

## CONVERTER FOR TH THERMAL FLOWMETER TRX/THC Series

### GENERAL

The TRX/THC series converter is used in combination with the TH series.

The converter is equipped with functions necessary for process monitoring and control, such as instantaneous flow rate, integrated flow rate, and alarm transmission.

In addition, data processing with a host computer has been made available through serial communication with RS485 interface. The lineup includes models that support panel mount, and models that support waterproof housing.

### FEATURES

- High-precision measuring with an accuracy of F.S.  $\pm 1.0\%$  is possible. (F.S.  $\pm 2.0\%$  for waterproof housing type)
- LCD with backlight ensures easy viewing. (LED display is used for the waterproof housing type)
- Self-diagnosis function is provided to ensure easy maintenance.



### FUNCTIONAL COMPARISON

| Function                        | Converter model                |                            |                            |                           |
|---------------------------------|--------------------------------|----------------------------|----------------------------|---------------------------|
|                                 | TRX-600                        | THC100                     | TRX-700                    | TRX-900                   |
| Installation                    | Wall or 2B pipe                | Panel                      | Panel                      | Wall or 2B pipe           |
| Construction                    | IP65 equivalent Jet-proof type | IP20 equivalent Indoor use | IP20 equivalent Indoor use | IP54 equivalent Field use |
| Flow rate indication            | ○                              | ○                          | ○                          | ○                         |
| Total indication                | ○                              | ○                          | ○                          | ○                         |
| Analog output DC 4 to 20 mA     | ○                              | ○                          | ○                          | ○                         |
| Pulse output                    | ○                              | ○                          | ○                          | ○                         |
| Digital output RS485            | ○                              | ○                          | ○                          | ○                         |
| Flow alarm                      | △                              | ○                          | ○                          | ○                         |
| Temperature correction function | ○                              | ○                          | ○                          | ○                         |
| Accuracy (F.S.)                 | $\pm 2.0\%$                    | $\pm 1.0\%$                | $\pm 1.0\%$                | $\pm 1.0\%$               |

○: Standard △: Optionally available ×: Not available

### CONNECTABLE SENSOR

| Sensor model | Converter model |        |         |         |
|--------------|-----------------|--------|---------|---------|
|              | TRX-600         | THC100 | TRX-700 | TRX-900 |
| TH-1100      | ○               | ○      | ○       | ○       |
| TH-1200      | ○               | ○      | ○       | ○       |
| TH-1400      | ○               | ○      | ○       | ○       |
| TH-1700      | ○               | ○      | ○       | ○       |
| TH-1800      | ○               | ○      | ○       | ○       |
| TH-3200      | ○               | ×      | ×       | ×       |
| TH-1100-SP   | ○               | ×      | ×       | ×       |
| TH-3200-SP   | ○               | ×      | ×       | ×       |

### ELECTRIC CONNECTION AND DEDICATED SIGNAL CABLE

The thermal flowmeter is connected with a special signal cable between the converter and the sensor. Refer to the following table for details.

| Converter |                           |                      | Special cable | Sensor  |  |
|-----------|---------------------------|----------------------|---------------|---|--|
| Model     | Conduit                   | Maximum cable length |               | Model   | Conduit                                    |
| TRX-600   | Cylindrical plug terminal | 50 m                 | ↔             | TH-1100, 1200, 1400, 1700<br>1800, 1100-SP, 3200-SP | Exclusive connector or M3.5 screw terminal |
| THC100    | Cylindrical plug terminal | 100 m                |               |   |  |
| TRX-700   | Cylindrical plug terminal | 100 m                |               |   |  |
| TRX-900   | M3 screw terminal         | 100 m                |               | TH-3200   | M3.5 screw terminal                        |

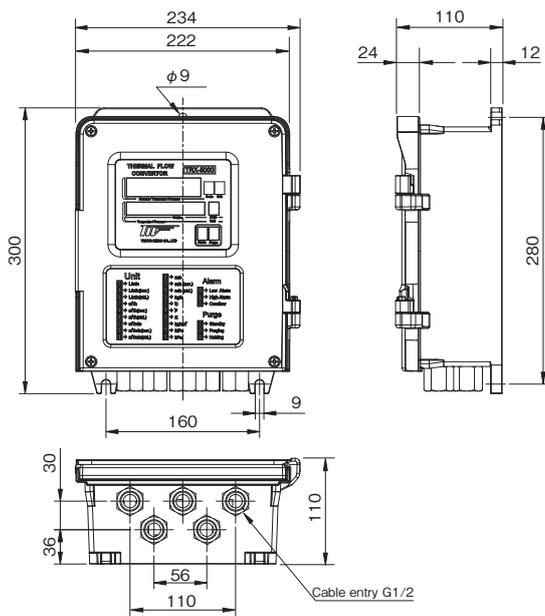
### TRX-600

The TRX-600 is a waterproof converter. The TRX-600 can be installed indoors or outdoors. Wall mount or optional 2B pipe mount is available. Functions can be expanded using optional boards to suit your requirements.

### MODEL CODE

| MODEL CODE                            |                      |   |                          | CONTENTS                        |  |
|---------------------------------------|----------------------|---|--------------------------|---------------------------------|--|
| TRX-6                                 |                      |   |                          |                                 |  |
| Temperature correction (Input signal) | 0                    |   |                          | No correction                   |  |
|                                       | 1                    |   |                          | Resistance temp.sensor (Pt100Q) |  |
|                                       | 2                    |   |                          | DC4 to 20mA temp. signal        |  |
|                                       | 3                    |   |                          | DC1~5V temp.signal              |  |
| Power supply                          | 1                    |   |                          | AC100V±10%                      |  |
|                                       | 2                    |   |                          | AC110V±10%                      |  |
|                                       | 3                    |   |                          | AC115V±10%                      |  |
|                                       | 4                    |   |                          | AC200V±10%                      |  |
|                                       | 5                    |   |                          | AC220V±10%                      |  |
|                                       | 6                    |   |                          | AC240V±10%                      |  |
| Cable length                          | 1                    |   |                          | 5m                              |  |
|                                       | 2                    |   |                          | 10m                             |  |
|                                       | 3                    |   |                          | 15m                             |  |
|                                       | 4                    |   |                          | 20m                             |  |
|                                       | 5                    |   |                          | 25m                             |  |
|                                       | 6                    |   |                          | 30m                             |  |
|                                       | 7                    |   |                          | 40m                             |  |
|                                       | 8                    |   |                          | 50m                             |  |
|                                       | F                    |   |                          | Other                           |  |
| 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                   |  |
|                                       | Purge output         | 0 |                          | No purge control                |  |
| 1                                     |                      |   | Contact output           |                                 |  |
| Contact output                        | 2                    |   | AC power supply          |                                 |  |
|                                       | 1                    |   | Flow switch (H-L)        |                                 |  |
|                                       | 2                    |   | Flow switch (H)          |                                 |  |
|                                       | 3                    |   | Flow switch (L)          |                                 |  |
|                                       | 4                    |   | Abnormality alarm output |                                 |  |
| For high-current type                 |                      |   |                          | -H                              | When using in combination with TH-3200, 3200-SP. |

### DIMENSION



### STANDARD SPECIFICATION

|                                 |   |
|---------------------------------|---|
| Connectable detector            | TH-1100/1200/1400/1700<br>1800/3000/1100-SP/3200-SP   |
| Installation                    | Installation on wall or 2" pipe (Option)  |
| Protective construction         | Jet-proof type (IP65 equivalent)  |
| Accuracy                        | Display ±2.0%F.S.±1digit  |
|                                 | Output ±2.0%F.S.  |
| Display                         | Upper side<br>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<br>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<br>Displayed on the panel [ALARM] [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 | Pt100 Ω resistance temp. sensor (3-wire type)<br>Thermometer with analog output (required separately) (DC 4 to 20 mA or DC 1 to 5 V temperature signal)                   |
| 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 can be set.<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.

## THC100

The THC100 is a panel mount type converter.

The THC100 can be installed indoors. This model is the successor model to the conventional TRX700 series, and is a high-precision and high-performance model with a signal processing circuit equipped with a high-speed CPU.

### MODEL CODE

| Model code                             |   |   |   |   |   |   |   |    |     | Description |   |
|--|---|---|---|---|---|---|---|----|-----|-------------|---|
| THC                                    | ① | ② | ③ | - | ④ | ⑤ | ⑥ | -  | ⑦⑧⑨ |             |   |
| Type                                   | 1 |   |   |   |   |   |   |    |     |             | DIN 96 x 96 Panel mount type  |
| Installation                           | 0 |   |   |   |   |   |   |    |     |             | Standard  |
| Power supply                           | 0 |   |   |   |   |   |   |    |     |             | Standard AC90~264V 50/60Hz  |
|  | 1 |   |   |   |   |   |   |    |     |             | DC24V±10%   |
| Availability of temperature correction |   |   |   |   | N |   |   |    |     |             | No (Calculated at the operating temperature specified by the customer)  |
|  |   |   |   |   | P |   |   |    |     |             | Resistance temp.sensor (Pt100)  |
|  |   |   |   |   | C |   |   |    |     |             | Correction via RS485 (temperature signal)   |
| Availability of pressure correction    |   |   |   |   | N |   |   |    |     |             | No (Calculated at the operating pressure specified by the customer)   |
|  |   |   |   |   | S |   |   |    |     |             | Pressure gauge with DC4-20 mA output  |
|  |   |   |   |   | C |   |   |    |     |             | Correction via RS485 (pressure signal)  |
| Availability of high-temperature model |   |   |   |   | N |   |   |    |     |             | Standard (TH-1000 series)   |
|  |   |   |   |   | H |   |   |    |     |             | 5A model (TH-3200 Series)   |
| Cable length                           |   |   |   |   |   |   |   |    | 05  |             | The cable length can be specified from a minimum of five meters in five-meter increments up to a maximum of 100 meters. |
|  |   |   |   |   |   |   |   |    | 10  |             |   |
|  |   |   |   |   |   |   |   |    | ... |             | Up to 50 meters can be used for the high-temperature model. If the cable is not required, "-⑦⑧⑨" can be omitted.        |
|  |   |   |   |   |   |   |   |    | 50  |             |   |
|  |   |   |   |   |   |   |   |    | ... |             |   |
|  |   |   |   |   |   |   |   |    | 95  |             |   |
|  |   |   |   |   |   |   |   | 00 |     |             | 100m  |
| Sensor and cable connection type       |   |   |   |   |   |   |   |    |     | T           | Standard (terminal box)   |
|  |   |   |   |   |   |   |   |    |     | C           | Connector connection  |

(Note) Select "Temp. and Press. correction" in any of the following cases.  
 • When measuring the actual flow rate (Volume flow rate display in use)

### STANDARD SPECIFICATION

|                               |   |  |
|-------------------------------|---|--|
| Connectable detector          | TH-1100/1200/1400/1700/1800   |  |
| Installation                  | THC100: panel mount (DIN96x96)  |  |
| Protective construction       | THC100: IP20 equivalent (indoor use)  |  |
| Accuracy                      | Instantaneous flow rate   | ±1%F.S.±1digit   |
| Analog output                 | DC 4 to 20 mA / Allowable load resistance 500 Ω or less   |  |
| Pulse output                  | Open collector output<br>Photocoupler, 30VDC, 100 mA<br>Pulse width: Standard 50ms<br>(selectable from 10, 20, 50, 100, and 200 ms)   |  |
| Contact output of alarm       | Contact output DC30V (100mA)  |  |
| Serial communication (RS-485) | 9600/19200/38400/57600/76800/115200bps (Selectable)<br>ID Address: 00~99<br>Protocol: 8N1 & Modbus RTU<br>Output: Instantaneous flow rate, integrated flow rate, temperature, pressure, heating current, firmware version, serial number, error message, etc. |  |
| Display                       | Dot matrix LCD, 16 characters × 2 lines<br>With backlight   |  |
| Indication                    | Upper section   | Select one from the instantaneous flow rate, temperature, or pressure<br>Or an error message |
|                               | Lower section   | Select one from the integrated flow rate, temperature, or pressure<br>Or an error message    |
| Number of digits              | Instantaneous flow rate   | Seven digits (0.000 to 1000000)  |
|                               | Integrated flow rate  | Eight digits (0.000 to 99999999)   |
| Temp. correction function     | Pt100 Ω resistance temp. sensor (3-wire type)<br>* Separately required (customer is responsible)  |  |
| Pressure correction function  | Pressure gauge with analog output (DC 4 to 20 mA)<br>* Separately required (primarily for actual flow rate indication)<br>(customer is responsible)   |  |
| Response time                 | 3 seconds (63% step response)   |  |
| Dimensions                    | 96H×96W×243D [mm]   |  |
| Mass                          | About 1.95 kg   |  |
| Cable length                  | 100 m (max.)  |  |
| Power supply                  | AC90~264V 50/60Hz / DC24V±10%   |  |
| Power consumption             | 80 W (max.)   |  |
| Elect. connection             | Pin terminal connector  |  |
| Ambient temp.                 | 0~50°C  |  |
| Ambient humidity              | 10 to 90% RH (No dew condensation)  |  |

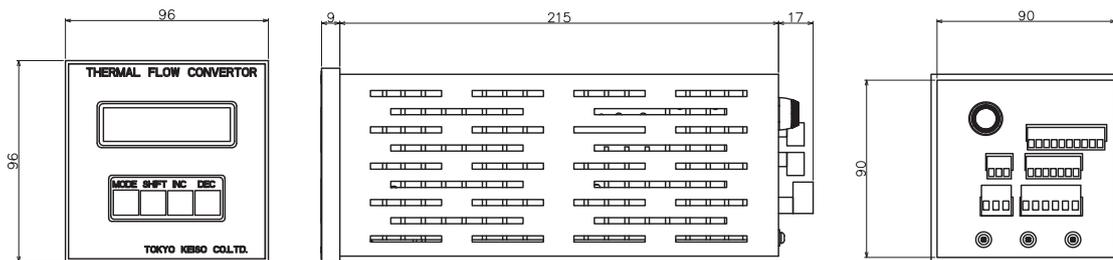
THC100



THC100

DIMENSION

- THC100 (For panel mount)



## 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, panel mount type TRX-700 and waterproof housing, field mount type TRX-900 are available.

### 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-1100/1200/1400/1700/1800  |  |
| 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                     | Instantaneous flow rate<br>±1%F.S. ±1digit   |  |
| Analog output                | DC 4 to 20 mA / Allowable load resistance 500Ω or less   |  |
| Pulse output                 | Open collector output / DC 35 V/ 50 mA (max.)  |  |
| Contact output of alarm      | SPDT relay contact (High alarm/ Low alarm)<br>AC 250 V / 5 A (DC 24 V / 5 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. |  |
| Display                      | 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.                  |
| Number of digits             | Instantaneous flow rate  | Five digits (0.000 to 99999)   |
|                              | Integrated flow rate   | Seven digits (0.00 to 9999999)   |
| 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



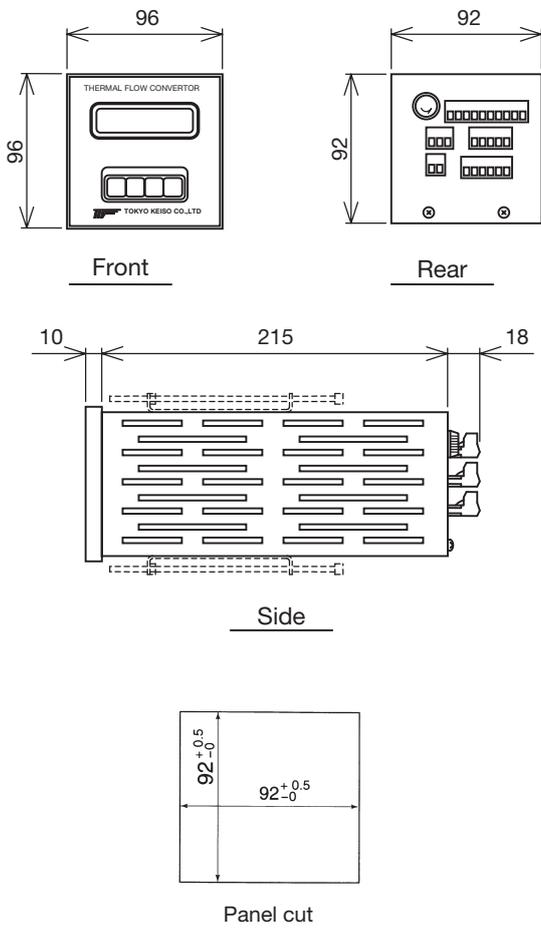
TRX-700



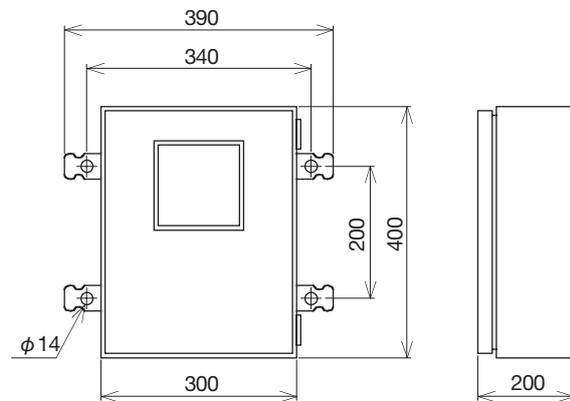
TRX-900

DIMENSION

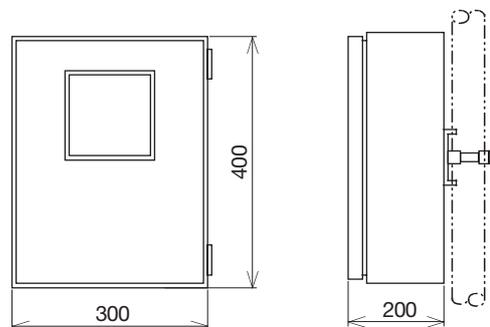
- TRX-700 (Panel mount type)



- TRX-900 (Wall mount type)



- TRX-900 (2B pipe mount type)



\* Specification is subject to change without notice.

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