High-precision Electro-pneumatic Regulator EVR Series

Ever advancing evolution! Astounding accuracy and stability!

Increased pressure variations with accuracy and stability



A wide range of control pressure variations

The ideal pressure for your equipment can now be selected. You can better optimize your equipment's air pressure control.

9 Variation

100 kPa | 200 kPa | 300 kPa | 400 kPa | 500 kPa
600 kPa | 700 kPa | 800 kPa | 900 kPa

Easy operation Visualized operational status

2 switches allow for various settings

Zero point designation
Input signal 0 % pressure adjustment

Span point adjustment
Input signal 100 % pressure adjustment

Response setting
Selection from three patterns



Operation indicator

"Green" display at control pressure, "Red" display when outside adjustment range



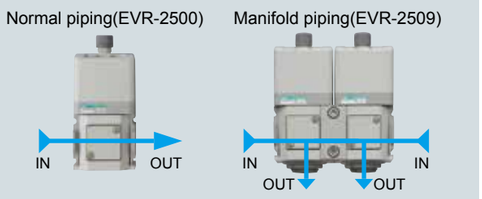
Compatibility/installation Easy replacement

- **Compatible mounting** with the Previous model (EV2500).
- Two types of connectors are available.


Straight type


LModel

- Manifold is also usable.



High-precision pressure control Top class in the industry

The new control method, with built-in microcomputer, achieves higher-precision pressure control.

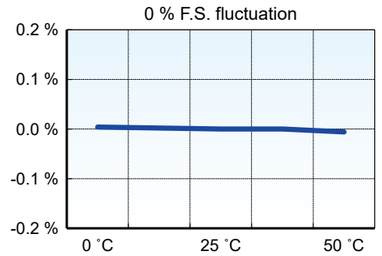
Unit : kPa

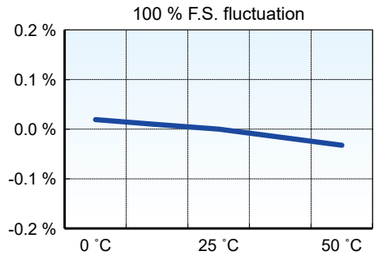
Item \ Control pressure	100	200	300	400	500	600	700	800	900
Hysteresis	0.3	0.6	1.5			3			
Linearity	±0.5	±1	±2.5			±5			
Resolution	0.1	0.2	0.5			0.9			
Repeatability	0.2	0.4	1			1.8			

* Under CKD prescribed conditions

Temperature stability Improved stability

Built-in temperature compensation reduces the influence of ambient temperatures. No need for pressure correction due to equipment temperature rise.

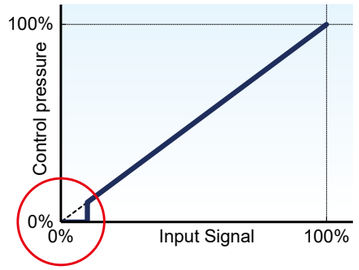




* These are typical values and not guaranteed values.

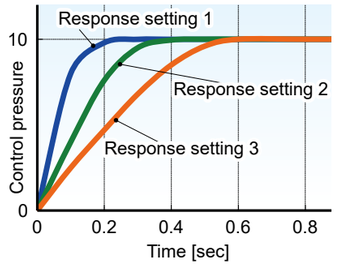
Pressure stability New functions

Residual pressure 0 when the input signal is 0 %.



* There is residual pressure when the secondary circuit is closed.

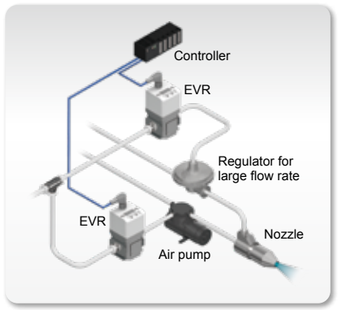
Newly added function allows **selection of response settings.**



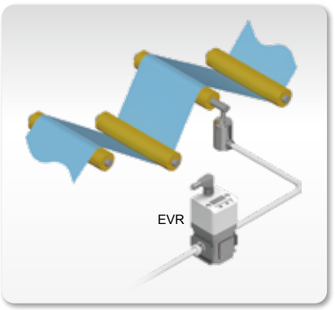
* These are typical values and not guaranteed values.

System application examples

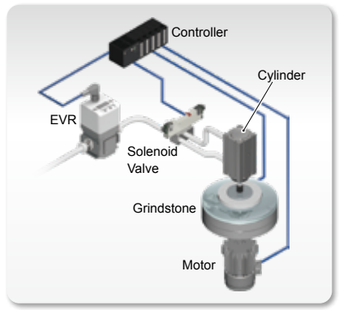
Fluid pressure control



Balancer tension control



Grinding force control

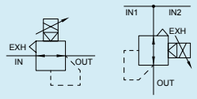




High-precision Electro-pneumatic Regulator

EVR Series

Circuit Diagram Symbol



For compatible detailed model numbers, please see our website.

Model No. Notation

EVR - 2 50 0 - 0 8 - E2 - S1 C

- Model No.
- ❷ Body shape
- ❹ Port Size
- ❻ Cable Option
- ❶ Pressure control range
- ❸ Input Signal
- ❺ Exhaust option
- ❼ Bracket option

❶Pressure control range

Code	Content
10	5 to 100 kPa
20	5 to 200 kPa
30	5 to 300 kPa
40	5 to 400 kPa
50	5 to 500 kPa
60	10 to 600 kPa
70	10 to 700 kPa
80	10 to 800 kPa
90	10 to 900 kPa

❷Body shape

Code	Content
0	Single Unit
9	Manifold

❸Input Signal

Code	Content
0	0-10 VDC
1	0-5 VDC
2	4 to 20 mADC or 1 to 5 VDC

❹Port Size

Code	Content
8	Rc1/4
8 g	G1/4
8 N	NPT1/4

Note) Port Size : This refers to the port size of the IN port and OUT port. When "8 G" or "8 N" is selected, exhaust option "E 2" is included.

❺Exhaust option

Code	Content	
Blank	Rc1/4 port	
E2	With Silencer	

❻Cable Option

Code	Content		
Blank	None		
S1	Straight type	1 m	
S3		3 m	
L1	L-type	1 m	
L3		3 m	

❼Bracket option

Code	Content	
Blank	None	
C	C-bracket	
B	B-Bracket	

* ❷ When "9" (manifold) body shape is selected, "B" (B type bracket) cannot be selected.

● Discrete option (cable, exhaust, bracket) model No.

EVR - S1

❶ Option

* Exhaust option discrete model No. : Rc1/4 is EVR-E.

❶Option

Code	Content		
Exhaust option *			
E2	Silencer		
Cable Option			
S1	Straight type	1 m	
S3		3 m	
L1	L-type	1 m	
L3		3 m	
Bracket option			
C	C-bracket		
B	B-Bracket		

Specifications

Item		EVR-2100 (2109)	EVR-2200 (2209)	EVR-2300 (2309)	EVR-2400 (2409)
Operating Fluid		Clean compressed air (ISO 8573-1:2010 [1:3:2])			
Max. Operating pressure		200 kPa	400 kPa	450 kPa	600 kPa
Min. Operating pressure		Set pressure + 50 kPa			
Proof pressure	Supply side	300 kPa	600 kPa	650 kPa	900 kPa
	Output side	150 kPa	300 kPa	450 kPa	600 kPa
Pressure control range	*1	5 to 100 kPa	5 to 200 kPa	5 to 300 kPa	5 to 400 kPa
Power supply voltage		24 VDC ±10 % (Stabilized power supply with ripple factor 1 % or less)			
Current consumption		0.1 A or less			
Input Signal(Input Impedance)		0−10 VDC (6 kΩ) 0−5 VDC (10 kΩ) 4-20 mADC or 1-5VDC (250 Ω)			
Analog output (load impedance)		1 to 5 VDC (10 kΩ and over)			
Performance (Response setting 1) *2	Hysteresis	0.3 kPa or less	0.6 kPa or less	1.5 kPa or less	
	Linearity	Within ±0.5 kPa	Within ±1.0 kPa	Within ±2.5 kPa	
	Resolution	0.1 kPa or less	0.2 kPa or less	0.5 kPa or less	
	Repeatability	0.2 kPa or less	0.4 kPa or less	1.0 kPa or less	
Temperature characteristics (Response setting 1) Reference temperature 25 °C	Zero point fluctuation	±0.06 kPa/°C	±0.12 kPa/°C	±0.30 kPa/°C	
	Span fluctuation	±0.06 kPa/°C	±0.12 kPa/°C	±0.30 kPa/°C	
Max. flow rate L/min (ANR)		250	400	480	600
Step response (Response setting 1)	No load *3	0.2 sec or less			
Ambient temperature		5 to 50 °C			
Mounting orientation		Free			
Enclosure		IP64 equivalent (Body), IP67 (Cable connector) *4			
Weight		300 g (320 g)			

Item		EVR-2500 (2509)	EVR-2600 (2609)	EVR-2700 (2709)	EVR-2800 (2809)	EVR-2900 (2909)
Operating Fluid		Clean compressed air (ISO 8573-1:2010 [1.3.2])				
Max. Operating pressure		700 kPa	750 kPa	850 kPa	950 kPa	1.000 kPa
Min. Operating pressure		Set pressure + 50 kPa				
Proof pressure	Supply side	1,050 kPa	1,120 kPa	1,200 kPa	1,400 kPa	1,500 kPa
	Output side	750 kPa	900 kPa	1,050 kPa	1,200 kPa	1,350 kPa
Pressure control range	*1	5 to 500 kPa	10 to 600 kPa	10 to 700 kPa	10 to 800 kPa	10 to 900 kPa
Power supply voltage		24 VDC ±10 % (Stabilized power supply with ripple factor 1 % or less)				
Current consumption		0.1 A or less				
Input Signal(Input Impedance)		0−10 VDC (6 kΩ) 0−5 VDC (10 kΩ) 4-20 mADC or 1-5 VDC (250 Ω)				
Analog output (load impedance)		1 to 5 VDC (10 kΩ and over)				
Performance (Response setting 1) *2	Hysteresis	1.5 kPa or less	3.0 kPa or less			
	Linearity	Within ±2.5 kPa	Within ±5.0 kPa			
	Resolution	0.5 kPa or less	0.9 kPa or less			
	Repeatability	1.0 kPa or less	1.8 kPa or less			
Temperature characteristics (Response setting 1) Reference temperature 25 °C	Zero point fluctuation	±0.30 kPa/°C	±0.60 kPa/°C			
	Span fluctuation	±0.30 kPa/°C	±0.60 kPa/°C			
Max. flow rate L/min (ANR)		800	850	900	950	1,000
Step response (Response setting 1)	No load *3	0.2 sec or less				
Ambient temperature		5 to 50 °C				
Mounting orientation		Free				
Enclosure		IP64 equivalent (Body), IP67 (Cable connector) *4				
Weight		300 g (320 g)				

*1 : Control stops when the input signal is 1 % F.S. or less.

*2 : The characteristics above are : 24±0.1 VDC power supply voltage, 25±3 °C ambient temperature, no load, Operating pressure range : These values are for "max. control pressure +0.05 MPa" to max. Operating pressure and 10 to 100 % control pressure. In addition, when the secondary side is a closed circuit, pressure fluctuations will occur if the product is used for blowing or for similar applications.

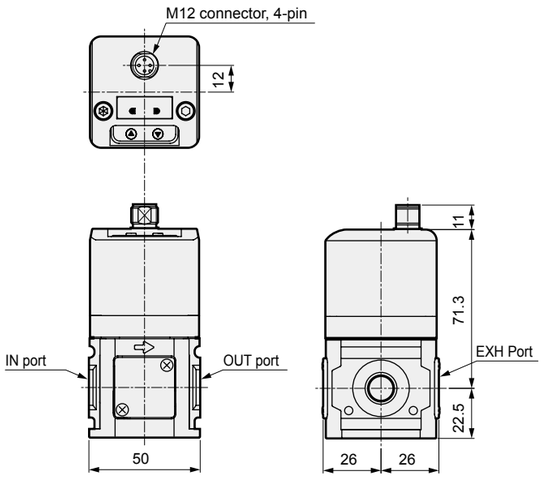
*3 : Operating pressure : Max operating pressure, step amount : 50 % F.S. → 100 % F.S.
50 % F.S. → 60 % F.S.
50 % F.S. → 40 % F.S.

*4 : The main body protection degree IP64 is limited to vertical installation with the cable connector facing up.

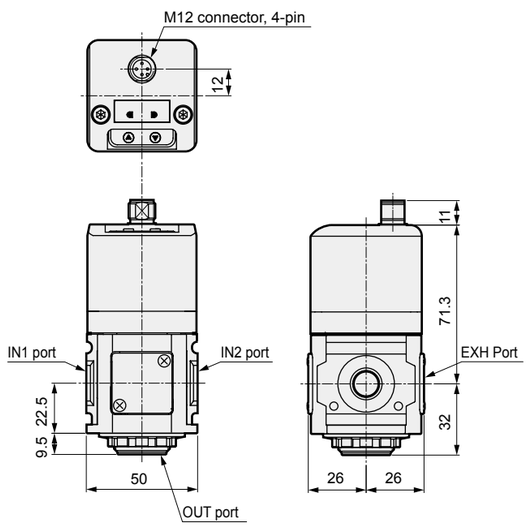
Air Preparation Components
F.R.L.
Filter Regulator
Filter
Regulator
Lubricator
Drain Separator
Mechanical Pressure SW
Residual Pressure Exhaust Valve
Slow Start Valve
Antibacterial/ Bacteria Removing Filter
Ozone FR
Siloxane/ OzoneRemover
Flame Resistant FR
Oil-free Regulator
Medium Pressure FR
No copper/ 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

●EVR-2□00



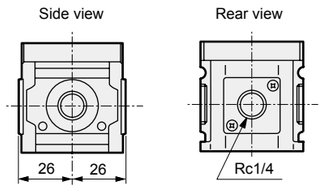
●EVR-2□09



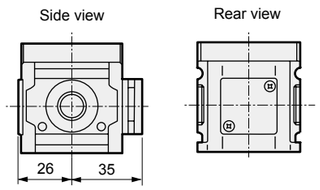
Option Outline Dimension Drawing

Exhaust option

● Standard : Blank



● Dedicated silencer : -E2

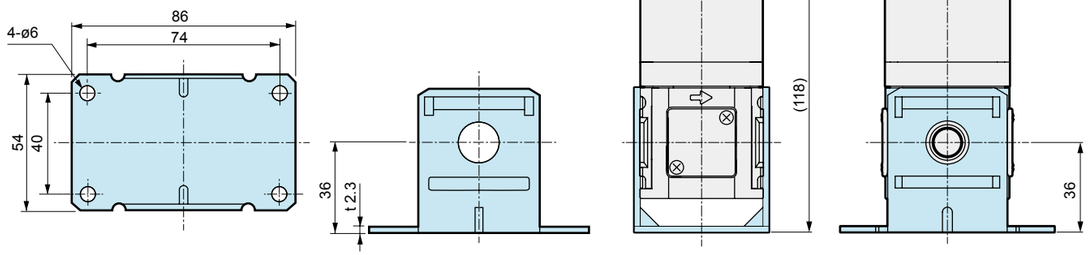


Weight : 10 g

Option Outline Dimension Drawing

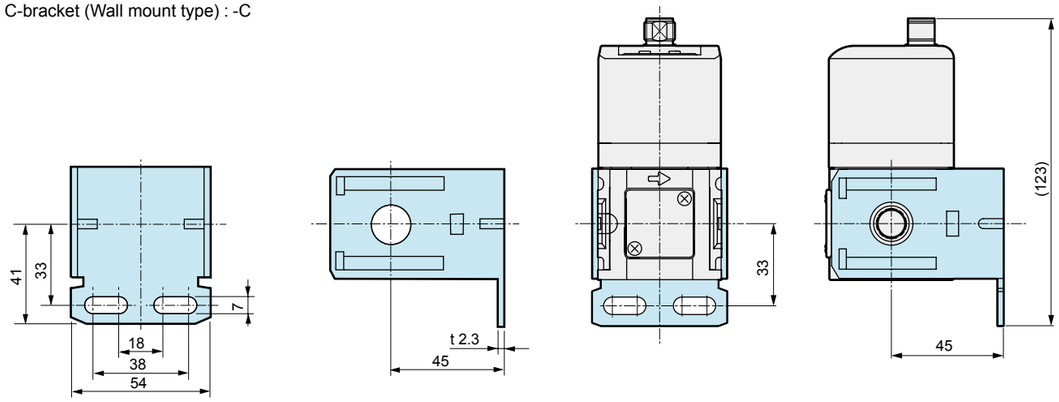
Bracket option

● B-bracket (Floor mount type) : -B



Material : SPCC
Treatment : Zinc plating
Weight : 165 g

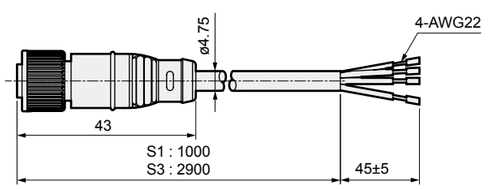
● C-bracket (Wall mount type) : -C



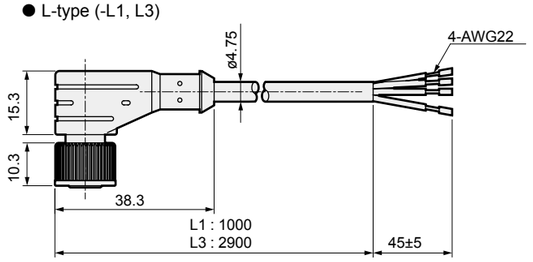
Material : SPCC
Treatment : Zinc plating
Weight : 148 g

Cable Option

● Straight type (-S1, -S3)



● L-type (-L1, L3)



* Cable / Connector

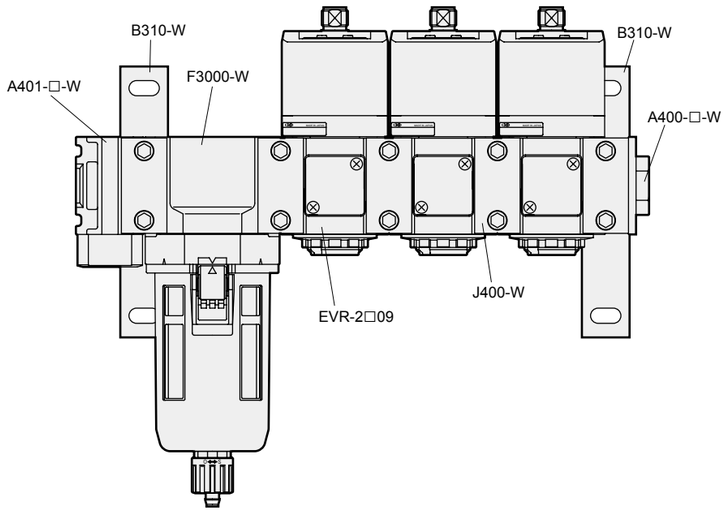
* Pin No.	Insulation Color	Application	Input signal type			Weight g
			0-10 V	0-5 V	4-20 mA 1-5 V	
1	Brown	Power Supply ⊕	24 V			S1 : 50 S3 : 135 L1 : 55 L3 : 140
2	Black	--	Analog 1 to 5 V			
3	Blue	Common	0 V			
4	White	Input Signal	0-10 V	0-5 V	4-20 mA 1-5 V	

If not using the cable connector, the following recommended cable sockets can be used.
Screw type ELW1KA4012 CORRENS (Hirschmann)
Straight type (Solder) Model XS2C-D421 OMRON
L-type (Solder) Model XS2C-D422 OMRON

Option Outline Dimension Drawing

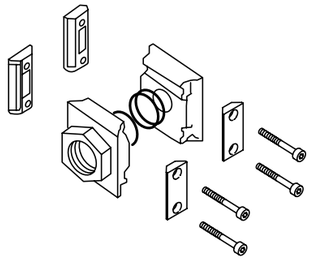
Other peripheral devices

● System-up example



● A400-8/10/15-W

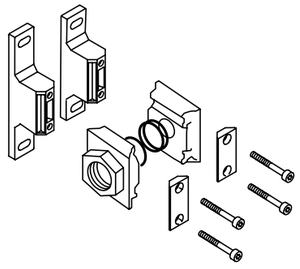
Piping adapter set



Weight : 160 g
Material : Aluminum alloy die-casting
painting treatment

● A400-8-W/10-W/15-W-B31W

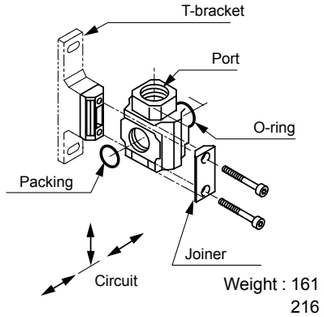
Pipe adaptor set



Weight : 270 g
Material : Aluminum alloy die-casting
painting treatment

● D401-00-8/10/15-W-(B31W)

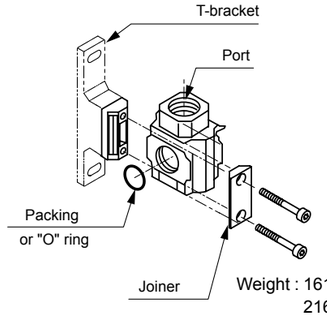
Distributor



Weight : 161 g
216 g (B31W)
Material : Aluminum alloy die-casting
painting treatment

● A401-8/10/15-W-(B31W)

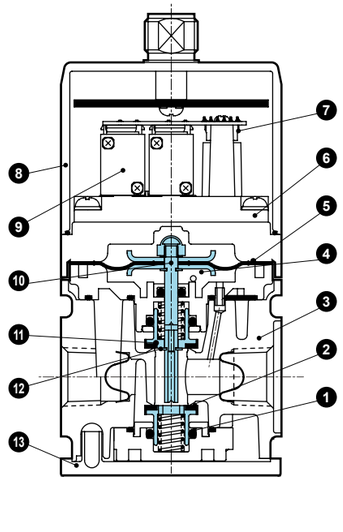
L-type piping adapter



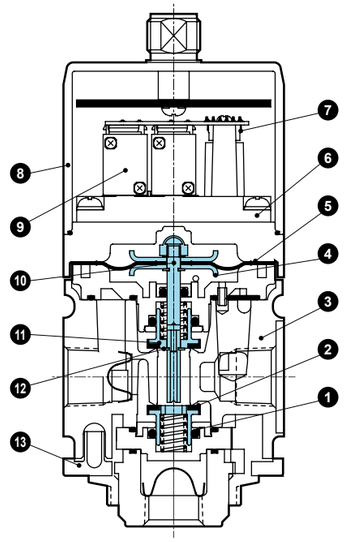
Weight : 161 g
216 g (B31W)
Material : Aluminum alloy die-casting
painting treatment

Internal structure and parts list

●EVR-2□00



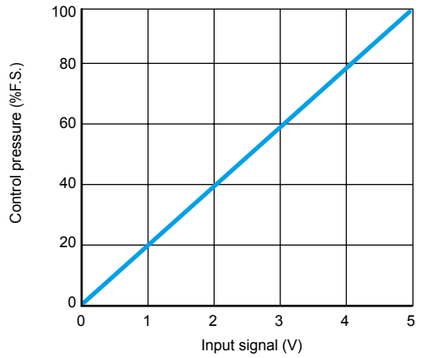
●EVR-2□09



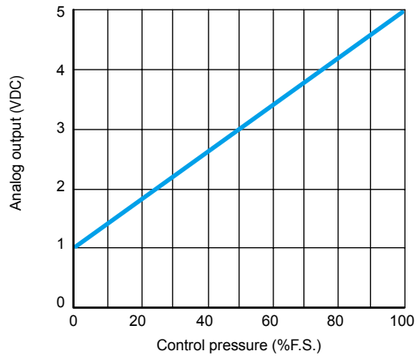
Do not disassemble

Part No.	Part Name	Material
1	O-ring	Fluoro rubber
2	Bottom valve	Brass, Special nitrile rubber
3	Body	Aluminum alloy die-casting
4	Disk	Aluminum alloy
5	Diaphragm	Special nitrile rubber
6	Valve base	Polyphenylene sulfide resin
7	Pressure sensor	(Diffusion semiconductor)
8	Housing	ABS resin
9	2-way valve	-
10	Rod	Stainless steel
11	Top valve	Brass, Special nitrile rubber
12	E-ring	Steel
13	Plate cover	ABS resin

Input/Output characteristics

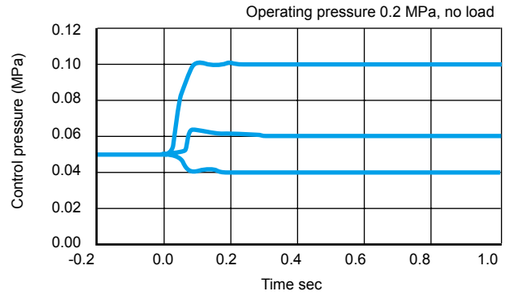


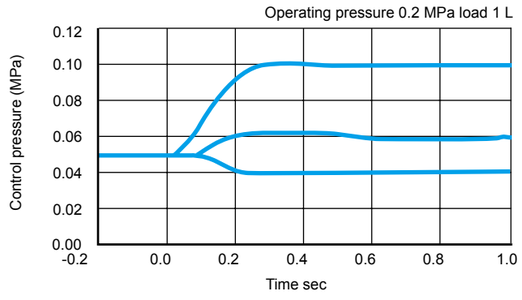
Analog output



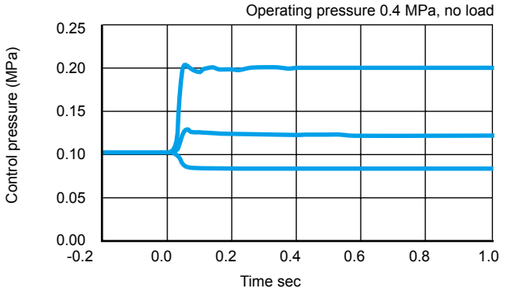
Step response characteristics (Response setting 1)

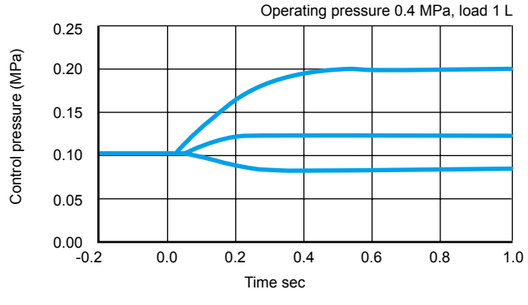
●EVR-2100





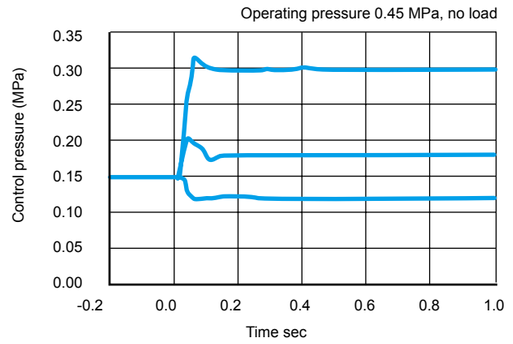
●EVR-2200

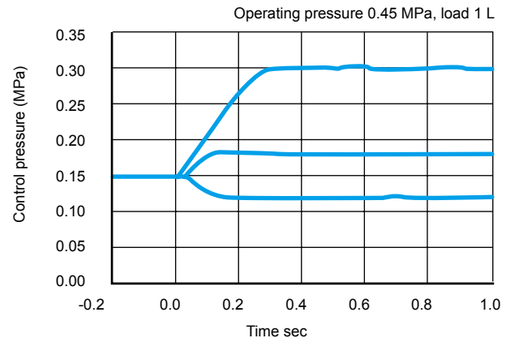




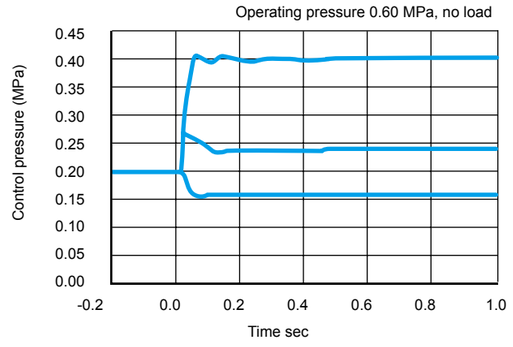
Step response characteristics (Response setting 1)

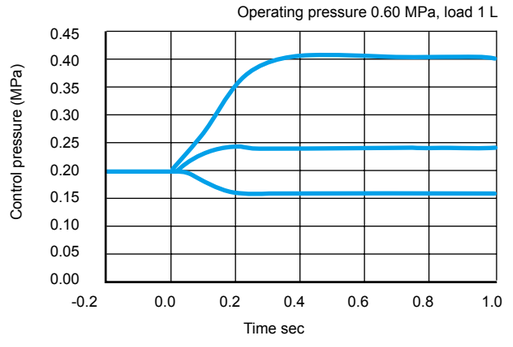
●EVR-2300



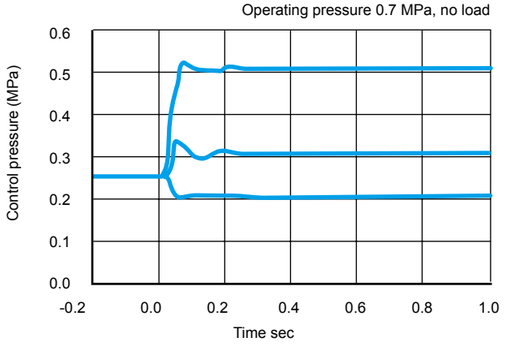


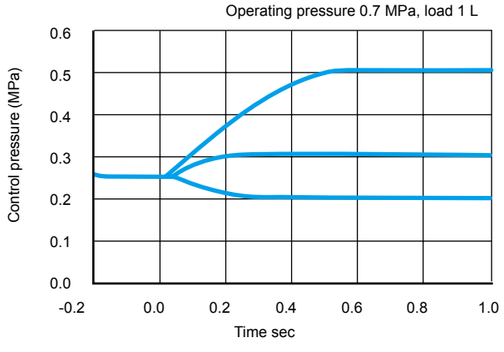
●EVR-2400



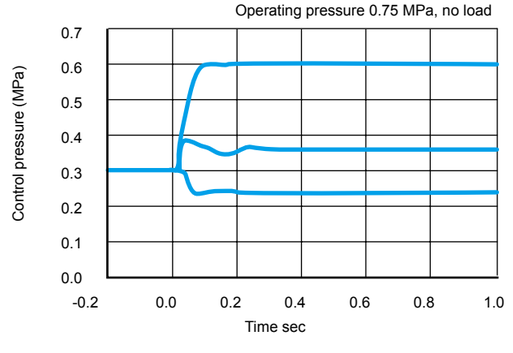


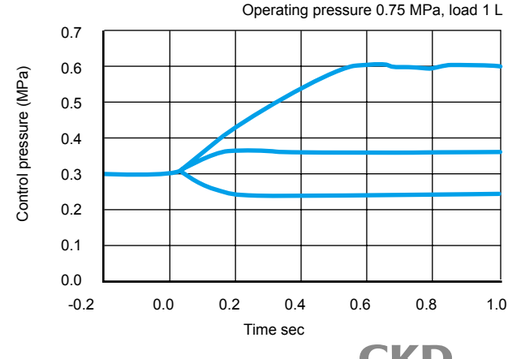
●EVR-2500





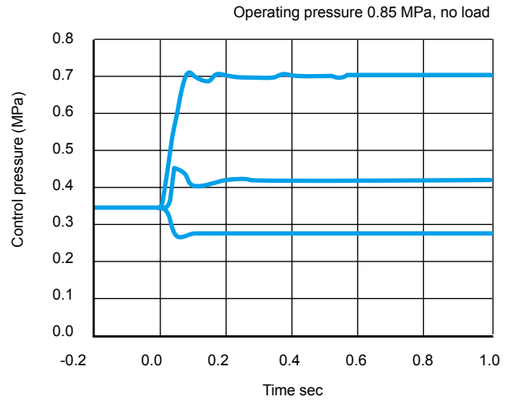
●EVR-2600

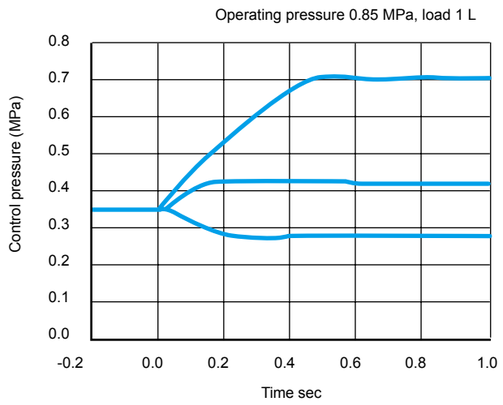




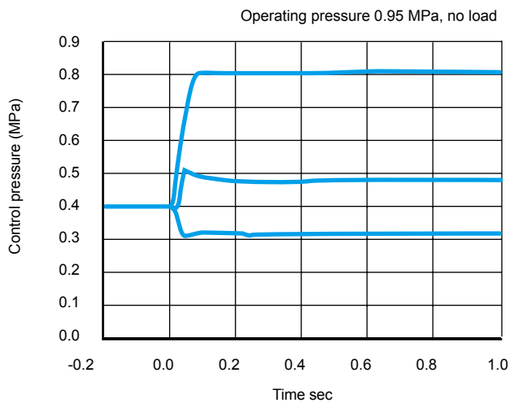
Step response characteristics (Response setting 1)

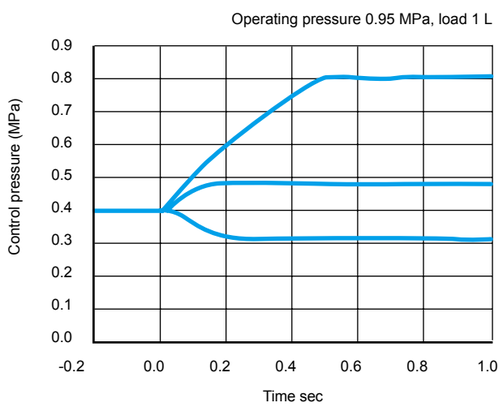
●EVR-2700



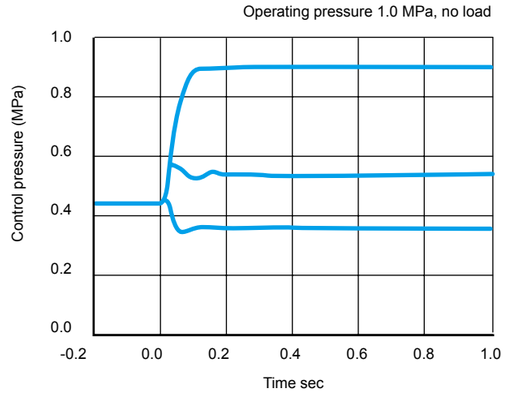


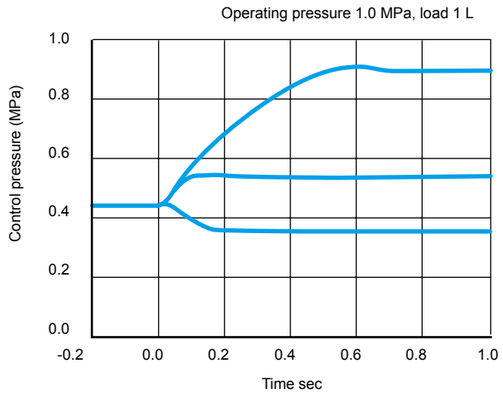
●EVR-2800





●EVR-2900





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

To Use This Product Safely

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

Individual Precautions : High precision electro-pneumatic regulator EVR Series

Design / Selection

⚠WARNING

■ If the primary pressure is left applied while the power is OFF, the secondary pressure may rise to the primary pressure. If this causes a safety issue, take safety measures on the system, such as using a valve on the primary or secondary side.

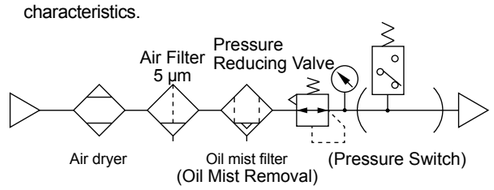
⚠CAUTION

■ Responsiveness is affected by the Operating pressure and load volume. Also, if the Operating pressure fluctuates, the secondary control pressure will be affected. 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.

■ Poor quality air will deteriorate characteristics and adversely affect durability.

■ Use clean dry air "equivalent to ISO 8573-1 Class 1.3.2" for the air quality.
- 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 secondary pressure is lowered with an input signal, etc., secondary air passes through the EV and is discharged from the exhaust port (EXH 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.

■ Do not let the primary pressure drop below "Set secondary pressure + 0.05 MPa".
- In particular, with the secondary pressure set within a range up to 12 %F.S., if the primary pressure is not supplied for long periods, the product service life will be shortened and its characteristics will deteriorate. Avoid this 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 a dryer, air filter, oil mist filter, or regulator, select one with a flow rate higher than the flow rate to be used.

■ Avoiding leaving the power and input signal applied without pressurization, as it leads to deterioration of life and characteristics.

■ This product becomes uncontrollable in the range where the input signal is up to 1 % F.S.
- The exhaust port (EXH port) should be open to the atmosphere to discharge air.

■ If an input signal outside the specification range shown in the table below is applied, the solenoid valve will operate excessively, causing deterioration of life and characteristics, so use within the specification range.

0-10 V type	0 to 5 V-type	4-20 mA
Less than 0 V Over 10 V	Less than 0 V Over 10 V	Less than 4 mA Over 20 mA

■ For current input type, the power supply ground and signal common are common in wiring.
- When driving several EV units 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.

■ Current input type can also be used with input signal 1-5 VDC, but unlike other voltage input types, the input impedance is small at 250 Ω, so use a signal generator suitable for it.

■ Structurally, EVR consumes a small amount of air from the EXH port while secondary pressure is generated.

■ The EVR-2509 series has two supply port systems, IN1 and IN2, on both left and right sides of the main body. Be sure to plug any unused supply ports.

■ Drip-proof environment
Check the protection structure of this product in the specification column of each product, and refrain from using if it becomes a problem in the usage environment.

■ 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.

■ 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.

■ 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 set pressure changes from zero to 50 % of the max. control pressure
Secondary side payload : 300 cm^3

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

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