CKD

SM－312366－A

INSTRUCTION MANUAL

PARECT
Electro-pneumatic Regulator

MEVT Series

SERIAL TRANSMISSION TYPE
MEVT-T9GAR

CC-Link

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

Ver.4

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (ISO 4414 *1 JIS B 8370 *2).

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.**

Observe the cautions on handling described in this manual, as well as the following instructions:
Additionally, the caution is classified into the following three groups, “CAUTION”, “WARNING”, and “DANGER”, to identify the degree of the danger it presents and possible hazard.

⚠ **DANGER** : Failure to pay attention to DANGER notices may cause a situation that results in a fatality or serious injury and that requires urgent addressing.

⚠ **WARNING** : Failure to pay attention to WARNING notices may result in a fatality or serious injury.

⚠ **CAUTION** : Failure to pay attention to WARNING notices may result in injury or damage to equipment or facilities.

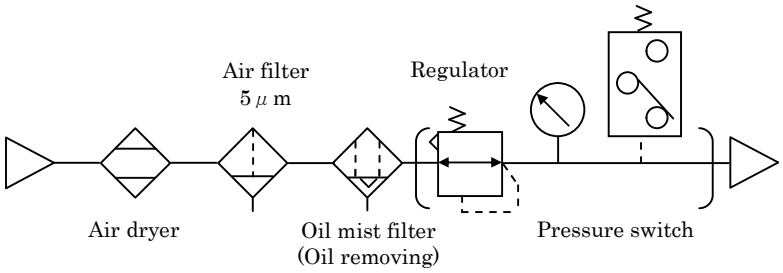
*1) ISO 4414 : Pneumatic fluid power ··· Recommendations for the application of equipment to transmission and control systems.

*2) JIS B 8370 : General rule for pneumatic systems

CAUTION

Points to caution when handling the product

(1) Inferior quality air will deteriorate the product characteristics and affect its durability badly. Use an air dryer, filter and Oil mist filter to eliminate solid material, moisture and tar and thus provide clean air from the pressure source.



When the control pressure decreases, for example, the air runs from the secondary side through the regulator to the exhaust port (R). Dust inside the secondary side piping or the load circuit, therefore, will similarly deteriorate the product's characteristics and greatly affect its durability. Ensure the interior of the piping is always clean.

(2) The products response capability will be affected by the working pressure and load volume. When a stable response is required, regulate the working pressure.

(3) Flush air into the pneumatic pipes employed in the PARECT electro-pneumatic regulator before connection. Be careful not to allow sealant tape to stray into the pipes.

(4) To avoid malfunction caused by electrical noise:

(a) Insert a line filter into the AC power line.

(b) 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.

(c) Keep the MEVT series cables as far away as possible from power line for motor.

(d) In the case of the influence of noise, each slave station can possibly be supplied the power and wire individually.

(e) Wire the power line as short as possible.

(f) Don't share the power with devices that generate the noise, such as inverter motor.

(g) Don't wire the power line or communication line in parallel with other lines.

(5) Avoid unplanned dismantling of the product. We shall not warrant the product operation in cases where it has been dismantled without authorization.

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

(7) If the product remains connected to its supply pressure for a long time while leaving the power turned off, the output pressure may increase to the level of the supply pressure. For safety, when there is a problem, use the valve on either the inlet or outlet side. It is recommended to set up the system for safe operation.

(8) If the power is turned off when the unit is up to control pressure, the pressure will be maintained. 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.

(9) Since the working pressure is supposed to provide the exact control pressure, it is important for the working pressure not to drop below "Control pressure + Maximum control pressure × 0.1".
In particular, if the primary pressure is supplied for a long period of time with the secondary pressure specified in a range that exceeds 0MPa up to 12% F.S., this will shorten the life span of the product and thus the product should not be used in this way.

(10) The MEVT Series regulators may oscillate if a leak occurs to the secondary side piping. When connecting pipes to the regulator, connect them firmly to prevent leaks. Do not use the regulator for blowing or in any other application where the secondary side can be affected by back pressure. If used in such applications, the regulator will not be able to achieve the specified pressure. Moreover, a large oscillation noise will be heard and the product's durability will be greatly reduced.

(11) Don't supply the input signal over maximum control pressure, because an excessive input signal exerts a bad influence on the deterioration of the characteristic and also the durability.

(12) Keep the exhaust port (R) open to the air to allow the release of the exhaust into the air.

(13) When it is maintained the condition where the power is on and the working pressure isn't supplied or the condition where the power is on and the input signal is missing from the control range, the deterioration of the characteristic and also life occur. Therefore, the product should not be used in this way.

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MEVT Series

PARECT Electro-pneumatic Regulator
SERIAL TRANSMISSION TYPE (MEVT-T9GAR)

Manual No. SM-312366-A

Apr. 6. 2006
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1. DESIGN AND SELECTION

⚠ WARNING :

(1) With a thorough understanding of compressed air characteristics, design a pneumatic circuit.

- Where instantaneous stop holding at emergency stop is required, the same function as in the mechanical or hydraulic or electrical units cannot be expected.
- There arise pop-up, jet-out and leaking phenomena caused by compressibility and expansibility, which are air characteristics.

(2) Prior to use, always ensure that the product withstands the operating environment.

- The product cannot be used in corrosive gas, chemical liquid solvent, water, water vapor (steam) and ozone atmosphere. When a product is exposed to water droplets, oil or metallic powder, such as spatters and chips, be sure to protect it.
- No product can be used in the explosive gas atmosphere.

(3) Always give special care to the electric circuit during emergency stop, and cylinder operation, etc. during power failure.

(4) Attach a "residual pressure discharge valve" to the compressed air inlet of the equipment.

- The pressure switch controls operation so that it cannot be carried out where the set pressure is not reached.
  The residual pressure discharge valve discharges compressed air remaining inside the pneumatic circuit, to prevent accidents caused by pneumatic equipment operation due to residual pressure.

⚠ CAUTION :

(1) Note the maintenance conditions clearly in the equipment instruction manual.

- The product functions may significantly lower, depending on the operating condition, operating environment and maintenance situation, thereby safety might not be secured. If this maintenance work is conducted accurately and correctly, it is possible to exhibit the product function and performance sufficiently.

(2) Use be a constant voltage power supply.

(3) Check the leak current to avoid a malfunction caused by such leakage from other control equipment.

- The EVT may malfunction under the influence of leak current when a programmable controller or the like is used.

In case of 24 V DC:	1.8mA or less

(4) 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 the MEVT series cables as far away as possible from power line for motor.
- Absolutely use the designated line for the serial transmission type.
- In the case of the influence of noise, each slave station can possibly be supplied the power and wire individually.
- Wire the power line as short as possible.
- Don’t share the power with devices that generate the noise, such as inverter motor.
- Don’t wire the power line or communication line in parallel with other lines.

(5) Do not use combined with a cylinder having a substantial leakage amount such as, a few friction cylinder or an air bearing cylinder.

- Avoid using a product in blowing or under the operating conditions that the back pressure is applied to the secondary side. No set pressure can be maintained, and its service life may be shortened along with a large beat sound.

(6) EVT100 arises residual pressure of 2kPa max and EVT500, 10kPa max even when the input signal is set to 0%. When 0MPa is required, take adequate measures; for example, attach a 3-way valve to the secondary side for changeover to the atmosphere.

⚠ CAUTION :

(7) Use a valve on inlet and outlet as needed.

- 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.

(8) Operating Environment
Avoid using a product in the place where it is exposed direct to sunlight, water, oil or the like. Contact us when using a product that falls outside the designated specifications and specifications for special applications.

- Ambient Temperature
  Contact us when the product is used at exceeding 50℃ or a low temperature not exceeding 5℃.
- Vibration & impact
  Avoid using the product at the vibration of 50 m/s^2min. and impact of 300m/s^2min.

(9) The SUB power terminal can be used for transfer wiring to other devices. However, contain the current passing from the MAIN terminal to the SUB terminal, within 1.5A. The unusual rise of temperature by the over current will break the MEVT. Be careful to avoid noise effects of other devices.

2. INSTALLATION

⚠ WARNING :

(1) For MEVT installation, do not use the method of supporting the MEVT with piping.

- Attach and fix the MEVT main body.

(2) Do not wash and coat the MEVT, using water and solvent.

- Some plastics parts may be damaged.
  The coating agent may block the exhaust port, causing malfunctions.

(3) Check the piping port position by the product label or nameplate, etc. for correct connections.

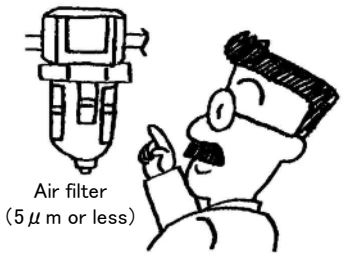
- Wrong piping connection causes abnormal operation of the actuator.

⚠ CAUTION : **When installing:**

(1) Keep a sufficient space for removal & re-installation, wiring and piping work around the EVT.

(2) Provide a pneumatic filter just in the pre-stage of the circuit in which the pneumatic equipment is used.

(3) The response time is affected by operating pressure and load capacity.
When stable reproducibility is required for this responsibility, set up a regulator in the pre-stage.



(4) Attaching position

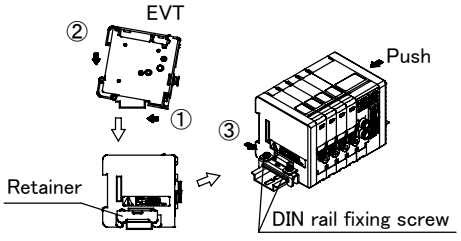
- Since the MEVT is designed for DIN rail mounting, fix the DIN rail to the attaching surface at intervals of 50 to 100mm where the total manifold mass exceeds 1kg or in the environment under vibration and impact, and then ensure that no abnormality is identified in the installation condition before use.
- There is no restriction in the attaching direction and attaching posture. Check the mounting screw doesn't get loose by resonance during operation, to avoid the manifold to fall off.
- Removal & re-installation of MEVT

  To Remove MEVT:
  Loosen the DIN rail fixing screws. (4pcs. in 2 right & left places)

  To Re-install MEVT:

  1. Set the jaw over the DIN rail from ① to ② as shown below.
  2. Press the retainer in the direction to ③ below.
  3. While pressing it so that no clearance is produced between the blocks, tighten the DIN rail fixing screws. (Recommendable tightening torque: 0.6 to 0.8N·m.)

- When the retainer jaw is not hooked firmly, air leakage and product falling-off may result: always check this mounting condition carefully.

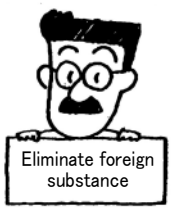


⚠ CAUTION :

When piping work

(1) Do not detach the MEVT packing bag until piping work is started.
- If the packing bag is removed before piping work, foreign substance may intrude into the interior EVT from the piping port, thus causing trouble and malfunctions, etc.

(2) In piping work, flushing is required just before connecting to the pneumatic equipment.
- Foreign substance intruding inside during piping work must not incorporate into the EVT.



(3) Make piping arrangements so that the coupling section in the piping connection part is not detached due to equipment motion, vibration and tension or the like.

(4) Release the exhaust port (R) to air for satisfactory exhaust.

(5) Do not reduce the EVT exhaust port (R) to less than the bore diameter of the piping connecting port.
The EVT exhaust port (R) will breathe due to valving element motion; therefore, foreign substance near or around the exhaust port (R) may be sucked, and where the exhaust port (R) faces upward, foreign substance may intrude thereinto.
Attach a silencer or make piping connection with the exhaust port (R) looking down.
- If no smooth exhaust is insured, the actuator will not be actuated normally. When a manifold is used, exhaust may interfere with normal operation of other EVT's.

(6) When piping connection has been completed and compressed air is supplied, take care so that no high pressure is applied suddenly.
- The piping is disconnected and the piping tube springs out, causing accidents.
- <CAUTION>: If compressed air is supplied too slowly, there may arise air leak phenomena since no sealing pressure is generated in some EVT internal sealing mechanism.

(7) When the piping connection has been completed and compressed air is supplied, be sure to check that no air is leaking from all piping connection sections.
- Apply leakage detecting solution to the piping connection part with a brush to check for air leaking.

(8) Where a nylon tube or polyurethane tube is used for piping material, exercise the following care:
- Always use a flame retardant tube in the atmosphere such that spatters scatter about.

(9) Do not throttle the input port.
- Supply pressure lowers during equipment operation, resulting in malfunctions.

⚠ CAUTION :

(10) Piping Connection

- Applicable Tube:
  Use our CKD designated tube.
  Soft nylon (F-1500 Series)
  Polyurethane (U-9500 Series)
  When a commercially available tube is used, give care to outside diameter accuracy, wall thickness and hardness. The hardness of the polyurethane tube used should be 93 deg. min. (Rubber hardness tester)
  If a tube that does not satisfy outside diameter accuracy and hardness as specified is used, the chucking force may lower, thereby causing the tube to come off and making it hard to insert the tube.

Tube Size

Outside diameter (mm)	Inside diameter (mm)	
	Nylon	Urethane
φ4	φ2.5	φ2
φ6	φ4	φ4

Outside Diameter Tolerance

Soft & hard nylon φ4, φ6	±0.1mm
Urethane φ4, φ6	+0.1mm
	−0.15mm

- Tube Bending Radius
  The tube bending radius should exceed the minimum bending radius. (Otherwise, tube detachment and air leakage may result.)

Tube bore	Minimum bending radius (mm)	
	Nylon	Urethane
φ4	10	10
φ6	20	20

- Minimum Tube Length
  The standard length of output port (A) side tube used should correspond to the tube internal volume of 1mℓ or more. (Otherwise, oscillation may result.)

Tube bore	Minimum Length (mm)	
	Nylon	Urethane
φ4	200	320
φ6	80	80

- Tube Cutting
  Using the tube cutter (AZ-1200), cut a tube vertically in the axial direction. Insertion of the tube cut aslant causes air leakage.
- Tube Connection State
  Provide the linear part as long as the outside diameter of the tube used from the joint edge part to avoid sharply bending piping at the joint insertion port. Take care so that the tube tensile force in the lateral direction does not exceed 40N.
- Applicable Blank Plug
  Always use the blank plug designated by CKD.
  Blank plug GWP□-B Series

3. OPERATION

Operating Conditions:

The pressure supplied to the electro-pneumatic regulator should be used in the pressure range from the minimum operating pressure to maximum operating pressure that is specified in "5.3 Specifications".

For supply power, use a stabilized power supply with the ripple rate 1% max. at supply voltage 24 V DC+/-10%.

The input signal used and other working conditions should be based on "5.3 Specifications".

Zero (Point) & Span Adjustment:

This product is factory adjusted for the specified control pressure output in relation to each input signal before shipment.

As a rule, no zero & span adjustment change is allowed.

If zero & span adjustments are required at customer's end, contact our nearest sales office or agent.

However, it should be understood that the zero and span adjusted product is out of warranty.

⚠ WARNING :

Air Quality:

(1) Supply only "compressed air".

(2) For compressed air, always use clean air that does not contain corrosive gas.

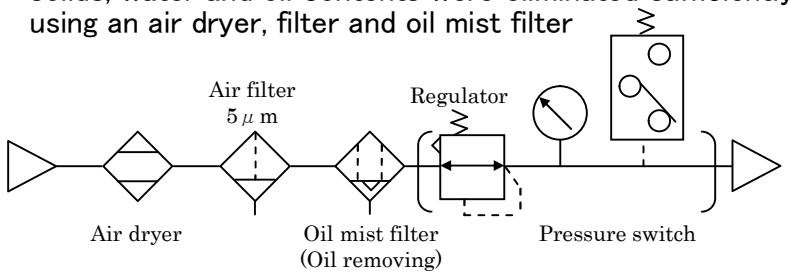
(3) Be sure to use oil-free filtrated dry air "ISO Grade 1.3.2".

⚠ CAUTION :

Air Quality:

(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



- Also, where control pressure is reduced, for example, secondary air is discharged from the exhaust port (R) via the EVT interior. If the secondary piping and load side interior are stained, the equipment will be adversely affected; for example, the characteristics are downgraded; it is, therefore, necessary to make efforts for making the interior piping cleaner.

⚠ CAUTION :

- The pneumatic equipment should be disassembled and re-assembled by the worker who got technical knowledge thereon: this work requires the level of pneumatic skill qualification class 2 or higher.
- When the pneumatic equipment is disassembled and re-assembled, read the instruction manual for the corresponding product carefully and have a thorough understanding of the contents, then start this operations work.

Miscellaneous:

(1) Avoid disassembly; otherwise, accidents may result. It should be understood that the operation after disassembly falls outside the warranty range.

(2) If the power is turned off when the unit is up to control pressure, the pressure will be maintained. 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.

(3) Since the working pressure is supposed to provide the exact control pressure, it is important for the working pressure not to drop below "Control pressure + Maximum control pressure × 0.1".
In particular, if the primary pressure is supplied for a long period of time with the secondary pressure specified in a range that exceeds 0MPa up to 12% F.S., this will shorten the life span of the product and thus the product should not be used in this way.

(4) The MEVT Series regulators may oscillate if a leak occurs to the secondary side piping. When connecting pipes to the regulator, connect them firmly to prevent leaks. Do not use the regulator for blowing or in any other application where the secondary side can be affected by back pressure. If used in such applications, the regulator will not be able to achieve the specified pressure. Moreover, a large oscillation noise will be heard and the product's durability will be greatly reduced.

4. MAINTENANCE

⚠ WARNING :

(1) Prior to maintenance work, be sure to turn the power OFF and stop supply compressed air to ensure that no residual pressure is present.

- These operations are the conditions required for securing operational safety.

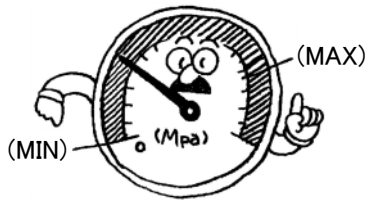
⚠ CAUTION :

(1) Carry out routine and periodic checking as planned so that maintenance control is implemented correctly.

- Unless this maintenance control is satisfactory, the product functions remarkably lower, leading to equipment malfunction and accidents, such as short service life, damage and malfunctioning.

1. Pressure control to supply compressed air

- Check to see if the set pressure is supplied.
  Check to see if the pressure gauge during equipment operation is pointing to the set pressure.



2. Pneumatic filter control

- Check to see if the bowl and element fouling condition is normal.

3. Control for compressed air leak in the piping connection part

- Check to see if the condition of the connection section especially in the movable part is normal.

4. EVT operating condition control

- Check for operation delay and check to see if the exhaust status is normal.

5. Control for pneumatic actuator operating condition

- Check to see if the pneumatic actuator is working smoothly.
  Check to see if the stopped condition at the stroke end is normal.
  Check to see if the section coupled with the load is normal.

5. PRODUCTS

5.1 General outline of the system

MEVT※-※-T9GAR-※-※-3

1) The MEVT※-※-T9GAR-※-※-3 is a PARECT Electro-pneumatic regulator mounted with a slave station to the EVT-T9GAR which can be connected to the open field network CC-Link. There are some following characteristics.
   (1) It helps to curtail wiring man-hours since only the CC-Link cable is required to connect it to a PLC.
   (2) Installation can choose which the under or back fixation.
   (3) The HOLD/CLEAR switch can be used to hold or clear the output signal during a communication fault or analog output permission signal is turned off.
   (4) The communication speed can be set to : 156k, 625k, 2.5M, 5M, 10M bps.

2) What are CC-Link ?
   CC-Link, which is an open field network for FA purposes, reduces wiring of I/O devices such as sensors and valves and intelligent devices such as high speed counters and inverters, and the system can be controlled without consciousness of communications..
   It has the following features.
   (1) CC-Link is the fastest network in the industry (10Mbps), and it can meet requirements of sensors requiring quick responses and communication of large volume data.
   (2) The remote control that handles bit data and data communications that handle word data (analog) can be made simultaneously, while the communication time is fast and stable.
   (3) An n-to-n cyclic transmission between controllers can be made, making distributed control easier.

NOTE) Be sure to read the User's Manual.
This manual mainly describes the MEVT※-※-T9GAR-※-※-3 and the slave station EVT-T9GAR. Also, read the User's Manual for the master station and other slave stations to be connected to this system.
In addition, regarding the PARECT Electro-pneumatic Regulator, please read this manual and the above manuals carefully to fully understand the functions and performance of the product to be able to use it properly.

If the customer has any question about the CC-Link, contact the following home page.

CC-Link Association
Home page address : **http://www.cc-link.org**

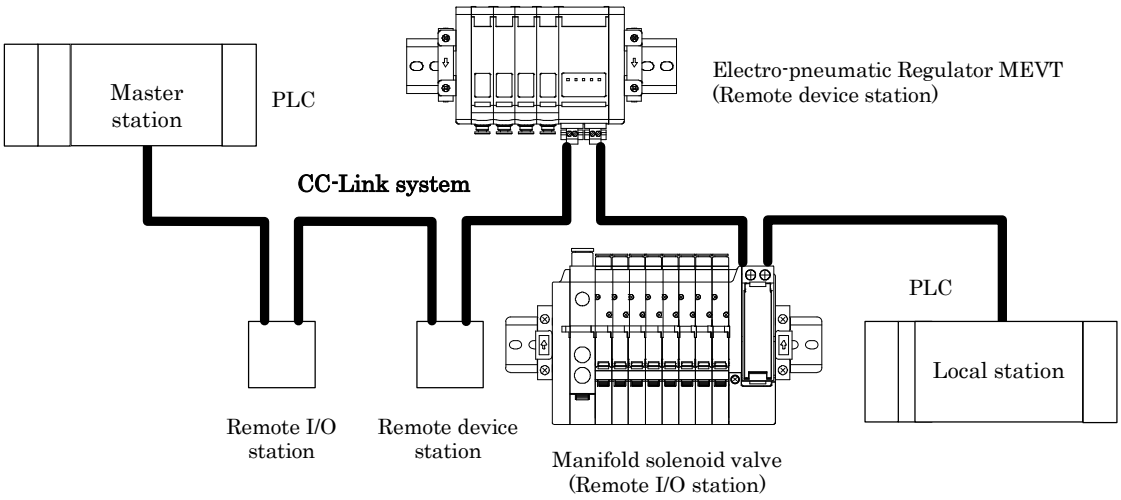
5.2 Structure of the System

This system chiefly consists of PLC body, Master unit, the PARECT Electro-pneumatic regulator MEVT※-※-T9GAR-※-※-3 and peripheral equipment.

- Combination of PLC and Master unit

PLC Maker	Type of CPU	Type of Master Unit
MITSUBISHI ELECTRIC CORPORATION	For A series	AJ61BT11
	For AnS series	A1SJ61BT11
	For QnA series	AJ61QBT11
	For QnAS series	A1SJ61QBT11
	For Q series	QJ61BT11
	For FX series	FX2N-16CCL-M
	Personal computer (PCI bus)	A80BD-J61BT11
NEC ,Ltd	Personal computer (PCI bus)	FC-UG-X002
etc.	Various	The Master Unit adaptable CC-Link

- Fundamental structure of system



Master station ·····Station controlling remote I/O stations, remote device stations, and local stations.
Remote I/O station ·····Remote station that handles ON/OFF data only.
Remote device station ·····Remote station that handles ON/OFF data and numerical data.
Local station ·····Station that has its own CPU and can communicate with the master station and other local stations.
Intelligent device station ·····Station informed by the transient transmission. (including the local station)

5.3 Specifications

1) PARECT Electro-pneumatic Regulator (Individual) ※1

Model / Item		EVT100	EVT500
Media		Cleaned air (equivalent to ISO 1. 3. 2)	
Max. working pressure		200kPa	0.7MPa
Min. working pressure		Control pressure ＋ Max. control pressure × 0.1	
Proof pressure	Inlet side	300kPa	1.05 MPa
	Outlet side	150kPa	0.75MPa
Pressure control range		0 to 100kPa	0 to 0.5MPa
Power supply voltage		DC24V±10% (Stabilized power supply with a ripple rate of 1% or less)	
Consumption current		0.1A or lower	
Insulation resistance		100MΩ (DC500V megger) or more	
Withstand voltage		AC 1500V 1 minute	
Hysteresis ※2, 3		0.4% F.S. or less	
Linearity ※2, 3		±0.5% F.S. or less	
Resolution ※2, 3		0.1% F.S. or less	
Repeatability ※2, 3		0.3% F.S. or less	
Temperature characteristic	Zero point fluctuation	0.15% F.S. / or less	
	Span fluctuation	0.07% F.S. / or less	
Max. flow rate (ANR) ※4		2L / min	6L / min
Step response ※5, 6	No load	0.1s or less	
	15cm³ load	0.5s or less	
Ambient temperature		5 to 50℃	
Fluid temperature		5 to 50℃	
Lubrication		Nil	
Indicator ※7		Green/Red LED	
Installation position		Free	
Working environment		No corrosive gas	
Dimensions		W14×D75×H75	
Mass (body)		80g	

※1： The above specifications are valid when the product is powered by 24±0.15VDC at normal temperature.

※2： Accuracy of serial transmission department is not included.

※3： These specifications are valid at a working pressure which is "1.1 times the maximum control pressure" (EVT100：110kPa, EVT500：0.55MPa) and control pressure is from 10 to 100%. It is also assumed that the secondary side circuit constitutes a closed circuit. If the product is used for such purposes as blowing, for example, a pressure fluctuation may occur.

※4： Working pressure：Maximum operating pressure, Control pressure：Maximum control pressure

※5： Working pressure：Maximum working pressure, Step rate：
- 50% F.S. → 100% F.S.
- 50% F.S. → 60% F.S.
- 50% F.S. → 40% F.S.

※6： Serial transmission delay is not included.

※7： Indicator is for a rough standard. Accuracy is not guaranteed.

2) PARECT Electro-pneumatic Regulator (Manifold specifications)

Item		Specifications
Manifold type		Block manifold
Installation type		DIN rail mount type
Air supply and exhaust		Concentrated supply and exhaust
Max. manifold number		12 ※8, 9
Port size	Output port (A)	φ4、φ6 Push-in joint
	Input port (P) Exhaust port (R)	φ4、φ6 Push-in joint

※8： Slave station is possible installation to maximum 3 units to one manifold.

※9： PARECT Electro-pneumatic regulator maximum 4 units to one slave station.

3) Slave station specification

Item		Specifications
Power supply voltage (Slave side)		DC24V±10% (Stabilized power supply with a ripple rate of 1% or less)
Consumption current (Slave side)		80mA or lower (Except for load current)
Ambient temperature		5 to 50℃
Ambient humidity		30 to 85%RH (No dew fall)
Working environment		No corrosive gas
Object of communication		CC-Link Ver1.10 conformance
Transmission speed		156k/625k/2.5M/5M/10M bps (Selectable by switch)
Max. number of Input / Output (AD/DA)		4 / 4
DA output	Pressure set ting data	12 bit
	Accuracy	±1%F.S. or less (Accuracy of EVT is not included.)
AD input	Pressure monitoring data	12 bit
	Accuracy	±6%F.S. or less (Accuracy of EVT's monitoring voltage is included.)
Fuse		Slave power supply:24V 2A
No. of monopolized stations		1 station (Remote device station)

⚠ CAUTION:

- Incorrect address settings of serial transmission slave stations could cause the EVT and the actuator to malfunction. Before using the product, check the set addresses of the slave stations.
- Do not touch electric wiring connections (exposed live parts) this will cause an electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.
- For operation of serial transmission slave stations, read the communication system operation manual carefully.
- This product works only on DC. Use this product as per the specified supply voltage.
- The output data (pressure setting) is placed in the cleared state until I/O communication is started after power-ON.

4) Profile

Remote register signal list

EVT-T9GAR → Master		Master → EVT-T9GAR	
Remote Input (RX)	Name	Remote Output (RY)	Name
RXn0	CH1 A/D conversion completion flag	RYn0	CH1 Analog output permission signal
RXn1	CH2 A/D conversion completion flag	RYn1	CH2 Analog output permission signal
RXn2	CH3 A/D conversion completion flag	RYn2	CH3 Analog output permission signal
RXn3	CH4 A/D conversion completion flag	RYn3	CH4 Analog output permission signal
RXn4	Reserve	RYn4	Not used
RXn5	Reserve	RYn5	Not used
RXn6	Reserve	RYn6	Not used
RXn7	Reserve	RYn7	Not used
RXn8	Not used	RYn8	Not used
RXn9	Not used	RYn9	Not used
RXnA	Not used	RYnA	Not used
RXnB	Not used	RYnB	Not used
RXnC	Not used	RYnC	Not used
RXnD	Not used	RYnD	Not used
RXnE	Not used	RYnE	Not used
RXnF	Not used	RYnF	Not used
RX(n+1) 0	Reserve	RY(n+1) 0	Reserve
RX(n+1) 1	Reserve	RY(n+1) 1	Reserve
RX(n+1) 2	Reserve	RY(n+1) 2	Reserve
RX(n+1) 3	Reserve	RY(n+1) 3	Reserve
RX(n+1) 4	Reserve	RY(n+1) 4	Reserve
RX(n+1) 5	Reserve	RY(n+1) 5	Reserve
RX(n+1) 6	Reserve	RY(n+1) 6	Reserve
RX(n+1) 7	Reserve	RY(n+1) 7	Reserve
RX(n+1) 8	Not used	RY(n+1) 8	Not used
RX(n+1) 9	Not used	RY(n+1) 9	Not used
RX(n+1) A	Not used	RY(n+1) A	Not used
RX(n+1) B	Remote READY	RY(n+1) B	Vacant
RX(n+1) C	Not used	RY(n+1) C	Not used
RX(n+1) D	Not used	RY(n+1) D	Not used
RX(n+1) E	(Reserve:QnA)	RY(n+1) E	(Reserve:QnA)
RX(n+1) F	(Reserve:QnA)	RY(n+1) F	(Reserve:QnA)

n : Address given to the master unit according to the station number setting

Details of remote I/O signals

Device No.	Signal name	Description
RXn0～3	A/D conversion completion flag	The signal is turned on upon completion of first A/D conversion after power-on. Once the signal is turned, it is not turned off (during correct communication). Conversion is made in four channels without relations to the number of connected load units (EVT). After the signal is turned on, save the digital output value (monitored pressure data).
RX(n+1) B	Remote ready	The signal is turned on after power-on. Once the signal is turned on, it is not turned off (during correct communication). The signal is used to interlock in the reading/writing cycle of the master unit.
RYn0～3	Analog output permission signal	Analog value output permission signal. The analog value (output voltage added to the load (EVT)) is issued after this signal is turned on. The analog output is not output if this signal is turned off. The state of the load (EVT) follows the setting of the output selection switch of the slave station in the output prohibition state. - HOLD: The output data sent to the EVT immediately before the output is prohibited is held. - CLEAR: The output data sent to the EVT is reset to "0."

Remote register signal list

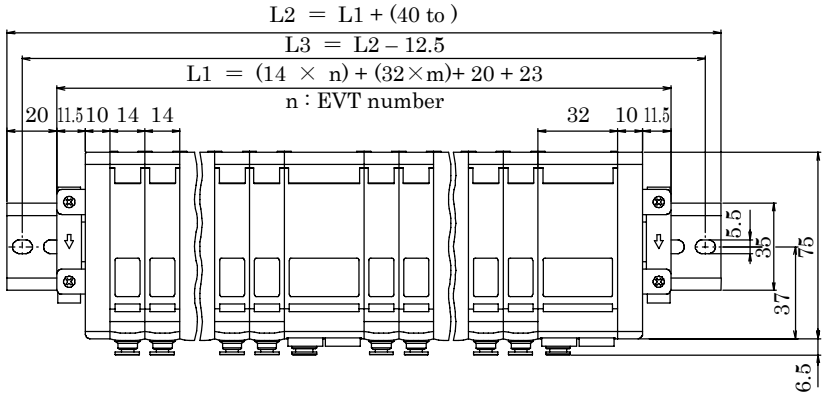
Master → EVT-T9GAR			EVT-T9GAR → Master		
Address	Name	Default	Address	Name	Default
RWwm	CH1 Digital value setting area	0	RWrn	CH1 Digital output value	0
RWwm+1	CH2 Digital value setting area	0	RWrn+1	CH2 Digital output value	0
RWwm+2	CH3 Digital value setting area	0	RWrn+2	CH3 Digital output value	0
RWwm+3	CH4 Digital value setting area	0	RWrn+3	CH4 Digital output value	0

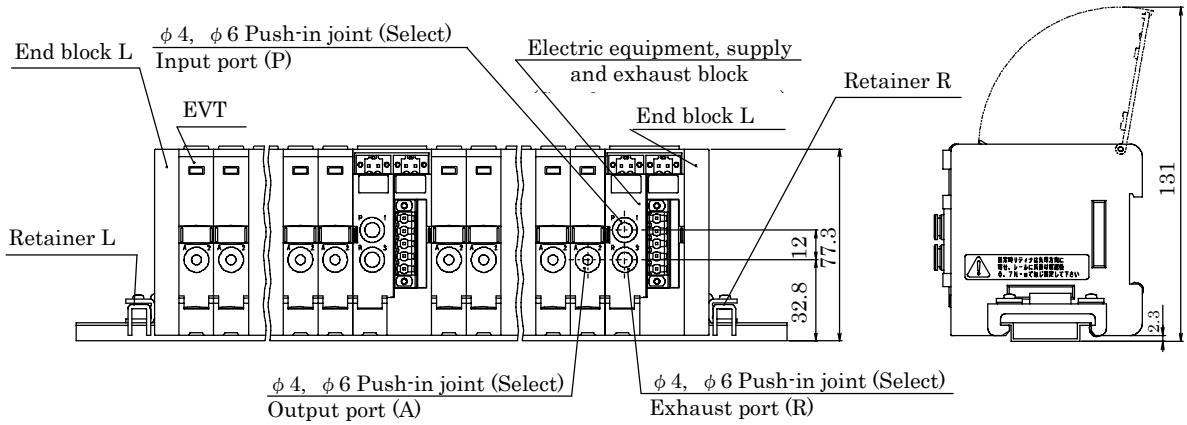
m, n : Address given to the master unit according to the station number setting

Device No.	Signal name	Description
RWwm～RWwm+3	Digital value setting area (Pressure data setting)	・ The digital value for performing D/A conversion (load (EVT) control) is written from the CPU of the PLC. ・ After the power is turned on, the digital value of all channels is reset to "0." ・ The digital value that can be set is a 16-bit binary, and the setting range covers 12 bits. The upper four bits are ignored. Calculation formula: (EVT500) Digital value = EVT pressure setting (MPa) × 4095/0.5 (EVT100) Digital value = EVT pressure setting (MPa) × 4095/0.1 Example: Adjusting the EVT pressure at 0.3MPa (EVT500) Digital value (decimal)＝0.3×4095/0.5＝2457 Digital value (hexadecimal)＝0999Hex b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 — — — — [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Data section (12bits)
RWrn～RWrn+3	Digital output value (Monitored pressure data)	・ The monitored load (EVT) output is converted into a digital value and stored. ・ The digital output value is indicated in a 12-bit binary. "0" is set in the upper four bits. Calculation formula: (EVT500) EVT pressure (MPa) = monitored output (decimal) × 0.5/4095 (EVT500) EVT pressure (MPa) = monitored output (decimal) × 0.1/4095 Example: If the monitored output value is 0555hex (EVT500) Monitored output value (hexadecimal) ＝0555Hex Monitored output value (decimal) ＝1365 EVT pressure＝1365×0.5/4095≒0.1667MPa b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 0 0 0 0 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Data section (12bits)

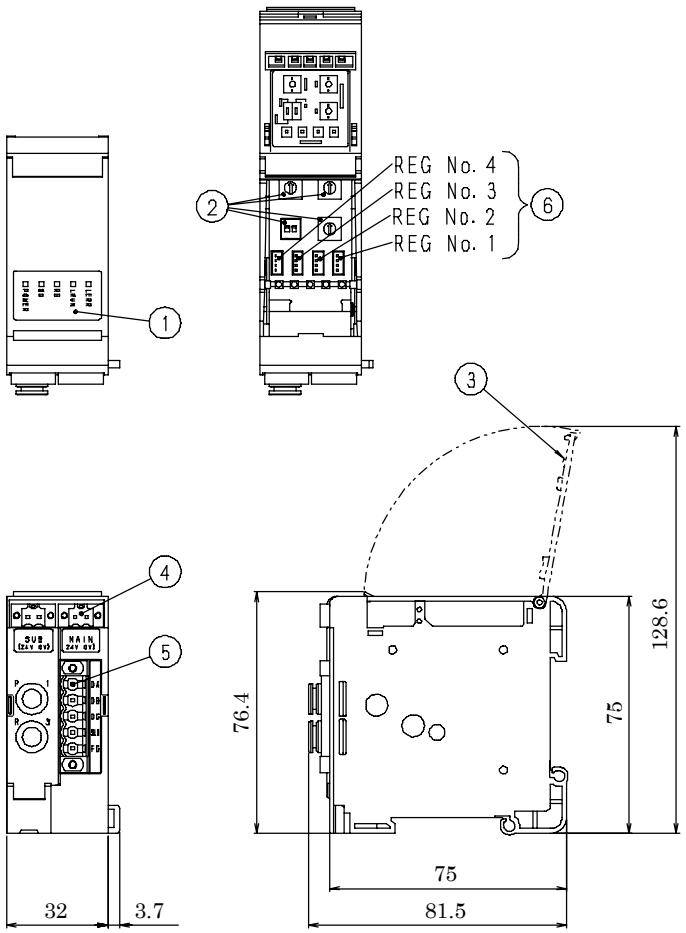
5.4 Dimensions

1) Serial transmission type CC-Link (T9GAR) (unit: mm)





2) Slave station appearance



① Monitor lamps
Monitor lamps show the state of the main body of the slave station and the network.

② Setting switches
Enter the settings of the station number of the slave station, transmission speed, output issued upon analog output permission signal shutdown and communication faults, and terminating station.

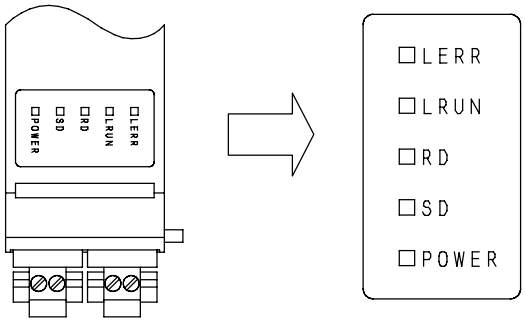
③ Cover
Cover protects monitor lamps and setting switches.

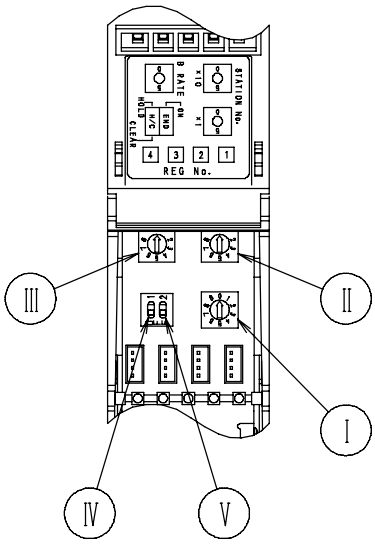
④ Power supply connector
Power (DC24V) for slave station is connected.

⑤ Communication connector
Communication cable for the Network is connected.

⑥ Valve connector
EVT cable is connected.

5.5 Switch and LED display





1) Switches

Enter the settings of the station number of the slave station, transmission speed, output issued upon analog output permission signal shutdown and communication faults, and terminating station.

Symbol	Switch name	Description of setting
Ⅰ, Ⅱ	(Station number setting)	Specify the station number of the slave station in the range from 1 to 64. Specify the tens digit at II, and specify the units digit at I.
Ⅲ	(Transmission speed setting)	Specify the transmission speed for communication with the master station in the range from 0 to 4.
Ⅳ	(Output mode setting)	Select whether the output state is held (HOLD) or reset (CLEAR) upon analog output permission signal shutdown and communication faults.
Ⅴ	(Terminating station setting)	Turn on if the slave station is at the end of the network configured with the master station being at another end. * An external resistor may be connected according to some wiring specifications. (Refer to Section 5.5 5)

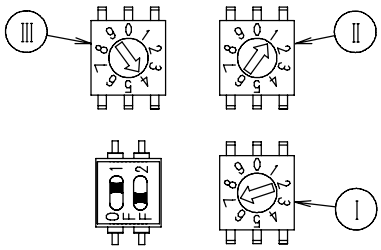
⚠ CAUTION :

- If the switch setting is changed with the power turned on, settings other than HOLD/CLEAR are not recognized. To change the setting, turn the power off.
- The cover of the slave station unit can easily be opened and closed. Keep the cover closed except when you have to change switch positions or reconnect wires. If you keep the cover open unnecessarily, foreign matter may enter the circuit board causing an unexpected failure, or the cover may be broken by accidental contact. While the cover is open as you change switch positions or reconnect wires, be careful not to cause the entry of foreign matter.
- Setting switch has been precisely built. Disorderly handling may cause damage of switch. To set station number, never touch internal circuit printed board.

2) Station number settings (Switches I and II)
Enter the station number of the product in the range from 1 to 64. (No duplicate station number is allowed.)
Enter the tens digit at x10 (switch II).
Enter the units digit at x1 (switch I).

3) Transmission speed setting (BRATE) (Switch III)
Enter the speed of communication with the master station.

Transmission speed (B RATE)	Setting
156kbps	0
625kbps	1
2.5Mbps	2
5Mbps	3
10Mbps	4
Prohibited	5～9



Example) STATION No. : 17
Transmission speed (BRATE) : 4(10Mbps)

⚠ CAUTION :

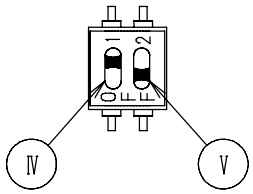
- Enter the same transmission speed at all stations in the network including the master, local and remote stations. Correct data link is not established if the transmission speed setting of even only one station is different from that of the others.

4) Output mode setting (Switch IV)
Enter the data to be output upon analog output permission signal shutdown and communication faults.

Switch state	Description of setting
ON (HOLD)	・ The output of the corresponding channel immediately before shutdown of the analog output permission signal is held even after the “analog output permission signal” flag is turned off. ・ The outputs of all channels are held upon a communication fault. (However, the description is true only for the designated address.)
OFF (CLEAR)	・ The output data of the corresponding channel is reset to "0" upon shutdown of the “analog output permission signal” flag. ・ The outputs of all channels are turned off (output data sent to EVT: "0") upon a communication fault. (However, the description is true only for the designated address.)

5) Terminating station setting (Switch V)

Switch state	Description of setting
ON	Terminating station
OFF	Intermediate station

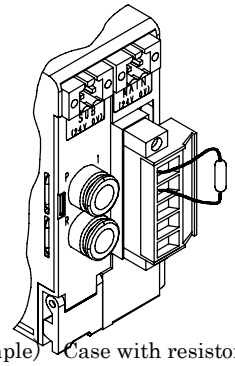


Example) Output setting mode: HOLD
Terminating station setting: Intermediate station

※ Terminating station setting

This slave station is equipped with a built-in 110Ω terminator across communication lines DA and DB. Merely turn switch V on to configure the slave station as a terminating station. There is no need for an external terminator connected to the connector of the product.

To use the slave station as a terminating station in a network where a terminator other than 110Ω is necessary for the communication cable such as the special CC-Link cable (special high performance CC-Link cable (FANC-SBH made by Kuramo Electric Co., Ltd.)), turn the terminating station setting switch V off. Then connect a marketed or special accessory terminator to the communication connector of this product according to the connection condition (specification) to configure the terminating station.



Example) Case with resistor connected across DA and DB

⚠ CAUTION :

- If the switch setting is changed with the power turned on, settings other than HOLD/CLEAR are not recognized. To change the setting, turn the power off.
- Refer to the user's manual of the master station or the one issued by CC-Link Association to connect the terminator correctly. An inadequate terminator or wrong connection method may cause communication faults.
- To connect an external terminator, be sure to turn the terminating station setting off.
- To connect an external terminator, provide the resistor leads with insulation treatment to avoid short circuits.

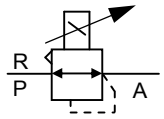
5) LED indication

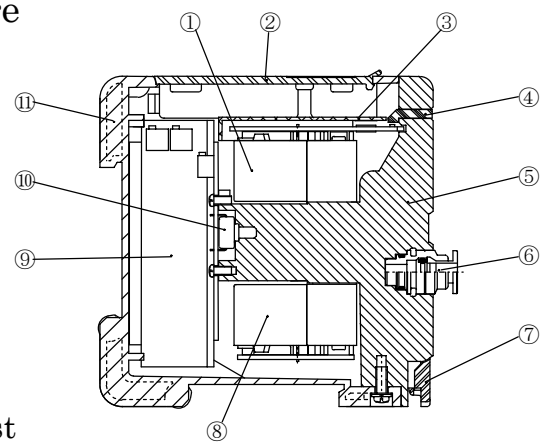
The states of the slave station and network are indicated. Refer to the table below for LED indication

LED name	Description of indication
LERR	Unlit during correct communication (LRUN: lit). Lit upon a transmission error (CRC error). Lit upon station number setting or transmission setting error. Blinks if the station number setting or transmission speed setting is changed in the middle. Unlit upon timeout.
LRUN	Lit when the slave station is ready to receive correct data from the master station. Unlit upon timeout.
RD	Lit upon reception of data.
SD	Lit upon transmission of data.
POWER	Lit after the power is turned on.

5.6 Inside structure

- EVT



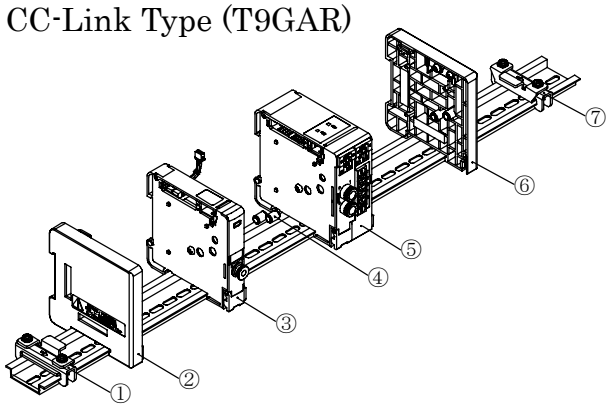


Main component list

No.	Name of parts	Material	No.	Name of parts	Material
1	Valve for supply	—	7	Connecting hook plate	Polyamid
2	Wiring cover	Acryloni-trile-butadiene-styr ene	8	Valve for exhaust	—
3	Valve cover	Acryloni-trile-butadiene-styr ene	9	Controller	—
4	Indicator lens	Polycarbonate	10	Pressure sensor	—
5	Body	Polyamid	11	Case	Acryloni-trile-butadiene-styr ene
6	Push-in joint	—			

5.7 Component

Serial Transmission CC-Link Type (T9GAR)



Main component list

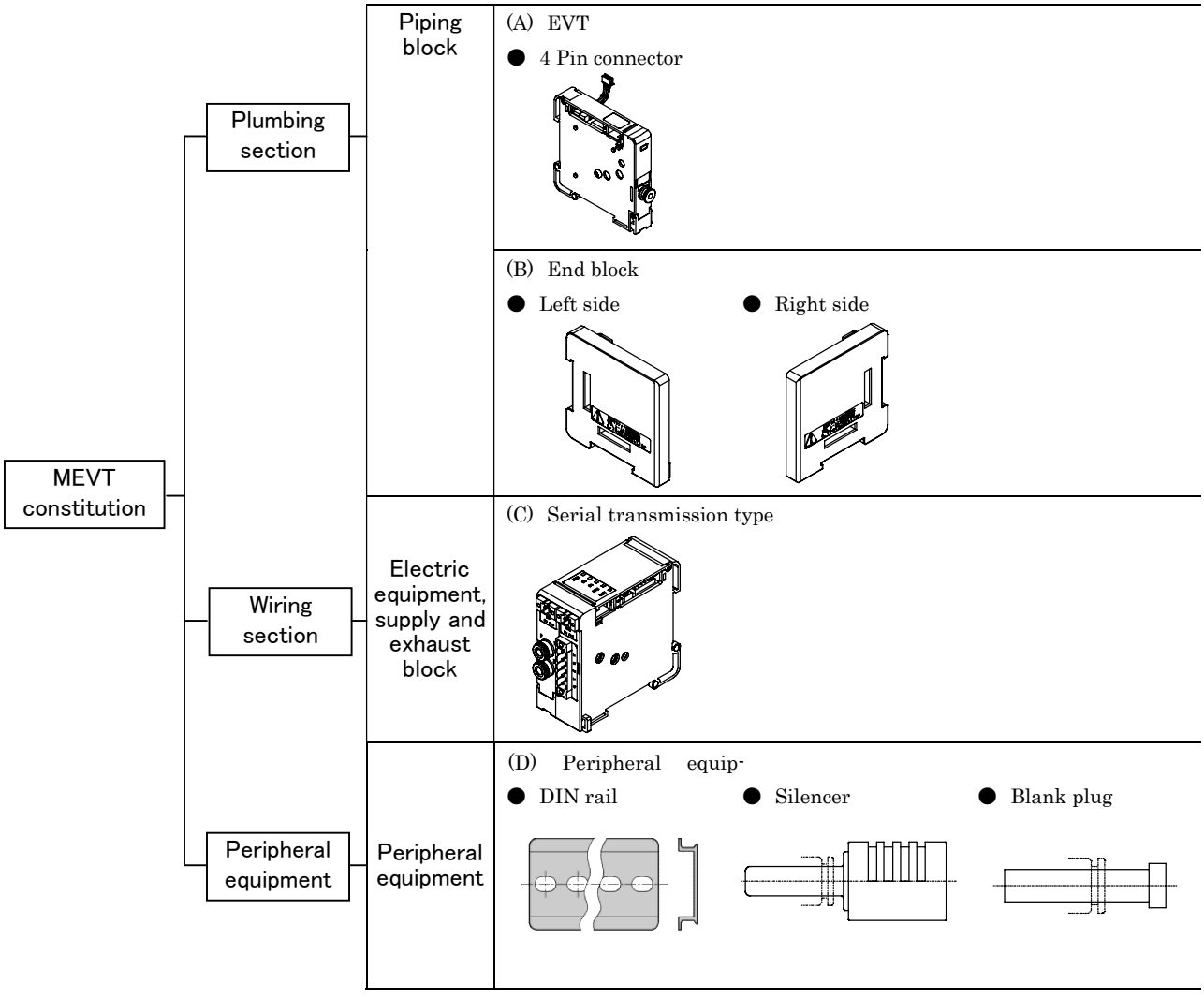
No.	Name of parts	Model no.	No.	Name of parts	Model no.
1	Retainer L	EVT-HL	6	End block R	EVT-ER
2	End block L	EVT-EL	7	Retainer R	EVT-HR
3	EVT	EVT※00			
4	Pipe joint	EVT-P			
5	Electric equipment, supply and exhaust block	EVT-T※			

Mass (g)

Name of parts		Mass	Name of parts		Mass
EVT	EVT※00	80	Electric equipment, supply and exhaust block	T9GAR	145
End block	EVT-EL	30	Retainer	EVT-H※	25
	EVT-ER	30	Pipe joint	EVT-P	—

5.8 Block constitution

- EVT:
  ① The EVT can be installed on the DIN rails by the required number of stations. However, the number of stations is determined, depending on the kind of the slave station.
  (Refer to "PARECT Electropneumatic Regulator (Manifold) Specifications" given in Section 5.3 - (2).)
  ② The EVT is called "1st, 2nd, 3rd …" from the right side with the joint in front.
  ③ REG. No. marked on the EVT wiring cover is assigned as 1, 2, 3 … from the nearer side for each connected electric equipment, supply and exhaust block.
- Electric equipment, supply and exhaust block:
  ① The EVT can be installed in the connecting part of each block freely as required.
- End block:
  ① Set up the EVT on both sides for the serial transmission type.



5.9 Troubleshooting the slave station

The slave station troubleshooting procedure must be given not to the discrete unit but to the entire system. The slave station gives LED indication according to the specifications of CC-Link. When a fault occurs, refer to LED indication of the slave station, that of the master station and the data of special registers to know details of the fault and take adequate corrective actions.

Faults concerning this slave station and remedies are shown below.

POWER	SD	RD	LRUN	LERR	Description	Remedy
○	○	○	○	●	Normal	
					The PLC is stopped after it has run.	Run the PLC.
○	○	○	○	◎	The switch setting (station number or BRATE) is changed.	Check the switch setting (station number or BRATE) of the slave station.
○	−	○	−	●	There is a duplicate station number.	Check for duplication in station number setting at the switch and check for duplication in station number of the number of occupied stations. (Turn the power off then on again.)
○	−	○	●	●	The PLC is stopped after power-on.	Run the PLC.
○	●	○	●	●	Designation as a reserved station	Cancel designation of the reserved station.
○	●	○or ●	●	●	Broken wire in communication cable	Repair the broken wire. (“LRUN” is unlit at stations later than the broken point.)
					Short circuited communication cable	Correct the short circuit. (“LRUN” is unlit at all stations.)
○	●	○or ●	●	○	"65" or a larger station number is specified.	Check the station number. (Turn the power off then on again.)
○	●	●	●	○	"5" or a larger BRATE is specified.	Check the BRATE setting. (Turn the power off then on again.)
○	●	−	●	●	The BRATE setting is different from that of other stations.	Keep consistency in the BRATE setting among all stations. (Turn the power off then on again.)
○	●	●	●	●	The PLC is reset.	Run the PLC.
					The PLC is turned off.	Turn the PLC on and run it.
●	●	●	●	●	The power is not turned on.	Supply regulated 24VDC power (ripple ratio within 1%) to the slave station.
					The source voltage is low.	Check the source voltage (check for voltage drop).

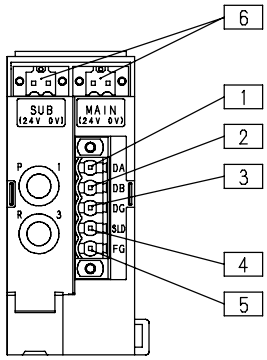
○ : Lit ◎ : Blink ● : Unlit − : Indefinite

Note: LED indication may differ from that shown above with some master stations.

6. WIRING

The Slave station has a network connector. The network cable is connected to this network connector.
(Refer to Tightening torque “6.5 Screw and tightening torque”.)

	Terminal name	Function	Target of connection	Cable color (Slave station indication)
1	DA	Communication terminal	Connect to the "DA" communication cable of the master station or other slaves such as remote I/O station.	Blue(DA)
2	DB	Communication terminal	Connect to the "DB" communication cable of the master station or other slaves such as remote I/O station.	White(DB)
3	DG	Communication terminal	Connect to the "DG" communication cable of the master station or other slaves such as remote I/O station.	Yellow(DG)
4	SLD	Shielding terminal	Connect to the "SLD" communication cable of the master station or other slaves such as remote I/O station.	Bare wire (SLD)
5	FG	Grounding terminal	Ground in the class 3 or better condition. ※1	(FG)
6	MAIN SUB ※2	Power supply of slave station (Incl. power supply for load)	Use regulated 24VDC +/-10% power (ripple ratio within 1%).	(24V)(0V)



※1. The SLD and FG terminals are connected with each other inside the slave station.

※2. MAIN and SUB are connected with each other inside the slave station. (Refer to Section 6.4 Power Cable Wiring.)

⚠ CAUTION :

- Do not touch electric wiring connections (exposed live pats) : this will cause an electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.
- Take care so that the tensile force and impact force are not applied to the power line and signal line. In the case of a long wiring, unexpected force may be generated due to its dead weight and shock, thereby causing damage to the connector and equipment. In this case, proper action should be taken therefor; for example, fix the wiring to the equipment halfway.
- When a cable is inserted into the connector, it may intrude into not the connector tightening side, but the other side; it is, therefore, necessary to keep the cable fixing screw loose enough.
- When inserting the power connector and communication connector, do not forget to tighten the connector fixing screw firmly. Both connectors, if only inserted, are detached, causing malfunctions. When no connector fixing screw is provided, ensure that the connector jaw is hooked securely.

6.1 Communication line

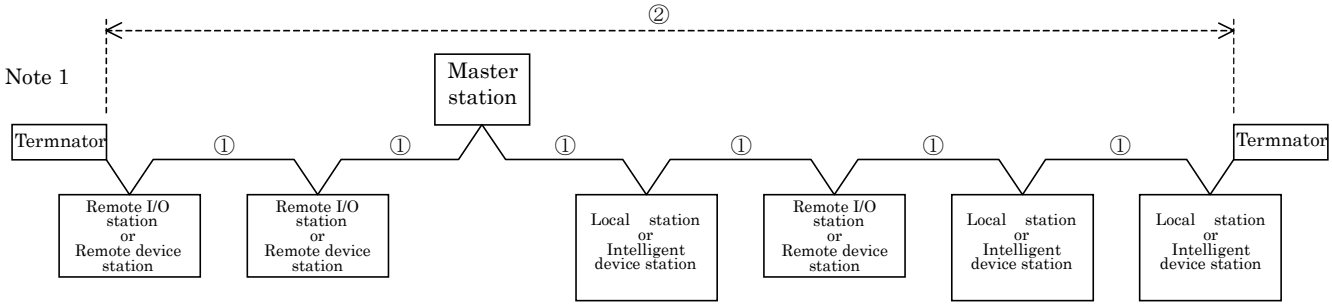
In this system, a special CC-Link cable is used as a communication cable. The special CC-Link cable includes variations, and the compatible version, transmission distance and terminator resistance vary according to the cable.
Part of recommended cables are shown below. Special CC-Link cables other than those listed below can be used, too。

Model	Manufacturer	Compatible version	Impedance characteristics	Terminator
FANC-SB	Kuramo Electric Co., Ltd.	1.00	100Ω	110Ω
FANC-FBH	Kuramo Electric Co., Ltd.	1.00	130Ω	130Ω
FANC-110SBH	Kuramo Electric Co., Ltd.	1.10	110Ω	110Ω
CCL-SBS [100]	Sumitomo Wiring Systems, Ltd.	1.00	100Ω	110Ω
CS-110	Daiden Co., Ltd.	1.10	110Ω	110Ω
CCNC-SB	Nihon Electric Wire & Cable Co., Ltd.	1.00	100Ω	110Ω
CCNC-SBH	Nihon Electric Wire & Cable Co., Ltd.	1.00	130Ω	130Ω

Note: To use the cable rated at a terminator resistance of 130Ω, do not use the built-in terminating resistor (110Ω) of the slave station. (Refer to Section 5.5 5) Terminating Station Setting.

6.2 Transmission distance

- In case of Ver. 1.10 system
  All the devices and cables must be compatible with Ver. 1.10. If any Ver. 1.00 device is included, devices function according to Ver. 1.00 specifications.



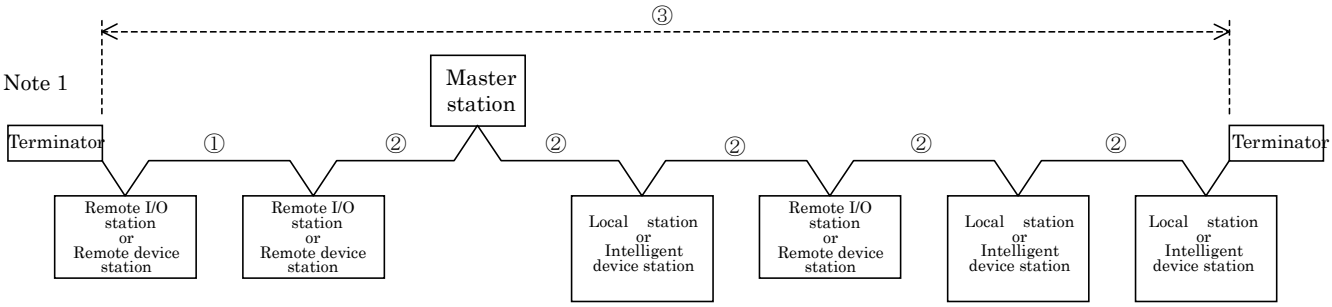
Note 1: Because a terminator is built in the slave station, no external terminator is necessary with a switch setting even if the slave station is installed at the end of the communication cable (network).
(Check the resistance of the terminator and connection terminal without fail. In some cases, the built-in terminator of the slave station may not be used.)
[Refer to Section 5.5 5] Terminating station setting.]

B RATE	Transmission speed	① Cable length between adjacent stations	② Max. total cable extension
4 (10Mbps)	10Mbps	0.2m or above	100m
3 (5Mbps)	5Mbps		160m
2 (2.5Mbps)	2.5Mbps		400m
1 (625kbps)	625kbps		900m
0 (156kbps)	156kbps		1200m

Note: The wiring distance specified above is for a network configured with only Ver. 1.10 stationary CC-Link cables. If Ver. 1.10 movable CC-Link cable is used, the wiring distance changes according to the cable specifications. Contact the cable manufacturer for details.

- In case of Ver. 1.00 system
  If a Ver. 1.00 device or cable is used in the system, devices function according to Ver. 1.00 specifications.

1. To configure a system including local or intelligent device stations

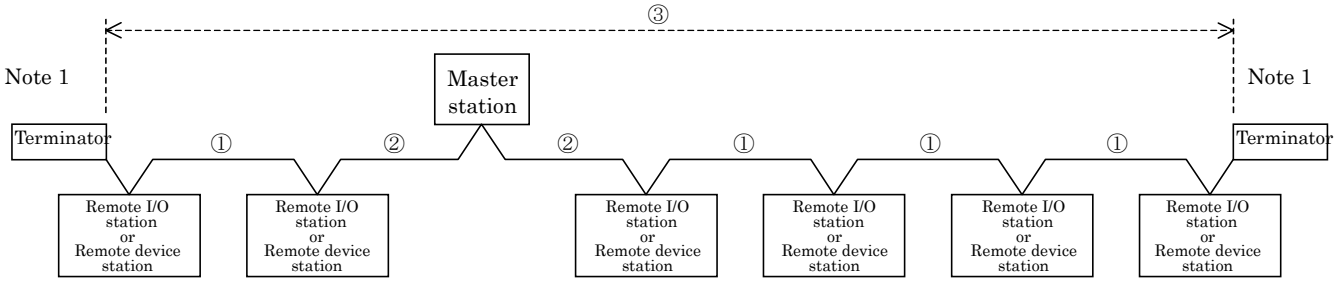


Note 1: Because a terminator is built in the slave station, no external terminator is necessary with a switch setting even if the slave station is installed at the end of the communication cable (network).
(Check the resistance of the terminator and connection terminal without fail. If the high performance cable is used, the built-in terminator of the slave station cannot be used.)
[Refer to Section 5.5 5] Terminating Station Setting.]

B RATE (transmission speed)	Special CC-Link cable			Special high performance CC-Link cable		
	①※ Cable length between adjacent stations	② Cable length between adjacent stations	③ Max. total cable extension	①※ Cable length between adjacent stations	② Cable length between adjacent stations	③ Max. total cable extension
4 (10Mbps)	1.0m or above	2.0m or above	100m	1.0m or above	2.0m or above	80m
	0.6m or above		80m	0.7m or above		50m
	0.3m or above		50m			
3 (5Mbps)	0.6m or above		150m	0.6m or above	2.0 or above m	150m
	0.3m or above		110m	0.3m or above		110m
2 (2.5Mbps)	0.3m or above		200m	0.3m or above		200m
1 (625kbps)			600m			600m
0 (156kbps)			1200m			1200m

※ ① supposes the cable length between remote I/O stations and remote device stations. If the master station or a local or intelligent device station is included, cable length ② is applicable.

2. To configure a system including remote I/O and remote device stations only

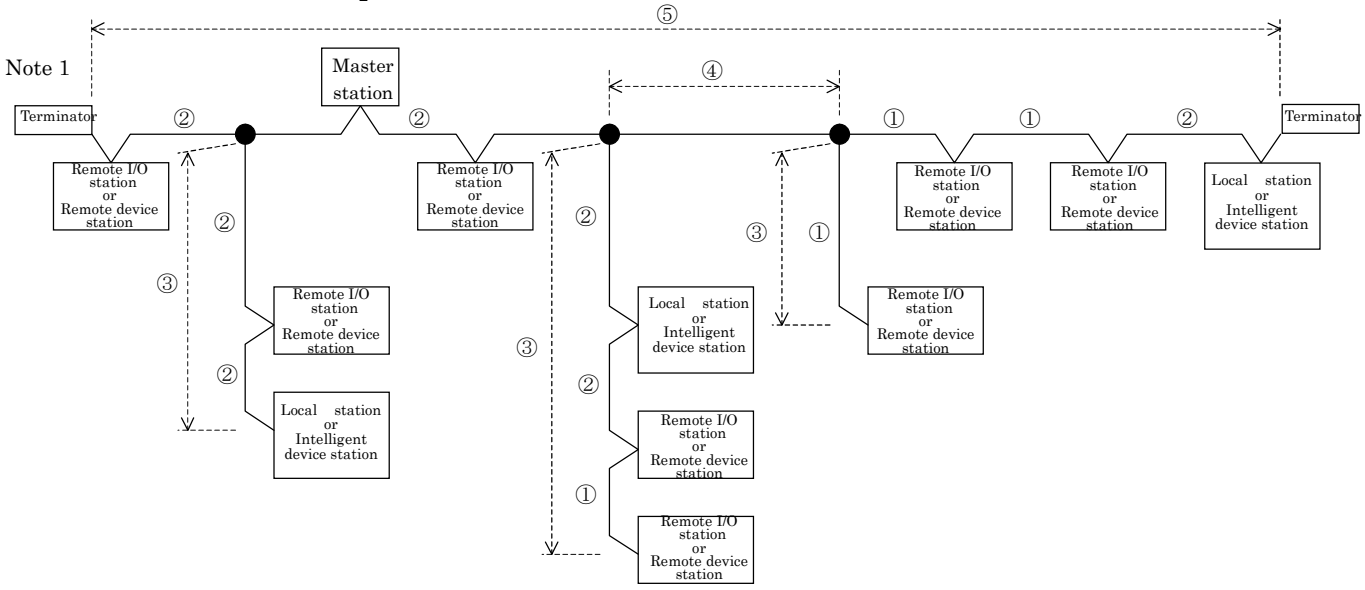


Note 1: Because a terminator is built in the slave station, no external terminator is necessary with a switch setting even if the slave station is installed at the end of the communication cable (network).
(Check the resistance of the terminator and connection terminal without fail. If the high performance cable is used, the built-in terminator of the slave station cannot be used.)
[Refer to Section 5.5 5] Terminating Station Setting.]

B RATE (transmission speed)	Total number of remote stations	① Cable length between adjacent stations	② Cable length to master station	Special CC-Link cable	Special high performance CC-Link cable
				③ Max. total cable extension	③ Max. total cable extension
4 (10Mbps)	64 or less	1.0m or above	1m or above	100m or less	100m or less
		0.7m or above		80m or less	100m or less
		0.6m or above		80m or less	30m or less
		0.4m or above		50m or less	30m or less
		0.3m or above		50m or less	20m or less
	48 or less	0.4m or above		50m or less	100m or less
		0.3m or above		50m or less	80m or less
	32 or less	0.3m or above		50m or less	100m or less
3 (5Mbps)	64 or less	0.3m or above		50m or less	160m or less
		0.6mor above		10m or less	160m or less
2 (2.5Mbps)		0.3m or above		200m or less	400m or less
1 (625kbps)				600m or less	900m or less
0 (156kbps)				1200m or less	1200m or less

- T branch connection

(1) Without a repeater



Note 1: Because a terminator is built in the slave station, no external terminator is necessary with a switch setting even if the slave station is installed at the end of the trunk line communication cable (network). If the slave station is connected to the T branch, the connection method varies according to the master station and the built-in terminator may not be used in some cases. Check the resistance of the terminator and connection terminal without fail.
[Refer to Section 5.5 5)Terminating Station Setting.]

B RATE	Number of stations connected in each branch	① Cable length between adjacent remote I/O or remote device stations	② Cable length between master, local or intelligent device station and its adjacent station	③ Max. branch line length	Total branch line length	④ T branch interval	⑤ Max. total trunk line length
1 (625kbps)	6	0.3m or above	1m or above (※1)	8m	50m	No limit	100m
0 (156kbps)			2m or above (※2)		200m		500m

※1 In case of a system configured with remote I/O or remote device stations only

※2 In case of system configuration including local or intelligent device stations

Note 1: Use Ver. 1.10 special CC-Link cable (impedance characteristics: 110Ω) and special CC-Link cable (impedance characteristics: 100Ω). Do not use special high performance CC-Link cables (impedance characteristics: 130Ω).

Note 2: The T branch is not allowed in a system where the transmission speed is 2.5M, 5M, or 10Mbps.

(2) With repeaters

Use repeaters to include T branches at all transmission speeds.

Use repeaters to extend the transmission distance.

Note: The system including repeaters is not covered with CC-Link specifications. Adopt wiring conforming to the repeater specifications.

⚠ CAUTION :

- The transmission distance varies according to the transmission speed, communication cable and other particulars. Refer to the master station user's manual or manuals prepared by CC-Link Association to prepare wiring in the specification range.
- The number of connected stations varies according to the number of occupied stations, station type and other conditions. Refer to the master station user's manual or manuals prepared by CC-Link Association.
- With Ver. 1.10, different cable manufacturers can be included. With Ver. 1.00, only one cable manufacturer is allowed.
- Do not use the special CC-Link cable and special high performance CC-Link cable together in a single network.
- The specifications of the T branch connection may vary according to the master station. Be sure to refer to the master station user's manual for details before preparing wiring.
- To connect repeaters, adopt wiring conforming to the specifications of the repeater.
- To use movable communication cables, the wiring distance varies according to cable specifications. Contact the cable manufacturer for details.

6.3 Communication line wiring

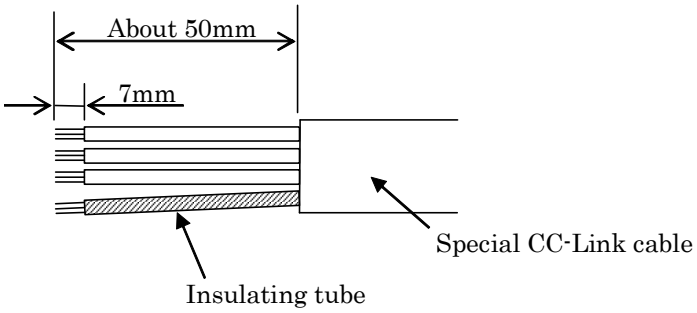
Follow the procedure below to connect the special CC-Link cable to the slave station.

① Check for safety and turn the slave station off.

② Peel off the cable sheath without cutting conductor cables (sheath peeling length: 7mm). Connect the bare cable without soldering (otherwise poor contact may be caused). Crimp terminals specified below are recommended. Note that the peeling length varies according to the type of the crimp terminals. (See the figure below.)

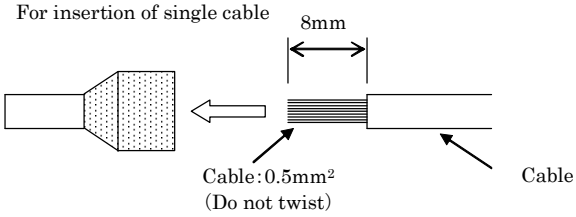
※ The thickness of the shield must be within 1.5mm² with two cables, and use insulating tube or the like for insulation. To use a crimp terminal, choose one matching the thickness of the shield.

● If no crimp terminal is used



● If crimp terminal is used

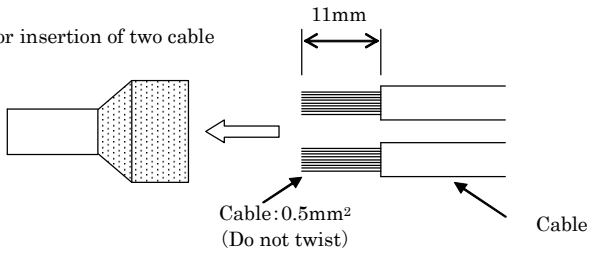
For insertion of single cable



Crimp terminal
Part name:Sleev with insulating
Model:H0.5/12
Manufacturer:Weidmuller

Special crimp tool
Part name:Crimper
Model:PZ1.5 or PZ4
Manufacturer:Weidmuller

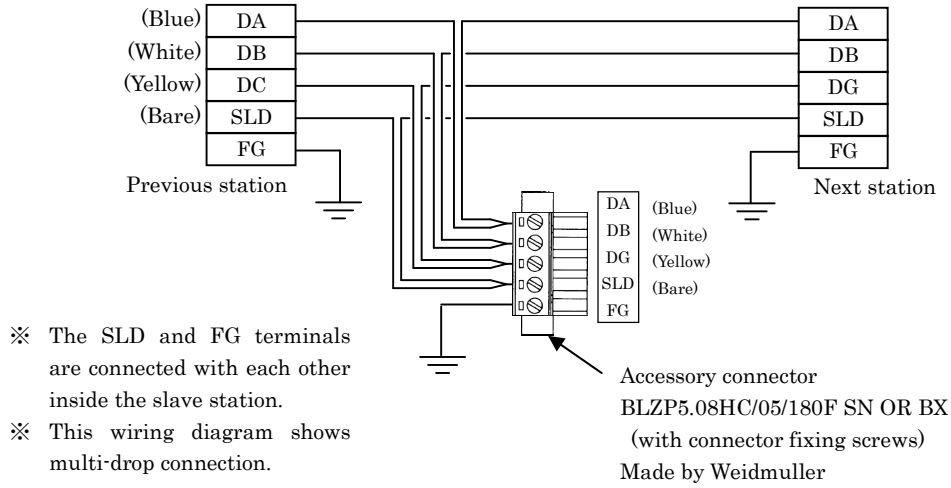
For insertion of two cable



Crimp terminal
Part name:Sleev with insulating
Model:H0.5/15
Manufacturer:Weidmuller

Special crimp tool
Part name:Crimper
Model:PZ1.5 or PZ4
Manufacturer:Weidmuller

③ nsert the DA (blue), DB (white), DG (yellow) and SLD (bare) cables of the CC-Link cable into the corresponding holes (DA, DB, DG and SLD) while taking care of the orientation of the accessory connector (BLZP5.08HC/05/180F SN OR BX) (see the figure below). The accessory connector can be removed from the product.



④ Using the fixing screw of the connector, securely tighten each cable. (Tightening torque: 0.5N-m)

⑤ Connect the grounding cable (FG) similarly. To install a crimp terminal to the grounding cable, choose the one matching the accessory connector. The cross section of the grounding cable must be between 0.5 and 1.5mm^2.

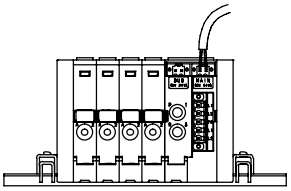
⑥ Check that the communication cable names (DA, DB, DG, SLD and FG) indicated on the right side of the female connector of the main body of the slave station agree with those indicated on the connected communication cable (that is no wiring error), and insert the connector into the slave station and tighten the fixing screws securely to a tightening torque of 0.4N-m.

⚠ CAUTION :

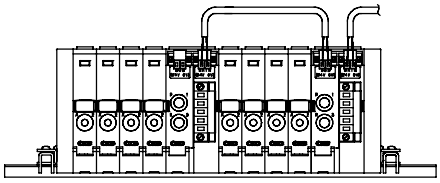
- For the communication line, be sure to use the cable conforming to the CC-Link specification.
- Maintain a sufficient bending radius for the communication line: avoid bending the communication line unnecessarily.
- With the communication line at least 30cm apart from other wirings, lay the line. If this line is laid in the same duct with the wiring having many high-frequency components, such as the high-frequency line, power line and inverter, malfunctions may result.

6.4 Power line wiring

In the case of a single electric equipment, supply and exhaust block (4 MEVT's max.):
Input the power line to the MAIN power terminal.



In the case of one or more electric equipment, supply and exhaust blocks (5 MEVT's min.):
Input the power line into the first MAIN power terminal and input it into the another MAIN power terminal via SUB power terminal as shown below.

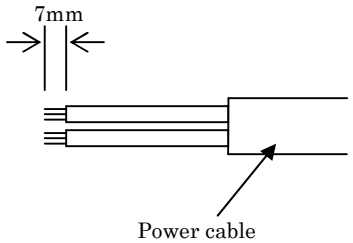


Power line (Wire size: 0.5 to 1.5mm^2):

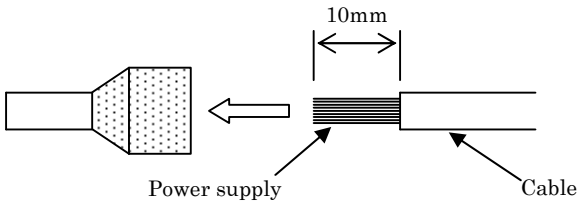
Connect the power cable to this product according to the following procedure.

1. After checking for safety, turn the slave station power "OFF".
2. Remove the cable covering without cutting the cable halfway. (Wire peeling length: 7mm)
   Since there is a possibility of poor contact in the exposed wire if finished by solder, the wire must be connected with its covering separated without finishing by solder.
   Also, the following is recommended as a crimp terminal. (The wire peeling length required when a crimp terminal is mounted is 10mm.)

◇ When no crimp terminal is used:



◇ When a crimp terminal is used:



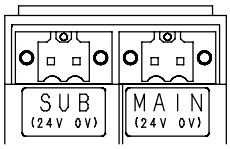
Recommendable crimp terminal:
Description: Sleeve with insulation cover
Type No. : H□/14 (with insulation cover)
(□ = 0.5, 0.75, 1 & 1.5)
Manufacturer: Weidmuller

Dedicated crimp terminal tool:
Description: Crimper
Type No.: PZ1.5 or PZ4
Manufacturer: Weidmuller

3. Fix the power cable to the power terminal by the adequate tightening torque of 0.5N・m while matching the polarity: 24V line to 24V terminal and 0V line to 0V terminal.
   Supplied connector : BL3.5/2F (with connector fixing screw) Weidmuller Japan
   In this product (T9GAR), the slave station (unit) power supply and load (EVT) power supply cannot be separated from each other, which are common.

⚠ CAUTION :

- Do not touch electric wiring connections (exposed live pats) : this will cause an electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.
- After checking the slave station terminal polarity and cable terminal polarity, connect the power supply. (Left side: 24V – right side: 0V as illustrated below)

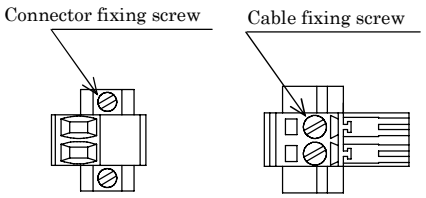


- Select a power cable after calculating the current consumption.
- Where the power is supplied to several slave stations from one power supply, select a cable and make wiring connections in consideration of voltage drop caused by electric wires.
- When voltage drop is unavoidable, always take adequate action; for example, divide the power line into plural systems or provide another power supply in order to maintain the specified supply voltage.
- 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 the MEVT series cables as far away as possible from power line for motor.
  - In the case of the influence of noise, each slave station can possibly be supplied the power and wire individually.
  - Wire the power line as short as possible.
  - Don't share the power with devices that generate the noise, such as an inverter motor.
  - Don't wire the power line or communication line in parallel with other lines.
- Since the SUB power terminal is only for crossover wiring, use only the MAIN power terminal in individual wiring. Since application of power supply to the SUB power terminal and MAIN power terminal together may cause malfunctions, avoid such wiring.
- The MAIN power terminal and SUB power terminal are connected with each other inside. Connect to the MAIN terminal in regular cases. If the SUB power terminal is not used, leave the accessory connector connected on the SUB power terminal to avoid short circuits.
- The SUB power terminal can be used for transfer wiring to other devices. However, contain the current passing from the MAIN terminal to the SUB terminal, within 1.5A. The unusual rise of temperature by the over current will break the MEVT. Be careful to avoid noise effects of other devices.

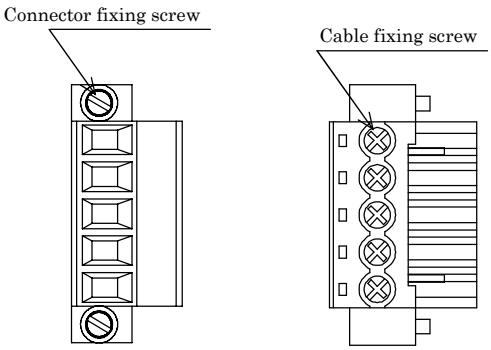
6.5 Screw and tightening torque

The adequate torque to tighten screws used in this product are shown below.

	Connector fixing screw	Cable fixing screw
Power connector	0.4N·m	0.25N·m
Communication connector	0.4N·m	0.5 N·m



Power connector



Communication connector

6.6 Maintenance

1) How to attach the connector

1. Turn the slave station power “OFF”.
2. Set the slave station address and the output in the event of communication error.
3. Fix the power connector and the communication connector tightly.
4. After checking for safety, turn the slave station power “ON”.

⚠ CAUTION :
- In turning the slave station “ON”, check the slave station address and the output or the like in the event of communication error.

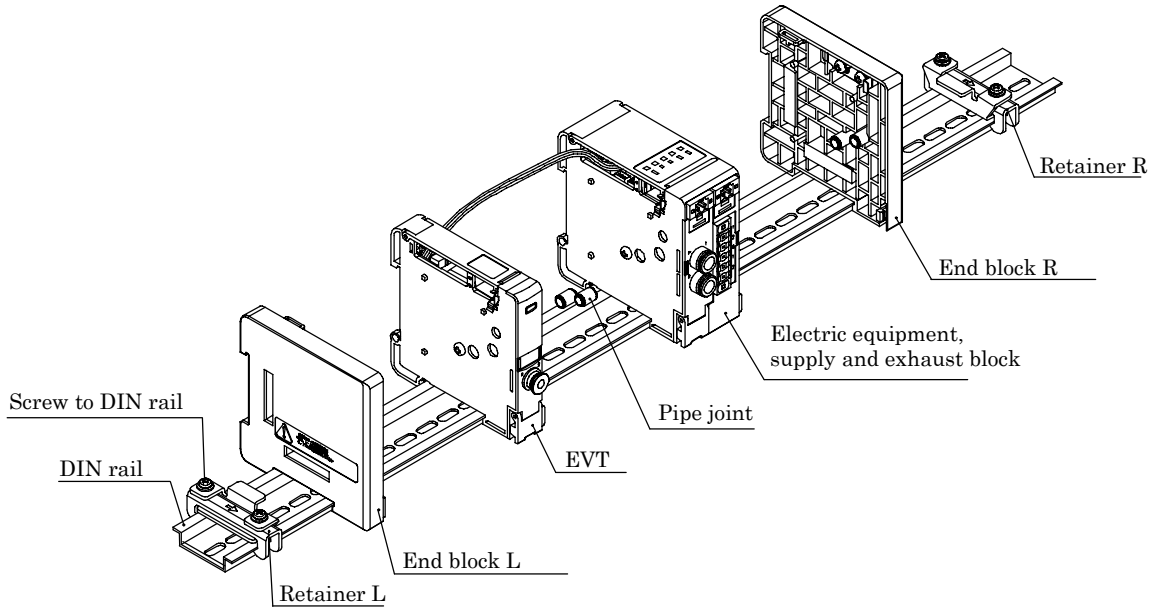
2) How to remove the connector

1. After checking for safety, turn the slave station power “OFF”.
2. After it is confirmed that the power of the slave station is off, remove the power connector and the communication connector.

⚠ CAUTION :
- Avoid pulling the cable or connector unnecessarily; otherwise, wire disconnection and damage may result.
- The touch to the electrical wiring connection part (bare live part) may give rise to electric shocks.

7. HOW TO EXTEND EVT

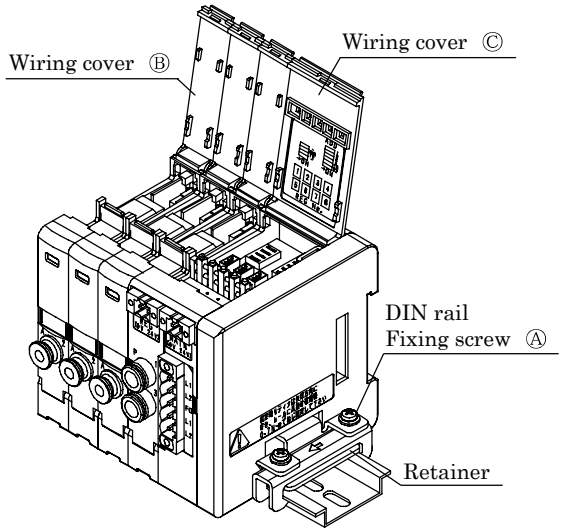
Disassembled MEVT



How To Extend EVT

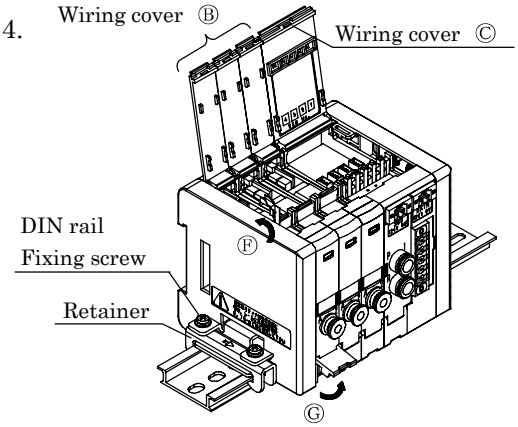
1. Loosen screws to fix DIN railⒶ.
2. Open the wiring coverⒷ.
3. Open the wiring coverⒸ.

Serial transmission type (T9GAR)

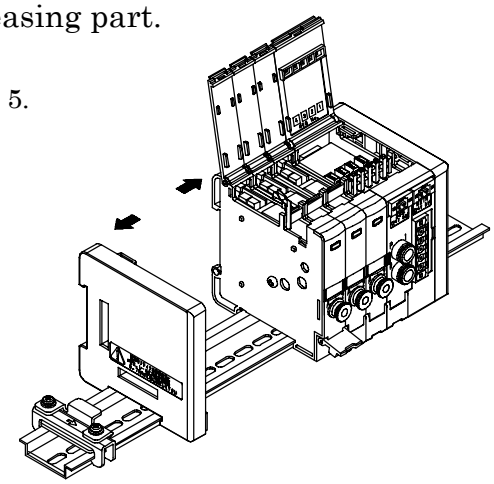


4. Unhook the connecting hook spring Ⓕ and connecting hook plate Ⓖ in the place where it is desired to increase the station to separate the blocks each other.
5. Separate the blocks in the station increasing part.

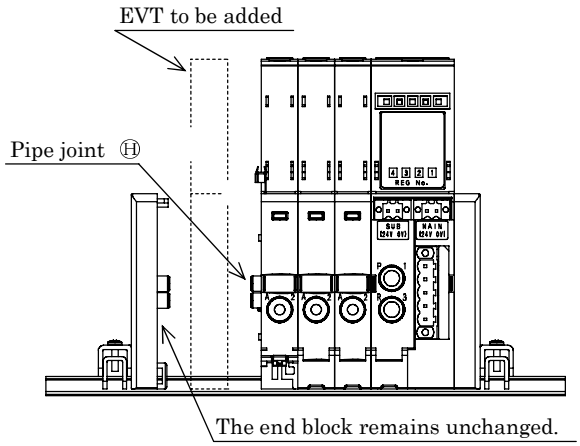
4.



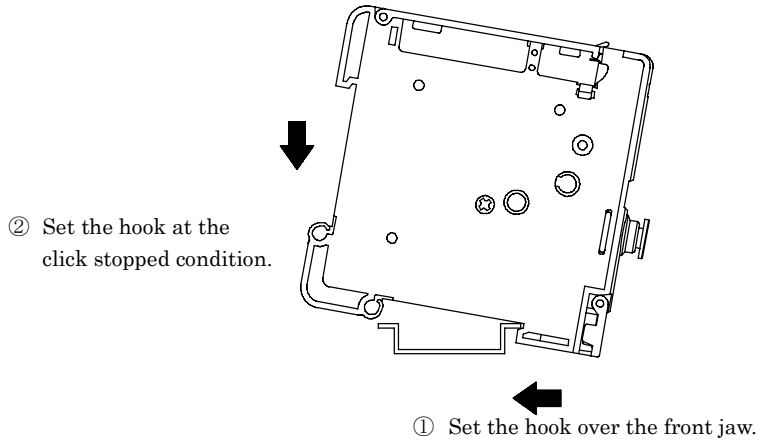
5.



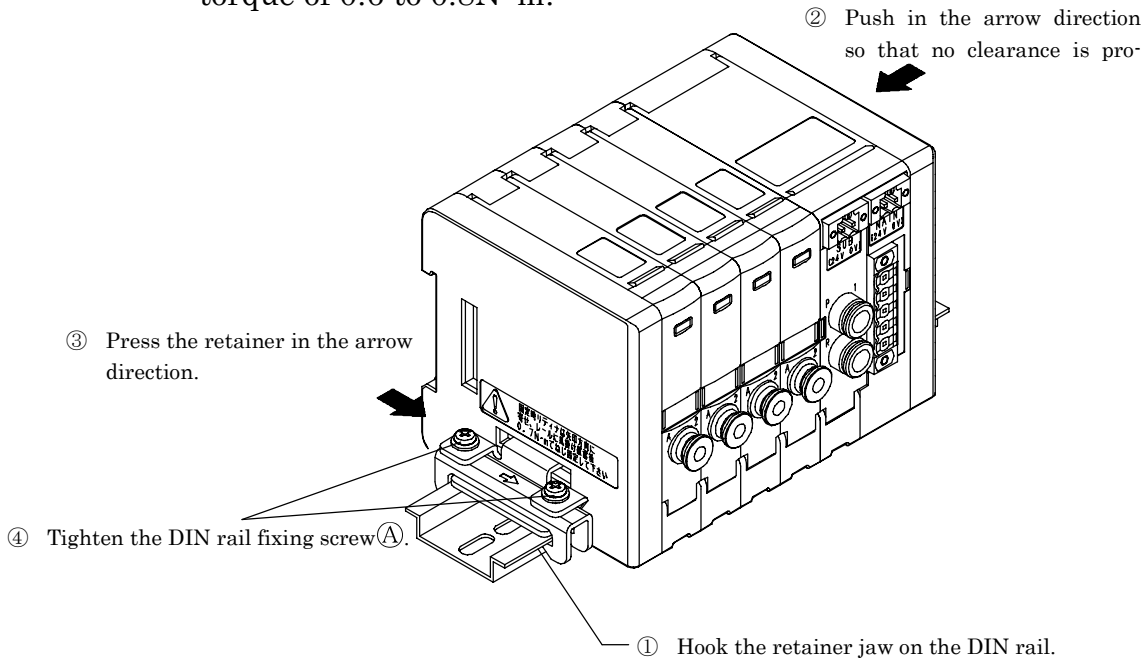
6. Insert the pipe joint Ⓗ (2pcs.) into the input (P) and exhaust (R) ports in the separated block.
   NOTE: The separation part, as shown below, is in the condition such that 4pipe joints Ⓗ (2pcs. each from both sides) are protruded.



7. Attach the added EVT to the DIN rails.



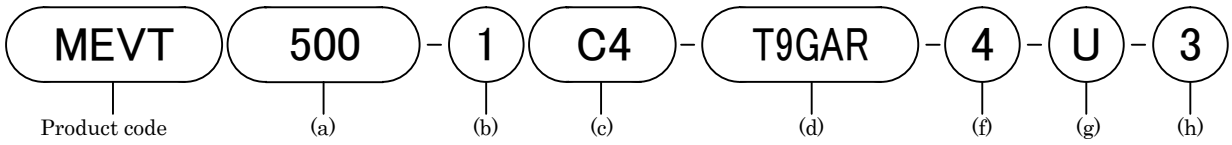
8. Press the end block so that no clearance is produced between the blocks, and hook the connecting hook springⒻ and connecting hook plateⒼ for coupling.
9. Insert the extended EVT signal line into the internal connector in the electric equipment, supply & exhaust block.
10. Close the wiring coverⒸ.
11. Close the wiring coverⒷ while giving care to signal line entangling.
12. ① Hook the retainer jaw on the DIN rail.
    ② While pressing the end block so that no clearance is produced between the blocks,
    ③ Press the retainer in the arrow direction, then
    ④ Tighten the DIN rail fixing screwⒶ by the recommendable tightening torque of 0.6 to 0.8N･m.



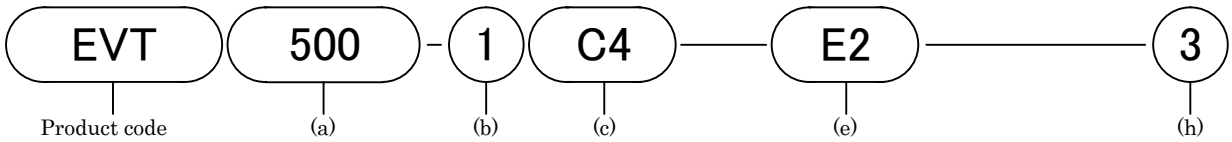
8. PRODUCT CODE

8.1 How to order

Manifold



Individual



Symbol	Description
(a) Control pressure range	
100	0 to 100kPa
500	0 to 0.5MPa
(b) Input signal	
1	0 to 5VDC
(c) Port size (Output port (A))	
C4	ϕ 4 Push-in joint
C6	ϕ 6 Push-in joint
(d) Electric equipment, supply and exhaust block	
T9DAR	Serial transmission type (DeviceNet In / Out = 4 / 4)
(e) Lead wire	
E2	4 Pin connector
(f) Manifold number	
1	1
to	
12	12
(g) DIN rail installation	
U	Under
B	Back
(h) Voltage	
3	DC24V

Precautions in Selecting Model

Note 1: The control input signal of serial transmission CC-Link type is only 0 to 5V DC.

Note 2: The input (P) & exhaust (R) port size should be designated in the electric equipment, supply & exhaust block.

Note 3: The input (P) & output (A) port has a built-in filter.

8.2 Component code

The following are component codes.

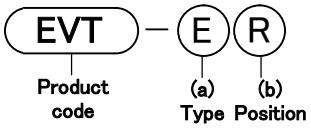
Plumbing section

A. EVT

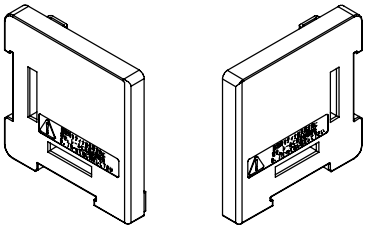
Select codes for individual from the optional table.

B. End block

In the case of the serial transmission type (T9GAR), install End blocks to both sides of manifold.

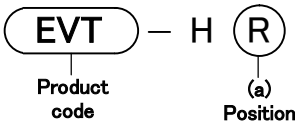


(a) Type		(b) Position	
E	Concentrated exhaust	L	Left
		R	Right

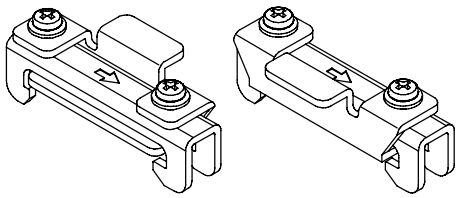


＜Retainer＞

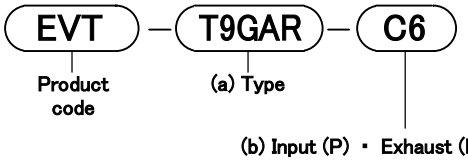
Fix retainers to both sides of manifold.

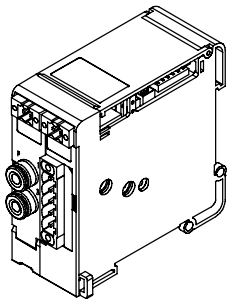


(a) Position	
L	Left
R	Right



C. Electric equipment, supply and exhaust block (Wiring section)



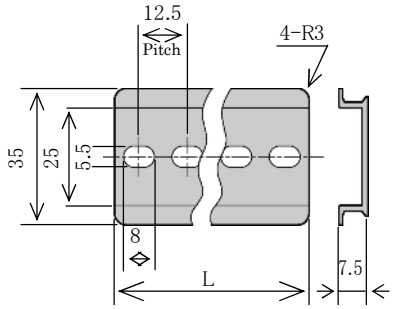


(a) Type		(b) Input (P) ・ Exhaust (R) port size	
T9GAR	CC-Link Ver1.10 Input / output = 4 / 4	C4	ϕ 4 Push-in joint
		C6	ϕ 6 Push-in joint

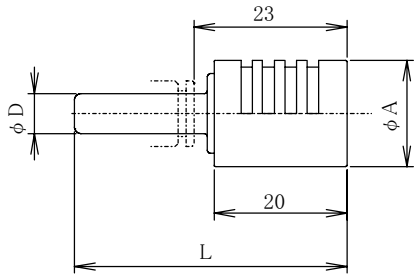
Peripheral equipment　DIN rail, Silencer, Blank plug

● DIN rail

EVT-BAA ＜Length＞

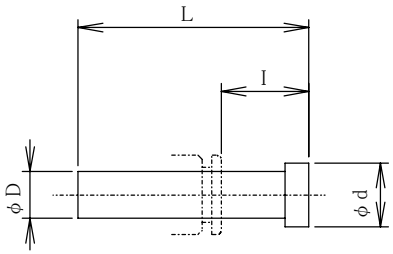


● Silencer



Product code	D	L	A
SLW-H6	6	41	16

● Blank plug



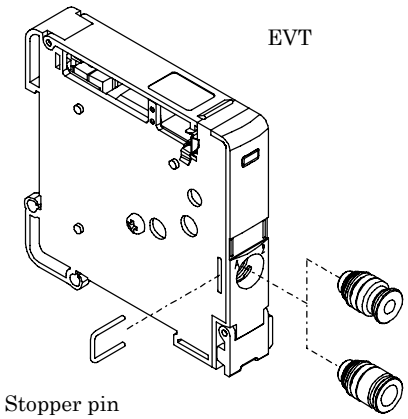
Product code	D	L	I	d
GWP4-B	4	27	9	6
GWP6-B	6	29	11	8

● Push-in joint

Model	Name of parts	Push-in joint Product code
EVT	φ 4 Straight type	4G1- JOINT -C4
	φ 6 Straight type	4G1- JOINT -C6

How to replace push-in joints.

⚠ CAUTION : In changing the push-in joint size, check the procedure and replace the joint.
It should be noted that incorrect mounting causes air leakage or the like.



① Pull out the stopper pin with a screwdriver or the like.
② Pull out the Push-in joint.
※ Take care so that the filter is not detached during this replacement.
③ Insert the joint for replacement vertically until it comes to the end.
④ Insert the stopper pin. Just pull the joint to check for mounting.