



**Pressure Independent Control Valve** (DN65-250/ 2-1/2"-10")

***NexusValve***  
*Vivax*



IP 54 CE cRU<sup>®</sup> US



# Table of contents

## Chapter NexusValve Vivax Pressure Independent Control Valve (DN 65-250)

<b>1.</b>	<b>Introduction</b>	<b>4</b>
2.1	Intelligent setting	6
2.2	Fail safety mode	7
2.3	3 in 1: Control, Balancing and differential pressure control function	8
2.3.2	Detailed drawing using floating analysis	9
2.3.3	Advanced flow precision ( $\pm 5\%$ ) / EQM quality and high authority	9
<b>3.</b>	<b>Valve Sizes</b>	<b>10</b>
3.1	One for All - Actuator	10
3.2	BLDC motor	10
<b>4.</b>	<b>Dimensions</b>	<b>12</b>
<b>5.</b>	<b>Specifications</b>	<b>13</b>
5.1	Actuator connection diagram	14
5.2	Specification of functions	14
<b>6.</b>	<b>Installation/Operation</b>	<b>16</b>
6.1	Install and direction of Actuator	16
6.2	Actuator valve assembling method	16
6.3	Actuator manual operating method	17
6.4	Actuator mode setting	18
6.5	Status of Actuator indicator by valve size	20

# 1. Introduction



The new PICV

**NexusValve**  
**Vivax**



## 2. Function and Setting

Precise control function and convenient standard selection as CV calculation is unnecessary. Instant flow rate setting is possible on site as per the condition of system. Simple flow input and control mode setting.



### 2.1 Intelligent setting



**To set Flow Rate:** Available to check and set flow rate from FND

**Range of Flow Rate:** Due to digital programming when setting range of flow rate, digital programming makes it easier to set up rate of flow

**Energy Saving Through Unbalanced Valve:** SMART-IS actuator provides precise energy to the supplier of internal system of HVAC

## 2.2 Fail safety mode

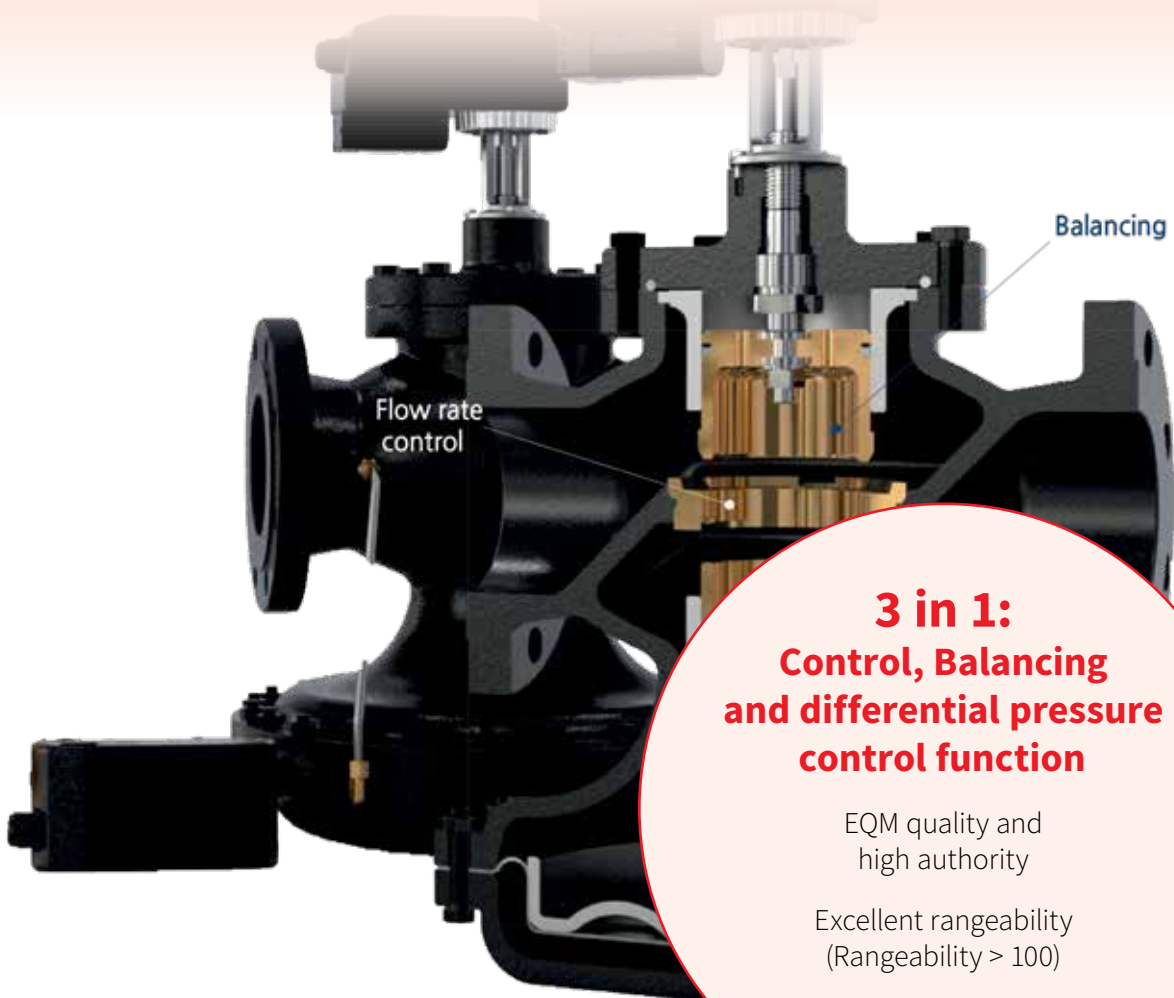
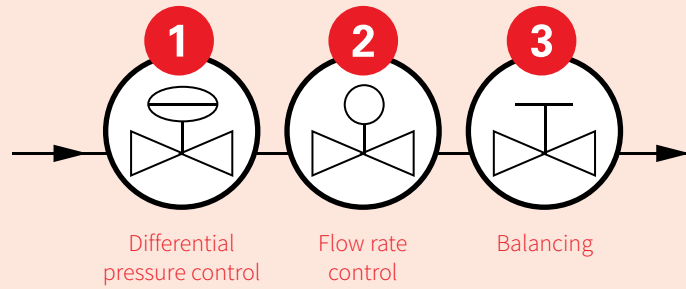
When the power due to sudden power cut or system error, by using sub-battery it will allow valve to operate to a safe range.



Operating time	60 ~ 330 Sec (full open ↔ full close)
Control input	<ul style="list-style-type: none"> <li>▪ voltage input (0 ~ 10 VDC, 2 ~ 10 VDC )</li> <li>▪ Current Input (0 ~ 20 mA, 4 ~ 20 mA)</li> <li>▪ On-Off Input (24 V: Open, 0 V: Close)</li> <li>▪ 3-Point-Floating Input (P3 24 V: Open, P4 24 V: Close)</li> <li>▪ PWM Control (0.1 ~ 5.0 Sec, 0.1 ~ 25 Sec)</li> <li>▪ Internal Input</li> </ul>
Torque	<ul style="list-style-type: none"> <li>▪ Running: 8,0 Nm (5.9 ftlb)</li> <li>▪ Stall: 10 Nm (7,4 ftlb)</li> </ul>
Feedback	0 ~ 10 V, 2 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA
Surrounding temp	-20°C ~ 60°C
Wire	24 AWG
Cover material	Plastic
Power	24V DC 50/60 Hz
Power consumption	Running 5 W / Standby 2.5 W
Movement velocity	1 RPM / 1.5 RPM (optional)
Water resistance level	IP54
Weight	1.1 kg / 2,43 lbs

## 2. Function and Setting

### 2.3 3 in 1: Control, Balancing and differential pressure control function



### **3 in 1: Control, Balancing and differential pressure control function**

EQM quality and  
high authority

Excellent rangeability  
(Rangeability > 100)

Advanced flow precision  
(5%)



### 2.3.1 Excellent Rangeability (Rangeability > 100)

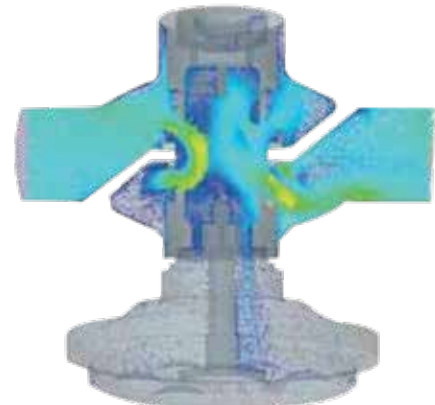
Minimum control rate of flow:

$$q_{\min} = \frac{q_{\max}}{R_a \sqrt{\beta}}$$

SMART-IS min control flow rate  
 $R_a \geq 100$  Authority  $\geq 0.82$   
 $Q_{\min} < 1\%$  of  $Q_{\max}$

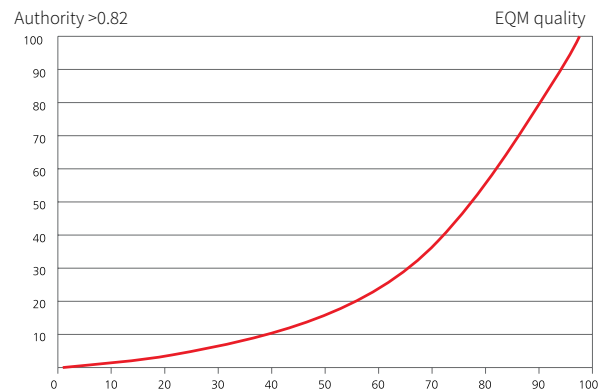
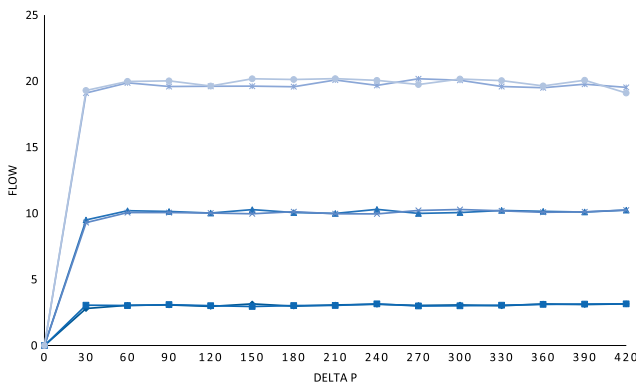
### 2.3.2 Detailed drawing using floating analysis

Minimized zones of turbulences grant a low head loss and high accuracy



### 2.3.3 Advanced flow precision (± 5%) / EQM quality and high authority

Advanced flow precision (± 5%)   Advanced flow precision (± 5%)



## 3. Valve Sizes

### 3.1 One for All - Actuator

- Equal actuator is used in different valve sizes
- Actuator - Compact size and weight
- Accurate precision with screw type control

#### Same actuator is used in different valve sizes

Depending on the size of the valve, the size of the actuator has to be increased due to increase in pressure. However, with All for ONE - Actuator, invented by the producers unique technology, same actuator can control stably in all valve sizes.



### 3.2 BLDC motor

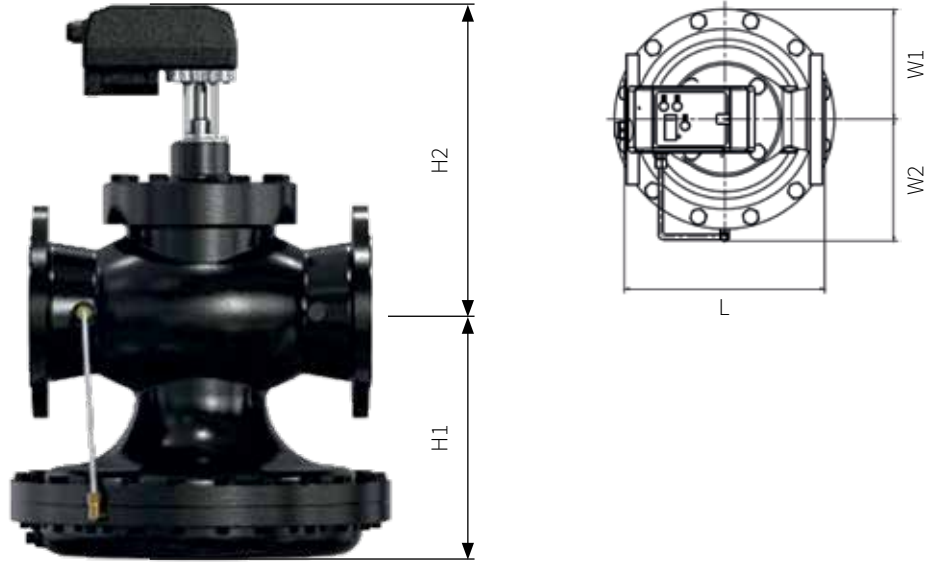


**Motor Life** 10,000 hours  
**Durability** 50,000 times (Close → Open)

**One for All  
Actuator**



## 4. Dimensions



mm	65 LF	65	80	100	125 (HF)	150	150 (HF)	200 200 (HF)	250 250 (HF)
H1	191	185	185	260	266	266	350	393	421
H2	291	300	300	320	346	346	400	440	508
W1	154	154	154	221	212	212	212	200	250
W2	161	161	161	227	219	219	219	216	283
L	254	272	272	352	400	400	400	543	730
Weight kg	35	45	76	95	100	150	281	281	360

inch	65LF	65	80	100	125(HF)	150	150 (HF)	200 (HF)	250 (HF)
H1	7.52	7.28	7.28	10.24	10.47	10.47	13.78	15.47	16.57
H2	11.46	11.81	11.81	12.60	13.62	13.62	15.75	17.32	20.00
W1	6.06	6.06	6.06	8.70	8.35	8.35	8.35	7.87	9.84
W2	6.34	6.34	6.34	8.94	8.62	8.62	8.62	8.50	11.14
L	0.00	10.71	10.71	13.86	15.75	15.75	15.75	21.38	28.74
Weight lbs	77.2	99.2	167.6	209.4	220.5	330.7	619.5	619.5	793.7

## 5. Specifications

Item number	NexusValve Vivax	Size (DN)		Flow control range					
		mm	inch	ℓ/h		ℓ/m		GPM (US)	
				Q <sub>min</sub>	Q <sub>max</sub>	Q <sub>min</sub>	Q <sub>max</sub>	Q <sub>min</sub>	Q <sub>max</sub>
MN80597.040 US: VIV-0250L	DN65LF	65LF	2 1/2	3.000	20.000	50	333	13	88
MN80597.041 US: VIV-0250H	DN65	65	2 1/2	5.000	30.000	83	500	22	132
MN80597.042 US: VIV-0300S	DN80	80	3	5.000	30.000	83	500	22	132
MN80597.043 US: VIV-0400S	DN100	100	4	15.000	55.000	250	917	66	242
MN80597.044 US: VIV-0500L	DN125	125	5	15.000	90.000	250	1.500	66	396
MN80597.045 US: VIV-0500H	DN125HF	125HF	5	15.000	120.000	250	2.000	66	528
MN80597.046 US: VIV-0600L	DN150	150	6	15.000	90.000	250	1.500	66	396
MN80597.047 US: VIV-0600H	DN150HF	150HF	6	15.000	150.000	250	2.500	66	660
MN80597.048 US: VIV-0800L	DN200A	200A	8	50.000	200.000	833	3.333	220	881
MN80597.049 US: VIV-0800H	DN200HF	200HF	8	100.000	300.000	1.667	5.000	440	1,321
MN80597.050 US: VIV-1000L	DN250A	250A	10	100.000	300.000	1.667	5.000	440	1,321
MN80597.051 US: VIV-1000H	DN250HF	250HF	10	150.000	500.000	2.500	8.333	660	2,201

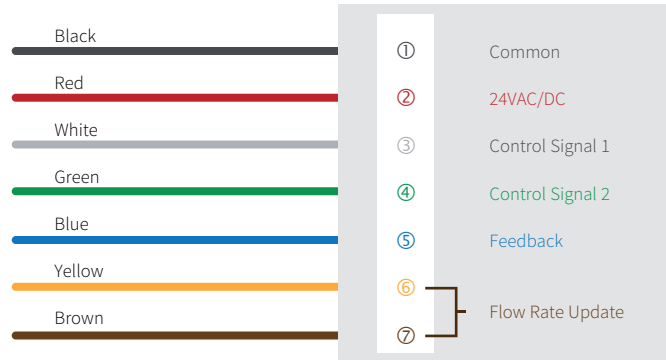
Note: US delivered with ANSI flange

NexusValve Vivax	DN65LF	DN65	DN80	DN100	DN125	DN150	DN200A	DN250A	DN125HF	DN150HF	DN200HF	DN250HF
<b>Set pressure</b>	1.6 MPa (PN16) / 232 psi											
<b>Applied pressure differential range</b>	30 ~ 400 kPa / 4.35 ~ 58 psid						60 ~ 400 kPa / 8.7 ~ 58 psid					
<b>Applicable fluid</b>	Hot/Cold water											
<b>Temp. (Fluid)</b>	5°C ~ 120°C / 41 °F ~ 248 °F											
<b>Temp. (surrounding)</b>	-20°C ~ 60°C / -4 °F ~ 140 °F											
<b>End connection</b>	FLANGE (ANSI: 10 K / DIN: PN 16)											
<b>Materials</b>	<b>Body</b>	Ductile iron EN-GJS-450										
	<b>Disc</b>	Bronze DIN 17656 GB-CuSn5ZnPb										
	<b>Diaphragm</b>	EPDM										

## 5. Specifications

### 5.1 Actuator connection diagram

- ①, ② connects to power line
- ③, ④ connects as per specification (refer to manual)
- ⑤ is only for feedback line
- ⑥, ⑦ Flow Rate Update
- Possible for extra Remote control connection (Option)

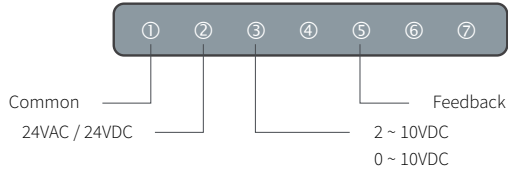


### 5.2 Specification of functions

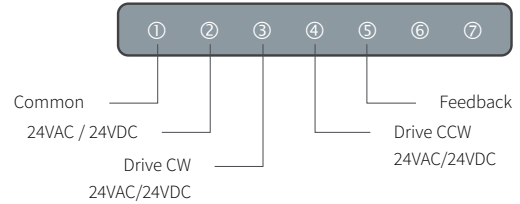
Functions	No.	1	2	3	4	5	6	7
	Color	Black	Red	White	Green	Blue	Yellow	Brown
Internal control		Common	24VAC/DC			Feed Back		
Voltage control		Common	24VAC/DC	0 ~ 10VDC 2 ~ 10VDC				
Electric current control		Common	24VAC/DC	0 ~ 20mA 4 ~ 20mA				
On/OFF Control		Common	24VAC/DC	24VDC (Open) 0VDC (Close)				
3 Point Floating Control		Common	24VAC/DC	Drive CW (Close) 24DC (Open)	Drive CCW (Close) 24DC			
PWM Control		Common	24VAC/DC	PWM Control Signal				

- ※ For digital type, as it is sensitive to the electric noise generated by other electric equipment, to prevent from the noise it is recommended to connect 1k ohm, 0.5W to ③ and ① or ④ and ①
- ※ Contact head office for PWM control and 3 Point Floating control
- ※ Use Up/Down Button for value setting

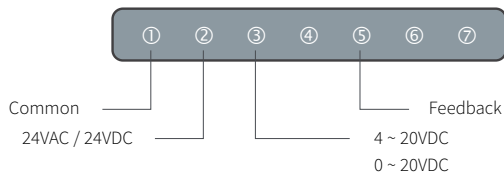
**Analogue voltage control (2 ~ 10VDC / 0 ~ 10VDC)**



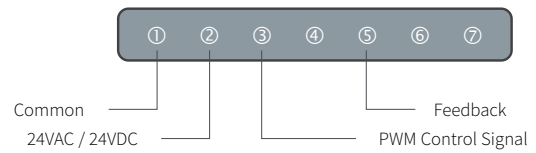
**3 Point Floating control**



**Analogue electric current control (4 ~ 20mA / 0 ~ 20mA)**

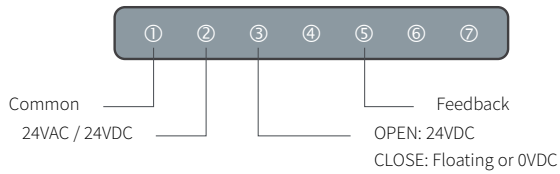


**PWM control**

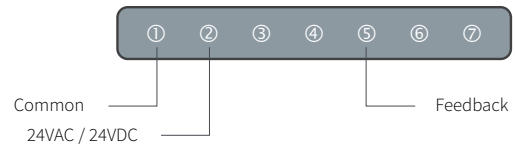


※ PWM Type 1: 0.1 ~ 5sec/20ms step  
PWM Type 2: 0.1 ~ 25sec/100ms step

**Analogue electric current control (4 ~ 20mA / 0 ~ 20mA)**

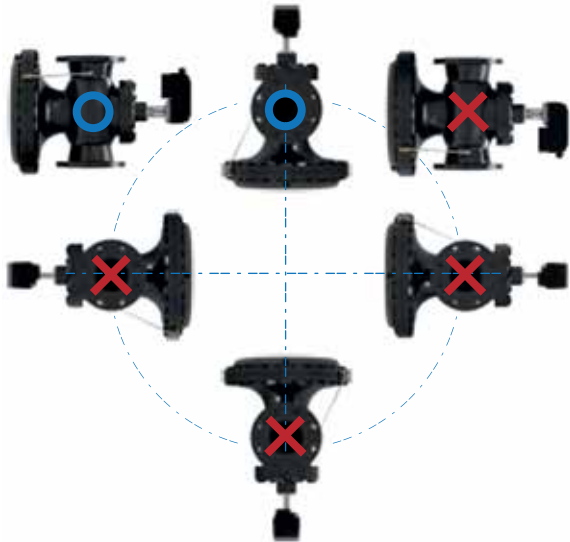


**Internal control (Enter from main body)**



## 6. Installation/Operation

### 6.1 Install and direction of Actuator



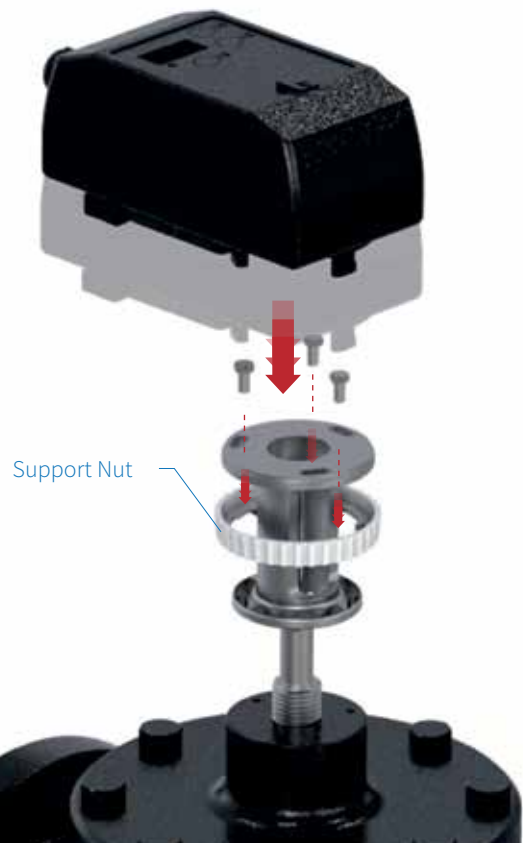
This product has been tested under restricted environment and is water/dustproof in specific situations. (Satisfies requirements for IP 54 level under International standard IEC 60529 – Degrees of Protection provided by Enclosures [IP Code])

However, under certain circumstances the product may be damaged.

Install actuator so that it is higher than horizontal to the valve so that it prevents condensation (refer to diagram)

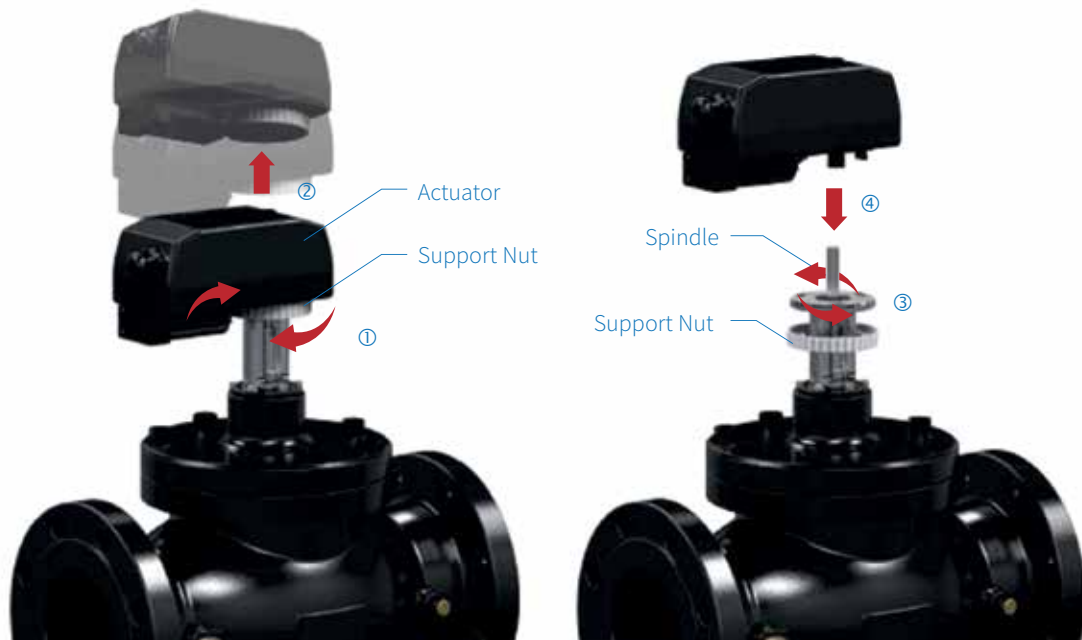
### 6.2 Actuator valve assembling method

1. Make sure to check WIRE connection before installing
2. When assembling Support Nut and Actuator, maintain horizontal form of Support Nut
3. Check the conditions of Valve size and the valve of Actuator setting before/.installing





### 6.3 Actuator manual operating method



- ① Rotate Support Nut clockwise
- ② Detach Actuator
- ③ Rotate Spindle anti-clockwise using a tool, then
- ④ Re-insert Actuator

# 6. Installation/Operation

## 6.4 Actuator mode setting



- 1 **DISPLAY** : 4 Digit FND Display
- 2 : UP
- 3 : DOWN
- 4 **MODE** : Function/Setting  
(Double click for Function mode)

Once power is on **Erro** will be displayed and value of valve will be set to 0.

**Do not set the buttons at this stage.** If you set the button when value is 0 control will not be fully functional due to misleading rate of flow value.

※ **Safety function:** if it does not read 0 value and **Erro** is still displayed, press button will set value as 0.

### Actuator setting method

- Double click button to switch to setting mode
- In Setting mode, use / button to change setting value
- Press button again to switch to other functions

### Control while in operation (INT mode)

- In Setting mode change **S-02** function to INT mode
- Input can be set as much as 0 ~ 100% or 0 ~ max flow rate depending on the **S-01**
- **Erro** code appears in FND reassemble the parts

SET	Setting	Display	Display meaning	Operating method	Notes
S-01	Input and select display method	FLo	'Flow'	Press  /  to select method of input and press MODE to finish.	※ Control with INT Mode flow value (if operating on body, control with flow value)
		PErc	'%'		※ Control with INT Mode % value (if operating on body, control with % value)
S-02	Select Input	0-10	voltage	Set to Voltage JOG	Voltage between Pn3 - Pn1: 0V-10V
		2-10	voltage	Set to Voltage JOG	Voltage between Pn3 - Pn1: 2V-10V
		0-20	voltage	Set to Voltage JOG	Electric current between Pn3 - Pn1: 0mA-20mA
		4-20	voltage	Set to Voltage JOG	Electric current between Pn3 - Pn1: 4mA-20mA
		on-F	ON/OFF	24V: Open, 0V: Close	Voltage between Pn3 - Pn1: 24V: Open, 0V: Close
		rt	-	-	Flow data update
		3-FL	3Point Floating Input	P3 23V: Open, P4 24V: Close	Voltage between Pn3 - Pn1: 24V: Open Voltage between Pn3 - Pn1: 24V: Close
		P-05	PWM 5Sec	PWM (0.1~5.0Sec)	0.1Sec: 0%, 5Sec: 100%
		P-25	PWM 25Sec	PWM (0.1~25.0Sec)	0.1Sec: 0%, 25Sec: 100%
		int	Internal Input	Enter from main body	Operates with main body setting (controls with Set1 setup)

SET	Setting	Display	Display meaning	Operating method	Notes
5-03	Min flow setting	Display Min flow value	Display "Min" flow setting	Press $\Delta$ / $\nabla$ to select flow input and press MODE to finish.	Min flow value should be less than Max flow value
5-04	Max flow setting	Display Max flow value	Display "Max" flow setting	Press $\Delta$ / $\nabla$ to select flow input and press MODE to finish.	Max flow value should be larger than Min flow value
5-05	Check setting value & current value	Fd-F	Display 'Flow' Feedback value	Press $\Delta$ / $\nabla$ to select display and press MODE to finish.	FND (display method)
		Fd-P	Display '%' Feedback value		
		St-F	Display "Flow" setting value		
		St-P	Display "%" setting value		
5-06	Rotation angle adjustment	Max valve Rotation angle	Max pulse value adjustment	Press $\Delta$ / $\nabla$ to select flow input and press MODE to finish.	#Do not alter. Correct maximum rotation angle for each valve.
5-07	Rotation angle offset adjustment	0( $\pm$ 10%)	Display digits	Press $\Delta$ / $\nabla$ to select values ( $\pm$ 10.0) and press MODE to finish.	Increase/decrease flow by $\pm$ 10.0%
5-08	Select valve location when no power	CLoS	Valve is closed when no power	If no power select Open or Close as valve location.	Option
		oPEr	Valve is opened when no power		
5-09	Select Flow unit	Lit	SI unit	Press $\Delta$ / $\nabla$ to select select curve and press MODE to finish.	SMS unit: L/min SMF unit: m3/hour
		gAL	GPM unit		Unit: gal/min
5-10	Select Flow curve	L in	Control by input flow value	Press $\Delta$ / $\nabla$ to select select curve and press MODE to finish.	Linear Curve (1 Convert to value of 1st Graph)
		EPeR	Control by input curve		Equal Percentage Curve (Convert to value of 2nd Graph)
5-11	Min control Volt Calibration	Min Volt analogue value	Adjust min Volt value	Press $\Delta$ / $\nabla$ to select min Volt value and press MODE to finish.	Read min Volt from set value
5-12	Volt Calibration	Max Volt analog value	Adjust max Volt value	Press $\Delta$ / $\nabla$ to select max Volt value and press MODE to finish.	Read max Volt from set value
5-13	Select speed of rotation	PE01	Speed of rotation 1rpm	3 types of selection options 1. AUTO (1-1.5 auto adjustment) 2. PE01 (1rpm) 3. PE15 (1.5rpm)	
		PE15	Speed of rotation 1.5rpm		
		AUTO	rpm automatic adjustment		
5-14	Select Feedback method	0-10	Feedback method (Voltage)	From control centre/room select type of feedback signal	
		2-10			
		0-20	Feedback method (Current)		
		0-20			

\*Depending on the 5-09 setting, maximum flow rate value may be altered.

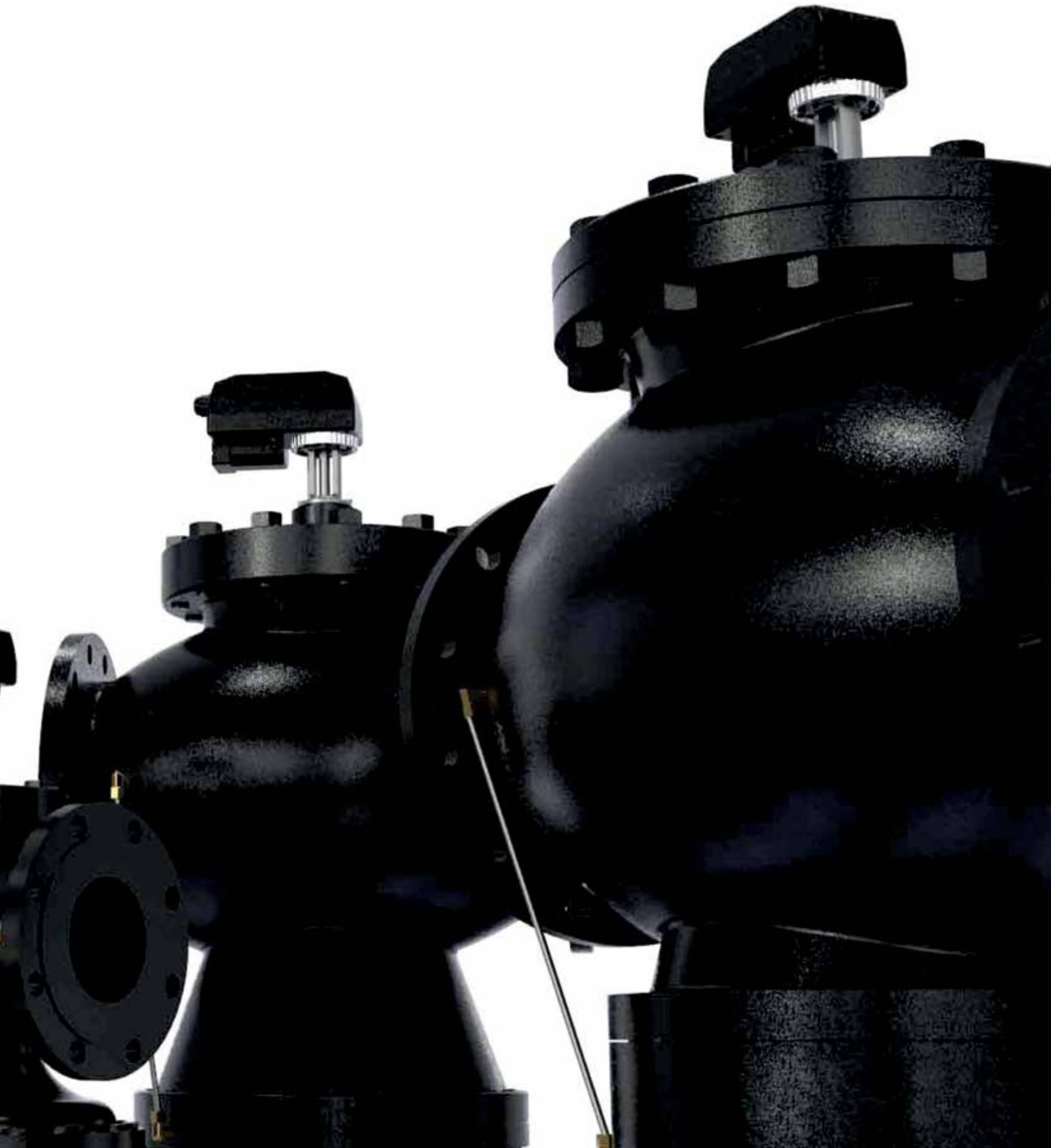
## 6. Installation/Operation

### 6.5 Status of Actuator indicator by valve size

Type												
Size (DN)	65 LF	65	80	100	125	125 HF	150	150 HF	200	200 HF	250	250 HF
FND Indicator	F-64	F-65	F-80	F-100	F-125	F-126	F-150	F-151	F-200	F-201	F-250	F-251



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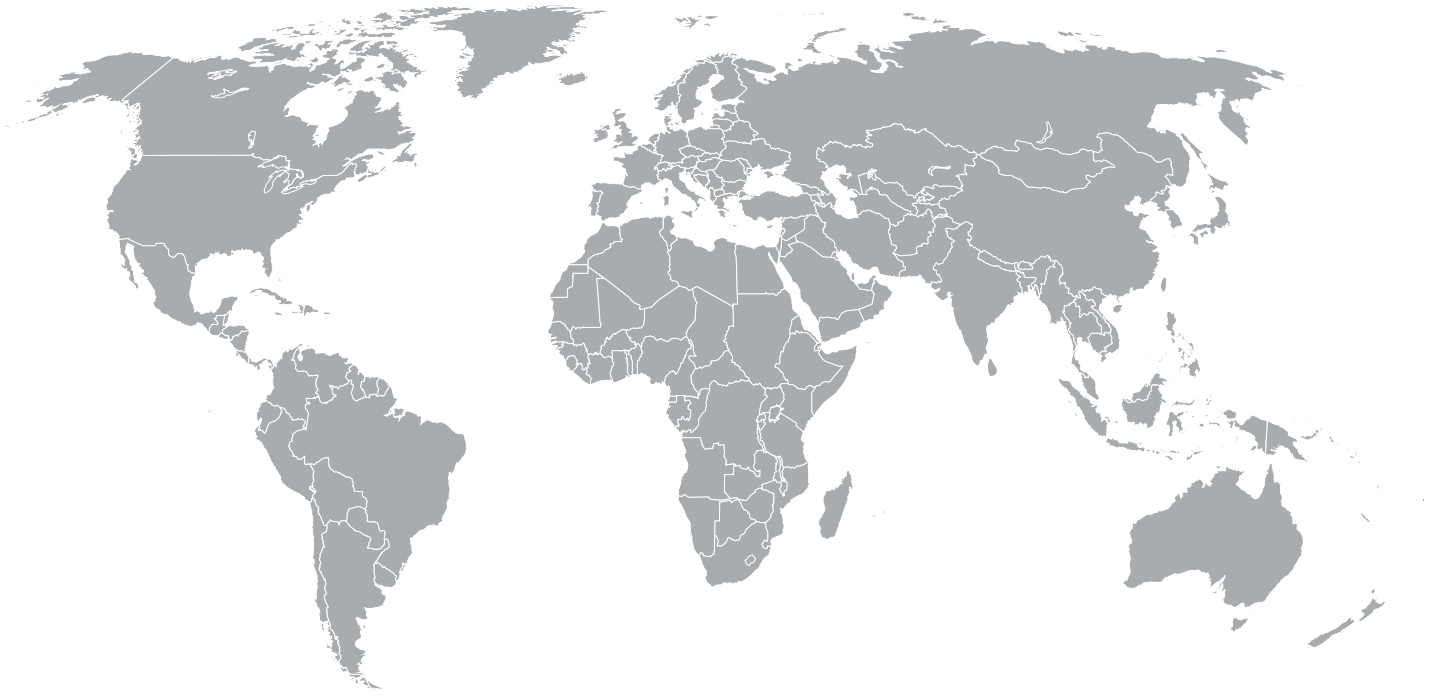
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Subject to modifications

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