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Flow



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Datasheet

Turbine Flow Meter

SUP-FLC220

Supmea

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Datasheet**Turbine Flow Meter
SUP-FLC220**

The liquid turbine flowmeter is a velocity-type instrument used to measure the volumetric flow of low-viscosity liquids (such as water, liquefied petroleum gas, refined oil, light crude oil, organic liquids, and inorganic liquids free of fibers and particulate impurities) in closed pipelines. It is widely applied in industries such as petroleum, chemical, metallurgy, water supply, and papermaking, making it an ideal instrument for flow measurement and energy conservation.

The turbine flowmeter is suitable for measuring liquids in closed pipelines that are non-corrosive to stainless steel 430F and duplex stainless steel 2205, and that are free from fibers and particulate impurities. When paired with specialized display instruments, it can also perform functions such as batch control and overrun alarms. The sensor is suitable for media with a kinematic viscosity of less than $5 \times 10^{-6} \text{ m}^2/\text{s}$ under operating conditions. For liquids with viscosity greater than $5 \times 10^{-6} \text{ m}^2/\text{s}$, the sensor must undergo wet calibration with the actual fluid before use.

Features

- High accuracy with excellent repeatability.
- Wide turndown ratio, up to 10:1.
- Multiple structural designs available for flexible user selection.
- Simple structure, easy installation, and convenient operation.
- Low overall power consumption.
- No sealing rings, ensuring zero leakage.

**Turbine Flow Meter**

Principle

When the liquid to be measured flows through the flow meter sensor, the internal impeller rotates with the kinetic energy of the liquid. At this time, the impeller blades cause the magnetic resistance in the detection device to change periodically, so the two ends of the detection coil are induced and The electrical pulse signal proportional to the flow rate is amplified by the preamplifier and then sent to the display unit. The single-chip microcomputer system in the display unit performs calculations according to the measured pulse number and the instrument coefficient K of the flow meter and displays the instantaneous flow and the cumulative total.

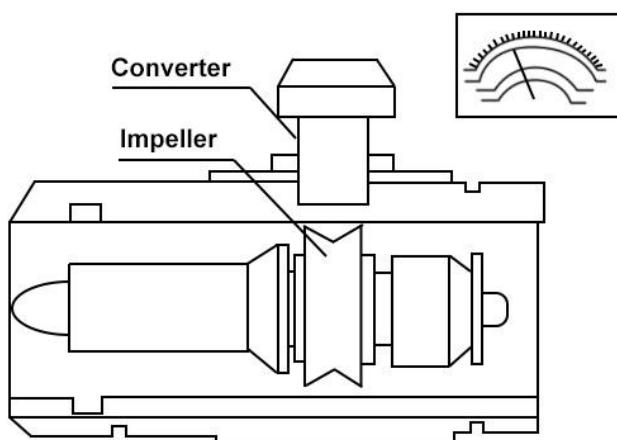


Figure 1

The relationship between the meter coefficient and instantaneous flow rate, frequency, pulse number, and the cumulative total is as follows:

$$K=f/Q \text{ and } K=N/V$$

where:

f—flow signal frequency (Hz)

Q—instantaneous flow rate (m³/s, or /L/s)

N—number of pulses

V—total volume (m³)

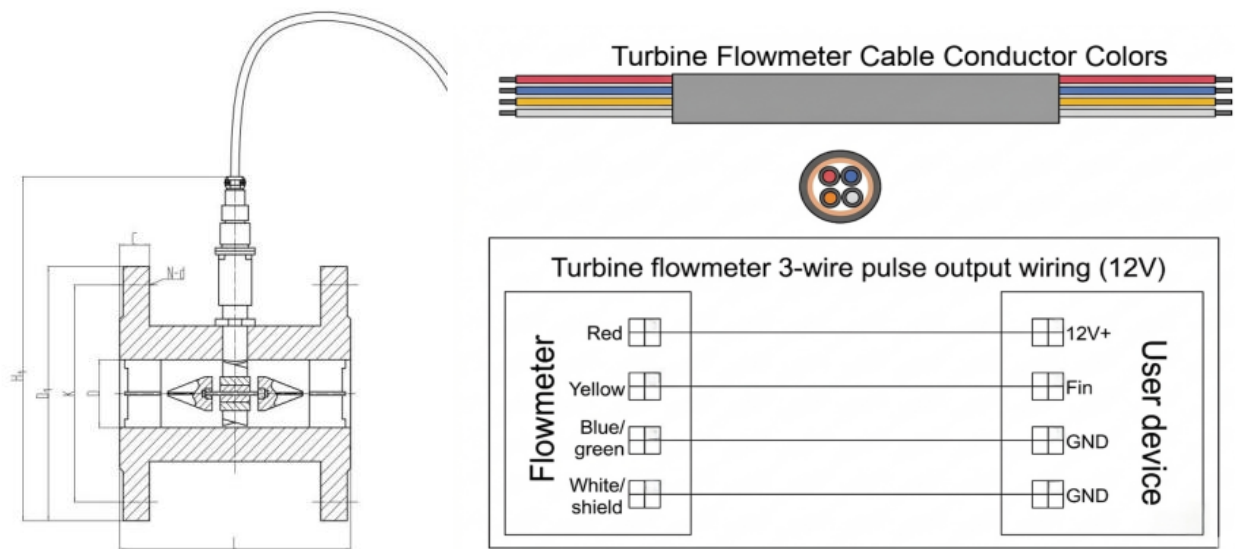
K—meter coefficient (1/m³ or 1/L)

Parameters		
Input		
Measured Variables	Volumetric Flow Rate	
Nominal Diameter	Flange Connection: DN15 ~ DN300 Clamp Connection: DN10 ~ DN100 Threaded Connection: DN4 ~ DN100 Note: Other sizes available upon request.	
Flow Range	Nominal Diameter	Flow Range
	DN4	(0.04~0.25) m³/h
	DN6	(0.1~0.6) m³/h
	DN10	(0.2~1.2) m³/h
	DN15	(0.6~6) m³/h
	DN20	(0.7~7) m³/h
	DN25	(1~10) m³/h
	DN32	(1.5~15) m³/h
	DN40	(2~20) m³/h
	DN50	(4~40) m³/h
	DN65	(7~70) m³/h
	DN80	(10~100) m³/h
	DN100	(20~200) m³/h
	DN125	(25~250) m³/h
	DN150	(30~300) m³/h
	DN200	(80~800) m³/h
	DN250	(89~890) m³/h
	DN300	(128~1280) m³/h
Output		
Transmitter Output	(4~20) mA output, load resistance ≤500 Ω	
Pulse Output	Three-wire pulse output	
Communication Output	RS485 Interface, MODBUS Communication Protocol	
Power Supply		
Power Supply Input	DC: 24V Battery powered: 3.6 V lithium battery	
Power Consumption	24 VDC supply, power consumption ≤0.3 W	
Electrical Interface	M20 × 1.5 or Aviation Connector	
Performance Parameters		
Accuracy	0.5 Class / 1.0 Class	
Repeatability	Within 1/3 of accuracy grade	
Process Conditions		
Measuring Medium	Liquids without fibers, solid particles, or corrosive properties	

	Viscosity $\leq 5 \times 10^{-6} \text{ m}^2/\text{s}$ (for liquids with viscosity $> 5 \times 10^{-6} \text{ m}^2/\text{s}$, real-fluid calibration of the flowmeter is required)	
Medium Temperature	Standard type: $-20 \sim 80 \text{ }^{\circ}\text{C}$	
	High-temperature type: $-20 \sim 120 \text{ }^{\circ}\text{C}$	
Process Pressure	Threaded Connection	Pressure Resistance 1.6 MPa
	Flange Connection	DN15 ~ DN50, Pressure Resistance 2.5 MPa DN65 ~ DN300, Pressure Resistance 1.6 MPa
	Clamp Connection	Pressure Resistance 1.6 MPa
Environmental Conditions		
Operating Environment	Temperature: $(-20 \sim 55) \text{ }^{\circ}\text{C}$ Humidity: 5% ~ 90%	
Storage Environment	Temperature: $(-20 \sim 55) \text{ }^{\circ}\text{C}$ Humidity: $\leq 85\%$	
Protection Rating	IP65 (pulse sensor head: IP00)	

Wiring

Non-indicating Pulse Output Wiring Instructions



Note: Conventional pulse wiring is a 3-wire wiring method. When the instrument is installed in a pipeline and there is interference during use, the white wire/shielded wire of the sensor can be connected to the power supply GND, which can effectively reduce the interference during use.

Wiring Instructions for Display-type Turbine Flowmeter

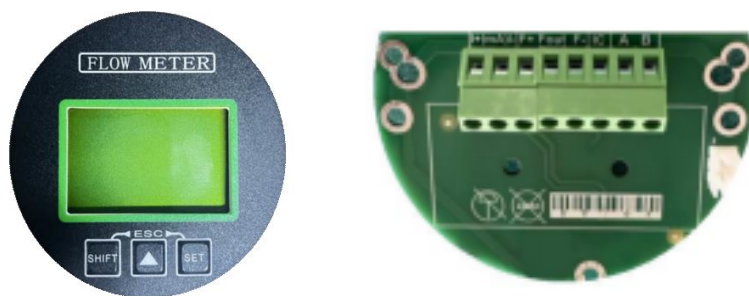


Figure 4 Terminal Diagram of Display-type Turbine Flowmeter

(1) Pulse Output Wiring

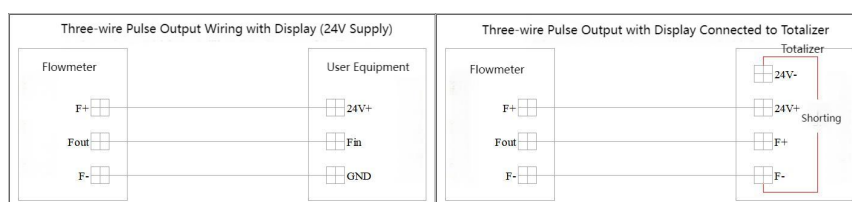


Figure 5 Pulse Output Wiring Diagram

(2) (4–20mA) Output

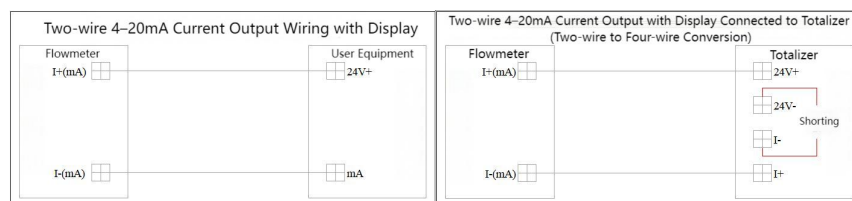


Figure 6 Two-wire (4–20mA) Output Wiring Diagram

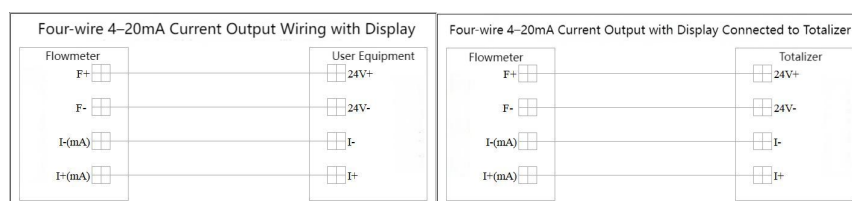


Figure 7 Four-wire (4–20mA) Output Wiring Diagram

(3) RS485 Output Wiring

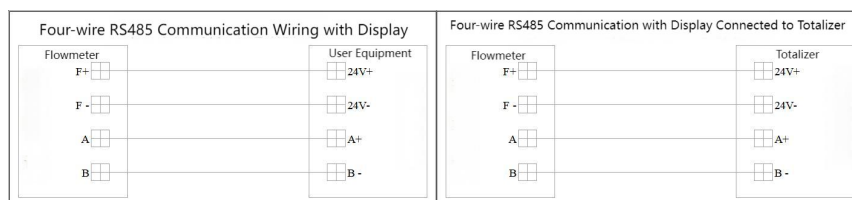


Figure 8 RS485 Output Wiring Diagram

Dimension

Dimensions of Non-Display Type Turbine Flow Meters

Threaded Connection

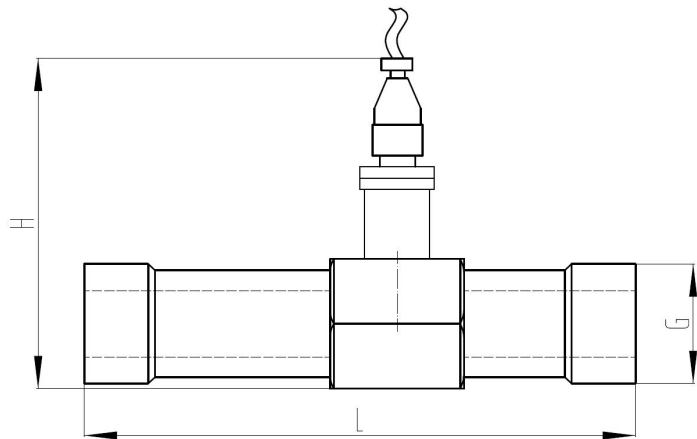


Figure 9 Outline Drawing of Threaded Connection Turbine Flow Meter

Table 1 Dimensions of Threaded Connection Turbine Flow Meters

Nominal Diameter (mm)	L (mm)	H (mm)	Thread Specifications/G
DN15	75	160	G1
DN20	85	160	G1
DN25	100	160	G1 1/4
DN32	120	170	G1 1/2
DN40	140	180	G2
DN50	150	196	G2 1/2

Clamp Connection

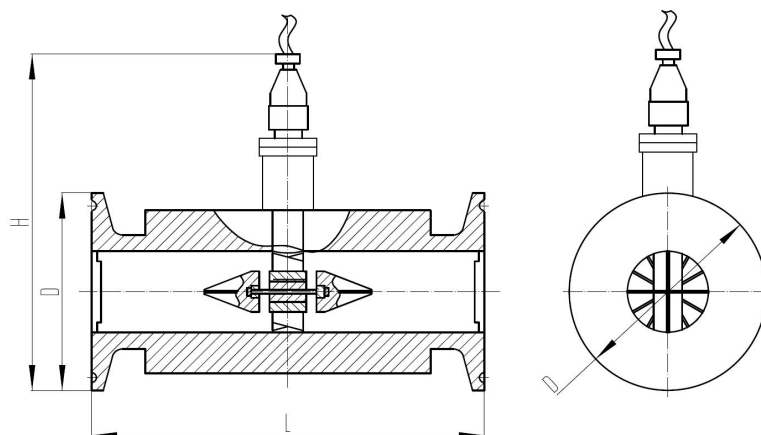


Figure 10 Outline Drawing of Clamp Connection Turbine Flow Meter

Table 2 Dimensions of Clamp Connection Turbine Flow Meters

Nominal Diameter (mm)	L (mm)	H (mm)	Clamp Outer Diameter D (mm)
DN15	75	170	Φ50.5
DN20	85	170	Φ50.5
DN25	100	170	Φ50.5
DN32	120	170	Φ50.5
DN40	140	185	Φ64
DN50	150	200	Φ78

Clamp Standard: ISO2852

Flange Connection

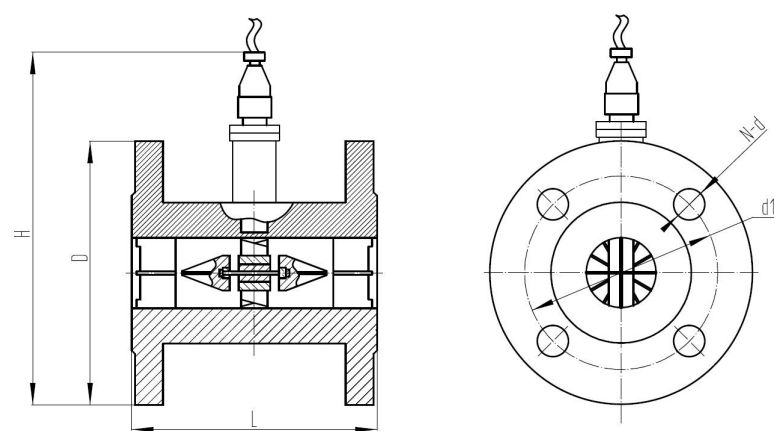


Figure 11 Outline Drawing of Flanged Connection Turbine Flow Meter

Table 3 Dimensions of Flanged Connection Turbine Flow Meters

Nominal Diameter (mm)	L (mm)	D (mm)	N	d (mm)	d1 (mm)	Hexagon Head Bolt		H (mm)
						Specification	Quantity	
DN15	75	Φ95	4	14	65	M12	8	185
DN20	85	Φ105	4	14	75	M12	8	190
DN25	100	Φ115	4	14	85	M12	8	200
DN32	120	Φ140	4	18	100	M16	8	215
DN40	140	Φ150	4	18	110	M16	8	225
DN50	150	Φ165	4	18	125	M16	8	240
DN65	175	Φ185	8	18	145	M16	16	260
DN80	200	Φ200	8	18	160	M16	16	270
DN100	220	Φ220	8	18	180	M16	16	290
DN125	250	Φ250	8	18	210	M16	16	320
DN150	300	Φ285	8	22	240	M20	16	350
DN200	360	Φ340	12	22	295	M20	24	400
DN250	400	Φ405	12	26	355	M24	24	450
DN300	500	Φ460	12	26	410	M24	24	515

Flange Standard: GB/T20592

Dimensions of Display Type Turbine Flow Meters

Threaded Connection

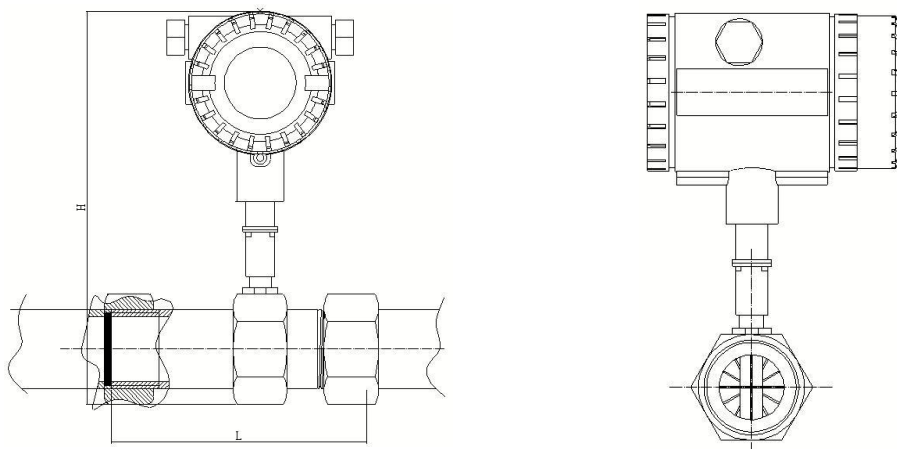


Figure 12 Outline Drawing of Threaded Connection Turbine Flow Meter

Table 4 Dimensions of Threaded Connection Turbine Flow Meters

Nominal Diameter (mm)	L (mm)	Thread Specifications/G	H (mm)
DN4	50±1	G1/2	200±10
DN6	50±1	G1/2	200±10
DN10	50±1	G1/2	200±10
DN15	75±1	G1	200±10
DN20	85±1	G1	210±10
DN25	100±1	G1 1/4	210±10
DN32	120±1	G1 1/2	210±10
DN40	140±1	G2	215±10
DN50	150±1	G2 1/2	220±10
DN65	175±1	G3	240±10
DN80	200±1	G3 1/2	240±10
DN100	220±1	G4 1/2	245±10

Clamp Connection

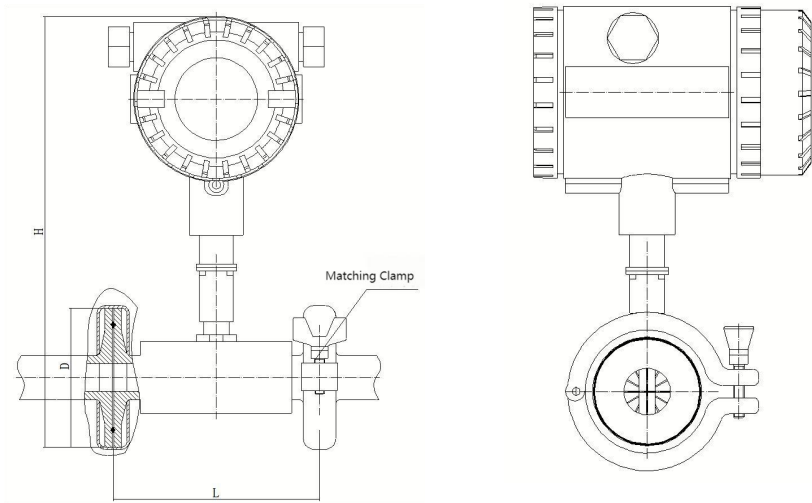


Figure 13 Outline Drawing of Clamp Connection Turbine Flow Meter

Table 5 Dimensions of Clamp Connection Turbine Flow Meters

Nominal Diameter (mm)	L (mm)	Clamp Outer Diameter D (mm)	H (mm)
DN10	50±1	Φ34	200±10
DN15	75±1	Φ50.5	200±10
DN20	85±1	Φ50.5	210±10
DN25	100±1	Φ50.5	210±10
DN32	120±1	Φ50.5	220±10
DN40	140±1	Φ64	220±10
DN50	150±1	Φ77.5	230±10
DN65	175±1	Φ91	240±10
DN80	200±1	Φ106	240±10
DN100	220±1	Φ119	245±10

Clamp Standard: ISO2852

Flange Connection

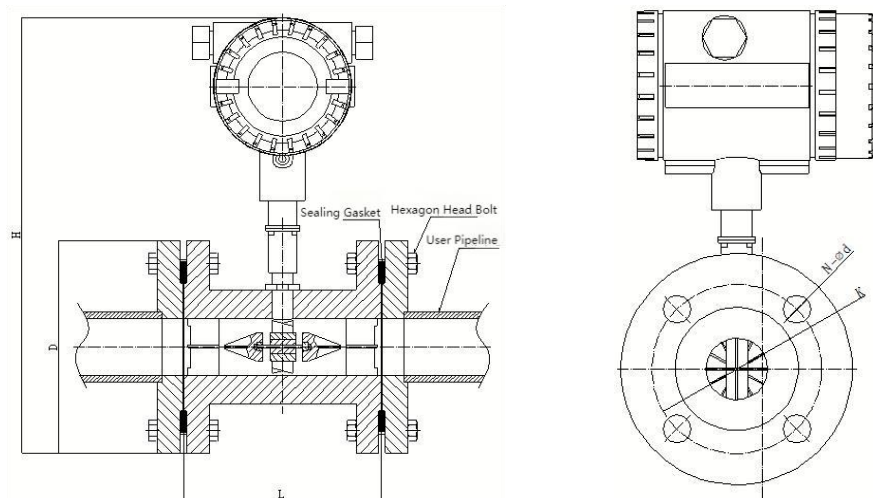


Figure 14 Outline Drawing of Flanged Connection Turbine Flow Meter

Table 6 Dimensions of Flanged Connection Turbine Flow Meters

Nominal Diameter (mm)	L (mm)	D (mm)	N	d (mm)	K (mm)	Hexagon Head Bolt		H (mm)
						Specification	Quantity	
DN15	75±1	Φ95±1.2	4	14	65	M12	8	280±10
DN20	85±1	Φ105±1.2	4	14	75	M12	8	285±10
DN25	100±1	Φ115±1.2	4	14	85	M12	8	290±10
DN32	120±1	Φ140±1.2	4	18	100	M16	8	303±10
DN40	140±1	Φ150±1.2	4	18	110	M16	8	308±10
DN50	150±1	Φ165±1.2	4	18	125	M16	8	316±10
DN65	175±1	Φ185±1.2	8	18	145	M16	16	326±10
DN80	200±1	Φ200±1.2	8	18	160	M16	16	334±10
DN100	220±1	Φ220±1.2	8	18	180	M16	16	344±10
DN125	250±1	Φ250±1.2	8	18	210	M16	16	359±10
DN150	300±2	Φ285±1.2	8	22	240	M20	16	377±10
DN200	360±2	Φ340±1.2	12	22	295	M20	24	405±10
DN250	400±2	Φ405±2	12	26	355	M24	24	438±10
DN300	500±2	Φ460±2	12	26	410	M24	24	466±10

Flange Standard: GB/T20592

Ordering code

SUP-FLC220 -04-B0-M1-TG-NT-1-K0-WG									Description
SUP-FLC220	-	-	-	-	-	-	-	-	
Nominal Diameter	04								DN4(1/16")
	06								DN6(1/8")
	10								DN10(3/8")
	15								DN15(1/2")
	20								DN20(3/4")
	25								DN25(1")
	32								DN32(1.25")
	40								DN40(1.5")
	50								DN50(2")
	65								DN65(2.5")
	80								DN80(3")
	1C								DN100(4")
	1E								DN125(5")
	1G								DN150(6")
	2C								DN200(8")
	2G								DN250(10")
	3C								DN300(12")
Process Connection	B0								G-type Internal Thread (BSPP)
	H2								HG/T20592 PN40
	H1								HG/T20592 PN16
	I0								ISO2852 Clamp
	XX								Others
Process Connection and Body Material		M1							304SS
		M2							316SS
Heat Resistance Temperature			TG						-20-80℃
			TH						-20-120℃
Impeller Material				NT					430FSS
				MD					Duplex Stainless Steel 2205
Measurement Range and Accuracy					1				Standard Measuring Range, 1.0 Class
					3				Standard Measuring Range, 0.5 Class
Output, Display, and Power Supply						K0			Pulse, No Display, 24VDC
						K4			Pulse+2-Wire 4-20mA, With Display, 24VDC+Dual Power Supply
						K3			Pulse+2-Wire 4-20mA, With Display, 24VDC

	K5		Pulse+3-Wire 4-20mA+RS485, With Display, 24VDC
	KA		Pulse+3-Wire 4-20mA+HART, With Display, 24VDC
Electrical Interface, Housing Material, and Protection Rating		WG	M20×1.5 Cable Gland, Aluminum Alloy, IP65
		WF	Aviation Connector, IP00