TECHNICAL GUIDANCE

TM-1400

MINI CONVERTER UNIT

OUTLINE

TM-1400 MINI CONVERTER UNIT is power supply and indication unit which is used in combination with Tokyo Keiso's TC-1000, TC-2000, TC-3000, and EP-TC-1000/2000V series mass flow controllers.

All necessary functions of power supply to the mass flow controllers and scaling indication of flow signal, and flow rate setting function with the change of external/manual setting are provided in DIN 72mm compact housing.

Additionally, totalizing pulse output is provided as option for easy composition of the flow-rate regulating system of various gases.

Conventionally, each independent function is integrated, and space-saving and simple installation work are attained.

STANDARD SPECIFICATION

❑Flow rate

Indication:	By 3-1/2 digit Red LED (10.2mm height)	
Accuracy:	±1 digit additional to detector accuracy	
Output	Select from the following two functions (Factory set)	
	(1) DC4 to 20mA	Load resistance 550Ω or less
	(2) DC0 to 5V	Load resistance 5kΩ or more
Output accuracy:	(1) DC4 to 20mA	±0.1% F.S. additional to detector accuracy
	(2) DC0 to 5V	Detector accuracy

❑Totalizing pulse rate (TM-14□1-2□)

Scaling factor:	60 to 12000c/h (F.S.)	
Totalizing pulse:	Output	Open collector pulse
	Rating	V_{CE}= 50V max.
		V_{SAT}= 1.2V max.
		I_{CE}= 20mA max.
Pulse width:	100ms (ON time)	

❑Flow rate setting

(1) External setting input signal
A mass flow controller is controlled by inputting voltage or current signal into TM-1400 from external device.

(2) Manual setting
Switching and setting ratio of the input of setting from outside are possible with the model with minimum memory 1% manual setting function and 10 rotations analog dial vernier.
And it is also with a compulsive control selection capability such as flow stop or full open.

❑External setting input signal

Select from the following three functions. (Factory setting)

(1) DC4 to 20mA	Input resistance 250Ω
(2) DC0 to 5V	Input resistance 100kΩ
(3) DC1 to 5V	Input resistance 100kΩ

Soft start function is possible as option. (Time constant: 5 seconds)

❑Other functions

Power supply:	AC85 to 240V (50Hz/60Hz)
Consumption power:	15VA
Electric connection:	(1) Connection with a mass flow controller Exclusive cable with connector
	(2) Connection with power supply and external device M3 screw terminal
Environmental condition:	0 to 50°C / 20 to 85%RH (To be free from condensation)
Withstand voltage:	Power supply to Earth terminal AC1500V, 1min.
Insulation resistance:	Power supply to Earth terminal 20MΩ or more (DC500V)
Enclosure:	Indoor use (Equivalent to IP20)
Housing material:	Noryl resin containing glass fiber
Weight:	(Approx. 550g)

MODEL CODE

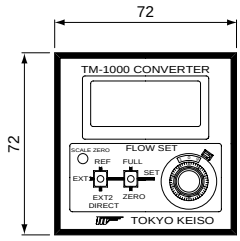
TM-14			—			Description
Analog output	1					DC4 to 20mA
	2					DC0 to 5V
Totalizing pulse output		0				Not provided
		1				Provided
Flow rate setting method			—	2		External setting / With manual setting change
External setting input signal					0	Not provided
					1	DC4 to 20mA
					2	DC0 to 5V
					3	DC1 to 5V

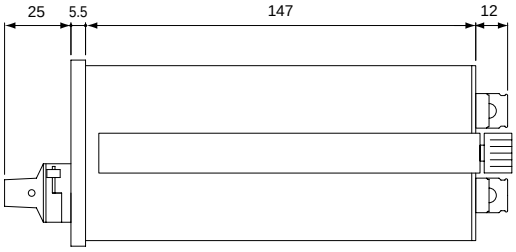
APPLICABLE FLOW CONTROLLERS AND EXCLUSIVE CABLE

Applicable controller	Cable code	—	Cable length (m)
TC-1000, 2000, 3000	SC-CM	—	Standard: 2m
EP-TC-1000/2000V	SC-TM	—	Max.: 100m
	SC-T-EPC	—	

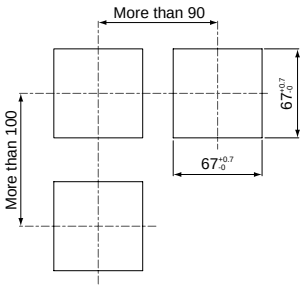
Note) ·SC-CM cable 100m → "SC-CM-100"
·Maximum cable length of SC-TM and SC-T-EP is 100m.

DIMENSIONS

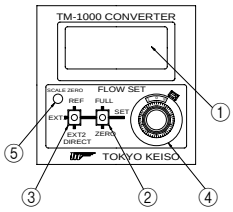


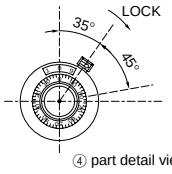


Panel cut and installation interval



FRONT PANEL

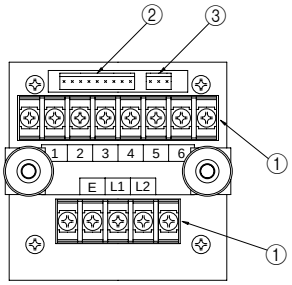




④ part detail view

No	Name	Contents	
①	Flow indicator	Flow indication 3-1/2 digit by Red LED	
②	Flow setting switch	FULL	Forcible settig to 100% of flow rate
		SET	Switch ③ is set.
		ZERO	Forcible setup to 0% of flow rate
③	Flow setting standard signal changing switch	Switch ③ functions when switch ② is in the state of SET.	
		REF	Flow rate setting can be made by flow rate setting dial. (0 to 100%)
		EXT(1)	External setting input signal can be partial set by flow rate setting dial. Division setting of the external setting signal can be made by flow rate setting dial. (External setting signal × 0 to 100%)
		EXT(2) DIRECT	External setting input signal overrides flow rate setting signal. Flow rate setting dial does not work.
④	Flow rate setting dial	Flow rate setting by 10 rotation analog dial (%)	
		Clockwise rotation	Flow rate increases.
		Counterclockwise rotation	Flow rate decreases.
		Upper scale	1/10 division of full scale
		Lower scale	1/100 division of full scale
⑤	Zero adjustment trimmer	SCALE ZERO	Zero adjustment trimmer of flow rate indication and Analog output

TERMINAL



①Terminal block

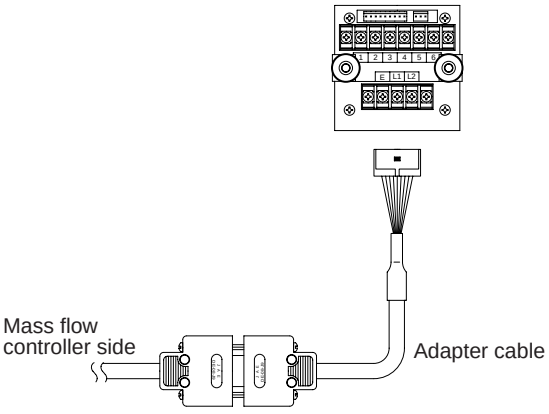
No	Contents	
1	+	Analog output
2	–	
3	C (+)	Totalizing pulse output
4	E (–)	
5	+	External setting input signal
6	–	
E	Grounding	
L1	AC power supply	
L2		

②Connector for mass flow controller
③Connector for external power supply

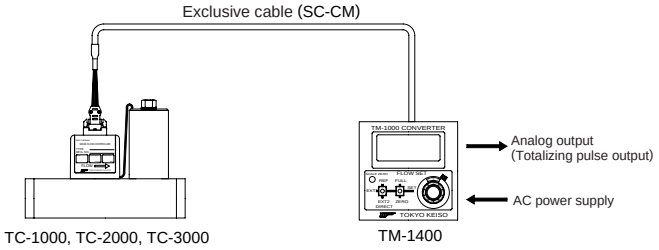
*AC power supply is L1 and L2 of terminal block ①.
Be careful when wiring.

CONBINATION WITH MASS FLOW CONTROLLER

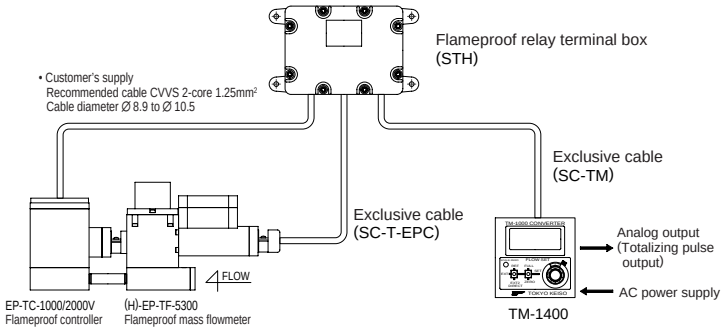
When a model change is made from TM-7000 series to TM-1400 series using an existing mass flow controller, a panel adapter case and an adapter cable are needed. (Please specify it at ordering.)



● Connection with TC-1000, TC-2000, and TC-3000



● Connection with EP-TC-1000 / 2000V



*Specification is subject to change without notice.

TOKYO KEISO CO.,LTD.

Head Office : Shiba Toho Building, 1–7–24 Shibakoen, Minato-ku, Tokyo 105–8558
Tel : 03–3431–1625 (KEY) ; Fax : 03–3433–4922
e-mail : overseas.sales@tokyokeiso.co.jp ; URL : http://www.tokyokeiso.co.jp

ISO 9001 Certified
JQA-2172