

# 01

[www.goldenrules.co.kr](http://www.goldenrules.co.kr)

**Golden Rules Co.,Ltd**

Air, Flue gas, Exhaust gas

## **Pitot Tube-Mass Flow Meter KC-7730I 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		10 barg / 30 barg / Max 450 barg	
	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

# 1. Pitot Tube-MASS FLOWMETER (Air, Flue, Exhaust Gas)

## 1-4. KC-7730I D/P-Mass Series

### Feature

- Mixed gas Automatic Calculator (4~20mA input : 8-Channel)
- **5-for multi-: Rate, integrated, volume, mass flow, temp', press', density**
- Input Power DC 24 V, < 100mA
- Output accuracy  $\pm 0.1\%$ ,  $\pm 2.5\ \mu A$
- 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)



Pitot tue – Mass flowmeter  
Model : KC-7730I

### Description

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

It is a 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-7730I series is a product designed based on differential pressure mass flow measurement technology.

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

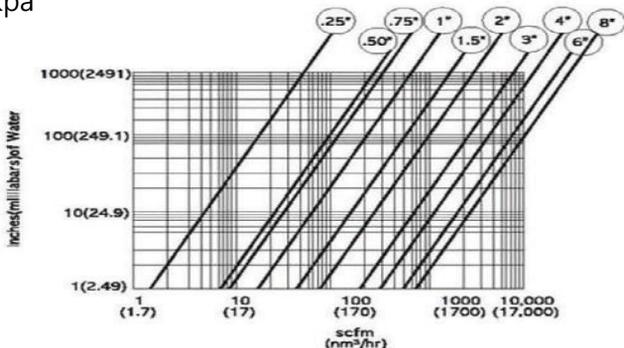
The information contained herein is subject to change without notice.

**Performance Specifications**

- ◆ **Accuracy of Point Velocity**  
±0.5% of F.S  
(Option : ±0.1% of F.S)
- ◆ **Repeatability**  
±0.5% of Full Scale
- ◆ **Sensor Accuracy**  
< 0.2% 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

**Operating Specifications**

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



**Mass Flow Rates (Air)**

Air Flow Ranges							
Pipe Size		Minimum		Maximum		Weight	
A	B	Nm3/m	Nm³/h	Nm3/m	Nm³/h		일반
15A	1/2-inch	0.13	8.0	1.33	80	5kg	3kg
20A	3/4-inch	0.27	16	2.7	160	5kg	3kg
25A	1-inch	0.4	24	120	240	6kg	4kg
40A	1 1/2-inch	0.98	59	9.8	590	7.2kg	5.2kg
50A	2-inch	1.53	92	15.3	920	8.6kg	6.6kg
80A	3-inch	3.3	200	33.3	2000	11kg	9kg
100A	4-inch	5.83	350	58.3	3500	16.2kg	14.2kg
150A	6-inch	12.7	760	127	7600		
200A	8-inch	21.7	1300	217	13,000		

**Mass Flow Rates (Bio gas)**

Pipe Size (배관경)		Minimum (최소)	Maximum (최대)	Weight (중량)
Pipe Size		Minimum	Maximum	Pressure / Temp'
A	B	Nm³/h	Nm³/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

**◆ Fluid & Ambient temperature**

Air : -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: m<sup>3</sup>/h(m<sup>3</sup>), 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 – STS316 (Option : STS316L)

Flow inline Body – STS304 (Option : STS316, STS316LS)

**◆ 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**

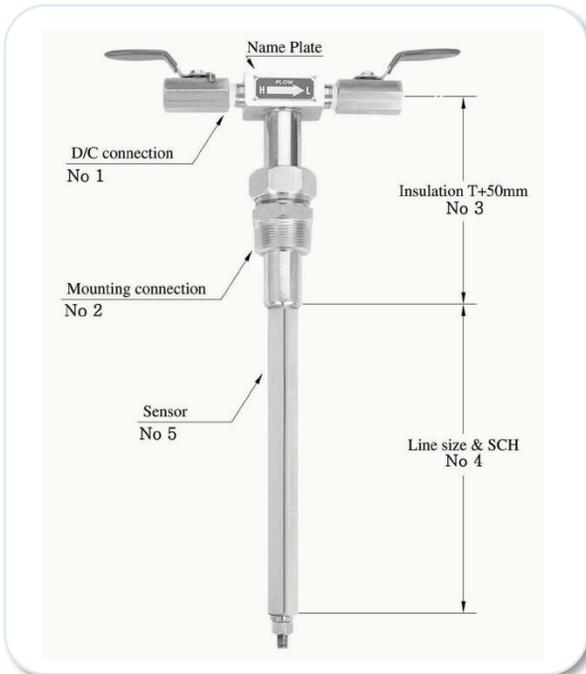
CE (CASE)

KCS Certificate

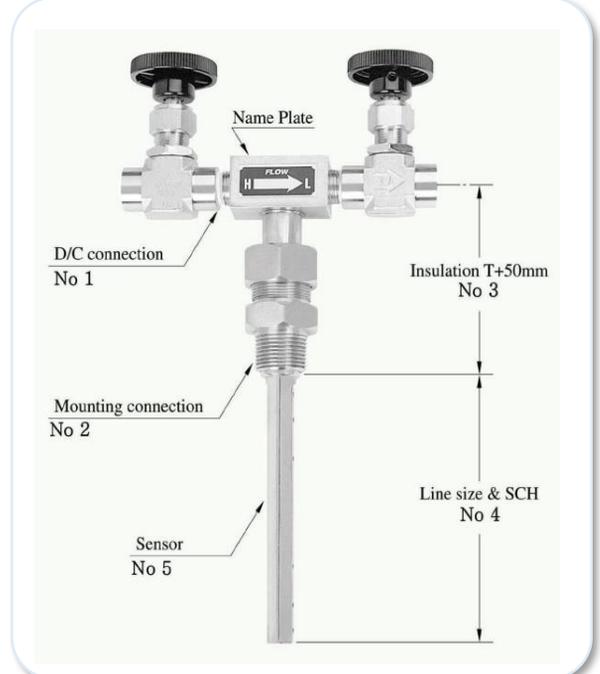
Atex Certificate

Ex (Ex d IIC T6)

**Sensor name & installation drawing KC-7730I \_ Pitot tube type**

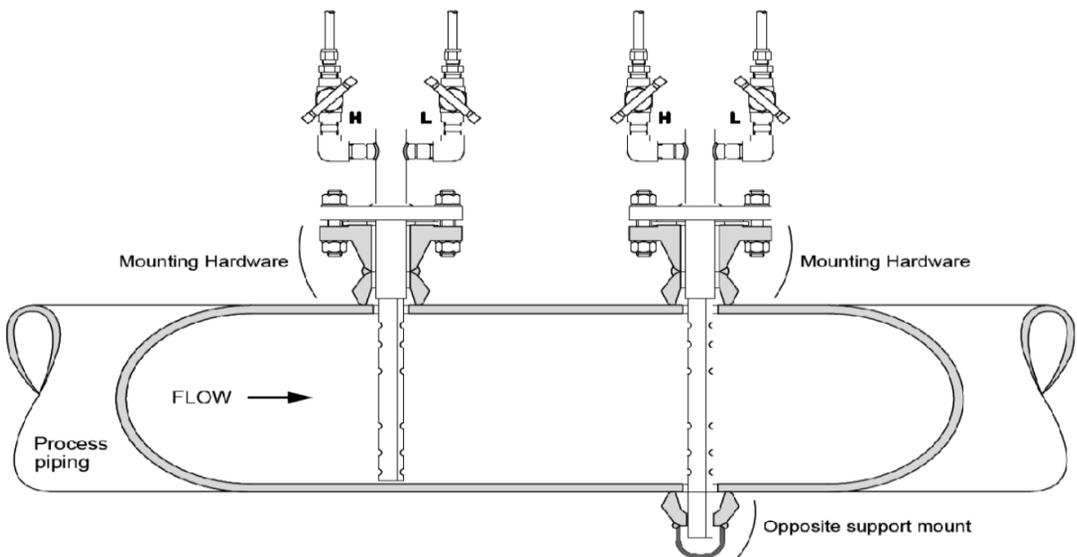


High pressure or Large diameter(18"~118")



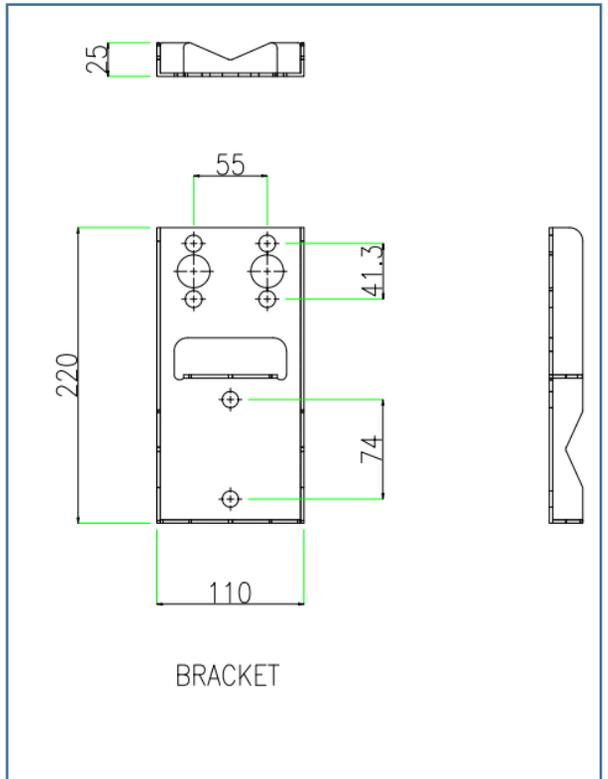
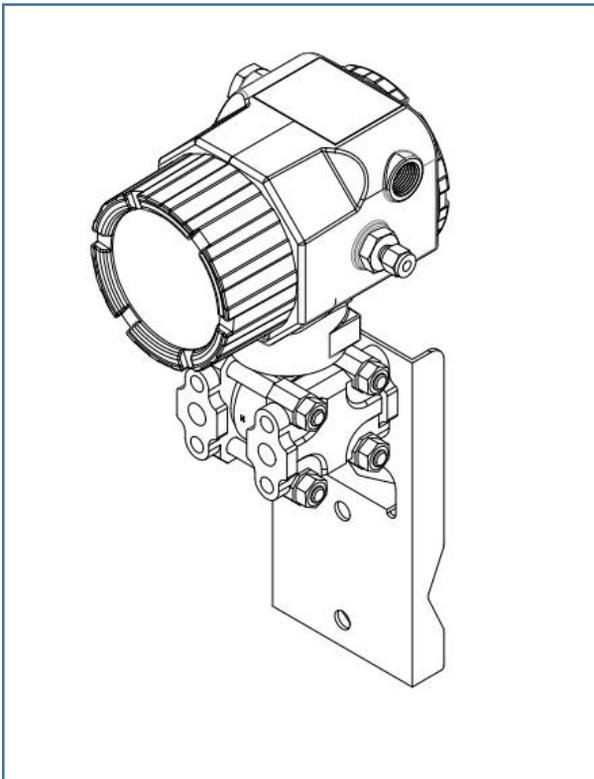
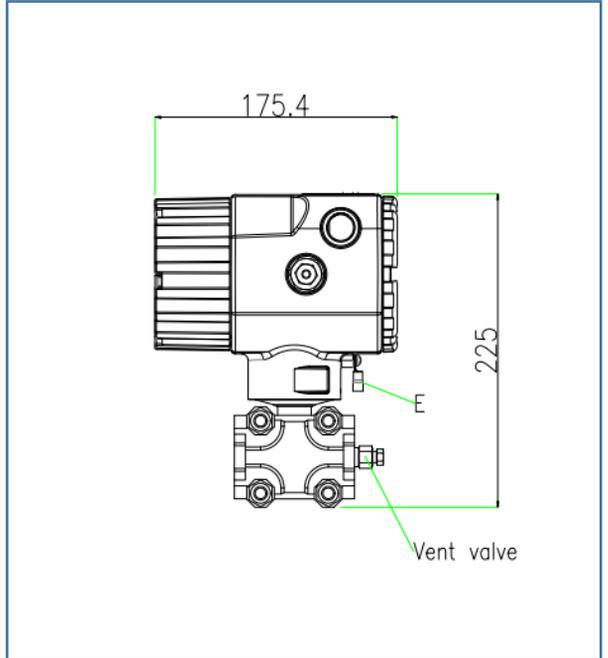
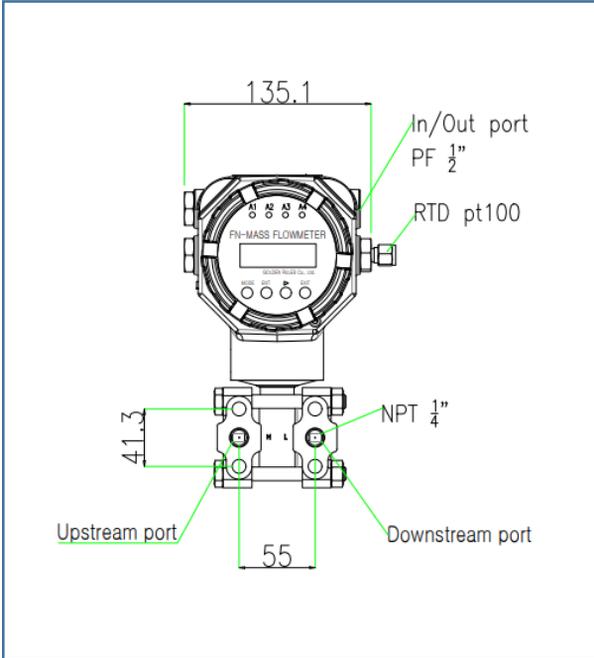
Low pressure or Small ~ Large diameter(3"~80")

※ The shape of the sensor may be changed according to the circumstances of the manufacturer. -> Refer to detail approval drawing



How to install small diameter and large diameter

**Mass flow transmitter dimensions KC-6000 Series**



## Golden Rules

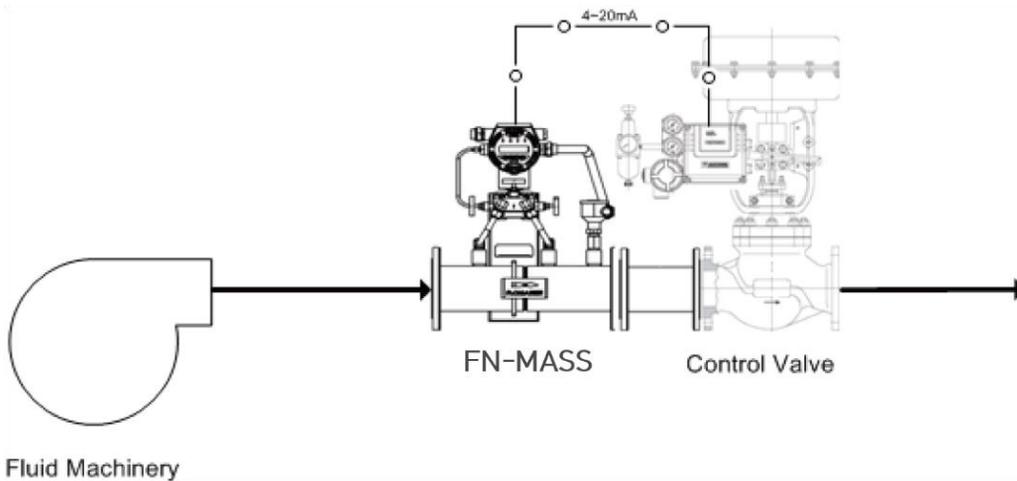
The FN-Mass flow meter realizes the following control with the current output signal.

01 – Mass flow(kg/h) Control

02 – Energy flow(MJ/h) Control

03 – Volume flow(m<sup>3</sup>/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-7730I FN –Mass Flowmeter)

Straight Pipe Length Requirements at 1 atm			
Piping condition	KC-7730I 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.

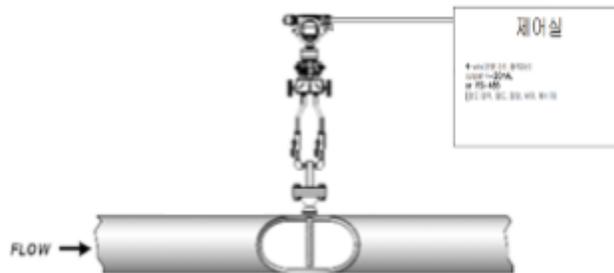
(3) For comparison purposes only. Table shows number of diameter(D) of upstream straight pipe length required for an ISO Standard 5167 Orifice plate with a beta ration of 0.7

(4) Consult factory for pressure effects.

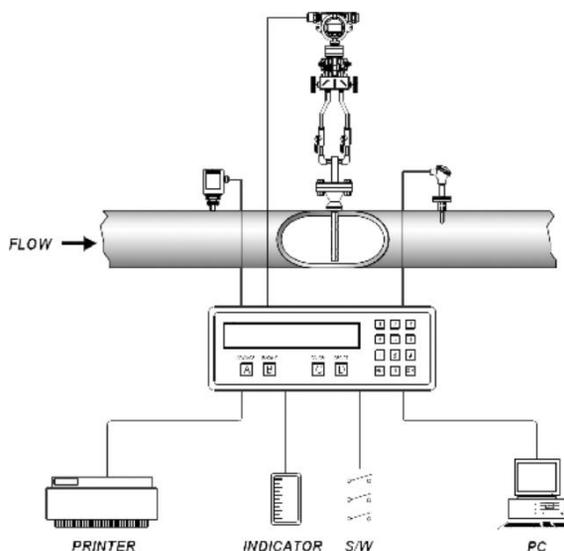
## APPLICATION

### Schematic diagram and advantages of all-in-one differential pressure

1. The installation cost is greatly reduced.
2. Since it is a direct-type mass flow meter, the accuracy is much higher than that of the existing differential pressure type ( $\pm 0.5\%$  F.S).
3. Simultaneous monitoring of 5 data (flow, temperature, pressure, density, heat quantity) by communication output in heavy-duty monitoring panel
4. Since it is a mass flow meter equipped with temperature and pressure sensors, there is no need to separately install it on the pipe.

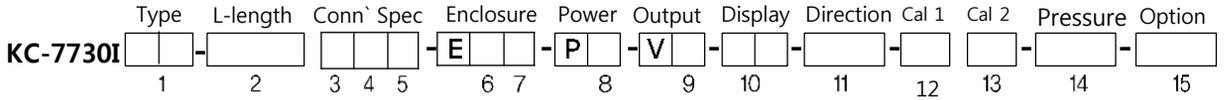


New concept mass flow method ~ all-in-one flow sensor, temperature, pressure sensor and flow computer



Existing differential pressure method- Flow, temperature, pressure sensor, flow computer separate configuration

**Order Code KC-7730I Series (Pitot tube-MASS FLOWMETER)**



Type	Code 1
Gas	30G
Mixed gas	30MX
Air	30BA
<b>Hazardous-Area Location Endosure</b>	<b>FM153B</b>
Agency approved, customer specified	W

Insert length <sup>4</sup>	Code 2
6" (15 cm)	06
9"	09
12"	12
18"	18
24"	24
36"	36
Special Length	(in)
Probe with 2" JIS 10k RF Flange	(in)-M5
High Pressure with Retractor Valve	(in)-M9
Agency approved, customer specified	W

Mounting	Code 3,4,5
None	0
Compression Fitting <sup>2</sup> (3/4" tube X 3/4" Male NPT)	10
Threadlet (3/4" Female NPT) Specify pipe O.D. in parentheses	2( )
Compression Fittings (IP67) (1/2" tube X 3/4" Male NPT)	3
Curved Duct Bracket (3/4" tube Compression Fitting) Specify duct O.D. in Parentheses	4( )
Low Pressure Retract Valve Specify duct O.D. in parentheses	8( )
Compression Fittings (3/4" tube X 1" Male NPT)	15( )
Agency approved, customer spec'	W

Enclosure <sup>5</sup>	Code 6,7
Hazardous-Area Location Enclosure	2
IP67 Integral or Remote	N2
Agency approved, customer specified	W

Input Power	Code 8
DC 24 V ±10 %, 60 mA	2
AC 100-240 V ±10 %, 10 watts (옵션)	3
Agency approved, customer specified	W

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

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

Flow Direcion	Code 11
Horizontal <b>Left to Right</b> or Vertical UP	<b>1</b>
Horizontal Right to Left or Vertical Down	2
Agency approved, customer specified	W

Calbration1 <sup>9</sup> (Gas)	Code 12
Standard Calibration (Small Size)	A
Air, only for 1/2" and large pipe Size	
Compressed Air, only for 2" and large pipe size	D
Customer Calibration	B
Agency approved, customer specified	W

Calbration2 <sup>9</sup> (Gas)	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 145 psig (10 barg)	L
Medium pressure Below 435 psig (30 barg)	M (Option)
High pressure Below 5,801 psig (400 barg)	H (Option)
Agency approved, customer specified	W

Option	Code 15
Air Purging System	Option
Pulse	Option
Agency approved, customer specified	W

## FLOW MEASUREMENT PRINCIPLE

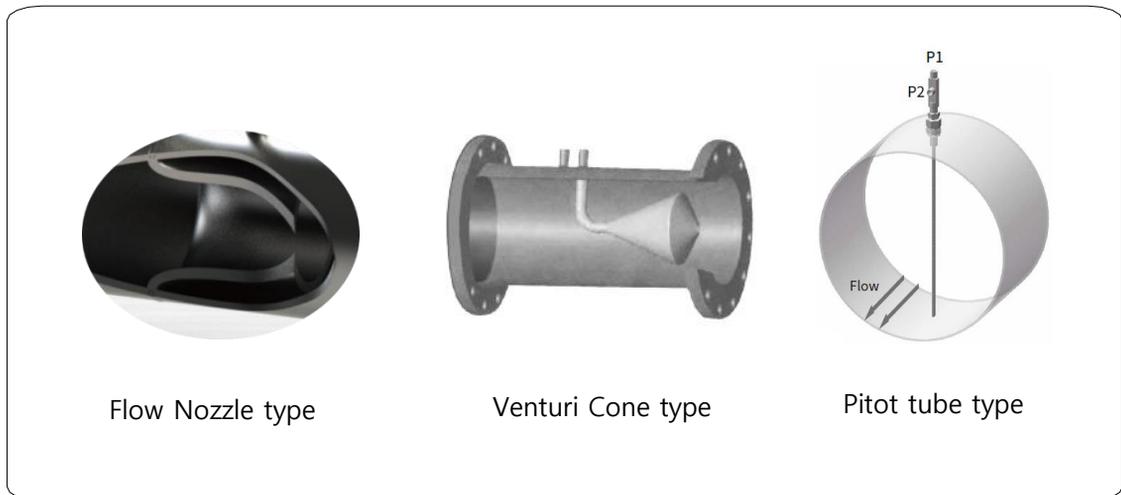
### ■ D/P type

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

**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.

**유량계산식**

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 ( $\kappa$ )	$\kappa = -\frac{V}{p} \left( \frac{\partial p}{\partial V} \right)_s = \frac{\gamma}{Y}$	$\kappa = \gamma = \frac{c_p}{c_v}$

**기체팽창계수**

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

$\kappa$  = isentropic exponent

$\tau$  = pressure ratio

$\beta$  = diameter ratio

**유량계산식**

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

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

$q_m$  = mass flow rate[kg/s]

$q_v$  = volumetric flow rate[m<sup>3</sup>/s]

$\rho_1$  = upstream density[kg/m<sup>3</sup>]

$\Delta p$  = differential pressure[Pa]

## 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 ~ <b>17EA</b>
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 ~ <b>4EA</b>
GTC CO., LTD.	GTC CO., LTD.	FN-MASS KC-7730A, Compressed Air ~ <b>12EA</b>
Bugang Tech	Icheon (Remnant Corpse Disposal System)	KC-7730G-FM153BEx, 25A, LPG
BELTECH CO.,LTD	Beltech test league	FN-MASS KC-7730A, Compressed Air ~ <b>4EA</b>
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 ~ <b>10EA</b>
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 ~ <b>4EA</b>
Korea Institute of Machinery and Materials	Cheonan, Chungcheongnam-do (Puritech)	FN-MASS KC-7730A, Compressed Air ~ <b>4EA</b>
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 ~ <b>10EA</b>
SUNHWAN ENG	Kunyoung Machinery	KC-7730OP-FM153BEx, 50A, NG
SEA ANTLE	SEA ANTLE	FN-MASS KC-7730A, Compressed Air ~ <b>2EA</b>
COMP KOREA	COMPRESSURED AIR	FN-MASS KC-7730A, Compressed Air ~ <b>3EA</b>
FINETECH	FINETECH	FN-MASS KC-7730A, Compressed Air ~ <b>15EA</b>
ILJIN MATERIAL	IKSAN PLANT	FN-MASS KC-7730A, Compressed Air ~ <b>2EA</b>
PURITECH	PURITECH	FN-MASS KC-7730A, Compressed Air ~ <b>4EA</b>
J KEISIS CO.,LTD,	J KEISIS CO.,LTD.	FN-MASS KC-7730A, Compressed Air ~ <b>22EA</b>
JUNG WOO FLOW	JUNG WOO FLOW	FN-MASS KC-7730A, Compressed Air ~ <b>3EA</b>
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730A, Compressed Air ~ <b>10EA</b>
Wonkwang valve	STX ENGINE	KC-7730H-FM153B-G050-H2 Mixture
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ <b>10EA</b>
VPE KOREA	VPE KOREA	FN-MASS KC-7730GF, Compressed Air
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ <b>20EA</b>
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ <b>30EA</b>
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ <b>30EA</b>
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 ~ <b>3EA</b>
LG ELECTRONICS	Cheongju Factory	FN-MASS KC-7730S, 스팀,100A,125A,200A ~ <b>3EA</b>
LG ELECTRONICS	Cheongju Factory	FN-MASS KC-7730G-FM153BEx,LNG,50A(2),65A(2),80A(1),100A,125A,150A ~ <b>8EA</b>
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air
SAMSUNG ELECTRONICS	For precise measurement of gas accumulation	KC-7730GF O2-65A, N2-32A ~ <b>2EA</b>
Korea Water Resources Corporation	Korea Water Resources Corporation	FN-MASS KC-7730SF 25A Steam, Water ~ <b>2EA</b>
Chungbuk Sewage Treatment Plant	For testing of water and wastewater facilities	KC-7730B-FM153BEx, 300A, 350A, Bio gas~ <b>2EA</b>
Innowill Co.,Ltd.	Korea Energy Research Institute	FN-MASS KC-7730GF,100A,50A,Blower Air ~ <b>2EA</b>

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 ~ <b>2EA</b>
Toray Advanced Materials.	For precise measurement of gas accumulation	FN-MASS KC-7730OP-FM153B ~ <b>2EA</b> O2-65A, N2-32A
Energy Technology Evaluation Institute	Ammonia decomposition hydrogen production purification system	FN MASS KC-7730OP-FM153B ~ <b>2EA</b> 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 ~ <b>12EA</b> 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 ~ <b>2EA</b>
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 ~ <b>3EA</b>
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 ~ <b>3EA</b>
LS Cable & System / POSCO R&D Center	For precise measurement of LNG consumption	LNG,80A,160Nm3/h,31°C,30Kpa,24V.RS-485~ <b>6EA</b>
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 ~ <b>6EA</b> KC-7730L,Liquid,80A,40A,25A ~ <b>10EA</b>
Hyundai Motor	For precision testing of hydrogen generator	KC-7730H-FM153BEx, H2,3/8",2-40m3/h,8.2Barg ~ <b>2EA</b>
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 ~ <b>3EA</b>
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 ~ <b>2EA</b> 100A, 28~280Nm3/h ~ <b>1EA</b>
Hyundai Motor	Hydrogen equipment, for precise measurement of hydrogen gas	KC-7730H-FM153BEx, 10A, H2 GAS, 5000SLPM -50~95°C, 40BAR ~ <b>3EA</b>
Posco Pohang	For precision measurement of air lines	KC-7730G,50A,800Kpa,25°C,63-630Nm3/h ~ <b>3EA</b>
Maeil Dairies Gochang Cheese Factory	For Steam EMS System Project	KC-7730S,80A,125A179°C,7.9BAR ~ <b>2EA</b>
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~ <b>3EA</b>
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 ~ <b>3EA</b>
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 ~ <b>3EA</b>





**Golden Rules**

• GOLDEN RULES

[www.goldenrules.co.kr](http://www.goldenrules.co.kr)

Air & Gas & Steam & Liquid

**Mass Flowmeter**

Specialized manufacturer

**Distributor**

Certified in accordance with

KC Q ISO 9001 : 2015

KC Q ISO 14001 : 2015

 (주)골든룰