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Thermal Mass Flowmeter Gases Inline Type



THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

Features

- Rate & total, volume, mass flow, indication
- Input Power DC 24 V or 100-240VAC
- Output accuracy $\pm 0.1\%$, $\pm 2.5\ \mu\text{A}$ (4~20 mA)
- Field validation of flowmeter calibration settings
- Smart program interface (RS-485 standard)
- Direct mass flow monitoring eliminates need for Temperature and pressure compensation
- Simple signal Processing & calibration
- Excellent reproducibility
- Excellent long-term stability
- Best price-performance ratio
- Easy adaptable for different application or into housings
- No mechanical moved components
- Greatly reduces upstream piping requirements (7-5D)
- Outstanding range ability (Turn down ratio 1000:1)
- 0.1-second response to changes in flow rate
- Ex(IP66), KC



Gas inline type
KC-2610GF
(IP67)



Gas inline type
KC-2620Ex
(IP66)



Airframe General Special Type
KC-2610GF-G-T(Option : S)



Product Introduction

Golden Rules' KC-2600GF Series Smart inline mass flowmeter accommodates the change measurement requirements and instrument-validation demands of fluid flow monitoring installations.

The versatile microprocessor-based transmitter integrates the function of flow measurement, flow-range adjustment, meter validation and diagnostics, in either a probe-mounted or remote housing.

Mass flow rate and totalized flow, as well as other configuration variables are displayed on the meter's Optional 2X16 LCD panel. The programmable transmitter is easily configured via an RS-485 communication port and Golden Rules Smart interface software, or via the display and magnetic switches in the instrument panel. The Golden Rules KC-2600GF Series allows you to configure or change the following parameters: flow range, totalize, time response, low flow cutoff and a calibration correction factor that compensates for flow profile flow variations. Golden Rules's Smart interface software guides you through a procedure to fully validate instrument performance. The meter is available with variety of input signal, mounting and packaging option.

THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

Performance Specification

◆ Accuracy of Point Velocity

±0.5% of F.S

Repeatability

±0.2 % of Full Scale

◆ Temperature Coefficient

±0.03 % Reading / ±(10 ~ 38) °C

±0.06 % Reading / ±(25 ~ 50) °C

◆ Pressure Drop

It can be ignored within ± 50 psig (3.4 barg)

◆ Response Time

1 second 63% of final velocity value

◆ Measuring Range

0.01 ~ 66.2 m/sec

◆ Function

Rate & Total

Mass Flow Rates

Air Flow Ranges							
Pipe Size		Minimum		Maximum		Weight (kg)	
A	B	Scfm	Nm ³ /h	Scfm	Nm ³ /h	Ex proof	General
8A	¼-inch	0.5	-0.7	9	14	5	3
15A	½-inch	2	3.0	40	60	5	3
20A	¾-inch	4	5.9	75	120	5	3
25A	1-inch	6	8.9	120	180	6	4
40A	1½-inch	15	22	280	440	7.2	5.2
50A	2-inch	23	33	470	680	8.6	6.6
80A	3-inch	50	74	1000	1500	11	9
100A	4-inch	90	130	1800	2700	16.2	14.2
150A	6-inch	200	300	4000	5900		
200A	8-inch	350	520	7000	10,000		

Notes: Air or N2 Flow Standard Condition :21°C(70°F) & 21°C(70°F) scfm:0°C, Nm³/h 1atm

Operating Specification

◆ Fluid

Air & Gas

◆ Pressure (limitation)

Compression Fittings : 508 psig (35 barg) option

150 lb Flange, JIS 10k RF PN16 DIN (-40 ~ 150) °C (-40 ~ 302) °F : 230 psig (15.9 barg)

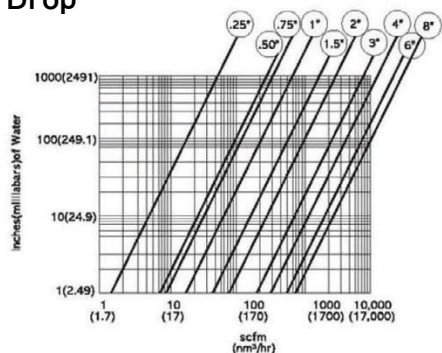
150 lb Flange, JIS 10k RF PN16 DIN 121 °C (250 °F) : 185 psig (12.8 barg)

150 lb Flange, JIS 10k RF PN16 DIN 400 °C (752 °F) : 155 psig (10.7 barg)

NPT -40 ~ 150 °C ((-40 ~ 302) °F) : 508 psig (35 barg)

High Pressure Retract Valve : 1000 psig (70 barg)

◆ Pressure Drop



THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

◆ Fluid & Ambient temp'

Gases : (-40 ~ 302) °F ((-40 ~ 150) °C)

Ambient : (-4 ~ 185) °F ((-20 ~ 85) °C)

◆ Input Power (selection)

DC24 V ±10 %, 200 mA

(100 ~ 240) V AC ±10 %, 10 watts (Option)

◆ Output Signal

Linear (4 ~ 20) mA & Pulse

◆ Display

Adjustable variables via remote control switch or Smart interface software

Adjustable : Full scale : (0 ~100) %

Flow: m³/h(m³), L/h(L), mL/h(mL), kg/h(kg)

Time response 1 ~ 7 sec / Correction factor setting 0.5 ~ 5 /

Zero & Span

Totalizer

8-digits (99,999,999 Count) in engineering units Reset table by

Software or remote control switch

◆ Software

Smart interface Windows® -based Software 8MB RAM of RAM, preferred 16MB of RS-485 communication

Additional features: Zero cut-off adjustment / Linearization adjustment / Save / Load configuration / For meter validation

Physical Specification

◆ Wetted Part Mat'l

Sensor Probe - Ceramic + 303SS (Platinum) Option : 316SS, 316LSS

Flow Body - 304SS (Option 316SS, 316LSS)

Enclosure

Hazardous-Area CASE (Ex d[ib] IIC T4 : IP66)

General-Area CASE (IP67)

◆ Electrical Connection

2 X ½"NPT or Exp Cable Gland(SS) 22C

◆ Mounting (selection)

¾" Compression Fitting과 ¾" Male NPT (Standard)

ANSI 150lb Flange, JIS 10k RF Flange (Option)

¾" Compression Fitting과 1" Male NPT (Option)

Ball Valve System (Option)

◆ Certification

Ex (Ex d[ib] IIC T4)

CE (CASE 전체)

KGS Certificate

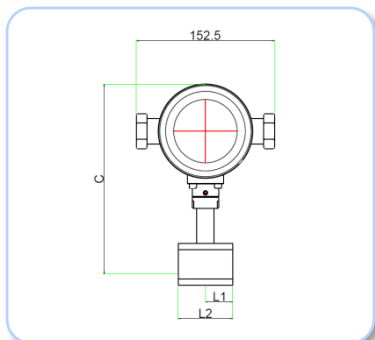
KC Certificate

THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

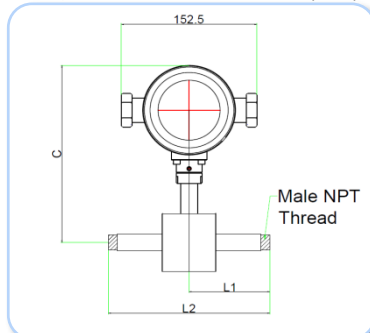
Dimensional Specification & Chart I

❖ General type KC-2610GF(IP67)

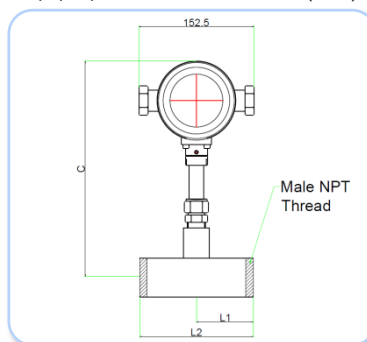
●1/4," 3/8" NPT – Front View (EN2)



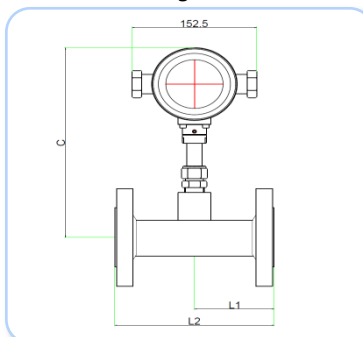
●1/2," 3/4" NPT – Front View (EN2)



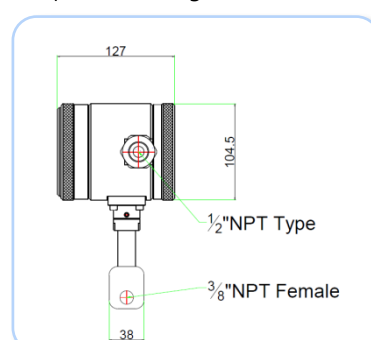
●1/4," 3/8" NPT – Front View (EN2)



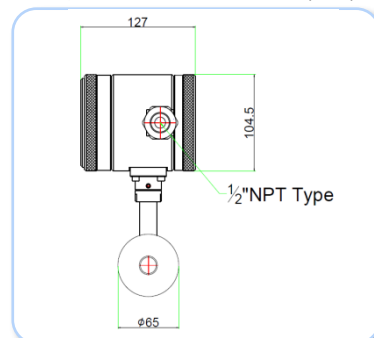
●1/2," 3/4" Flange – Front View (EN2)



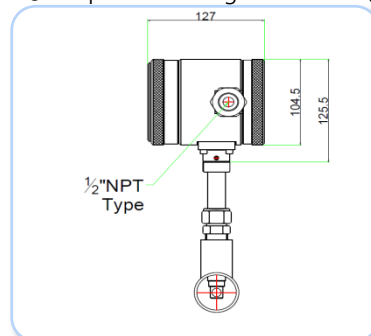
●Compression Fitting – Side View (EN2)



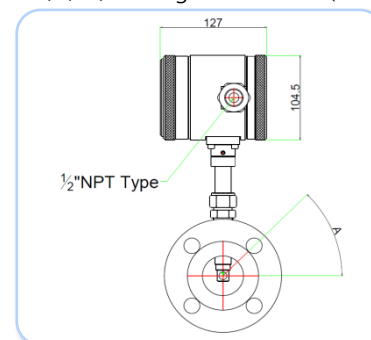
●1/2," 3/4" NPT – Side View (EN2)



●Compression Fitting – Side View (EN2)



●1/2," 3/4" Flange – Side View (EN2)



SIZE for NPT & Flange			
Size	C	L1	L2
1/4" & 3/8"	210.5	30	60
1/2"	210.5	90.7	180
3/4"	210.5	90.7	180
1"	272.5	101.5	180
1-1/2"	272.5	101.5	180
2"	272.5	101.5	200
3"	334.6	101.5	250
4"	334.6	127	250
6"	334.6	127	250
8"	334.6	127	300

SIZE for ANSI 150# FLANGE				
Size	C	L1	L2	A
1/2"	210.5	101.5	180	45°
3/4"	210.5	101.5	180	45°

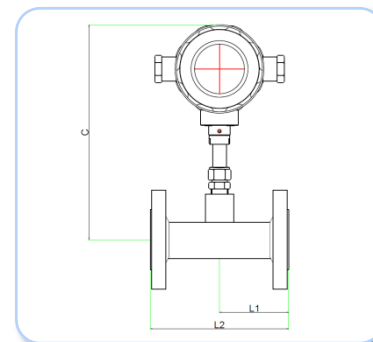
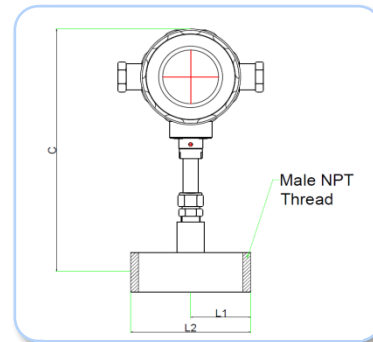
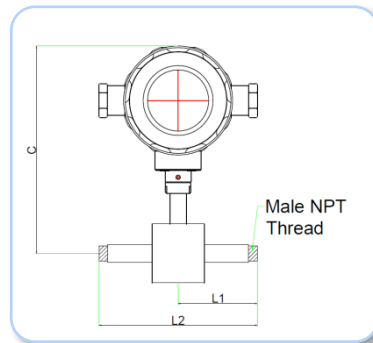
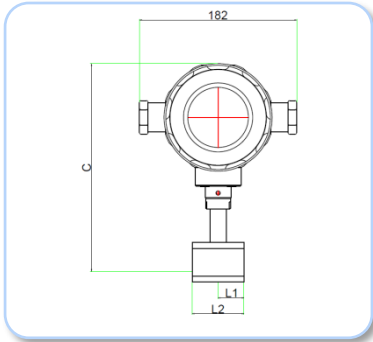
※ The shape of the sensor and Housing manufacturers are Subject to Change.

All dimensions are inches. Millimeters are in parentheses

THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

Dimensional Specification & Chart II

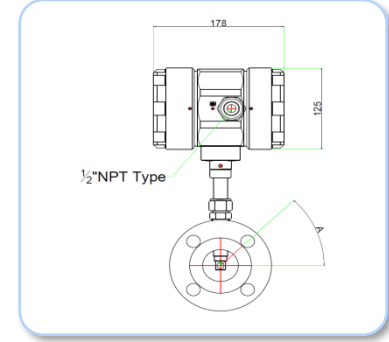
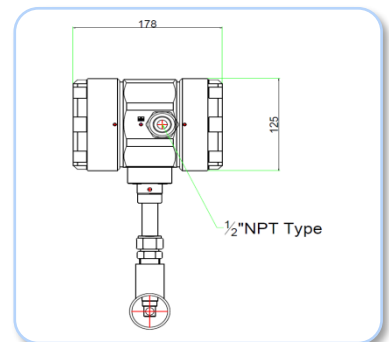
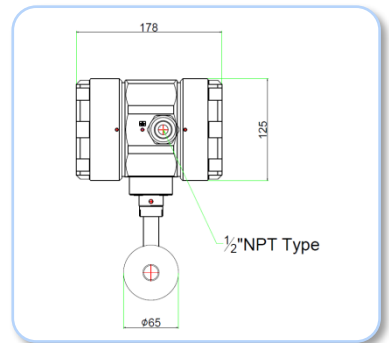
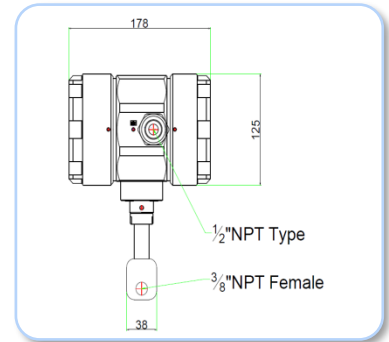
❖ Ex proof KC-2620Ex(IP66)



SIZE for NPT & Flange			
Size	C	L1	L2
1/4" & 3/8"	241.5	30	60
1/2"	241.5	90.7	180
3/4"	241.5	90.7	180
1"	283.5	101.5	180
1-1/2"	283.5	101.5	180
2"	283.5	101.5	200
3"	344.6	101.5	250
4"	344.6	127	250
6"	344.6	127	250
8"	404.6	127	300

SIZE for ANSI 150# FLANGE				
Size	C	L1	L2	A
1/2"	241.5	101.5	180	45°
3/4"	241.5	101.5	180	45°

※ The shape of the sensor and Housing manufacturers are Subject to Change.



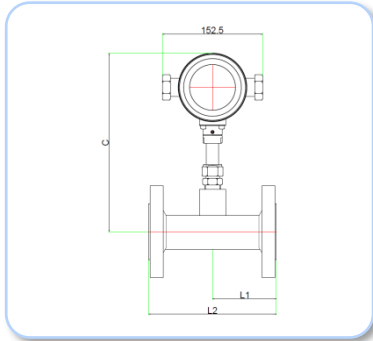
All dimensions are inches. Millimeters are in parentheses

THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

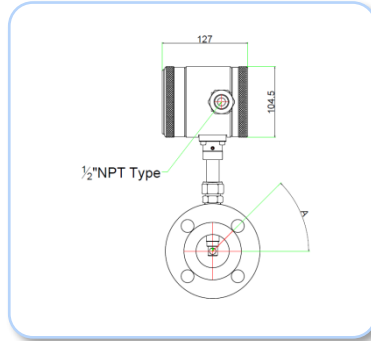
Dimensional Specification & Chart III

General type KC-2610GF(IP67)

- 1 1/2,"~ 8" 150lb & JIS 10k RF Flange
– Front View (EN2)

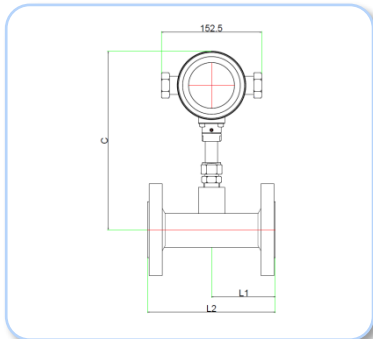


- 1 1/2,"~ 8" 150lb & JIS 10k RF Flange
– Side View (EN2)

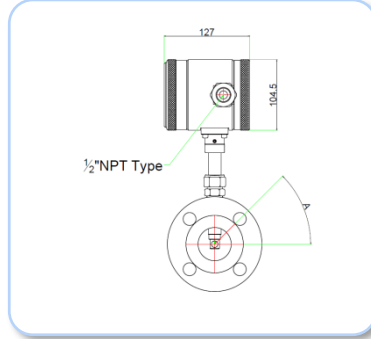


Size for ANSI 150lb Flange				
Size	C	L1	L2	A
1.5 inch	283.5	101.5	180	45°
2 inch	283.5	101.5	200	45°
3 inch	344.6	127	250	45°
4 inch	344.6	127	250	22.5°
6 inch	344.6	127	250	22.5°
8 inch	404.6	127	300	22.5°

- DIN Flange – Front View (EN2)



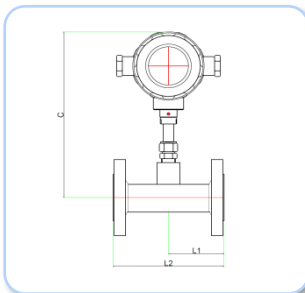
- DIN Flange – Side View (EN2)



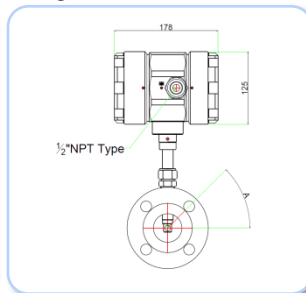
Size for DIN PN16 Flange			
Size	C	L1	L2
DN40	283.5	101.5	180
DN50	283.5	101.5	200
DN80	344.6	127	250
DN100	344.6	127	250
DN150	344.6	127	250
DN200	404.6	127	300

❖ Ex proof KC-2620Ex

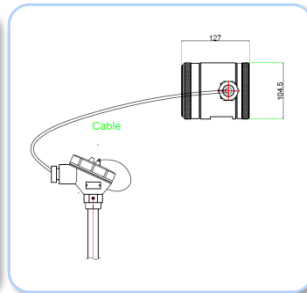
- 1 1/2,"~ 8" 150lb & JIS 10k RF Flange
– Front View (EN2)



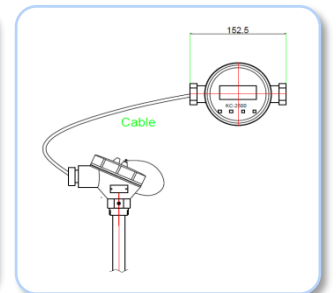
- 1 1/2,"~ 8" 150lb & JIS 10k RF Flange
– Side View (EN2)



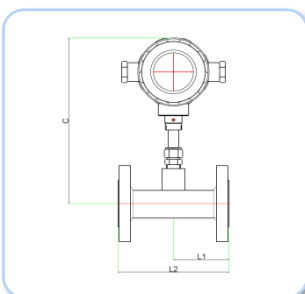
- Remote Mount Junction Box
– Front View (EN4)



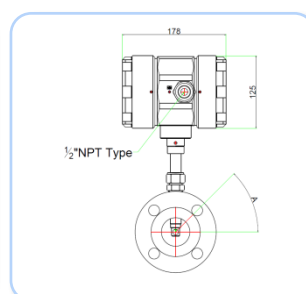
- Remote Mount Junction Box
– Front View (EN4)



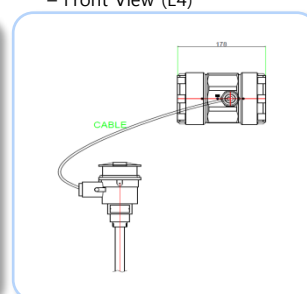
- DIN Flange – Front View (E2)



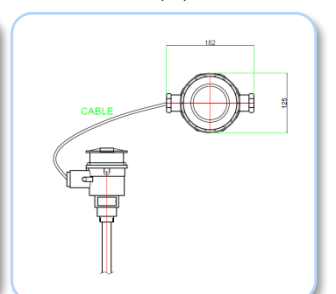
- DIN Flange – Side View (E2)



- Remote Mount Junction Box
– Front View (E4)



- Remote Mount Junction Box
– Side View (E4)



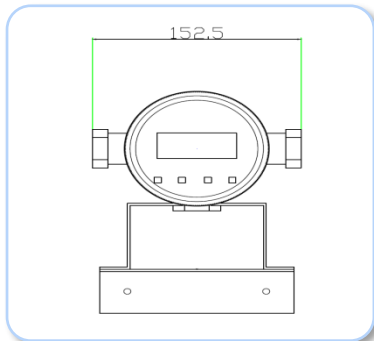
※ The shape of the sensor and Housing manufacturers are Subject to Change

THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

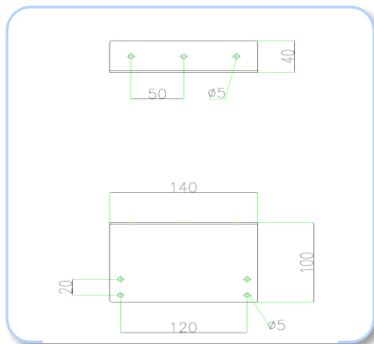
Dimensional Specification & Chart IV

❖ General type KC-2610GF-R

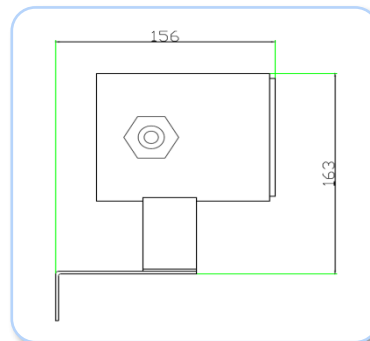
● Remote Rear Bracket Electronics (EN4)



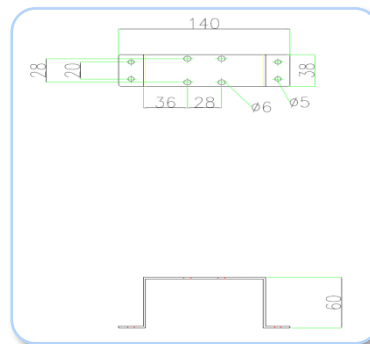
● panel mounting bracket 1



● Remote Side Bracket Mounted Electronics (EN4)

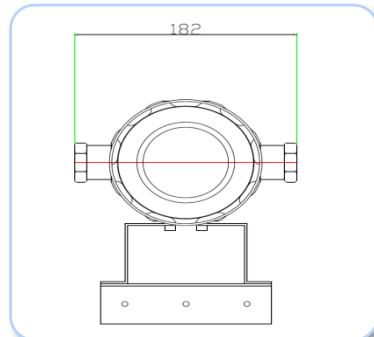


● panel mounting bracket 2

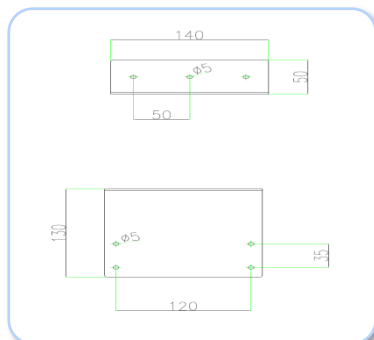


❖ Ex proof KC-2620Ex-R

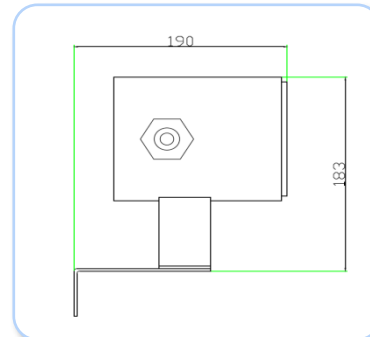
● Remote Rear Bracket Electronics (E4)



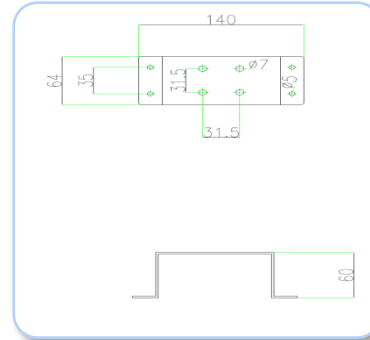
● panel mounting bracket 1



● Remote Side Bracket Mounted Electronics (E4)



● panel mounting bracket 2



THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

Low Pressure Ball Valve Dimensional

●Side view

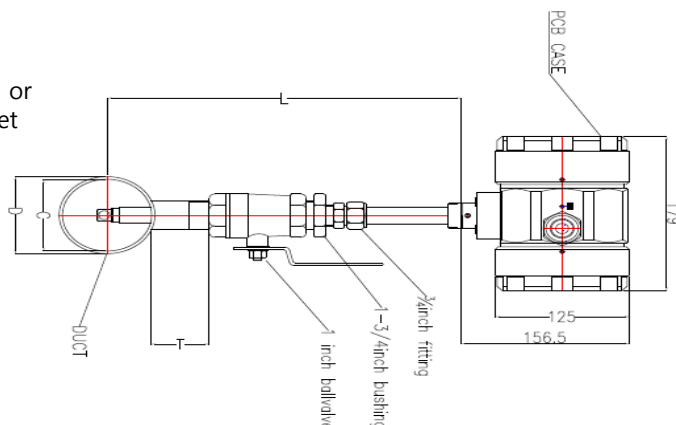
VARIABLE

L = Normal Probe Length

D = Duct O.D

C = Duct I.D

T = Height of "Threadolet" or
Customer provided weldolet



All dimensions are inches. Millimeters are in parentheses.

All drawings save a ± 0.25 inch(6.4 mm) tolerance. Certified and available be on request.

Piping Requirement (KC-2600GF inline type)

Straight Pipe Length Requirements at 1 atm			
Piping condition	KC-2610GI Smart – IN™		Orifice Plate (3)
	Upstream(1)	Downstream(2)	
90° Elbow or T-Piece	10 - 7D	5 - 3D	28D
Reduction (4:1)	10 - 7D	5 - 3D	14D
Expansion (4:1)	10 - 7D	5 - 3D	30D
After Control Valve	10 - 7D	5 - 3D	32D
Two 90° Elbows (in same plane)	10 - 7D	5 - 3D	36D
Two 90° Elbows (in same plane)	10 - 7D	5 - 3D	62D

- Note : (1) Number of diameters (D) of straight pipe required between upstream disturbance and the flowmeter.
(2) Number of diameters (D) of straight pipe required downstream of the flowmeter.
(3) For comparison purposes only. Table shows number of diameter(D) of upstream straight pipe length required for an ISO Standard 5167 Orifice plate with a beta ration of 0.7
(4) Consult factory for pressure effects.

THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

Order Code KC-2600 Series(Gases inline Type)

Type1 Type2 Conn' SIZE Power Display Direc. Press. Option
KC-26 - - - P - - - -
1 2 3 4 5 6 7 8 9

Type1	Code 1
General Gases	10GF
Bio Gases	10BF
Explosion-Proof	20Ex

Type2	Code 2
General Type	G
Remote Type	R

Connection Spec.	Code 3
Thread	T
Air Coupler	C
Lok Fitting	L
DIN / ANSI / JIS Flange	D / A / J
Agency approved, customer specified	W

Size	Code 4
1/4" (DN6)	0
3/8" (DN10)	1
1/2" (DN15)	2
3/4" (DN20)	3
1" (DN25)	4
1-1/4" (DN32)	5
1-1/2" (DN40)	6
2" (DN50)	7
2-1/2" (DN65)	8
3" (DN80)	9
4" (DN100)	10
5" (DN125)	11
6" (DN150)	12
8" (DN200)	13
10" (DN250)	14
12" (DN300)	15
Agency approved, customer specified	W

Power Supply	Code 5
DC 24 V	1
AC 100 ~ 240 V	2
Agency approved, customer specified	W

Display	Code 6
No Readout	NR
Digital Display	DD
Agency approved, customer specified	W

Flow Direction	Code 7
Horizontal / Left -> Right	1
Horizontal / Right -> Left	2
Vertical / Lower -> Upper	3
Vertical / Upper -> Lower	4
Agency approved, customer specified	W

Pressure Range	Code 8
Low pressure Below 43 psig (3 barg)	L
Medium pressure Below 232 psig (16 barg)	M
High pressure Below 363 psig (25 barg)	H
Agency approved, customer specified	W

Option	Code 9
Special Type	S
Agency approved, customer specified	W

Note

1. Flange is tapped and threaded on the compression fitting
2. The male connector is permanently tightened with ferrule of two combined materials
3. Flange must be ANSI or DIN specification
4. Maximum length is 60-inch(1524mm)
5. Enclosure required for agency approvals, T6 rate at 40°C
6. Wire resistance must be less than 8 ohms
7. Turndown ratio is 100:1 min. & 1000:1 max.
8. SFPS is the abbreviation for standard feet per second at 14.7psia(1.01 bar(a) & 70°F (21.1°C)
9. Customer specified calibration must not exceed temperature & pressure limitations of the 2610GF, 2620Ex Series products specifications

THERMAL MASS FLOW METER(Air & Gas) KC-2600 Series

Flow measurement principle



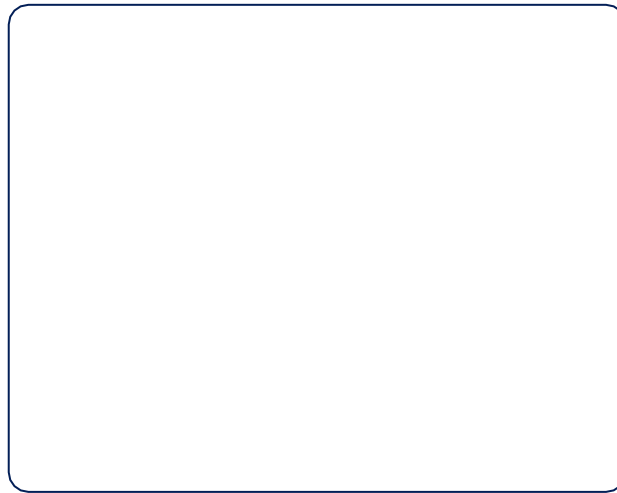
**KC-2600 Series
Thermal Mass Sensor**

Golden Rule's unique Mass Flow probe ensures exceptional accuracy, robustness, and reliability in industrial flow meters. The Mass Flow sensor consists of two sensing elements: a flow rate sensor and a temperature sensor that automatically compensates for gas temperature changes. The new device incorporates two temperature-sensitive platinum resistors on a single chip. The high-ohm resistor is used to measure the reference temperature, while the low-ohm resistor acts as a heater. By using a bridge circuit, the different resistance values of the two elements generate different levels of self-heating. Self-heating depends on the supply voltage, mass flow, and the medium in which the sensor is located. Higher voltage increases self-heating, while higher flow rates increase cooling. If self-heating is continuously maintained by a suitable controller, the voltage will increase with higher flow rates, enabling mass flow measurement.

◆Simply select to suit the application

Application	Type		Mass Flowmeter	
			Thermal	
Object of Measurement	Liquid		X	
	Gas		O	
	Vaper		X	
	steam		X	
Application	control		X	
	Monitor		O	
	Supply		X	
Operating condition	Temperature		Gas	- 40 to 150°C
	Pressure		Max 100bar	
	Pressure loss		Negligible	
	Range ability		Large	
Installing condition	Bore		Ø8 to Ø6,000	
	Straight Pipe length	upstream	7D	
		downstream	3D	
	Piping work		Required	
	Explosion-proofing		O	
Performance	Accuracy		Gas	±0.5% F.S
	Velocity		Gas	0.1~100 m/s

**Air & Gas & Steam & Liquid
Mass Flowmeter
Specialized Manufacturer**



Certified in accordance with
KC Q ISO 9001 : 2015
KC Q ISO 14001 : 2015

GOLDEN RULES Co.,Ltd