

“Sensing the pulse of industry”

TM03 Series Intelligent Magnetic Flow Sensors

The **TM03** Series is part of TM’s family of magnetic flow Sensors, each refreshingly having the highest signal to media noise ratio, with fast response low power consumption and attractive prices.

Production is strictly adhered and certified to ISO 9001 conditions. This assures consistent quality and guarantees to operate correctly to customized conditions straight from the packing crate.

The **TM03** is a general purpose magnetic flow sensor with a wide range of electrode and thick liner materials. It is suitable for drinking water, unfiltered raw sewage, pastes, slurries and a wide range of chemicals. But this is no ordinary mag meter. TM03 powerful magnetizing current, complete with adjustable high exciter frequencies, provides insignificant media noise. For example, normal greasy sewage coatings have virtually no effect on accuracy.

Sizes range from 10mm to 2000mm (0.5” – 80”).

There is a choice of 2 Converters for **TM03**. They may be compact or remote, but all have the same unique technology.

These range from the basic to those that may be 0.2% accuracy, submerged, or have communication protocols, or with explosion proof option.

Please see the **TMC03** and **TMC04** specifications.

All TM SERIES are supplied with Calibration Certificates traceable to the USA National Institute of Standards and Technology (NIST) and other Internationally recognized standards.

Features:

- **TM Seiries** technology offers the highest possible signal : media noise ratio
- Suitable for permanent coatings of sewage grease, calcium carbonate and similar
- High accuracy < $\pm 0.2\%$ of reading > 0.1 m/s (0.3 fps) converter dependent
- Resolution to 1000th of range
- Calibration Certificates provided with traceability to USA NIST and other international standards
- Quality Assurance to ISO 9001
- Custom calibration guarantees operation to specification straight out of the packing crate
- Range of sizes 10 – 2000mm (0.5” – 80”)
- Meets European EMC Conformity Standards EN 61326 – 1 for use in industrial locations
- Meets European Pressure Equipment Directive – Sound Engineering Practice



TM03 with TMC03 and TMC04 Converter Specification

Accuracy:	< ± 0.5% of reading > 0.1 m/s (0.33 fps) to 10m/s (33 fps)
TMC03 Converter	< ± 0.0005 m/s (0.0016 fps) for < 0.1 m/s (0.33 fps)
High accuracy version:	With remote TMC 04 Converter : < ±0.2% of reading > 0.1 m/s (0.33 fps) to 10m/s (33 fps) < 0.0002 m/s (0.00066 fps) for < 0.1 m/s (0.33 fps)
Sizes:	10 – 2000mm diameter (0.5” – 80”)
Maximum pressures:	Diameter dependent: 10 – 80mm (0.5” – 3”): 40 bar g (580 psig) 100 – 150mm (4” – 6”): 17.6 bar g (255 psig) 200 – 900mm (8” – 36”): 10 bar g (145 psig) 1000 – 2000mm (40” – 80”): 6.6 bar g (100 psig)
Flanged connections:	ANSI 150 or 300 rf, DIN 2633 PN6, PN10, PN16, PN25, PN40 JIS 10k, JIS16k, JIS25k, JIS 40 k AWWA flat face, Class D
European Pressure Equipment Directive:	TMC conform to the European Pressure Directive PED97/23/EC, Article 3, Sound Engineering Practice (SEP), Table 7 Group 2, Table 8 Group 1, and Table 9, Group 2 up to the maximum specified pressures With compact TMC Converters : 100°C (212°F) With remote TMC Converters : 150°C (300°F)
Maximum temperatures:	Note: for rubber and polyurethane liners maximum is 65°C (150°F) -25° C (- 13°F) for remote or compact TMC Converters 5 micro
Minimum temperature:	Siemens/cm (5 micro mhos/cm)
Media minimum conductivity:	AISI 304 non-magnetic stainless steel flow tube, lined.
Materials of construction:	Flange and other construction materials: epoxy coated carbon steel AISI 304 stainless steel AISI 316 stainless steel
Electrode/grounding materials:	AISI 316L stainless steel, Hastelloy B, Hastelloy C, titanium, platinum, tantalum
Electrode seals:	Viton, Kalrez
Liner materials:	Hard rubber/soft rubber: 50 – 2000 mm (2” – 80”) PTFE: 25 – 2000mm (1” – 80”) Polyurethane: 25 – 300mm (1” – 12”) F46 polyimide: 10 – 300mm (0.5” – 12”) PFA: 10 – 300mm (0.5” – 12”)
Sensor Protection class:	IP65 / NEMA 4X weatherproof for compact converters. With remote converters: IP67 temporary protection water immersion 1m w.g. IP 68 protected against water immersion to 5 m w.g. for long periods. IP 65 / NEMA 4X weatherproof NEMA 6P protected for water immersion to 5 m w.g for long periods
Cable length:	8 m (26 feet) standard. Special max cable length: 90 meters OR 3 x actual media conductivity 300 feet OR 10 x actual media conductivity whichever is less.
European EMC Conformity:	Meets EN61326 – 1 Class A, Table 2 for industrial locations compatible
Converters:	TMC03 (compact or remote), TMC 04 (compact or remote)
Min and max ranges:	See separate specifications Min range 0 – 1m/s (0 – 3 fps) mean velocity Max range 0 – 10m/s (0 – 33fps) mean velocity

Note: Min Range $m^3/h = 0.0028 \text{ mm nominal size}^2$ Max Range $m^3/h = 0.028 \times \text{mm nominal size}^2$

Min range gpm = $8 \times \text{inches nominal size}^2$ Max Range gpm = $80 \times \text{inches nominal size}^2$

Ranges are expressed 0 – max flow rate required. Choose any range between the min and max above

TM03 Dimensional Details

DN	Rated Pressure (Mpa)	Physical external dimension of instrument (mm)					Flanged Details (mm)			Weight kg
		a	bf	c	d	e	D	Do	n x A	
10	4.0	150	308	156	107	72	90	60	4 x 14	7
15		150	308	156	107	72	95	65	4 x 14	7.5
20		200	308	156	107	72	105	75	4 x 14	8
25		200	313	115		78	115	85	4 x 14	9
32		200	319	140		78	140	100	4 x 18	9.5
40		200	332	150		63	150	110	4 x 18	11.8
50		200	346	165		109	165	125	4 x 18	13.5
65		200	367	185		105	185	145	8 x 18	15.5
80		200	382	200		101	200	160	8 x 18	17.25
100		1.6	250	397	220		150	220	180	8 x 18
125	250		429	250		150	250	210	8 x 18	28.9
150	300		459	285		180	285	240	8 x 22	35
200	1.0	350	517	340		222	340	295	8 x 22	47.5
250		400	570	395		254	395	350	8 x 22	67.8
300		500	617	445		316	445	400	12 x 22	85
350		600	668	505		305	505	460	12 x 22	127
400		600	723	565		380	565	515	16 x 22	183.5
450		600	773	615		380	615	565	16 x 26	194.5
500		600	825	670		400	670	620	20 x 26	210
600		600	930	780		456	780	725	20 x 26	303
700		700	1038	895		545	895	840	20 x 30	470
800		800	1148	1015		580	1015	950	24 x 30	500
900	900	1248	1115		690	1115	1050	24 x 33	700	
1000	1000	1355	1230		750	1230	1160	28 x 36	921	
1200	0.6	1200	1674	1405		1206	1405	1340	32 x 33	
1400		1400	1874	1630		1406	1630	1560	36 x 36	
1600		1600	2084	1830		1606	1830	1760	40 x 36	
1800		1800	2304	2045		1806	2045	1970	44 x 39	
2000		2000	2540	2265		2006	2265	2180	48 x 42	
2200	0.25	2200	2704	2405		2206	2405	52 x 45		

Note : DN3, DN6 and DN8 flanges have the similar standard as DN10 flange

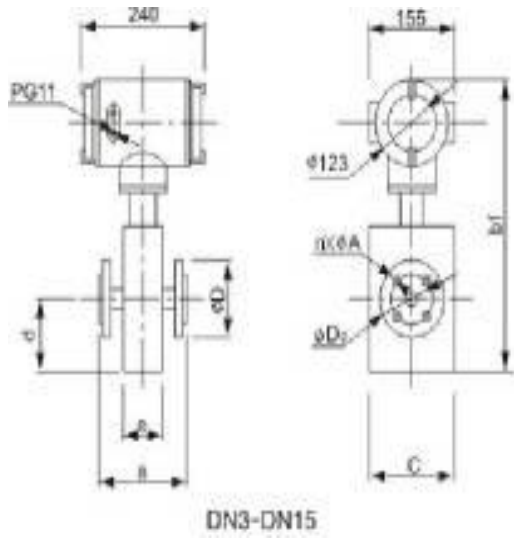
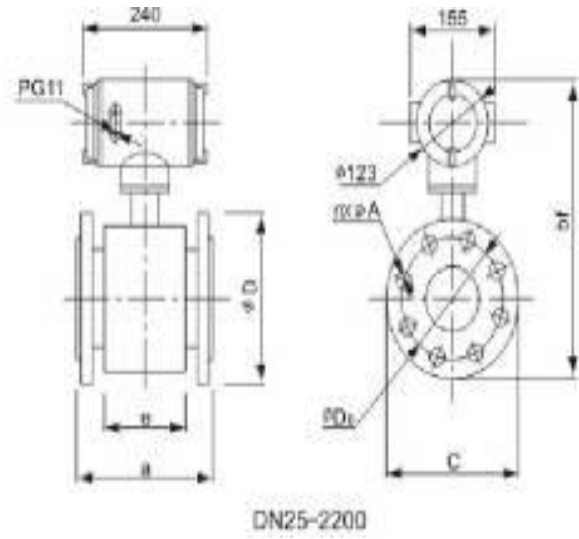


图5



Compact **TM03** with Integral Flow Converter

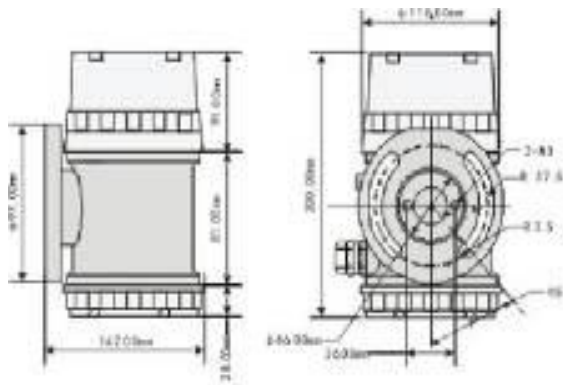
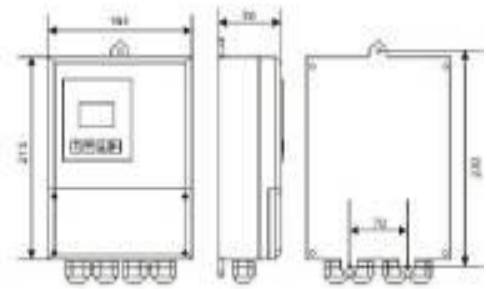


图4

Compact **TM03** Flow Converter



Remote **TM04** Flow Converter

Technical Data Sheet & General Specifications

Basic type Example :	TM03	C3	6	A	1	0250	LV	1	A	1	B	30m	1000gpm	1
Converter	TMC03 Compact	C1												
	TMC04 Remote	C2												
	TMC04 Flameproof	C3												
	TMC03 Hi-accuracy	C4												
Flanged Connections	DIN 2633 PN6		1											
	DIN 2633 PN10		2											
	DIN 2633 PN16		3											
	DIN 2633 PN25		4											
	DIN 2633 PN40		5											
	ANSI 150 rf		6											
	ANSI 300 rf		7											
	JIS 10k		8											
	JIS 16k		9											
	JIS 25k		10											
	JIS 40K		11											
	AWWA ff.Class D		12											
Flange Material	Epoxy Coated Carbon Steel			A										
	AISI 304 stainless steel			B										
	AISI 316 stainless steel			C										
Casing Material	Epoxy Coated Carbon Steel		1											
	AISI 304 stainless steel		2											
	AISI 316 stainless steel		3											
Sensor Diameter mm	10 mm = 0010					0010								
	100mm = 0100					0100								
	2000mm = 2000					2000								
Electrode Materials	AISI 316L						L							
	Hastelloy C						C							
	Hastelloy B						B							
	Titanium						T							
	Platinum						P							
	Tantalum						A							
Liner Materials	Hard Rubber (50 - 2000mm) (2" - 80")							1						
	PTFE (25 - 2000mm) (1" - 80")							2						
	Polyurethane (25 - 300mm) (1" - 12")							3						
	FA46 Polyimide (10 - 300mm) (½" - 12")							4						
	PFA (10 - 300mm) (½" - 12")							5						
	Soft Rubber (50 - 2000mm) (2" - 80")							6						
Ingress Protection	IP 65 (NEMA 4X)								A					
	IP 67								B					
	IP 68 (NEMA6P) with Remote Converter								C					
Outputs (see separate converter type specs)	4 - 20mA with scaled pulse output (Converter TMC03)									1				
	4 - 20mA with scaled pulse output + RS485 (Converter TMC03)									2				
	4-20mA with scaled pulse output + HART (Converter TMC04)									3				
Power Supply	85 - 265 VAC 50/60Hz										A			
	24 Vdc										B			
Cable Length	8 meters (26feet) standard, Only for Remote type TMC04 Converter											1		
	Longer Cable length to specify when ordering (price on application)													
	Compact converter TMC03- potted cable not available											2		
Flow Range	Select betw zero and min & max flow ranges and state units eg. 0-5000gpm or 0-33m3/hr													
Grounding	Grounding Electrode Integral in Sensor Body													1
	No Grounding Ring or Electrode													2

TM03 with Converter TMC03 or TMC04 Enquiry Form

Customer's Name, Project Name, & Location:						
Detail	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6
Quantity						
Media Type						
ADD any special notes, such as Dirty (D), Clean (C), Deionised Water(DW) Note: For energy measurement, solutions of ethylene glycol, propylene glycol, glycol substitutes, or brine, a special flow configuration is necessary. Please provide % solution by weight.....						
Typical Flow Rate With Units						
Min & Max Flow Rate With Units						
Cable Length (8m / 26 feet standard)						
Bi-directional (B)/ Uni-directional (U)						
Pressure Range and Units						
Temperature Range and Units						
Liquid Viscosity and Units						
Explosive Atmosphere and Type Required						
Nominal Pipe Size (N) or ID (I) Specify mm or inches						
Pipe Schedule or Wall Thickness Specify mm or inches						
Straight Pipe Runs Available						
Pipe Material Is Pipe Electrically Isolated (Yes/No)						
Is the flow sensor to be used in an area of magnetic fields ? Yes or No						
Electronics Weatherproof (WP), Local (L), or Remote (R)						
Analog and Pulse Frequency						
Is Communication Network Required? If yes, specify which						
Complete Energy System (Yes/No) Requires 2 temperature sensors						
Mass (M) or Volumetric (V) Flow.						
Sensor Submersible (Yes/No) If yes, to how many metres w.g. Not available with temperature sensors						

Note: For energy flow applications a separate Energy Flow Computer is necessary, with an integral temperature sensor and remote temperature sensor for supply and return pipes. Both temperature sensors are matched and require 4-20mA outputs and are provided with identical protection.

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