

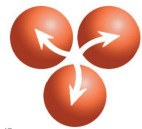
Trigas DM

Durchflussmesser-Manufaktur



TF- & DM-Series

*Turbine-
flowmeter*



Turbine flowmeter

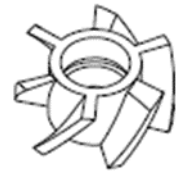
.. are the ideal solution for measuring applications in liquids when high accuracy, very fast response times, compact design, high reliability are also required in continuous operation and flow changes at fluctuating operating temperatures. A variety of selectable connections allows the measuring instruments to be used as required.

Applications

The TF- & DM-Series turbine flowmeters have a wide range of applications. These include i.a. Monitoring of flow rates of fuels and coolants and lubricants in engine and engine construction, measurement of dosing quantities in the food and pharmaceutical sector, monitoring and measurement of high-purity water in the research and development sector, quantity measurement for consumption calculations and much more.

Advantages

- New helical rotor blades design for improved linearity and lower pressure loss.
- Interference-free signal transmission by digital output signal.
- Precision ball bearings for better repeatability and optimum results at low flow rates.
- Very large measuring range.
- Integrated temperature sensor in the sensor (pickoff).



Flow meter manufacture

As a specialist in flow measurement technology, *TrigasDM* supplies high-quality measuring instruments, electronics and calibrators for liquids and gases.

Made in Germany

Our products are exclusively developed and manufactured in Neufahrn, 20 km north of Munich, ensuring world-class technical know-how for our customers.

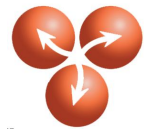
Contact

We are proud of our high-quality products and friendly customer service and welcome you as a valued customer to our growing family. You can benefit from our long-standing experience and our comprehensive technical support.

TrigasDM GmbH
Erdinger Str. 2b

85375 Neufahrn, Germany

Tel.: +49 8165 9999-300
Fax: +49 8165 9999-369
E-Mail: info@trigasdm.com
www.trigasdm.com



Technical data

Flow range:	see "Measuring ranges" table
Response time:	<3 ms
Temperature range:	TF-Series -270° C up to 150° C DM-Series -270° C up to 400° C
Operating pressure:	up to 540 bar depending on connection <u>AN</u> : up to 540 bar <u>HS</u> : up to 34 bar <u>Tri-Clamp</u> : up to 50 bar
Viscosity:	Each turbine is calibrated according to customer specifications and delivered with individual calibration protocols. (Standard viscosity: 1.3 mm ² /s)
Calibration accuracy:	≤±0.03% of reading
Repeatability:	≤±0.05% of reading
Linearity:	≤±0.5% of reading value in the linear flow range ≤±0.1% with linearization electronics
Standard material:	Stainless steel

Measuring ranges

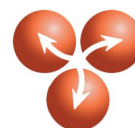
Model	Linear Range		Extended Flowrange			K-Faktor ¹⁾ [Impulse/l]	max. Frequency ¹⁾ [Hz]
	[l/min]		[l/min]				
	RF ²⁾ und Mag ³⁾		RF ²⁾	Mag ³⁾	Alle		
	min.	max.	min.	min.	max.		
DM2-8	0,5 ⁴⁾	5 ⁴⁾	0,05	0,8	5,5	22600	2300
TF/DM4-8	0,95	12	0,1	0,4	13	8700	1950
TF/DM6-8	1,9	20	0,2	0,5	24	4860	2000
TF/DM8-8	2,8	33	0,3	0,6	38	3720	2100
TF/DM-08	3,0	40	0,4	0,8	48	2450	1950
TF/DM-10	4,5	60	0,6	1,1	70	1710	2000
TF/DM-12	7,6	90	0,9	1,9	95	1260	2000
TF/DM-16	19	220	2,2	3,8	240	550	2200
TF/DM-20	34	400	3,8	6,0	490	245	2000
DM-24	57	700	6,0	10	820	110	1500
DM-32	83	1100	10	13	1300	65	1400
DM-40	151	1510	17	19	1700	48	1200

1) The K-factors and frequency data are average values. Each turbine is calibrated according to customer specifications and delivered with individual calibration protocols.

2) RF = Frequency-modulated pickoff

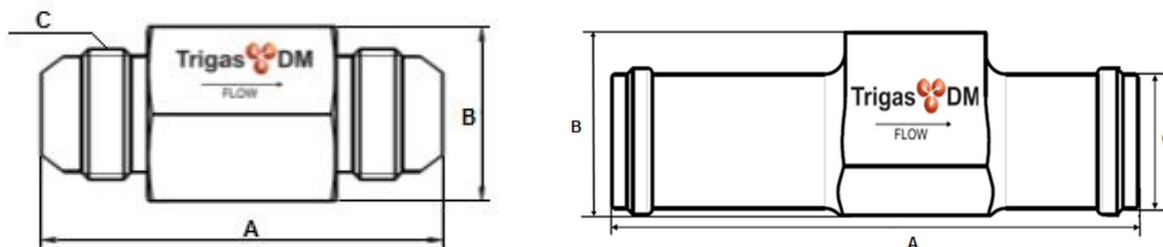
3) Mag = Magnetic pickoff

4) DM2-8 ≤±2% of reading



Dimensions

Other end fittings are available upon request.



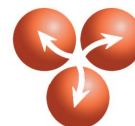
TF- & DM-Series AN-Housing

Model	Inner Ø	Housing [mm]		Connection	Tube Ø AN-Size	Pickoff	
	[mm]	A	B	C	["]	t [mm]	Thread
DM2-8	7,6	62,2	25 / 25	¾" -16UNJF-3A	1/2	7,7	DM-Serie 5/8" - 18UNF-2B TF-Serie 1 1/16"-24NEF-2B
TF/DM4-8	7,6	62,2	25 / 25	¾" -16UNJF-3A	1/2	7,7	
TF/DM6-8	9,4	62,2	25 / 25	¾" -16UNJF-3A	1/2	7	
TF/DM8-8	10,2	62,2	25 / 25	¾" -16UNJF-3A	1/2	6,7	
TF/DM-08	11,2	62,2	25 / 25	¾" -16UNJF-3A	1/2	6,2	
TF/DM-10	12,8	69,1	SW 36	7/8" -14UNJF-3A	5/8	10,6	
TF/DM-12	14,3	82,6	SW 36	1-1/16" -12UNJ-3A	3/4	9,5	
TF/DM-16	21,9	90,4	SW 41	1-5/16" -12UNJ-3A	1	8,1	
TF/DM-20	25,4	103	SW 50	1-5/8" -12UNJ-3A	1 1/4	10,3	
DM-24	33,4	116,6	SW 55	1-7/8" -12UNJ-3A	1 1/2	8,9	
DM-32	44,5	154,0	SW 70	2-1/2" -12UNJ-3A	2	10,4	

TF- & DM-Series HS-Gehäuse

Model	Inner Ø	Housing [mm]		Connection	Pickoff	
	[mm]	A	B	C	t [mm]	Thread
DM2-8	7,6	62,2	22 / 17	9,5	7,2	DM-Serie 5/8" - 18UNF-2B TF-Serie 1 1/16"-24NEF-2B
TF/DM4-8	7,6	62,2	22 / 17	9,5	7,2	
TF/DM6-8	9,4	62,2	25 / 25	12,7	6,6	
TF/DM8-8	10,2	62,2	25 / 25	12,7	6,2	
TF/DM-08	11,2	62,2	25 / 25	12,7	5,7	
TF/DM-10	12,8	69,1	26 / 22	15,9	10,1	
TF/DM-12	14,3	82,6	26 / 22	19,1	7,0	
TF/DM-16	21,9	90,4	33 / 25	25,4	5,7	
TF/DM-20	25,4	103,0	43 / 27	31,8	10,4	
DM-24	33,4	116,6	50 / 24	38,1	8,9	
DM-32	44,5	154,0	63 / 24	50,8	10,4	
DM-40	59,7	128,0	Ø 85	64,0	8,1	

The total height is calculated from the height (B) of the flow meter plus measuring element minus the screw-in depth (t).



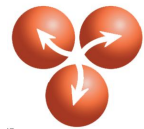
Pressure drop

Subsequently, the pressure losses at different flow rates are listed.

Model	Pressure drop [bar]						
	% of the max. linear flow						
	10%	25%	40%	55%	70%	85%	100%
DM2-8	0,00	0,01	0,03	0,05	0,08	0,11	0,15
TF/DM4-8	0,01	0,03	0,06	0,16	0,19	0,27	0,35
TF/DM6-8	0,01	0,02	0,06	0,11	0,16	0,23	0,32
TF/DM8-8	0,01	0,05	0,11	0,20	0,30	0,46	0,61
TF/DM-08	0,01	0,03	0,08	0,14	0,21	0,29	0,36
TF/DM-10	0,06	0,12	0,23	0,41	0,61	0,92	1,22
TF/DM-12	0,06	0,13	0,24	0,42	0,64	0,93	1,22
TF/DM-16	0,06	0,09	0,16	0,27	0,39	0,57	0,74
TF/DM-20	0,06	0,13	0,24	0,43	0,62	0,96	1,31
DM-24	0,07	0,16	0,32	0,60	0,89	1,32	1,74
DM-32	0,07	0,08	0,14	0,24	0,34	0,51	0,66
DM-40	0,03	0,06	0,13	0,21	0,40	0,45	0,61

Max.operating pressure

Model	Max.operating pressure [bar]	
	AN	HS
DM2-8	540	34
TF/DM4-8	540	34
TF/DM6-8	450	34
TF/DM8-8	410	34
TFDM-08	410	34
TF/DM-10	410	34
TF/DM-12	410	34
TF/DM-16	350	34
TF/DM-20	350	34
DM-24	250	34
DM-32	250	34
DM-40	N/A	34

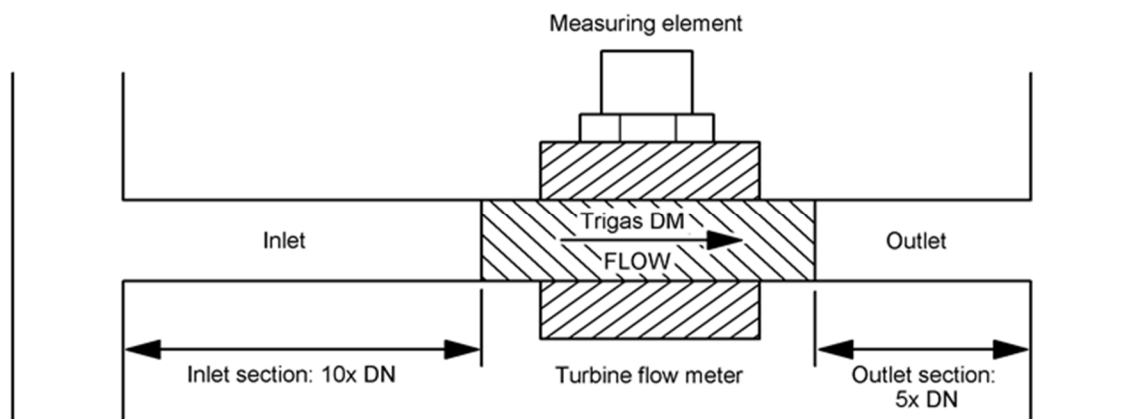


Piping Configuration

Turbine flow meters can be affected by the velocity profile of the fluid being measured. Installation with proper pipe runs will reduce or completely eliminate flow profile induced measurement errors during calibration and operation.

A straight run of pipe of at least 10 times the pipe diameter in an upstream direction, and 5 times the pipe diameter in a downstream direction are recommended (see figure and table). The upstream section should be fitted with flow straightening vane.

Appropriate flow straightening sets (up- and downstream) are available on request.



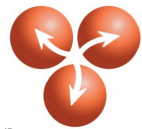
Inlet section and outlet section, schematic diagram

Contamination / filter

All pipe sections and components in the metering line must be cleaned prior to the installation of the flow meter. Pipe Sealants, metal shavings and slag can damage the flow meter.

If the cleanliness of the fluid cannot be guaranteed, a filter should be installed upstream of the flow meter, subject to the diameter of the flow meter.

Model	Inner Ø [mm]	Filter mesh width
DM2-8	7,6	10 Mikrometer
TF/DM4-8	7,6	10 Mikrometer
TF/DM6-8	9,4	10 Mikrometer
TF/DM8-8	10,2	10 Mikrometer
TFDM-08	11,2	10 Mikrometer
TF/DM-10	12,8	10 Mikrometer
TF/DM-12	14,3	10 Mikrometer
TF/DM-16	21,9	20 Mikrometer
TF/DM-20	25,4	20 Mikrometer
DM-24	34,4	50 Mikrometer
DM-32	44,5	50 Mikrometer
DM-40	59,8	50 Mikrometer

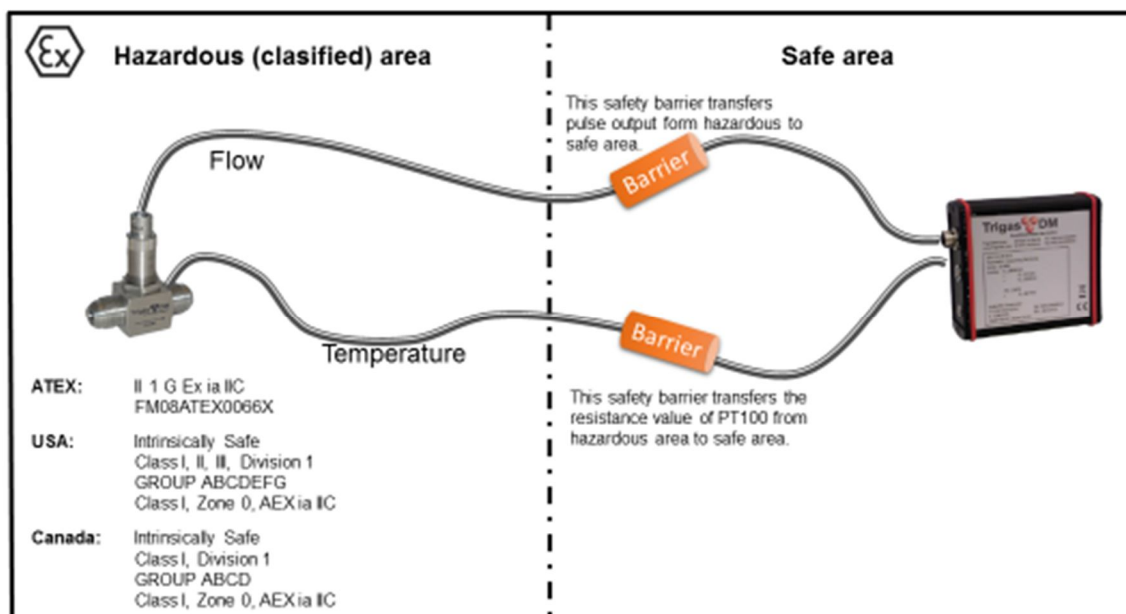


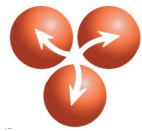
Explosion protection (ATEX)

- Pickoffs and electronics can be supplied in explosion proof versions (ATEX) on request. With explosion proof electronics, *TrigasDM* turbine flow meters can be used in environments as severe as Ex-Zone 1.
- The design consists of the turbine flow meter and the ATEX Pickoff. The following type of protection applies to this construction:

ATEX:	II 1 G Ex ia IIC FM08ATEX0066X
USA:	Intrinsically Safe Class I, II, III, Division 1 GROUP ABCDEFG Class I, Zone 0, AEX ia IIC
Canada:	Intrinsically Safe Class I, Division 1 GROUP ABCD Class I, Zone 0, AEX ia IIC

- The turbine flow meter is installed in the hazardous area.
- The mounting of the barrier and the TriLIN is carried out in the safe area.
- Without barriers, the turbine flow meter must not be operated in the hazardous area.
- Cable lengths of up to 400 m are possible depending on the safety barrier used.



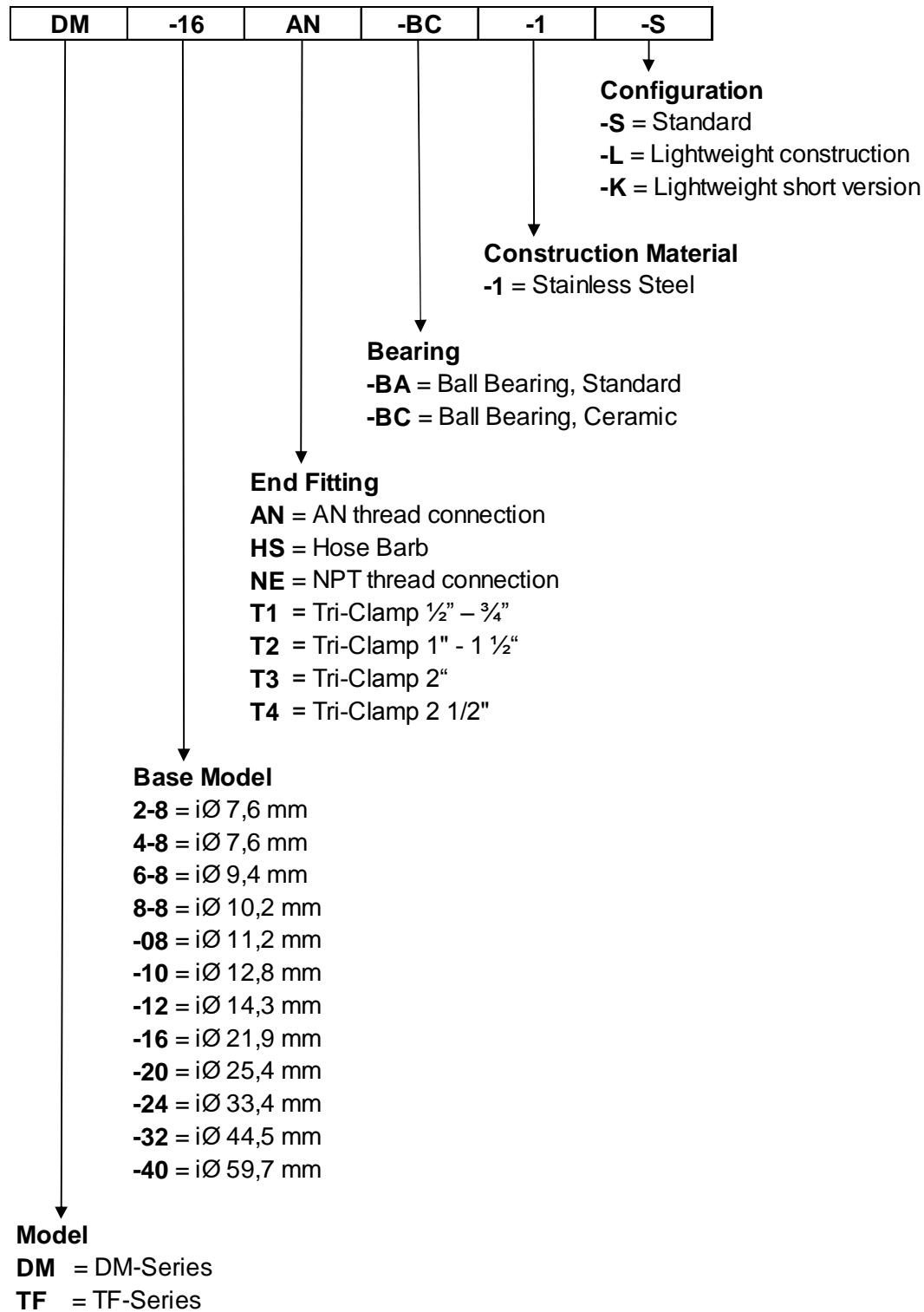


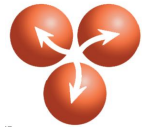
Model numbering key

The type number describes the properties of the measuring instrument.

Model numbering key TF- & DM-Series

(f.e. DM-16AN-BC-1-S)





Model numbering key Pickoff
(f.e. R07C3T)

