

Main_catalog

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Golden Rules Co.,Ltd

Thermal Mass Flowmeter



The nation's development item, 100% domestic goods, Patent **NO.** 10-1606497

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- Inline type KC-2600BF

Flow Sensing Principle

■ Thermal Mass Flow Sensing



**KC-2600 Series
Thermal Mass Sensor**

Golden Rule Co., Ltd.'s unique Mass Flow probe guarantees excellent accuracy, robustness and reliability of industrial flowmeters. The mass flow sensor consists of two sensing parts, one is a flow sensor and the other is a temperature sensor that automatically compensates for changes in gas temperature. The new device consists of two temperature platinum resistors on a single chip. A high ohm resistor is used to measure the reference temperature, while a low ohm resistor is used as a heater. By using the bridge circuit, the different resistance values of the two elements generate different self-heating. Self-heating depends on the supply voltage, mass flow and the medium in which the sensor is placed. A higher voltage increases self-heating, and a higher flow rate increases cooling. If self-heating is continuously maintained by a suitable controller, the voltage will be increased with a high flow rate so that the mass flow can be measured.

◆ 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

Delivery performance

Taekyung Chemical, Kumho Petrochemical, LG Chemical Daesan Plant, LG Chemical Cheongju Plant, SK Chemicals Ulsan Plant, Hanmi Fine Chemicals Sihwa Plant, Kolon Glotech Gumi Plant, Hanwha Chemical Yeosu Plant, Shinchang Yeosu Plant, POSCO Chemical, KCC Yeosu Plant, KCC Daejuk Plant

Korea Gas Corporation -> 4 EA

Samcheok base, Tongyeong base headquarters, Gwangju nursery DME pilot project

Resource recovery facility -> 6 EA

Gyeongnam Yangsan, Mokdong Yangcheon

Medicine -> 4 EA

Samsung Biologics Songdo, Hanmi Pharmaceutical Pyeongtaek Plant

Bridge -> 22 EA

Busan Gwangan Bridge, Yeongjong Bridge, Mokpo New Millennium Bridge

Car -> 110 EA

Hyundai Powertech Dangjin Plant, Hyundai Motors Ulsan/Asan Plant, Kia Motors Hwaseong Plant

Semiconductor & Electronics -> 53 EA

Samsung Electronics Suwon/Hwaseong Plant, LG Siltron Gumi Plant, LG Electronics Cheongju Plant, LG Innotek, Cheongju Plant, Dongjin Semichem Hwaseong Plant, Korea Molex Gwangju Plant

Construction -> 109 EA

POSCO E&C, Samsung C&T, Lotte E&C, Hyundai E&C, Hanwha, Halla OMS, Doosan E&C, Taeyoung E&C

Food -> 13 EA

Dongseo Food Bupyeong/Changwon Plant, Namyang Dairy, Haitai Beverage, OB Beer Cheongju Plant

Cement -> 5 EA

Halla Cement Bucheon Plant, Hanil Cement (Gongju, Mokpo, Haman, Gaya Plant)

Delivery performance

Communication -> 2 EA

KT Busan

Machine -> 31 EA

Korea NSK Cheonan Factory, Bearing Art Yeongju Factory

Energy Saving System Project (for compressed air) -> 162 EA

1. Gyeongbuk region (Daegu Dalseong Industrial Complex & Gyeongbuk Gumi Industrial Complex)-300 units for compressed air, **129 units** currently being delivered after receiving an order in August 2016

2. In the process of being delivered to other factories for the basic unit check of compressed air usage -> **11 EA**

POSCO Gwangyang 65A-1ea(2005.12),
Bogwang Phoenix Park 250A-2ea(2006.5),
Samsung Biologics 100A-2ea(2012.7),
POSCO Gwangyang 50A-1ea(2012.8),
SamyangMillmax Asan Plant 80A-1ea(2015.8),
LG Electronics Cheongju Plant 80A-1ea (2015.8),
Kia Motors Hwaseong Plant 250A-1ea (2017.1),
Kolon Glotech Gumi Plant 100A-1ea (2017.7),
SK Technopack Cheonan Plant 150A-1ea (2017.8),

3. Gyeongnam & Busan industrial complex energy management system PJT energy saving compressed air -> **22 EA**

Castech Korea Co., Ltd. Busan Factory 80A-1ea (2016.7),
Dongun Forging Co., Ltd. Busan Factory
65A-1ea, 80A-1ea, 100A-2ea, 150A-2ea (2016.7)
Samshin Precision Co., Ltd. Gyeongnam Haman Factory 200A-3ea(2018.8),
Boyoung Metal Goryeong(2018.9)-3ea,
HM Metal Haman Plant-3ea,
etc.-6ea

01

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Golden Rules Co.,Ltd

Thermal Mass Flow Meter
Speicalty Manufacture

KC-2600GI Series Air & Gas insertion type



GOLDEN RULES 07

The nation's development item, 100% domestic goods, Patent **NO. 10-1660226**

01. THERMAL MASS FLOW METER (Air & Gas)

01. Insertion type KC-2600GI Series

Insertion Type Thermal Mass Flowmeter

**General insertion type
KC-2610GI
(IP67)**



**Ex-proof insertion type
KC-2620Ex
(IP66)**



Features

- Rate & total, volume, mass flow indication
- Input Power DC 24 V or 100-240VAC
- Output accuracy $\pm 0.1\%$, $\pm 2.5 \mu A$ (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

무게	방폭	일반
	5.56kg	3.5kg

Description

Golden Rules' KC-2600GI 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-2600GI 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.

Performance Specification

◆ **Accuracy of Point Velocity**

±1.0% 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	
A	B	Scfm	Nm ³ /h	Scfm	Nm ³ /h
25A	1-inch	0-6	0-8.9	0-120	0-180
40A	1½-inch	0-15	0-22	0-280	0-440
50A	2-inch	0-23	0-33	0-470	0-680
80A	3-inch	0-50	0-74	0-1000	0-1500
100A	4-inch	0-90	0-130	0-1800	0-2700
150A	6-inch	0-200	0-300	0-4000	0-5900
200A	8-inch	0-350	0-520	0-7000	0-10.000

Notes: Air or N2 Flow Standard Condition :21°C(70°F) & 21°C(70°F) scfm:0°C, Nm³/h 17|압

Operating Specification

◆ **Fluid**

Gases (Air, O2, N2, LNG, LPG Other Gas)

◆ **Pressure (limitation)**

Compression Fittings : 508 psig (35 barg) option

150 lb Flange, JIS 10k RF PN16 (DN) : (-40 ~ 150) °F ((-40 ~ 65) °C)
: 230 psig (16 barg)

Low Pressure Retract Valve : 100 psig (7 barg)

High Pressure Retract Valve : 1000 psig (70 barg)

◆ **Pressure Drop**

It can be safely ignored for pipes over 3 inches.

◆ **Fluid & Ambient temp'**

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

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

Gas accumulation range

Up to 5 X 10⁻⁴ with helium gas

◆ **Input Power (selection)**

DC24 V ±10 %, 200 mA

100 ~ 240 V AC ±10 %, 10 watts

◆ Output Signal (Standard)

Linear (4 ~ 20) mA & Pulse

◆ Display

Alphanumeric 2 X 16 backlight LCD

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 specifications**◆ Wetted Materials**

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

Protection Tube – 303SS (Option : 316SS, 316LSS)

◆ Enclosure

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

General-Area CASE (IP67)

◆ Electrical Connection

2 X ½"PF or Ex Cable Gland(SS) 22C

◆ Mounting (Selection)

¾" Compression Fitting & ¾" Male NPT (Standard)

ANSI 150lb Flange, JIS 10k RF Flange

¾" Compression Fitting & 1" Male NPT (Option)

Ball Valve System (Option)

◆ Certification

Ex (Ex d[ib] IIC T4)

CE (CASE)

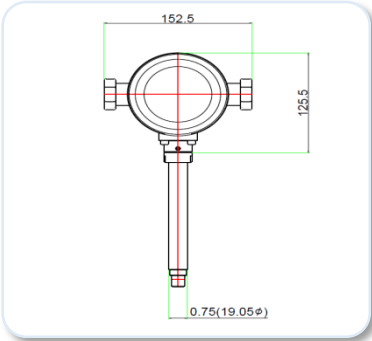
KGS Certificate

KC Certificate

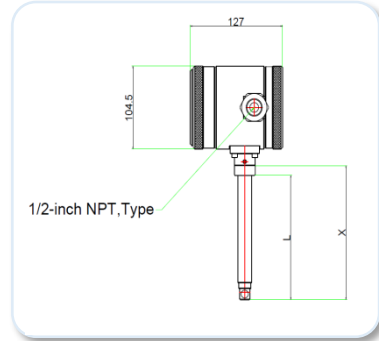
Dimensional Specification & Chart I

♣ General KC-2610GI (IP67)

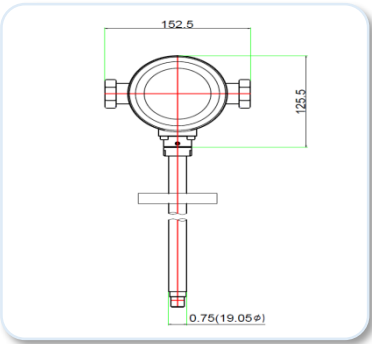
● Compression Fitting – Front View (EN2)



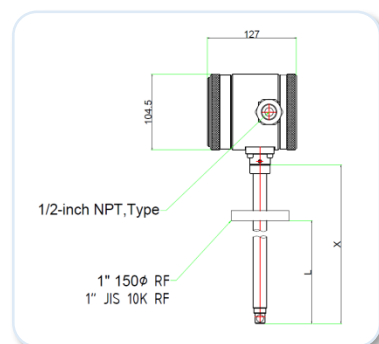
● Compression Fitting – Side View (EN2)



● Flange Mounting – Front View (EN2)

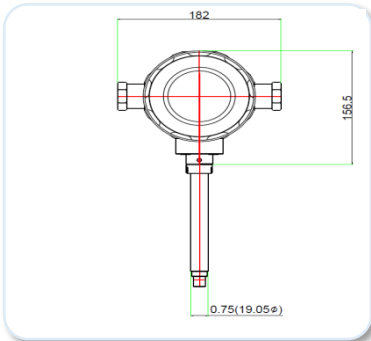


● Flange Mounting – Side View (EN2)

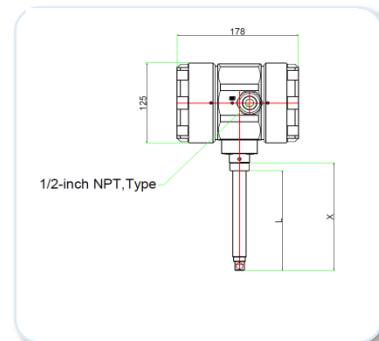


♣ Ex-proof KC-2620Ex (IP66)

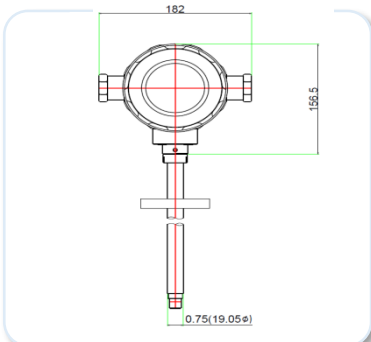
● Compression Fitting – Front View (E2)



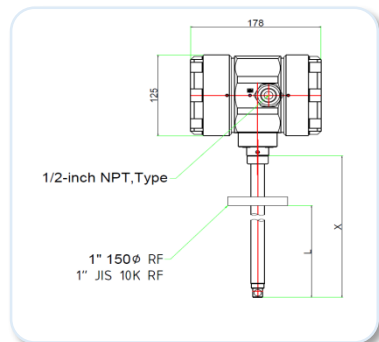
● Compression Fitting – Side View (E2)



● Flange Mounting – Front View (E2)



● Flange Mounting – Side View (E2)

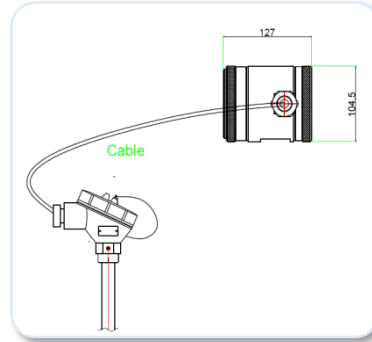
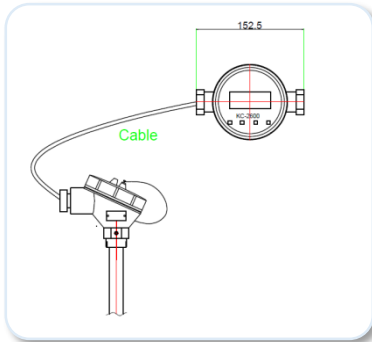


The shape of the sensor and Housing manufacturers are Subject to Change.

Dimensional Specification & Chart II

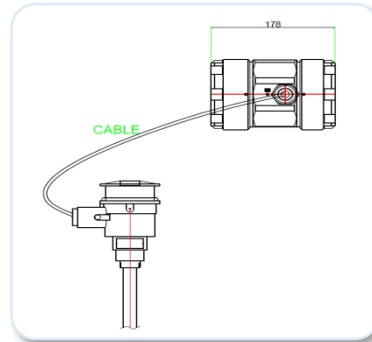
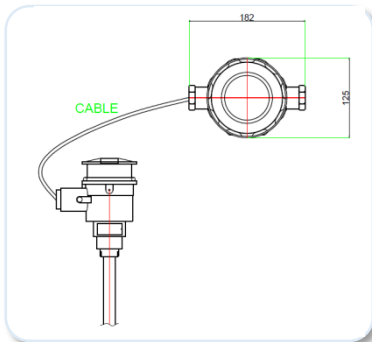
♣ General Insertion type KC-2610GI-R

- Remote Mount Junction Box – Front View (EN4) Remote Mount Junction Box – Side View (EN4)



♣ Ex-proof Insertion type KC-2620Ex-R

- Remote Mount Junction Box – Front View (E4) Remote Mount Junction Box – Side View (E4)



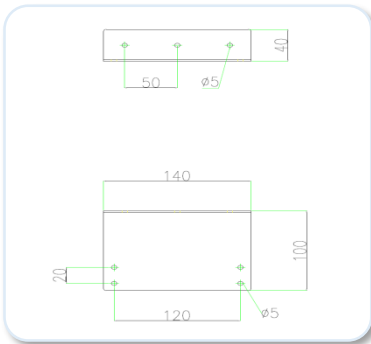
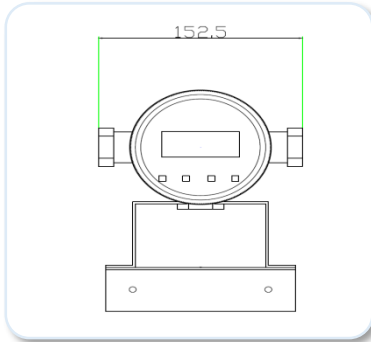
Length Chart		
Code	L	X
L06	6.0 (152.4)	7.5 (190.5)
L09	9.0 (228.6)	10.5 (266.7)
L13	13.0 (330.2)	14.5 (368.3)
L18	18.0 (457.2)	19.5 (495.3)
L24	24.0 (609.6)	25.5 (647.7)
L36	36.0 (914.4)	37.5 (952.5)

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

Dimensional Specification & Chart III

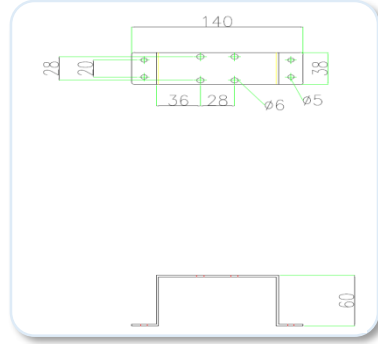
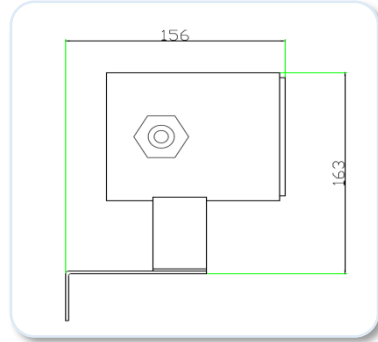
General Insertion type KC-2610GI-R

● Remote Rear Bracket Electronics (EN4)



Panel mounting bracket 1

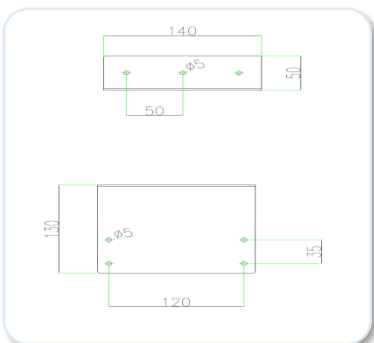
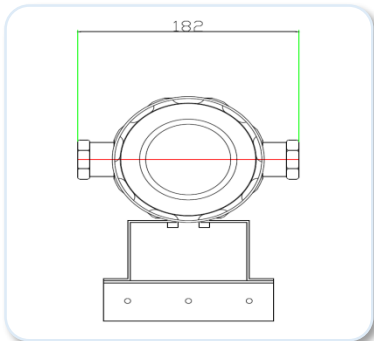
● Remote Side Bracket Mounted Electronics (EN4)



Panel mounting bracket 2

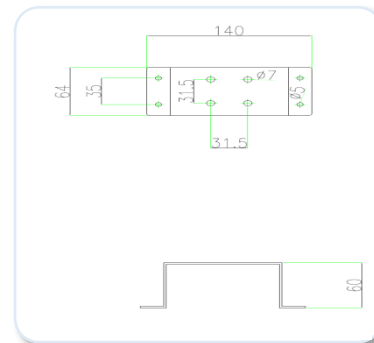
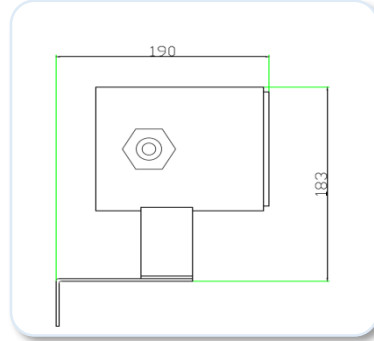
Ex-proof Insertion type KC-2620Ex-R

● Remote Rear Bracket Electronics (E4)



Panel mounting bracket 1

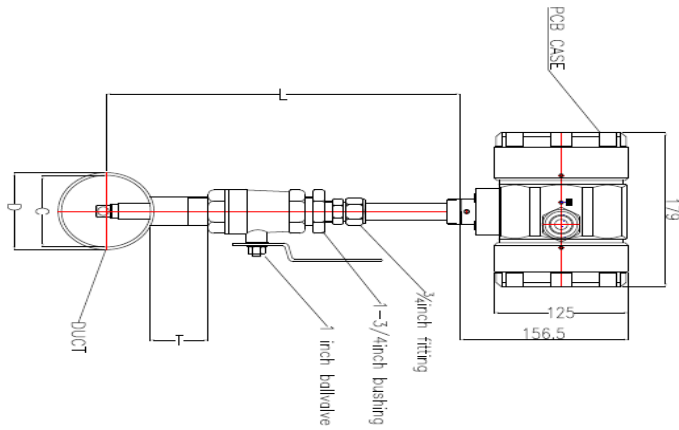
● Remote Side Bracket Mounted Electronics (E4)



Panel mounting bracket 2

Low Pressure Ball Valve Dimensional

● Side view



VARIABLE

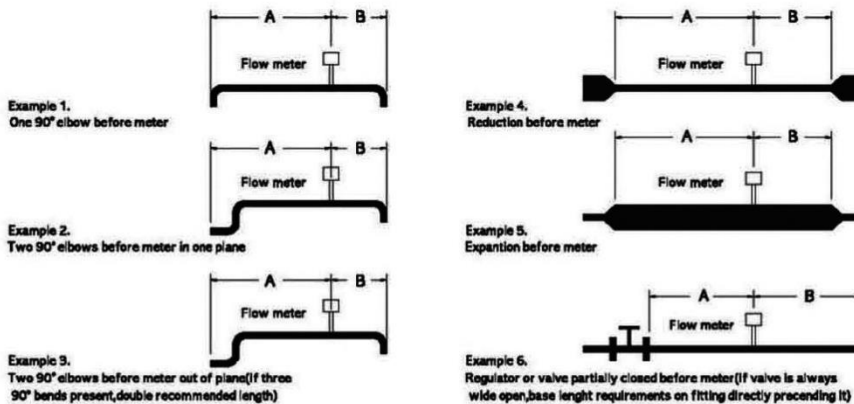
L = Normal Probe Length
 D = Duct O.D
 C = Duct I.D
 T = Height of "Threadolet" or Customer provided weldolet

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.

Upstream & Downstream dimension (KC-260GI insertion)

Select an installation that minimize possible distortion in the flow profile, Valves, elbows, control valves and other piping components may cause flow disturbances. Check your specific piping condition against the examples shown below.

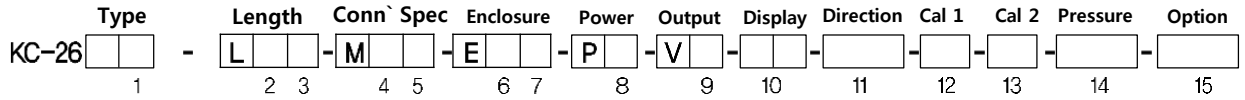
In order to achieve accurateness and repeatable performance install the flow meter using the recommended number of straight run pipe diameters upstream and downstream of the sensor.



Example	A-Upstream(1)Requirements	B-Downstream(2)Requirements
1	10-7D	5-3D
2	15-10D	5-3D
3	20-15D	10-5D
4	10-7D	5-3D
5	20-15D	10-5D
6	20-15D	5-3D

(1)Number of diameter(D)of straight pipe required between upstream disturbance and the flow meter.
 (2)Number of diameter(D)of straight pipe required downstream of the flow meter.

Order Code KC-2600GI Series (Gas Insertion type)



Type	Code 1	Input Power	Code 8	Calibration 2 ⁹	Code 13
IP67 or IP65	10 GI	DC 24 V ±10 %, 200 mA	2	70 °F(21 °C) 14.7 psig (1.103 barg)	A
Hazardous-Area Location Enclosure	20 Ex	AC 100 ~ 240 V ±10 % (옵션)	3	32 °F(0 °C) 14.7 psig (1.103 barg)	B
Agency approved, customer specified	30	Agency approved, customer specified	W	Agency approved, customer specified	W

Length ⁴	Code 2,3	Output Signal	Code 9	Pressure Limit	Code 14
6" (15 cm)	06	RS-485S (RS-232C)	1	Low pressure	L
9" (23 cm)	09	Pulse, Alarm	3	Below 43 psig (3 barg)	
12" (30 cm)	12	DC 4~20 mA, 0~5 V DC	4	Medium pressure	M
18" (46 cm)	18	Agency approved, customer specified	W	Below 145 psig (10 barg)	
24" (61 cm)	24			High pressure	H
36" (92 cm)	36			Below 725 psig (50 barg)	(option)
Special Length	(in)	Flow Display	Code 10	Option	Code 15
Probe with 2" JIS 10k RF Flange	(in)-M5	No Readout	NR	Agency approved, customer specified	W
High pressure with Retractor Valve	(in)-M9	Digital Display	DD		
Agency approved, customer specified	WW	Agency approved, customer specified	WW		

Connection Specification	Code 4,5
None	0
Compression Fitting ² (¾" Tube X ¾" Male NPT)	10
Thread let (¾" Female NPT) Specify Pipe O.D in parentheses	2()
Compression Fitting (IP67) (½" Tube X ¾" Male NPT)	3
Curved Duct Bracket (¾" Tube Compression Fitting) Specify Duct O.D in parentheses	4()
Low Pressure Retractor Valve Specify Duct O.D in parentheses	8()
Compression Fittings (¾" Tube X 1" Male NPT)	15()
Agency approved, customer specified	WW

Enclosure ⁵	Code 6,7
Hazardous-Area Location Enclosure	2
Remote Hazardous-Area Location Enclosure(Only with Ex Meter)	3(Ft)
Remote Hazardous-Area Location Enclosure(Only with Junction Box)	4(Ft)
IP67 or IP65	N2
Remote IP67 with Junction Box	N4(Ft)
Agency approved, customer specified	WW

Direction	Code 11
Horizontal Free or Vertical UP	1
Horizontal Free or Vertical Down	2
Agency approved, customer specified	W

Calibration 1 ⁹	Code 12
Standard Calibration	A
Air, only for 3" and large pipe size	
Compressed Air, only for 3" and large pipe size	D
Customer Calibration	B
Air	
Air equivalency (Digester Gas, Flue, Gas etc.)	C
Nitrogen, Helium, Argon, Carbon Dioxide Compressed Air or Digester Gas	E
Hydrocarbon (Natural Gas, Methane, Ethane, Propane etc.)	F
Hydrogen or Hydrogen Mixture	G
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.Custmoer specified calibration must not exceed temperature & pressure limitations of the 2610GI, 2620Ex Series products specifications

02

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Golden Rules Co.,Ltd

Thermal Mass Flow Meter

KC-2600GF Series Air & Gas Inline type



The nation's development item, 100% domestic goods, Patent **NO.** 10-1660226

02. THERMAL MASS FLOW METER (Air & Gas)

2 Inline type KC-2600GF Series

Inline Type Thermal Mass Flowmeter



**Gas inline type
KC-2610GF
(IP67)**



**Gas inline type
KC-2620Ex
(IP66)**



**Gas inline MFM
KC-2610GM**



**Gas inline MFM
KC-2620Ex-GM**

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

Description

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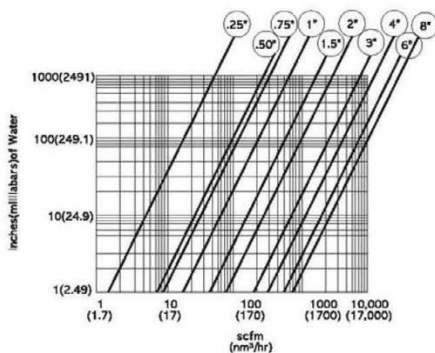
The information contained herein is subject to change without notice.

Performance Specification

- ◆ **Accuracy of Point Velocity**
±0.5% of F.S
- ◆ **Repeatability**
±0.2 % of Full Scale
- ◆ **Temperature Coefficient**
±0.03 % Reading / ±(10 ~ 38) °C내에서 °C
±0.06 % Reading / ±(25 ~ 50) °C내에서 °C
- ◆ **Pressure Drop**
It can be ignored within ± 50 psig (3.4 bara).
- ◆ **Response Time**
1 second 63% of final velocity value
- ◆ **Measuring Range**
0.01 ~ 66.2 m/sec
- ◆ **Function**
Air, O2, N2, LNG, LPG Other Gas

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**



Mass Flow Rates

Air Flow Ranges							
Pipe Size		Minimum		Maximum		Weight (kg)	
A	B	Scfm	Nm ³ /h	Scfm	Nm ³ /h	방폭	일반
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
100 A	4-inch	90	130	1800	2700	16.2	14.2
150 A	6-inch	200	300	4000	5900		
200 A	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

◆ 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

◆ 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)

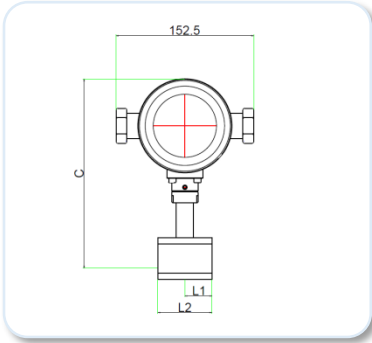
¾" Compression Fitting과 ¾" Male NPT (Standard)
ANSI 150lb Flange, JIS 10k RF Flange (Option)
¾" Compression Fitting과 1" Male NPT (Option)
Ball Valve System (Option)

◆ Certification

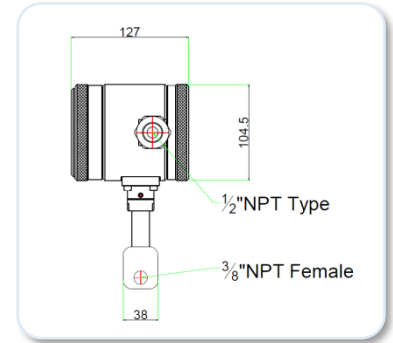
Ex (Ex d[ib] IIC T4)
CE (CASE 전체)
KGS Certificate
KC Certificate

Dimensional Specification & Chart I General KC-2610BF (IP67)

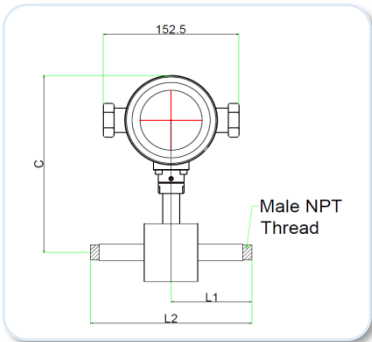
●1/4," 3/8" NPT – Front View (EN2)



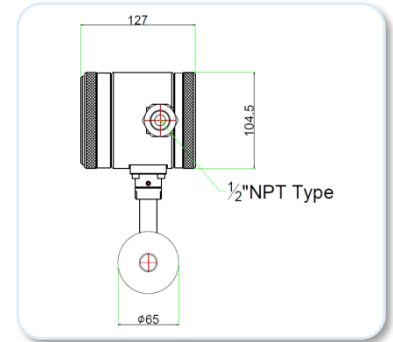
●Compression Fitting – Side View (EN2)



●1/2," 3/4" NPT – Front View (EN2)

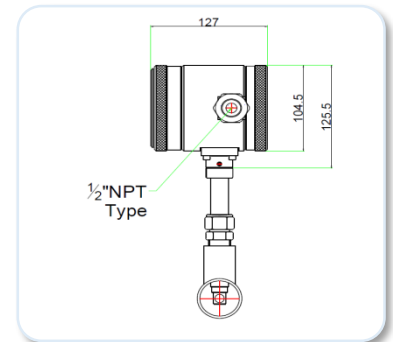


●1/2," 3/4" NPT – Side View (EN2)

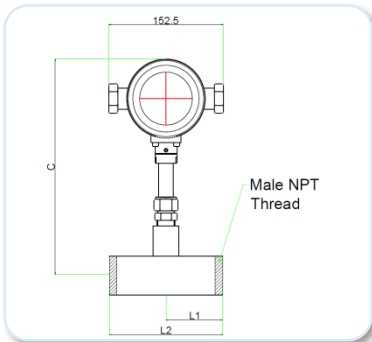


SIZE for NPT			
Size	C	L1	L2
1/4" & 3/8"	210.5	30	60
1/2"	210.5	90.7	181.4
3/4"	210.5	90.7	181.4
1"	272.5	101.5	203
1-1/2"	272.5	101.5	203
2"	272.5	101.5	203
3"	334.6	127	254
4"	334.6	127	254
6"	334.6	127	254
8"	404.6	127	254

●Compression Fitting – Side View (EN2)



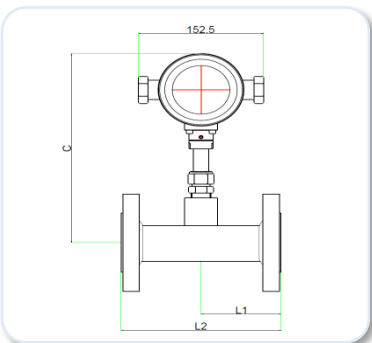
●1/4," 3/8" NPT – Front View (EN2)



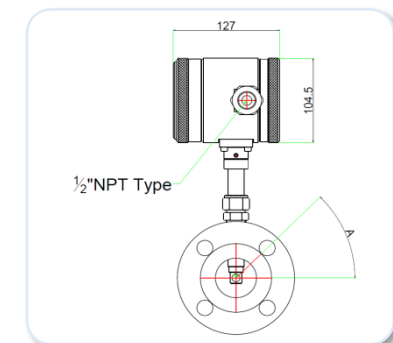
SIZE for ANSI 150# FLANGE				
Size	C	L1	L2	A
1/2"	210.5	101.5	203	45°
3/4"	210.5	101.5	203	45°

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

●1/2," 3/4" Flange – Front View (EN2)



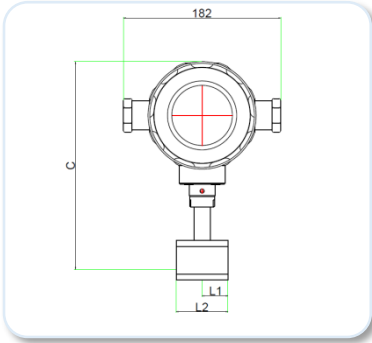
●1/2," 3/4" Flange – Side View (EN2)



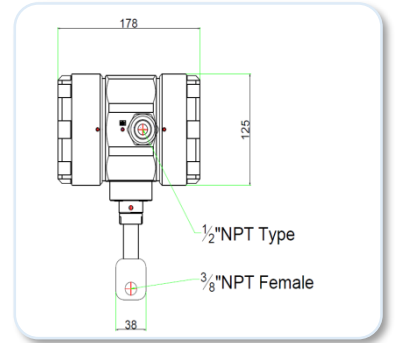
All dimensions are inches. Millimeters are in parentheses.

Dimensional Specification & Chart II Ex-proof KC-2620Ex

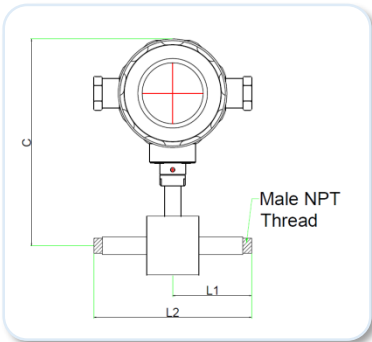
●1/4," 3/8" NPT – Front View (E2)



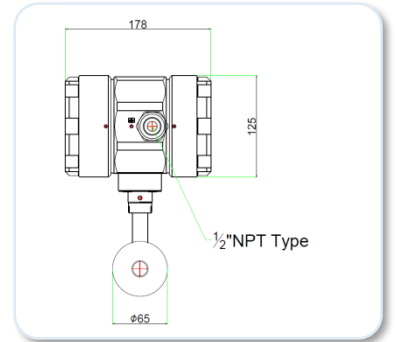
●Compression Fitting – Side View (E2)



●1/2," 3/4" NPT – Front View (E2)

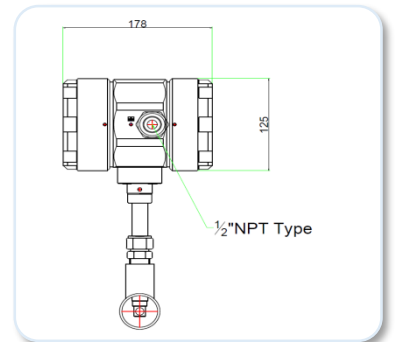


●1/2," 3/4" NPT – Side View (E2)

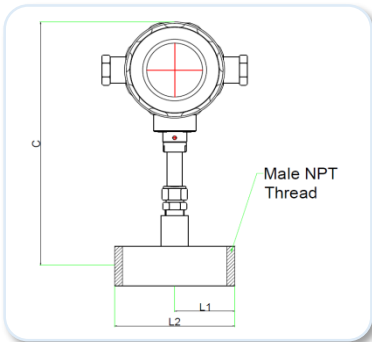


SIZE for NPT			
Size	C	L1	L2
1/4" & 3/8"	241.5	30	60
1/2"	241.5	90.7	181.4
3/4"	241.5	90.7	181.4
1"	283.5	101.5	203
1-1/2"	283.5	101.5	203
2"	283.5	101.5	203
3"	344.6	127	254
4"	344.6	127	254
6"	344.6	127	254
8"	404.6	127	254

●Compression Fitting – Side View (E2)



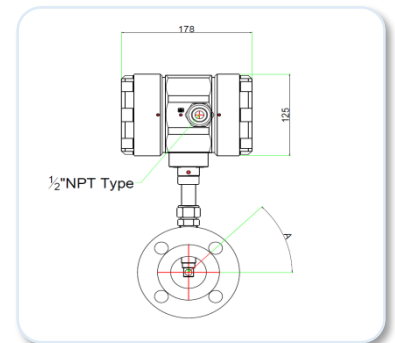
●1/4," 3/8" NPT – Front View (E2)



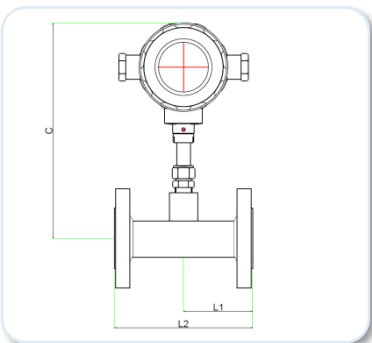
SIZE for ANSI 150# FLANGE				
Size	C	L1	L2	A
1/2"	241.5	101.5	203	45°
3/4"	241.5	101.5	203	45°

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

●1/2," 3/4" Flange – Side View (E2)

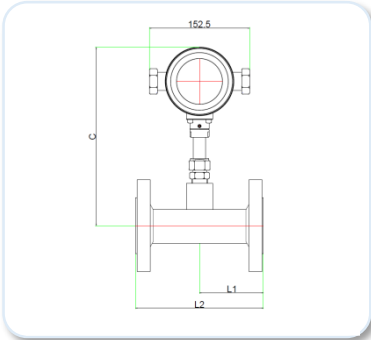


●1/2," 3/4" Flange – Front View (E2)

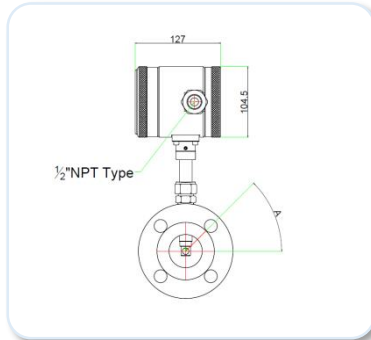


Dimensional Specification & Chart III KC-2610GF (IP67)

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

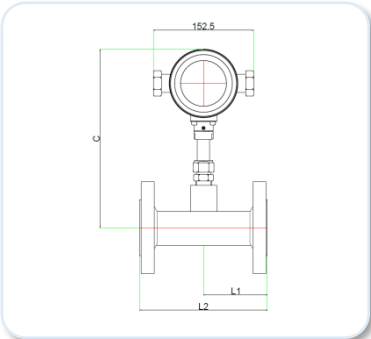


●1-1/2" ~ 8" – Side View (EN2)
150# Flange, JIS 10k RF Flange

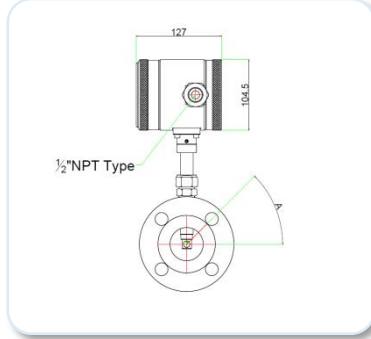


Size for ANSI 150# Flange				
Size	C	L1	L2	A
1-1/2"	283.5	101.5	203	45°
2"	283.5	101.5	203	45°
3"	344.6	127	254	45°
4"	344.6	127	254	22.5°
6"	344.6	127	254	22.5°
8"	404.6	127	254	22.5°

●DIN Flange – Front View (EN2)



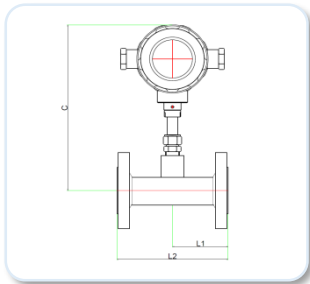
●DIN Flange – Side View (EN2)



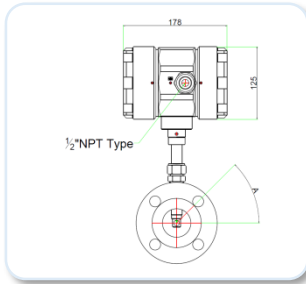
Size for PN16 DN Flange			
Size	C	L1	L2
DN40	283.5	101.5	203
DN50	283.5	101.5	203
DN80	344.6	127	254
DN100	344.6	127	254
DN150	344.6	127	254
DN200	404.6	127	254

Dimensional Specification & Chart III KC-2620Ex (Ex-proof)

●1-1/2" ~ 8" – Front View(E2)
150# Flange, JIS 10k RF Flange

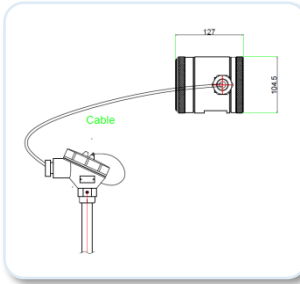


●1-1/2" ~ 8" – Side View(E2)
150# Flange, JIS 10k RF Flange

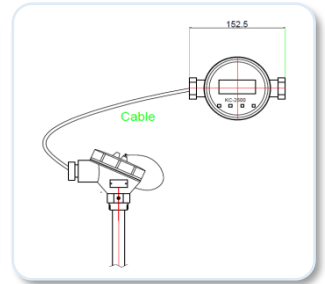


General Remot type KC-2610GF-R

●Remote Mount Junction Box – Front View(EN4)

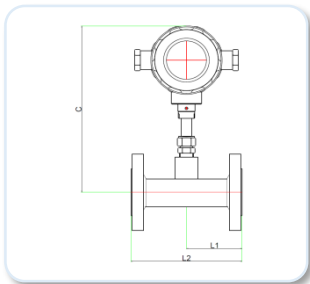


●Remote Mount Junction Box – Side View(EN4)

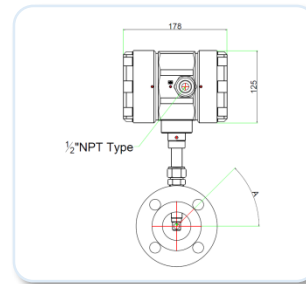


Ex-proof Remote type KC-2620Ex-R

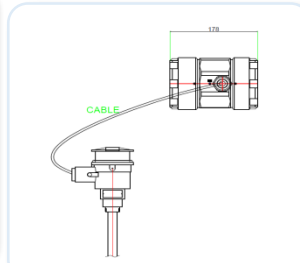
●DIN Flange – Front View(E2)



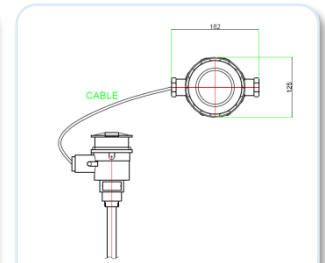
●DIN Flange – Side View(E2)



●Remote Mount Junction Box – Front View(E4)



●Remote Mount Junction Box – Side View(E4)

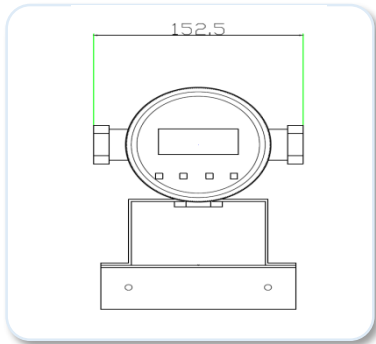


※ The shape of the sensor and Housing manufacturers are Subject to Change.

Dimensional Specification & Chart V

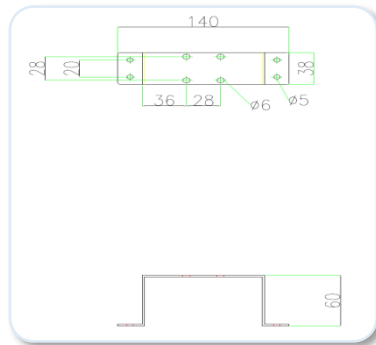
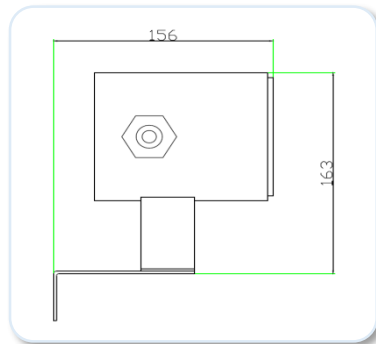
♣ General Remote type KC-2610GF-R

● Remote Rear Bracket Electronics (EN4)



● panel mounting bracket 1

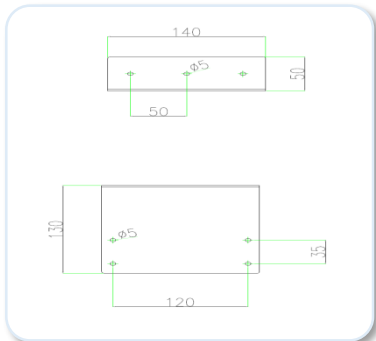
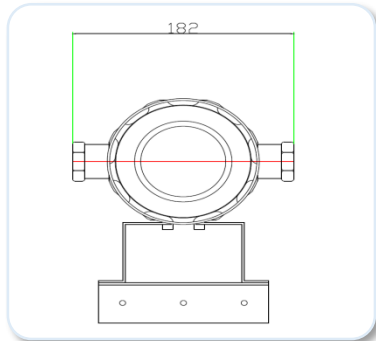
● Remote Side Bracket Mounted Electronics (EN4)



● panel mounting bracket 2

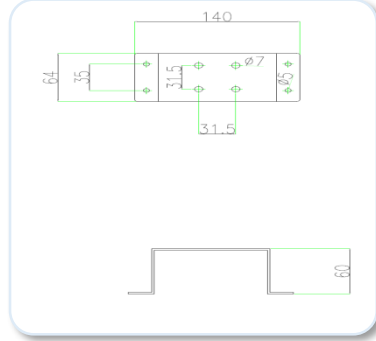
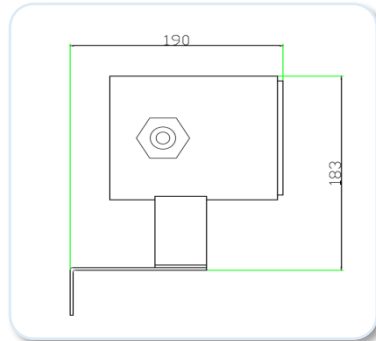
♣ Ex-proof Remote type KC-2620Ex-R

● Remote Rear Bracket Electronics (E4)



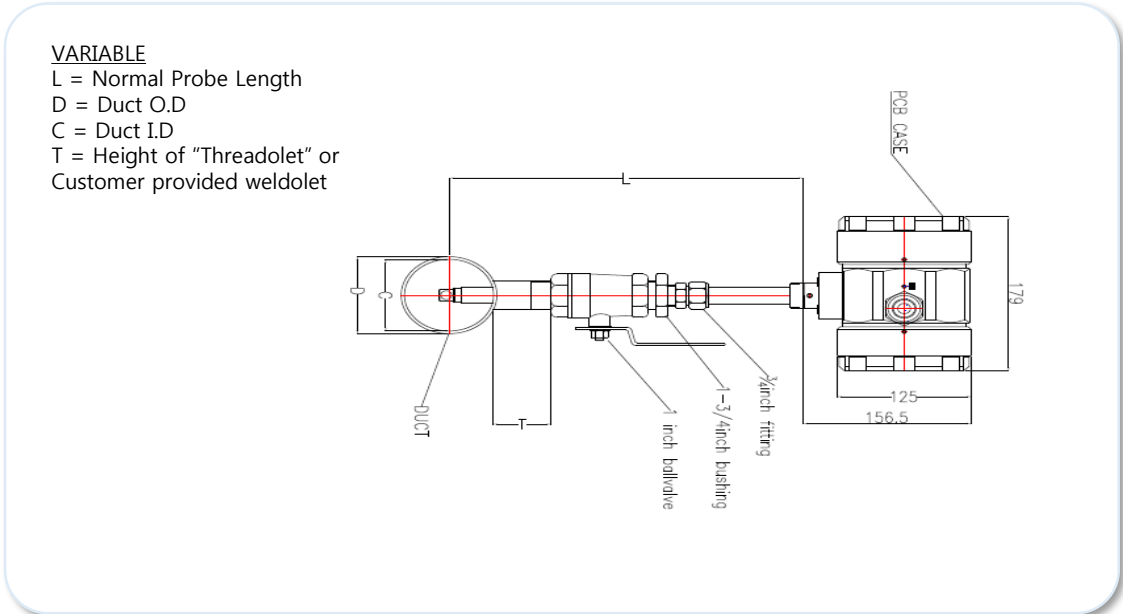
● panel mounting bracket 1

● Remote Side Bracket Mounted Electronics (E4)



Low Pressure Ball Valve Dimensional & Specification

●Side View



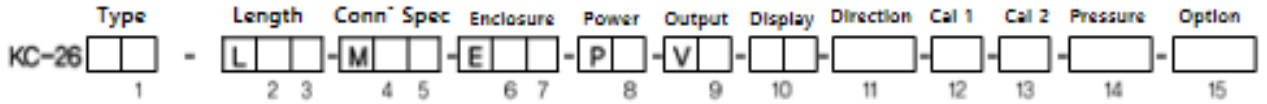
±0.25 All dimensions are inches. Millimeters are in parentheses.
 All drawings save a ±0.25 inch(6.4 mm) tolerance.
 Certified and available be on request.

Piping Requirement (KC-2600GF inline type)

Piping condition	KC-2600 Smart- IN™		Orifice Plate(3)
	Upstream(1)	Downstream(2)	
90° Elbow or T-Piece	10D	5D	28D
Reduction (4:1)	10D	5D	14D
Expansion (4:1)	10D	5D	30D
After Control Valve	10D	5D	32D
Two 90° Elbows (in same plane)	10D	5D	36D
Two 90° Elbows (in same plane)	10D	5D	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.

Order Code KC-2600GF Series (Gases inline type)



Type	Code 1
IP67 or IP65	10GF
Hazardous-Area Location Enclosure	20Ex
MFM (IP67)	10GM

Input Power	Code 8
DC 24 V ±10 %, 200 mA	2
AC 100 ~ 240 V ±10 % (음선)	3
Agency approved, customer specified	W

Calibration 2 ⁹	Code 13
70 °F(21 °C) 14.7 psig (1.103 barg)	A
32 °F(0 °C) 1 atm (76 mmHg)	B
Agency approved, customer specified	W

Connection type	Code 2
DIN Flange	D
ANSI Flange	A
JIS Flange	J
Agency approved, customer specified	W

Output Signal	Code 9
RS-485S	1
Pulse	3
DC 4~20 mA,	4
Agency approved, customer specified	W

Pressure limit	Code 14
Low pressure Below 43 psig (3 barg)	L
Medium pressure Below 145 psig (10 barg)	M
High pressure Below 725 psig (50 barg)	H (option)

Connection Spec' 1,3	Code 3,4,5		
Size	DIN	150 lb	JIS 10k
1" (DN25)	D4	F4	J4
1-1/4" (DN32)	D5	F5	J5
1-1/2" (DN40)	D6	F6	J6
2" (DN50)	D7	F7	J7
2-1/2" (DN65)	D8	F8	J8
3" (DN80)	D9	F9	J9
3-1/2" (DN90)	D10	F10	J10
4" (DN100)	D11	F11	J11
5" (DN125)	D12	F12	J12
6" (DN150)	D13	F13	J13
7" (DN175)	D14	F14	J14
8" (DN200)	D15	F15	J15
10" (DN250)	D16	F16	J16
12" (DN300)	D17	F17	J17
Agency approved, customer specified	W		

Display	Code 10
No Readout	NR
Digital Display	DD
Agency approved, customer specified	W

Option	Code 15
Agency approved, customer specified	W

Flow Direction	Code 11
Horizontal Free or Vertical UP	1
Horizontal Free or Vertical Down	2
Agency approved, customer specified	W

Calibration 1 ⁹	Code 12
Standard Calibration	A
Air, only for 3" and large pipe size	
Compressed Air, only for 3" and large pipe size	D
Customer Calibration	B
Air	
Air equivalency (Digester Gas, Flue, Gas etc.)	C
Nitrogen, Helium, Argon, Carbon Dioxide Compressed Air or Digester Gas	E
Hydrocarbon (Natural Gas, Methane, Ethane, Propane etc.)	
Hydrogen or Hydrogen Mixture	G
Agency approved, customer specified	W

Enclosure ⁵	Code 6,7
Hazardous-Area Location Enclosure	2
Remote Hazardous-Area Location Endosure(Only with Ex Meter)	3(Ft)
Remote Hazardous-Area Location Endosure(Only with Junction Box)	4(Ft)
IP67 or IP65	N2
Remote IP67 with Junction Box	N4(Ft)
Agency approved, customer specified	W

Note

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

03

www.goldenrules.co.kr
Golden Rules Co.,Ltd

Thermal Mass Flow Meter

KC-2600BI Series Bio Gas Insertion type



The nation's development item, 100% domestic goods, Patent **NO. 10-1660226**

03. THERMAL MASS FLOW METER (Bio Gas)

3 Insertion type KC-2600BI Series

Insertion Type Thermal Mass Flowmeter

**General insertion type
KC-2610BI
(IP67)**



**Ex-proof insertion type
KC-2620Ex
(IP66)**



Features

- Rate & total, volume, mass flow indication
- Input Power DC 24 V or 100-240VAC
- Output accuracy $\pm 0.1\%$, $\pm 2.5\ \mu A$ (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

무게	방폭	일반
	5.56kg	3.5kg

Description

Golden Rules' KC-2600BI 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-2600BI 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.

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 (배관경)		Minimum (최소)		Maximum (최대)	
A	B	Scfm	Nm ³ /h	Scfm	Nm ³ /h
25A	1-inch	6	8.9	120	180
40A	1 ¹ / ₂ -inch	15	22	280	440
50A	2-inch	23	33	470	680
80A	3-inch	50	74	1000	1500
100A	4-inch	90	130	1800	2700
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 Spec'

- ◆ **Fluid**
Bio gas & Mixed gas

- ◆ **Pressure (limitation)**
Compression Fittings : 508 psig (35 barg) option
150 lb Flange, JIS 10k RF PN16 (DN) : (-40 ~ 150) °F ((-40 ~ 65) °C)
: 230 psig (16 barg)
Low Pressure Retract Valve : 100 psig (7 barg)
High Pressure Retract Valve : 1000 psig (70 barg)

- ◆ **Pressure Drop**
It can be safely ignored for pipes over 3 inches.

- ◆ **Fluid & Ambient temp'**
Gases : (-40 ~ 302) °F ((-40 ~ 150) °C)
Ambient : (-4 ~ 185) °F ((-20 ~ 85) °C)

- Gas accumulation range**
Up to 5 X 10⁻⁴ with helium gas

- ◆ **Input Power (selection)**
DC24 V ±10 %, 200 mA
100 ~ 240 V AC ±10 %, 10 watts

◆ Output Signal (Standard)

Linear (4 ~ 20) mA & Pulse

◆ Display

Alphanumeric 2 X 16 backlight LCD

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

Seven digits (9,999,999,999 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 Materials**

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

Protection Tube – 303SS (Option : 316SS, 316LSS)

◆ Enclosure

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

General-Area CASE (IP67)

◆ Electrical Connection

2 X ½"PF or Ex Cable Gland(SS) 22C

◆ Mounting (Selection)

¾" Compression Fitting & ¾" Male NPT (Standard)

ANSI 150lb Flange, JIS 10k RF Flange

¾" Compression Fitting & 1" Male NPT (Option)

Ball Valve System (Option)

◆ Certification

Ex (Ex d[ib] IIC T4)

CE (CASE)

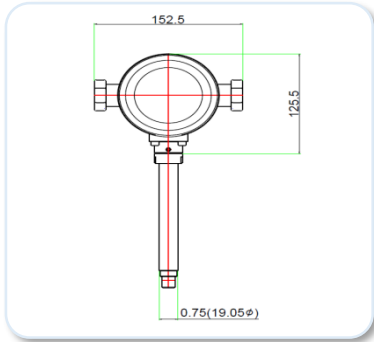
KGS Certificate

KC Certificate

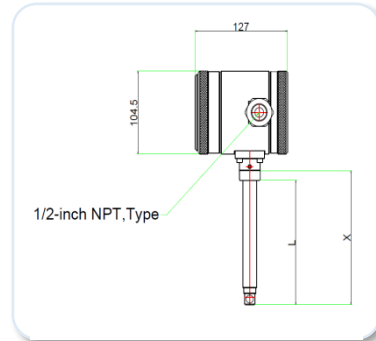
Dimensional Spec' & Chart I

General type KC-2610BI (IP67)

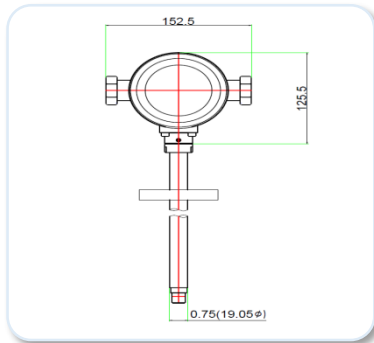
● Compression Fitting – Front View (EN2)



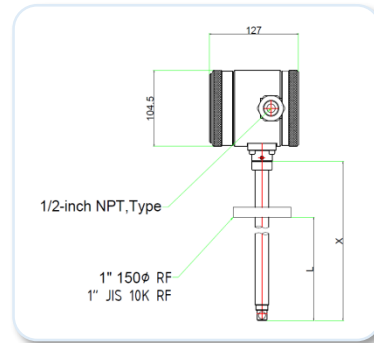
● Compression Fitting – Side View (EN2)



● Flange Mounting – Front View (EN2)

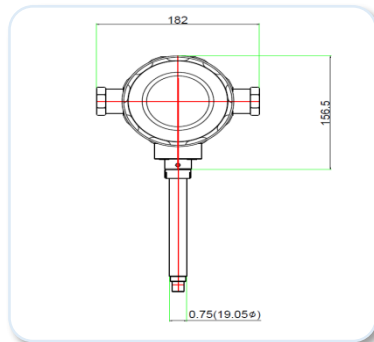


● Flange Mounting – Side View (EN2)

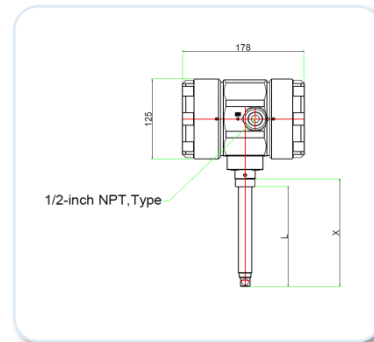


Ex-proof type KC-2620Ex (IP66)

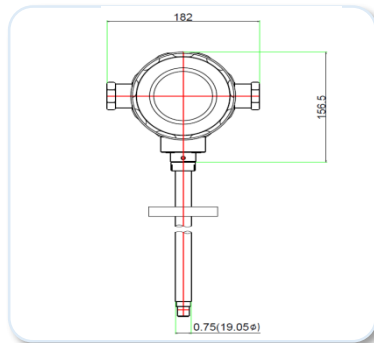
● Compression Fitting – Front View (E2)



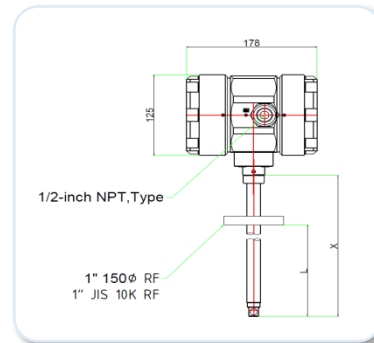
● Compression Fitting – Side View (E2)



● Flange Mounting – Front View (E2)



● Flange Mounting – Side View (E2)

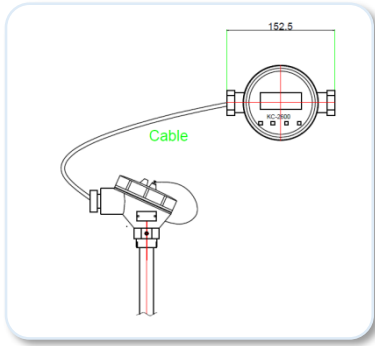


The shape of the sensor and Housing manufacturers are Subject to Change.

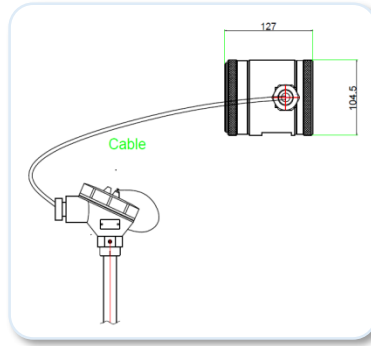
Dimensional Spec' & Chart II

♣ Genreal Remote KC-2610BI-R

● Remote Mount Junction Box – Front View (EN4)

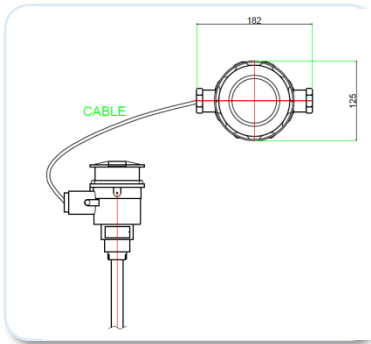


● Remote Mount Junction Box – Side View (EN4)

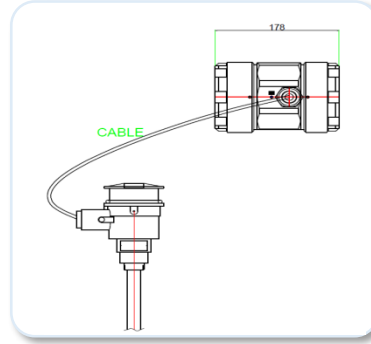


♣ Ex-proof Remote type KC-2610Ex-R

● Remote Mount Junction Box – Front View (E4)



● Remote Mount Junction Box – Side View (E4)



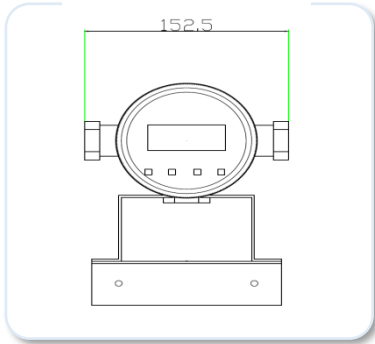
Length Chart		
Code	L	X
L06	6.0 (152.4)	7.5 (190.5)
L09	9.0 (228.6)	10.5 (266.7)
L13	13.0 (330.2)	14.5 (368.3)
L18	18.0 (457.2)	19.5 (495.3)
L24	24.0 (609.6)	25.5 (647.7)
L36	36.0 (914.4)	37.5 (952.5)

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

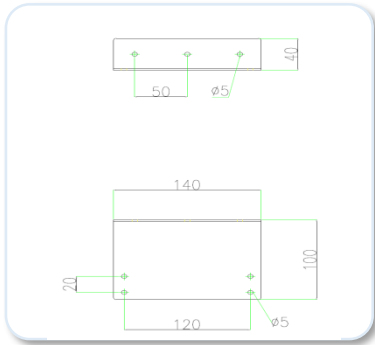
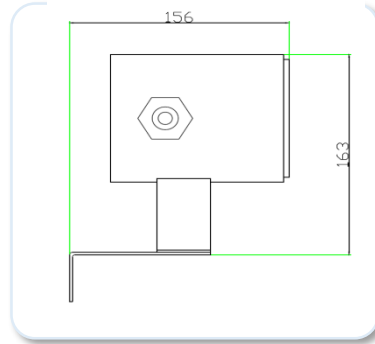
Dimensional Spec& Chart III

General Remote type KC-2610BI-R

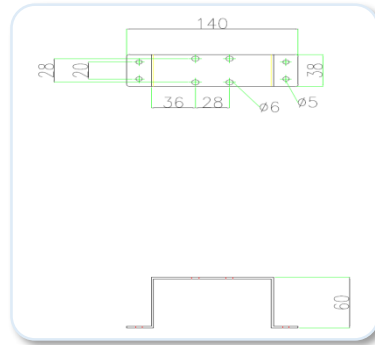
● Remote Rear Bracket Electronics (EN4)



● Remote Side Bracket Mounted Electronics (EN4)



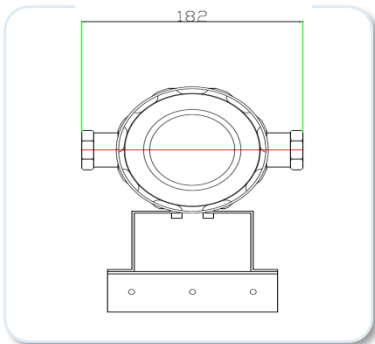
Panel mounting bracket 1



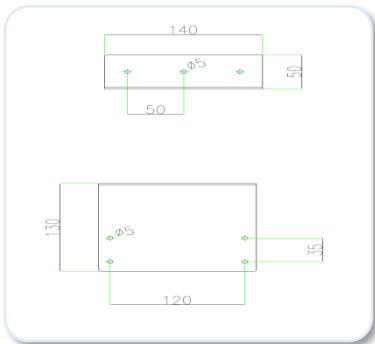
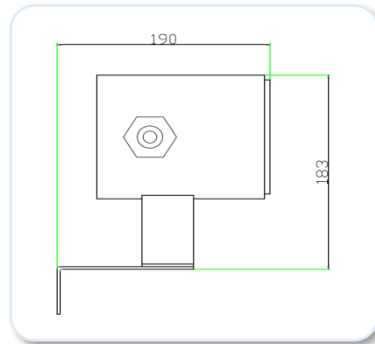
Panel mounting bracket 2

Ex-proof Remote type KC-2610Ex-R

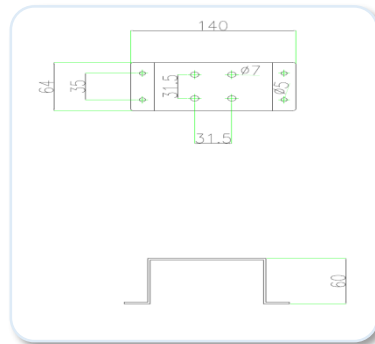
● Remote Rear Bracket Electronics (E4)



● Remote Side Bracket Mounted Electronics (E4)



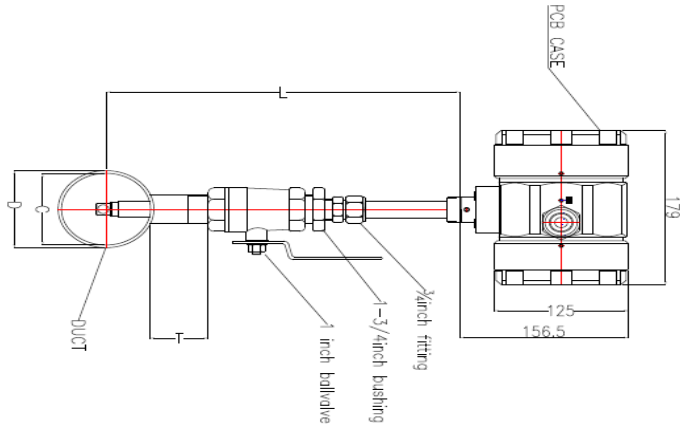
Panel mounting bracket 1



Panel mounting bracket 2

Low Pressure Ball Valve Dimensional

● side view



VARIABLE

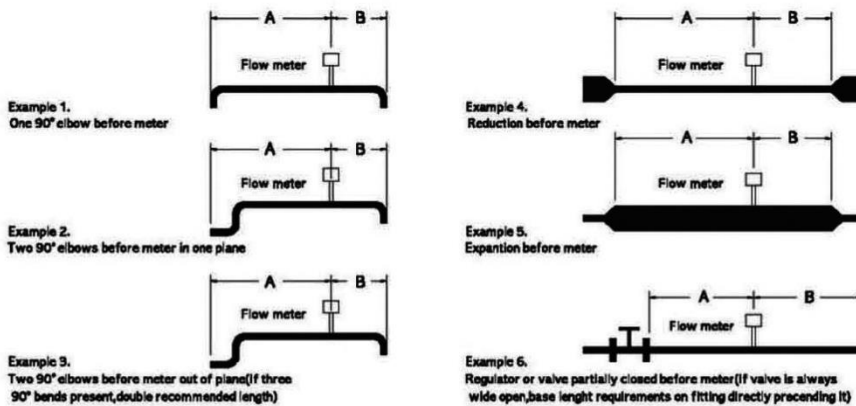
- L = Normal Probe Length
- D = Duct O.D
- C = Duct I.D
- T = Height of "Threadolet" or Customer provided weldolet

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.

Upstream&Downstream dimension(KC-2600BI insertion)

Select an installation that minimize possible distortion in the flow profile, Valves, elbows, control valves and other piping components may cause flow disturbances. Check your specific piping condition against the examples shown below.

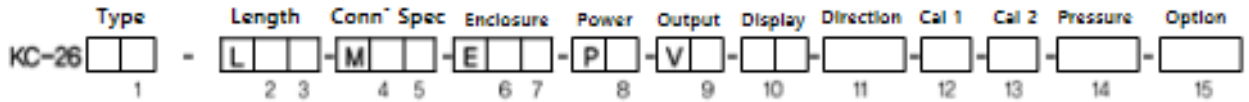
In order to achieve accurateness and repeatable performance install the flow meter using the recommended number of straight run pipe diameters upstream and downstream of the sensor.



Example	A-Upstream(1)Requirements	B-Downstream(2)Requirements
1	10~7D	5~3D
2	15~10D	5~3D
3	20~15D	10~5D
4	10~7D	5~3D
5	20~15D	10~5D
6	20~15D	5~3D

(1)Number of diameter(D)of straight pipe required between upstream disturbance and the flow meter.
 (2)Number of diameter(D)of straight pipe required downstream of the flow meter.

Order Code KC-2600BI Series (Bio Gas Insertion type)



Type	Code 1	Input Power	Code 8	Calibration 2 ⁹	Code 13
IP67 or IP65	10 BI	DC 24 V ±10 %, 200 mA	2	70 °F(21 °C) 14.7 psig (1.103 barg)	A
Hazardous-Area Location Enclosure	20 Ex	AC 100 ~ 240 V ±10 % (옵션)	3	32 °F(0 °C) 14.7 psig (1.103 barg)	B
Agency approved, customer specified	30	Agency approved, customer specified	W	Agency approved, customer specified	W

Length ⁴	Code 2,3	Output Signal	Code 9	Pressure Limit	Code 14
6" (15 cm)	06	RS-485S (RS-232C)	1	Low pressure	L
9" (23 cm)	09	Pulse, Alarm	3	Below 43 psig (3 barg)	
12" (30 cm)	12	DC 4~20 mA, 0~5 V DC	4	Medium pressure	M
18" (46 cm)	18	Agency approved, customer specified	W	Below 145 psig (10 barg)	
24" (61 cm)	24			High pressure	H
36" (92 cm)	36			Below 725 psig (50 barg)	(option)
Special Length	(in)	Flow Display	Code 10	Option	Code 15
Probe with 2" JIS 10k RF Flange	(in)-M5	No Readout	NR	Agency approved, customer specified	W
High pressure with Retractor Valve	(in)-M9	Digital Display	DD		
Agency approved, customer specified	WW	Agency approved, customer specified	WW		

Connection Specification	Code 4,5
None	0
Compression Fitting ² (¾" Tube X ¾" Male NPT)	10
Thread let (¾" Female NPT) Specify Pipe O.D in parentheses	2()
Compression Fitting (IP67) (½" Tube X ¾" Male NPT)	3
Curved Duct Bracket (¾" Tube Compression Fitting) Specify Duct O.D in parentheses	4()
Low Pressure Retractor Valve Specify Duct O.D in parentheses	8()
Compression Fittings (¾" Tube X 1" Male NPT)	15()
Agency approved, customer specified	WW

Enclosure ⁵	Code 6,7
Hazardous-Area Location Enclosure	2
Remote Hazardous-Area Location Enclosure(Only with Ex Meter)	3(Ft)
Remote Hazardous-Area Location Enclosure(Only with Junction Box)	4(Ft)
IP67 or IP65	N2
Remote IP67 with Junction Box	N4(Ft)
Agency approved, customer specified	WW

Direction	Code 11
Horizontal Free or Vertical UP	1
Horizontal Free or Vertical Down	2
Agency approved, customer specified	W

Calibration 1 ⁹	Code 12
Standard Calibration	A
Air, only for 3" and large pipe size	
Compressed Air, only for 3" and large pipe size	D
Customer Calibration	B
Air	
Air equivalency (Digester Gas, Flue, Gas etc.)	C
Nitrogen, Helium, Argon, Carbon Dioxide Compressed Air or Digester Gas	E
Hydrocarbon (Natural Gas, Methane, Ethane, Propane etc.)	F
Hydrogen or Hydrogen Mixture	G
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.Custmoer specified calibration must not exceed temperature & pressure limitations of the 2610BI, 2620Ex Series products specifications

04

www.goldenrules.co.kr
Golden Rules Co.,Ltd

Thermal Mass Flow Meter

KC-2600BF Series Bio Gas Inline type



The nation's development item, 100% domestic goods, Patent **NO.** 10-1660226

04. THERMAL MASS FLOW METER (Bio Gas)

4 Inline type KC-2600BF Series

Inline Type Thermal Mass Flowmeter

Features



**General inline type
KC-2610BF
(IP67)**

**Ex-proof inline type
KC-2620Ex
(IP66)**



**General MFM type
KC-2610BM**

**General MFM type
KC-2620Ex-BM**

- Rate & total, volume, mass flow, indication
- Input Power DC 24 V or 100-240VAC
- Output accuracy $\pm 0.1\%$, $\pm 2.5 \mu A$ (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

Description

Golden Rules' KC-2600BF 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-2600BF 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.

Performance Specification

◆ Accuracy of Point Velocity

±0.5% of F.S

◆ Repeatability

±0.2 % of Full Scale

◆ Temperature Coefficient

±0.03 % Reading / ±(10 ~ 38) °C내에서 °C
±0.06 % Reading / ±(25 ~ 50) °C내에서 °C

◆ Pressure Drop

It can be ignored within ± 50 psig
(3.4 bara).

◆ Response Time

1 second 63% of final velocity value

◆ Measuring Range

0.01 ~ 66.2 m/sec

◆ Function

Flow & Total

Mass Flow Rates

Air Flow Ranges(공기 유량 범위)							
Pipe Size (배관경)		Minimum (최소)		Maximum (최대)		Weight	
A	B	Scfm	Nm ³ /h	Scfm	Nm ³ /h	방폭	일반
8A	1/4-inch	0.5	0.7	9	14	5kg	3kg
15A	1/2-inch	2	3.0	40	60	5kg	3kg
20A	3/4-inch	4	5.9	75	120	5kg	3kg
25A	1-inch	6	8.9	120	180	6kg	4kg
40A	1 1/2-inch	15	22	280	440	7.2kg	5.2kg
50A	2-inch	23	33	470	680	8.6kg	6.6kg
80A	3-inch	50	74	1000	1500	11kg	9kg
100A	4-inch	90	130	1800	2700	16.2kg	14.2kg
150A	6-inch	200	300	4000	5900		
200A	8-inch	50	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

Bio gas & Mixed 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)

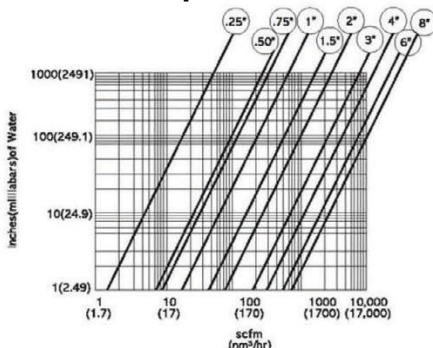
150 lb Flange, JIS 10k RF PN16 DIN 121 °C (250 °F) : 185 psig (12.8 barg)

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



◆ 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

◆ 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

Seven digits (9,999,999,999 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)

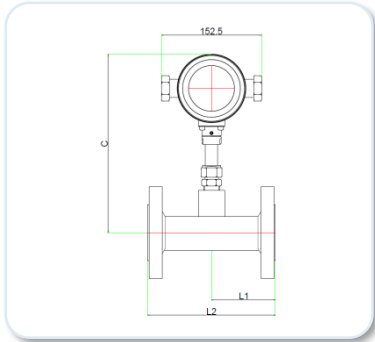
¾" Compression Fitting과 ¾" Male NPT (Standard)
ANSI 150lb Flange, JIS 10k RF Flange (Option)
¾" Compression Fitting과 1" Male NPT (Option)
Ball Valve System (Option)

◆ Certification

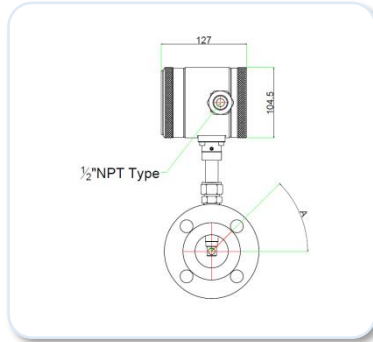
Ex (Ex d[ib] IIC T4)
CE (Proceeding)
KGS Certificate
KC Certificate

Dimensional Spec & Chart I General KC-2610GF (IP67)

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

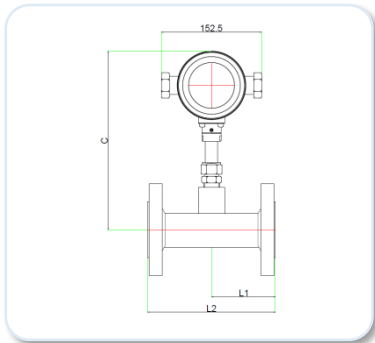


● 1 1/2,"부터 8" 150lb & JIS 10k RF Flange
- Side View (EN2)

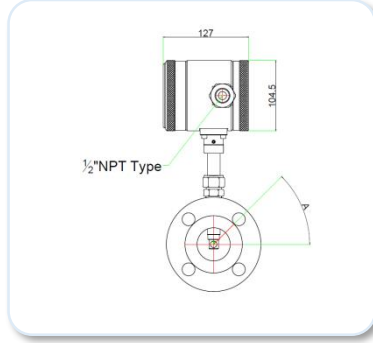


Size for ANSI 150lb Flange				
Size	C	L1	L2	A
1.5 inch	283.5	101.5	203	45°
2 inch	283.5	101.5	203	45°
3 inch	344.6	127	254	45°
4 inch	344.6	127	254	22.5°
6 inch	344.6	127	254	22.5°
8 inch	404.6	127	254	22.5°

● DIN Flange - Front View (EN2)



● DIN Flange - Side View (EN2)

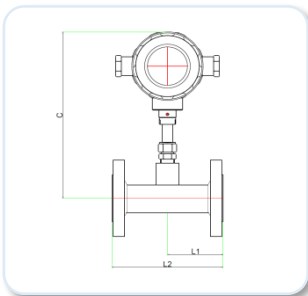


Size for DIN PN16 Flange			
Size	C	L1	L2
DN40	283.5	101.5	203
DN50	283.5	101.5	203
DN80	344.6	127	254
DN100	344.6	127	254
DN150	344.6	127	254
DN200	404.6	127	254

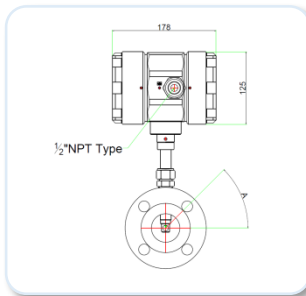
Dimension Spec&Chart II Ex-proof KC-2620Ex

General Remote type KC-2610BF-R

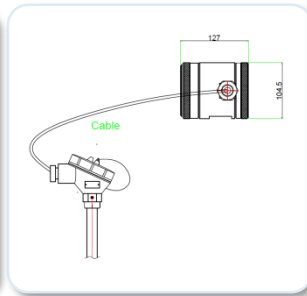
● 1 1/2,"부터 8" 150lb & JIS 10k RF Flange
- Front View (EN2)



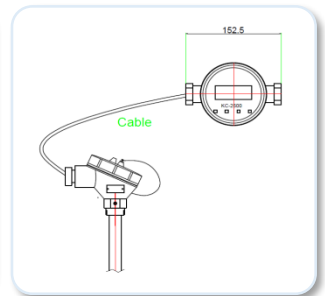
● 1 1/2,"부터 8" 150lb & JIS 10k RF Flange
- Side View (EN2)



● Remote Mount Junction Box
- Front View (EN4)

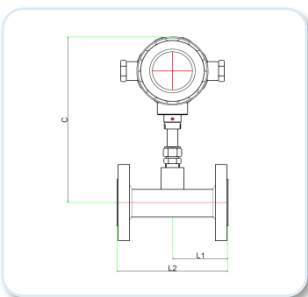


● Remote Mount Junction Box
- Front View (EN4)

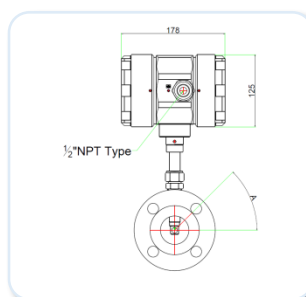


Ex-proof Remote type KC-2620Ex-R

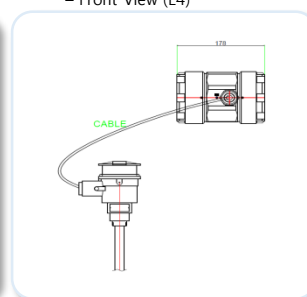
● DIN Flange - Front View (E2)



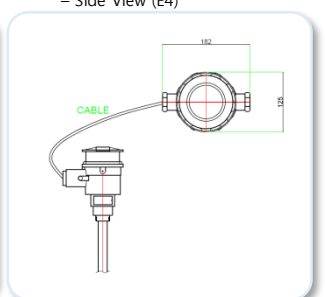
● DIN Flange - Side View (E2)



● Remote Mount Junction Box
- Front View (E4)



● Remote Mount Junction Box
- Side View (E4)

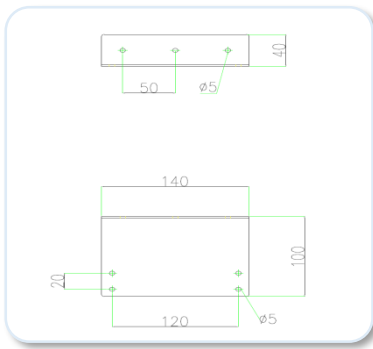
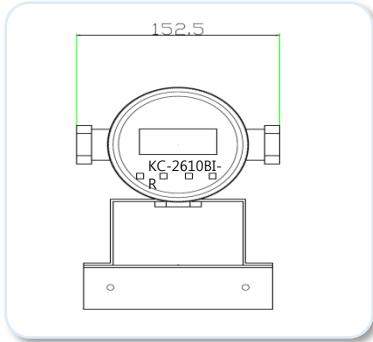


※ The shape of the sensor and Housing manufacturers are Subject to Change.

Dimensional Specification & Chart II (IP67)

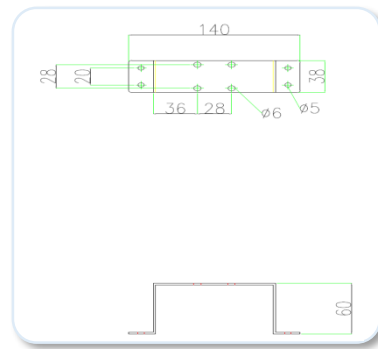
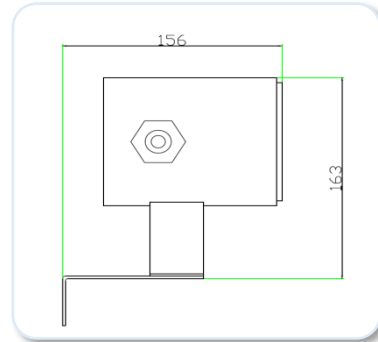
General Remote type KC-2610BF-R

● Remote Rear Bracket Electronics (EN4)



● panel mounting bracket 1

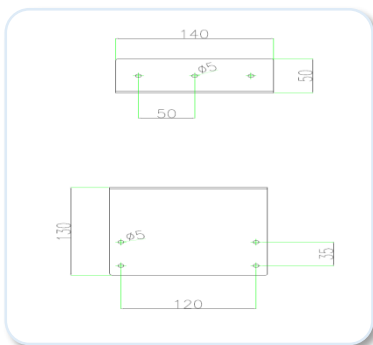
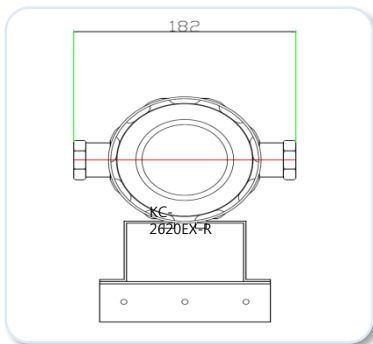
● Remote Side Bracket Mounted Electronics (EN4)



● panel mounting bracket 2

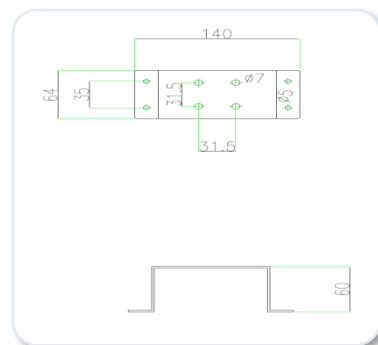
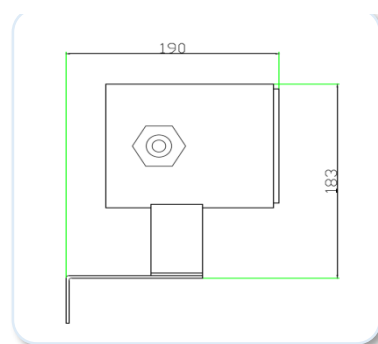
Ex-proof Remote type KC-2620Ex-R

● Remote Rear Bracket Electronics (EN4)



● panel mounting bracket 1

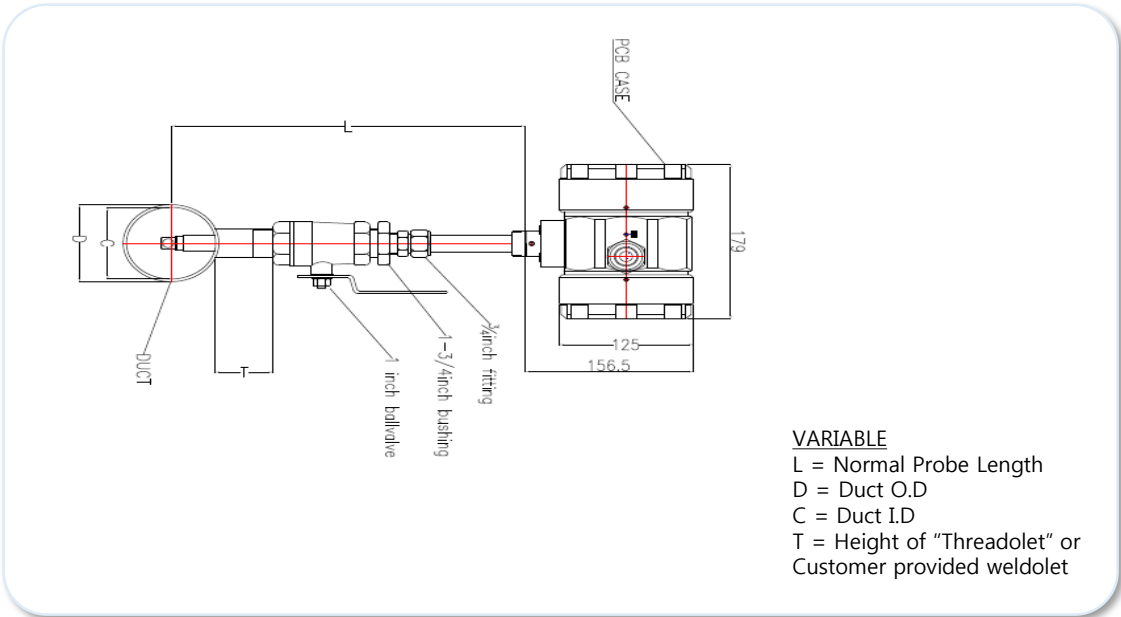
● Remote Side Bracket Mounted Electronics (EN4)



● panel mounting bracket 2

Ball Valve Low Pressure Ball Valve Dimensional & Chart III Specification 사양

●side view



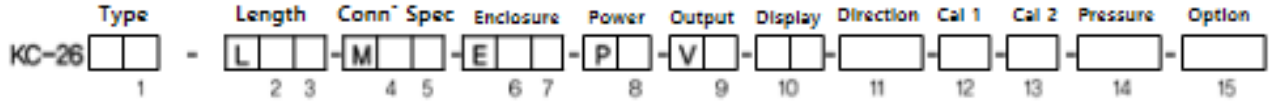
±0.25 inch(6.4 mm)의 ±0.25 All dimensions are inches. Millimeters are in parentheses.
 All drawings save a ±0.25 inch(6.4 mm) tolerance.
 Certified and available be on request.

Piping Requirement (KC-2600BF inline type)

Straight Pipe Length Requirements at 1 atm			
Piping condition	KC-2600BF Smart- IN™		Orifice Plate(3)
	Upstream(1)	Downstream(2)	
90° Elbow or T-Piece	10D	5D	28D
Reduction (4:1)	10D	5D	14D
Expansion (4:1)	10D	5D	30D
After Control Valve	10D	5D	32D
Two 90° Elbows (in same plane)	10D	5D	36D
Two 90° Elbows (in same plane)	10D	5D	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.

Order Code KC-2600BF Series (Bio Gas inline type)



2

Type	Code 1
IP67 or IP65	10BF
Hazardous-Area Location Enclosure	20Ex
MFM (IP67)	10BM

Input Power	Code 8
DC 24 V ±10 %, 200 mA	2
AC 100 ~ 240 V ±10 % (음선)	3
Agency approved, customer specified	W

Calibration 2 ⁹	Code 13
70 °F(21 °C) 14.7 psig (1.103 barg)	A
32 °F(0 °C) 1 atm (76 mmHg)	B
Agency approved, customer specified	W

Connection type	Code 2
DIN Flange	D
ANSI Flange	A
JIS Flange	J
Agency approved, customer specified	W

Output Signal	Code 9
RS-485S	1
Pulse	3
DC 4~20 mA,	4
Agency approved, customer specified	W

Pressure limit	Code 14
Low pressure Below 43 psig (3 barg)	L
Medium pressure Below 145 psig (10 barg)	M
High pressure Below 725 psig (50 barg)	H (option)

Connection Spec' 1,3	Code 3,4,5		
Size	DIN	150 lb	JIS 10k
1" (DN25)	D4	F4	J4
1-1/4" (DN32)	D5	F5	J5
1-1/2" (DN40)	D6	F6	J6
2" (DN50)	D7	F7	J7
2-1/2" (DN65)	D8	F8	J8
3" (DN80)	D9	F9	J9
3-1/2" (DN90)	D10	F10	J10
4" (DN100)	D11	F11	J11
5" (DN125)	D12	F12	J12
6" (DN150)	D13	F13	J13
7" (DN175)	D14	F14	J14
8" (DN200)	D15	F15	J15
10" (DN250)	D16	F16	J16
12" (DN300)	D17	F17	J17
Agency approved, customer specified	W		

Display	Code 10
No Readout	NR
Digital Display	DD
Agency approved, customer specified	W

Option	Code 15
Agency approved, customer specified	W

Flow Direction	Code 11
Horizontal Free or Vertical UP	1
Horizontal Free or Vertical Down	2
Agency approved, customer specified	W

Calibration 1 ⁹	Code 12
Standard Calibration	A
Air, only for 3" and large pipe size	
Compressed Air, only for 3" and large pipe size	D
Customer Calibration	B
Air	
Air equivalency (Digester Gas, Flue, Gas etc.)	C
Nitrogen, Helium, Argon, Carbon Dioxide Compressed Air or Digester Gas	E
Hydrocarbon (Natural Gas, Methane, Ethane, Propane etc.)	
Hydrogen or Hydrogen Mixture	G
Agency approved, customer specified	W

Enclosure ⁵	Code 6,7
Hazardous-Area Location Enclosure	2
Remote Hazardous-Area Location Endosure(Only with Ex Meter)	3(Ft)
Remote Hazardous-Area Location Endosure(Only with Junction Box)	4(Ft)
IP67 or IP65	N2
Remote IP67 with Junction Box	N4(Ft)
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 2610BF, 2620Ex Series products specifications



Golden Rules

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Air, Gas, Steam, Liquid
Mass & Total Flowmeter
Specialty Manufacture

Distributor

Certified in accordance with

KC Q ISO 9001 : 2015

KC Q ISO 14001 : 2015

 (주)골든룰