Perfect Observe and Control Device

Build Smart Cities

ŌMEAX

Smart Electric Ball Valve

Technical Data

TTBL -2VTD/3VTD series

Smart Electric Ball Valve

TBL…-2VTD/3VTD series

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

Product Features

- **Small Volume and High Precision**

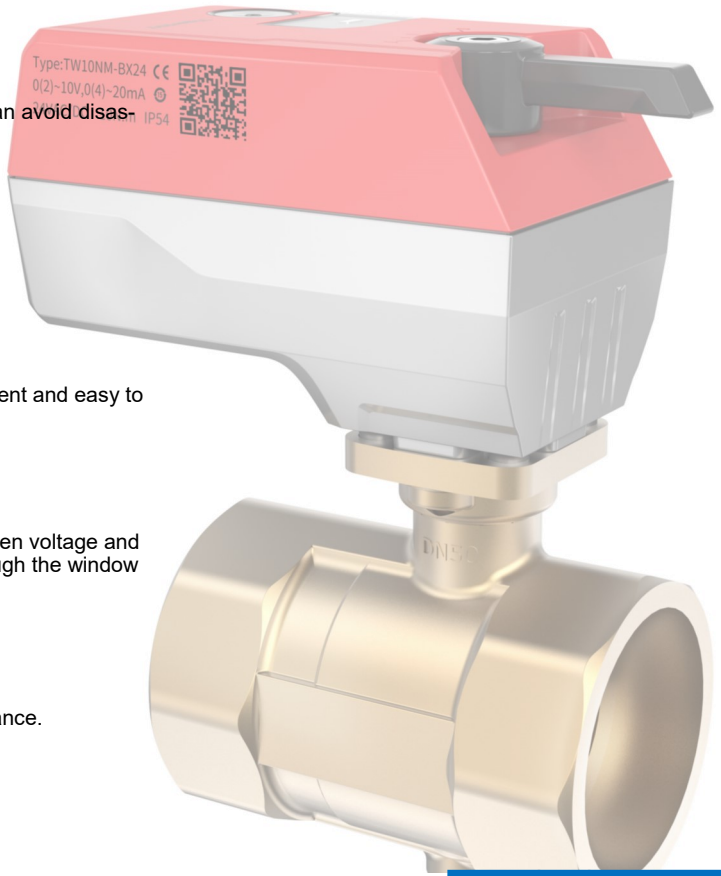
The actuator is designed with compact structure and small size, which is suitable for the air conditioning system with small space.

- **Equal-percentage Flow Characteristics**

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

- **Mistake-proofing Interface**

The interface of valve body and actuator adopts mistake proofing design, which can avoid disassembling and adjusting repeatedly caused by installation error.



- **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.

- **Multi-function window**

The actuator is equipped with an openable window that allows for switching between voltage and current modes through DIP switches. Users can observe the indicating lights through the window to know the operating status of the actuator.

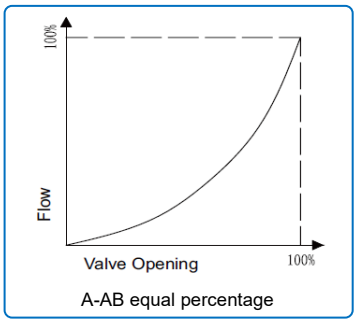
- **High Quality Materials**

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

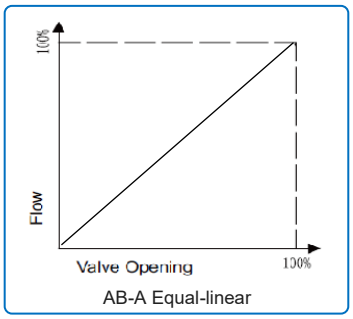
Type Overview

Control /feedback signal						(2)~10VDC 0(4)~20mA	(2)~10VDC 0(4)~20mA	(2)~10VDC 0(4)~20mA
Actuator type					Proportional	TW3NM-X24	TW5NM-X24	TW10NM-X24
					3-position	TW3NM-D24	TW5NM-D24	TW10NM-D24
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]	ΔPs [MPa]	ΔPs [MPa]	ΔPs [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
2-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-A Equal-linear

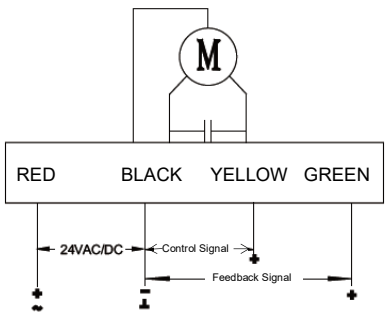
Relationship between Differential Pressure and Flow

$$Kvs = \frac{V}{\sqrt{\frac{\triangle P}{100}}}$$

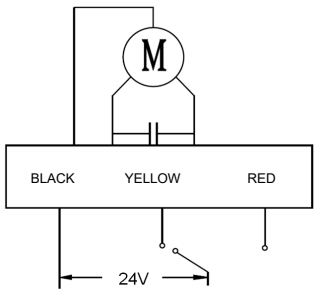
△P: Differential pressure when valve is full open (Unit: KPa)
V: Rating flow at the △P (Unit: m3/h)
Kvs: Nominal flow coefficient，which refers to the flow when medium (Density= 1g/cm3) goes through the full open control valve，whose △P is 100KvPa.

Wiring Diagram

- **TW3（5/10）NM-X24 wiring diagram**



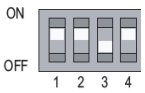
Proportional



3-position

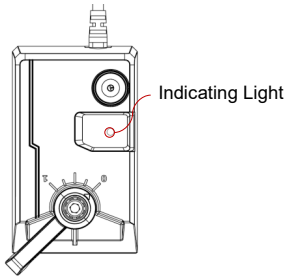
DIP Switch Setting Instruction

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



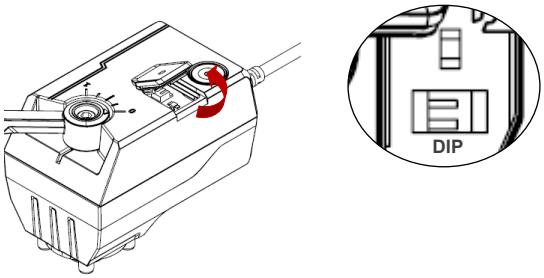
Indicating Light	Status	Description
Green	Always	Normal mode
Orange	Flashing	Stroke test
Red	Flashing	Alarming

Debugging Instruction

A. Connect the power supply and control signal cable.
B. Set the DIP switch to the needed position. When the DIP switch position is set, power on the actuator, and the setting function will take effect (the DIP switch can be set with power).

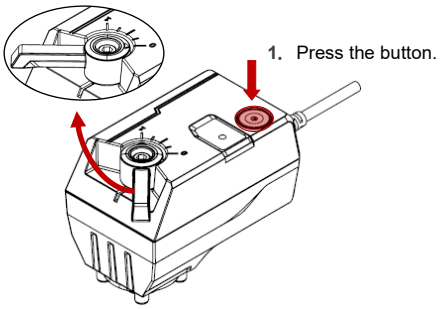
Operating Instruction

Opening Method of DIP cover



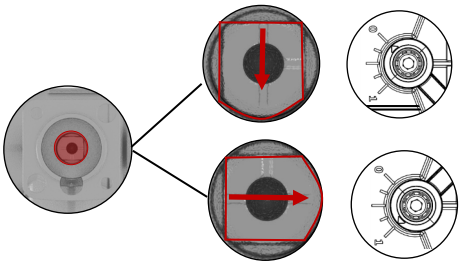
Manual function

2. Turn the handle, the pointer points to "1", and the valve opens;
   Turn the handle, the pointer points to "0", and the valve closes;



Actuator And Valve Assembly

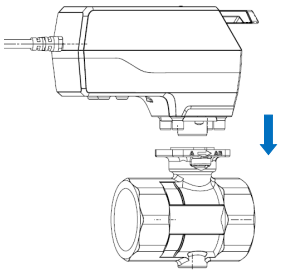
1. In order to better match the valve with the actuator, please ensure that the valve is closed and the actuator opening pointer is at "0" position before installation!



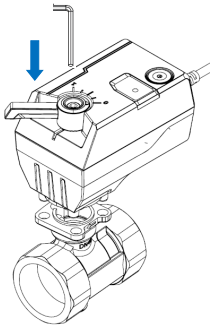
The valve shaft is at the position shown as on the left, the valve is closed, and the actuator pointer is at the "0" position.

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.

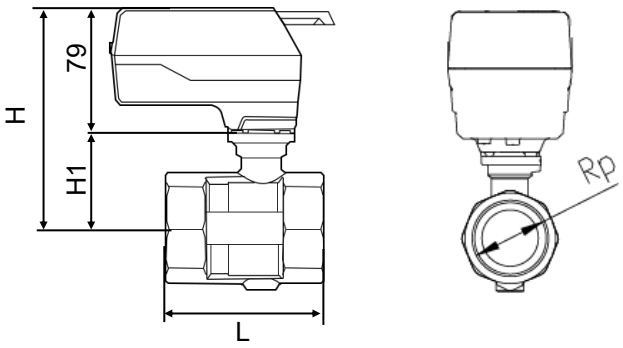


3. Insert a 5mm hex wrench into the pointer hole at the top and tighten it manually.



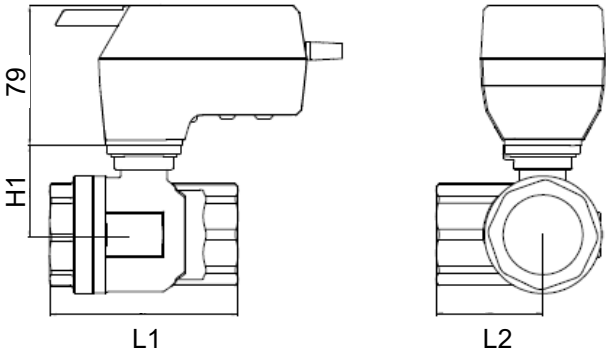
Dimension

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

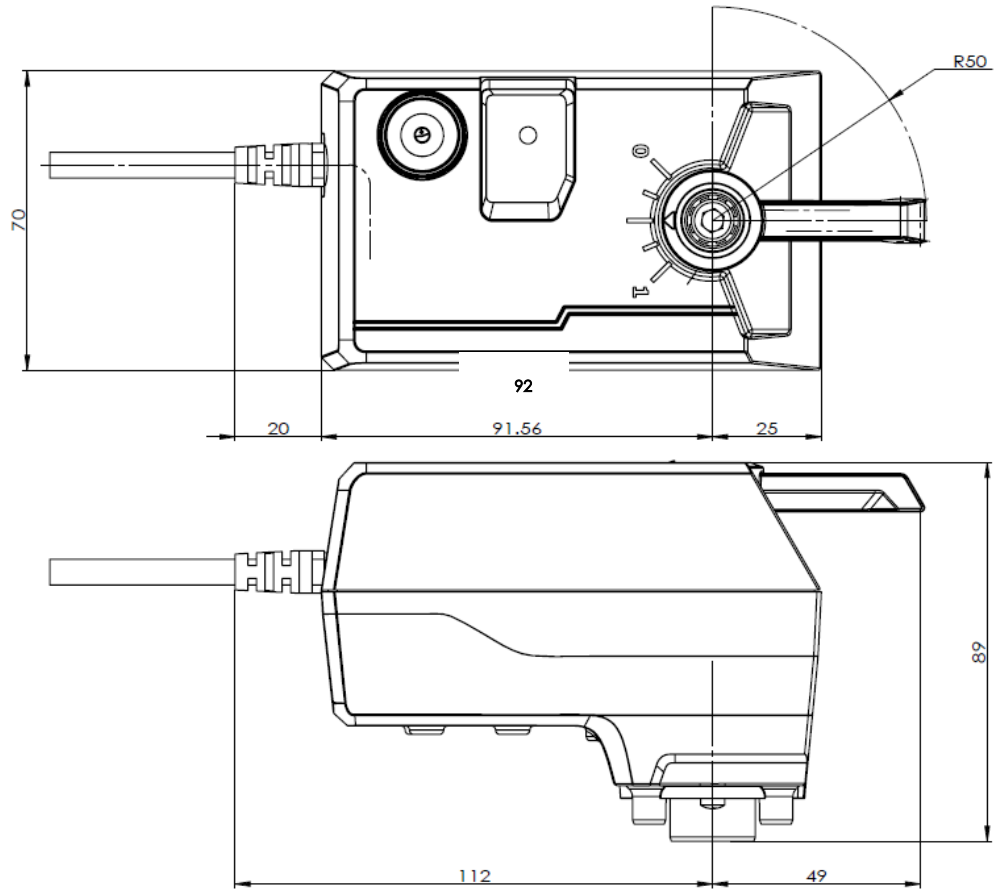
DN15~DN50 with actuator (3-way)



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

Dimension

Actuator



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
Medium temperature	-5~+120℃
Connection standard	Threaded ISO7-1 Rp
Valve body material	Brass
Valve core material	Stainless steel
Valve stem	Stainless steel

Technical Parameters

• Functional data-Actuator	
Rated output power	3N.M / 5N.M / 10N.M
Operating Voltage	24VAC/DC± 15%
Frequency	50Hz / 60Hz
Control sensibility	Proportional: 1.0%(default setting)
Blind zone	3.0% (default setting)
Velocity	30s/90°
Power	24VAC: 25VA Recommended transformer: 50VA 24VDC: 10VA DC switch power supply: 25VA Voltage transformer: 50VA
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	
Running	
Ambient temperature	-25~+65℃
Ambient humidity	≤95% RH non-condensing
Storage	
Ambient temperature	-40~+65℃
Ambient humidity	≤95% RH non-condensing