

# Liquid Turbine Flow meter

## Model: MDTF1

### Applications

- Universal measuring principle for low viscosity liquids
- Hydraulics
- Water, diesel, gasoline,
- The liquid turbine measuring principle is used in a wide range of different branches of industry, chemicals, petrochemicals, oil and gas, food, and – no less importantly – in custody transfer applications. Liquid turbine flowmeters can measure virtually all fluids: cleaning agents, fuels, vegetable oils, solvents, silicon oils, fruit solutions, vinegar, alcohol



### Special features

- Flow measurement up to 800 m<sup>3</sup>/h
- Process pressures up to 350 bar
- Fluid temperature up to 150 °C
- Pulse output linear with flow rate and 10:1 rangeability(4-20 mA output) (turndown) ensure custody transfer accuracy
- Communication: HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, MODBUS RS485
- Turbine materials: 316 L, Hastelloy C, Hastelloy B, Titanium, Tantalum



### Description

- |                       |  |
|-----------------------|--|
| ■ Accuracy class      | 1% - 0.5% or 0.2% of rate  |
| ■ Liquid Viscosity    | 1...10 CST   |
| ■ Flow unite          | liter, m <sup>3</sup> , metric Ton or USG per second, minute or hour (the user should specify the required flow unit while ordering); also percent of the measurement range could be displayed |
| ■ Ambient Temperature | Sensor: -10...55°C, Converter: -15... 50°C   |
| ■ Turbine materials   | 316L, Hastelloy C, Hastelloy B, Ti, Ta, Pt/Iridium alloy, Stainless steel, painting tungsten carbide   |
| ■ Nominal diameter    | DN 4 mm to DN 200 mm   |
| ■ Communication       | Rs485 (Modbus protocol), HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, MODBUS Rs485   |
| ■ Output signal       | 4 - 20 mA, Pulse or alarm (option)   |
| ■ Frequency output    | 1...5000 Hz, 36 VDC max. & 250 mA max.   |
| ■ Baud rate           | 1200...19600 Hz  |
| ■ Pulse Output        | 1...3000 Hz  |
| ■ Pulse Output Width  | Can be set by the user   |
| ■ Alarm Outputs       | High & Low limits, Transistor output, maximum 250 mA @ 36 VDC<br>When high and low limits are reached a bell-like icon will be displayed on the lcd  |
| ■ Load resistance     | 4 - 20 mA, 0 - 500Ω  |
| ■ LCD display         | Instantaneous flow, Flow velocity, Percentage, Empty pipe ratio, Forward and reverse accumulation, Alarm display   |
| ■ Damping Type        | 1...10 second  |
| ■ Total flow          | 6 digit display + 2 decimal point  |
| ■ Liquid temp.        | Non freezing -20 ...150°C  |
| ■ Rotor material      | 420 stainless steel (13%Cr) CD 4 MC u (option)   |

- **Bearing material**                      Tungsten carbide
- **Body material**                        304 stainless steel, 316 stainless steel (option)
- **Protection**                            IP 65

## MDTF1 Series

Designed from DN 4 mm to 200 mm in size with a flow range of 0.04 m<sup>3</sup>/h to 800 m<sup>3</sup>/h, these meters are factory-configured and calibrated to international standards to provide the user with assurance of both quality and performance of the meter. A calibration certificate is included with each flowmeter shipped to the users.

## Pressure Class Selection

Code	Pressure Class	Code	Pressure Class	Code	Pressure Class
P2	2 MPa	P8	16 MPa	P14	30 MPa
P4	4 MPa	P10	20 MPa	P16	35 MPa
P6	6 MPa	P12	25 MPa	Cu	Customer

## Diameter selection

Model	Tube Diameter (mm)	Connection NPT or BSP	Rated Pressure (Bar)	Minimum / Maximum Flow (m <sup>3</sup> /h)		Model	Tube Diameter (mm)	Connection DIN	Rated Pressure (Bar)	Minimum / Maximum Flow (m <sup>3</sup> /h)	
				Standard	Extended					Standard	Extended
<b>Thread Connection</b>						<b>Flange Type</b>					
M1	4	1/2	60	0.04...0.25	0.04...0.4	M9	15	1/2	25	0.6...6	0.4...8
M2	6	1/2	60	0.1...0.6	0.06...0.6	M10	20	3/4	25	0.8...8	0.45...9
M3	10	1/2	60	0.2...1.2	0.15...1.5	M11	25	1	25	1...10	0.5...10
M4	15	1	60	0.6...6	0.4...8	M12	32	1 1/4	25	1.5...15	0.8...15
M5	20	1	60	0.8...8	0.45...9	M13	40	1 1/2	25	2...20	1...20
M6	25	1 1/4	60	1...10	0.5...10	M14	50	2	25	4...40	2...40
M7	32	2	60	1.5...15	0.8...15	M15	65	2 1/2	16	7...70	4...70
M8	40	2	60	2...20	1...20	M16	80	3	16	10...100	5...100
M0	50	2 1/2	60	4...40	2...40	M17	100	4	16	20...200	10...200
ANSI flange rating of 150#, 300# and 600# are available. other pressure ratings for DIN flanges for up to 3600 psi are also available						M18	125	5	16	25...250	13...250
						M19	150	6	16	30...300	15...300
						M20	200	8	16	80...800	40...800



## MDTF 1 Liquid Turbine Flow meter

ORDERING CODE	Example: MDTF 1	M6	S	F	A	L	B1	L	B	N	M	D	I
Nominal Diameter please see the diameter selection table													
Please specify		M6											
Flow Range													
S - Standard			S										
E - Extended													
C - Customer													
Process Connection													
F - Flange				F									
S - Sanitary													
T - Thread													
W - Wafer													
O - Other													
Flang Type													
D - DIN Please specify PN													
A - ASME Please specify class					A								
C - Customer													
Converter - Indicator													
N - Whithout													
L - Local indication						L							
W - Wall - Mounting box converter - Indicator													
Body Material													
B1 - Carbon steel							B1						
B2 - 304 Stainless steel													
B3 - 316 Stainless steel													
Wet Part Material													
L - Tantalum								L					
C - 2CR13													
D - CD 4 MCU													
H - Hastelloy C													
B - Hastelloy B													
T - Titanium													
V - 316L Stainless steel													
M - Monel													
P - Pt / Iridium alloy													
O - Other													
Accuracy													
A - 1%													
B - 0.5%									B				
C - 0.2%													
OutPut													
A - 4 ~ 20 mA with EX case													
N - Not required only totalizer										N			
U - 4 ~ 20 mA. Frequency / pulse													
M - Modbus RS485													
P - Pulse with EX case													
D - Pulse with DIN conector													
C - Customer													
Digital Communication													
N - No Communication													
M - Modbus RS485											M		
H - Hart													
F - Foundation fieldbus													
P - Profibus DP/PA													
G - GPRS													
Power Supply													
A - 85 ~ 250 VAC													
D - 20 ~ 36 VDC												D	
B - Battery power													
Z - Dual power ( battery and 24 VDC )													
Protection Grade													I
E - IP 68 Explosion - proof													
P - IP 68													
I - IP 65													



<b>ORDERING CODE</b>	Example: <b>MDTF1</b>	<b>T1</b>	<b>N</b>
Temperature Rating			
T1 - (-20...80°C)		<b>T1</b>	
T2 - (-20...120°C)			
T3 - (-20...150°C)			
Infrared Remote Control			
N - Not required			<b>N</b>
R - Required			

### ■ PLEASE SPECIFY THE FOLLOWING INFORMATION WHEN YOU INQUIRE.

(Fill in the form below to the extent possible. Further details will be finalized in later consultation.)

- Fill in the blanks. Tick the boxes  that apply.

<b>1. Sensor unit</b>			
<b>2. Process fluid (※1)</b>	Name: _____	SP. gr : _____	Viscosity : _____ Concentration : _____ %
<b>3. Flow range</b>	Maximum _____	Normal _____	Full scale _____ <input type="checkbox"/> kg/h <input type="checkbox"/> Others _____
<b>4. Fluid temperature</b>	Maximum _____ °C	Normal _____ °C	Min. _____ °C
<b>5. Operating pressure</b>	Maximum _____ MPa	Normal _____ MPa	Min. _____ MPa
<b>6. Ambient temperature</b>	Maximum _____ °C	Min. _____ °C	
<b>7. Fluid flow direction</b>	<input type="checkbox"/> Left→Right <input type="checkbox"/> Right→Left <input type="checkbox"/> Bottom→Top ( <input type="checkbox"/> Top →Bottom )		
<b>8. Nominal size</b>	_____ mm or _____ inch		
<b>9. Required accuracy</b>	± _____ % of reading ± _____ % of full scale		
<b>10. Process connection</b>	<input type="checkbox"/> Flange connection (Flange rating) <input type="checkbox"/> Ferrule connection <input type="checkbox"/> Screw connection		
<b>11. Explosion proof</b>	<input type="checkbox"/> Not required <input type="checkbox"/> TIIS <input type="checkbox"/> ATEX <input type="checkbox"/> IECEx <input type="checkbox"/> KCS <input type="checkbox"/> CSA <input type="checkbox"/> EAC <input type="checkbox"/> NEPSI <input type="checkbox"/> ITRI		
<b>12. Power supply</b>	_____ V <input type="checkbox"/> AC <input type="checkbox"/> DC		
<b>13. Output specifications</b>	Pulse output	<input type="checkbox"/> Volt. pulse: [0]: 1.5V [1]: 13VDC min. Out. impedance: 2.2kΩ	
		<input type="checkbox"/> Open drain output (equivalent to open collector output ) [Min.10V to Maximum 30V, 50mADC, ON resistance 0.6Ω or less]	
		<input type="checkbox"/> Output frequency: Any point from 0.1 to 10000Hz at full scale	
	Analog output	Two outputs from flow rate (mass or volume).	
		4 to 20mADC Maximum load: 500Ω	
Additional damping	0 to 200s. (variable)		
Alarm output	Slug flow	High _____ g/mL	Low _____ g/mL
<b>14. Communication protocol</b>	<input type="checkbox"/> HART <input type="checkbox"/> FOUNDATION fieldbus <input type="checkbox"/> PROFIBUS <input type="checkbox"/> Modbus (Address: _____ )		
<b>15. Transmission length</b>	Sensor unit ( _____ ) m	Transmitter ( _____ ) m	Receiving instrument
<b>16. Receiver</b>	<input type="checkbox"/> Totalizer <input type="checkbox"/> Indicator <input type="checkbox"/> Recorder <input type="checkbox"/> Flow controller <input type="checkbox"/> Batch controller <input type="checkbox"/> Density computer <input type="checkbox"/> Computer <input type="checkbox"/> Others		
<b>17. Dedicated cable length</b>	In case of Remote-mount type _____ m		
<b>18. In case of separate type transmitter</b>	<input type="checkbox"/> Stanchion type w/bracket and 2" U bolt		
<b>19. No. of units required</b>			
<b>20. Application</b>			
<b>21. Other considerations</b>			
<b>22. Cable gland</b>	<input type="checkbox"/> Standard <input type="checkbox"/> ATEX directive compliant <input type="checkbox"/> ATEX directive compliant for earthed cable		
<b>23. Maritime certification</b>			



Address: 7191 Yonge street, Toronto, Canada

Tel: +16472221281(5 line)

Web: [www.madecotech.com](http://www.madecotech.com)

Email: [Info@madecotech.com](mailto:Info@madecotech.com)