CKD

Digital Electro-pneumatic Regulator

EVD-1000/3000 Series

INSTRUCTION MANUAL

SM-A40414-A

- Read this Instruction Manual before using the product.
- Read the safety notes carefully.
- Keep this Instruction Manual in a safe and convenient place for future reference.

CKD Corporation

PREFACE

Thank you for purchasing CKD's **"EVD-1000/3000 Series" digital electro-pneumatic regulator**.
This Instruction Manual contains basic matters such as installation and usage instructions in order to ensure optimal performance of the product. Please read this Instruction Manual thoroughly and use the product properly.
Keep this Instruction Manual in a safe place and be careful not to lose it.

Product specifications and appearances presented in this Instruction Manual are subject to change without notice.

- The product is intended for users who have basic knowledge about materials, piping, electricity, and mechanisms of pneumatic components. CKD shall not be responsible for accidents caused by persons who selected or used the product without knowledge or sufficient training.
- Since there are a wide variety of customer applications, it is impossible for CKD to be aware of all of them. Depending on the application or usage, the product may not be able to exercise its full performance or an accident may occur due to fluid, piping, or other conditions. It is the responsibility of the customer to check the product specifications and decide how the product shall be used in accordance with the application and usage.

SAFETY INFORMATION

When designing and manufacturing any device incorporating the product, the manufacturer has an obligation to ensure that the device is safe. To that end, make sure that the safety of the machine mechanism of the device, the pneumatic control circuit, and the electric system that controls such mechanism is ensured.

To ensure the safety of device design and control, observe organization standards, relevant laws and regulations, which include the following:

ISO 4414 and JIS B 8370 (the latest edition of each standard)

In order to use our products safely, it is important to select, use, handle, and maintain the products properly.
Observe the warnings and precautions described in this Instruction Manual to ensure device safety.

Although various safety measures have been adopted in the product, customer's improper handling may lead to an accident. To avoid this:

Thoroughly read and understand this Instruction Manual before using the product.

To explicitly indicate the severity and likelihood of a potential harm or damage, precautions are classified into three categories: "DANGER", "WARNING", and "CAUTION".

⚠ **DANGER**	Indicates an imminent hazard. Improper handling will cause death or serious injury to people.
⚠ **WARNING**	Indicates a potential hazard. Improper handling may cause death or serious injury to people.
⚠ **CAUTION**	Indicates a potential hazard. Improper handling may cause injury to people or damage to property.

Precautions classified as "CAUTION" may still lead to serious results depending on the situation.
All precautions are equally important and must be observed.

Other general precautions and tips on using the product are indicated by the following icon.

Indicates general precautions and tips on using the product.

Precautions on Product Use

⚠ DANGER

Use the product within the specified voltage range.
Applying voltage beyond the specified range may cause a malfunction, damage to the sensor, electric shock, or fire.

Do not connect a load exceeding the rated output.
The output circuit may become damaged or a fire may occur.

Precautions on Design and Selection

⚠ WARNING

Do not supply anything other than compressed air.

Use clean compressed air that does not contain corrosive gases.

Use "ISO Class 1.3.2" equivalent oil-free clean dry air.

Understand the compressed air characteristics before designing a pneumatic pressure circuit.

- Note that if the pressure needs to be stopped instantly at an emergency stop, the same functions as those for mechanical, hydraulic, or electrical regulators cannot be expected.
- The air may pop out, flow out, or leak out due to its compression and expansion characteristics.

Make sure that the product can withstand the working environment before use.

- The product cannot be used in an atmosphere where corrosive gas, chemical liquid, solvent vapor, water, and water vapor are present. If water drop, oil, or metal chips (such as spatter or cutting chips) may come into contact with the product, provide an appropriate protection.
- The product cannot be used in an explosive gas atmosphere.

Consider the effects of an emergency stop on the electric circuit and power outages on the cylinder when designing the system and selecting the product.

Install a pressure switch and a residual pressure exhaust valve on the compressed air supply side of the device.
The pressure switch prevents the product from operating if the set pressure is not reached. The residual pressure exhaust valve discharges compressed air remaining in the pneumatic pressure circuit in order to prevent the residual pressure from causing the pneumatic components to operate and to cause accidents.

Do not leave the pressure applied to the primary side of the product when the power is not turned on.
The secondary side pressure may rise to the same level as the primary side pressure. If there are safety concerns, design a system that ensures safety by providing measures such as installing a valve on the primary side or the secondary side.

⚠ CAUTION

Use the product within the working pressure range.

Specify maintenance conditions in the instruction manual of the customer's device.
Depending on the conditions of use, working environment, and maintenance conditions, the functions of the product may decline significantly and the safety may not be ensured. Proper maintenance will deliver optimum performance.

Use a constant voltage power supply.

Check for leakage currents from the external control devices to prevent a malfunction.
When using a control device such as a programmable controller, leakage currents from the control device may affect the product and cause it to malfunction.

Reference value	For 24 VDC	1.8 mA or less

⚠ CAUTION

If a stable reproducibility is necessary for the response time of the system, install a precision regulator before the product.

The response time is affected by the working pressure and the capacity of the load on the secondary side.

Take the following measures to prevent malfunctions caused by noise.

- Insert a line filter in the AC power supply line.
- Use a surge suppressor such as a CR or diode for the inductive load (such as a solenoid valve or a relay) to remove noise at its source.
- Install the wiring for the product away from strong electric fields.
- Use shielded wires for wiring to the product.
- Connect the shielded wires to the ground on the power side.
- Wire the power lines as short as possible.
- Do not share the power supply with noise-generating devices such as inverters or motors.
- Do not wire the power cables and the signal cables in parallel with other power lines.

Consult the PLC manufacturer when using a current input type.

For the current input type, the power ground and the signal share a common connection due to wiring reasons.
When driving multiple electro-pneumatic regulators with one PLC and a D/A unit, correct signals may not be input due to wiring problems of the circuit type used with the D/A unit.

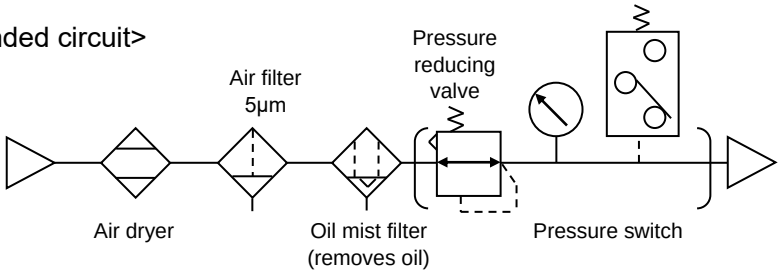
For the current input type, use a signal generator appropriate for the input impedance.

The current input type can be used with the input signal of 1 V to 5 V. Since the input impedance of the product is 250 Ω, which is smaller than other voltage input type products, use a signal generator appropriate for the impedance.

Do not use air of poor quality.

- For the source of pneumatic air, use clean air from which solids, moisture, and oil have been sufficiently removed with a dryer, an air filter, and an oil mist filter. Do not use air containing oil that adversely affects the product characteristics.

<Recommended circuit>



- When the secondary side pressure is reduced with an input signal, the secondary side air passes through the product and is discharged from the exhaust port. Maintain the inside of the pipes clean since contamination inside the secondary side pipes and the load also has an adverse effect on the product characteristics.

Do not expect the pressure on the secondary side to remain for a long period. Take measures to remove residual pressure as necessary.

The pressure on the secondary side will remain if the power is turned off while the pressure is applied but not for a long period. Reduce the set pressure with an input signal and then turn off the power or discharge the pressure using a residual pressure exhaust valve as necessary.

Make sure that the primary side pressure does not become lower than the minimum working pressure (EVD-1100/3100: set pressure +50 kPa, EVD-1500/1900/3500/3900: set pressure +100 kPa).

Not supplying the primary side pressure for a long period while the power is turned on will shorten the product service life.

Before using the product as an air blow with the control pressure of the secondary side released to the atmosphere, test the usage under actual conditions of use or contact CKD.

The pressure may fluctuate depending on the piping and blowing conditions.

Select a dryer, an air filter, an oil mist filter, and a regulator that can accommodate a flow rate

⚠ CAUTION

higher than the flow rate used for the product.

When using the product out of the specified conditions or for a special application, consult CKD about the specifications.

Do not use the product where it is exposed to direct sunlight or where water, oil, and other liquids may directly splash onto the product.

Do not install the product in places where moisture, saline matters, dusts, or cutting chips are present and pressure is applied or reduced.

The degree of protection of the product is equivalent to IP40. The product cannot be used where the temperature changes sharply or humidity is high as condensation may develop in the product and cause damage.

If 0 MPa is required, bleed the secondary side or install a 3-way valve to release the pressure to the atmosphere.

Although the pressure control range of the product includes 0 MPa, the pressure on the secondary side will not be completely released (the pressure of 1%FS or less of the maximum control pressure will remain).

Working conditions for CE compliance

This product conforms to the EMC Directive and CE standard. The standard for the immunity for industrial environments applied to this product is EN61000-6-2; the following requirements must be satisfied in order to conform to this standard:

Conditions

The evaluation of this product is performed by using a cable that has a power supply line and a signal line, paired to assess the product's performance.

This product is not equipped with surge protection. Implement surge protection measures on the system side.

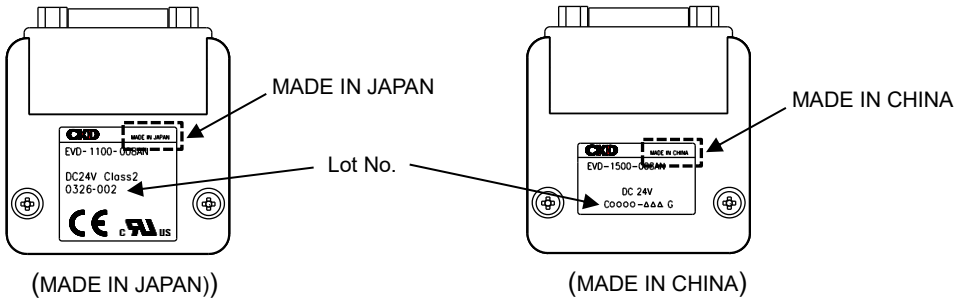
Regarding UL standard

If this product is being used as a UL-compliant product, please take care the below.

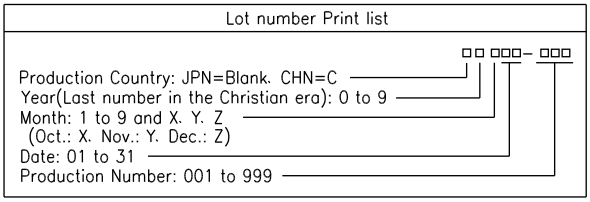
- Maximum surrounding air temperature rating of 50°C or equivalent.
- Please use the "Class 2" power supply.

UL File No.	UL Standard	Description
E339318	UL 508	Industrial Control Equipment

※UL mark is for Japanese products only.



(MADE IN JAPAN)) (MADE IN CHINA)



UL mark is attached to products produced after October 2020.
(Lot №0X01-001 or later)

Note

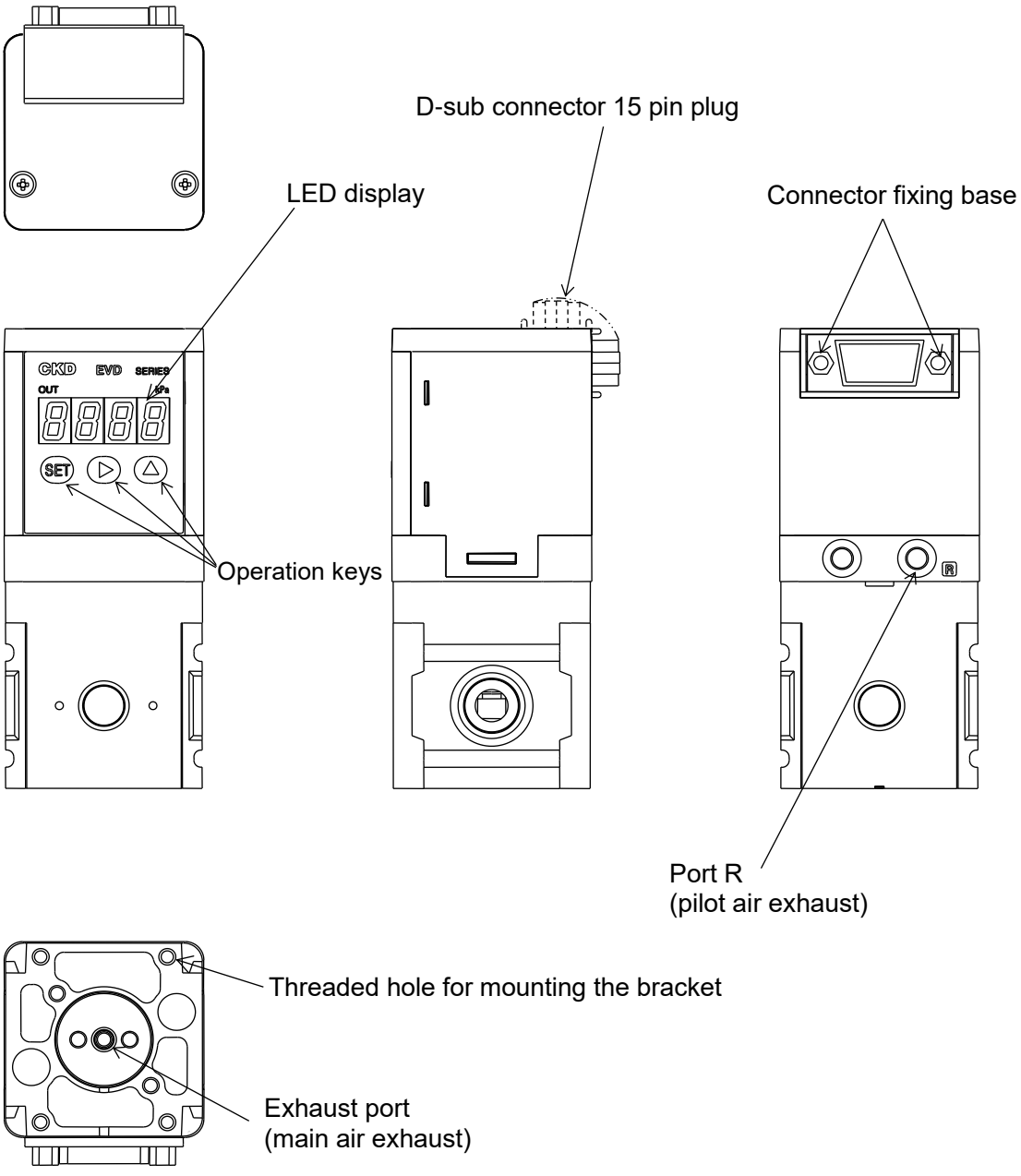
CONTENTS

1. PRODUCT OVERVIEW

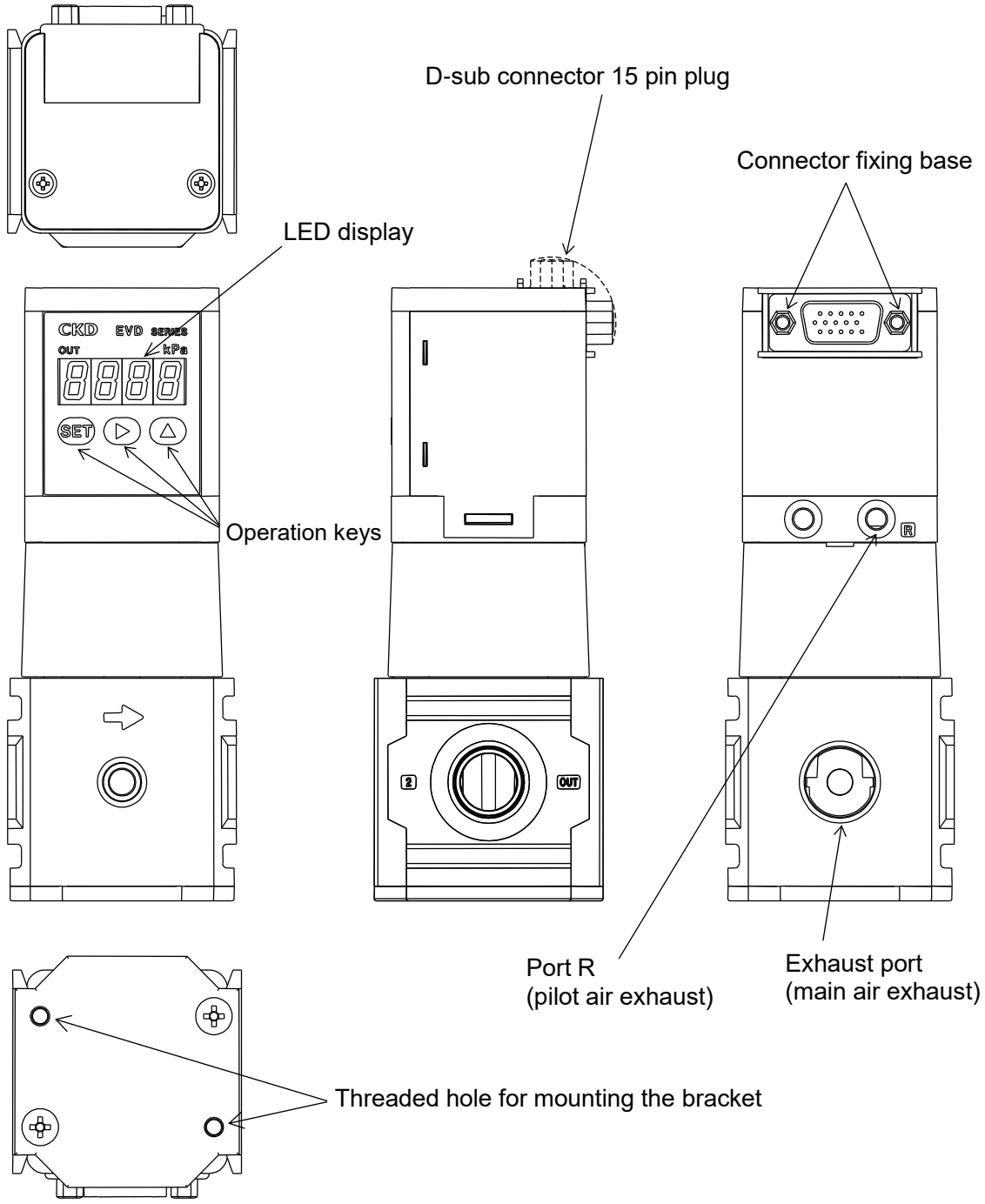
1.1 Part Name

1.1.1 Body

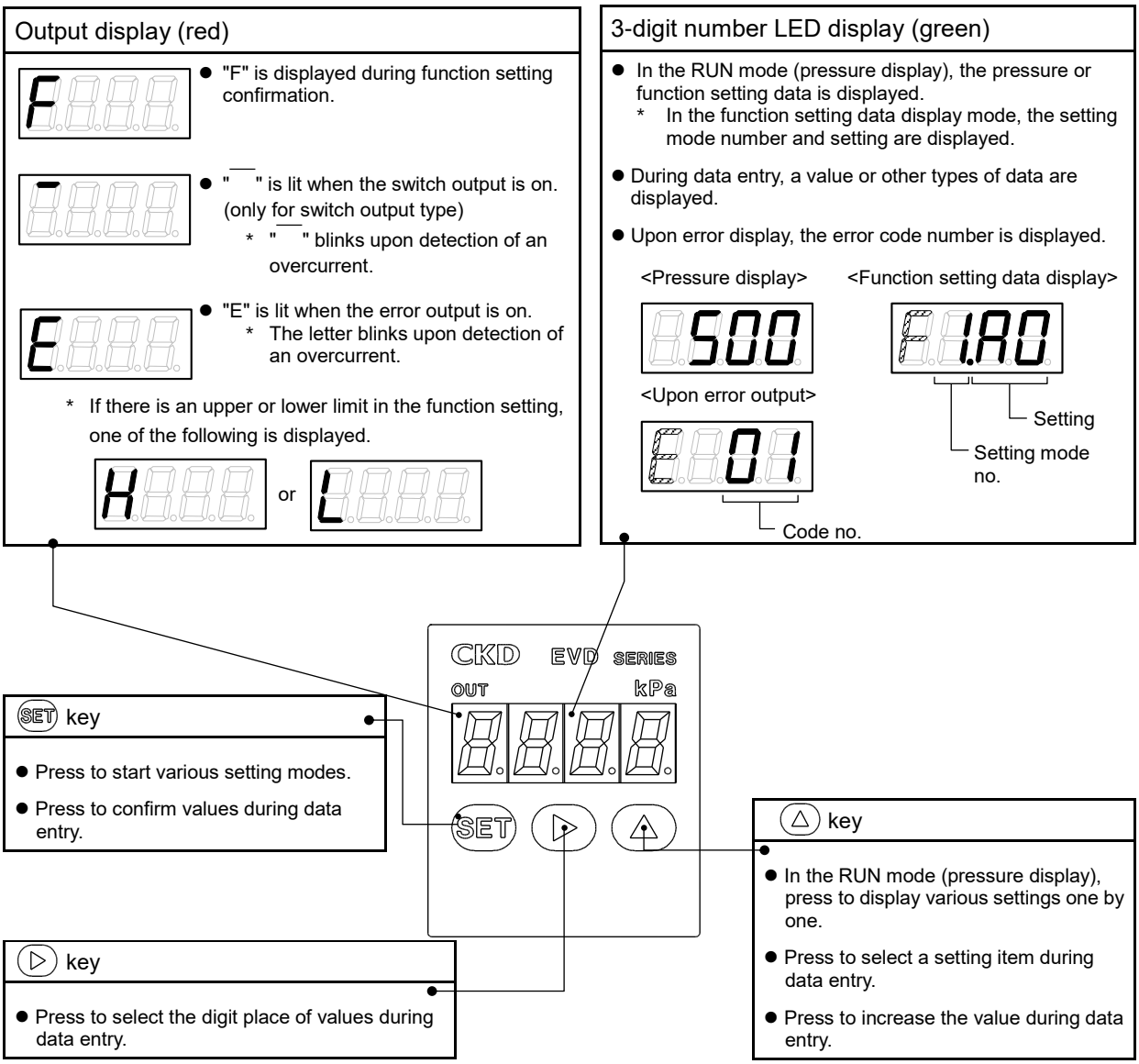
■ **EVD-1000 Series**



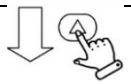
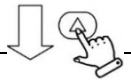
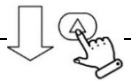
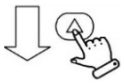
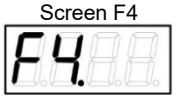
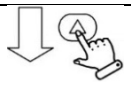
■ EVD-3000 Series



1.1.2 Names and functions of display and operation panel



1.2 Functions

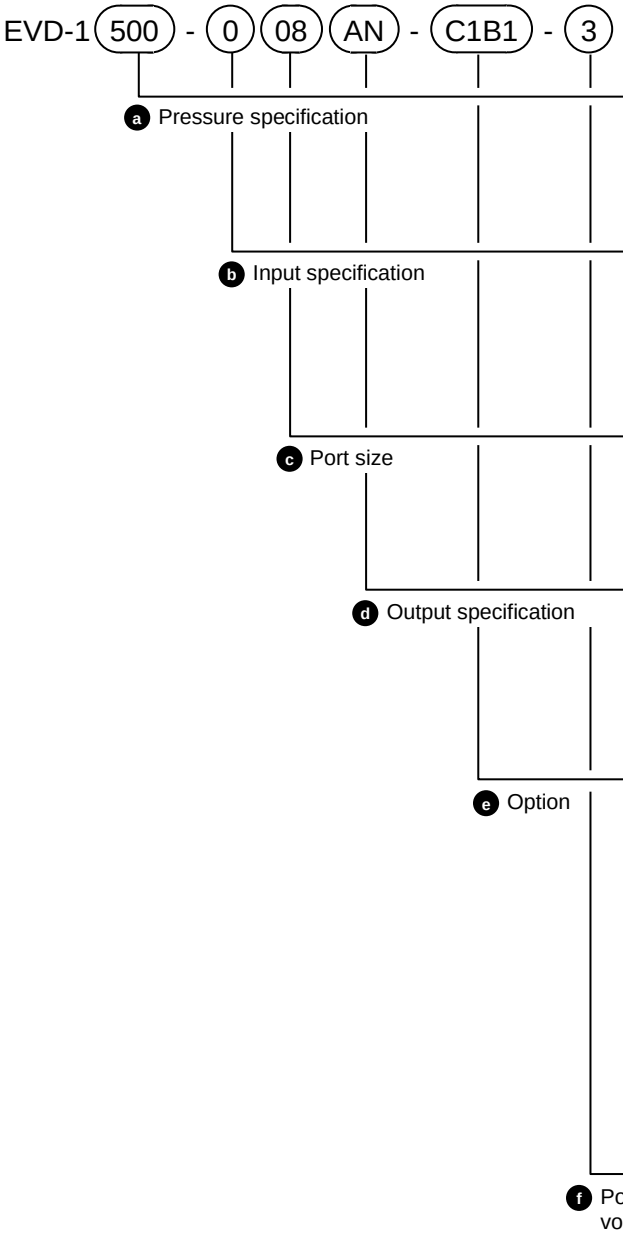
Screen	Description	Details (run mode)	Setting details (setting mode)	Related page
	Pressure display	Indicates the secondary side pressure with 3-digit number. Unit: kPa 1 digit = 1 kPa		
 Screen F1  	**Input signal selection**	Indicates the selected input signal type and current set value (pressure conversion value). * When preset input (8-point) is selected, the currently selected preset number and set value are displayed.	**<Analog input type>** Select analog input, preset input, or direct memory input. For preset input or direct memory input, input a set value in this mode. **<Parallel input type>** Select parallel input or direct memory input. For direct memory input, input a set value in this mode.	**P.27** **P.28** **P.33** **P.34** **P.32**
Screen F2  	**Zero/span adjustment**	Indicates the validity of the zero/span adjustment and the set value. When enabled, "**F2.on**" is displayed, zero point set value (L) and span point set value (H) are displayed alternately. * This function is set to full-scale at the factory setting.	Select using with full-scale or with zero/span adjustment. When zero/span adjustment is selected, the adjustment value can be set randomly in this mode.	**P.29** **P.35** **P.32**
Screen F3 	**Automatic power off**	Indicates whether automatic power off is enabled or disabled. * This function is set to disabled at the factory setting.	Select to enable or disable the automatic power off. Note: The automatic power off time is set to approximately one minute and cannot be changed.	**P.29** **P.35**
 Screen F4 	**Switch output** * **Switch output type only**	Indicates whether switch output is enabled or disabled and the set value. For "**Mode 1** enabled", "**F4.1**" is displayed, and "−" tolerance range set value (L) and "+" tolerance range set value (H) are displayed alternately. For "**Mode 2** enabled", "**F4.2**" is displayed and lower set value (L) and upper set value (H) are displayed alternately. *This function is set to disabled  at the factory setting.	Select to enable or disable the switch output. If enabled, "**Mode 1**" and "**Mode 2**" can be selected. +/− tolerance values and upper/lower values can be set randomly. Note: The hysteresis width cannot be set.	**P.30** **P.36** **P.32**
 Screen F5 	**Proportional value change** * **EDV-1100/3100 only**	Indicates the validity of proportional value change and its set level. For "Higher proportional value",  is displayed. For "Lower proportional value",  and its set level are displayed alternately. * The value is set to standard value  at the factory setting.	Select to either using the standard value or changing the proportional value. The proportional value level can be set in this mode only if "Lower proportional value" is selected (10 levels).	**P.31** **P.37** **P.32**

F4: Switch output is available only for the switch output type. This function cannot be used for analog output type.
Target model: EVD-1□00-□□SN, EVD-1□00-□□SP, EVD-3□00-□□SN, EVD-3□00-□□SP

F5: Proportional value change is a function limited to the maximum pressure 100 kPa type.
Target model: EVD-1100-□□□, EVD-3100-□□□
* For EVD-1500, EVD-1900, EVD-3500, EVD-3900, contact your nearest CKD sales office or distributor.

1.3 Model Number Indication

■ EVD-1000 Series



Symbol	Description
a Pressure specification	
100	100 kPa
500	500 kPa
900	900 kPa

b Input specification	
0	0 VDC to 10 VDC
1	0 VDC to 5 VDC
2	4 mADC to 20 mADC
P	Parallel 10-bit

c Port size	
08	Rc1/4
08G	G1/4
08N	NPT1/4

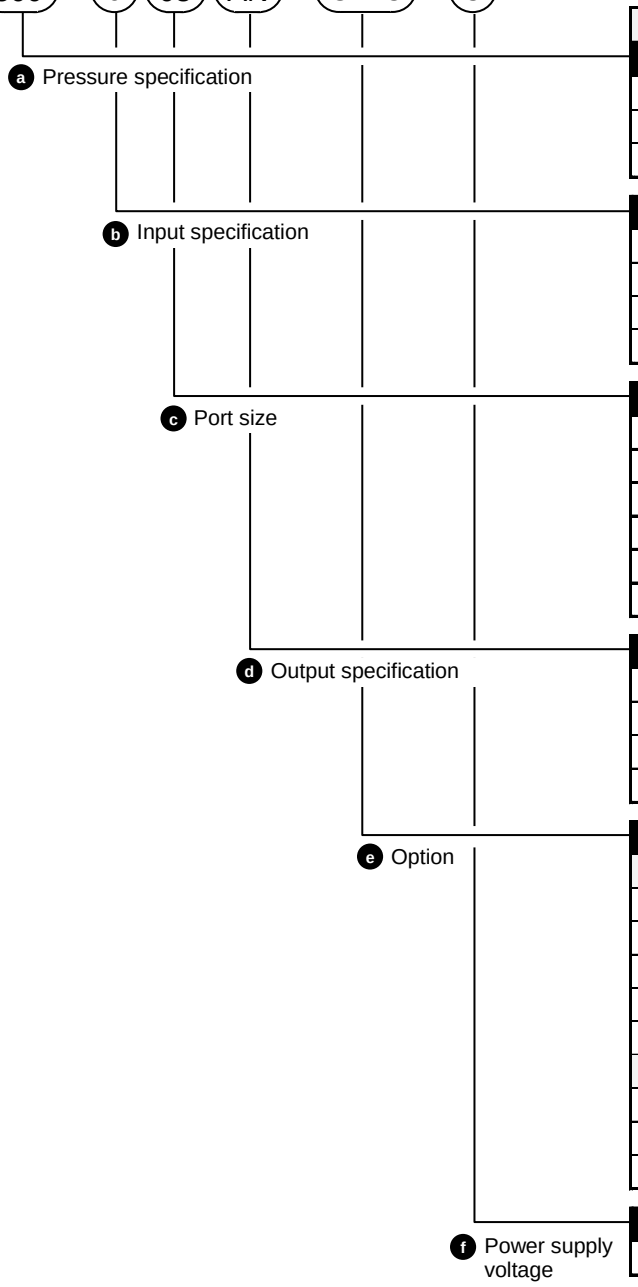
d Output specification	
AN	1 V to 5 V analog, error (NPN)
AP	1 V to 5 V analog, error (PNP)
SN	Switch (NPN), error (NPN)
SP	Switch (PNP), error (PNP)

e Option	
Cable option	
Blank	None
C1	Analog 9-conductor cable, 1 m
C3	Analog 9-conductor cable, 3 m
P1	Parallel 15-conductor cable, 1 m
P3	Parallel 15-conductor cable, 3 m
Bracket option	
Blank	None
B1	B-type bracket, floor mounted
L1	L-type bracket, wall mounted

f Power supply voltage	
3	24 VDC

■ EVD-3000 Series

EVD-3 (500) - (0) (08) (AN) - (C1B3) - (3)



Symbol	Description
a Pressure specification	
100	100 kPa
500	500 kPa
900	900 kPa
b Input specification	
0	0 VDC to 10 VDC
1	0 VDC to 5 VDC
2	4 mADC to 20 mADC
P	Parallel 10-bit
c Port size	
08	Rc1/4
10	Rc3/8
08G	G1/4
10G	G3/8
08N	NPT1/4
10N	NPT3/8
d Output specification	
AN	1 V to 5 V analog, error (NPN)
AP	1 V to 5 V analog, error (PNP)
SN	Switch (NPN), error (NPN)
SP	Switch (PNP), error (PNP)
e Option	
Cable option	
Blank	None
C1	Analog 9-conductor cable, 1 m
C3	Analog 9-conductor cable, 3 m
P1	Parallel 15-conductor cable, 1 m
P3	Parallel 15-conductor cable, 3 m
Bracket option	
Blank	None
B3	B-type bracket, floor mounted
L3	L-type bracket, wall mounted
f Power supply voltage	
3	24 VDC

1.4 Specifications

■ EVD-1100-0/1/2/P (maximum pressure: 100 kPa)

Descriptions		EVD-1100-[*1][*2]□ (*1--- 0/1/2) Analog type	EVD-1100-P[*2]□ Parallel type
Working fluid		Clean compressed air (equivalent to ISO Class 1. 3. 2)	
Max. working pressure		160 kPa	
Min. working pressure		Control pressure +50 kPa	
Proof pressure	Inlet side	240 kPa	
	Outlet side	150 kPa	
Pressure control range Note 1		0 kPa to 100 kPa	
Power supply voltage		24 VDC ± 10% (stabilized power supply with ripple rate of 1% or less)	
Current consumption		0.15 A or less (starting current is 0.6 A or less when the power is turned on)	
Input signal (input impedance)		0 VDC to 10 VDC (6.7 kΩ) 0 VDC to 5 VDC (10 kΩ) 4 mADC to 20 mADC (250 kΩ)	10-bit
Preset input		8-point	None
Output signal Note 2		Analog output: 1 VDC to 5 VDC (connected load impedance 500 kΩ or more) Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Error output signal		NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Direct memory setting		1 kPa to 100 kPa (min. set width 1 kPa/set resolution 1 kPa)	
Hysteresis Note 3		0.5%FS or less	
Linearity Note 3		± 0.3%FS or less	
Resolution Note 3		0.2%FS or less	
Repeatability Note 3		0.3%FS or less	
Temperature characteristics	Zero point fluctuation	0.15%FS/°C or less	
	Span fluctuation	0.07%FS/°C or less	
Max. flow rate (ANR) Note 4		60 L/min	
Step response Note 5	No load	0.2 sec or less	
	With 1000 cm^3 load	0.8 sec or less	
Vibration resistance		98 m/s^2 or less	
Ambient temperature		5°C to 50°C	
Fluid temperature		5°C to 50°C	
Port size		[*2] =08 Rc1/4 [*2] =08G G1/4 [*2] =08N NPT1/4	
Mounting orientation		No restriction	
Weight (body)		250 g	
Protection circuit		Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection	

Note 1: There is 1%FS or less residual pressure (1 kPa or less) when the input signal is 0%.
Note 2: Select either analog output or switch output.
Note 3: The characteristics are based on the condition that power supply voltage is 24 VDC ± 0.1 VDC, working pressure is set to maximum control pressure +50 kPa, and control pressure is 10% to 90% (with no load, ambient temperature of 25°C ± 3°C). Also, the specified values are only for when the secondary side is a closed circuit and pressure fluctuations will occur if the product is used for blowing or similar applications.
Note 4: The above characteristics are based on the condition that working pressure and control pressure are set to their maximum.
Note 5: The above characteristics are based on the condition that working pressure is set to maximum and the step amount is changed from (50%FS to 100%FS
50%FS to 60%FS
50%FS to 40%FS.

■ EVD-1500-0/1/2/P (maximum pressure: 500 kPa)

Descriptions		EVD-1500-[*1][*2]□ (*1--- 0/1/2)	EVD-1500-P[*2]□
		Analog type	Parallel type
Working fluid		Clean compressed air (equivalent to ISO Class 1. 3. 2)	
Max. working pressure		700 kPa	
Min. working pressure		Control pressure +100 kPa	
Proof pressure	Inlet side	1050 kPa	
	Outlet side	750 kPa	
Pressure control range Note 1		0 kPa to 500 kPa	
Power supply voltage		24 VDC ± 10% (stabilized power supply with ripple rate of 1% or less)	
Current consumption		0.15 A or less (starting current is 0.6 A or less when the power is turned on)	
Input signal (input impedance)		0 VDC to 10 VDC (6.7 kΩ)	10-bit
		0 VDC to 5 VDC (10 kΩ)	
		4 mADC to 20 mADC (250 kΩ)	
Preset input		8-point	None
Output signal Note 2		Analog output: 1 VDC to 5 VDC (connected load impedance 500 kΩ or more)	
		Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Error output signal		NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Direct memory setting		5 kPa to 500 kPa (min. set width 1 kPa/set resolution 1 kPa)	
Hysteresis Note 3		0.5%FS or less	
Linearity Note 3		± 0.3%FS or less	
Resolution Note 3		0.2%FS or less	
Repeatability Note 3		0.3%FS or less	
Temperature characteristics	Zero point fluctuation	0.15%FS/°C or less	
	Span fluctuation	0.07%FS/°C or less	
Max. flow rate (ANR) Note 4		400 L/min	
Step response Note 5	No load	0.2 sec or less	
	With 1000 cm^3 load	0.8 sec or less	
Vibration resistance		98 m/s^2 or less	
Ambient temperature		5°C to 50°C	
Fluid temperature		5°C to 50°C	
Port size		[*2] =08 Rc1/4 [*2] =08G G1/4 [*2] =08N NPT1/4	
Mounting orientation		No restriction	
Weight (body)		250 g	
Protection circuit		Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection	

Note 1: There is 1%FS or less residual pressure (5 kPa or less) when the input signal is 0%.
Note 2: Select either analog output or switch output.
Note 3: The characteristics are based on the condition that power supply voltage is 24 VDC ± 0.1 VDC, working pressure is set to maximum control pressure +100 kPa, and control pressure is 10% to 90% (with no load, ambient temperature of 25°C ± 3°C). Also, the specified values are only for when the secondary side is a closed circuit and pressure fluctuations will occur if the product is used for blowing or similar applications.
Note 4: The above characteristics are based on the condition that working pressure and control pressure are set to their maximum.
Note 5: The above characteristics are based on the condition that working pressure is set to maximum and the step amount is changed from (50%FS to 100%FS
50%FS to 60%FS
50%FS to 40%FS.

■ EVD-1900-0/1/2/P (maximum pressure: 900 kPa)

Descriptions		EVD-1900-[*1][*2]□ (*1--- 0/1/2)	EVD-1900-P[*2]□
		Analog type	Parallel type
Working fluid		Clean compressed air (equivalent to ISO Class1. 3. 2)	
Max. working pressure		1000 kPa	
Min. working pressure		Control pressure + 100 kPa	
Proof pressure	Inlet side	1500 kPa	
	Outlet side	1350 kPa	
Pressure control range Note 1		0 kPa to 900 kPa	
Power supply voltage		24 VDC ± 10% (stabilized power supply with ripple rate of 1% or less)	
Current consumption		0.15 A or less (starting current is 0.6 A or less when the power is turned on)	
Input signal (input impedance)		0 VDC to 10 VDC (6.7 kΩ)	10-bit
		0 VDC to 5 VDC (10 kΩ)	
		4 mADC to 20 mADC (250 kΩ)	
Preset input		8-point	None
Output signal Note 2		Analog output: 1 VDC to 5 VDC (connected load impedance 500 kΩ or more)	
		Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Error output signal		NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Direct memory setting		9 kPa to 900 kPa (min. set width 1 kPa/set resolution 2 kPa)	
Hysteresis Note 3		0.5%FS or less	
Linearity Note 3		± 0.3%FS or less	
Resolution Note 3		0.2%FS or less	
Repeatability Note 3		0.3%FS or less	
Temperature characteristics	Zero point fluctuation	0.15%FS/°C or less	
	Span fluctuation	0.07%FS/°C or less	
Max. flow rate (ANR) Note 4		400 L/min	
Step response Note 5	No load	0.2 sec or less	
	With 1000 cm^3 load	0.8 sec or less	
Vibration resistance		98 m/s^2 or less	
Ambient temperature		5°C to 50°C	
Fluid temperature		5°C to 50°C	
Port size		[*2] =08 Rc1/4 [*2] =08G G1/4 [*2] =08N NPT1/4	
Mounting orientation		No restriction	
Weight (body)		250 g	
Protection circuit		Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection	

Note 1: There is 1%FS or less residual pressure (9 kPa or less) when the input signal is 0%.
Note 2: Select either analog output or switch output.
Note 3: The characteristics are based on the condition that power supply voltage is 24 VDC ± 0.1 VDC, working pressure is set to maximum control pressure +100 kPa, and control pressure is 10% to 90% (with no load, ambient temperature of 25°C ± 3°C). Also, the specified values are only for when the secondary side is a closed circuit and pressure fluctuations will occur if the product is used for blowing or similar applications.
Note 4: The above characteristics are based on the condition that working pressure and control pressure are set to their maximum.
Note 5: The above characteristics are based on the condition that working pressure is set to maximum and the step amount is changed from (50%FS to 100%FS
50%FS to 60%FS
50%FS to 40%FS.

■ EVD-3100-0/1/2/P (maximum pressure: 100 kPa)

Descriptions		EVD-3100-[*1][*2]□ (*1--- 0/1/2)	EVD-3100-P[*2]□
		Analog type	Parallel type
Working fluid		Clean compressed air (equivalent to ISO Class 1. 3. 2)	
Max. working pressure		160 kPa	
Min. working pressure		Control pressure +50 kPa	
Proof pressure	Inlet side	240 kPa	
	Outlet side	150 kPa	
Pressure control range Note 1		0 kPa to 100 kPa	
Power supply voltage		24 VDC ± 10% (stabilized power supply with ripple rate of 1% or less)	
Current consumption		0.15 A or less (starting current is 0.6 A or less when the power is turned on)	
Input signal (input impedance)		0 VDC to 10 VDC (6.7 kΩ)	10-bit
		0 VDC to 5 VDC (10 kΩ)	
		4 mADC to 20 mADC (250 kΩ)	
Preset input		8-point	None
Output signal Note 2		Analog output: 1 VDC to 5 VDC (connected load impedance 500 kΩ or more)	
		Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Error output signal		NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Direct memory setting		1 kPa to 100 kPa (min. set width 1 kPa/set resolution 1 kPa)	
Hysteresis Note 3		0.5%FS or less	
Linearity Note 3		± 0.3%FS or less	
Resolution Note 3		0.2%FS or less	
Repeatability Note 3		0.3%FS or less	
Temperature characteristics	Zero point fluctuation	0.15%FS/°C or less	
	Span fluctuation	0.07%FS/°C or less	
Max. flow rate (ANR) Note 4		700 L/min	
Step response Note 5	No load	0.2 sec or less	
	With 1000 cm^3 load	0.8 sec or less	
Vibration resistance		98 m/s^2 or less	
Ambient temperature		5°C to 50°C	
Fluid temperature		5°C to 50°C	
Port size	IN, OUT port	[*2] =08 Rc1/4, [*2] =10 Rc3/8 [*2] =08G G1/4, [*2] =10G G3/8 [*2] =08N NPT1/4, [*2] =10N NPT3/8	
	EXH port	[*2] =08,10 Rc3/8 [*2] =08G,10G G3/8 [*2] =08N,10N NPT3/8	
Mounting orientation		No restriction	
Weight (body)		450 g	
Protection circuit		Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection	

Note 1: There is 1%FS or less residual pressure (1 kPa or less) when the input signal is 0%.
Note 2: Select either analog output or switch output.
Note 3: The characteristics are based on the condition that power supply voltage is 24 VDC ± 0.1 VDC, working pressure is set to maximum control pressure +50 kPa, and control pressure is 10% to 90% (with no load, ambient temperature of 25°C ± 3°C). Also, the specified values are only for when the secondary side is a closed circuit and pressure fluctuations will occur if the product is used for blowing or similar applications.
Note 4: The above characteristics are based on the condition that working pressure and control pressure are set to their maximum.
Note 5: The above characteristics are based on the condition that working pressure is set to maximum and the step amount is changed from (50%FS to 100%FS
50%FS to 60%FS
50%FS to 40%FS.

■ EVD-3500-0/1/2/P (maximum pressure: 500 kPa)

Descriptions		EVD-3500-[*1][*2]□ (*1--- 0/1/2)	EVD-3500-P[*2]□
		Analog type	Parallel type
Working fluid		Clean compressed air (equivalent to ISO Class 1. 3. 2)	
Max. working pressure		700 kPa	
Min. working pressure		Control pressure +100 kPa	
Proof pressure	Inlet side	1050 kPa	
	Outlet side	750 kPa	
Pressure control range Note 1		0 kPa to 500 kPa	
Power supply voltage		24 VDC ± 10% (stabilized power supply with ripple rate of 1% or less)	
Current consumption		0.15 A or less (starting current is 0.6 A or less when the power is turned on)	
Input signal (input impedance)		0 VDC to 10 VDC (6.7 kΩ) 0 VDC to 5 VDC (10 kΩ) 4 mADC to 20 mADC (250 kΩ)	10-bit
Preset input		8-point	None
Output signal Note 2		Analog output: 1 VDC to 5 VDC (connected load impedance 500 kΩ or more)	
		Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Error output signal		NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Direct memory setting		5 kPa to 500 kPa (min. set width 1 kPa/set resolution 1 kPa)	
Hysteresis Note 3		0.5%FS or less	
Linearity Note 3		± 0.3%FS or less	
Resolution Note 3		0.2%FS or less	
Repeatability Note 3		0.3%FS or less	
Temperature characteristics	Zero point fluctuation	0.15%FS/°C or less	
	Span fluctuation	0.07%FS/°C or less	
Max. flow rate (ANR) Note 4		1500 L/min	
Step response Note 5	No load	0.2 sec or less	
	With 1000 cm^3 load	0.8 sec or less	
Vibration resistance		98 m/s^2 or less	
Ambient temperature		5°C to 50°C	
Fluid temperature		5°C to 50°C	
Port size	IN, OUT port	[*2] =08 Rc1/4, [*2] =10 Rc3/8 [*2] =08G G1/4, [*2] =10G G3/8 [*2] =08N NPT1/4, [*2] =10N NPT3/8	
	EXH port	[*2] =08,10 Rc3/8 [*2] =08G,10G G3/8 [*2] =08N,10N NPT3/8	
Mounting orientation		No restriction	
Weight (body)		450 g	
Protection circuit		Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection	

Note 1: There is 1%FS or less residual pressure (5 kPa or less) when the input signal is 0%.
Note 2: Select either analog output or switch output.
Note 3: The characteristics are based on the condition that power supply voltage is 24 VDC ± 0.1 VDC, working pressure is set to maximum control pressure +100 kPa, and control pressure is 10% to 90% (with no load, ambient temperature of 25°C ± 3°C). Also, the specified values are only for when the secondary side is a closed circuit and pressure fluctuations will occur if the product is used for blowing or similar applications.
Note 4: The above characteristics are based on the condition that working pressure and control pressure are set to their maximum.
Note 5: The above characteristics are based on the condition that working pressure is set to maximum and the step amount is changed from (50%FS to 100%FS
50%FS to 60%FS
50%FS to 40%FS.

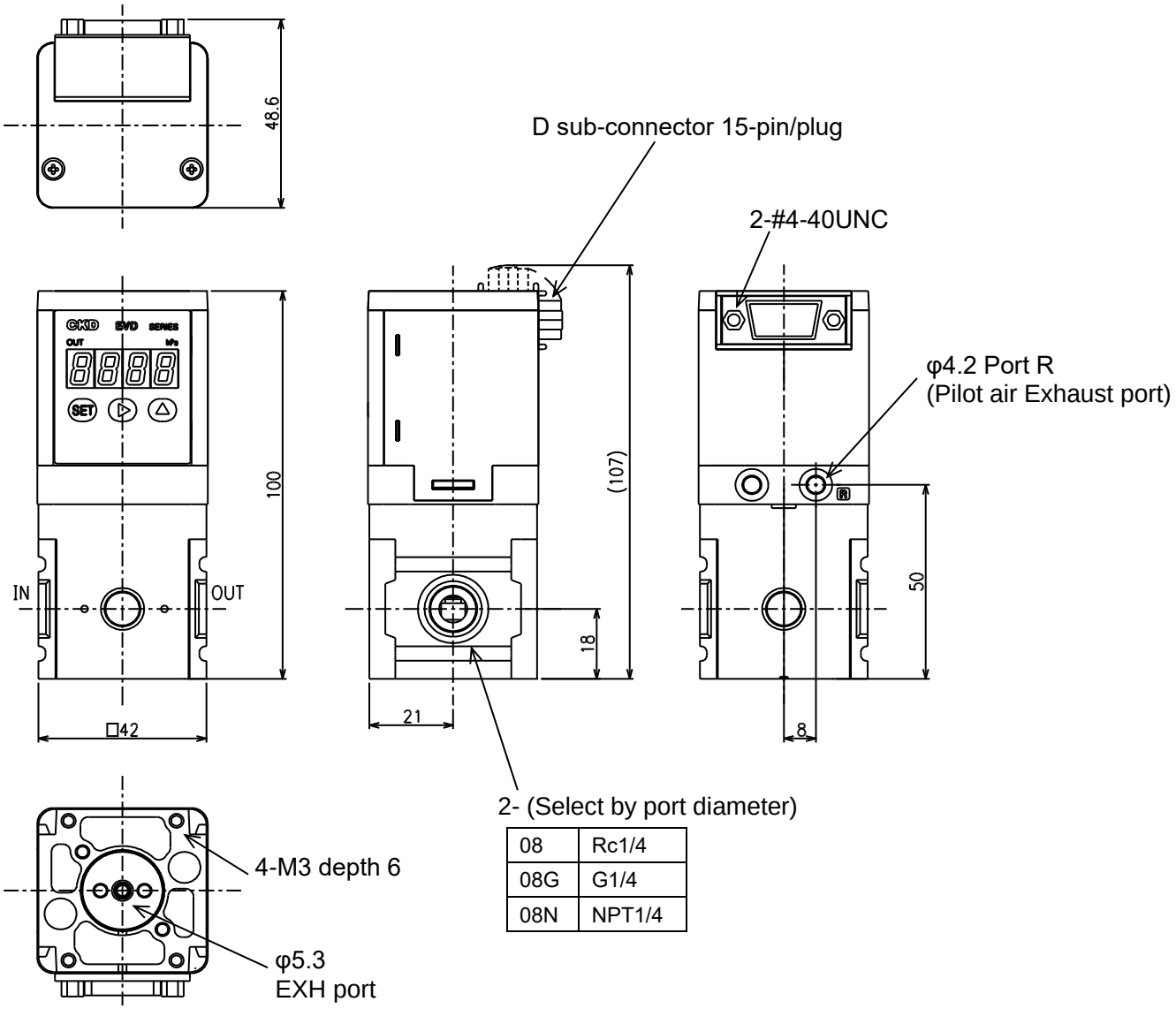
■ EVD-3900-0/1/2/P (maximum pressure: 900 kPa)

Descriptions		EVD-3900-[*1][*2]□ (*1--- 0/1/2)	EVD-3900-P[*2]□
		Analog type	Parallel type
Working fluid		Clean compressed air (equivalent to ISO Class1. 3. 2)	
Max. working pressure		1000 kPa	
Min. working pressure		Control pressure + 100 kPa	
Proof pressure	Inlet side	1500 kPa	
	Outlet side	1350 kPa	
Pressure control range Note 1		0 kPa to 900 kPa	
Power supply voltage		24 VDC ± 10% (stabilized power supply with ripple rate of 1% or less)	
Current consumption		0.15 A or less (starting current is 0.6 A or less when the power is turned on)	
Input signal (input impedance)		0 VDC to 10 VDC (6.7 kΩ)	10-bit
		0 VDC to 5 VDC (10 kΩ)	
		4 mADC to 20 mADC (250 kΩ)	
Preset input		8-point	None
Output signal Note 2		Analog output: 1 VDC to 5 VDC (connected load impedance 500 kΩ or more)	
		Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Error output signal		NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, compatible with PLC/relay	
Direct memory setting		9 kPa to 900 kPa (min. set width 1 kPa/set resolution 2 kPa)	
Hysteresis Note 3		0.5%FS or less	
Linearity Note 3		± 0.3%FS or less	
Resolution Note 3		0.2%FS or less	
Repeatability Note 3		0.3%FS or less	
Temperature characteristics	Zero point fluctuation	0.15%FS/°C or less	
	Span fluctuation	0.07%FS/°C or less	
Max. flow rate (ANR) Note 4		1500 L/min	
Step response Note 5	No load	0.2 sec or less	
	With 1000 cm^3 load	0.8 sec or less	
Vibration resistance		98 m/s^2 or less	
Ambient temperature		5°C to 50°C	
Fluid temperature		5°C to 50°C	
Port size	IN, OUT port	[*2] =08 Rc1/4, [*2] =10 Rc3/8 [*2] =08G G1/4, [*2] =10G G3/8 [*2] =08N NPT1/4, [*2] =10N NPT3/8	
	EXH port	[*2] =08,10 Rc3/8 [*2] =08G,10G G3/8 [*2] =08N,10N NPT3/8	
Mounting orientation		No restriction	
Weight (body)		450 g	
Protection circuit		Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection	

Note 1: There is 1%FS or less residual pressure (9 kPa or less) when the input signal is 0%.
Note 2: Select either analog output or switch output.
Note 3: The characteristics are based on the condition that power supply voltage is 24 VDC ± 0.1 VDC, working pressure is set to maximum control pressure +100 kPa, and control pressure is 10% to 90% (with no load, ambient temperature of 25°C ± 3°C). Also, the specified values are only for when the secondary side is a closed circuit and pressure fluctuations will occur if the product is used for blowing or similar applications.
Note 4: The above characteristics are based on the condition that working pressure and control pressure are set to their maximum.
Note 5: The above characteristics are based on the condition that working pressure is set to maximum and the step amount is changed from (50%FS to 100%FS
50%FS to 60%FS
50%FS to 40%FS.

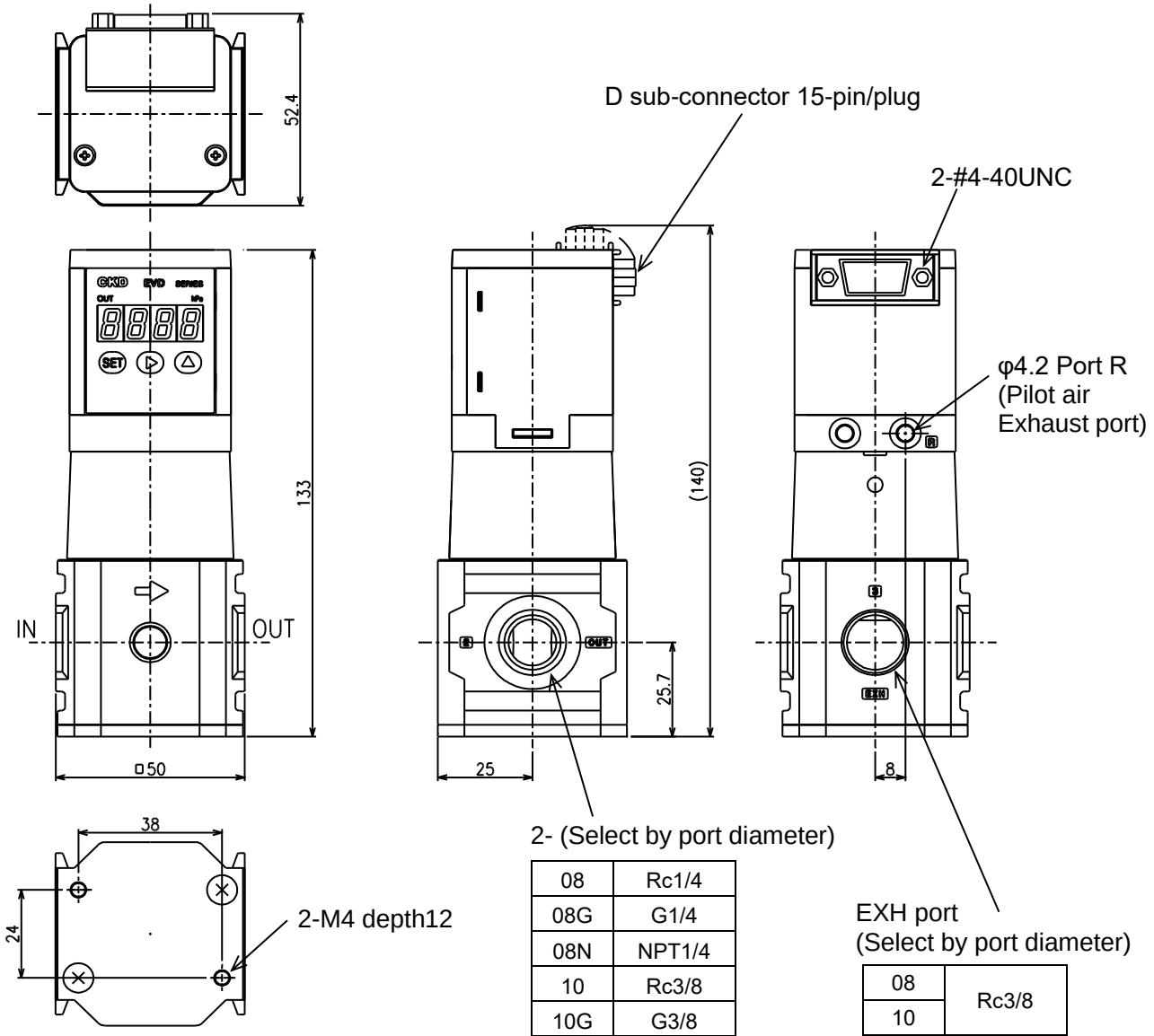
1.5 Dimensions

■ **EVD-1000 Series**



08	Rc1/4
08G	G1/4
08N	NPT1/4

■ EVD-3000 Series

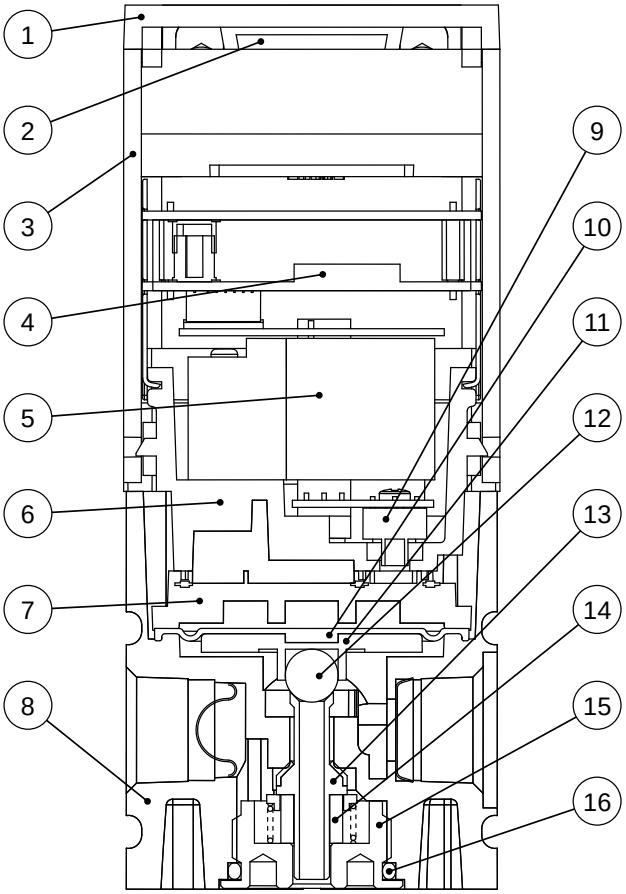


08	Rc1/4
08G	G1/4
08N	NPT1/4
10	Rc3/8
10G	G3/8
10N	NPT3/8

08	Rc3/8
10	
08G	G3/8
10G	
08N	NPT3/8
10N	

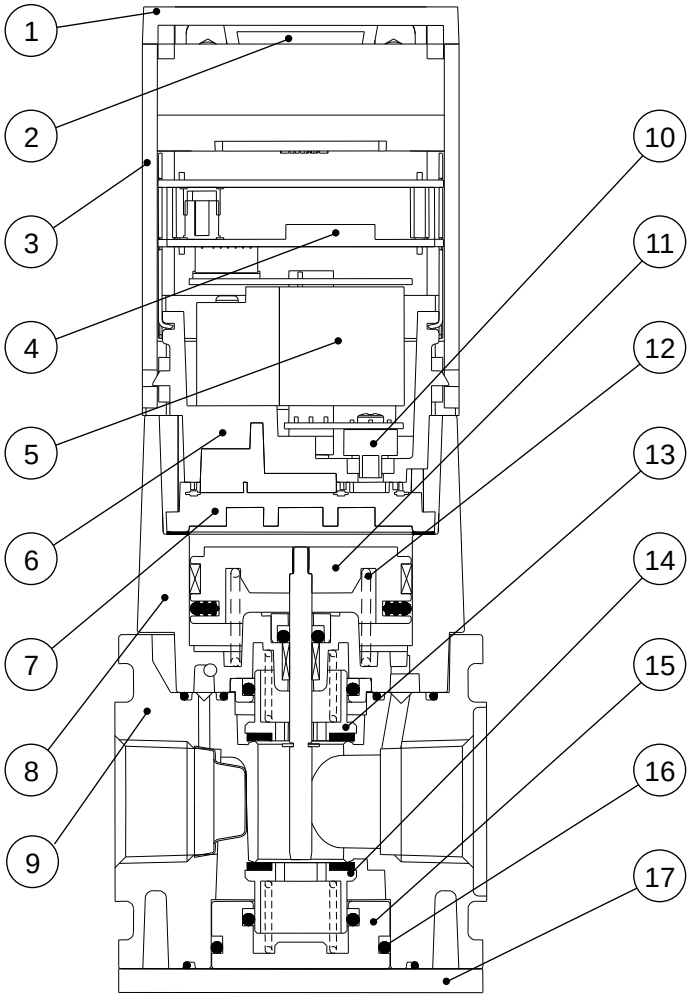
1.6 Internal Structure

■ EVD-1000 Series



No.	Part name	Material
1	Lid	PBT resin
2	D-sub connector	---
3	Housing	ABS resin
4	Controller board	---
5	3-way valve	---
6	Valve base	Polyphenylene sulfide resin
7	Pilot chamber	Polyphenylene sulfide resin
8	Body	Aluminum alloy die casting
9	Pressure sensor	---
10	Diaphragm	Special NBR
11	Relief seat	Aluminum alloy
12	Steel ball (exhaust valve)	Stainless steel
13	Valve	Special NBR, stainless steel
14	Bottom rubber	Silicone rubber
15	Bottom plug	Brass, electroless nickel plating
16	O-ring	Fluoro rubber

■ EVD-3000 Series



No.	Part name	Material
1	Lid	PBT resin
2	D-sub connector	---
3	Housing	ABS resin
4	Controller board	---
5	3-way valve	---
6	Valve base	Polyphenylene sulfide resin
7	Pilot chamber	Polyphenylene sulfide resin
8	Piston body assembly	Aluminum alloy die-casting, etc.
9	Body	Aluminum alloy die-casting
10	Pressure sensor	———
11	Piston assembly	Aluminum alloy, stainless steel, etc.
12	Spring	Stainless steel
13	Top valve	Brass, Special nitrile rubber
14	Bottom valve	Brass, Special nitrile rubber
15	Bottom cap	Brass
16	O-ring	Nitrile rubber
17	Base plate	Steel plate

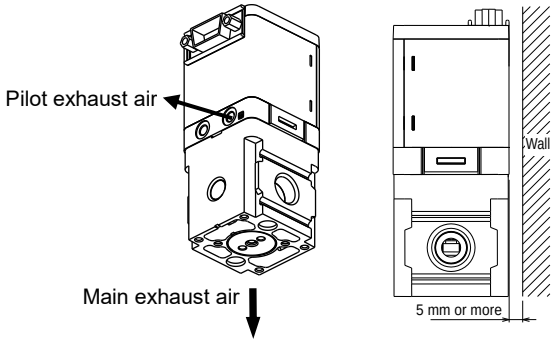
2. INSTALLATION

2.1 Mounting

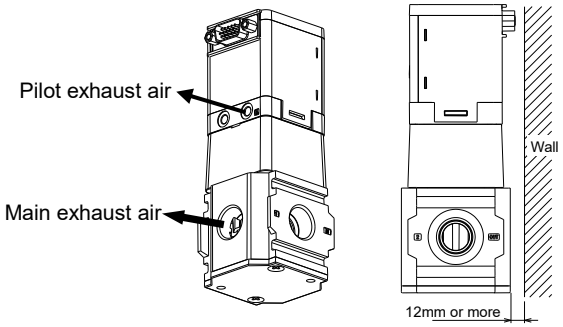
⚠ CAUTION

Secure sufficient space around the product for operation, mounting, removing, wiring, and piping.
Install a pneumatic filter immediately before the circuit in which pneumatic components are used.
Install the product so that the exhaust port is not blocked and there is sufficient space for exhaust.

・EVD-1000 Series

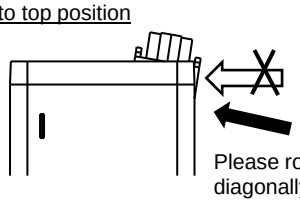


・EVD-3000 Series

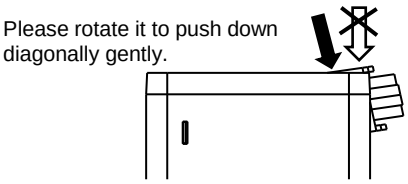


Do not force it in the direction of the arrow.
The case may be damaged.

Side to top position

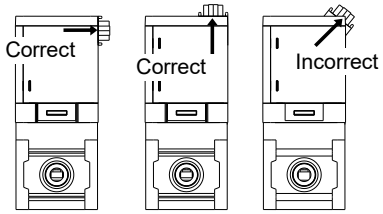


Top to side position

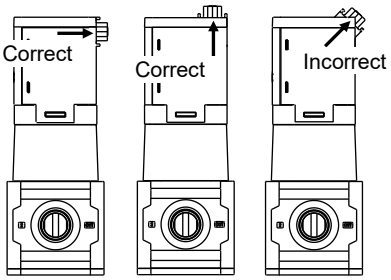


Make sure that the D-sub connector faces up or sideways (not diagonally). If the cable can be moved, secure the cable.
The rotating mechanism of the D-sub connector is not designed for use with cables that are not secured.

・EVD-1000 Series

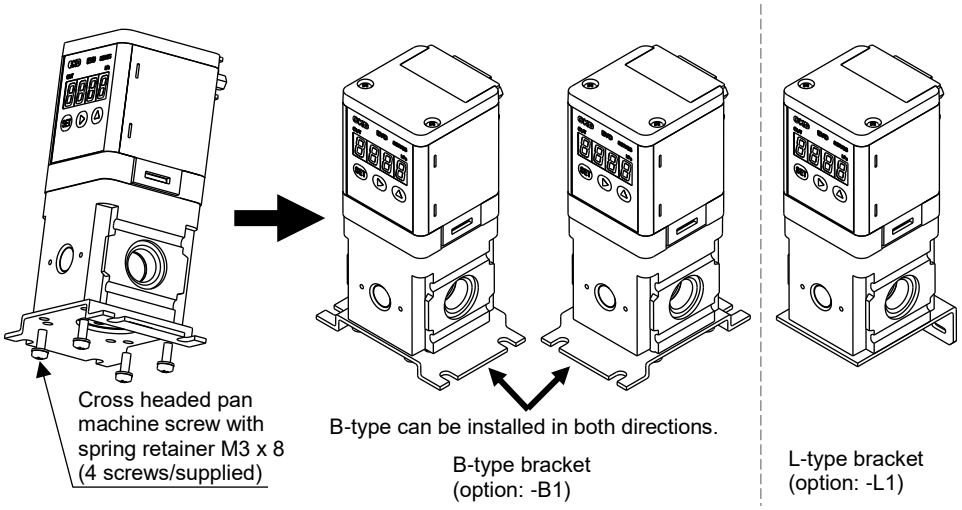


・EVD-3000 Series

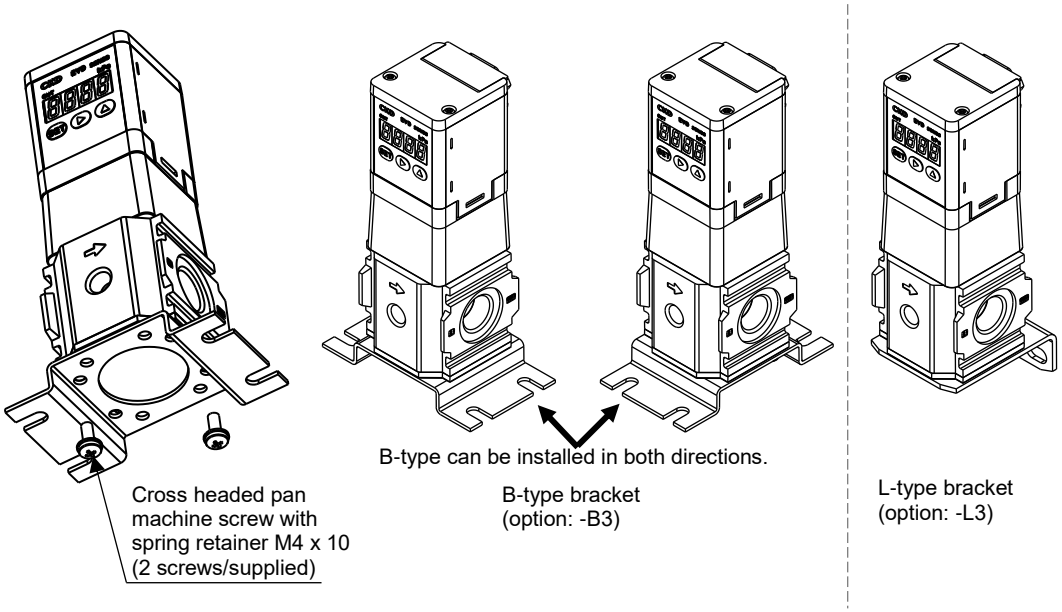


1 Attach the optional bracket to the bottom of the product.
For the optional bracket, refer to "6.1 Optional Part Model Number".

・EVD-1000 Series



・EVD-3000 Series



2 Install the body to the specified position.

2.2 Piping

⚠ CAUTION

Do not remove the port seal until just before piping.
If the port seal is removed before ready to begin piping, foreign matters may enter from the piping ports and cause a failure or malfunction.

Fully flush and clean the air pipe before use.

Open the exhaust port to the atmosphere.
The pressure cannot be properly controlled if the exhaust port is blocked with a plug.

Tighten the pipes with the appropriate tightening torque.
Observe the appropriate tightening torque to prevent air leakage and damage to the threads. To prevent damage to the screw threads, first use your hands to lightly tighten the pipe and use a tool to tighten the pipe further.

[Recommended tightening torque]

Port screw	Tightening torque N·m
1/4	6 to 8
3/8	13 to 15

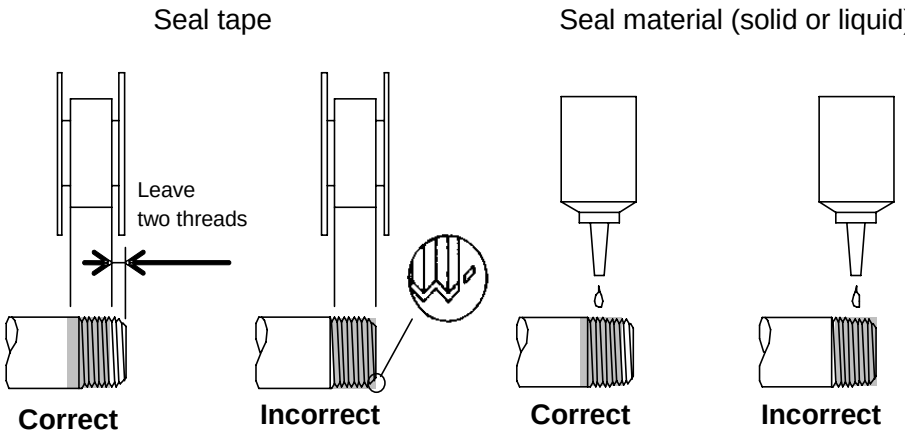
Do not apply high pressure suddenly when supplying the compressed air for the first time after connecting the pipes.

When supplying compressed air for the first time after piping is complete, make sure that there is no air leakage at the joints.
Apply leak detection agent to the joints in the piping using a brush to check for air leakage.

2.2.1 Seal material

Apply a seal tape or seal material to the screw threads leaving two or more threads at the pipe end uncovered or uncoated. If the pipe end is fully covered or coated, a shred of seal tape or residue of seal material may enter inside of the pipes or device and cause a failure.

When using a seal tape, wind it around the screw threads in the direction opposite from the screw threads and press it down with your fingers to attach it firmly.
When using a liquid seal material, be careful not to apply it to the resin parts. It damages the resin parts and causes a failure or malfunction. Also, do not apply it to the internal threads.



2.3 Wiring

⚠ WARNING

Check the connector pins and the cable conductor colors before wiring.
Incorrect wiring may cause damage, failure, and malfunctions of the product. Check the wire color described in the Instruction Manual before wiring.

Check the wiring insulation.
Make sure that the wires do not contact other circuits and there is no ground fault and insulation failure between terminals. Overcurrent may flow into the product and result in damage.

Use a DC stabilized power supply for the product that is within the rating and insulated from the AC power.
Uninsulated power may cause an electric shock. If the power is not stabilized, the peak value may exceed the rating. This may damage the product or lead to poor accuracy.

Stop the control device and the machinery and turn off the power before wiring.
Operating the product suddenly may cause an unexpected behavior and a dangerous situation. Perform an electrical current test with the control device and the machinery stopped and set the required data. Discharge static electricity from your body, tools, and devices before and during work. For movable sections, use wiring material with the same level of bending resistance as the robot wire.

Use the product within the power supply voltage range.
If voltage or AC power (100 VAC) out of the specified range is applied, the product may burst or an electric shock or a fire may occur.

Do not short-circuit the load.
The product may burst or burn.

⚠ CAUTION

Insulate unused wires to avoid contact with other wires.
Incorrect wiring may cause damage, failure, and malfunctions of the product.

2.3.1 D-sub connector

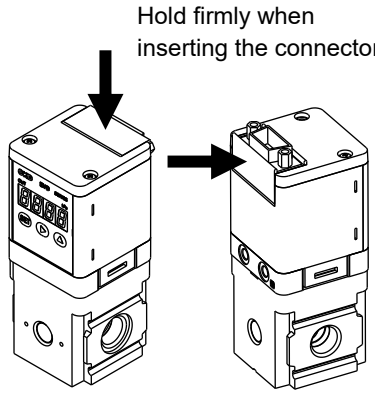
⚠ CAUTION

Insert the D-sub connector all the way in.

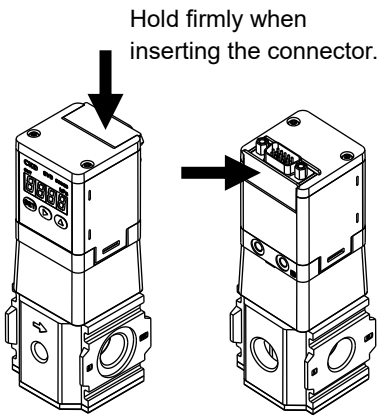
Hold the D-sub connector firmly so that it faces up or sideways when inserting it.

The rotating mechanism of the D-sub connector allows a 90 degree rotation.

・EVD-1000 Series

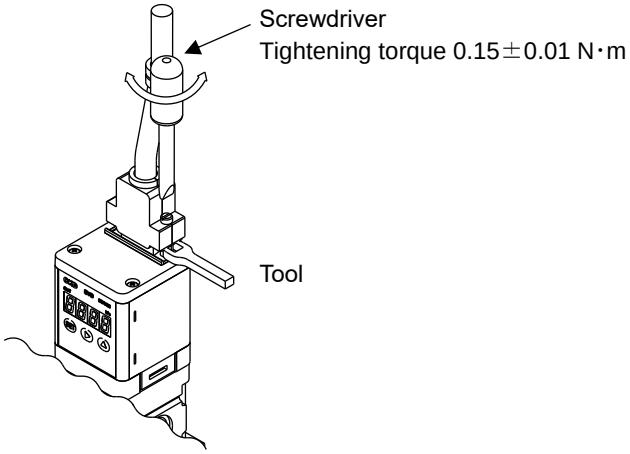


・EVD-3000 Series



Lock the D-sub connector to prevent it from falling off.

When loosening the lock, secure the fixing base with a tool.



Check the product model number and use extreme care when wiring.

Insulate wires to avoid contact with other wires (including the shielded wires) when analog output, switch output, or preset input is not used.

Connect the shielded wires to the ground on the power side.

2.3.2 Cable connection

■ Analog input type: EVD-1□00-0/1/2, EVD-3□00-0/1/2

D-sub socket pin no.	1	2	3	4	5	6 to 9	10	11			12	13		14	15
Optional cable insulator color	Brown	Orange	Yellow	-	Red	-	Gray	White			-	Green		Blue	Black
Item	Preset input signal			Not used	Power+	Not used	Common	Input signal			Not used	Analog output	Switch output	Error output	Power− (0 V)
Input type	Bit 1	Bit 2	Bit 3		+24 VDC			0 VDC to 10 VDC	0 VDC to 5 VDC	4 mADC to 20 mADC		Output 1 VDC to 5 VDC	NPN or PNP output	NPN or PNP output	

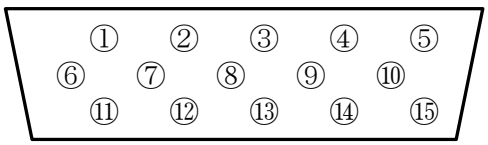
* Pin number 10 is the common terminal for the preset input and the integration reset signals (pin numbers 1 to 3).

■ Parallel input type: EVD-1□00-P, EVD-3□00-P

D-sub socket pin no.	1	2	3	4	5	6	7	8	9	10	11	12	13		14	15
Optional cable insulator color	Brown	Orange	Yellow	Purple	Red	Light blue	Pink	White (with black line)	Red (with black line)	Gray	White	Green (with black line)	Green		Blue	Black
Item	Parallel input signal				Power+	Parallel input signal				Common	Parallel input signal		Analog output	Switch output	Error output	Power− (0 V)
Input type	Bit 1	Bit 2	Bit 3	Bit 4	+24 VDC	Bit 5	Bit 6	Bit 7	Bit 8		Bit9	Bit10	Output 1 VDC to 5 VDC	NPN or PNP output	NPN or PNP output	

* Pin number 10 is the common terminal for the parallel input signals (pin numbers 1 to 4, 6 to 9, 11, and 12).

<Connector pin layout> (product body)

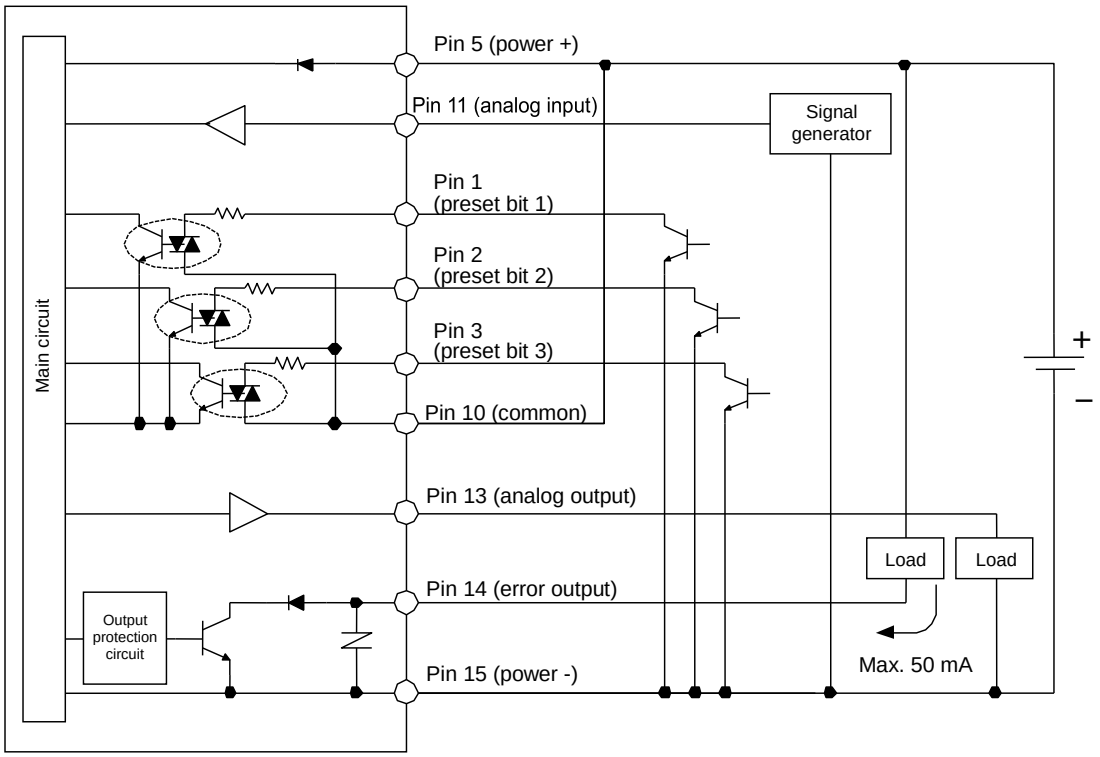


* Pins number 4, 6, 7, 8, 9 and 12 are not provided for the analog input type.

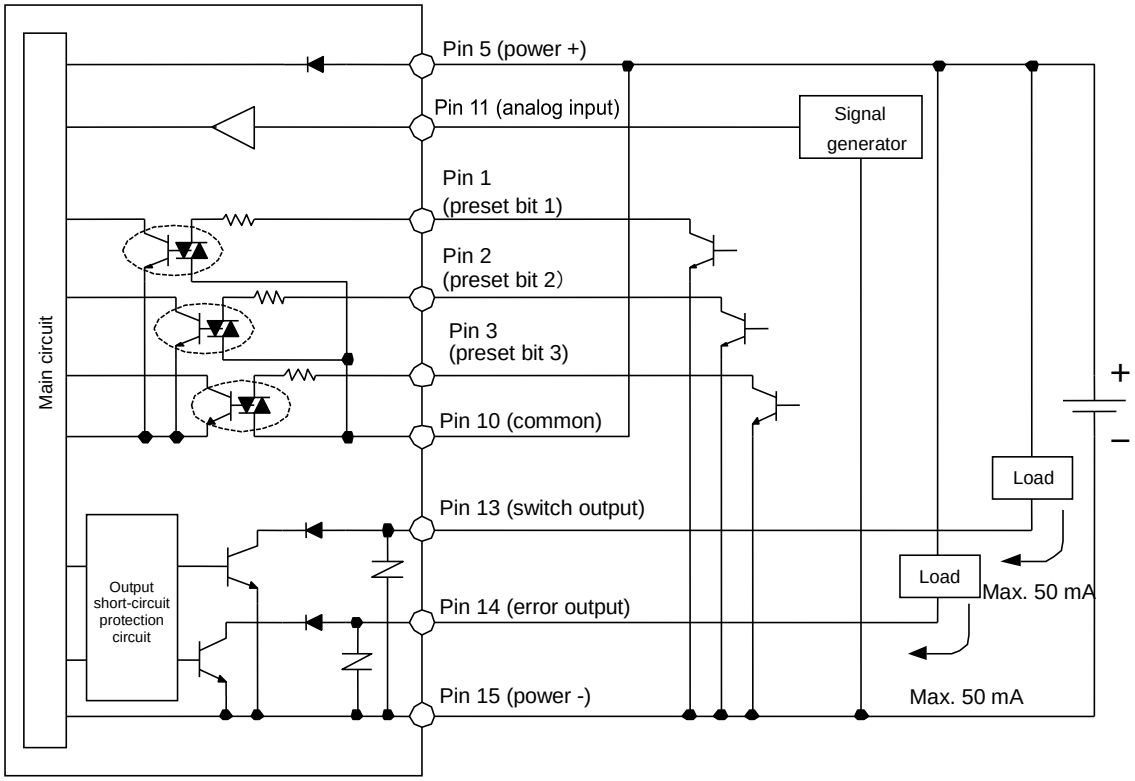
2.3.3 Example of internal circuit and load connection

■ Analog input type: EVD-1☐00-0/1/2, EVD-3☐00-0/1/2

• EVD-1☐00-☐☐AN, EVD-3☐00-☐☐AN: Analog output + error <NPN> output type

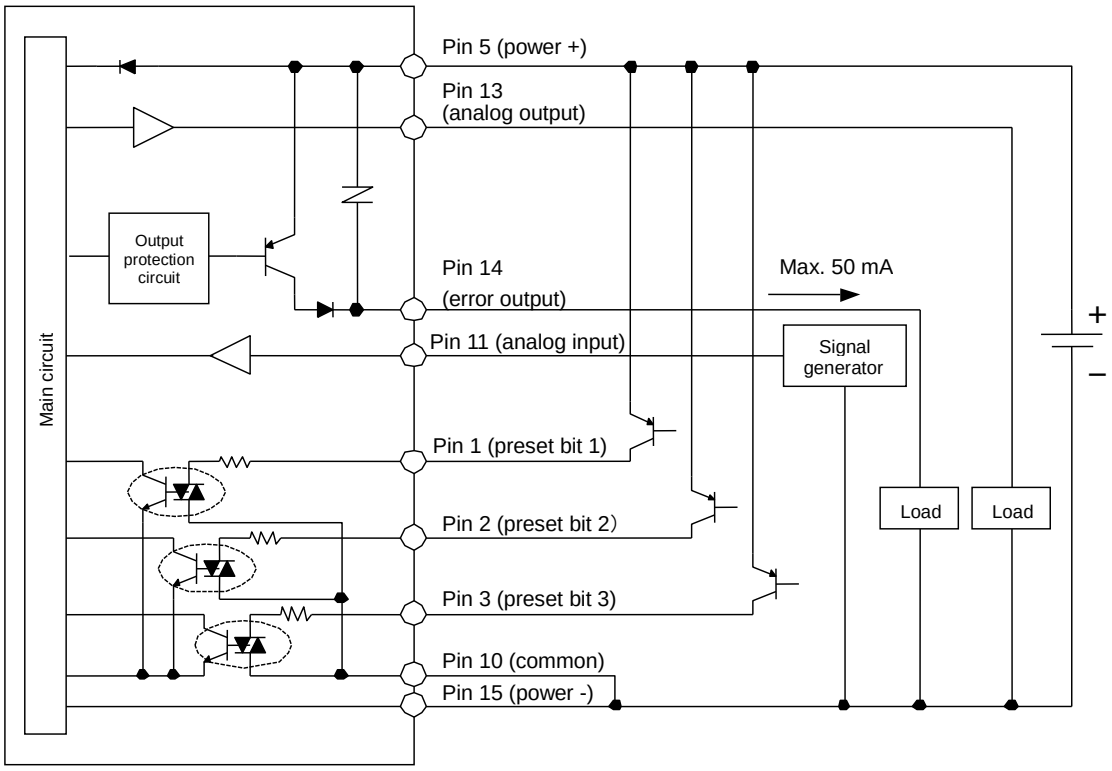


• EVD-1☐00-☐☐SN, EVD-3☐00-☐☐SN: Switch output <NPN> + error <NPN> output type

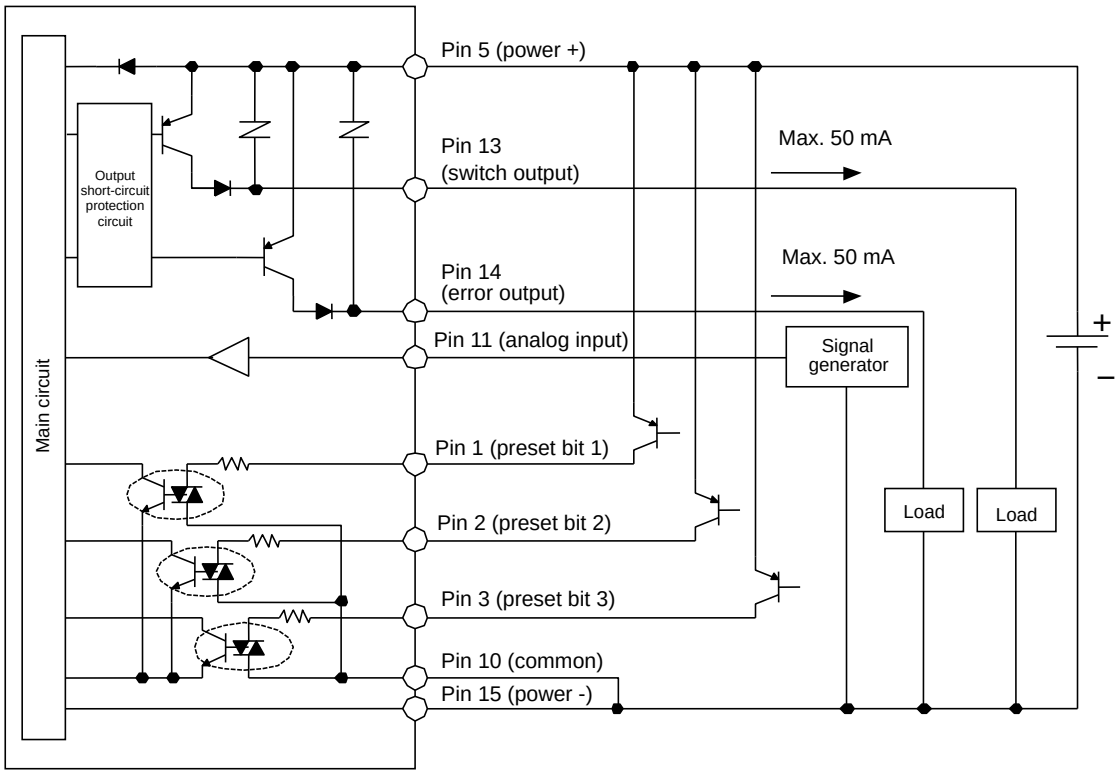


■ Analog input type: EVD-1☐00-0/1/2, EVD-3☐00-0/1/2

- EVD-1☐00-☐☐AP, EVD-3☐00-☐☐AP: Analog output + error <PNP> output type

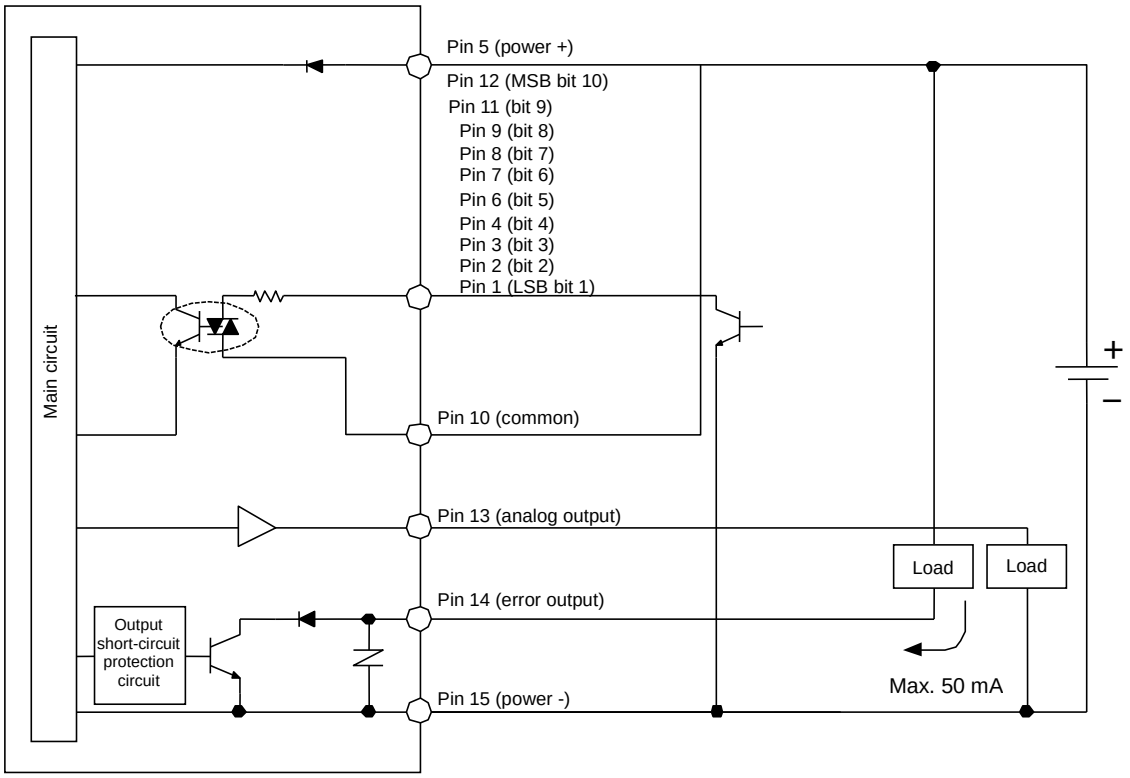


- EVD-1☐00-☐☐SP, EVD-3☐00-☐☐SP: Switch output <PNP> + error <PNP> output type

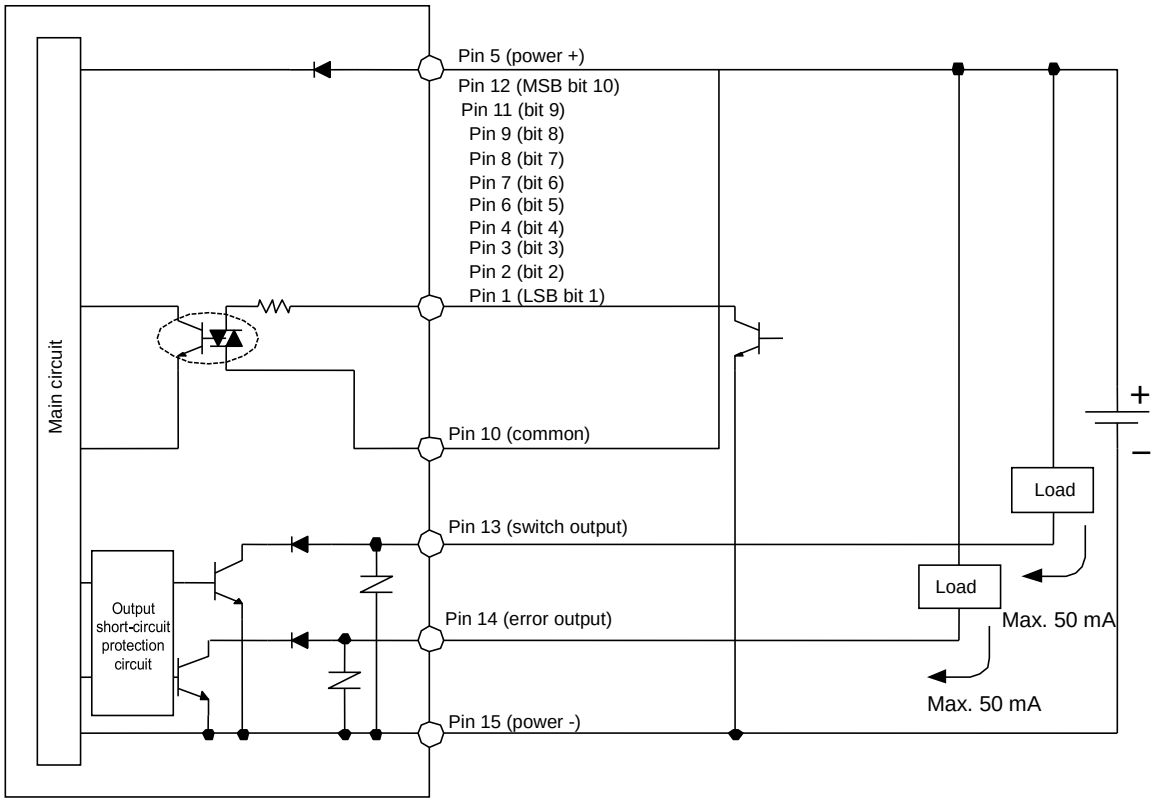


■ Parallel input type: EVD-1☐00-P, EVD-3☐00-P

• EVD-1☐00-☐☐AN, EVD-3☐00-☐☐AN: Analog output + error <NPN> output type

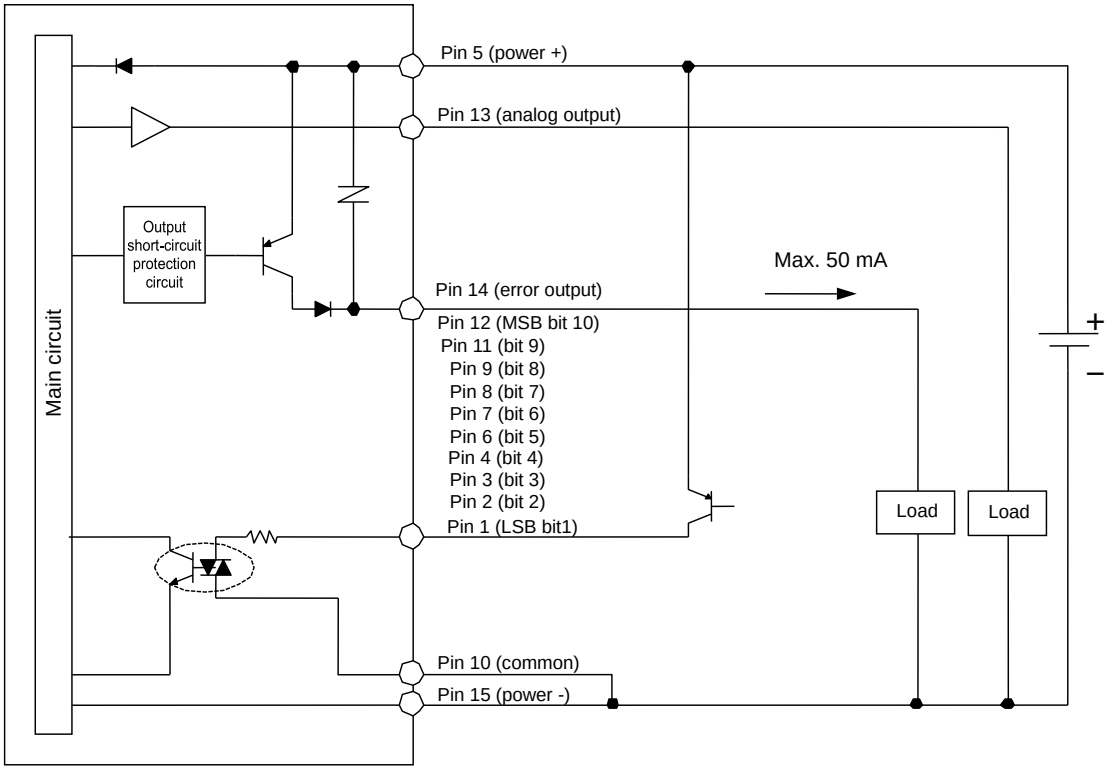


• EVD-1☐00-☐☐SN, EVD-3☐00-☐☐SN: Switch output <NPN> + error <NPN> output type

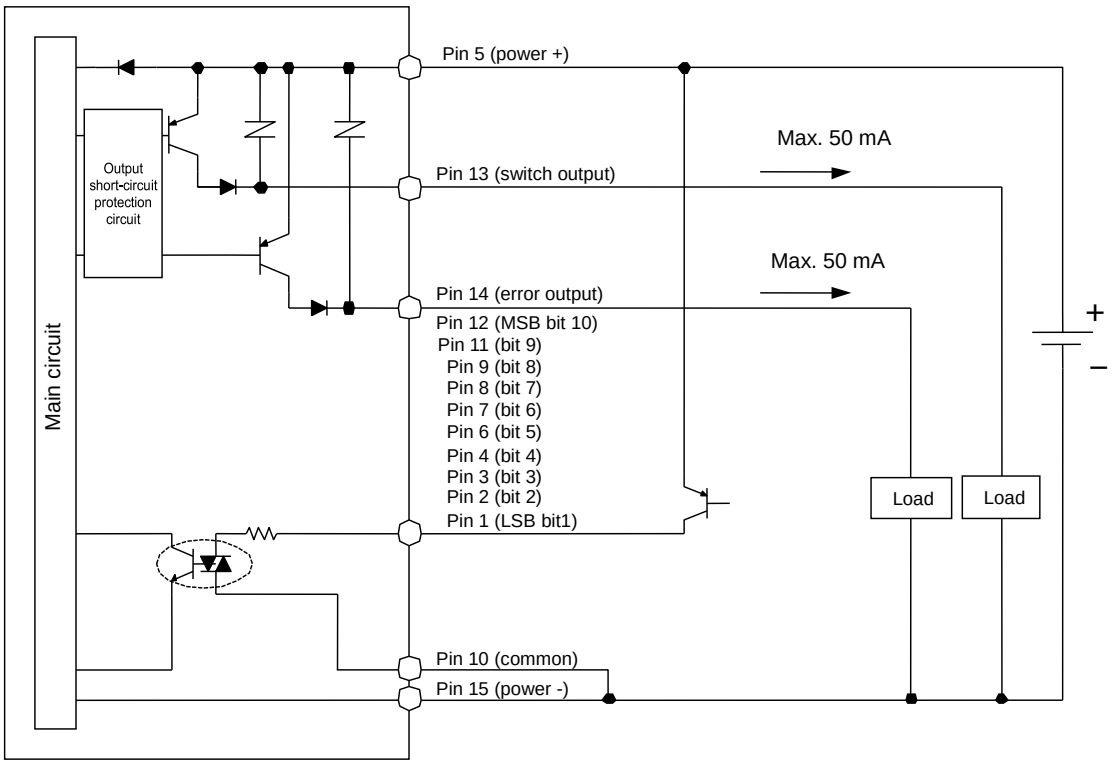


■ Parallel input type: EVD-1☐00-P, EVD-3☐00-P

- EVD-1☐00-☐☐AP, EVD-3☐00-☐☐AP: Analog output + error <PNP> output type



- EVD-1☐00-☐☐SP, EVD-3☐00-☐☐SP: Switch output <PNP> + error <PNP> output type



3. USAGE

⚠ CAUTION

Create a program and control circuit that ignores signals for approximately two seconds immediately after energized.
Pressure control will not operate for approximately two seconds immediately after energized for self-diagnosis.

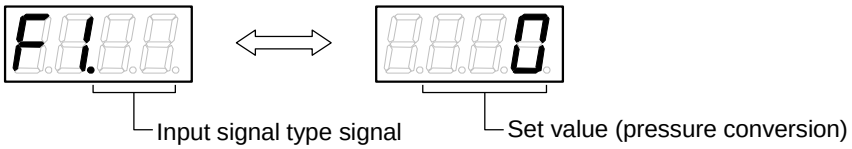
Stop the device before changing the set output value.
Control system devices may operate unintentionally.

Release the key lock before changing settings.

3.1 Checking the Set Value (RUN Mode)

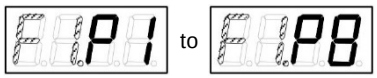
3.1.1 Input signal type and pressure monitor

The F1 screen shows the input signal type and its set value.



■ **Analog input type**

EVD-1☐00-0☐☐-☐-☐, EVD-3☐00-0☐☐-☐-☐
EVD-1☐00-1☐☐-☐-☐, EVD-3☐00-1☐☐-☐-☐
EVD-1☐00-2☐☐-☐-☐, EVD-3☐00-2☐☐-☐-☐

Input signal type code	Description
	Analog [Note 1] 0 VDC to 10 VDC input
	Analog [Note 1] 0 VDC to 5 VDC input
	Analog [Note 1] 4 mADC to 20 mADC input
	Preset input Displays the selected preset number.
	Direct memory input

Note 1: Any of "F1.A0", "F1.A1", or "F1.A2" is displayed depending on the model number.

■ Parallel input type

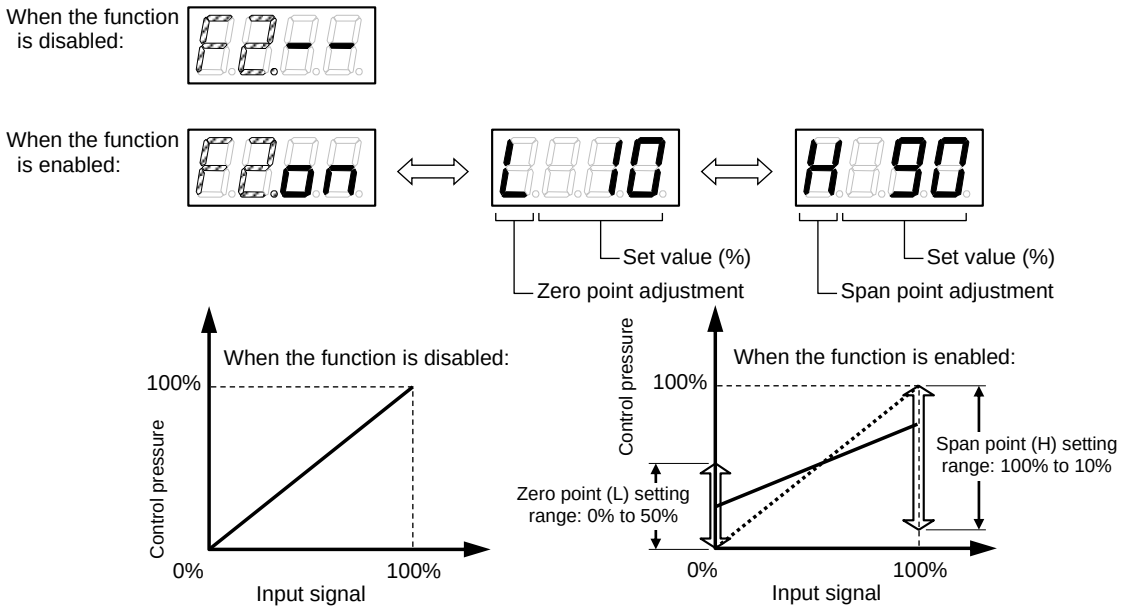
EVD-1□-P□□-□-□, EVD-3□-P□□-□-□

Input signal type code	Description
	Parallel 10-bit input
	Direct memory input

3.1.2 Zero/span adjustment

If the preset input or direct memory input is selected on the F1 screen, this function is disabled.

The F2 screen shows whether the zero/span adjustment is enabled or disabled and its set value.



3.1.3 Automatic power off

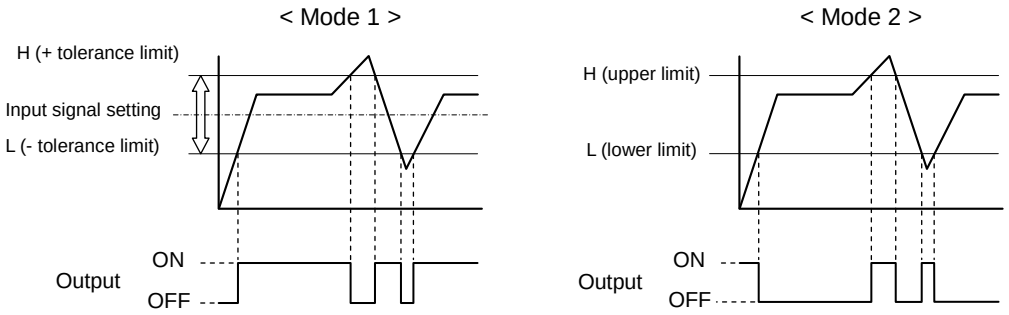
The F3 screen shows whether the automatic power off is enabled or disabled.

When the function is disabled: When the function is enabled:

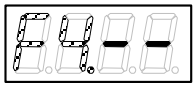
3.1.4 Switch output (EVD-□□□□-□□SN/SP)

This function is disabled for analog output type. "--" is displayed on the screen but the function cannot be used.

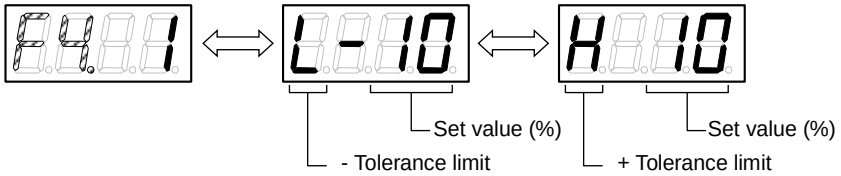
The F4 screen shows whether the switch output is enabled or disabled and its set value.



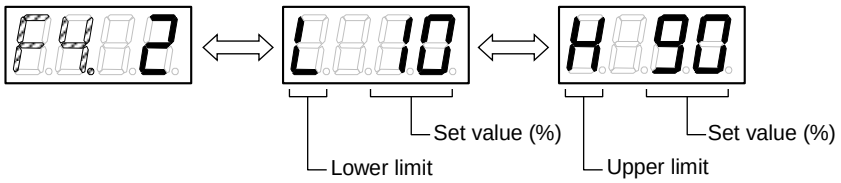
When the function is disabled:



Mode 1:



Mode 2:

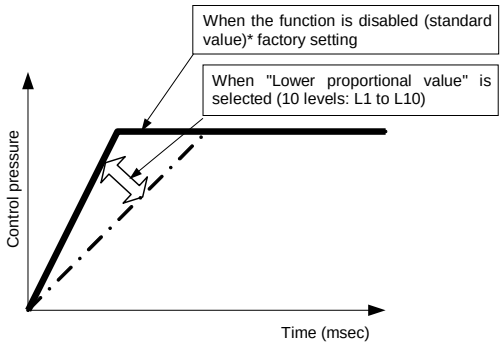


3.1.5 Proportional value change (EVD-□100-□□□)

This screen is not displayed for EVD-1500, EVD-1900, EVD-3500, EVD-3900.

In the F5 screen, whether the proportional value change is enabled or disabled and its set level can be confirmed.

- When disabled: Controls with standard values (factory setting).
- When enabled: "Higher proportional value" or "Lower proportional value" can be selected. The set value can be selected from 10 levels only when "Lower proportional value" is selected.



Proportional value change function

Note: The figure above is reference. The actual values will change depending on the piping and load conditions.

■ Effect of increasing the proportional value

A higher accuracy control can be achieved depending on the piping and load capacity conditions.
Note that hunting will occur easily.

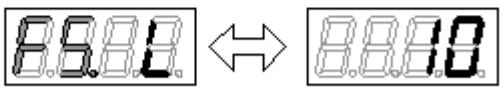
■ Effect of decreasing the proportional value

More stable control can be achieved depending on the piping and load capacity conditions. It is effective especially if control pressure fluctuates significantly or hunting occurs.

When the function is disabled

When "Higher proportional value" is selected (H)

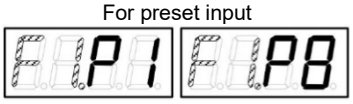
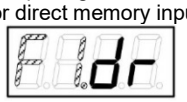
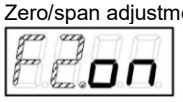
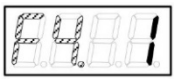
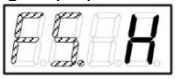
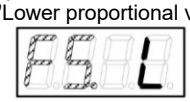
When "Lower proportional value" is selected (L)



Set level

3.2 How to Set (Setting Mode)

3.2.1 Setting ranges

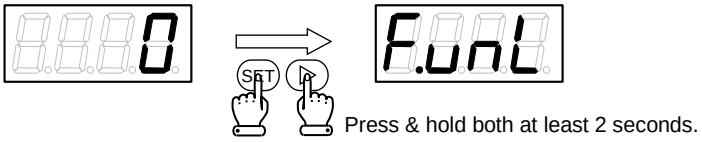
Function	Display	Setting details	Specifications
F1: Input signal selection For preset input 		Sets a set value (pressure).	Range: Note 1 1100, 3100/000 to 100 1500, 3500/000 to 500 1900, 3900/000 to 900 Min. set unit: 1 kPa
F1: Input signal selection For direct memory input 		Sets a set value (pressure).	Range: Note 1 1100, 3100/000 to 100 1500, 3500/000 to 500 1900, 3900/000 to 900 Min. set unit: 1 kPa
F2: Zero/span adjustment 		Sets a zero point adjustment value.	Range: 00 to 50 Note 2 Min. set unit: 1%
		Sets a span point adjustment value.	Range: 100 to 010 Note 2 Min. set unit: 1%
F4: Switch output Note 3 For **mode1** 		Sets a "−" set value.	Range: 00 to 50 Min. set unit: 1%
		Sets a "+" set value.	Range: 00 to 50 Min. set unit: 1%
F4: Switch output Note 3 For **mode2** 		Sets a lower limit value.	Range: 00 to 90 Note 2 Min. set unit: 1%
		Sets an upper limit value.	Range: 100 to 010 Note 2 Min. set unit: 1%
F5: Proportional value change Note 4 For "Higher proportional value" 		Cannot set a level.	
F5: Proportional value change Note 4 For "Lower proportional value" 		Sets a level.	Range: 01 to 10 Min. set unit: 1%

Note 1: If a pressure value is set to 1%FS or less, pressure may not be controlled due to residual pressure.
Note 2: The setting range may be limited depending on the set value.
Note 3: Switch output is a function limited to the switch output type. It is not available for the analog output type.
Target model: EVD-1□00-□□SN, EVD-1□00-□□SP, EVD-3□00-□□SN, EVD-3□00-□□SP,
Note 4: Proportional value change is a function limited to the maximum pressure range 100 kPa type.
Target model: EVD-1100-□□□, EVD-3100-□□□
* For EVD-1500, EVD-1900, EVD-3500, EVD-3900 contact your nearest CKD sales office or distributor.

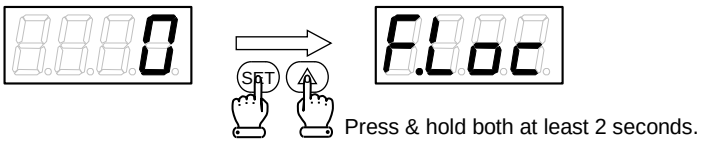
3.2.2 Key lock

Key lock prevents incorrect operation.
When the power is turned on (including re-turn on), the key is locked. Release the key lock before changing the setting.

- How to release key lock



- How to lock key

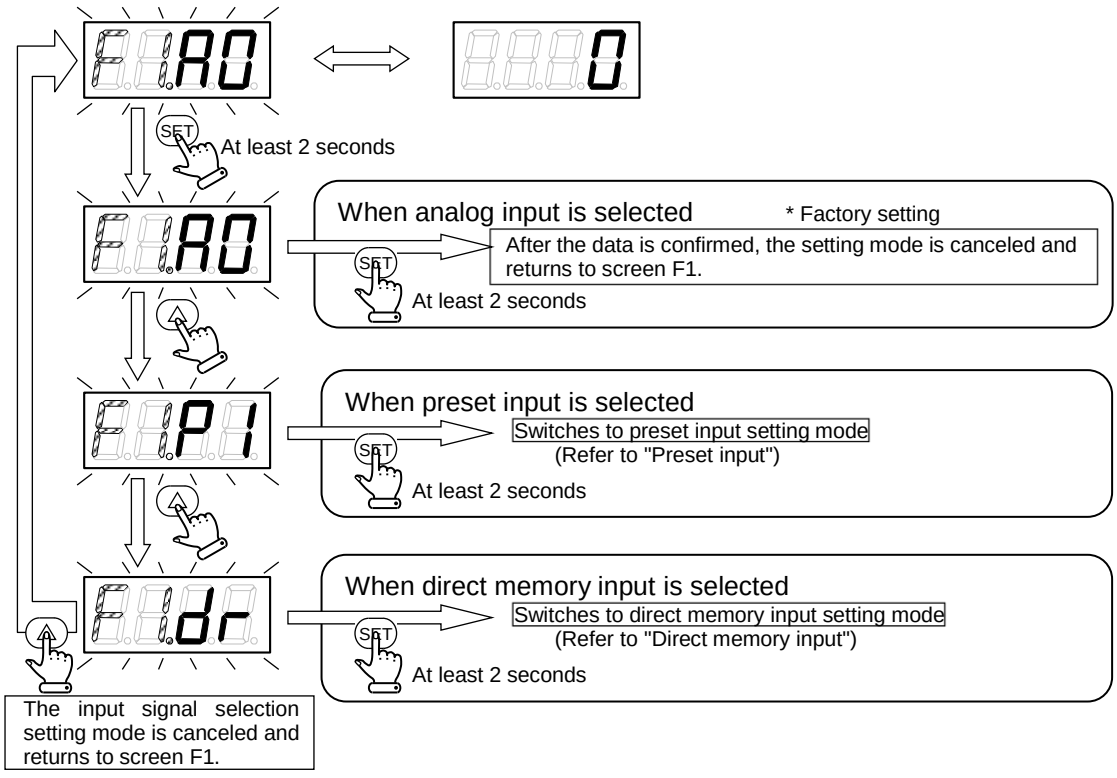


3.2.3 Input signal

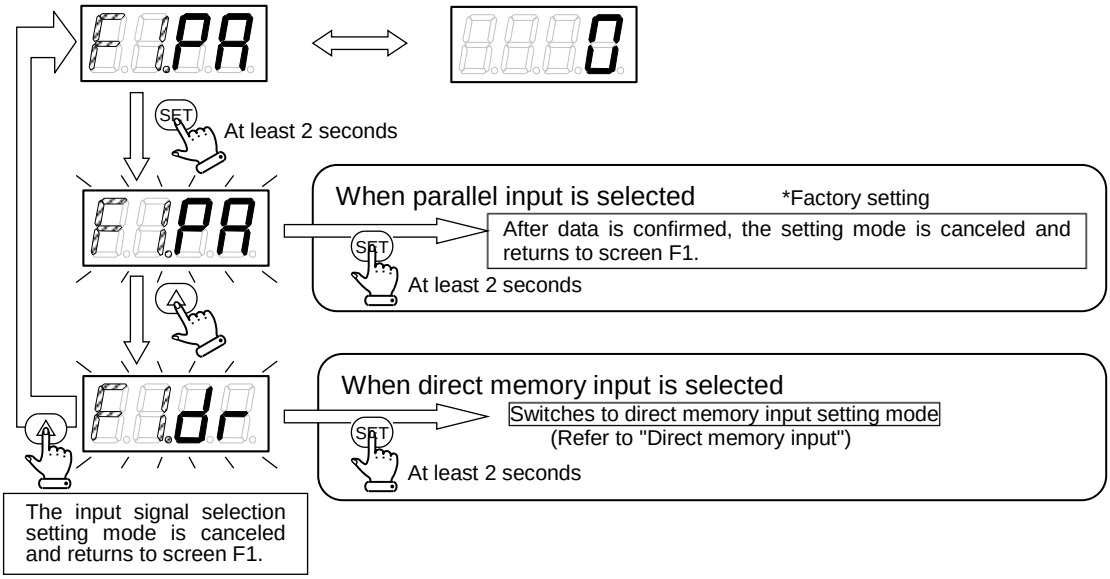
Analog input specifications cannot be changed.

In F1 screen, press and hold the [SET] key at least two seconds to switch to the setting mode.

■ Input signal for analog input type



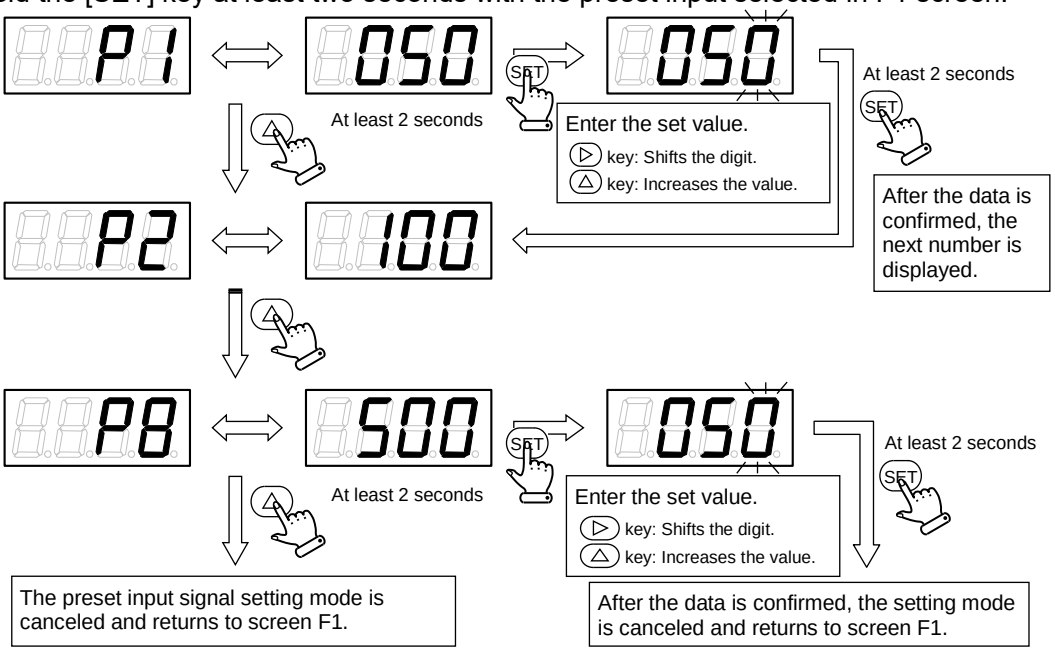
■ Input signal for parallel input type



* For relationship between input signal and control pressure, refer to "7.1 Correspondence between the Parallel Input Signal and the Control Pressure".

■ Preset input

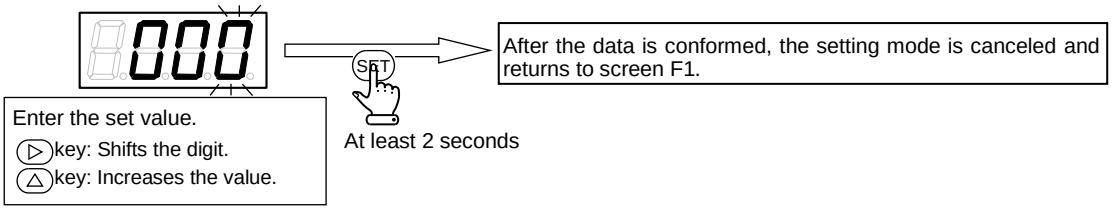
Press and hold the [SET] key at least two seconds with the preset input selected in F1 screen.



* For relationship between input signal and preset memory, refer to "7.2 Correspondence between the Preset Memory and the Input Signal".

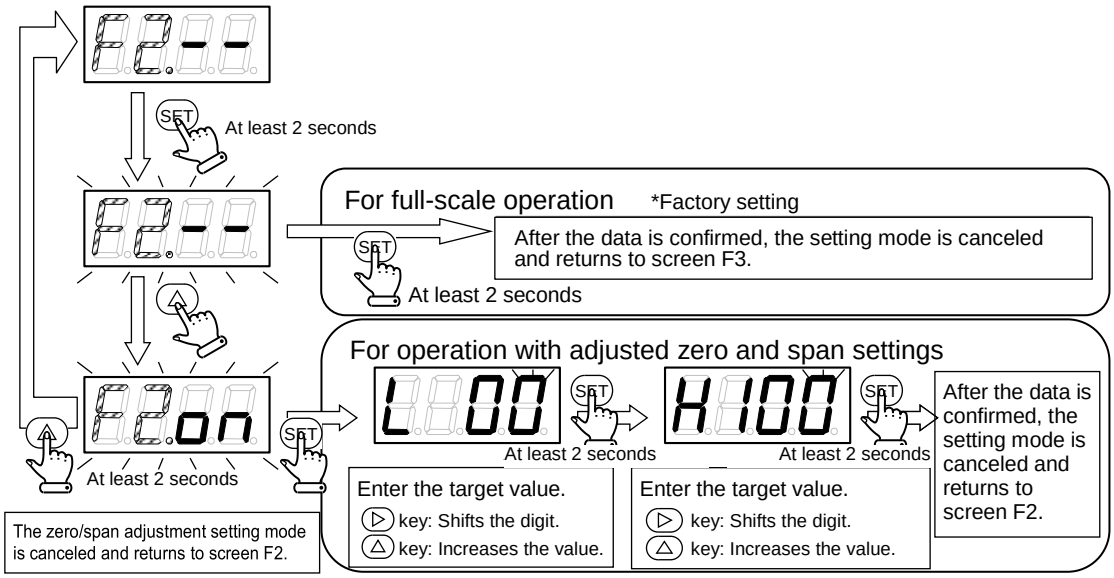
■ Direct memory input

Press and hold the [SET] key at least two seconds with the direct memory input selected in F1 screen.



3.2.4 Zero/span adjustment

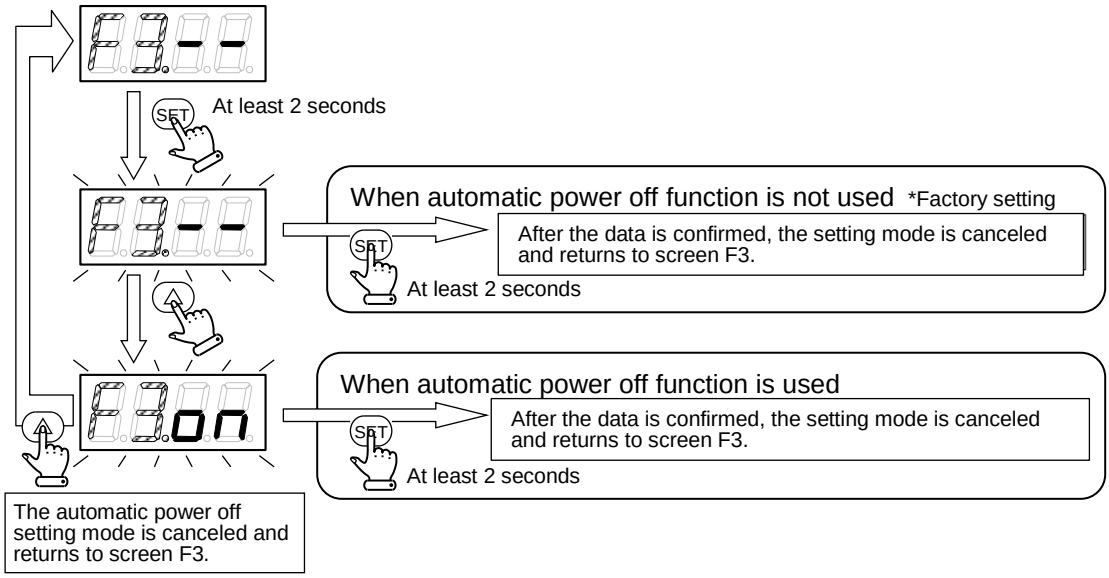
In F2 screen, press and hold the [SET] key at least two seconds to switch to the setting mode.



* If the preset input or direct memory input is selected with F1 (input signal selection), this function cannot be used. It can be used for full-scale operation.

3.2.5 Automatic power off

In F3 screen, press and hold the [SET] key at least two seconds to switch to the setting mode.

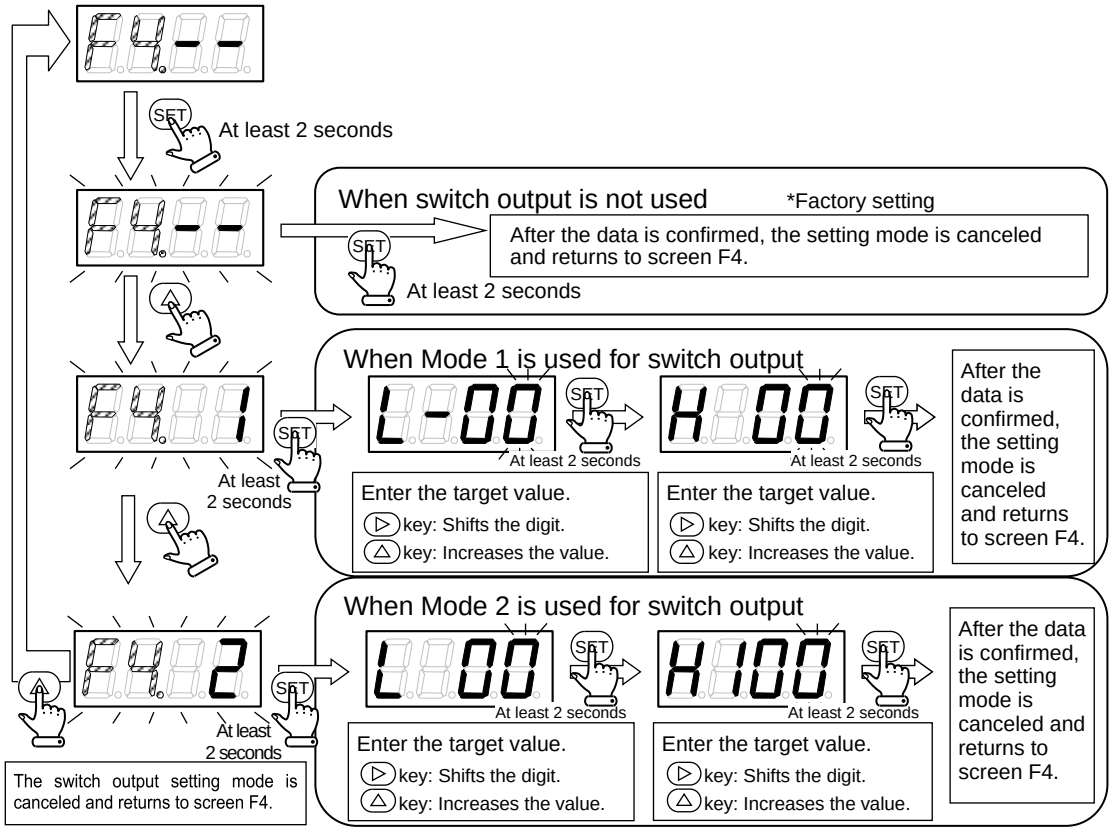


* If any key is pressed during automatic power off, the display turns on.
* The automatic power off set time is approximately one minute and cannot be changed.

3.2.6 Switch output (target model: EVD-□□□□-□□SN/SP)

This function is disabled for analog output type. "--" is displayed on the screen but the function cannot be used.

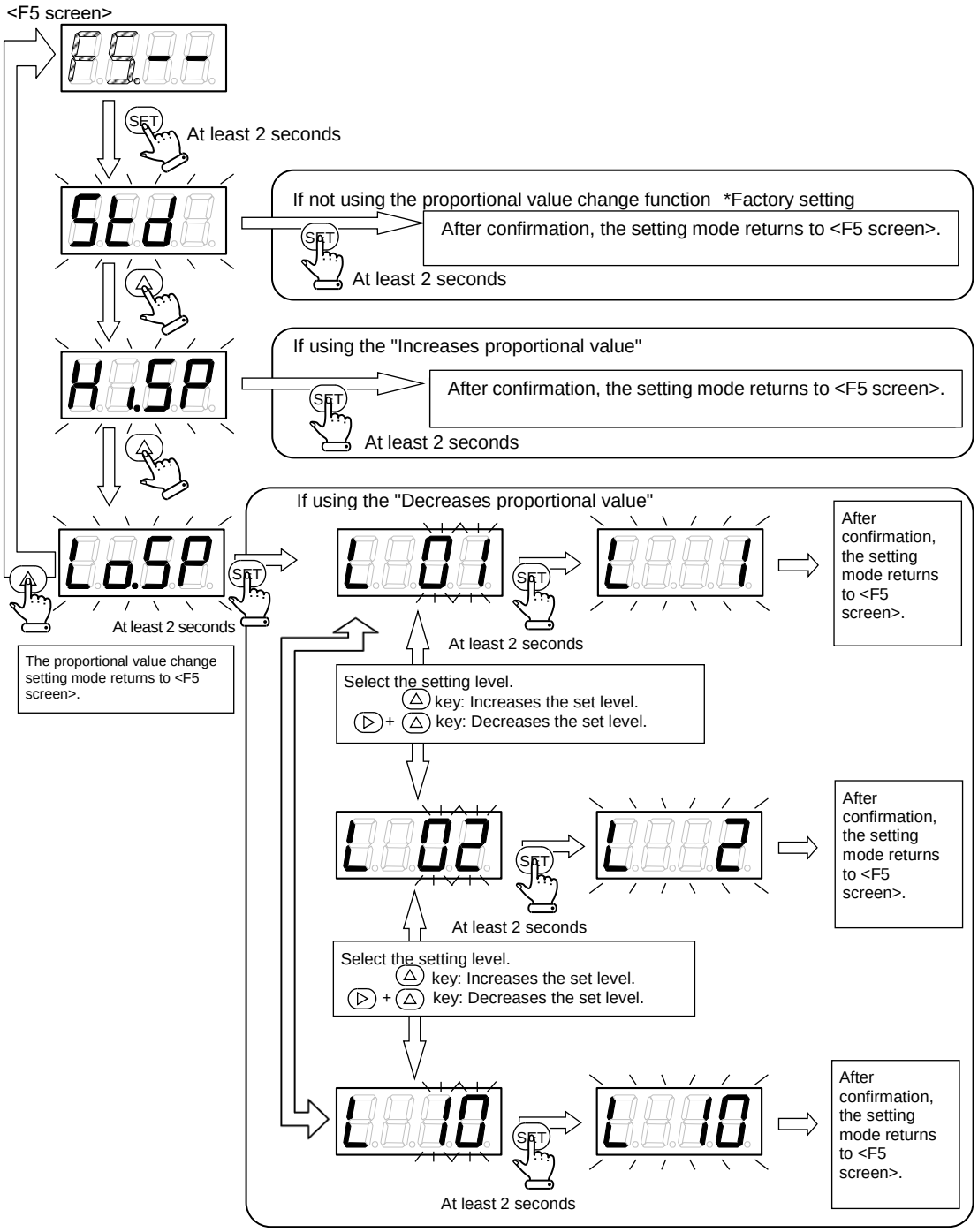
In F4 screen, press and hold the [SET] key at least two seconds to switch to the setting mode.



3.2.7 Proportional value change setting (EVD-□100-□□□)

This screen is not displayed for EVD-1500, EVD-1900, EVD-3500, EVD-3900.

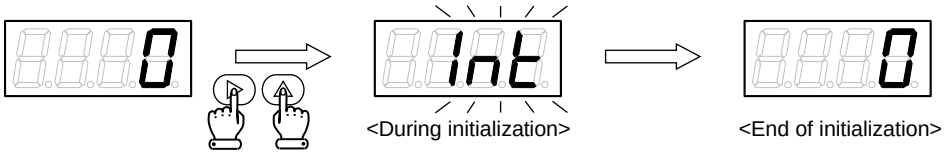
In the F5 screen, press and hold the [SET] key at least two seconds to switch to the setting mode.



* For "Lower proportional value", operation takes place with the set level displayed on the screen while selecting a set level. When the set level is determined, press and hold the [SET] key at least two seconds to confirm the value.

3.2.8 Factory setting mode (initialization)

■ How to initialize



Screen	Function	Setting display	Setting details
F1 screen	Input signal selection	Analog type / Parallel type A0, A1, A2	Analog [Note 1]/parallel input
F2 screen	Zero/span adjustment		Full-scale (zero/span adjustment disabled)
F3 screen	Automatic power off		Automatic power off disabled
F4 screen	Switch output [Note 2]		Switch output disabled
F5 screen	Proportional value change [Note 3]		Standard setting (proportional value change disabled)

Note 1: A0, A1, or A2 is displayed depending on the model number.
Note 2: The switch output function is available only with the switch output type. It is not available with the analog output type.
Target model: EVD-1□00-□□SN, EVD-1□00-□□SP, EVD-3□00-□□SN, EVD-3□00-□□SP
Note 3: The proportional value change function is available only with the type having a maximum pressure of 100 kPa.
Target model: EVD-1100-□□□, EVD-3100-□□□
* For EVD-1500, EVD-1900, EVD-3500, EVD-3900 contact your nearest CKD sales office or distributor.

4. MAINTENANCE AND INSPECTION

⚠ WARNING

Turn off the power, stop the supply of compressed air and make sure that there is no residual pressure before maintenance.

⚠ CAUTION

Plan and conduct daily and periodic inspections so that maintenance can be managed correctly.
If maintenance is not properly managed, the product's functions may deteriorate significantly and this may lead to faults (such as short service life, damage, and malfunctions) or accidents.

If an abnormality occurs during operation, immediately stop using the product, turn off the power, and shut off the pneumatic pressure source.

Conduct periodic inspections at least once a year to confirm that the product operates properly.

Do not use materials such as solvents, alcohol, or detergent to remove dirt or stains.
The case is made of resin and resin can be damaged by these materials. Use a waste cloth that is soaked in a diluted neutral detergent and wrung out well to wipe off dirt.

4.1 Periodic Inspection

Conduct periodic inspections at least once a year to prevent accidents or problems, such as functional deterioration, short service life, damage, or malfunctions.

■ Pressure of supplied compressed air

- Is the set pressure supplied?
- Does the pressure gauge indicate the set pressure during operation of the device?

■ Pneumatic filter

- Is drainage correctly discharged?
- Is the bowl or element clean enough to use?

■ Leakage of compressed air from piping connections

- Are all connections, especially at movable sections, correctly connected?
  (The product may not operate properly if leakage occurs from piping.)

■ Operational status

- Is there any delay in operation?
- Are the valves exhausting properly?

■ Operation of pneumatic actuator

- Are operations smooth?
- Is the actuator reaching the end stop properly?
- Are loads connected properly?

If an abnormality is found, contact your nearest CKD sales office or distributor.

5. TROUBLESHOOTING

5.1 Problems, Causes, and Solutions

If the product does not operate as intended, check the table below for a possible solution.

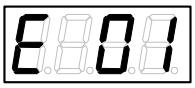
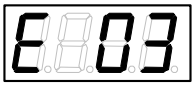
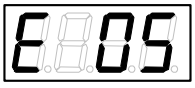
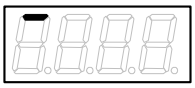
Problem	Cause	Solution
Setting cannot be changed.	Key is locked.	Release the key lock according to "3.2.2 Key lock" and change the settings.
	Operation keys do not work.	Replace the product.
Pressure does not display.	Automatic power off function is enabled.	Press any operation key. * If the display turns on and then off after one minute, the automatic power off function is enabled. * Refer to "3.2.5 Automatic power off" to disable the automatic power off.
	Power supply is not connected correctly.	Connect the rated power correctly.
	There is disconnection inside EVD.	Replace the product.
Displayed pressure is abnormal.	Primary side pressure is insufficient.	Maintain the primary side supply pressure so that it is at least the minimum working pressure.
	There is leakage on secondary side piping.	Check if there is leakage from piping.
	There is a failure in pressure sensor.	Replace the product. Make sure that excessive pressure does not apply on the secondary side due to pressure entering from other pipes.
Switch output does not turn ON.	Switch output is disabled.	Refer to "3.2.6 Switch output (target model: EVD-□□□□-□□SN/SP)".
	There is a failure in EVD.	Replace the product.
Switch output does not turn OFF.	There is a failure in EVD.	Replace the product.
Loud noise is generated.	There is significant leakage which is greater than maximum flow rate.	Using the product in this state will shorten the service life extremely. Reconsider the usage.
	There is air entering from secondary side piping which exceeds relief performance.	Using the product in this state will shorten the service life extremely. Reconsider the usage.
	Power is turned on and input signal is set with no primary side pressure supplied.	Supply the primary side pressure and then turn on the power supply and set the input signal.
	Set input signal is greater than primary side pressure.	Maintain the primary side supply pressure so that it is at least the minimum working pressure.
	Primary side pressure is less than minimum working pressure.	Maintain the primary side supply pressure so that it is at least the minimum working pressure.
1%FS or more pressure is output even if power is turned off.	Zero point is increased with zero/span adjustment.	If the zero point is increased, the set pressure is output even when the power is turned off. If atmospheric pressure condition is required, install a 3-way valve on the secondary side.
	Power is turned off while input signal is set.	Turn on the power and set the input signal to 0%.
	Product has been left with power turned off and with primary side pressure supplied for a long period.	If the product has been left unused for a long period, set the primary side pressure to zero. If the secondary side pressure rises, turn on the power and set the input signal to 0%.
	There is a failure in EVD.	Make sure that there is no abnormality in piping and wiring and then replace the product.

Problem	Cause	Solution
Primary side pressure is output as it is.	There is a failure in EVD.	Make sure that there is no abnormality in piping and wiring and then replace the product.
Pressure cannot be controlled.	Input signal is abnormal.	For the analog type, check that the input signal common and the power ground are in the same wiring.
		For the parallel type, check the correspondence between the input bit and the wiring.
	There is a failure in pressure sensor.	Replace the product. Make sure that excessive pressure does not apply on the secondary side due to pressure entering from other pipes.
Pressure is not output.	Primary side pressure is not supplied.	Check that the primary side pressure is normal.
	Wiring is abnormal.	Check that the wiring is normal. In addition, check that the connector is properly connected.
Pressure does not reach set pressure.	Primary side pressure is insufficient.	Maintain the primary side supply pressure so that it is at least the minimum working pressure.
Pressure does not drop.	Passage of exhaust port is blocked.	Mount the product so that the air can be exhausted from port R and the exhaust port.
Pressure is unstable.	Power supply voltage is unstable.	Use a stabilized power supply that satisfies the product specifications.
	Input signal is unstable.	Check whether the noise is affecting the signal. Connect the shielded wires to the ground on the power side.
	Primary side pressure is unstable.	Install a regulator on the primary side of the EVD to stabilize the primary side pressure.
	There is leakage from piping.	Check leakage from piping on the primary side and secondary side. * Changing the proportional value ("Lower proportional value") may stabilize the pressure (refer to "3.1.5 Proportional value change (EVD-□100-□□□)"). Note 1
Pressure oscillates.	Primary side pressure is too high against control pressure.	Reduce the primary side supply pressure as much as possible but maintain at least the minimum working pressure.
	Mismatched piping capacity, leakage, or foreign matter contamination on secondary side.	Oscillation may be avoided by changing the piping condition. Reconsider the diameter of the piping, increase or decrease the load capacity, or check leakage on the secondary side. * Changing the proportional value ("Lower proportional value") may stabilize the pressure (refer to "3.1.5 Proportional value change (EVD-□100-□□□)"). Note 1

Note 1: The proportional value change function is available only with the type having a maximum pressure of 100 kPa.
Target model: EVD-1100-□□□, EVD-3100-□□□
For EVD-1500, EVD-1900, EVD-3500, EVD-3900 contact your nearest CKD sales office or distributor.

If you have any other questions or concerns, contact your nearest CKD sales office or distributor.

5.2 Error Code

Display	Cause	Solution
	Supplied power voltage is out of the rated range.	● Check the product power specifications, set power voltage within the rated range and turn on the power again.
	Input signal exceeds the rated range.	● Check the product input signal type, set the input signal within the rated range and turn on the power again.
	Error occurred during EEPROM reading or writing.	● Contact your nearest CKD sales office or distributor.
	Error occurred during memory reading or writing.	● Contact your nearest CKD sales office or distributor.
	Secondary side pressure does not maintain the set value for five or more consecutive seconds. If it is below the set value by 20%FS or more, detection accuracy is ± 6%.	● Check the primary side pressure, supply pressure within the rated operating differential pressure range and turn on the power again. ● Check that there is no leakage from the pipes, fittings, or other components, correctly connect the pipes and turn on the power again. ● Contact your nearest CKD sales office or distributor.
	Switch output overcurrent protection circuit is activated.	● Check that the load current does not exceed the rated range, correct the connections and turn on the power again.

* If an error above occurs, an error output is turned ON at the same time that the error is displayed.

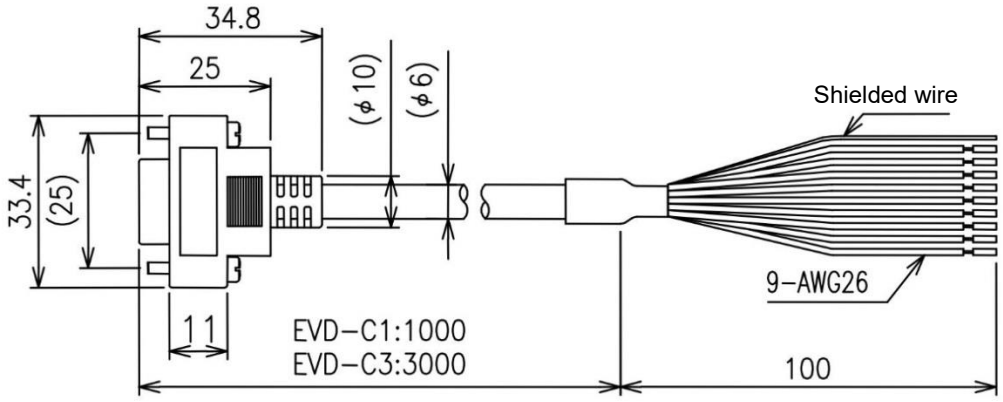
6. OPTION

6.1 Optional Part Model Number

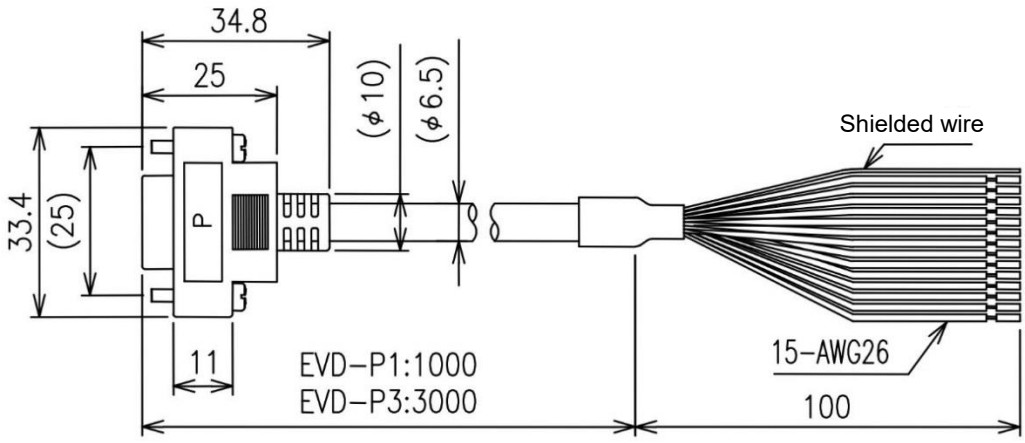
EVD - C1

Symbol	Description
Cable option	
C1	Analog 9-conductor cable, 1 m
C3	Analog 9-conductor cable, 3 m
P1	Parallel 15-conductor cable, 1 m
P3	Parallel 15-conductor cable, 3 m

●EVD-C1, EVD-C3



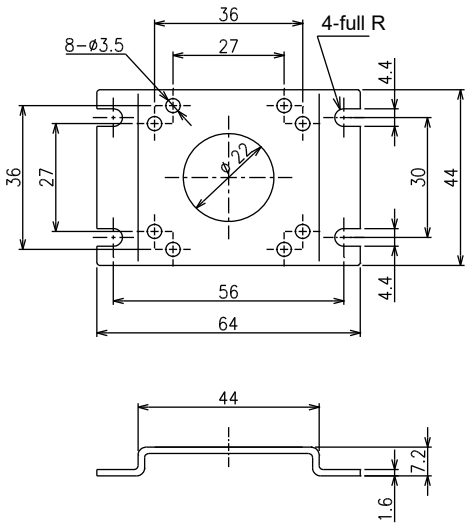
●EVD-P1, EVD-P3



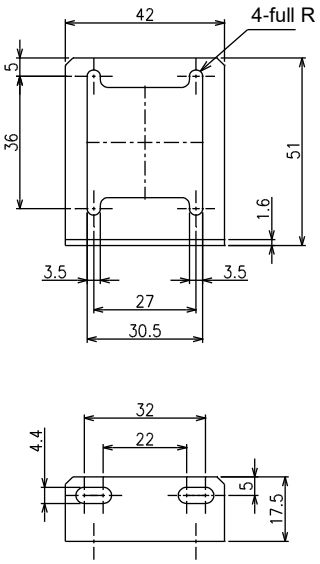
EVD- B1

Symbol	Description
Bracket option	
B1	B-type bracket, floor mounted, EVD-1000
L1	L-type bracket, wall mounted, EVD-1000
B3	B-type bracket, floor mounted, EVD-3000
L3	L-type bracket, wall mounted, EVD-3000

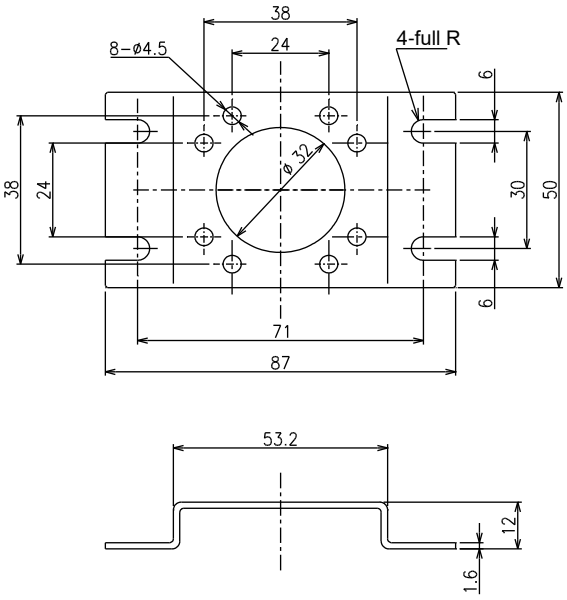
●EVD-B1



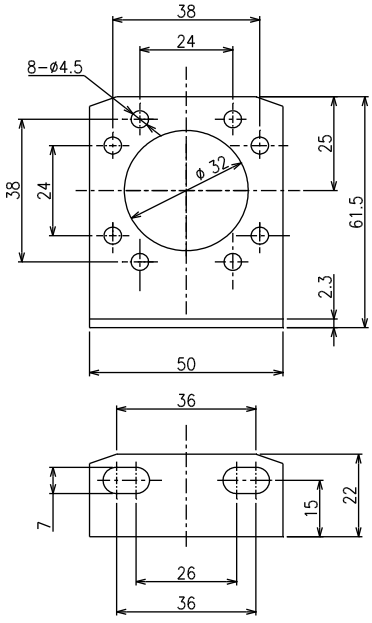
●EVD-L1



●EVD-B3



●EVD-L3



7. REFERENCE INFORMATION

7.1 Correspondence between the Parallel Input Signal and the Control Pressure

The parallel input signal is 10-bit and ranges from 0 to 1023 when converted to a decimal number.

Input signal = EVD set pressure (kPa)/maximum control pressure x 1023

The maximum control pressure is as follows:
・100 kPa for EVD-1100, 3100
・500 kPa for EVD-1500, 3500
・900 kPa for EVD-1900, 3900

Example: Setting 300 kPa in EVD-1500
300 (kPa)/500 (kPa) x 1023 = 613.8 --> 614

The following is the back calculation with the input signal set to 614:
500 (kPa) x 614/1023 ≈ 300 (kPa)

When 614 (decimal number) is converted to a binary number, it becomes 1001100110. "1" sets the input signal to ON and "0" sets the input signal to OFF (refer to the following table).

D-sub socket pin no.	12	11	9	8	7	6	4	3	2	1
Optional cable insulator color	Green (with black line)	White	Red (with black line)	White (with black line)	Pink	Light blue	Purple	Yellow	Orange	Brown
Input type	Bit 10 MSB	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1 LSB
Binary [For 614 (decimal)]	1	0	0	1	1	0	0	1	1	0
Input signal	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF

7.2 Correspondence between the Preset Memory and the Input Signal

D-sub socket pin no.	3	2	1	Preset memory no.
Optional cable insulator color	Yellow	Orange	Brown	
Input type	Bit 3	Bit 2	Bit 1	
Input signal	OFF	OFF	OFF	P1
	OFF	OFF	ON	P2
	OFF	ON	OFF	P3
	OFF	ON	ON	P4
	ON	OFF	OFF	P5
	ON	OFF	ON	P6
	ON	ON	OFF	P7
	ON	ON	ON	P8

8. WARRANTY PROVISIONS

8.1 Warranty Conditions

■ Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified below, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.
However, following failures are excluded from this warranty:

- Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or this Instruction Manual.
- Failure caused by incorrect use such as careless handling or improper management.
- Failure not caused by the product.
- Failure caused by use not intended for the product.
- Failure caused by modifications/alterations or repairs not carried out by CKD.
- Failure that could have been avoided if the customer's machinery or device, into which the product is incorporated, had functions and structures generally provided in the industry.
- Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
- Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.

■ Confirmation of product compatibility

It is the responsibility of the customer to confirm compatibility of the product with any system, machinery, or device used by the customer.

■ Others

The terms and conditions of this warranty stipulate basic matters.
When the terms and conditions of the warranty described in individual specification drawings or the Specifications are different from those of this warranty, the specification drawings or the Specifications shall have a higher priority.

8.2 Warranty Period

The product is warranted for one (1) year from the date of delivery to the location specified by the customer.