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Golden Rules Co.,Ltd

Bio Gas

FN-Mass Flow Meter

KC-7730B Series



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

APPLICATION

◆ Simply select to suit the application

Application	Type		Mass Flowmeter	
			D/P-type	FN-MASS FLOWMETER
Object of Measurement	Liquid		○	
	Gas		○	
	Vaper		○	
	steam		○	
Application	control		○	
	Monitor		○	
	Supply		○	
Operating condition	Temperature		Gas	- 40 to 100°C (Option:400°C)
			Liquid & Oil	-40 to 100°C(Option:400°C)
			Steam	-20 to 200°C(Option:400°C)
	Pressure		Min. 20mmAq / Nor. 300mmAq/ Max 1Bar	
	Pressure loss		Negligible	
	Range ability		Large	
Installing condition	Bore		Ø10 to Ø500	
	Straight	upstream	10 ~ 7D	
	Pipe length	downstream	5 ~ 2D	
	Piping work		Required	
	Explosion-proofing		○	
Performance	Accuracy		Gas	±0.5% F.S(Option: 0.1%)
			Liquid & Oil	±0.5% F.S(Option: 0.1%)
			Steam	±0.5% F.S(Option: 0.1%)
	Velocity		Gas	0.1~100 m/s
			Liquid & Oil	0.1~100 m/s
			Steam	0.1~100 m/s

01 FN-MASS FLOWMETER (Bio Gas)

1-2. FN-MASS KC-7730B Series

Features



Bio Gas
KC-7730B

- Mixed gas Automatic Calculator (4~20mA input : 8-Channel)
- **5-for multi-: Rate, integrated, volume, mass flow, temp', pressure, density**
- Input Power DC 24 V, < 100mA
- Output accuracy $\pm 0.1\%$, $\pm 2.5\ \mu\text{A}$ (4~20 mA, 4-Wire)
- Field validation of flowmeter calibration settings
Smart program interface (RS-485 standard)
- Direct mass measurement of the flow function eliminates the need for additional temperature and pressure compensation
- Simple signal Processing & calibration
- Built-in flow function of compression coefficient, expansion coefficient, viscosity coefficient, direct calculation formula
- Excellent reproducibility & long-term stability
- Best price-performance ratio
- Easy adaptable for different application or into housings
- No mechanical moved components
- Greatly reduces upstream piping requirements (10-5D)
- Outstanding range ability (Turndown ratio 35:1, Option 50:1)
- 0.1-second response to changes in flow rate
- High pressure fluid can be measured (up to 400 Barg)
- High temperature fluid measurement up to 400°C
- CE, Ex(IP67)

Description

Golden Rules' KC-7730B Series D/P type FN-Mass flowmeter accommodates the change measurement requirements and instrument-validation demands of fluid flow monitoring installations.

It is a LOK Fitting, Flange type, and it is a microprocessor commercially capable of measuring flow rate, adjusting flow rate, and diagnosing at the same time.

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 Rule's KC-7730B series is a product designed based on differential pressure mass flow measurement technology.

Golden Rule's KC-7730B series is a product designed based on differential pressure mass flow measurement technology. It is a built-in flow function that takes into account the compression coefficient, expansion coefficient, and viscosity coefficient rather than the conventional temperature and pressure correction method. Enthalpy, etc. can be provided to the user.

Performance Specifications

- ◆ **Accuracy of Point Velocity**
 ±0.5% of F.S / ±1.0% of R.D
 (Option : ±0.1% of F.S / ±0.5% of R.D)
- ◆ **Repeatability**
 ±0.5% of Full Scale
- ◆ **Sensor Accuracy**
 < 0.05% of span
- ◆ **Turndown Ratio**
 35:1 (Option 50:1)
- ◆ **Pressure Loss**
 0.1 ~ Below 0.3 Bar
- ◆ **Response Time**
 0.1 second
- ◆ **Measuring Range**
 0.1 ~ 100 m/sec
- ◆ **Function**

5-for multi-measurement : rate, total, volume, mass, density, temp', pressure, energy indication

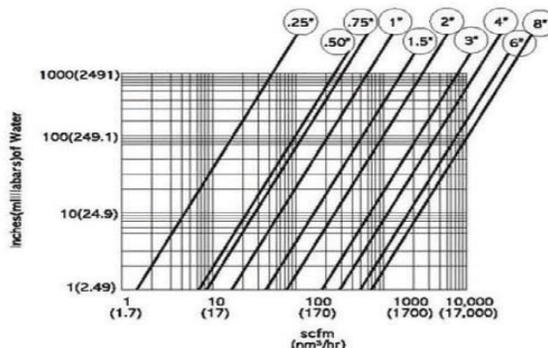
Mass Flow Rates (Bio gas)

Bio gas Flow Ranges				
Pipe Size		Minimum	Maximum	Pressure / Temp'
A	B	Nm ³ /h	Nm ³ /h	Pressure / Temp'
50A	2-inch	4.8	160 (digester)	250mmAq / 30-40°C
80A	3-inch	20	700 (generator)	1,250mmAq 1,350mmAq 1,500mmAq / 25-30°C
100A	4-inch	10	350 (digester) 300 (digester)	250/300mmAq / 25-30°C
125A	5-inch	8.6	300 (generator)	1,500mmAq / 20-35°C
150A	6-inch	14.3	500 (digester)	200mmAq / 35-40°C
200A	8-inch	28.6	1,000 (digester)	250mmAq / 30°C

Notes: Air & N2 flow standard conditions : 21°C(70°F) &
 21°C(70°F) scfm:0°C Nm³/h 1Atm

Operating Specifications

- ◆ **Fluid**
 Bio Gas, Mixed Gas
- ◆ **Input Power**
 DC 24 V ±10 %, < 100 mA
 100~240VAC ±10 %, < 10 Watts (Option)
- ◆ **Output Signal**
 Linear 4 ~ 20 mA, 4Wire
 RS-485S
- ◆ **Pressure Drop**
 15.5 kpa



◆ Fluid & Ambient temperature

Gas : -40 ~ 100 °C (-40 ~ 212 °F) Option : 110 ~ 400°C (230 ~ 732 °F)

Pipe Temp' : Over 300 °C 이상 (572 °F)

Ambient : -4 ~ 185 °F (-20 ~ 85 °C) Option : -70 ~ 100 °C (-94 ~ 212 °F)

◆ Pressure (limitations)

Compression fitting : 500 psig (35 barg)

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

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

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

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

◆ Displays

Display instructions: instantaneous & integration, volume, mass measurement

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 0.1 sec / Correction factor setting 0.5 ~ 5 /

Zero & Span

◆ Totalizer

Flow rate and total oxygen point (0000. / 000.0/ 00.00 / 0.000)

Seven digits (9,999,999,99.9 Count) in engineering units Reset table by Software

◆ Software (Option)

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**

D/P Sensor – STS304 (Option : STS316, STS316L)

Flow inline Body – STS304 (Option : STS316, STS316L)

◆ Enclosure

Hazardous-Area Enclosure CASE (Ex d IIC T6 : IP67)

General-Area Enclosure CASE (IP67)

◆ Electrical Connections

2 X ½" PF or Exp Cable Gland(SS) 22C

◆ Mounting (Selection)

ANSI 150lb Flange, JIS 10k RF Flange, other

◆ Certification

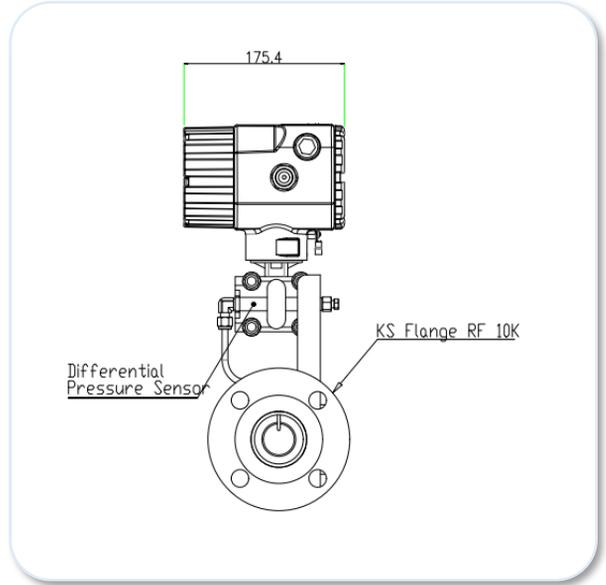
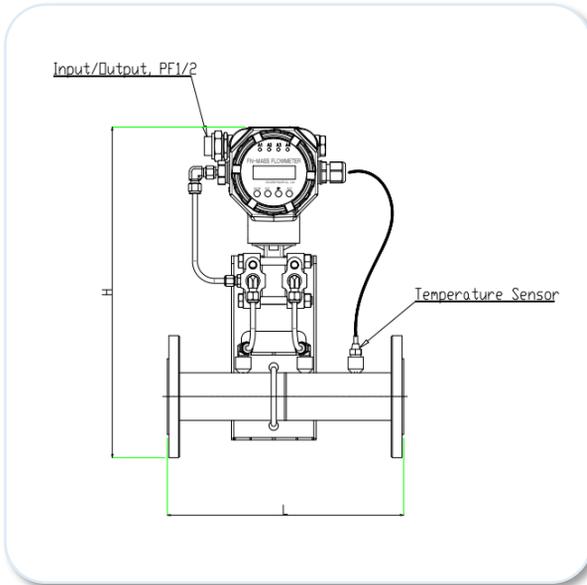
CE (CASE)

KCS Certificate

Atex Certificate

Ex (Ex d IIC T6)

Dimensional Spec & Chart KC-7730B



※ The shape of the sensor and housing manufacturers are subject to change

Unit : mm

Size	H	L
15A	375	300
20A	380	300
25A	390	300
32A	402	300
40A	406	300
50A	420	300
65A	442	300
80A	442	350
100A	451	400
125A	508	409
150A	540	451
200A	575	522
250A	626	602
300A	684	672

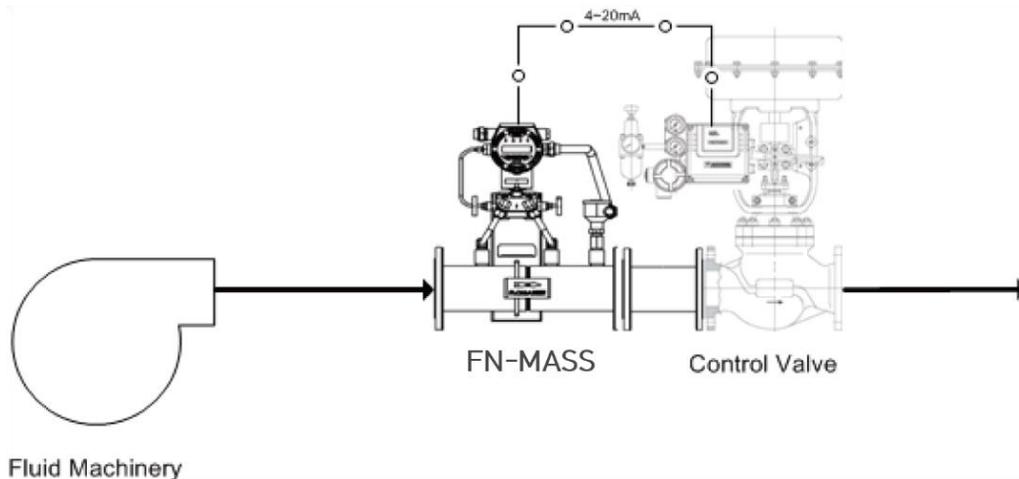
The FN-Mass flow meter realizes the following control with the current output signal.

01 – Mass flow(kg/h) Control

02 – Energy flow(MJ/h) Control

03 – Volume flow(m³/h) Control

04 – Pressure(kPa) Control



It responds to customers' needs with a fast response speed and can realize energy savings due to $\pm 0.5\%$ precision control, minimizing losses in industrial sites.

Piping Requirement (KC-7730B FN-Mass Flow meter)

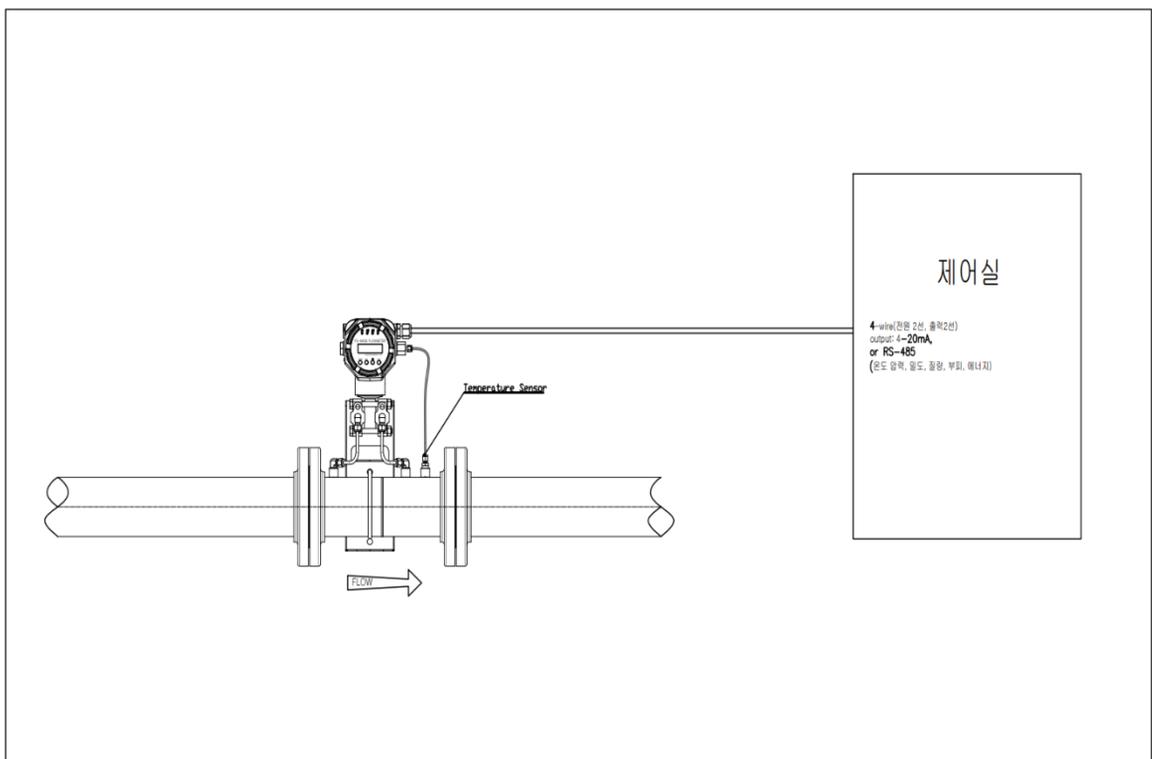
Straight Pipe Length Requirements at 1 atm			
Piping condition	KC-7730B Smart- IN™		Orifice Plate(3)
	Upstream(1)	Downstream(2)	
90° Elbow or T-Piece	10D	5D	28D
Reduction (4:1)	10D	5D	14D
Expansion (4:1)	10D	5D	30D
After Control Valve	10D	5D	32D
Two 90° Elbows (in same plane)	10D	5D	36D
Two 90° Elbows (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.

APPLICATION

◆ Overview and Advantages of All-In-One FN-Mass Flow Meter

1. Significantly reduced installation construction cost.
2. Since it is a direct type FN mass flow meter, the accuracy is much higher than the existing differential pressure type ($\pm 0.5\%$ F.S)
3. Wide range of flow rate when measuring high temperature, high pressure and large flow rate (turndown ratio 35:1, Option 50:1)
4. Simultaneous monitoring of 5 data (flow rate, temperature, pressure, density, heat amount) by the central cancer monitoring panel with communication output
5. Easy to install as it is a temperature/pressure sensor/flow computer all-in-one mass flow meter



Order Code KC-7730B Series (FN-Mass Flowmeter)

KC-77 - - **E** - **P** - **V** - - - - - - - -

1 2 3 4 5 6 7 8 9 10 11 **12** 13 14 15

Type	Code 1
Orifice Plate	30B1
Flow Nozzle	30B2
Venturi Tube or Venturi Cone	30B3
Hazardous-Area Location Endosure	FM153B
Agency approved, customer specified	W

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

Connection Spec' ^{1,3}	Code 3,4,5		
Size	DIN	150 lb	JIS 10k
1/2" (DN15)	D2	F2	J2
3/4" (DN20)	D3	F3	J3
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
4" (DN100)	D11	F11	J11
5" (DN125)	D12	F12	J12
6" (DN150)	D13	F13	J13
8" (DN200)	D15	F15	J15
10" (DN250)	D16	F16	J16
12" (DN300)	D17	F17	J17
Agency approved, customer specified	W		

Enclosure ⁵	Code 6,7
Hazardous-Area Location Enclosure	2
IP67	N2
Agency approved, customer specified	W

Input Power	Code 8
DC 24 V ±10 %, < 100 mA	2
AC 100-240 V ±10 %, 10 watts (옵션)	3
Agency approved, customer specified	W

Output (Selection)	Code 9
RS-485S & 4-20mA, 4Wire (Std.)	1
DC 4~20 mA , 2Wire (Option)	2
Agency approved, customer specified	W

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

Flow Direction	Code 11
Horizontal Left to Right or Vertical U P	1
Horizontal Right to Left or Vertical Down	2
Agency approved, customer specified	W

Calibration ^{1,9} (Air)	Code 12
Standard Calibration	A
Air, only for 3/8" and large pipe Size	
Compressed Air, only for 1" and large pipe size	D
Customer Calibration	B
Agency approved, customer specified	W

Calibration ^{2,9} (Air)	Code 13
70 °F(21 °C) 14.7 psig (1.103 barg)	A
32 °F(0 °C) 14.7 psig (1.103 barg)	B
Agency approved, customer specified	W

Pressure Limit	Code 14
Low pressure Below (20mmAq~ 300mmAq)	L
Medium pressure Below (300mmAq ~ 0.2 Bar)	M
High pressure Below (Max. 1 barg)	H
Agency approved, customer specified	W

Option	Code 15
Material : 316SS, 316LSS	H
Agency approved, customer specified	W

FLOW MEASUREMENT PRINCIPLE

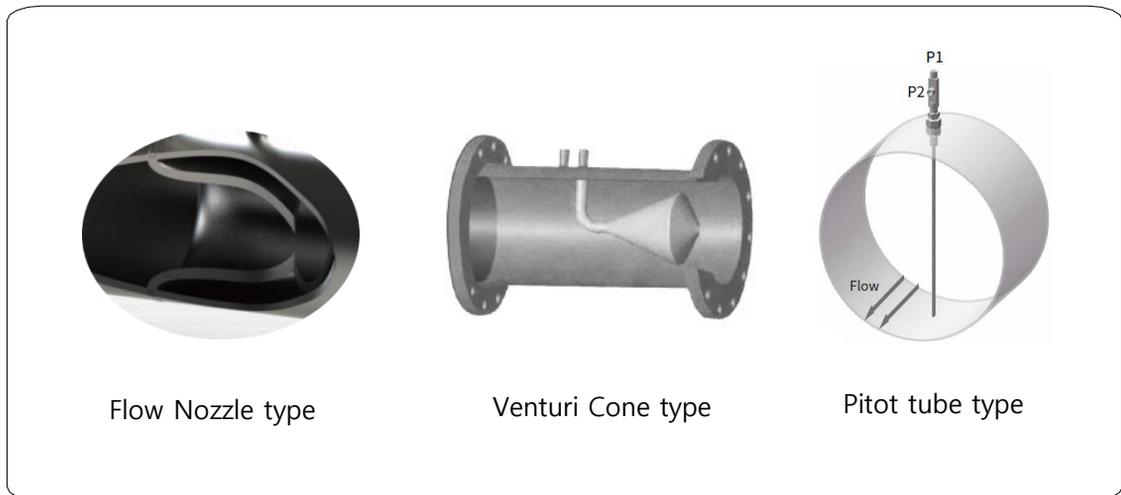
■ D/P type

FN mass flow sensor (orifice, flow nozzle, venturi nozzle, pitot tube)

Orifice piping pipe standard: D-0.5D / Corner / Flange

Absolute pressure and differential pressure sensor: STS316, STS316L

Temperature sensor : RTD Pt100 (3-wire)



KC-7730 Series Measurement Sensor

Golden Rule's unique FN-Mass Flow meter guarantees excellent accuracy of industrial flowmeters, and robustness and reliability in the case of high pressure and high pressure.

As a differential pressure measurement method, the sensor is a new mass flow meter that uses an orifice plate, flow nozzle, Venturi, V-Cone, Pitot tube to measure the flow rate by using a proprietary patented technology while minimizing pressure loss.

It is a new-concept mass flow transmitter that derives flow through high-level calculations under the conditions of variable physical properties of real fluids.

It is a measuring instrument that is capable of engineering in demanding conditions at industrial sites and is developed with domestic proprietary technology to minimize industrial loss and secure technological freedom, and to have excellent accuracy and stability.

In addition, it can be used in various fluids, and supplements the required intuition of the existing differential pressure flowmeter through various experimental data to maintain the desired degree in the short intuition.

By configuring the communication network (RS-485), you can monitor the progress of the mass flow meter, and install an automatic valve to control the mass flow of user settings.

The flow nozzle and orifice are manufactured according to ISO-5167 standard and ISO-9001 quality management system.

Flow Calculator

Term	Real gas	Perfect gas
Equation of state	$pV = ZRT$	$pV = RT$
Compressibility factor	Z	$Z = 1$
Isothermal deviation factor	$Y = \frac{p}{V} \left(\frac{\partial V}{\partial p} \right)_T = 1 - \frac{p}{Z} \left(\frac{\partial Z}{\partial p} \right)_T$	$Y = 1$
Isobaric deviation factor	$X = \frac{T}{V} \left(\frac{\partial V}{\partial T} \right)_p = 1 - \frac{T}{Z} \left(\frac{\partial Z}{\partial T} \right)_p$	$X = 0$
Isentropic exponent (κ)	$\kappa = -\frac{V}{p} \left(\frac{\partial p}{\partial V} \right)_s = \frac{\gamma}{Y}$	$\kappa = \gamma = \frac{c_p}{c_v}$

Gas expansion coefficient

$$\varepsilon = \sqrt{\left(\frac{\kappa \tau^{2/\kappa}}{\kappa - 1} \right) \left(\frac{1 - \beta^4}{1 - \beta^4 \tau^{2/\kappa}} \right) \left(\frac{1 - \tau^{(\kappa-1)/\kappa}}{1 - \tau} \right)}$$

κ = isentropic exponent

τ = pressure ratio

β = diameter ratio

Flow Calculator

$$q_m = \frac{C}{\sqrt{1 - \beta^4}} \varepsilon \frac{\pi}{4} d^2 \sqrt{2 \Delta p \rho_1}$$

$$q_v = \frac{q_m}{\rho_1}$$

q_m = mass flow rate [kg/s]

q_v = volumetric flow rate [m³/s]

ρ_1 = upstream density [kg/m³]

Δp = differential pressure [Pa]

APPLICATION : Digester bio gas

Sewage treatment plant, livestock manure, landfill, food wastewater biogas

Currently, we are experiencing many difficulties due to the problem of biogas flowmeters installed across the country. As a replacement for imported ultrasonic flowmeters, our differential pressure mass flowmeter is becoming an alternative. There is no hunting and high accuracy when measuring biogas containing contaminants such as moisture, particles, and dust. Currently, 21 sets are under approval at 8 sites including 4 major sewage treatment plants, landfill sites in the metropolitan area, Miryang, and Uljin livestock manure treatment plants.

◆ **Client : Cheongju Environment Office ~ 1 Set**

Fluid : Bio gas
 Size : 350A (for digester main)
 Fluid temperature : 25~40 ' C
 Flow range : 50 ~ 1,000Nm³/h
 Operating pressure : 50~300mmAq
 Design pressure : 500mmAq

For measuring the rear end of digester tank

◆ **Environmental Management Corporation project**

- * Fluid : Bio gas
- * Line size : 100A (for gas holder main)
- * Flow range : 50 ~ 500 Nm³/hr
- * Flow pressure : 50 ~ 250 mmH₂O
- * Fluid temperature : 40 ~ 60'C
- * Delivery quantity : 1 Set

Based on the know-how accumulated in the anaerobic biogas field for the past 11 years, this is a differential pressure mass flow meter exclusively developed for biogas.

The biogas coming out of the digester tank by the natural pressure (25~250mmH₂O) is not only very low pressure due to its characteristics, but it is also full of moisture, dust, and particles, so it is impossible to measure it with an existing flowmeter.

◆ **The reason why it cannot be used with an existing flow meter is briefly listed.**

The thermal mass flow meter is a measurement method using a temperature difference, and there is hunting and errors in the flow rate due to moisture. The turbine flowmeter does not rotate the blades due to the corrosion of the rolling holding the turbine blades. The vortex flowmeter is a product used in high-pressure lines and cannot measure low pressure. Existing differential pressure flowmeters cannot measure the low pressure line and cause errors due to moisture.

APPLICATION : Digester Bio Gas

◆ Client : Guri Sewage Treatment Plant

◆ Project name : Digester bio gas Boiler 1, 2, 3

◆ Delivery model : KC-7730B-FM153BEx

- * Fluid : Bio Gas (for boiler supply)
- * Line size : 80A
- * Flow range : 70 ~ 700 Nm³/h
- * Fluid pressure : 1350, 1500, 1250 mmAq
- * Fluid temperature : 25~40°C
- * Delivery quantity : 3 Set



APPLICATION : Digester Bio Gas

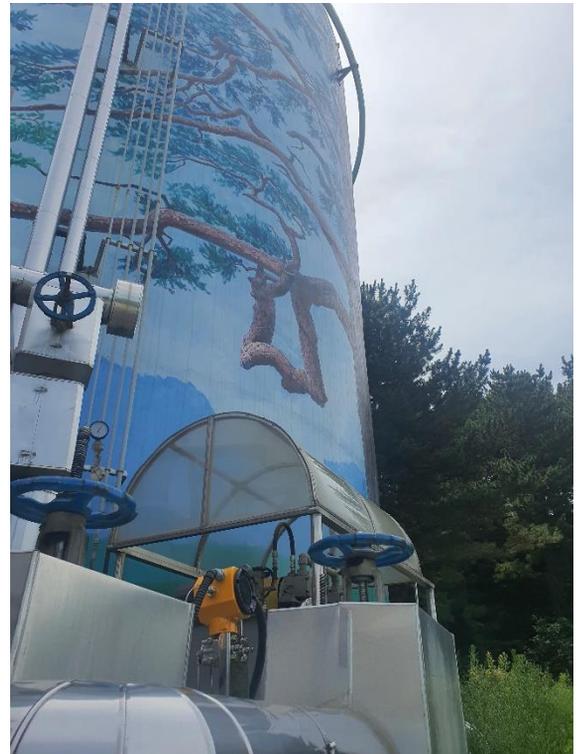
◆ **Client : Uljin Livestock Manure Treatment Plant**

◆ **Project name : Digester bio gas**

◆ **Delivery model : KC-7730B-FM153BEx**

- * Fluid : Bio gas
- * Line size : 80A (for generator supply)
- * Flow range : 15 ~ 150 Nm³/h
- * Fluid pressure : 20 ~ 250 mmH₂O
- * Fluid temperature : 60°C
- * Delivery quantity : 1 Set

- * Line size : 100A (for main digester)
- * Flow range : 30 ~ 300 Nm³/h
- * Fluid pressure : 0.1 ~ 0.15 Bar
- * Fluid temperature : 40°C
- * Delivery quantity : 1 Set



APPLICATION : Digester Bio Gas

◆ **Client : Eumseong Livestock Manure Treatment Plant**

◆ **Project name : Digester bio gas**

◆ **Delivery model : KC-7730B-FM153BEx**

- * Fluid : Bio gas
- * **Line size : 125A (for Digester)**
- * Flow range : 6 ~ 210 Nm³/h
- * Fluid pressure : 20 ~ 250 mmH₂O
- * Fluid temperature : 30°C
- * Delivery quantity : 1 Set



* **Line size : 125A (for generator supply)**

- * Flow range : 3.7 ~ 130 Nm³/h
- * Fluid pressure : 43 ~ 1,500 mmH₂O
- * Delivery quantity : 2 Set



Delivery performance ~ 345 EA

Client	Enduser	Model
The Yoon Synergy	The Yoon Synergy	FN-MASS KC-7730A, Compressed Air
ILJIN AIR TECH	ILJIN AIR TECH	FN-MASS KC-7730A, Compressed Air
COMP KOREA	COMP KOREA	FN-MASS KC-7730A, Compressed Air ~ 17EA
Daejeon Urban Railway Corporation	Yuseong Hot Spring Pumping Station	FN-MASS KC-7730L, Water
BELTECH CO.,LTD	BELTECH LAP	FN-MASS KC-7730L, Water
Korea Institute of Machinery and Materials	Korea Institute of Machinery and Materials	KC-7730G-FM153BEx, 25A, LPG
Sepratech Co., Ltd.	Hanwha Ulsan Plant	FN-MASS KC-7730A, Compressed Air ~ 4EA
GTC CO., LTD.	GTC CO., LTD.	FN-MASS KC-7730A, Compressed Air ~ 12EA
Bugang Tech	Icheon (Remnant Corpse Disposal System)	KC-7730G-FM153BEx, 25A, LPG
BELTECH CO.,LTD	Beltech test league	FN-MASS KC-7730A, Compressed Air ~ 4EA
Sambu General Machinery	Sambu General Machinery	FN-MASS KC-7730A, Compressed Air
Gyeongsan Paper	Gyeongsan Paper	KC-7730S-FM153BEx, 250A, Steam
Act Co., Ltd.	Act Co., Ltd.	FN-MASS KC-7730A, Compressed Air ~ 10EA
SEON BO INDUSTRY	Busan (Gupyong 2nd Factory)	FN-MASS KC-7730A, Compressed Air
Korea Institute of Machinery and Materials	Cheonan, Chungcheongnam-do (Puritech)	KC-7730G-FM153BEx,40A,O2 Gas ~ 4EA
Korea Institute of Machinery and Materials	Cheonan, Chungcheongnam-do (Puritech)	FN-MASS KC-7730A, Compressed Air ~ 4EA
TURBO MAN	Iksan, Jeollabuk-do (Hite Jujeong)	KC-7730L-FM153BEx, 25A, Ethanol
Pukyong National University	YONDANG CAMPUS	FN-MASS KC-7730A, Compressed Air
DONGIL CNE	Hanwha Onsan Plant	FN-MASS KC-7730A, Compressed Air
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730A, Air ~ 10EA
SUNHWAN ENG	Kunyoung Machinery	KC-7730OP-FM153BEx, 50A, NG
SEA ANTLE	SEA ANTLE	FN-MASS KC-7730A, Compressed Air ~ 2EA
COMP KOREA	COMPRESSURED AIR	FN-MASS KC-7730A, Compressed Air ~ 3EA
FINETECH	FINETECH	FN-MASS KC-7730A, Compressed Air ~ 15EA
ILJIN MATERIAL	IKSAN PLANT	FN-MASS KC-7730A, Compressed Air ~ 2EA
PURITECH	PURITECH	FN-MASS KC-7730A, Compressed Air ~ 4EA
J KEISIS CO.,LTD,	J KEISIS CO.,LTD.	FN-MASS KC-7730A, Compressed Air ~ 22EA
JUNG WOO FLOW	JUNG WOO FLOW	FN-MASS KC-7730A, Compressed Air ~ 3EA
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730A, Compressed Air ~ 10EA
Wonkwang valve	STX ENGINE	KC-7730H-FM153B-G050-H2 Mixture
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 10EA
VPE KOREA	VPE KOREA	FN-MASS KC-7730GF, Compressed Air
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 20EA
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 30EA
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 30EA
BOYN E&M CO.,LTD.	Urban Railroad Corporation	FN-MASS KC-7730GF, Compressed Air
Kukdong Jeyeon	Kukdong Jeyeon	FN-MASS KC-7730WF, Water
Kukdong Jeyeon	Kukdong Jeyeon	KC-7730L-FM153B-G080-Ethylene Glycol
Korea Aerospace Research Institute	Korea Aerospace Research Institute	FN-MASS KC-7730G-FM153B, H2 Mixture ~ 3EA
LG ELECTRONICS	Cheongju Factory	FN-MASS KC-7730S,스팀,100A,125A,200A ~ 3EA
LG ELECTRONICS	Cheongju Factory	FN-MASS KC-7730G-FM153BEx,LNG,50A(2),65A(2),80A(1),100A,125A,150A ~ 8EA
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air
SAMSUNG ELECTRONICS	For precise measurement of gas accumulation	KC-7730GF O2-65A, N2-32A ~ 2EA
Korea Water Resources Corporation	Korea Water Resources Corporation	FN-MASS KC-7730SF 25A Steam, Water ~ 2EA
Chungbuk Sewage Treatment Plant	For testing of water and wastewater facilities	KC-7730B-FM153BEx, 300A, 350A, Bio gas~ 2EA
Innowill Co.,Ltd.	Korea Energy Research Institute	FN-MASS KC-7730GF,100A,50A,Blower Air ~ 2EA

Client	Enduser	Model
INFORAD CO.,LTD.	Korea Energy Research Institute For vacuum pump precision flow test	FN-MASS KC-7730OP 공기 25A, 40A
Korea Energy Research Institute	Hydrogen charging station 1st and 2nd plants	KC-7730G-FM153B, H2 Mixture, 50A, 8.2barg 25.2-252 kg/h, 200°C
INNO WILL CO.,LTD.	Korea Energy Research Institute	FN-MASS KC-7730OP 50A, 65A, AIR ~ 2EA
Toray Advanced Materials.	For precise measurement of gas accumulation	FN-MASS KC-7730OP-FM153B ~ 2EA O2-65A, N2-32A
Energy Technology Evaluation Institute	Ammonia decomposition hydrogen production purification system	FN MASS KC-7730OP-FM153B ~ 2EA 20A,NH3 Mix, 7.43barg, 20A-H2 Mix, 6.93barg
Korea Aerospace Industries' Sacheon site	Korean fighter KF-21 fuel system integrated rig test equipment	FN MASS KC-7730OP-FM153B ~ 12EA JP-5,100A(2),15A(3), Liquid, 20A(6),32A(1)
Energy Technology Evaluation Institute	Alkaline water electrolysis for BOP hydrogen measurement	FN-MASS KC-7730OP-FM153B, ½", 5Nm3/h
KEPCO Electric Power Research Institute (Daejeon)	For precision measurement of hydrogen generators	FN-MASS KC-7730OP-FM153B 3/8", 200 LPM, 3-5 Barg
POSCO KWANG YANG	Nitrogen gas purification system	FN-MASS KC-7730OP, 150A, 5,000Nm3/h
POSCO Pohang Stainless Steel 3	For precise measurement of gas cutters	KC-7730OP-FM153B, 25A, LNG, O2 ~ 2EA
SK Innovation	For precise measurement of hydrogen gas	KC-7730H-FM153BEx, ½", 55-1520LPM, Nor17 Max 30Barg
Guri Sewage Treatment Plant	For precise measurement of biogas consumption	KC-7730G-FM153BEx, Bio gas, 80A ~ 3EA
INNO WILL CO.,LTD.	Korea Energy Research Institute	FN-MASS KC-7730OP 150A, AIR
Haesung DS Co., Ltd. Changwon Headquarters	For precision measurement of semiconductor plasma process and hydrogen generator	KC-7730H-FM153BEx, 3/8",15-150LPM,3-5Barg
Uljin Livestock Manure Treatment Plant	For precision measurement of biogas for supply to generators	KC-7730B, Bio Gas, 50~500mmH2O,,40~60°C 100A-800Nm3/h, 80A-500Nm3/h ~ 3EA
LS Cable & System / POSCO R&D Center	For precise measurement of LNG consumption	LNG,80A,160Nm3/h,31°C,30Kpa,24V.RS-485~ 6EA
POSCO R&D Center	1For sintering steam research project	KC-7730S,Steam,250A,8-80Ton/h,193°C,8BAR
POSCO KWANG YANG	For precise steam measurement	KC-7730S,Steam,100A,7000kg/h,190°C,7Bar
Lithium Plus Geumsan Plant	Sodium hydroxide crystallization facility pjt for semiconductor fuel cell	KC-7730S,Steam,200A,150A,100A ~ 6EA KC-7730L,Liquid,80A,40A,25A ~ 10EA
Hyundai Motor	For precision testing of hydrogen generator	KC-7730H-FM153BEx, H2,3/8",2-40m3/h,8.2Barg ~ 2EA
LG Energy Solution	Danil Gaschem Co., Ltd., for precise measurement of nitrogen gas	KC-7730G,N2 Gas,7.5Bar,70-1200Nm3/h,25°C
ECO PRO CO.,LTD.	For air precision measurement in laboratory test facilities	KC-7730G,Air,300A,130m3/min,95-101Kpa,25°C
Eumseong Livestock Manure Treatment Plant	For precision measurement of biogas for supply to generators	KC-7730B, Bio Gas, 50~300mmH2O,,40~60°C 125A-125Nm3/h, 208Nm3/h ~ 3EA
Posco Pohang	For precision measurement of air lines	KC-7730G,50A,800Kpa,25°C,63-630Nm3/h
Water Resources Corporation	Membrane filter for precise measurement of air	KC-7730G,300A,25°C,0.8Bar,800-8000Nm3/h
Daejeon Techno Park Hydrogen Electric Vehicle	For precise measurement of hydrogen gas at hydrogen charging stations	KC-7730H-FM153BEx, H2 GAS, ½", 1~10Nm3/min, 20°C, 250Bar
Ulsan Sewage Treatment Plant	For precise steam line measurement	KC-7730S-FM153BEx, Steam, 50A, 1~10Ton/h, 205°C, 17Bar
Korea Land & Housing CorporationHwaseong Dongtan 2 Clean Energy C	For precision measurement of biogas trade	KC-7730B-FM153BEx, Bio gas, 250mmAq, 30~40°C, 50A, 20-200Nm3/h ~ 2EA 100A, 28~280Nm3/h ~ 1EA
Hyundai Motor	Hydrogen equipment, for precise measurement of hydrogen gas	KC-7730H-FM153BEx, 10A, H2 GAS, 5000SLPM -50~95°C, 40BAR ~ 3EA
Posco Pohang	For precision measurement of air lines	KC-7730G,50A,800Kpa,25°C,63-630Nm3/h ~ 3EA
Maeil Dairies Gochang Cheese Factory	For Steam EMS System Project	KC-7730S,80A,125A179°C,7.9BAR ~ 2EA
ECO PRO CO., LTD.	For O2 Gas trading	KC-7730-FM153B, 80A, O2 Gas, 30-1,500Nm3/h 25°C, 8.8 Bar
Hyundai Rotem Tongyeong Hydrogen Refueling Station	For hydrogen gas trading	KC-7730H-FM153B,20A,2-70kg/h,40°C,200Bar~ 3EA
Gunpo Biomass Plant	for biogas trade	KC-7730B-FM153B,200A,120-4,200Nm3/h
Environmental Facility Management Co., Ltd.	For biogas trade	KC-7730B-FM153BEx, Bio gas, 250mmAq, 20~30°C, 100A, 10-300Nm3/h ~ 3EA
KEPCO Research Institute	For hydrogen generator measurement	KC-7730H-FM153B,20A-20Nm3/h,100Nm3/h,40- 90°C,9.7Bar, 15A-140Nm3/h, 100°C, 200Bar ~ 3EA



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