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Golden Rules Co.,Ltd

H2, Special Gas
FN-Mass Flow Meter
KC-7730H-FM153BEx 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		O	
	Gas		O	
	Vaper		O	
	steam		O	
Application	control		O	
	Monitor		O	
	Supply		O	
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		20 barg / 250 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		O	
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 (H2 & Special Gas)

1-3. FN-Mass KC-7730H-FM153BEx

Features

- Mixed gas Automatic Calculator (4~20mA input : Basic Mode)
- **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 (Turn down ratio 40:1)
- 0.1-second response to changes in flow rate
- Hydrogen gas measurement for high pressure at hydrogen charging stations (max. 1380 Bar)
- High temperature fluid measurement up to 400°C
- CE, Ex(IP67)



H2,Special, Gas type
KC-7730H-FM153BEx

Description

Golden Rules' KC-7730H-FM153BEx Series FN-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 Flange-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 remote switches in the instrument panel.

The Golden Rules KC-7730H-FM153BEx Series allows you to configure or change the following parameters : flow range, Totalize, time response, low flow cut-off 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 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)

◆ **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**

H2, Special, High Pressure Gas

◆ **Input Power**

DC 24 V ±10 %, < 100 mA
100~240VAC ±10 %, < 10 Watts

◆ **Output Signal**

Linear 4 ~ 20 mA, 4Wire
RS-485
Pulse (Option)

◆ **Pressure Drop**

15.5 kpa

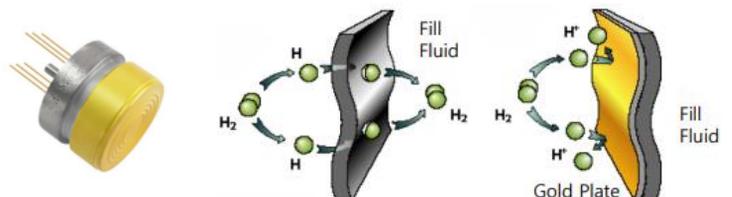
◆ **Pressure Loss**

0.1 ~ Below 0.3 Bar

Mass Flow Rates (H2 Gas)

H2 Gas Flow Ranges							
Pipe Size		NL/min		NM ³ /h		Fluid	Pressure/ Temp'
A	B	Kg/min		Kg/h			
		최소	최대	최소	최대	Fluid	Press'/Temp'
10A	3/8-inch	5.7	200	0.34	12.00	H ₂	3-5Barg/20°C
10A	3/8-inch	4.3	150	0.28	9.00	H ₂	3-5Barg/20°C
10A	3/8-inch	33.0	666.7	2.0	40.00	H ₂	8.2Barg/25°C
10A	3/8-inch	50.0	416.6	3.0	25.00	H ₂	7Barg/20°C
15A	1/2-inch	300	5,000	18.0	300.0	H ₂	40Barg/95°C
15A	1/2-inch	55.0	1,520	3.30	91.20	H ₂	17-30Barg/ 20°C
15A	1/2-inch	285.7	10,000	17.14	600.0	H ₂	250Barg/20°C
15A	1/2-inch	23.83	833.3	1.43	50.00	H ₂	7Barg/25°C
15A	1/2-inch	2.38	83.33	0.14	5.00	H ₂	1-5Barg/20°C
15A	1/2-inch	66.66	2,333	4.0	140.00	H ₂	200Barg/ 100°C
20A	3/4-inch	23.83	833.3	1.43	50.00	H ₂ + Mix	7.3Barg/20°C
20A	3/4-inch	23.83	833.3	1.43	50.00	H ₂ + Mix	6.9Barg/20°C
20A	3/4-inch	9.52	333.3	0.60	20.00	H ₂	9.7Barg/ 40-90°C
20A	3/4-inch	47.61	1,666	2.90	100	H ₂	9.7Barg/ 40-90°C
20A	3/4-inch	0.05	1.16	2.00	70.00	H ₂	200Barg/40°C
25A	1-inch	23.83	833.3	1.43	50.00	H ₂	7Barg/25°C
50A	2-inch	0.12	4.20	7.20	252.0	H ₂	8.2Barg/200' C
50A	2-inch	100.0	3,500	6.00	210.5	H ₂	7.9Barg/150' C

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



◆ Fluid & Ambient temperature

Gas : -40 ~ 100 °C (-40 ~ 212 °F) Option : -70 ~ 400 °C (-94 ~ 752 °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 – STS316L+Plated gold(H₂ Gas), STS316L(Special Gas)

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

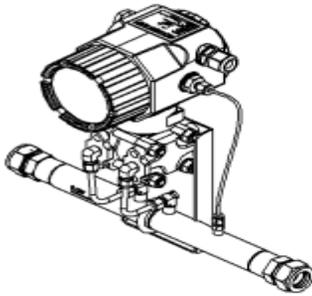
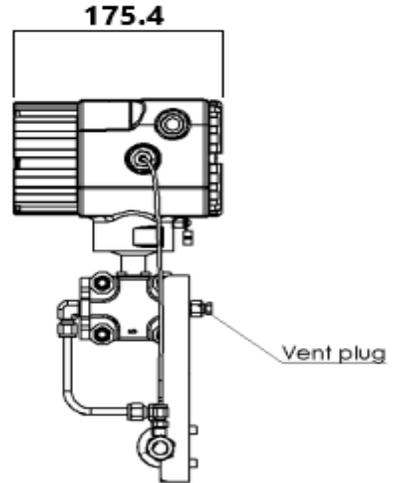
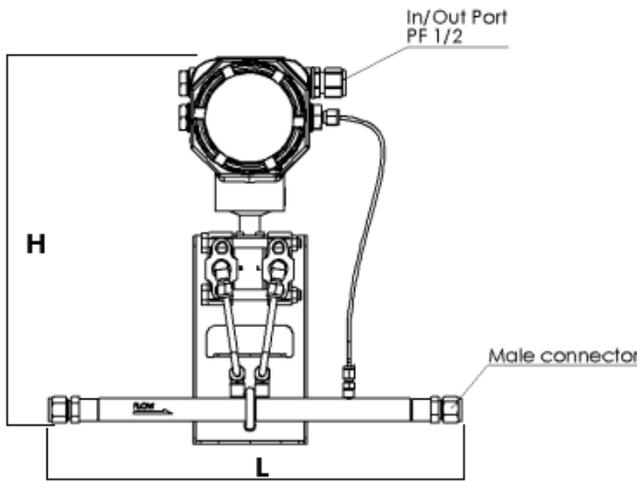
CE (CASE 전체)

KCS Certificate

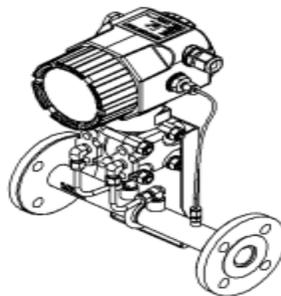
Atex Certificate

Ex (Ex d IIC T6)

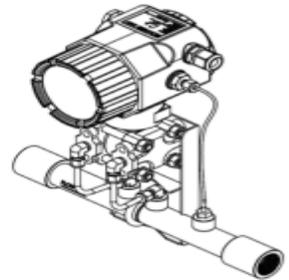
Dimensional Spec' & Chart KC-7730H-FM153BEx



LOK fitting



Flange



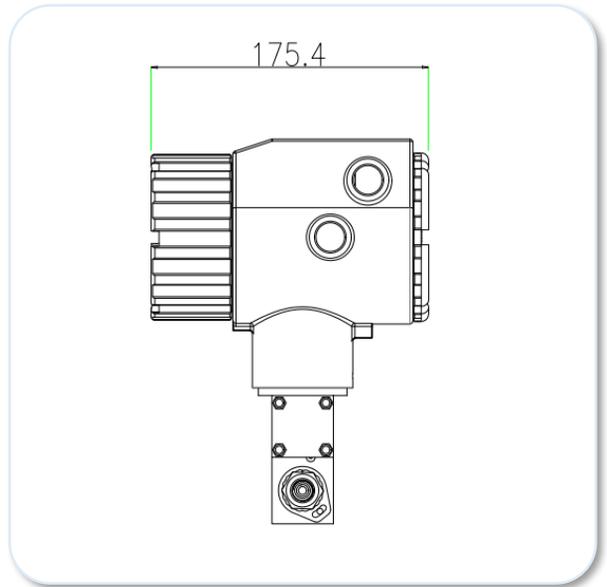
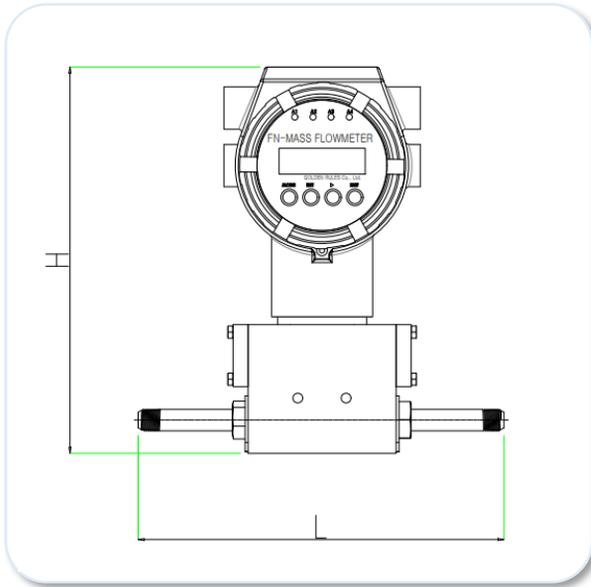
PT Female(Socket)

※ The shape of the sensor depends on the circumstances of the manufacturer. subject to change. -> Refer to the detailed approval drawing

단위 : mm

Size	H	L
3/8" Thread / Lok	255.1	300
1/2" Lok / Flange	256.1 / 375	300
3/4" Lok / Flange	257.6	300
1" Flange	358.5	300
32A	402	300
40A	406	300
50A	420	300
65A	442	350
80A	442	400
100A	451	409
125A	508	451
150A	540	522
200A	575	602
250A	626	672

Dimensional Spec' & Chart For high pressure hydrogen filling station **Max 400 Bar**



※ The shape of the sensor depends on the circumstances of the manufacturer. subject to change. -> Refer to the detailed approval drawing

단위 : mm

Size	H	L
3/8" Cone&Thread tubing	255.1	300
1/2" Cone&Thread tubing	256.1 / 375	300
3/4" Cone&Thread tubing	257.6	300
1" Cone&Thread tubing	358.5	300

Golden Rules

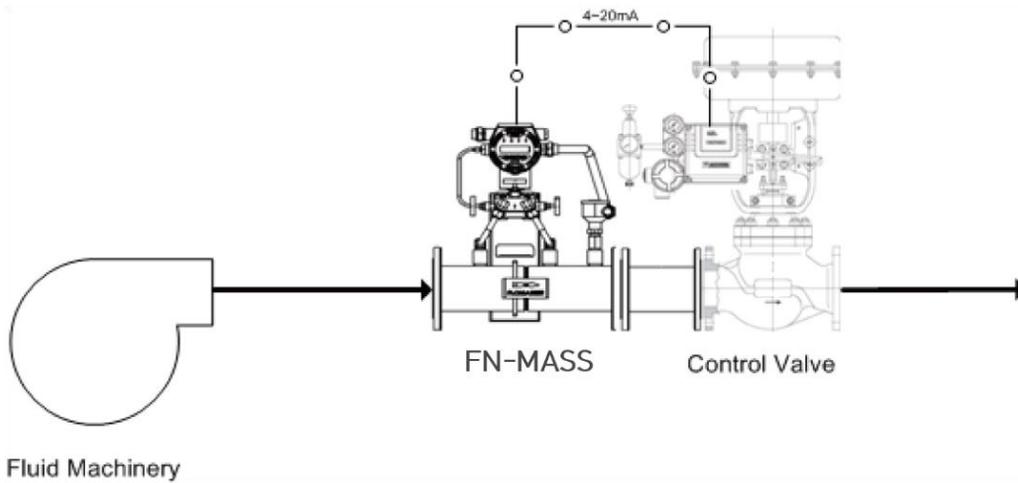
The FN-Mass flow meter realizes the following control with the current output signal.

01 – Mass flow(kg/h) Control

02 – Energy flow(MJ/h) Control

03 – Volume flow(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-7730H-FM153BEx)

Straight Pipe Length Requirements at 1 atm			
Piping condition	KC-7730H-FM153BEx 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.

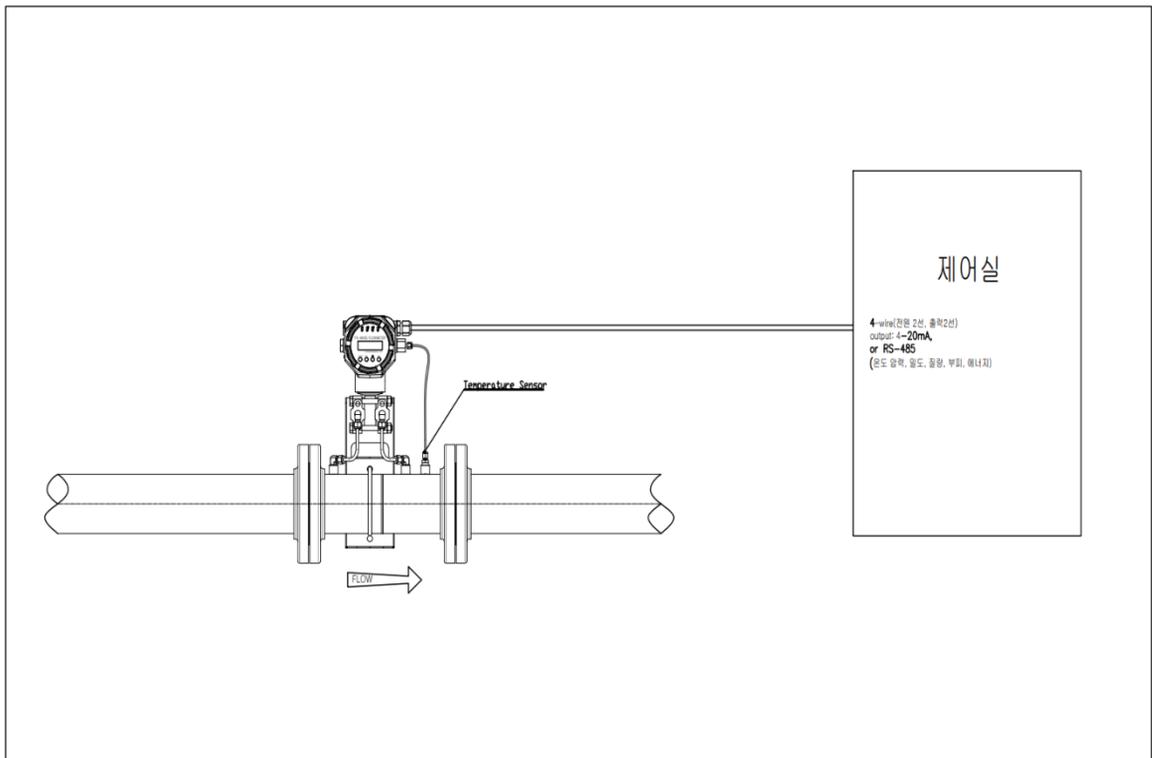
(3) For comparison purposes only. Table shows number of diameter(D) of upstream straight pipe length required for an ISO Standard 5167 Orifice plate with a beta ration of 0.7

(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



FLOW MEASUREMENT PRINCIPLE

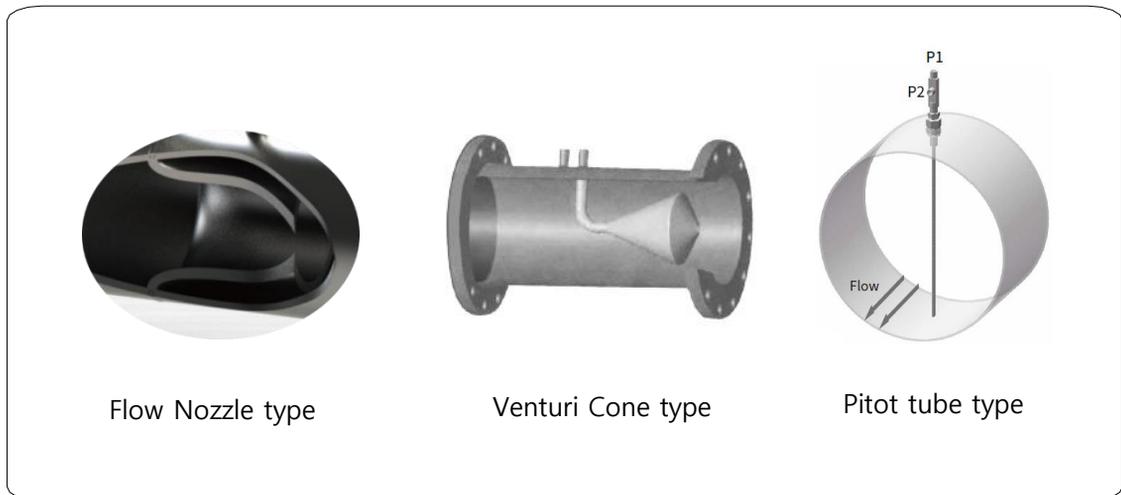
■ D/P type

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+Plated Gold

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]

hydrogen definition

Mass flow meter for hydrogen gas measurement at hydrogen refueling stations

Hydrogen is colorless, odorless and non-toxic, and its unit energy is more than 5 times that of fossil fuels. However, because hydrogen is the lightest, it rarely exists alone on the surface of the earth, and exists mostly in the atmosphere. Hydrogen is a clean energy, but it has the disadvantage of being difficult to manage. In other words, to use hydrogen, it is necessary to use very high pressure gas or liquid hydrogen in a cryogenic state. Currently, the most economical method is to use gaseous hydrogen in an ultra-high pressure state as energy.

The mileage of a hydrogen car is proportional to the amount of fuel charged, and this is accomplished by charging high-pressure hydrogen into the vehicle storage tank. The existing hydrogen filling pressure was 350 bar (35 MPa) or less, but it is a global trend to fill the tank above 700 bar (70 MPa) for a high mileage. For hydrogen charging of 700 bar, the charging pressure of the hydrogen dispenser is higher than 840 bar to supply the hydrogen car.

The hydrogen mass flowmeter of Golden Rule includes two pressure sensors and a temperature sensor, and the pressure sensor is full scale as the pressure rises (because the error is reduced, it measures the flow rate more accurately than any other sensor in the ultra-high pressure state of 70 MPa or more) The two pressure sensors have an automatic zero adjustment function, so they can maintain high accuracy in any installation environment.

The design of a hydrogen flow meter for a hydrogen filling station is designed through Golden Rule's DPP G1 program. The tightening mechanism is a venturi nozzle, the filling pressure is 84 MPa, the filling temperature 15°C, the flow rate is 260 kg/h, and the filling density is 45.287 kg/m³. It's possible. Pressure piping is 20,000 psi, tube size 9/16", and stainless 316 cold material cone and thread type nipple is used, so it has no leakage and is very durable. Golden Rule is a pressure-explosion-proof certified (Ex d IIC T6) product from the Korea Gas Safety Corporation for this hydrogen mass flow meter.

APPLICATION : hydrogen generator

◆ Client : KEPCO Electric Power Research Institute

◆ Project name : PG2-based 10Nm³/H₂/h class water electrolysis system

◆ Delivery model : KC-7730H-FM153BEx

- * Fluid : H₂ GAS
- * Line size : 10A (3/8")
- * Flow range : 6 ~ 200 NL/min
- * Fluid pressure : 3 ~ 5 Barg
- * Fluid temperature : 24°C
- * Delivery quantity : 1 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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