X482012 Ver.1.0

KOGANEI

SmartMini Compressor

Positive pressure type (compressor)

Negative pressure type (vacuum pump)

OWNER'S MANUAL Ver. 1.0

Thank you for purchasing a positive pressure type or negative pressure type "Smart Mini Compressor" from Koganei.

To use this product safely and correctly, be sure to read and fully understand this OWNER'S MANUAL before using the product.

Also, keep it at hand after you have read it.

Contents

1. Safety precautions

Always read these precautions carefully before use.

Before selecting and using products, please read all the Safety Precautions carefully to ensure proper product use.
The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury or damage to assets.
Follow the Safety Precautions in ISO4414 (Pneumatic fluid power—General rules and safety requirements for systems and their components), JIS B 8370 (Pneumatic system regulations), and other safety regulations.

The directions are ranked according to degree of potential danger or damage: " DANGER", "WARNING", "CAUTION", and "ATTENTION".

⚠ DANGER	Indicates situations that can be clearly predicted as dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
⚠ WARNING	Indicates situations that, while not immediately dangerous, could become dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
⚠ CAUTION	Indicates situations that, while not immediately dangerous, could become dangerous. Minor or semi-serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
⚠ ATTENTION	While there is no chance of injury, these points should be observed for appropriate use of the product.

■ This product was designed and manufactured for use in general industrial machinery.

■ In the selection and handling of the equipment, the system designer or other responsible person with fully adequate knowledge and experience should always read the Safety Precautions, Catalog, Owner's Manual and other literature before commencing operation. Making mistakes in handling is dangerous.
■ The customer is responsible for verifying and determining the compatibility of the product with the customer's system.
■ After reading the Owner's Manual, etc., always store them where they are easily available for reference to users of this product.
■ If transferring or lending the product to another person, always attach the Owner's Manual, etc., to the product where they are easily visible, to ensure that the new user can use the product safely and properly.
■ The danger, warning, and caution items listed under these "Safety Precautions" do not cover all possible cases. Read the Catalog and Owner's Manual carefully, and always keep safety first.

⚠ DANGER

● Do not use the product for the purposes listed below:
1. Medical equipment related to maintenance or management of human lives or bodies
2. Mechanical devices or equipment designed for the purpose of moving or transporting people
3. Critical safety components in mechanical devices
This product has not been planned or designed for purposes that require advanced levels of safety. It could cause loss of human life.
● Do not use the product in locations with or near dangerous substances, such as flammable or ignitable substances. This product is not explosion-proof. It could ignite or burst into flames.
● The product must be installed in a flat and level place with enough space to work. Injury could result if the product overturns, falls, or operates abnormally.
● Persons using a pacemaker or other similar medical devices should maintain a distance of at least one meter [3.280 ft] away from the product. The magnetic field of the strong magnet built into the product may cause the pacemaker to malfunction.
● Never attempt to modify the product. Doing so creates the risk of injury, electric shock, fire, etc. due to abnormal operations.
● Never attempt inappropriate disassembly or assembly of the product relating to its basic configuration, or its performance or functions. Doing so creates the risk of injury, electric shock, fire, etc.
● Do not splash water on the product. Spraying the product with water, washing it, or using it in water could result in malfunction leading to injury, fire, etc.
● Do not perform any adjustment work on any internal or attached mechanisms (such as connecting or disconnecting wiring connectors, adjusting pressure switches, disconnecting tubes or sealed plugs, etc.) while the product is operating.
Doing so could result in abnormal operation leading to injury.

⚠ WARNING

● Do not use the product in excess of its specification range. Use in excess of its specification range could result in product breakdown, loss of function, or damage. It could also drastically reduce operating life.
● Before supplying electricity to start operating the product, be sure to do a safety check of the operating range. Unintentional supply of electricity may cause electric shock or injury due to contact with moving parts.
● Do not touch the terminals while the electric power is on. There is a possibility of electric shock and abnormal operation.
● If you ever notice abnormal noise or abnormally high vibration, immediately stop operation. Continued use under such conditions may result in damage to the product, abnormal operation due to damage, or runaway operation, etc.
● Do not throw the product into fire. The product could explode and/or release toxic gases.
● Do not sit on the product, place your feet on it, or place other objects on it. Doing so creates the risk of injury due to tripping or the product tipping over or falling, and erratic or runaway operation due to damage or breakage to the product.
● Before doing maintenance inspections, repairs, or replacement of any parts, always completely cut off all electric power, air, and vacuum pressure connections, and confirm that the pressure in the product and connected pipes is atmospheric pressure. In particular, be aware that residual pressure will still be in the product or air storage tank. Residual pressure inside the product may cause pressurized air to blow out unexpectedly and cause injury.
● Provide adequate shielding measures for use in the locations described below. Failure to install such measures creates the risk of abnormal operations, and could cause injury or damage to equipment.
1. Locations where high electric currents or strong magnetic fields are generated
2. Locations where static electricity or other types of noise are generated
3. Locations where there is the possibility of radioactive contamination
● Use safety circuits or system designs to prevent damage to machinery or injury to personnel when the machine is shut down abnormally due to emergency stop or power failure.
● Correctly apply the rated voltage to the product. Applying the wrong voltage will make it impossible to obtain the specified functions, and creates the risk of damage to and burnout of the product.
● When the device has not been used for long periods (over 30 days), it is possible that the contacting parts may have become stuck leading to slow operation or sudden movements. Check for proper operation a minimum of once every 30 days.
● Do not locate the AC adapter (with power cable) near power lines carrying large currents, or in locations subject to strong magnetic fields or surges. It could result in unintended operation.
● Do not allow lead wires and other cords to become damaged. Allowing cords to be damaged, bent excessively, pulled, rolled up, placed under heavy objects, or squeezed between two objects may cause current leaks or defective continuity that can lead to fire, electric shock, or abnormal operation.
● Always check the catalog and other reference materials for correct product wiring and piping. Improper wiring or piping causes abnormal operation of the actuator, etc.
● Do not use the product near the ocean, in direct sunlight, near

mercury vapor lamps, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions or stop functions.

- In initial operations after the equipment has been idle for 48 hours or more, or has been in storage, there is a possibility that contacting parts may stick, resulting in equipment operation delays or sudden movements. For these initial operations, always run a test operation before use to check that operating performance is normal.
- Because Koganei products may be used under a wide variety of conditions, decisions concerning conformance with a particular system should be made upon the careful evaluation by the person in charge of system design. Assurances concerning expected system performance and safety are the responsibility of the designer who decides system conformity. Be sure to use the latest catalogs and technical materials to study and evaluate specification details, to consider the possibility of machine breakdown, and to configure a system that ensures fail-safe safety and reliability.
- Do not use the product in locations subject to direct sunlight (ultraviolet radiation), in locations with dust, salt, or iron particles, or in locations with media and/or ambient atmosphere that include organic solvents, phosphate ester type hydraulic oil, sulfur dioxide gas, chlorine gas, acids, etc. Such uses could lead to loss of functions within a short period, sudden degradation in performance, or reduced operating life.

⚠ CAUTION

- When installing the product, leave room for adequate working space around it. Failure to do so will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- Do not use the product in environments where there is corrosive gas, flammable gas, flammable liquid, etc. There is a risk that the formation of rust could cause strength to deteriorate, or the motor to catch fire or explode.
- Do not scratch, dent, or deform the product by climbing on the product, using it as a step, or placing objects on top of it. Doing so could damage or break the product, resulting in operation shutdown or degraded performance.
- When transporting or mounting a heavy product, firmly support the product using a lift or support, or use multiple people to ensure personal safety.
- Always be sure to post a "Work in Progress" sign during installation, adjustment, or other operations, to avoid unintended supply of electric power, etc. Turning on the power unexpectedly could cause injury due to electric shock or abrupt operations.
- Do not bring any magnetic media within 1 meter [3.280 ft] of the energized product. Doing so creates the risk of damage to data on the magnetic media due to magnetism.
- Do not block the ventilation holes on the sides of the product. Doing so creates the risk of injury or damage to the equipment.
- When carrying the product, be sure to stop operation and take care not to drop it.
- The compressor does not have a pressure regulator, or an internal filter or other filtration device. An air filter and regulator must be installed to use the product.
- Always attach a filter to the suction port of the vacuum pump. Without a filter, dust, dirt, etc. will enter the pump, causing it to stop functioning after a short period of time, rapid performance degradation, and a reduced operating life.
- Air leakage from the product is not zero. Designs should take into consideration the capacity and retention time required to retain pressure (including vacuum).
- The targeted vacuum pressure may not be reached at high elevations or due to atmospheric pressure fluctuations. In such cases, change the unload pressure by operating the pressure switch.
- Turn off the power before wiring the I/O and communication cables.
- Avoid locations subject to strong vibration and/or impact.

⚠ ATTENTION

- When considering the possibility of using this product in situations or environments not specifically noted in the Catalog or Instruction Manual, or in applications where safety is an important requirement, such as in an aircraft facility, combustion equipment, leisure equipment, safety equipment and other places where human life or assets may be greatly affected, use the product sufficiently within its specified ratings and performance and take adequate safety precautions, such as the use of fail-safes. Be sure to consult us about such applications.
- Always check the catalog and other reference materials for correct product wiring and piping.
- When handling the product, wear protective gloves, safety glasses, safety shoes, etc., as required to maintain safety.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and function over its operating life. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfactory, to prevent accidents from happening.
- Ambient temperature must be between 5 to 40ºC [41 to 104°F]. When incorporating the product into some other equipment, be especially careful that the ambient temperature is 0 to 40℃ [32 to 104°F].
- Use rubber feet or the tapped holes on the bottom of the product or L-brackets to secure the product in place. There is a possibility of increased product noise, product movement, internal malfunction, or abnormal operation.
- For inquiries about the product, consult the Koganei Overseas Department. The address and telephone number are shown on the back cover of this Owner's Manual.

⚠ Other

- Always observe the following items.
  1. When using this product in pneumatic systems, always use genuine KOGANEI parts or compatible parts (recommended parts).
     When conducting maintenance and repairs, always use genuine Koganei parts or compatible parts (recommended parts).
     Always observe the required methods.
  2. Do not attempt inappropriate disassembly or assembly of the product relating to basic configurations, or its performance or functions.

Koganei cannot be responsible if these items are not properly observed.

Warranty and General Disclaimer

1. Warranty Period
The warranty period for Koganei products is 1 year from the date of delivery.
* However, some products have a 2-year warranty; contact your nearest Koganei sales office or the Koganei overseas department for details.

2. Scope of Warranty and General Disclaimer

(1) When a product purchased from Koganei or from an authorized Koganei distributor or agent malfunctions during the warranty period in a way that is attributable to Koganei's responsibility, Koganei will repair or replace the product free of charge. Even if a product is still within the warranty period, its durability is determined by its operation cycles and other factors. Contact your nearest Koganei sales office or the Koganei overseas department for details.

(2) The Koganei product warranty covers individual products. Therefore, Koganei is not responsible for incidental losses (repair of this product, various expenses required for replacement, etc.) caused by breakdown, loss of function, or loss of performance of Koganei products.

(3) Koganei is not responsible for any losses or for any damages to other machinery caused by breakdown, loss of function, or loss of performance of Koganei products.

(4) Koganei is not responsible for any losses due to use or storage of the product in a way that is outside of the product specifications prescribed in Koganei catalogs and instruction manuals, and/or due to actions that violate the mounting, installation, adjustment, maintenance or other safety precautions.

(5) Koganei is not responsible for any losses caused by breakdown of the product due to factors outside the responsibility of Koganei, including but not limited to fire, natural disaster, the actions of third parties, and intentional actions or errors by the purchaser.

2. Models

● Compressors and vacuum pumps

SMP □ **4** □ **-** □ **-** □ **-** □

Power cable specifications
Blank: No power cable
D1L : With power cable 1 m [3.280 ft] (For DC24V)
D3L : With power cable 3 m [9.840 ft] (For DC24V)
AD :With AC adaptor (For AC100 to AC240V)
*The included AC cord is compatible with AC100V. When using, please connect it to an AC100V outlet.

Installation direction
Y: Horizontal
T: Vertical

Drain port specification[Note]
Blank: Sealing plug included
V : Push-button valve assembly

Installation specifications
Blank: None (bottom mount)
G : Rubber feet
L : L bracket

Type
P: Positive pressure (compressor)
V: Negative pressure (vacuum pump)

Smart mini-compressor

Note: Not selectable for negative pressure type (vacuum pump)

● Additional parts

・Power cable

SMP K P - □

Power cable specifications
D1L: With power cable 1 m [3.280 ft] (For DC24V)
D3L: With power cable 3 m [9.840 ft] (For DC24V)
AD :With AC adaptor (For AC100 to AC240V)
*The included AC cord is compatible with AC100V. When using, please connect it to an AC100V outlet.

Type
P: For power supply

Type
K: Cable

・Communication cable

① USB—RS485 converter: Use to connect to a PC

IBM2A-H1 - □

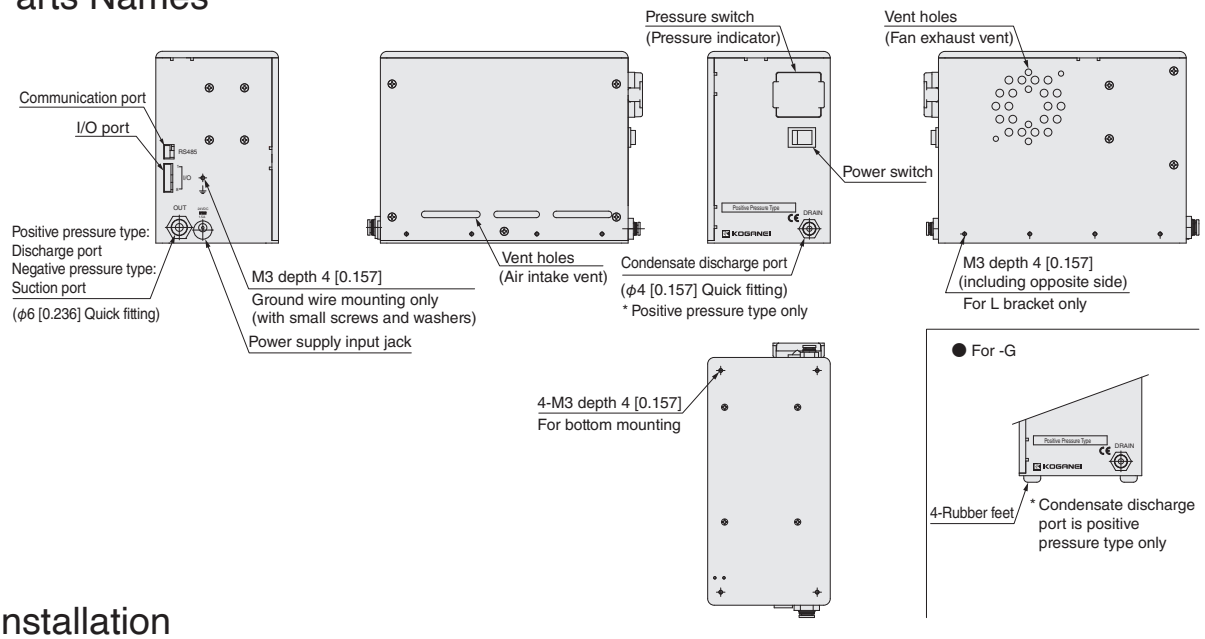
Blank: With USB cable
N : Without USB cable

② RS485 communications loose wire specifications: Use to connect to a PLC, etc.

EW2KN - □

Cable length
1L: 1 m [3.280 ft]
3L: 3 m [9.840 ft]

3. Parts Names



4. Installation

1. The product should be installed on a level and flat surface by one of the following methods.

[Installation methods]

① Bottom mount: Use the M3 depth 4 mm [0.157 in.] on the bottom of the product to secure it. (Tightening torque: 0.63 N·m [5.576 in·lbf])

② Rubber feet (-G): If you have selected rubber feet, install the product on a flat firm surface to prevent wobbling.

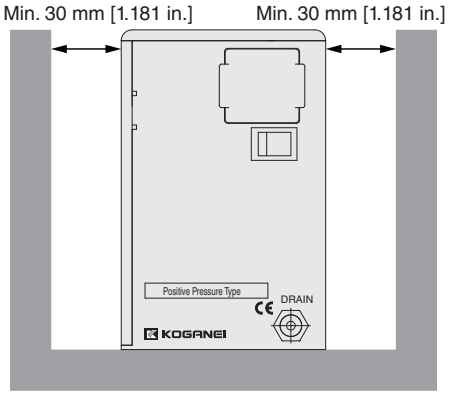
③ L-bracket (-L): If you have selected L-brackets, use the provided L-brackets to secure the product. (Tightening torque for L-bracket to product: 0.63 N·m [5.576 in·lbf])

Note 1: Install the product so its bottom faces down.

2: In order to fix the product, use the bolts attached to the product, or use bolts that are within the thread depth. Usage of long bolts will result in damage to internal components.

2. Ensure the installation surface is adequate.

3. The sides of the product with ventilation holes must be at least 30 mm [1.181 in.] away from walls, and care must be taken not to block the ventilation holes. If ventilation space is not provided, internal temperatures will rise due to lack of ventilation, resulting in a significant decrease in life expectancy.



4. Positive pressure types (compressors) are not equipped with internal filters or other filtration devices or pressure regulating devices.

Also, since condensate (moisture) is generated, a moisture separator, filter, and regulator should be installed when compressed air is used.

* Recommended models: Water separator **IBCY30**, filter regulator **FRZB30**.

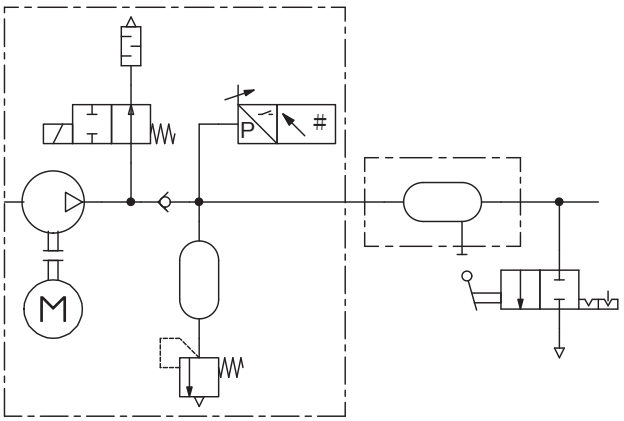
* Install in the order of compressor, water separator, filter and regulator.

5. Be sure to install a filter on the suction port side of the negative pressure type (vacuum pump). Without a filter, dust, dirt, etc. will enter the pump, causing it to stop functioning after a short period of time, rapid performance degradation, and a reduced operating life.

* Recommended model: Filter **VLF050**

6. Be sure to install a mechanism for exhausting residual pressure on the OUT (Vacuum) side of the compressor or vacuum pump.

Example



5. Wiring

5.1. Wiring for power supply

[When using DC power supply]

・Use the following power cables.
Model: SMPKP-D1L (1 m [3.280 ft])
Model: SMPKP-D3L (3 m [9.840 ft])

・Connect the loose wires to a DC24V (22 to 27V) power supply.
Pay particular attention to the wire polarity to prevent mis-wiring when connecting wires.
<Power cable signal table>

No.	Signal name	Wire color
1	24V	White
2	0V	Black

・Insert the plug all the way into the power input jack of the product. Connections that are not secure may cause electric shock or electric leakage.

[When using AC power supply]

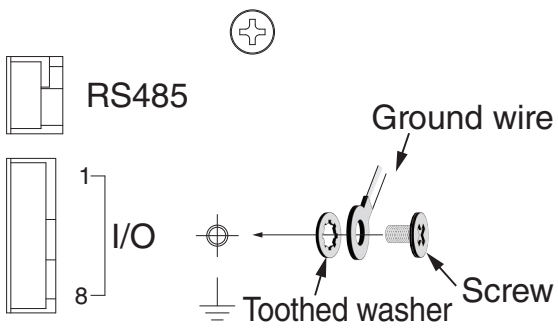
・Use the following AC adaptors.
Model: SMPKP-AD

・Insert the plug all the way into the power input jack of the product. Connections that are not secure may cause electric shock or electric leakage.

・Insert the plug all the way into the power input jack and then connect to an AC 100V power source (outlet).

5.2. Installing the ground wire

Install a ground wire for noise resistance.
(M3 small screw with washer, tightening torque: 0.63 N-m [5.576 in-lbf],and ground wire should be provided by user.)
* AWG16 to 18, 2 m [6.560 ft] or less is recommended for the ground wire.



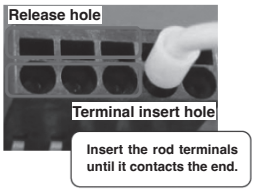
5.3. Installing the I/O cable

Customers using the I/O function should plug in the I/O cable as shown below.

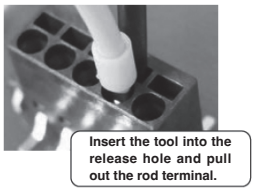
Note: The I/O cable must be provided by the customer.

<When using bar terminals/single wires>

Connection method

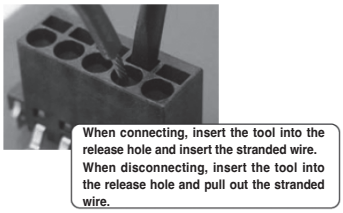


Removal method

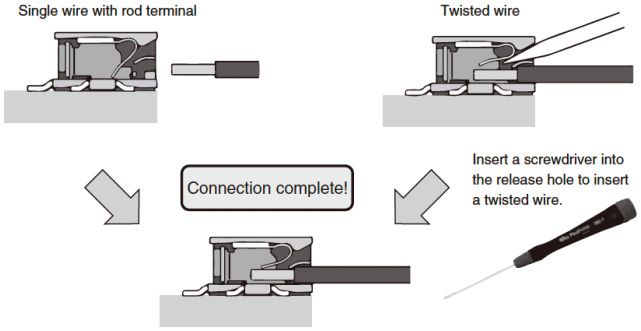


<When using stranded wire>

When using stranded wire

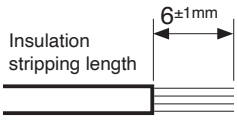


Note: Do not apply excessive force to the terminal block when inserting tools. This may damage the terminal block.



Applicable wires

Single wire	0.14 to 0.5 mm^2 [0.0002 to 0.0007 in^2]
Twisted wire	0.2 to 0.5 mm^2 [0.0003 to 0.0007 in^2]
Rod terminal	0.25 to 0.34 mm^2 [0.0003 to 0.0005 in^2]
AWG	26 to 20 [0.039 to 0.787]



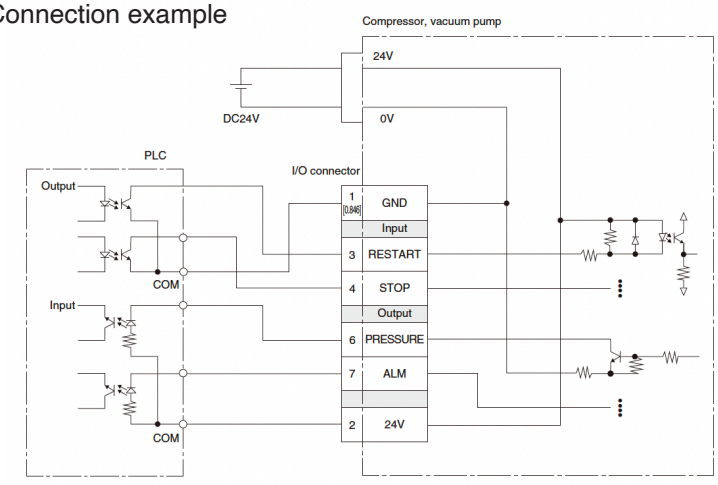
Note: Do not pre-solder the wires. It may cause poor contact.

I/O connector signal table

NO.	Signal name	Input/output	Description
1	GND	-	Power supply
2	24V	-	Power supply
3	RESTART	Input	Operation start signal
4	STOP	Input	Operation start signal
5	N.C.	-	Not connected
6	PRESSURE	Output	Threshold output
7	ALM	Output	Alarm output
8	N.C.	-	Not connected

* The upper I/O connector of the product is No. 1 and the lower is No. 8.

・Connection example



* For details about the I/O, see page 12.

6. Piping

1. The connection ports of compressors and vacuum pumps are quick fittings for 6 mm [0.236 in.] outside diameter tubing.

NOTE
1. Use tubing with an exterior that is not damaged. If tubing becomes damaged after repeated use, cut off the damaged portion.
2. Do not allow tubing to become severely bent or twisted near the connection to a fitting. Such a condition creates the risk of air leakage. The table below shows minimum radius guidelines for nylon and urethane tubing.
3. Do not use extremely soft tubing, which causes a severe drop in pull-out strength.
4. Before removing any tubes, always turn off the air supply. Also, be sure to confirm that the air inside the pipes is completely vented before starting.

mm [in.]

Tube size	Minimum bending radius	
	Nylon tube	Urethane tube
ϕ6 [0.236]	30 [1.181]	15 [0.591]

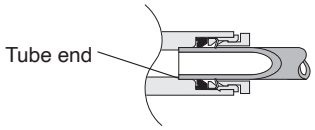
2.Attaching and detaching tubes

NOTE
Before attaching or detaching the tube, be sure to turn off the power switch and bleed air using the residual pressure exhaust mechanism.

Precautions for attaching tubes

① Confirm that the cut surface of the tube is cut straight across, that the outer surface of the tube is not damaged, and that the tube has not become oval shaped.

② When connecting tubes, if you do not insert the tube all the way to the tube end, it may result in leaks.



③ After installing the tube, pull on it to check that it does not come off.

Precautions for opening tubes

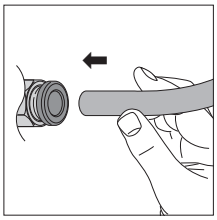
① Before opening tubing, be sure to confirm that the pressure inside the compressor is zero.

② Uniformly press the release ring inwards as far as it goes and then pull out the tubing. If you do not fully press in on the release ring, the tube may not come out, or the tubing may become scratched causing debris to be left inside the fitting.

How to attach and detach tubes

① Attaching tubes

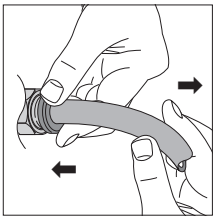
Quick fittings are equipped with lock claws that hold tubes in place when they have been pushed all the way to the end, and with an elastic sleeve for sealing the periphery around the tubes.



② Removing tubes

When removing a tube, pressing the release ring opens the lock claw and the tube can be pulled out.

Be sure to stop the air before removing tubes.



3.Sealing the condensate port

Insert a sealing plug or a push-button valve (ϕ4 [0.157] tubes provided by customer) into the condensate port. (A sealing plug is inserted at time of shipment.) If the condensate port is not sealed, the pressure will not rise.

* Negative pressure types (vacuum pumps) do not have a condensate port.

7. Operation

1. Before operation, make sure that all piping and wiring has been done correctly.

2. For the positive pressure type (compressor), when the power switch is turned ON, the pressure switch comes on and the pressure display value rises. When the pressure in the compressor reaches 0.6 MPa [87 psi], it automatically stops (unloads). When compressed air is consumed and the pressure in the compressor drops to 0.50 MPa [73 psi], it automatically restarts operating (loads).

NOTE When compressed air consumption exceeds the compressor's capacity, the compressor operates continuously.

* **The above load and unload pressures are initial values.** The setting can be changed by setting the pressure switch.
See page 11 for setting details (unload pressure: Hi-1, load pressure: Lo-1)

3. For the negative pressure type (vacuum pump), when the power switch is turned ON, the pressure switch comes on and the pressure display value falls. When the pressure in the vacuum pump reaches 85 kPa [25.109 inHg], it automatically stops (unloads). As air is sucked in, the pressure in the vacuum pump increases, and when it reaches 60 kPa [17.724 inHg], the pump automatically restarts operating (loading).

NOTE The vacuum pump operates continuously when the air suction volume exceeds the capacity of the vacuum pump.

* **The above load and unload pressures are initial values.** The setting can be changed by setting the pressure switch.
See page 11 for setting details (unload pressure: Hi-1, load pressure: Lo-1)

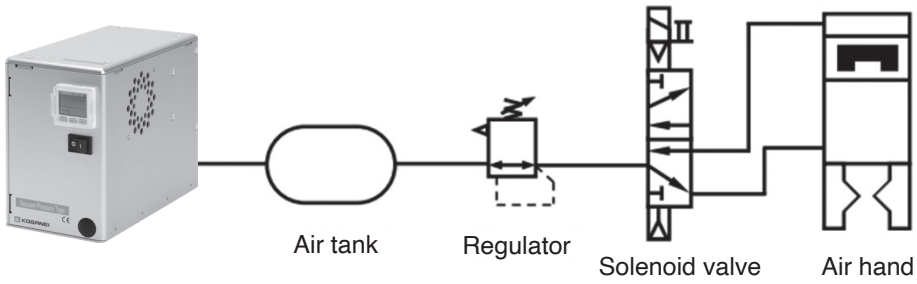
* The targeted vacuum pressure may not be reached at high elevations or due to atmospheric pressure fluctuations. In such cases, change the unload pressure by operating the pressure switch.

4. When the power switch is turned OFF, the device stops operating.

NOTE Be careful, because even after operation has stopped, the compressor and vacuum pump will still have residual pressure in the internal tank, piping, etc.

5. If a large amount of compressed air or vacuum is temporarily required, connecting an external air tank (Koganei type: DPT) may be effective.

● An example of stable use of the air hand



※ By attaching an air tank, pressure fluctuations will be smoothed. Please select whether or not to use a tank and its capacity according to your usage.

6. If there is any abnormality in the system, an alarm occurs and the drive unit stops. When that happens, the pressure gauge indicator flashes.

However, the fan does not stop if the temperature is abnormal. If the abnormality is eliminated by turning the power OFF/ON The alarm is cancelled.

* If an alarm occurs, eliminate the cause of the alarm before restarting operations. See page 16 for details.

7. The following additional functions are available when I/O is used.

① PRESSURE output: Output when pressure is above threshold (0.4 MPa [58 psi])

* This is a criterion for the proper operation of pneumatic equipment.

* The above thresholds are initial values. The setting can be changed by setting the pressure switch.
See page 11 for details on the settings (Threshold pressure: P-2)

② ALM output: Output when an alarm occurs

* See page 16 for details.

③ STOP input: Stops motor and fan drive at any time

* This is useful to temporarily stop the vibration of the product. However, the pressure does not increase because it is not driven below the load pressure.

④ RESTART input: Restarts drive at any time

* Deactivates the STOP and alarm conditions and returns to the normal state.

* If an alarm occurs, eliminate the cause of the alarm before restarting operations.

8. The following additional functions are available when communications are used.

① I/O functions can also be used from communications

② Reading of error history

③ Initialization of error history

④ Reading of accumulated operating hours and motor activation times

⑤ Reading of versions

* Free support software is also available.

8. Draining condensate

<Positive pressure type (compressor) only>

Condensate collects in the piping inside the compressor. So, you need to drain the condensate periodically.

1. When equipped with a sealing plug (condensate port specification: blank)

A sealing plug (model: UP4 (1 pc)) is inserted into the condensate port.

The condensate can be drained by taking the sealing plug out of the condensate port.

Before removing the sealing plug, be sure to relieve the pressure and check that the secondary side pressure is at atmospheric pressure. Be sure to put the sealing plug back in after the condensate has been drained.

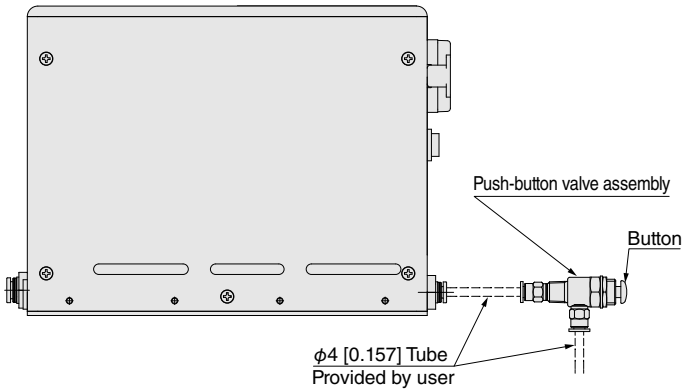
2. When equipped with a push-button type valve (condensate port specifications: -V)

An assembly of a push-button valve (model: 2P (1 pc)) and fittings (model: TS4-M5M (2 pcs)) is provided.

Remove the sealing plug inserted in the drain port and insert the 4 [0.157 in.] outside diameter tube (provided by the user) to the depth of the drain port and push-button valve.

You can drain the condensate by pushing the button on the push-button valve.

Note that if the button is pressed when the secondary side is not at atmospheric pressure, air and condensate will come out vigorously and the pressure on the secondary side will drop.



* This product is an oil-free compressor and does not use lubricating oil, but impurities such as moisture, oil, dust, and wear powder from the air will be contained in the drain.

* Negative pressure types (vacuum pumps) do not generate condensate, so they do not have a condensate port.

9. Pressure switch settings

1. Before operation, make sure that all piping and wiring has been done correctly.

<For positive pressure types (compressors)>

The compressor stops operating when the pressure exceeds the Hi-1 threshold (default value 0.6 MPa [87 psi]) and restarts operating when the pressure drops below the Lo-1 threshold (default value 0.5 MPa [73 psi]). Furthermore, the PRESSURE output is turned on when the pressure is above the threshold value P-2 (default value 0.4 MPa [58 psi]).

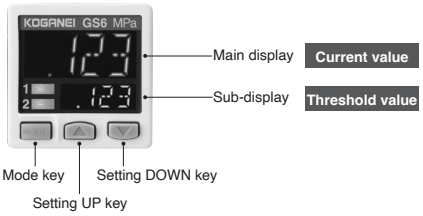
<For negative pressure type (vacuum pump)>

The vacuum pump stops operating when the pressure drops below the Lo-1 threshold (default value 85 kPa [25.109 inHg]) and restarts operating when the pressure exceeds the Hi-1 threshold (default value 60 kPa [17.724 inHg]). Furthermore, the PRESSURE output is turned on when the pressure is below the threshold value P-2 (default value 50 kPa [14.770 inHg]).

Each threshold value can be set with the pressure switch (GS6) on the front of the product.

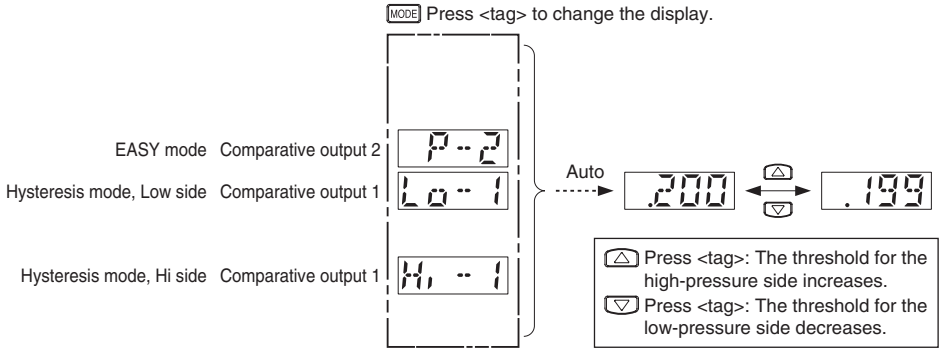
[Initial values]

Threshold value	Initial value: Positive pressure type (MPa [psi])	Initial value: Negative pressure type (kPa [inHg])
Hi-1	0.600 [87]	-60 [-17.724]
Lo-1	0.500 [73]	-85 [-25.109]
P-2	0.400 [58]	-50 [-14.770]



[Setting method]

●The threshold values are set in the sub-display. The main display does not change.



NOTE Never change any setting other than the threshold values. (Do not press and hold the mode key) Doing so can lead to unexpected operation or malfunction of the product.

[Reference: Initial settings other than threshold values]

Setting item	Compressor (Positive pressure type)		Vacuum pump (negative pressure type)	
	Setting value	Indication	Setting value	Indication
Output mode settings for comparative output 1	HYS	HYS	HYS	HYS
Output mode settings for comparative output 2	EASY	EASY	EASY	EASY
N.O./N.C. switching	Output 1: N.C. Output 2: N.O.	ic2o	Output 1: N.O. Output 2: N.C.	loc2
Response time setting	2.5	2.5	2.5	2.5
Switching the display of the main display	Red when ON Green when OFF	R-ON	Green when ON RED when OFF	G-ON
Switching between units	MPa	MPA	kPa	KPA

10. I/O interface

I/O connector signal table

NO.	Signal name	Input/output	Description
1	GND	-	Power supply
2	24V	-	Power supply
3	RESTART	Input	Operation start signal
4	STOP	Input	Operation stop signal
5	N.C.	-	Not connected
6	PRESSURE	Output	Threshold output
7	ALM	Output	Alarm output
8	N.C.	-	Not connected

10.1. Details of input signals

There are 2 dedicated command inputs as input signals.

○ Custom command inputs

Dedicated command inputs are inputs to control from an external device.

The dedicated command inputs are accepted when the OFF state is switched to the ON state (the moment when the contact closes).

■ Operation stop input (STOP)

This is an input to stop the product temporarily. Stops the pump and fan drive of the product regardless of the pressure.

■ Operation start input (RESTART)

This is an input to restart a stopped product.

10.2. Details of output signals

The two output signals are ALM and PRESSURE. ON and OFF refer to the turning on and off of the output transistor.

○ Custom outputs

These outputs are used to exchange signals with external devices.

■ Alarm output (ALM)

This signal turns ON when an abnormality occurs in the system.

■ Threshold output (PRESSURE)

This signal is turned on when the pressure is above the threshold value P-2 (default value 0.4 MPa [58 psi]).

This signal is used to determine if the pressure is above the threshold value, thereby enabling stable activation of the air equipment.

10.3. Input/output circuits

This section provides the specifications for the input/output circuits and connection examples. Refer to the examples when connecting to a programmable controller or other external devices.

10.3.1. Input/output circuit specifications

◯Input power supply

Input voltageDC24V

◯Input circuit

Insulation method: Photocoupler insulation

Input response: 30 ms or less

Input current: 5mA/DC24V

Input sensitivity: ON current min. 3 mA, OFF current max 1 mA

◯Output circuit

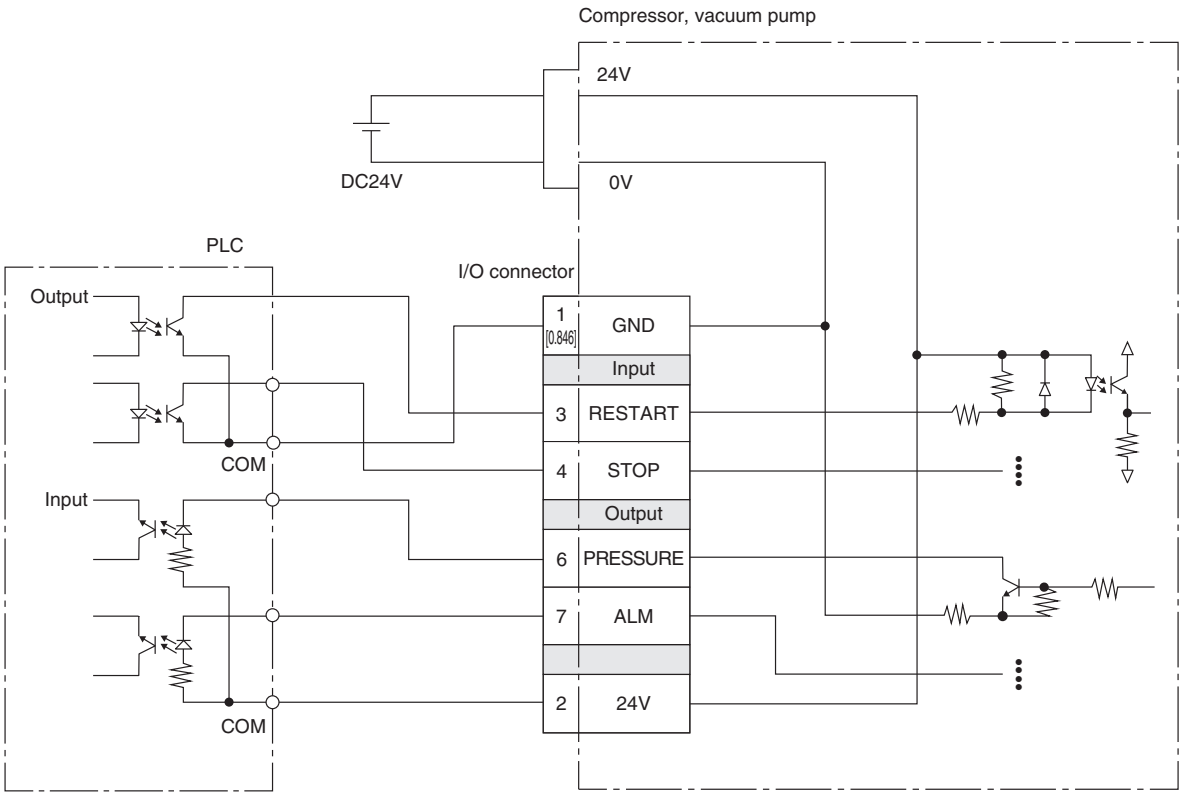
Output terminal: Open collector output (NPN output)

Output response: 1 ms or less

Maximum output current: 50 mA/24 VDC per 1 output

Residual ON voltage: 1.5 V or less

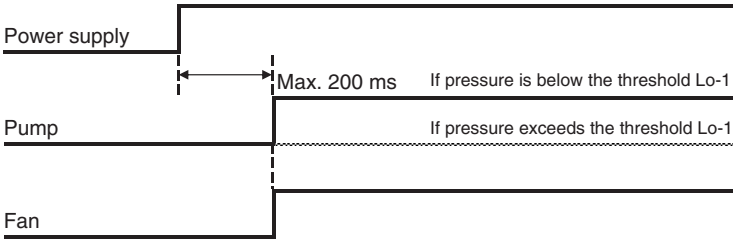
10.3.2. Connection example



* The power switch has been omitted.

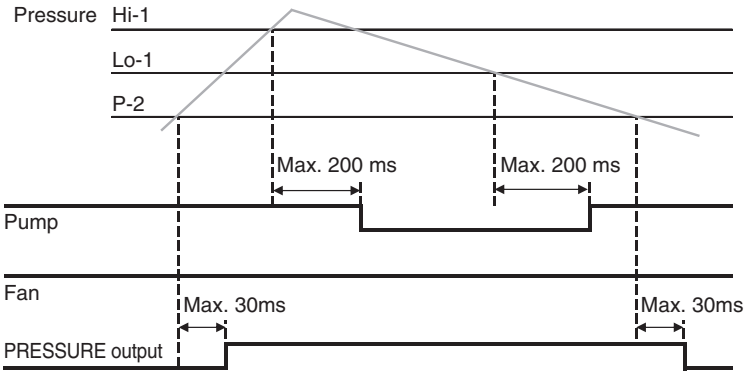
10.4. Timing charts

10.4.1. When the power is turned on



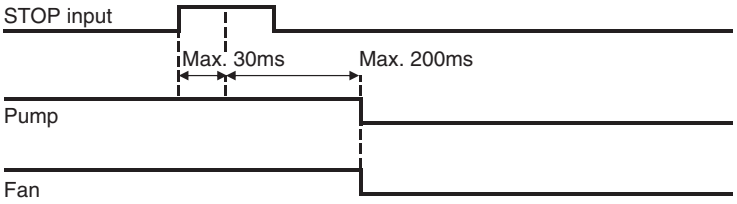
* When the power is turned on and the STOP signal is ON, neither the pump nor the fan will operate.
* When power is turned on while an alarm has occurred, the ALM signal turns ON after about 3 seconds.

10.4.2. When operation is normal

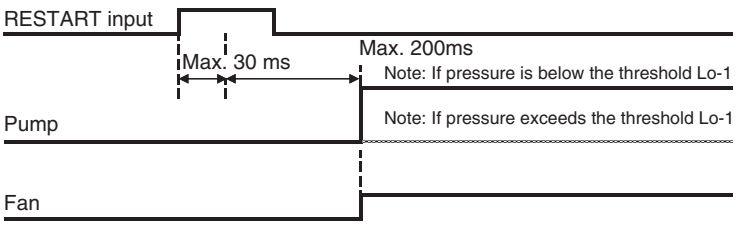


■ The pump stops and restarts according to the pressure.
(The threshold values can be set by the pressure switches)
① When the pressure exceeds the threshold value P-2, the PRESSURE output turns ON.
② When the pressure exceeds the threshold value Hi-1, the pump stops.
* The pump may take up to 1 second to completely stop due to inertia.
③ When the pressure drops below the threshold value Lo-1, the pump restarts.
* The pump may take up to 2 seconds to reach maximum speed due to inertia.
④ When the pressure drops below the threshold value P-2, the PRESSURE output turns OFF.

10.4.3. When custom command is executed



* When inputting a motion stop signal, keep the dedicated command input ON for 30 ms or longer.
* The pump may take up to 1 second to completely stop due to inertia.

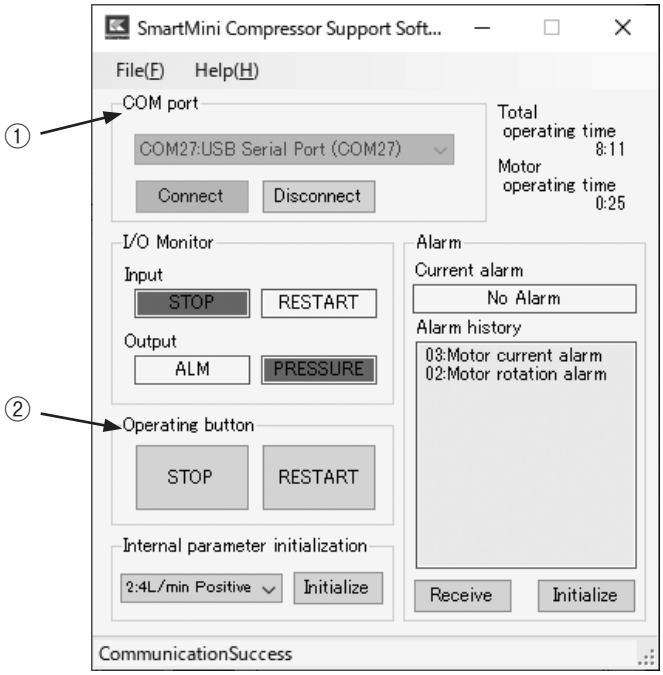


* When inputting a motion start signal, keep the dedicated command input ON for about 30 ms.
* The pump may take up to 2 seconds to reach maximum speed due to inertia.

Note: May vary depending on the presence or absence of alarms and the state at the time of STOP input.

11. Communications

11.1. Support software



- Download the support software from Koganei's homepage (free of charge)
- Connect the communication cable, set the COM port, and press "Connect" to start communications. (①)
- One click to STOP and RESTART. (②)
- Shows the status of I/O, current alarms, alarm history, cumulative operating time (power ON time), and motor activation time.
- The parameters are set to match the model at the time of shipment, so there is no need to initialize them. However, if there is some trouble and a "parameter error" occurs, re-set the model and perform "internal parameter initialization.

[Reference] Communication specifications

Item	Description
Communication protocol	Modbus-RTU
Physical layer	RS-485
Communication method	Half-duplex, asynchronous
Maximum connected device count	1 unit
Communication speed	115200 bps
Data bit	8 bit
Start bit	1 bit
Stop bit	1 bit
Parity	Even
Flow control	None

* Modbus® is a registered trademark of Schneider Electric Inc. and is licensed to Modbus Organization Inc.

* Customers who wish to manage smart mini compressors using communication functions from PLCs and other devices without using support software should contact our Technical Service Center.

12. Troubleshooting

If the pressure gauge indicator on the front of the product is flashing, an alarm has occurred.

In addition, when an alarm occurs, the product's pump drive stops and the alarm output turns ON.

When an alarm has occurred, turn the power off temporarily, eliminate the cause of the alarm, and then turn on the power again.

Symptom	Probable cause	Countermeasure
Power does not turn on	Power is off	Check to make sure that the power cable is connected.
Pump does not drive Pressure gauge is lit	Set air pressure has been reached	Reconsider the threshold values of the pressure gauge.
	Stopped by a STOP input	Turn ON the RESTART input.
Pump does not drive Pressure gauge is flashing	System abnormality has occurred	Refer to 12.1 List of alarms.

12.1. List of alarms

Check the alarm that caused the pressure gauge indicator to flash.

If external communications (RS485) are being used, you can also check by reading the alarm history.

No.	Alarm	Pressure gauge indicator
1	Parameter is faulty	0.25s off → 0.25s on →…
2	Motor speed is abnormal	(0.5s off → 0.5s on →)×2 times → 2.0s off →…
3	Motor current is abnormal	(0.5s off → 0.5s on →)×3 times → 2.0s off →…
4	Temperature abnormality	(0.5s off → 0.5s on →)×4 times → 2.0s off →…
5	IO overcurrent	(0.5s off → 0.5s on →)×5 times → 2.0s off →…
6	Power supply voltage is low	(0.5s off → 0.5s on →)×6 times → 2.0s off →…
7	Power supply voltage high	(0.5s off → 0.5s on →)×7 times → 2.0s off →…

No.	Alarm	Description	Probable cause	Countermeasure
1	Parameter is faulty	Internal data has been corrupted	Power supply was turned off while writing data.	Initialize internal parameters and reconnect power.
2	Motor speed is abnormal	Speed was outside threshold for more than a specified period	Set air pressure is too high Power supply voltage is low Ambient temperature is high Service life	Check power supply voltage Check ambient temperature Check operating time
3	Motor current is abnormal	Current was outside threshold for more than a specified period		
4	Temperature abnormality	Temperature is too high		
5	IO overcurrent	Current is too high	Overcurrent of external output	Reevaluate connections to external devices.
6	Power supply voltage is low	Input voltage of power supply is too low	Setting mistake for power supply voltage value Power supply is unstable	Raise the power supply voltage Use a stable power supply
7	Power supply voltage high	Input voltage of power supply is too high	Setting mistake for power supply voltage value	Reduce the power supply voltage.

Note: In the case of alarm No. 4 Temperature abnormality, the fan continues to be driven.

13. Specifications

13.1. Positive pressure type (compressor)

Model	SMPP4Y	SMPP4T
Installation direction	Horizontal	Vertical
Maximum pressure MPa [psi]	0.6 [87]	
Discharge flow rate (at 0.5 MPa [73 psi]) L/min.(ANR) [ft^3/min.(SCFM)]	4.0 [0.141]	
Control pressure[Note 1] (Unload/load) MPa [psi]	0.6 [87]/0.5 [73] [Note 2]	
Noise[Note 3] dB	50	
Piping port	Quick fitting for tubes with outside diameter ϕ6 [0.236]	
Mass kg [lb]	2.4 [5.292]	
Ambient temperature range ℃ [°F]	5 to 40 [41 to 104] (non-condensation, non-freezing)	
Input voltage V	DC24 (switching power supply can be used) [Note 4]	
Rated current A	2.7 (Instantaneous 5)	
Power supply specifications	AC adapter/DC power supply cable	

Note 1: When the internal pressure reaches the unload pressure, the compressor stops temporarily and restarts when the pressure drops to the load pressure (restart pressure).

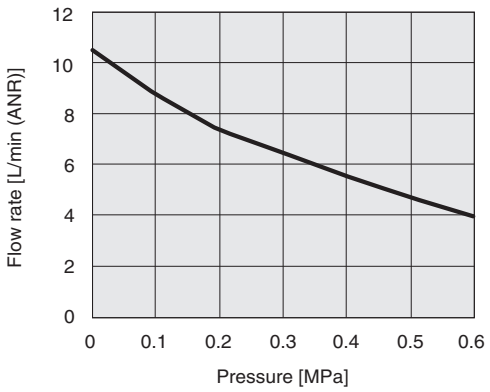
2: Initial value. Settings can be changed by user.

3: Values measured under Koganei measurement conditions. Measured at a distance of 1 m [3.280 ft] from the front (installed with the pressure indicator monitor facing front).
The value may be greater than the stated value depending on operating and installation conditions.

4: Use an input voltage in the range of 22V to 27V.

● Flow rate characteristics

SMPP4□



* Based on our initial performance tests

13.2. Negative pressure type (vacuum pump)

Model	SMPV4Y	SMPV4T
Installation direction	Horizontal	Vertical
Achievable vacuum pressure[Note 1] kPa [inHg]	−85 [−25.109]	
Maximum suction flow L/min.(ANR) [ft³/min.(SCFM)]	10 [0.353]	
Control pressure[Note 2] (Unload/load) kPa [inHg]	−85 [−25.109]/−60 [−17.724] [Note 3]	
Noise[Note 4] dB	50	
Piping port	Quick fitting for tubes with outside diameter ϕ6 [0.236]	
Mass kg [lb]	2.4 [5.292]	
Ambient temperature range ℃ [°F]	5 to 40 [41 to 104] (non-condensation, non-freezing)	
Input voltage V	DC24 (switching power supply can be used) [Note 5]	
Rated current A	2.7 (Instantaneous 5)	
Power supply specifications	AC adapter/DC power supply cable	

Note 1: Standard atmospheric pressure (1013 hPa)

2: When the internal pressure reaches the unload pressure, the vacuum pump stops temporarily and restarts when the pressure rises to the load pressure (restart pressure).

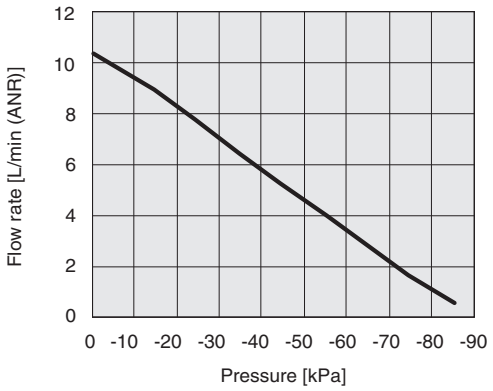
3: Initial value. Settings can be changed by user.

4: Values measured under Koganei measurement conditions. Measured at a distance of 1 m [3.280 ft] from the front (installed with the pressure indicator monitor facing front).
The value may be greater than the stated value depending on operating and installation conditions.

5: Use an input voltage in the range of 22V to 27V.

● Flow rate characteristics

SMPV4□

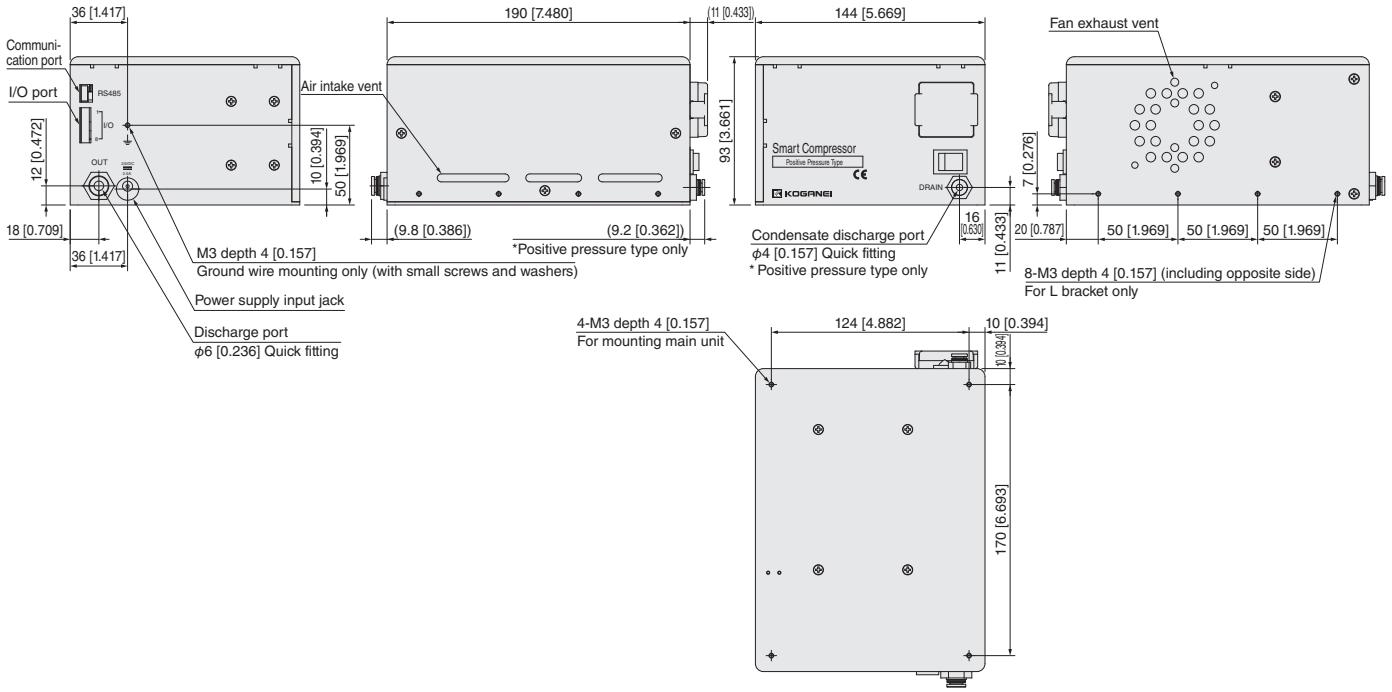


* Based on our initial performance tests

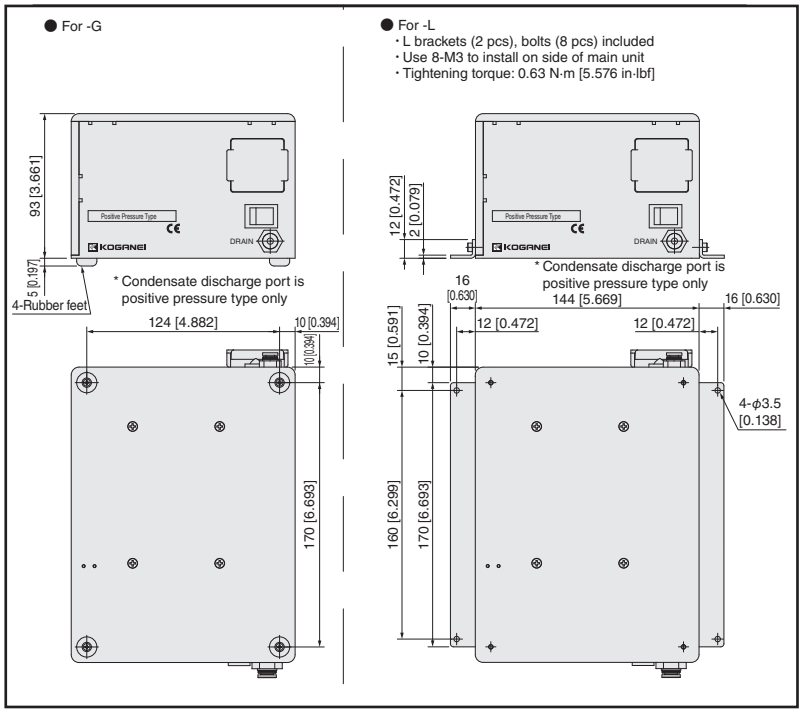
14. Dimensions (mm [in.])

SMPP4Y
SMPV4Y

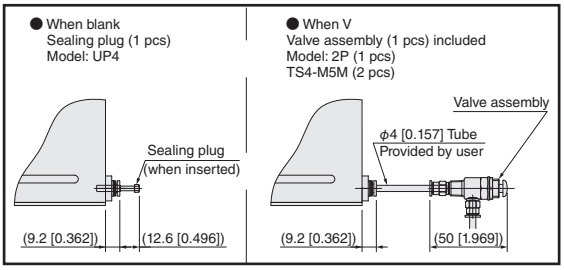
(Horizontal)



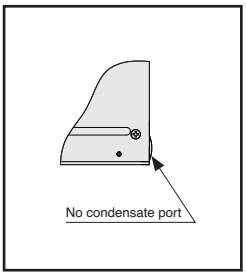
Installation specifications



Condensate port specifications (positive pressure type only)

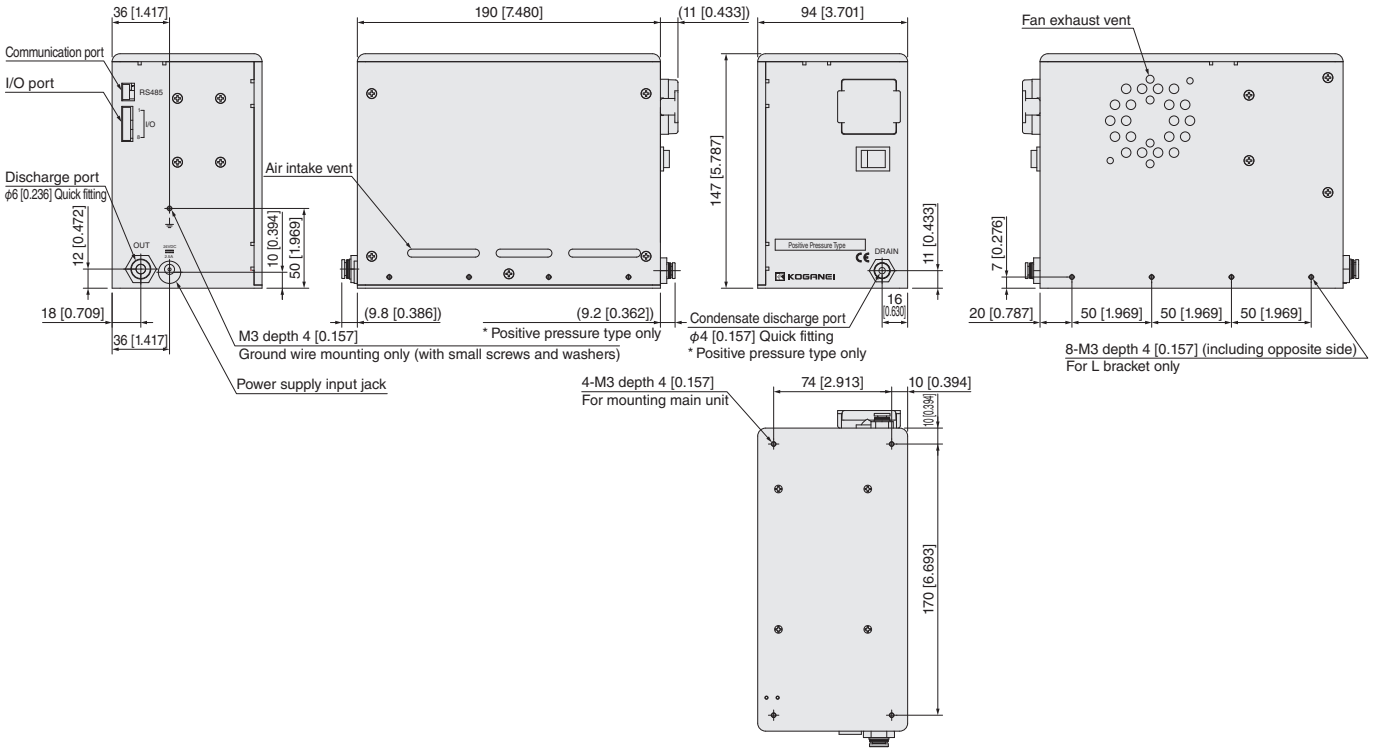


Appearance of negative pressure type

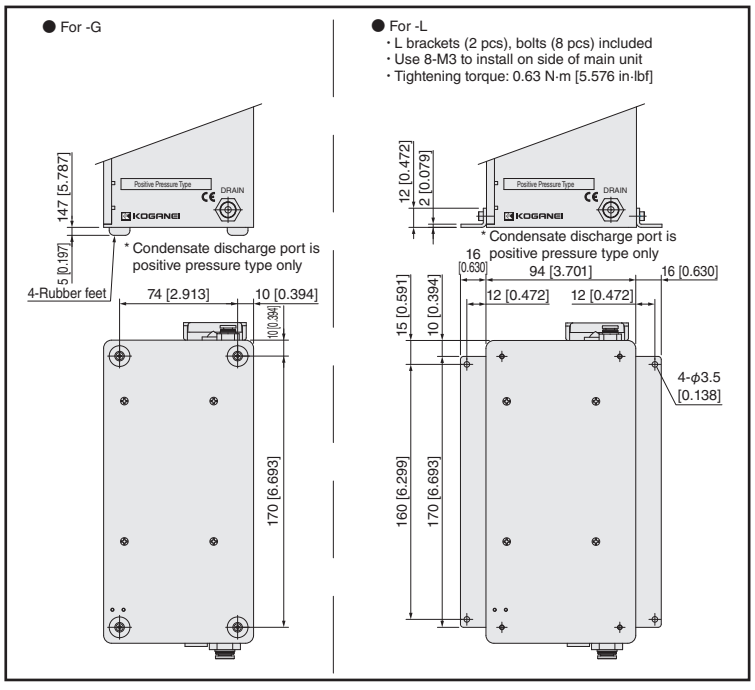


Dimensions (mm [in.])

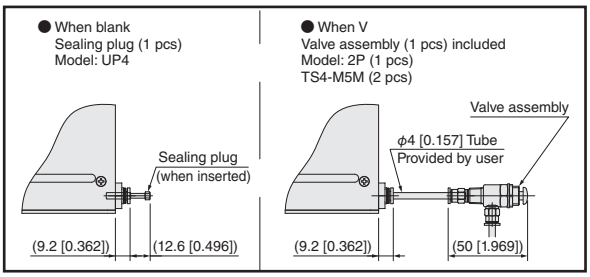
SMPP4T
SMPV4T
(Vertical)



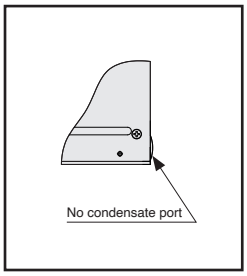
Installation specifications



Condensate port specifications (positive pressure type only)



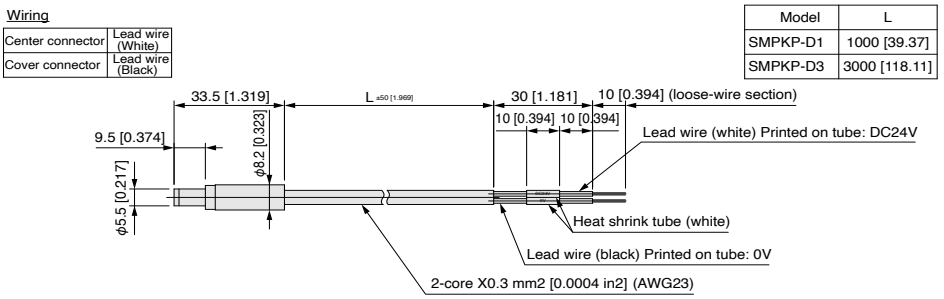
Appearance of negative pressure type



Dimensions (mm [in.])

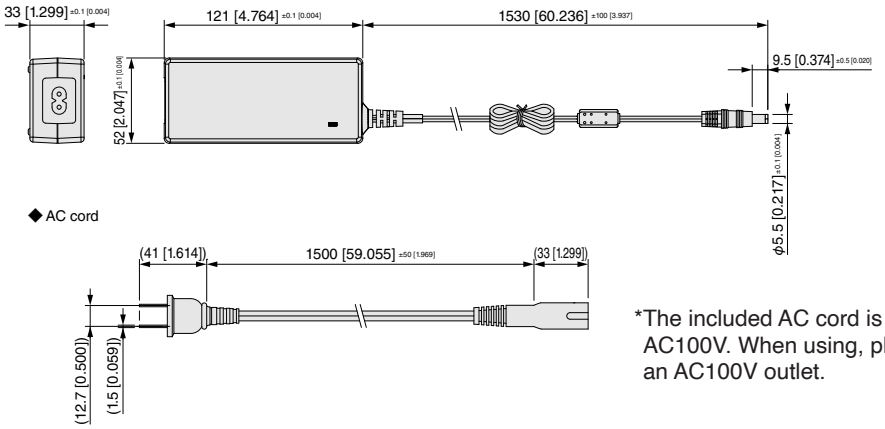
● SMPKP-D□

Power cable (for DC24V)



● SMPKP-AD

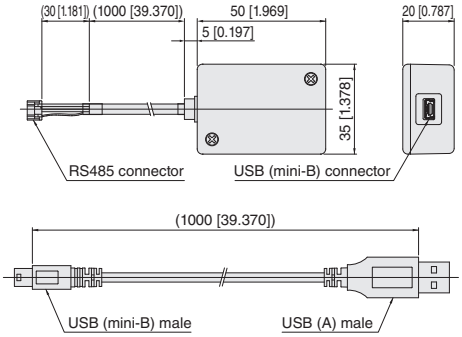
AC adapter (for AC100 to 240V)



*The included AC cord is compatible with AC100V. When using, please connect it to an AC100V outlet.

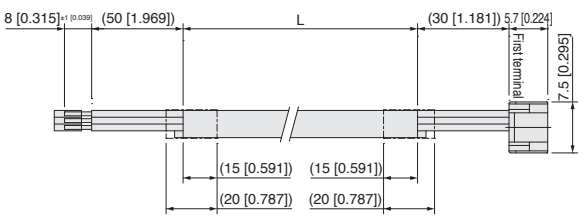
● IBM2A-H1-□

Communication cables (USB-RS485 converter)



● EW2KN-□

Communication cables (for RS485 communications, loose wires)



MODEL	L
EW2KN-1L	1000 [39.37]
EW2KN-3L	3000 [118.11]

Connector terminal layout (Controller bottom)

NO.	Parts	Color
1	A	White
2	B	Pink
3	GND	Yellow
4		
5		

15. Repairs

(1) If any abnormality occurs in the product, stop operation and check to see if the product is malfunctioning.
(2) For repair, please contact the place of order or Koganei.
(3) When requesting for repair, please provide the following information.
① Model name and serial number (indicated on the label)
② Period of use and condition of use
③ Faulty part and description of the fault

Note: When returning products that contain or may contain substances, fluids, or their residues that are considered hazardous to the human body, please contact us and submit an International Chemical Safety Card (ICSC, SDS) for the hazardous substances to ensure safety.
Please return the products only after we have received your approval to pick them up.
Also, please clean (detoxify) the returned items properly before returning them.

If you have any questions, please contact our nearest sales office.

If you have any problems with the content of this publication or technical questions, please contact the Koganei Overseas Group below.
Contact the Koganei Overseas Group below.

<Contact>

OVERSEAS GROUP
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TEL: 0120-44-0944

SmartMini Compressor

Positive pressure type (compressor)

Negative pressure type (vacuum pump)

OWNER'S MANUAL

August 2025 Ver.1.0 X482012

KOGANEI CORPORATION
Overseas Group
TEL: 0120-44-0944

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