FL 180/25-RV 1	92317	VZOA 40 FL 180/25-IN 0.1	92327
	VZOA 15 FL 180/25-IN 0.01	92318		
	VZOA 20 FL 180/25	92319	VZOA 50 FL 180/25	92328
	VZOA 20 FL 180/25-RV 1	92320	VZOA 50 FL 180/25-RV 10	92329
	VZOA 20 FL 180/25-IN 0.01	92321	VZOA 50 FL 180/25-IN 1	92330
	VZOA 25 FL 180/25	92322		
	VZOA 25 FL 180/25-RV 1	92323		
	VZOA 25 FL 180/25-IN 0.1	92324		

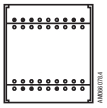
Modifications	Paired for differential measurement	96112
	Type approval for ships (e.g. GL, LRS, DNV)	96295
	With EEC legal verification	96026
Option / Accessory	Cable mounted on IN	80019

Accessories

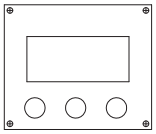
Ordering details for accessories

	Type	Description	Order No.
Threaded connections 	VSR 1/2”	for DN 15	81160
	VSR 3/4” × 1/2”	for DN 20	81163
	VSR 3/4”	for DN 20	81166
	VSR 1”	for DN 25	81169
	VSR 11/2”	for DN 40	81181
Threaded connections kit 	PS-Kit VZO 4	1/8” – 8	81583
Mounting kit 	PS-Kit VZO 8	Mounting Kit	81130
	VSR 3/8”	Threaded connections to suit PS-Kit VZO 8	81156

Order details for supplementary equipment

	Type	Description	Order No.
Remote totaliser 	CP 2 2293	Totaliser, zeroing selectable	94504
Isolated switch amplifier 	Ex version	with relay output, max. 10 Hz	81705
	Ex version	with electronic output, max. 5 kHz	80013

Order details for supplementary equipment with mounting kits

	Type	Description	Order No.
Transducers 	Flow calculator	freely programmable, with analogue output 4...20 mA, indication of flow rate, limiting values	92439
	Differential flow calculator	freely programmable, with analogue output 4...20 mA, indication of flow rate, limiting values. Both inputs can be read out individually.	92440
	Frequency current converter	freely programmable.	92439
Mounting kit	Kit	for wall mounting or on DIN-35 mm rail	on request

Meter data

Function

CONTOIL® flow meters work on the volumetric principle of rotary piston meters (positive displacement meters).
The main features of this measuring principle are large measuring ranges, high accuracy, suitability for high viscosities and independence from power supply; flow disturbances do not influence proper operation.

Construction

Rotary piston, guide roller and drive are the only moving parts in contact with the liquid. Their movement is transmitted by a magnetic coupling through a sealing plate. The hydraulic part is completely separated from the totalising module.

VZF/VZFA 15 ... 50
Connections are made radially with two cable entries underneath the display unit which can be mounted and rotated through 90° steps.

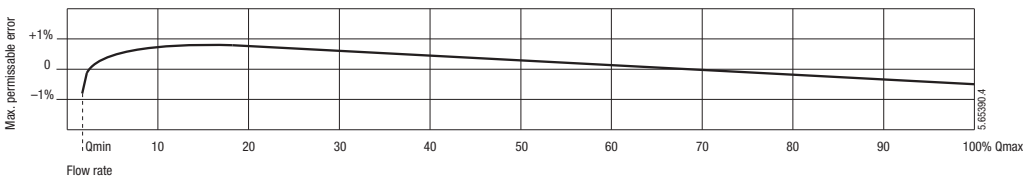
VZO/VZOA 15 … 50
With the exception of the counter with the RV Reed pulser, the roller counter can be rotated through 360° for optimum readability.

VZO/VZOA 4 and 8
The connections for the inlet and outlet are situated vertically from below in the base plate. With the OEM meter version the connections are situated on the side.

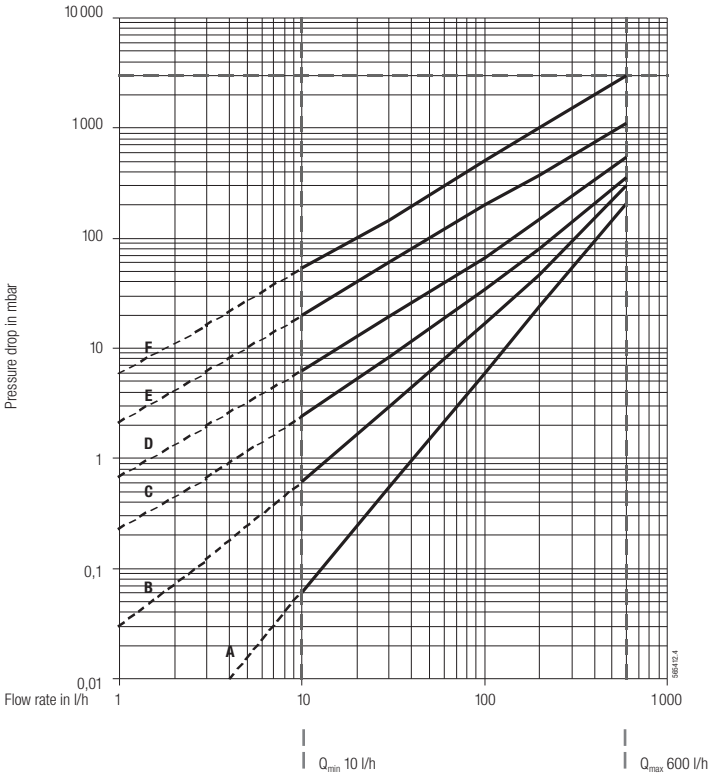
Measuring error limits: Reference conditions
Measuring error limits according to technical data of meter in % of actual value for the whole measuring range.

Reference conditions

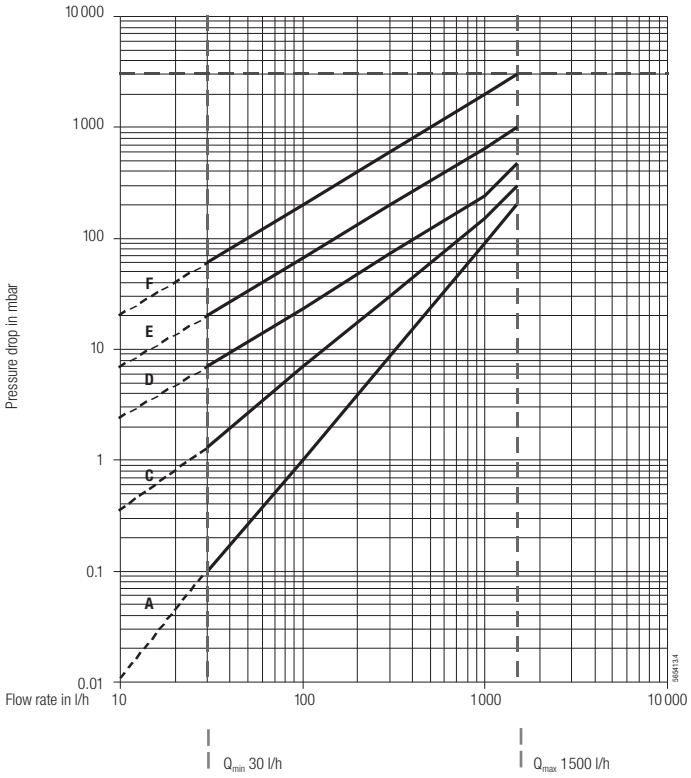
Liquid: Calibration oil similar to extra light heating oil, density at 20 °C = 814 kg/m^3
Viscosity = 5.0 mm^2/s according to DIN 51757 / ISO 3104 (corresponds to 4.1 mPa.s)
Temperature: 18...25 °C
Horizontal mounting, readings from counter.
CONTOIL® Oil meters are never to be tested with water, otherwise they will get damaged.



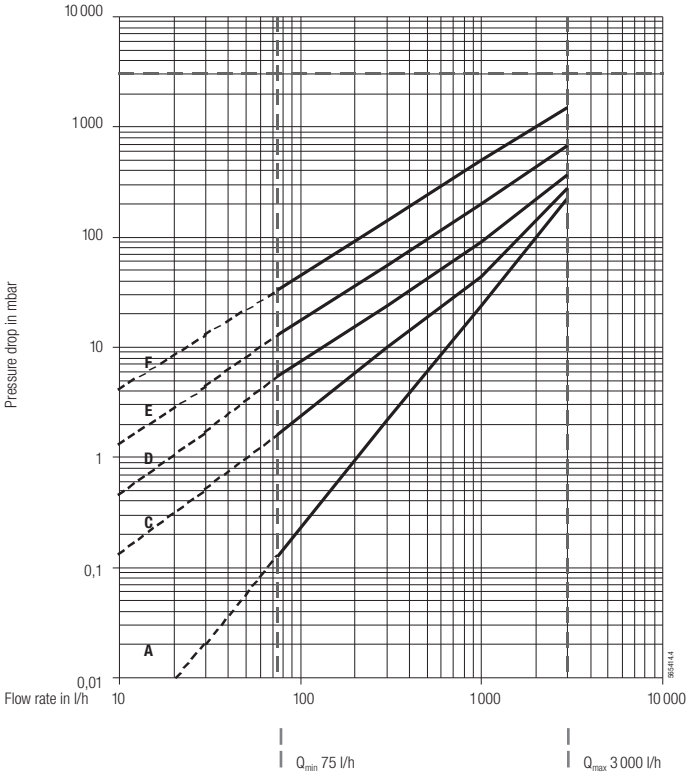
DN 15



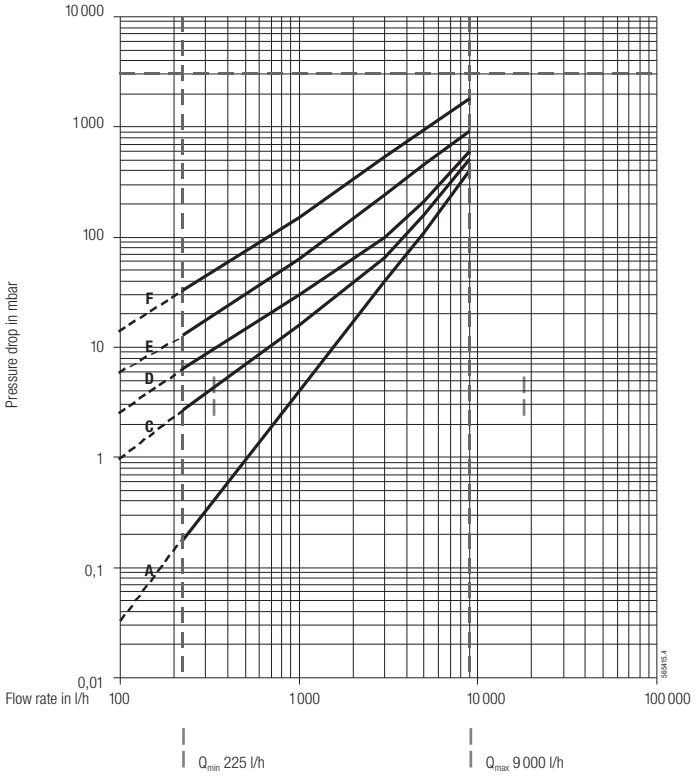
DN 20



DN 25



DN 40

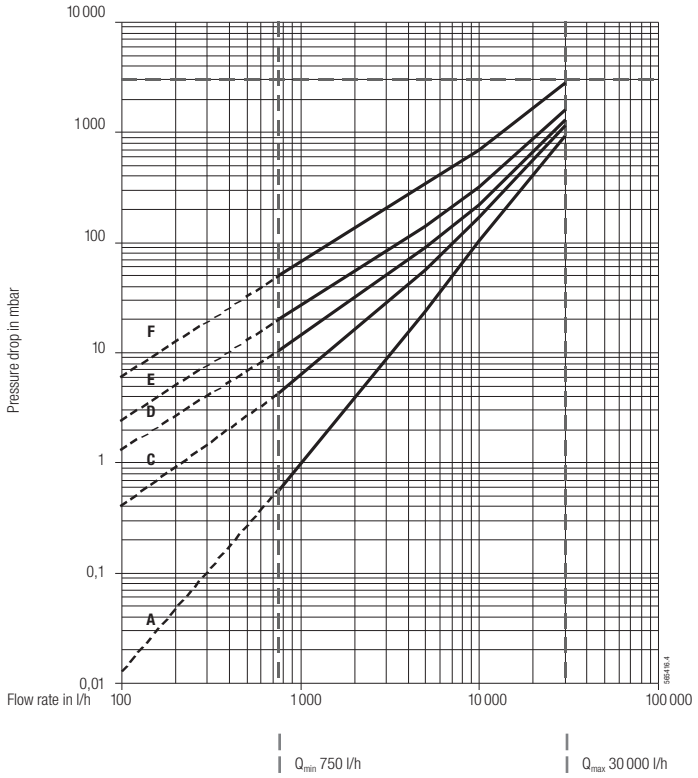


Viscosity diagrams:

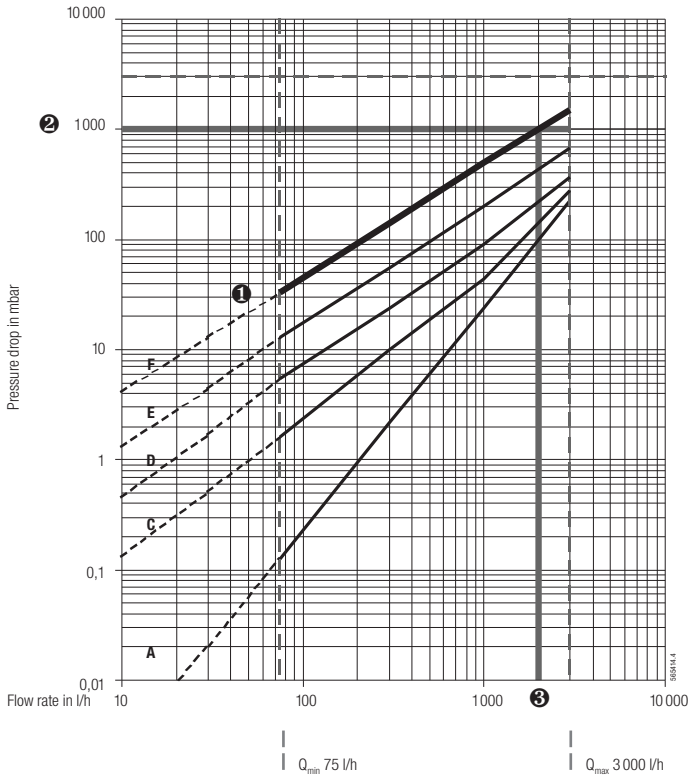
A = 5 mPa.s
B = 25 mPa.s
C = 50 mPa.s
D = 100 mPa.s
E = 200 mPa.s
F = 500 mPa.s

For a pressure drop of more than 1 bar, it is recommended to use the next larger meter size.
Maximum permissible pressure drop = 3 bar

DN 50



Example



Mineral oil, viscosity 450 mPa.s
VZO 25 mounted on pressure side of pumps

❶ Viscosity curves DN 25
select closest curve
F = 500 mPa.s

❷ Assume max. permissible pressure drop = 1 bar

❸ The intersection of curve F with the line corresponding to 1bar gives a flow rate of 2000 l/h.

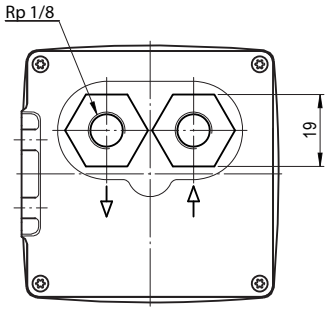
Materials				**Meter Size DN**				
Part	Material	4	8	15	20	25	40	50
Housing / Measuring unit	Brass	●	●					
Housing with threaded ends	Cast brass			●	●	●		
	Spheroidal graphite iron GJS 40						●	
Housing with flanges	Spheroidal graphite iron GJS 40			●	●	●	●	●
Measuring chamber								
- PN 16 / 25	Cast brass			●	●	●	●	
	Alu-Bronze							●
- PN 40	Stainless steel			●	●	●	●	●
Seals	NBR butadiene-acrynitril	●						
	FPM fluorelastomer	S	●	●	●	●	●	●
Rotary piston	Anodized aluminium	●	●	●	●	●	●	●
Ancillaries	Plastic			●	●	●	●	●

S = Special versions

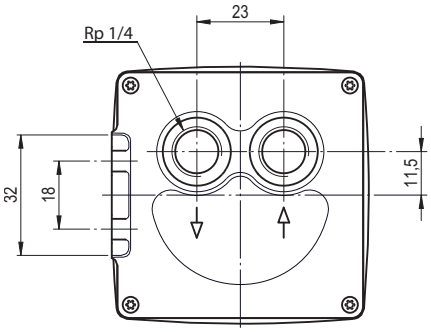
Dimensions in mm

VZO/VZOA 4 and 8

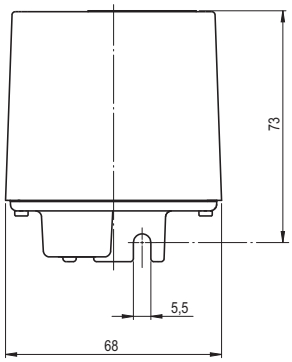
DN 4

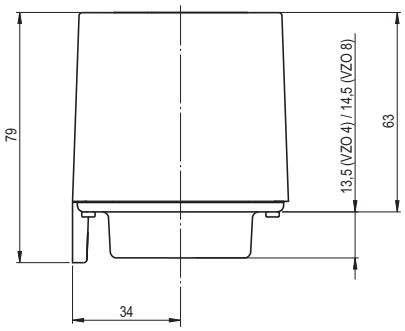


DN 8

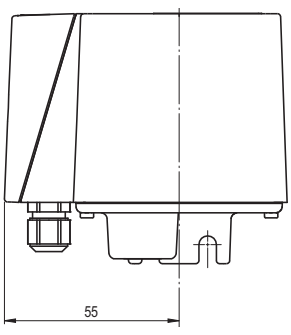


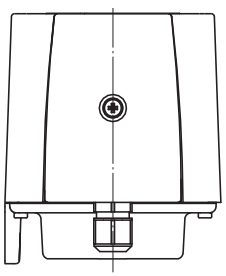
without pulser





with pulser

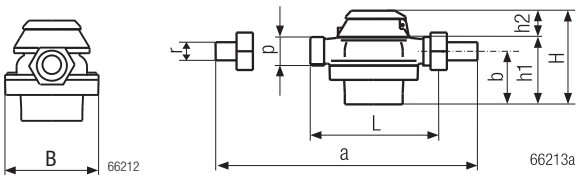




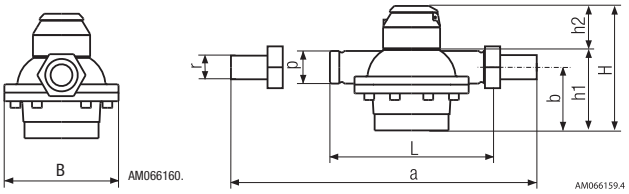
Dimensions in mm

Flow sensors (all types)

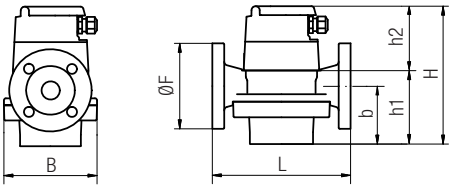
DN 15, 20, 25: with threaded ends (ISO 228-1)



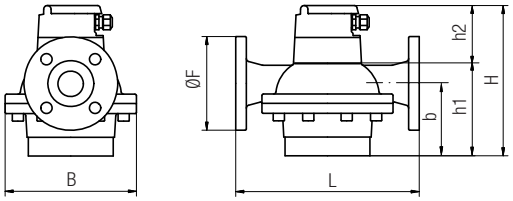
DN 40: with threaded ends (ISO 228-1)



DN 15, 20, 25: with flanges (DIN 2501/SN 21843)



DN 40, 50: with flanges (DIN 2501/SN 21843)



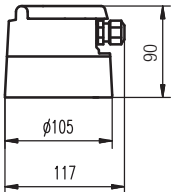
Nominal size	L	B	a	Ø F	b	h1	p	r
DN 15	165	105	260	95	45	65	G $^{3}/_{4}$”	G $^{1}/_{2}$”
DN 20	165	105	260	105	54	74	G 1”	G $^{3}/_{4}$”
DN 25	190	130	305	115	77	101	G 1$^{1}/_{4}$”	G 1”
DN 40	300	210	440	150	116	153	G 2”	G 1$^{1}/_{2}$”
DN 50	350	280	–	165	166	209	–	–

Dimensions of transducer groups / measurement transducer

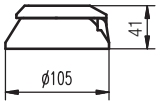
Oil flow meter	VZF / VZFA	VZO 15 - 25						VZO 40 - 50 / VZOA 15 - 50					
Max. temperature	130/180°C	130°C			180°C			130°C			180°C		
Pulsers	all	-	RV	IN	-	RV	IN	-	RV	IN	-	RV	IN
Dimensional drawing	1	2	3	6	5	4	7	5	4	6	5	4	7

VZF(A), VZO(A) Dimensional drawings 1 - 7 from table above

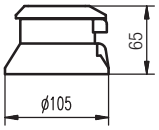
1



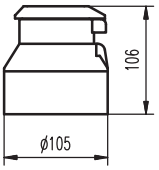
2



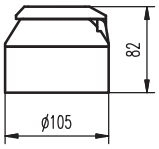
3



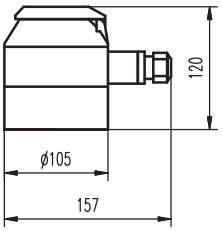
4



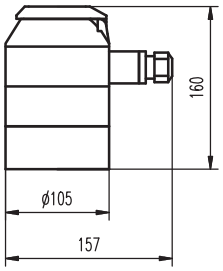
5



6



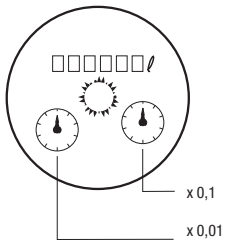
7



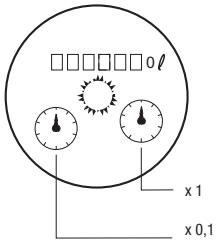
Display / Roller counter

VZF / VZFA

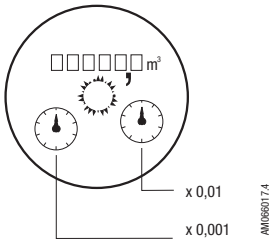
VZO / VZOA 15



VZO / VZOA 20, 25, 40



VZO / VZOA 50



AM066017.4

Selection of the optimal meter

Type		VZF	VZO	VZO	VZFA	VZOA	VZOA
		15-50	4-8	15-50	15-50	4-8	15-50
Application							
Direct consumption measurement		●	●	●	●	●	●
Differential measurement		–	–	–	●	–	●
Measuring points with metrolog. approval / calibration (optional)		–	–	–	–	●	●
Measuring points with marine type approval (optional)		●	–	●	●	–	●
Most frequent areas of use							
Domestic / industrial burner	light/medium oil	●	●	●	●	●	●
	heavy oil 1)	●	–	●	●	–	●
Diesel engines	diesel oil	●	●	●	●	●	●
Ship motors	heavy oil 1)	●	–	●	●	–	●
Petrol engines			2)			–	
Common applications							
Heating systems		●	●	●			
Ships		●		●	●		●
Diesel locomotives		●	●	●	●		●
Trucks/coaches/construction machinery			●	●			●
Fuel types							
Light heating fuel		●	●	●	●	●	●
Medium heating fuel		●	●	●	●		●
Heavy heating fuel		●	–	●	●	–	●
Diesel		●	●	●	●	●	●
Petrol 2)			2)				
Display of flow data							
Total volume		●	●	●	●	●	●
Resettable volume		●	–	–	●	–	–
Instantaneous flow rate		●	–	–	●	–	–
Method of display							
LCD Electronic display		●	–	–	●	–	–
Total volume display on roller counter		–	●	●	–	●	●
Measuring error limits							
±1 % if actual value		●	●	●	–	●	–
±0,5 % of actual value or smaller		–	–	–	●	–	●
PTB approval	Class 1	–	–	–	●	●	●
EC approval/verification	Class 1	–	–	–	–	DN 4	–
	Class 0.5	–	–	–	–	DN 8	●
Outputs 4)							
Current output	4..20mA	●	–	–	●	–	–
Digital outputs	volume pulses	●	–	–	●	–	–
	frequency signal	●	–	–	●	–	–
	min/max limiting values	●	–	–	●	–	–
Pulser (Option)							
Inductive, with decadic pulse value		–	–	●	–	–	●
Reed pulser for remote totalisation		–	●	●	–	●	●

● applicable – not applicable

Fuels and suitable Meter sizes	DN 4	DN 8	DN 15	DN 20	DN 25	DN 40	DN 50
Light heating fuel	●	●	●	●	●	●	●
Medium heating fuel	●	●	●	●	●	●	●
Heavy heating fuel	–	–	3)	●	●	●	●
Diesel	●	●	●	●	●	●	●
Petrol	2)	2)	–	–	–	–	–

1) Only in accordance with the maximum mesh size of the dirt filter as per technical data.
2) Determine conditions of use with supplier (other measured values!).
3) DN 15 only when the plant has a dirt filter with a max. 0.1 mm mesh size.
4) Two freely selectable independent outputs are always available.

Application note

For viscosities higher than 5mPa.s or for installations on the suction side of a pump, pressure drop and possible limitation of flow range must be taken into consideration.

DMS Metering Solutions
X-Cel House, Chrysalis Way,
Langley Bridge,
Eastwood,
NG16 3RY

DMS METERING SOLUTIONS

Tel.: 01773 534555
Fax: 01773 534666
Email: sales@dmsltd.com
Web: www.dmsltd.com