

### ■ GENERAL

MTF1603 metal tube variable area meters (rotameters) are ideal for high pressure, high temperature and other demanding flow applications where safety is a concern. Features include: globally-recognized approvals for use in hazardous environments, analog and digital LCD local display options, multiple process connection options, several available materials of construction for metering of aggressive fluids and corrosion resistance, HART enabled 4-20mA output to provide for remote monitoring and control. The MTF1603 excellent repeatability makes it a good choice for batching applications. For versions without electronic output, no power supply is required. The MTF1603 low - pressure drop provides additional value by allowing for economical pump selection.



### ■ SPECIFICATIONS

Diameter	DN15, DN25, DN50, DN80, DN100, DN150 For other diameter, please negotiate with the manufacturer.
Flow range	Liquid: 1.0~150000L/h Gas: 0.05~3000m <sup>3</sup> /h
Measurement Ratio	10:1 (standard), 20:1 (optional)
Accuracy	1.5% (standard), 1.0% (optional)
Pressure rating	DN15, DN25, DN50: 4.0MPa(standard), 20MPa max DN80, DN100, DN150: 1.6MPa(standard) DN80: Max 10MPa, DN100: Max 6.4MPa, DN150: Max 4.0MPa
Medium temperature	Standard: -30°C to +120°C, High temperature: 120°C to 350°C (PTFE liner max 80°C)
Power supply	24VDC(12~36VDC), Lithium battery, 220VAC
Output signal	2-wire: 4-20mA or 4-20mA/HART 3-wire: Modbus (RTU), Accumulated pulse (24V, 50% duty ratio)
Alarm	2-wire: high and low relay alarm (contact rating: 24VDC, 0.2A) 3-wire or 4 wire: high and low alarm (contact rating: 250VAC, 3A) Transistor relay high and low alarm (contact rating: 24VDC or 220VAC 3A)
Output load	500Ω(24V power supply)
Ambient temperature	Mechanical type: -40°C-120°C Digital with output type: -30°C- 60°C
Storage condition	Temperature: -40°C~85°C Humidity: ≤85%
Process connection	Standard: DIN Flange, other flange standard can be customized. For other connection modes, please negotiate with manufacturer
Cable entry	M20×1.5(std), 1/2NPT(opt)
Protection level	IP65
Explosion-proof	Intrinsic safety type: ExiaIICT6 Flame-proof type: ExdIICT6
Viscosity of medium	DN15: η<5mPa.s DN25: η<250mPa.s DN50~DN150: η<300mPa.s
Wetted material	R1: 304, 1Cr18Ni9Ti; R0: 316, 0Cr18Ni12Mo2Ti; RL: 316L, 00Cr17Ni14Mo2Ti; Ti: Titanium alloy; RP: PTFE liner

■ **FLOW RANGE**

● MTF1603 Vertical installation type flow range

Size	Float No.	Water (L/h) 0.01013MPa, 20°C		Air (Nm <sup>3</sup> /h) 0.01013MPa, 20°C	Pressure loss(KPa)	
	Float material	Stainless steel	PTFE, Ti	Stainless steel	Stainless steel	PTFE, Ti
DN15	F15.0	1.0-10	-	-	1.5	-
	F15.1	1.6-16	-	0.05-0.5	1.5	-
	F15.2	2.5-25	-	0.07-0.7	1.5	-
	F15.3	4.0-40	2.5-25	0.12-1.2	1.5	1.5
	F15.4	6.0-60	4.0-40	0.18-1.8	1.5	1.5
	F15.5	10.0-100	6.0-60	0.28-2.8	1.5	1.5
	F15.6	16.0-160	10.0-100	0.45-4.5	1.5	1.5
	F15.7	25.0-250	16.0-160	0.75-7.5	3.0	1.5
	F15.8	40.0-400	25.0-250	1.2-12	3.0	3.0
	F15.9	60.0-600	40.0-400	1.8-18	3.5	3.0
DN25	F25.0	100-1000	60-600	3-30	1.5	1.5
	F25.1	120-1200	80-800	3.5-35	1.5	1.5
	F25.2	160-1600	100-1000	4.5-45	3.0	1.5
	F25.3	200-2000	120-1200	6.0-60	3.0	1.5
	F25.4	250-2500	160-1600	7.5-75	3.5	3.0
	F25.5	300-3000	200-2000	9.0-90	3.5	3.0
	F25.6	400-4000	250-2500	12.0-120	8.0	3.5
	F25.7	500-5000	300-3000	15.0-150	8.0	3.5
	F25.8	600-6000	-	18.0-180	16.0	-
DN50	F50.0	600-6000	400-4000	18.0-180	3.0	3.0
	F50.1	800-8000	500-5000	24.0-240	3.0	3.0
	F50.2	1000-10000	600-6000	30.0-300	4.0	3.0
	F50.3	1200-12000	800-8000	36.0-360	4.0	3.0
	F50.4	1600-16000	1000-10000	48.0-480	8.0	4.0
	F50.5	2000-20000	1200-12000	60.0-600	8.0	4.0
DN80	F80.0	2500-25000	1600-16000	75-750	14.0	8.0
	F80.1	3000-30000	2000-20000	90-900	14.0	9.0
	F80.2	4000-40000	2500-25000	120-1200	20.0	12.0
	F80.3	5000-50000	3000-30000	150-1500	20.0	15.0
DN100	F100.0	6000-60000	4000-40000	180-1800	28.0	25.0
	F100.1	8000-80000	5000-50000	240-2400	28.0	27.0
	F100.2	10000-100000	6000-60000	300-3000	40.0	38.0
DN125	F125.1	10000-100000	8000-80000	300-3000	45.0	35.0
	F125.2	12500-125000	10000-100000	-	48.0	40.0
DN150	F150.1	12500-125000	10000-100000	-	48.0	40.0
	F150.2	15000-150000	12500-125000	-	50.0	42.5

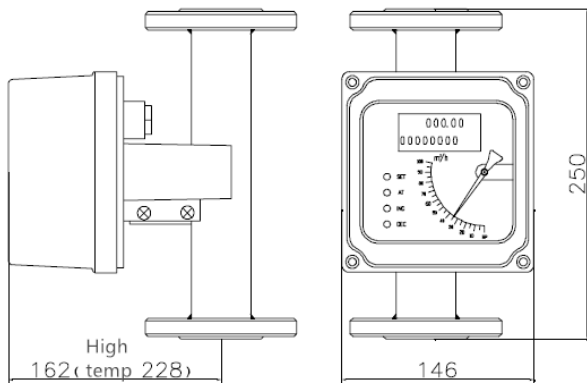
● MTF1603 Horizontal installation type flow range

Size	Float No.	Water (L/h) 0.01013MPa, 20°C		Air (Nm <sup>3</sup> /h) 0.01013MPa, 20°C	Pressure loss(KPa)	
	Float material	Stainless steel	Ti	Stainless steel	Stainless steel	Ti
Size	F15.5	16.0-160	10.0-100	0.45-4.5	1.5	1.5
	F15.6	20.0-200	12.0-120	0.6-6.0	1.5	1.5
	F15.7	25.0-250	16.0-160	0.75-7.5	2.0	2.0
	F15.8	40.0-400	25.0-250	1.2-12	2.0	2.0
	F15.9	60.0-600	40.0-400	1.8-18	3.5	3.5
DN25	F25.0	100-1000	60-600	3-30	1.5	1.5
	F25.1	160-1600	100-1000	4.5-45	1.5	3.0
	F25.2	200-2000	120-1200	6.0-60	3.0	3.0
	F25.3	250-2500	160-1600	7.5-75	3.0	3.5
	F25.4	300-3000	200-2000	9.0-90	3.5	3.5
	F25.5	400-4000	250-2500	12.0-120	8.0	8.0
DN50	F50.0	600-6000	400-4000	18-180	3.0	3.0
	F50.1	800-8000	500-5000	24-240	3.0	3.0
	F50.2	1000-10000	600-6000	30-300	4.0	4.0
	F50.3	1200-12000	800-8000	36-360	4.0	4.0
	F50.4	1600-16000	1000-10000	48-480	8.0	8.0
DN80	F80.1	2500-25000	1600-16000	75-750	14.0	14.0
	F80.2	3000-30000	2000-20000	90-900	14.0	14.0
	F80.3	4000-40000	2500-25000	120-1200	20.0	22.0
DN100	F100.0	6000-60000	4000-40000	180-1800	30.0	30.0
	F100.1	8000-80000	5000-50000	240-2400	30.0	30.0
	F100.2	10000-100000	6000-60000	300-3000	45.0	45.0
DN125	F125.1	10000-100000	8000-80000	300-3000	45.0	45.5
	F125.2	12500-125000	10000-100000	-	46.0	48.0
DN150	F150.1	12500-125000	10000-100000	-	48.0	46.0
	F150.2	15000-150000	12500-125000	-	50.0	50.0

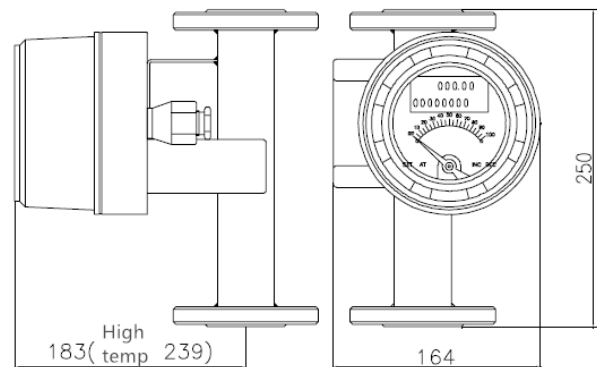
■ **STRUCTURE DRAWING**

MTF1603 Series Metal Tube rotameter can be divided into 5 types according to the direction of liquid, and each type also be classified into the standard type, high-temperature type, jacket type and so on. All types will be respectively described below:

■ **Vertical installation type**

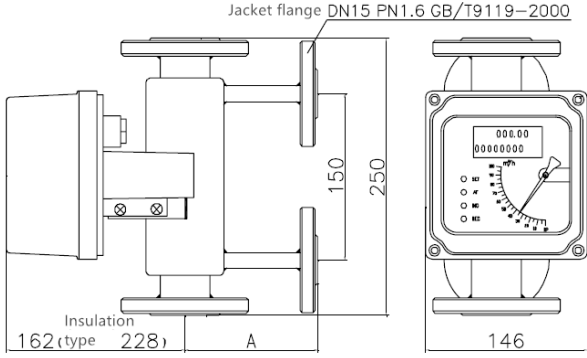


Standard Type M4 Indicator

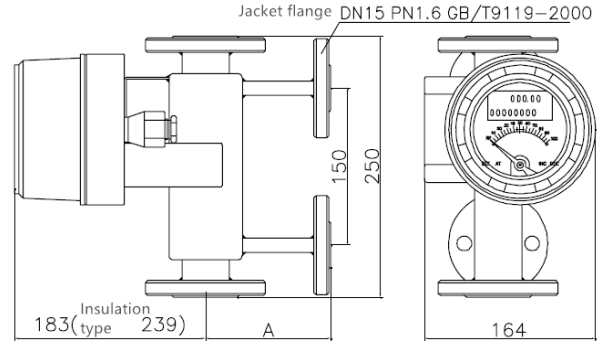


Standard Type M5 Indicator

## Metal Turbe Rotameter MTF1603 Series

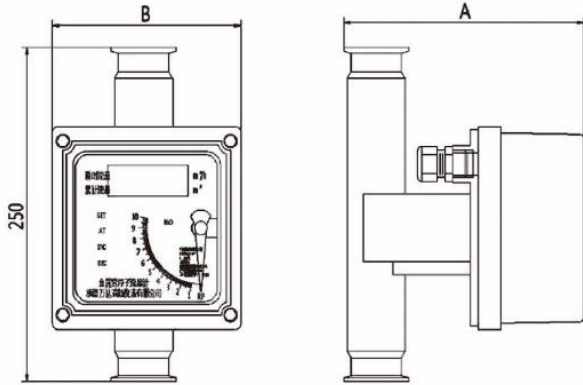


Cooling Jacket Type M4 Indicator

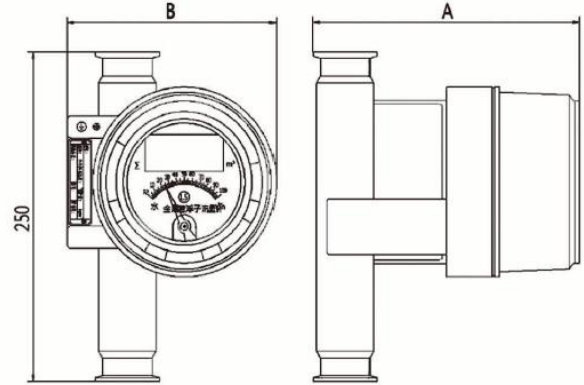


Cooling Jacket Type M5 Indicator

Size	DN15	DN25	DN50	DN80	DN100	DN150	DN200
A	100	120	135	150	160	40	200
Weight of standard type (kg)	5.0	6.5	10	16	17	35	50
Weight of jacket type (kg)	7.5	9.5	13	19	20	40	55



Sanitary Type M4 Indicator



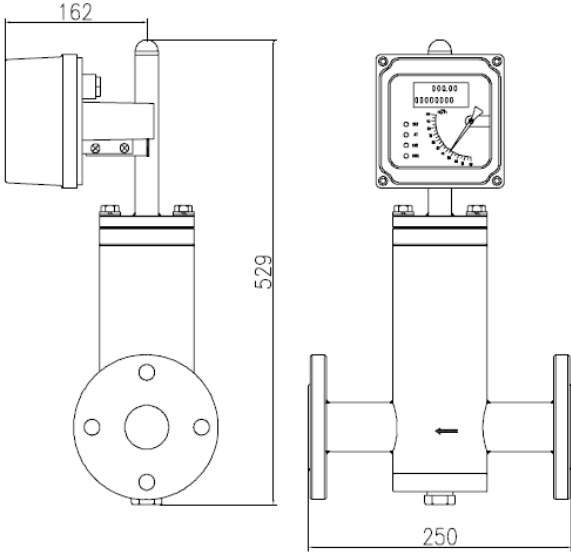
Sanitary Type M5 Indicator

M4	φ 10	φ 19	φ 25	φ 32	φ 38	φ 51	φ 63	φ 76	φ 89	φ 108	φ 114	φ 133	φ 140	φ 159
A	200	200	200	200	200	210	210	220	230	240	250	260	270	280
B	150	150	150	150	150	155	160	170	175	185	190	200	210	220

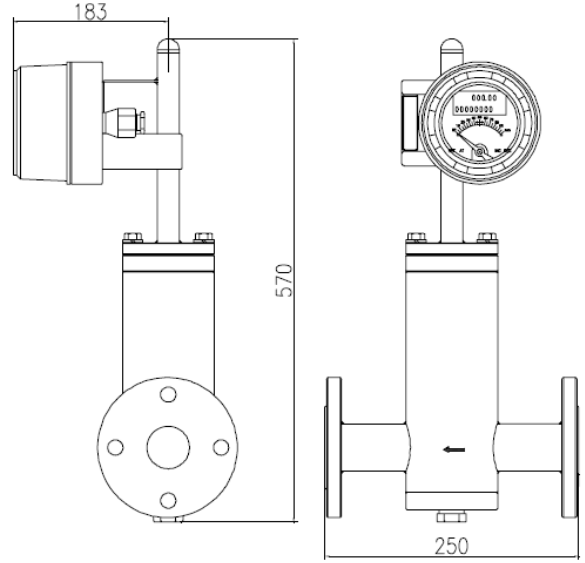
M5	φ 10	φ 19	φ 25	φ 32	φ 38	φ 51	φ 63	φ 76	φ 89	φ 108	φ 114	φ 133	φ 140	φ 159
A	210	210	210	210	210	220	220	230	240	250	260	270	280	290
B	165	165	165	165	165	170	180	190	195	205	220	235	245	270

■ **Horizontal installation type**

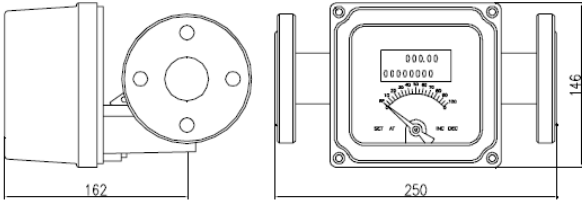
Horizontal flowmeters, select T type for the size  $\leq$  DN50, select spring construction for the size  $>$  DN25



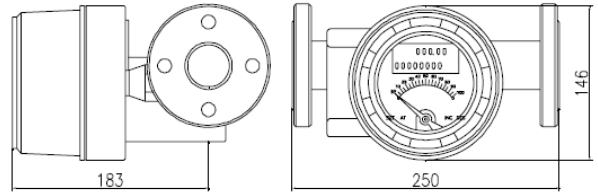
T type construction M4 indicator



T type construction M5 indicator



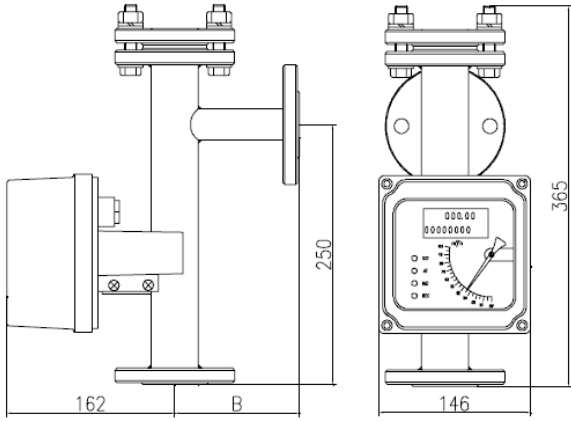
Spring-construction M4 indicator



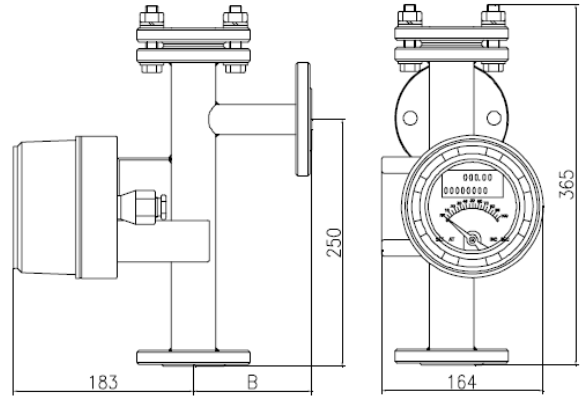
Spring-construction M5 indicator

Size	DN15	DN25	DN50	DN80	DN100	DN150	DN200
Weight of T type construction kg	6	10	20				
Weight of spring construction kg				16	17	35	50

■ **Bottom-entry and Side-exit type**



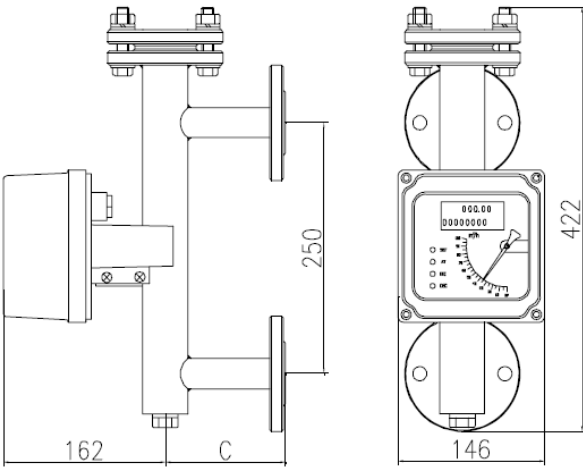
Standard Type M4 Indicator



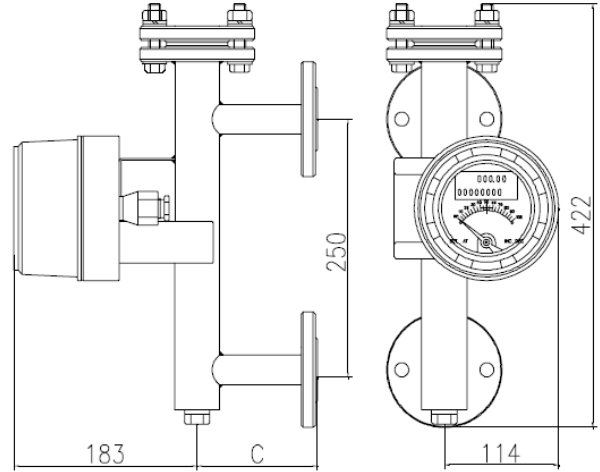
Standard Type M5 Indicator

Size	DN15	DN25	DN50	DN80	DN100	DN150	DN200
C	100	120	135	150	160	180	200
Weight kg	5.5	6.5	13	22	26	50	57

■ **Side-entry and Side-exit type**



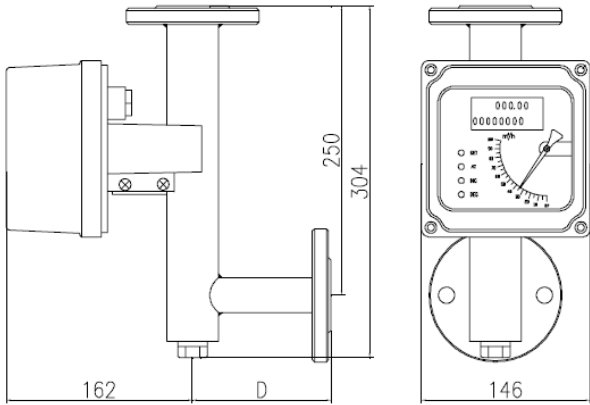
Standard Type M4 Indicator



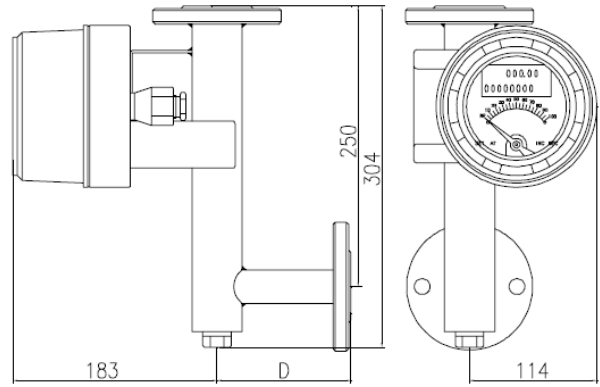
Standard Type M5 Indicator

Size	DN15	DN25	DN50	DN80	DN100	DN150	DN200
D	100	120	135	150	160	180	200
Weight kg	5.5	6.5	10.5	16	17	36	52

■ **Side-entry and Top-exit type**



Standard Type M4 Indicator



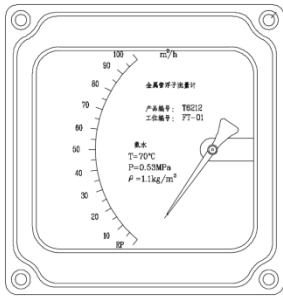
Standard Type M5 Indicator

Size	DN15	DN25	DN50	DN80	DN100	DN150	DN200
D	100	120	135	150	160	180	200
Weight kg	5.5	6.5	10.5	16	17	36	52

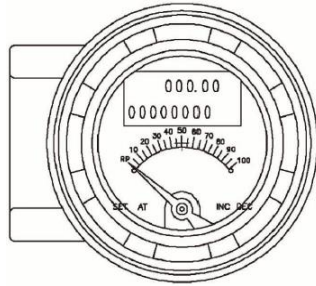
■ **OPTIONAL INDICATORS**

Type of Indicator	Functional Description of Indicator
M1 Type	<ul style="list-style-type: none"> <li>■ Mechanical with pointer display;</li> <li>■ No power supply; No 4-20mA;</li> <li>■ Optional flow alarm device;</li> <li>■ Instantaneous flow or percent-scale value for option.</li> </ul>
M3 Type	<ul style="list-style-type: none"> <li>■ Digital display, battery powered (Battery Model No.: ER26500,3.6V,7.5AH,-20°C~60°C, 2 years life).</li> <li>■ No 4-20mA output;</li> <li>■ Flame explosion proof can be optional;</li> <li>■ Display the instantaneous and cumulative flow rates;</li> <li>■ Parameters can be checked or modified by pressing keys on the keyboard;</li> </ul>
M4 Type	<ul style="list-style-type: none"> <li>■ Digital and pointer display;</li> <li>■ The pointer indicates instantaneous flow rate and digitally displays instantaneous and accumulated flow rates;</li> <li>■ Intrinsic safety type ExiallCT6 for optional;</li> <li>■ 2-wire 4-20mA (standard), HART (optional);</li> <li>■ DC24V power supply;</li> <li>■ 4 keys on the panel which are used to check and modify internal parameters.</li> </ul>
M5 Type	<ul style="list-style-type: none"> <li>■ Digital and pointer display;</li> <li>■ Pointer indicates the instantaneous flow rate and digitally displays instantaneous flow rate and accumulated flow rates;</li> <li>■ Flame-proof Exd II CT6 for optional;</li> <li>■ 2-wire 4-20mA (standard), HART (optional), Alarm output (optional);</li> <li>■ DC24V power supply;</li> <li>■ 4 keys on the panel which are used to check and modify internal parameters.</li> </ul>

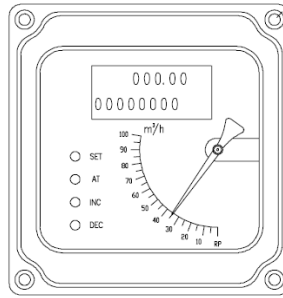
Metal Turbe Rotameter MTF1603 Series



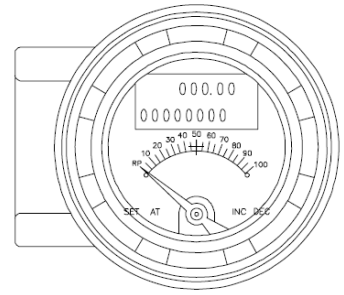
M1 type



M3 type



M4 type



M5 type

MODEL SELECTION

Example: MTF1603-V/R1/M1/N/N/L/50										
MTF1603	- X	/X	/X	/X	/X	/X	/X	/X	/X	
Structure	V									Vertical installation
	H									Horizontal installation
	BS									Bottom-entry and Side-exit type
	SS									Side-entry and Side-exit type
	ST									Side-entry and Top-exit type
	TR									Sanitary type
Wetted material	R1									SS304, 1Cr18Ni9Ti
	R0									SS316, 0Cr18Ni12Mo2Ti
	RL									SS316L, 00Cr17Ni14Mo2Ti
	RP									PTFE liner
	Ti									Titanium alloy
	H									HB or HC
Indicator type	M1									Mechanical with pointer display
	M3									Digital display, No output, Battery power
	M4									Digital display with 4-20mA output, 24VDC (Intrinsic safety option)
	M5									Digital display with 4-20mA output, 24VDC (Flame-proof option)
Communication	N									None
	H									HART
	M									Modbus (RTU)
Explosion type	N									None
	I									Intrinsic safety type: ExialICT6
	F									Flame-proof type: ExdIICT6
Medium	L									Liquid
	G									Gas
Other options	E									Cooling jacket
	T									High temperature (above 120deg C)
	P									High pressure (above standard pressure for each size)
	Z									Others
Alarm function	K1									2-wire: high and low relay alarm (contact rating: 24VDC, 0.2A)
	K2									3-wire or 4 wire: high and low alarm (contact rating: 250VAC, 3A)
	K3									Transistor relay high and low alarm (contact rating: 24VDC or 220VAC 3A)
Line size									DN10, DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN125, DN150, DN200	