


D2-138735


DIGITAL Electro-pneumatic Regulator

ER Series

ANALOG INPUT TYPE ER104-\*0/I/2\*

Instruction





For Safety Use

To use this product safely, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (ISO 4414 \*1).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident.

Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety.

However, improper operation could result in an accident.

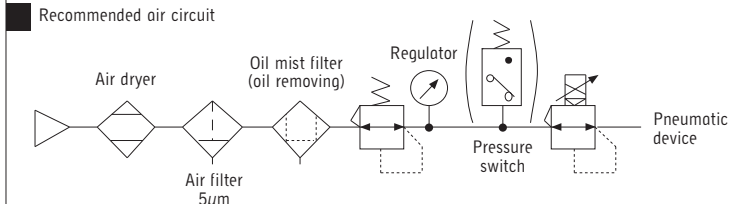
To prevent such accidents **read this operation manual carefully for proper operation.**

93-7522-0067 rev.C

Caution for use

1) Bad quality air makes its characteristics and durability worse. For the pneumatic source, use cleaned air from which the solids, water and oil contents were eliminated sufficiently, using an air dryer, filter and oil mist filter.

Recommended air circuit



2) The response time is affected by the supply pressure and load capacity. When stable reproducibility is required for this responsibility, set up a regulator in the prestage.

3) Sufficiently flush air pipes before connecting to proportional pressure controls. Check that sealing tape is not caught when piping.

4) Tighten pipes with the appropriate torque. Pipes must be connected with the appropriate torque to prevent air leak-ages and screw damage. First tighten the screw by hand to prevent damage to screw threads, then use a tool.

Port screw	Tightening torque Nm
G1/4	6 to 8

5) Correct pressure control is not possible if the exhaust port is plugged. Release this port to the atmosphere.

6) If an error is found during operation, turn the power off and stop the compressed air supply immediately and stop operation.

7) This product does not conduct pressure control for about two seconds for self diagnosis immediately after it is turned on. Build a control circuit or program to ignore signals for about two seconds immediately after power-on.

8) The case is made of resin. Do not use solvent, alcohol, detergent or other chemicals when removing dirt. They may cause damage to the resin. Use waste cloth immersed in diluted neutral detergent and squeezed.

9) If the product is left as it is with the supply pressure when no power is turned ON, the secondary side pressure may increase up to the supply pressure.If some trouble is concerned on safety, take proper safety measures in the system; for example, use a valve on inlet or outlet.

10) If the power is turned off under pressure, the secondary pressure is held. In this case, if you need to be in an exhaust state, lower the control pressure first and then turn off the power or use the exhaust valve. However, the maintained pressure is not guaranteed to last for very long.

11) Since the supply pressure is supposed to provide the exact control pressure, it is important for the working pressure not to drop below iset secondary pressure + 1 bar. If supply pressure is not supplied for a long time when power is ON, product life is shortened. Avoid this use.

12) Avoid operating the product in places where it may be affected by direct sunlight, water or oil.

13) The protective structure of this product is equivalent to that of the IP40. Do not install thisproduct at places susceptible to moisture, salt, dust or chips or under positive or negative pressure. Do not operate at places with steep temperature changes or in high humidity because dew condensation inside the main body will cause problems.

14) To avoid malfunction caused by electrical noise.

- Insert a line filter into the AC power line.
- Use a surge suppresser like a CR or diode in the inductive load (solenoid valve, relay and so on) to remove any noise at the source.
- Keep cables connected to this product as far away as possible from power line.
- Use a shielded cable to connect a device.
- The shielded wire should be grounded on the power supply side.
- Wire the power line as short as possible.
- Don't share the power with devices that generate the noise, such as in-verter motor.
- Don't wire the power line or input signal line in parallel with other lines.

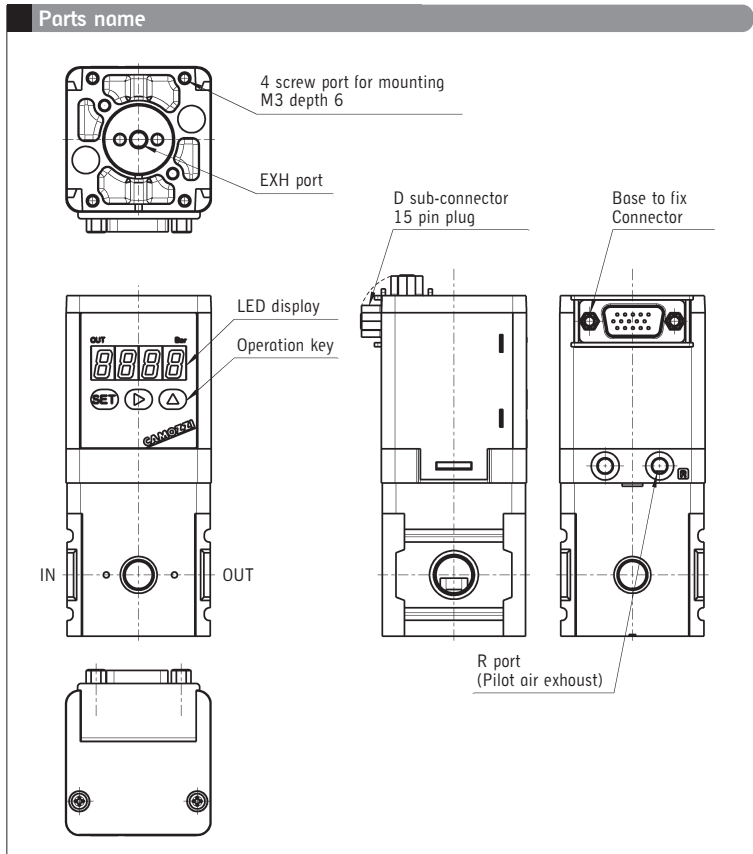
15) The current input type can be used with input signal 1 to 5V, but as op-posed to other voltage input types, input impedance is small (250 Ω). Use an appropriate voltage generator.

16) When the current input type is wired, the power ground and signal com-mon are shared. When driving several electro pneumatic regulators with one PLC and D/A, depending on the D/A unit circuit, wiring could prevent the correct signal from being input. Consult with the PLC maker.

17) Check the leak current to avoid a malfunction caused by such leakage from other control equipment. The ER may malfunction under the influence of leak current when a programmable controller or the like.

In case of 24 V DC	1.8mA or less
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Parts name



4 screw port for mounting  
M3 depth 6

EXH port

D sub-connector  
15 pin plug

Base to fix  
Connector

LED display


Operation key

IN

OUT

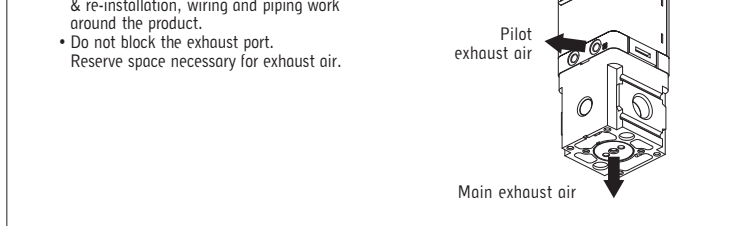
R port  
(Pilot air exhaust)

Installation



CAUTION

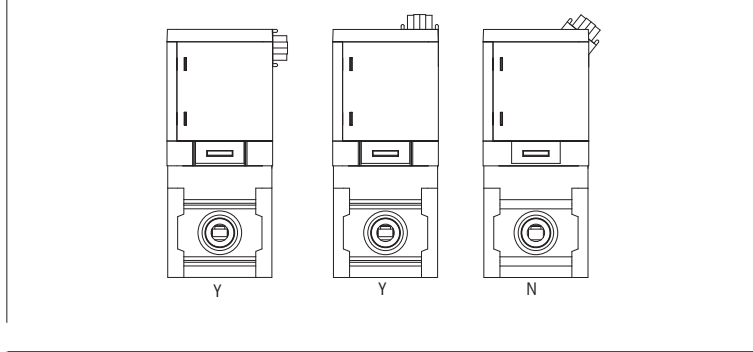
- Keep a sufficient space for operation & re-installation, wiring and piping work around the product.
- Do not block the exhaust port. Reserve space necessary for exhaust air.



Pilot exhaust air

Main exhaust air

The rotation mechanism of the D-sub connector does not assume operation with a moving unit. Use at either the top or side position (do not use at an odd angle), and fix the cable if the cable moves.



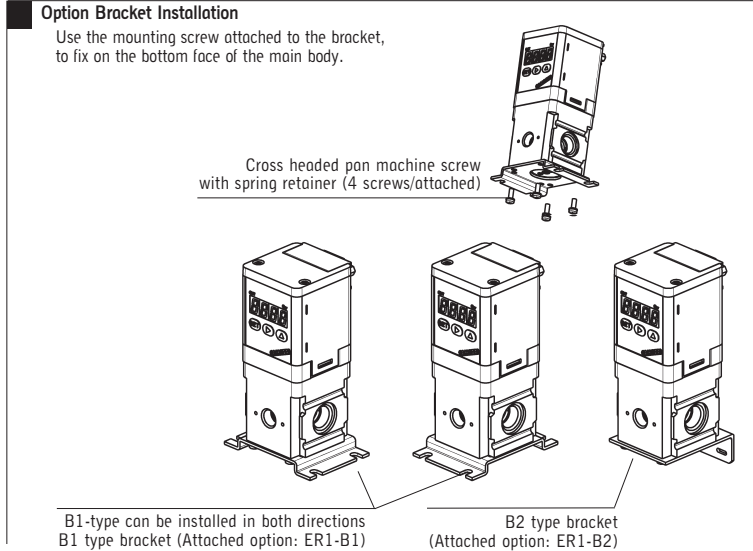
Y

Y

N

Option Bracket Installation

Use the mounting screw attached to the bracket, to fix on the bottom face of the main body.



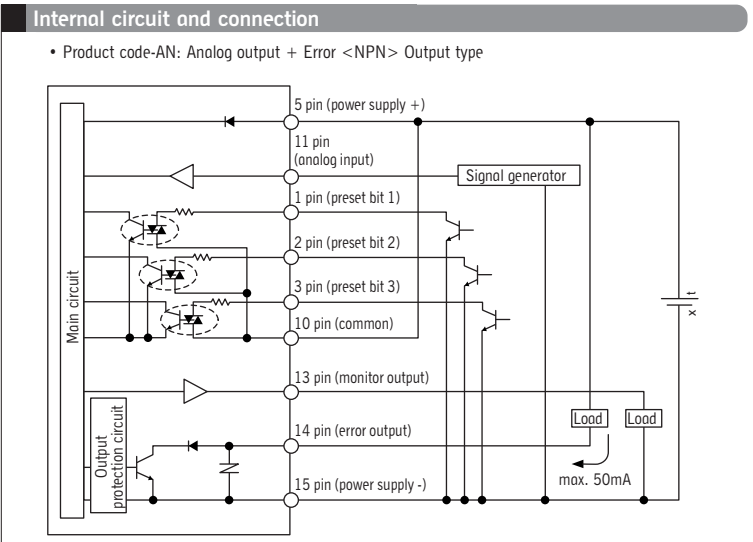
Cross headed pan machine screw with spring retainer (4 screws/attached)

B1-type can be installed in both directions  
B1 type bracket (Attached option: ER1-B1)

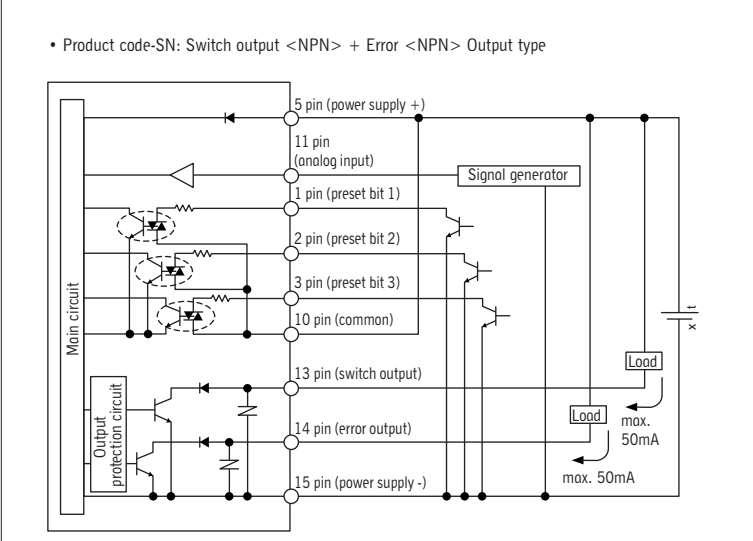
B2 type bracket  
(Attached option: ER1-B2)

Internal circuit and connection

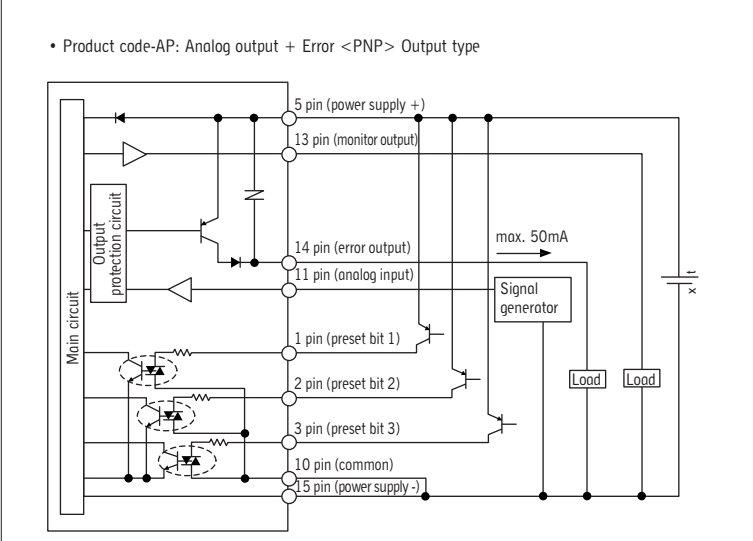
• Product code-AN: Analog output + Error <NPN> Output type



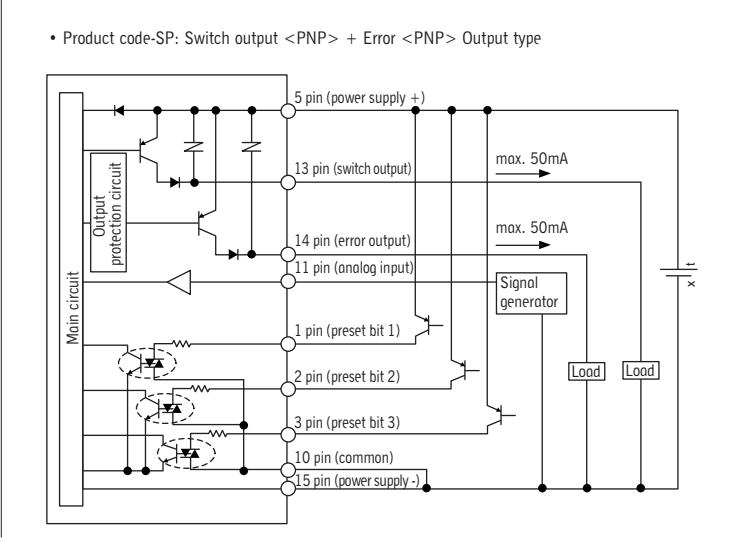
• Product code-SN: Switch output <NPN> + Error <NPN> Output type




• Product code-AP: Analog output + Error <PNP> Output type



• Product code-SP: Switch output <PNP> + Error <PNP> Output type



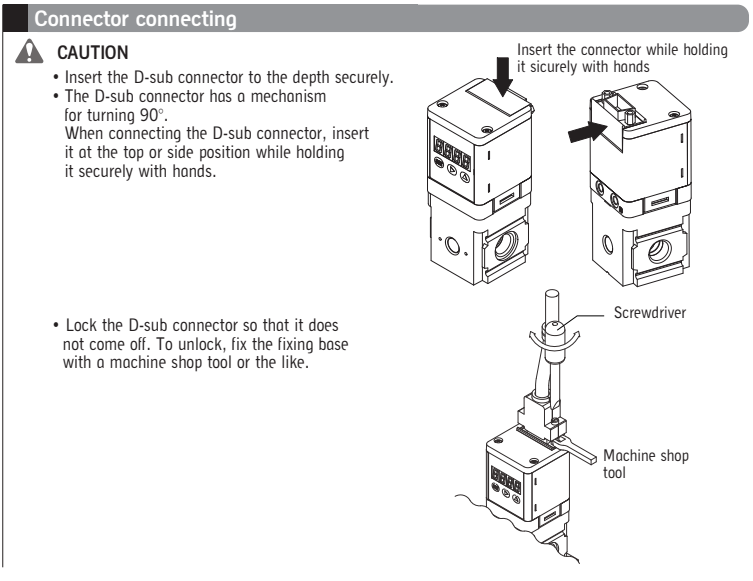
Connector connecting



CAUTION

- Insert the D-sub connector to the depth securely.
- The D-sub connector has a mechanism for turning 90°.

When connecting the D-sub connector, insert it at the top or side position while holding it securely with hands.

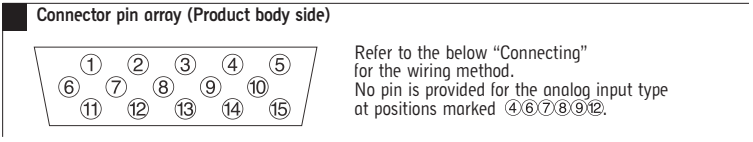


Insert the connector while holding it sicurely with hands

Screwdriver

Machine shop tool

Connector pin array (Product body side)

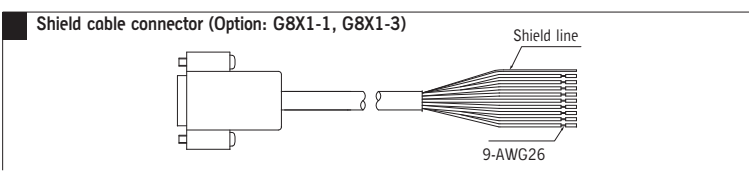


① ② ③ ④ ⑤  
⑥ ⑦ ⑧ ⑨ ⑩  
⑪ ⑫ ⑬ ⑭ ⑮

Refer to the below "Connecting" for the wiring method.

No pin is provided for the analog input type at positions marked ④⑥⑦⑧⑨⑫.


Shield cable connector (Option: G8X1-1, G8X1-3)



Shield line

9-AWG26

Connecting



CAUTION

- Check the product code and take sufficient care of connection.
- Handle the unused monitor output, switch output or preset input so that it does not make contact with other cables (including shielded cables).
- Ground the shield wire on the power (-) side.

D sub socket pin No.	1	2	3	4	5	6 - 9	10	11	12	13	14	15
Option cable isolator color	Brown	Orange	Yellow	-	Red	-	Gray	White	-	Green	Blue	Black
Type of input	Preset input signal 1bit	2bit	3bit	N/A	+24V DC	N/A	Common	Input signal 0-10 VDC 0-5 VDC 4-20 mA	N/A	Monitor output 1-5 DC	Switch output N P N P	Error output N P N P GND

Possible colour modification will be indicated on the cable's packaging.

Specification

Item	Type	ER104-50 ER104-51 ER104-52	ER104-90 ER104-91 ER104-92
	Media	Cleaned air	
Max. working pressure		7 Bar	10 Bar
Min. working pressure		Control pressure + 1 Bar	
Pressure control range		0÷5 Bar (residual press 0,05 Bar or less)	0.5 - 9 Bar (residual press 0,09 Bar or less)
Power supply voltage		DC24V±10% (stabilized power supply with a ripple rate 1% or less)	
Consumption current		0.15A or less (rush current 0.6A or less when the power is turned on)	
Input signal		0-10 VDC 0-5 VDC 4-20 mADC	
Output signal		Analog output 1-5VDC (load to be connected impedance 500kΩ or more)  Switch output NPN or PNP, open collector output, 30V or less, 50mA or less, voltage drop 2.4V or less, compatible for usage in PLC and Relay	
Error output signal		NPN or PNP, open collector output, 30V or less, 50mA or less, voltage drop 2.4V or less, compatible for usage in PLC and Relay	
Direct memory set		0,05 ~5 Bar (setting min. width 0,01 Bar setting resolution 0,01 Bar)	0,09 ~9 Bar (setting min. width 0,01 Bar setting resolution 0,02 Bar)
Hysteresis *1)		0.5% F.S. or less	
Linearity *1)		±0.3% F.S. or less	
Max. flow rate (ANR) *2)		400 L/min	
Step response *3)		0.2sec. or less (No load)	
Ambient/Fluid temperature		5~50°C	
Protective circuit		Power reverse protect, Switch output reverse protect, Switch output load short protect	

\*1) Above characteristics are values where power voltage is 24VDC, and working pressure is "max. control pressure+1 Bar [ER104-5\*: 6 bar, ER104-9\*: 10 bar], and control pressure is 10 to 90%.

\*2) Working pressure: Max. working pressure, Control pressure : Max. control pressure.

\*3) Working pressure: Max. working pressure,  
Step rate: 50 → 100% F.S., 50 → 60% F.S., 50 → 40% F.S.



D2-138737

## DIGITAL Electro-pneumatic Regulator ER Series ANALOG INPUT TYPE ER2\*-\*0/1/2\* Instruction

Thank you for purchasing Camozzi's product.  
Please take care below sentences to use this product safely.  
Retain this instruction with the product for further consultation whenever necessary.  
Please read the instruction manual or the catalog about more details.

### For Safety Use

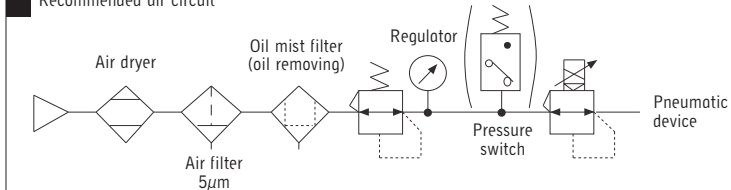
To use this product safely, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (ISO 4414 \*1).  
We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.  
Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident.  
Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.  
This product incorporates many functions and mechanisms to ensure safety.  
However, improper operation could result in an accident.  
To prevent such accidents **read this operation manual carefully for proper operation.**

93-7522-0069 rev.C

### Caution for use

- 1) Bad quality air makes its characteristics and durability worse. For the pneumatic source, use cleaned air from which the solids, water and oil contents were eliminated sufficiently, using an air dryer, filter and oil mist filter.

### Recommended air circuit



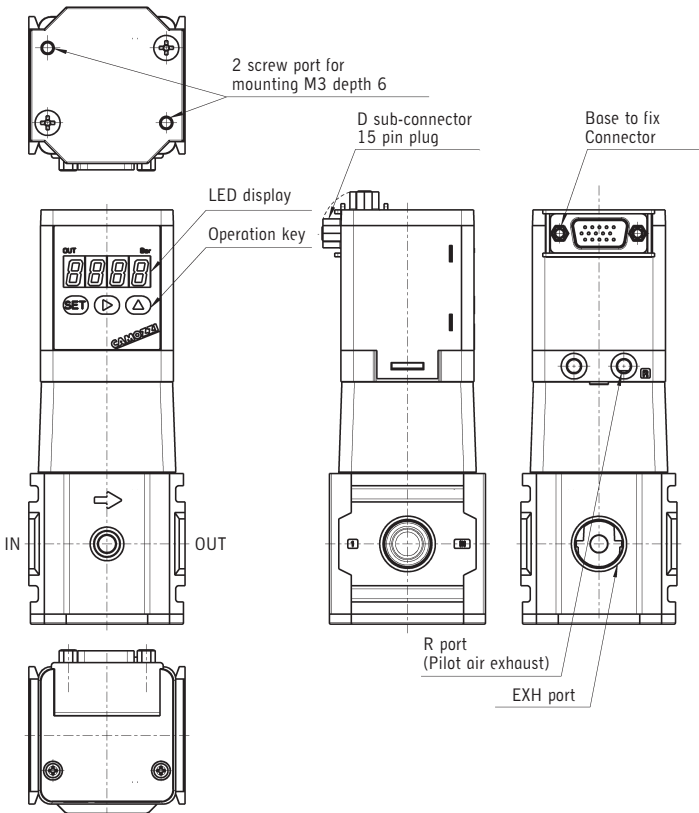
- 2) The response time is affected by the supply pressure and load capacity. When stable reproducibility is required for this responsibility, set up a regulator in the prestage.
- 3) Sufficiently flush air pipes before connecting to proportional pressure controls. Check that sealing tape is not caught when piping.
- 4) Tighten pipes with the appropriate torque. Pipes must be connected with the appropriate torque to prevent air leak-ages and screw damage. First tighten the screw by hand to prevent damage to screw threads, then use a tool.

Port screw	Tightening torque Nm
G1/4	6 to 8
G3/8	13 to 15

- 5) Correct pressure control is not possible if the exhaust port is plugged. Release this port to the atmosphere.
- 6) If an error is found during operation, turn the power off and stop the compressed air supply immediately and stop operation.
- 7) This product does not conduct pressure control for about two seconds for self diagnosis immediately after it is turned on. Build a control circuit or program to ignore signals for about two seconds immediately after power-on.
- 8) The case is made of resin. Do not use solvent, alcohol, detergent or other chemicals when removing dirt. They may cause damage to the resin. Use waste cloth immersed in diluted neutral detergent and squeezed.
- 9) If the product is left as it is with the supply pressure when no power is turned ON, the secondary side pressure may increase up to the supply pressure. If some trouble is concerned on safety, take proper safety measures in the system; for example, use a valve on inlet or outlet.
- 10) If the power is turned off under pressure, the secondary pressure is held. In this case, if you need to be in an exhaust state, lower the control pressure first and then turn off the power or use the exhaust valve. However, the maintained pressure is not guaranteed to last for very long.
- 11) Since the supply pressure is supposed to provide the exact control pressure, it is important for the working pressure not to drop below set secondary pressure + 1 bar. If supply pressure is not supplied for a long time when power is ON, product life is shortened. Avoid this use.
- 12) Avoid operating the product in places where it may be affected by direct sunlight, water or oil.
- 13) The protective structure of this product is equivalent to that of the IP40. Do not install this product at places susceptible to moisture, salt, dust or chips or under positive or negative pressure. Do not operate at places with steep temperature changes or in high humidity because dew condensation inside the main body will cause problems.
- 14) To avoid malfunction caused by electrical noise.
  - Insert a line filter into the AC power line.
  - Use a surge suppressor like a CR or diode in the inductive load (solenoid valve, relay and so on) to remove any noise at the source.
  - Keep cables connected to this product as far away as possible from power line.
  - Use a shielded cable to connect a device.
  - The shielded wire should be grounded on the power supply side.
  - Wire the power line as short as possible.
  - Don't share the power with devices that generate the noise, such as in-verter motor.
  - Don't wire the power line or input signal line in parallel with other lines.
- 15) The current input type can be used with input signal 1 to 5V, but as op-posed to other voltage input types, input impedance is small (250 Ω). Use an appropriate voltage generator.
- 16) When the current input type is wired, the power ground and signal com-mon are shared. When driving several electro pneumatic regulators with one PLC and D/A, depending on the D/A unit circuit, wiring could prevent the correct signal from being input. Consult with the PLC maker.
- 17) Check the leak current to avoid a malfunction caused by such leakage from other control equipment. The ER may malfunction under the influence of leak current when a programmable controller or the like.

In case of 24 V DC | 1.8mA or less

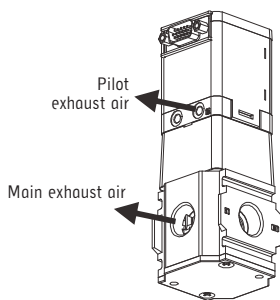
### Parts name



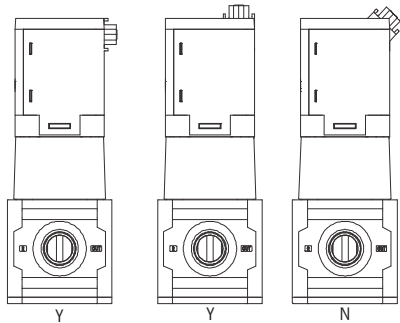
### Installation

#### CAUTION

- Keep a sufficient space for operation & re-installation, wiring and piping work around the product.
- Do not block the exhaust port. Reserve space necessary for exhaust air.

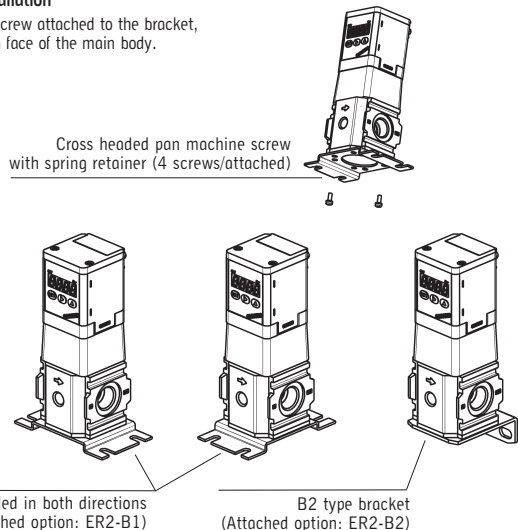


- The rotation mechanism of the D-sub connector does not assume operation with a moving unit. Use at either the top or side position (do not use at an odd angle), and fix the cable if the cable moves.



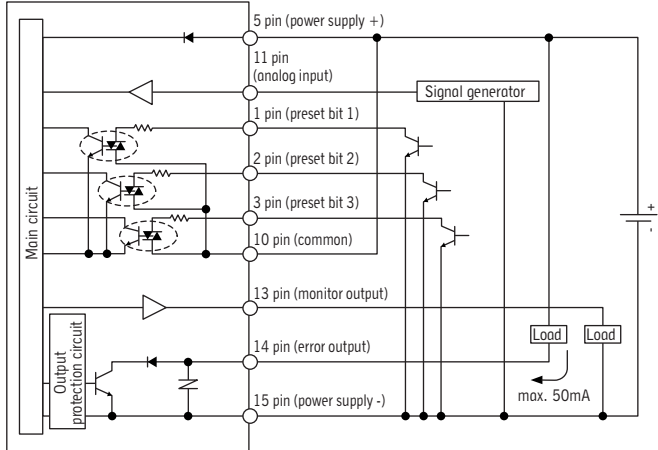
### Option Bracket Installation

Use the mounting screw attached to the bracket, to fix on the bottom face of the main body.

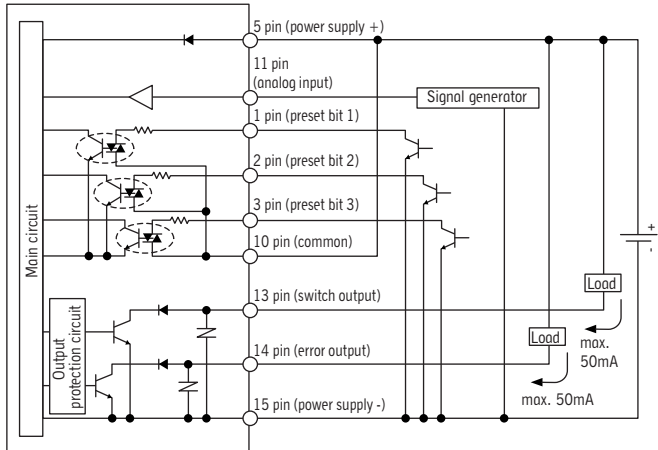


### Internal circuit and connection

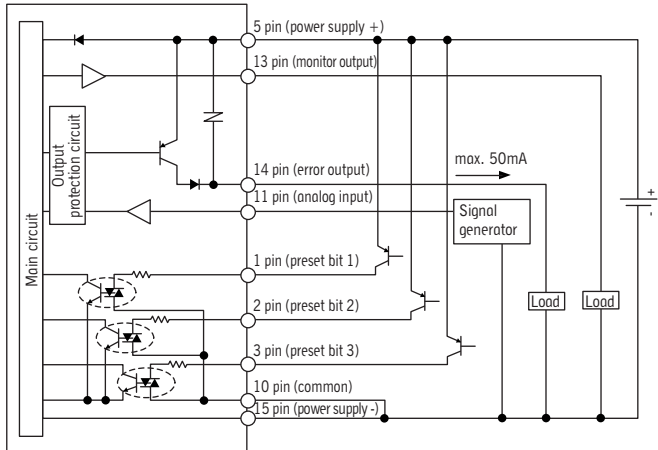
- Product code-AN: Analog output + Error <NPN> Output type



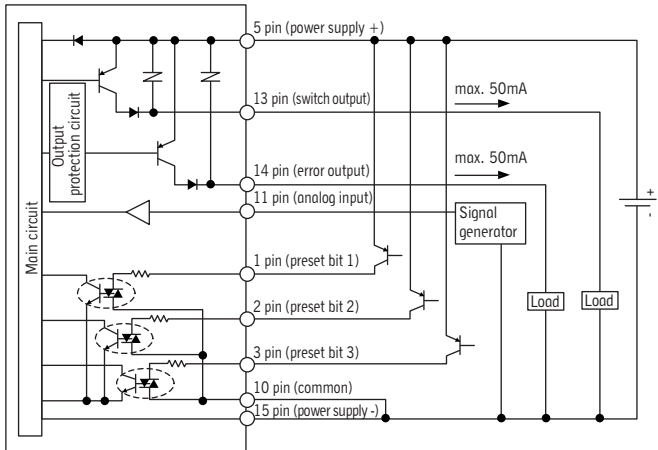
- Product code-SN: Switch output <NPN> + Error <NPN> Output type



- Product code-AP: Analog output + Error <PNP> Output type



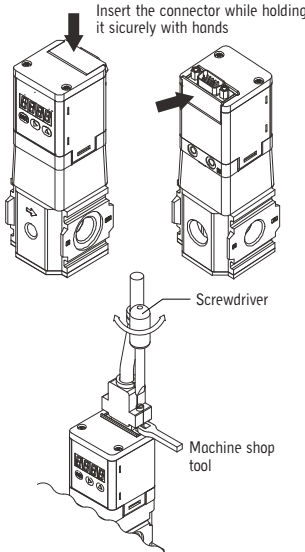
- Product code-SP: Switch output <PNP> + Error <PNP> Output type



### Connector connecting

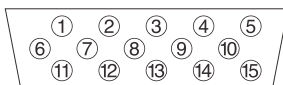
#### CAUTION

- Insert the D-sub connector to the depth securely.
  - The D-sub connector has a mechanism for turning 90°.
- When connecting the D-sub connector, insert it at the top or side position while holding it securely with hands.



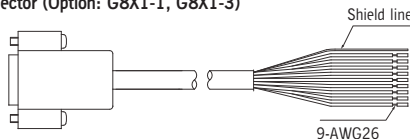
- Lock the D-sub connector so that it does not come off. To unlock, fix the fixing base with a machine shop tool or the like.

### Connector pin array (Product body side)



Refer to the below "Connecting" for the wiring method.  
No pin is provided for the analog input type at positions marked 4, 6, 7, 8, 9, 12.

### Shield cable connector (Option: G8X1-1, G8X1-3)



### Connecting

#### CAUTION

- Check the product code and take sufficient care of connection.
- Handle the unused monitor output, switch output or preset input so that it does not make contact with other cables (including shielded cables).
- Ground the shield wire on the power (-) side.

D sub socket pin No.	1	2	3	4	5	6 - 9	10	11	12	13	14	15	
Option cable isolator color	Brown	Orange	Yellow	-	Red	-	Gray	White	-	Green	Blue	Black	
Type of input	Preset input signal			Power			Input signal			Monitor output	Switch output	Error output	Power
	1bit	2bit	3bit	N/A	+24V DC	N/A	Common	0-10 VDC	0-5 VDC	4-20 mA	N/A	1-5 DC	N P N P N P N P

Possible colour modification will be indicated on the cable's packaging.

### Specification

Item	Type	ER2*-50*	ER2*-90*
		ER2*-51*	ER2*-91*
		ER2*-52*	ER2*-92*
Media		Cleaned air	
Max. working pressure		7 Bar	10 Bar
Min. working pressure		Control pressure + 1 Bar	
Pressure control range		0 ÷ 5 Bar (residual press 0,05 Bar or less)	0.5 - 9 Bar (residual press 0,09 Bar or less)
Power supply voltage		DC24V±10% (stabilized power supply with a ripple rate 1% or less)	
Consumption current		0.15A or less (rush current 0.6A or less when the power is turned on)	
Input signal		0-10 VDC 0-5 VDC 4-20 mA DC	
Output signal		Analog output 1-5 VDC (load to be connected impedance 500kΩ or more) Switch output NPN or PNP, open collector output, 30V or less, 50mA or less, voltage drop 2.4V or less, compatible for usage in PLC and Relay	
Error output signal		NPN or PNP, open collector output, 30V or less, 50mA or less, voltage drop 2.4V or less, compatible for usage in PLC and Relay	
Direct memory set		0,05 ~ 5 Bar (setting min. width 0,01 Bar setting resolution 0,01 Bar)	0,09 ~ 9 Bar (setting min. width 0,01 Bar setting resolution 0,02 Bar)
Hysteresis *1)		0.5% F.S. or less	
Linearity *1)		±0.3% F.S. or less	
Max. flow rate (ANR) *2)		1500 L/min	
Step response *3)		0.2sec. or less (No load)	
Ambient/Fluid temperature		5~50°C	
Protective circuit		Power reverse protect, Switch output reverse protect, Switch output load short protect	

\*1) Above characteristics are values where power voltage is 24VDC, and working pressure is "max. control pressure+1 Bar [ER2\*-5\*: 6 bar, ER2\*-9\*: 10 bar], and control pressure is 10 to 90%.

\*2) Working pressure: Max. working pressure, Control pressure : Max. control pressure.

\*3) Working pressure: Max. working pressure, Step rate: 50 → 100% F.S., 50 → 60% F.S., 50 → 40% F.S.



