



# TECHNICAL GUIDANCE

## TM-2000

### MINI CONVERTOR UNIT

#### OUTLINE

TM-2000 MINI CONVERTOR UNIT is power supply and indication unit which is used in combination with Tokyo Keiso's TF-1000 and TF-1100 series MINI THERMAL MASS FLOWMETERS.

All necessary functions of power supply to the detectors and scaled flow indication is provided in DIN 72mm compact housing.

Additionally, either totalization (with scaled pulse output) of flow or high and low alarm is available for total gas volume management or stable gases supply applications.

Also, analog re-output function (DC4 to 20mA or DC0 to 5 V) is provided as standard for further connection to recorders and/or process control loop.



#### STANDARD SPECIFICATION

##### ● FLOW RATE INDICATION

Indication : By 4 digit LCD (13mm height)  
Accuracy :  $\pm 0.1\%$  F.S.  $\pm 1$  last digit additional to detector accuracy

Analog re-output (Alternative)  
: a) DC4 to 20mA Max.load 500 $\Omega$   
: b) DC0 to 5V Min.load 100k $\Omega$

Output accuracy :  $\pm 0.1\%$  F.S. additional to detector accuracy

##### ● TOTALIZATION FUNCTION

Indication : By 7 digit LCD (6mm height)  
Scaled pulse : Output Open collector  
Rating DC30V, 20mA Max.  
Pulse width 100mS (Fixed)  
Pulse rate Equal to counter increments

Indication accuracy :  $\pm 0.1\%$  F.S. additional to detector accuracy

Scaling factor : 18,000 c/h (Max.)

Total re-set : By manual push button or short-circuiting of terminal

##### ● LOW CUT : Standard 2% (Freely programmable)

Corresponding function: Flow rate indication, Flow rate output, Totalization indication, and Scaled pulse output

##### ● ALARM FUNCTION

Alarm indication : Red color LED (The light is turned on in operation)  
Alarm output : SPST NO (Make contact) or NC (Break contact) (The contact will be opened without power supply)

Setting accuracy :  $\pm 1.0\%$  F.S.

Contact rating : AC125V, 0.4A/DC30V, 2A

Setting point : 2 points (High and Low)

Setting range : 0 to 100% of span

Setting : Field adjustable through front panel key

Hysteresis width :  $1 \pm 0.5\%$  F.S.(Fixed)

##### ● ANALOG INPUT (Alternative)

: a) DC4 to 20mA Input resistance 250 $\Omega$

: b) DC0 to 5V Input resistance 200k $\Omega$

##### ● OTHER FUNCTION

Multi-data : Max.8 different data can be programmed. (Channel selection by front panel key)

Linearise function (Option)

: a) Fourth formula multiplier method

: b) Extraction of square-root multiplier method

Data back up : Total count and operation parameters are memorized by EEROM for 10 years.

##### ● EXTERNAL POWER SUPPLY : DC $\pm 12$ V, +200mA, -200mA

##### ● OTHER SPECIFICATION

Power supply : AC85 to 250V 50/60Hz

Power consumption : 15VA

Electrical connection : Pin terminal

Ambient temp : 0 to 50 $^{\circ}$ C (To be free from condensation)

Withstand voltage : Power supply to Earth terminal  
AC1500V, 1 min.

Insulation resistance : Power supply to Earth terminal  
More than 20M $\Omega$  (DC500V)

Construction : Indoor use (IP20 equ.)

Housing material : ABS resin containing glass fiber

Weight : Approx.450g

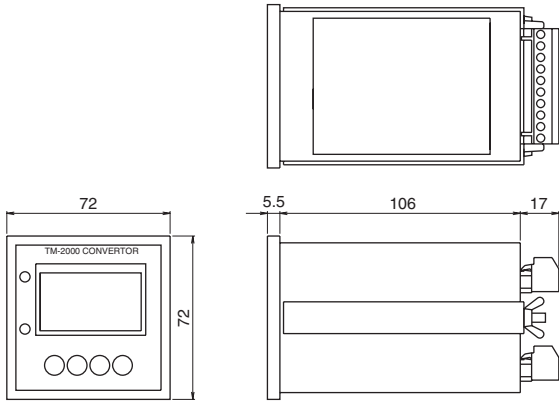
#### MODEL CODE

Model code		Description	
TM -	2		
Analog Input	1		DC4 ~ 20mA
	2		DC0 ~ 5V
Analog Output	1		DC4 ~ 20mA
	2		DC0 ~ 5V
Alarm Output	1	H : NO, L : NO	H : High
	2	H : NC, L : NC	L : Low
	3	H : NO, L : NC	NO : Make contact
	4	H : NC, L : NO	NC : Break contact
Input & Output characteristics	Standard	—	Linear
	Option	— H	Fourth formula multiplier method
	Option	— R	Extraction of square-root multiplier method

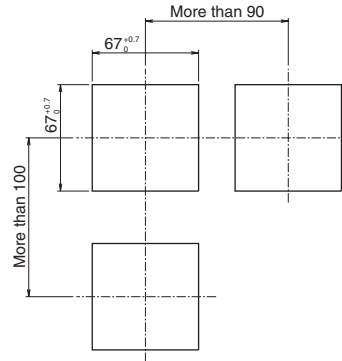
#### APPLICABLE FLOWMETERS AND EXCLUSIVE CABLE

Applicable flowmeters	Cable code	Cable length
TF-900/1000/1100/1300	SC-MM2	2m : Standard 100m (Max.)
TF-1200/1400	SC-MA2	
TF-5300/6300	SC-FM2	
(H-) EP-TF-5300	SC-EP2	
HM-1000/5000 (Option)	SC-HM	

**DIMENSIONS**

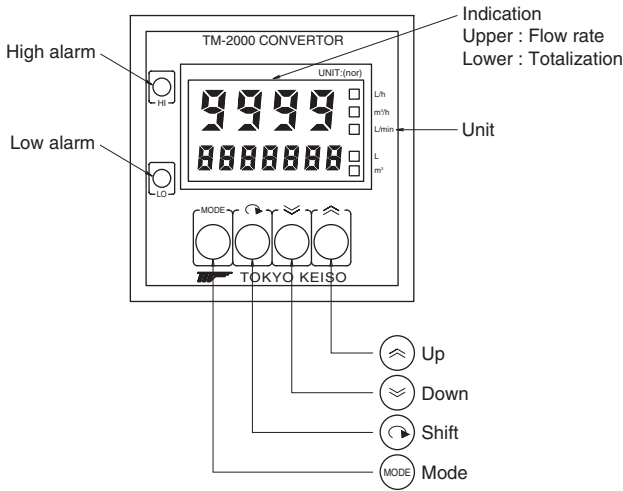


**PANEL CUT AND MOUNT DISTANCE**

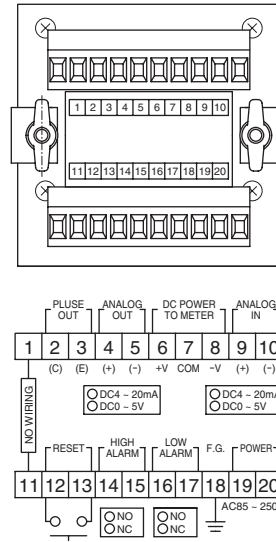


Note) Recommending mount panel in 1 to 5mm thickness.

**FRONT PANEL**



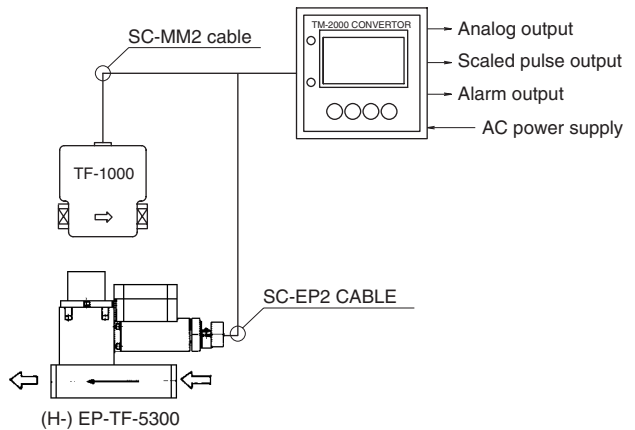
**TERMINAL**



**WIRING**

No.	Description	No.	Description
1	Non - use	11	Non - use
2	(C) Pulse	12	Reset
3	(E) Output	13	
4	(+) Analog	14	High alarm output
5	(-) Output	15	
6	(+V) DC power	16	Low alarm output
7	(COM) to meter	17	
8	(-V)	18	F. G.
9	(+) Analog	19	AC power supply
10	(-) Input	20	

**APPLICATIONS**



\* Specification is subject to change without notice.

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