

Trigas  **DM**

Durchflussmesser-Manufaktur



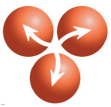
DML SERIES

PELTON WHEEL FLOWMETERS

FOR MEASUREMENTS AS LOW AS **3.8 ml/min**

Datasheet

DML-Series, EN / 10411



Pelton Wheel flowmeters

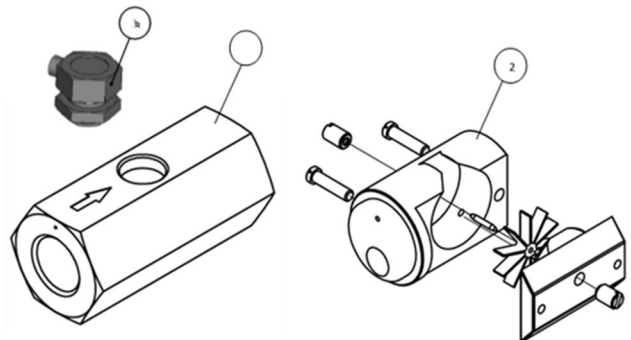
Pelton Wheel flowmeters are the ideal solution for measurement applications in liquids, where high accuracy, very fast response time, compact design, high reliability in continuous operation and insensitivity to fluctuating flow and temperature are required. A variety of end fitting options allows the measuring instruments to be easily connected to the process piping. The DML series is a turbine flowmeter variant specifically designed for high-precision, very low flow measurement of **liquids and gases**.

Applications

The DML-Series turbine flowmeters are suited for a wide range of applications. These include monitoring of fuel, coolants and lubricants in engine development and construction, measurement of dosing quantities in the food and pharmaceutical sector, monitoring and measurement of high-purity water in the research and development sector, diesel consumption calculations and much more.

Advantages

- Precision machined inlet and outlet orifices for improved linearity and reduced pressure loss
- Digital output signal for Interference-free transmission
- Precision sapphire jewel bearings for better repeatability and optimal results at low flow rates
- Wide measuring ranges
- Pulse sensor (pickoff) in the housing with integrated temperature sensor



Flow meter manufacture

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

Made in Germany

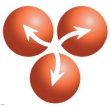
Our products are exclusively developed and manufactured in Neufahrn, 20 km north of Munich, ensuring world-class technical know-how for our customers.

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.

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Technical data

Flow range: see "Measuring ranges" table
 Response time: < 4 ms
 Temperature range: -50 °C to +150 °C with Jewel bearings
 -270 °C to +400 °C with ball bearings
 (Consult factory for pickoff Temperature rating)
 Operating pressure: Maximum 200 bar, with G (BSPP) female threads
 (Higher pressures are possible as special configurations.)
 BSP: BS EN 10226-1:2004,
 BS EN 10226-2:2005, BS EN 10226-3:2005.
 If fitting adaptors are used as part of the installation process, the pressure ratings listed above are superseded by the rating of the adaptors. Please consult appropriate standards or contact the adaptor manufacturer.
 Viscosity: Each DML series Pelton Wheel flowmeter is calibrated according to customer specifications and delivered with individual calibration protocols. (Standard viscosity: 1.3 mm²/s)

Liquid

Calibration accuracy: $\leq \pm 0,03\%$ of Reading
 Repeatability: $\leq \pm 0,1\%$ of Reading
 Accuracy: $\leq \pm 0,25\%$ with Linearization Electronics
 Linearity: $\leq \pm 0,1\%$ with Linearization Electronics


Gas

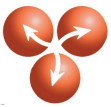
Calibration accuracy: $\leq \pm 0,3\%$ of Reading
 Repeatability: $\leq \pm 0,2\%$ of Reading
 Accuracy: $\leq \pm 0,60\%$ with Linearization Electronics
 Linearity: $\leq \pm 0,1\%$ with Linearization Electronics

Materials of Construction: Stainless steel -1.4305/303 Housing, 1.4104/430F Rotor
 Ceramic Ball Bearings: Si₃N₄, 1.4108/440C, 1.4016/430
 Jewel Bearings: Synthetic Sapphire

Measuring ranges

a) Gas, Jewel Bearing, Code JG only

 Model	Standard Range		Extended Range		K-Factor ¹⁾ Pulse/ml	max. Frequency ¹⁾ Hz
	ml/min		ml/min			
	min.	max.	min.	max.		
DML0.6	42,5	425	-	-	170	1200
DML1.0	70,8	708	57	848	85	1000
DML2.0	141,5	1415	99	1698	36	860
DML4.0	339,8	3398	226	5663	14	760
DML5.0	566,3	5663	425	8495	8,5	800



b) Liquid – Jewel Bearing, Code JL Only

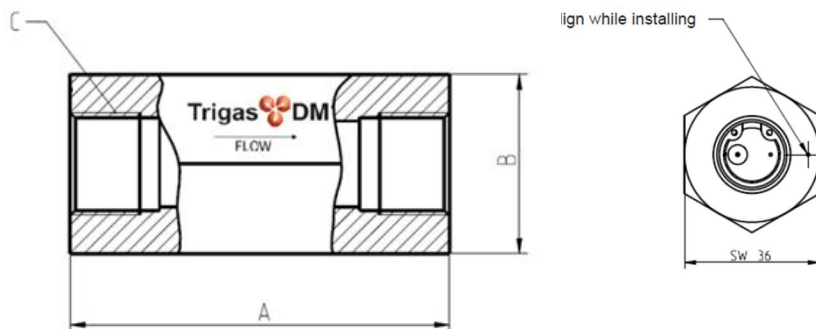
 Model	Standard Range		Extended Range		K-Factor ¹⁾	max. Frequency ¹⁾
	ml/min		ml/min		Pulse/ml	Hz
	min.	max.	min.	max.		
DML0.6	7,57	75,7	3,8	303	211	270
DML1.0	30,3	303	11	605	119	600
DML2.0	94,6	946	38	1514	48	750
DML4.0	302,8	3028	76	4920	15	650
DML5.0	567,7	5677	189	7570	9	825

c) Liquid – Ball Bearing (Bearing Code BC and BA)

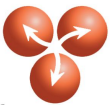
 Model	Standard Range		Extended Range		K-Factor ¹⁾	max. Frequency ¹⁾
	ml/min		ml/min		Pulse/ml	Hz
	min.	max.	min.	max.		
DML0.6	7,57	75,7	7,75	303	211	270
DML1.0	30,3	303	18,9	605	119	600
DML2.0	94,6	946	75,7	1514	48	750
DML4.0	302,8	3028	189,2	4920	15	650
DML5.0	567,7	5677	378,5	7570	9	825

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

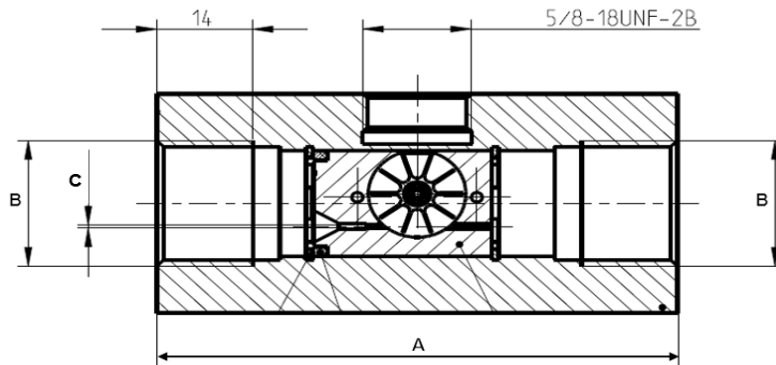
Dimensions



Model	Inner Ø [mm]	Housing [mm]			Pickoff Measuring sensor	
		length A	Height/Width B	Thread Type	Screw in depth [mm]	Thread Type
DML0.6	0,6	76,2	SW 36	BSPP-G ½" FEMALE	17,7	5/8"-18UNF- 2B
DML1.0	1,0					
DML2.0	2,0					
DML4.0	4,0					
DML5.0	5,0					



End Fitting types and operating pressure



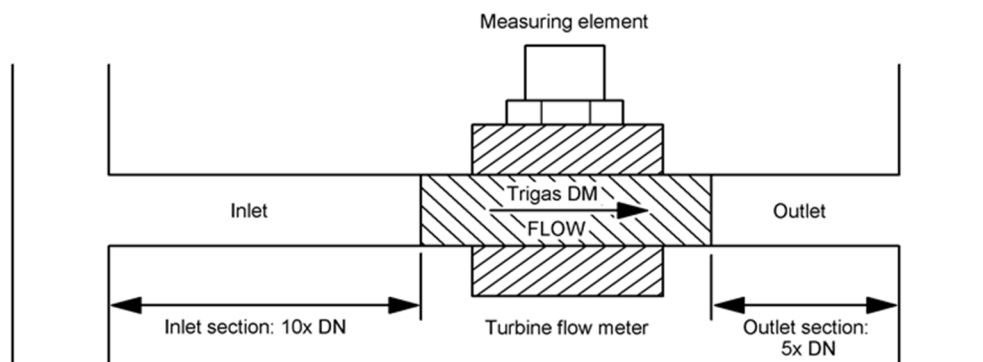
Model	A [mm]	B [Inch]	C [mm]	max. operating pressure [bar]
DML0.6	76,2	G1/2" (20,955mm)	0,6	400
DML1.0			1,0	
DML2.0			2,0	
DML4.0			4,0	
DML5.0			5,0	

NOTE

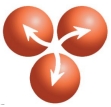
Other end fittings can be supplied on request

Piping Configuration

Pelton wheel flowmeters are generally not affected by upstream flow disturbances (such as vortex or airfoil distortions) because the flow in the flowmeter's body fully normalizes the flow in all but the largest models. However, it is recommended that standard recommendations for directing flow are followed for optimal accuracy.



Inlet section and outlet section, schematic diagram



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.

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. The selection of the filter depends on the precision opening of the flow meter and the bearing of the rotor. Contamination between the inside of the housing and Pelton wheel can lead to a blockage of the flow.
- A filter must always be used for gas measurements
Sapphire bearings (Codes LJ, LG): 100 micrometer
Ball bearings (Codes BA, BC): 10 micrometer

Explosion protection (ATEX)

All TrigasDM flow meters can be configured for installation in hazardous areas such as Zone 0. With suitable transducers and safety barriers, **ATEX: II 1G Ex ia IIC (zone 0, 1, 2)** is possible.

Please contact TrigasDM for more information.

Declaration of conformity

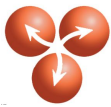
TrigasDM flow meters are not subject to the WEEE directive for Waste Electrical and Electronic Equipment and comply with the RoHS directive for Restriction of Hazardous Substances.

TrigasDM flow meters comply with applicable EU directives (EU Declaration of Conformity).

Warranty

TrigasDM GmbH (supplier) guarantees that all the equipment supplied hereunder is flawless regarding materials and workmanship, provided that the equipment was selected in accordance with its intended purpose, installed properly and not operated incorrectly.

Only the current "General Terms and Conditions" of TrigasDM apply. You can either request a copy of the terms and conditions by calling +49 8165 9999-300, or visit our website at www.trigasdm.com for information.



Model numbering key DML Series

Type code:	#1	#2	#3	#4	#5	#6
Example:	DML	0,6	AF	-BC	-1	-S

1	Code	
Type	DML	
2	Code	Size / Measuring range liquids
Pelton wheel	0.6	iØ 0.6 mm Orifice
	1.0	iØ 1.0 mm Orifice
	2.0	iØ 2.0 mm Orifice
	4.0	iØ 4.0 mm Orifice
	5.0	iØ 5.0 mm Orifice
3	Code	Process connection
	GF	G threads, ½" Female
4	Code	Bearings
Bearings	-BC	Ball Bearings, Ceramic, Liquids only
	-BA	Ball Bearings, Stainless, Liquids only
	-JL	Jewel Bearing, Sapphire, Liquid
	-JG	Jewel Bearing, Sapphire, Gas
5	Code	Material housing and internals
Material	-1	1 - 1.4305/303, 1.4104/430F Rotor
6	Code	Housing Configuration
Housing	-S	Standard

Model numbering key Pickoff

List of available Pickoffs. Consult factory for compatibility and special applications

Type	Part Number	Description
RF Pickoffs	101466	Low Profile, Pivot, with PT100, 6-lead, 5m cable with ODU 7-pin half-shell connector, -55 to +180°C
	101128	High Profile, 2-pin MS connector, -74 to + 204°C
	101130	High Profile with PT100, 4-pin MS Bayonet connector, -55 to + 125°C
	101463	High Profile with PT100, 4-pin MS Bayonet connector, extended Temperature Range : -200 to + 230°C
	101104	High Profile, NPT ½" thread and 20 cm flying leads, -74 to + 204°C
	101103	High Profile with PT100, NPT ½" thread and 20 cm flying leads, -55 to + 177°C
Amplified RF Pickoffs	101462	High profile, 3-pin MS connector, -40 to +125°C
	101461	High profile, 5m 3-lead shielded cable with flaying leads, -40 to +85°C
	CF	High profile with PT100, -40 to +125°C
Special Purpose RF Pickoffs	101464	Lysis Smart Pickoff, Low Profile, Pivot design, with T sensor, 5-lead, 5 m cable with ODU 5-pin half-shell connector, -40 to +125°C (For Lysis LSA-ST-05 & LSA-ST-08)
	101465	Lysis Smart Pickoff, Low Profile, Pivot design, with T sensor, 5-lead, 5 m cable with ODU 5-pin Nut/Nose connector, -40 to +125°C (For Lysis LSA-ST-07)