Digital Electro-Pneumatic Regulator

EVD Series

Functions include pressure display, error display and direct memory.

Pursuing further compactness, high functionality, and ease of use.

EVD-1000

- Port size : Rc1/4, G1/4, NPT1/4
- Flow rate : 60, 400 L/min
- Pressure range : 1 00, 500, 900 kPa
- Flow path non-grease specification

High flow rate type

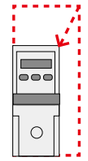
EVD-3000

- Port size : Rc1/4, G1/4, NPT1/4, Rc3/8, G3/8, NPT3/8
- Flow rate : 700, 1500 L/min
- Pressure range : 100, 500, 900 kPa

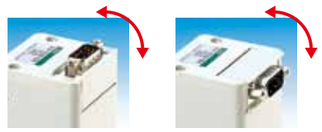
Easy to use and superior installability

- Equipped with a digital display that shows the control status at a glance.
  Digital display of output pressure value in 3 digits In addition to error display, output status (switch output ON-OFF) is displayed.

- Parallel input is available as standard
  Direct control from PLC is possible
- Compact design, 25 % less than our previous models



- D-sub-connector with high versatility has been adopted, 2 directions for connection
  Rotates 90° between the top and side, allowing the top outlet or side connection to be freely selected according to the situation.



- Modular
  Can be connected with filters and regulators such as C1000 Series

Built-in microcomputer for higher functionality

- Error display function
  Notifies error occurrence by display and electrical signal
- Zero/span adjustment function
  Zero/span adjustment is possible according to usage
- Direct memory function
  No external input signal required. Freely adjust secondary pressure with product operation keys
- Preset input function
  Up to 8 channels of pressure can be stored in the body and switched by external signals
- Switch output function
  Switch output (built-in overcurrent protection) is possible by setting upper and lower limit pressures

Realizes high-precision, high-response pressure control

- Linearity ±0.3 %
- Hysteresis 0.5 %
- Response time 0.2 sec is realized
- Proportional value change function (EVD□100 only)
  More precise and stable control is possible by adjusting proportional value up (1 step) and proportional value down (10 steps)

Eco-friendly design

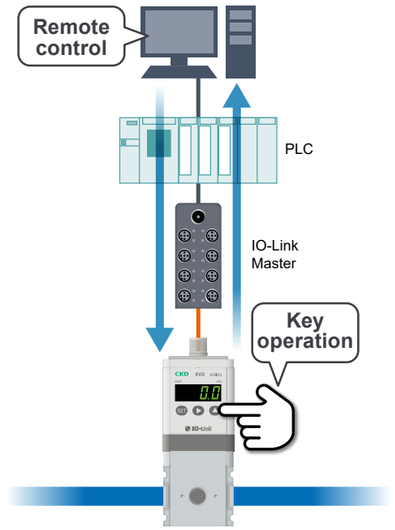
- Energy saving
  Equipped with auto power OFF function that can automatically turn off the digital display
- Materials display
  Main parts indicate material names, facilitating separation for recycling

Variation

Series	Pressure range	Input Signal	Port Size	Output method	Output signal unit	Max. Flow Rate	Flow path	Applicable standards
EVD-1000	100 kPa 500 kPa 900 kPa	IO-Link Analog 10bit Parallel	Rc1/4 G1/4 NPT1/4	Analog NPN PNP Switch output	kPa kPa psi bar	60 L/min 400 L/min	Grease-free	CE UKCA cULus
EVD-3000	100 kPa 500 kPa 900 kPa	IO-Link Analog 10bit Parallel	Rc1/4 Rc3/8 G1/4 G3/8 NPT1/4 NPT3/8	Analog NPN PNP Switch output	kPa kPa psi bar	700 L/min 1500 L/min	Fluorine grease Vaseline (made to order)	CE UKCA cULus

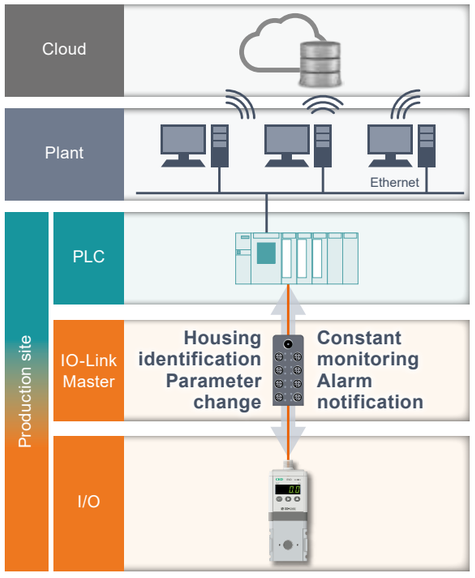
Improved existing communication with IO-Link

- Various settings can be set with key operations and remotely
  - Switch input method
  - Preset memory value input
- 2 switch output types can be set and output simultaneously
- Error details can be checked remotely
- Intuitive pressure setting available
  - Set the pressure value you want to control as is
- Equipped with pressure unit switching function
  (* This will be a function for overseas use in)
- Secure setting and safety confirmation at equipment startup
  - With display, controlled pressure value can be checked
- Monitoring of operation time possible
- Equipped with pressure control stop function
  - Stop control when control is not needed



Features of IO-Link

IO-Link is a digital communication standard for sensors and actuators in factory sites. (IEC61131-9)
It is possible to transmit parameters and event data that could not be transmitted with analog communication.



Constant monitoring by digital data is possible.

Since parameters can be set and changed from the network, remote operation of the equipment is possible.

Model No., serial No., etc. can be confirmed on the network.

Since settings can be copied from the master, troublesome parameter resetting during maintenance is unnecessary.

Device failure and disconnection can be confirmed.

It can also be converted and connected to Ethernet-based networks, enabling IoT of equipment.

Communication specifications

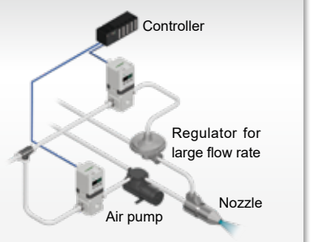
Item	Details
Communication protocol	IO-Link
Communication protocol version	V1.1
Transmission speed	COM3 (230.4 kbps)
Port type	A

Item	Details
Process data length (input)	6 byte
Process data length (output)	4 byte
Minimum cycle time	2 ms
Data Storage	1 kbyte
SIO Mode Support	None

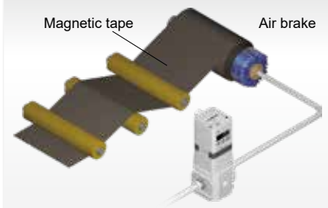
Application Examples

: Pilot pressure control : Blow : Others
: Tension : Pressing

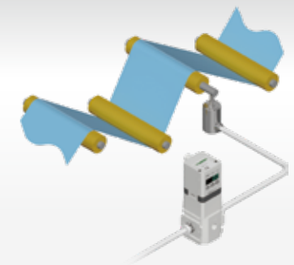
Various fluid pressure control



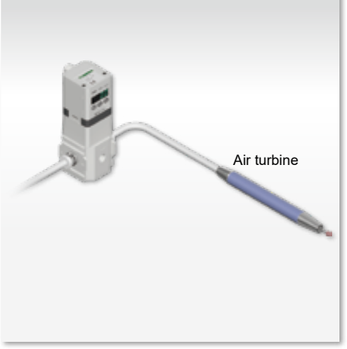
Various tension controls using air brakes



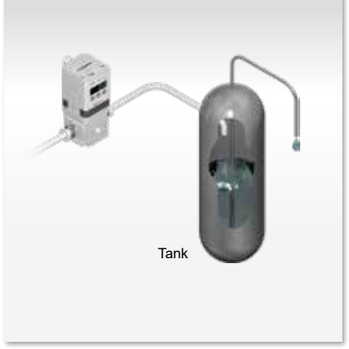
Balancer tension control



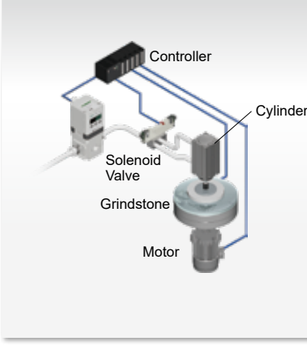
Air turbine rotation speed control



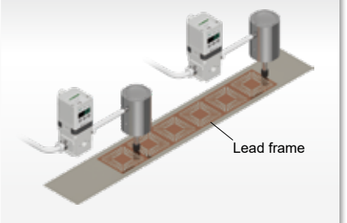
Liquid Discharge Amount Control



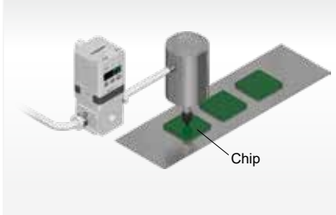
Polishing force control



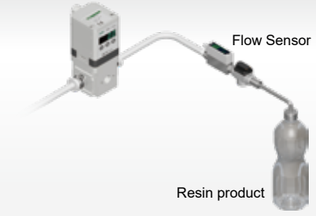
Fixing of lead frames, etc.



Assembly of chip parts



Leak test

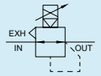


Digital Electro-Pneumatic Regulator

EVD-1000 Series

Analog Type/Parallel Type

Circuit Diagram Symbol



For compatible detailed model No.s, please visit the CKD website.

Model No. Notation

EVD - 1 | 500 | - | 0 | 08 | AN | - | C1B1 | - 3

- EVD: Model No.
- 1: ❶ Pressure Control Range
- 500: ❶ Pressure Control Range
- 0: ❷ Input Signal
- 08: ❸ Port Size
- AN: ❹ Output signal
- C1B1: ❺ Option
- 3: Power voltage : 24 VDC

❶Pressure Control Range

Code	Content
100	0-100 kPa
500	0-500 kPa
900	0-900 kPa

Note) There is 1 % F.S. or less residual pressure when the input signal is 0 %.

❷ Input Signal

Code	Content
0	0-10 VDC
1	0-5 VDC
2	4-20 mADC
P	Parallel 10 bit

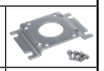
❸ Port Size

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

❹Output signal

Code	Content
AN	1-5 V Analog, Error (NPN)
AP	1-5 V Analog, Error (PNP)
SN	Switch (NPN), Error (NPN)
SP	Switch (PNP), Error (PNP)

❺ Option

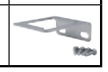
Code	Content	
Cable Option		
Blank	None	
C1	Analog 9-core, Cable 1 m	
C3	Analog 9-core, Cable 3 m	
P1	Parallel 15-core, Cable 1 m	
P3	Parallel 15-core, Cable 3 m	
Bracket Option		
Blank	None	
B1	B-bracket, Floor mounting type	
L1	L-bracket, Wall mounting type	

● Option (Cable, Bracket) Single Unit Model No.

EVD - C1

❶ Option

❶ Option

Code	Content	
Cable Option		
C1	Analog 9-core, Cable 1 m	
C3	Analog 9-core, Cable 3 m	
P1	Parallel 15-core, Cable 1 m	
P3	Parallel 15-core, Cable 3 m	
Bracket Option		
B1	B-bracket, Floor mounting type	
L1	L-bracket, Wall mounting type	

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

● Structure usable in rechargeable battery manufacturing processes

EVD - . . . . - P4□

Note) Please contact us for details.

Food Manufacturing Process Compatible Specification

(Catalog No. CC-1271AA)

● Uses food-grade lubricant usable in food manufacturing processes

EVD - . . . . - FP1

Specifications

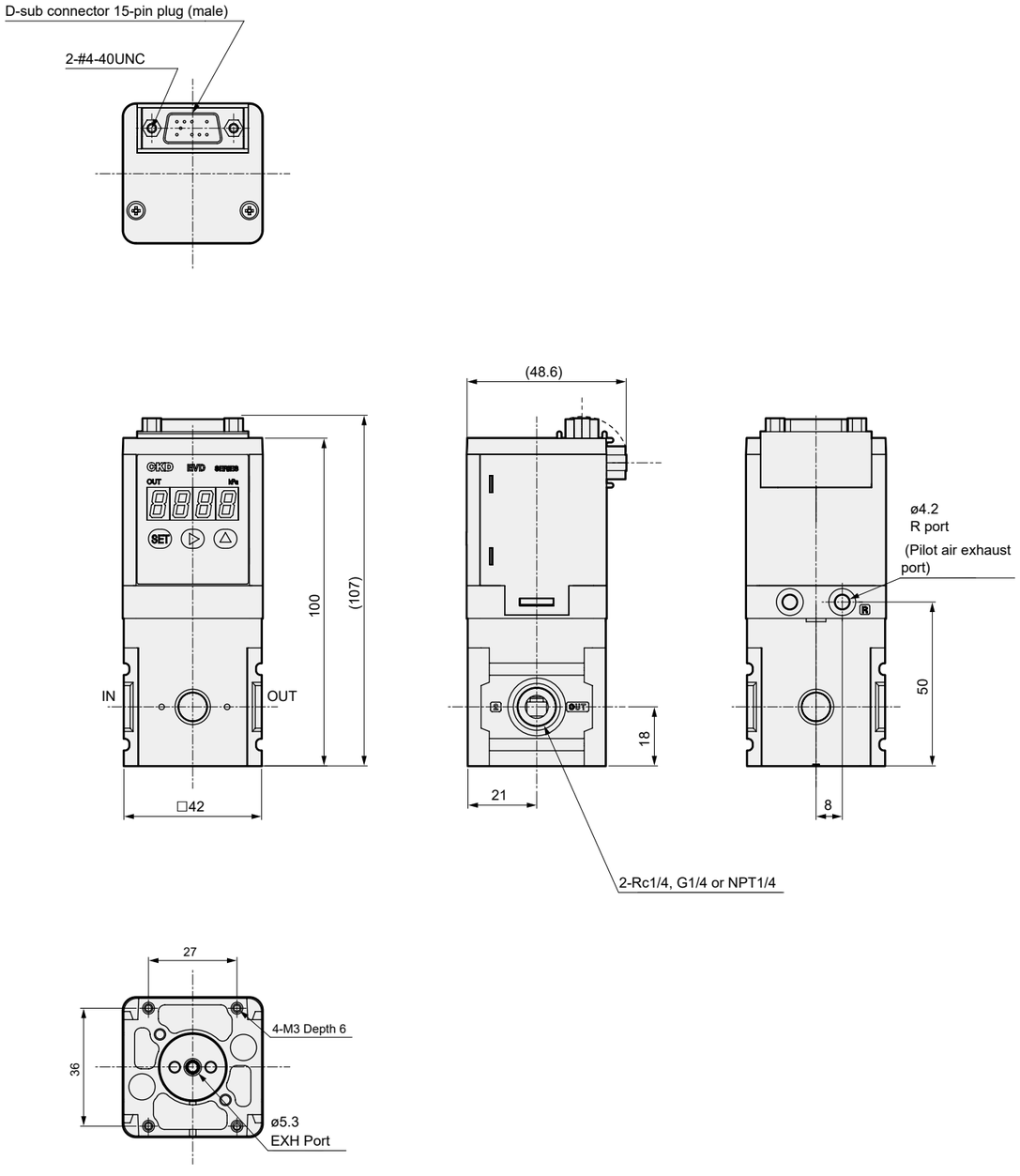
Item		EVD-1100-□08 analog (□...0/1/2)	EVD-1100-P08□ Parallel type	EVD-1500-□08 analog (□...0/1/2)	EVD-1500-P08□ Parallel type	EVD-1900-□08 analog (□...0/1/2)	EVD-1900-P08□ Parallel type
Operating Fluid		Clean compressed air (Equivalent to ISO 8573-1 : 2010 [1 : 3 : 2])					
Max operating pressure		160 kPa		700 kPa		1000 kPa	
Min. Operating pressure		Set pressure + 50 kPa		Set pressure + 100 kPa			
Proof Pressure	Supply side	240 kPa		1050 kPa		1500 kPa	
	Output side	150 kPa		750 kPa		1350 kPa	
Pressure control range *1		0 to 100 kPa		0 to 500 kPa		0 to 900 kPa	
Power supply voltage		24 VDC ±10 %(Stabilized power supply with ripple factor 1 % or less)					
Current consumption		0.15 A or less (Inrush current 0.6 A or less when power is ON)					
Input Signal(Input Impedance)		0 to 10 VDC (6.7 kΩ) 0−5 VDC (10 kΩ) 4-20mADC (250 Ω)	10 bit	0 to 10 VDC (6.7 kΩ) 0−5 VDC (10 kΩ) 4-20mADC (250 Ω)	10 bit	0 to 10 VDC (6.7 kΩ) 0−5 VDC (10 kΩ) 4-20mADC (250 Ω)	10 bit
Preset input		8 points	None	8 points	None	8 points	None
Output signal *2		Output accuracy : ±6 % F.S. or less, Analog output : 1-5 VDC (Connection load impedance 500 kΩ or more)					
		Switch output : NPN or PNP open collector output, 30 V or less 50 mA or less, voltage drop 2.4 V or less, PLC/Relay compatible					
Error output signal		NPN or PNP open collector output, 30 V or less 50 mA or less, voltage drop 2.4 V or less, PLC/Relay compatible					
Direct memory setting		1 to 100 kPa (Min. setting width 1 kPa/setting resolution 1 kPa)		5 to 500 kPa (Min. setting width 1 kPa/setting resolution 1 kPa)		9 to 900 kPa (Min. setting width 1 kPa/setting resolution 2 kPa)	
Pressure display	Display method	7-segment LED 3 digits, Display accuracy : ±2 % F.S. or less					
	Display range	0 to 100 kPa		0 to 500 kPa		0 to 900 kPa	
	Display resolution	1 kPa		1 kPa		1 kPa	
Hysteresis *3		0.5 % F.S. or less					
Linearity *3		±0.3 % F.S. or less					
Resolution *3		0.2 % F.S. or less					
Repeatability *3		0.3 % F.S. or less					
Temperature characteristics	Zero point fluctuation	±0.15 % F.S./°C or less					
	Span fluctuation	±0.07 % F.S./°C or less					
Max. flow rate (ANR) *4		60 L/min		400 L/min			
Step response *5	No load	0.2 sec or less					
Vibration resistance		98 m/s^2 or less					
Ambient temperature		5 to 50 °C					
Fluid temperature		5 to 50 °C					
Port size		Port size option 08...Rc1/4, 08G...G1/4, 08N...NPT1/4					
Mounting orientation		Free					
Weight		250 g					
Protection circuit		Power supply reverse connection protection, Switch output reverse connection protection, Switch output load short circuit protection					

*1 : There is 1 % F.S. or less residual pressure when the input signal is 0 %. (EVD-1100 : 1 kPa, EVD-1500 : 5 kPa, EVD-1900 : 9 kPa)
*2 : Either analog output or switch output can be selected.
*3 : The condition of the values above is : 24±0.1 VDC power supply voltage, 25±3 °C ambient temperature, no load, Operating pressure of +50 kPa/EVD-1500, +100 kPa (max. control pressure) at EVD-1100, and 10 to 90 % control pressure. Also, it is limited to the case where the secondary side is a closed circuit, and pressure fluctuation occurs in usage such as blowing.
*4 : The above characteristics are values when the Operating pressure is the Max operating pressure and the control pressure is the maximum control pressure.
*5 : The above characteristics are values when the Operating pressure is the Max operating pressure and the step amount is
50 % F.S. → 100 % F.S.
50 % F.S. → 60 % F.S.
50 % F.S. → 40 % F.S.

Air Preparation Components
F.R.L.
Filter Regulator
Filter
Regulator
Lubricator
Drain Separator
Mechanical Pressure SW
Residual Pressure Exhaust Valve
Slow Start Valve
Antibacterial/ Bacteria Removing Filter
Ozone FR
Siloxane/ OzoneRemover
Flame Resistant FR
Oil-free Regulator
Medium Pressure FR
No copper/ PTFEv Specification
Air Unit Equipment
Adapter Joiner
Pressure Gauge
Compact F.R.L.
Large F.R.L.
Precision Regulator
Clean FR
Electro-Pneumatic Regulator
Air Booster
Ending

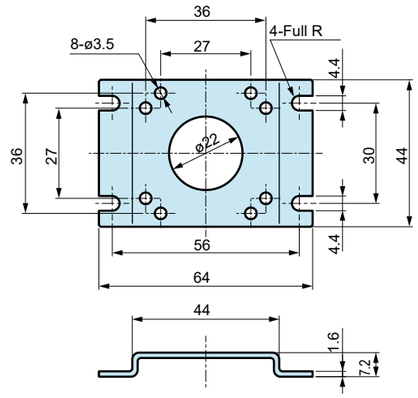
Dimensions

● Connector upward



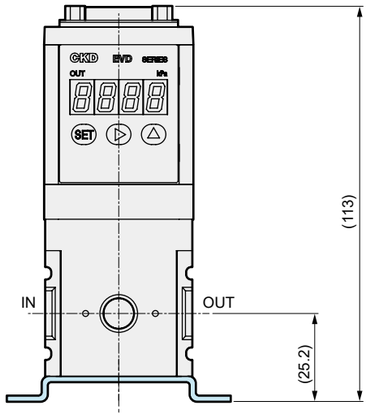
Option Outline Dimension Drawing

● B-bracket (-B1) : Floor mount type

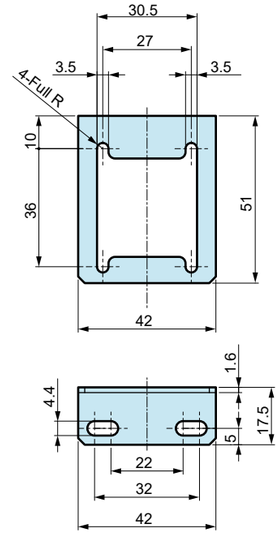


Material : SPCC
Ni plating treatment
Weight : 32 g

● B-bracket assembly

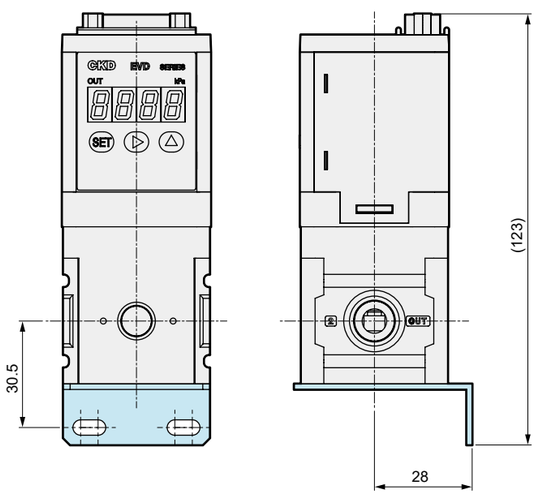


● L-bracket (-L1) : Wall mount type



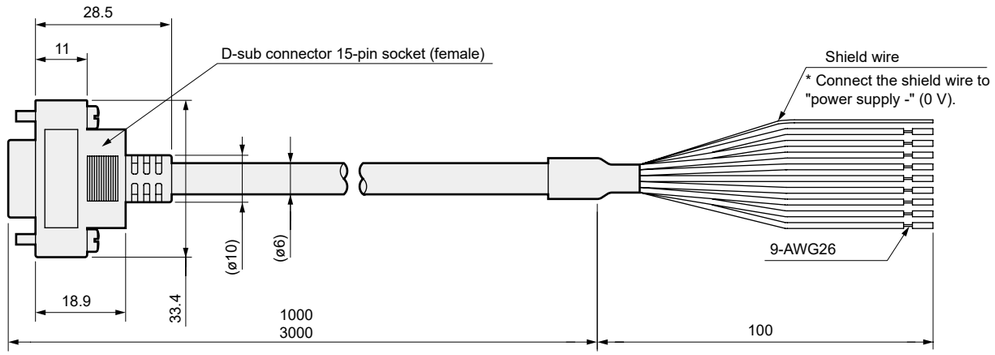
Material : SPCC
Ni plating treatment
Weight : 21 g

● L-bracket assembly



Cable Option Dimensions

● EVD-C1, EVD-C3

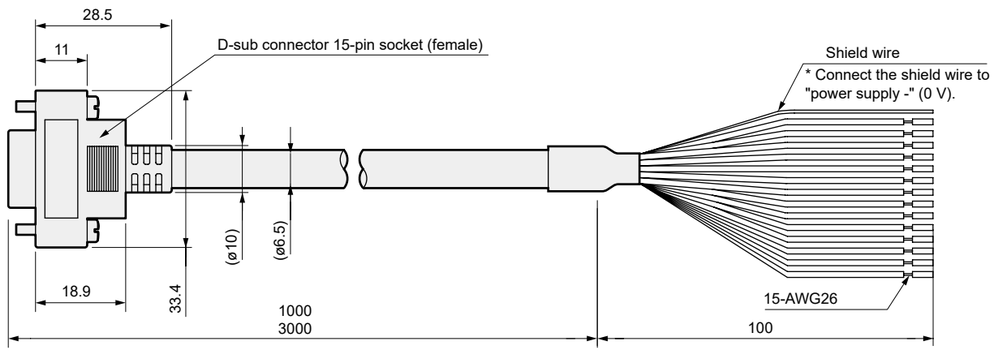


Wire material	Tin-plated annealed copper wire
Conductor O.D.	Approx. 0.48
Insulator O.D.	0.88

D-sub socket pin No.	1	2	3	4	5	6	7	8	9	10	11			12	13		14	15	Weight g
Insulator color	Brown	Orange	Yellow	-	Red	-	–	–	-	Gray	White			-	Green		Blue	Black	
Name	Preset input signal			Unused	Power supply +	Unused	Unused	Unused	Unused	Common	Input Signal			Unused	Analog output	Switch output	Error output	Power supply - (0 V)	C1 : 67 C3 : 166
Input type	Bit 1	Bit 2	Bit 3		+24 VDC						0-10 VDC	0-5 VDC	4-20 mADC		Output 1-5 VDC	NPN or PNP output	NPN or PNP output		

Note) The common of pin 10 is the common for preset inputs (pins 1 to 3).

● EVD-P1, EVD-P3

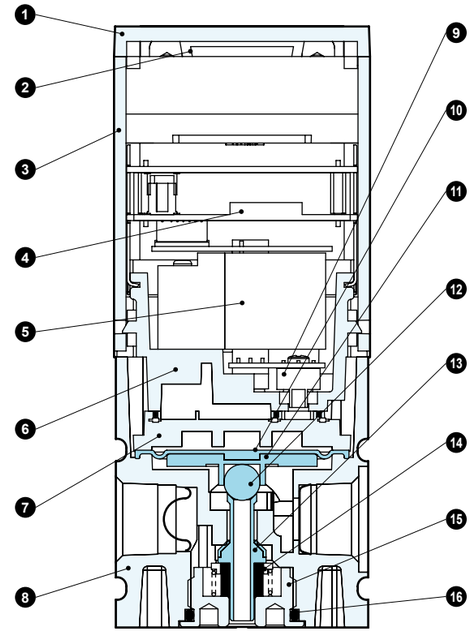


Wire material	Tin-plated annealed copper wire
Conductor O.D.	Approx. 0.48
Insulator O.D.	0.88

D-sub socket pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13		14	15	Weight g
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	
Name	Parallel input signal				Power supply +	Parallel input signal				Common	Parallel input signal		Analog output	Switch output	Error output	Power supply - (0 V)	P1 : 82 P3 : 205
Input type	Bit 1	Bit 2	Bit 3	Bit 4	+24 VDC	Bit 5	Bit 6	Bit 7	Bit 8		Bit 9	Bit 10	Output 1-5 VDC	NPN or PNP output	NPN or PNP output		

Note) The common of pin 10 is the common for parallel input signals (pins 1 to 4, 6 to 9, 11, and 12).

Internal structure and parts list

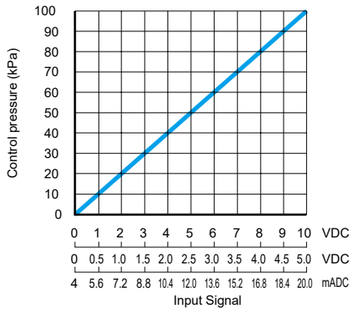


Do not disassemble

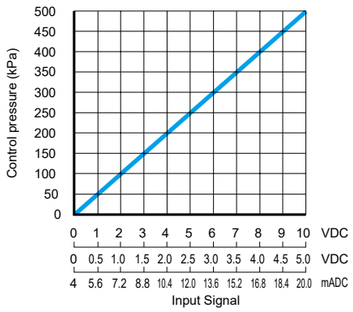
Part No.	Part Name	Material
1	Cover	PBT resin
2	D-sub Connector	-
3	Housing	ABS resin
4	Controller board	-
5	3-way valve	-
6	Valve base	Polyphenylene sulfide resin
7	Pilot chamber	Polyphenylene sulfide resin
8	Body	Aluminum alloy die-casting
9	Pressure sensor	-
10	Diaphragm	Special Nitrile Rubber
11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

Input/Output characteristics

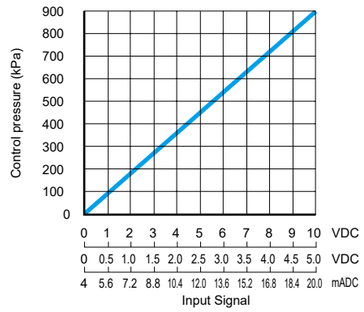
● EVD-1100



● EVD-1500

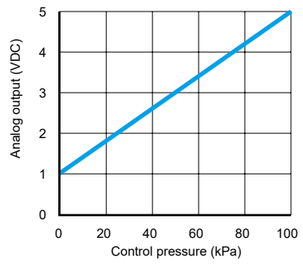


● EVD-1900

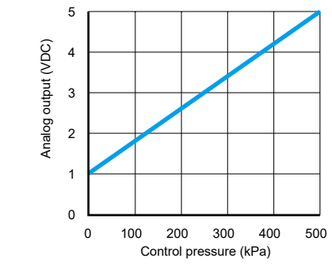


Analog output (analog output only : Model No. : AN/AP)

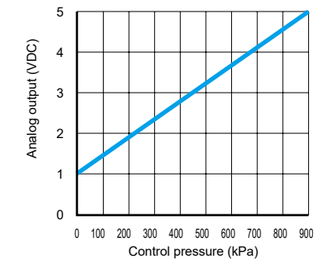
● EVD-1100



● EVD-1500

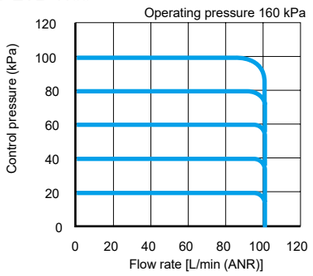


● EVD-1900

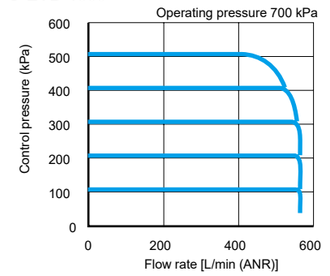


Flow characteristics

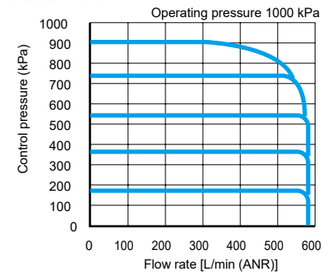
● EVD-1100



● EVD-1500

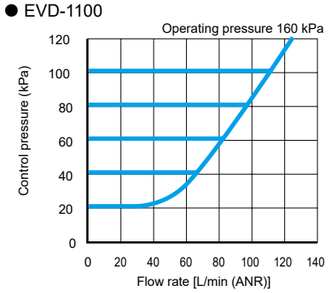


● EVD-1900



Relief characteristics

● EVD-1100



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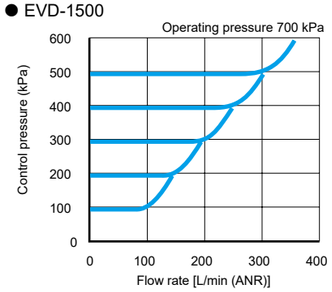
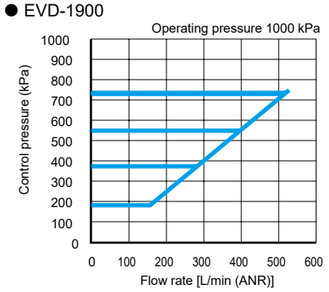


● EVD-1900



MEMO

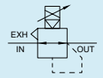
Air Preparation Components
F.R.L.
Filter Regulator
Filter
Regulator
Lubricator
Drain Separator
Mechanical Pressure SW
Residual Pressure Exhaust Valve
Slow Start Valve
Antibacterial/ Bacteria Removing Filter
Ozone FR
Siloxane/ OzoneRemover
Flame Resistant FR
Oil-free Regulator
Medium Pressure FR
No copper/ PTFEv Specification
Air Unit Equipment
Adapter Joiner
Pressure Gauge
Compact F.R.L.
Large F.R.L.
Precision Regulator
Clean FR
Electro-Pneumatic Regulator
Air Booster
Ending

Digital Electro-Pneumatic Regulator

EVD-3000 Series

Analog Type/Parallel Type

Circuit Diagram Symbol



For compatible detailed model No.s, please visit the CKD website.

Model Number Notation

EVD - 3 | 500 | - | 0 | 08 | AN | - | C1B3 | - 3

- EVD - 3: Model No.
- 500: ❶ Pressure Control Range
- 0: ❷ Input Signal
- 08: ❸ Port Size
- AN: ❹ Output signal
- C1B3: ❺ Option
- 3: Power voltage : 24 VDC

❶ Pressure Control Range

Code	Content
100	0-100 kPa
500	0-500 kPa
900	0-900 kPa

Note) There is 1 % F.S. or less residual pressure when the input signal is 0 %.

❷ Input Signal

Code	Content
0	0-10 VDC
1	0-5 VDC
2	4-20 mADC
P	Parallel 10 bit

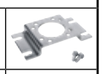
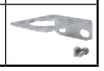
❸ Port Size

Code	Content
08	Rc1/4
10	Rc 3/8
08G	G1/4
10 g	G3/8
08N	NPT1/4
10 N	NPT3/8

❹ Output signal

Code	Content
AN	1-5V Analog, Error (NPN)
AP	1-5V Analog, Error (PNP)
SN	Switch (NPN), Error (NPN)
SP	Switch (PNP), Error (PNP)

❺ Option

Code	Content	
Cable Option		
Blank	None	
C1	Analog 9-core, Cable 1 m	
C3	Analog 9-core, Cable 3 m	
P1	Parallel 15-core, Cable 1 m	
P3	Parallel 15-core, Cable 3 m	
Bracket Option		
Blank	None	
B3	B-bracket, floor mount type	
L3	L-bracket, wall mount type	

● Option (Cable, Bracket) Single Unit Model No.

EVD - C1

❶ Option

❶ Option

Code	Content	
Cable Option		
C1	Analog 9-core, Cable 1 m	
C3	Analog 9-core, Cable 3 m	
P1	Parallel 15-core, Cable 1 m	
P3	Parallel 15-core, Cable 3 m	
Bracket option		
B3	B-bracket, floor mount type	
L3	L-bracket, wall mount type	

Rechargeable battery compatible specification

(Catalog No. CC-1226AA)

● Structure usable in rechargeable battery manufacturing processes

EVD - . . . . - P4□

Note) Please contact us for details.

Food Manufacturing Process Compatible Specification

(Catalog No. CC-1271AA)

● Uses food-grade lubricant usable in food manufacturing processes

EVD - . . . . - FP1

Specifications

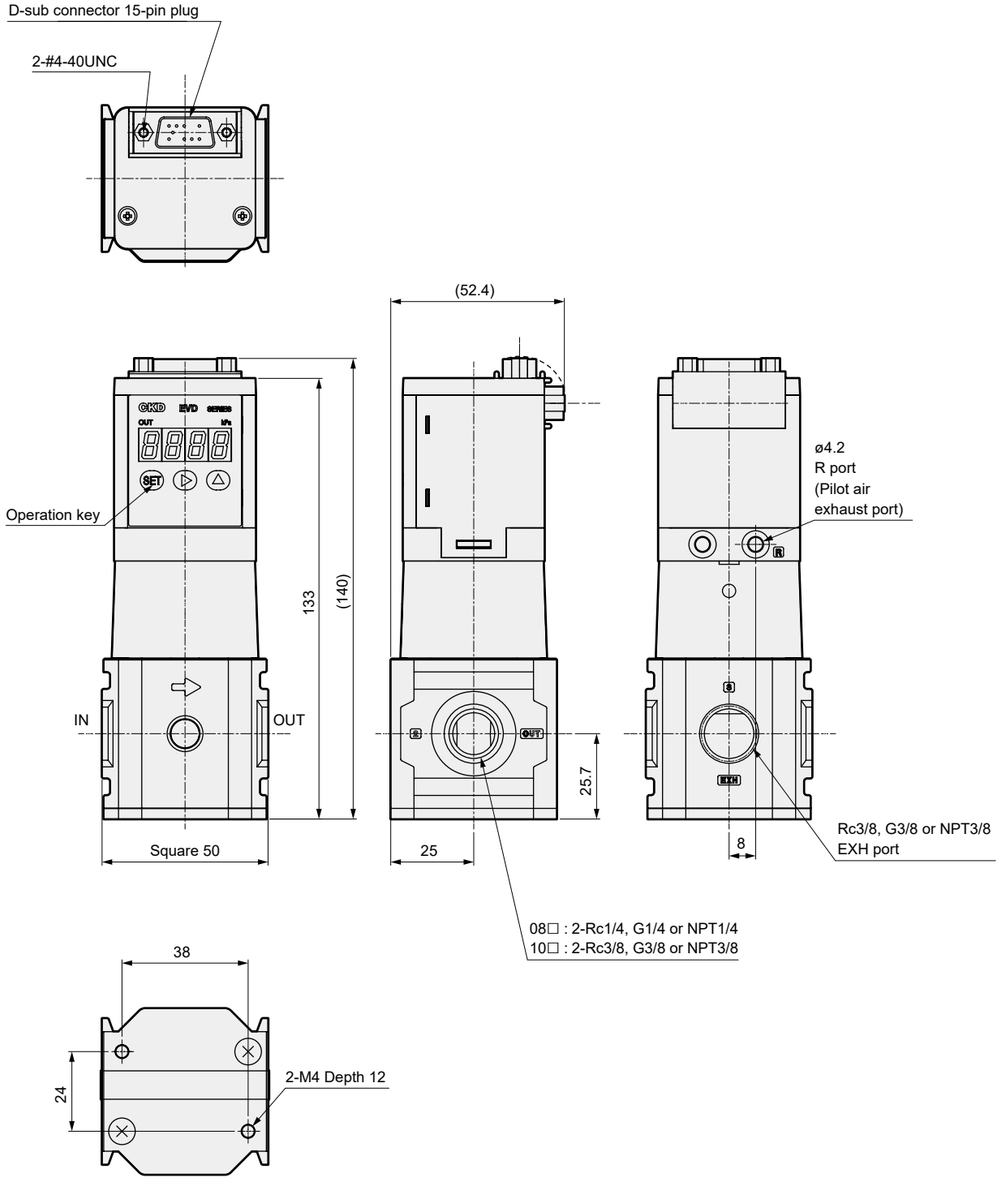
Item		EVD-3100-□08/ EVD-3100-□10/ analog (□...0/1/2)	EVD-3100-P08□ EVD-3100-P10□ Parallel type	EVD-3500-□08/ EVD-3500-□10/ analog (□...0/1/2)	EVD-3500-P08□ EVD-3500-P10□ Parallel type	EVD-3900-□08/ EVD-3900-□10/ analog (□...0/1/2)	EVD-3900-P08□ EVD-3900-P10□ Parallel type
Operating Fluid		Clean compressed air (Equivalent to ISO 8573-1 : 2010 [1 : 3 : 2])					
Max operating pressure		160 kPa		700 kPa		1000 kPa	
Min. Operating pressure		Set pressure + 50 kPa		Set pressure + 100 kPa			
Proof Pressure	Supply side	240 kPa		1050 kPa		1500 kPa	
	Output side	150 kPa		750 kPa		1350 kPa	
Pressure control range	*1	0 to 100 kPa		0 to 500 kPa		0 to 900 kPa	
Power supply voltage		24 VDC ±10 % (Stabilized power supply with ripple factor 1 % or less)					
Current consumption		0.15 A or less (Inrush current 0.6 A or less when power is ON)					
Input Signal (Input impedance)		0 to 10 VDC (6.7 kΩ) 0−5 VDC (10 kΩ) 4-20 mADC (250 Ω)	10 bit	0 to 10 VDC (6.7 kΩ) 0−5 VDC (10 kΩ) 4-20 mADC (250 Ω)	10 bit	0 to 10 VDC (6.7 kΩ) 0−5 VDC (10 kΩ) 4-20 mADC (250 Ω)	10 bit
Preset input		8 points	None	8 points	None	8 points	None
Output signal	*2	Output accuracy : ±6 % F.S. or less, Analog output : 1-5 VDC (Connection load impedance 500 kΩ or more)					
		Switch output : NPN or PNP open collector output, 30 V or less 50 mA or less, voltage drop 2.4 V or less, PLC/Relay compatible					
Error output signal		NPN or PNP open collector output, 30 V or less 50 mA or less, voltage drop 2.4 V or less, PLC/Relay compatible					
Direct memory setting		1 to 100 kPa (Setting min. width 1 kPa, Setting resolution 1 kPa)		5 to 500 kPa (Setting min. width 1 kPa, Setting resolution 1 kPa)		9 to 900 kPa (Setting min. width 1 kPa, Setting resolution 2 kPa)	
Pressure display	Display method	7-segment LED 3 digits, Display accuracy : ±2 % F.S. or less					
	Display range	0 to 100 kPa		0 to 500 kPa		0 to 900 kPa	
	Display resolution	1 kPa		1 kPa		1 kPa	
Hysteresis	*3	0.5 % F.S. or less					
Linearity	*3	±0.3 % F.S. or less					
Resolution	*3	0.2 % F.S. or less					
Repeatability	*3	0.3 % F.S. or less					
Temperature characteristics	Zero point fluctuation	±0.15 % F.S. / °C or less					
	Span fluctuation	±0.07 % F.S. / °C or less					
Max. flow rate (ANR)	*4	700 L/min		1500 L/min			
Step response *5	No load	0.2 sec or less					
Vibration Resistance		98 m/s² or less					
Ambient temperature		5 to 50 °C					
Fluid temperature		5 to 50 °C					
Port size	IN, OUT port	Port size option 08...Rc1/4, 10...Rc3/8, 08G...G1/4, 10G...G3/8, 08N...NPT1/4, 10N...NPT3/8					
	EXH Port	Rc3/8, G3/8, NPT3/8					
Mounting orientation		Free					
Weight		450 g					
Protection circuit		Power supply reverse connection protection, Switch output reverse connection protection, Switch output load short circuit protection					

*1 : There is 1 %F.S. or less residual pressure when the input signal is 0 %. (EVD-3100 : 1 kPa, EVD-3500 : 5 kPa, EVD-3900 : 9 kPa)
*2 : Either analog output or switch output can be selected.
*3 : The condition of the values above is : 24±0.1VDC power supply voltage, 25±3 °C ambient temperature, no load, Operating pressure of +50 kPa/EVD-3500, +100 kPa (max. control pressure) at EVD-3100, and 10 to 90 % control pressure. Also, it is limited to the case where the secondary side is a closed circuit, and pressure fluctuation occurs in usage such as blowing.
*4 : The above characteristics are values when the Operating pressure is the Max operating pressure and the control pressure is the maximum control pressure.
*5 : The above characteristics are values when the Operating pressure is the Max operating pressure and the step amount is
- 50 % F.S. → 100 % F.S.
- 50 % F.S. → 60 % F.S.
- 50 % F.S. → 40 % F.S.

Air Preparation Components
F.R.L.
Filter Regulator
Filter
Regulator
Lubricator
Drain Separator
Mechanical Pressure SW
Residual Pressure Exhaust Valve
Slow Start Valve
Antibacterial/ Bacteria Removing Filter
Ozone FR
Siloxane/ OzoneRemover
Flame Resistant FR
Oil-free Regulator
Medium Pressure FR
No copper/ PTFEv Specification
Air Unit Equipment
Adapter Joiner
Pressure Gauge
Compact F.R.L.
Large F.R.L.
Precision Regulator
Clean FR
Electro-Pneumatic Regulator
Air Booster
Ending

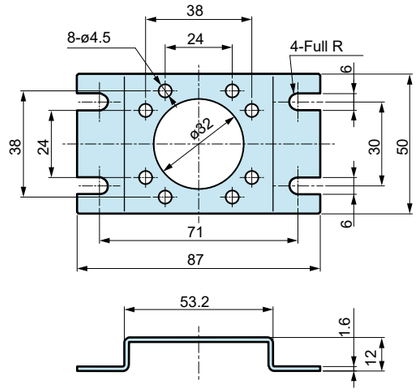
Dimensions

● Connector upward



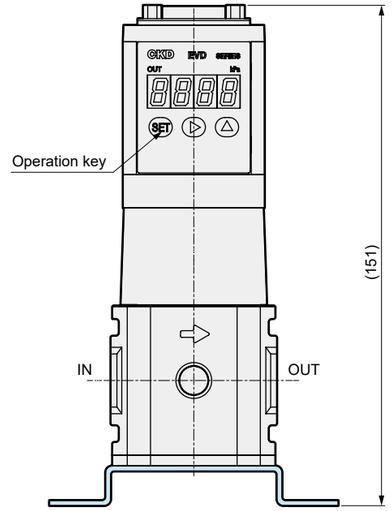
Option Outline Dimension Drawing

● B-Bracket (-B3) Floor mount type

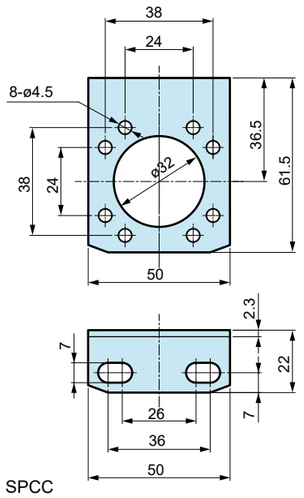


Material : SPCC
Ni plating treatment
Weight : 48 g

● B-bracket assembly

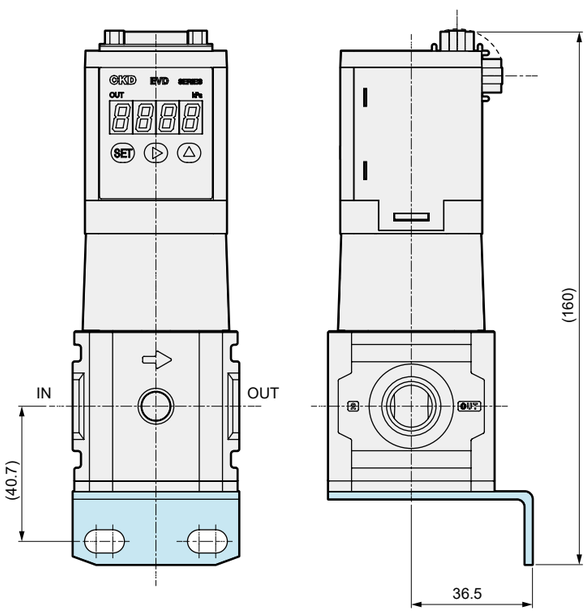


● L-Bracket (-L3) Wall mount type



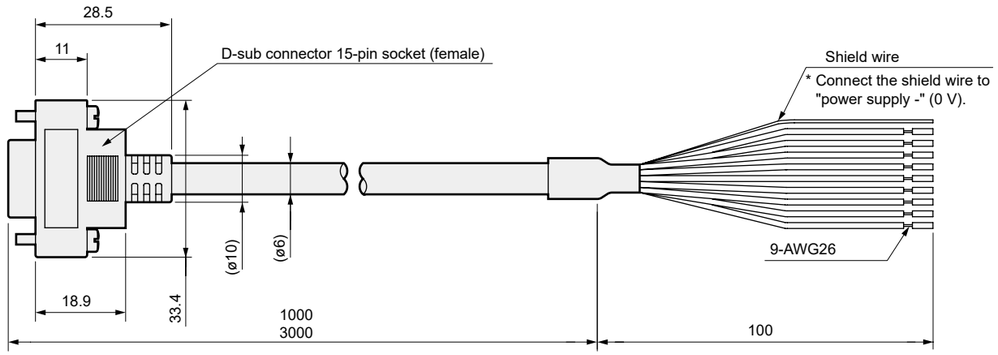
Material : SPCC
Ni plating treatment
Weight : 51 g

● C-bracket assembly



Cable Option Dimensions

● EVD-C1, EVD-C3

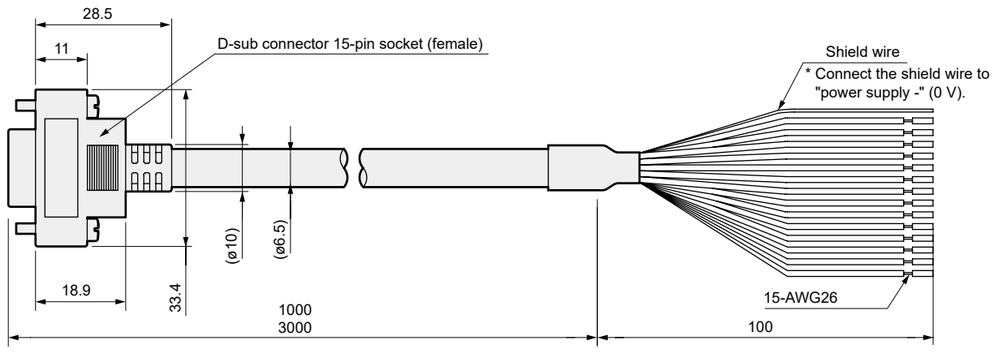


Wire material	Tin-plated annealed copper wire
Conductor O.D.	Approx. 0.48
Insulator O.D.	0.88

D-sub socket pin No.	1	2	3	4	5	6	7	8	9	10	11			12	13		14	15	Weight g
Insulator color	Brown	Orange	Yellow	-	Red	-	–	–	-	Gray	White			-	Green		Blue	Black	
Name	Preset input signal			Unused	Power supply +	Unused	Unused	Unused	Unused	Common	Input Signal			Unused	Analog output	Switch output	Error output	Power supply - (0 V)	C1 : 67 C3 : 166
Input type	Bit 1	Bit 2	Bit 3		+24 VDC						0-10 VDC	0-5 VDC	4-20 mADC		Output 1-5 VDC	NPN or PNP output	NPN or PNP output		

Note) The common of pin 10 is the common for preset inputs (pins 1 to 3).

● EVD-P1, EVD-P3

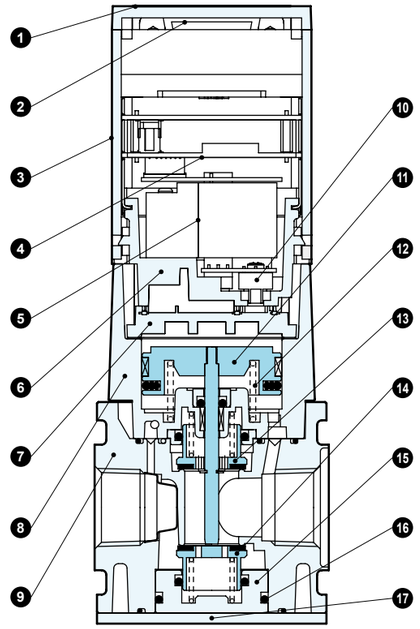


Wire material	Tin-plated annealed copper wire
Conductor O.D.	Approx. 0.48
Insulator O.D.	0.88

D-sub socket pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13		14	15	Weight g
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	
Name	Parallel input signal				Power supply +	Parallel input signal				Common	Parallel input signal		Analog output	Switch output	Error output	Power supply - (0 V)	P1 : 82 P3 : 205
Input type	Bit 1	Bit 2	Bit 3	Bit 4	+24 VDC	Bit 5	Bit 6	Bit 7	Bit 8		Bit 9	Bit 10	Output 1-5 VDC	NPN or PNP output	NPN or PNP output		

Note) The common of pin 10 is the common for parallel input signals (pins 1 to 4, 6 to 9, 11, and 12).

Internal structure and parts list

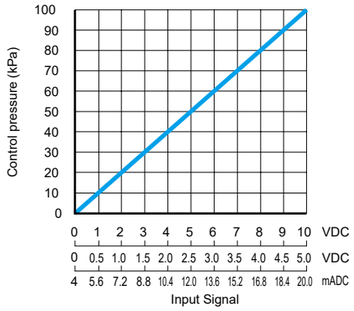


Do not disassemble

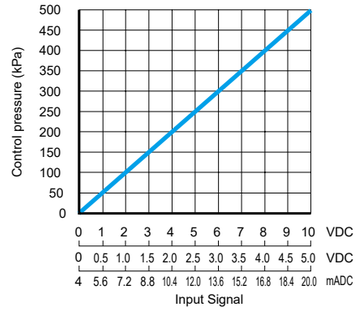
Part No.	Part Name	Material
1	Cover	PBT resin
2	D-sub Connector	-
3	Housing	ABS resin
4	Controller board	-
5	3-way valve	-
6	Valve base	Polyphenylene sulfide resin
7	Pilot chamber	Polyphenylene sulfide resin
8	Piston body assembly	Aluminum alloy die-casting, etc.
9	Body	Aluminum alloy die-casting
10	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	Bottom plate	Steel plate

Input/Output characteristics

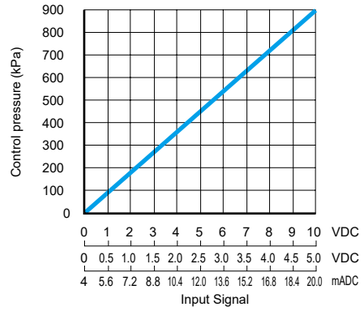
● EVD-3100



● EVD-3500

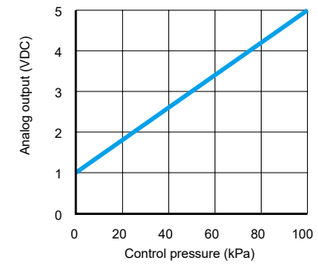


● EVD-3900

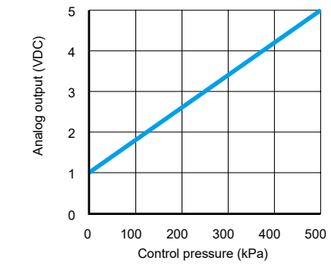


Analog output (analog output only : Model No. : AN/AP)

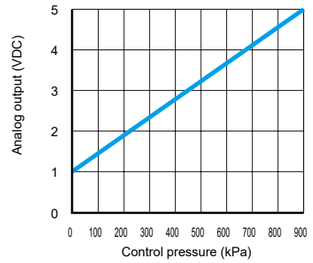
● EVD-3100



● EVD-3500

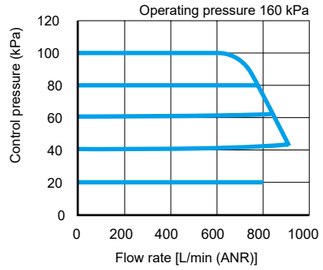


● EVD-3900

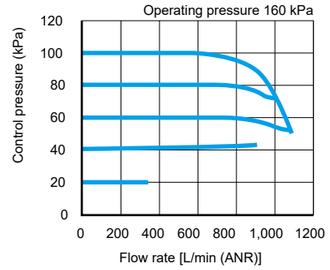


Flow characteristics

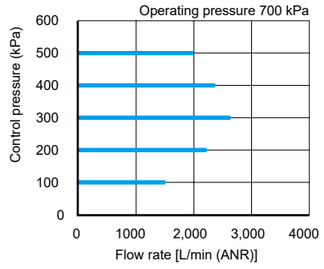
●EVD-3100-□08



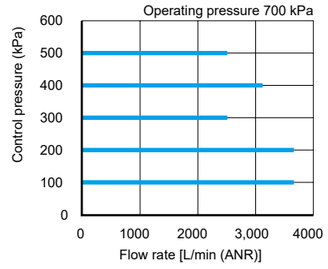
●EVD-3100-□10



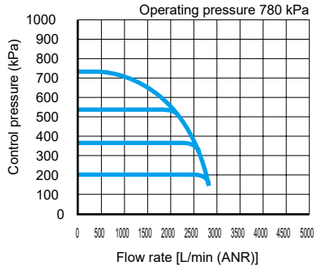
●EVD-3500-□08



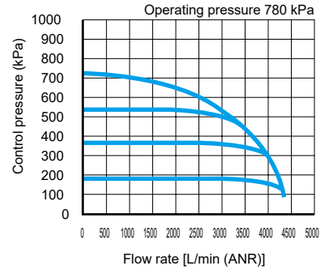
●EVD-3500-□10



●EVD-3900-□08

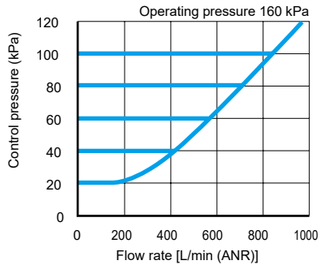


●EVD-3900-□10

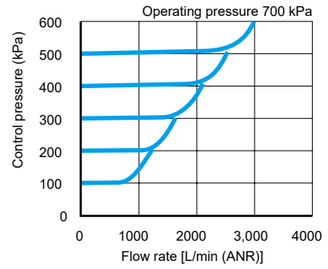


Relief characteristics

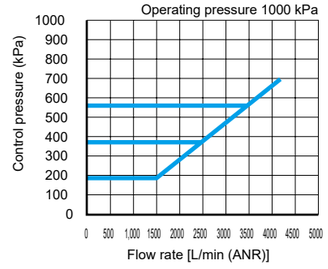
●EVD-3100



●EVD-3500



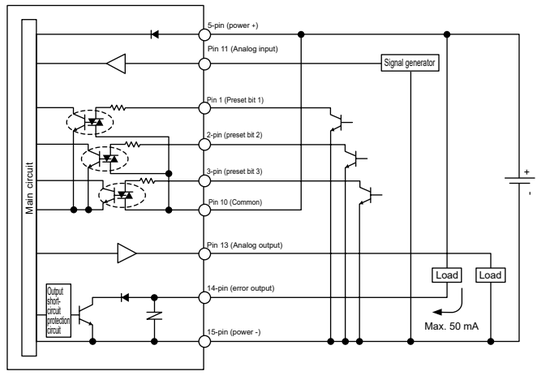
●EVD-3900



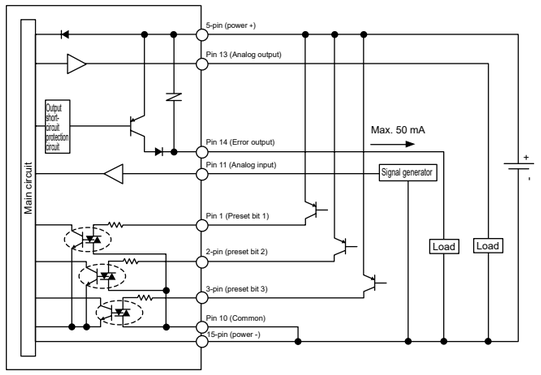
Wiring method

Internal circuit and load connection example : Analog input type

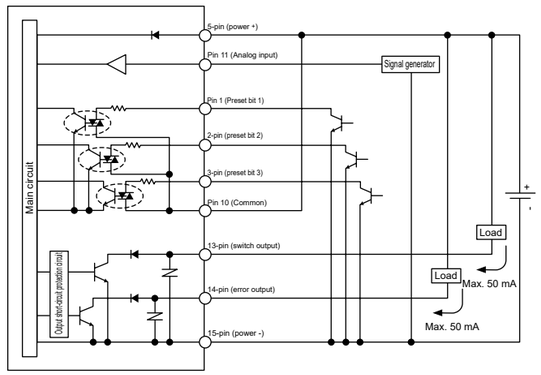
EVD-1□-0□AN-□-□, EVD-1□-1□AN-□, EVD-1□-2□AN-□
EVD-3□-0□AN-□-□, EVD-3□-1□AN-□, EVD-3□-2□AN-□
(Analog input, analog output + error output type NPN output)



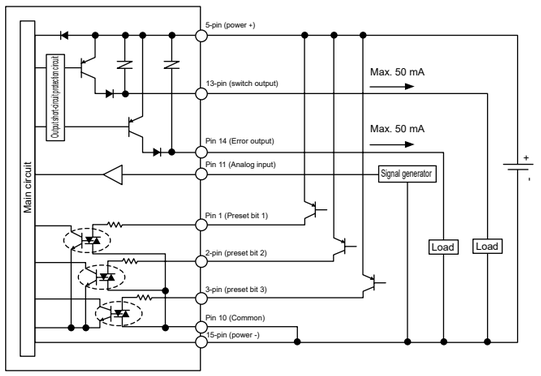
EVD-1□-0□AP-□-□, EVD-1□-1□AP-□, EVD-1□-2□AP-□
EVD-3□-0□AP-□-□, EVD-3□-1□AP-□, EVD-3□-2□AP-□
(Analog input, analog output + error output type PNP output)



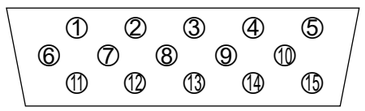
EVD-1□-0□SN-□-□, EVD-1□-1□SN-□, EVD-1□-2□SN-□
EVD-3□-0□SN-□-□, EVD-3□-1□SN-□, EVD-3□-2□SN-□
(Analog input, switch output + error output type NPN output)



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)



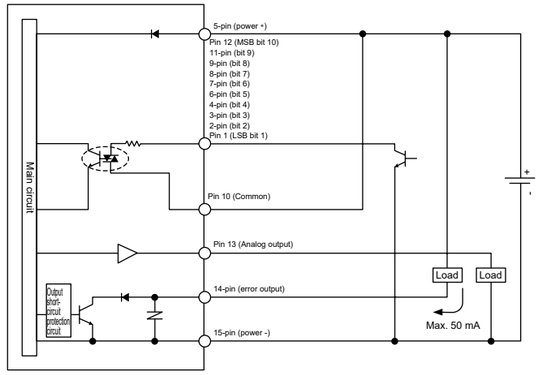
■ Connector pin layout (Product body side)
[Analog input type]



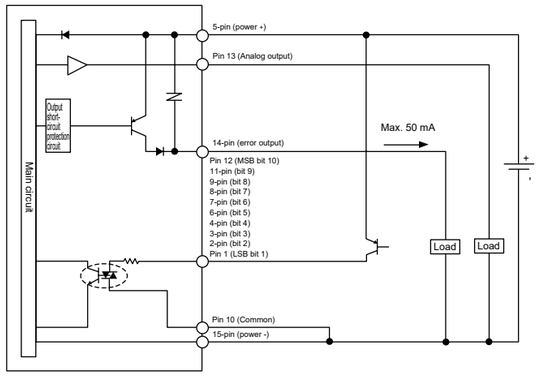
For analog input type,
④, ⑥, ⑦, ⑧, ⑨, ⑫ does not have a pin.

Internal circuit and load connection example : Parallel input type

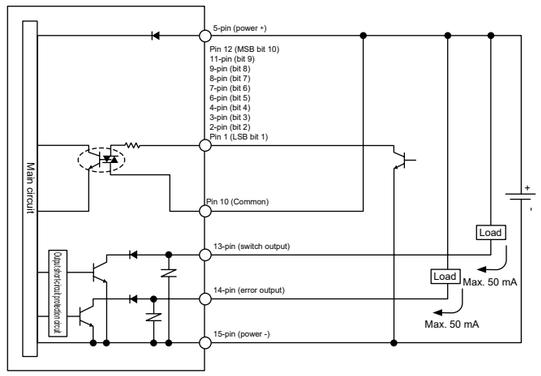
EVD-1□-P□AN-□-□
EVD-3□-P□AN-□-□
(Parallel input, analog output + error output type NPN output)



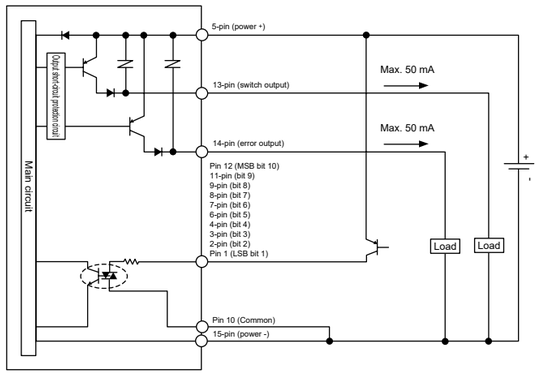
EVD-1□-P□AP-□-□
EVD-3□-P□AP-□-□
(Parallel input, analog output + error output type PNP output)



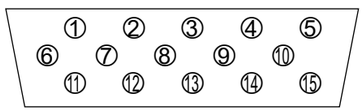
EVD-1□-P□SN-□-□
EVD-3□-P□SN-□-□
(Parallel input, switch output + error output type NPN output)



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



■ Connector pin assignment (Product body side)
[Parallel input type]



Input Method

■ Relation of parallel input signal and control pressure

The parallel input signal has 10 bits, and when converted into a decimal is 0-1023. Input signal = EVD setting pressure (kPa) /maximum control pressure x 1023 The maximum control pressure is 100 kPa for EVD-1100
500 kPa for EVD-1500
900 kPa for EVD-1900.

Ex.) When setting EVD-1500 to 300 kPa
300 (kPa) /500 (kPa) x1023=613.8→614

(Calculating backward,
setting to 614 results in 500 (kPa) x 614/1023 ≈ 300 (kPa).)

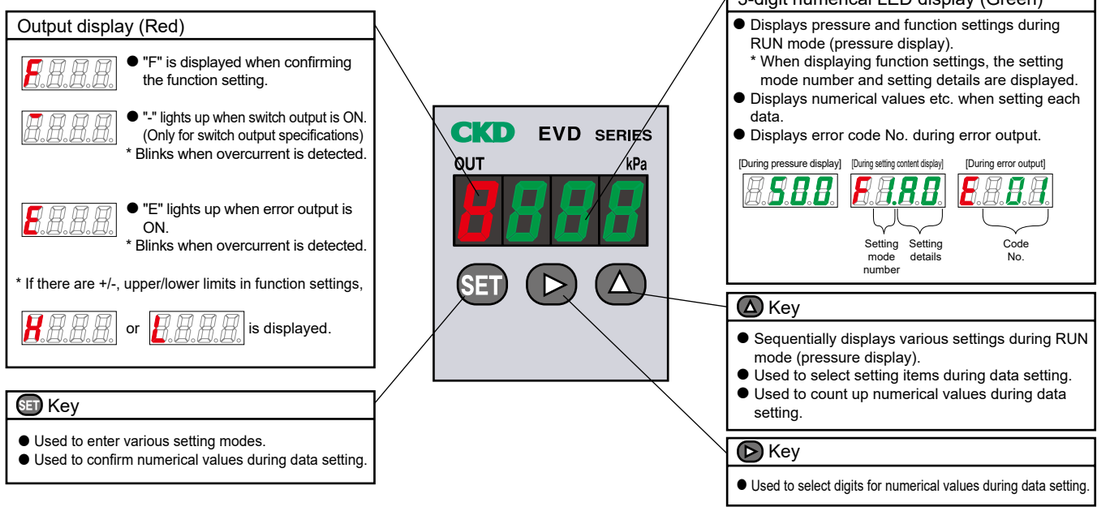
Converting 614 (decimal) to binary gives 1001100110. Set 1 to input signal ON and 0 to input signal OFF. (See table below)

D-sub socket pin No.	12	11	9	8	7	6	4	3	2	1
Cable Option 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

■ Relation of preset memory and input signal

D-sub socket pin No.	3	2	1	Preset memory
Cable Option 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

Names and functions of display/operation parts



Function list

Screen display	Name	Display content (in RUN mode)	Setting content (in Setting mode)
	Pressure display	Secondary pressure can be checked with the 3-digit numeric LED. Unit : kPa	
Screen F1	Input signal selection	You can check the selected input signal type and current target value (pressure converted value). * When preset input (8 points) is selected, the currently selected preset No. and set value are displayed.	For analog input type : Select from analog input / preset memory input / direct memory input. For preset input / direct memory input, enter the set value in this mode. For parallel type : Select from parallel input / direct memory input. For direct memory input, enter the target value in this mode.
Screen F2	Zero/Span adjustment	You can check the presence/absence of Zero/Span adjustment and its set value. If "Yes", F2.on - Zero point adjustment value (L) - Span point adjustment value (H) are displayed alternately. * Factory setting is full scale (-).	You can choose to use full scale or adjust Zero/Span. If Zero/Span adjustment is selected, you can set the adjustment value arbitrarily in this mode.
Screen F3	Auto power off	You can check the enable/disable status of the auto power off function. * Factory setting is disabled (-).	You can select enable/disable for the auto power off function. * Auto power off time is approx. 1 minute. Time cannot be changed.
Screen F4	Switch Output * Switch output specification only	You can check the enable/disable status of switch output and its set value. When "Mode 1 enabled", F4.0 -- Tolerance setting value (L) - + Tolerance setting value (H) are displayed alternately. When "Mode 2 enabled", F4.1 - Lower limit setting value (L) - Upper limit setting value (H) are displayed alternately. * Factory setting is disabled (-).	You can select enable/disable for switch output. If enabled, you can select Mode 1 or Mode 2. +/- tolerance, upper/lower limits can be set arbitrarily. * Hysteresis width cannot be set.
Screen F5	Proportional value change	You can check the presence/absence of proportional value change and its setting level. When "Proportional value up", F5.H is displayed. When "Proportional value down", F5.L - setting level are displayed alternately. * Factory setting is standard value (-).	You can choose to use the standard value or change the proportional value. You can set the proportional value level in this mode only when "Proportional value down" is selected. (10 levels)
* EVD-□100 only			

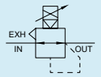
For details on operation and setting methods, refer to CKD Components Product website (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

Digital Electro-Pneumatic Regulator

EVD-1000 Series

IO-Link type

Circuit Diagram Symbol



For compatible detailed model No.s, please visit the CKD website.

Model No. Notation

EVD - 1 | 500 - C | 08 | KA - MS - 3

- EVD: Model No.
- 1: ❶ Pressure Control Range
- 500: ❶ Pressure Control Range
- C: Input signal : IO-Link
- 08: ❷ Port Size
- KA: ❸ Unit change
- MS: ❹ Option
- 3: Power voltage : 24 VDC

❶ Pressure Control Range

Code	Content
100	0-100 kPa
500	0-500 kPa
900	0-900 kPa

❷ Port Size

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

❸ Unit change

Code	Content
Blank	No unit switching
KA	With unit switching

Note) The unit change function KA type is available only outside Japan.

❹ Option

Code	Content	
Cable Option		
Blank	None	
MS	Straight (female) / Straight (male) 3 m	
ML	L-type (female) / Straight (male) 3 m	
MM	One side Straight (female) 3 m	

Code	Content	
Bracket option		
Blank	None	
B1	B-bracket, floor mount type	
L1	L-bracket, wall mount type	

● Option (cable, bracket) discrete model No.

EVD - MS3

- MS3: ❶ Option

❶ Option

Code	Content	
Cable Option		
MS3	Straight (Female) / Straight (Male) 3 m	
ML3	L-type (female) / Straight (male) 3 m	
MM3	One side Straight (female) 3 m	
Bracket option		
B1	B-bracket, Floor mounting type	
L1	L-bracket, Wall mounting type	

Rechargeable battery compatible specification

(Catalog No. CC-1226AA)

● Structure usable in rechargeable battery manufacturing processes

EVD - • • • • - P4□

Note) Please contact us for details.

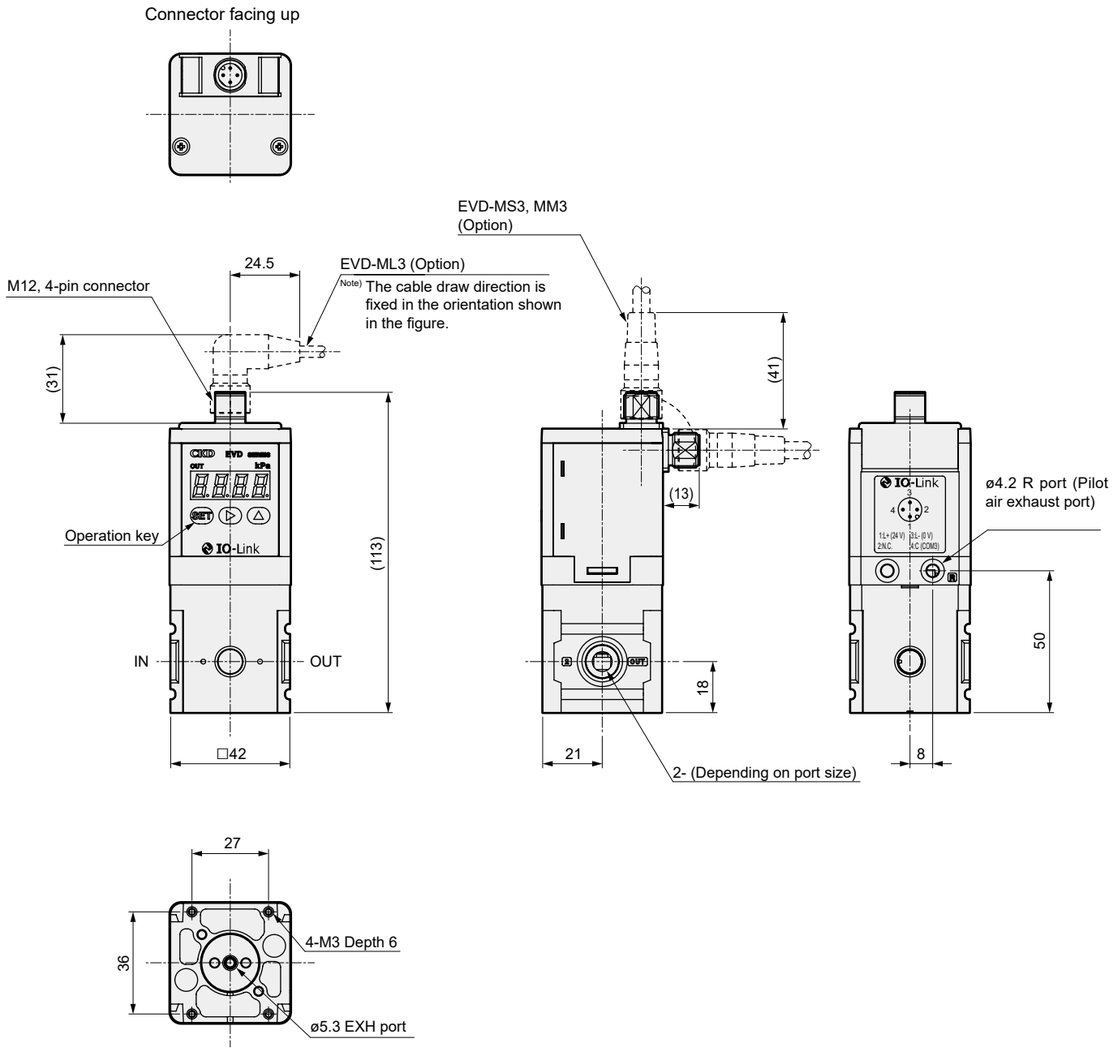
Specifications

Item		EVD-1100-C [❷] [❸]	EVD-1500-C [❷] [❸]	EVD-1900-C [❷] [❸]
Operating Fluid		Clean compressed air (Equivalent to ISO 1.3.2)		
Max. Operating pressure		160 kPa	700 kPa	1000 kPa
Min. Operating pressure		Set pressure + 50 kPa	Set pressure + 100 kPa	
Proof Pressure	Supply side	240 kPa	1050 kPa	1500 kPa
	Output side	150 kPa	750 kPa	1350 kPa
Pressure control range	*1	0 to 100 kPa	0 to 500 kPa	0 to 900 kPa
Power supply voltage		24 VDC ±10 % (Stabilized power supply with ripple rate 1 % or less)		
Current consumption	*2	0.15 A or less (Starting current at power ON : 0.6 A or less) (Port type A)		
Input Signal		IO-Link		
Preset input		8 points (IO-Link)		
Pressure display	Display method	7-segment LED 3 digits, Display accuracy : ±2 % F.S. or less		
	Display range	0 to 100 kPa	0 to 500 kPa	0 to 900 kPa
	Display resolution	1 kPa	1 kPa	1 kPa
Direct memory setting		1 to 100 kPa (Min. setting width 1 kPa / Setting resolution 1 kPa)	5 to 500 kPa (Min. setting width 1 kPa/setting resolution 1 kPa)	9 to 900 kPa (Min. setting width 1 kPa/setting resolution 2 kPa)
Hysteresis	*3	0.5 % F.S. or less		
Linearity	*3	±0.3 % F.S. or less		
Resolution	*3	0.2 % F.S. or less		
Repeatability	*3	0.3 % F.S. or less		
Temperature characteristics	Zero point fluctuation	±0.15 % F.S. / °C or less		
	Span fluctuation	±0.07 % F.S. / °C or less		
Max. flow rate (ANR)	*4	60 L/min	400 L/min	
Step Response	*5 No load	0.2 sec or less		
Vibration resistance		98 m/s² or less		
Ambient temperature		5 to 50 °C		
Fluid temperature		5 to 50 °C		
Port size [❷]		Port size option 08...Rc1/4, 08G...G1/4, 08N...N1/4		
Unit change [❸]	*6 Blank	No unit switching function		
	KA	Unit switching kPa / psi / bar (Accessory : Unit label psi / bar)		
Mounting orientation		Free		
Weight (body)		250 g		
Protection circuit		Power reverse connection protection		

*1 : There is 1 % F.S. or less residual pressure when the input signal is 0 %. (EVD-1100 : 1 kPa or less, EVD-1500 : 5 kPa or less, EVD-1900 : 9 kPa or less)
*2 : Use an IO-Link master with sufficient power supply capacity per port.
*3 : The above characteristics apply when the power supply voltage is 24 VDC±0.1V, the Operating pressure is maximum control pressure +50 kPa (EVD-1100) , maximum control pressure +100 kPa (EVD-1500, 1900) , and the control pressure is 10 to 90 %. (No load, ambient temperature 25 ±3 °C)
Also, this is limited to cases where the secondary side is a closed circuit, and pressure fluctuation occurs in usage methods such as blowing.
*4 : The above characteristics are when the Operating pressure is the max. Operating pressure and the control pressure is the max. control pressure.
*5 : The above characteristics are values when the Operating pressure is the Max operating pressure and the step amount is
- 50 % F.S. → 100 % F.S.
- 50 % F.S. → 60 % F.S.
- 50 % F.S. → 40 % F.S.

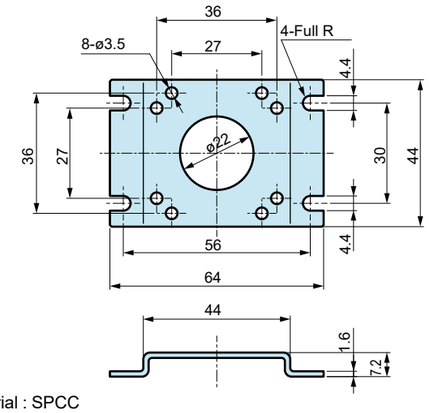
*6 : The unit switching function KA type is available only for outside Japan.

Dimensions



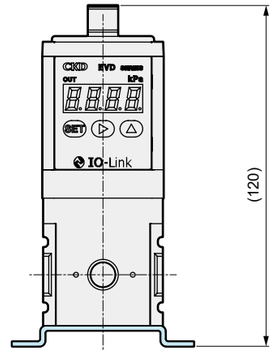
Option Outline Dimension Drawing

● B-bracket (-B1) : Floor mount type

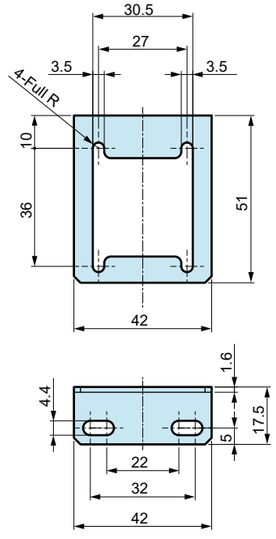


Material : SPCC
Ni plating treatment
Weight : 32 g

● B-bracket assembly

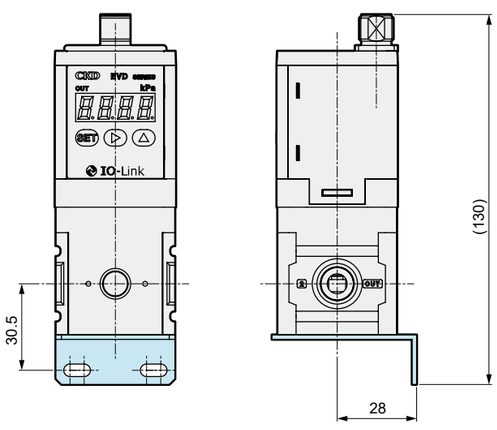


● L-bracket (-L1) : Wall mount type



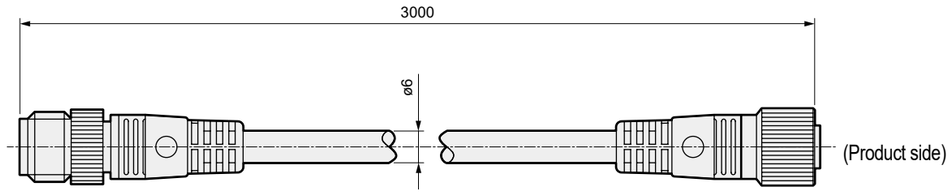
Material : SPCC
Ni plating treatment
Weight : 21 g

● L-bracket assembly

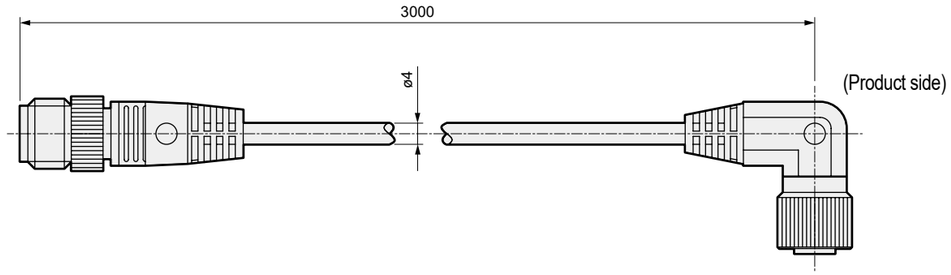


Cable Option Dimensions

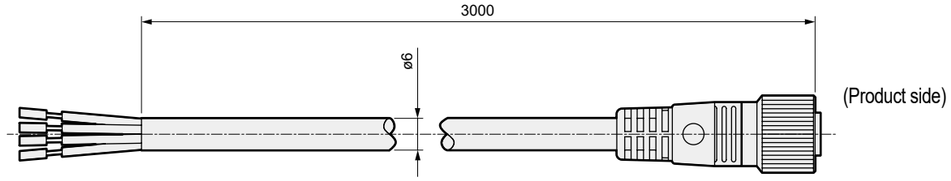
● EVD-MS3



● EVD-ML3



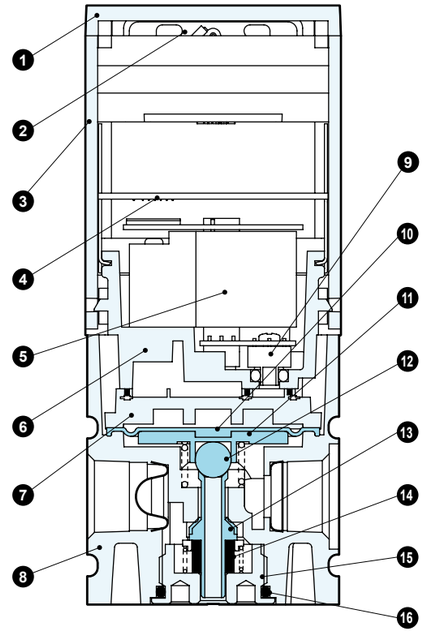
● EVD-MM3



Cable color	Application
Brown	L+ (24 VDC)
White	N.C. *
Blue	L- (GND)
Black	C (IO-Link)

*Insulate the wire so that it does not contact other wires.

Internal structure and parts list

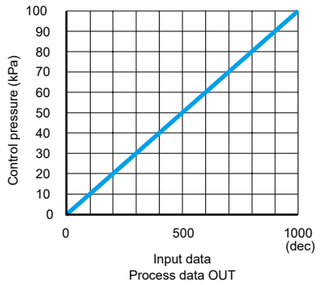


Do not disassemble

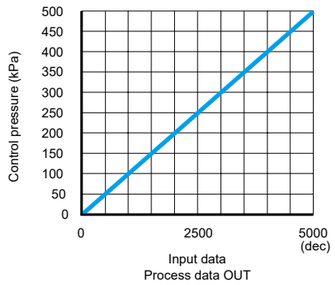
Part No.	Part Name	Material
1	Cover	PBT resin
2	M12 connector	-
3	Housing	ABS resin
4	Controller board	-
5	3-way valve	-
6	Valve base	Polyphenylene sulfide resin
7	Pilot chamber	Polyphenylene sulfide resin
8	Body	Aluminum alloy die-casting
9	Pressure sensor	-
10	Diaphragm	Special nitrile rubber
11	Relief seat	Aluminum alloy
12	Steel ball (exhaust valve)	Stainless steel
13	Valve	Special nitrile rubber, Stainless steel
14	Bottom rubber	Silicone rubber
15	Bottom plug	Brass, Electroless nickel plating
16	O-ring	Fluoro rubber

Input/Output characteristics

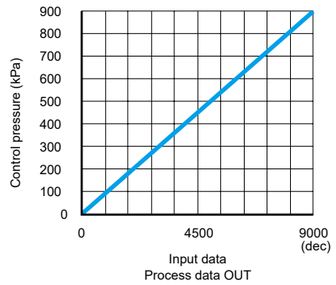
● EVD-1100



● EVD-1500

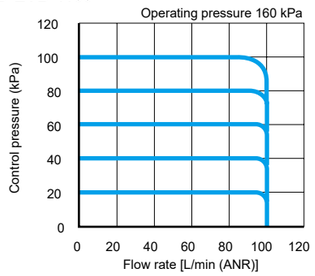


● EVD-1900

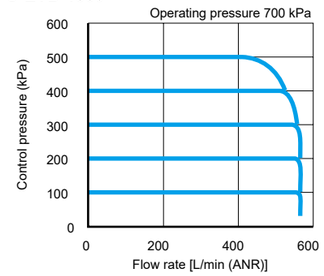


Flow characteristics

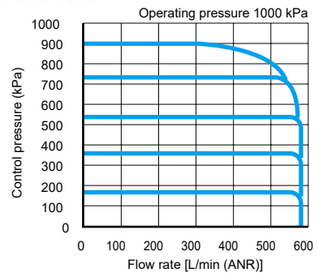
● EVD-1100



● EVD-1500

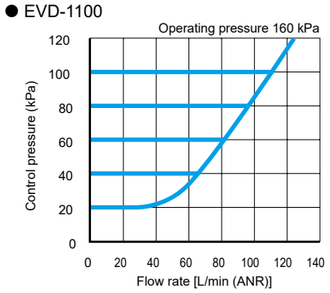


● EVD-1900

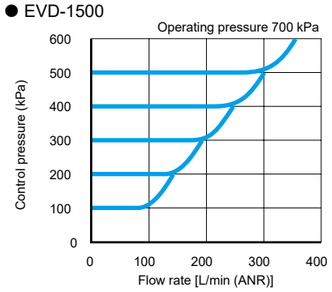


Relief characteristics

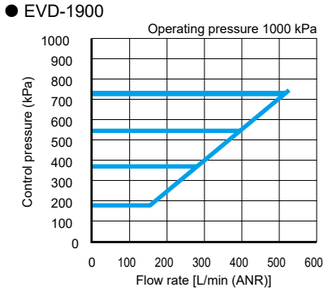
● EVD-1100



● EVD-1500



● EVD-1900



MEMO

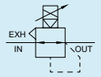
Air Preparation Components
F.R.L.
Filter Regulator
Filter
Regulator
Lubricator
Drain Separator
Mechanical Pressure SW
Residual Pressure Exhaust Valve
Slow Start Valve
Antibacterial/ Bacteria Removing Filter
Ozone FR
Siloxane/ OzoneRemover
Flame Resistant FR
Oil-free Regulator
Medium Pressure FR
No copper/ PTFEv Specification
Air Unit Equipment
Adapter Joiner
Pressure Gauge
Compact F.R.L.
Large F.R.L.
Precision Regulator
Clean FR
Electro-Pneumatic Regulator
Air Booster
Ending

Digital Electro-Pneumatic Regulator

EVD-3000 Series

IO-Link type

Circuit Diagram Symbol



For compatible detailed model No.s, please visit the CKD website.

Model No. Notation

EVD - 3 | 500 - C | 08 | KA - MS - 3

- EVD: Model No.
- 500: ❶ Pressure Control Range
- C: Input signal : IO-Link
- 08: ❷ Port Size
- KA: ❸ Unit change
- MS: ❹ Option
- 3: Power voltage : 24 VDC

❶ Pressure Control Range

Code	Content
100	0-100 kPa
500	0-500 kPa
900	0-900 kPa

❷ Port Size

Code	Content
08	Rc1/4
10	Rc 3/8
08G	G1/4
10 g	G3/8
08N	NPT1/4
10 N	NPT3/8

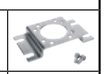
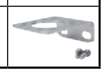
❸ Unit change

Code	Content
Blank	No unit switching
KA	With unit switching

Note) The unit change function KA type is available only outside Japan.

❹ Option

Code	Content	
Cable Option		
Blank	None	
MS	Straight (female) / Straight (male) 3 m	
ML	L-type (female) / Straight (male) 3 m	
MM	One side Straight (female) 3 m	

Code	Content	
Bracket option		
Blank	None	
B3	B-bracket, floor mount type	
L3	L-bracket, wall mount type	

● Option (cable, bracket) discrete model No.

EVD - MS3

- MS3: ❶ Option

❶ Option

Code	Content	
Cable Option		
MS3	Straight (Female) / Straight (Male) 3 m	
ML3	L-type (female) / Straight (male) 3 m	
MM3	One side Straight (female) 3 m	
Bracket option		
B3	B-bracket, Floor mounting type	
L3	L-bracket, Wall mounting type	

Rechargeable battery compatible specification

(Catalog No. CC-1226AA)

● Structure usable in rechargeable battery manufacturing processes

EVD - . . . . - P4□

Note) Please contact us for details.

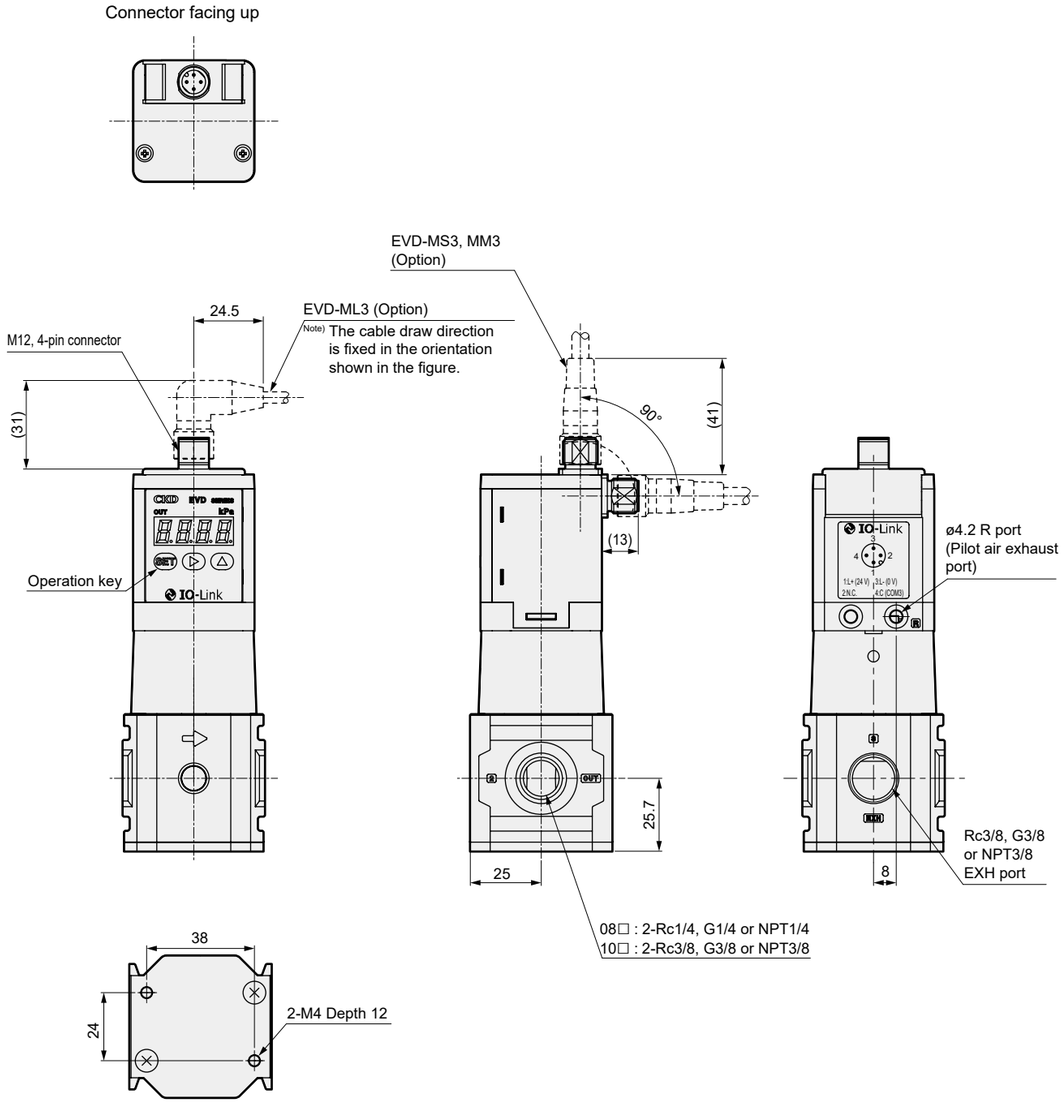
Specifications

Item		EVD-3100-C [❷] [❸]	EVD-3500-C [❷] [❸]	EVD-3900-C [❷] [❸]
Operating Fluid		Clean compressed air (Equivalent to ISO 1.3.2)		
Max. Operating pressure		160 kPa	700 kPa	1000 kPa
Min. Operating pressure		Set pressure + 50 kPa	Set pressure + 100 kPa	
Proof Pressure	Supply side	240 kPa	1050 kPa	1500 kPa
	Output side	150 kPa	750 kPa	1350 kPa
Pressure control range *1		0 to 100 kPa	0 to 500 kPa	0 to 900 kPa
Power supply voltage		24 VDC ±10 % (Stabilized power supply with ripple rate 1 % or less)		
Current consumption *2		0.15 A or less (Starting current at power ON : 0.6 A or less) (Port type A)		
Input Signal		IO-Link		
Preset input		8 points (IO-Link)		
Pressure display	Display method	7-segment LED 3 digits, Display accuracy : ±2 % F.S. or less		
	Display range	0 to 100 kPa	0 to 500 kPa	0 to 900 kPa
	Display resolution	1 kPa	1 kPa	1 kPa
Direct memory setting		1 to 100 kPa (Min. setting width 1 kPa / Setting resolution 1 kPa)	5 to 500 kPa (Min. setting width 1 kPa/setting resolution 1 kPa)	9 to 900 kPa (Min. setting width 1 kPa/setting resolution 2 kPa)
Hysteresis *3		0.5 % F.S. or less		
Linearity *3		±0.3 % F.S. or less		
Resolution *3		0.2 % F.S. or less		
Repeatability *3		0.3 % F.S. or less		
Temperature characteristics	Zero point fluctuation	±0.15 % F.S. / °C or less		
	Span fluctuation	±0.07 % F.S. / °C or less		
Max. flow rate (ANR) *4		700 L/min	1500 L/min	
Step Response *5	No load	0.2 sec or less		
Vibration resistance		98 m/s^2 or less		
Ambient temperature		5 to 50 °C		
Fluid temperature		5 to 50 °C		
Port size [❷]	IN, OUT port	Port size option 08...Rc1/4, 10...Rc3/8, 08G...G1/4, 10G...G3/8, 08N...NPT1/4, 10N...NPT3/8		
	EXH Port	Rc3/8, G3/8, NPT3/8		
Unit change [❸] *6	Blank	No unit switching function		
	KA	Unit switching kPa / psi / bar (Accessory : Unit label psi / bar)		
Mounting orientation		Free		
Weight (body)		470 g		
Protection circuit		Power reverse connection protection		

*1 : There is 1 % F.S. or less residual pressure when the input signal is 0 %. (EVD-3100 : 1k Pa or less, EVD-3500 : 5 kPa or less, EVD-3900 : 9 kPa or less)
*2 : Use an IO-Link master with sufficient power supply capacity per port.
*3 : The above characteristics apply when the power supply voltage is 24 VDC±0.1V, the Operating pressure is maximum control pressure +50 kPa (EVD-3100) , maximum control pressure +100 kPa (EVD-3500, 3900) , and the control pressure is 10 to 90 %. (No load, ambient temperature 25 ±3 °C)
Also, this is limited to cases where the secondary side is a closed circuit, and pressure fluctuation occurs in usage methods such as blowing.
*4 : The above characteristics are when the Operating pressure is the max. Operating pressure and the control pressure is the max. control pressure.
*5 : The above characteristics are values when the Operating pressure is the Max operating pressure and the step amount is
- 50 % F.S. → 100 % F.S.
- 50 % F.S. → 60 % F.S.
- 50 % F.S. → 40 % F.S.

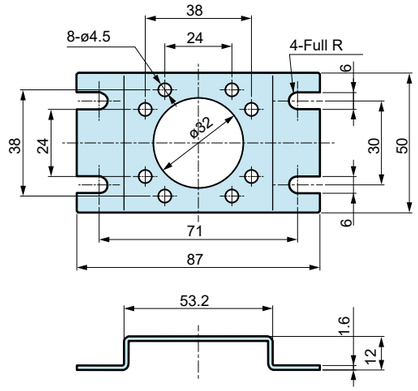
*6 : The unit switching function KA type is available only for outside Japan.

Dimensions



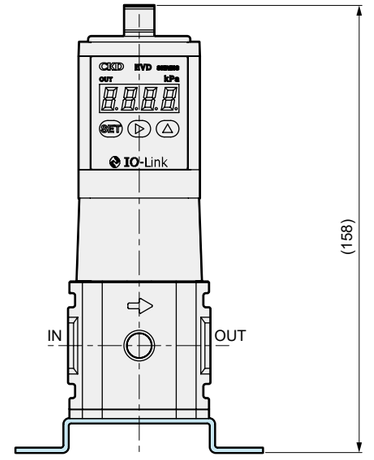
Option Outline Dimension Drawing

● B-Bracket (-B3) Floor mount type

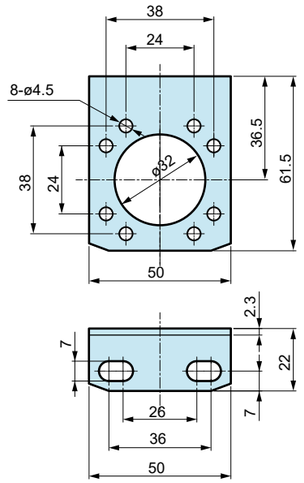


Material : SPCC
Ni plating treatment
Weight : 48 g

● B-bracket assembly

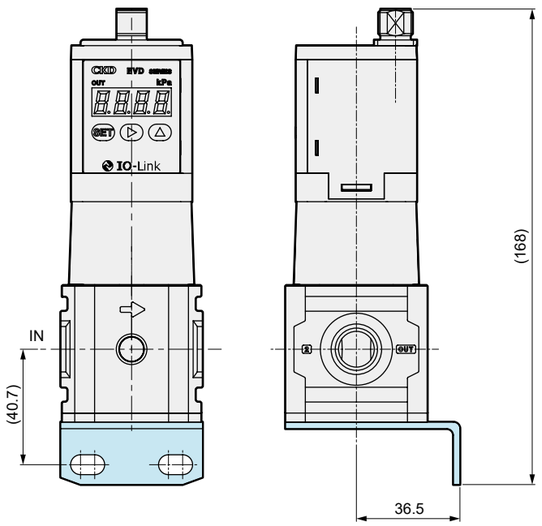


● L-Bracket (-L3) Wall mount type



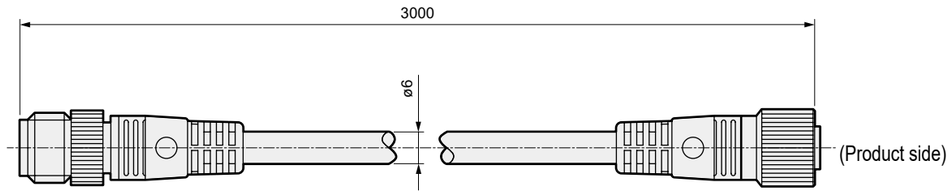
Material : SPCC
Ni plating treatment
Weight : 51 g

● L-bracket assembly

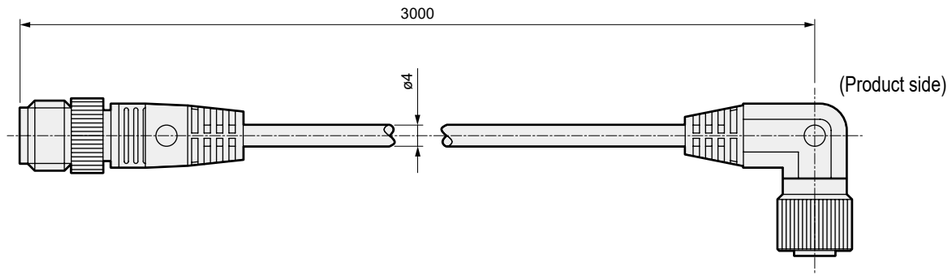


Cable Option Dimensions

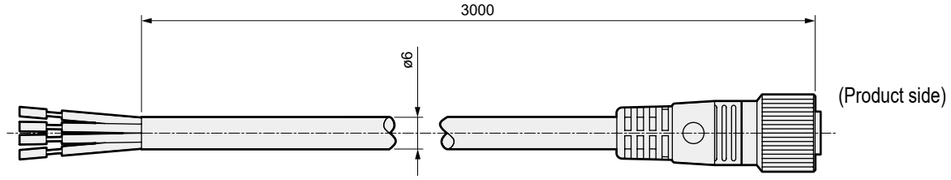
● EVD-MS3



● EVD-ML3



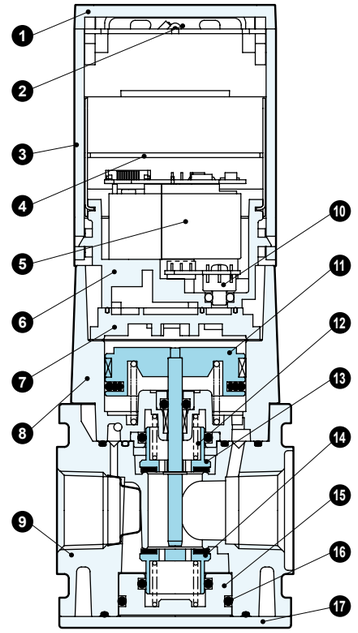
● EVD-MM3



Cable color	Application
Brown	L+ (24 VDC)
White	N.C.*
Blue	L- (GND)
Black	C (IO-Link)

* Insulate the wire so that it does not contact other wires.

Internal structure and parts list

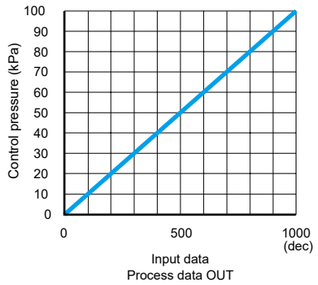


Do not disassemble

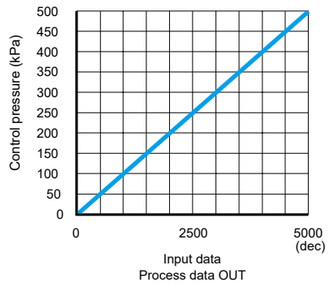
Part No.	Part Name	Material
1	Cover	PBT resin
2	M12 connector	-
3	Housing	ABS resin
4	Controller board	-
5	3-way valve	-
6	Valve base	Polyphenylene sulfide resin
7	Pilot chamber	Polyphenylene sulfide resin
8	Piston body assembly	Aluminum alloy die-casting, etc.
9	Body	Aluminum alloy die-casting
10	Pressure 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	Bottom plate	Steel plate

Input/Output characteristics

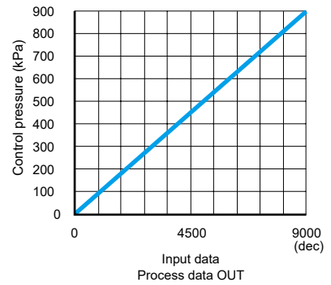
● EVD-3100



● EVD-3500



● EVD-3900



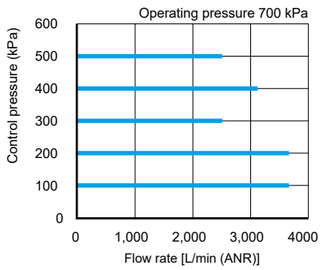
Flow characteristics

● EVD-3100-□08

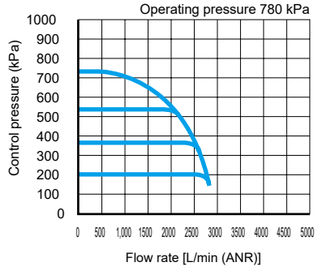
● EVD-3100-□10

● EVD-3500-□08

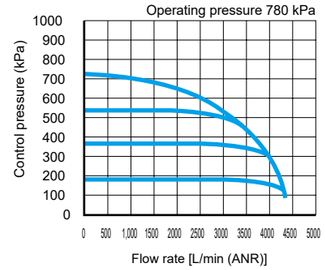
● EVD-3500-□10



● EVD-3900-□08

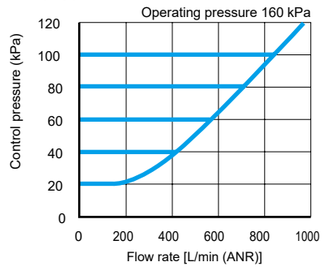


● EVD-3900-□10

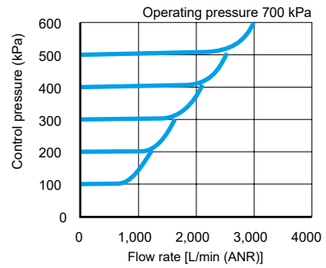


Relief characteristics

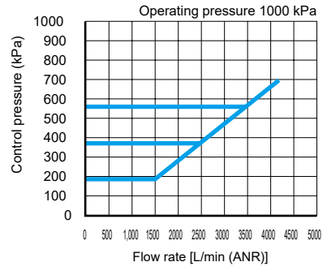
● EVD-3100



● EVD-3500

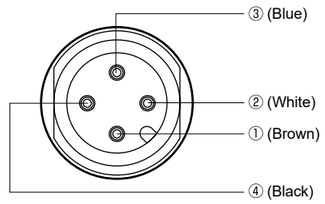


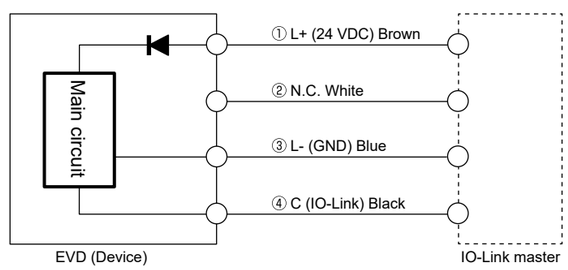
● EVD-3900



Wiring method

⚠ Caution Be careful of incorrect wiring.





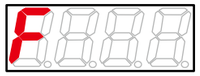
Terminal No.	Option cable color	Name
①	Brown	L+ (24 VDC)
②	White	N.C.
③	Blue	L- (GND)
④	Black	C (IO-Link)

Note) The optional cable of our electro pneumatic regulator EVR and EVS2 Series is an M12 connector, and can be connected to the product connector. The relationship between the terminal No. and wiring color is different from the specifications of the IO-Link cable. Do not use as it will lead to incorrect wiring.

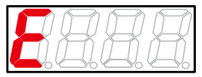
Applicable models : EVR-S1 / EVR-S3 / EVR-L1 / EVR-L3 / EV2000-C11 / EV2000-C13

Names and functions of display/operation parts

Displayed pressure (Red)

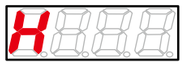


●F is displayed when confirming the function setting.

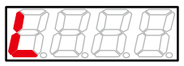


●E lights up when error output is ON.

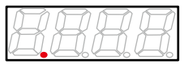
* When there is an upper/lower limit in function setting,



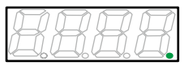
or



is displayed.



● Red Dot blinks during IO-Link communication. Red Dot lights when power is ON, and IO-Link is not in communication.



● During IO-Link communication, when ProcessDataOut becomes invalid due to a communication error or the like between the IO-Link master and its host network, the green dot in the lower right corner of the display blinks.

3-digit numerical LED display (Green)

●Displays the pressure display and function setting details during RUN mode.

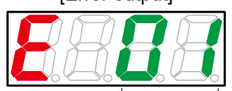
* When displaying function settings, the setting mode number and setting details are displayed.

●Displays numerical values etc. when setting each data.

●Displays error code No. when an error is displayed.

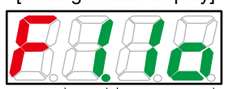
[Pressure display]

[Error output]



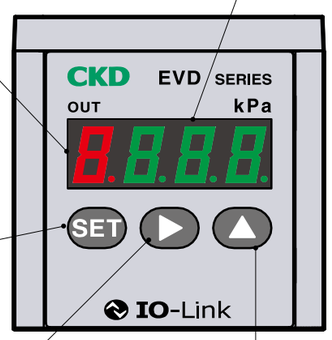
Code No.

[Setting details display]



Setting details

Setting mode number



SET key

●Used to enter various setting modes.

● Used to confirm numerical values etc. when setting each data.

“ ▶ “ key

● Used to select digits of numerical values etc. when setting each data.

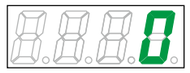
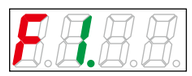
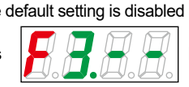
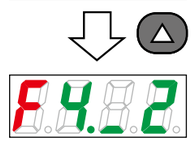
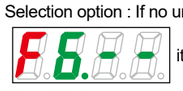
“ ▲ “ key

● Setting details are sequentially displayed during RUN mode.

● Used to select setting items when setting each data.

● When setting each data, this key is used to count up the values, etc.

Function list

Screen display	Name	Display content (in RUN mode)	Setting content (in Setting mode)
	Pressure display	Secondary pressure can be checked with the 3-digit numeric LED. The display is converted to the set unit.	
Screen F1 ▲ 	Input specification setting	Selected input specification, current pressure value, and unit setting can be confirmed.	Select either Normal mode input / Preset input / Direct memory input via IO-Link communication. In case of Preset input / Direct input, enter the set value in this mode.
Screen F2 ▲ 	Zero/Span adjustment	No function.  is displayed.	
Screen F3 ▲ 	Auto power off	You can check the enable/disable status of the auto power off function. * The default setting is disabled and is included. It has  been disabled.	Validity/Invalidity of auto power OFF function can be selected. Note) Auto power OFF time is approx. 1 minute. Time cannot be changed.
Screen F4 ▲  ▼ ▲ 	Switch Output	Validity/Invalidity of switch output 1, 2 and their set values can be confirmed. If "Mode 1 Valid", after displaying F4._1 or F4._2, Switch output No. 1, "-" Tolerance range setting value (L) , "+" Tolerance range setting value (H) are displayed. If "Mode 2 Valid", after displaying F4._1 or F4._2, Switch output No. 2, Lower limit setting value (L) and Upper limit setting value (H) are displayed. * Factory setting is Invalid "F4._1" ↔ "1-" Invalid "F4._2" ↔ "2-".	Validity/Invalidity of switch output 1, 2 can be selected. If Valid, "Mode 1" and "Mode 2" can be selected. +/- Tolerance, Upper/Lower limit values can be set arbitrarily.
Screen F5 ▲ 	Proportional value setting	You can check the presence/absence of proportional value change and its setting level. When "Proportional value up", F5.H is displayed. If "Proportional value DOWN", F5.L - Setting level are displayed alternately. * The default setting for is the standard value (-)	You can choose to use the standard value or change the proportional value. Only when "Proportional value DOWN" is selected, the proportional value level can be set in this mode. (10 levels)
Screen F6 ▲ 	Unit setting	Unit can be confirmed. Selection option : If no unit switching (Blank) ,  it will be displayed as. When "Unit change : Yes" (code : KA) is selected, F6 and the unit are repeatedly displayed. * Default setting is "F6." ↔ “kPa".	Selection option : Only for unit switching (code : KA) , unit setting can be selected from "kPa", "psi", "bar". If no unit switching (Blank) is selected, it cannot be switched.
Screen F7 ▲ 	Setting at the time of communication error	The operation of pressure control when an IO-Link communication error occurs can be confirmed.	Pressure control operation upon IO-Link communication error can be set to HOLD/ CLEAR.
Screen F8 ▲ 	Input zero operation stop function	Validity/Invalidity of input zero operation stop function can be confirmed. * The default setting is disabled at the.  When invalid, control does not stop at set pressure 0 % F.S.	Validity/Invalidity of input zero operation stop function can be selected. When valid, control stops at set pressure 0 % F.S.

Communication specifications

■ General

Item	Details
Communication Protocol	IO-Link
Communication protocol version	V1.1
Transmission speed	COM3 (230.4 kbps)
Port type	A
Process data length (input)	6 byte
Process data length (output)	4 byte

Item	Details
Min. cycle time	2 ms
Data Storage	1 kbyte
SIO Mode Support	None
Device ID	Refer to Table 1 below

■ Parameters

Device ID

Device ID	Product ID	Remarks
0 x 215001	EVD-☐100-C	100 kPa range
0 x 215002	EVD-☐500-C	500 kPa range
0 x 215003	EVD-☐900-C	900 kPa range
0 x 215004	EVD-☐100-C-KA	100 kPa range (With unit switching)
0 x 215005	EVD-☐500-C-KA	500 kPa range (With unit switching)
0 x 215006	EVD-☐900-C-KA	900 kPa range (With unit switching)

Table 1 Control Pressure Range by Model

Model No.	Select Unit	Control pressure			Remarks
		Display (7-segment)	ProcessData Display range (kPa)	ProcessData Output value	
EVD-1100-C EVD-3100-C	None (kPa fixed)	0 to 100	0.0 to 100.0	0 to 1000	Unit switching Without
EVD-1500-C EVD-3500-C	None (kPa fixed)	0 to 500	0.0 to 500.0	0 to 5000	Unit switching Without
EVD-1900-C EVD-3900-C	None (kPa fixed)	0 to 900	0.0 to 900.0	0 to 9000	Unit switching Without
EVD-1100-C☐KA EVD-3100-C☐KA	kPa	0 to 100	0.0 to 100.0	0 to 1000	Unit switching With
	psi	0 to 14.5	0.0 to 14.50	0 to 1450	
	bar	0 to 1.00	0.0 to 1.000	0 to 1000	
EVD-1500-C☐KA EVD-3500-C☐KA	kPa	0 to 500	0.0 to 500.0	0 to 5000	Unit switching With
	psi	0 to 72.5	0.0 to 72.50	0 to 7250	
	bar	0 to 5.00	0.0 to 5.000	0 to 5000	
EVD-1900-C☐KA EVD-3900-C☐KA	kPa	0 to 900	0.0 to 900.0	0 to 9000	Unit switching With
	psi	0 to 130	0.0 to 130.5	0 to 1305	
	bar	0 to 9.00	0.0 to 9.000	0 to 9000	

Note) Please refer to Instruction Manual SM-A20758 for setting parameters.

Note) Please download the IO-Link setting file (IODD) from our website (https://www.ckd.co.jp/en/).

Process data IN

PD	PD0								PD1							
Bit	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
	MSB															LSB
Data Name	Set pressure															
Data Range	2 byte															
Format	UInteger 16															

PD	PD2								PD3							
Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	MSB															LSB
Data Name	Control pressure															
Data Range	2 byte															
Format	UInteger 16															

PD	PD4								PD5							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Data Name	Error	WARNING	Normal operation	-	–	-	Switch Output		MSB			LSB	Input setting		-	Start/Stop
							2	1	Error code							
Data Range	True/False								0 to 15				0 to 2		-	True/False
Format	Boolean								UInteger 4				UInteger 2		-	Boolean

Process data OUT

PD	PD0								PD1							
Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	MSB															LSB
Data Name	Set pressure															
Data Range	2 byte															
Format	UInteger 16															

PD	PD2								PD3							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Data Name	-	–	–	–	-	Preset			-	–	–	–	–	–	-	Start/Stop *1
						3	2	1								
Data Range	-	–	–	–	-	0 to 7			-	–	–	–	–	–	-	True/False
Format	-	–	–	–	-	UInteger 3			-	–	–	–	–	–	-	Boolean

*1 : When turning OFF the EVD power supply, make sure that the set pressure of Process data OUT is zero (Bit 16 - 31 = 0) → stopped (Bit 0 = 0) before turning OFF the power supply. The solenoid valve unnecessary operation data is saved when transitioning from Start → Stop.

*2 : Data areas marked with "-" are unused areas. Data is invalid.

For details on operation and setting methods, refer to the CKD Components Product Site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

Explanation of Terms

Max operating pressure

Maximum value of primary pressure that can be used. Varies depending on pressure specification.

Min. Operating pressure

Minimum value of primary pressure that can be used. Varies depending on pressure specification.

Proof Pressure

Pressure value under which the electro pneumatic regulator will not break even if momentarily applied. (Not the pressure value that can be used)
The supply side (primary side) and output side (secondary side) are listed separately to limit the withstand pressure of the pressure sensor mounted on the secondary side.

Pressure Control Range

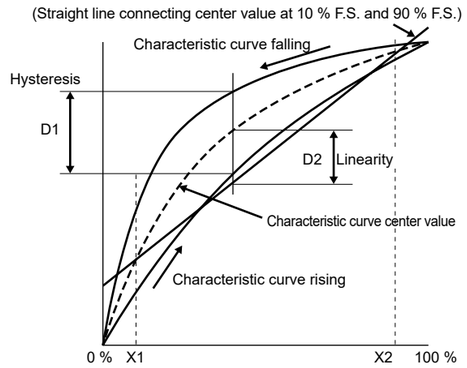
Indicates the pressure which can be controlled. Depending on the product,
residual pressure may be generated. With the EVD, 1 % F.S. or less residual
pressure is generated when the input signal is 0 % F.S.

Note) Different from accuracy guarantee range.
Please refer to the Hysteresis and Linearity sections below.

Hysteresis (measuring circuit 1)

The difference (D1) of the rise curve and lower curve when the input signal is reciprocated once between 0 % and 100 %, indicated as a percentage of the full scale (F.S.).
(Hysteresis) = Max. value of D1 / Control pressure of F.S. x 100 [%]

Note) The scope of warranty will differ according to the product.
For EVD, the guaranteed range is 10 % to 90 % F.S.



Linearity (Measurement circuit 1)

The input signal (X1) % F.S. and (X2) % F.S. when the input signal is reciprocated once between 0 % F.S. and 100 % F.S.
The difference (D2) from the reference line connecting the %F.S. is expressed as a percentage of the full scale (FS).
(Linearity) = Max. value of D2 / FS control pressure x 100 [%]

Note) The scope of warranty will differ according to the product.
For EVD, X1 = 10 % F.S. and X2 = 90 % F.S.

Resolution (Measurement circuit 1)

The min. value of the input signal generated when the control pressure changes, indicated as a percentage of the full scale (F.S.). The input signal is pressurized from 0 % F.S. to 15 % F.S. and held for 10 seconds or longer and the input signal is The value is indicated as the difference with the input signal obtained, then gradually increased until the control pressure starts to rise again. The same applies to 50 % F.S. and 85 % F.S. input signals.

Repeatability (Measurement Circuit 1)

The maximum value of the control pressure variation when the same setting value is repeatedly applied is indicated as a percentage of the full scale (F.S.).
The value is calculated with the variation of the control pressure (D3) when the input signals 0 % F.S. and 50 % F.S. are repeatedly applied.
(Repeatability) = D3 / FS control pressure x 100 [%]

Temperature Characteristics

Indicates the fluctuation of the control pressure according to changes in the ambient temperature (reference temperature 25 °C) converted per 1 °C.
Zero point and span width are described.

Max. Flow Rate (measuring circuit 2)

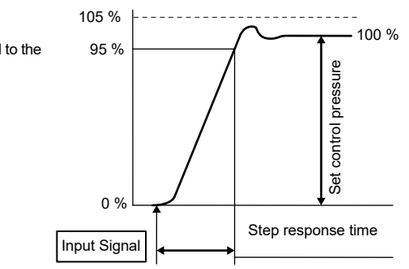
Represents the flow rate that can flow at control pressure 100 % F.S.

Relief characteristics (measuring circuit 3)

Represents the relationship between control pressure and exhaust flow rate when back pressure is applied to the secondary side from the outside in the pressure control state.
Measure the relief flow rate when back pressure is gradually increased.

Step response (Measurement cycleRoad 1)

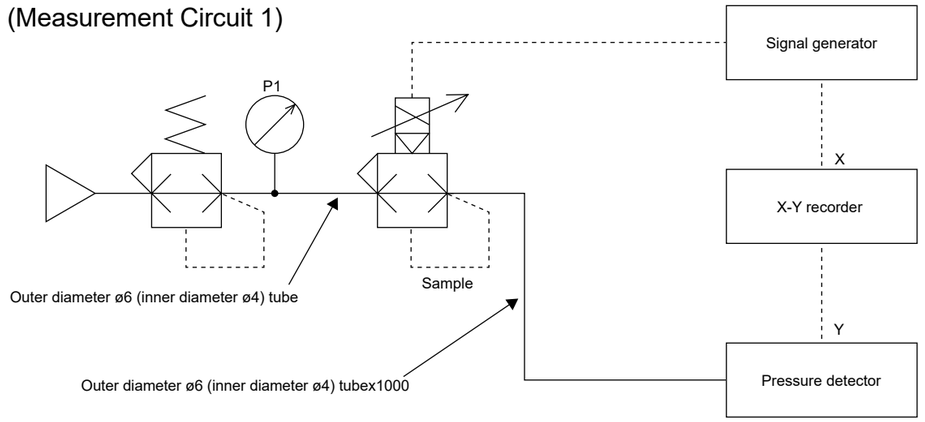
Represents the time until the control pressure reaches the set pressure for a step input signal.
Measure the time from applying the input signal until the control pressure converges within the range of set value ±5 % F.S.



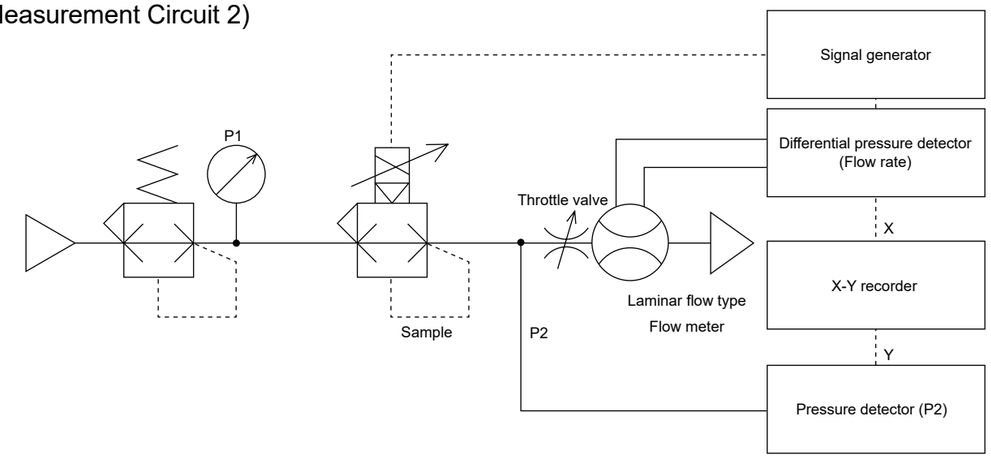
(Response time) = Time to reach within ±5 % of final value

Our measurement circuit

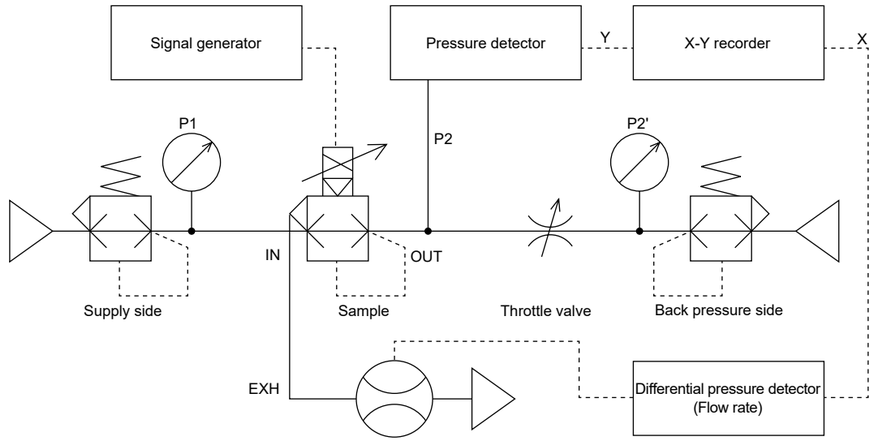
(Measurement Circuit 1)



(Measurement Circuit 2)



(Measurement Circuit 3)



To Use This Product Safely

Be sure to read this before use. Refer to Intro 27 for general precautions.

Individual Precautions : Digital Electro-Pneumatic Regulators EVD Series

Design / Selection

⚠ WARNING

■ Design pneumatic circuits understanding the characteristics of compressed air.
- The same functions as mechanical, hydraulic and electrical methods cannot be anticipated.
- The product cannot be used for immediate stopping and holding in case of emergency stop.
- Due to the compressibility and expandability characteristics of air, phenomena such as ejection, jetting, and leakage can occur.
- Design the circuit so that compressed air in the system is exhausted.

■ Confirm that the product can withstand the operating environment before use.
- This product cannot be used in an atmosphere containing corrosive gas, chemical liquids, solvents, water or steam. If water, oil, or metal chips (spatter or cutting chips, etc.) could come in contact with the product, provide appropriate protection.
- A gauge pressure sensor is built in. To protect the sensor, do not seal the product, and make sure that air can be introduced.
- This product cannot be used in an explosive gas atmosphere.

■ Pay attention to the electric circuit during emergency stop and to the cylinder operation during power outages.

■ Install a "pressure switch" and "residual pressure exhaust valve" on the device's compressed air supply side.
- The pressure switch disables operation if set pressure cannot be reached. The residual pressure exhaust valve releases compressed air into the pneumatic pressure circuit to prevent accidents caused by pneumatic components operation under residual pressure.

■ If the primary pressure is left applied while the power is OFF, the secondary pressure may rise to the primary pressure. Due to the structure, a small amount of air is consumed from the EXH port when the secondary pressure is generated. Set the primary Regulators to 0 or use a valve on the primary side to shut off the supply source when not using the regulator.

⚠ CAUTION

■ Clearly state the maintenance conditions in the equipment's instruction manual.
- Depending on the usage conditions, operating environment, and maintenance, the product's functionality may significantly deteriorate, and safety may not be ensured. Proper maintenance allows the product to fully demonstrate its functions.

1. Control of supplied compressed air pressure　2. Control of pneumatic filter
3. Control of compressed air leakage at piping connections
4. Operational status contro　5. Control of current consumption

■ Use a constant voltage power supply.

■ Check for leakage current to avoid malfunction due to leakage current from other control devices.
- When using a programmable controller, etc., leakage current may affect the electro pneumatic regulator and cause malfunction.

For 24 VDC	1.8 mA or less

■ Responsiveness is affected by the Operating pressure and load volume. Also fluctuation of the Operating pressure affects the secondary side control pressure. If stable reproducibility is required, stabilize the Operating pressure by installing a regulator in the preceding stage.

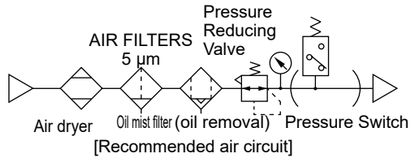
■ Take the following measures to avoid malfunction due to noise.
- Install a line filter in the AC power supply line.
- Use a surge suppressor such as a CR or diode on the inductive load (solenoid valve, relay, etc.) and remove noise from the source.
- Keep wiring to components separate from strong magnetic fields.
- Connect wiring to components with a shield wire.
- Ground the shield wire on the power supply side.
- Keep the power supply cable 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.

■ For current input type, the power supply ground and signal common are common in wiring.
- When driving several electro pneumatic regulators with one PLC and D/A unit, depending on the D/A unit circuit, wiring could prevent the correct signal from being input. Contact the PLC manufacturer.

■ The current input type can be used with an input signal of 1-5 V. However, because input impedance is small (250 Ω) when compared to other voltage input types, use an appropriate voltage generator.

■ Poor air quality will cause poor characteristics and adversely affect the durability.

■ Use clean dry air of ISO 8573-1 : 2010 [1 : 3 : 2] or equivalent.
- For the pneumatic source, always supply clean air, from which solids, moisture and oils have been sufficiently removed with a dryer, Air Filters and oil mist filter. Do not use lubricated air as it will adversely affect the characteristics.



[Recommended air circuit]

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

■ If the power is turned off in a pressurized state, the secondary pressure is held.
- To discharge pressure, lower set pressure with an input signal and then turn OFF, or use a residual pressure exhaust valve, etc. Also, this holding state does not guarantee long-term holding.

■ Primary pressure :
- Pressure specification : For 100 kPa, make sure that the pressure is not less than the "set pressure +50 kPa".
- Pressure specification : For 500/900 kPa, make sure that the pressure is not less than the "set pressure + 100 kPa".
- Product life is shortened if primary pressure is not supplied for a long period while power is ON. Avoid this type of usage.

■ When using by opening the secondary control pressure to the atmosphere like air blowing, pressure fluctuation may occur depending on piping conditions and blowing conditions. Please test under actual usage conditions or contact us.

■ When selecting the dryer, Air Filters, oil mist filter or Regulators, select a device with a flow rate higher than that used by proportional pressure controls.

■ About Operating Environment
Do not use the product where the product is exposed to direct sunlight or may come in contact with water, oil, etc. The product cannot be used with large temperature variations or high temperature/humidity since condensation may occur inside the body. Consult with CKD on specifications for use outside the designated specifications or for special applications.

■ Drip-proof environment
The degree of protection of this product is equivalent to IP40. Do not install in locations with moisture, salt, dust, cutting chips, or under pressurized/depressurized environments. Cannot be used in locations with rapid temperature changes or high humidity environments as condensation inside the main unit may cause problems.

■ Apply a signal to offset the residual pressure (1 % F.S. or equivalent) in the waiting status where the input signal is set to 0 kPa. If an offset signal is not applied, unnecessary operation of the solenoid valve will occur, resulting in a shorter service life.

■ Even when pressure is set to 0 kPa, secondary pressure is not released and remains as is within the max. control pressure range of 1 % F.S. or less. If OkPa is required, bleed the secondary side or install a 3-way valve on the secondary side to switch to atmosphere, etc.

■ Depending on the piping and load conditions, the control pressure of this product may not be stable, resulting in an oscillatory state in which the pressure repeatedly rises and falls. If that condition continues, the product life will be shortened, so be sure to review piping conditions, etc.

■ The processing performance of EVD-1000 Series is intended for small control targets. Status If pressure rises and falls frequently with large secondary side payload or with long piping to the control target, reducing the pressure will take a long time and the service life may become shorter since load is applied to the diaphragm and other exhaust side components. In these applications, use EVD-3000 Series with higher supply and exhaust port performance.

■ This product has moving parts in its operation structure, and characteristics such as accuracy will change over time. Before use, evaluate as a system, and depending on operation frequency, take measures such as using it as a regular maintenance part.

■ For this product, the warranty period is 1 year or 3 million repetitive operations, whichever comes first, so please use this as a guide for inspection.
* The conditions for 3 million operations defined in the warranty period are as follows. When repeatedly applying a step input signal where the control pressure goes from zero to the maximum control pressure. The Operating air quality in this case shall be clean compressed air from the recommended air circuit. The secondary side payload shall be 300 cm^3.

■ Operating conditions for CE compliance
This product is a CE compliant product adapted to the EMC Directive. The harmonized standard regarding immunity applied to this product is EN61000-6-2, but the following conditions are mandatory for compliance with this standard.
Condition
- 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.

■ Description of items regarding UL
Note the following when using this product in compliance with UL/ULc standards.
- Temperature rating Max 50 °C
- Use Class 2 power supply.

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

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Components Product Site (https://www.ckd.co.jp/kiki/en/) → 'model No.' → Instruction Manual.

MEMO