

Direct acting 2-port solenoid valve for dry air
General purpose

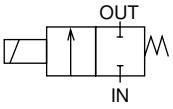
AB31/AB41-Z Series

- NC (open when energized)
- Port size: Rc1/8 to Rc1/2

RoHS CAD

JIS symbol

- NC (open when energized)



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	Standard specifications
Working fluid	For dry air (atmospheric dew point -60°C and over)/inert gas/low vacuum [1.33 x 10^2 Pa (abs)]
Working pressure differential MPa	0 to 4 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	5 (≈730 psi, 50 bar)
Proof pressure (water pressure) MPa	25 (≈3600 psi, 250 bar)
Fluid temperature °C	-10 (14°F) to 45 (113°F) (no freezing)
Ambient temperature °C	-10 (14°F) to 45 (113°F)
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm^3/min(ANR)	0.2 or less
Mounting orientation	Unrestricted

Individual specifications

1 MPa = 10 bar

Item / Model No.		Port size	Orifice size (mm)	Max. working pressure differential (MPa)	Rated voltage	Power consumption (W) AC	Power consumption (W) DC	Weight (kg)
AB31- 01 02	-1-******Z	Rc1/8 Rc1/4	1.5	2.5 (≈360 psi)	100 VAC 50/60 Hz 200 VAC 50/60 Hz	17	14	0.45
	-2-******Z		2.0	1.5 (≈220 psi)				
	-3-******Z		3.0	0.5 (≈73 psi)				
	-4-******Z		3.5	0.35 (≈51 psi)				
	-5-******Z		4.0	0.2 (≈29 psi)				
	-6-******Z		5.0	0.12 (≈17 psi)				
AB41- 02 03	-1-******Z	Rc1/4 Rc3/8	1.5	4.0 (≈580 psi)	12 VDC 24 VDC 48 VDC 100 VDC			0.57 (Rc1/4) 0.59 (Rc3/8)
	-2-******Z		2.0	2.5 (≈360 psi)				
	-3-******Z		3.0	0.9 (≈130 psi)				
	-4-******Z		3.5	0.6 (≈87 psi)				
	-5-******Z		4.0	0.4 (≈58 psi)				
	-6-******Z		5.0	0.2 (≈29 psi)				
	-7-******Z		7.0	0.1 (≈15 psi)				
AB41- 03 04	-8-******Z	Rc3/8 / Rc1/2	10.0	0.03 (≈4.4 psi)				0.68

*1 : The model numbers above show the basic port size (Rc). Refer to How to order for other combinations.
*2 : The port size model No. is 01 for Rc1/8 (6A), 02 for Rc1/4 (8A), 03 for Rc3/8 (10A) and 04 for Rc1/2 (15A).
*3 : The voltage fluctuation range must be within ±10% of the rated voltage.
*4 : The leakage current must be less than the values shown below.
*5 : When using at low vacuum, vacuum the OUT port side.

Leakage current: Voltage / Model No.	100 VAC	200 VAC	12 VDC	24 VDC	48 VDC	100 VDC
AB31-*-*-******Z	10 mA or less	5 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less
AB41-*-*-******Z	10 mA or less	5 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less

Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics	
			C[dm³/(s·bar)]	b
NC (open when energized)				
AB31-01/02 -1-******Z	Rc1/8 Rc1/4	1.5	0.29	0.53
-2-******Z		2.0	0.53	0.52
-3-******Z		3.0	1.1	0.52
-4-******Z		3.5	1.7 [1.5]	0.49 [0.47]
-5-******Z		4.0	2.1 [1.9]	0.48 [0.47]
-6-******Z		5.0	3.0 [2.6]	0.42 [0.38]
AB41-02/03 -1-******Z	Rc1/4 Rc3/8	1.5	0.29	0.53
-2-******Z		2.0	0.53	0.52
-3-******Z		3.0	1.1	0.52
-4-******Z		3.5	1.7 [1.5]	0.49 [0.47]
-5-******Z		4.0	2.1 [1.9]	0.48 [0.47]
-6-******Z		5.0	3.0 [2.6]	0.42 [0.38]
-7-******Z		7.0	4.8 [4.6]	0.29 [0.37]
AB41-03/04 -8-******Z	Rc3/8 Rc1/2	10.0	9.3 [8.1]	0.36 [0.31]

*1 : Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*2 : Dimensions shown in [ ] are for stainless steel body.

How to order

AB31 - **02** - **3** - **H** **3A** **A** **B** **G** **S** **Z** - **DC24V**

AB41

Model No.

Ⓓ Coil housing Ⓖ Other options

Ⓔ Manual override (locking)

Ⓕ Mounting plate

Ⓗ With surge suppressor

Ⓘ Voltage

Ⓐ Port size

Ⓑ Orifice size

Ⓒ Body/sealant combination

*1

*2

Code	Description	Code	Description	Code	Description	Model No. AB31	AB41	AB41 Low pressure Large flow
Ⓐ Port size								
01	Rc1/8	**1G**	G1/8	**1N**	1/8NPT	●		
02	Rc1/4	**2G**	G1/4	**2N**	1/4NPT	●	●	
03	Rc3/8	**3G**	G3/8	**3N**	3/8NPT		●	●
04	Rc1/2	**4G**	G1/2	**4N**	1/2NPT			●

Ⓑ Orifice size				
1	ø1.5	●	●	
2	ø2	●	●	
3	ø3	●	●	
4	ø3.5	●	●	
5	ø4	●	●	
6	ø5	●	●	
7	ø7		●	
8	ø10			●

Ⓒ Body/sealant combination							
	Body	**Seal**	**Treatment**	**Remarks**			
H	Copper alloy	Nitrile rubber	Oil-prohibited	—	●	●	●
J		Fluoro rubber		—	●	●	●
P		Ethylene propylene rubber		—	●	●	●
L	Stainless steel	Nitrile rubber		—	●	●	●
M		Fluoro rubber		—	●	●	●
R		Ethylene propylene rubber		—	●	●	●

Refer to Intro Page 39 for reference on material combinations.

Ⓓ to Ⓘ

Refer to page 335 for details on the coil housing, other options and voltage, etc.

The combinations indicated with ● in the above table are available.

[Example of model No.]

AB31-02-3-H3ABSZ-DC24V

Model : AB31

Ⓐ Port size : Rc 1/4
Ⓑ Orifice size : ø3
Ⓒ Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
Ⓓ Coil housing : Open frame lead wire for DC voltage
Ⓔ Manual override (locking) : None
Ⓕ Mounting plate : With mounting plate
Ⓖ Other options : None
Ⓗ Surge suppressor : With surge suppressor
Ⓘ Voltage : 24 VDC

⚠ Precautions for model No. selection

Notes for Ⓒ

*1 : The body for the low pressure large flow rate AB41-03/04-8 is bronze (standard) or stainless steel (option).

*2 : Do not use fluid containing oil with ethylene propylene rubber, since it is not oil-resistant.

For Items Ⓓ to Ⓘ, the combinations indicated with codes are available.
Note that if options for Items Ⓔ to Ⓗ are not required, they should be left blank.

Ⓓ Coil housing			Ⓔ	Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ Rated voltage
Description			Manual override (Locking)	Mounting plate	Cable gland (marine cable gland)			Conduit (conduit piping)		With surge suppressor	Description
					A-15a	A-15b	A-15c	CTC19	G1/2		
3A	Open frame	Lead wire (IP65 or equivalent)	A	B				G	H	S	12 VDC, 24 VDC, 48 VDC, 100 VDC
3M		With HP terminal box (G1/2)			D	E	F				
3N		HP terminal box with lamp (G1/2)									12 VDC, 24 VDC, 100 VDC
3I		HP terminal box (IP65 or equivalent) (G1/2)									12 VDC, 24 VDC, 48 VDC, 100 VDC
3J		HP term box, lamp (IP65, equiv) (G1/2)									12 VDC, 24 VDC, 100 VDC
5A	Open frame (diode integrated)	Lead wire (IP65 or equivalent)	A	B				G	H		100 VAC, 200 VAC
5M		With HP terminal box (G1/2)			D	E	F				
5N		HP terminal box with lamp (G1/2)									
5I		HP terminal box (IP65 or equivalent) (G1/2)									
5J		HP term box, lamp (IP65, equiv) (G1/2)									

⚠ Refer to the following cautions for Items Ⓓ to Ⓘ.

3A 5A



- Open frame
  Lead wire 300mm
- 5A (diode integrated)

3M 3N 5M 5N



- Open frame HP terminal box
- 5M, 5N (diode integrated)

3I 3J 5I 5J



- Open frame HP terminal box (IP65 or equivalent)
- 5I, 5J (diode integrated)

G H



- Conduit
- G(CTC19)
- H(G1/2)

Refer to page 330 for coil selection.

⚠ Precautions for model No. selection

Notes for Ⓓ

*3 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage. Voltage of less than 100 VAC is not available.

Notes for Ⓔ to Ⓗ

*4 : Manual override (Item Ⓔ A) cannot be mounted on the low pressure large flow rate AB41-03/04-8.
*5 : For Ⓖ, select an option from D, E, F, G and H.
*6 : The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
*7 : Surge suppressor is incorporated as standard in the coil with diode.
*8 : Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that tropicalization is not available when the manual override option (A) is selected.

Notes for Ⓘ

*9 : 100 VAC coil is compatible with 100 VAC 50/60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz.
*10 : For voltages other than above, contact CKD.
*11 : The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.