

# NDV BALL VALVES



**NIPPON DAIYA VALVE Co., Ltd.**

## 1. 2-Way Ball Valve

Fire Safe Type Ball Valve: F100NB  
High Pressure / Large Bore Ball Valve: E(K)100S  
Jacketed Ball Valve: E100JNC  
Extension Stem Ball Valve: FEX100NB

2-Way Ball Valve

## 2. 3-Way Ball Valve

2 Seats 3-Way Ball Valve: E300NB-L2  
4 Seats 3-Way Ball Valve: E300NB-T4/L4  
3 Seats 3-Way Ball Valve: E300N-T3/L3

3-Way Ball Valve

## 3. V-Port Valve

V100ND(NC)

V-Port Valve

## 4. Pneumatically Operated Valve

Pneumatically Operated 2-Way Ball Valve  
Pneumatically Operated 3-Way Ball Valve  
Pneumatically Operated V-Port Valve

Pneumatically Operated Valve

## 5. Electrically Operated Valve

Electrically Operated 2-Way Ball Valve  
Electrically Operated 3-Way Ball Valve  
Electrically Operated V-Port Valve

Electrically Operated Valve

## 6. Special Purpose Ball Valve

High Temperature Ball Valve  
Y-Shaped 3-Way Ball Valve  
Ball Valve for Shield Tunneling Method  
Top Entry Ball Valve

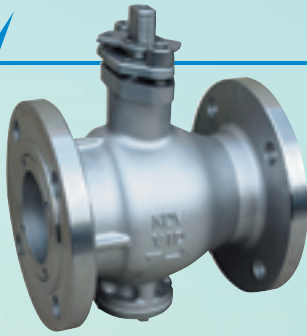
Special Purpose Ball Valve

## 7. Safety Instructions

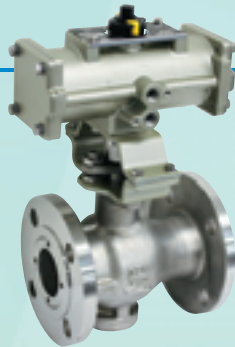
Safety Instructions

For further technical details and specifications, Please contact NDV or local representative.

## ***V-Port Valve***



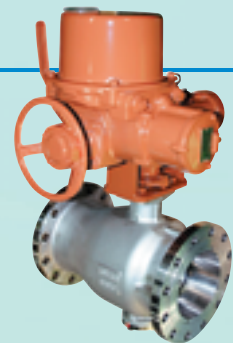
Lever Operated  
Valve  
V100ND (NC)



Pneumatically Operated  
ON-OFF Valve  
VPN1100ND (NC)



Pneumatically Operated  
ON-OFF Valve  
VPN3100ND (NC)



Electrically Operated  
Valve  
VMS4100ND (NC)

## ***Special Purpose Ball Valve***

### ***High Temperature Ball Valve***



Metal Seat Ball Valve  
F(H)100NB-ST

### ***Y-Shaped 3 Way Ball Valve***



Pneumatically Operated ON-OFF Ball Valve  
YWN1300

### ***Ball Valve for Shield Tunneling Method***



Hydraulically Operated Ball Valve  
EKTON1100N

### ***Top Entry Ball Valve***



Lever Operated Ball Valve  
T100S

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## Electrically Operated Valve

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### Models and Features of Electrically Operated Valve

- SRH Type
- SRJ Type
- SHA Type, SD# Type
- PMK Type

#### 5-1. Electrically Operated 2-Way Ball Valve

- Fire Safe Ball Valve: F□4100NB

#### 5-2. Electrically Operated 3-Way Ball Valve

- 2 Seats 3-Way Ball Valve: E□4300NB-L2
- 4 Seats 3-Way Ball Valve: E□4300NB-T4/L4
- 3 Seats 3-Way Ball Valve: E□4300N-T3/L3

#### 5-3. Electrically Operated V-Port Valve: V□4100ND(NC)



Models and Features of Electrically Operated Valve

Applicable Models

Manufacturer	Type	Nominal Size			
		F100NB	E300NB-L2/T4/L4	E300N-T3/L3	V100ND (NC)
Seibu Electric & Machinery	SRH	DN 15 to 150	DN 15 to 150	DN125 to 150	DN 25 to 200
	SRJ	DN 15 to 200	DN 15 to 200	DN125 to 150	DN 25 to 200
	SHA, SD#	DN125 to 200	DN125 to 200	DN125 to 200	—
Kawaden	PMK	DN 15 to 200	DN 15 to 200	DN125 to 200	DN 25 to 200

The products other than above are also available upon request.

SRH Type (Seibu Electric and Machinery made)

Features

- Compact and lightweight actuator using aluminum alloy and engineering plastic.
- Applicable to single-phase AC power.
- No built-in torque switch.
- Motor is protected by built-in thermal protector.
- Manual operation can be done by a spanner.(Interlock switch is not built in.)
- Usable as regulating valve if a seitroller (electrical positioner) is installed.

Specification

SRH Torque Actuator

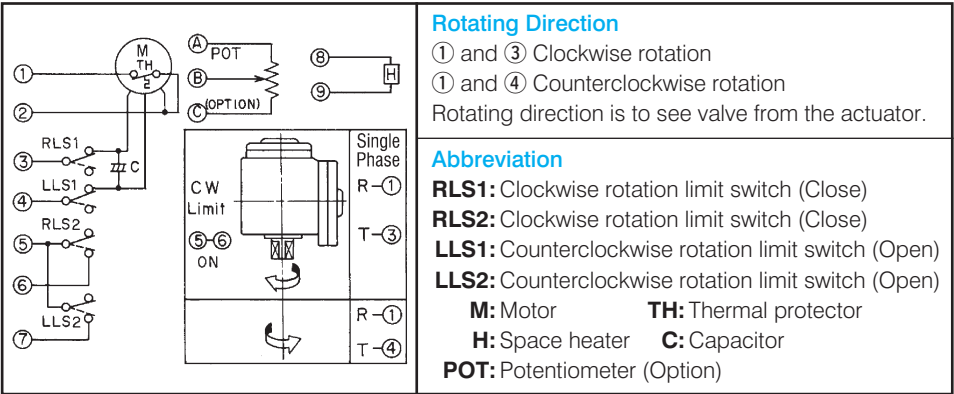
Type		SRH-007	SRH-020	SRH-060
Maximum Output Torque <i>N · m</i>		70	200	600
Open/Close Time (50/60Hz) <i>sec./90°</i>		12/10	12/10	18/15
Power Supply (50/60Hz) <i>V</i>		Single-phase 100/110, 200/220		
Motor	Output <i>W</i>	10	40	100
	Thermal Class	Class E		
	Thermal Protector	Incorporated		
Torque Limit Switch		Not incorporated		
Space Heater <i>W</i>		5		
Microswitch Contact Capacity		AC250V-5A, DC125V-0.4A (Inductive load)		
Lead Inlet		2-G1/2		
Ambient Temperature		-10°C to 50°C		
Protection Structure		IP55/JPW55 (Outdoor waterproof)		
Terminal		Screw size M3.5 × 12P		
Manual Operation		Manually operable using spanner		

Option: Potentiometer, Seimitter, Seitroller



Installed Image

Connecting Diagram



**SRJ Type** (Seibu Electric and Machinery made)**Features**

- Compact and lightweight actuator using aluminum alloy. Protection structure is IP68 (Submersible).
- Accommodate either single phase or three phase AC power. (Single phase three wire is not applicable to SRJ1 and 2.)
- Motor is protected by built-in torque switch and thermal protector. Damage by excessive valve torque is also prevented by the torque switch.
- Valve can be operated manually by handwheel and be automatically recovered after power input.
- Explosion proof type (conforming to Ex d II BT4/IEC) is also available.
- Usable as regulating valve if seitrroller (electrical positioner) is installed. (Seitrroller includes Seimitter function.)



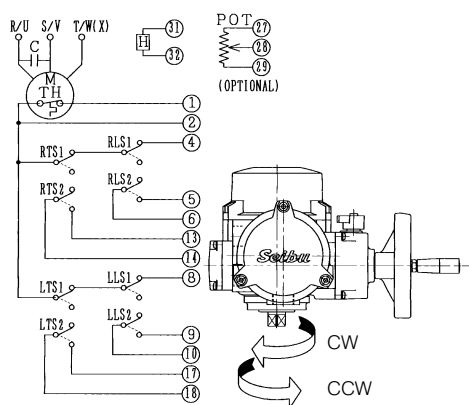
Installed Image

**Specification****SRJ Torque Actuator**

Type		SRJ-010-7	SRJ-010	SRJ-020	SRJ-060	SRJ-1	SRJ-2
Maximum Output Torque <i>N · m</i>		70	125	250	600	1000	2000
Open/Close Time (50/60Hz) <i>sec./90°</i>		18/15					36/30
Power Supply (50/60Hz) <i>V</i>		Single-phase 100/110, 200/220 • 3-phase 200/220, 400/440				*	
Motor	Output <i>W</i>	40			100	200	
	Thermal Class	Class B					
	Brake	Permanent brake included					
	Thermal Protector	Incorporated					
Torque Limit Switch		Incorporated					
Space Heater <i>W</i>		5 to 8					
Microswitch Contact Capacity		AC250V-2A, DC125V-0.4A (Inductive load)					
Lead Inlet		3-G1					
Ambient Temperature		-10°C to 50°C					
Protection Structure		IP68 (Submersible)					
Terminal		Screw size M4 × 32P, Motor M4 × 3P					
Manual Operation		With handwheel Automatically recoverable					

Option: Explosion proof (Ex d II BT4), Potentiometer, Seimitter, Seitrroller

\*: Inapplicable to single phase three wire

**Connecting Diagram****Rotating Direction**

Single-phase: **R-U, T-X** | 3-phase: **R-W, S-V, T-U** Clockwise rotation  
 Single-phase: **R-V, T-X** | 3-phase: **R-U, S-V, T-W** Counterclockwise rotation  
 Rotating direction is to see valve from the actuator.

**Abbreviation**

**RLS1, RLS2:** Clockwise rotation limit switch  
**LLS1, LLS2:** Counterclockwise rotation limit switch  
**RTS1, RTS2:** Clockwise rotation torque switch  
**LTS1, LTS2:** Counterclockwise rotation torque switch  
**M:** Motor      **TH:** Thermal protector  
**H:** Space heater      **C:** Capacitor  
**POT:** Potentiometer (Option)

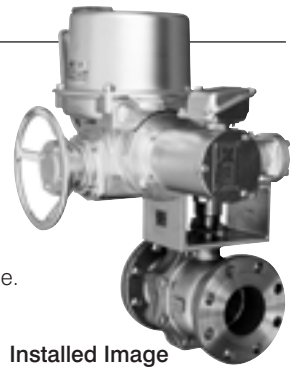
Terminal			
Switch	No.	CCW limit	CW limit
RLS 1	1-4		
RLS 2	5-6		
LLS 1	1-8		
LLS 2	9-10		

— : Contact ON      - - - - : Contact OFF

**13-14:** Overtorque at clockwise limit: ON  
**1-4:** Overtorque at clockwise limit: OFF  
**17-18:** Overtorque at counterclockwise limit: ON  
**1-8:** Overtorque at counterclockwise limit: OFF  
**31-32:** Heater power source terminal  
**27, 28, 29:** Potentiometer terminal

**SHA Type and SD# Type** (Seibu Electric and Machinery made)**Features**

- Robust actuator with ductile cast iron primary and secondary gear.
- Applicable to 3-phase AC power.
- Motor is protected by built-in torque switch. Damage by excessive valve torque is also prevented by the torque switch. In order to protect motor completely, use of thermal relay at panel is advisable.
- Local control priority and Central control priority are available for manual/automatic changeover.
- Interlock switch is incorporated for local control priority.
- Many other options such as single phase motor, DC motor, regulating valve specification are available.

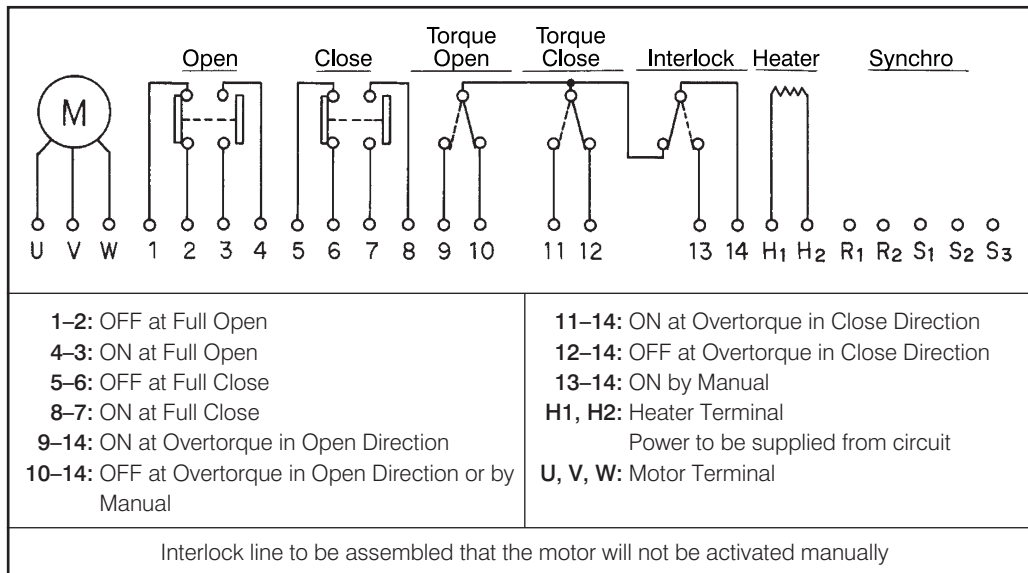


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**Specification****SHA and SD# Torque Actuator**

Type		SHA-01	SHA-02	SHA-04	SDB-075	SDE-15	SDG-22
Maximum Output Torque $N \cdot m$		Settle according to the specification					
Open/Close Time (50/60Hz) $sec./90^\circ$		35/29	35/29	35/29	35/30	35/30	35/30
Power Supply (50/60Hz) $V$		3-phase 200/220, 400/440					
Motor	Output $W$	0.1	0.2	0.4	0.75	1.5	2.2
	Thermal Class	Class B					
	Brake	Not incorporated					
Torque Limit Switch		Incorporated					
Space Heater $W$		10			30		
Microswitch Contact Capacity		AC250V-5A, DC125V-0.5A (Inductive load)					
Lead Inlet		2-G1, 1-G3/4 (for motor)					
Ambient Temperature		-25°C to 50°C					
Protection Structure		IP55/JPW55 (Outdoor waterproof)					
Terminal		Screw size M4×24P, Motor M4×3P			Screw size M4×24P		
Manual Operation		With manual/electrical changeover lever					

Option: Potentiometer, Seimitter, Motor with brake, Thermal motor

**Connecting Diagram**



**PMK Type** (Kawaden made)**Features**

- Compact and lightweight actuator using aluminum alloy.
- Applicable to single phase AC power
- Torque switch is not incorporated.
- Motor is protected by built-in thermal protector.

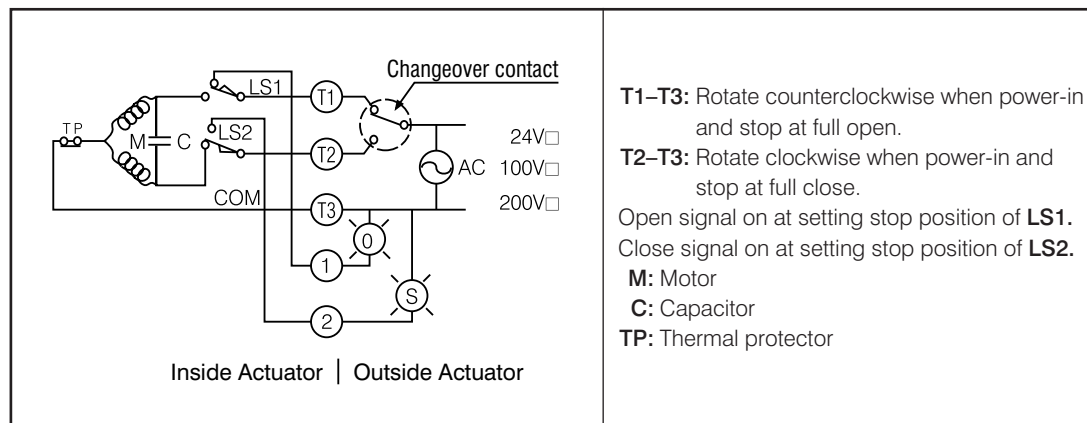


Installed Image

**Specification****PMK Torque Actuator**

Type		PMK-300YS	PMK-600YS	PMK-600YSP	PMK-010SS	PMK-030SS	PMK-060SS	PMK-080SS
Maximum Output Torque <i>N · m</i>		29.4	58.8	68.6	147.1	313.8	588.4	784.5
Open/Close Time (50/60Hz) <i>sec./90°</i>		8.5/7	8.5/7	12/10	24.5/20	38.5/31.5	57/47	71.5/58.5
Power Supply (50/60Hz) <i>V</i>		Single Phase 100/110, 200/220						
Motor	Output <i>W</i>	20W	25W				40W	
	Thermal Class	Class E	Class B	Class E	Class B			
	Brake	Not incorporated						
Torque Limit Switch		Not incorporated						
Space Heater <i>W</i>		10						
Lead Inlet		1-G1/2			2-G3/4			
Ambient Temperature		-10°C to 50°C						
Protection Structure		IP54 (rainproof)						
Terminal		Screw Size M3 × 8P						
Manual Operation		Actuator bottom axis can be manipulated						

**Options:** Potentiometer, Intermediate switch, Space heater, Limit switch, Torque Limiter

**Connection Diagram**

5-1 Electrically Operated 2-Way Ball Valve Fire Safe Type: F94100NB

Valve Codes

Valve Code for F□4100NB

FSR4107NB-NTF-050-( )-J10KRF



1 Actuator (Electrically Operated Valve)			2 4	3 Body Material	4 Seat Material (refer to P10)	
SR	SRH Type	Seibu Electric and Machinery	Electrically Operated Valve	04	FCD400	NTF, NCF, NGR, CFM, CFMR
MSJ	SRJ Type			07	SCS13A	
SH	SHA, SD# Type			12	SCS14A	
PMK	PMK Type			13	SCS16A	
5 Nominal Size (DN or A)			7 Connection	* Improvement Identification Code		
Conforming to ISO 6708 and JIS B 2001			J10KRF	JIS 10KRF	None	Original Design
6 Actuator Code			J20KRF	JIS 20KRF	N	First Improvement
According to the required actuator specification, 8 numbers code will be applied.			A150RF	ASME CL150	NB	Second Improvement
			A300RF	ASME CL300	NC	Third Improvement
					ND	Fourth Improvement

## FSR4100NB (SRH Type Actuator)

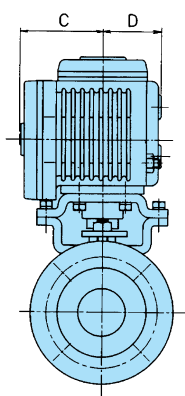
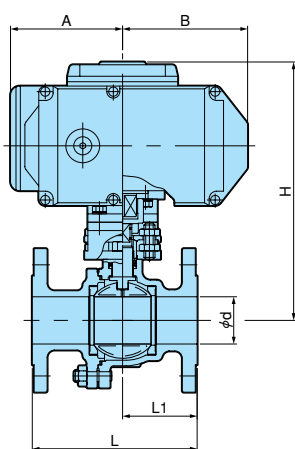
## Actuator Selection Table

Refer to P37 for selecting rank according to operating condition.

DN	Rank	Shutoff Deferential Pressure: MPa															Rank	DN
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0		
15	A																A	15
	B																B	
	C																C	
20	A																A	20
	B																B	
	C																C	
25	A																A	25
	B																B	
	C																C	
40	A																A	40
	B																B	
	C																C	
50	A																A	50
	B																B	
	C																C	
65	A																A	65
	B																B	
	C																C	
80	A																A	80
	B																B	
	C																C	
100	A																A	100
	B																B	
	C																C	
125	A																A	125
	B																B	
	C																C	
150	A																A	150
	B																B	
	C																C	

## Dimension

Unit: mm



Nominal size DN	Actuator					d	10K CL150		20K CL300		H	Mass (Approx. kg) Stainless Cast Steel	
	Code	A	B	C	D		L	L1	L	L1		10K CL150	20K CL300
15	SRH-007	100	108	75	60	13	108	45	140	63	213	7.3	7.7
20						19	117	50	152	70	217	8.5	9.0
25						25	127	51	165	71	233	9.7	10.4
40						38	165	70.5	190	76.5	251	12.9	13.7
50	SRH-020	121	135	90	63	51	178	80.5	216	86	259	16.6	18.2
65						64	190	87	241	103	279	19.1	20.7
80	SRH-020	121	135	90	63	76	203	97	283	124	317	30.0	36.5
100						102	229	116	305	135	351	42.0	53.5
125	SRH-060	158	164	133	85	127	356	148	381	158	413	68.0	81.0
150						152	394	173	403	178	433	85.0	99.0

Please contact NDV or local representative if specific installing direction for actuator is required.

## FMSJ4100NB (SRJ Type Actuator)

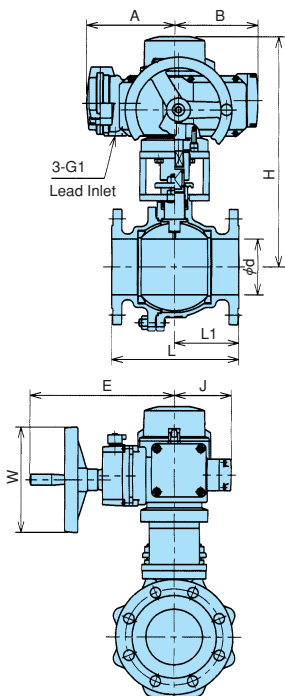
## Actuator Selection Table

Refer to P37 for selecting rank according to operating condition.

DN	Rank	Shutoff Deferential Pressure: MPa															Rank	DN
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0		
15	A																A	15
	B																B	
	C																C	
20	A																A	20
	B																B	
	C																C	
25	A																A	25
	B																B	
	C																C	
40	A																A	40
	B																B	
	C																C	
50	A																A	50
	B																B	
	C																C	
65	A																A	65
	B																B	
	C																C	
80	A																A	80
	B																B	
	C																C	
100	A																A	100
	B																B	
	C																C	
125	A																A	125
	B																B	
	C																C	
150	A																A	150
	B																B	
	C																C	
200	A																A	200
	B																B	
	C																C	

## Dimension

Unit: mm



Nominal size DN	Actuator						<div></div>	10K CL150		20K CL300		<div></div>	Mass (Approx. kg) Stainless Cast Steel	
	Code	A	B	E	J	W		d	L	L1	L		L1	H
15	SRJ-010-7	186	167	272	104	160	13	108	45	140	63	328	18.3	18.7
20							19	117	50	152	70	332	19.0	19.5
25							25	127	51	165	71	345	20.7	21.4
40	SRJ-010						38	165	70.5	190	76.5	363	23.7	24.5
50							51	178	80.5	216	86	371	25.6	27.2
65							64	190	87	241	103	412	32.0	35.5
80	SRJ-020						76	203	97	283	124	422	35.5	42.0
100							102	229	116	305	135		50.5	62.0
	SRJ-060						202	191	316	130	245			
125	SRJ-020	186	167	272	104	160	127	356	148	381	158	513	76.0	—
	SRJ-060	202	191	316	130							530	81.0	94.0
	SRJ-1	240	267	354	191							600	107.0	120.0
150	SRJ-060	202	191	316	130	245	152	394	173	403	178	550	101.0	115.0
	SRJ-1	240	267	354	191							620	126.0	140.0
200	SRJ-060	202	191	316	130		203	457	207	502	235	606	134.8	—
	SRJ-1	240	267	354	191							669	155.0	180.0
	SRJ-2													

Please contact NDV or local representative if specific installing direction for actuator is required.

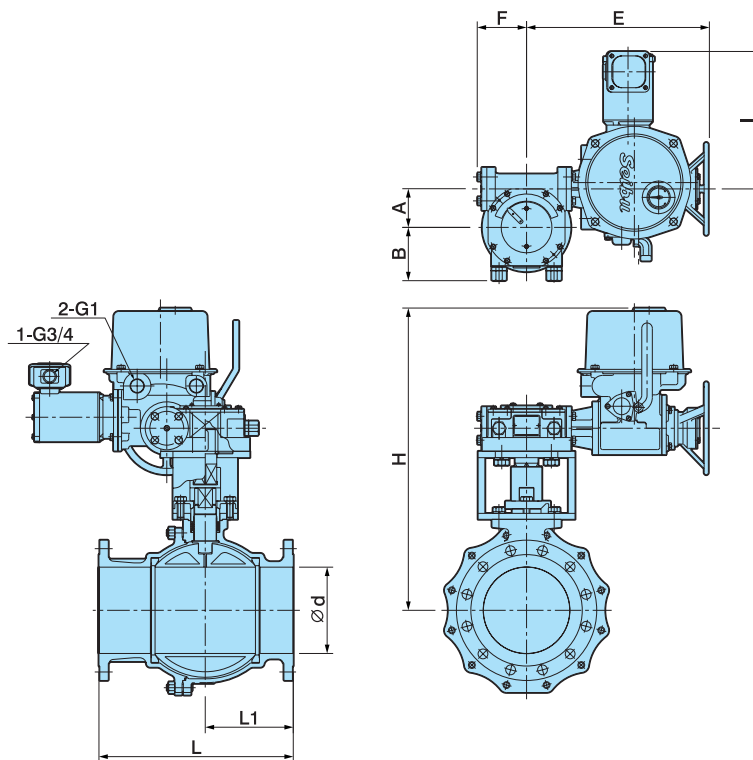
## FSH4100NB, FSD4100NB (SHA and SDB Type Actuator)

## Actuator Selection Table

Refer to P37 for selecting rank according to operating condition.

DN	Rank	Shutoff Differential Pressure: MPa															Rank	DN
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0		
125	A																A	125
	B																B	
	C																C	
150	A																A	150
	B																B	
	C																C	
200	A																A	200
	B																B	
	C																C	

## Dimension



Unit: mm

Nominal size DN	Actuator						d	10K CL150		20K CL300		H	Mass (Approx. kg) Stainless Cast Steel	
	Code	A	B	E	F	I		L	L1	L	L1		10K CL150	20K CL300
125	SHA-02					325	127	356	148	381	158	647	121.0	134.0
150	SHA-04	91	126	430	116	318	152	394	173	403	178	667	138.0	152.0
	SHA-02					325								
200	SHA-04	117	152	544	144	318	203	457	207	502	235	715	172.0	197.0
	SDB-075					375						734	217.0	242.0

Please contact NDV or local representative if specific installing direction for actuator is required.



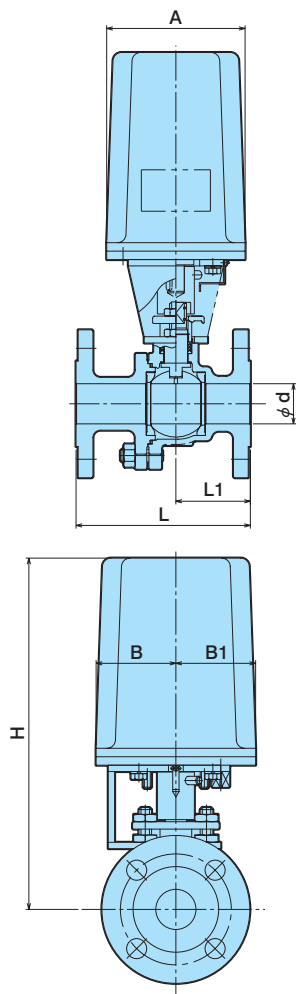
## FPMK4100NB (PMK Type Actuator)

Actuator Selection Table

Refer to P37 for selecting rank according to operating condition.

DN	Rank	Shutoff Differential Pressure: MPa								Rank	DN
		0.2	0.6	1.0	1.4	1.8	2.2	2.6	3.0		
15	A									A	15
	B									B	
	C									C	
20	A									A	20
	B									B	
	C									C	
25	A									A	25
	B									B	
	C									C	
40	A									A	40
	B									B	
	C									C	
50	A									A	50
	B									B	
	C									C	
65	A									A	65
	B									B	
	C									C	
80	A									A	80
	B									B	
	C									C	
100	A									A	100
	B									B	
	C									C	
125	A									A	125
	B									B	
	C									C	
150	A									A	150
	B									B	
	C									C	
200	A									A	200
	B									B	
	C									C	

## Dimension



Unit: mm

Nominal size DN	Actuator					10K CL150		20K, CL300			Mass (Approx. kg) Stainless Cast Steel	
	Code	A	B	B1		d	L	L1	L		L1	H
15	PMK-300YS	131	75.5	75.5	13	108	45	140	63	301	7.7	8.1
20					19	117	50	152	70	306	8.3	8.8
25					25	127	51	165	71	314	9.8	10.5
40	PMK-600YS	131	75.5	75.5	38	165	70.5	190	76.5	333	12.3	—
50					PMK-600YSP	51	178	80.5	216	86	342	12.5
65	PMK-010SS	178	70	70		64	190	87	241	103	368	14.5
80					425						19.6	23.1
100	PMK-030SS	197	76	76	76	203	97	283	124	435	25.0	31.5
										470	—	34.0
125	PMK-010SS	178	70	70	102	229	116	305	135	467	37.0	48.5
	PMK-030SS	197	76	76						502	39.5	51.0
	PMK-060SS	272	100	100						127	356	148
PMK-080SS					659	76.0	89.0					
150	PMK-030SS	197	76	76	152	394		173	403	178	558	73.5
	PMK-060SS	272	100	100			680				87.0	101.0
	PMK-080SS											
200	PMK-060SS	272	100	100	203	457	207	502	235	740	128.0	—
	PMK-080SS											

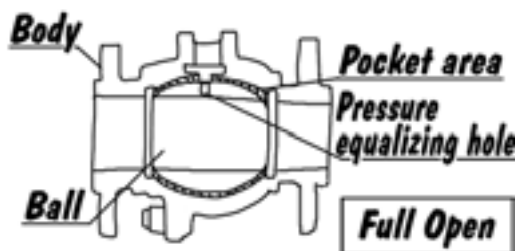
Please contact NDV or local representative for the combination of DN50-PMK010SS or DN80-PMK030SS



# Safety Instructions

## 1. Selection of Valves

- 1 Usable ranges for products described on this brochure are limited according to the domestic/international code and standard and NDV standard. Appropriate products must be selected after confirming the usage conditions (fluid, pressure, temperature etc.).
- 2 Materials for the main parts of valves must be selected properly considering working conditions (fluid, temperature etc.).
- 3 Please specify degrease or water proof when issuing order. (Some of the products may not be applicable for degrease or water proof.)
- 4 Soft seat floating ball valve must be used at full open/close position. Usage at intermediate position may cause damages of the surface of ball and/or seat.
- 5 Because of the structure of ball valve, abnormal pressure rise at pocket (\*) occurs if the fluid is liquid and the temperature fluctuates. Ball top is provided with a hole to prevent this abnormal pressure rise. The alternative countermeasure should be taken incase the abnormal pressure rise happens by temperature rise at the pocket during valve full closing. Please consult with NDV or local representative if the case occurs.
  - \* During valve full OPEN: Space between ball and shell
  - During valve full CLOSE: Space between ball and shell, Ball bore portion
- 6 Floating ball valve has a mechanism to seal by pushing ball against the seat of the outlet side with fluid pressure. Please consult with NDV or local representative in case that the pressure change is large in operation condition because seat leakage may occur at low pressure operation.
- 7 Please consult with NDV or local representative in case that fluid includes abrasive matter because an abrasion may occur at seat, body or other parts of valve.

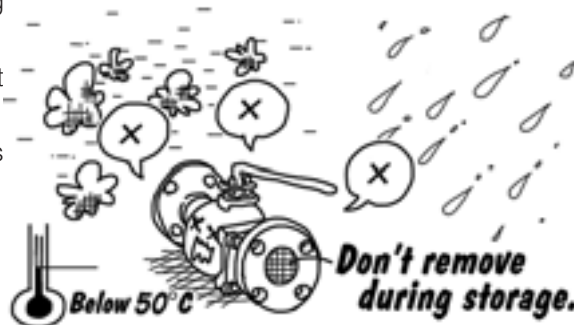


## 2. Receipt and Carriage

- 1 Wrapping and packing conditions, products condition and number of goods must be checked and confirmed at the time of the receipt.
- 2 Delivered goods may be heavy depending on the bore size. Unloading and carriage must be done using proper machines and tools according to the relevant law for safety and health. Do not go under lifted goods, do not insert hand or leg below goods and do not operate lifting machine under the lifted goods.
- 3 If packing is by corrugated board, the packing strength will become low when wetted. Handling must be carefully done if the corrugated board is wet.

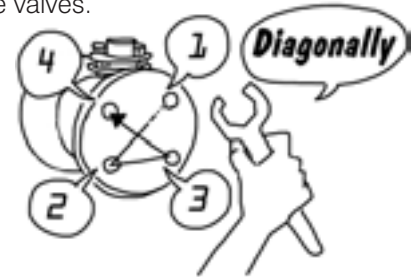
## 3. Storage

- 1 It is recommended to store products under packing condition until installing them to piping.
- 2 If products are stored for some time after unpacking, dust proof seal (cap) at flange face must not be removed.
- 3 Products must be stored under below mentioned conditions in order to avoid rust and/or degradation of materials.
  1. To protect from rain or water
  2. Ambient temperature must be below 50°C  
(The temperature might be different by installed accessories.)
  3. To avoid high humidity and dust atmosphere



## 4. Installation to Piping

- 1 Remove dust proof seal (cap) at connection flange face and confirm that there are no dusts and/or deposits inside. Confirm also that there are no foreign materials inside of the piping after cleaning. Blow off by air or flush by fluid if necessary.
- 2 Ball valves have not a restriction for the flow direction. Install valves to piping considering the position of operation handle and the other necessary issues for safety operation. If flow direction is marked on the valve for some reason such as a protection of abnormal pressure rise, install as directed by the mark.
- 3 Keep a space for overhauling. The space needs necessary area for lifting a complete set of the valve.
- 4 Valves are delivered at full open position unless otherwise specified. Install valves keeping full open position.
- 5 Install valves avoiding strong tension, compression or bending stress to the valves.
- 6 When installing valves, bolts for installation must be tightened diagonally and equally. Unbalanced tightening may cause leakages from connection flanges.
- 7 Confirm that tightening bolts and nuts are not loosened. Retighten them if loosened.
- 8 After installing valves, blowing off by air or flushing by fluid at full open valve condition must be done to clean foreign materials in piping. (Do not close and open valve during blowing off or flushing.)



## 5. Operation

- 1 Do not operate valve with excessive torque by attaching a pipe or a wrench to the lever handle for opening or closing.
- 2 Never put fingers or hands into the inside of valve.
- 3 If there is any leakage from the gland, tighten further the gland bolt. If valve is used for fluid of large temperature change, degree of stress relief of packing is large and therefore, retightening must be done after the temperature once becomes high and falls to low.
- 4 Products may be damaged if remaining fluid in the valve is frozen. If there is a possibility of frozen, heat piping line or clean the inside of valves.

## 6. Pneumactical and Electrical Actuator

- 1 Air vent and electric wiring terminal are fitted with seals. Do not remove the seals until installation to the connections.
- 2 Actuators are delivered after adjustment. Do not disassemble or readjustment. Call NDV or local representative, if some adjustment seems necessary.
- 3 Use air dehumidified and cleaned by filtration.
- 4 Operating pressure and power source must be confirmed by the plate attached to the valve and/or the specification.
- 5 Take care that rain or water will not enter from air hole of the actuator.

## 7. Disassembling and assembling

- 1 Before remove a valve from piping, discharge the fluid in the piping and relieve the pressure. In this occasion, the valve must be opened and closed several times to relieve the pressure in the valve. Special attention must be given if the fluid is hazardous like poisonous or abrasive fluid.
- 2 Be careful not to damage the seal part of ball surface and flange face during disassembling and assembling.



# Memo

[illegible]



- The ISO 9001 · 14001 certificate was awarded



## CAUTION

Specifications and performance figures of products contained in this catalog are on the design calculations, in-house tests, actual records of product application, and the official standards and specifications. They are presented as the user guide on the use of product concerned under general service conditions. Users intending to use the product under a special condition are required to receive engineering advice from this company in advance or to make their own studies and evaluation to verify performance on their own responsibility. This company shall not be liable for any damages, material or human, that may arise without following this procedure. In as much as full care was taken in editing this catalog, users are kindly requested to make contact with this company for any questions or discrepancies found. This catalog is subject to change without notice for the purpose of correcting error, supplementing or improving insufficient content, updating the content to the improved product performance, design change, discontinuation of product and other reasons. Revised version automatically invalidates catalogs issued prior to the current version. Check the version with our Sales Dept. or local representative before you place orders.

## WARNING

## CAUTION

There are several points to be noticed for the use of ball valve based on the structural characteristics. When valve is delivered, a leaflet for Safety Instructions is in the package. Please read this instruction thoroughly before handling and use of products in order to use them safely and stably for a long time.

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