

## TH Series THERMAL FLOWMETER

### GENERAL

**TH series THERMAL FLOWMETER** is a flowmeter for gas flow measurement. Based on Tokyo Keiso's original theory and measuring principle, the velocity of various kinds of gases are measured by thermal principle. **TH** can cover from very slow velocity to high velocity that offers very wide range ability compared to other methods of velocity detection of Orifice, Vortex etc.

Various types of detectors and converters are available to meet variety of applications and functional requirements.

### FEATURES

- High accuracy  
The flow rate of various gases can be measured at high accuracy of  $\pm 1.0\%$  F.S.\*1 based on our theory.
- Wide rangeability  
Accurate measurement in practical use at the flow rate as low as 0.5 m/sec. solving the difficulties in measuring gas flow with orifices or vortex flowmeters.
- Extremely low pressure loss  
The thin cylindrical shape of sensor is effective in minimising line pressure loss.
- Long life  
Long term running is guaranteed by the provision of a detector without moving parts and of a converter with a highly reliable circuit.
- Less influence from pressure fluctuation  
Thanks to basic operational principle, TH Thermal Flowmeter is less influenced from by a change of a pressure of the gas.
- Less influence from gas temperature fluctuation  
In normal usage, gas temperature fluctuation may cause such slight change on output as to be negligible and may be ignored. When gas temperature varies widely during operation and very accurate flow rate is required, temperature compensation function is available.  
(Not applicable for TR-1000 converter)
- Mass flow  
Mass flow is obtained by measuring gas temperature and computing it by temperature compensation circuit.
- Applicable to various kinds of gases  
Based on well analyzed heat conduction mechanism of thin metal tube, applications for gases do not require actual flow rate calibration so long as the physical characteristics are properly specified.
- Cost effectiveness  
Even in large pipe size application, the only price increasing factor is thin lead pipes of the detector, So the instrument, as a whole, provides excellent cost effectiveness.
- Wide variation of converter unit  
To meet applications and requirements, 4 different types of converter unit are ready to choose.
- High and low temperature version  
This version is available for the measurement of gases from  $-196^{\circ}\text{C}$  to  $+550^{\circ}\text{C}$ .  
Namely, this flowmeter can be used for the applications with which the conventional one could not comply.














### RECOMMENDED APPLICATION

- Semiconductor Gas supply lines
- Medical Oxygen supply facilities
- Air conditioning
- Utility Gas supply lines in industries
- High Temperature Dry Air lines
- Combustion Gas lines
- Low Pressure and Low Velocity Gas lines
- Incineration Facilities lines
- Electric Power Plant lines
- Flow Rate Measurement System for Automobile Examination lines
- Other Gas supply applications

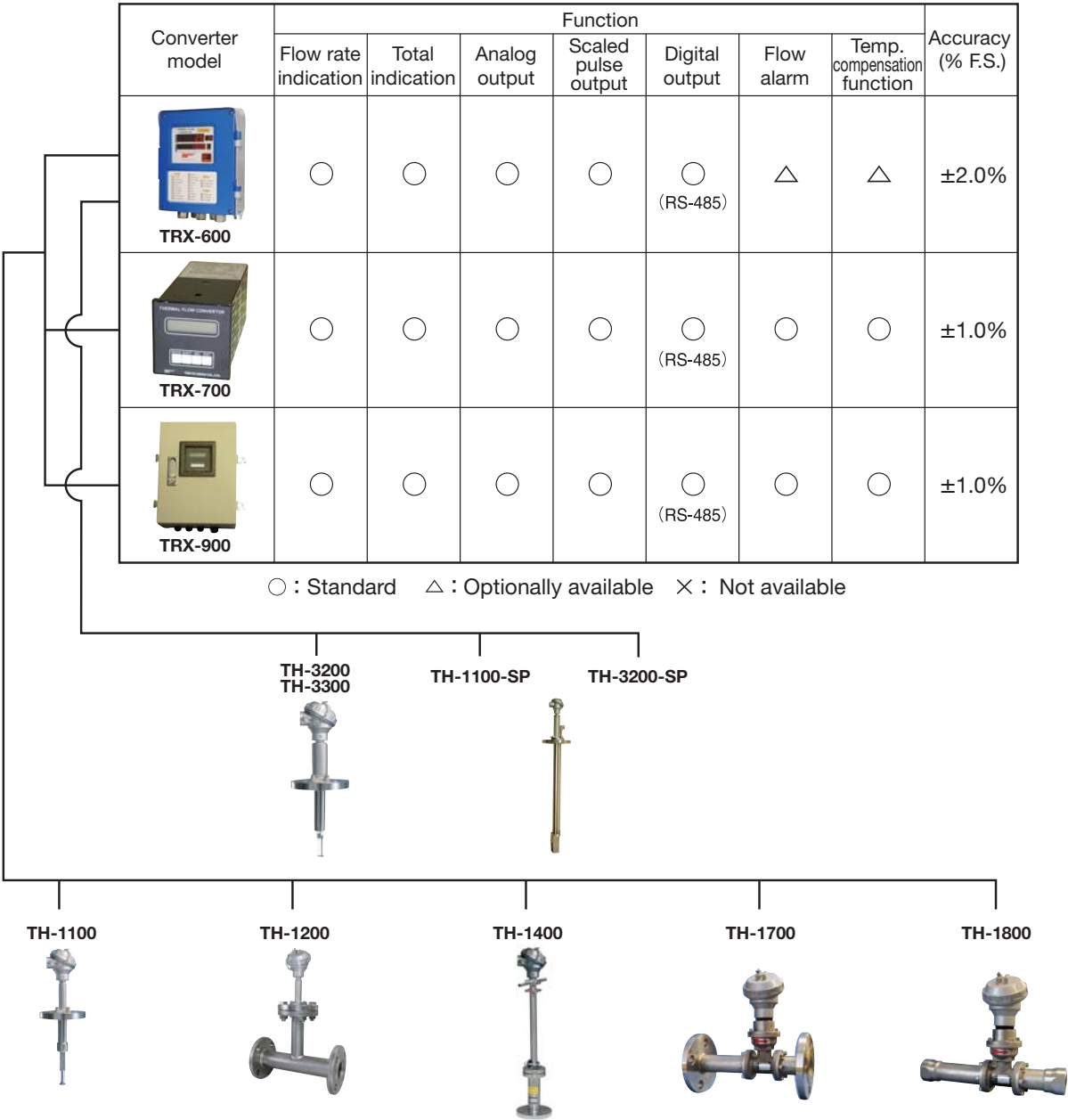
\*1 Accuracy of some converters are  $\pm 2.0\%$  F.S.

**LINE UP OF TH THERMAL FLOWMETERS**

Widely prepared Line-up of **TH** Thermal Flowmeters covers various applications and requirements.

|   |  |
|---|--|
| <p><b>GENERAL PURPOSE SENSORS</b></p> <p>Air conditioning, general utility, Oxygen line for medical applications.....Different types of sensors are ready.</p>  | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><b>TH-1100</b><br/>Insertion type</p> </div> <div style="text-align: center;">  <p><b>TH-1200</b><br/>Flange type</p> </div> <div style="text-align: center;">  <p><b>TH-1400</b><br/>Variable Length<br/>Insertion type</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p><b>TH-1700</b><br/>Small sized</p> </div> <div style="text-align: center;">  <p><b>TH-1800</b><br/>Built-in Straightener type</p> </div> </div> |
| <p><b>SENSOR WITH PURGE FUNCTION</b></p> <p>Suitable for the lines of incineration plant, and various flow rate measurements under the dust condition.</p>  | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><b>TH-1100-SP</b><br/>Insertion type<br/>(Max. Temp. 240°C)</p> </div> <div style="text-align: center;">  <p><b>TH-3200-SP</b><br/>Insertion type<br/>(Max. Temp. 360°C)</p> </div> </div>  |
| <p><b>HIGH AND LOW TEMP VERSION</b></p> <p>Special version for measurement of extremely low temperature gases and of very high temperature gases mainly in drying application. Low temp. version covers upto minus 196C and High temp. version covers upto plus 550C.</p> | <div style="text-align: center;">  <p><b>TH-3200, TH-3300</b><br/>Insertion type</p> </div>   |
| <p><b>CONVERTERS FOR GENERAL PURPOSE SENSORS AND HIGH QUALITY SENSORS</b></p> <p>General type and Intelligent type, Panel mount type and Field mount type. You can select any one of them which meets your requirement.</p>   | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><b>TRX-600</b><br/>General, Field mount</p> </div> <div style="text-align: center;">  <p><b>TRX-700</b><br/>Intelligent, Panel mount</p> </div> </div> <div style="text-align: center; margin-top: 20px;">  <p><b>TRX-900</b><br/>Intelligent, Field mount</p> </div>   |

COMBINATION EXAMPLES



OPERATION PRINCIPLE

When a heated metallic tubule is located in a gas flow path, the heat of the tubule is removed by the velocity. The lost heat is described by the following formula:

$$H = f(\rho U \times \Delta T)$$

Where **H** : Lost heat     $\rho$  : Density  
**U** : Velocity     $\Delta T$  : Difference of temperature gas and heated tubule

On the contrary, the generated heat on the tubule is described by the function of supplied voltage and current onto the tubule,

$$W = f(V \times I)$$

Where **W** : Generated heat  
**V** : Supplied voltage    **I** : Supplied current

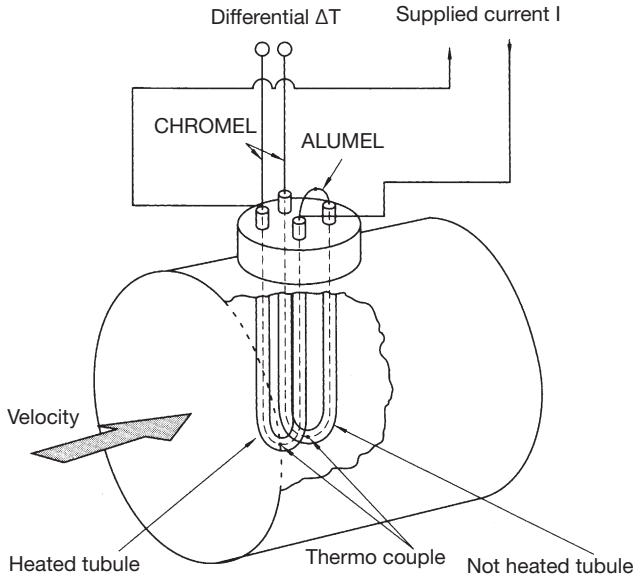
When the heated tubule is in balanced condition, the lost heat and generated heat are equal, and if the  $\Delta T$  is controlled electrically, the velocity is calculated from the figures of supplied voltage and current

$$\rho U = f(V \times I)$$

The total flow rate is calculated from the velocity and the cross section area of flow path:

$$Q = \rho U \times A$$

Where **Q** : Flow rate    **U** : Average velocity  
**A** : Cross section area of flow path



FOR GENERAL PURPOSE

TH-1100

OUTLINE

TH-1100 is an insertion type detector of light weight and small size for easy installation.

Low cost measurement possible even for large size line. Besides normal pipe line, gas flow measurement in square duct also possible.

MODEL CODE

| TH-11                | Model code |   |   |   |        | Description  |
|----------------------|------------|---|---|---|--------|--|
|                      | ①          | ② | ③ | ④ | ⑤      |  |
| ① Process pipe size  | 5          |   |   |   |        | 50 mm (2")   |
|                      | 6          |   |   |   |        | 65 mm (2-1/2")   |
|                      | 7          |   |   |   |        | 80 mm (3")   |
|                      | 8          |   |   |   |        | 100 mm (4")  |
|                      | 9          |   |   |   |        | 125 mm (5")  |
|                      | A          |   |   |   |        | 150 mm (6")  |
|                      | B          |   |   |   |        | 200 mm (8")  |
|                      | C          |   |   |   |        | 250 mm (10")   |
|                      | D          |   |   |   |        | 300 mm (12")   |
|                      | E          |   |   |   |        | 350 mm (14")   |
| F                    |            |   |   |   | Others |  |
| ② Sensor material    | 1          |   |   |   |        | SUS304   |
|                      | 2          |   |   |   |        | SUS316   |
|                      | 3          |   |   |   |        | SUS316L  |
|                      | F          |   |   |   |        | Special  |
| ③ Process connection | 1          |   |   |   |        | 32A JIS10K flange  |
|                      | 2          |   |   |   |        | 1-1/4" ANSI 150 flange   |
|                      | F          |   |   |   |        | Others   |
| ④ L length           | 1          |   |   |   |        | Standard   |
|                      | F          |   |   |   |        | Special  |
| ⑤ Special            |            |   |   | W |        | Terminal box type<br>(Make it blank if in case of connector type.) |
|                      |            |   |   | E |        | EP grade: Electrolytic polishing<br>(Except sensor part)           |
|                      |            |   |   | B |        | BA grade: Electrolytic polishing<br>(Except sensor part)           |
|                      |            |   |   | C |        | Connector type (For built-in type)                                 |

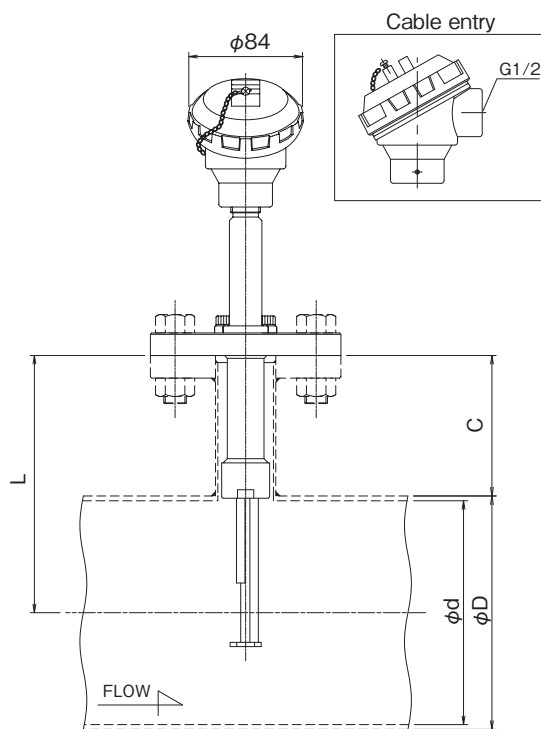
STANDARD SPECIFICATION

|   |   |                          |
|---|---|--------------------------|
| Type  | Insertion type<br>(Std. 32 mm JIS10K flange)                              |                          |
| Available size                                  | 50 mm (2") to 1500 mm (60")<br>* Up to 1500 mm size available on request. |                          |
| Measuring range                                 | Min.  | Air : 0 to 0.5 m/s (nor) |
|   | Max.  | Air : 0 to 130 m/s (nor) |
| Max. Op. Press                                  | 1.0 MPa   |                          |
| Max. Op. Temp. segment                          | 80°C / 180°C / 240°C  |                          |
| Material  | Sensor  | SUS316                   |
|   | Detector  | SUS304, SUS316, SUS316L  |
|   | Seal  | FPM, Others Construction |
| Water proof                                     | IP65 equiv.   |                          |
| Required upstream straight run (Recommendation) | 20D (D: Inside diameter)  |                          |

Note: No cable gland is attached. Provide cable glands suitable for the cable of 12 mm in diameter.



DIMENSION



| Process pipe size (mm) | L (mm)                      |
|------------------------|-----------------------------|
| 50 to 150              | 182                         |
| 200 to 250             | 200                         |
| 300 to 350             | 250                         |
| More than 400          | Consult factory for details |

Note:

- In case of the dimension except our standard one, advise us of therequired dimension for "L" or "C".
- Advise us of the dimension for "phi d" and "phi D".

## TH-1200

### OUTLINE

TH-1200 is a flange connected detector.  
Perfect fit on process piping.  
6 sizes from 50 mm to 150 mm available.  
The temperature well (protective tube) will be provided with a temperature sensor when electrolytic polishing inside nozzle is required.

### MODEL CODE

| TH-12                | Model code |   |   |   | Description   |
|----------------------|------------|---|---|---|---|
|                      | ①          | ② | ③ | ④ |   |
| ① Process pipe size  | 5          |   |   |   | 50 mm (2")  |
|                      | 6          |   |   |   | 65 mm (2-1/2")  |
|                      | 7          |   |   |   | 80 mm (3")  |
|                      | 8          |   |   |   | 100 mm (4")   |
|                      | 9          |   |   |   | 125 mm (5")   |
|                      | A          |   |   |   | 150 mm (6")   |
| ② Sensor material    | 1          |   |   |   | SUS304  |
|                      | 2          |   |   |   | SUS316  |
|                      | 3          |   |   |   | SUS316L   |
|                      | F          |   |   |   | Special   |
| ③ Process connection |            | 3 |   |   | JIS10K flange   |
|                      |            | 4 |   |   | ANSI 150 flange   |
|                      |            | F |   |   | Others  |
| ④ Special **         |            |   | W |   | Terminal box type (Make it blank if in case of connector type.) |
|                      |            |   | S |   | With straightener built in                                      |
|                      |            |   | E |   | EP grade: Electrolytic polishing (Except sensor part)           |
|                      |            |   | B |   | BA grade: Electrolytic polishing (Except sensor part)           |
|                      |            |   | T |   | With tap for thermometer installation (Rc1/8)                   |
|                      |            |   | C |   | Connector type (For built-in type)                              |

\* Protective tube comes with a thermometer mounting seat of electrolytic polishing  
\*\* For example, the model code with "a built-in straightener", "EP grade" and "a temperature nozzle" is "TH-12□□□-□WEST." products.

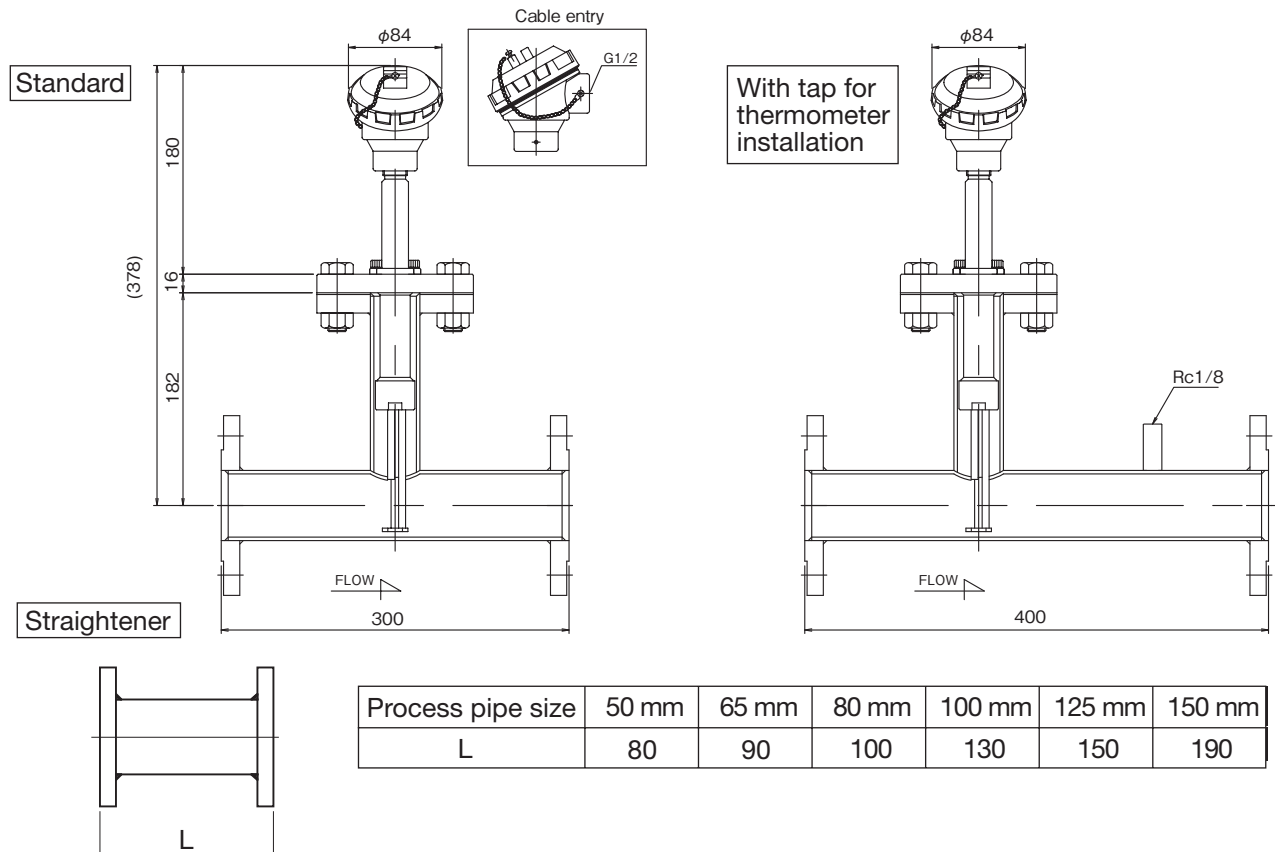


### STANDARD SPECIFICATION

|   |   |  |
|---|---|--|
| Type  | Flange ended                                    |  |
| Available size                                  | 50 mm (2") to 150 mm (6")                       |  |
| Measuring range                                 | Min.  | Air : 0 to 0.5 m/s (nor)   |
|   | Max.  | Air : 0 to 130 m/s (nor) (Without straightener)<br>Air : 0 to 40 m/s (nor) (With straightener) |
| Max. Op. Press.                                 | 1.0 MPa   |  |
| Max. Op. Temp. segment                          | 80°C / 180°C                                    |  |
| Material  | Sensor  | SUS316   |
|   | Detector  | SUS304, SUS316, SUS316L  |
|   | Seal  | FPM, Others Construction   |
| Water proof                                     | IP65 equiv.                                     |  |
| Required upstream straight run (Recommendation) | 20D (Without straightener) (D: Inside diameter) |  |
|   | 3D to 5D (With straightener)                    |  |

Note: No cable gland is attached. Provide cable glands suitable for the cable of 12 mm in diameter.

### DIMENSION



## TH-1400

### OUTLINE

TH-1400 is a variable length insertion detector provided for checking flow profile in pipe line. Gate valve (customer's supply) can be added for easy maintenance without interrupting process operation.

### MODEL CODE

| TH-14                | Model code |   |   |   |        | Description   |
|----------------------|------------|---|---|---|--------|---|
|                      | ①          | ② | ③ | ④ | ⑤      |   |
| ① Process pipe size  | 5          |   |   |   |        | 50 mm (2")  |
|                      | 6          |   |   |   |        | 65 mm (2-1/2")  |
|                      | 7          |   |   |   |        | 80 mm (3")  |
|                      | 8          |   |   |   |        | 100 mm (4")   |
|                      | 9          |   |   |   |        | 125 mm (5")   |
|                      | A          |   |   |   |        | 150 mm (6")   |
|                      | B          |   |   |   |        | 200 mm (8")   |
|                      | C          |   |   |   |        | 250 mm (10")  |
|                      | D          |   |   |   |        | 300 mm (12")  |
|                      | E          |   |   |   |        | 350 mm (14")  |
| F                    |            |   |   |   | Others |   |
| ② Sensor material    | 1          |   |   |   |        | SUS304  |
|                      | 2          |   |   |   |        | SUS316  |
|                      | 3          |   |   |   |        | SUS316L   |
|                      | F          |   |   |   |        | Special   |
| ③ Process connection | 1          |   |   |   |        | 40A JIS10K flange   |
|                      | 2          |   |   |   |        | 1-1/2" ANSI 150 flange  |
|                      | F          |   |   |   |        | Others  |
| ④ L length           | 1          |   |   |   |        | Standard  |
|                      | F          |   |   |   |        | Special   |
| ⑤ Special            |            |   |   |   |        | Standard type (Blank)   |
|                      |            |   |   |   | W      | Terminal box type (Make it blank if in case of connector type.) |
|                      |            |   |   |   | E      | EP grade: Electrolytic polishing (Except sensor part)           |
|                      |            |   |   |   | B      | BA grade: Electrolytic polishing (Except sensor part)           |

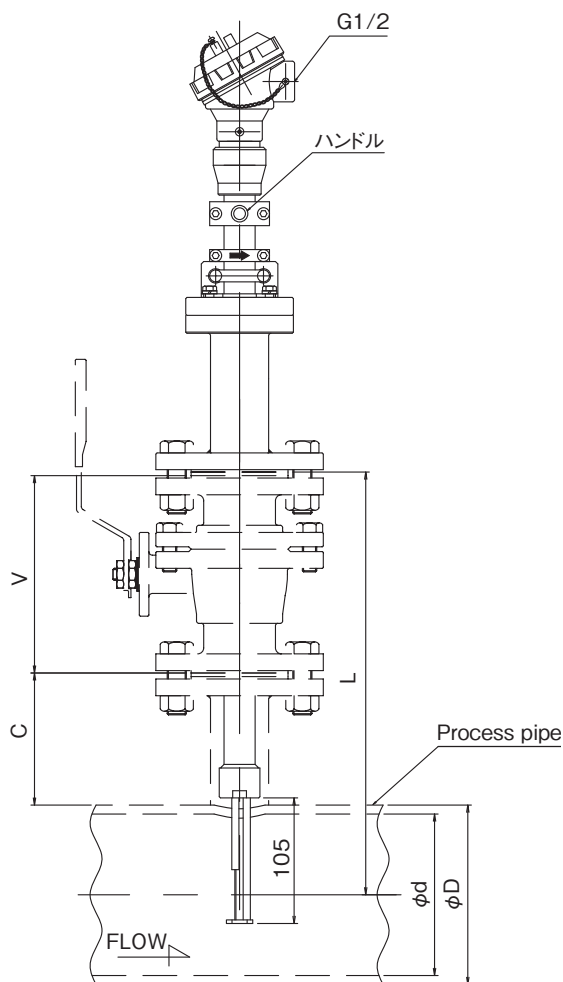
### STANDARD SPECIFICATION

|  |   |                          |
|--|---|--------------------------|
| Type   | Insertion type<br>(Std. 40 A JIS10K flange)                               |                          |
| Available size                                     | 50 mm (2") to 1500 mm (60")<br>* Up to 1500 mm size available on request. |                          |
| Measuring range                                    | Min.  | Air : 0 to 0.5 m/s (nor) |
|  | Max.  | Air : 0 to 130 m/s (nor) |
| Max. Op. Press.                                    | 1.0 MPa   |                          |
| Max. Op. Temp. segment                             | 80°C / 180°C  |                          |
| Material   | Sensor  | SUS316                   |
|  | Detector  | SUS304, SUS316, SUS316L  |
|  | Seal  | FPM, PTFE Others         |
| Water proof  | IP65 equiv.   |                          |
| Required upstream straight run<br>(Recommendation) | 20D (D: Inside diameter)  |                          |

Note: No cable gland is attached. Provide cable glands suitable for the cable of 12 mm in diameter.



### DIMENSION



| Process pipe size (mm) | L (mm)                      |
|------------------------|-----------------------------|
| 50 to 150              | 182                         |
| 200 to 250             | 200                         |
| 300 to 350             | 250                         |
| More than 400          | Consult factory for details |

Note:

- In case of the dimension except our standard one, advise us of the required dimension for "L" or "C".
- Advise us of the dimension "V" for valve if it is used.

# TH-1700

## OUTLINE

TH-1700 series can be manufactured from the nominal diameter 15 mm to 50 mm.  
The process connection is only flange connection type.  
5 sizes from 15 mm to 50 mm available.  
The temperature well (protective tube) will be provided with a temperature sensor when electrolytic polishing inside nozzle is required.



## MODEL CODE

| TH-17                   | Model code |   |   |   |   | Description  |
|-------------------------|------------|---|---|---|---|--|
|                         | ①          | ② | ③ | ④ | ⑤ |  |
| ① Process pipe size     | 1          |   |   |   |   | 15 mm (1/2")   |
|                         | 2          |   |   |   |   | 20 mm (3/4")   |
|                         | 3          |   |   |   |   | 25 mm (1")   |
|                         | 4          |   |   |   |   | 40 mm (1 1/2")   |
|                         | 5          |   |   |   |   | 50 mm (2")   |
| ② Operating Temp. range | 1          |   |   |   |   | Std. / Temp. range (0 to 80°C)                                 |
|                         | 2          |   |   |   |   | High Temp. / Temp. range (0 to 180°C)                          |
|                         | 7          |   |   |   |   | Low Temp. / Protected against dew condensation (-20 to + 80°C) |
| ③ Sensor material       |            | 4 |   |   |   | SUS304 / SCS14   |
|                         |            | 5 |   |   |   | SUS316 / SCS14   |
|                         |            | 6 |   |   |   | SUS316L / SCS16  |
| ④ Process connection    |            |   | 1 |   |   | JIS10K flange  |
|                         |            |   |   | F |   | Others   |
| ⑤ Special               |            |   |   |   |   | Standard type (Blank)  |
|                         |            |   |   | E |   | EP grade: Electrolytic polishing (Except sensor part)          |
|                         |            |   |   | B |   | BA grade: Electrolytic polishing (Except sensor part)          |
|                         |            |   |   | T |   | With tap for thermometer installation (Rc1/8)                  |
|                         |            |   |   | C |   | Connector type (For built-in type)                             |

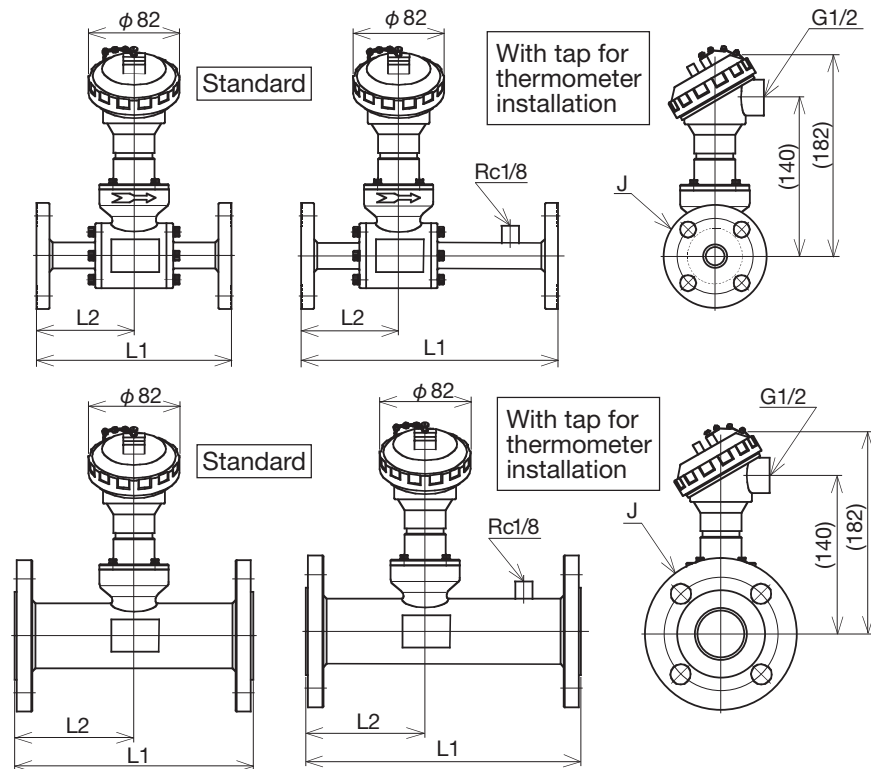
\*Protective tube comes with a thermometer mounting seat of electrolytic polishing products.

## STANDARD SPECIFICATION

|   |                            |                                       |
|---|----------------------------|---------------------------------------|
| Type  | Flange ended               |                                       |
| Available size                                  | 15 mm (1/2") to 50 mm (2") |                                       |
| Measuring range                                 | Min.                       | Air : 0 to 0.5 m/s (nor)              |
|   | Max.                       | Air : 0 to 130 m/s (nor)              |
| Max. Op. Press.                                 | 1.0 MPa                    |                                       |
| Max. Op. Temp. segment                          | 80°C / 180°C               |                                       |
| Material  | Sensor                     | SUS316                                |
|   | Detector                   | SCS14, SCS16, SUS304, SUS316, SUS316L |
|   | Seal                       | FPM, Others Construction              |
| Water proof                                     | IP65 equiv.                |                                       |
| Required upstream straight run (Recommendation) | 20D (D: Inside diameter)   |                                       |

Note: No cable gland is attached. Provide cable glands suitable for the cable of 12 mm in diameter.

## DIMENSION



Standard type

| Size Dimension | L1  | L2  | J                 |
|----------------|-----|-----|-------------------|
| 15 mm          | 180 | 90  | 15A JIS10K flange |
| 20 mm          |     |     | 20A JIS10K flange |
| 25 mm          |     |     | 25A JIS10K flange |
| 40 mm          | 300 | 150 | 40A JIS10K flange |
| 50 mm          |     |     | 50A JIS10K flange |

With tap for thermometer installation type

| Size Dimension | L1  | L2  | J                 |
|----------------|-----|-----|-------------------|
| 15 mm          | 270 | 90  | 15A JIS10K flange |
| 20 mm          |     |     | 20A JIS10K flange |
| 25 mm          |     |     | 25A JIS10K flange |
| 40 mm          | 330 | 150 | 40A JIS10K flange |
| 50 mm          |     |     | 50A JIS10K flange |

## TH-1800

### OUTLINE

TH-1800 has a built-in flow straightener which eliminates the necessity of straight run upstream and downstream.

(Slight pressure loss is created by this built-in flow straightener. Consult factory when process pressure is very low.)

The temperature well (protective tube) will be provided with a temperature sensor when electrolytic polishing inside nozzle is required.



### MODEL CODE

| TH-18                   | Model code |   |   |   |   | Description  |
|-------------------------|------------|---|---|---|---|--|
|                         | ①          | ② | ③ | ④ | ⑤ |  |
| ① Process pipe size     | 1          |   |   |   |   | 15 mm (1/2")   |
|                         | 2          |   |   |   |   | 20 mm (3/4")   |
|                         | 3          |   |   |   |   | 25 mm (1")   |
|                         | 4          |   |   |   |   | 40 mm (1 1/2")   |
|                         | 5          |   |   |   |   | 50 mm (2")   |
| ② Operating Temp. range | 1          |   |   |   |   | Std. / Temp. range (0 to 80°C)                                 |
|                         | 2          |   |   |   |   | Temp. range (0 to 180°C)                                       |
|                         | 7          |   |   |   |   | Low Temp. / Protected against dew condensation (-20 to + 80°C) |
| ③ Sensor material       |            |   | 4 |   |   | SUS304 / SCS14   |
|                         |            |   | 5 |   |   | SUS316 / SCS14   |
|                         |            |   | 6 |   |   | SUS316L / SCS16  |
| ④ Process connection    |            |   | 1 |   |   | JIS10K flange  |
|                         |            |   | 2 |   |   | JIS Rc screw (3/8")  |
|                         |            |   | 3 |   |   | JIS Rc screw (1/2")  |
|                         |            |   | 4 |   |   | JIS Rc screw (3/4")  |
|                         |            |   | 5 |   |   | JIS Rc screw (1")  |
|                         |            |   | F |   |   | Others   |
| ⑤ Special               |            |   |   |   |   | Standard type (Blank)  |
|                         |            |   | E |   |   | EP grade: Electrolytic polishing (Except sensor part)          |
|                         |            |   | B |   |   | BA grade: Electrolytic polishing (Except sensor part)          |
|                         |            |   | T |   |   | With tap for thermometer installation (Rc1/8)                  |
|                         |            |   | C |   |   | Connector type (For built-in type)                             |

\*Protective tube comes with a thermometer mounting seat of electrolytic polishing products.

### STANDARD SPECIFICATION

|   |                               |                                       |
|---|-------------------------------|---------------------------------------|
| Type  | Flange or Screw ended         |                                       |
| Available size                                  | 15 mm (1/2") to 50 mm (2")    |                                       |
| Measuring range                                 | Min.                          | Air : 0 to 0.5 m/s (nor)              |
|   | Max.                          | Air : 0 to 45 m/s (nor)               |
| Max. Op. Press.                                 | 1.0 MPa                       |                                       |
| Max. Op. Temp. segment                          | 80°C / 180°C                  |                                       |
| Material  | Sensor                        | SUS316                                |
|   | Detector                      | SCS14, SCS16, SUS304, SUS316, SUS316L |
|   | Seal                          | FPM, Others Construction              |
| Water proof                                     | IP65 equiv.                   |                                       |
| Required upstream straight run (Recommendation) | 3D to 5D (D: Inside diameter) |                                       |

Note: No cable gland is attached. Provide cable glands suitable for the cable of 12 mm in diameter.

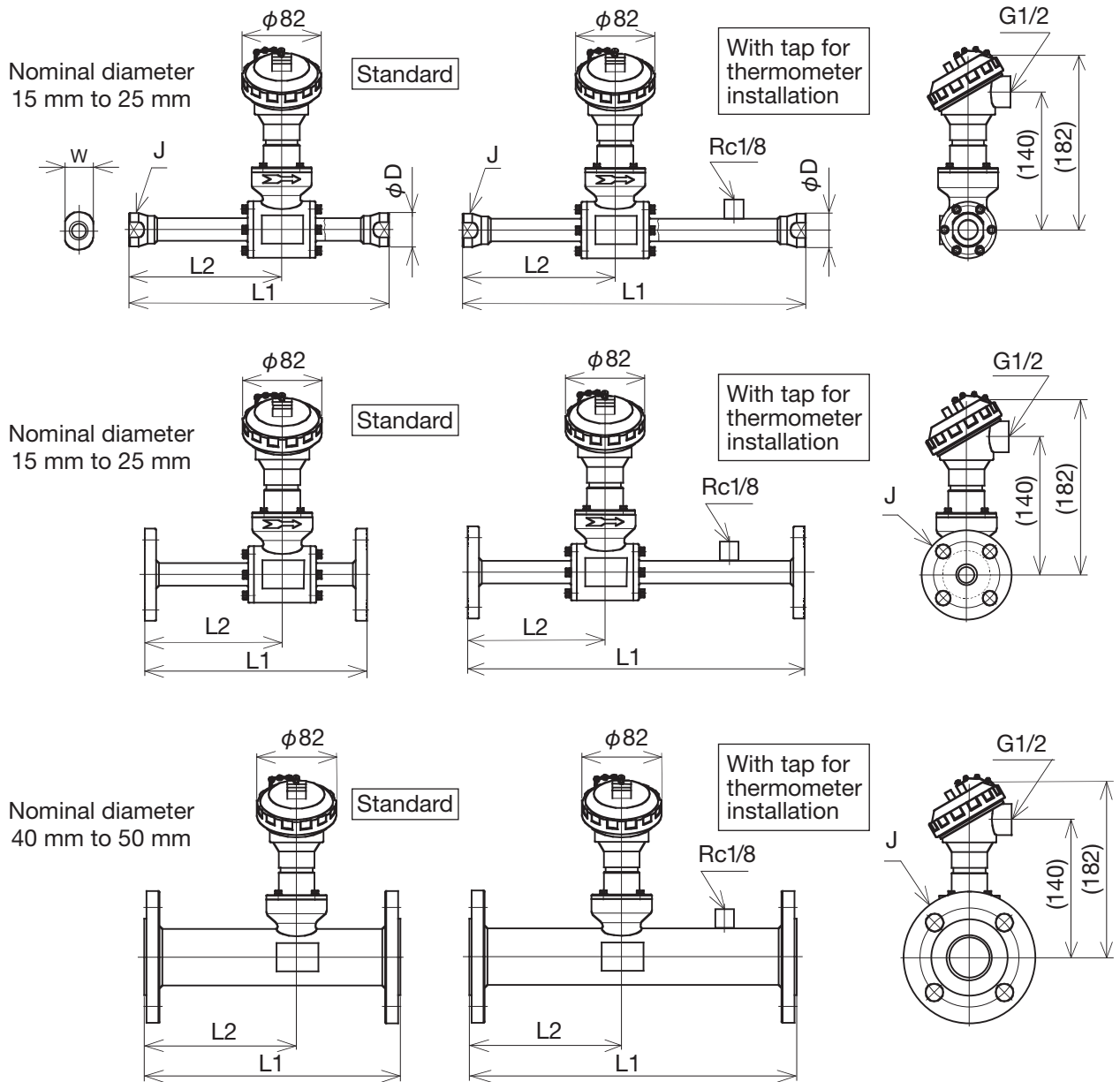
### \*Available process connection and sizes

| Nominal diameter<br>Connection | 15 mm  | 20 mm | 25 mm | 40 mm | 50 mm |
|--------------------------------|--------|-------|-------|-------|-------|
|                                | Flange | ○     | ○     | ○     | ○     |
| Rc3/8                          | ○      | ×     | ×     | ×     | ×     |
| Rc1/2                          | ○      | ○     | ×     | ×     | ×     |
| Rc3/4                          | ×      | ○     | ○     | ×     | ×     |
| Rc1                            | ×      | ×     | ○     | ×     | ×     |

Note) ○ : Producible × : Unproducible



DIMENSION



Standard type

| Dimension | Size |     | J                 | phi D  | W  |
|-----------|------|-----|-------------------|--------|----|
|           | L1   | L2  |                   |        |    |
| 15 mm     | 210  | 105 | Rc3/8 • Rc1/2     | phi 36 | 32 |
|           | 180  | 90  | 15A JIS10K flange | -      | -  |
| 20 mm     | 250  | 145 | Rc1/2 • Rc3/4     | phi 36 | 32 |
|           | 220  | 130 | 20A JIS10K flange | -      | -  |
| 25 mm     | 280  | 170 | Rc3/4 • Rc1       | phi 46 | 41 |
|           | 240  | 150 | 25A JIS10K flange | -      | -  |
| 40 mm     | 280  | 170 | 40A JIS10K flange | -      | -  |
| 50 mm     | 320  | 210 | 50A JIS10K flange | -      | -  |

With tap for thermometer installation type

| Dimension | Size |     | J                 | phi D  | W  |
|-----------|------|-----|-------------------|--------|----|
|           | L1   | L2  |                   |        |    |
| 15 mm     | 300  | 105 | Rc3/8 • Rc1/2     | phi 36 | 32 |
|           | 270  | 90  | 15A JIS10K flange | -      | -  |
| 20 mm     | 340  | 145 | Rc1/2 • Rc3/4     | phi 36 | 32 |
|           | 310  | 130 | 20A JIS10K flange | -      | -  |
| 25 mm     | 370  | 170 | Rc3/4 • Rc1       | phi 46 | 41 |
|           | 330  | 150 | 25A JIS10K flange | -      | -  |
| 40 mm     | 350  | 170 | 40A JIS10K flange | -      | -  |
| 50 mm     | 390  | 210 | 50A JIS10K flange | -      | -  |

## SENSOR WITH PURGE FUNCTION

### TH-1100-SP / TH-3200-SP

#### OUTLINE

TH-1100-SP / TH-3200-SP are the sensors with purge function. Purged gas prevents the dust to the sensor section from adhering and removes the adhered dust, resulting in performing the stable measurement of flow rate.

Note: Regarding the adhesive dust, it may be that the sufficient effect can not be obtained.



#### MODEL CODE

| TH-11<br>TH-32       | Model code |   |   |   |   |     | Description   |
|----------------------|------------|---|---|---|---|-----|---|
|                      | ①          | ② | ③ | ④ | ⑤ | -SP |   |
| ① Process pipe size  | A          |   |   |   |   |     | 150 mm (6")   |
|                      | B          |   |   |   |   |     | 200 mm (8")   |
|                      | C          |   |   |   |   |     | 250 mm (10")  |
|                      | D          |   |   |   |   |     | 300 mm (12")  |
|                      | E          |   |   |   |   |     | 350 mm (14")  |
|                      | F          |   |   |   |   |     | Others  |
| ② Sensor material    | 1          |   |   |   |   |     | SUS304  |
|                      | 2          |   |   |   |   |     | SUS316  |
|                      | 3          |   |   |   |   |     | SUS316L   |
|                      | F          |   |   |   |   |     | Special   |
| ③ Process connection | 1          |   |   |   |   |     | 65A JIS10K flange   |
|                      | F          |   |   |   |   |     | Others  |
| ④ L length           |            | 1 |   |   |   |     | Standard  |
|                      |            | F |   |   |   |     | Special   |
| ⑤ Special            |            |   |   |   |   |     | Standard type (Blank)   |
|                      |            |   |   |   | C |     | Connector type (Make it blank if in case of terminal box type.) |

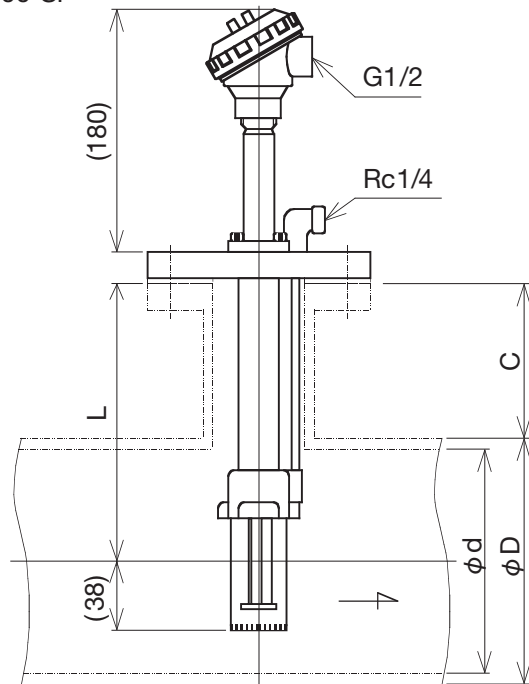
#### STANDARD SPECIFICATION

| Model   | TH-1100-SP   | TH-3200-SP   |
|---|--|--|
| Type  | Insertion type<br>(Std. 65A JIS10K flange)                                 |  |
| Available size                                  | 150 mm (6") to 1500 mm (60")<br>* Up to 1500 mm size available on request. |  |
| Measuring range                                 | Min.   | Air : 0 to 0.5 m/s (nor)    Air : 0 to 5 m/s (nor) |
|   | Max.   | Air : 0 to 75 m/s (nor)                            |
| Max. Op. Press.                                 | 1.0 MPa  | 0.1 MPa  |
| Max. Op. Temp. segment                          | 80°C / 240°C   | 550°C  |
| Material  | Sensor   | SUS316   |
|   | Detector   | SUS304, SUS316, SUS316L                            |
|   | Seal   | FPM, Others  |
| Water proof                                     | IP65 equiv.  |  |
| Required upstream straight run (Recommendation) | 20D (D: Inside diameter)   |  |

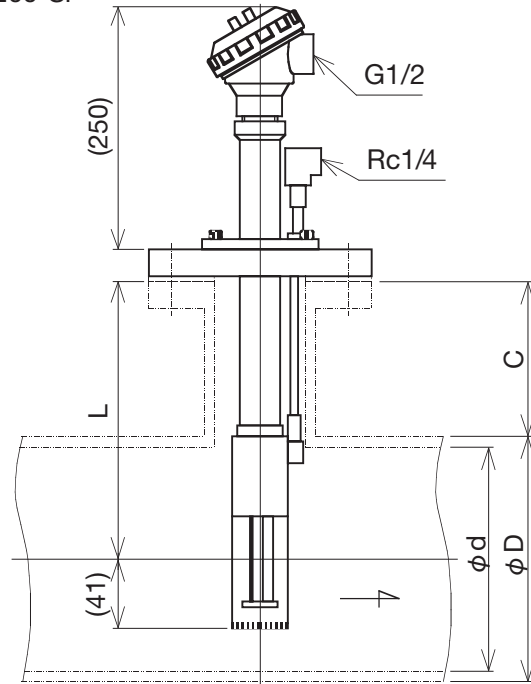
Note: No cable gland is attached. Provide cable glands suitable for the cable of 12 mm in diameter.

#### DIMENSION

TH-1100-SP



TH-3200-SP



| Process pipe size (mm) | L (mm)                      |
|------------------------|-----------------------------|
| 150                    | 182                         |
| 200 to 250             | 200                         |
| 300 to 350             | 250                         |
| More than 400          | Consult factory for details |

Note:

- In case of the dimension except our standard one, advise us of the required dimension for "L" or "C".
- Advise us of the dimension for "φd" and "φD".

## HIGH AND LOW TEMP. VERSION

### TH-3200 / TH-3300

#### OUTLINE

HIGH AND LOW TEMP. VERSION is available for TH series THERMAL FLOWMETER.

Low temp. version covers upto minus 196°C and High temp. version covers upto plus 550°C.

HIGH AND LOW TEMP. VERSION will be used together with TRX-600 type converter.

#### MODEL CODE

| TH-3                 | Model code |   |   |   |   | Description                        |
|----------------------|------------|---|---|---|---|------------------------------------|
|                      | ①          | ② | ③ | ④ | ⑤ |                                    |
| ① Type               | 2          |   |   |   |   | For high temp. Max. 0.1 MPa press. |
|                      | 3          |   |   |   |   | For low temp. Max. 0.1 MPa press.  |
| ② Process pipe size  | 6          |   |   |   |   | 65 mm (2-1/2")                     |
|                      | 7          |   |   |   |   | 80 mm (3")                         |
|                      | 8          |   |   |   |   | 100 mm (4")                        |
|                      | 9          |   |   |   |   | 125 mm (5")                        |
|                      | A          |   |   |   |   | 150 mm (6")                        |
|                      | B          |   |   |   |   | 200 mm (8")                        |
|                      | C          |   |   |   |   | 250 mm (10")                       |
|                      | D          |   |   |   |   | 300 mm (12")                       |
| ③ Sensor material    | E          |   |   |   |   | 350 mm (14")                       |
|                      | F          |   |   |   |   | Others                             |
|                      | 1          |   |   |   |   | SUS304                             |
|                      | 2          |   |   |   |   | SUS316                             |
|                      | 3          |   |   |   |   | SUS316L                            |
|                      | F          |   |   |   |   | Special                            |
| ④ Process connection | 1          |   |   |   |   | Standard                           |
|                      | F          |   |   |   |   | Special                            |
| ⑤ L length           | 1          |   |   |   |   | Standard                           |
|                      | F          |   |   |   |   | Special                            |

#### STANDARD SPECIFICATION

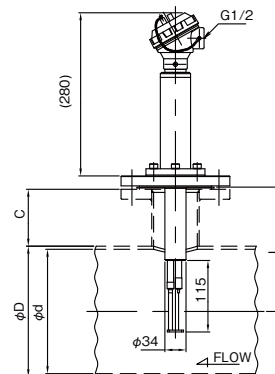
| Model   | TH-3200                                   | TH-3300                     |
|---|---|-----------------------------|
| Type  | Insertion type<br>Std. 32 A JIS10K flange |                             |
| Available size                                  | 65 mm (2-1/2") to 1500 mm (60")           |                             |
| Measuring range                                 | Min.                                      | Air : 0 to 5 m/s (nor)      |
|   | Max.                                      | Air : 0 to 75 m/s (nor)     |
| Max. Op. Press.                                 | 0.1 MPa                                   |                             |
| Max. Op. Temp.                                  | 0 to 550°C (for high temp.)               | -196 to 0°C (for low temp.) |
| Material  | Sensor                                    | SUS316                      |
|   | Detector                                  | SUS304, SUS316, SUS316L     |
| Water proof                                     | IP65 equiv.                               |                             |
| Required upstream straight run (Recommendation) | 20D (D: Inside diameter)                  |                             |

Note: No cable gland is attached. Provide cable glands suitable for the cable of 12 mm in diameter.



#### DIMENSION

- Sensor
- TH-3200 / TH-3300



| Process pipe size(mm) | L (mm)                      |
|-----------------------|-----------------------------|
| 65 to 150             | 182                         |
| 200 to 250            | 200                         |
| 300 to 350            | 250                         |
| More than 400         | Consult factory for details |

#### Note:

- In case of the dimension except our standard one, advise us of the required dimension for "L" or "C".
- Advise us of the dimension for "φ d" and "φ D".

TRX-600

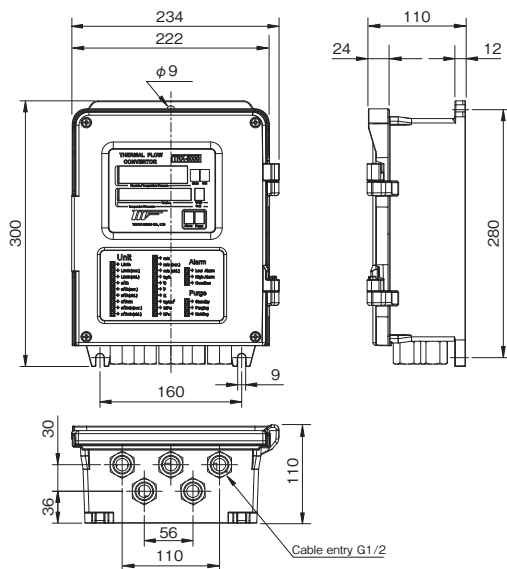
OUTLINE

TRX-600 is the converter designed for the thermal flowmeter of the field installation type in waterproof construction. By having improved the loaded CPU performances, the high precision and high efficiency have been achieved, and most operation factors can be set up or modified by the users, just by the key operation on the front panel. Moreover, the maximum 7 kinds of data are programmable beforehand, and also it is possible to expand the various functions by the optional circuit board.

MODEL CODE

| MODEL CODE                                     |                      | CONTENTS                        |                                 |
|--|----------------------|---------------------------------|---------------------------------|
| TRX-6  | 0 - - - - -          |                                 |                                 |
| Temperature correction (Input signal)          | 0                    |                                 |                                 |
|  | 1                    | Resistance temp.sensor (Pt100Q) |                                 |
|  | 2                    | DC4 to 20mA temp. signal        |                                 |
| Power supply                                   | 1                    | DC1~5V temp.signal              |                                 |
|  | 2                    | AC100V±10%                      |                                 |
|  | 3                    | AC110V±10%                      |                                 |
|  | 4                    | AC115V±10%                      |                                 |
|  | 5                    | AC200V±10%                      |                                 |
|  | 6                    | AC220V±10%                      |                                 |
| Cable length                                   | 1                    | 5m                              |                                 |
|  | 2                    | 10m                             |                                 |
|  | 3                    | 15m                             |                                 |
|  | 4                    | 20m                             |                                 |
|  | 5                    | 25m                             |                                 |
|  | 6                    | 30m                             |                                 |
|  | 7                    | 40m                             |                                 |
|  | 8                    | 50m                             |                                 |
| Cable entry                                    | 1                    | G1/2                            |                                 |
|  | 2                    | Other                           |                                 |
| 2" pipe mount fitting                          | 0                    | Not provided                    |                                 |
|  | 1                    | Provided                        |                                 |
| Optional PCB (Note)                            | Purge control output | 0                               | No purge control                |
|  |                      | 1                               | Open collector input (Standard) |
|  |                      | 2                               | Contact input                   |
| Make it blank in case of no optional function. | Purge output         | 0                               | No purge control                |
|  |                      | 1                               | Contact output                  |
|  | Contact output       | 2                               | AC power supply                 |
|  |                      | 1                               | High and low alarm              |
| For high-current type                          | -H                   | 2                               | High alarm                      |
|  |                      | 3                               | Low alarm                       |
|  |                      | 4                               | Abnormality alarm               |
|  |                      |                                 |                                 |

DIMENSION



STANDARD SPECIFICATION

|                                 |  |   |
|---------------------------------|--|---|
| Connectable detector            | TH-1100(-HQ)/1200/1400/1500-HQ<br>1700/1800/3000/1100-SP/3200-SP   |   |
| Installation                    | Installation on wall or 2" pipe (Option)   |   |
| Protective construction         | Jet-proof type (IP65 equivalent)   |   |
| Accuracy                        | Indication   | ±2.0%F.S.±1digit  |
|                                 | Output   | ±2.0%F.S.   |
|                                 | Integration  | ±2.0%F.S.   |
| Display                         | Upper side   | Selected and displayed by Instantaneous flow and temperature<br>Flow rate: 6-digit LED (0.000 to 99999.9)<br>Temperature: 4-digit LED (-25.0 to 550.0)(※1)  |
|                                 | Lower side   | Selected and displayed by integrated flow and temperature.<br>Integration: 8-digit LED (0.000 to 99999999)<br>Temperature: 4-digit LED (-25.0 to 550.0)(※1) |
|                                 | Lower right  | Displayed on the panel[ALARM]<br>[H] Upper, [L] Lower & [E] Abnormal  |
| Analog output                   | DC4 to 20mA, and allowable load resistance: Less than 500Ω   |   |
| Pulse output                    | Open collector output<br>PhotoMOS relay, DC30V/100mA (Max)   |   |
| Digital output RS-485           | 2400/4800/9600bps (Selectable)<br>ID Address: 0 to 99<br>Protocol: 8N1<br>Output: Instantaneous flow, integrated flow, temperature, and error code         |   |
| Temperature correction function | 3-wire type resistance temp. sensor (Pt100) or temp. sensor with analog output (DC4 to 20mA or DC1 to 5V) is separately required.                          |   |
| Alarm output (Option)           | 1 point out of [H], [L], & [E]<br>SPDT Relay contact output<br>AC240V/0.4A (DC30V/2A)  |   |
| Purge control function (Option) | AC240V/0.4A (DC30V/2A)<br>Valve control output function for purge operation<br>Purge cycle and time settable<br>Output: AC (Input power supply) or contact |   |
| Response speed                  | 3 to 5 sec. (63% Step response)  |   |
| Electric connection             | Pin terminal connector   |   |
| Power supply                    | AC100, 110, 115, 200, 220, 240V ±10%<br>50/60Hz  |   |
| Power consumption               | Approx.30VA  |   |
| Housing                         | Aluminum die-cast / Cobalt blue or Silver  |   |
| Dimension                       | 234W × 300H × 110D (mm)  |   |
| Mass                            | 5.4 kg (Wall mount)<br>7.4kg (2" pipe)   |   |
| Ambient temperature             | -10 to 60°C  |   |
| Ambient humidity                | 10 to 90%RH (No dew condensation)  |   |

※1: The thermometer is separately required for the temperature display.

## TRX-700 / TRX-900

### OUTLINE

TRX-700 / TRX-900 series are an intelligent type converter for thermal flowmeters. High-precision and high-performance capacities have been achieved by the new design of a signal processing circuit mounting double CPU's.

All the operation factors are handled by the operating keys arranged on the front panel that enables to make settings and alterations in a user-friendly way.

Functions necessary for process monitoring and controlling such as flow rate, totalization and alarm output are all installed as the standard specification.

In addition, data processing with a host computer has made available through serial communication with RS-485 interface.

Easy maintenance with self-diagnosis function

DIN96 × 96 compact housing

Two types available

- a) TRX-700 Panel mount type
- b) TRX-900 Field mount type (Water proof housing)

### MODEL CODE

| Model code                            |   |   | Description                           |
|---------------------------------------|---|---|---------------------------------------|
| TRX-                                  | ① | ② ③                                     |                                       |
| ① Type                                | 7 |   | DIN 96 × 96 Panel mount type          |
|                                       | 9 |   | Water proof housing, Field mount type |
| ② Temperature and pressure correction | 0 |   | No correction                         |
|                                       | 1 |   | Temperature correction                |
|                                       | 4 |   | Temp. and Press. correction*          |
| ③ Cable length                        | 1 | 5 m                                     |                                       |
|                                       | 2 | 10 m                                    |                                       |
|                                       | 3 | 15 m                                    |                                       |
|                                       | 4 | 20 m                                    |                                       |
|                                       | 5 | 25 m                                    |                                       |
|                                       | 6 | 30 m                                    |                                       |
|                                       | 7 | 35 m                                    |                                       |
|                                       | 8 | 40 m                                    |                                       |
|                                       | 9 | 45 m                                    |                                       |
|                                       | A | 50 m                                    |                                       |
|                                       | F | 50 m to 100 m *Specify the cable length |                                       |

Note : Select "Temp.and Press.correction" in any of the following cases.  
 • When measuring the actual flow rate (Volume flow rate display in use)  
 • When the process pressure changes by 0.5 MPa or more.

### STANDARD SPECIFICATION

|                                  |  |  |
|----------------------------------|--|--|
| Connectable detector             | TH-1100/1100-HQ/1200<br>1400/1500-HQ/1700/1800   |  |
| Installation                     | TRX-700 : Panel mount type (DIN 96 × 96)<br>TRX-900 : Wall or 2B pipe mount type)  |  |
| Construction                     | TRX-700 : IP20 equiv. (Indoor use)<br>TRX-900 : IP54 equiv. (Field use)  |  |
| Accuracy                         | Analog output  | ±1%F.S. ±1digit (Flow rate)  |
|                                  | Pulse output   | ±1.05%F.S. ±1digit (Totalization)  |
| Analog output                    | DC 4 to 20 mA / Allowable load resistance 500Ω   |  |
| Pulse output                     | Open collector output / DC 35 V/ 50 mA (max.)  |  |
|                                  | Pulse width : 50, 100, 200 msec<br>Pulse rate : 0.0 to 600 c/min<br>0 to 36000 c/h   |  |
| Contact output of alarm          | SPDT relay contact (High alarm/ Low alarm)<br>AC 125 V/0.4 A (DC 20 V/2 A)   |  |
| Digital output (RS-485)          | 1200 / 2400 / 4800 / 9600bps (Selectable)<br>ID address : 00 to 99<br>Protocol : 8N1<br>Output : Flow rate, totalization, bar graph, temp., pressure, heating current, firmware version, serial No., error message, etc. |  |
|                                  | Dot matrix LCD, 16 characters × 2 lines<br>With backlight  |  |
| Indication                       | Upper section  | Select one item from flow rate, totalization, temp., Pressure, heating voltage, internal temp. and SPS ripple, or error message. |
|                                  | Lower section  | Select one item from bar graph, flow rate, Totalization, temp., pressure and heating current, Or error message.                  |
| Maximum number of display digits | Analog output  | 5 digits (0.000 to 99999) (Flow rate)  |
|                                  | Pulse output   | 7 digits (0.00 to 9999999) (Totalization)  |
| Temp. correction function        | 3-wire type resistance temp. sensor (Pt100Ω) is required separately.   |  |
| Pressure correction function     | Pressure gauge with DC 4 to 20 mA analog output is required separately. (Used mainly for indication of actual flow rate.)  |  |
| Response time                    | 3 seconds (63% step response)  |  |
| Dimensions                       | 96 H × 96 W × 243 D (mm)   |  |
| Mass                             | About 1.95 kg  |  |
| Cable length                     | 100 m (max.)   |  |
| Power supply                     | AC 90 to 264 V 50/60 Hz  |  |
| Power consumption                | 60 W (max.)  |  |
| Elect. connection                | Pin terminal connector   |  |
| Ambient temp.                    | 0 to 50°C  |  |
| Ambient humidity                 | 10 to 90% RH (No dew condensation)   |  |



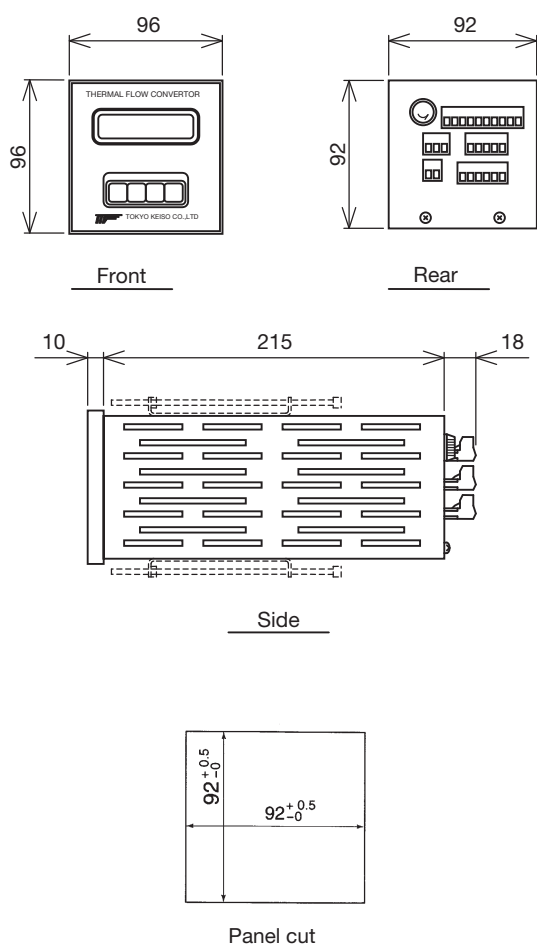
TRX-700



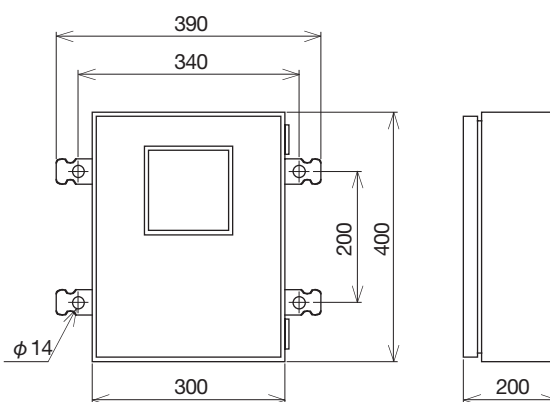
TRX-900

**DIMENSION**

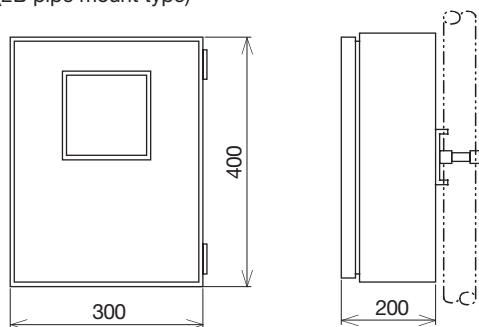
- TRX-700 (Panel mount type)



- TRX-900 (Wall mount type)



- TRX-900 (2B pipe mount type)



FLOW RATE RANGE (Full scale)

TH-1100/TH-1400

Unit : m<sup>3</sup>/h(nor)

| Gas Size | AIR            | N <sub>2</sub> | CO <sub>2</sub> | O <sub>2</sub> | Ar              | 13A            | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> | He           | H <sub>2</sub> |
|----------|----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|-------------------------------|--------------------------------|-----------------|--------------|----------------|
| 50 mm    | 45 to 840      | 45 to 840      | 25 to 1135      | 45 to 820      | 40 to 1675      | 40 to 545      | 50 to 550       | 15 to 540                     | 10 to 440                      | 40 to 800       | 5 to 34      | 5 to 30        |
| 65 mm    | 60 to 1395     | 60 to 1395     | 30 to 1885      | 60 to 1360     | 50 to 2775      | 50 to 905      | 65 to 915       | 20 to 895                     | 10 to 735                      | 55 to 1330      | 7 to 45      | 7 to 39        |
| 80 mm    | 70 to 1965     | 70 to 1965     | 35 to 2655      | 70 to 1915     | 60 to 3915      | 60 to 1275     | 75 to 1290      | 20 to 1260                    | 15 to 1035                     | 65 to 1875      | 10 to 53     | 10 to 47       |
| 100 mm   | 90 to 3385     | 90 to 3380     | 50 to 4570      | 90 to 3295     | 80 to 6735      | 80 to 2195     | 100 to 2220     | 25 to 2170                    | 20 to 1785                     | 85 to 3225      | 17 to 69     | 17 to 62       |
| 125 mm   | 115 to 5155    | 115 to 5145    | 60 to 6955      | 115 to 5020    | 100 to 10250    | 100 to 3340    | 120 to 3380     | 35 to 3305                    | 20 to 2715                     | 105 to 4910     | 26 to 85     | 26 to 78       |
| 150 mm   | 135 to 7360    | 135 to 7345    | 70 to 9940      | 135 to 7170    | 120 to 14640    | 120 to 4775    | 145 to 4830     | 40 to 4720                    | 25 to 3880                     | 125 to 7010     | 37 to 98     | 37 to 89       |
| 200 mm   | 175 to 12650   | 175 to 12625   | 90 to 17080     | 175 to 12325   | 155 to 25160    | 155 to 8205    | 190 to 8300     | 50 to 8115                    | 35 to 6670                     | 160 to 12050    | 1200 to 1584 | 65 to 109      |
| 250 mm   | 220 to 19685   | 220 to 19650   | 115 to 26580    | 220 to 19180   | 190 to 39160    | 190 to 12770   | 235 to 12920    | 60 to 12630                   | 40 to 10380                    | 200 to 18750    | 1460 to 2457 | 1330 to 1537   |
| 300 mm   | 260 to 28145   | 260 to 28090   | 150 to 37995    | 260 to 27415   | 230 to 55980    | 230 to 18255   | 280 to 18465    | 75 to 18060                   | 60 to 14835                    | 240 to 26810    | 1780 to 3498 | 1620 to 2189   |
| 350 mm   | 295 to 35190   | 295 to 35125   | 185 to 47510    | 295 to 34280   | 270 to 69995    | 255 to 22825   | 315 to 23090    | 90 to 22580                   | 75 to 18550                    | 265 to 33520    | 2170 to 4058 | 1930 to 2539   |
| 400 mm   | 335 to 46460   | 335 to 46375   | 245 to 62725    | 335 to 45260   | 355 to 92405    | 295 to 30130   | 360 to 30485    | 115 to 29810                  | 95 to 24490                    | 305 to 44255    |              |                |
| 450 mm   | 380 to 59310   | 380 to 59200   | 310 to 80070    | 380 to 57775   | 455 to 117960   | 335 to 38465   | 410 to 38915    | 150 to 38055                  | 120 to 31765                   | 345 to 56490    |              |                |
| 500 mm   | 425 to 73440   | 425 to 73305   | 385 to 99150    | 425 to 71540   | 565 to 146065   | 370 to 47630   | 455 to 48190    | 185 to 47125                  | 150 to 38715                   | 385 to 69950    |              |                |
| 550 mm   | 470 to 89420   | 470 to 89255   | 465 to 120725   | 470 to 87110   | 685 to 177850   | 410 to 57995   | 505 to 58675    | 225 to 57380                  | 185 to 47140                   | 425 to 85175    |              |                |
| 600 mm   | 510 to 106260  | 510 to 106060  | 555 to 143460   | 510 to 103510  | 815 to 211345   | 445 to 68920   | 550 to 69725    | 265 to 68185                  | 215 to 56020                   | 465 to 101215   |              |                |
| 650 mm   | 555 to 124170  | 555 to 123940  | 645 to 167635   | 555 to 120960  | 950 to 246965   | 485 to 80535   | 595 to 81475    | 310 to 79675                  | 255 to 65460                   | 500 to 118275   |              |                |
| 700 mm   | 595 to 144735  | 595 to 144465  | 755 to 195405   | 595 to 140995  | 1110 to 287870  | 525 to 93875   | 640 to 94970    | 360 to 92875                  | 295 to 76300                   | 540 to 137865   |              |                |
| 750 mm   | 645 to 166885  | 645 to 166575  | 870 to 225305   | 645 to 162570  | 1280 to 331920  | 560 to 108240  | 690 to 109505   | 415 to 107090                 | 340 to 87980                   | 615 to 158960   |              |                |
| 800 mm   | 735 to 190610  | 735 to 190260  | 990 to 257340   | 715 to 185685  | 1460 to 379115  | 600 to 123630  | 735 to 125075   | 470 to 122315                 | 390 to 100490                  | 700 to 181560   |              |                |
| 850 mm   | 830 to 215920  | 830 to 215520  | 1125 to 291510  | 810 to 210340  | 1655 to 429455  | 640 to 140045  | 785 to 141685   | 535 to 138555                 | 440 to 113830                  | 795 to 205670   |              |                |
| 900 mm   | 935 to 242815  | 935 to 242365  | 1265 to 327815  | 910 to 236535  | 1860 to 482940  | 680 to 157485  | 830 to 159330   | 600 to 155810                 | 495 to 128005                  | 890 to 231285   |              |                |
| 1000 mm  | 1155 to 299520 | 1155 to 298965 | 1555 to 404370  | 1125 to 291775 | 2295 to 595725  | 755 to 194265  | 925 to 196540   | 740 to 192200                 | 610 to 157900                  | 1100 to 285300  |              |                |
| 1100 mm  | 1405 to 365118 | 1405 to 364440 | 1900 to 492930  | 1370 to 355675 | 2795 to 726190  | 915 to 236810  | 1020 to 239580  | 905 to 234295                 | 740 to 192485                  | 1340 to 347780  |              |                |
| 1200 mm  | 1675 to 435020 | 1675 to 434215 | 2260 to 587310  | 1630 to 423775 | 3330 to 865225  | 1085 to 282150 | 1115 to 285450  | 1075 to 279150                | 885 to 229335                  | 1600 to 414365  |              |                |
| 1300 mm  | 1965 to 511050 | 1965 to 510105 | 2655 to 689955  | 1915 to 497840 | 3910 to 1016445 | 1275 to 331465 | 1290 to 335340  | 1265 to 327940                | 1040 to 269420                 | 1875 to 486785  |              |                |
| 1400 mm  | 2280 to 593200 | 2280 to 592105 | 3080 to 800870  | 2225 to 577870 | 4540 to 1179850 | 1480 to 384750 | 1500 to 389250  | 1460 to 380660                | 1205 to 312730                 | 2175 to 565045  |              |                |
| 1500 mm  | 2620 to 681490 | 2620 to 680225 | 3540 to 920060  | 2555 to 663870 | 5215 to 1355435 | 1700 to 442010 | 1720 to 447175  | 1685 to 437310                | 1385 to 359270                 | 2500 to 649135  |              |                |

TH-1200 [Without flow Straightener]

Unit : m<sup>3</sup>/h(nor)

| Gas Size | AIR         | N <sub>2</sub> | CO <sub>2</sub> | O <sub>2</sub> | Ar           | 13A         | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> | He       | H <sub>2</sub> |
|----------|-------------|----------------|-----------------|----------------|--------------|-------------|-----------------|-------------------------------|--------------------------------|-----------------|----------|----------------|
| 50 mm    | 45 to 840   | 45 to 840      | 25 to 1135      | 45 to 820      | 40 to 1675   | 40 to 545   | 50 to 550       | 15 to 540                     | 10 to 440                      | 40 to 800       | 5 to 34  | 5 to 30        |
| 65 mm    | 60 to 1395  | 60 to 1395     | 30 to 1885      | 60 to 1360     | 50 to 2775   | 50 to 905   | 65 to 915       | 20 to 895                     | 10 to 735                      | 55 to 1330      | 7 to 45  | 7 to 39        |
| 80 mm    | 70 to 1965  | 70 to 1965     | 35 to 2655      | 70 to 1915     | 60 to 3915   | 60 to 1275  | 75 to 1290      | 20 to 1260                    | 15 to 1035                     | 65 to 1875      | 10 to 53 | 10 to 47       |
| 100 mm   | 90 to 3385  | 90 to 3380     | 50 to 4570      | 90 to 3295     | 80 to 6735   | 80 to 2195  | 100 to 2220     | 25 to 2170                    | 20 to 1785                     | 85 to 3225      | 17 to 69 | 17 to 62       |
| 125 mm   | 115 to 5155 | 115 to 5145    | 60 to 6955      | 115 to 5020    | 100 to 10250 | 100 to 3340 | 120 to 3380     | 35 to 3305                    | 20 to 2715                     | 105 to 4910     | 26 to 85 | 26 to 78       |
| 150 mm   | 135 to 7360 | 135 to 7345    | 70 to 9940      | 135 to 7170    | 120 to 14640 | 120 to 4775 | 145 to 4830     | 40 to 4720                    | 25 to 3880                     | 125 to 7010     | 37 to 98 | 37 to 89       |

TH-1200 [With flow Straightener]

Unit : m<sup>3</sup>/h(nor)

| Gas Size | AIR        | N <sub>2</sub> | CO <sub>2</sub> | O <sub>2</sub> | Ar         | 13A        | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> | He        | H <sub>2</sub> |
|----------|------------|----------------|-----------------|----------------|------------|------------|-----------------|-------------------------------|--------------------------------|-----------------|-----------|----------------|
| 50 mm    | 5 to 285   | 5 to 285       | 5 to 385        | 5 to 275       | 0 to 565   | 5 to 185   | 5 to 185        | 5 to 180                      | 5 to 150                       | 5 to 270        | 5 to 99   | 5 to 61        |
| 65 mm    | 10 to 450  | 10 to 450      | 10 to 610       | 10 to 440      | 15 to 895  | 5 to 290   | 5 to 295        | 5 to 290                      | 5 to 235                       | 5 to 430        | 7 to 180  | 7 to 108       |
| 80 mm    | 10 to 690  | 10 to 690      | 15 to 930       | 10 to 670      | 20 to 1375 | 10 to 445  | 10 to 450       | 10 to 440                     | 5 to 365                       | 10 to 655       | 10 to 254 | 10 to 159      |
| 100 mm   | 15 to 1200 | 15 to 1200     | 20 to 1625      | 15 to 1170     | 30 to 2390 | 10 to 780  | 10 to 790       | 10 to 770                     | 10 to 635                      | 15 to 1145      | 17 to 428 | 17 to 267      |
| 125 mm   | 25 to 1810 | 25 to 1810     | 35 to 2445      | 25 to 1760     | 45 to 3600 | 15 to 1175 | 15 to 1185      | 15 to 1160                    | 15 to 955                      | 25 to 1725      | 26 to 645 | 26 to 403      |
| 150 mm   | 35 to 2605 | 35 to 2605     | 45 to 3520      | 35 to 2540     | 65 to 5185 | 25 to 1690 | 25 to 1710      | 25 to 1670                    | 20 to 1375                     | 35 to 2480      | 37 to 916 | 37 to 573      |

TH-1700

Unit : L/min(nor)

| Gas Size | AIR          | N <sub>2</sub> | CO <sub>2</sub> | O <sub>2</sub> | Ar           | 13A         | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> | He        | H <sub>2</sub> |
|----------|--------------|----------------|-----------------|----------------|--------------|-------------|-----------------|-------------------------------|--------------------------------|-----------------|-----------|----------------|
| 15 mm    | 235 to 1355  | 235 to 1355    | 120 to 1830     | 235 to 1320    | 205 to 2700  | 205 to 880  | 250 to 890      | 65 to 870                     | 45 to 715                      | 215 to 1290     | 8 to 160  | 8 to 100       |
| 20 mm    | 315 to 2430  | 315 to 2430    | 165 to 3285     | 315 to 2370    | 275 to 4840  | 275 to 1575 | 340 to 1595     | 90 to 1560                    | 60 to 1280                     | 285 to 2315     | 15 to 280 | 15 to 170      |
| 25 mm    | 400 to 3900  | 400 to 3895    | 210 to 5270     | 400 to 3800    | 350 to 7760  | 350 to 2530 | 430 to 2560     | 115 to 2505                   | 75 to 2055                     | 365 to 3715     | 20 to 350 | 20 to 260      |
| 40 mm    | 620 to 9295  | 620 to 9280    | 320 to 12550    | 620 to 9055    | 545 to 18490 | 545 to 6030 | 665 to 6100     | 175 to 5965                   | 115 to 4900                    | 565 to 8855     | 50 to 530 | 50 to 480      |
| 50 mm    | 775 to 14815 | 775 to 14790   | 400 to 20005    | 775 to 14435   | 680 to 29470 | 675 to 9610 | 830 to 9720     | 215 to 9505                   | 145 to 7810                    | 705 to 14115    | 70 to 670 | 70 to 600      |

TH-1800

Unit : L/min(nor)

| Gas Size | AIR        | N <sub>2</sub> | CO <sub>2</sub> | O <sub>2</sub> | Ar           | 13A        | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> | He         | H <sub>2</sub> |
|----------|------------|----------------|-----------------|----------------|--------------|------------|-----------------|-------------------------------|--------------------------------|-----------------|------------|----------------|
| 15 mm    | 10 to 560  | 10 to 560      | 10 to 760       | 10 to 550      | 15 to 1120   | 5 to 365   | 5 to 370        | 5 to 360                      | 5 to 295                       | 10 to 535       | 2 to 130   | 1 to 80        |
| 20 mm    | 15 to 1010 | 15 to 1010     | 15 to 1365      | 15 to 985      | 25 to 2010   | 10 to 655  | 10 to 660       | 10 to 645                     | 10 to 530                      | 15 to 960       | 3 to 240   | 2 to 150       |
| 25 mm    | 20 to 1620 | 20 to 1620     | 25 to 2185      | 20 to 1580     | 40 to 3225   | 15 to 1050 | 15 to 1060      | 15 to 1040                    | 10 to 855                      | 20 to 1545      | 5 to 400   | 3 to 240       |
| 40 mm    | 40 to 3540 | 40 to 3535     | 55 to 4780      | 40 to 3450     | 80 to 7045   | 30 to 2295 | 30 to 2325      | 25 to 2270                    | 25 to 1865                     | 40 to 3370      | 10 to 940  | 6 to 570       |
| 50 mm    | 65 to 5855 | 65 to 5845     | 90 to 7905      | 65 to 5705     | 130 to 11645 | 45 to 3795 | 45 to 3840      | 45 to 3755                    | 35 to 3085                     | 65 to 5575      | 16 to 1520 | 10 to 920      |

Note:

- (1) Above flow rates are shown at the conditions of 0°C and 1.0 atm, which are converted from the flow rates measured at 20 °C and 1.0 atm. Consult us if the required full scale of each size is not more than 40% of the maximum flow rate of above flow rate range with 0.1 MPa or more in pressure.
- (2) Let us know each gas property with its volume % when the gas is mixed one.

# TH THERMAL FLOWMETER

TH-3200/TH-3300

Unit : m<sup>3</sup>/h(nor)

| Gas Size | AIR             | N <sub>2</sub>  | CO <sub>2</sub> | O <sub>2</sub>  | Ar              | 13A             | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> | He           | H <sub>2</sub> |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------|--------------------------------|-----------------|--------------|----------------|
| 65 mm    | 60 to 820       | 60 to 820       | 75 to 1105      | 60 to 800       | 110 to 1630     | 55 to 530       | 65 to 535       | 35 to 525                     | 30 to 430                      | 55 to 780       | 7 to 45      | 7 to 39        |
| 80 mm    | 80 to 1140      | 80 to 1140      | 105 to 1540     | 75 to 1110      | 155 to 2270     | 60 to 740       | 75 to 750       | 50 to 730                     | 40 to 600                      | 75 to 1085      | 10 to 53     | 10 to 47       |
| 100 mm   | 135 to 1960     | 135 to 1955     | 180 to 2645     | 130 to 1910     | 260 to 3900     | 85 to 1270      | 100 to 1285     | 85 to 1255                    | 70 to 1030                     | 125 to 1865     | 17 to 69     | 17 to 62       |
| 125 mm   | 200 to 2980     | 200 to 2975     | 270 to 4020     | 195 to 2900     | 395 to 5925     | 130 to 1930     | 130 to 1955     | 130 to 1910                   | 105 to 1570                    | 190 to 2835     | 26 to 85     | 26 to 78       |
| 150 mm   | 285 to 4250     | 285 to 4245     | 385 to 5740     | 280 to 4140     | 565 to 8400     | 185 to 2755     | 190 to 2790     | 185 to 2730                   | 150 to 2240                    | 270 to 4050     | 37 to 98     | 37 to 89       |
| 200 mm   | 485 to 7245     | 485 to 7230     | 655 to 9780     | 470 to 7055     | 965 to 14405    | 315 to 4695     | 320 to 4750     | 310 to 4645                   | 255 to 3815                    | 460 to 6900     | 1200 to 1584 | 65 to 109      |
| 250 mm   | 745 to 11140    | 745 to 11120    | 1005 to 15040   | 725 to 10850    | 1480 to 22155   | 485 to 7225     | 490 to 7310     | 480 to 7145                   | 395 to 5870                    | 710 to 10610    | 1460 to 2457 | 1330 to 1537   |
| 300 mm   | 1060 to 15855   | 1060 to 15825   | 1430 to 21400   | 1030 to 15445   | 2105 to 31535   | 690 to 10280    | 695 to 10400    | 680 to 10175                  | 560 to 8355                    | 1010 to 15100   | 1780 to 3498 | 1620 to 2189   |
| 350 mm   | 1320 to 19800   | 1320 to 19765   | 1785 to 26735   | 1290 to 19290   | 2630 to 39385   | 860 to 12845    | 870 to 12995    | 850 to 12705                  | 700 to 10440                   | 1260 to 18860   | 2170 to 4058 | 1930 to 2539   |
| 400 mm   | 1745 to 26135   | 1740 to 26090   | 2355 to 35285   | 1700 to 25460   | 3470 to 51985   | 1130 to 16950   | 1145 to 17150   | 1120 to 16770                 | 920 to 13780                   | 1660 to 24895   |              |                |
| 450 mm   | 2230 to 33385   | 2225 to 33320   | 3005 to 45070   | 2170 to 32520   | 4430 to 66400   | 1445 to 21650   | 1460 to 21905   | 1430 to 21420                 | 1175 to 17600                  | 2120 to 31800   |              |                |
| 500 mm   | 2760 to 41375   | 2755 to 41295   | 3725 to 55860   | 2690 to 40305   | 5490 to 82290   | 1790 to 26835   | 1810 to 27150   | 1770 to 26550                 | 1455 to 21810                  | 2630 to 39410   |              |                |
| 550 mm   | 3365 to 50430   | 3360 to 50385   | 4540 to 68080   | 3275 to 49125   | 6690 to 100300  | 2185 to 32705   | 2210 to 33090   | 2160 to 32360                 | 1775 to 26585                  | 3205 to 48035   |              |                |
| 600 mm   | 4000 to 59985   | 3995 to 59870   | 5400 to 80985   | 3900 to 58435   | 7955 to 119305  | 2595 to 38905   | 2625 to 39360   | 2570 to 38490                 | 2110 to 31620                  | 3810 to 57135   |              |                |
| 650 mm   | 4680 to 70160   | 4670 to 70030   | 6315 to 94720   | 4560 to 68345   | 9305 to 139545  | 3035 to 45505   | 3070 to 46035   | 3005 to 45020                 | 2470 to 36985                  | 4455 to 66830   |              |                |
| 700 mm   | 5460 to 81860   | 5450 to 81710   | 7370 to 110515  | 5320 to 79745   | 10855 to 162815 | 3540 to 53095   | 3585 to 53715   | 3505 to 52530                 | 2880 to 43155                  | 5200 to 77975   |              |                |
| 750 mm   | 6300 to 94470   | 6290 to 94295   | 8505 to 127545  | 6135 to 92030   | 12530 to 187900 | 4085 to 61275   | 4135 to 61990   | 4045 to 60620                 | 3320 to 49805                  | 6000 to 89985   |              |                |
| 800 mm   | 7200 to 107995  | 7190 to 107795  | 9720 to 145805  | 7015 to 105205  | 14320 to 214800 | 4670 to 70045   | 4725 to 70865   | 4620 to 69300                 | 3800 to 56935                  | 6860 to 102870  |              |                |
| 850 mm   | 8165 to 122430  | 8150 to 122205  | 11020 to 165290 | 7955 to 119265  | 16235 to 243510 | 5295 to 79410   | 5360 to 80335   | 5240 to 78565                 | 4305 to 64545                  | 7775 to 116620  |              |                |
| 900 mm   | 9185 to 137780  | 9170 to 137525  | 12405 to 186015 | 8950 to 134220  | 18270 to 274035 | 5960 to 89365   | 6030 to 90410   | 5895 to 88410                 | 4845 to 72635                  | 8750 to 131240  |              |                |
| 1000 mm  | 11345 to 170175 | 11325 to 169860 | 15320 to 229745 | 11055 to 165775 | 22565 to 338465 | 7360 to 110375  | 7445 to 111865  | 7280 to 109200                | 5985 to 89715                  | 10810 to 162095 |              |                |
| 1100 mm  | 13850 to 207680 | 13820 to 207295 | 18695 to 280385 | 13490 to 202315 | 27540 to 413065 | 8980 to 134700  | 9085 to 136275  | 8885 to 133270                | 7300 to 109485                 | 13190 to 197820 |              |                |
| 1200 mm  | 16515 to 247685 | 16480 to 247225 | 22295 to 334390 | 16090 to 241280 | 32845 to 492830 | 10710 to 160645 | 10835 to 162525 | 10600 to 158940               | 8705 to 130575                 | 15730 to 235925 |              |                |
| 1300 mm  | 19415 to 291220 | 19380 to 290865 | 26215 to 393170 | 18915 to 283695 | 38615 to 579225 | 12595 to 188885 | 12740 to 191095 | 12460 to 186875               | 10235 to 153530                | 18495 to 277935 |              |                |
| 1400 mm  | 22555 to 338295 | 22515 to 337665 | 30450 to 456720 | 21970 to 329550 | 44860 to 672845 | 14630 to 219415 | 14800 to 221980 | 14475 to 217080               | 11890 to 178345                | 21485 to 322235 |              |                |
| 1500 mm  | 25930 to 388900 | 25880 to 388180 | 35005 to 525040 | 25260 to 378845 | 51570 to 773495 | 16820 to 252240 | 17015 to 255185 | 16640 to 249555               | 13670 to 205025                | 24700 to 370435 |              |                |

TH-1100-SP

Unit : m<sup>3</sup>/h(nor)

| Gas Size | AIR            | N <sub>2</sub> | CO <sub>2</sub> | O <sub>2</sub> | Ar             | 13A            | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> |
|----------|----------------|----------------|-----------------|----------------|----------------|----------------|-----------------|-------------------------------|--------------------------------|-----------------|
| 150 mm   | 120 to 3800    | 120 to 3790    | 65 to 5130      | 120 to 3700    | 105 to 7560    | 105 to 2465    | 130 to 2490     | 35 to 2435                    | 25 to 2000                     | 110 to 3620     |
| 200 mm   | 165 to 6840    | 165 to 6830    | 85 to 9235      | 165 to 6665    | 145 to 13610   | 145 to 4435    | 175 to 4490     | 45 to 4390                    | 30 to 3605                     | 150 to 6515     |
| 250 mm   | 210 to 10870   | 210 to 10850   | 110 to 14675    | 210 to 10590   | 185 to 21620   | 185 to 7050    | 225 to 7130     | 60 to 6975                    | 40 to 5730                     | 190 to 10355    |
| 300 mm   | 255 to 15715   | 255 to 15685   | 145 to 21215    | 255 to 15310   | 220 to 31255   | 220 to 10190   | 270 to 10310    | 70 to 10085                   | 55 to 8285                     | 230 to 14970    |
| 350 mm   | 285 to 19755   | 285 to 19720   | 180 to 26670    | 285 to 19245   | 265 to 39295   | 250 to 12810   | 305 to 12960    | 85 to 12675                   | 70 to 10415                    | 260 to 18815    |
| 400 mm   | 330 to 26220   | 330 to 26175   | 240 to 35400    | 330 to 25545   | 350 to 52155   | 290 to 17005   | 355 to 17205    | 115 to 16825                  | 95 to 13825                    | 300 to 24975    |
| 450 mm   | 375 to 33600   | 375 to 33540   | 305 to 45365    | 375 to 32730   | 450 to 66830   | 330 to 21790   | 400 to 22045    | 145 to 21560                  | 120 to 17715                   | 340 to 32005    |
| 500 mm   | 420 to 41720   | 420 to 41640   | 380 to 56325    | 420 to 40640   | 555 to 82980   | 365 to 27060   | 450 to 27375    | 180 to 26770                  | 150 to 21995                   | 380 to 39740    |
| 550 mm   | 460 to 50905   | 460 to 50810   | 460 to 68725    | 460 to 49590   | 675 to 101245  | 405 to 33015   | 495 to 33400    | 220 to 32665                  | 180 to 26835                   | 420 to 48485    |
| 600 mm   | 505 to 60585   | 505 to 60475   | 545 to 81795    | 505 to 59020   | 805 to 120505  | 440 to 39295   | 540 to 39755    | 260 to 38875                  | 215 to 31940                   | 460 to 57710    |
| 650 mm   | 545 to 70885   | 545 to 70755   | 640 to 95700    | 545 to 69055   | 940 to 140990  | 480 to 45975   | 585 to 46515    | 305 to 45485                  | 250 to 37370                   | 495 to 67520    |
| 700 mm   | 590 to 82720   | 590 to 82565   | 745 to 111675   | 590 to 80580   | 1100 to 164520 | 520 to 53650   | 635 to 54275    | 355 to 53080                  | 295 to 43605                   | 535 to 78790    |
| 750 mm   | 640 to 95460   | 640 to 95285   | 860 to 128880   | 635 to 92995   | 1270 to 189870 | 555 to 61915   | 685 to 62640    | 410 to 61255                  | 340 to 50325                   | 610 to 90930    |
| 800 mm   | 730 to 109115  | 730 to 108915  | 985 to 147315   | 710 to 106295  | 1450 to 217030 | 595 to 70770   | 730 to 71600    | 470 to 70020                  | 385 to 57525                   | 695 to 103935   |
| 850 mm   | 825 to 123685  | 825 to 123455  | 1115 to 166985  | 805 to 120485  | 1640 to 246000 | 635 to 80220   | 780 to 81160    | 530 to 79365                  | 435 to 65205                   | 785 to 117810   |
| 900 mm   | 930 to 139165  | 930 to 138905  | 1255 to 187880  | 905 to 135565  | 1845 to 276790 | 675 to 90260   | 825 to 91315    | 595 to 89300                  | 490 to 73365                   | 885 to 132555   |
| 1000 mm  | 1145 to 171815 | 1145 to 171495 | 1550 to 231960  | 1120 to 167370 | 2280 to 341725 | 750 to 111435  | 920 to 112740   | 735 to 110250                 | 605 to 90575                   | 1095 to 163665  |
| 1100 mm  | 1400 to 209585 | 1400 to 209200 | 1890 to 282960  | 1365 to 204170 | 2780 to 416855 | 910 to 135935  | 1015 to 137525  | 900 to 134490                 | 740 to 110490                  | 1335 to 199635  |
| 1200 mm  | 1670 to 249850 | 1670 to 249385 | 2250 to 337315  | 1625 to 243390 | 3315 to 496935 | 1080 to 162050 | 1110 to 163945  | 1070 to 160325                | 880 to 131715                  | 1590 to 237985  |
| 1300 mm  | 1960 to 293645 | 1960 to 293100 | 2645 to 396440  | 1910 to 286055 | 3895 to 584040 | 1270 to 190455 | 1285 to 192885  | 1260 to 188430                | 1035 to 154805                 | 1865 to 279705  |
| 1400 mm  | 2275 to 340975 | 2275 to 340345 | 3070 to 460340  | 2215 to 332160 | 4525 to 678180 | 1475 to 221155 | 1495 to 223740  | 1460 to 218800                | 1200 to 179760                 | 2165 to 324785  |
| 1500 mm  | 2615 to 391840 | 2615 to 391115 | 3530 to 529010  | 2545 to 381710 | 5200 to 779345 | 1695 to 254145 | 1715 to 257115  | 1680 to 251440                | 1380 to 206575                 | 2490 to 373235  |

Note:

- (1) Above flow rates are shown at the conditions of 0°C and 1.0 atm. which are converted from the flow rates measured at 20 °C and 1.0 atm. Consult us if the required full scale of each size is not more than 40% of the maximum flow rate of above flow rate range with 0.1 MPa or more in pressure.
- (2) Let us know each gas property with its volume % when the gas is mixed one.



TH-3200-SP

Unit : m<sup>3</sup>/h(nor)

| Gas<br>Size | AIR             | N <sub>2</sub>  | CO <sub>2</sub> | O <sub>2</sub>  | Ar              | 13A             | CH <sub>4</sub> | C <sub>3</sub> H <sub>8</sub> | C <sub>4</sub> H <sub>10</sub> | NH <sub>3</sub> |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------|--------------------------------|-----------------|
| 150 mm      | 255 to 3815     | 255 to 3805     | 345 to 5150     | 250 to 3715     | 510 to 7585     | 165 to 2475     | 170 to 2500     | 165 to 2445                   | 135 to 2010                    | 245 to 3635     |
| 200 mm      | 455 to 6805     | 455 to 6790     | 615 to 9185     | 445 to 6625     | 905 to 13530    | 295 to 4410     | 300 to 4465     | 295 to 4365                   | 240 to 3585                    | 435 to 6480     |
| 250 mm      | 725 to 10830    | 725 to 10810    | 975 to 14625    | 705 to 10550    | 1440 to 21545   | 470 to 7025     | 475 to 7105     | 465 to 6950                   | 385 to 5710                    | 690 to 10315    |
| 300 mm      | 1045 to 15675   | 1045 to 15645   | 1415 to 21165   | 1020 to 15270   | 2080 to 31180   | 680 to 10165    | 690 to 10285    | 675 to 10060                  | 555 to 8265                    | 1000 to 14930   |
| 350 mm      | 1315 to 19715   | 1315 to 19680   | 1775 to 26620   | 1285 to 19205   | 2615 to 39215   | 855 to 12785    | 865 to 12935    | 845 to 12650                  | 695 to 10395                   | 1255 to 18780   |
| 400 mm      | 1750 to 26185   | 1745 to 26135   | 2360 to 35350   | 1705 to 25505   | 3475 to 52080   | 1135 to 16980   | 1145 to 17180   | 1120 to 16800                 | 920 to 13805                   | 1665 to 24940   |
| 450 mm      | 2240 to 33560   | 2235 to 33500   | 3025 to 45310   | 2180 to 32695   | 4450 to 66755   | 1455 to 21770   | 1470 to 22020   | 1440 to 21535                 | 1180 to 17695                  | 2135 to 31970   |
| 500 mm      | 2780 to 41680   | 2775 to 41605   | 3755 to 56275   | 2710 to 40605   | 5530 to 82905   | 1805 to 27035   | 1825 to 27350   | 1785 to 26745                 | 1465 to 21975                  | 2650 to 39700   |
| 550 mm      | 3395 to 50865   | 3385 to 50770   | 4580 to 68675   | 3305 to 49550   | 6745 to 101170  | 2200 to 32990   | 2225 to 33375   | 2180 to 32640                 | 1790 to 26815                  | 3230 to 48450   |
| 600 mm      | 4040 to 60550   | 4030 to 60435   | 5450 to 81745   | 3935 to 58985   | 8030 to 120430  | 2620 to 39270   | 2650 to 39730   | 2590 to 38855                 | 2130 to 31920                  | 3845 to 57675   |
| 650 mm      | 4725 to 70850   | 4715 to 70715   | 6480 to 95650   | 4605 to 69015   | 9395 to 140915  | 3065 to 45950   | 3100 to 46490   | 3035 to 45460                 | 2490 to 37350                  | 4500 to 67485   |
| 700 mm      | 5515 to 82680   | 5505 to 82525   | 7445 to 111625  | 5370 to 80540   | 10965 to 164445 | 3575 to 53625   | 3620 to 54250   | 3540 to 53055                 | 2910 to 43585                  | 5250 to 78755   |
| 750 mm      | 6365 to 95425   | 6350 to 95245   | 8590 to 128830  | 6200 to 92955   | 12655 to 189790 | 4130 to 61890   | 4175 to 62615   | 4085 to 61230                 | 3355 to 50305                  | 6060 to 90890   |
| 800 mm      | 7275 to 109080  | 7260 to 108875  | 9820 to 147265  | 7085 to 106260  | 14465 to 216950 | 4720 to 70745   | 4775 to 71575   | 4670 to 69995                 | 3835 to 57505                  | 6930 to 103900  |
| 850 mm      | 8245 to 123645  | 8230 to 123415  | 11130 to 166930 | 8030 to 120450  | 16395 to 245925 | 5350 to 80195   | 5410 to 81135   | 5290 to 79345                 | 4350 to 65185                  | 7855 to 117775  |
| 900 mm      | 9275 to 139125  | 9260 to 138870  | 12525 to 187830 | 9035 to 135530  | 18450 to 276715 | 6020 to 90235   | 6090 to 91290   | 5955 to 89275                 | 4890 to 73345                  | 8835 to 132520  |
| 1000 mm     | 11455 to 171775 | 11435 to 171455 | 15465 to 231910 | 11160 to 167335 | 22780 to 341650 | 7430 to 111410  | 7515 to 112715  | 7350 to 110225                | 6040 to 90555                  | 10910 to 163620 |
| 1100 mm     | 13970 to 209550 | 13945 to 209160 | 18865 to 282905 | 13610 to 204130 | 27785 to 416780 | 9065 to 135910  | 9170 to 137500  | 8965 to 134465                | 7365 to 110470                 | 13310 to 199600 |
| 1200 mm     | 16655 to 249810 | 16625 to 249350 | 22485 to 337265 | 16225 to 243355 | 33125 to 496860 | 10805 to 162025 | 10930 to 163920 | 10690 to 160300               | 8780 to 131695                 | 15865 to 237950 |
| 1300 mm     | 19575 to 293605 | 19540 to 293065 | 26430 to 396390 | 19070 to 286015 | 38935 to 583965 | 12700 to 190430 | 12845 to 192655 | 12565 to 188405               | 10320 to 154785                | 18645 to 279665 |
| 1400 mm     | 22730 to 340940 | 22690 to 340305 | 30690 to 460290 | 22145 to 332125 | 45210 to 678100 | 14745 to 221130 | 14915 to 223715 | 14585 to 218780               | 11985 to 179735                | 21650 to 324750 |
| 1500 mm     | 26120 to 391800 | 26075 to 391075 | 35265 to 528960 | 25445 to 381675 | 51955 to 779270 | 16945 to 254120 | 17140 to 257090 | 16765 to 251415               | 13770 to 206555                | 24880 to 373200 |

\*Measuring range : 0 to Full scale

Ex) TH-1100 50 mm, Air

Min. measuring range : 0 to 45 m<sup>3</sup>/h (nor)

Max. measuring range : 0 to 840 m<sup>3</sup>/h (nor)

Note:

(1) Above flow rates are shown at the conditions of 0°C and 1.0 atm. which are converted from the flow rates measured at 20 °C and 1.0 atm.

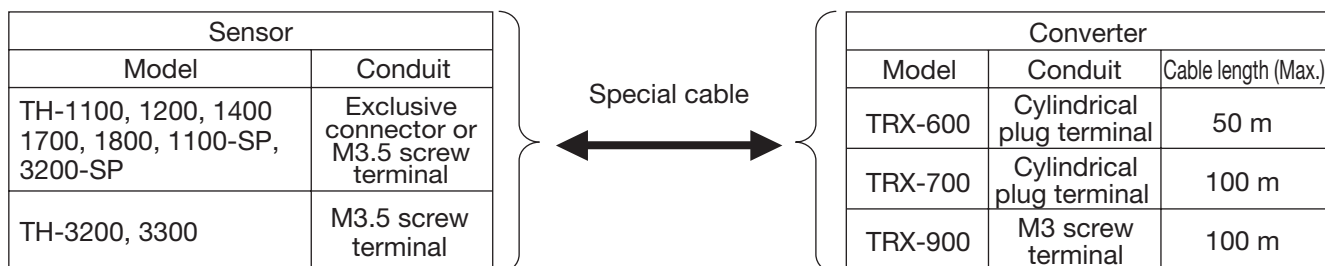
Consult us if the required full scale of each size is not more than 40% of the maximum flow rate of above flow rate range with 0.1 MPa or more in pressure.

(2) Let us know each gas property with its volume % when the gas is mixed one.

## APPLICATION EXAMPLE

Thermal Flowmeter is connected with the special signal cable between sensor and converter. Refer to the following table for details.

- Connection and special signal cable



## SUGGESTIONS

- TH series Thermal Flowmeter is not suitable for the measurement of gases containing condensate and/or sticking contamination. In that case, we can provide air purge system as option. Consult factory for details.
- Specified straight run for upstream and downstream is required for accurate measurement. Refer to instruction manual for details.

\* Specification is subject to change without notice.

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