



Operation Manual

PRODUCT NAME

Regulator Valve

MODEL / Series / Product Number

VEX1 Series

SMC Corporation

Contents

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Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems.

ISO 4413: Hydraulic fluid power -- General rules relating to systems.

IEC 60204-1: Safety of machinery -- Electrical equipment of machines .(Part 1: General requirements)

ISO 10218: Manipulating industrial robots -Safety.

etc.



Caution

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



Warning

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Danger

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



Safety Instructions

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction(WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.



Regulator Valve / Precautions 1

Be sure to read this before handling.

Design / Selection

Warning

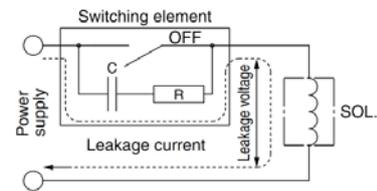
1. **Confirm the specifications.**
This product is designed for use in compressed air systems only. Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. Please contact SMC when using a fluid other than compressed air. We do not guarantee against any damage if the product is used outside of the specification range.
2. **Please consult with SMC if the intended application calls for absolutely zero leakage due to special atmospheric requirements or if the use of a fluid other than air is required.**
3. **The mineral grease used on internal sliding parts and seals may come in contact with outlet side components. Please consult with SMC if this is not desirable.**
Please contact SMC if the Material Safety Data Sheet (SDS) of the grease is required.
4. **Do not disassemble the product or make any Modifications, including additional machining.**
It may cause human injury and/or an accident.
5. **Actuator drive**
When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures (cover installation or Approach prohibition) to prevent potential danger caused by actuator operation.
6. **Not suitable for use as an emergency shutoff valve, etc.**
The valves presented in this catalog are not designed for safety applications such as an emergency shutoff valve. If the valves are used for the mentioned applications, additional safety measures should be adopted.
7. **Ventilation**
Provide ventilation when using a valve in a confined area, such as in a closed control panel. For example, install a ventilation opening, etc. in order to prevent pressure from increasing inside of the confined area and to release the heat generated by the valve.
8. **Extended periods of continuous energization (For external pilot solenoid type only)**
 - If a valve will be continuously energized for an extended period of time, the temperature of the valve will increase due to the heat generated by the coil. This will likely adversely affect the performance of the solenoid valve and any nearby peripheral equipment. If the valve is to be energized continuously for extended periods of time or the total energization time per day is longer than the non-energized time, consider using the valve with a N.O. (Normal open) function. This can be achieved by supplying pilot air to the P2 port, which will shorten the energization time.
 - For applications such as mounting a valve on a control panel, incorporate measure to limit the heat radiation so that it is within the operating temperature range.
In particular, note that the temperature rise will be greater if the product is energized for extended periods of time.
9. **Attach a safety device if damage or malfunction of equipment and devices on the outlet side may result from the output pressure exceeding the set pressure.**
10. **After releasing the inlet pressure, there may be a delay in the release of the residual pressure on the outlet side.**
The value of the residual pressure can be checked using the outlet pressure gauge.
11. **Please contact SMC if air will not be consumed in the system for long periods of time, or if the outlet side will be used with a sealed circuit and a balanced circuit, since this may cause the set pressure of the outlet side to fluctuate.**

12. **Since a safety margin is calculated into the maximum regulating pressure value of set pressure range appearing in the catalog's specification table, the set pressure may exceed the range.**
13. **Please contact SMC when a circuit requires the use of a regulator having relief sensitivity with high precision and setting accuracy.**

Caution

1. **Select a model that is suitable for the desired air cleanliness by referring to SMC Best Pneumatics catalog.**
2. **Leakage voltage**

Take note that the leakage voltage will increase when a resistor is used in parallel with switching element or a C-R circuit (surge voltage suppressor) is used for protecting a switching device because of the passing leakage voltage through the C-R circuit. The suppressor residual leakage voltage should be as follows.



DC coil

- VEX1101, VEX1201, VEX1301 2% or less of rated voltage
- VEX1501, VEX1701, VEX1901 3% or less of rated voltage

AC coil

- VEX1101, VEX1201, VEX1301 20% or less of rated voltage
- VEX1501, VEX1701, VEX1901 15% or less of rated voltage

3. **Solenoid valve drive for AC with a solid state output (SSR, TRIAC output, etc.)**

1) Current leakage

When using a snubber circuit (C-R element) for surge protection of the output, a very small amount of electrical current will continue to flow even during the OFF state.

This results in the valve not returning. In a situation where the tolerance is exceeded, as in the above case, take measures to install a bleeder resistor.

2) Minimum allowable load amount (Min. load current)

When the consumption current of a valve is less than the output's minimum allowable load volume or the margin is small, the output may not switch normally. Please contact SMC.

4. **Surge voltage suppressor**

If a surge protection circuit contains nonstandard diodes, such as Zener diodes or varistor, a residual voltage that is in proportion to the protective circuit and the rated voltage will remain. Therefore, take into consideration the surge voltage protection of the controller.

In the case of diodes, the residual voltage is approximately 1V.

5. **Operation in a low temperature condition**

When using the valve in a low temperature condition, take appropriate measures to avoid freezing of drainage, moisture, etc. in low temperature.

The minimum operating temperature for this product is 0°C.



Regulator Valve / Precautions 2

Be sure to read this before handling.

Mounting

Warning

1. Operation Manual (this copy)

Install the products and operate them only after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed torque specifications.

Caution

1. Before connecting the valve, ensure that the correct flow direction is observed: Inlet "1(P)" and outlet "2(A)". Incorrect connection may cause malfunction.

2. Ensure sufficient top, bottom and front clearance for maintenance and operation of each component.

Piping

Caution

1. Connection of pipings and fittings

When screwing the piping or fitting into the valve, tighten it as follows.

1) When using SMC's fitting, follow the procedures below to tighten it.

• Connection thread: M5

First, tighten by hand, then use a wrench appropriate for the hexagon flats of the body to tighten an additional 1/6 to 1/4 turn.

A reference value for the tightening torque is 1 to 1.5 N·m.

Note) Excessive tightening may damage the thread portion or deform the gasket and cause air leakage.

Insufficient tightening may loosen the threads, or cause air leakage.

• When using a fitting other than SMC fitting, follow the instructions given by relevant fitting manufacturer.

2) For the fitting with sealant R or NPT, first, tighten it by hand, then use a wrench appropriate for the hexagon flats of the body to tighten it a further two or three turns. For a tightening torque guide, refer to the table below.

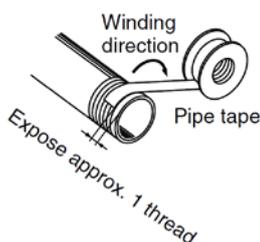
| Connection thread size (R, NPT) | Proper tightening torque (N·m) |
|---------------------------------|--------------------------------|
| 1/8 | 3 to 5 |
| 1/4 | 8 to 12 |
| 3/8 | 15 to 20 |
| 1/2 | 20 to 25 |
| 3/4 | 28 to 30 |
| 1 | 36 to 38 |
| 1 1/4 | 40 to 42 |
| 1 1/2 | 48 to 50 |
| 2 | 48 to 50 |

2. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

3. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if pipe tape is used, leave 1 thread ridge exposed at the end of the threads.



Wiring

Caution

1. Polarity

When connecting power to a solenoid valve with a DC specification and equipped with a light or surge voltage suppressor, check for polarity.

If there is polarity, take note of the following.

No diode to protect polarity:

If a mistake is made regarding the polarity, damage may occur to the diode in the valve, the switching element in a control device or power supply equipment, etc.

With diode to protect polarity:

If polarity connection is wrong, the valve does not operate.

2. Applied voltage

When electric power is connected to a solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

3. Check the connections.

Check if the connections are correct after completing all wiring.

Lubrication

Warning

1. The product has been lubricated for life by the manufacturer, and does not require additional lubrication while in service.

2. If a lubricant is used in the system, use class 1 turbine oil (no additives), ISO VG32. For details about lubricant manufacturers brands, refer to the SMC website. Additionally, please contact SMC for details about class 2 turbine oil (with additives) ISO VG32.

Once lubricant is utilized within the system, since the original lubricant applied within the product during manufacturing will be washed away, please continue to supply lubrication to the system. Without continued lubrication, malfunctions could occur.

If turbine oil is used, refer to the Safety Data Sheet (SDS) of the oil.

Air Supply

Warning

1. Type of fluids

Please consult with SMC when using the product in applications other than compressed air.

2. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.

Compressed air that contains a large amount of condensate can cause malfunction of valves and other pneumatic equipment.

Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

3. Drain flushing

If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. It causes malfunction of pneumatic equipment.

If the drain bowl is difficult to check and remove, installation of a drain bowl with an auto drain option is recommended.

For compressed air quality, refer to SMC Best Pneumatics catalog.

4. Use clean air.

Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

When synthetic oil is used for the compressor oil, depending on the type of synthetic oil used, or on the conditions of use, there may be adverse effects on the resin of the pneumatic equipment or on the seals if the oil is flowed out to the outlet side, so the mounting of a main line filter is recommended.



Regulator Valve / Precautions 3

Be sure to read this before handling.

Air Supply

Caution

1. **Ensure that the fluid and ambient temperature are within the specified range.**

When using at low temperatures, drain or moisture could solidify or freeze, causing damage to the seals and equipment malfunction. If the fluid temperature is less than 5°C, the moisture in the circuit could freeze, causing damage to the seals and equipment malfunction. Therefore, take appropriate measures to prevent freezing.

2. **When extremely dry air is used as the fluid, degradation of the lubrication properties inside the equipment may occur, resulting in reduced reliability (or reduced service life) of the equipment. Please consult with SMC.**

3. **Install an air filter.**

Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 µm or smaller.

4. **If excessive carbon powder is seen, install a mist separator on the upstream side of the valve.**

If excessive carbon dust is generated by the compressor, it may adhere to the inside of a valve and cause it to malfunction.

For compressed air quality, refer to SMC Best Pneumatics catalog.

Operating Environment

Warning

1. **Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.**

Refer to the construction diagram for details of the materials used in the product.

2. **Do not expose the product to direct sunlight for an extended period of time.**
3. **Do not use in a place subject to heavy vibration and/or shock.**
4. **Do not mount the product in locations where it is exposed to radiant heat.**
5. **Do not use in an environment where flammable gas or explosive gas exists. Usage may cause a fire or explosion. The products do not have an explosion proof construction.**
6. **If it is used in an environment where there is possible contact with oil, weld spatter, etc., exercise preventive measures.**
7. **When the solenoid valve is mounted in a control panel or its energized for a long time, make sure ambient temperature is within the specification of the valve.**

Maintenance

Warning

1. **Maintenance should be performed according to the procedures indicated in this Operation Manual.**

If these procedures are not observed, malfunction or damage to machinery or equipment may occur.

2. **Maintenance work**

If handled improperly, compressed air can be dangerous. Assembly, handling, repair and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

3. **Drain flushing**

Remove drainage from air filters regularly.

4. **Removal of equipment, and supply/exhaust of compressed air**

When components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from sudden movement.

5. **Low frequency operation**

Valves should be operated at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)

6. **Manual override**

When the manual override is operated, connected equipment will be actuated.

Operate after safety is confirmed.



VEX1 Series

Specific Product Precautions 1

Be sure to read this before handling.

Operating Fluid

Caution

1. Condensate and dust caught in the supply pressure line may lead to operation failure. Install a mist separator (SMC AM or AFM series) as well as an air filter (SMC AF series). For detailed information regarding the quality of the compressed air described above, refer to "Air Preparation Equipment Model Selection Guide" (P. 2 and 3) in Best Pneumatics 5.
2. Make sure to perform a maintenance periodically on air filter and mist separator (by discharging the drain and cleaning a filter element or replacing with new one).

Piping

Warning

Select the valve size using the flow-rate characteristics given in the catalog as reference, and leave sufficient margin for the required flow rate on the pressure regulator supply side and relief exhaust side.
Rapid change in the flow rate due to repeated pressure regulation and relief exhaust may cause damage to the internal components.

Regulator for Signals (regulator for pilot air)

Caution

When using the pressure regulator to supply a signal (regulator for pilot air), use the relief type. When the regulator is used in the two pressure switching setting, use a more sensitive regulator on the high pressure side.

- Applicable model
Regulator Series IR2000
Series VEX1^A_B33 etc
- In the case of multiple pressure control, consider using series ITV or the E-P HYREG® series VY, which can simplify your system.

Option

| Description | Part no. | | | | | | |
|-----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------|
| | VEX110□-01-02 | VEX120□-01-02 | VEX130□-02-04 | VEX150□-04-10 | VEX170□-10-12 | VEX190□-14-20 | |
| Bracket (With bolt and washer) | B | VEX1-18-1A | - | VEX3-32A | VEX5-32A | VEX7-32A | VEX9-32A |
| | F | VEX1-18-2A | - | - | - | - | - |
| Pressure gauge ^{Note)} | G | G27-10-01 | | G36-10-01 | | G46-10-01 | |

Note) When requiring a gauge different than that mentioned above, specify the model number.
Option is packed with it.
Example: VEX1300-03
G36-4-01

Sub-plate and gasket part no.

| Body size | 2 | | | | | | | | | | | | | | | | |
|-------------|--|--------|-----------|----------|-----|----------|-----|--|--------|-------------|------------|----|----------|---|----------|-----|----------|
| Sub-plate | VEX1-9-1□□P | | | | | | | | | | | | | | | | |
| | Port size <table border="1"> <thead> <tr> <th>Symbol</th> <th>Port size</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>1/8</td> </tr> <tr> <td>B</td> <td>1/4</td> </tr> </tbody> </table> | Symbol | Port size | A | 1/8 | B | 1/4 | Thread type <table border="1"> <thead> <tr> <th>Symbol</th> <th>Thread type</th> </tr> </thead> <tbody> <tr> <td>Nil</td> <td>Rc</td> </tr> <tr> <td>F</td> <td>G</td> </tr> <tr> <td>N</td> <td>NPT</td> </tr> <tr> <td>T</td> <td>NPTF</td> </tr> </tbody> </table> | Symbol | Thread type | Nil | Rc | F | G | N | NPT | T |
| Symbol | Port size | | | | | | | | | | | | | | | | |
| A | 1/8 | | | | | | | | | | | | | | | | |
| B | 1/4 | | | | | | | | | | | | | | | | |
| Symbol | Thread type | | | | | | | | | | | | | | | | |
| Nil | Rc | | | | | | | | | | | | | | | | |
| F | G | | | | | | | | | | | | | | | | |
| N | NPT | | | | | | | | | | | | | | | | |
| T | NPTF | | | | | | | | | | | | | | | | |
| Base gasket | VEX1-11-2 | | | | | | | | | | | | | | | | |

How to Wire DIN Terminal (VEX1101, 1201, 1301)

Caution

- Connection
1. Loosen the set screw and pull out the connector from the terminal block of the solenoid.
 2. Remove screw and insert screwdriver into the slit area near the bottom of terminal block to separate block and housing.

3. Loosen the terminal screws (slotted screws) on the terminal block, insert the core of the lead wire into the terminal, and attach securely with the terminal screws.
4. Tighten the ground nut to secure the cable.

*Use caution in wiring because it will not meet the IP65 (enclosure) standard if you use the other cable than prescribed heavy-duty cable of size (ø3.5 to ø7).
Tighten the ground nut and set screw within the specified range of torque.

•Change of electrical entry (Orientation)

After separating terminal block and housing, the cable entry direction can be changed by attaching the housing in the desired direction (4 directions in 90 increments).

*In the case of w/ indicator light, avoid damaging the light with lead wire.

•Precautions

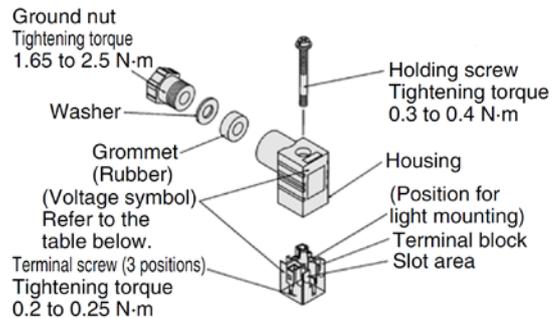
Plug a connector in or out vertically, never at an angle.

•Applicable cable

O.D.: ø3.5 to ø7

(Reference)

0.5 mm² 2 core and 3 core wires equivalent to JIS C 3306



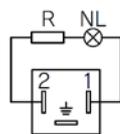
•Connector part no.: VK300-82-1

•Part no. of connector with indicator light

| Rated voltage | Voltage symbol | Part no. |
|---------------|----------------|---------------|
| 100 VAC | 100V | VK300-82-2-01 |
| 110 VAC | 110V | VK300-82-2-03 |
| 200 VAC | 200V | VK300-82-2-02 |
| 220 VAC | 220V | VK300-82-2-04 |
| 240 VAC | 240V | VK300-82-2-07 |
| 6 VDC | 6V | VK300-82-4-51 |
| 12 VDC | 12V | VK300-82-4-06 |
| 24 VDC | 24VDC | VK300-82-3-05 |
| 48 VDC | 48VDC | VK300-82-3-53 |

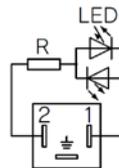
•Circuit with indicator light

AC circuit diagram



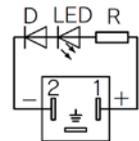
NL: Neon bulb
R: Resistor

12 VDC or less circuit diagram



LED: Light emitting diode
R: Resistor

24 VDC or more circuit diagram



D: Protective diode
LED: Light emitting diode
R: Resistor



VEX1 Series

Specific Product Precautions 2

Be sure to read this before handling.

Light/Surge Voltage Suppressor (VEX1101, 1201, 1301)

⚠ Caution

| Rated voltage | Grommet type (G) | DIN terminal (D) | Part no. symbol |
|---------------|----------------------|--|-----------------|
| AC | W/o indicator light | No.1 No.2 Varistor | S |
| | With indicator light | No.1 No.2 Neon light Varistor | Z |
| 24 V 48 V | W/o indicator light | No.1(+) No.2(-) Diode | S |
| | With indicator light | No.1 No.2 LED Diode | Z |
| 6 V 12 V | W/o indicator light | No.1 No.2 Varistor | S |
| | With indicator light | No.1 No.2 LED Diode | Z |

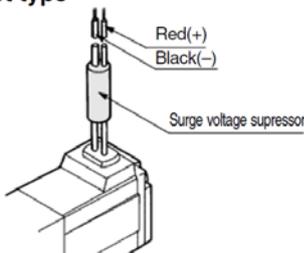
Precautions on connection for 24 VDC or more

Grommet type should be connected as following; Red lead wire for (+) side, Black lead wire for (-) side respectively.

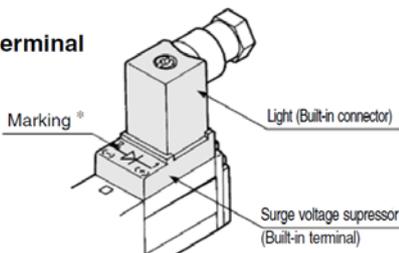
With the DIN terminal, connect the positive (+) side to the connector's no. 1 terminal, and the negative (-) side to the no. 2 terminal. [Refer to the marks on the terminal board.]

*For 12 VDC or below, there is no positive (+) or negative (-) directionality.

• Grommet type



• DIN terminal



*Markings

For AC, 12 VDC or less



For 24 VDC or more



How to Wire DIN Terminal (VEX1501, 1701, 1901)

⚠ Caution

Disassembly

- 1) After loosening the screw ①, then if the housing ② is pulled in the direction of the screw ①, the connector will be removed from the body of equipment (solenoid, etc.).
- 2) Pull the screw ① out of the housing ②.
- 3) On the bottom part of the terminal block ③, there's a cut-off part ⑨. If a small flat head screwdriver is inserted between the opening in the bottom, terminal block ③ will be removed from the housing ②.
- 4) Remove the cable gland ④, plain washer ⑤ and rubber seal ⑥.

Wiring

- 1) Pass the cable ⑦ through the cable gland ④, plain washer ⑤ and rubber seal ⑥ in this order, and then insert them into the housing ②.
- 2) Loosen the screw ⑪ attached to the terminal block ③. Then, pass the lead wire ⑩ through the terminal block ③ and tighten the screw ⑪ again.
Note 1) Tighten within the tightening torque of 0.5 N·m ±15%.
Note 2) Cable ⑦ outside diameter: ø6 to ø8 mm
Note 3) Crimped terminal like round-shape or Y-shape cannot be used.

Assembly

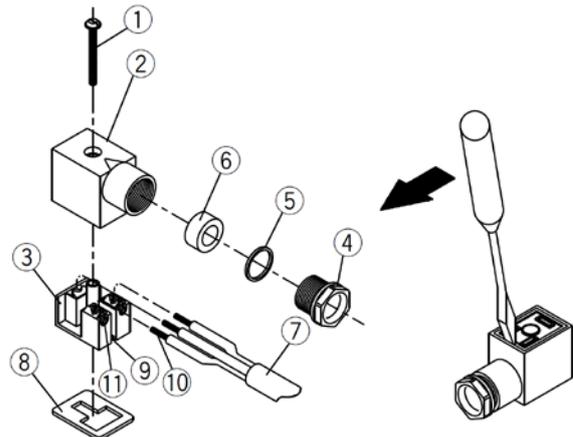
- 1) Pass the cable ⑦ through the cable gland ④, plain washer ⑤ and rubber seal ⑥ in this order and connect to the terminal block ③. Then, mount the terminal block ③ on the housing ②. (Push it down until you hear the click sound.)
- 2) Put the rubber seal ⑥ and plain washer ⑤ in this order into the cable entry of the housing ②, and then tighten the cable gland ④ securely.
- 3) Insert the gasket ⑧ between the bottom part of terminal block ③ and the plug attached to the equipment. Then, screw in ① from the top of the housing ② to tighten it.
Note 1) Tighten within the tightening torque of 0.5 N·m ±20%.

Changing the entry direction

The orientation of a connector can be changed 180°, depending on the combination of a housing ② and a terminal block ③.

Connector for DIN Terminal

| Description | Part no. |
|---------------|----------------------------|
| DIN connector | B1B09-2A (Standard) |
| | GM209NJ-B17 (CE-compliant) |





VEX1 Series

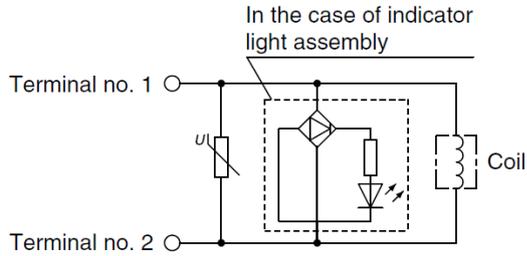
Specific Product Precautions 3

Be sure to read this before handling.

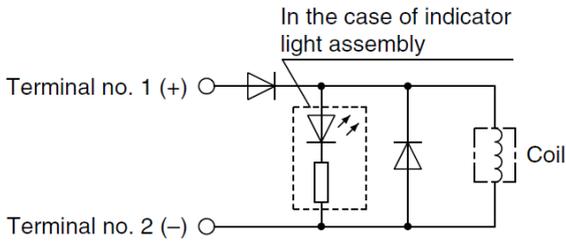
Light/Surge Voltage Suppressor (VEX1501, 1701, 1901)

⚠ Caution

AC



DC

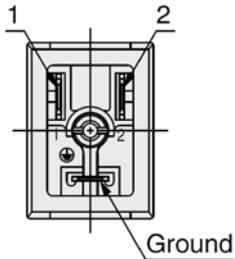


Electrical Connection (VEX1501, 1701, 1901)

⚠ Caution

DIN terminal is connected inside as in the figure below. Connect to the corresponding power supply.

DIN terminal block



| | | |
|--------------|---|---|
| Terminal no. | 1 | 2 |
| DIN terminal | + | - |

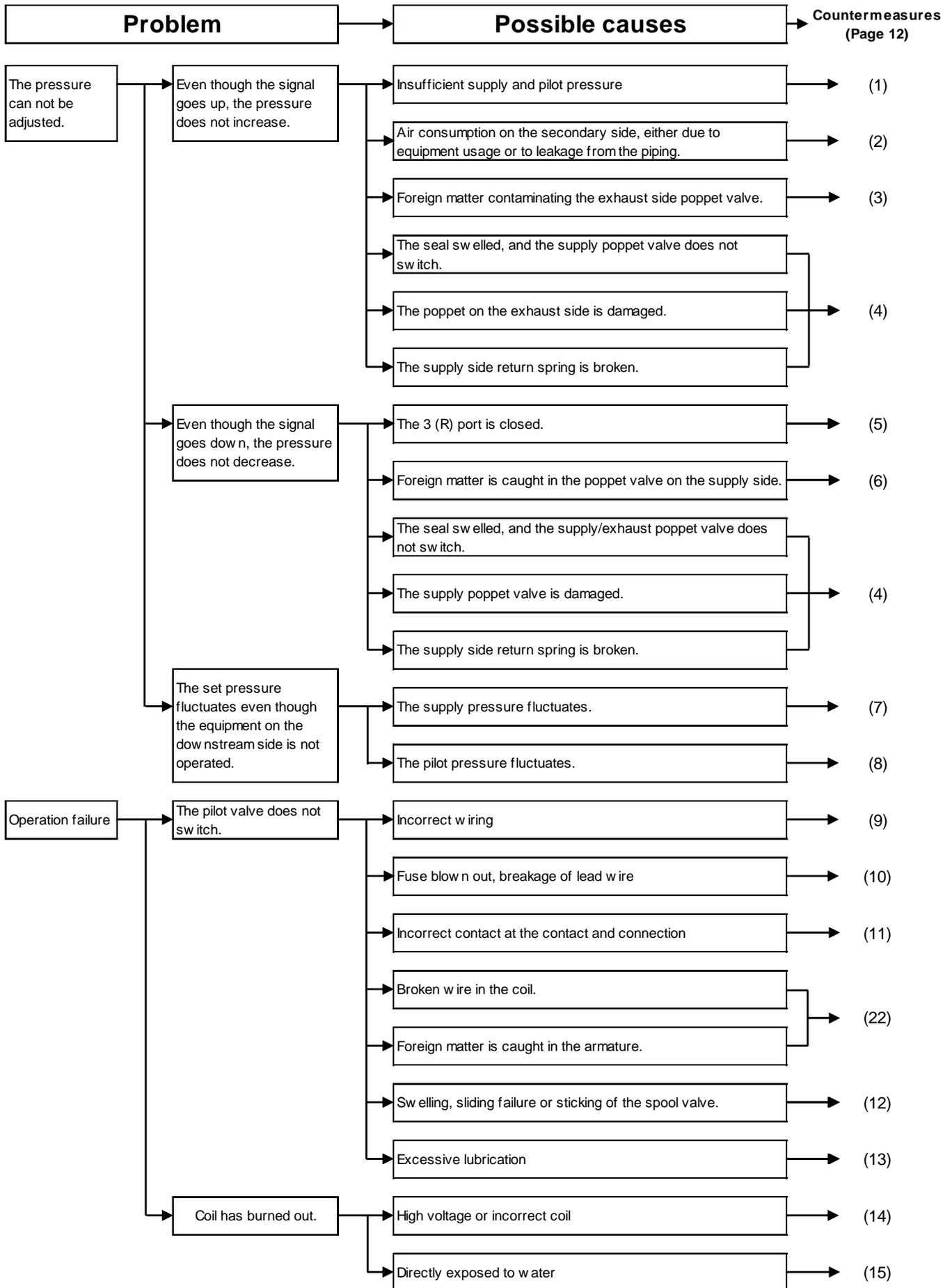
- Applicable cable O.D.
ø6 to ø8

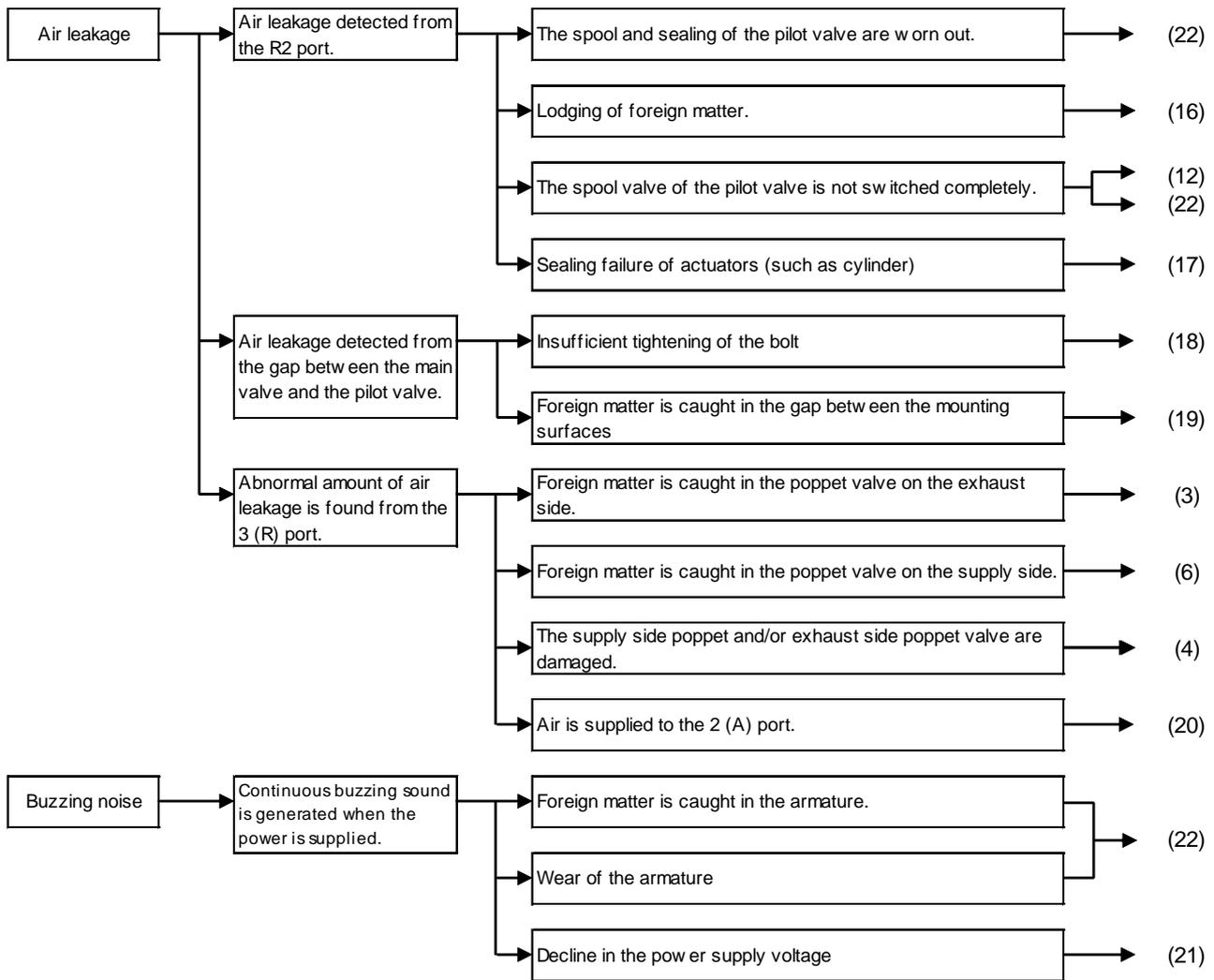
Lead Wire Color (VEX1501, 1701, 1901)

⚠ Caution

| Voltage | Color |
|---------|--------------------|
| 100 VAC | Blue |
| 200 VAC | Red |
| DC | Red (+), Black (-) |
| Others | Gray |

Troubleshooting





Countermeasures

| No. | Countermeasure |
|------|---|
| (1) | Ensure proper supply pressure and pilot pressure |
| (2) | Stop the equipment which is using the air. Locate the source of any air leaks and repair them. |
| (3) | Pressurize port 2 (A) and exhaust air from port 3 (R). (It is possible to blow the poppet valve.) |
| (4) | Replace the valve. |
| (5) | Open the 3 (R) port. |
| (6) | Supply air to port 2 (A). (It is possible to blow the poppet valve.) |
| (7) | Install a tank on the supply side to stabilize the supply pressure. |
| (8) | Install a tank on the pilot pressure supply side to stabilize the pilot pressure. |
| (9) | Connect wires correctly. |
| (10) | Replace the part. |
| (11) | Replace the part or connect wires correctly. |
| (12) | <ul style="list-style-type: none"> · If incorrect oil has been used for lubrication, remove the oil with air blow, and replace the valve with a new one. If a lubricant is used in the system after the replacing the valve, use turbine oil Class 1 (with no additive) ISO VG32. · If there is a large amount of condensate or condensate cannot be removed completely, mount an auto drain or install a dryer and replace the valve. dryer and replace the valve. |
| (13) | Reduce the amount of lubrication to the amount at which the oil does not splash from the exhaust port [3(R) port]. |
| (14) | Check the voltage, and replace the pilot valve assembly. |
| (15) | Protect the valve especially the coil to prevent it from being exposed to water. |
| (16) | If air leakage is caused by foreign matter, remove foreign matter in the piping by air blow and replace the valve. |
| (17) | Repair or replace the actuators. |
| (18) | Stop the air and additionally tighten the bolt. |
| (19) | Remove foreign matter. |
| (20) | Check the air flow direction, and if it is incorrect, mount the regulator in the correct fluid flow direction. |
| (21) | Adjust the voltage so that voltage during operation will satisfy the specification. |
| (22) | Replace the pilot valve assembly. |

If the countermeasures above are not effective, there may be a problem with the valve.
Stop using the valve immediately.

If any of the examples below are applicable, there may be an internal problem in the valve.
Stop using the valve immediately.

1. The voltage used was not the rated voltage.
2. The oil supplied was not the specified type.
3. Lubrication was stopped during operation. Or, lubrication was interrupted temporarily.
4. The product was directly exposed to water.
5. Severe impact was applied.
6. Foreign matter such as condensate or dust has entered the product.
7. Other than those specified, if precautions on the operation manual apply.

*If the product has failed, then please return the valve as it is.

| Revision history | | |
|------------------|---------------------|----|
| A | Renewal | EP |
| B | Renewal | NR |
| C | Safety Instructions | Po |
| D | Renewal | TY |
| E | Renewal | VX |

| | | |
|----------|---------------------|----|
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1st printing :EP

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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