

TIV

TECHNICAL GUIDANCE

Flameproof Construction
Covering Hydrogen Atmosphere

Thermal Mass Flowmeter / Mass Flow Controller

EP-TF-5300 Series **EP-TC-1000 Series**
H-EP-TF-5300 Series **EP-TC-2000V Series**

OUTLINE

EP-TF-5300 Series are Thermal Mass Flowmeter for the gases with a flameproof construction. The mass flow rate of various kinds of gases can be measured, regardless of such process conditions as pressure, temperature etc.

The minimum full scale is 5mL/min (nor), and the maximum full scale is 500L/min (nor). Maximum Operating Pressure is 4.9MPa which covers the various applications.

Meantime, H-EP-TF-5300 Series (for the high pressure) can cover the max. operating pressure up to 14.7MPa. Thermal Mass Flow Controller (EP-TC-1000 Series) is the flameproof control valve, and this can be used together with EP-TF-5300 Series. The mass flow rate of the various kinds of gasses can be automatically controlled .

EP-TC-2000V Series is for the high pressure and used together with H-EP-TF-5300 Series, covering the maximum operating pressure of 9.8MPa.

FEATURES

❑ FLAMEPROOF CONSTRUCTION

Both Mass Flowmeter and Mass Flow Controller cover the hydrogen atmosphere(JIS Class "1" area).

The application has become much wider than before.

❑ HIGH ACCURACY ($\pm 1\%$ F.S.)

The gas mass flow rate can be measured in high accuracy because of our theory and the know-how for many years.

❑ EXTENSIVE FLOW RANGE

These instruments can be used for the applications from the pilot plant to the actual industrial applications.

❑ SUPPORTING INSTRUMENT READY

The indication, integration and controlling can be conducted, assembled with TM-1400/2000 Mini Converter unit.



(H-) EP-TF-5300 Flameproof Mass Flowmeter for High Pressure

STANDARD SPECIFICATIONS

Model	(H-)EP-TF-5310	(H-)EP-TF-5320	(H-)EP-TF-5330	(H-)EP-TF-5340
Flow Range (Full Scale)	5mL/min(nor) to 20L/min(nor)	20 to 80L/min(nor)	80 to 300L/min(nor)	300 to 500L/min(nor)
Flow output signal	DC 0 to 5V			
Accuracy	±1.0% F.S. (25°C Standard)			
Response time	Within 3 seconds for 90%			
Max. operating pressure	4.9 MPa (H-EP-TF-5300 is up to 14.7 MPa)			
Ambient and gas temp.	5 to 50°C			
Temperature effect	Span 0.1% F.S./ °C max. Zero point 0.05% F.S./ °C max.			
Pressure effect	0.1% F.S.(0.1 MPa) max.			
Enclosure	Flameproof construction JIS d3aG4			
Cable entry	G1/2(=PF1/2) Female screw			
Power source	DC +15V 25mA max. Model TM-2000 DC -15V 5mA max (Use Converter unit.)			
Gas contact material	SUS316, Viton or CR			
Connection size (OD)	1/4"	1/4", 3/8"	3/8", 1/2"	3/8", 1/2", 3/4"
Type of connection	Swagelok, VCR, VCO, Rc (=PT), NPT, Flange			

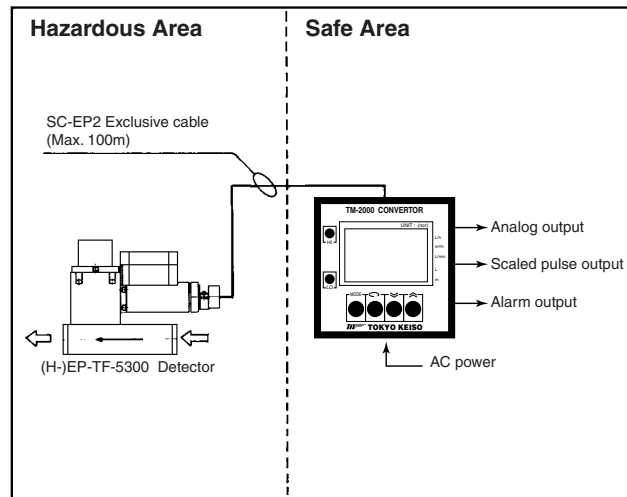
MODEL CODE

Model Flow Rate Gas Connection Fluid

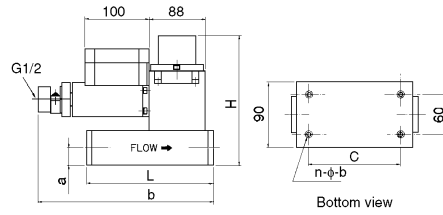
EP-TF-53 0-

H-	1			For high pressure
	2			5mL/min(nor)~20L/min(nor)
	3			20L/min(nor)~80L/min(nor)
	4			80L/min(nor)~300L/min(nor)
				300L/min(nor)~500L/min(nor)
		(AX10+B)10 ⁰ Unit mL/min(nor)		1L/min(nor)=1000mL/min(nor) L/min(nor): Normal Liters per minute
		S		Swagelok
		R		VCR (EP-TF-5300)
		O		VCO (EP-TF-5300)
		P		Rc (=PT)
		N		NPT
		F		Flange
	0 4			1/4"
	0 6			3/8"
	0 8			1/2"
	1 2			3/4"

FLOW MEASUREMENT ONLY (WITH TM-2000 Mini converter unit)



EXTERNAL DIMENSION (EP-TF-5300)



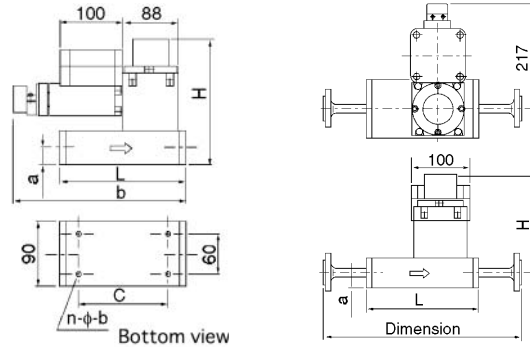
Dimension	H	L*	a	b	c	n-ø-d	Estimated Mass
Model EP-TF-5310	177	107	16	268	60	4-M5-10	6.0kg
EP-TF-5320	183	116	19	261	60	4-M5-10	7.0kg
EP-TF-5330	203	182	29	281	104	4-M10-15	10.5kg
EP-TF-5340	203	222	29	281	144	4-M10-15	12.0kg

* (1) L dimension is for Rc or NPT thread connection.
* (2) Flow direction can be changed by 90 degrees.

EXTERNAL DIMENSION (H-EP-TF-5300)

Screw Connection

Flange Connection



SCREW OR SWAGELOK CONNECTION

Dimension	H	L	a	b	c	n-ø-d	Estimated Mass
Model H-EP-TF-5310	183	124	19	276	60	4-M5-10	7.0kg
H-EP-TF-5320	193	150	24	282	60	4-M5-10	8.5kg
H-EP-TF-5330	205	223	30	313	110	4-M10-15	12.5kg
H-EP-TF-5340	205	263	30	313	150	4-M10-15	14.0kg

(1) In case of Swagelok, the fitting is regarded as the accessory, and it is not screwed in the body.
(2) Cable entry can be changed by 90 degrees against the flow direction.

FLANGE CONNECTION

List for dimension between surfaces. (mm)

In case the cable entry is the right angle against the flow direction.

Connection size: 15mm (1/2") or 20mm (3/4")

Standard	JIS		ANSI · JPI			
	10K	20K	150Lb	300Lb	800Lb	1500Lb
Model H-EP-TF-5310	250	270	250	270	300	320
H-EP-TF-5320	270	290	270	290	320	340
H-EP-TF-5330	340	360	340	360	390	410
H-EP-TF-5340	380	400	380	400	430	450

ESTIMATED MASS (kg)

Connection size: 20mm (3/4")

Standard	JIS		ANSI · JPI			
	10K	20K	150Lb	300Lb	800Lb	1500Lb
Model H-EP-TF-5310	8.5	8.7	8.7	9.2	10.0	12.5
H-EP-TF-5320	10.0	10.2	10.2	10.7	11.5	14.0
H-EP-TF-5330	14.0	14.2	14.2	14.7	15.5	18.0
H-EP-TF-5340	15.5	15.7	15.7	16.2	17.0	19.5

EP-TC-1000/2000V MASS FLOW CONTROLLER

EP-TC Series Mass Flow Controller is the flameproof control valve and is used together with(H-) EP-TF-5300 Mass Flowmeter.

Standard Specification for EP-TC-1000

Model	EP-TC-1000	
Scale Range*1	Min. 0 to 5mL/min (nor) Max. 0 to 100L/min (nor)	
Flow Control Range	2 to 100% of full scale	
Response Time	3 sec. for 98% of setting value	
Input Setting Signal	DC 0 to 5V	
Primary Side Max. Pressure	2.9MPa	
Controllable Differential Pressure	0.07 to 0.3MPa	
Gas Temperature	5 to 50°C	
Ambient Temperature	5 to 50°C	
Enclosure	Flameproof, JIS d3aG4	
Power Source	DC +15V 25mA max. (Use TM-1400 Type Converter unit.) DC -15V 320mA max.	
Gas Contact Material	SUS 316, SHOMAC®*2, Viton or CR	
Connection	Caliber	OD 1/4", 3/8"
	Standard	Swagelok, VCR, VCO, Rc(=PT), NPT

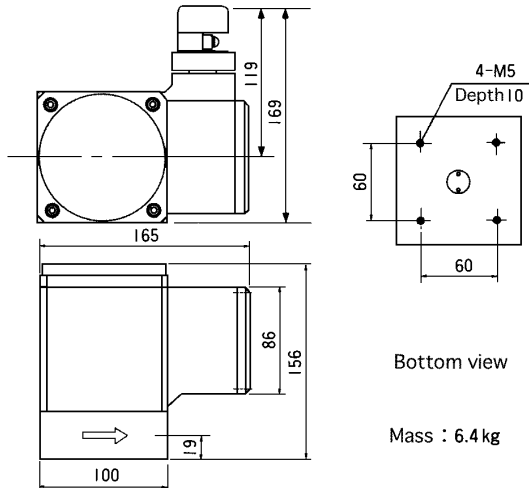
*1: Flow rate based on N₂. Min. flow range of H₂ is 250mL/min (nor).

*2: Specially high purity Ferrite system Stainless steel (High corrosion resistant and strong magnetic material)

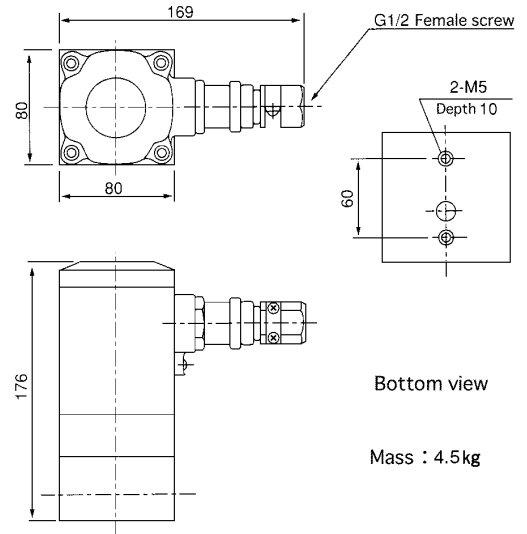
Standard Specification for EP-TC-2000V

Model	EP-TC-2000V	
Scale Range*1	Min. 0 to 200mL/min (nor) Max. 0 to 100L/min (nor)	
Flow Control Range	2 to 100% of full scale	
Response Time	Within 3 sec. for 98% of setting value	
Input Setting Signal	DC 0 to 5V	
Primary Side Max. Pressure	9.8 MPa	
Controllable Differential Pressure	Less than F.S. 20L/min (nor) 20% to 80% of Primary pressure More than F.S. 20L/min (nor) 20% to 40%	
Enclosure	Flameproof, Exd II CT6	
Gas Temperature	5 to 48°C	
Ambient Temperature	5 to 48°C	
Power Source	DC +15V 25mA max. (Use TM-1400 Type Converter unit.) DC -15V 320mA max.	
Gas Contact Material	SUS 316, SHOMAC®*2 Viton or CR	
Connection	Caliber	OD 3/8"
	Standard	Swagelok (OD1/4", 3/8"), Rc (=PT)

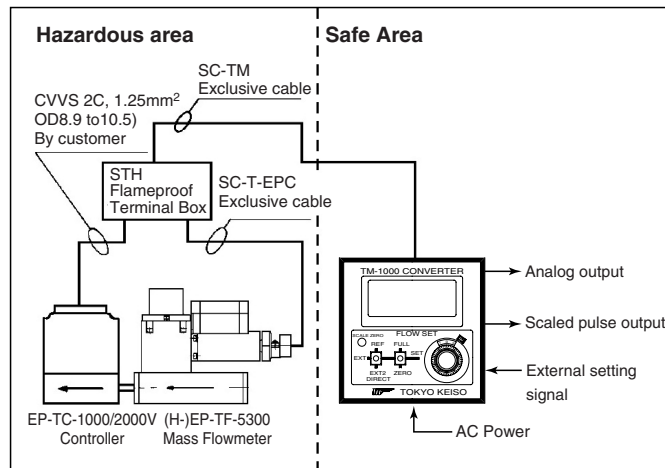
EXTERNAL DIMENSION (EP-TC-1000)



EXTERNAL DIMENSION (EP-TC-2000V)



FLOWMETER / CONTROLLER (With TM-1400 Mini converter unit)

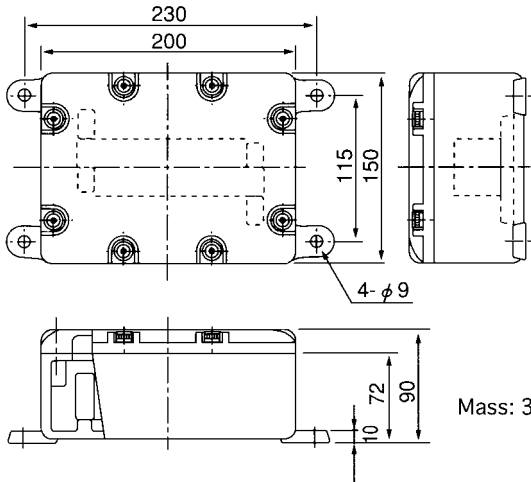


PERIPHERAL EQUIPMENT / ACCESSORY Mass Flowmeter / Controller

FLAMEPROOF TERMINAL BOX

When using EP-TC-1000/2000V with Mass Flow Controller, this is used for connection at the hazardous area.

Model	STH-1S-A
Construction	Flameproof, JIS d2G4
Material	AC7A-F
Cable Entry	3XG1/2 (Cable gland attached)
Paint Color	Mansel 7.5BG6/1.5



EXCLUSIVE CABLE

- SC-EP2 (H-)EP-TF-5300 to TM-2000 Max. 100m
- SC-TM STH Flameproof Terminal Box to TM-1400 Max. 100m
- SC-T-EPC (H-)EP-TF-5300 to STH Flameproof Terminal Box in total

CAUTIONS

- Install this at the place where the rainwater does not splash directly.
- The inside diameter of sensor pipe is 0.3mm. Flash piping before installation and remove the dust, water etc. completely.
- Read Instruction Manual carefully.

TM-1400/2000 MINI CONVERTER UNIT

TM-1400/2000 is a compact converter unit based on DIN 72, and not only Indication, but the ratio setting can be made with the mass flow controller.



TM-1400



TM-2000

Technical Guidance for TM-1400/2000 Mini Converter Unit is separately available. Contact us if needed.

ORDERING /INQUIRY FORM

Model	(H-)EP-TF-53□□/EP-TC-1000/2000V				
Gas					
Primary Side Pressure	Max.	MPa	Normal	MPa	Min. MPa
Variation Range of Secondary Pressure	~				MPa
Temperature	°C				
Full Scale	□ mL/min. (nor)		□ L/min. (nor)		
Connection Size	□ 1/4"	□ 3/8"	□ 1/2"	□ 3/4"	
Connection Standard	□ Swagelok		□ Rc (=PT) □ Others		

Converter	□ TM-22□□-□ (Indication/Integration/Alarm)		For mass flowmeter
	□ TM-14□□-□□ (Indication/Setting)		For mass flow controller
Exclusive cable	SC-TM	□	m (Max. 100m in total)
	SC-T-EPC	□	m
	SC-EP2	□	m (Max. 100m)

* Specification is subject to change without notice.



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