

Pneumatic Valves
Catalog No. CB-023S

Discrete valve
Body piping

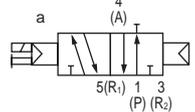
3GA1, 2, 3 / 4GA1, 2, 3-FP1 Series

● Applicable cylinder bore size: $\varnothing 20$ to $\varnothing 100$

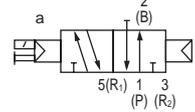


JIS symbol

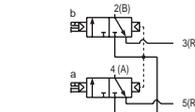
- 3-port valve
2-position single NC



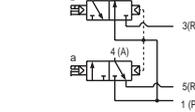
- 2-position single NO



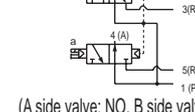
- Two 3-port valves integrated
(A side valve: NC, B side valve: NC)



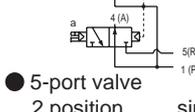
- Two 3-port valves integrated
(A side valve: NO, B side valve: NO)



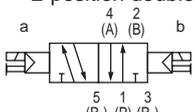
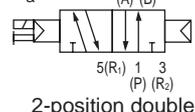
- Two 3-port valves integrated
(A side valve: NO, B side valve: NC)



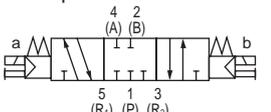
- Two 3-port valves integrated
(A side valve: NC, B side valve: NO)



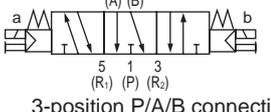
- 5-port valve
2 position single



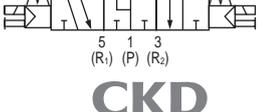
- 3-position
All ports closed



- 3-position A/B/R connection



- 3-position P/A/B connection



Common specifications

Item	Description
Valve and operation	Pilot operated soft spool valve
Working fluid	Compressed air
Max. working pressure MPa	0.7
Min. working pressure MPa	0.2
Proof pressure MPa	1.05
Ambient temperature °C	-5 to 55 (no freezing)
Fluid temperature °C	5 to 55
Manual override	Non-locking/locking common (standard)
Pilot exhaust method	Main valve/pilot valve common exhaust
Degree of protection*1	Dust-proof
Vibration resistance m/s ²	50 or less
Shock resistance m/s ²	300 or less
Atmosphere	Cannot be used in corrosive gas environments

*1: Avoid dripping water or oil, etc., during use. IP65 (water jet proof) applies for DIN terminal box specifications. However, the specified outer diameter of the cord and tightening torque must be used for fixing in place.

Electrical specifications

Item		Description			
Rated voltage	V	DC24	DC12	AC100	AC200
Voltage fluctuation range		±10%			
Holding current (A)	Standard	0.015 (0.017)	0.030 (0.034)	0.009 (0.009)	0.006 (0.006)
	(*2) With low exoergic/energy circuit	0.005	0.010	-	-
Power consumption W	Standard	0.35(0.40)			
	(*2) With low exoergic/energy circuit	0.1			
Apparent power VA	(*2) (*3)	-		0.93 (0.98)	1.40
		Thermal class B			
Surge suppressor	Option				
Indicator	Lamp (option)				

*2: Values in () apply when lamp is included. In addition, the type with low exoergic/energy circuit is only available with lamp.

*3: 200 VAC is the value of DIN terminal box (with lamp).

Individual specifications

Port size		3GA1, 4GA1	3GA2, 4GA2	3GA3, 4GA3
Rc thread, M5	Port A/B	Push-in fitting $\varnothing 4$, $\varnothing 6$ M5	Push-in fitting $\varnothing 4$, $\varnothing 6$, $\varnothing 8$ Rc1/8	Push-in fitting $\varnothing 6$, $\varnothing 8$, $\varnothing 10$ Rc1/4
	Port P/R1/R2	M5	Rc1/8	Rc1/4

Item		3GA1		3GA2		3GA3		4GA1		4GA2		4GA3		
		ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
Response time ms	Two 3-port valves integrated	9	12	12	29	-	-	-	-	-	-	-	-	
	2-position	Single	15	15	19	19	25	28	15	15	19	19	25	28
		Double	-	-	-	-	-	-	9	-	18	-	24	-
3-position	ABR connection	-	-	-	-	-	-	8	15	17	30	23	45	

Values with lamp/surge suppressor are shown. The response times are values with working pressure of 0.5 MPa at 20°C. They depend on the pressure.

Item		3GA1	3GA2	3GA3	4GA1	4GA2	4GA3		
Weight g	2-position	Single	Grommet lead wire	48 (41)	104 (74)	142 (100)	48 (41)		
		E-connector	50 (43)	106 (76)	144 (102)	50 (43)	111 (81)	153 (111)	
		DIN terminal box	-	141 (111)	177 (135)	-	146 (116)	186 (144)	
	3-position	Double	Grommet lead wire	-	-	-	65 (58)	127 (97)	174 (128)
		E-connector	-	-	-	-	69 (62)	131 (101)	178 (132)
		DIN terminal box	-	-	-	-	169 (139)	214 (168)	
All ports closed	Grommet lead wire	-	-	-	67 (60)	139 (109)	183 (141)		
	E-connector	-	-	-	71 (64)	143 (113)	187 (145)		
	DIN terminal box	-	-	-	-	181 (151)	223 (181)		

- Values in () do not include the pipe adaptor. Values for the E-connector include the socket assembly (with 300 mm lead wire). For the EJ-connector, add 16 g/connector to the E-connector weight.
- The weight of the two 3-port valves integrated type is the same as that of 2-position double.

3GA1, 2, 3/4GA1, 2, 3-FP1 Series

Discrete valve; Body piping

Flow characteristics

Model No.	Solenoid position	P → A/B		A/B → R1/R2		
		C[dm ³ /(s·bar)]	b	C[dm ³ /(s·bar)]	b	
3GA1 4GA1	Two 3-port valves integrated	0.98	0.45	0.71	0.34	
	2-position	1.2	0.47	0.72	0.37	
	3-position	All ports closed	1.1	0.39	0.70	0.34
		ABR connection	1.1	0.33	0.72	0.34
	PAB connection	1.3	0.61	0.72	0.36	
3GA2 4GA2	Two 3-port valves integrated	1.8	0.29	2.3	0.32	
	2-position	2.4	0.33	2.8	0.30	
	3-position	All ports closed	2.2	0.28	2.5	0.28
		ABR connection	2.3	0.26	2.8	0.27
	PAB connection	2.5	0.38	2.4	0.30	
3GA3 4GA3	2-position	3.4	0.29	4.0	0.24	
	3-position	All ports closed	3.1	0.27	3.4	0.28
		ABR connection	3.1	0.33	4.1	0.20
		PAB connection	3.5	0.43	3.4	0.32

*1: Effective cross-sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

Electric actuator	Pneumatic cylinders	Assistive device	Pneumatic valves	F.R.L./Auxiliary Components Electronic Component	Vacuum components	Main line components	Fluid control valves	Main line components	Anti-bacterial/ bacteria-removing filter	Vacuum components	Fluid control valves

FP1

FP2

3GA1, 2, 3/4GA1, 2, 3-FP1 Series

Discrete valve; Body piping

How to order

4GA1 1 0 R - M5 - E2 - 1 - FP1

3GA1 1 0 R - M5 - E2 - 1 - FP1

Discrete valve for integrated base

4GA1 1 9 R - M5 - E2 H - 3 - FP1

Discrete 3-port valve for base mounting

3GA1 1 9 R - M5 - E2 H - 3 - FP1

A Model No. **B** Solenoid position

C Port size

D Electrical connections
Refer to page 98 for the circuit diagram with surge suppressor/lamp.

E Option

F Voltage

⚠ Precautions for model No. selection

*1: For the 3GA normally closed, the piping connection 2 (B) and 3 (R2) ports are plugged. For 3GA normally open type, avoid plugging the 5 (R1) port. This may cause malfunction.

*2 3-position all ports closed and PAB connection are not provided with the exhaust check valve.

3: E2 and E2*J connectors and 12, 24 VDC are only supported. In addition, surgeless "S" and low exoergic/energy circuit "E" cannot be selected together.

*4: Surgeless specifications.

*5: A filter is built into port P as standard.

*6: Only the DIN terminal box is supported.

A Model No.					
3GA1	3GA2	3GA3	4GA1	4GA2	4GA3

Code	Description	3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
B Solenoid position							
1	2 position single				●	●	●
2	2-position double				●	●	●
3	3-position all ports closed				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
1	2-position single: normally closed *1	●	●	●			
11	2-position single: Normally open *1	●	●	●			
66	Two 3-port valves integrated	○	○				
67	Two 3-port valves integrated	A side valve: Normally closed		○	○		
		B side valve: Normally open					
76	Two 3-port valves integrated	A side valve: Normally open		○	○		
		B side valve: Normally closed					
77	Two 3-port valves integrated	A side valve: Normally open		○	○		
		B side valve: Normally open					

C Port size							
Port	4(A)/2(B)Port	Port P/R1/R2 (5) = M5, (1/8) = Rc1/8, (1/4) = Rc1/4					
C4	ø4 push-in fitting	(1)			(1)		
C6	ø6 push-in fitting	(1)	(2)		(1)	(2)	
C8	ø8 push-in fitting		(2)	(3)		(2)	(3)
C10	ø10 push-in fitting			(3)			(3)
M5	M5	(1)			(1)		
06	Rc1/8		(2)			(2)	
08	Rc1/4			(3)			(3)

D Electrical connections							
Refer to the electrical connection list on next page.							

E Option							
Blank	Non-locking/Locking common manual override	●	●	●	●	●	●
M	Manual override of non-locking	○	○	○	○	○	○
H	With exhaust check valve (*2)	●	●	●	●	●	●
P	With mounting plate	●	●	●	●	●	●
S	Surgeless (*3)	●	●	●	●	●	●
E	Low exoergic/energy saving circuit(*3), (*4)	●	●	●	●	●	●
F	Port A/B filter integrated (*5)	●	●	●	●	●	●

F Voltage							
1	100 VAC(rectifier integrated)	●	●	●	●	●	●
2	200 VAC(rectifier integrated) (*6)	●	●	●	●	●	●
3	24 VDC	●	●	●	●	●	●
4	12 VDC	●	●	●	●	●	●

■ is not available.

○ : indicates made to order.

Refer to the 4GA1 to 3 Series in "Pneumatic Valves (CB-023SA)" for dimensions.

3GA1, 2, 3/4GA1, 2, 3-FP1 Series

Discrete valve; Body piping

[Electrical connections list]

		A Model No.					
		3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
D Electrical connections							
Blank	Grommet leadLine(300mm) (*7)	●	●	●	●	●	●
B	DIN terminal box (Pg7) with surge suppressor and indicator lamp (*8)(*10)	●	●	●	●	●	●
BN	DIN terminal box (Pg7) (without terminal box) With surge suppressor(*8)(*10)	●	●	●	●	●	●
E-connector (upward/lateral common)							
E0	Lead wire (300 mm) (*9)	●	●	●	●	●	●
E00	Lead wire (500 mm) (*9)	●	●	●	●	●	●
E01	Lead wire(1000 mm) (*9)	●	●	●	●	●	●
E02	Lead wire(2000 mm) (*9)	●	●	●	●	●	●
E03	Lead wire(3000 mm) (*9)	●	●	●	●	●	●
E0N	No lead wire(Without socket)	●	●	●	●	●	●
E1	No lead wire(socket/terminal attached) (*9)	●	●	●	●	●	●
E2	Lead wire (300 mm) with surge suppressor/lamp	●	●	●	●	●	●
E20	Lead wire (500 mm) with surge suppressor/lamp	●	●	●	●	●	●
E21	Lead wire(1000 mm) with surge suppressor/lamp	●	●	●	●	●	●
E22	Lead wire(2000 mm) with surge suppressor/lamp	●	●	●	●	●	●
E23	Lead wire(3000 mm) with surge suppressor/lamp	●	●	●	●	●	●
E2N	No lead wire(without socket) with surge suppressor/lamp	●	●	●	●	●	●
E3	No lead wire(socket/terminal attached) with surge suppressor/lamp	●	●	●	●	●	●
EJ-connector (socket with cover, upward/lateral common)							
E01J	Lead wire(1000 mm) (*9)	●	●	●	●	●	●
E02J	Lead wire(2000 mm) (*9)	●	●	●	●	●	●
E03J	Lead wire(3000 mm) (*9)	●	●	●	●	●	●
E21J	Lead wire(1000 mm) with surge suppressor/lamp	●	●	●	●	●	●
E22J	Lead wire(2000 mm) with surge suppressor/lamp	●	●	●	●	●	●
E23J	Lead wire(3000 mm) with surge suppressor/lamp	●	●	●	●	●	●

*7: The grommet lead wire specifications are compatible with DC voltage only.

*8: A lamp comes with the terminal box.

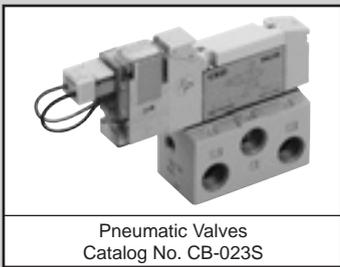
*9: AC voltage is with a rectifier circuit.

*10: The terminal box is a EN175301-803TypeC (former DIN43650-C) compliant product.

Electric actuator	Pneumatic cylinders	Assistive device	Pneumatic valves	FR/L Auxiliary Components Electronic Component	Vacuum components	Main line components	Fluid control valves	Main line components	Anti-bacterial/ bacteria-removing filter	Vacuum components	Fluid control valves
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FP1

FP2



Pneumatic Valves
Catalog No. CB-023S

Discrete valve
Base piping

3GB1, 2/4GB1, 2, 3-FP1 Series

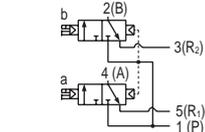
● Applicable cylinder bore size: $\varnothing 20$ to $\varnothing 100$



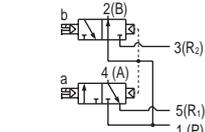
FP1
Electric actuator
Pneumatic cylinders
Assistive device
Pneumatic valves
P.R.L./Auxiliary Components
Electronic Component
Vacuum components
Main line components
Fluid control valves
Main line components
Anti-bacterial/bacteria-removing filter
Vacuum components
Fluid control valves

JIS symbol

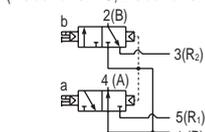
- Two 3-port valves integrated
(A side valve: NC, B side valve: NC)



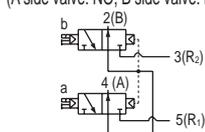
(A side valve: NC, B side valve: NO)



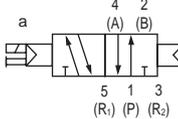
(A side valve: NO, B side valve: NC)



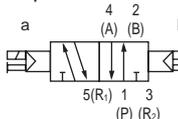
(A side valve: NO, B side valve: NO)



- 5-port valve
2 position single

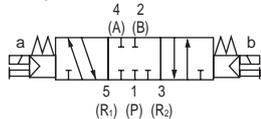


- 2-position double

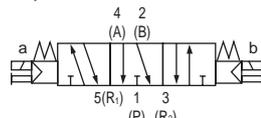


- 3-position

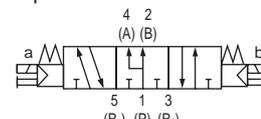
All ports closed



- 3-position A/B/R connection



- 3-position P/A/B connection



Common specifications

Item	Description
Valve and operation	Pilot operated soft spool valve
Working fluid	Compressed air
Max. working pressure MPa	0.7
Min. working pressure MPa	0.2 (*2)
Proof pressure MPa	1.05
Ambient temperature °C	-5 to 55 (no freezing)
Fluid temperature °C	5 to 55
Manual override	NNlock/lock common (standard)
Pilot exhaust method	Internal pilot Main valve/pilot valve common exhaust External pilot Main valve/pilot valve individual exhaust
Degree of protection*1	Dust-proof
Vibration resistance m/s ²	50 or less
Shock resistance m/s ²	300 or less
Atmosphere	Cannot be used in corrosive gas environments

*1: Avoid water drops or oil, etc., during use. IP65 (water jet proof) applies for DIN terminal box specifications. However, the specified outer diameter of the cord and tightening torque must be used for fixing in place.

*2: The working pressure range is 0 to 0.7MPa when the external pilot (option code: K) is selected. Set the external pilot pressure between 0.2 and 0.7 MPa.

Electrical specifications

Item	Description	Rated voltage V			
		DC24	DC12	AC100	AC200
Voltage fluctuation range		±10%			
Holding current (A)	Standard	0.015 (0.017)	0.030 (0.034)	0.009 (0.009)	0.006 (0.006)
	With low exoergic/energy circuit (*3)	0.005	0.010	-	-
Power consumption W	Standard	0.35(0.40)			
	With low exoergic/energy circuit (*3)	0.1			
Apparent power VA (*3) (*4)	Standard	-	-	0.93 (0.98)	1.40
	Thermal class	B			
Surge suppressor	Option				
Indicator	Lamp (option)				

Note3 Values in () apply when lamp is included. In addition, the type with low exoergic/energy circuit is only available with lamp.

*4: 200 VAC is the value of DIN terminal box with lamp.

Individual specifications

Port size		3GB1/4GB1	3GB2/4GB2	4GB3
Rc thread	Port A/B	Rc1/8	Rc1/4	Rc1/4, Rc3/8
	Port P/R1/R2	Rc1/8	Rc1/4	Rc1/4, Rc3/8

Item	3GB1/4GB1		3GB2/4GB2		4GB3		
	ON	OFF	ON	OFF	ON	OFF	
Response time ms	Two 3-port valves integrated		9	12	12	29	-
	2-position	Single	15	15	19	19	25
		Double	9	-	18	-	24
3-position	ABR connection	8	15	17	30	23	

Values with a lamp/surge suppressor are shown. The response times are values with working pressure of 0.5 MPa at 20°C. They depend on the pressure.

Item	3GB1/4GB1		3GB2/4GB2		4GB3	
Weight g	2-position	Single	Grommet lead wire	80 (38)	156 (74)	215 (96)
			E-connector	82 (40)	158 (76)	217 (98)
			DIN terminal box	-	193 (111)	249 (130)
		Double	Grommet lead wire	97 (55)	173 (91)	233 (114)
			E-connector	101 (59)	177 (95)	237 (118)
			DIN terminal box	-	216 (134)	273 (154)
	3-position	All ports closed	Grommet lead wire	98 (56)	184 (102)	242 (123)
			E-connector	102 (60)	188 (106)	246 (127)
			DIN terminal box	-	227 (145)	282 (163)

• Values in () do not include the single sub-plate. Values for the E-connector include the socket assembly (with 300 mm lead wire). For the EJ-connector, add 16 g/connector to the E-connector weight.

• The weight of the two 3-port valves integrated type is the same as that of 2-position double.

3GB1, 2/4GB1, 2, 3-FP1 Series

Discrete valve; Base piping

Flow characteristics

Model No.	Solenoid position		P → A/B		A/B → R1/R2	
			C[dm ³ /(s·bar)]	b	C[dm ³ /(s·bar)]	b
3GB1 4GB1	Two 3-port valves integrated		0.92	0.08	1.1	0.26
	2-position		1.3	0.27	1.2	0.22
	3-position	All ports closed	1.1	0.31	1.1	0.27
		ABR connection	1.1	0.31	1.3	0.29
		PAB connection	1.4	0.30	1.1	0.26
3GB2 4GB2	Two 3-port valves integrated		1.7	0.42	2.1	0.26
	2-position		2.6	0.20	2.6	0.19
	3-position	All ports closed	2.3	0.32	2.2	0.22
		ABR connection	2.2	0.23	2.6	0.16
PAB connection		2.4	0.10	2.4	0.22	
4GB3	2-position		4.3	0.24	4.2	0.24
	3-position	All ports closed	3.3	0.40	3.4	0.27
		ABR connection	3.3	0.36	4.2	0.18
		PAB connection	4.5	0.28	3.4	0.30

*1: Effective cross-sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

Electric actuator	Pneumatic cylinders	Assistive device	Pneumatic valves	F.R.L./Auxiliary Components	Electronic Component	Vacuum components	Main line components	Fluid control valves	Main line components	Anti-bacterial/ bacteria-removing filter	Vacuum components	Fluid control valves

FP1

FP2

3GB1, 2/4GB1, 2, 3-FP1 Series

Discrete valve; Base piping

How to order

4GB1 1 0 R - 06 - E2 - 3 - FP1

3GB1 66 0 R - 06 - E2 - 3 - FP1

Discrete valve for integrated base

4GB1 1 9 R - 00 - E2 H - 3 - FP1

3-port discrete valve for integrated base

3GB1 66 9 R - 00 - E2 H - 3 - FP1

A Model No.
B Solenoid position

C Port size

D Electrical connections
Refer to page 98 for the circuit diagram with surge suppressor/lamp.

E Option

F Voltage

⚠ Precautions for model No. selection

- *1: Not compatible when combined with external pilot (K).
- *2: 3-position all ports closed and PAB connection are not provided with the exhaust check valve.
- *3: E2* and E2*J connectors and 12, 24 VDC only are supported. Surgeless "S" and low exoergic/energy circuit "E" cannot be selected together.
- *4: Surgeless specifications.
- *5: A filter is built into port P as standard.
- *6: Only the DIN terminal box is supported.
- *7: The grommet lead wire specifications are compatible with DC voltage only.
- *8: A lamp comes with the terminal box.
- *9: AC voltage is with a rectifier circuit.
- *10 The terminal box is a EN175301-803TypeC (former DIN43650-C) compliant product.

A Model No.

	3GB1	3GB2	4GB1	4GB2	4GB3
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B Solenoid position

Code	Description	3GB1	3GB2	4GB1	4GB2	4GB3
1	2 position single					
2	2-position double					
3	3-position all ports closed					
4	3-position ABR connection					
5	3-position PAB connection					
66	Two 3-port valves integrated*1 A side valve:Normally closed B side valve:Normally closed	○	○			
67	Two 3-port valves integrated*1 A side valve:Normally closed B side valve:Normally open	○	○			
76	Two 3-port valves integrated*1 A side valve:Normally open B side valve:Normally closed	○	○			
77	Two 3-port valves integrated*1 A side valve:Normally open B side valve:Normally open	○	○			

C Port size

Port	4(A)/2(B) port	P/R 1/Port R2 (1/8) = Rc1/8 (1/4) = Rc1/4 (3/8) = Rc3/8		
06	Rc1/8	(2)	(2)	
08	Rc1/4		(3)	(3)
10	Rc3/8			(4)
00	Discrete valve for integrated base			

D Electrical connections

Blank	Grommet lead wire (300 mm) (*7)	●	●	●	●	●
B	DIN terminal box (Pg7) With surge suppressor/lamp (*8) (*10)		●		●	●
BN	DIN terminal box (Pg7) (without terminal box) With surge suppressor (*8) (*10)		●		●	●

E-conductor (upward/lateral common)

E0	Lead wire (300 mm) (*9)	●	●	●	●	●
E00	Lead wire (500 mm) (*9)	●	●	●	●	●
E01	Lead wire (1000 mm) (*9)	●	●	●	●	●
E02	Lead wire (2000 mm) (*9)	●	●	●	●	●
E03	Lead wire (3000 mm) (*9)	●	●	●	●	●
E0N	Without lead wire (without socket)(*9)	●	●	●	●	●
E1	Without lead wire (socket/terminal attached)(*9)	●	●	●	●	●
E2	Lead wire (300 mm) with surge suppressor and indicator lamp	●	●	●	●	●
E20	Lead wire (500 mm) with surge suppressor and indicator lamp	●	●	●	●	●
E21	Lead wire (1000 mm) with surge suppressor and indicator lamp	●	●	●	●	●
E22	Lead wire (2000 mm) with surge suppressor and indicator lamp	●	●	●	●	●
E23	Lead wire (3000 mm) with surge suppressor and indicator lamp	●	●	●	●	●
E2N	Without lead wire (without socket) with surge suppressor and indicator lamp	●	●	●	●	●
E3	Without lead wire (socket/terminal attached) with surge suppressor and indicator lamp	●	●	●	●	●

EJ-conductor (socket with cover, upward/lateral common)

E01J	Lead wire (1000 mm) (*9)	●	●	●	●	●
E02J	Lead wire (2000 mm) (*9)	●	●	●	●	●
E03J	Lead wire (3000 mm) (*9)	●	●	●	●	●
E21J	Lead wire (1000 mm) with surge suppressor and indicator lamp	●	●	●	●	●
E22J	Lead wire (2000 mm) with surge suppressor and indicator lamp	●	●	●	●	●
E23J	Lead wire (3000 mm) with surge suppressor and indicator lamp	●	●	●	●	●

E Option

Blank	Manual override of non-locking/locking common	●	●	●	●	●
M	Manual override of non-locking	○	○	○	○	○
H	With exhaust check valve (*2)	●	●	●	●	●
K	External pilot					
S	Surgeless (*3)	●	●	●	●	●
E	Low exoergic/energy saving circuit(*3), (*4)	●	●	●	●	●
F	Port A/B filter built in (*5)	●	●	●	●	●

F Voltage

1	100 VAC (rectifier integrated)	●	●	●	●	●
2	200 VAC (rectifier integrated) (*6)		●		●	●
3	24 VDC	●	●	●	●	●
4	12 VDC	●	●	●	●	●

■ is not available.

○ indicates made to order.

Refer to the 4GB1 to 3 Series in "Pneumatic Valves (CB-023SA)" for dimensions.