

TF

TECHNICAL GUIDANCE

Compact design with indicator and flow adjustment valve

TF-600D/600V Series MINI-THERMAL MASS FLOWMETER

OUTLINE

The TF-600D/600V series mass flowmeter has evolved from the existing cost-effective TF-600 mini-mini thermal mass flowmeter; and features an easy-to-read digital indicator and analog or digital (optional) signal output function. Indication can be either checked at the site or remotely managed. The lineup includes a model with a flow adjustment valve, which is ideal for being mounted on units for saving space.

FEATURES

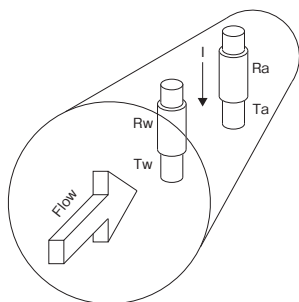
- ☐ Thermal mass flow measurement
 - Not influenced by changes in pressure and temperature
- ☐ Flow adjustment valve
 - A model with a flow adjustment needle valve is available.
- ☐ Whole quantity passage detection system
 - No-bypass simple construction for easy maintenance
- ☐ High durability
 - A highly durable general-purpose temperature sensor
- ☐ Digital indicator
 - Easy-to-read indication by the self-illuminated LED
- ☐ Analog output, totaled pulse output, and flow rate alarm output
 - Ensuring easy remote monitoring, batch operation, and safe operation
- ☐ User-friendly concept
 - Parameters can be set by keys on the panel.
- ☐ Complying with the CE marking

OPERATION PRINCIPLE

The TF-600D/600V series mass flowmeter has a resistance thermometer (R_w) in the flow path and heats it with electricity to a certain temperature (T_w). When gas with a temperature of T_a flows through this path, current (I) is adjusted to keep the temperature difference ($T_w - T_a$) constant.

The quantity of heat ($R_w \cdot I^2$) transferred from the resistance thermometer to the gas is a function of the mass flow rate of the gas, thus the mass flow rate can be calculated from the value of current (I).

The electric circuit used to detect the flow rate can compensate for even minute changes in properties which are caused by changes in temperature. Thus the mass flow rate can be measured with high accuracy. Current (I) is converted to an electric signal in proportion to a specific flow rate and output.



MODEL CODE

Model Code						Description	
TF-6							
Flow range	0					Max. 100 L/min(nor), connection size 1/4	
	2					Max. 200 L/min(nor), connection size 3/8	
	3					Max. 500 L/min(nor), connection size 1/2	
	4					Max. 1000 L/min(nor), connection size 3/4	
Power supply	1					24 V DC, 0 to 5 V output	
Construction *1	D					With indicator	
	V					With indicator and valve	
Indicator	0					Mounted	
Scale range [L/min(nor)]		050	—		0 to 5	TF-601D	TF-601V
		100	—		0 to 10		
		200	—		0 to 20		
		500	—		0 to 50		
		101	—		0 to 100	TF-621D	TF-621V
		151	—		0 to 150		
		201	—		0 to 200		
		301	—		0 to 300		
		401	—		0 to 400	TF-631D	TF-631V
		501	—		0 to 500		
		601	—		0 to 600		
		801	—		0 to 800		
		102	—		0 to 1000	TF-641D	— *1
Connection rating						P —	Rc screw
						S —	Swagelok connector *1
						R —	VCR connector *2
Fluid						A	Air
						N	N2
						<input type="checkbox"/>	Others *3

*1 The maximum scale range of TF-631V is 400 L/min (nor). TF-641D can be specified only with an indicator.

*2 The size 1/2 inch or smaller is available for VCR connection. VCR connection is not available for TF-641D.

*3 Contact TOKYO KEISO Co., Ltd. for gases other than air and N2.

STANDARD SPECIFICATIONS

Model code	TF-601D TF-601V	TF-621D TF-621V	TF-631D TF-631V *1	TF-641D
Fluid	Air, Nitrogen *2			
Scale range *3, 6	Min.	0 to 5 L/min(nor)	0 to 150 L/min(nor)	0 to 300 L/min(nor)
	Max.	0 to 100 L/min(nor)	0 to 200 L/min(nor)	0 to 500 L/min(nor)
Rangeability	1:10			
Temperature range	0 to 50°C (without condensation)			
Pressure range	-0.05 to 0.75 MPa			
Temperature influence	±0.2% F.S. /°C Max (23±10°C)			
Pressure influence	±3% F.S. Max at -0.05 to 0.75 MPa			
Response	2 seconds for 90% (variable by key operation or communication)			
Wetted part materials	Body and flow path: SCS14, SUS316 Sensor: POM, Ni, Polyimide, Epoxy Seal: Fluorocarbon rubber			
Indication	Either flow rate or totalized flow is selectable with panel keys. 4-digit, 7-segment red LED Letter height: 7 mm			
Indication accuracy	Flow rate: ±3% F.S. ±1 dig at 23°C Totalization: ±3% F.S. ±1 dig at 23°C			
Analog output	0 to 5 V DC			
Analog output accuracy	±3%F.S. at 23°C			
Totalized pulse output *4	Open collector: 30 V DC/50 mA Pulse width: 50 msec Multiplier: ×0.01, 0.1, 1, 10, 100 *5			
Flow alarm output *4	Open collector: 30 V DC/50 mA High, Low, High and Low alarm contact output Setting range: 0 to 100% F.S. Red LED turns ON for alarm.			
Digital output	RS485 (Dedicated cable provided)			
Housing / Protection	ABS resin / IP20, not waterproof (IP20)			
Installation	Horizontal or vertical			
Electric connection	Connector (Dedicated cable provided)			
Power supply	24 V DC ±10%			
Consumption current	Approx. 100 mA			
Data backup	Totalized values are saved in EEPROM at power-off.			
Process connection	Rc1/4 1/4SWL, 1/4VCR	Rc3/8, 3/8SWL Equivalent to 3/8VCR	Rc1/2, 1/2SWL Equivalent to 1/2VCR	Rc3/4, 3/4SWL
Mass (Approx.)	TF-601D: 260 g TF-601V: 420 g	TF-621D: 360 g TF-621V: 620 g	TF-631D: 670 g TF-631V: 980 g	TF-641D: 1230 g

*1 The scale range of TF-631V is max 400 L/min (nor).

*2 Contact TOKYO KEISO Co., Ltd. for other measuring fluids.

*3 Low cut-off: 5.0 % F.S. (applicable to flow indication, analog output, totalized flow indication, totalized pulse output)

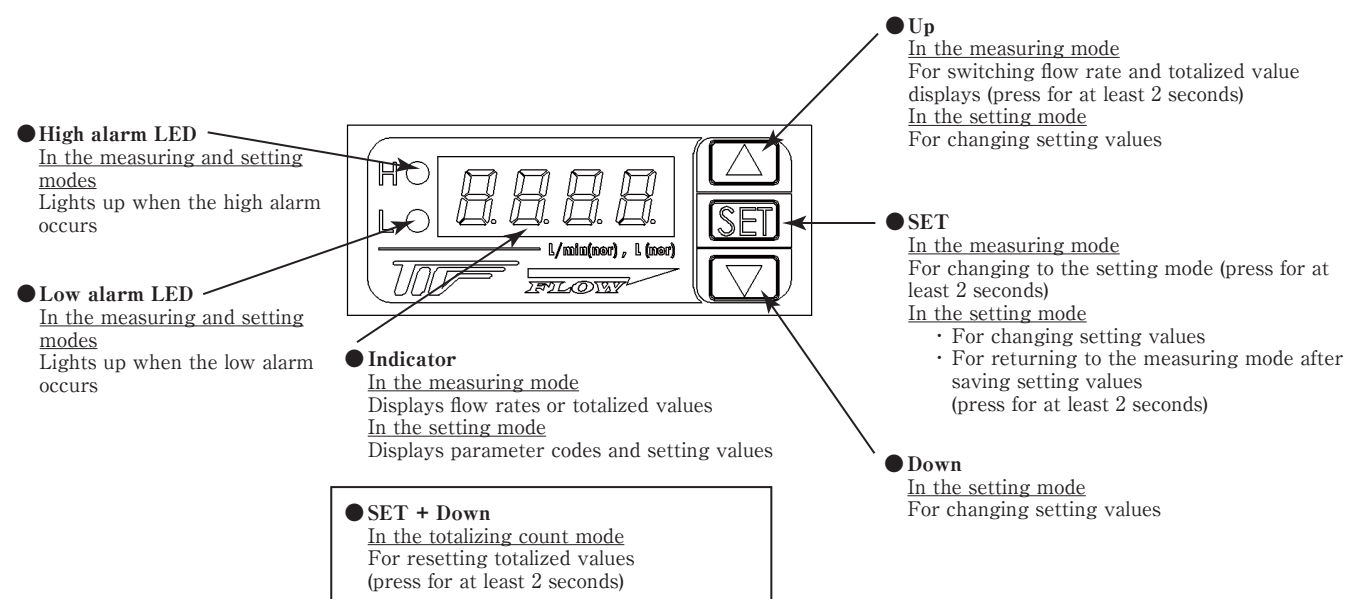
*4 Designate a line for outputting totalized pulse output and flow alarm output.

*5 Totalizing pulse rate: Max. 600 c/min

Totalizing pulse rate (c/min)=Flow rate÷Totalizing multiplier (L (nor))

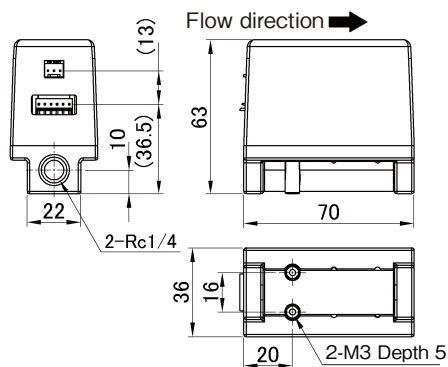
*6 If the flow rate is over approximately 110% of the flow range, "-O.L.-" is displayed instead of flow rate.

FRONT PANEL

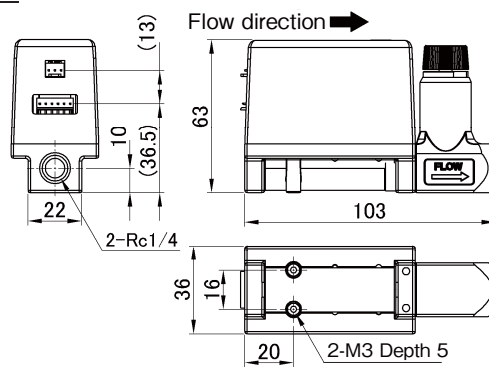


DIMENSIONS (Unit : mm)

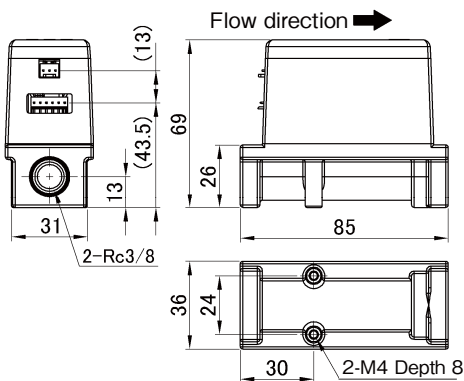
TF-601D



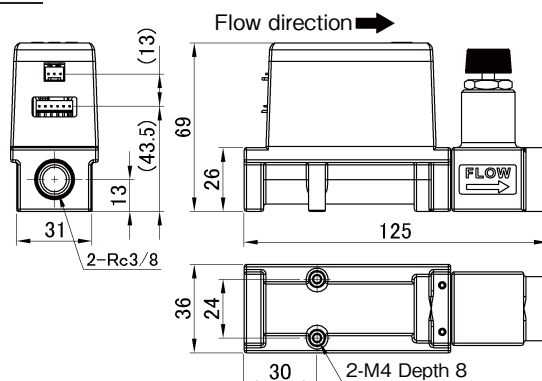
TF-601V



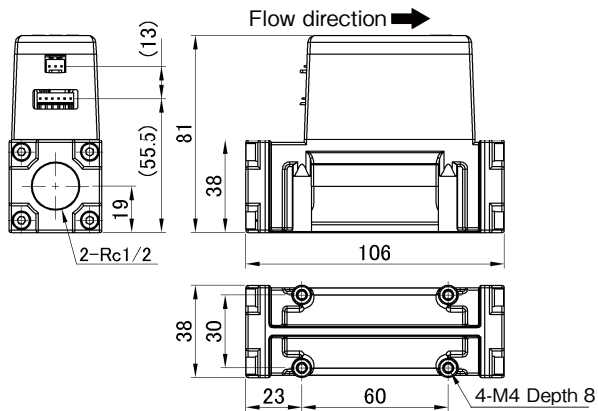
TF-621D



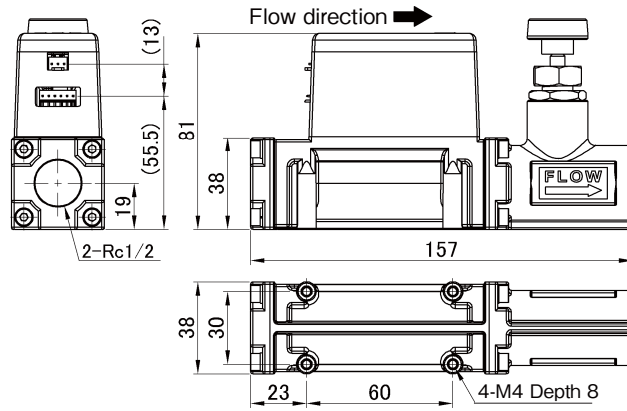
TF-621V



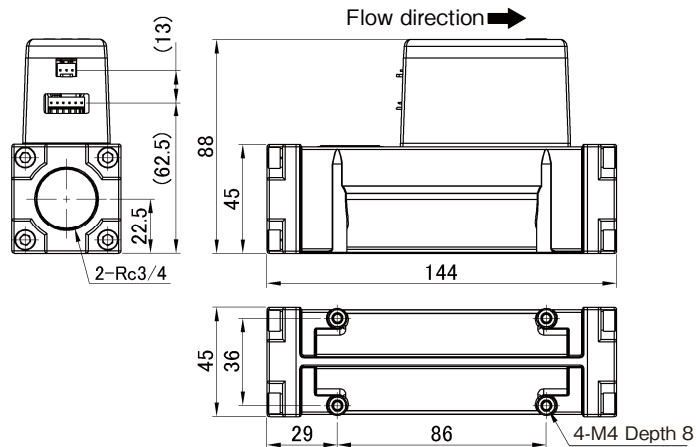
TF-631D



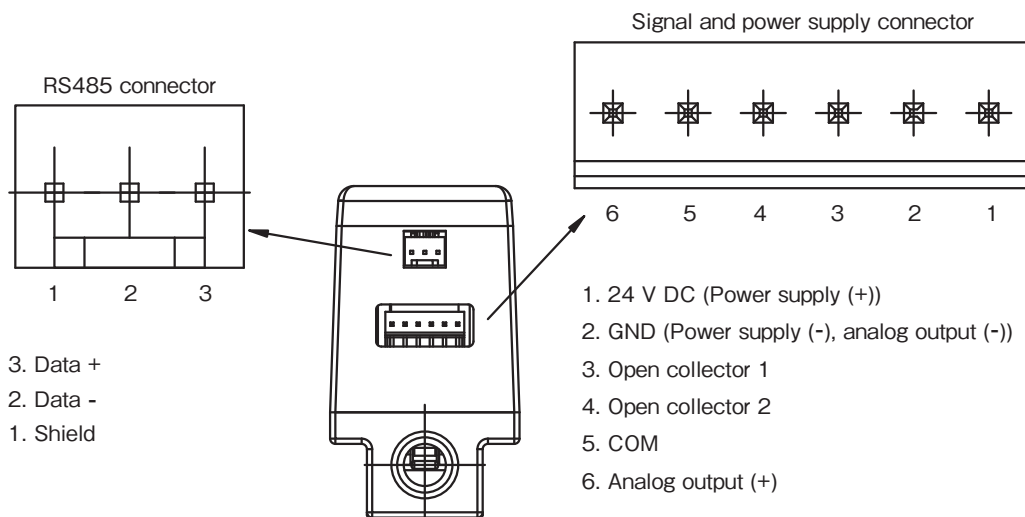
TF-631V



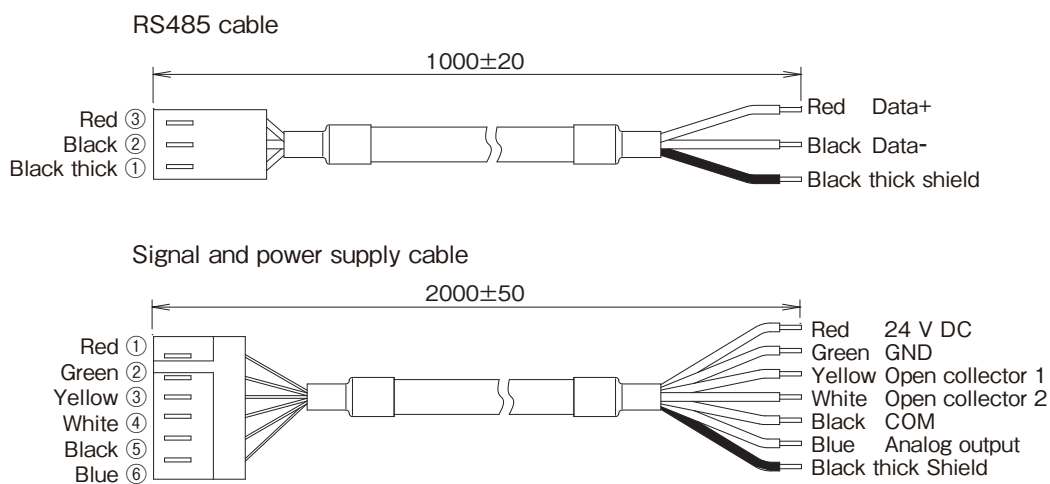
TF-641D



CONNECTOR ARRANGEMENT



CABLE WITH CONNECTOR (ACCESSORY)



* Specification is subject to change without notice.

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