

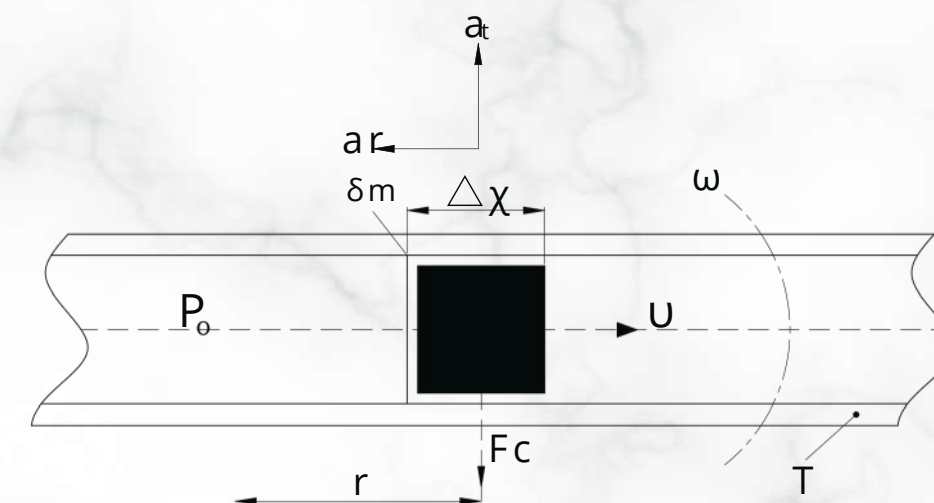


Flow Meters

1. Coriolis Mass Flow Meter Data Sheet of Coriolis Mass Flow Meter

Working Principle

When a particle inside a pipe that is undergoing rotational motion around a point P experiences motion toward or away from the center of rotation, an inertial force will be generated. The principle is illustrated in Fig. 1.



In the figure, a particle with mass δm moves at a constant velocity v within a pipe that rotates at an angular velocity ω around a fixed point P. This particle will obtain two acceleration components:

1. The normal acceleration α_r (centripetal acceleration) has a magnitude of $\omega^2 r$, and its direction points towards point P.
2. The tangential acceleration α_t (Coriolis acceleration) has a magnitude of $2\omega v$, and its direction is perpendicular to α_r .

According to Newton's second law of motion (force = mass $\times$ acceleration), it is certain that the existence of Coriolis acceleration requires the application of a corresponding force in the direction of α_t . The magnitude of this force is $2\omega v \delta m$, and it is exerted by the pipe that rotates upward. The reactive force acting on the pipe is $F_c = 2\omega v \delta m$ (abbreviated as the "Coriolis force").

In the diagram, the fluid element $\delta m = \rho A \Delta x$, so the Coriolis force can be expressed as follows:

$$\Delta F_c = 2\omega v \delta m = 2\omega v \rho A \Delta x = 2\omega \delta q m \Delta x$$

where, A is the cross-sectional area of the pipe.

$$\delta q m = \delta m / dt = v \rho A$$

For a specific rotating pipe, its frequency characteristics are fixed, and ΔF_c depends on $\delta q m$. Therefore, by directly or indirectly measuring the Coriolis force applied by the flowing fluid in the rotating pipe, the mass flow rate can be determined. This is the fundamental principle behind the mass flowmeter.

Overview



The GCF-1000 series mass flowmeter utilizes the Coriolis Force principle to achieve direct and precise measurement of fluid mass flow, without the need for any pressure, temperature, or density calculations or corrections. The instrument consists of two main components: the sensor unit and the transmitter unit. The instrument is designed and manufactured in accordance with the national standards for intrinsically safe explosion-proof type, with explosion-proof markings of Ex db ib IIC T6 Gb and Ex tb IIIC T80°C Db.

The GCF-1000 series mass flowmeter employs the core processor of a fully digital, self-adaptive driving circuit, a closed-loop DSP signal processing, and a special structural design. This provides features such as high stability, strong anti-vibration performance, fast response, high accuracy (flow accuracy: up to $\pm 0.1\%$, density accuracy: up to $\pm 0.05\%$, temperature accuracy: up to $\pm 1^\circ\text{C}$), and low pressure drop. Additionally, the instrument has multi-parameter measurement functionality, capable of simultaneously displaying instantaneous mass (volume), totalized mass (volume), density (concentration, alcohol content, sugar content), and temperature. They can measure a variety of non-Newtonian fluids, slurries, suspensions, high-viscosity fluids, steam, gas-liquid two-phase flows, and other complex process conditions.

Furthermore, with continuous technological advancements, our flowmeters are now equipped with self-diagnostic and alarm functions. These include sensor fault diagnosis, usage status diagnosis, system setting diagnosis, as well as self-diagnosis of process noise interference, wiring grounding, and coil faults. In the event of related faults, the system can provide a fault alarm display.

High reliability

High sensitivity

High measurement ratio

Measurement High precision

Coriolis Mass Flowmeter Serie



Product Features:

- | | | |
|--|---|--|
| <p>01
Through fluid mechanics and thermodynamics research, different vibrating measurement tube structures have been precisely designed. Non-linear vibration suppression technology and smooth flow path design provide strong anti-interference capabilities, ensuring high sensitivity and high range ratio.</p> | <p>02
Classic U-tube, refined triangle tube, micro S-tube, and compact V-tube designs are available to suit various operating conditions.</p> | <p>03
Explosion-proof touch screen operation with engineer and operator passwords for easy adjustment of the instrument; Configurable response time, stability coefficient, and small signal range; multi-language support (Chinese, English, Russian, German, Spanish, etc.); supports various communication protocols including Modbus RTU, HART, FF bus, PROFIBUS PA, etc.</p> |
| <p>04
Power supply options include 220VAC or 24VDC, with free conversion between the two and self-adaptability.</p> | <p>05
Full digital closed-loop control and DSP digital processing circuits achieve high stability and accurate measurement even under two-phase flow and complex operating conditions.</p> | <p>06
Dynamic vibration balancing matching technology and dynamic accuracy correction are provided to reduce system errors during intermittent operation.</p> |
| <p>07
The flow transmitter can be directly paired with a sender for 4G or 5G wireless transmission. It can also be paired with a batch controller to directly print receipts, enabling quantity control or flow rate control functions.</p> | <p>08
Based on special custom high-uniformity, high-smoothness, proper solid solution, reasonable elasticity, and all-digital circuit design, the flowmeter zero point has ultra-stability, accepting 0-0.001g/s orders.</p> | <p>09
The products can be custom-ordered with any high-precision section as needed, with ultra-low temperatures down to -273°C, ultra-high pressures up to 100 MPa, and ultra-high temperatures up to 450°C, and the typical range exceeded for the same pipe diameter.</p> |

Calibration Pipelines



We have 13 national authority approved calibration pipelines with
measurement accuracy up to one part per 10,000



Technical Specifications

General Technical Specifications

Applicable Media: Suitable for liquids, gases, solids, liquid-solid, gas-solid, gas-liquid-solid (gases in the form of small bubbles), and other media. Measuring Tube Materials: 316LSS, nickel-based alloys, C4 steel, high-nickel alloys, copper-nickel alloys, titanium, tantalum, zirconium, or other customer-required materials. Transmitter Housing Materials: Cast aluminum with painting; 316SS; 316LSS

NACE Certification: Sulfur and hydrogen resistant
Pressure Rating: 1.6 MPa, 4 MPa, 10 MPa, 20 MPa or user-specified pressure rating, up to 100 MPa
available Display: Instantaneous value with 4 digits before and 2 digits after the decimal point, cumulative value with 6 digits before and 2 digits after the decimal point
Power Supply: 24VDC or 220VA, compatible with both 24VDC and 220VA power sources
Output Signals: 4~20mA, 0~10KHz pulse equivalent output
Communication Signal : Modbus RTU, HART, FF bus, PROFIBUS PA, etc.
Explosion-proof Marking: Ex db ib II C T6 Gb; Ex tb IIIC T80°C Db
Protection Level: IP66, IP67

Flow Accuracy >>

MassFlow/VolumeFlow Accuracy
Grade: ±0.1% ~ ±0.5% Re
peatability: ±±0.05%

Density Performance Indicators >>

Liquid Resolution: ±0.0005 g/cm3(0.5 kg/m3)
Repeat ability: ±0.0002 g/cm3(0.2 kg/m3)
Measuring Accuracy: ±0.002 g/cm3 (2 kg/cm3)
or: ±0.001 g/cm3(1 kg/m3)

Temperature Accuracy >>

±1°C ±0.05% of the Tested Value (°C)

Viscosity Compensation >>

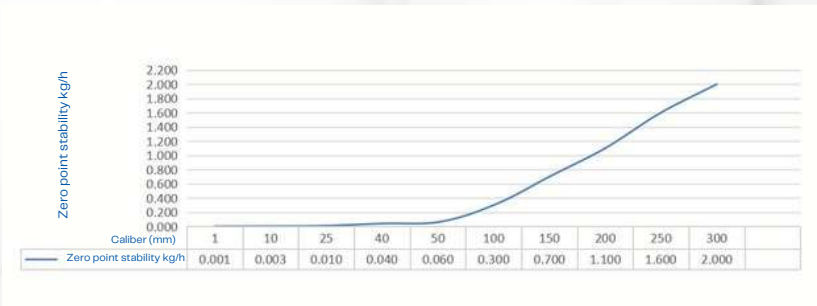
For viscosity exceeding 400 centipoises, viscosity correction compensation is required when ordering.

Temperature Range >>

Medium Temperature: -273~100°C;-200~100°C;-50~150°C; -50~250°C;-50~350°C;-50~450°C
Ambient -41°C ~80°C;-20°C ~50°C
Temperature:

Zero Point Stability Indicators>

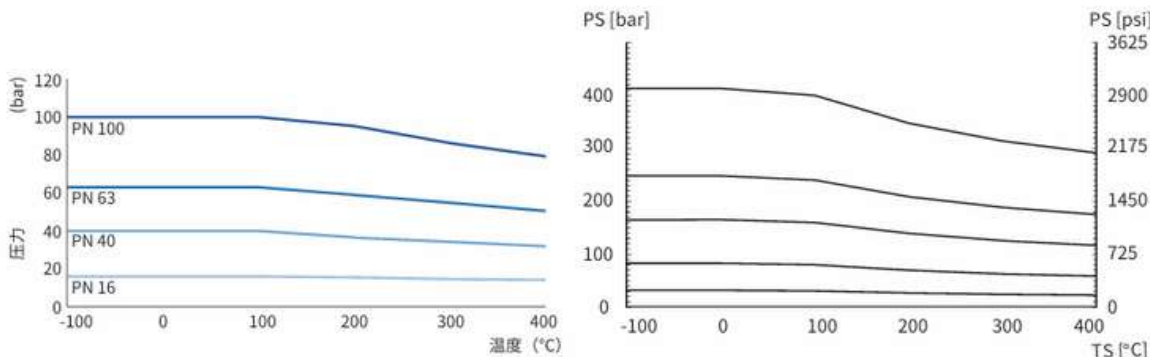
Flow x Measurement Uncertainty (e.g. 0.1%)> Zero Point Stability Maximum Measurement Error (%):
Measurement
Uncertainty
Repeatability: ±1/2x measurement uncertainty
Measurement Uncertainty (e.g. 0.1%) ≤ Zero Point Stability/ Measured Value) x 100%
Repeatability: + (1/2 Zero Point Stability / Measured Value) x 100%



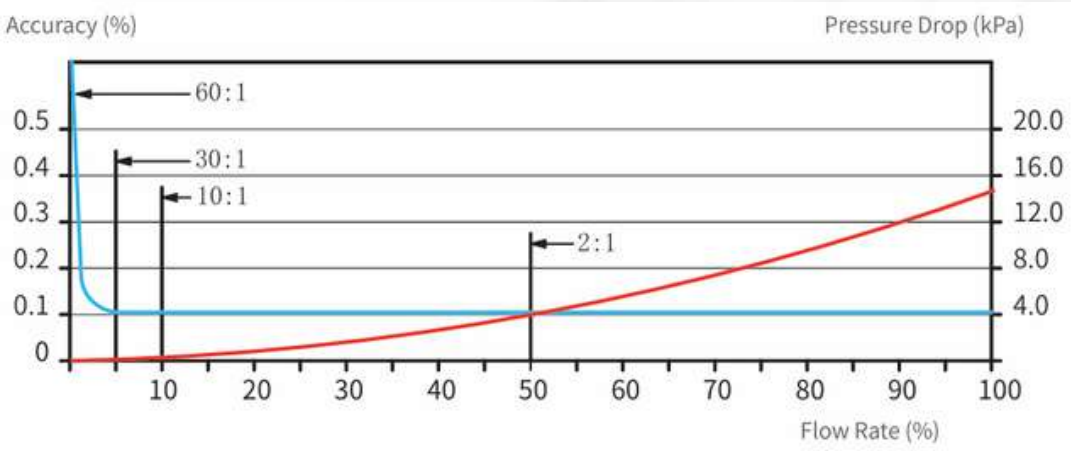
Factory Calibration Conditions

The checking and calibration of flow measurement uncertainty is based on linearity, repeatability, and hysteresis. Performance indicators are based on the calibrated operating conditions (typically 20~30°C, 0.2~0.4MPa pressure), with water or air as the test medium. The measurement accuracy is based on the calibration device's frequency or pulse equivalent output as the original basis, with factors affecting performance parameters such as:

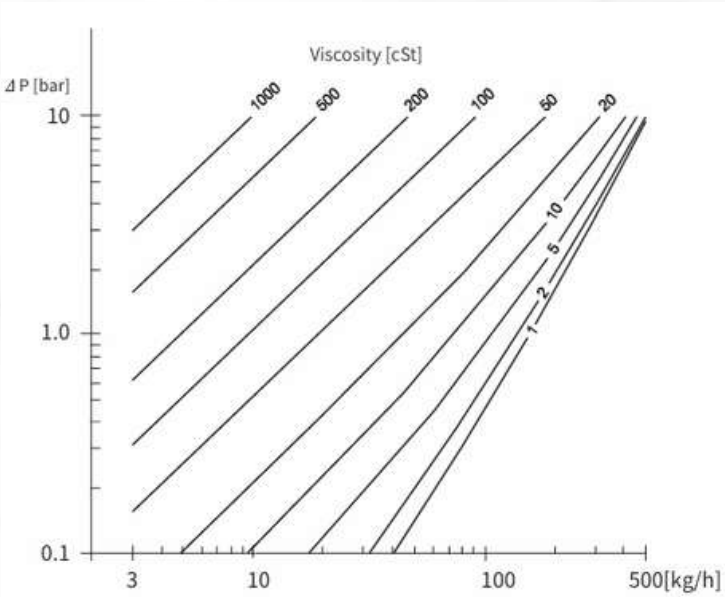
(I) Pressure/Temperature Curve



(II) Flow Rate/Accuracy/Pressure Drop Curve



(III) Pressure Loss/Viscosity Curve



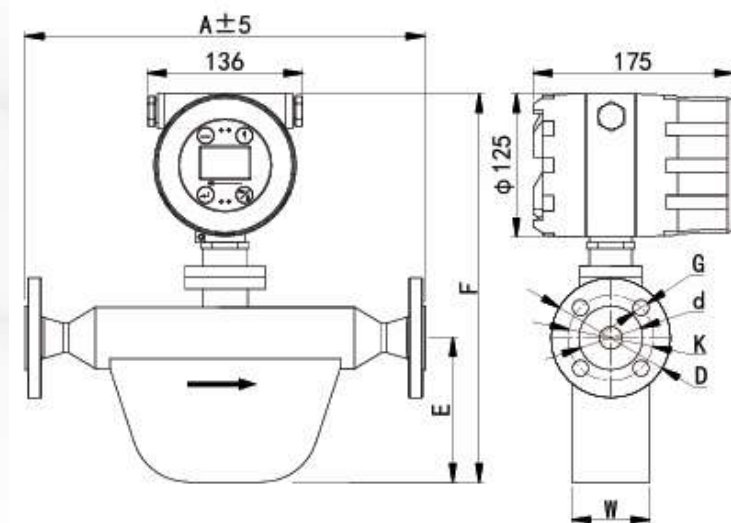


Mass Flowmeter Installation and Commissioning

Instrument Dimension Diagrams

The mass flowmeter consists of a precision digital transmitter and sensor.

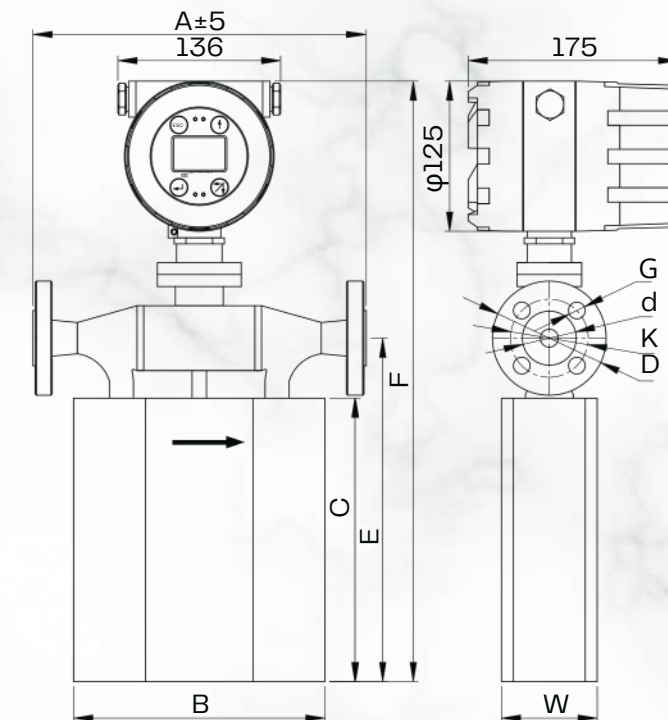
V-Type A Series Dimensions



(Unit: mm)										
Model	Pipe Size, DN	Pressure, MPa	A	E	F	W	G	K	d	D
GCF-1-V10	10	4	480	150	375	68	14	60	40	90
GCF-1-V15	15	4	480	150	375	68	14	65	45	95
GCF-1-V20	20	4	620	189	413	68	14	75	58	105
GCF-1-V25	25	4	721	205	435.5	85	14	85	68	115
GCF-1-V40	40	4	923	285	536.5	123	18	110	88	150
GCF-1-V50	50	4	925	285	536.5	123	18	125	102	165
GCF-1-V65	65	4	990	320	584.5	150	18	145	122	185
GCF-1-V80	80	1.6	1060	270	535	150	18	160	138	200
GCF-1-V100	100	1.6	1192	280	558	185	18	180	158	220
GCF-1-V125	125	1.6	1200	280	558	185	18	210	188	250
GCF-1-V150	150	1.6	1320	360	638	185	22	240	212	285
GCF-1-V200A	200	1.6	1584	380	675	218	22	295	268	340
GCF-1-V200B	200	1.6	1903	465	800	265	22	295	268	340
GCF-1-V250	250	1.6	1931	490	838	320	26	355	320	405
GCF-1-V300	300	1.6	2006	520	893	360	26	410	378	460

Note: The above models are a default integral type and the split type needs customization.

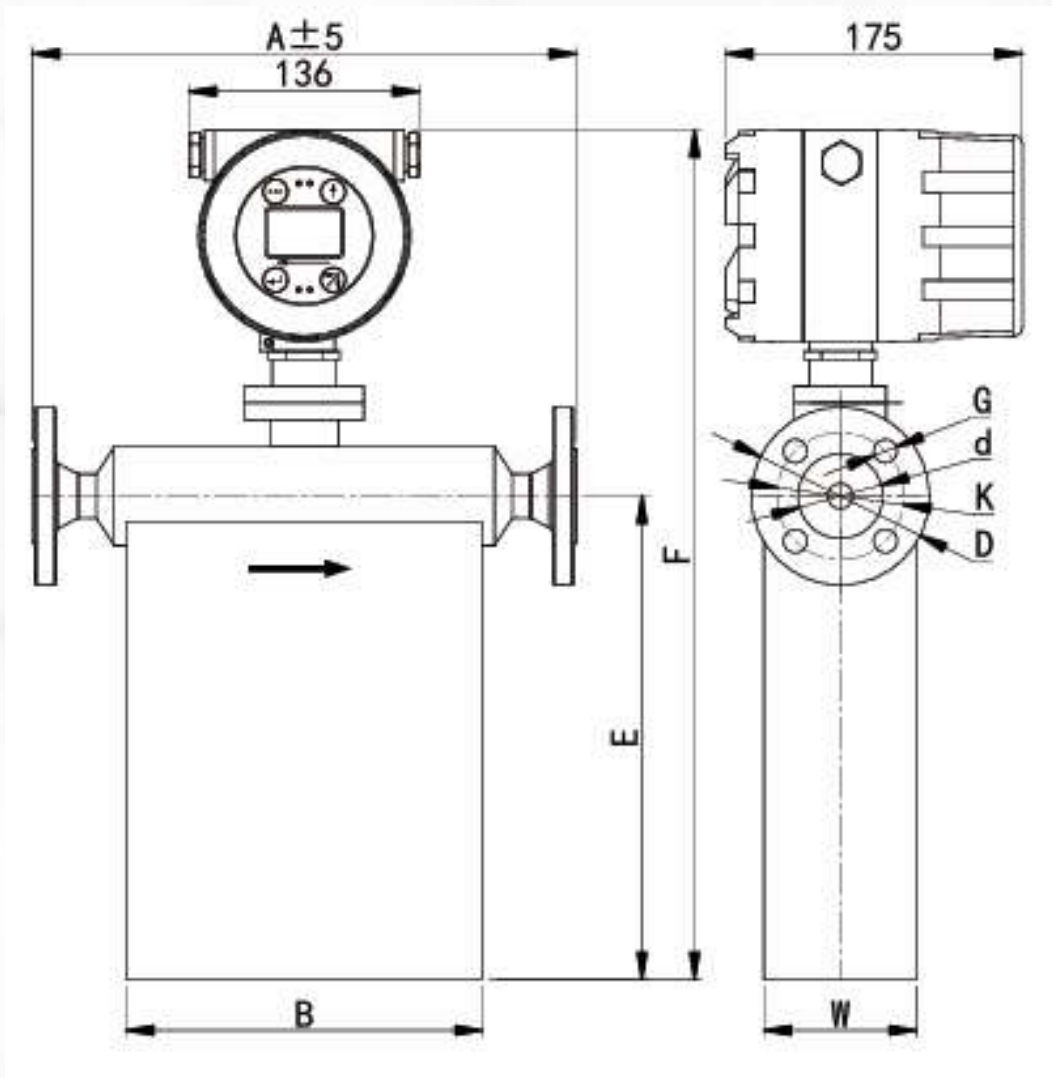
U-Type B Series Dimensions



(Unit: mm)												
Model	Pipe Size, DN	Pressure, MPa	A	B	C	E	F	W	G	K	d	D
GCF-1-U10	10	4	278	210	236	286	500	80	14	60	40	90
GCF-1-U15	15	4	284	210	276	326	540	80	14	65	45	95
GCF-1-U20	20	4	304	230	326	376	590	90	14	75	58	105
GCF-1-U25	25	4	410	300	443	500	716	120	14	85	68	115
GCF-1-U40	40	4	450	360	483	563	787	130	18	110	88	150
GCF-1-U50	50	4	500	370	530	610	834	140	18	125	99	165
GCF-1-U65	65	1.6	530	410	601	691	928	150	18	145	122	185
GCF-1-U80	80	1.6	660	450	611	701	938	160	18	160	132	200
GCF-1-U100	100	1.6	620	510	740	858	1113	260	18	180	158	220
GCF-1-U125	125	1.6	628	510	740	858	1113	260	18	210	188	250
GCF-1-U150	150	1.6	645	510	740	917	1194	260	22	240	212	285
GCF-1-U200	200	1.6	786	670	970	1150	1425	280	22	295	268	340
GCF-1-U250	250	1.6	1120	950	922	1107	1432	405	26	355	320	405
GCF-1-U300	300	1.6	1120	950	922	1107	1432	405	26	410	378	460

Note: The above models are a default integral type and the split type needs customization.

U-Type C Series Dimensions

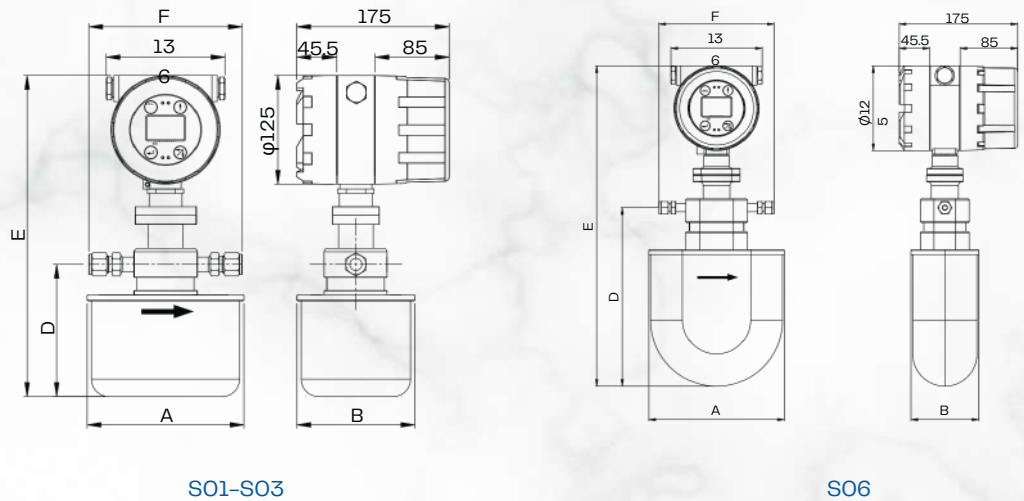


(Unit: mm)

Model	Pipe Size, DN	Pressure, MPa	A	B	E	F	W	G	K	d	D
GCF-1-U10	10	4	321	210	235	451	90	14	60	40	90
GCF-1-U15	15	4	321	210	285	501	90	14	65	45	95
GCF-1-U20	20	4	340	230	340	556	90	14	75	58	105
GCF-1-U25	25	4	420	300	455	679	100	14	85	68	115
GCF-1-U40	40	4	445	320	510	740	110	18	110	88	150
GCF-1-U50	50	4	475	350	560	802	110	18	125	102	165
GCF-1-U65	65	1.6	540	410	650	907	125	18	145	122	185
GCF-1-U80	80	1.6	575	450	660	917	135	18	160	138	200

Note: The above models are a default integral type and the split type needs customization.

S-Type Dimensions

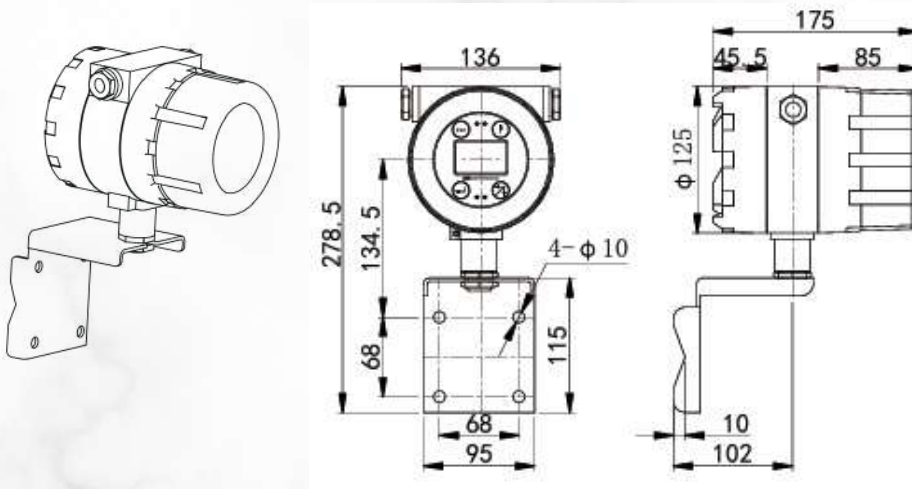


(Unit: mm)

Model	Outer Diameter of Connecting Tube, φ	Pressure, MPa	A	B	D	E	F
GCF-1-S01	6	0~20	170	120	137	353.5	146
GCF-1-S02	6	0~20	170	120	137	353.5	146
GCF-1-S03	8	0~20	180	135	152	368.5	152
GCF-1-S06	8	0~20	200	100	263	472	170

Note: It is a split type structure by default but it can also be customized as an integral type based on the installation requirements.

Split-Type Transmitter Dimension Drawings



Instrument Installation

Install shutoff valves at the inlet and outlet of the flowmeter, and provide proper support. Perform zero point calibration of the instrument before its initial use.

The connected piping and instrument interface must be on the same central axis, without applying any additional force to the instrument. Unnecessary additional force may affect the measurement accuracy of the instrument.

- Install the instrument away from heat sources to prevent transmitter damage from overheating.
- The Coriolis mass flowmeter operates based on the vibration principle, so the installation location should avoid vibration as much as possible, keep away from vibration sources, and provide stable front and rear support for the installed piping. If vibration sources are unavoidable, it is recommended to use metal flexible hoses for connection.
- For measurement of steam or high viscosity fluids, install the instrument vertically as much as possible.
- When measuring high-temperature fluids that require insulation, the insulation housing or heat tracing pipe must not be in direct contact with the sensor housing. We can provide customized insulation housing for the sensor, which can be used for steam, thermal oil, or electric (explosion-proof) insulation and heat tracing. After heat tracing, there will be a 50° C temperature difference between the instrument housing and the measurement pipe.
- The measured fluid must be in a suitable flow state. If the natural environmental conditions are not suitable for the fluid flow state, measures can be taken to adjust the fluid temperature (heating/cooling/insulation) to make the measured fluid in a suitable flow state.
- Installation Direction: Ensure the arrow direction on the sensor nameplate is consistent with the fluid flow direction (the direction the fluid flows through the pipe).
- The sensor and transmitter numbering must correspond one-to-one, and cannot be arbitrarily changed; otherwise, measurement errors may occur.

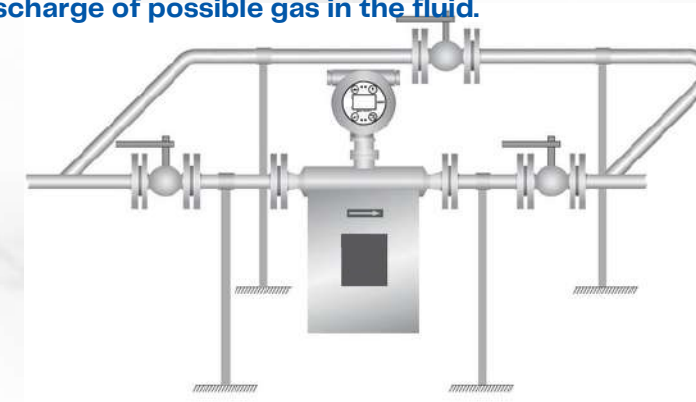


Flowmeter Installation Methods

Horizontal Installation

Suitable for liquid measurement conditions, to ensure the discharge of possible gas in the fluid.

Horizontal Installation of U-Type Mass Flowmeter



Horizontal Installation of V-Type Mass Flowmeter



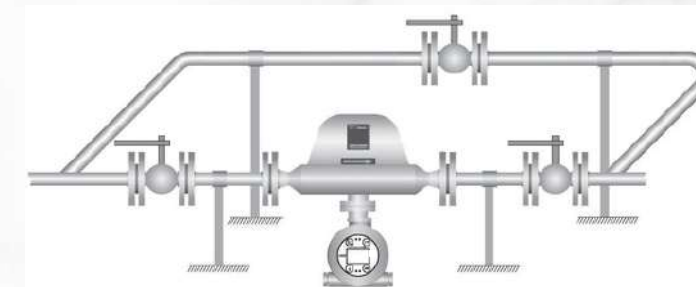
Inverted Installation

Suitable for gas, high viscosity liquid, gas-solid, and liquid-solid fluid measurement conditions to ensure the discharge of possible condensate in the fluid.

Inverted Installation of U-Type Mass Flowmeter



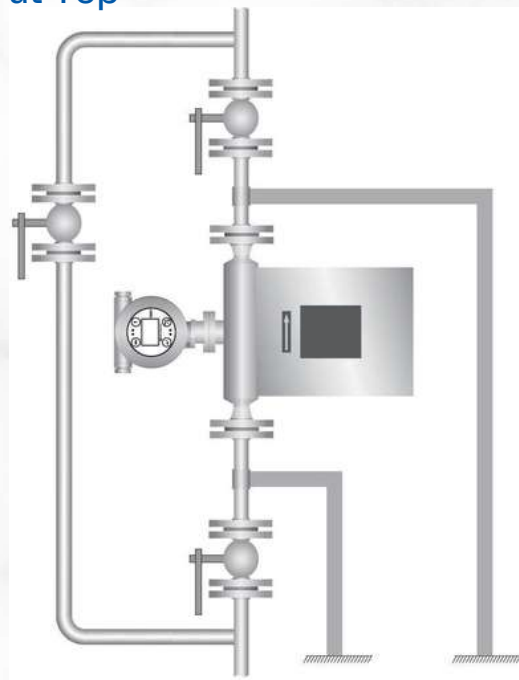
Inverted Installation of V-Type Mass Flowmeter





Flag Installation, Inlet at Bottom and Outlet at Top

Suitable for high viscosity liquids, high temperature fluids, liquid-solid or gas-solid fluids, and operating conditions that require regular emptying of the fluid in the pipe.



Flag Installation of U-Type Mass Flowmeter



Flag Installation of V-Type Mass Flowmeter

Flag Installation, Inlet at Top and Outlet at Bottom

When installed vertically downward in the pipe, it is recommended to install an orifice plate or reducer to prevent the occurrence of an empty pipe measurement during the measurement process.



Small-Diameter Installation Methods

Horizontal Installation

Split-Type Horizontal Installation of S-Type Mass Flowmeter



Integral-Type Horizontal Installation of S-Type Mass Flowmeter



Please consult the manufacturer for bracket installation methods.

Inverted Installation

Split-Type Inverted Installation of S-Type Mass Flowmeter



Integral-Type Inverted Installation of S-Type Mass Flowmeter

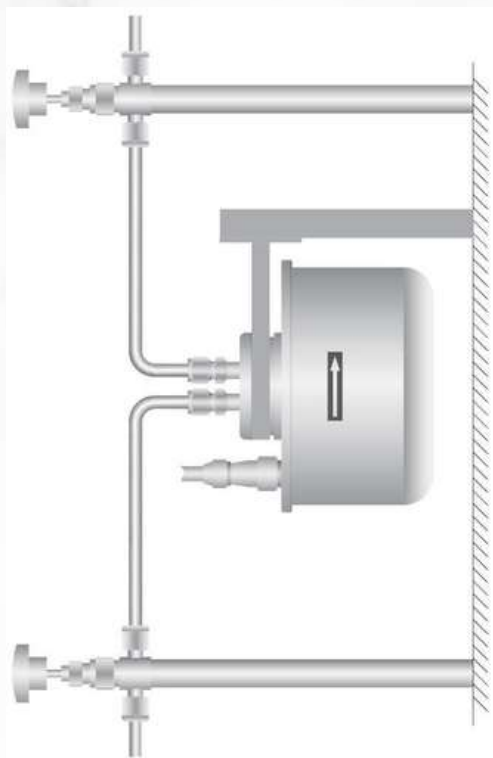


Please consult the manufacturer for bracket installation methods.

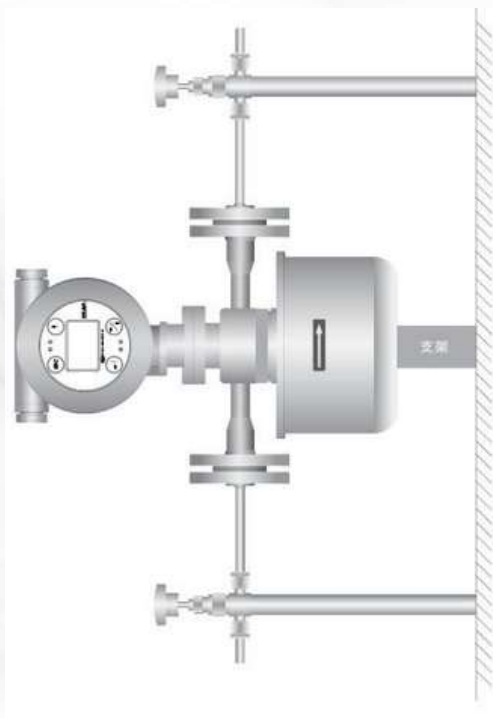


Flag Installation

Split-Type Flag Installation of S-Type Mass Flowmeter



Integral-Type Flag Installation of S-Type Mass Flowmeter



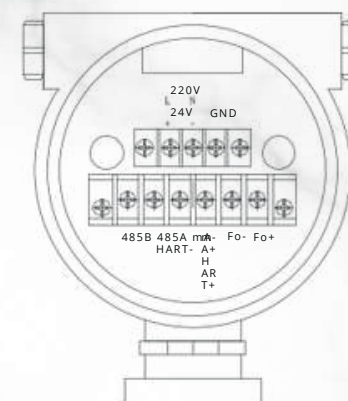
Please consult the manufacturer for bracket installation methods.

Wiring Instructions

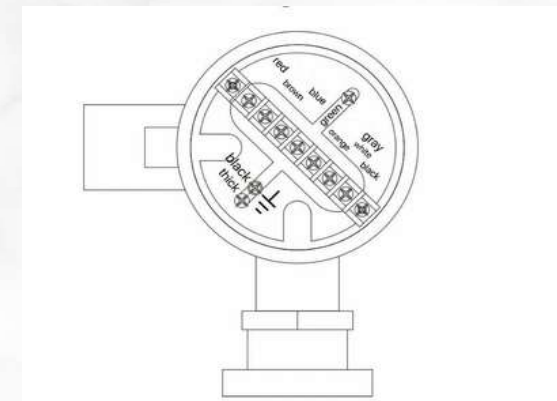
Wiring between Sensor and Transmitter

For integrated instruments, the connection and installation have been completed prior to factory delivery.

The split-type sensor and transmitter are connected through a dedicated cable and connector, which have been pre-installed at the factory. Users can connect them through the connector.



Wiring of Transmitter



Wiring for Split-Type Explosion-Proof Junction Box

Wiring Instructions

24V+/- or 220VAC	24VDC power supply (current not less than 500mA) or 220VAC auto-switching
Fo+/-	Frequency output (instantaneous mass flow rate or volumetric flow rate) / Pulse output (settable equivalent)
mA+/-	Current output (instantaneous flow rate or density selectable)
(HART +/-)	HART
485A \485B	RS-485 communication (baud rate: "9600", address of this device: set to "1")
FF+ \FF-	FF bus (only one communication method can be selected)
PA+ \PA-	PA bus (only one communication method can be selected)
GND	Signal shielding grounding
	Instrument housing grounding

Warning

The power supply voltage may cause serious injury. Ensure the power is cut off before installing or servicing the instrument.

Incorrect installation may prevent the instrument from working properly or cause damage. Refer to the installation section of the instructions and the wiring section of the sensor.

Incorrect installation and operation in hazardous areas may cause danger. Refer to the explosion-proof section for technical parameters in hazardous areas.

The frequency output and current output of the transmitter cannot be externally connected to any level of power supply. The frequency and current outputs are defaulted to active output. Special instructions are required when ordering if passive output is needed. Incorrect external power supply may damage the instrument.

Powering on and Checking the Instrument

Make sure the instrument wiring is correct before powering on. The transmitter design has conventional anti-misalignment protection, but incorrect wiring may still damage the instrument. Make sure the wiring is correct before powering on.

After powering on, the instrument display will show: ▾

Initializing, please wait...

Troubleshooting Common Issues

Fault Phenomenon	Cause of Fault	Solutions
The instrument does not display.	Check if the power supply is normal.	Ensure the power supply is working properly.
The measured value fluctuates greatly.	Check if the sensor/pipeline connection has strong vibration.	Add support or use a flexible hose for connection.
Cannot enter the measurement interface on startup.	The sensor is not connected.	Check the cable and connect it correctly to the sensor.
Large zero point drift.	The sensor installation has stress.	The connection pipeline and sensor interface should be coaxial.
Measurement error.	No support for installation, no zero point calibration.	Install support at the inlet and outlet, and perform zero point calibration.

Repair and Maintenance

The product's service life is related to the quality of repair and maintenance. To extend the product's service life, proper repair and maintenance are essential.

- STEP 01

Keep the flowmeter clean and avoid placing it in a dusty environment. Protect it from sunlight and moisture.


- STEP 02

Handle the flowmeter with care, avoid dropping or throwing it.


- STEP 03

For long-term storage or non-use, it is recommended to flush and blow out the flowmeter sensor. For high viscosity fluid measurement, regular cleaning is recommended.


- STEP 04

Perform regular maintenance on the flowmeter. For users with high accuracy requirements, the flowmeter should be calibrated regularly by the national metrology department.



Transmitter Settings

Function Settings

1 User Menu Password

User Menu Password: 020
The user menu password can be used to "view records," "modify settings," "test outputs," and "clear fault codes," etc.
The "Modify Settings" menu can be used to perform functions such as "Clear Totalizer," "Zero Point Calibration," "Unit Conversion," "Decimal Point Settings," "Response Time Adjustment," "Output Current Signal (Flow/Density) Switching," and "Low Signal Cutoff," etc.

2 System Menu Password

The system menu is related to the calibration parameters of the instrument and is not recommended for the user's modification. If there is a genuine need, please contact the after-sales service and operate under the guidance of relevant technical personnel.

3 Selection of Measurement Units

The conversion of the range after selecting different units is automatically completed by the software.
Metric units: t/h, kg/h, g/h, t/min, kg/min, g/min, kg/s, g/s, m³/h, L/h, ml/h, m³/min, L/s, and ml/s
Imperial units: lb/h, oz/h, lb/min, oz/min, lb/s, oz/s, gal/h, gal/min, and gal/s

4 Output Settings

You can choose (4-20) mA output for flow, density, concentration, and temperature (can also be negotiated for simultaneous output);
Communication options: Modbus RTU protocol, HART protocol, FF bus protocol, PROFIBUS PA;
Frequency output or pulse output can be selected: Frequency output only corresponds to instantaneous mass flow or the corresponding volume flow of mass flow; the pulse output equivalent can be set.

Instrument Panel

The transmitter panel buttons are touch buttons, and no cover needs to be opened. You can operate them directly by touching them.



Zero Point Calibration

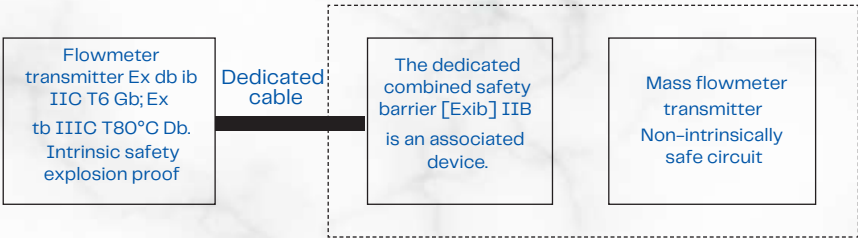
First, ensure the flowmeter is installed correctly and let the measured fluid pass through the flowmeter for 3-5 minutes. First, close the flowmeter outlet valve, then close the flowmeter inlet valve, and maintain a stationary state for 1-2 minutes to perform the zero point calibration. First, enter the password (⬅️), adjust the cursor to the middle by pressing (⬆️), enter the password 020 by pressing (⬆️) to enter, press (⬅️) to enter the menu bar, point (⬆️) to "Modify Settings", point (⬅️) to enter the operation page, point (⬆️) to "Zero Point Calibration", press (⬅️) to enter the modification, point (⬆️) to change it to "Yes", click (⬅️), and after the calibration screen ends, the instrument will automatically jump to the normal display interface, and it can be used normally.

Flow Direction Settings

If the fluid flow direction is the same as the flowmeter's marking, set the flow direction to "Forward" in the "Modify Settings" menu for positive flow measurement. This is the default factory setting. If the fluid flow direction is opposite to the flowmeter's marking, set the flow direction to "Reverse" in the "Modify Settings" menu for reverse flow measurement.

Explosion Proof

The GCF-1 series mass flowmeter consists of a sensor and a transmitter (with a dedicated combined safety barrier, referred to as the "safety barrier") The GCF-1 series mass flowmeter sensor is an intrinsically safe explosion-proof product. The transmitter is a dedicated associated device of the sensor, with an explosion protection marking of Ex db ib IIC T6 Gb; Ex tb IIIC T80°C Db.



Explosion Proof Performance

The explosion proof performance tests are conducted by the explosion-proof electrical product inspection and certification department in accordance with the relevant clauses of GB/T 3836.1-2021, GB/T 3836.2-2021, GB/T 3836.4-2021, and GB/T 3836.31-2021. The explosion proof performance must comply with the requirements of GB/T 3836.1-2021, GB/T 3836.2-2021, GB/T 3836.4-2021, and GB/T 3836.31-2021 standards.

Modbus RTU Address Table

No.	Register	Address (Hex/Dec)	Chinese Menu Name
1	41001	0x03E8 / 1000	Instantaneous Mass Flow
2	41003	0x03EA / 1002	Instantaneous Mass Flow
3	41005	0x03EC / 1004	Instantaneous Volume Flow
4	41007	0x03EE / 1006	Instantaneous Volume Flow
5	41009	0x03F0 / 1008	Density
6	41011	0x03F2 / 1010	Temperature
7	41013	0x03F4 / 1012	Component A Content
8	41015	0x03F6 / 1014	Internal Parameter
9	41017	0x03F8 / 1016	Internal Parameter
10	41019	0x03FA / 1018	Internal Parameter
11	41021	0x03FC / 1020	Internal Parameter
12	41023	0x03FE / 1022	Internal Parameter
13	41025	0x0400 / 1024	Internal Parameter
14	41027	0x0402 / 1026	Internal Parameter
15	41029	0x0404 / 1028	Internal Parameter
16	41031	0x0406 / 1030	Internal Parameter
17	41033	0x0408 / 1032	Internal Parameter
18	41035	0x040A / 1034	Internal Parameter
19	41037	0x040C / 1036	Internal Parameter
20	41039	0x040E / 1038	Internal Parameter



No.	Register	Address (Hex/Dec)	Chinese Menu Name
21	41041	0x0410 / 1040	Internal Parameter
22	41043	0x0412 / 1042	Internal Parameter
23	41045	0x0414 / 1044	Internal Parameter
24	41047	0x0416 / 1046	Internal Parameter
25	41049	0x0418 / 1048	Internal Parameter
26	41051	0x041A / 1050	Internal Parameter
27	41053	0x041C / 1052	Internal Parameter
28	41055	0x041E / 1054	Internal Parameter
29	41057	0x0420 / 1056	Internal Parameter
30	41059	0x0422 / 1058	Internal Parameter
31	41061	0x0424 / 1060	Internal Parameter
32	41063	0x0426 / 1062	Internal Parameter
33	41065	0x0428 / 1064	Internal Parameter
34	41067	0x042A / 1066	Internal Parameter
35	41069	0x042C / 1068	Internal Parameter
36	41071	0x042E / 1070	Internal Parameter
37	41073	0x0430 / 1072	Internal Parameter
38	41075	0x0432 / 1074	Internal Parameter
39	41077	0x0434 / 1076	Accumulated Quantity Reset
40	41079	0x0436 / 1078	Internal Parameter
41	41081	0x0438 / 1080	Internal Parameter
42	41083	0x043A / 1082	Internal Parameter
43	41085	0x043C / 1084	Internal Parameter
44	41087	0x043E / 1086	Internal Parameter
45	41089	0x0440 / 1088	Internal Parameter
46	41091	0x0442 / 1090	Internal Parameter
47	41093	0x0444 / 1092	Internal Parameter
48	41095	0x0446 / 1094	Internal Parameter
49	41097	0x0448 / 1096	Internal Parameter
50	41099	0x044A / 1098	Internal Parameter
51	41101	0x044C / 1100	Internal Parameter
52	41103	0x044E / 1102	Internal Parameter
53	41105	0x0450 / 1104	Zero Point Calibration
54	41107	0x0452 / 1106	Internal Parameter
55	41109	0x0454 / 1108	Internal Parameter
56	41111	0x0456 / 1110	Internal Parameter

Communication Settings Instructions

1. Default factory parameter settings: Baud rate: 9600, Data bits: 8, Stop bits: 1, Parity check: None.
2. All the communication setting parameters can be modified within the instrument.
3. All data types are in floating-point format.
4. When performing remote calibration, ensure that the instrument is fully filled and stationary.

Instrument Model Selection Guide

Code: GCF-1 Unified Product Code		
V-Type	Diameter	Measurement Range
V10	Instrument Bore: 10 mm	0-1.5t/h
V15	Instrument Bore: 15 mm	0-3t/h
V20	Instrument Bore: 20 mm	0-7t/h
V25	Instrument Bore: 25 mm	0-13t/h
V40	Instrument Bore: 40 mm	0-22t/h
V50	Instrument Bore: 50 mm	0-33t/h
V65	Instrument Bore: 65 mm	0-60t/h
V80	Instrument Bore: 80 mm	0-100t/h
V100	Instrument Bore: 100 mm	0-160t/h
V125	Instrument Bore: 125 mm	0-230t/h
V150	Instrument Bore: 150 mm	0-300t/h
V200A	Instrument Bore: 200 mm	0-400t/h
V200B	Instrument Bore: 200 mm	0-500t/h
V250	Instrument Bore: 250 mm	0-800t/h
V300	Instrument Bore: 300 mm	0-1500t/h
U-Type	Diameter	Measurement Range
U01	Instrument Bore: 1 mm	0-10kg/h
U02	Instrument Bore: 2 mm	0-40kg/h
U03	Instrument Bore: 3 mm	0-100kg/h
U06	Instrument Bore: 6 mm	0-200kg/h
U10	Instrument Bore: 10 mm	0-1500kg/h
U15	Instrument Bore: 15 mm	0-3000kg/h
U20	Instrument Bore: 20 mm	0-7000kg/h
U25	Instrument Bore: 25 mm	0-13t/h
U40	Instrument Bore: 40 mm	0-22t/h
U50	Instrument Bore: 50 mm	0-33t/h
U65	Instrument Bore: 65 mm	0-60t/h
U80	Instrument Bore: 80 mm	0-100t/h
U100	Instrument Bore: 100 mm	0-160t/h
U125	Instrument Bore: 125 mm	0-230t/h
U150	Instrument Bore: 150 mm	0-300t/h
U200	Instrument Bore: 200 mm	0-400t/h
U250	Instrument Bore: 250 mm	0-800t/h
U300	Instrument Bore: 300 mm	0-1500t/h
Triangular Type	Diameter	Measurement Range
3CLS10	Instrument Bore: 10 mm	0-1.5t/h
3CLS15	Instrument Bore: 15 mm	0-3t/h
3CLS20	Instrument Bore: 20 mm	0-7t/h
3CLS25	Instrument Bore: 25 mm	0-13t/h





Code: GCF-1- (1) (2) (3) Unified Product Code														
Code Instrument Precision Grade														
A ±0.5% Mass flow (standard gas accuracy)														
N ±0.2% Mass flow (standard liquid accuracy)														
M ±0.15% Mass flow														
H ±0.1% Mass flow														
Code Sensor Medium Temperature Range (above 250°C or below -50°C is a split type)														
A -50-150°C														
B -50-250°C														
C -50-350°C														
D -50-450°C														
E -200-100°C														
F -273-100°C														
Code Transmitter's Operating Environment Temperature														
E -30-30°C														
F -40-80°C														
Code Instrument Pressure Rating														
16 1.6MPa (16bar)														
40 4MPa (40bar)														
100 10MPa (100bar)														
200 20MPa (200bar)														
400 40MPa (400bar)														
1000 100MPa (1000bar)														
XXX Customized pressure up to a maximum of 100MPa														
Code Sensor Material														
A Measurement pipe material: 316LSS, flange material: 304SS (standard configuration)														
B Wetted material: 316LSS, flange material: 316LSS														
C Wetted material: Hastelloy														
D Wetted material: high nickel alloy														
E Wetted material: Titanium Ti (ASTM B361)														
F Wetted material: Tantalum Ta (ASTM B708)														
G Wetted material: C4 steel (ASTM A601/12004)														
H Wetted material: copper-nickel alloy														
I Wetted material: nickel-based alloy														
J Other possible customized materials, need to be confirmed with technical personnel														
Code Sensor Housing Material														
K 304SS (standard configuration)														
L 304LSS														
M 316LSS														
N Other customized materials and processing methods														
Code Process connection														
A HG/T 20592-2009 (standard)														
B ANSI B16.5														
C Sanitary clamp														
D Threaded connection														
E Other customized special interfaces														
Code Transmitter Connection														
A Integrated														
B Separated														
Code Transmitter Housing Material														
A Cast aluminum + painting														
B 316SS														
C 316L														
Code Output														
A 4-20mA (HART)+0-10kHz+Modbus RTU (default)														
B 4-20mA+0-10kHz+FF														
C 4-20mA+0-10kHz+Profibus PA														
D 4-20mA+4-20mA (HART)+0-10kHz														
Code Calibration Certificate														
E Factory Certification Certificate														
F Third-party National Certificate														
Code Languages (can be switched internally)														
A Chinese														
B English														
C Russian														
D German														
E Spanish														
Code Electrical Interface														
L M20×1.5														
K 1/2" NPT														
M 3/4" NPT														
Code Power Supply														
A 220VAC														
D 24VDC														
F Self-adaptive														
Code Explosion-proof Certificate														
F Exd IIB T4 C T6 Gb														
Ex ib IIC T80°C Db														
Code Protection Level														
A IP67														
B IP66														
Special configuration														
GCF-1-UID N A E 16 A K A A A B E A K D F A														

① represents the transmitter housing material (No marking for die-cast aluminum, S for 316SS, L for 316L)

② represents the sensor shape

③ represents the diameter

Instructions

Default Flange Grade: 150LB for overseas, 4MPa for domestic; higher pressure can be customized, up to 100MPa; integrated by default, separate type can be customized (cable length needs to be informed in advance);

Default Flange Standards: Weld Neck Flanges-ANSI B16.5 for overseas, HG/T 20592-2009 for domestic; Other connection methods can be customized.

Model Selection Considerations

- For measuring liquids, combine the commonly used flow and the maximum and minimum flow to select the appropriate instrument range.
- For measuring gases, combine the process pipe diameter, pressure, and commonly used quantity, and calculate the maximum and minimum flow to select the instrument.
- For measuring high viscosity fluids or liquid-solid two-phase fluids, inform the viscosity, density, process pipe diameter, commonly used quantity, and maximum and minimum quantity to select the instrument.
- For measuring corrosive media, inform the specific chemical name of the medium to assist the manufacturer in selecting the appropriate measurement pipe material.

It is recommended that the commonly used quantity be more than 1/3 of the instrument's standard range, and the user's minimum flow be more than 1/10 of the instrument's range. If the user has special



2. Electromagnetic Flow Meter (GEF-1000 Series)

Product Highlights

0.1s Response time

Wide 1:150 ratio range

Excellent small flow to 0.01m³/h

Suitable for liquid conductivity media above 20us/cm



Features

99.999% pure copper for coil

No mechanically moving parts

IP68 proof, Maximum 3 meters immersion in water

Bi-directional Measurement

Advanced wire-winding technology, No drift zero point

Robust, fully welded and potted construction In-house

wet calibration for all diameters(up to DN3000)

>3mm thickness PTFE liner, durable service life

Technical Data

Diameter	PTFE: DN6-DN1000 Rubber: DN50-DN3000
Flow Direction	Positive; Negative
Repeatability Error	±0.1%
Accuracy	±0.5% of rate; ±0.2% of rate
Medium Temperature	Rubber Liner: -20...+60℃
	PTFE Liner: -20...+120℃
	PFA Liner: -20...+180℃
Velocity	0.3-10m/s
Ambient Temperature	-20...+60℃
Relative Humidity	5%-95%
Power Consumption	<20W
Protection	IP65; IP68 (Remote Type)

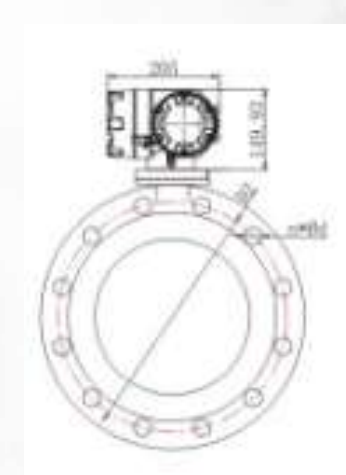
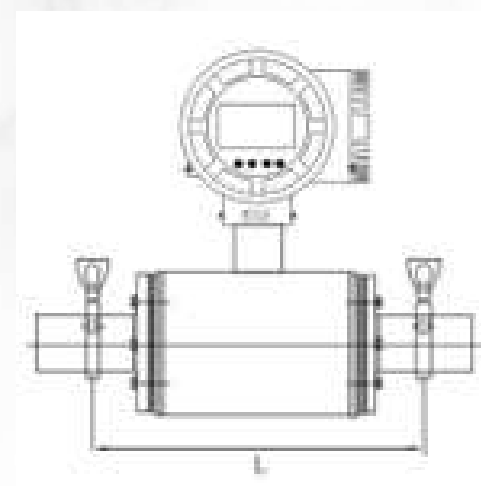


Y- Compact Type



L- Remote Type

Technical Drawing





Model Selection

Model	Suffix Code											Description
GEF-	1	2	3	4	5	6	7	8	9	10	11	Electromagnetic Flow Meter
Type	B											B type
	Y											Y type (optional explosion proof)
	H											Energy Meter (PT1000 temperature sensors)
Diameter	XXX											Stand for diameter 0006: DN6; 0015: DN15 0100: DN100; 2200: DN2200
Structure		S										Compact Type with local display
		L										Remote Type; 10 meters cable default
Electrode Material			M									SS316L
			T									Titanium
			D									Tantalum
			H									Hastelloy C
			P									Platinum-Iridium
Signal Output					0							No Output
					1							4-20mA / Pulse
Liner Material						X						Rubber
						P						Polyurethane
						F						PTFE
						A						PFA
Power Supply							-0					110-240V AC
							-1					24V DC (20-36V DC)
							-2					Battery Power Supply
Communication								0				No Communication
								1				Modbus RS485
								2				HART
								3				GPRS
Sensor Grounding									0			No Grounding
									1			Grounding Ring
									2			Grounding Electrode
Connection										DXX		D15: DIN PN16 Flange ; D25: DIN PN25 Flange...
										AXX		A15: ANSI150# Flange; A30: ANSI 300# Flange...
										JXX		J10: JIS 10K Flange; J20: JIS 20K Flange...
										XXX		On request
Body Material											CS	Carbon Steel
											S4	Stainless Steel 304

Flow Range

Diameter		Flow Rate (m ³ /h)		
		V=0.3m/s	V=6m/s	V=10m/s
mm	Inch	Min	Calibrated	Max
2.5	1/10"	0.0053	0.106	0.177
4	1/8"	0.014	0.271	0.452
6	1/4"	0.03	0.6	1
10	3/8"	0.1	1.7	3
15	1/2"	0.2	4	6
20	3/4"	0.3	7	11
25	1"	0.5	11	18
32	1-1/4"	0.9	17	29
40	1-1/2"	1	27	45
50	2"	2	42	71
65	2-1/2"	4	72	120
80	3"	5	109	181
100	4"	8	170	283
125	5"	13	265	442
150	6"	20	382	636
200	8"	34	679	1131
250	10"	53	1060	1767
300	12"	76	1527	2545
350	14"	104	2078	3465
400	16"	136	2714	4524
450	18"	171	3435	5726
500	20"	212	4241	7069
600	24"	305	6107	10179
700	28"	415	8310	13850
800	32"	542	10860	18100
900	36"	662	13740	22900
1000	40"	848	16962	28270

2 Years Long Warranty





Sanitary Magnetic Flow Meter Model Selection

Model	Suffix Code									Description
GEF-	①	②	③	④	⑤	⑥	⑦	⑧	⑨	Sanitary Magnetic Flow Meter
Diameter	XXXX									Stand for diameter Diameter XXXX 0010: DN10 0100: DN100
Structure	S									Compact Type with local display
	L									Remote Type; 10 meters cable default
Electrode Material		M								SS316L
		T								Titanium
		D								Tantalum
		H								Hastelloy C
		P								Platinum-Iridium
Signal Output			0							No Output
			1							4-20mA/ Pulso
Liner Material				F						PTFE
				A						PFA
Power Supply					0					110-240VAC
					1					24V DC (20-36V DC)
					2					Battery Power Supply
Communication						0				No Communication
						1				Modbus RS485
						2				HART
						3				GPRS
Sensor Grounding							0			No Grounding
							2			Grounding Electrode
Body Material									S4	Stainless Steel 304



Insertion Magnetic Flow Meter Model Selection

Model	Suffix Code							Description
GEF-	①	②	③	④	⑤	⑥	⑦	Insertion Magnetic Flow Meter
Diameter	XXXX							Stand for diameter 0100: DN100 3000: DN3000
Structure	S							Compact type
	L							Remote type
Electrode Material	M							SS316L
	T							Titanium
	D							Tantalum
	H							Hastelloy C
	P							Platinum-Iridium
Signal Output	0							No Output
	1							4-20mA/Pulse
Power Supply	-0							110-240V AC
	-1							24V DC (20-36V DC)
	-2							Battery Power Supply
Communication	0							No Communication
	1							Modbus RS485
	2							HART
	3							GPRS
Connection							B	Ball Valve Type





3. Gas Turbine Flow Meter

Description

The gas turbine flow meters are specially designed for use in natural gas and other fluid measurement. The volume and mass flow rate are available.



Application

- Natural gas transmission and distribution network
- Petrochemical industry
- Urban gas industry
- Electric power industry
- Gas skids
- LNG gas station

Application

- Temperature & pressure compensation
- Digital absolute pressure transmitter
- Segment LCD, displays normally at -30°C
- Integrated movement
- Communication: Modbus RS485
- Simultaneous display of flow rate, total flow volume, pressure, and temperature

Technical Parameter

Output	Pulse
	4-20mA
Accuracy	±1.0% of Rate; ±1.5% of Rate
Ambient Temp.	-20...+60°C
Fluid Temp.	-20...+80°C
Body Material	SS304
	SS316
	Cast Steel (DN50- DN200)
Rotor Material	Aluminum Alloy
	Plastic ABS
Bearing Material	SS304
Protection	IP 65

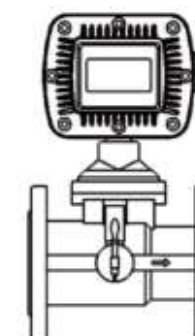


D4- Compensation Type



E-Non-Compensation Type

Drawing Maps





Model Selection

Model	Suffix Code									Description
LWQ-	1	2	3	4	5	6	7	8		Gas Turbine Flow Meter
Diameter	XXX									Stand for diameter 020: DN20; 050: DN50 100: DN100; 400: DN400
Converter Type	E1									Battery power supply; No output; Ex; Digital display
	E2									24V DC; 2-wire 4-20mA/ Pulse output; Ex; Digital display
	E4									24V DC; 0-20mA/ Pulse output; Local display; Ex; Digital display
	D2									24V DC; 2/3 wires 4-20mA/ Pulse output; Digital display; Temperature & Pressure Compensation; RS 485
	D4									24V DC; 4-20mA/ Pulse output; Modbus RS485; Digital display; Temperature & Pressure Compensation
	Notice									1) Modbus RS485 is optional for E2, E4, D4, D2 2) Battery Power(24V DC + Battery) is optional for E2, E4, D2, D4 3) D4 converter only configures with cast structure 304 body select
Accuracy	10									±1.0% of rate
	15									±1.5% of rate
Flow Range		S								Standard Range: S, S1; S2 optional
Body Material						S4				SS304
						S6				SS316
						CS				Cast structure 304 for D4 only
Rotor Material								AB		ABS Plastic
								AA		Aluminum Alloy
Explosion Proof								BT		Exd II BT6 Gb
								NA		None
THM Male Thread; Available from DN25...DN50										
THF Female Thread; Available from DN25...DN50										
DXX DN15: DIN PN16 Flange; D25: DIN PN25 Flange...										
AXX A15: ANSI 150# Flange; A30: ANSI 300# Flange...										
JXX J10: JIS 10K Flange; J20: JIS 20K Flange...										

Flow Range

Diameter (mm/inch)	Code	Flow Range (m³/h)	Max Pressure loss (kPa)	Connection
25(1")	S	4-40	1.5	Flange/Thread
40(1.5")	S	6-65	1.5	
50(2")	S	7-70	0.5	
	S1	10-100	1.0	
	S2	16-160	1.0	
65(2.5")	S	15-200	1.0	Flange
	S1	13-250	1.0	
80(3")	S	13-250	1.0	
	S1	20-400	2.5	
100(4")	S	20-400	1.0	
	S1	32-650	1.5	
125(5")	S	40-600	1.3	
150(6")	S	50-1000	1.0	
	S1	80-1600	2.0	
200(8")	S	80-1600	0.5	
	S1	130-2500	1.0	
250(10")	S	130-2500	0.5	
	S1	200-4000	1.5	
300(12")	S	320-6500	1.0	
350(14")	S	400-8000	1.5	
400(16")	S	650-13000	2.0	





.4. Liquid Turbine Flow Meter



Description

The liquid turbine flow meter is specially designed for liquid measurement. It operates according to the turbine principle.

Application

- Petrochemical/energy industry
- Thermal instrumentation system
- Industrial water
- Chilled water
- Clean water
- Food and beverage industry

Features

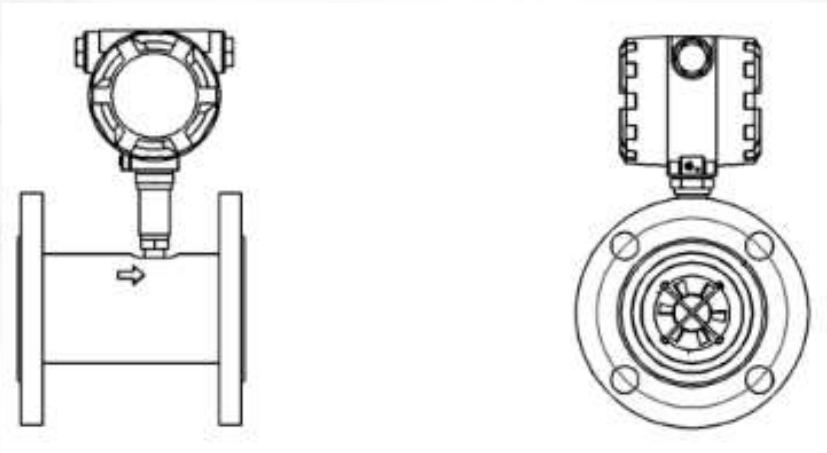
- Light oil & purity liquid measurement
- Modbus RS485 communication
- Backlit display
- Working temperature: -10°C ~ +150°C
- Unit of GPM, Kg/h, Ft³/h, LPM, BPD, m³/h, Ton/h
- Totalizer reset
- High/low alarm

Technical Data

Output	Pulse: 4-20mA	
Accuracy	±1.0 of Rate; ±0.5% of Rate	
Ambient Temp.	- 20...+60 °C	
Fluid Temp.	- 20...+150 °C	
Body Material	SS304; SS316	
Rotor Material	2Cr13; CD4MCu	
Bearing Material	Tungsten Carbide	
Connection	Flange of DIN, JIS, ANSI	DN15- DN 200
	Thread of G, BSP, NPT	DN4- DN 50
	Sanitary Tri- Clamp	DN10- DN100
	Water	DN50- DN200
Communication	RS485	
Power Supply	24V DC; Battery; 220V AC	
Protection	IP65	
Explosion Proof	Exd IIC T6 Gb	



Technical Drawings





Model Selection

Model	Suffix Code										Description
GTF-1000L	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	Liquid Turbine Flow Meter
Diameter	XXX										Stand for diameter 004: DN4; 006: DN6 100: DN100; 200: DN200
Converter Type	N1										24V DC; Pulse output; No display
	N2										24V DC; Pulse output; No display; Ex
	A										24V DC; 4-20mA output; No display; Ex
	E1										Battery power supply; No output; Ex; Digital display
	E2										24V DC; 2/3 wires 4-20mA/ Pulse output; Ex; Digital display
	E4										24V DC; 0-20mA output; Ex; Digital display
	G										220V AC; 4-20mA output; Ex; Digital display
	FE										FE: Fluidwell E series converter(Refer to page 11)
	FF										FF: Fluidwell F series converter(Refer to page 12)
	Notice:										1) Modbus RS485 is optional for E2, E4, and G type 2) Dual Power(24V DC+ Battery) is optional for E2, E4, G type
Accuracy	10										±1.0% of rate
	05										±0.5% of rate
	02										±0.2% of rate (consult with factory)
Flow Range			S								Standard Range
			E								Extended Range
Body Material					S4						SS304
					S6						SS316
Rotor Material						Cr					2Cr13
						CD					CD4MCu
Explosion Proof							CT				Exd II CT8 Gb
							NA				No explosion proof
Connection								THM			Male thread; Available from DN4... DN50
								THF			Female thread; Available from DN4... DN50
								WAF			Water connection
								TIC			DN10- DN 100 (Sanitary type)
								DXX			D16: DIN PN16 Flange; D25: DIN PN25 Flange...
								AXX			A15: ANSI 150# Flange; A30: ANSI 300# Flange...
Temperature								JXX			J10: JIS 10K Flange; J20: JIS 20K Flange...
								T1			-20... +80°C
								T2			-20... +120 °C
								T3			-20... +150 °C

Flow Range

Diameter (mm)	Standard Range (m³/h)	Extended Range (m³/h)	Max. pressure loss (kPa)
4	0.04-0.25	0.04-0.4	120
6	0.1-0.6	0.06-0.6	80
10	0.2-1.2	0.15-1.5	50
15	0.6-3.6	0.5-5	35
20	0.8-8	0.45-9	35
25	1-10	0.5-10	35
32	1.5-15	0.8-15	25
40	2-20	1-20	35
50	4-40	2-40	35
65	7-70	5-70	25
80	10-100	7-100	25
100	20-200	10-200	25
125	25-250	13-250	25
150	30-300	15-300	25
200	60-600	40-600	25





5. Vortex Flow Meter



Description

The vortex flow meter is engineered for metering, measurement, and control of most steam, gas, and liquid flow for very high reliability with long-term stability. It features medium versatility, high accuracy, simple structure, and low failure rate.

Application

- Boiler industry (steam measurement)
- Compressed air industry
- Petrochemical industry
- Energy industry
- Heating industry
- Metallurgy industry (plastics processing)

Features

- High-strength piezoelectric crystal, drop-resistant, strong impact resistance
- No moving parts, easy installation, high measurement accuracy
- Digital circuit design, high stability and low maintenance
- Wide flow range, wide temperature range, anti-electromagnetic interference performance
- Multi-range options
- High accuracy up to $\pm 0.2-0.5\%$
- Temperature range: -40°C to $+250^{\circ}\text{C}$
- Integrated and remote type options
- Wireless pressure/temperature transmitter optional
- Flow self-rectification
- Chemical resistant
- Remote type supports pressure and temperature compensation

Technical Data

Diameter	DN15- DN700 (DB Type)			
	DN10- DN 500 (DA Type)			
	DN200- DN2000 (Insertion Type)			
Accuracy	Liquid: $\pm 1.0\%$ of rate		Gas and steam: $\pm 1.5\%$ of rate ($\pm 1.0\%$ of rate is only for DA Type optional)	
Body Material	SS304		SS316	
Process Temp.	T1: $-20^{\circ}\text{C} \dots +100^{\circ}\text{C}$	T2: $-20^{\circ}\text{C} \dots +250^{\circ}\text{C}$	T3: $-20^{\circ}\text{C} \dots +300^{\circ}\text{C}$	T4: $-20^{\circ}\text{C} \dots +420^{\circ}\text{C}$
Ambient Temp.	$-10 \dots +50^{\circ}\text{C}$			
Connection	Flange; wafer; thread; tri-clamp			
Protection	IP65			
Power supply	24 V DC and battery for option			
Communication	RS485; HART			
Output	4-20mA; Pulse			



Wafer Connect

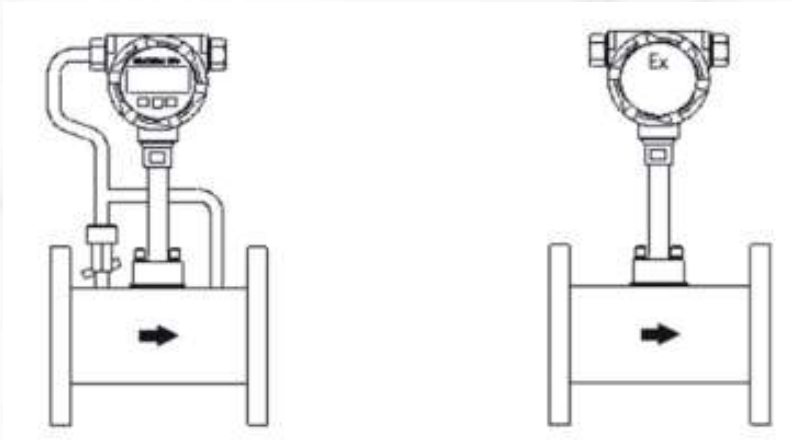


Wafer connect with Flange bolts



Remote Type

Technical Drawings





Product Detail

Model Selection



German Circuit

- ☒ Multiple Signals
- ☒ 4-20mA
- ☒ Pulse signal
- ☒ RS485



Protection Hose



Pressure Pipe



Display



Fish Scale Welding

Model	Suffix Code								Description
GVF	①	②	③	④	⑤	⑥	⑦	⑧	Vortex Flow Meter
Fluid	L								Liquid
	G								Gas/Air
	S								Steam
Diameter		XXX							Stand for diameter 015: DN15;050:DN50 100: DN100;300:DN300
Structure		S							Compact type
		L							Remote type
Converter Type		C							Fluid: liquid; 24V DC;4-20mA / Pulse output; Digital display; Ex
		V							224V DC; 4-20mA/ Pulse output (V type is only for Gas/ Steam application) No compensation
		DB							24V DC;4-20mA output/ Pulse;Temperature & Pressure Compensation; 3 wires for option
		DA							24V DC;4-20mA output/pulse;Temperature & Pressure Compensation; Digital display; $\pm 1.0\%$ accuracy; max 420°C; Ex;3 wires for option
		Notice							1) Modbus RS485 is optional for V,D series 2) Dual power (24V DC+Battery) is optional for C, V , D series
Body Material		S4							SS304
		S6							SS316
Explosion Proof		BT							ExdIBT6
		CT							Exiall CT1-CT6
		NA							No explosion proof
Connection		WAF							Wafer connection
		DXX							D16: DIN PN16 Flange;D25:DIN PN25 Flange..
		AXX							A15:ANSI150#Flange;A30:ANSI300# Flange..
		JXX							J10:JIS 10K Flange;J20:JIS 20K Flange.
Temperature		T1							-20...+100℃
		T2							-20...+250℃
		T3							-20+300℃
		T4							20℃...+420℃ (only for DA type)





Flow Range

Gas/ Air Measurement													
Density (kg/m ³)	0.5	0.8	1.2	2.4	3.6	4.8	6	7.2	8.4	9.6	12	20	Qmax
Diameter	Different density fluid, the mini flow rate Qmin (Unit:m ³ /h)												Unit: (m ³ /h)
DN15	5.28	3.85	3.52	3.08	2.97	2.86	2.75	2.64	2.53	2.42	2.31	2.2	38
DN20	9.02	7.26	5.5	5.28	5.17	4.95	4.73	4.4	4.29	4.18	4.07	3.3	67
DN25	11	9.9	8.69	8.36	7.92	7.59	7.26	6.82	6.49	5.94	5.5	4.95	100
DN32	28.6	19.8	15.4	14.52	14.08	13.42	13.2	12.87	12.32	11.99	11.11	9.9	170
DN40	41.8	27.5	22	20.9	19.8	18.7	17.6	16.5	15.4	14.3	13.2	11	300
DN50	52.8	44	34.1	31.9	30.8	28.6	25.3	24.2	23.1	22	19.8	13.2	500
DN65	88	72.6	58.3	49.5	48.4	46.2	44	41.8	38.5	33	28.6	19.8	780
DN80	143	110	88	83.6	77	72.6	68.2	63.8	55	50.6	41.8	30.8	1200
DN100	198	176	132	121	110	99	88	77	68.2	61.6	52.8	38.5	2000
DN125	308	275	209	187	171.6	159.5	148.5	132	110	99	83.6	60.5	2900
DN150	418	341	308	286	264	242	220	198	176	154	121	93.5	4100
DN200	880	660	550	528	473	440	418	396	363	330	297	220	7500
DN250	1100	968	869	803	748	682	649	572	528	462	440	330	12500
DN300	1430	1309	1254	1166	1078	990	902	836	770	682	638	440	16500





Flow Range

Liquid Measurement											
Density (kg/m ³)	500	600	700	800	900	1000	1200	1400	1600	1800	Qmax
Diameter	Different density fluid, the mini flow rate Qmin(Unit:m ³ /h)										(Unit:m ³ /h)
DN15	0.66	0.55	0.52	0.41	0.4	0.39	0.33	0.31	0.29	0.26	4.5
DN20	1.27	1.1	1.08	0.99	0.88	0.66	0.64	0.62	0.59	0.57	8
DN25	1.43	1.32	1.21	1.16	1.1	0.99	0.9	0.84	0.78	0.75	12
DN32	2.09	1.98	1.87	1.78	1.72	1.65	1.6	1.49	1.32	1.1	20
DN40	3.85	3.52	3.3	3.08	2.86	2.51	2.42	2.31	2.2	2.09	32
DN50	5.17	4.73	4.29	4.07	3.96	3.85	3.3	3.08	2.86	2.75	50
DN65	7.81	7.15	6.93	6.82	6.71	6.6	5.5	4.95	4.62	4.4	84
DN80	12.1	11	10.56	10.12	10.01	9.9	8.8	8.36	7.7	6.6	127
DN100	22	19.8	18.7	17.6	16.5	15.4	14.3	13.2	11	9.9	198
DN125	30.8	28.6	27.5	26.4	25.3	24.2	23.1	22	19.8	15.4	310
DN150	57.2	55	49.5	46.2	39.6	35.2	33	30.8	28.6	22	445
DN200	108.9	96.8	85.8	77	68.2	62.7	58.3	55	47.3	38.5	791
DN250	202.4	181.5	165	143	121	97.9	88	79.2	74.8	60.5	1237
DN300	275	242	220	198	176	140.8	132	121	107.8	84.7	1780





Flow Range

Saturated Steam Measurement														
Mpa		0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1	1.2	1.6	2	Unit
°C		120	134	144	152	159	165	175	180	184	192	204	215	
Kg/m³		1.12	1.67	2.19	2.68	3.18	3.67	4.62	5.16	5.63	6.67	8.52	10.57	
Diameter (mm)		Different steam density corresponding with flow range												kg/h
15	Qmin	3.85	5.67	7.41	9.12	11	12.54	15.95	17.93	19.36	22.55	29.37	36.19	
	Qmax	35	51.5	67.4	83	100	115	146	163	176	205	268	329	
20	Qmin	6.84	10.07	13.09	16.17	19.58	22.44	28.49	32.01	34.43	40.04	52.25	64.35	
	Qmax	62.2	91.6	120	147	178	204	259	291	313	365	476	586	
25	Qmin	10.68	15.73	20.46	25.3	30.69	34.98	44.55	49.94	53.79	62.59	81.73	100.54	
	Qmax	97.1	143	187	230	279	318	405	454	489	569	743	914	
32	Qmin	17.49	25.63	33.66	41.47	50.27	57.42	72.93	81.95	88.11	102.63	133.1	163.9	
	Qmax	159	234	306	378	457	522	664	745	802	933	1218	1499	
40	Qmin	25.3	36.3	47.3	58.3	70.4	80.3	102.3	110	121	143	187	231	
	Qmax	300	440	575	710	860	980	1250	1400	1500	1750	2280	2810	
50	Qmin	38.5	56.7	74.1	91.2	110	125.4	159.5	179.3	193.6	225.5	293.7	361.9	
	Qmax	550	810	1070	1330	1600	1860	2350	2660	2860	3350	4280	5210	
65	Qmin	64.9	95.7	125.4	150.7	182.6	209	264	303.6	326.7	379.5	485	605	
	Qmax	790	1160	1520	1835	2222	2540	3230	3620	3970	4620	6030	7422	
80	Qmin	98.45	144.1	189.2	233.2	282.7	319	407	451	495	572	748	924	
	Qmax	1195	1760	2300	2800	3400	3900	4900	5580	6000	6999	9100	11000	
100	Qmin	0.15	0.22	0.3	0.36	0.44	0.51	0.64	0.72	0.77	0.9	1.1	1.43	
	Qmax	1.87	2.75	3.6	4.43	5.36	6.12	7.78	8.73	9.4	11	14.3	17.6	
125	Qmin	0.24	0.35	0.46	0.56	0.68	0.78	1	1.1	1.21	1.41	1.84	2.2	
	Qmax	2.91	4.29	5.62	6.91	8.37	9.56	12	13.6	14.7	17	22.3	27.4	

