

# DP-Mass Flow Meter

## KC-7730 Series



## DP-Mass Flow Meter(KC-7730 Series)

### Description

Golden Rules' NEW KC-7730 Series D/P type DP-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 NEW KC-7730 series is a product designed based on differential pressure mass flow measurement technology.

Golden Rule's KC-7730 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.

### Features

- 4-for multi-: Rate, integrated, volume, mass flow, temp', pressure
- Input Power DC 24 V, < 100mA
- Output accuracy  $\pm 0.1\%$ ,  $\pm 2.5\ \mu\text{A}$  (4~20 mA, 2-Wire Loop)
- 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 20:1,)
- 0.1-second response to changes in flow rate
- High pressure fluid can be measured (up to 50 Barg)
- High temperature fluid measurement up to 350°C
- CE, Ex(IP67)



**Ring type KC-7730 Series**



**Inline type KC-7730 Series**

## DP-Mass Flow Meter(KC-7730 Series)

### Performance Specifications

#### ◆ Accuracy of Point Velocity

$\pm 0.5\%$  of F.S /  $\pm 1.0\%$  of R.D

#### ◆ Repeatability

$\pm 0.5\%$  of Full Scale

#### ◆ Sensor Accuracy

< 0.05% of span

#### ◆ Turndown Ratio

20:1

#### ◆ Pressure Loss

0.1 ~ Below 0.3 Bar

#### ◆ Response Time

0.1 second

#### ◆ Measuring Range

0.1 ~ 100 m/sec

#### ◆ Function

**4-for multi-measurement** : rate, total, volume, mass, temp', pressure indication

### Operating Specifications

#### ◆ Fluid

Steam (Saturated Steam, Super heated Steam)

Air, Gas, Liquid

#### ◆ Input Power

DC 24 V  $\pm 10\%$ , < 100 Ma

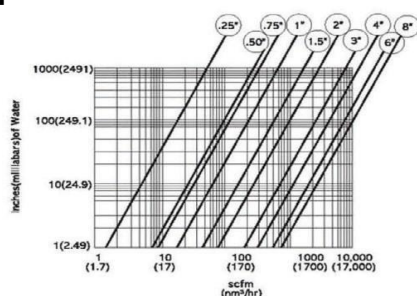
#### ◆ Output Signal

Linear 4 ~ 20 mA, 2Wire Loop

RS-485S

#### ◆ Pressure Drop

15.5 kpa



## DP-Mass Flow Meter(KC-7730 Series)

| Steam Flow Range |          |                  |         |                       |                       |                    |         |
|------------------|----------|------------------|---------|-----------------------|-----------------------|--------------------|---------|
| Pipe Size        |          | Pressure / Temp' |         | Flow Range (kg/h)     |                       | Flow Range (Ton/h) |         |
| A                | B        | Barg             | 'C      | Minimum               | Maximum               | Minimum            | Maximum |
| 25A              | 1-inch   | 6                | 120     | 2.85                  | 100                   |                    |         |
| 40A              | 1 ¼-inch | 16               | 200     |                       |                       | 1.4                | 50      |
| 40A              | 1 ¼-inch | 8                | 179     |                       |                       | 25                 | 80      |
| 40A              | 1 ¼-inch | 16               | 200     |                       |                       | 2.5                | 50      |
| 50A              | 2-inch   | 16-17            | 200-205 | 285.71                | 10,000                |                    |         |
| 50A              | 2-inch   | 8                | 179     |                       |                       | 20                 | 120     |
| 50A              | 2-inch   | 8                | 150~200 | 14.28                 | 500                   |                    |         |
| 65A              | 2 ½-inch | 8                | 179     |                       |                       | 65                 | 650     |
| 65A              | 2 ½-inch | 8                | 180     | 57.14                 | 2,000                 |                    |         |
| 80A              | 3-inch   | 7.9              | 179.5   | 85.71                 | 3,000                 |                    |         |
| 80A              | 3-inch   | 4~5              | 152     | 57.14                 | 2,000                 |                    |         |
| 100A             | 4-inch   | 7.9<br>7.0<br>2  | 179.5   | 57.14<br>200<br>21.42 | 2,000<br>7,000<br>750 |                    |         |
| 125A             | 5-inch   | 7.9              | 179.5   | 71.42                 | 2,500                 |                    |         |
| 150A             | 6-inch   | 2                | 133.2   | 85.71                 | 3,000                 |                    |         |
| 200A             | 8-inch   | 7.9              | 179.5   |                       |                       |                    |         |
| 200A             | 8-inch   | 38               | 400     | 428.57                | 15,000                | 10                 | 100     |
| 250A             | 10-inch  | 8                | 19.56   |                       |                       | 8                  | 80      |
| 250A             | 10-inch  | 8                | 210     |                       |                       | 1.1                | 11      |
| 250A             | 10-inch  | 8                | 150~200 |                       |                       | 0.23               | 8.33    |
| 300A             | 12-inch  | 8                | 210     | 314.28                | 11,000                | 1.1                | 11      |
| 400A             | 16-inch  | 8                | 176     | 1857.14               | 65,000                |                    |         |

## DP-Mass Flow Meter(KC-7730 Series)

### ◆ Fluid & Ambient temperature

Steam : -20 ~ 200 °C (-4 ~ 392 °F) Option : 210 ~ 350 °C (410 ~ 734.8 °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

F/N Sensor – STS316 (Option : 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 전체)

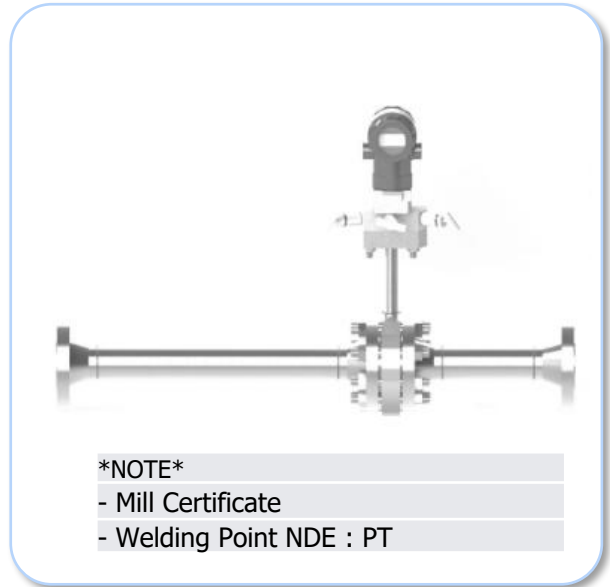
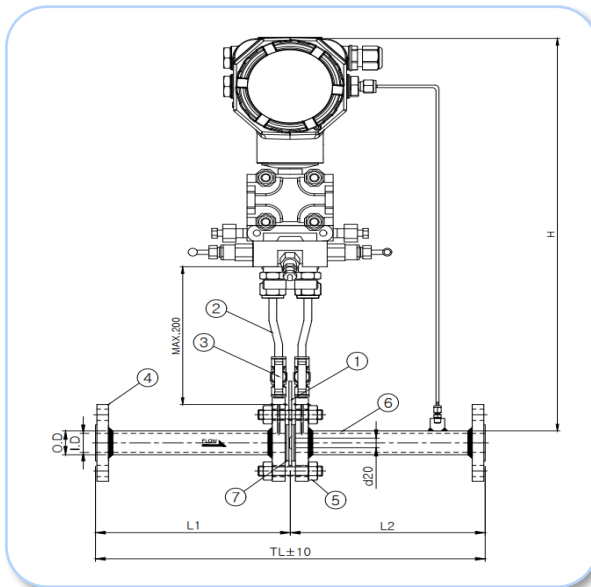
KCS Certificate : Pending

Atex Certificate : Pending

Ex (Ex d IIC T6)

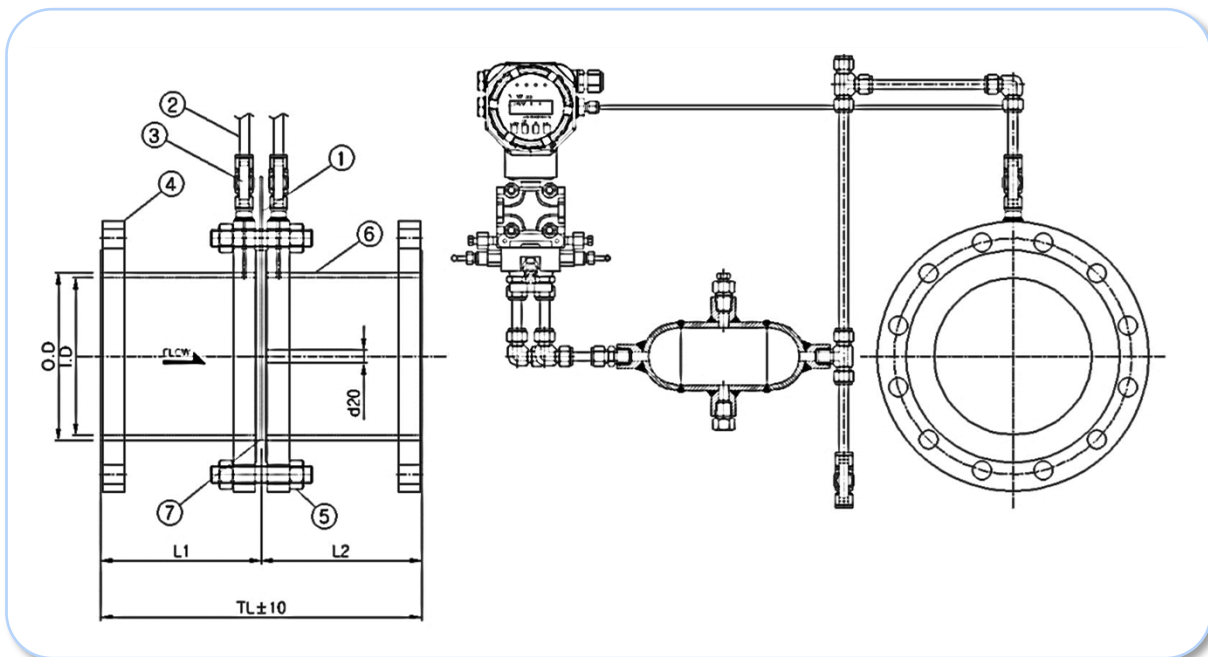
## DP-Mass Flow Meter(KC-7730 Series)

### Dimensional & Chart & Installation : General type



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

### Dimensional & Chart & Installation : High Temp'

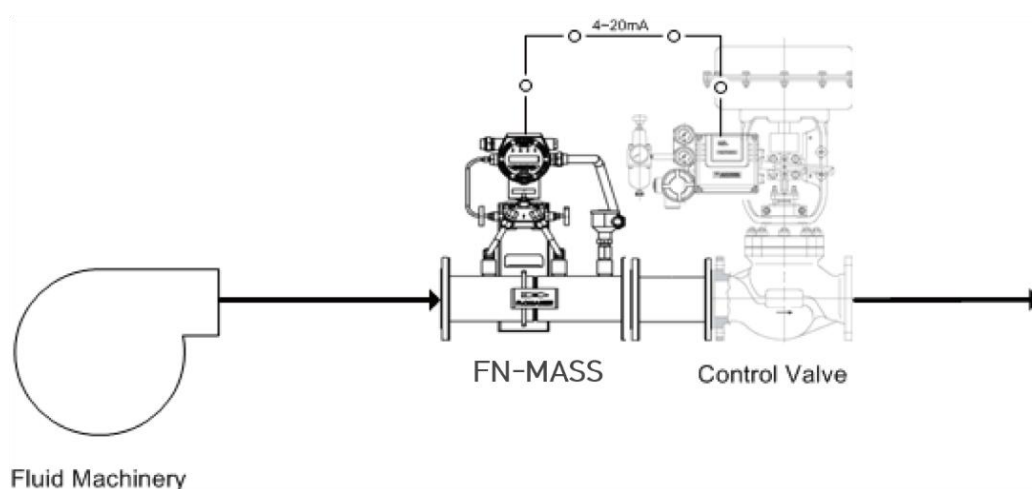


| Size       | H   | TL(L1+L2) |
|------------|-----|-----------|
| 15A ~ 500A | 750 | 800       |

## DP-Mass Flow Meter(KC-7730 Series)

The DP-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

| Straight Pipe Length Requirements at 1 atm |                                  |               |                  |
|--------------------------------------------|----------------------------------|---------------|------------------|
| Piping condition                           | KC-7730L Smart- IN <sup>TM</sup> |               | 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              |

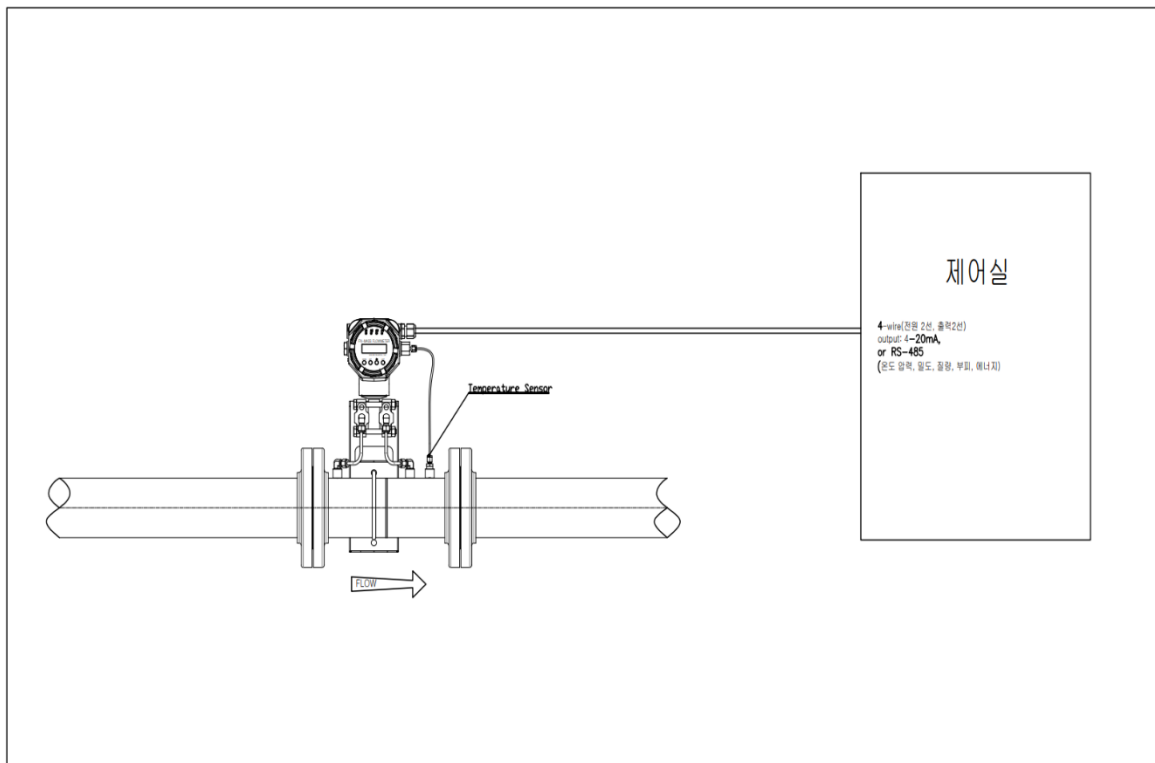
#### Note :

- (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.

## DP-Mass Flow Meter(KC-7730 Series)

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

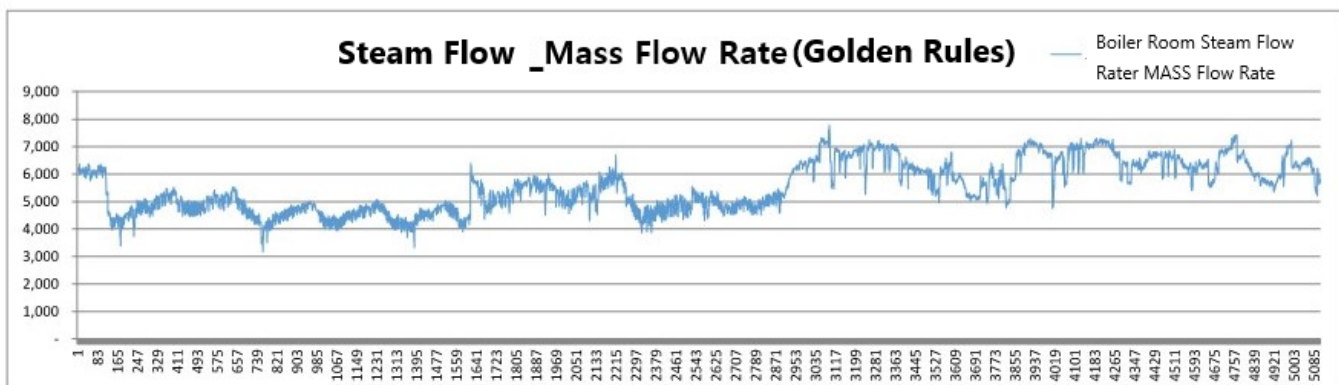
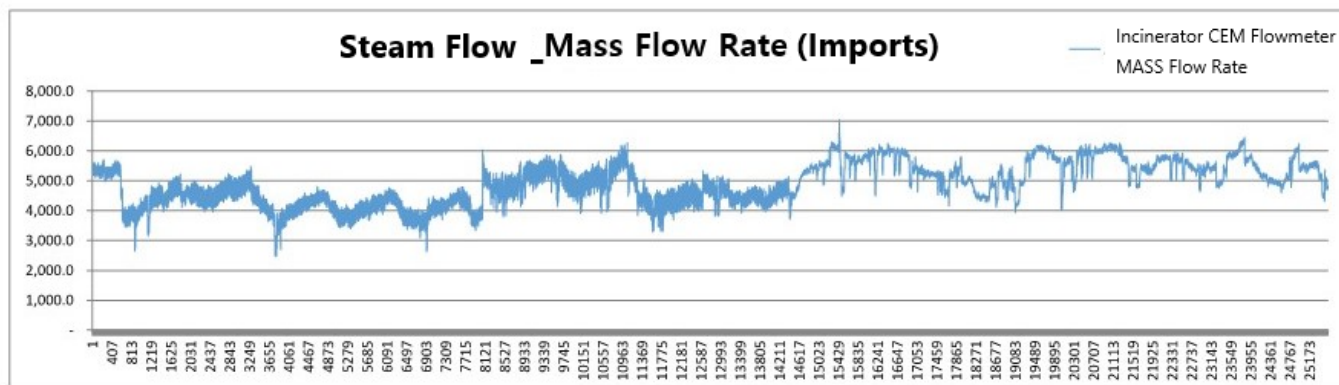
1. Significantly reduced installation construction cost.
2. Since it is a direct type FN mass flow meter, the accuracy is much higher than the existing differential pressure type ( $\pm 0.1\%$  F.S)
3. Wide range of flow rate when measuring high temperature, high pressure and large flow rate (turndown 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



## DP-Mass Flow Meter(KC-7730 Series)

### ◆ Steam Flowmeter Comparison Date

Steam Flowmeter Comparison Date (23.03.01 00:00~23.03.20 10:00) 173°C/7.5bar/200A



## DP-Mass Flow Meter(KC-7730 Series)

### Order Code

**Type**   **Conn' Size**   **Body**   **Power**   **Output**   **Display**   **Direc.**   **Press'**   **Option**  
**KC-7730**  -  -  - **P** - **V** -  -  -  -   
**1**   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**   **11**   **12**

| Type    | Code 1 |
|---------|--------|
| Liquid  | L      |
| Gas     | G      |
| Steam   | S      |
| Bio Gas | B      |

| Connection                          | Code 2    |
|-------------------------------------|-----------|
| Thread                              | T         |
| Tri-clamp                           | C         |
| Lok Fitting                         | L         |
| DIN / ANSI / JIS Flange             | D / A / J |
| Agency approved, customer specified | W         |

| Size          | Code 3 |
|---------------|--------|
| 1/2" (DN15)   | 1      |
| 3/4" (DN20)   | 2      |
| 1" (DN25)     | 3      |
| 1-1/2" (DN40) | 4      |
| 2" (DN50)     | 5      |
| 2-1/2" (DN65) | 6      |
| 3" (DN80)     | 7      |
| 4" (DN100)    | 8      |
| 5" (DN125)    | 9      |
| 6" (DN150)    | 10     |
| 8" (DN200)    | 11     |
| 10" (DN250)   | 12     |
| 12" (DN300)   | 13     |

| Body1                | Code 4 |
|----------------------|--------|
| General Type         | G      |
| Explosion-Proof Type | E      |

| Body2                               | Code 5 |
|-------------------------------------|--------|
| Integral type                       | 1      |
| Remote type                         | 2      |
| Agency approved, customer specified | W      |

| Body3 | Code 6 |
|-------|--------|
| IP66  | 1      |
| IP67  | 2      |

| Input Power                         | Code 7 |
|-------------------------------------|--------|
| DC 24V                              | 2      |
| AC 220V                             | 3      |
| Agency approved, customer specified | W      |

| Output                              | Code 8 |
|-------------------------------------|--------|
| DC 4~20 mA, Pulse active, RS-485    | 1      |
| Agency approved, customer specified | W      |

| Display                             | Code 9 |
|-------------------------------------|--------|
| No Readout                          | NR     |
| Digital Display                     | DD     |
| Agency approved, customer specified | W      |

| Flow Direction                      | Code 10 |
|-------------------------------------|---------|
| Horizontal / Left -> Right          | 1       |
| Horizontal / Right -> Left          | 2       |
| Vertical / Lower -> Upper           | 3       |
| Vertical / Upper -> Lower           | 4       |
| Agency approved, customer specified | W       |

| Pressure Range                      | Code 11 |
|-------------------------------------|---------|
| Low Pressure (Max. 10 bar)          | L       |
| Medium Pressure (Max. 30 bar)       | M       |
| High Pressure (Max. 200 bar)        | H       |
| Agency approved, customer specified | W       |

| Option                              | Code 12 |
|-------------------------------------|---------|
| FN Sensor Mat'l : 316SS, 316LS S    | FM      |
| DP Sensor Mat'l : 316LSS            | DM      |
| High Press. (max.50 Bar)            | HP      |
| Agency approved, customer specified | W       |

## DP-Mass Flow Meter(KC-7730 Series)

### FLOW MEASUREMENT PRINCIPLE

#### ■ D/P type

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

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

**Absolute pressure and differential pressure sensor:** STS316, STS316L

**Temperature sensor :** RTD Pt100 (3-wire)



**NEW KC-7730 Series Measurement Sensor**

Golden Rule's unique DP-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, V-Cone 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.

## DP-Mass Flow Meter(KC-7730 Series)

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

### Gas expansion coefficient

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

$\kappa$  = isentropic exponent

$\tau$  = pressure ratio

$\beta$  = 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[m<sup>3</sup>/s]

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

$\Delta p$  = differential pressure[Pa]

## DP-Mass Flow Meter(KC-7730 Series)

### ◆Simply select to suit the application

| Application           | Type               |            | Mass Flowmeter                   |                                 |
|-----------------------|--------------------|------------|----------------------------------|---------------------------------|
|                       |                    |            | FN-MASS FLOWMETER                |                                 |
| Object of Measurement | Liquid             |            | ○                                |                                 |
|                       | Gas                |            | ○                                |                                 |
|                       | Vaper              |            | ○                                |                                 |
|                       | steam              |            | ○                                |                                 |
| Application           | control            |            | ○                                |                                 |
|                       | Monitor            |            | ○                                |                                 |
|                       | Supply             |            | ○                                |                                 |
| Operating condition   | Temperature        |            | Gas                              | – 40 to 100°C<br>(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 200 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                     |

## DP-Mass Flow Meter(KC-7730 Series)

### Delivery performance ~ 388 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 (Gupyeong 2nd Factory)                   | FN-MASS KC-7730A, Compressed Air                                                      |
| Korea Institute of Machinery and Materials | Cheonan, Chungcheongnam-do (Puritech)          | KC-7730G-FM153BEx, 40A, O <sub>2</sub> 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-H <sub>2</sub> 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, H <sub>2</sub> 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 O <sub>2</sub> -65A, N <sub>2</sub> -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>                                 |

## DP-Mass Flow Meter(KC-7730 Series)

| Client                                                            | Enduser                                                                          | Model                                                                                                            |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| INFORAD CO.,LTD.                                                  | Korea Energy Research Institute<br>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<br>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><br>O2-65A, N2-32A                                                          |
| Energy Technology Evaluation Institute                            | Ammonia decomposition hydrogen production purification system                    | FN MASS KC-7730OP-FM153B ~ <b>2EA</b><br>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><br>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<br>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<br>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<br>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><br>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<br>~ <b>2EA</b>                                                      |
| LG Energy Solution                                                | Danil Gaschem Co., Ltd.,<br>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<br>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,<br>20°C, 250Bar                                                      |
| Ulsan Sewage Treatment Plant                                      | For precise steam line measurement                                               | KC-7730S-FM153BEx, Steam, 50A, 1~10Ton/h,<br>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,<br>50A, 20-200Nm3/h ~ <b>2EA</b><br>100A, 28~280Nm3/h ~ <b>1EA</b> |
| Hyundai Motor                                                     | Hydrogen equipment, for precise measurement of hydrogen gas                      | KC-7730H-FM153BEx, 10A, H2 GAS, 5000SLPM<br>-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<br>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~<br><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,<br>100A, 10-300Nm3/h ~ <b>3EA</b>                                  |
| KEPCO Research Institute                                          | For hydrogen generator measurement                                               | KC-7730H-FM153B,20A-20Nm3/h,100Nm3/h,40-<br>90°C,9.7Bar, 15A-140Nm3/h, 100°C, 200Bar ~ <b>3EA</b>                |

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**KC Q ISO 9001 : 2015**

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