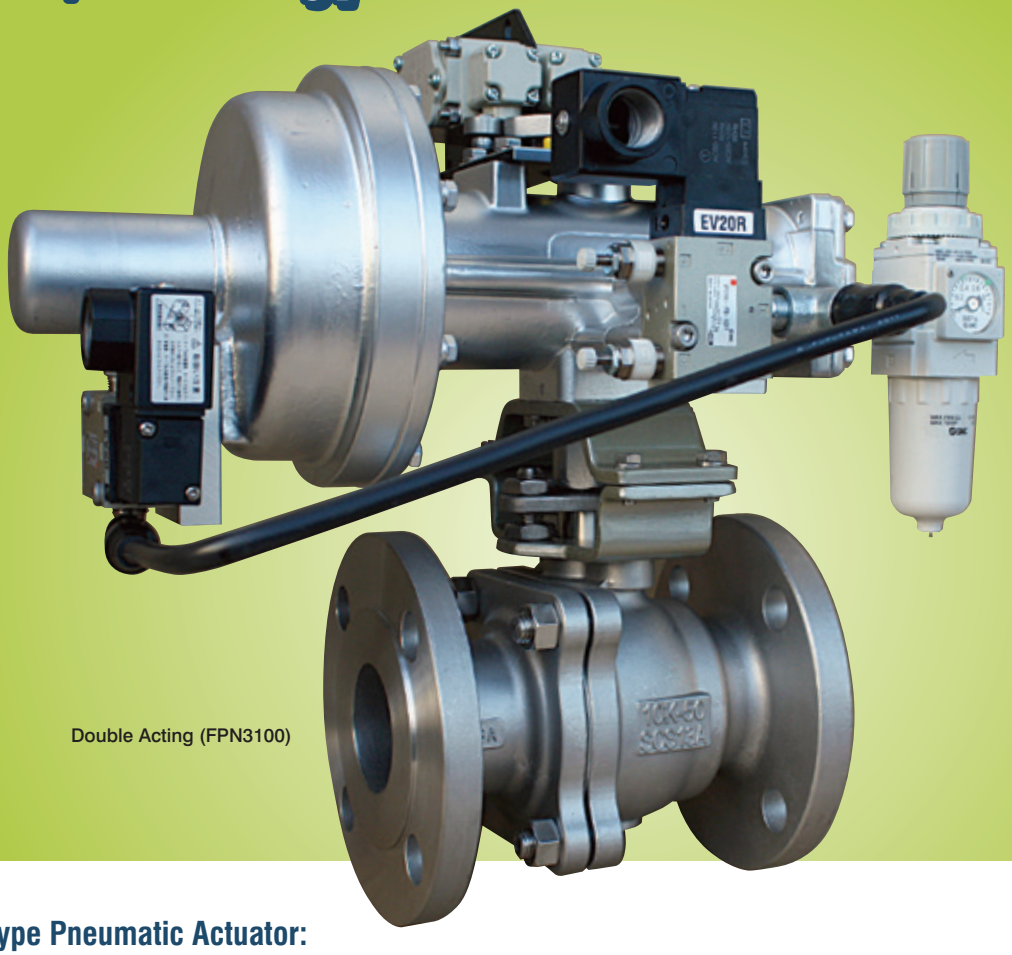
NDV

Catalog No. BE106-02

2-Staged Open/Close Type Ball Valve



Double Acting (FPN3100)

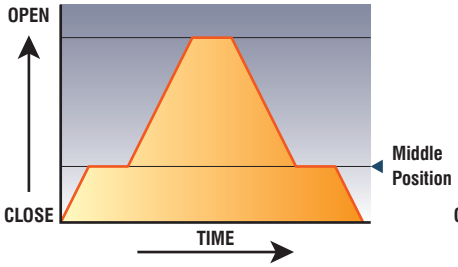
2-Staged Open/Close Rotary type Pneumatic Actuator:

NDV Rotary type Pneumatic Actuator (90 degree rotation, Scotch yoke type, double piston) with sub-cylinder enables 2-stage movement in open or close operaton.

Middle position open action

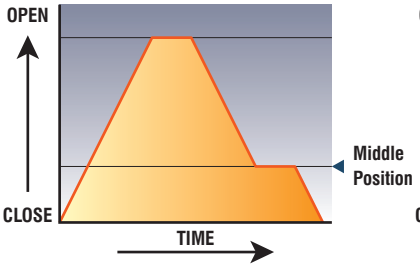
Pattern 1

2 stage to full open—2 stage to full close



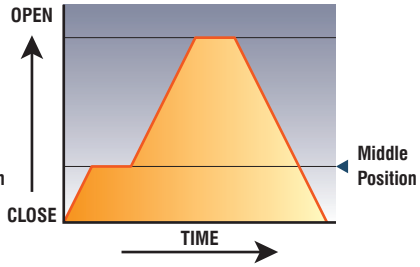
Pattern 2

1 stage to full open—2 stage to full close



Pattern 3

2 stage to full open—1 stage to full close



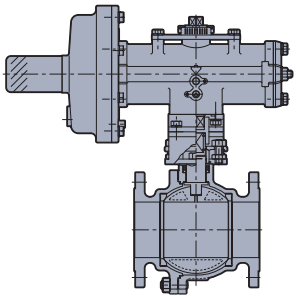
Possible to pass fluid in stable flow at 2 stages:

Suitable for fixed flow control and applicable for water hummer protection.

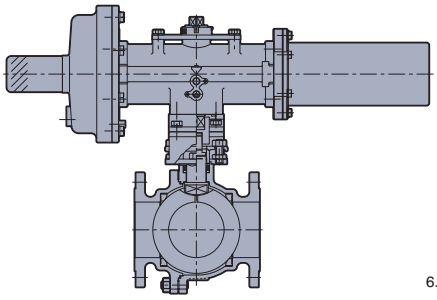
NIPPON DAIYA VALVE Co,. Ltd

Specifications

2-Staged Open/Close Rotary type Pneumatic Actuator



Double Acting Type
(Air to Open/Air to Close)



Single Acting Type
(Air to Open/Spring to Close)

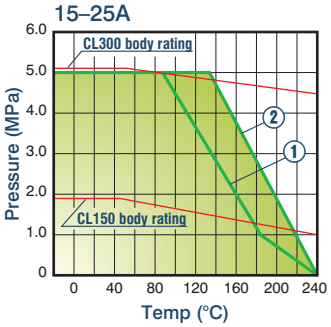
ITEMS		DOUBLE ACTING	SINGLE ACTING
Code Number Details are referred to the selection table.		PN-05TN PN-06TN PN-08TN PN-10TN PN-12TN	PO-06TN PO-08TN PO-10TN PO-12TN
Range of Nominal Size		15 to 150A	15 to 100A
Middle Opening Range		0 to 30% (30% opening at delivery time)	
Operational Air Pressure		0.4 to 0.7 MPa (Optional: 0.3 MPa)	
Allowable Ambient Temp.		-10°C to 50°C	
Accesories	**Standard**	Solenoid Valve 2 sets, Air Filter Regulator 1 set, Speed Controller 1 set	
	Optional	Limit switch, By-pass valve, Explosion proof etc.	
Manually Operation		Wrench can be used after exracting air by by-pass valve	Manually operating unit (option)

Pressure and Temperature Rating

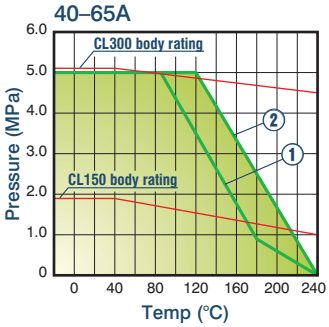
Valve Type: F100NB

Code	Seat Materials	Applied to
NTF	New-PTFE	①
NCF	PTFE reinforced with Carbon Fiber	
NGR	PTFE reinforced with Glass Fiber	
CFMR	CF with Inner/Outer Metal Ring	②

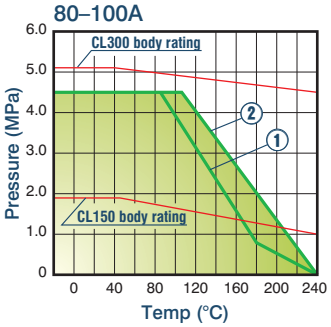
15–25A



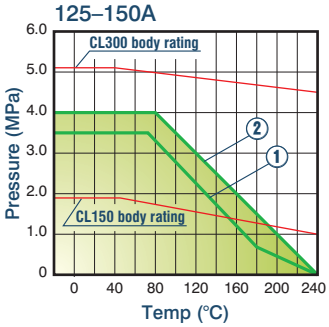
40–65A



80–100A



125–150A



Remarks: Since the high polymer materials used for seat materials, seat leakage may occure if it is used at very low pressure after used at high differencial pressure.

Standard Specifications of Valve

Specifications below are based on valve *Type F100NB*, Please refer to our Ball Valve brochure in detail.

Material	**Main Body**	FCD400, SCS13A, SCS14A, SCS16A
	Ball	SUS304, SUS316, SUS316L
	Seat	New-PTFE, Reinforced PTFE

Flange Code	JIS10KRF, JIS20KRF, ASME CL 150, 300
Painting (Body)	Silver (excepting stainless steel)

Usage Condition and Valve Grade

Mandatory torque power to activate valves depends on usage conditions such as fluid state,fluid temperature, seat materials, or shutoff differerntial pressure, even if their nominal size is the same. Please consider your usage conditions when you select actuator.

Valve Type: F100NB

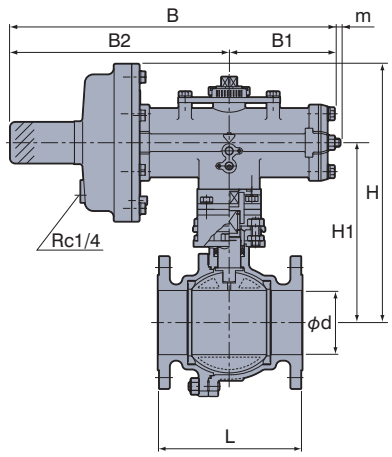
Condition		Factor
Seat Mterial	New-PTFE (NTF)	**a**
	PTFE reinforced with Carbon Fiber (NCF) CF with Inner/Outer Metal Ring (CFMR)	**b**
	PTFE reinforced with Glass Fiber (NGR)	**c**
Fluid State	Clean (less than 100CP)	**a**
	Solvent, Viscous (100 to 500CP)	**b**
	Sludge, Contamination (Slurry, Iron Powder), Powder	**c**
Fluid Temp.	-20°C to 150°C	**a**
	-100°C to -21°C, 151°C to 200°C	**b**

Factor Combination	Rank
3a	A
2a+b, a+2b	B
2a+c, 2b+c, a+b+c, 3b, 2c+a, 2c+b	C

ACTUATOR (DIMENSIONS, SELECTION TABLE)

Double Acting Type (Air to Open/Air to Close)

FPN3100NB



Unit: mm

Nominal Size (A)	d	L		Actuator Code PN-	B	B1	B2	m	H	H1
		10K, CL150	20K, CL300							
15	13	108	140	05TN	277	86	191	0–3	187	124
20	19	117	152	05TN	277	86	191	0–3	191	128
25	25	127	165	05TN	277	86	191	0–3	205	142
40	38	165	190	05TN	277	86	191	0–3	223	160
				06TN	336	107	229	0–3	248	168
50	51	178	216	06TN	336	107	229	0–3	256	176
				08TN	412	133	279	0–4	288	188
65	64	190	241	06TN	336	107	229	0–3	284	204
				08TN	412	133	279	0–4	316	216
80	76	203	283	08TN	412	133	279	0–4	326	226
				10TN	513	168	345	0–6	376	251
100	102	229	305	10TN	513	168	345	0–6	411	286
				12TN	629	210	419	2–9	452	302
125	127	356	381	12TN	629	210	419	2–9	491	341
150	152	394	403	12TN	629	210	419	2–9	511	361

Pressure: 0.4MPa

Nominal Size (A)	Rank	Shutoff Differential Pressure (MPa) 0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0	Rank	Nominal Size (A)
15	A	PN-05TN	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	PN-06TN	B	
	C		C	
50	A		A	50
	B		B	
	C		C	
65	A	PN-06TN	A	65
	B	PN-08TN	B	
	C		C	
80	A		A	80
	B		B	
	C	PN-10TN	C	
100	A		A	100
	B		B	
	C		C	
125	A	PN-12TN	A	125
	B		B	
	C		C	
150	A		A	150
	B		B	
	C		C	

PRODUCT CODE NUMBER

Code Number for FPN (PO) 3100NB

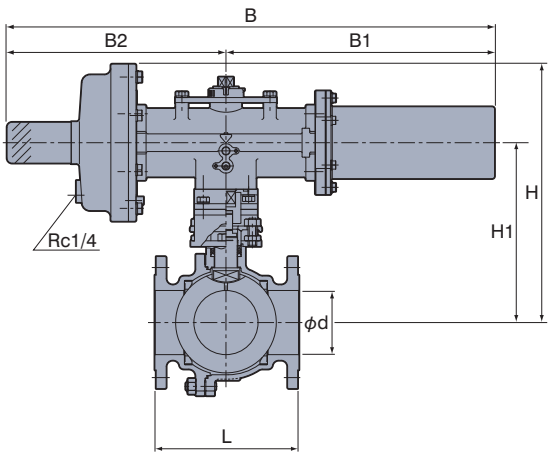
❶	❷	❸	*	❹	❺	❻	❼
F	PN	31	07	NB -	NTF	- 100	- 10TN	- J10KRF

F100NB (Fire Safe Type Ball Valve)

Single Acting Type (Air to Open/Spring to Close)

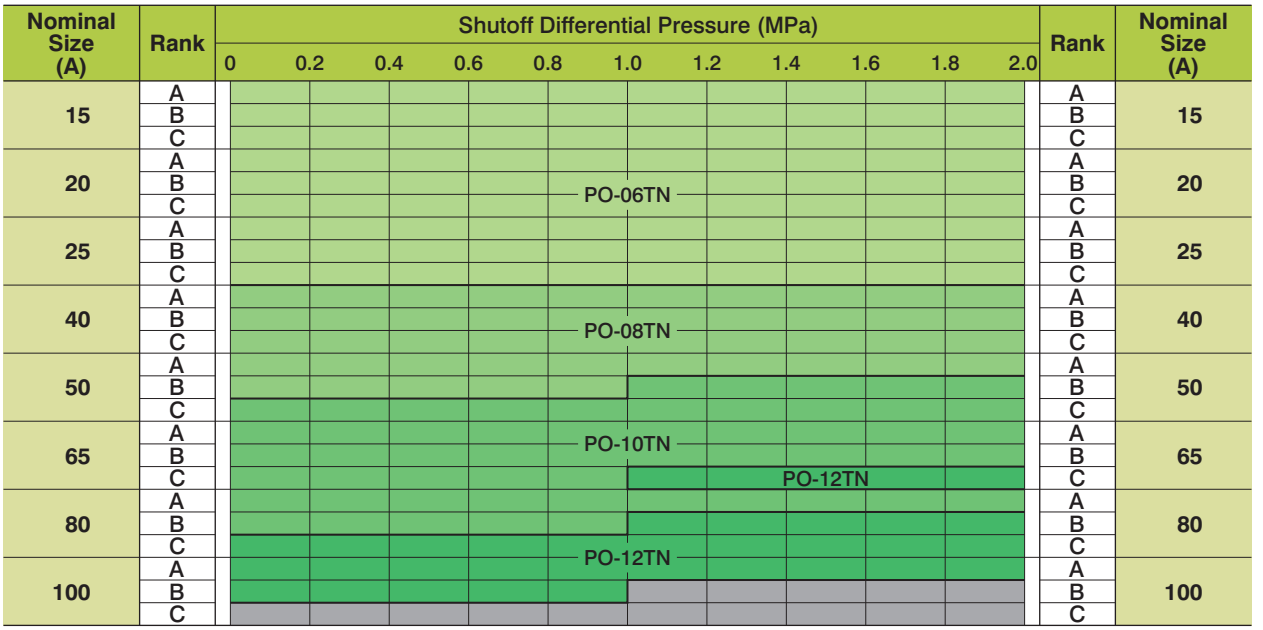
Unit: mm

FPO3100NB



Nominal Size (A)	d	L		Actuator Code PO-	B	B1	B2	H	H1
		10K, CL150	20K, CL300						
15	13	108	140	06TN	504	275	229	212	132
20	19	117	152	06TN	504	275	229	216	136
25	25	127	165	06TN	504	275	229	230	150
40	38	165	190	08TN	621	342	279	280	180
50	51	178	216	08TN	621	342	279	288	188
				10TN	770	425	345	338	213
65	64	190	241	10TN	770	425	345	366	241
				12TN	959	540	419	408	258
80	76	203	283	10TN	770	425	345	376	251
				12TN	959	540	419	418	268
100	102	229	305	12TN	959	540	419	452	302

Pressure: 0.4MPa



❶ Operation Type

PN	Double Acting
PO	Single Acting (Air to Open)

❷ 3=Control Valve
(2stage on-off)

❸ Body Material

04	FCD400
07	SCS13A
12	SCS14A
13	SCS16A

✻ Improvement Code

none	Initial
N	First Improvement
NB	Second Improvement
NC	Third Improvement

❹ Seat Material

NTF	New-PTFE
NCF	PTFE reinforced with Carbon Fiber
NGR	PTFE reinforced with Glass Fiber
CFMR	CF with Inner/Outer Metal Ring

❺ Nominal Size
Based on
ISO 6708 and JIS B 2001.

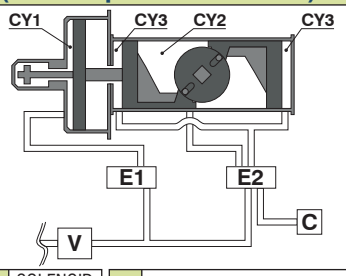
❻ Actuator Code

❼ Connection Code

J10KRF	JIS 10KRF
J20KRF	JIS 20KRF
A150RF	ASME CL 150
A300RF	ASME CL 300

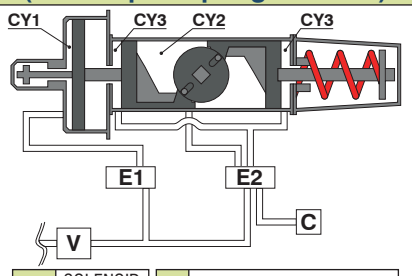
EXPLANATION on ACTION

Double Acting Type (Air to Open/Air to Close)



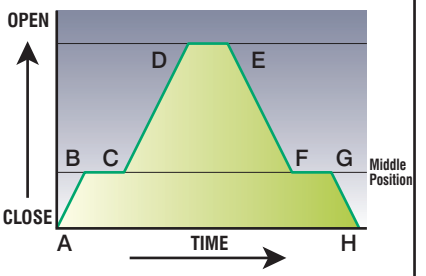
E1	SOLENOID VALVE 1	C	SPEED CONTROLLER
E2	SOLENOID VALVE 2	V	AIR FILTER REGULATOR

Single Acting Type (Air to Open/Spring to Close)

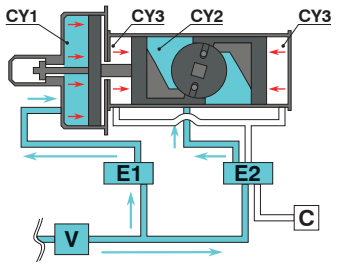


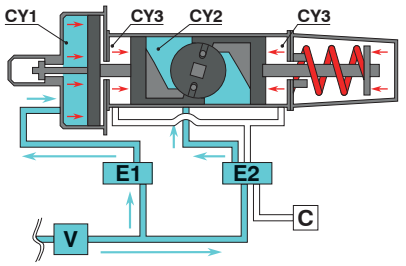
E1	SOLENOID VALVE 1	C	SPEED CONTROLLER
E2	SOLENOID VALVE 2	V	AIR FILTER REGULATOR

Middle Position Open Action

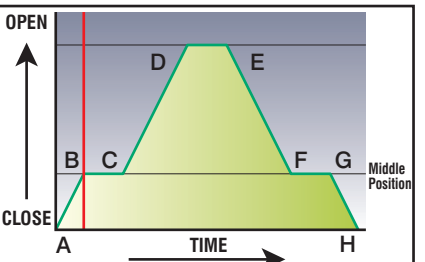


1



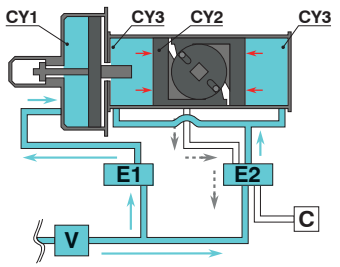


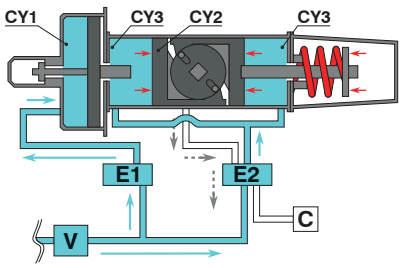
Action A→B When E1 is set ON, air goes to CY1. Then the valve opens to planned middle position.



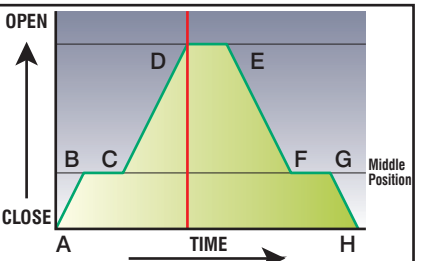
V. POSITION	SOLENOID V		V. ACTION
	E1	E2	
MIDDLE	ON	OFF	A→B

2



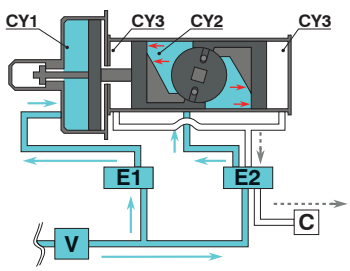


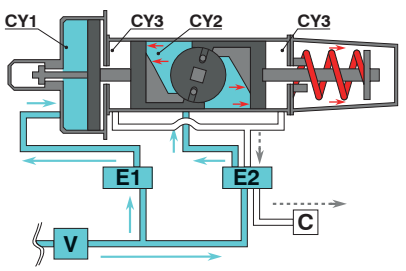
Action C→D When E1 is ON and E2 is set ON, air goes to CY3. Air at CY2 goes to atmosphere and the valve becomes fully open.



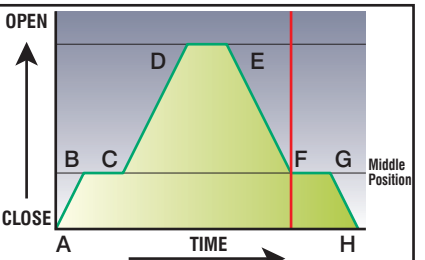
V. POSITION	SOLENOID V		V. ACTION
	E1	E2	
FULL OPEN	ON	ON	C→D(A→D)

3



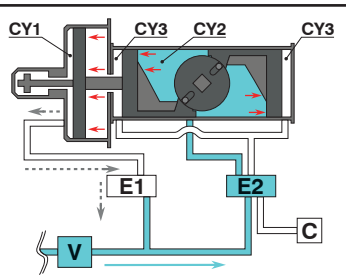


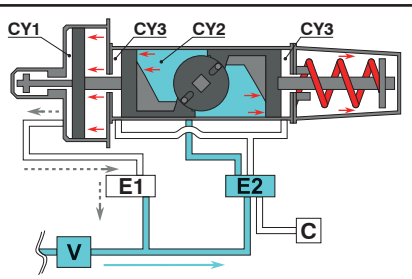
Action E→F When E1 is ON and E2 is set OFF, air goes to CY2. Air at CY3 goes to atmosphere and the valve closes to planned middle position.



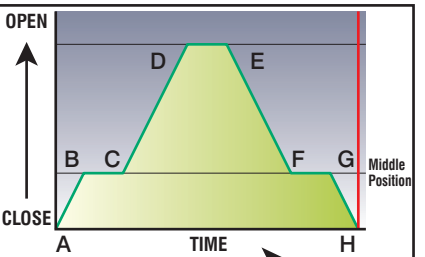
V. POSITION	SOLENOID V		V. ACTION
	E1	E2	
MIDDLE	ON	OFF	E→F

4





Action G→H When E1 and E2 is set OFF, air at CY1 goes to atmosphere. Then the valve becomes fully close.



V. POSITION	SOLENOID V		V. ACTION
	E1	E2	
FULL CLOSE	OFF	OFF	G→H

● The ISO 9001 · 14001 certificate was awarded

ISO9001 99QR-167
ISO14001 08ER-701

⚠ 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. When you select products for possible order placement, please check the issuance code number on the back of your catalog and verify with this company that it is the latest version.

⚠ WARNING ⚠ CAUTION

There are some instructions for use of diaphragm valve because of a constructional characteristic. When valve is delivered, the leaflet related to instruction on Safely is bundled. Please read this instructions thoroughly before beginning of use and handling to use your product safely and stably for a prolonged life.

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