



Compact, multi-function, digital control

Digital electro-pneumatic regulator EVD Series

DIGITAL ELECTRO PNEUMATIC REGULATOR EVD SERIES



CKD Corporation

CC-764A 5

Compact high-function digital control

D-sub connector

Digital indicators

Setting key



Module type

EVD-1000

- Port size : Rc1/4
- Flow rate : 60,400ℓ/min
- Pressure range : 100,500,900kPa
- Grease free flow path section

42

100

Large flow type

EVD-3000

- Port size: Rc1/4 to Rc3/8
- Flow: 700, 1500 ℓ /min
- Pressure range: 100, 500, 900kPa

EVD Series

Digital electro-pneumatic regulator

EVD Series digital electro pneumatic regulator - realizing various functions and ease-of-use in a compact size with a new functions including pressure display, error display and direct memory functions.

User-friendly and easy to install

Digital display shows the control state at a glance

The output pressure value is displayed digitally with three digits
The output state (switch output ON-OFF) is displayed in addition to the error display

Output display 3 digit LED display



Parallel input type available in standard line-up.

Control directly from PLC.

Compact design, 25% smaller (CKD comparison)



D-sub connector with 2 way connection

The connector can be rotated 90° the to top to the side providing more flexibility in mounting.



Module type

Filters and regulators such as C1000 Series can be connected.



Realizing multi-functions with microcomputer

Error display function

Errors are displayed and notified with electrical signals

Zero/span adjustment function

Zero and span can be adjusted according to the usage methods

Direct memory function

Signals from external sources not required.
Adjust secondary pressure with keys flexibly.

Preset input function

Save up to 8ch of pressure in the main unit and switch it with external signals.

Switch output function

Switch output (with built-in overcurrent protection) possible by setting the upper/lower limit pressure.

High accuracy, quick response pressure control

Linearity $\pm 0.3\%$

Hysteresis 0.5%

Response time 0.2 sec

(Proportional value change function (EVD*100 only))

Highly accurate and stable control is possible by adjusting the proportional value upward (one stage) or proportional value downward (ten stages).

Eco-friendly design

Complies with RoHS Directives

RoHS



All substances, such as lead and hexavalent chrome, which can adversely affect the global environment have been eliminated from the materials.

Energy saving

The auto power OFF function can automatically turn OPFF the digital display

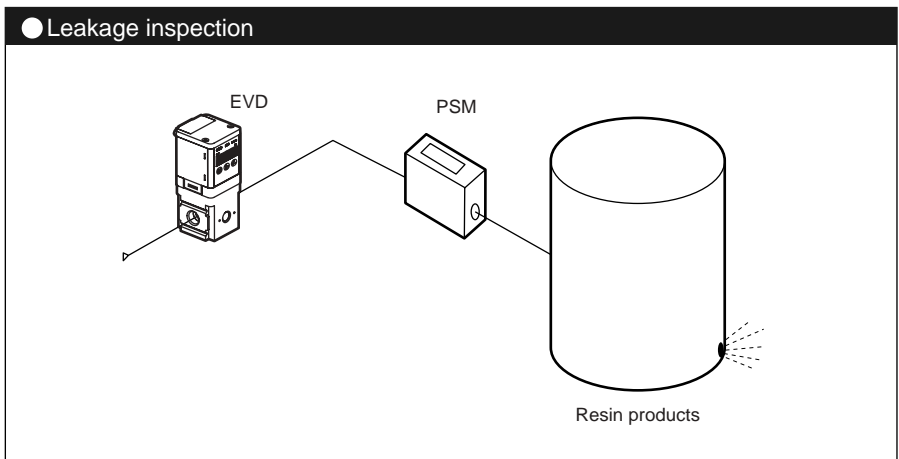
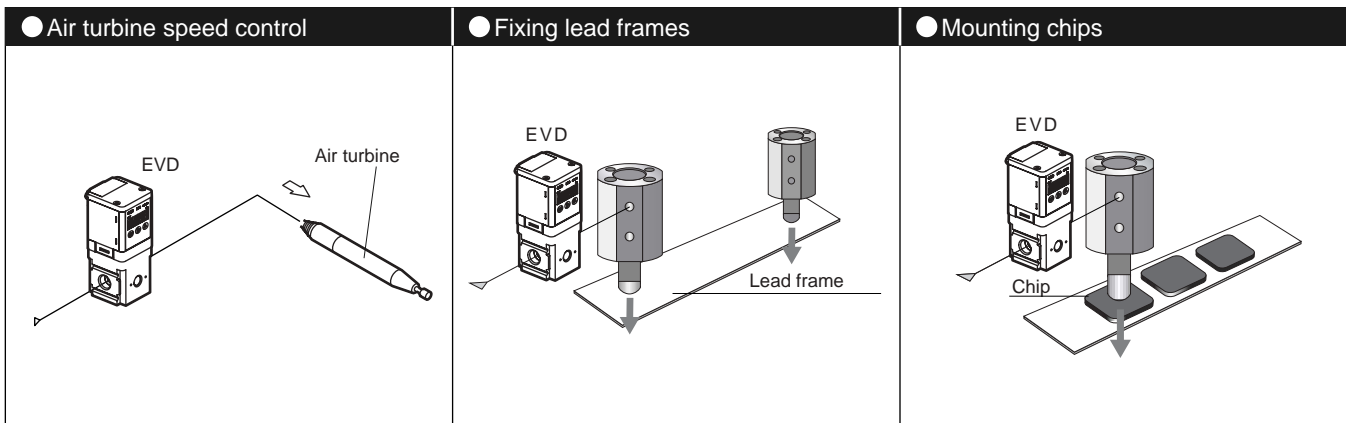
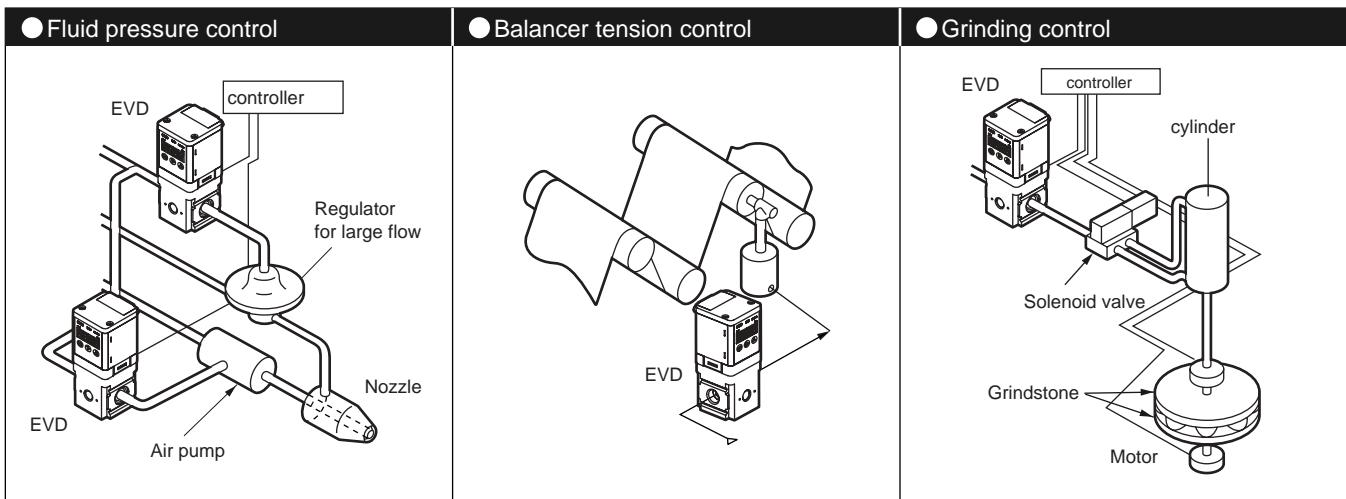
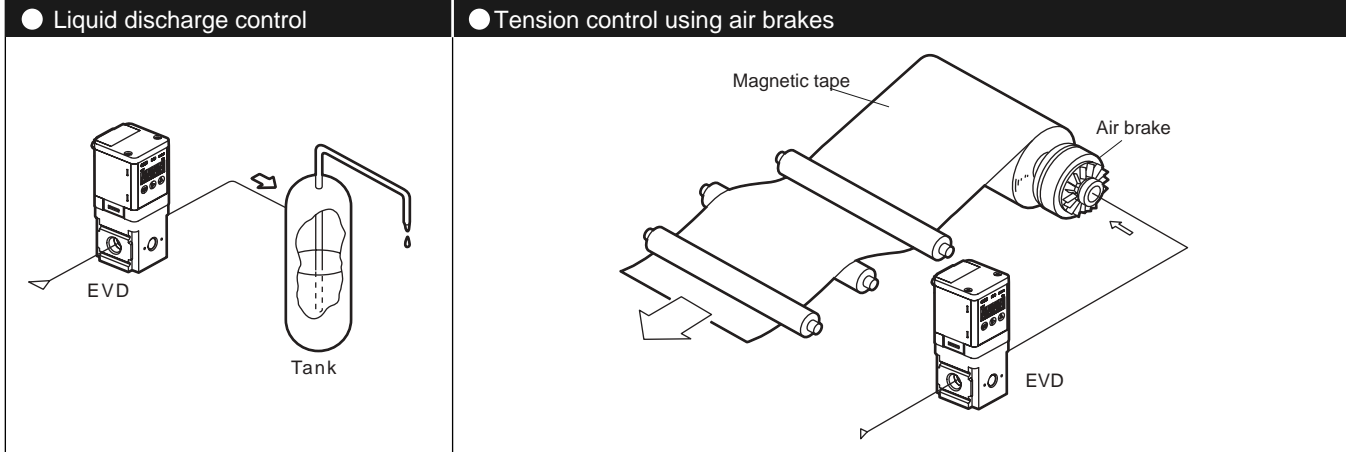
Material indication

Material names are indicated on the main components to facilitate sorting for recycling.

Digital electro pneumatic regulator variation

Series	Pressure range	Input signal	Port size	Output method	Maximum flow rate	Flow path material	Page
EVD-1000	100 kPa, 500 kPa, 900 kPa	10bit Analog, Parallel	Rc1/4	NPN PNP Switch Output, Analog Output	60 ℓ/min, 400 ℓ/min	Grease free	1
EVD-3000	100 kPa, 500 kPa, 900 kPa	10bit Analog, Parallel	Rc1/4, Rc3/8	NPN PNP Switch Output, Analog Output	700 ℓ/min, 1500 ℓ/min	Fluorine grease, Vaseline Custom order	5

Application of proportional pressure controls





Safety precautions

Always read this section before starting use.




When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely. Be sure to observe the description given under DANGER, WARNING and CAUTION to assure safety of the equipment. Check that device safety is ensured, and manufacture a safe device.

WARNING

- 1** This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience in handling.
- 2** Use this product in accordance of specifications.
This product must be used within its stated specifications. It must not be modified or machined.
This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)
 - ① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
 - ② Use for applications where life or assets could be adversely affected, and special safety measures are required.
- 3** Observe corporate standards, regulations, etc., related to the safety of device design and control, etc.
ISO 4414, JIS B 8370 (pneumatic system rules)
Principles for pneumatic cylinder selection and use
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.
- 4** Do not handle, pipe, or remove devices before confirming safety.
 - ① Inspect and service the machine and devices after confirming safety of the entire system related to this product.
 - ② Note that there may be hot or charged sections even after operation is stopped.
 - ③ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage
 - ④ and leakage of electricity.
When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.
- 5** Observe warnings ad cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

- | | |
|--|--|
| 
(DANGER) | : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning. |
| 
(WARNING) | : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries. |
| 
(CAUTION) | : When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage. |

Even items described under CAUTION may cause serious results.
In any case, important information that must be observed is explained.

Disclaimer

- 1** Term of warranty
"Warranty Period" is one (1) year from the first delivery to the customer.
- 2** Scope of warranty
In case any defect attributable to CKD is found during the Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgement.
This Limited Warranty will not apply to:
 - (1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
 - (2) Failure caused by other than the delivered product
 - (3) Use other than original design purposes.
 - (4) Third-party repair/modification
 - (5) Failure caused by reason that is unforeseeable with technology put into practical use at the time of delivery
 - (6) Failure attributable to force majeure.In no event shall CKD be liable for business interruptions, loss of profits, personal injury, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.
- 3** Compatibility confirmation
In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.



Pneumatic component (digital electro-pneumatic regulator)

Safety precautions

Always read this section before starting use.

Design & Selection

⚠ WARNING

■ Understand properties of compressed air before designing a pneumatic circuit.

- The same functions as mechanical, hydraulic, and electrical methods cannot be anticipated if instantaneous service interruption and holding are required during an emergency stop.
- Pop-out, air discharge, or leakage due to air compression and expansion could occur.

■ Confirm that the product will withstand the working environment.

- This product cannot be used in an environment containing corrosive gas, chemical liquids, solvents, water or steam. If water drip, oil or metal particles (spatter or cutting chips, etc.) could come in contact with the product, provide appropriate guarding
- Do not use in atmosphere with explosive gas.

■ Care must be taken to the electrical circuit during emergency stop and cylinder operation, etc., during a service interruption.

■ Install "pressure switch" and "shut-off valve" on compressed air inlet of equipment.

- Disable operation if the pressure could no reach the set pressure of the pressure switch. The shut-off valve will exhaust compressed air in the pneumatic pressure circuit, and will prevent accidents caused by operation of pneumatic components by residual pressure.

■ If the regulator is left standing with power off and primary pressure applied, secondary pressure could rise to the primary pressure level. Due to the structure, a small amount of air is consumed from the EXH port when secondary pressure is generated.

Set the primary regulator to 0 or use a valve on the primary side to shut off the supply source when not using the regulator.

⚠ CAUTION

■ Indicate the maintenance conditions in the device's instruction manual.

- The product's function can drop markedly with working status, working environment, and maintenance, and can prevent safety from being attained. With correct maintenance, the product functions will perform to its fullest.

■ Use a constant voltage power supply.

■ Check leakage current to prevent other fluid control components from malfunctioning due to leakage current.

- When using a PLC, etc., leakage current could cause the electro pneumatic regulator to malfunction.

When DC24V

1.8mA or less

■ Response is adversely affected by working pressure and volume of loads. Install a regulator before the sensor if stable repeatability is required.

■ Take the following countermeasures to prevent malfunction caused by noise.

- Provide a line filter in AC power line.
- Remove noise from inductive load (such as solenoid valve and relay) with a surge suppressor such as CR or diode in the source side.
- Keep distance between a line connected to components and strong magnetic field.
- Connect a line connected to components with shield wire.
- Connect shield wire to the ground of power side.
- Keep the power wire as short as possible.
- Do not share power with an inverter or components causing motor noise, etc.
- Do not lay the power wire, signal wire, and other power cables in parallel.

■ Due to wiring, the current input power ground and signal common are the same.

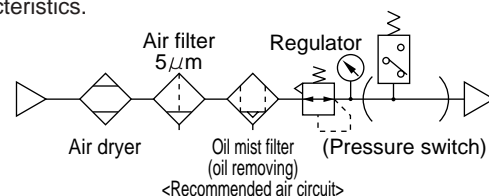
- When operating several EVDs with one PLC and D/A, depending on the D/A unit circuit, wiring could prevent the correct signal from being input. Consult with PLC maker.

■ The current input type can be used with input signal 1 to 5V, but as opposed to other voltage input types, input impedance is small (250 Ω). Use an appropriate voltage generator.

■ Poor air quality will worsen the features and adversely affects durability.

- Always supply clean air, from which solids, moisture and oil have been sufficiently removed with a dryer, air filter and oil mist filter.

Do not use lubricated air as it will adversely affect the characteristics.



- When the secondary pressure is lowered with an input signal, etc., the secondary air passes through the product and is discharged from the EXH port. Contamination on the secondary piping and the inside of the load will have an adverse effect on performance, etc. Keep the inside of the piping as clean as possible.

■ Secondary pressure will be maintained if power is turned off while pressurized. However, CKD does not guarantee maintained pressure over a long period of time.

- To discharge pressure, lower set pressure with an input signal and then turn OFF, or use a shut-off valve. There is no guarantee that this held state can be maintained for a long time.

Design & Selection

⚠ CAUTION

- Primary pressure requirements
 - 100kPa models: Maintain 50kPa above secondary pressure setting.
 - 500, 900kPa models: Maintain 100kPa above secondary pressure setting.
 - Product life is shortened if primary pressure is not supplied for a long time while power is on. Do not use this way.
- When releasing secondary control pressure to the atmosphere for purposes such as air blowing, pressure could fluctuate depending on piping conditions and flow conditions. Test under actual working conditions, or consult with CKD before using in this manner.
- When selecting dryer, air filter, oil mist filter or regulator, select a device with a flow rate higher than that used by proportional pressure controls.

■ Working conditions

Do not use the product where the product is exposed to direct-sunlight or may come in contact with water or oil, etc. Consult with CKD on specifications when using outside designated specifications or for special applications.

■ Drip-proof environment

This product's protective structure is equivalent to IP40. Do not install this product where it may be subject to water, salt, dust, or swarf is present or in a pressurized or depressurized environment. This product cannot be used where the temperature changes sharply or in a highly humid environment where internal damage could be caused by dew condensation.

- Even when pressure is set to 0 Mpa, secondary side pressure will not be completely released with less than 1%F.S. remaining. If precisely 0 MPa is required, bleed the secondary side or install a 3-way valve on the secondary side to switch the secondary side to atmospheric pressure.

Installation & Adjustment

⚠ DANGER

Installation & Adjustment

- Use power voltage and output within the specified voltage. Using voltage exceeding the specified voltage could result in malfunctions, controller damage, electrical shock, or fire. Do not apply load exceeding the output rating. Failure to observe this could result in damage to the output or fire.

⚠ WARNING

Wiring

- Check the connector pin and cable core wire color when wiring. Incorrect connections could cause damage, problems, or malfunctions. Check the wire color against instructions and precautions before wiring.
- Check wiring insulation. Check that wires do not contact other circuits and that there are no ground faults or insulation faults across terminals. Overcurrent may be admitted to damage.
- Use a DC stabilized power supply, within the specified rating, insulated from the AC power supply. Failure to insulate the power supply could result in electrical shock. If power is not stabilized, the peak value could exceed the rating and damage the product or reduce precision.
- Stop the control device and machine devices, and turn the power off before wiring. Starting operation suddenly could result in unpredictable operation and hazards. Conduct an energized test with control devices and equipment

stopped. Discharge electrostatic accumulated in personnel or tools before and during work. Use flexible wiring on the moving sections to prevent disconnection.

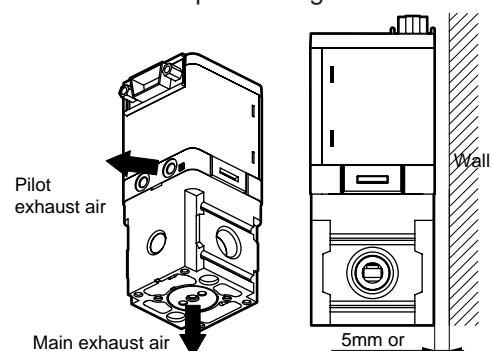
- Do not use this product at levels exceeding the power voltage range. If voltage exceeding the specified range or AC power (100 VAC) is applied, the controller could break or burn.

- Do not short-circuit the load. This product could rupture or burn.

⚠ CAUTION

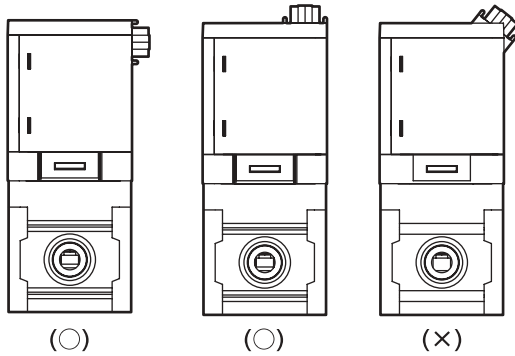
Installation & Adjustment

- Secure sufficient space around the product for installation, removal, wiring, and piping work.
- Install an air filter just before the circuit using the pneumatic component.
- Maintain sufficient space for exhaust and do not close the exhaust port during installation.



Installation & Adjustment

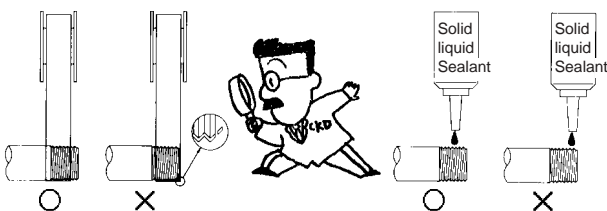
- The D-sub connector's rotating mechanism is not designed for use in moving applications. Use it at the top or side, not inclined. Fix any cables that could move in place.



CAUTION

Piping

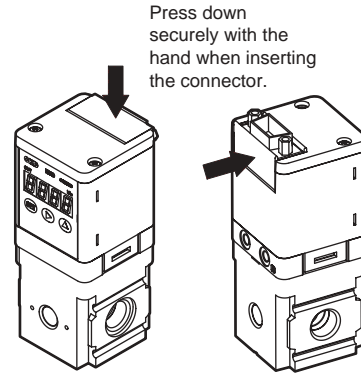
- Do not remove the port seal until just before piping the product.
 - Removing the port seal from the piping port before piping work starts could let foreign matter enter from the piping port and cause faults or faulty operation.
- Flush the pipe thoroughly before installation. Prevent pipe from catching tips of sealing tape when piping.
- When connecting pipes, wrap sealing tape in the opposite direction from threads starting 2 mm margin from the end of piping threads.
 - If sealing tape protrudes from pipe threads, it could be cut when screwed in. This could cause the tape to enter the pneumatic components and lead to damage.



Wiring

- The optional shield cable connector is a shielded wire.
 - Insulate wires that are not being used so that they do not contact other wires, including shielded wires. Unintended connection to the ground, etc., could cause malfunction or damage the product.
- Insert and fit the D-sub connector securely on the back.

- The D-sub connector has a 90° rotating mechanism. When fitting the D-sub connector, press it in by hand so that it faces the top or side.

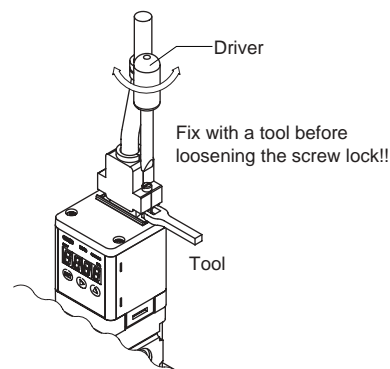


- Correct pressure control is not possible if the exhaust port is plugged. Release this port to the atmosphere.
- When connecting port, tighten with adequate torque.
 - Failure to observe this will lead to air leakage and/or damage to screws
 - Tighten by hand at first, then use a tool, to prevent damage to the thread.
 - Electric component section is mounted on the body with Please handle with care and refrain from applying excess force to it.

[Recommended tightening torque]

Port thread	Tightening torque N · m
Rc1/4	6.0 to 08.0
Rc3/8	13.0 to 15.0

- When supplying compressed air for the first time after connecting pipes, do not apply high pressure suddenly.
- When supplying compressed air for the first time after connecting piping, confirm that no air is leaking from any pipe connections.
 - Apply a leakage detection agent on pipe connections with a brush, and check for air leaks.
- Lock the D-sub connector so that it will not be dislocated. Before loosening the lock, fix the fixing block with a tool, etc.



During Use & Maintenance

⚠ WARNING

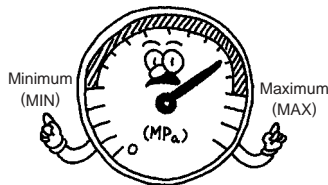
- Do not supply other than compressed air.
- Use clean compressed air that does not contain corrosive gases.
- Use oil free dry air equivalent to "ISO Class 8573-1" or JIS Class B 8329-1, 1.3.2"
- Before servicing the product, turn power OFF, stop the compressed air supply, and check that there is no residual pressure.
 - This is a requirement for ensuring safety.

⚠ CAUTION

- Conduct daily inspections and regular inspections to ensure that maintenance control is done correctly.
 - If maintenance is not conducted properly, the product's performance could be impaired drastically and lead to a shorter service life, damage, malfunctions, faults, and accidents.

1. Managing

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



2. Compressed air check

- Is the oil rate correctly adjusted?
Is the end absorber required even when using the SKH shock absorbing valve?

3. Leakage from piping connection check

- Is the connection, especially at movable sections, normal?
Leakage in piping may lead to malfunctioning.

4. Operation check

- Are any operations delayed? Is exhaust normal?

5. Actuator check

- Does it operate smoothly? Is end stop normal?
Is coupling with the load normal?

- If abnormal operation occurs, turn power off and disconnect from air pressure sources immediately and stop use.

- Use this product within the working pressure range.

- This product does not start pressure control for two seconds or so after power is turned on to complete self-diagnostics. Provide a control circuit or program that ignore signals for 3 seconds after power is turned on.

- If the output setting value is changed, control system devices could operate unintentionally. Stop devices before changing settings.

- Regularly inspect the product at least once a year or more, and confirm that it is operating correctly.

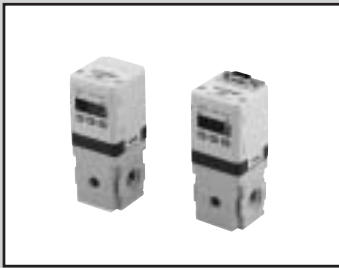
- This product uses a small solenoid valve as its actuator. Service life will be affected by working conditions and pressure switching frequency.

This product is warranted for 1 year or 3 million cycles of use, whichever comes first. Please use this as a reference.

*The conditions for the 3 million cycles in the warranty is as follows.

- Repeatedly input maximum control pressure signals in steps when the control pressure is zero. The air quality must be clean compressed air in the recommended air circuit and the secondary load capacity must be 300cm³.

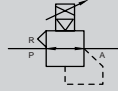
- This case is made of resin. Do not use solvent, alcohol or any other detergent in cleaning to remove contamination, etc. This may damage the resin. Wipe off dirt with a rag soaked in a diluted neutral detergent solution and wrung out well.



Digital electro-pneumatic regulator

EVD-1000 Series

JIS symbol



Specifications

Descriptions	EVD-110 0-*08 <input type="checkbox"/>	EVD-1100-P08 <input type="checkbox"/>	EVD-1500-*08 <input type="checkbox"/>	EVD-1500-P08 <input type="checkbox"/>	EVD-1900-*08 <input type="checkbox"/>	EVD-1900-P08 <input type="checkbox"/>
	Analog type (*...0/1/2)	Parallel type	Analog type (*0/1/2)	Parallel type	Analog type (*0/1/2)	Parallel type
Working fluid	Clean compressed air(ISO 1.3.2 or equivalent)					
Max. working pressure	160kPa		700kPa		1000kPa	
Min. working pressure	Control pressure range+50kPa			Control pressure range+100kPa		
Withstanding pressure	inlet side		1050kPa		1500kPa	
	Outlet side		750kPa		1350kPa	
Control pressure range Note 1	0 to 100kPa		0 to 500kPa		0 to 900kPa	
Power voltage	DC24V±10%(safety power supply with ripple ratio 1% or less)					
Current consumption	0.15A or less(power supply rush current 0.6A or less when power turned ON)					
Input signal	0-10VDC (6.7kΩ)	10bit	0-10VDC (6.7kΩ)	10bit	0-10VDC (6.7kΩ)	10bit
Input impedance	0-5VDC (10kΩ)		0-5VDC (10kΩ)		0-5VDC (10kΩ)	
	4-20mADC (250Ω)		4-20mADC (250Ω)		4-20mADC (250Ω)	
pre-set input	8 points	None	8 points	None	8 points	None
Output signal Note 2	Output precision:±6%F.S. or less, analog output:1 to 5VDC(connected load impedance500kΩ and over) Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, PLC and relay compatible					
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, PLC and relay compatible					
Direct memory setting	1 to 100kPa (setting minimum width 1kPa/setting resolution 1kPa)		5 to 500kPa (setting minimum width 1kPa/setting resolution 1kPa)		9 to 900kPa (setting minimum width 1kPa/setting resolution 2kPa)	
Pressure display	Display method	7 segment LED 3 digit,display precision:±2% F.S. or less				
	Display range	0 to 100kPa		0 to 500kPa		0 to 900kPa
	Display resolution	1kPa		1kPa		1kPa
Hysteresis Note 3	0.5%F.S. or less					
Linearity Note 3	±0.3%F.S. or less					
Resolution Note 3	0.2%F.S. or less					
Repeatability Note 3	0.3%F.S. or less					
Temperature characteristics	Zero point variation	0.15%F.S./°C or less				
	Span variation	0.07%F.S./°C or less				
Maximum flow rate(ANR) Note 4	60ℓ/min		400ℓ/min			
Step response Note 5	Loadless		0.2sec or less			
Mechanical vibration proof	98m/s ² or less					
Ambient temperature	5 to 50°C					
Working fluid temperature	5 to 50°C					
Port size	Rc1/4					
Mounting direction	Free					
Weight (body)	250 g					
Protective circuit	power supply reverse connection prevention, switch output reverse connection prevention, switch output load short-circuit protection					

Note1: There is residual pressure less than 1% F.S. when the input signal is 0% (EVD-1100:1kPa,EVD-1500:5kPa,EVD-1900:9kPa)

Note2: Select either analog output or switch output.

Note3: The above characters apply for a control pressure of 10 to 90% when power voltage is 24 VDC, working pressure is EVD-1100, maximum control pressure is +50 kPa/EVD-1500 or1900, and maximum control pressure is +100 kPa.

The secondary side is limited to a closed circuit. Pressure could fluctuate when using for applications such as blowing.

Note4: The above apply when working pressure is maximum and control pressure is maximum.

Note5: The above apply when working pressure is maximum and the step rate is

{	50% F.S. → 100% F.S.
	50% F.S. → 60% F.S.
	50% F.S. → 40% F.S.

How to order

EVD-1 **500** - **0** **8** **AN** - **C1B1** - **3**

A Pressure specifications

B Input specifications

C Port size

D Output specifications

E Option

F Power voltage

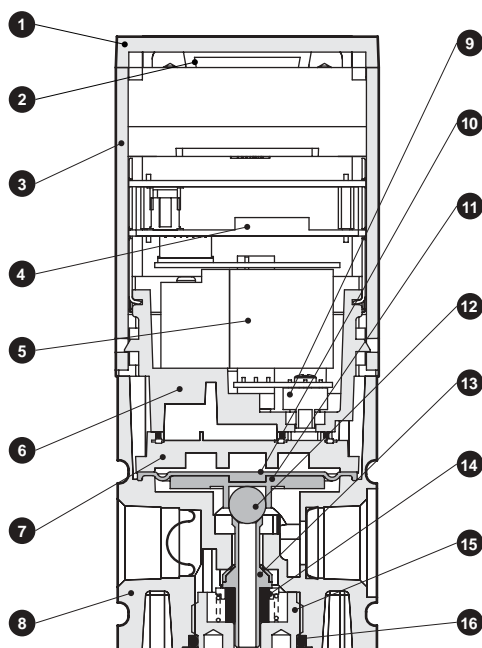
● Option (cable, bracket) discrete model no.

EVD- **C1**

E Option

Symbol	Descriptions
A Pressure specifications	
100	100kPa
500	500kPa
900	900kPa
B Input specifications	
0	0-10VDC
1	0-5VDC
2	4-20mADC
P	Parallel 10bit
C Port size	
8	Rc1/4
D Output specifications	
AN	1-5V analog, error(NPN)
AP	1-5V analog, error(PNP)
SN	Switch (NPN) , error(NPN)
SP	Switch (PNP) , error(PNP)
E Option	
Cable option	
Blank	None
C1	Analog 9 conductors, cable 1m
C3	Analog 9 conductors, cable 3m
P1	Parallel 15 conductors, cable 1m
P3	Parallel 15 conductors, cable 3m
Bracket option included	
Blank	None
B1	B type bracket, floor mounting type
L1	L type bracket, wall mounting type
F Power voltage	
3	DC24V

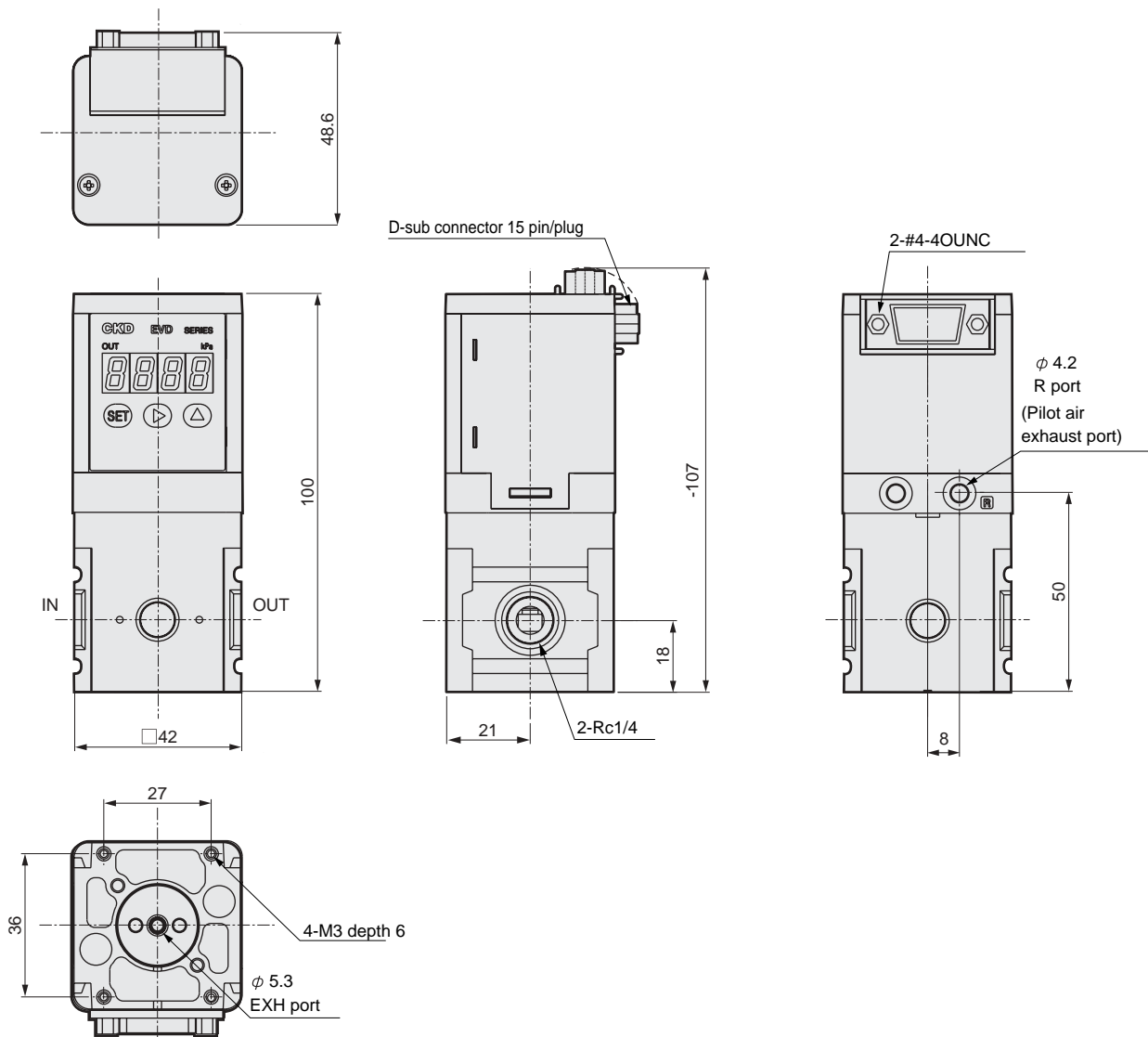
Internal structure and parts list



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

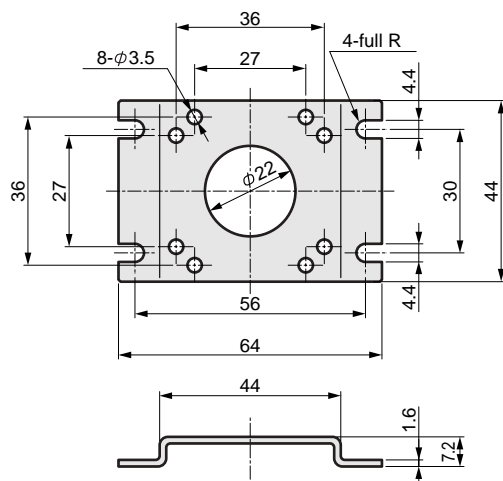
EVD-1000 Series

Dimensions

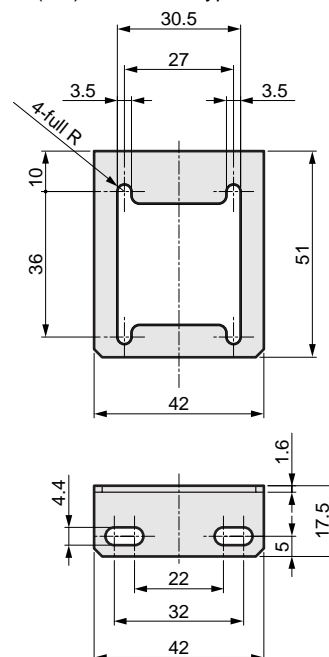


Option dimensions

● B-bracket (-B1): Floor mount type



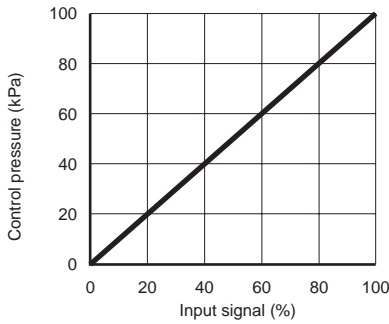
● L-bracket (-L1): Wall mount type



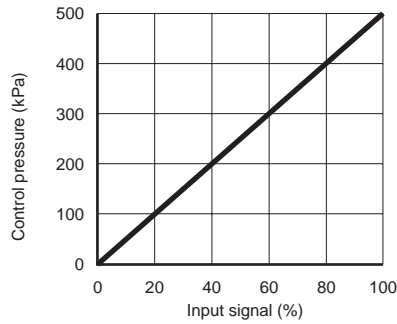
*Refer to page 10 for cable option dimensions.

Input output characteristics

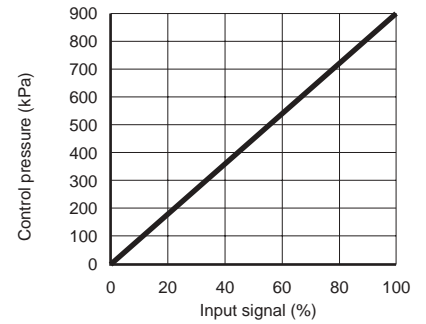
● EVD-1100



● EVD-1500

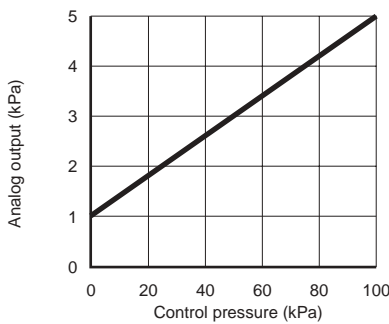


● EVD-1900

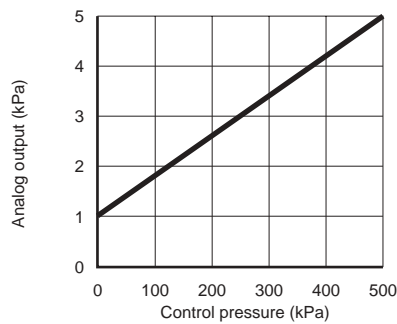


Monitor output (Analog output type only: Model no. AN/AP)

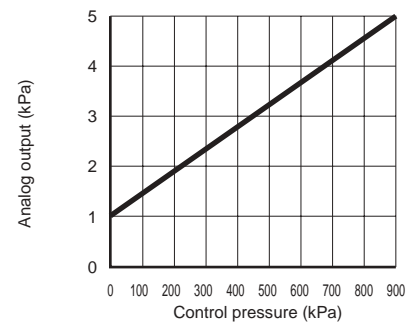
● EVD-1100



● EVD-1500

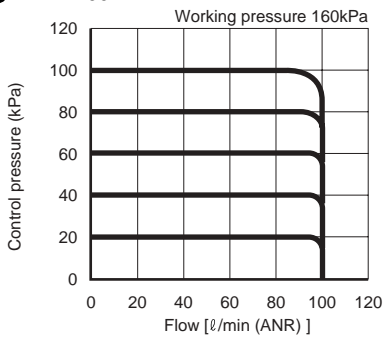


● EVD-1900

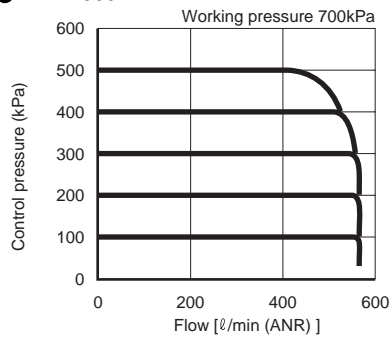


Flow characteristics

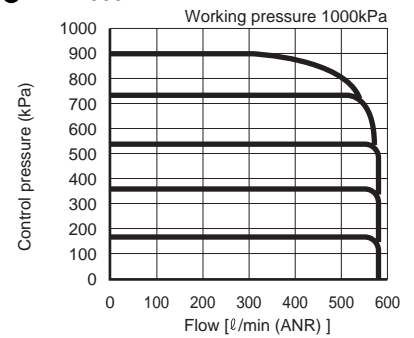
● EVD-1100



● EVD-1500

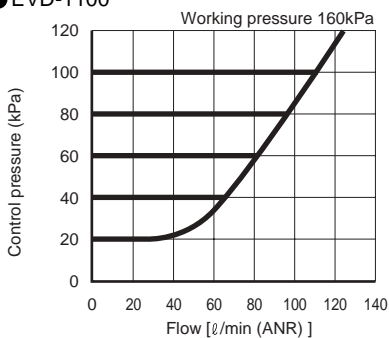


● EVD-1900

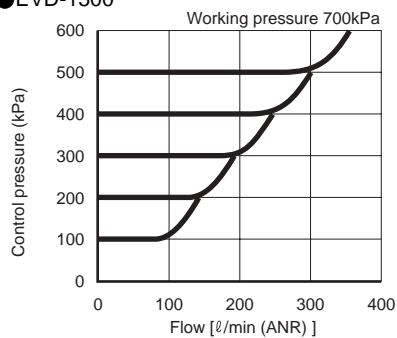


Relief characteristics

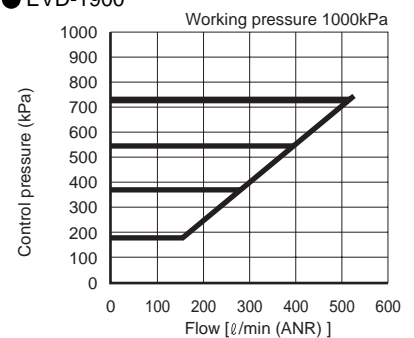
● EVD-1100



● EVD-1500



● EVD-1900

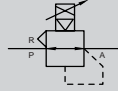




Digital electro-pneumatic regulator

EVD-3000 Series

JIS symbol



Specifications

Descriptions	EVD-3100-*08 <input type="checkbox"/>	EVD-3100-P08 <input type="checkbox"/>	EVD-3500-*08 <input type="checkbox"/>	EVD-3500-P08 <input type="checkbox"/>	EVD-3900-*08 <input type="checkbox"/>	EVD-3900-P08 <input type="checkbox"/>
	EVD-3100-*10 <input type="checkbox"/>	EVD-3100-P10 <input type="checkbox"/>	EVD-3500-*10 <input type="checkbox"/>	EVD-3500-P10 <input type="checkbox"/>	EVD-3900-*10 <input type="checkbox"/>	EVD-3900-P10 <input type="checkbox"/>
	Analog type (*0/1/2)	Parallel type	Analog type (*0/1/2)	Parallel type	Analog type (*0/1/2)	Parallel type
Working fluid	Clean compressed air(ISO 1.3.2 or equivalent)					
Max. working pressure	160kPa		700kPa		1000kPa	
Min. working pressure	Control pressure range+50kPa			Control pressure range+100kPa		
Withstanding pressure	Inlet side	240kPa		1050kPa		160kPa
	Outlet side	150kPa		750kPa		1350kPa
control pressure range	Note0 to 100kPa		0 to 500kPa		0 to 900kPa	
Power voltage	DC24V±10%(safety power supply with ripple ratio 1% or less)					
Current consumption	0.15A or less(power supply rush current 0.6A or less when power turned ON)					
Input signal	0-10VDC (6.7kΩ)	10bit	0-10VDC (6.7kΩ)	10bit	0-10VDC (6.7kΩ)	10bit
Input impedance	0-5VDC (10kΩ)		0-5VDC (10kΩ)		0-5VDC (10kΩ)	
pre-set input	8 points	None	8 points	None	8 points	None
Output signal	Note 2 Output precision:±6%F.S. or less, analog output:1 to 5VDC(connected load impedance500kΩ and over) Switch output: NPN or PNP open collector output, 30 V or less, 50 mA or less, voltage drop of 2.4 V or less, PLC and relay compatible					
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, PLC and relay compatible					
Direct memory setting	1 to 100kPa (setting minimum width 1kPa/setting resolution 1kPa)		5 to 500kPa (setting minimum width 1kPa/setting resolution 1kPa)		9 to 900kPa (setting minimum width 1kPa/setting resolution 2kPa)	
Pressure display	Display method	7 segment LED 3 digit,display precision:±2% F.S. or less				
	Display range	0 to 100kPa		0 to 500kPa		0 to 900kPa
	Display resolution	1kPa		1kPa		1kPa
Hysteresis	Note 3		0.5%F.S. or less			
Linearity	Note 3		±0.3%F.S. or less			
Resolution	Note 3		0.2%F.S. or less			
Repeatability	Note 3		0.3%F.S. or less			
Temperature characteristics	Zero point variation	0.15%F.S./°C or less				
	Span variation	0.07%F.S./°C or less				
Maximum flow rate(ANR) Note 4	700ℓ/min		1500ℓ/min			
Step response Note 5	Loadless		0.2sec or less			
Mechanical vibration proof	98m/s2 or less					
Ambient temperature	5 to 50°C					
Working fluid temperature	5 to 50°C					
Port size	IN, OUT port	Port size option 08: Rc1/4, 10: Rc3/8				
	EXH port	Rc3/8 to Rc1				
Mounting direction	Free					
Weight (body)	450g					
Protective circuit	Power supply reverse connection prevention, switch output reverse connection prevention, switch output load short-circuit protection					

Note1: There is residual pressure less than 1% F.S. when the input signal is 0%. (EVD-3100:1kPa, EVD-3500:5kPa, EVD-3900:9kPa)

Note2: Select either analog output or switch output.

Note3:The above characters apply for a control pressure of 10 to 90% when power voltage is 24 VDC, working pressure is EVD-3100, maximum control pressure is +50 kPa/EVD-3500 or3900, and maximum control pressure is +100 kPa.

The secondary side is limited to a closed circuit. Pressure could fluctuate when using for applications such as blowing.

Note4:The above apply when working pressure is maximum and control pressure is maximum.

Note5:The above apply when working pressure is maximum and the step rate is

}	50% F.S. →100% F.S.
	50% F.S. →60% F.S.
	50% F.S. →40% F.S.

How to order

EVD-3 **500** - **0** **8** **AN** - **C1B3** - **3**

A Pressure specifications

B Input specifications

C Port size (IN, OUT)

D Output specifications

E Option

F Power voltage

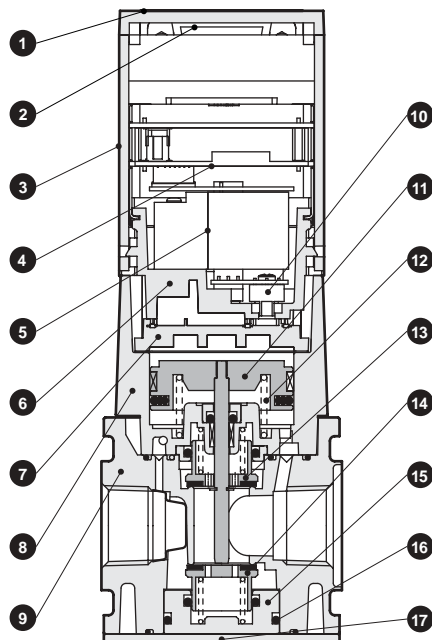
● Option(cable, bracket) discrete model no.

EVD- **C1**

E Option

Symbol	Descriptions
A Pressure specifications	
100	100kPa
500	500kPa
900	900kPa
B Input specifications	
0	0-10VDC
1	0-5VDC
2	4-20mADC
P	Parallel 10bit
C Port size (IN, OUT)	
8	Rc1/4
10	Rc3/8
D Output specifications	
AN	1-5V analog, error (NPN)
AP	1-5V analog, error (PNP)
SN	Switch (NPN), error (NPN)
SP	Switch (PNP), error (PNP)
E Option	
Cable option	
Blank	None
C1	Analog 9 conductors, cable 1m
C3	Analog 9 conductors, cable 3m
P1	Parallel 15 conductors, cable 1m
P3	Parallel 15 conductors, cable 3m
Bracket option included	
Blank	None
B3	B type bracket, floor mounting type
L3	L type bracket, wall mounting type
F Power voltage	
3	DC24V

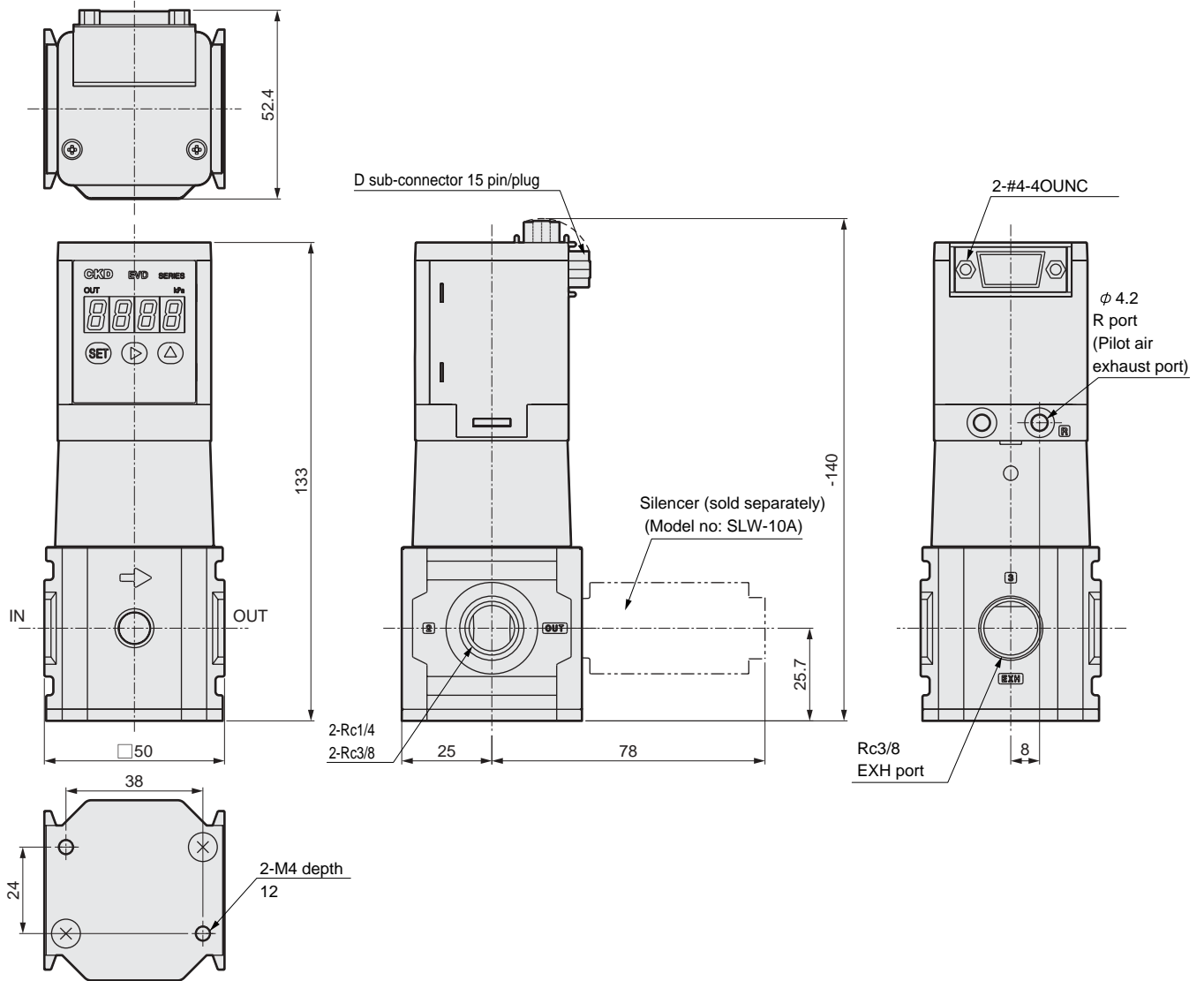
Internal structure and parts list



No.	Parts name	Material
1	Lid	PBT Resin
2	D-sub connector	-
3	Housing	ABS resin
4	Controller PCB	-
5	3 way valve	-
6	Valve sub-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	Bottom plate	Steel sheet

EVD-3000 Series

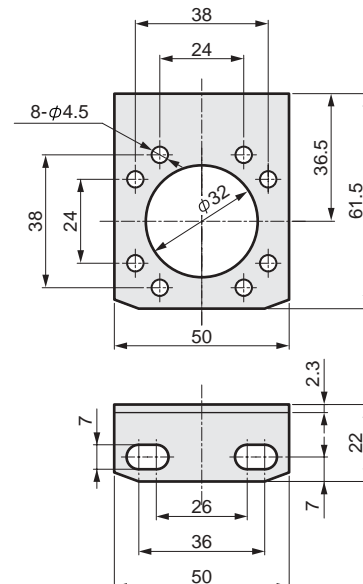
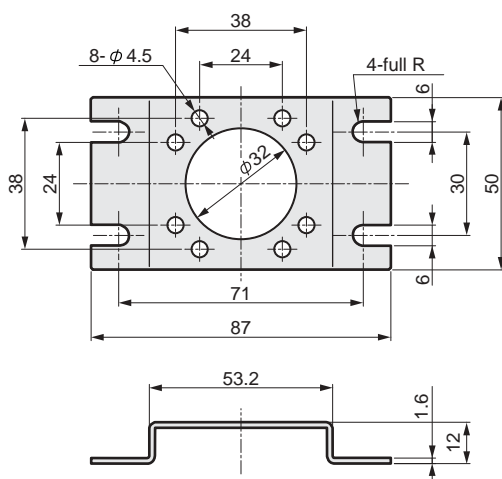
Dimensions



Option dimensions

● B-bracket (-B1) :Floor mount type

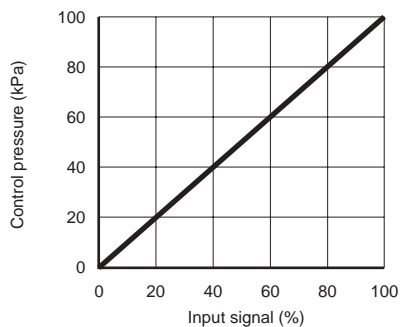
● L-bracket (-L1) :Wall mount type



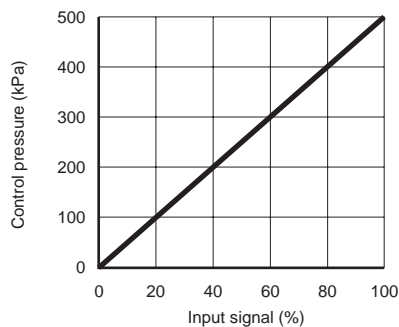
*Refer to page 10 for cable option dimensions.

Input output characteristics

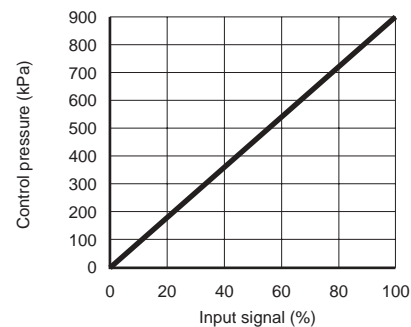
● EVD-3100



● EVD-3500

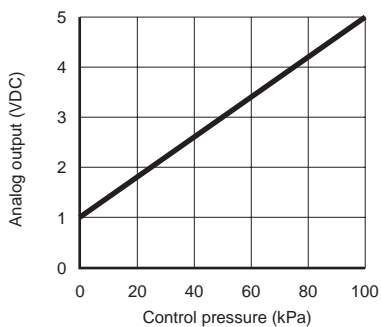


● EVD-3900

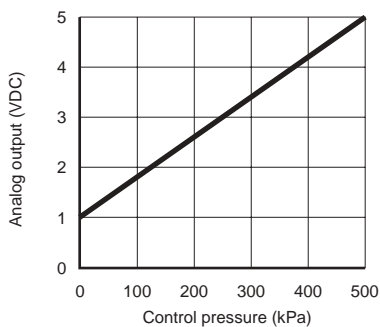


Monitor output (analog output type: Model no. AN/AP)

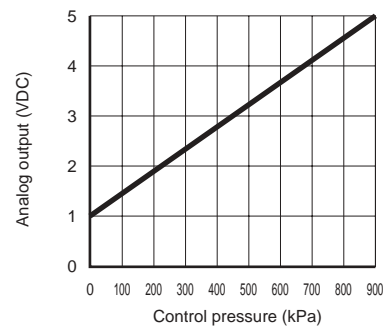
● EVD-3100



● EVD-3500

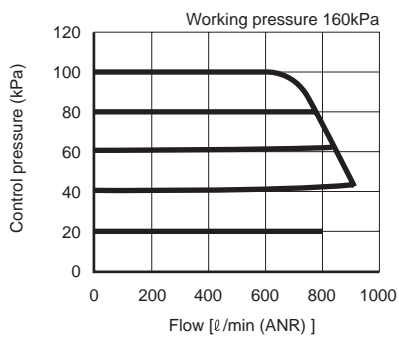


● EVD-3900

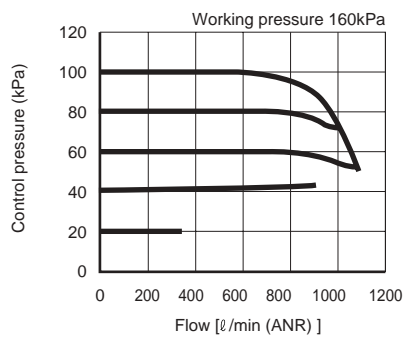


Flow characteristics

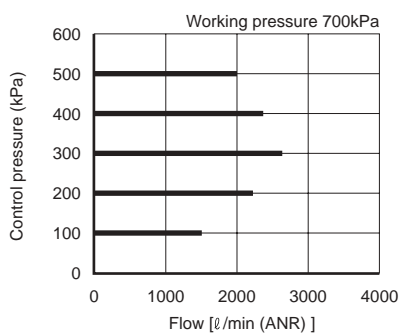
● EVD-3100-□08



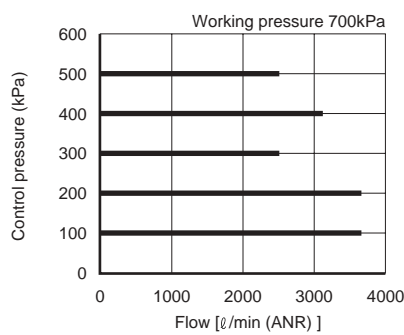
● EVD-3100-□10



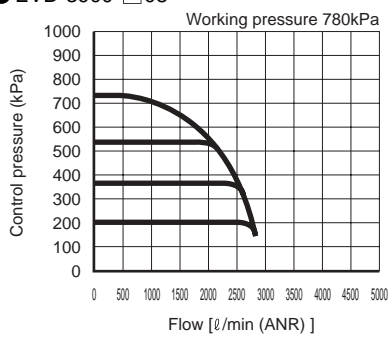
● EVD-3500-□08



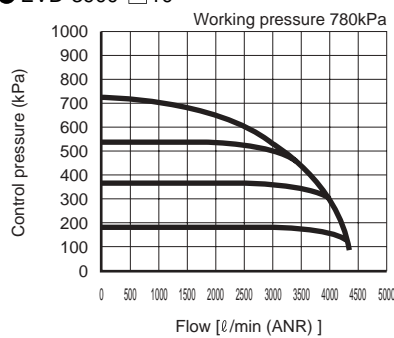
● EVD-3500-□10



● EVD-3900-□08

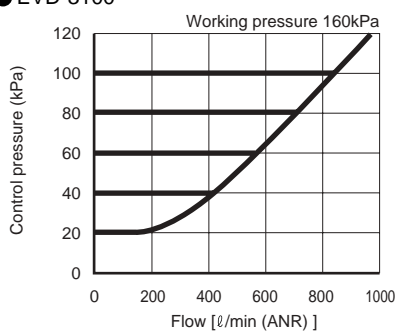


● EVD-3900-□10

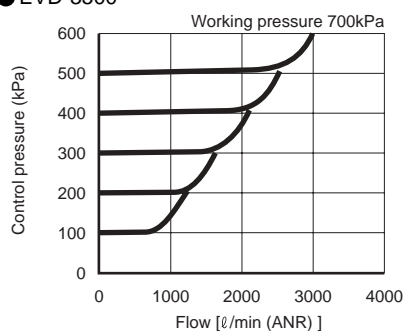


Relief characteristics

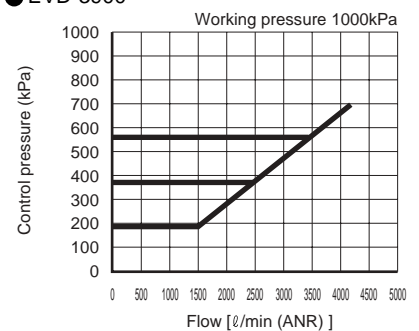
● EVD-3100



● EVD-3500

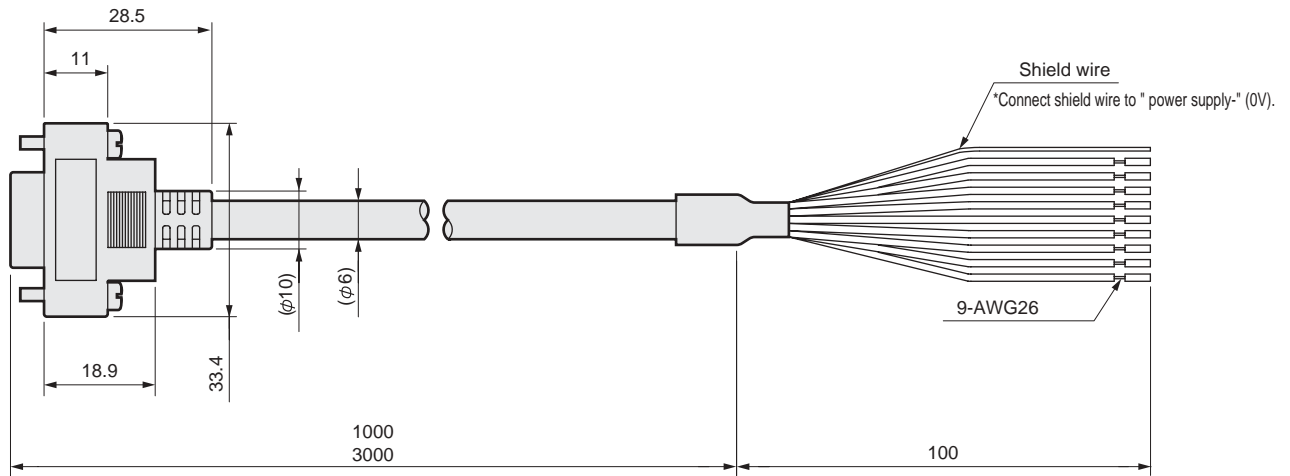


● EVD-3900



Cable optional dimensions

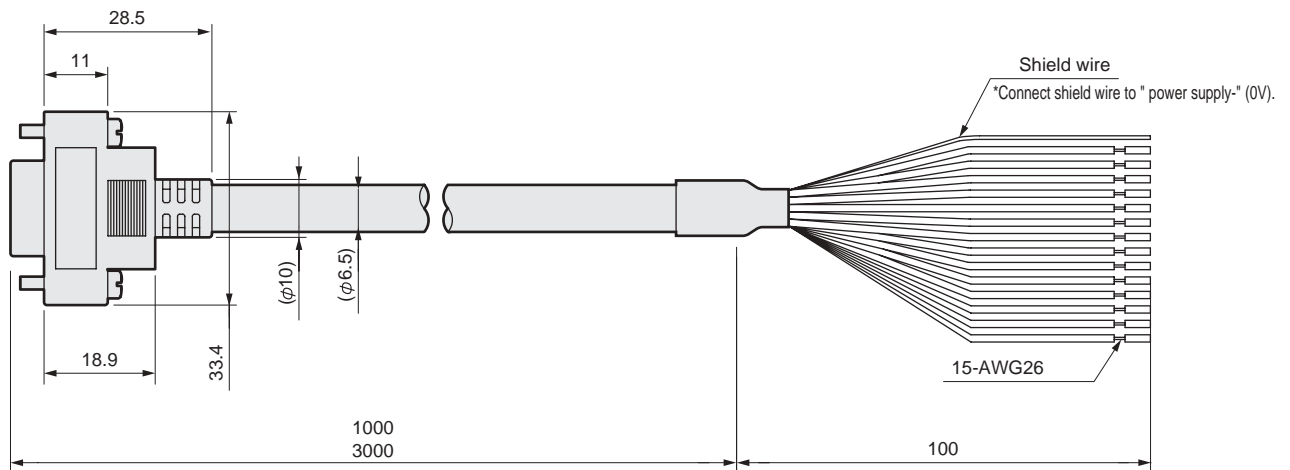
● EVD-C1, EVD-C3



D-sub socket Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
Isolator color	Brown	Orange	Yellow	-	Red	-	-	-	-	Gray	White	-	Green	Blue	Black			
Title	Pre-set input signal				Power +						Input signal	Vacant	Monitor Output	Switch Output	Error Output			
Type of input	Bit 1	Bit 2	Bit 3	Vacant	+24 VDC	Vacant	Vacant	Vacant	Vacant	Common	0-10 VDC	0-5 VDC	2010/04/20 mADC	Vacant	Output 1-5VDC	NPN Or PNP Output	NPN Or PNP Output	Power supply- (0V)

Note: The common for pin no. 10 is for preset input (pin 1, 2, 3)

● EVD-P1, EVD-P3

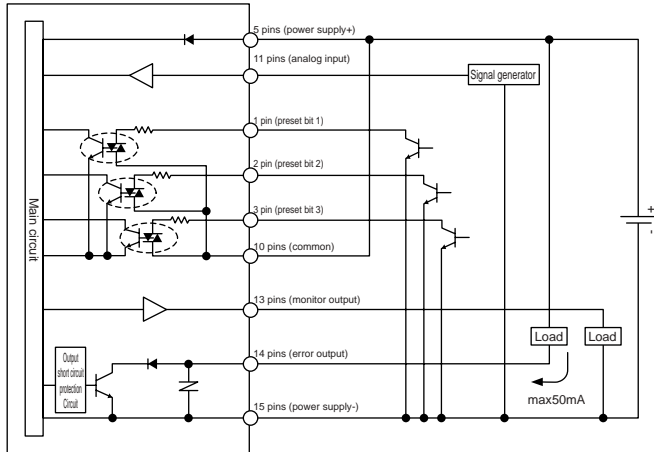


D-sub socket Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Isolator color	Brown	Orange	Yellow	Purple	Red	Light blue	Pink	White (With a black line)	Red (With a black line)	Gray	White	Green (With a black line)	Green	Blue	Black	
Title	Parallel input signal				Power supply +	Parallel input signal					Parallel input signal	Monitor Output	Switch Output	Error Output		
Type of input	Bit 1	Bit 2	Bit 3	Bit 4	+24 VDC	Bit 5	Bit 6	Bit 7	Bit 8	Common	Bit 9	Bit 10	Output 1-5 VDC	NPN Or PNP Output	NPN Or PNP Output	Power supply- (0V)

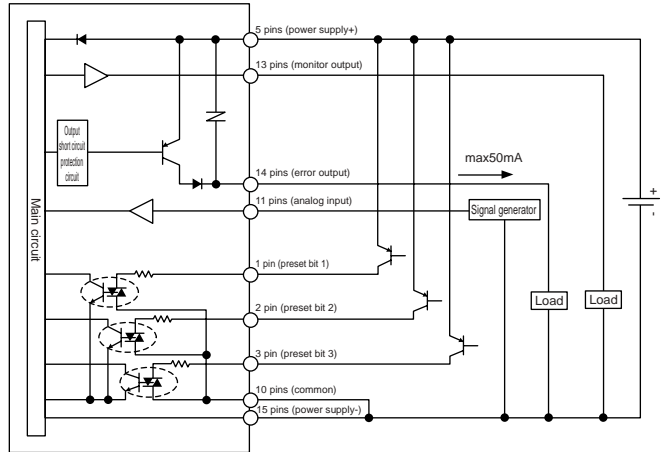
Note: The common for pin no.10 is for parallel input signal.

Internal circuit diagram and example of load connection Analog input type

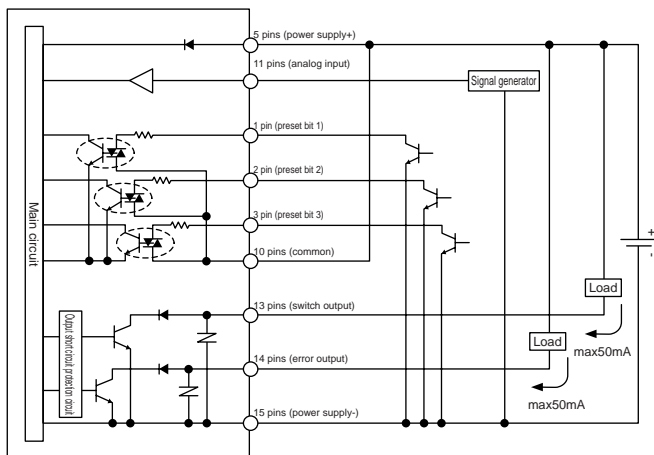
EVD-1□-0□AN-□-□, EVD-1□-1□AN-□, EVD-1□-2□AN-□
 EVD-3□-0□AN-□-□, EVD-3□-1□AN-□, EVD-3□-2□AN-□
 (analog input, analog output+error output type NPN output)



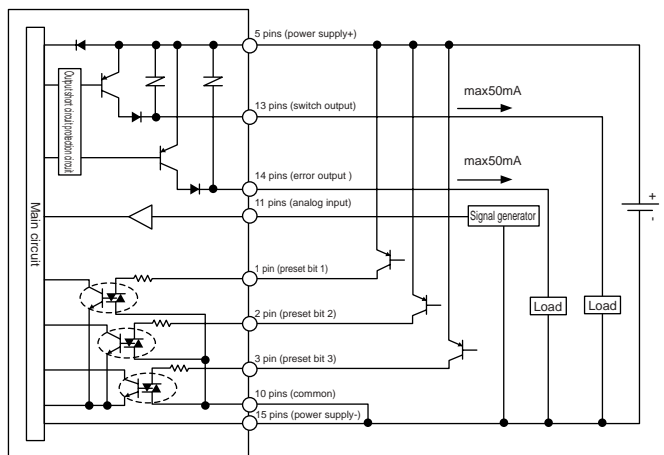
EVD-1□-0□AP-□-□, EVD-1□-1□AP-□, EVD-1□-2□AP-□
 EVD-3□-0□AP-□-□, EVD-3□-1□AP-□, EVD-3□-2□AP-□
 (analog input, analog output+error output type PNP output)



EVD-1□-0□SN-□-□, EVD-1□-1□SN-□, EVD-1□-2□SN-□
 EVD-3□-0□SN-□-□, EVD-3□-1□SN-□, EVD-3□-2□SN-□
 (analog input, switch output+error output type NPN output)

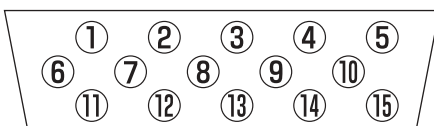


EVD-1□-0□SP-□-□, EVD-1□-1□SP-□, EVD-1□-2□SP-□
 EVD-3□-0□SP-□-□, EVD-3□-1□SP-□, EVD-3□-2□SP-□
 (analog input, switch output+error output type PNP output)



■ Connector pin layout (product body side)

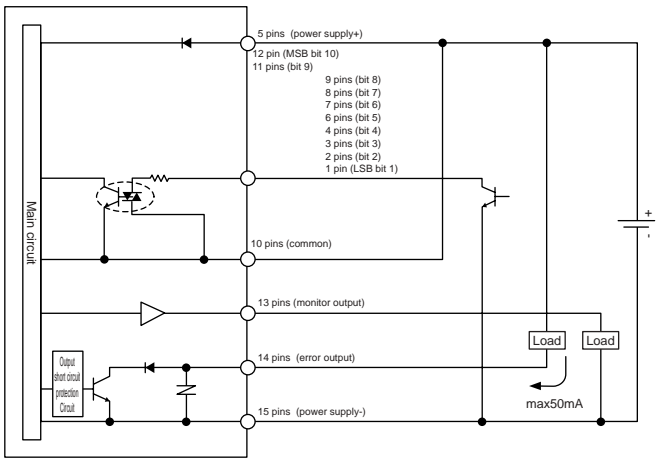
[Analog input type]



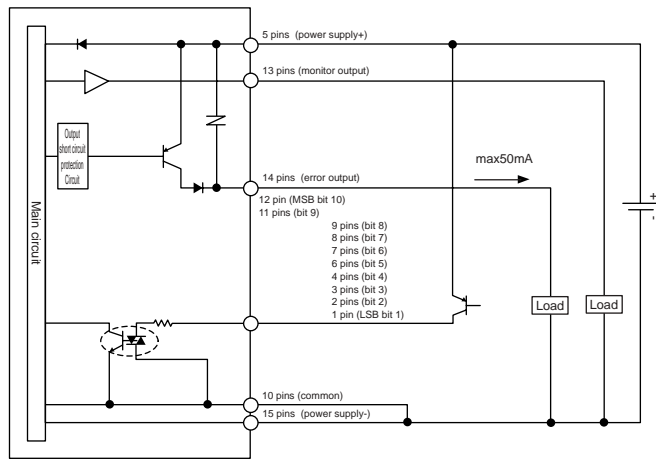
Analog input type does not have pins
 4, 6, 7, 8, 9, and 12

Internal circuit diagram and example of load connection Parallel input type

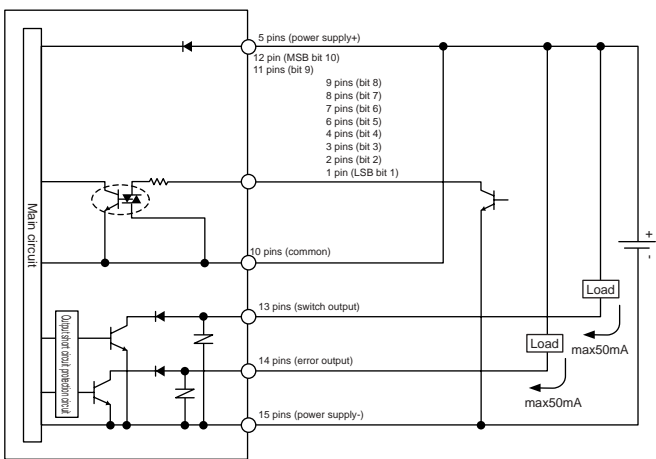
EVD-1□-P□AN-□-□
EVD-3□-P□AN-□-□
(parallel input, analog output+error output type NPN output)



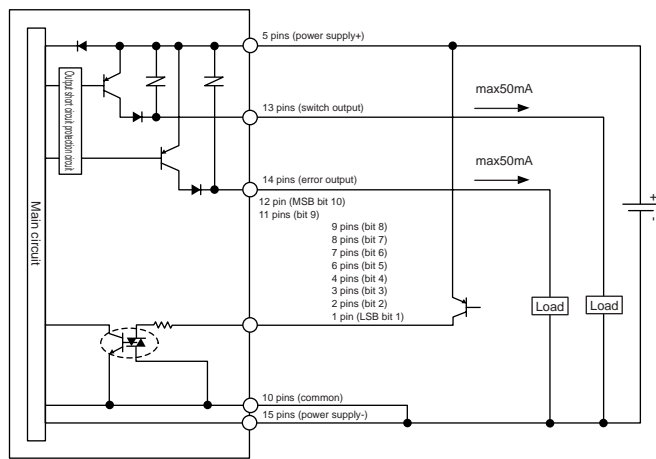
EVD-1□-P□AP-□-□
EVD-3□-P□AP-□-□
(parallel input, analog output+error output type PNP output)



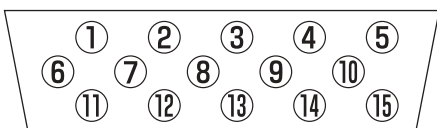
EVD-1□-P□SN-□-□
EVD-3□-P□SN-□-□
(parallel input, switch output+error output type NPN output)



EVD-1□-P□SP-□-□
EVD-3□-P□SP-□-□
(parallel input, switch output+error output type PNP output)



■ Connector pin layout (product body side)
[Parallel input type]



Input method

■ Relationship of parallel input signal and control pressure

The parallel input signal is a 10-bit signal. When converted to decimal, it is 0-1023.

Input signal = EVD setting pressure (kPa)/maximum control pressure x 1023
 Maximum control pressure is 100kPa for EVD-1100
 500kPa for EVD-1500
 900kPa for EVD-1900

e.g.) When setting to 300kPa for EVD-1500
 $300(\text{kPa})/500(\text{kPa}) \times 1023 = 613.8 \rightarrow 614$

(When calculated in reverse and set to 614, then
 $500(\text{kPa}) \times 614/1023 \doteq 300(\text{kPa})$)

When 614 (decimal) is converted to a binary, it is 1001100110.1 turns input signal ON, and zero turns input signal OFF.(Refer to the table below)

D-sub socket pin No.	12	11	9	8	7	6	4	3	2	1
Cable option Isolator color	Green (With black line)	White	Red (With black line)	White (With black line)	Pink	Light blue	Purple	Yellow	Orange	Brown
Type of input	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

■ Relation between preset memory and input signal.

D-sub-socket pin No.	3	2	1	Pre-set memory
Cable option Isolator color	Yellow	Orange	Brown	
Type of input	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

MEMO

Display/operating section names and functions

Output display (red)

● "F" is displayed when confirming function setting.

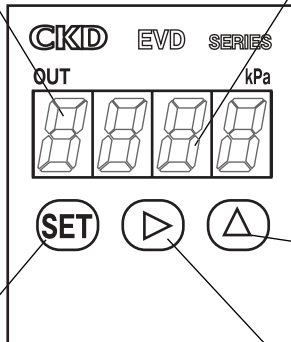
● "-" lights when the switch outputs on.
(Only when using switch output specifications)
*Flashes when an overcurrent is detected.

● "E" lights when error output is on.
● *Flashes when an overcurrent is detected.

*If there is a +/- or upper/lower limit to the function setting,
 or is displayed.

SET Key

- Use to enter each setting mode.
- Use to set values, etc., when setting data.



3 digit LED display (green)

- Displays the pressure display and function setting details during RUN mode (pressure display).
*The set mode No. and set details are displayed when function setting details are displayed.
- The value, etc., is displayed when setting data.
- The error code No. is displayed when an error is output.

<Pressure display> <Set details display> <Error output>

Setting Mode Number Setting Mode Descriptions Code No.

△ Key

- Setting details are sequentially displayed during RUN mode (pressure display).
- Use to select the setting item when setting data.
- Use to count up the value, etc., when setting data.

▶ Key

- Use to set values, etc., when setting data.

Function list

Display	Title	Display descriptions (RUN mode)	Setting descriptions (setting mode)	Setting method
	Pressure Indication	Secondary pressure is confirmed with the 3-digit numerical display LED. Unit: kPa		
	Input Signal Select	The selected input signal type and current target value (pressure conversion value) are confirmed. *When preset input (8-point) is selected, the currently selected preset No. and setting are displayed.	For analog input type: analog input, preset memory input, or direct memory input is selected. For preset input/direct memory input, input the setting for this mode. For parallel input: parallel input or direct memory input is selected. For direct memory input, input the setting for this mode.	P.16
	Zero /Span Adjustment	The validity of the zero/span adjustment and the setting value are confirmed. When "valid," the F2.on - zero point adjustment value (L) and span point adjustment value (H) are alternately displayed. *The default setting is full scale (- -).	Select whether to use with the full scale or with the zero and span adjusted. When zero/span adjustment is selected, the adjustment value for this mode can be set randomly.	P.17
	Automatic power off	The validity of the auto power off function is confirmed. *The default setting is invalid (- -).	The validity of the auto power off function is selected. Note: The auto power off time is about 1 minute, and cannot be changed.	P.17
	Switch Output * Switch Output Specifications only	The switch output validity and setting value are confirmed. When "Mode 1 valid" is selected, the F4.0 - - tolerable range setting value (L) - + tolerable range setting value (H) are alternately displayed. When "Mode 2 valid" is selected, F4.1 - minimum setting value (L) - maximum setting value (H) is alternately displayed. *The default setting is invalid (- -).	Switch output validity is selected. When valid, mode 1 or mode 2 can be selected. The +/- tolerable values and upper/lower limit values can be set randomly. Note: The hysteresis width cannot be set.	P.17
	Change proportional value	The validity of proportional value changes and the set level are confirmed. When "Proportional Value Up" is selected, F5.H is displayed. When "Proportional Value Down" is selected, the F5.L - setting value is alternately display. *The default setting is standard (- -).	Select whether to use the standard value or whether to change the proportional value. The proportional value level is set in this mode only when "Proportional Value Down" is selected. (10 stages)	P.18

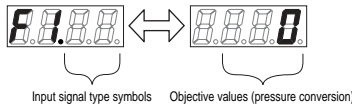
*EVD-*100 only

Operation

Display descriptions (RUN mode)

F1 (Input signal selection) display

The input signal type and target value are alternately displayed.



[Analog input type]

EVD-□-0□□-□-□, EVD-□-1□□-□-□, EVD-□-2□□-□-□

Input signal type symbols	Descriptions
	Analog 0 to 10 VDC input*
	Analog 0 to 5 VDC input*
	Analog 4 to 20mADC input*
	Preset memory input Displays selected preset no.
	Direct memory input*

*Either one of [F1, A0], [F1, A1], [F1, A2] will be displayed depending on the model no.

[Digital input type]

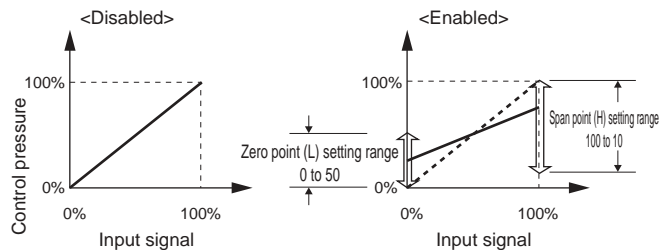
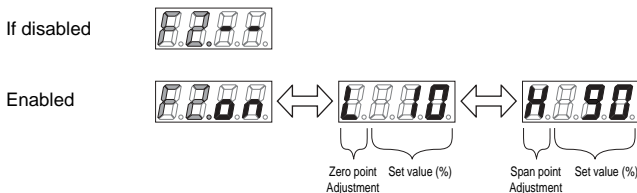
EVD-□-P□□-□-□

Input signal type symbols	Descriptions
	Parallel 10bit input
	Direct memory input*

F2 (Zero/span adjustment function) Screen F2 display details

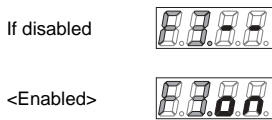
The validity of the zero/span adjustment and the setting value are confirmed.

This function is invalid if preset memory input or direct memory input is selected for F1 mode.



F3 (auto power off) Display

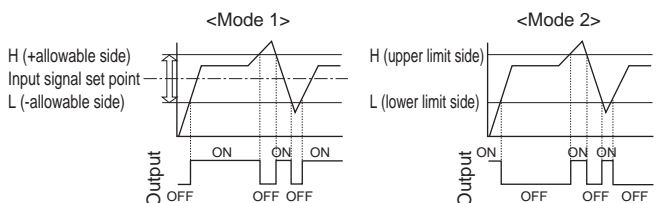
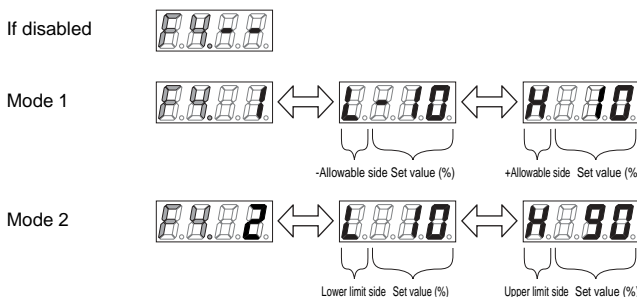
The validity of the auto power off function is confirmed.



F4 (switch output function) Display

The switch output validity and setting value are confirmed.

Note) It will be disabled for the analog output specification.



Display descriptions (RUN mode)

■ F5 screen (proportional value configuration function)

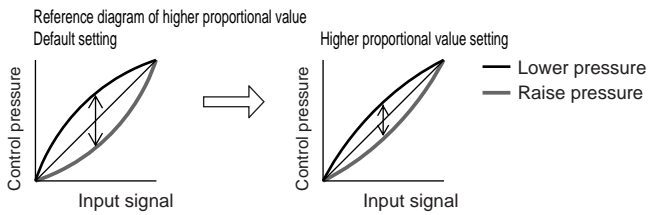
▲ Models: EVD-1100-□□□-□□, EVD-3100-□□□-□□
 Note: This screen will not be displayed on EVD-*500/EVD-*900

The validity of the proportional value and the set level are confirmed.

- If disabled : It will be controlled with default settings.
- When valid: "Proportional value up" or "proportional value down" is selected.
 The set level is selected from ten stages only when "proportional value down" is selected.

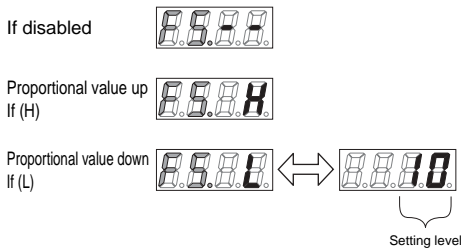
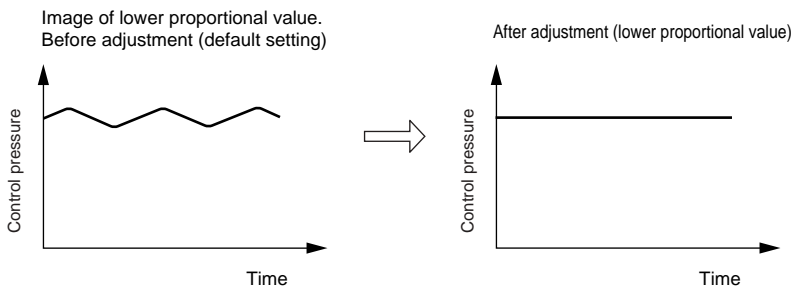
<Effects of higher proportional value>

The effect differs with piping and load capacity conditions, but control is done at higher accuracy. However, it must be used with extra caution due to the increased risk of hunching.



Proportional value down

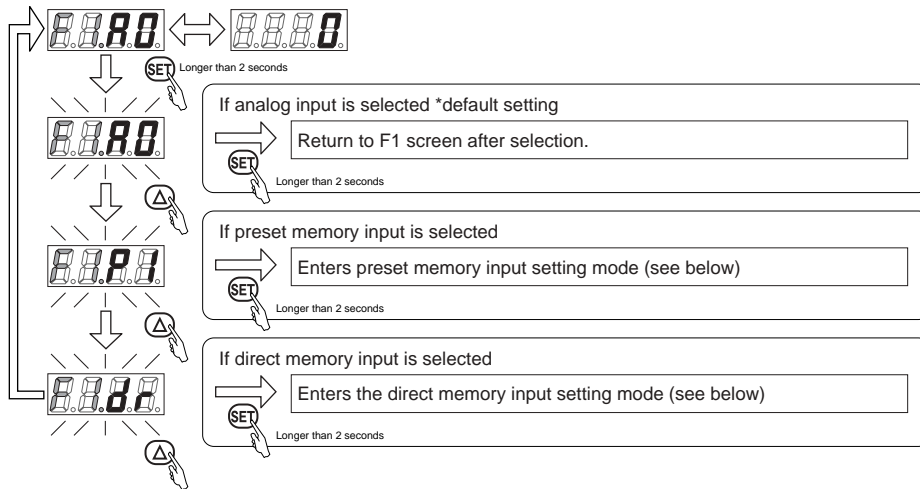
If vibration occurs during blow applications or during a leakage test, stable control is ensured by decreasing the proportional value as shown below.



Setting mode, setting method CAUTION (CAUTION) Release the key lock before changing setting details. (Refer to page 21)

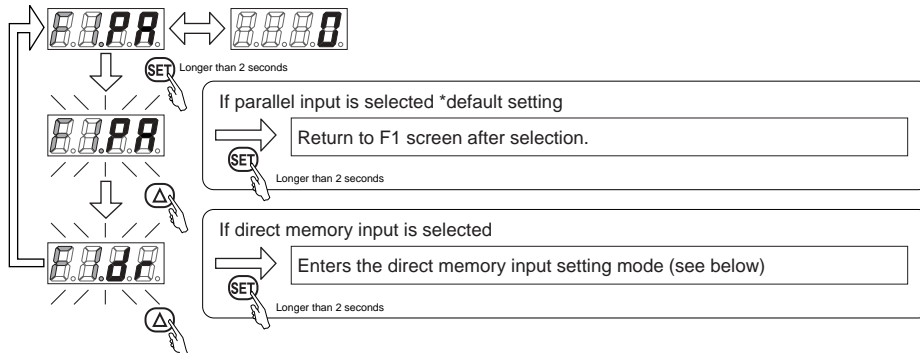
Hold down the SET key for two seconds or longer with the F1 (input signal selection function) screen F1 displayed. F2 setting mode is entered.

- Selecting analog type input signal
Note: Specifications for analog input can not be selected.



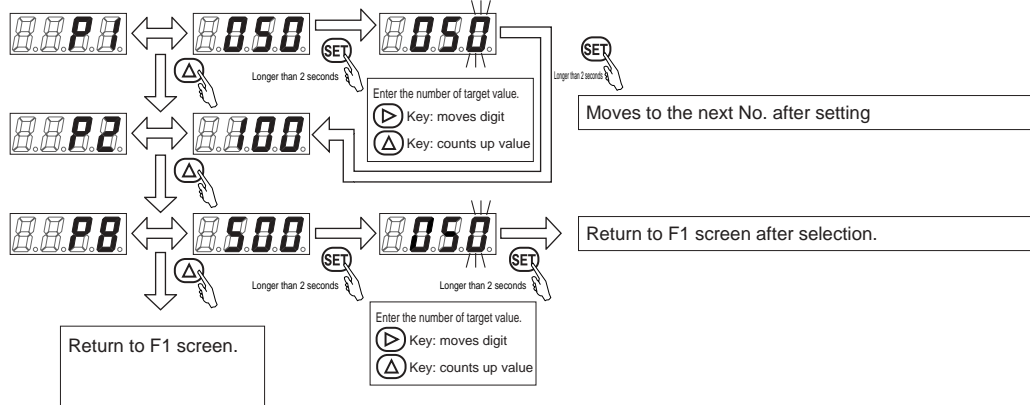
Return to F1 screen after selection.

- Selecting parallel type input signal;



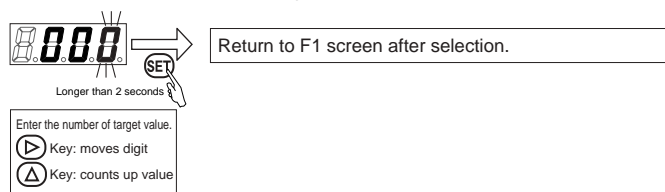
Return to F1 screen after selection.


- How to configure preset memory
*Hold down SET key for longer than 2 seconds in the F1 screen at pre-set memory input.



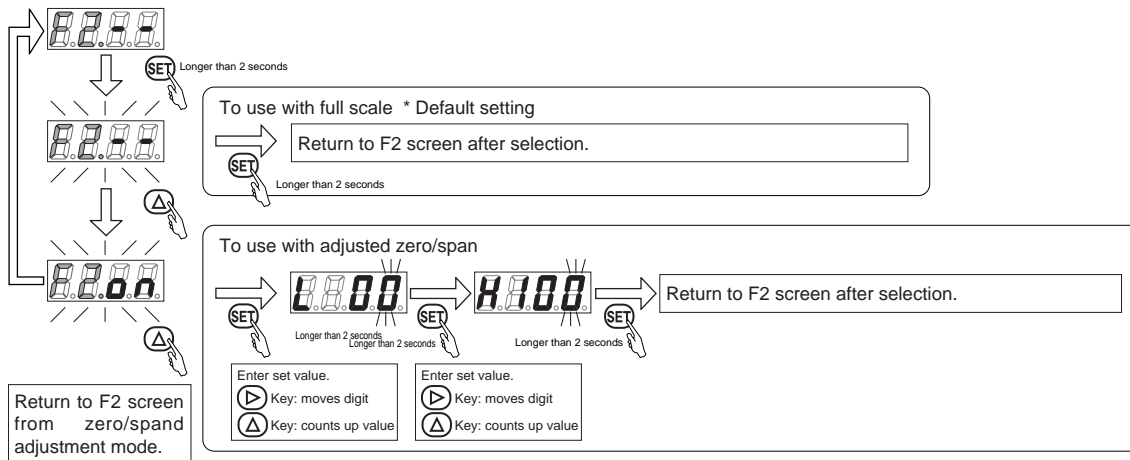
Return to F1 screen.

- How to configure direct memory
*Hold down SET key for longer than 2 seconds in the F1 screen direct memory input.



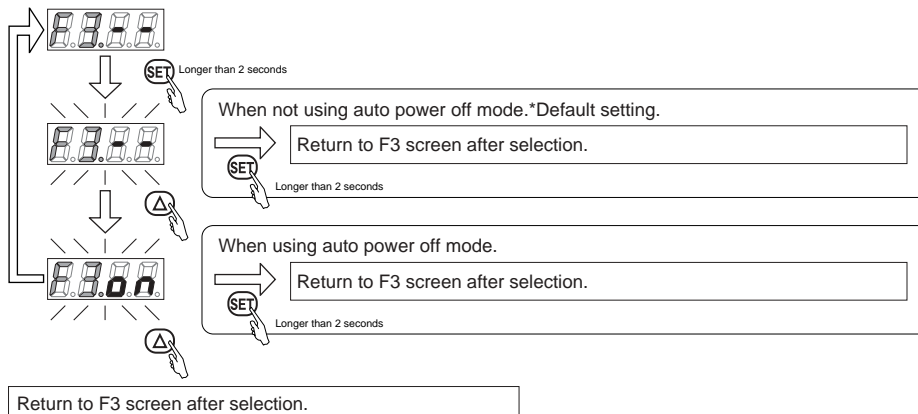
Setting mode, setting method  **CAUTION (CAUTION)** Release the key lock before changing setting details. (Refer to page 21)

■ **F2 (zero/span adjustment function)** Hold down the SET key for two seconds or longer on F2 screen. Enter F2 setting mode.



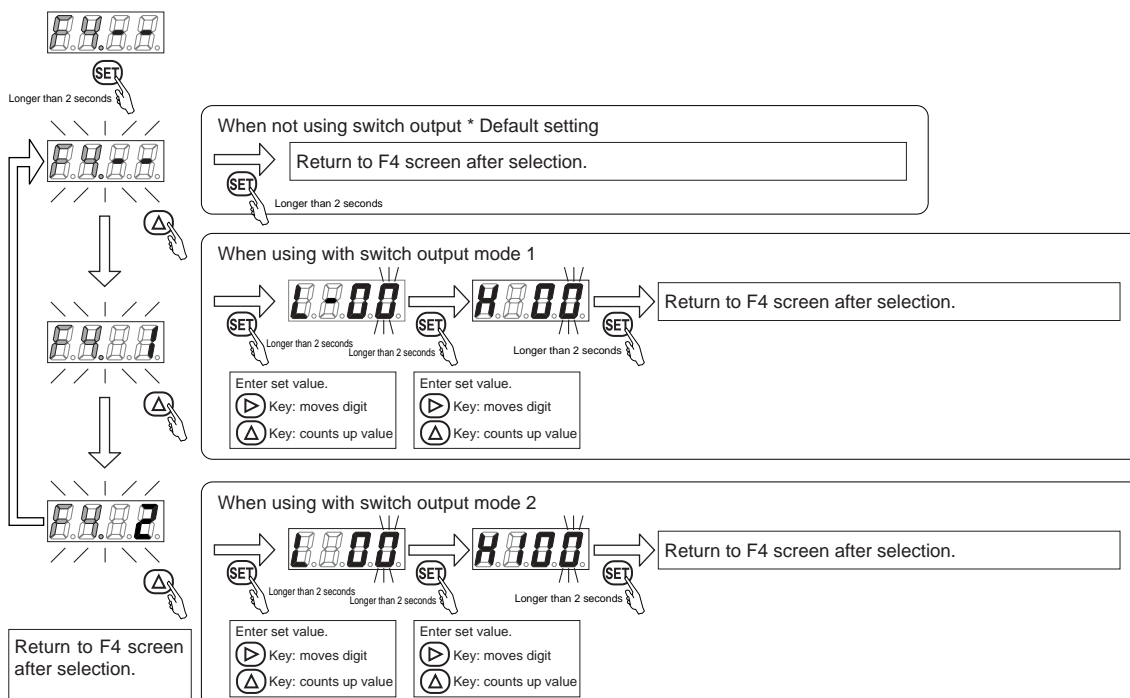
*This function cannot be used when preset memory input or direct memory input is selected with F1 (input signal selection function). It will be used with full scale.

■ **F3:** Hold down the SET key for two seconds or longer with the F3 (input signal selection function) screen displayed. F2 setting mode is entered.




*The display will turn on if any key is pressed during auto power off.
Note: The automatic power off time is about 1 minute, and cannot be

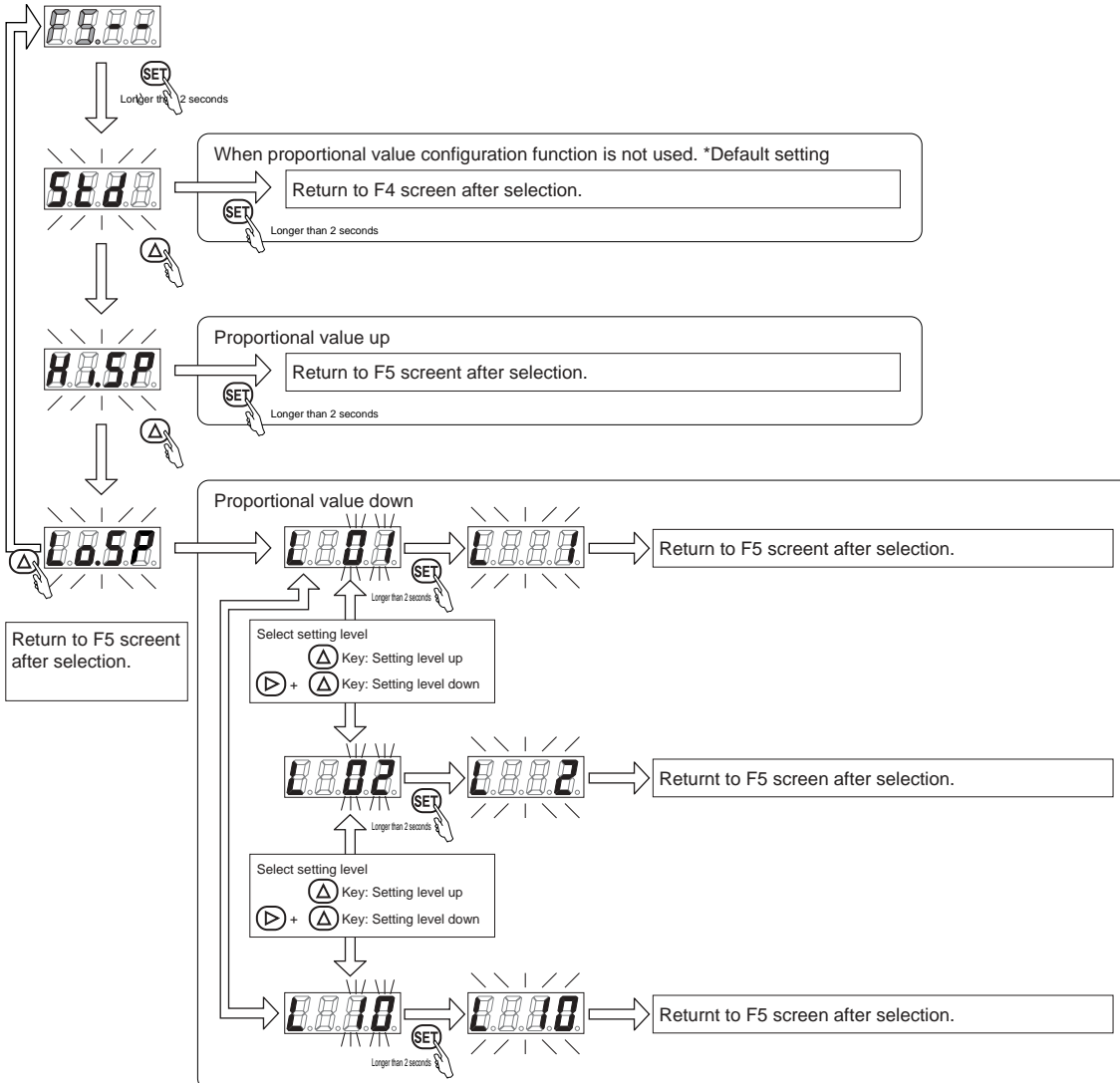
■ **F4 (switch output function):** Hold down the SET key for two seconds or longer with on the F3 screen. Enter F4 setting mode.



Setting mode, setting method CAUTION (CAUTION) Release the key lock before changing setting details. (Refer to page 21)

■ F5: Hold down the SET key for two seconds or longer with the F5 (proportional value configuration function) screen displayed. Enter F4 setting mode.

 Models: EVD-1100-□□□-□-□, EVD-3100-□□□-□-□
 Note: This screen will not be displayed on EVD-*500/EVD-*900

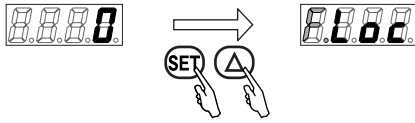


* When using with the proportional value down, it will operate according to the setting level shown on the display while selecting. When the set level is decided, press the "SET" key for two seconds or longer to enter the value.

Key lock

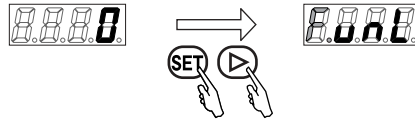
This function prevents incorrect operation. Undo the key lock when changing settings.

● How to use key lock



Hold down both for 2 seconds

● How to undo key lock



Hold down both for 2 seconds

*Keys will be locked after turning the power on.

Setting range for each function

Functions	Setting display screen	Setting details	Setting specifications
F1: Input signal selection function - If preset memory input is selected - 		Configure setpoint (pressure).	Range ^{Note 1} □ 100 / 000 to 100 □ 500 / 000 to 500 □ 900 / 000 to 900 Minimum setting increments: 1kPa
F1: Input signal selection function ~In case of direct memory input~ 		Configure set value (pressure).	Range ^{Note 1} □ 100 / 000 to 100 □ 500 / 000~500 □ 900 / 000~900 Minimum setting increments: 1kPa
Zero/span adjustment function 		Set the zero point adjustment value.	Range: 00 to 50 ^{Note 2} Minimum setting increment: 1%
		Set the span point adjustment value.	Range: 100 to 010 ^{Note 2} Minimum setting increment: 1%
▲ F4: Switch output function - When Mode 1 is selected - 		"-" set allowable value.	Range: 00 to -50 Minimum setting increment: -1%
		"+" set allowable value.	Range: 00 to 50 Minimum setting increment: 1%
▲ F4: Switch output function - When Mode 2 is selected - 		Set lower limit value.	Range: 00 to 90 ^{Note 2} Minimum setting increment: 1%
		Set upper limit value.	Range: 100 to 010 ^{Note 2} Minimum setting increment: 1%
▲ F5: Proportional value configuration function Proportional value up 		Level setting not possible.	
▲ F5: Proportional value configuration function Proportional value down 		"+" set allowable value.	Range: 01 to 10 Minimum setting increment: 1

Note 1: If set to a pressure of 1%F.S. or less, it may not be possible to control pressure due to the effect of residual pressure.

Note 2: The setting range may be limited depending on the setting value.

▲ F4: The switch output function is limited to the switch output type. Not available for analog output type.


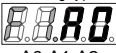









Models: EVD-□□-□□SN, EVD-□□-□□SP

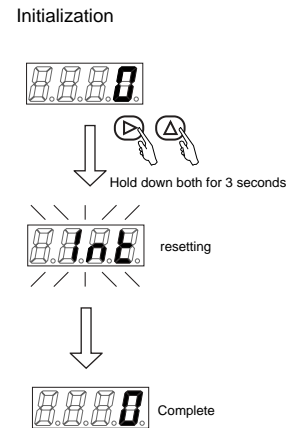
▲ F5: The proportional value configuration function is limited to the pressure range 100 kPa type.

Models: EVD-1100-□□□







*Contact our sales representative for EVD-1500/EVD1900.

How to reset settings (default)

Display	Title	Setting display	Setting details
F1 screen 	Input signal selection	Analog type  Parallel type  A0.A1.A2	Analog/ parallel input
F2 Display 		Zero/span adjustment	
F3 Display 	Automatic power off		Automatic power off ineffective
F4 Display 	Switch output *Switch output specification only		Switch output ineffective
P5 Display 	Change proportional value *EVD-□100 only		Default setting (Change in proportional value ineffective)



Error code

Error display	Causes	Measures
	Power supply voltage is beyond specifications Detected at DC19.5V or less Detection accuracy $\pm 10\%$	Check controller power specifications, set power voltage within the rating range, and turn power ON again.
	The input signal exceeded the rating range. Detected at 110% or more input. Detection accuracy $\pm 1\%$	Check the controller input signal type, set the input signal within the rating range, and turn power ON again.
	An error occurred during EEPROM reading or writing.	Contact your CKD branch or dealer.
	An error occurred during reading or writing memory.	Contact your CKD branch or dealer.
	Secondary pressure did not reach the set value for five seconds or more consecutively. 20% F.S. or less of the set value was not attained. (Detection accuracy $\pm 6\%$ F.S.)	Check primary pressure, provide pressure within the rating range, then turn power on again. Check that there are no leaks from piping, joints, or other devices, correct connect pipes, and turn power ON again. If the error is not resolved, contact your CKD branch or dealer.
	Overcurrent protection circuit for the switch output is operating.	Check whether load current exceeds the rating. Correctly connect, then turn power on again.

If the error above occurs, the error output will turn on simultaneously with the error display.

■ Glossary

Max. working pressure

Maximum pressure of the primary side that will satisfy the specifications.

Min. working pressure

Primary pressure required to control up to full scale pressure.

Withstanding pressure

Maximum pressure the regulator could withstand for an instant. The guaranteed value for the supply and exhaust is different because the withstanding pressure for the pressure sensor on the secondary side is different.

Control pressure range

Pressure that can be controlled. However, there may be some residual pressure depending on the product. Note1: There is residual pressure less than 1% F.S. when the input signal is 0%.

Note: This is different from the guaranteed accuracy range. Refer to the linearity and hysteresis section shown below.

Hysteresis (Measurement circuit)

The differences between the ascending and descending curve generated by input signals from 0% to 100%, relative to the full scale.

$$(\text{Hysteresis}) = \text{Max. value of } D1 / \text{Control pressure of FS} \times 100[\%]$$

The guaranteed accuracy range for EVD is 10 to 90% F.S.

Linearity (Measurement circuit 1)

The differences between the characteristic curve and the straight line connecting 10%F.S.(X1) and 90%F.S.(X2) in full scale.

$$(\text{Linearity}) = \text{Max. value of } D2 / \text{Control pressure of FS} \times 100[\%]$$

The guaranteed accuracy range for EVD is X1=10%F.S.and X2=90%F.S.

Resolution (Measurement circuit 1)

The min. value input signal that can cause change in control pressure expressed relative to full scale (FS). After pressurizing from input signal 0% F.S. to 15% F.S. and maintaining it for over 10 sec., increase the input signal slowly and the control pressure will rise after a lag, and the difference of input signal before and after the change in pressure is the resolution. The same is done for input signal 50% F.S. and 85% F.S.

Repetability (Measurement circuit 1)

The greatest dispersion of control pressure in relation to the F.S. after applying the same setting repeatedly.

Calculated from the dispersion (D3) of control pressure after applying input signal 0% F.S. and 50% F.S. repeatedly.

$$(\text{Repetability}) = \text{Control pressure of } D3 / \text{FS} \times 100[\%]$$

Temperature characteristics

Convert the changes of control pressure caused by changes in ambient temperature as per 1°C. (Standard temp. 25°C)

This specification is available for zero point and span width.

Maximum flow (Measurement circuit 2)

The amount of flow that can go through at 100% F.S.

Relief characteristics (Measurement circuit 3)

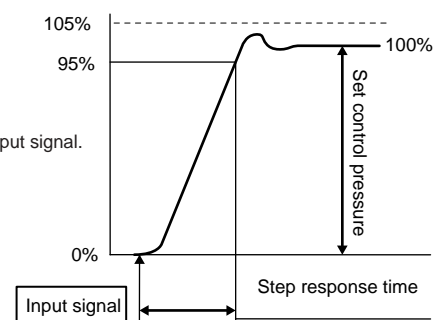
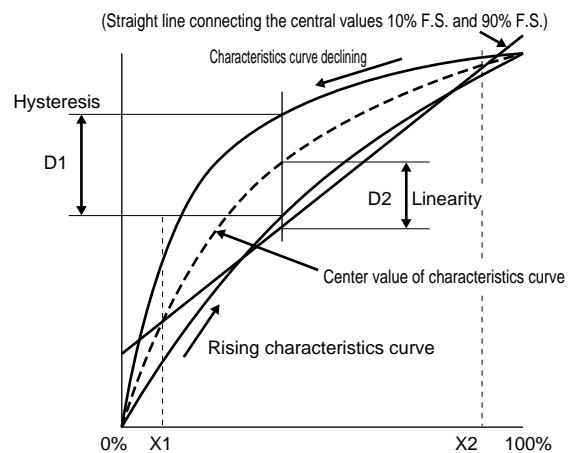
The relation of control pressure and exhaust flow when back pressure is applied to the secondary side from the outside while controlling pressure.

Measure the relief flow of when increasing the back pressure gradually.

Step response (Measurement circuit 1)

The time required for the control pressure to reach the set pressure in response to a step input signals.

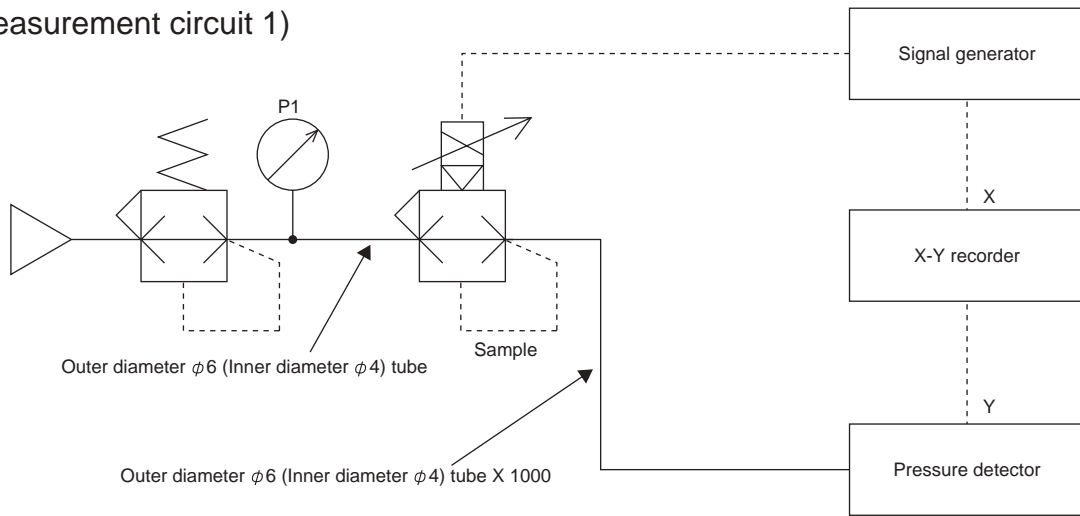
Measure the time required for the control pressure to reach ±5% of the set pressure after applying the input signal.



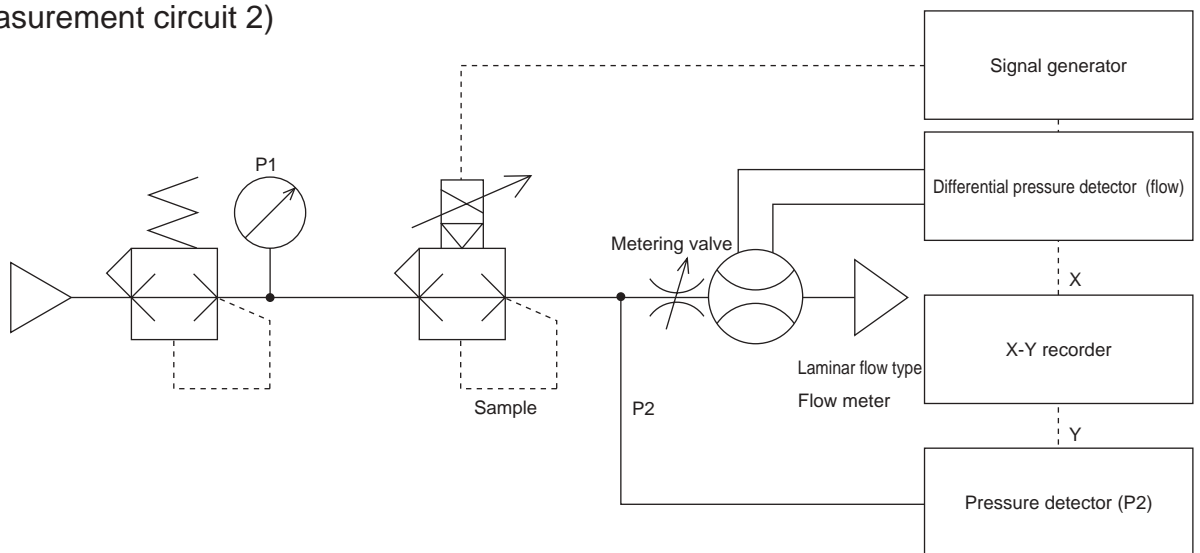
(Response time) = Time required to reach ±5% of final value.

CKD measurement circuit

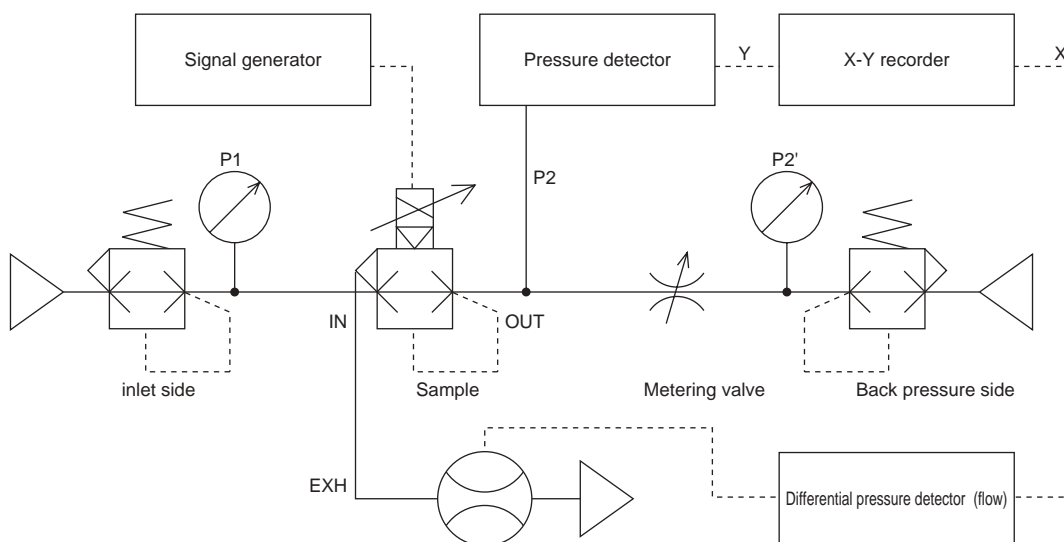
(Measurement circuit 1)



(Measurement circuit 2)

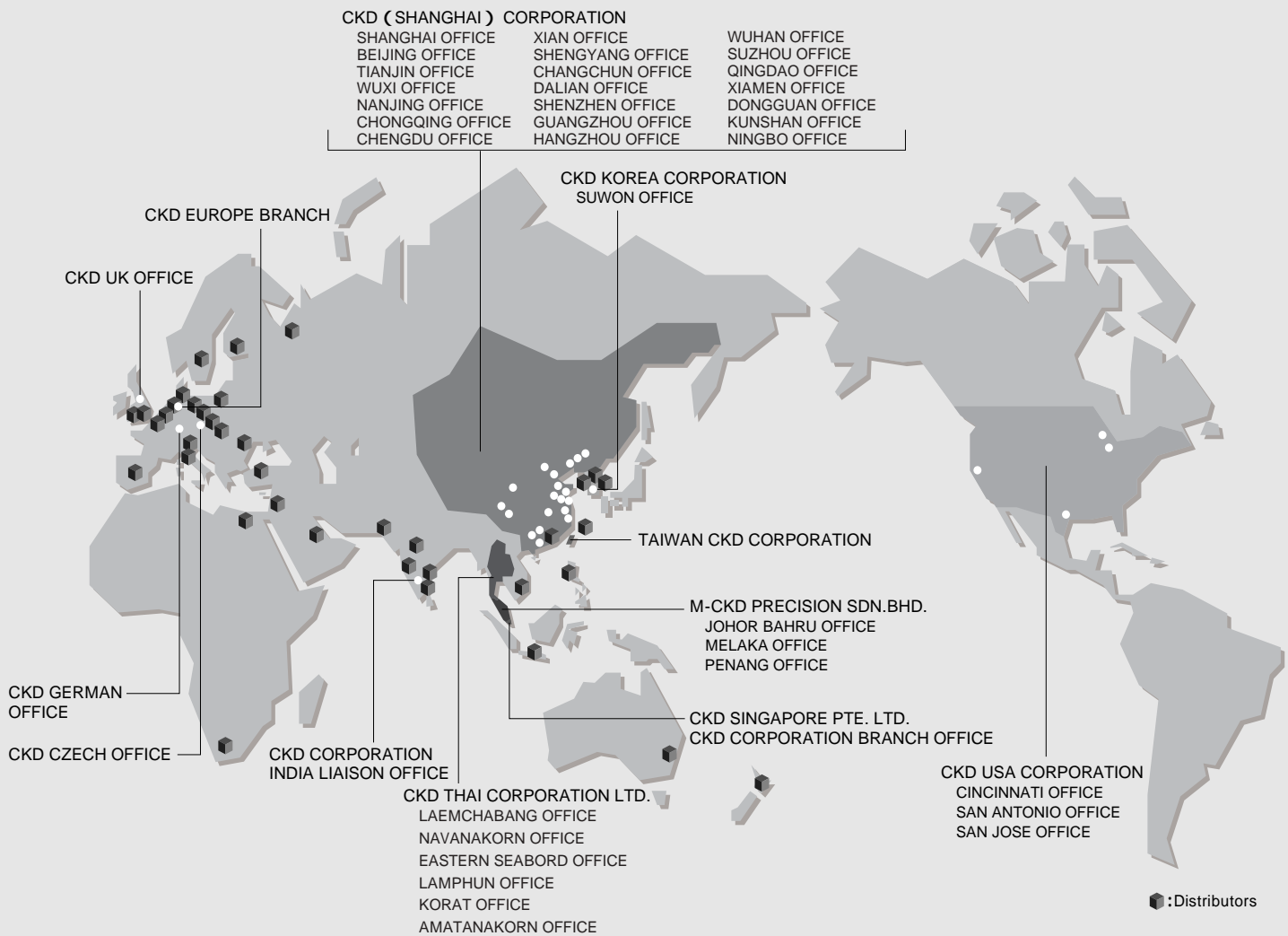


(Measurement circuit 3)



MEMO

MEMO



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