Perfect Observe and Control Device

Build Smart Cities

TigerIoT

Smart Electric Ball Valve
Technical Data Sheet

Rev.1.0.0

Smart Actuator

TW3NM/TW5NM/TW10NM Series
Torque: 3Nm / 5Nm / 10Nm

Product Features

- **Small Volume and High Precision**

The actuator is designed with compact structure and small size, which is suitable for the air conditioning system with small space.

- **Multiple Signals Setting on Site**

Multiple signals are available, such as 0(2)-10V, 0(4)-20mA, which can be shifted via DIP switches on site.

- **Manual Function**

The actuator handle can open and close the valve manually.

- **Automatically Stroke Testing**

It can automatically test the valve stroke while power on.

- **Easy disassembly and assembly**

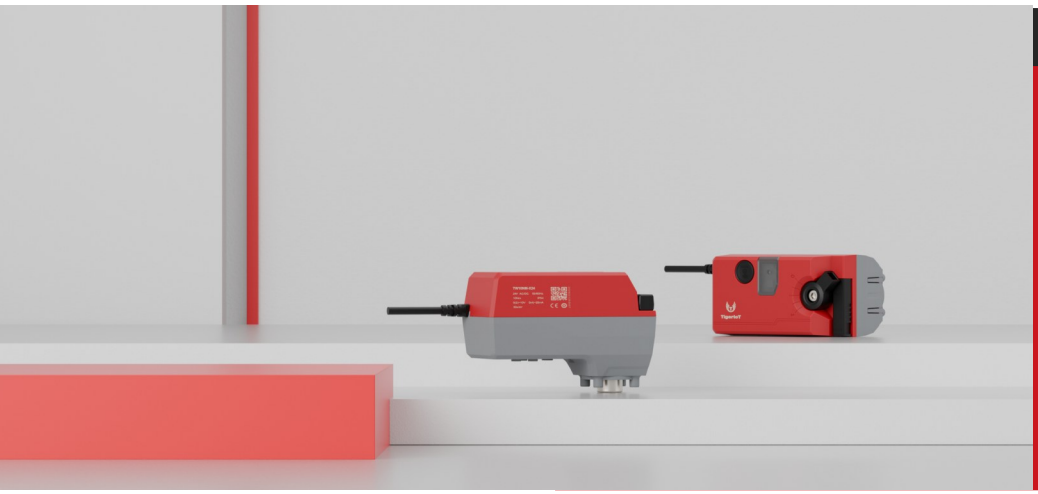
The connection between actuator and valve is realized by one screw. It is convenient and easy to pull and insert the actuator for disassembly and assembly.

- **Multi-function Window**

The actuator is equipped with an openable window. The signals can be shifted between 0~10V and 2~10V signals by DIP switches. You can observe the indicating lights through the window to know the operation status of the actuator.

Type Overview

Actuator type						
Force	Voltage	Type	Signal Loss Settings	Control signal	Feedback signal	Velocity
3N.M	24V	TW3NM-X24	Signal Loss LFail Safe	0(2)~10V，0(4)~20mA	0(2)~10V，0(4)~20mA	30s/90°
		TW3NM-XA24	Signal Loss Fail in Place	2-10V,4-20mA	2-10V,4-20mA	30s/90°
		TW3NM-D24	/	3-position	No signal	30s/90°
		TW3NM-D24-F2	/	3-position	2 SPDT Feedback	30s/90°
		TW3NM-24-485	/	RS485	RS485	30s/90°
	220V	TW3NM-D220	/	3-position	No signal	30s/90°
5N.M	24V	TW5NM-X24	Signal Loss Fail Safe	0(2)~10VDC，0(4)~20mA	0(2)~10VDC，0(4)~20mA	30s/90°
		TW5NM-XA24	Signal Loss Fail in Place	2-10V,4-20mA	2-10V,4-20mA	30s/90°
		TW5NM-D24	/	3-position	No signal	30s/90°
		TW5NM-24-485	/	RS485	RS485	30s/90°
		TW5NM-D24-F2	/	3-position	2 SPDT Feedback	30s/90°
	220V	TW5NM-D220	/	3-position	No signal	30s/90°
10N.M	24V	TW10NM-X24	Signal Loss Fail Safe	0(2)~10VDC，0(4)~20mA	0(2)~10VDC，0(4)~20mA	30s/90°
		TW10NM-XA24	Signal Loss Fail in Place	2-10V,4-20mA	2-10V,4-20mA	30s/90°
		TW10NM-D24	/	3-position	No signal	30s/90°
		TW10NM-D24-F2	/	3-position	2 SPDT Feedback	30s/90°
		TW10NM-24-485	/	RS485	RS485	30s/90°
	220V	TW10NM-D220	/	3-position	No signal	30s/90°



Smart Actuator

MINI Ultra-speed Series

MINI Fail Safe Series

扭矩：3Nm / 5Nm / 10Nm

Ultra-speed Series Type Overview Type Overview

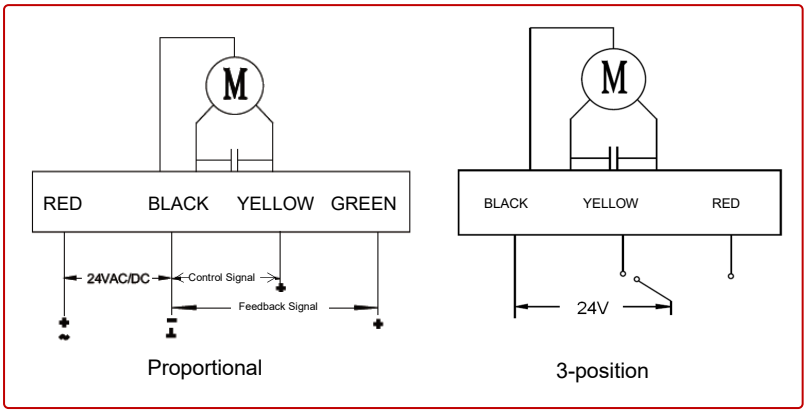
Ultra-speed Series						
Force	Voltage	Type	Signal Loss Settings	Control signal	Feedback signal	Velocity
3N.M	24V	TW3NM-X24Q	Signal Loss Fail Safe	0(2)~10V，0(4)~20mA	0(2)~10V，0(4)~20mA	4.2s/90°
		TW3NM-XA24Q	Signal Loss Fail in Place	2-10V,4-20mA	2-10V,4-20mA	4.2s/90°
		TW3NM-D24Q	/	3-position	No signal	4.2s/90°
		TW3NM-D24-F2Q	/	3-position	2 SPDT Feedback	4.2s/90°
5N.M	24V	TW5NM-X24Q	Signal Loss Fail Safe	0(2)~10VDC，0(4)~20mA	0(2)~10VDC，0(4)~20mA	4.2s/90°
		TW5NM-XA24Q	Signal Loss Fail in Place	2-10V,4-20mA	2-10V,4-20mA	4.2s/90°
		TW5NM-D24Q	/	3-position	No signal	4.2s/90°
		TW5NM-D24-F2Q	/	3-position	2 SPDT Feedback	4.2s/90°
10N.M	24V	TW10NM-X24Q	Signal Loss Fail Safe	0(2)~10VDC，0(4)~20mA	0(2)~10VDC，0(4)~20mA	4.2s/90°
		TW10NM-XA24Q	Signal Loss Fail in Place	2-10V,4-20mA	2-10V,4-20mA	4.2s/90°
		TW10NM-D24Q	/	3-position	No signal	4.2s/90°
		TW10NM-D24-F2Q	/	3-position	2 SPDT Feedback	4.2s/90°

Fail Safe Series Type Overview

Fail Safe Series						
Force	**Voltage**	**Type**	**Signal Loss Settings**	**Control signal**	**Feedback signal**	**Velocity**
3N.M	24V	TW3NM-X24R	Signal Loss Fail Safe	0(2)~10V，0(4)~20mA	0(2)~10V，0(4)~20mA	30s/90°
		TW3NM-D24R	/	3-position	No signal	30s/90°
		TW3NM-D24-F2R	/	3-position	2 SPDT Feedback	30s/90°
5N.M	24V	TW5NM-X24R	Signal Loss Fail Safe	0(2)~10VDC，0(4)~20mA	0(2)~10VDC，0(4)~20mA	30s/90°
		TW5NM-D24R	/	3-position	No signal	30s/90°
		TW5NM-D24-F2R	/	3-position	2 SPDT Feedback	30s/90°
10N.M	24V	TW10NM-X24R	Signal Loss Fail Safe	0(2)~10VDC，0(4)~20mA	0(2)~10VDC，0(4)~20mA	30s/90°
		TW10NM-D24R	/	3-position	No signal	30s/90°
		TW10NM-D24-F2R	/	3-position	2 SPDT Feedback	30s/90°

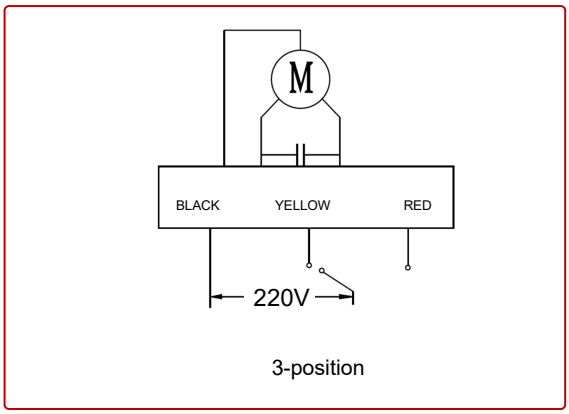
Wiring Diagram

- **24V wiring diagram**



Proportional

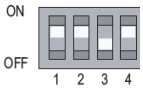
3-position



3-position

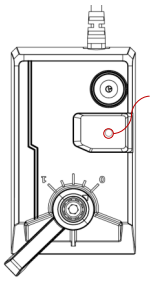
DIP Switch Setting Instruction

Default Setting



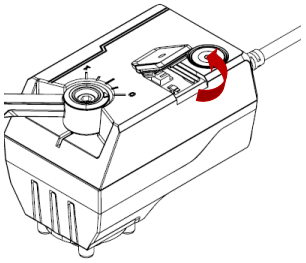
DIP	Function	Description	
S1-1	Control/valve position feedback signal	ON	4~20mA or 2~10VDC
		OFF	0~20mA or 0~10VDC
S1-2	Type of control signal	ON	Current signal
		OFF	Voltage signal
S1-3	Impedance match of control signal	ON	Voltage signal
		OFF	Current signal
S1-4	Type of feedback signal	ON	Current signal
		OFF	Voltage signal

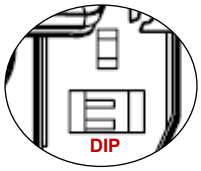
Indicating Light Instruction



Indicating Light	Status	Description
Green	Always	Normal mode
Orange	Flashing	Stroke test
Red	Flashing	Alarming

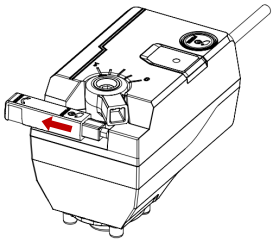
Opening Method of DIP cover



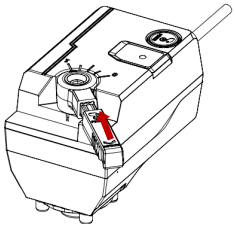


Manual Override Operation

1. Pull out the manual handle ;

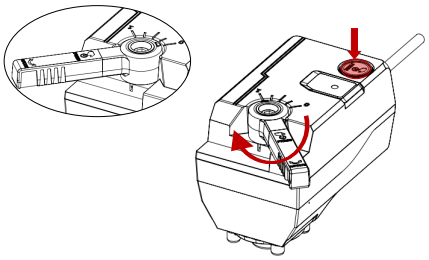


2.InseInsert the manual handle into the handle holder ;



3.Press and hold the manual override button, then rotate the manual handle ;

4. Rotate the handle until the pointer indicates "1" to open the valve.
Rotate the handle until the pointer indicates "0" to close the valve .

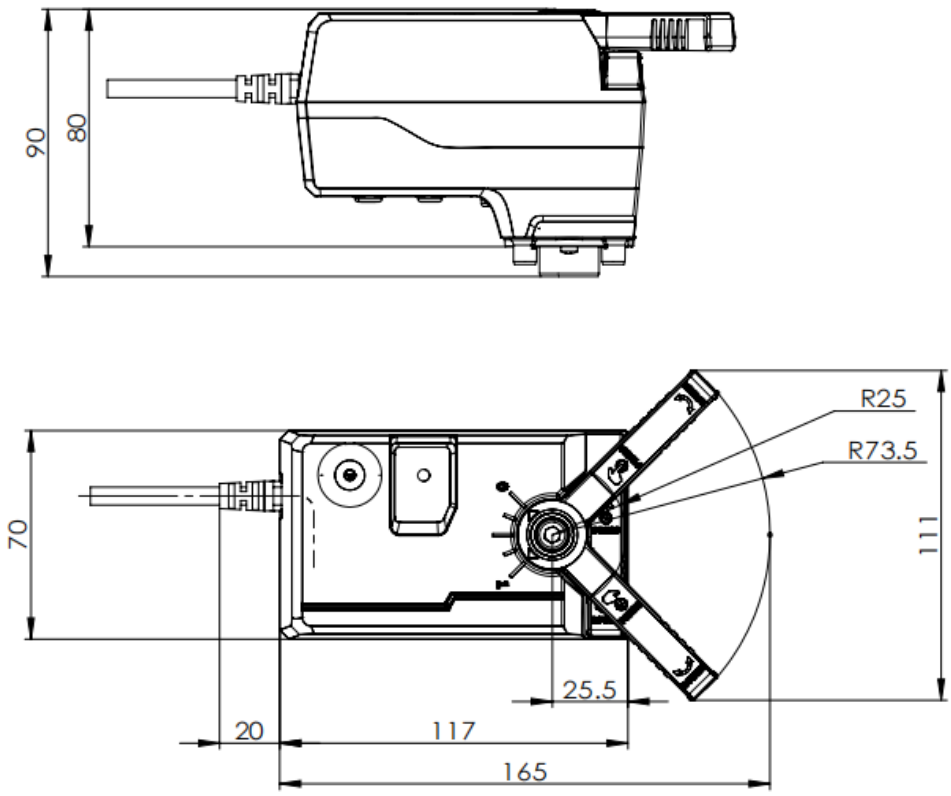


Technical Parameters

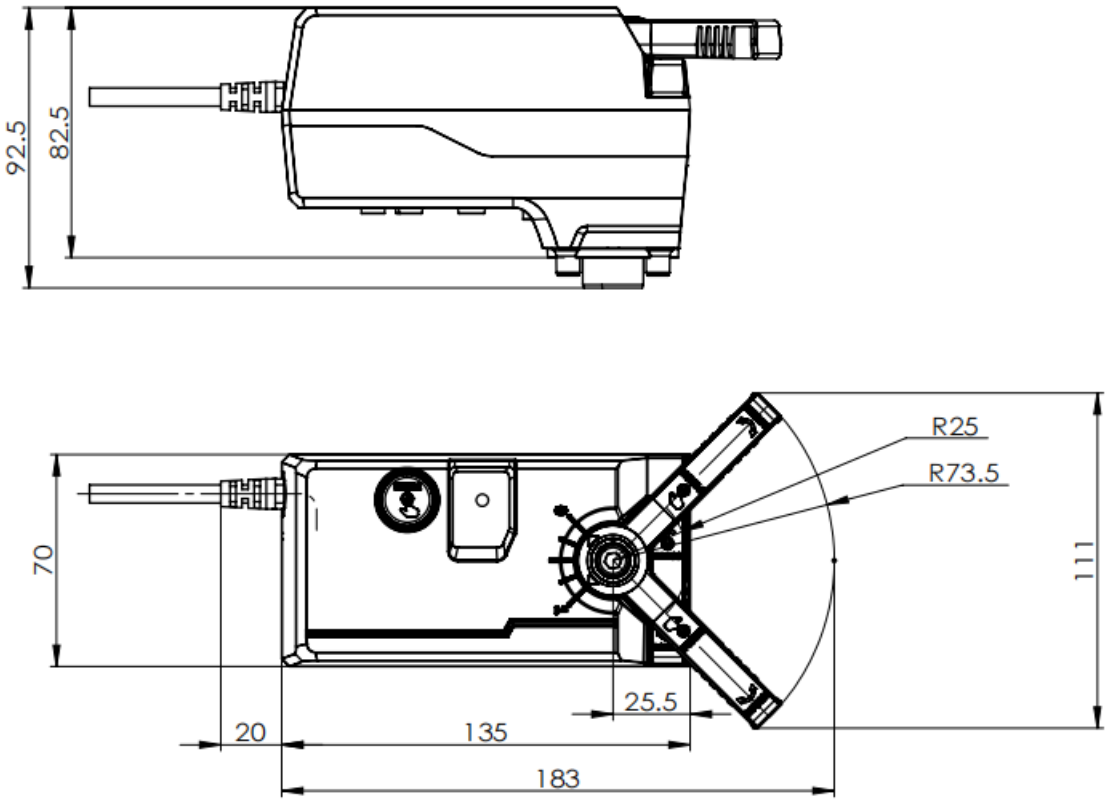
• Functional data-Actuator	
Rated output power	3N.M / 5N.M / 10N.M
Operating Voltage	24VAC/DC± 15% 220VAC± 15%
Frequency	50Hz / 60Hz
Control sensibility	Proportional: 1.0%(default setting)
Blind zone	3.0% (default setting)
Velocity	30s/90°
Power	24VAC/220VAC: 25VA Recommended transformer: 50VA 24VDC: 10VA DC switch power supply: 25VA
Impedance (only for proportional type)	
Voltage input impedance	>100K
Current input impedance	<0.2K
Load requirements (only for proportional	
Voltage output load requirement	>2K
Current output load requirement	<0.4K
Degree of protection	IP54
Lifetime	100 thousand full open and close
Environmental condition for running	-25~+65℃, ≤95% RH non-condensing
Environmental condition for storage	-40~+65℃, ≤95% RH non-condensing

Dimension

- **MINI**



- **MINI Ultra-speed Series / Fail Safe Series**



Ball Valve

TBL…-2VTD/3VTD series

Nominal size: 2-way DN15~DN50
3-way DN25~DN50
Nominal pressure: PN25

Product Features

- ### Equal-percentage Flow Characteristics

The valve from A to AB has a perfect equal-percentage control curve, and the rangeability is >100：1。

- ### Fixed Valve Core

2-port ball valve adopts fixed valve core structure to ensure the high close-off DP.

- ### Zero Leakage Rate

It is “0” leakage rate when the valve is closed from A to AB.

- ### Easy disassembly and assembly

The connection between actuator and valve is realized by one screw. It is convenient and easy to pull and insert the actuator for disassembly and assembly.

- ### Stainless Steel Full Core

It adopts full core structure with dual seal and is made of stainless steel with strong corrosion resistance.

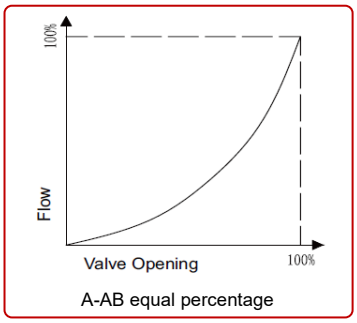
- ### High Quality Materials

The valve body is made of high-quality stainless steel with strong corrosion resistance.

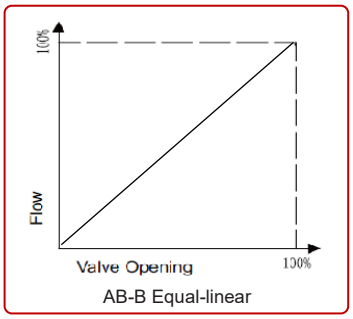
Type Overview

Actuator type				Proportional	(2)~10VDC, 0(4)~20mA	TW3NM-X24	TW5NM-X24	TW10NM-X24
					3-position	TW3NM-D24	TW5NM-D24	TW10NM-D24
					3-position	TW3NM-D220	TW5NM-D220	TW10NM-D220
Actuator force						3N.M	5N.M	10N.M
	Valve type	Caliber [in.]	[mm]	Connection	Kvs A-AB [m^3/h]	Kvs B-AB [m^3/h]	△Ps [MPa]	△Ps [MPa]	△Ps [MPa]
2-way	TBL15-2VTD-BX	1/2”	15	Threaded	4	/	1.0		
	TBL20-2VTD-BX	3/4”	20	Threaded	7.5	/	1.0		
	TBL25-2VTD-BX	1 ”	25	Threaded	15	/	1.0		
	TBL32-2VTD-BX	1 1/4”	32	Threaded	23	/		1.0	
	TBL40-2VTD-BX	1 1/2”	40	Threaded	35	/		1.0	
	TBL50-2VTD-BX	2”	50	Threaded	60	/			1.0
3-way	TBL25-3VTD-BX	1 ”	25	Threaded	10	7		1.0	
	TBL32-3VTD-BX	1 1/4”	32	Threaded	29	18		1.0	
	TBL40-3VTD-BX	1 1/2”	40	Threaded	51	27			1.0
	TBL50-3VTD-BX	2”	50	Threaded	95	44			1.0

Flow Characteristics



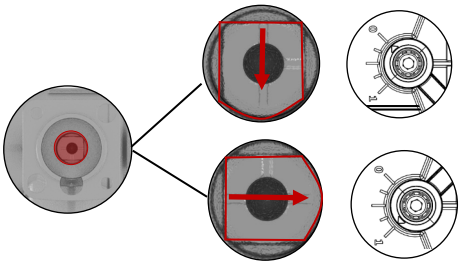
A-AB equal percentage



AB-B Equal-linear

Actuator And Valve Assembly

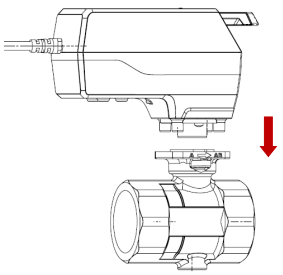
1. In order to better match the valve with the actuator, please ensure that the valve is closed and the actuator opening pointer is at "0" position before installation!



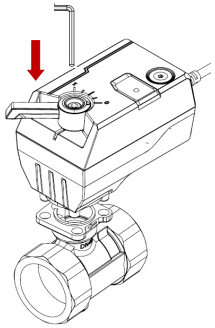
The valve shaft is at the position shown as on the left, the valve is closed, and the actuator pointer is at the "0" position.

The valve shaft is at the position shown as on the left, the valve is opened, and the actuator pointer is at the "1" position.

2. Align the locating hole and install the actuator vertically on the valve in the direction shown below.

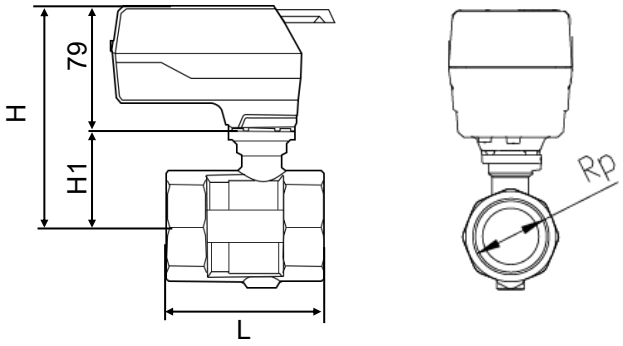


3. Insert a 5mm hex wrench into the pointer hole at the top and tighten it manually.



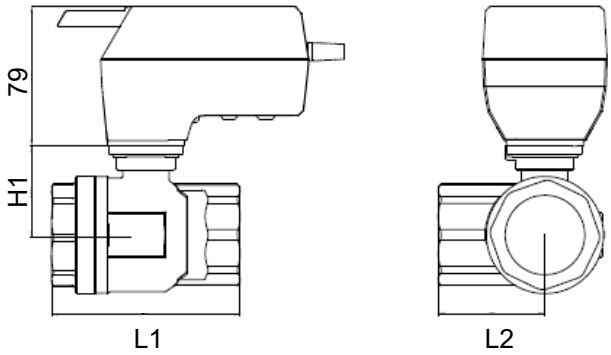
Dimension

DN15~DN50 with actuator (2-way)



Caliber	Rp	L mm	H1 mm	H mm
DN15	1/2	55	38	117
DN20	3/4	60	42	121
DN25	1	65	45	124
DN32	1-1/4	80	50	129
DN40	1-1/2	85	48	127
DN50	2	100	60	139

DN15~DN50 with actuator (3-way)



Ca;iber	Rp	L1 mm	H1 mm	L2 mm
DN25	1	78	40	46
DN32	1-1/4	93	44	54
DN40	1-1/2	106	50	60
DN50	2	127	56	71

Technical Parameters

• Functional data-Valve	
Nominal size	2-way: DN15~DN50 3-way: DN25~DN50
Nominal pressure	PN25
Flow characteristic	A-AB: equal percentage B-AB: equal linear
Valve rangeability	>100:1
Leakage rate	A-AB: zero leakage B-AB:<0.5%kvs
Permissible medium	Hot, chilled water, glycol solution≤50%
Medium temperature	-5~+120℃
Connection standard	Threaded ISO7-1 Rp
Valve body material	Brass
Valve core material	Stainless steel
Valve stem	Stainless steel
Valve seat	PTFE
O-ring	FKM, EPDM and NBR are optional

TigerIoT

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