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5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in Series **VZS2000**

Model

| Type of actuation | Model | Port size Rc | Flow characteristics | | | | | | Max. operating cycle (CPM) ⁽¹⁾ | Response time (ms) ⁽²⁾ | Weight (kg) ⁽³⁾ | |
|-------------------|-----------------|-----------------|------------------------------|------|------|------------------------------|------|------|--|--------------------------------------|-------------------------------|------|
| | | | 1 → 4/2 (P → A/B) | | | 4/2 → 5/3 (A/B → R1/R2) | | | | | | |
| | | | C [dm ³ /(s·bar)] | b | Cv | C [dm ³ /(s·bar)] | b | Cv | | | | |
| 2 position | Single | VZS2150 | 1/8 | 1.2 | 0.12 | 0.28 | 1.4 | 0.19 | 0.33 | 1200 | 17 or less | 0.14 |
| | Double | VZS2250 | 1/8 | 1.2 | 0.12 | 0.28 | 1.4 | 0.19 | 0.33 | 1200 | 13 or less | 0.19 |
| 3 position | Closed center | VZS2350 | 1/8 | 0.90 | 0.23 | 0.21 | 1.1 | 0.17 | 0.27 | 600 | 22 or less | 0.2 |
| | Exhaust center | VZS2450 | 1/8 | 1.1 | 0.12 | 0.25 | 1.3 | 0.13 | 0.31 | 600 | 22 or less | 0.2 |
| | Pressure center | VZS2550 | 1/8 | 1.2 | 0.12 | 0.26 | 1.4 | 0.19 | 0.33 | 600 | 22 or less | 0.2 |
| | Double check | VZS2650 | 1/8 | 0.71 | — | — | 0.81 | — | — | 500 | 26 or less | 0.3 |



Note 1) Min. operating cycle is based on JIS B 8375 (One time per 30 days).

Note 2) Response time is based on JIS B 8375-1981. (0.5 MPa, without light/surge voltage suppressor)

Note 3) For VZS2□50-□FZ-01

Note 4) "Note 1" and "Note 2" are with controlled clean air.

Reduction of wiring cost MIL standard D-sub connector with one-touch connection (Plug-in type)

Compact and large valve capacity: Width 15 mm

Flexible to increase and decrease manifold stations
(Stacking type manifold base)

High frequency/Long service life (more than 30 mil. times)

Possible to use in non-lubrication and dry air
(Metal seal structure)

Different variations for connection

Grommet type

L, M plug connector type: Individual take out of A and B sides

K plug connector type: Common take out of A and B sides

DIN terminal type: individual take out of A and B sides

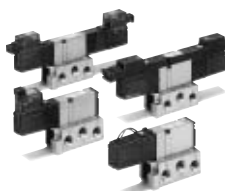
A little power consumption:

1.8 WDC

For serial transmission



Plug-in type



Non plug-in type

Standard Specifications

| Valve specifications | Fluid | | Air/Inert gas |
|----------------------------|--|---------|---|
| | Maximum operating pressure | | 1.0 MPa |
| | Minimum operating pressure | | 0.1 MPa |
| | Proof pressure | | 1.5 MPa |
| | Ambient and fluid temperature | | -10 to 50°C ⁽¹⁾ |
| | Lubrication | | Non-lube ⁽²⁾ |
| | Pilot valve manual override | | Non-locking push type (Flush) |
| | Shock/Vibration resistance (m/s ²) | | 150/50 ⁽³⁾ |
| | Enclosure | | Dustproof (Degrees of protection 0) ⁽⁴⁾ |
| | Coil rated voltage | | 100, 200 VAC, 50/60 Hz; 24 VDC |
| Electricity specifications | Allowable voltage fluctuation | | -15 to +10% of rated voltage |
| | Coil insulation type | | Class E or equivalent (120°C) ⁽⁵⁾ |
| | Apparent power (AC) | Inrush | 4.5 VA/50 Hz, 4.2 VA/60 Hz |
| | | Holding | 3.5 VA/50 Hz, 3 VA/60 Hz |
| | Power consumption (DC) | | 1.8 W |
| | Electrical entry | | Plug-in type (FZ) Non plug-in type Grommet (G), Plug connector (L, M, KZ) DIN terminal (D) |



Note 1) Use dry air at low temperatures.

Note 2) Use turbine oil Class 1 (ISO VG32), if lubricated.

Note 3) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 8.3 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 4) Based on JIS C 0920.

Note 5) Based on JIS C 4003.

Option Specifications

| | |
|--------------------|---|
| Coil rated voltage | 24, 48, 110, 220 VAC (50/60 Hz) |
| | 6, 12, 48 VDC |
| Manual override | Locking type (Tool required) |
| Option | With light/surge voltage suppressor ^(Note) |



Note) Plug-in, K plug connector type is standard with light/surge voltage suppressor.

VK

VZ

VF

VFR

VP4

VZS

VFS

VS4

VQ7

EVS

VFN

How to Order

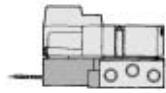
Light/Surge voltage suppressor

| | |
|----------|-------------------------------------|
| Z | With light/surge voltage suppressor |
| S | With surge voltage suppressor |

Note) With light/surge voltage suppressor is provided as standard.

Electrical entry

F: Plug-in type



Pilot valve manual override

Nil: Non-locking push type (Flush) **B*:** Locking type (Tool required)



* Option

Port size

| | |
|------------|-------------------|
| Nil | Without sub-plate |
| 01 | Rc 1/8 |



Plug-in

VZS2 2 50 — 1 F Z — 01

Non plug-in

VZS2 2 50 — 5 G — 01

Symbol

| | | |
|----------|----------------------------|--|
| 1 | 2 position single | |
| 2 | 2 position double | |
| 3 | 3 position closed center | |
| 4 | 3 position exhaust center | |
| 5 | 3 position pressure center | |
| 6 | 3 position double check | |

Coil rated voltage

| | |
|-----------|-------------------|
| 1 | 100 VAC, 50/60 Hz |
| 2 | 200 VAC, 50/60 Hz |
| 3* | 110 VAC, 50/60 Hz |
| 4* | 220 VAC, 50/60 Hz |
| 5 | 24 VDC |
| 6* | 12 VDC |
| 9* | Other |

* Option

Electrical entry

G: Grommet
Lead wire length: 300 mm



L: L plug connector
With lead wire



LN: L plug connector
Without lead wire



LO: L plug connector
Without connector



D: DIN terminal



M: M plug connector
With lead wire



MN: M plug connector
Without lead wire



MO: M plug connector
Without connector



DO: DIN terminal



H: Grommet
Lead wire length: 600 mm



KZ: K plug connector
With lead wire



KZN: K plug connector
Without lead wire



KZO: K plug connector
Without connector



Option

| | |
|------------|-------------------------------------|
| Nil | None |
| Z | With light/surge voltage suppressor |
| S | With surge voltage suppressor |



Note) Indicator light is not available for grommet type. With surge voltage suppressor is available for grommet type only. With light/surge voltage suppressor is provided as standard for K plug connector type.

* "DOZ" is not available.

Thread type

| | | |
|----------|------------|------|
| Standard | Nil | Rc |
| Option | N | NPT |
| | T | NPTF |
| | F | G |

How to Order Pilot Valve Assembly

SCZS2 A L — 2 — 1

Pilot valve assembly

Series VZS2000

Electrical entry, Light/Surge voltage suppressor

| Symbol | Electrical entry | Body type |
|-----------------|---|------------------|
| F (Note) | Plug-in | Plug-in type |
| G | Grommet | Non plug-in type |
| GS | Grommet/With surge voltage suppressor | |
| L | L plug connector | |
| LZ | L plug connector, With light/surge voltage suppressor | |
| M | M plug connector | |
| MZ | M plug connector, With light/surge voltage suppressor | |
| K (Note) | K plug connector | |
| D | DIN terminal | |
| DZ | DIN terminal/With light/surge voltage suppressor | |

Coil rated voltage

| | |
|-----------|-------------------|
| 1 | 100 VAC, 50/60 Hz |
| 2 | 200 VAC, 50/60 Hz |
| 3* | 110 VAC, 50/60 Hz |
| 4* | 220 VAC, 50/60 Hz |
| 5 | 24 VDC |
| 6* | 12 VDC |
| 9* | Other |

* Option

Manual override

| | |
|------------|-------------------------------|
| Nil | Non-locking push type (Flush) |
| B* | Locking type (Tool required) |

* Option

Applicable model

| | |
|-----------|-----------------------|
| A | Single/Double, A side |
| B | Double, B side |
| 3A | 3 position A side |
| 3B | 3 position B side |



Note) Since F and K types are attached without lamp cover, it should be arranged separately.

How to Order Light Cover Assembly

AXT171-2 1 A — 5 FZ

Light cover assembly

VZS2000 Light cover assembly

Applicable model

| | |
|----------|----------------------------|
| 1 | 2 position single |
| 2 | 2 position double |
| 3 | 3 position closed center |
| 4 | 3 position exhaust center |
| 5 | 3 position pressure center |
| 6 | 3 position double check |

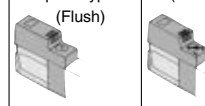
Voltage

| | |
|-----------|-------------------|
| 1 | 100 VAC, 50/60 Hz |
| 2 | 200 VAC, 50/60 Hz |
| 3* | 110 VAC, 50/60 Hz |
| 4* | 220 VAC, 50/60 Hz |
| 5 | 24 VDC |
| 6* | 12 VDC |
| 9* | Other |

* Option

Pilot valve manual override

Nil: Non-locking push type (Flush) **B*:** Locking type (Tool required)



* Option

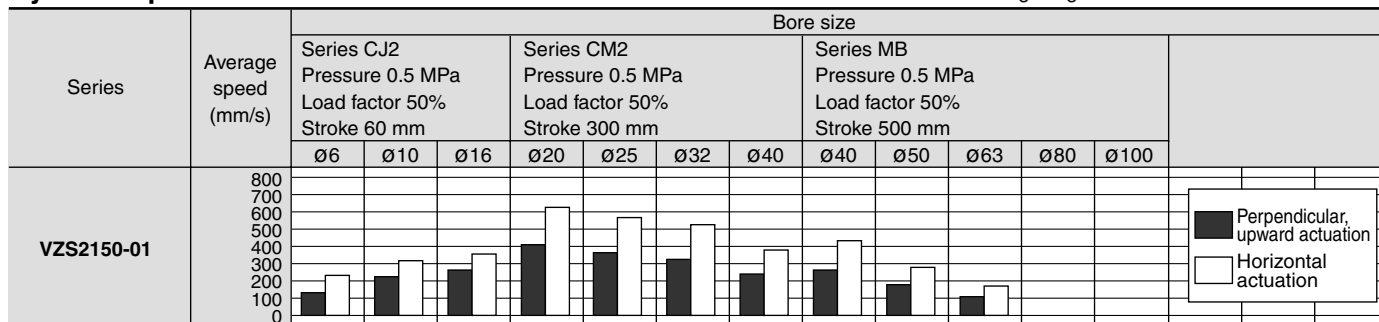
Electrical entry, Light/Surge voltage suppressor

| | |
|-----------|--|
| FZ | Plug-in With light/surge voltage suppressor |
| FS | Plug-in With surge voltage suppressor |
| KZ | K plug connector With light/surge voltage suppressor |
| KS | K plug connector With light/surge voltage suppressor |

5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in Series VZS2000

Use as a guide for selection.
Please confirm the actual conditions with SMC Sizing Program.

Cylinder Speed Chart



- * It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- * The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- * Load factor: ((Load weight x 9.8)/Theoretical force) x 100%

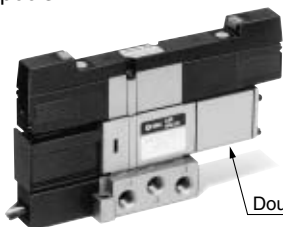
Conditions

| | Series CJ2 | Series CM2 | Series MB |
|------------|--------------------|-------------|-----------|
| VZS2150-01 | Tube bore x Length | T0604 x 1 m | |
| | Speed controller | AS3001F-06 | |
| | Silencer | AN110-1 | |

Double Check Spacer/Specifications

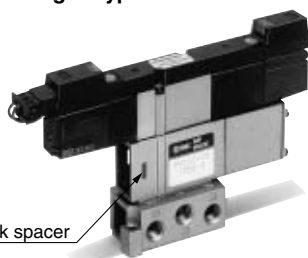
Can hold an intermediate cylinder position for an extended time

If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.



Double check spacer

Plug-in type



Double check spacer

Non plug-in type

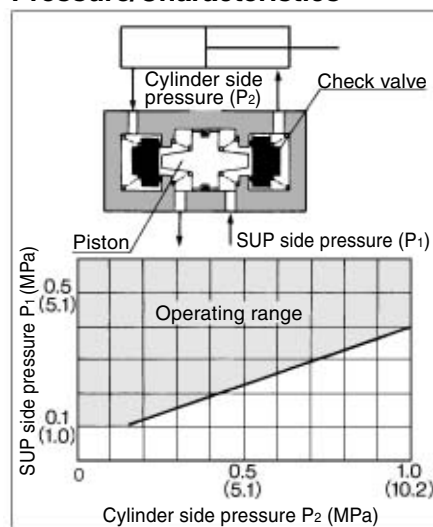
Specifications

| Double check spacer part no. | Plug-in type | Non plug-in type | | |
|------------------------------------|----------------------------------|-------------------------------------|----------------|-----------------------------------|
| | | VVZS2000-22A-1 | VVZS2000-22A-2 | |
| Applicable valve model | VZS2450-□FZ | VZS2450-□ G L M KZ D | | |
| Leakage (Supply pressure: 0.5 MPa) | Solenoid one side de-energized | 1(P) | 5(R1) 3(R2) | 100 Ncm ³ /min or less |
| | | 4(A) | 5(R1) | 100 Ncm ³ /min or less |
| | Solenoid both sides de-energized | 2(B) | 3(R2) | 0 |
| | | | | |

Caution

In the case of 3 position double check (VZS2650), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.

Check Valve Operating Pressure/Characteristics



- The combination of VZS2150, VZS2250 and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

VK

VZ

VF

VFR

VP4

VZS

VFS

VS4

VQ7

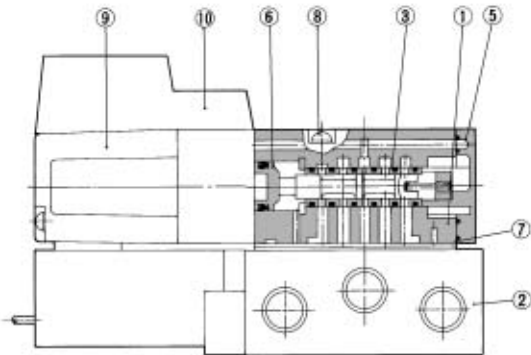
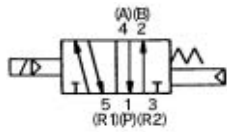
EVS

VFN

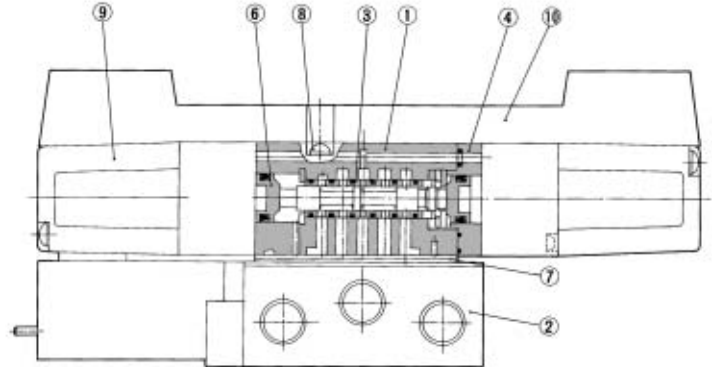
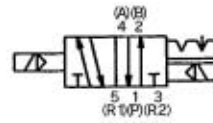
Series VZS2000

Construction

2 position single

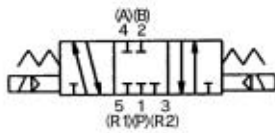


2 position double



3 position closed center/exhaust center/pressure center

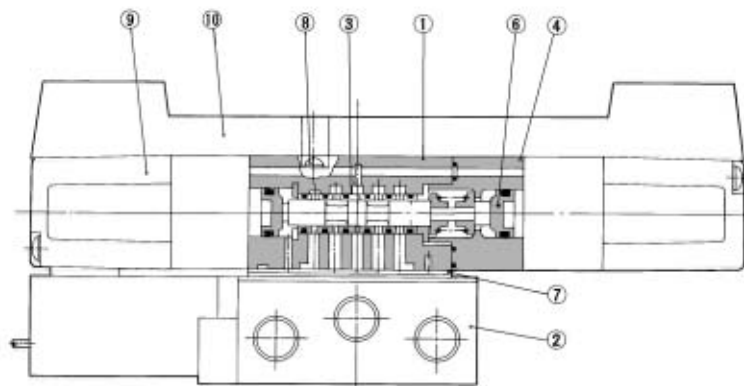
Closed center



Exhaust center



Pressure center



This figure shows a closed center type.

Component Parts

| No. | Description | Material | Note |
|-----|---------------|---------------------|-----------------|
| ① | Body | Aluminum die-casted | Platinum silver |
| ② | Sub-plate | Aluminum die-casted | Platinum silver |
| ③ | Spool/Sleeve | Stainless steel | — |
| ④ | Adapter plate | Resin | Black |
| ⑤ | End plate | Resin | Black |
| ⑥ | Piston | Resin | — |

Replacement Parts

| No. | Description | Material | Part no. |
|-----|------------------------------|--------------|---|
| ⑦ | Gasket | NBR | BG-VZS2000-1 (Groove gasket 1 pc., Round head combination screw 2 pcs.) |
| ⑧ | Round head combination screw | Carbon steel | BG-VZS2000 (Gasket 1 pc., Round head combination screw 2 pcs.) ^{Note)} |
| ⑨ | Pilot valve assembly | — | Refer to "How to Order Pilot Valve Assembly" on page 3-7-8. |
| ⑩ | Light cover assembly | — | Refer to "How to Order Light Cover Assembly" on page 3-7-8. |

Note) Refer to page 3-7-6.

Sub-plate Assembly

| | |
|-------------|---------------|
| Plug-in | VZS2000-P-01□ |
| Non plug-in | VZS2000-S-01□ |

* Mounting bolt and gasket are not attached.
* □: Thread type

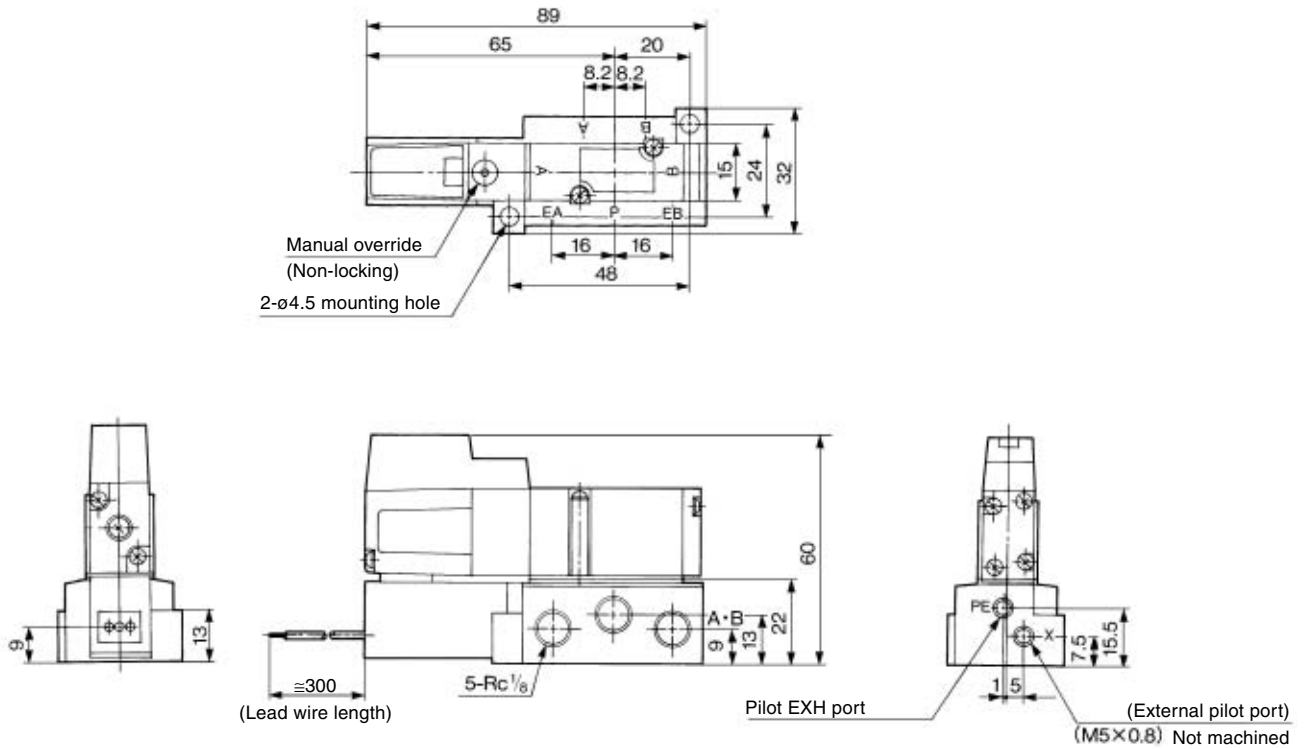
Thread Type

| Standard | Nil | Rc |
|----------|-----|------|
| | N | NPT |
| Option | T | NPTF |
| | F | G |

5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in Series VZS2000

Plug-in 2 position single/double, 3 position closed center/exhaust center/pressure center/double check

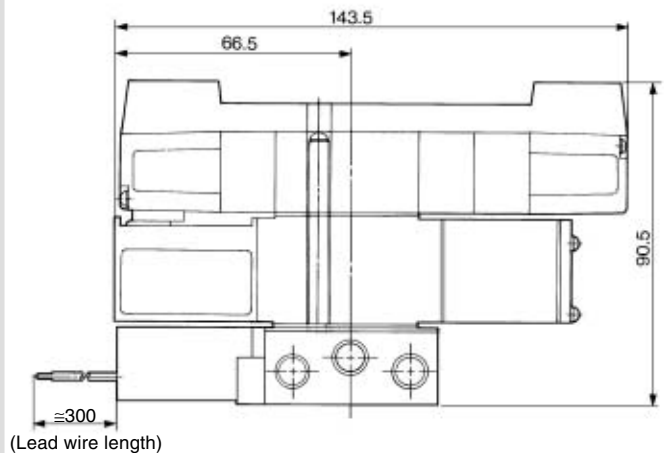
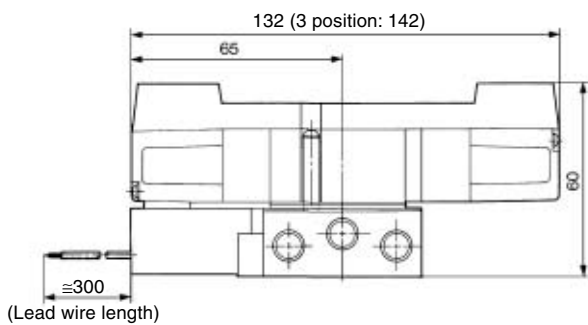
2 position single: VZS2150-□FZ-01



- VK
- VZ
- VF
- VFR
- VP4
- VZS**
- VFS
- VS4
- VQ7
- EVS
- VFN

2 position double : VZS2250-□FZ-01
 3 position closed center : VZS2350-□FZ-01
 3 position exhaust center : VZS2450-□FZ-01
 3 position pressure center: VZS2550-□FZ-01

3 position double check: VZS2650-□FZ-01



* Other dimensions are the same as the single type.

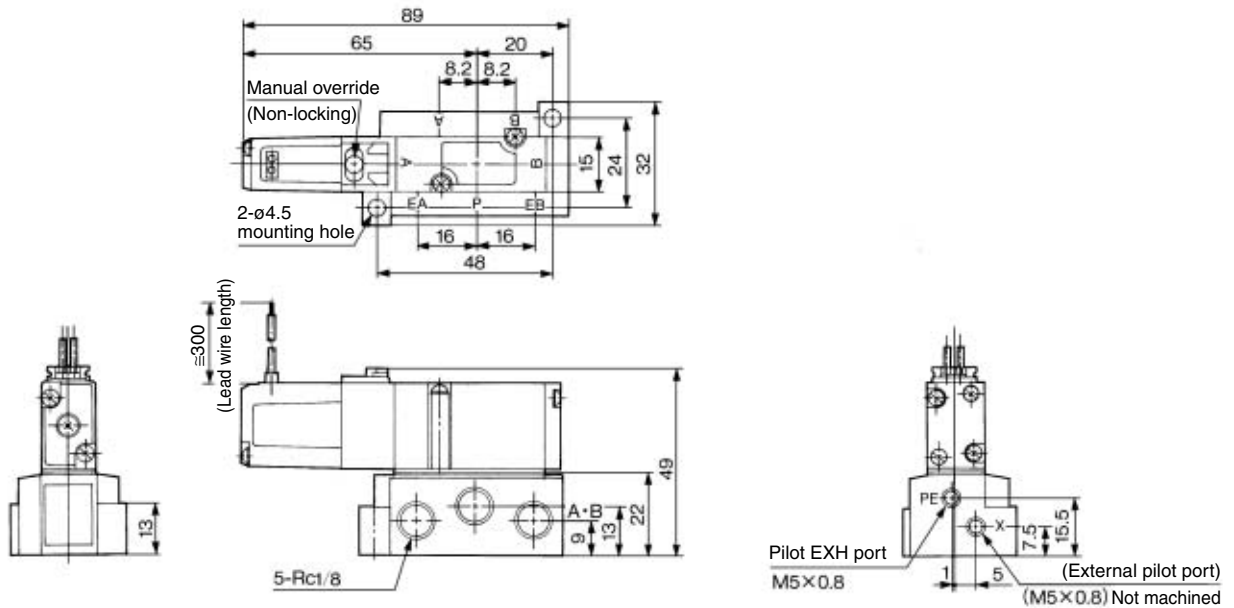


* Other dimensions are the same as the single type.

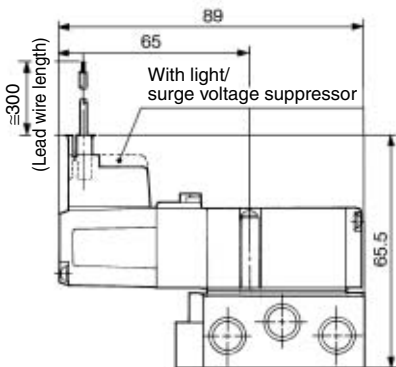
Series VZS2000

Non Plug-in 2 position single

Grommet: VZS2150-□_H(S)-01

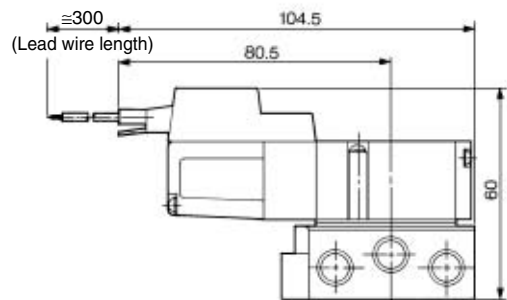


L plug connector: VZS2150-□L(Z)-01



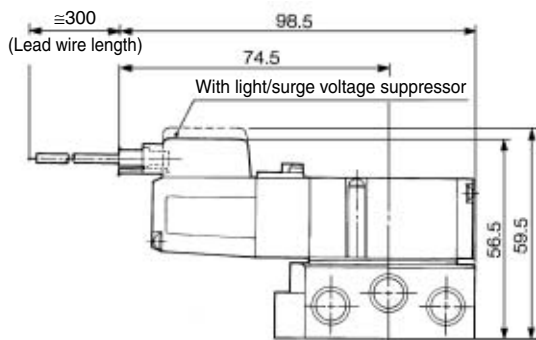
* Other dimensions are the same as the grommet type.

K plug connector: VZS2150-□KZ-01



* Other dimensions are the same as the grommet type.

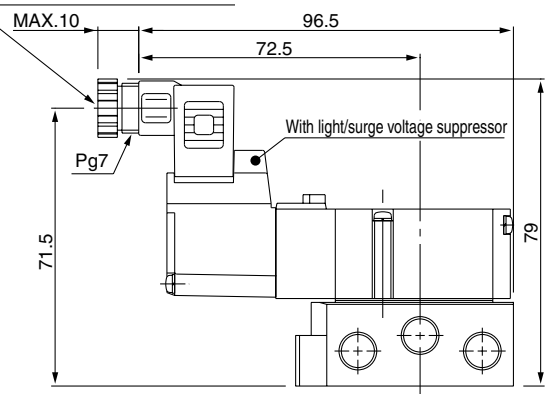
M plug connector: VZS2150-□M(Z)-01



* Other dimensions are the same as the grommet type.

DIN terminal: VZS2150-□D(Z)-01

Applicable cable O.D.: ϕ 3.5 to 7



* Other dimensions are the same as the grommet type.

5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in Series VZS2000

Non Plug-in 2 position double, 3 position closed center/exhaust center/pressure center

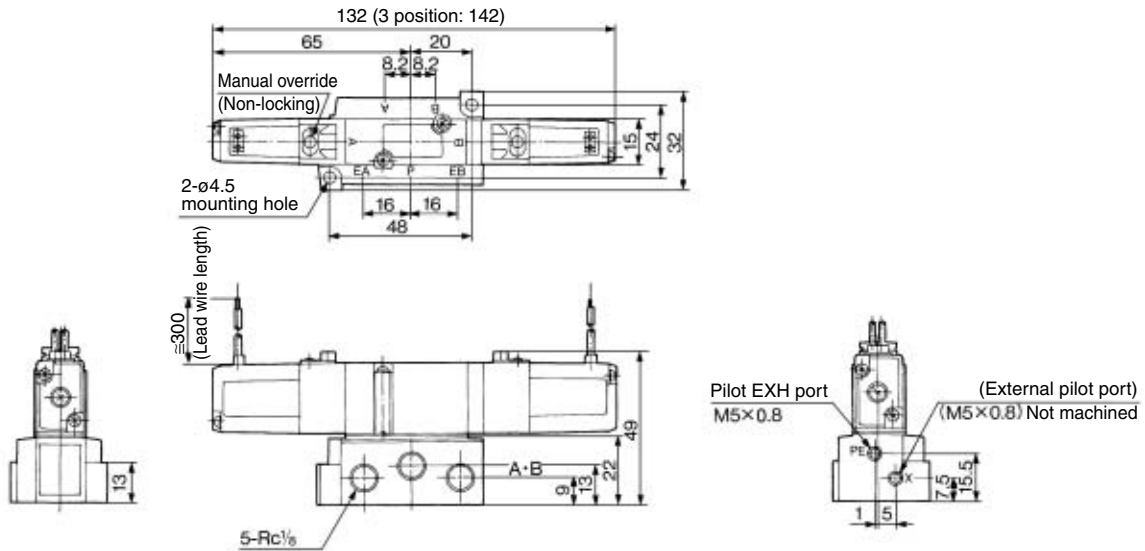
Grommet

2 position double: VZS2250-□^G_H(S)-01

3 position exhaust center: VZS2450-□^G_H(S)-01

3 position closed center: VZS2350-□^G_H(S)-01

3 position pressure center: VZS2550-□^G_H(S)-01



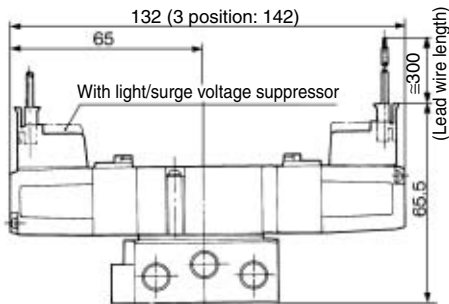
L plug connector

2 position double: VZS2250-□L(Z)-01

3 position closed center: VZS2350-□L(Z)-01

3 position exhaust center: VZS2450-□L(Z)-01

3 position pressure center: VZS2550-□L(Z)-01



* Other dimensions are the same as the grommet type.

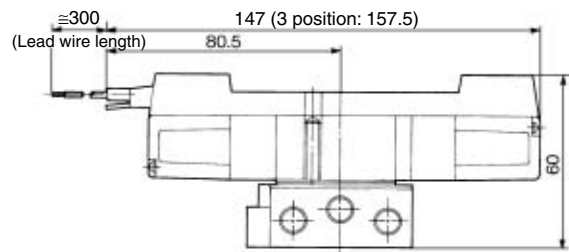
K plug connector

2 position double: VZS2250-□KZ-01

3 position closed center: VZS2350-□KZ-01

3 position exhaust center: VZS2450-□KZ-01

3 position pressure center: VZS2550-□KZ-01



* Other dimensions are the same as the grommet type.

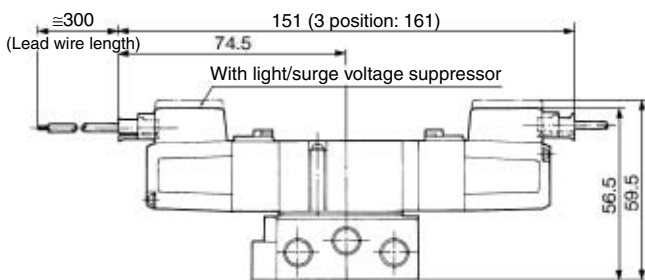
M plug connector

2 position double: VZS2250-□M(Z)-01

3 position closed center: VZS2350-□M(Z)-01

3 position exhaust center: VZS2450-□M(Z)-01

3 position pressure center: VZS2550-□M(Z)-01



* Other dimensions are the same as the grommet type.

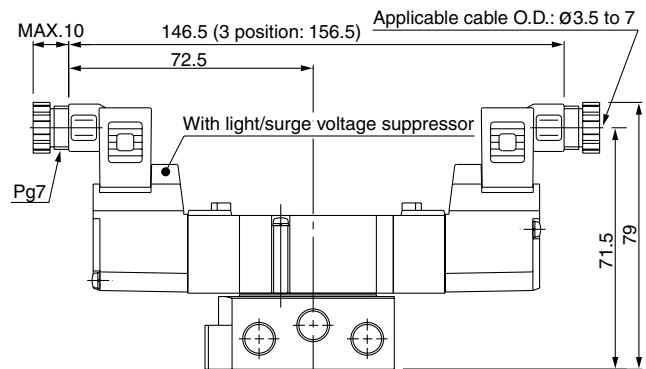
DIN terminal

2 position double: VZS2250-□D(Z)-01

3 position closed center: VZS2350-□D(Z)-01

3 position exhaust center: VZS2450-□D(Z)-01

3 position pressure center: VZS2550-□D(Z)-01



* Other dimensions are the same as the grommet type.

VK

VZ

VF

VFR

VP4

VZS

VFS

VS4

VQ7

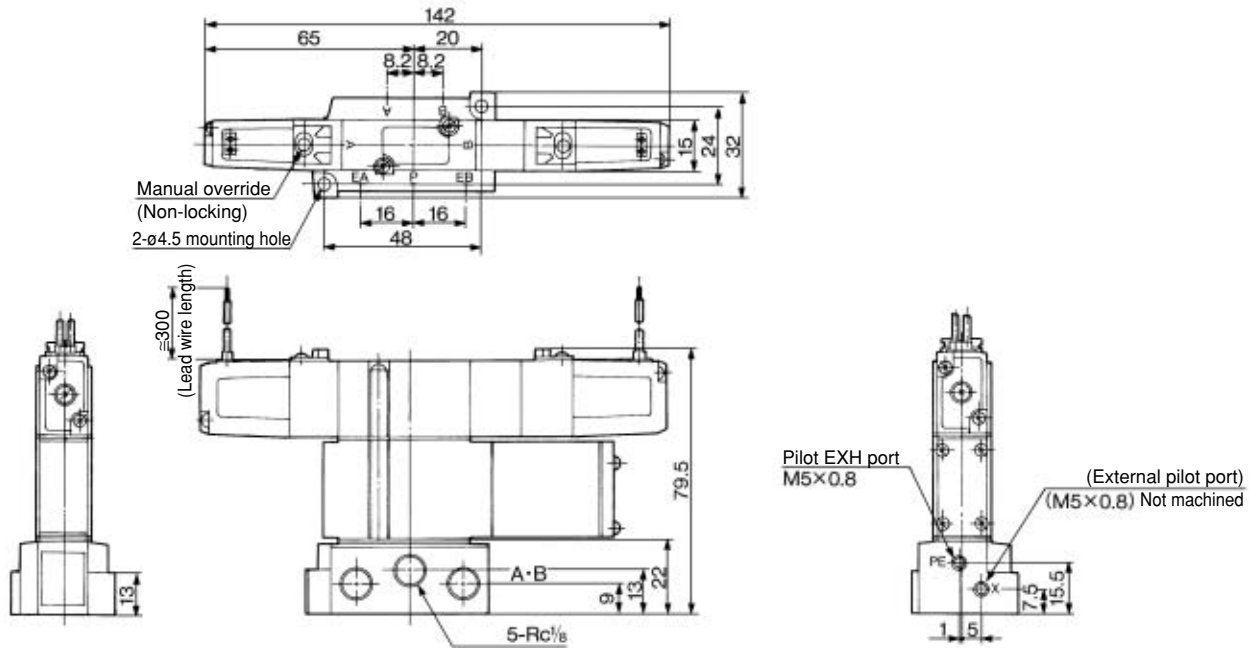
EVS

VFN

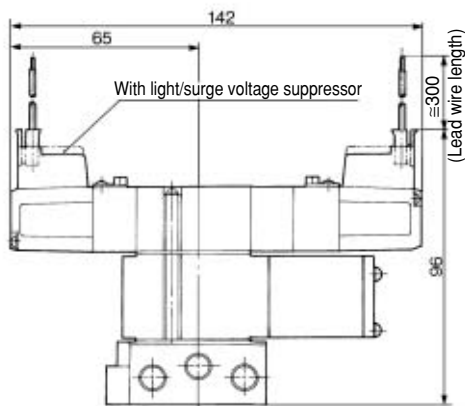
Series VZS2000

Non Plug-in 3 position double check

Grommet: VZS2650-□^G_H(S)-01

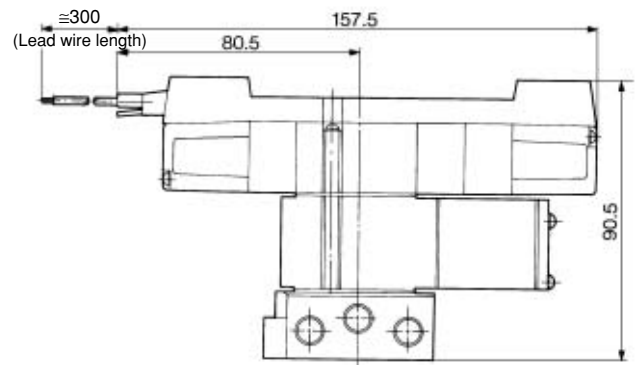


L plug connector: VZS2650-□L(Z)-01



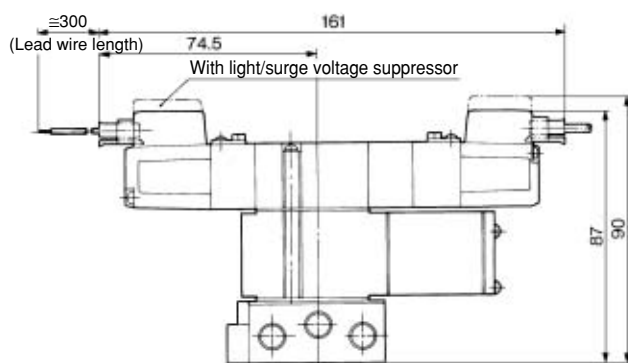
* Other dimensions are the same as the grommet type.

K plug connector: VZS2650-□KZ-01



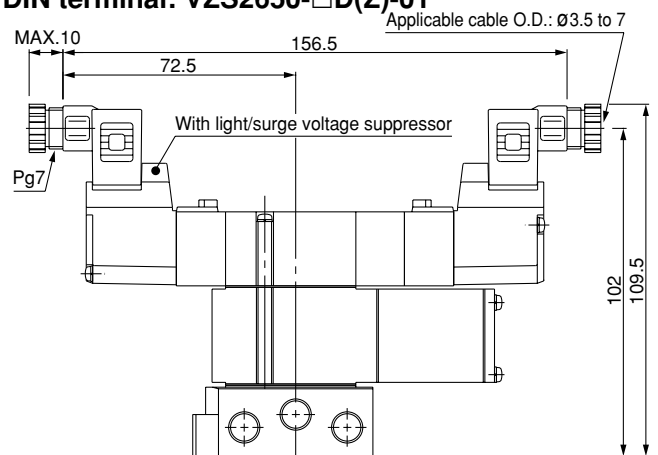
* Other dimensions are the same as the grommet type.

M plug connector: VZS2650-□M(Z)-01



* Other dimensions are the same as the grommet type.

DIN terminal: VZS2650-□D(Z)-01



* Other dimensions are the same as the grommet type.