1. Specifications

⊙ Model TBZ [Capacity]-[Correction category]-[Correction type] - [Flow direction]

Capacity	Compensation category	kind of compensation	Flow direction
□ 60 □ 150 □ 300	□ 0 (No correction) □ 3.5 (temperature and pressure correction 350kPa) □ 9.9 (temperature and pressure correction 980kPa) □ 3.5P (only pressure compensation 350kPa) □ 9.9P (only pressure compensation 980kPa)	□ N (Temperature: 0°C, Pressure: 1 atm) □ S (Compensation values other than N) * □ 0 (No compensation)	□ L (Left inlet) □ R (Right inlet) □ D (Top inlet) □ U (Bottom inlet)

*) Range of standard points: For pressure, 0 to 9999Pa in unit of 1Pa. For temperature, 0℃ to +60℃ in unit of 0.1℃.

Connection diameter

Model	TBZ60	TBZ150	TBZ300
Connection diameter	40A flange (JIS 10K)	50A flange (JIS 10K)	80A flange (JIS 10K)

Flow-rate range (Actual flow rate)

Model	TBZ60	TBZ150	TBZ300
Flow rate range	6 to 60 m^3/h	12.5 to 150 m^3/h	30 to 300 m^3/h

Accuracy

1) Synthetic accuracy

Model	TBZ□-0	TBZ□-3.5	TBZ□-3.5P	TBZ□-9.9	TBZ□-9.9P
Flow rate range of 50% to 100%	±1%FS and ±3%RS	±3%RS*		±4%RS*	±3.5%RS*
Flow rate range of lower limit to 50%		±5%RS*		±6%RS*	±5.5%RS*

*) Under the condition where atmospheric pressure is 101.325 kPa.

2) Measurement portion accuracy

Model	TBZ□-0	TBZ□-3.5	TBZ□-3.5P	TBZ□-9.9	TBZ□-9.9P
Flow measurement portion	±1%FS and ±3%RS				
Compensation calculation portion		±2%RSmax*		±3%RSmax*	±2.5%RSmax*

*) Under the condition where atmospheric pressure is 101.325 kPa.

3) Accuracy guaranteed pressure range

Compensation category	TBZ□-0	3.5/3.5P	9.9/9.9P
Accuracy guaranteed pressure range	Low pressure to 980 kPa	20 to 350 kPa	150 to 980 kPa

Maximum working pressure

Correction category	3.5/3.5P	0/9.9/9.9P
Maximum working pressure	350 kPa	980 kPa

Items with "⊙" represent selection items.

Pressure loss

Model	TBZ60	TBZ150	TBZ300
Pressure loss	0.4 kPa or less	0.4 kPa or less	0.9 kPa or less

(*) With air at a gauge pressure of 2kPa

Installation position: Free in gas inlet direction; from top, bottom, left, or right

Applicable fluid: Limited to only clean and dry gases (City gas, LP gas, air, nitrogen, argon, carbon dioxide, etc.).

Durability: 7 years (When used at room temperature with the load of 50% maximum flow-rate)

Use environment: -10 to +60°C, max 90%RH (No dew condensation)

Storage environment: -20 to +70°C, max 90%RH (No dew condensation)

Display Compensated accumulated flow volume, trip accumulated flow volume, uncompensated accumulated flow volume, compensated instantaneous flow-rate,uncompensated instantaneous flow-rate, temperature, pressure, setting values, decimal point, and pilot are displayed on the LCD. Changeover them by using "Change-over switch 1" and "Change-over switch 2".

Display \ Model	TBZ60/150/300	TBZ300-9.9(P)
Compensated accumulated flow volume (Only for compensation flow type)	9-digit display Minimum reading 10L 9999999.99 m^3	Minimum reading 100L
Trip accumulated flow volume	8-digit display Minimum reading 10L 999999.99 m^3	Minimum reading 100L
Uncompensated accumulated flow volume	9-digit display Minimum reading 10L 9999999.99 m^3	Minimum reading 100L
Compensated instantaneous flow-rate (Only for compensation flow type)	4-digit display Minimum reading 0.1m^3/h 999.9 m^3 /h	Minimum reading 1m^3/h
Uncompensated instantaneous flow-rate	4-digit display Minimum reading 0.1m^3/h 999.9 m^3 ./h	Minimum reading 1m^3/h
Temperature (Only for temperature pressure compensation type)	3-digit display Minimum reading 0.1°C 99.9°C	
Pressure (Only for compensation flow type)	3-digit display Minimum reading 1kPa 999 kPa	

Power source: Built-in lithium battery [battery life: 7 years (when used at room temperature)] The battery is not replaceable.

Item \ Model	TBZ-0	TBZ-9.9,3.5
Number of batteries	2	6
Lithium content	0.99 g (per battery)	0.81g (per battery)
Type	Battery pack	Battery pack

Temperature sensor: Platinum resistance temperature sensor, JIS Class A

Pressure sensor: Semiconductor type pressure sensor

Alarm function: At low battery pressure: The most significant digit of the integrated flow rate display blinks.
When exceeding the maximum working pressure: The pressure unit display (kPa) blinks.
At exceeding from the working temperature range:: The temperature unit display (°C) blinks.

Pulse output

Electrical specifications (Compensated) Unit pulse output

Specifications	(Corrected) Unit pulse output	High-density pulse output (Synchronized with the rotation of the vane wheel)
Method	Open collector	
Maximum rating	24VDC	
ON current	20 mA or less	10 mA or less
ON resistance	50Ω or less	100Ω or less
OFF resistance	100Ω or more	

Output unit

Model	Unit pulse output	High-density pulse output * (Vary according to individual difference of the flow measurement portion.)
	Standard	
TBZ60	100 L/P (Pulse output width: 40 ms)	Approx. 180cm^3/P
TBZ150	100 L/P (Pulse output width: 40 ms)	Approx. 470cm^3/P
TBZ300	100 L/P (Pulse output width: 40 ms)	Approx. 920cm^3/P

* Duty ratio is 0.45 to 0.55 (At a constant flow rate).

Pulse output setting conditions

Meter model				TBZ60			TBZ150			TBZ300		
Pulse unit				10L(*N*)	100L(*N*)	1m^3 (*N*)	10L(*N*)	100L(*N*)	1m^3 (*N*)	10L(*N*)	100L(*N*)	1m^3 (*N*)
Pressure sensor type	-0	Pulse width msec	40	○	⊙	○	○	⊙	○	○	⊙	○
			100	○	○	○	○	○	○	×	○	○
	-3.5		40	○	⊙	○	×	⊙	○	×	⊙	○
			100	×	○	○	×	○	○	×	○	○
	-9.9		40	×	⊙	○	×	⊙	○	×	⊙	○
			100	×	○	○	×	○	○	×	×	○

⊙: Standard ○ Allowed ×: Not allowed

Maximum extension distance: Varies according to input specifications of a remote counter.

Weight

Model	TBZ60	TBZ150	TBZ300
Weight	5.3 kg	6.0 kg	9.4 kg

Components

Part name	Material	Paint color	
		0	3.5/3.5P/9.9/9.9P
Main pipe	Stainless steel	Black	Silver
Flange	Steel		
Display	Aluminum alloy	Ivory	

Accessories: Instruction manual

Output signal wire unit

⊙ Option □ Attached □ Not attached

3-core cable

Cable length: 10 m

Connection:

Type of actual flow pulse	Unit pulse	High-density pulse
TBZ-0 (Actual flow type) Polarity of terminal	Blue Black + -	Red Black + -
Type of Compensated pulse	Compensated unit pulse	Uncompensated unit pulse
TBZ-3.5 (Compensation type) TBZ-9.9 (Compensation type) Polarity of terminal	Blue Black Blue Black + -	Red Black Red Black + -

Relay terminal box (4 terminals [with 10 round terminals])

2. Precautions in handling

Installation environment : Avoid areas with much electromagnetic noise, corrosive atmosphere, or high humidity liable to cause dew condensation.
Since this turbine meter is designed for indoor installation, install it at a place not exposed to splash of rainwater.
In outdoor installation, avoid water from splashing on, hitting, or touching the meter.
(Corresponding to dripproof structure IPX2)
Do not use it in flammable gas or other atmospheres.

Piping conditions: Straight pipes having a length of 10D (i.e. 10 times the pipe diameter) or greater must be provided prior and subsequent to this turbine meter.
The specified accuracy may not be satisfied in environments where a sudden reduction in flow rate or pulsation occurs; installation in positions where a sudden reduction in flow rate or pulsation occurs little is recommended.

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