Discontinue

CKD

SM－11228－A

INSTRUCTION MANUAL

SERIAL TRANSMISSION TYPE

M4TB $\frac{3}{4}$－T621

- 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.

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

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:

⚠ CAUTION

- Incorrect address settings of serial transmission slave stations could cause the solenoid valve and the cylinder to malfunction. Before using the product, check the set address of the slave stations.
- For operation of serial transmission slave stations, read the communication system operation manual carefully.
- 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.

Discontinue

CONTENTS

M4TB□-T621
Serial Transmission Type
INSTRUCTION MANUAL No. SM-11228-A

NOTE: Symbol No. given in gothic brackets at the side of Page No. on each page and Symbol No. near or around the illustration, such as [C2-4PP07] and [V2-503-B], are the editing symbols that are not related to this text.

JAN. 7, 2004

1. PRODUCT

1.1 General outline of the system

1) M4TB□-T621 Solenoid Valve

This valve is the manifold solenoid valve equipped with OMRON's programmable controller (PLC) SYSMAC α/C/CV series of SYSBUS wire system and multi-link, connectable serial transmission unit block (OPP2-12A).

(1) PLC and manifold solenoid valve can be connected with only 2-conductor cables (VCTF0.75 × 2C recommendable), thereby reducing the wiring manpower.

(2) In the case of SYSBUS wire system, up to 32 manifold solenoid valves with serial transmission unit block can be connected to a single remote I/O master block (station), thus enabling 16-unit distributed control. (Total cable extension distance 200 m) In the case of multi-link, a solenoid valve can be connected to up to 8 manifolds with serial transmission unit block, thus enabling 16-unit distributed control. (Corresponding to OMRON 16-output unit; total cable extension distance 200 m)

(3) The unit power supply and valve power supply can be separated from each other, each of which is provided with monitor LED's. By turning only the valve power "OFF", the communication test can be conducted.

(4) Since a terminal resistance switch is used, there is no need to provide a terminal resistance in the terminal strip (block).

(5) The output holding switch makes it possible to hold and turn off the output signal during communication errors.

2) SYSBUS Wire System

This system is one of the OMRON programmable controller, SYSMAC α/C/CV series of remote I/O units: the section between PLC and I/O equipment is connected with a single 2-conductor cable, thereby achieving substantial wire saving. The SYSBUS wire system is characterized by:

(1) Realizing economical distributed control with two-wire type cable

The I/O transmission terminal and valve wire-saving unit, etc. are connected with a single two-wire type cable. Further, up to 32 serial transmission unit blocks can be connected to a single remote I/O master block, thus making it possible to distribute 16-unit I/O processing. This arrangement enhances cost performance substantially.

(2) Maximum transmission distance 200 m – the distance can be extended up to 1 km also mixing with the light transmission line

The total wire transmission line extension is 200 m, and further, if the link adaptor (B500-AL007-P) is used, an optical fiber cable becomes also available, thereby making it possible to enhance noise resistance and realize an extension of 1 km in total.

[SM-11228-A]

3) Multi-link

"Multi-link" is a wire-saving system that a general-purpose transmission system can readily be set up by connecting the G730-M master block with various programmable controllers and personal computer, etc., using a wire harness.

The features are as follows:

(1) Realizing economical distributed control with two-wire type cable

The terminal for "multi-link" and valve wire-saving unit, etc. can be connected from the G730-M master block with a single two-wire type cable.

Further, when I/O are deficient in 32-signal transmission by the master block, the G730-N extension block can be connected, thus allowing up to 128-I/O control.

(2) Control is possible with machine controller CQM1:

By using the G730 interface unit for CQM1, up to 128 remote I/O's can be controlled without making wiring connection between CQM1 and master block. (In the case of the G730 interface unit for CQM1, 32 inputs and 32 outputs (64 I/O's in total) can be controlled for the master block, and when controllable I/O's are short, up to 128 inputs and outputs can be controlled by connecting the extension block.)

(3) The transmission distance is 200 m max.

NOTE: Be sure to read the OMRON Users Manual.

In this material, explanation is given mainly of M4TB□-T621 and serial transmission unit block OPP2-12A.

For the OMRON programmable controller SYSMAC α/C/CV series and SYSBUS wire system & multi-link, read each users manual.

Concerning this manifold solenoid valve as well, do not forget to read both this material and manual described above, and correctly use this system over a long period of time with thorough understanding of all functions and performance.

For further details on SYSBUS Wire System and "Multi-Link", contact:

OMRON Corporation
Home page address : **http://www.omron.co.jp/**

1.2 Structure of the system

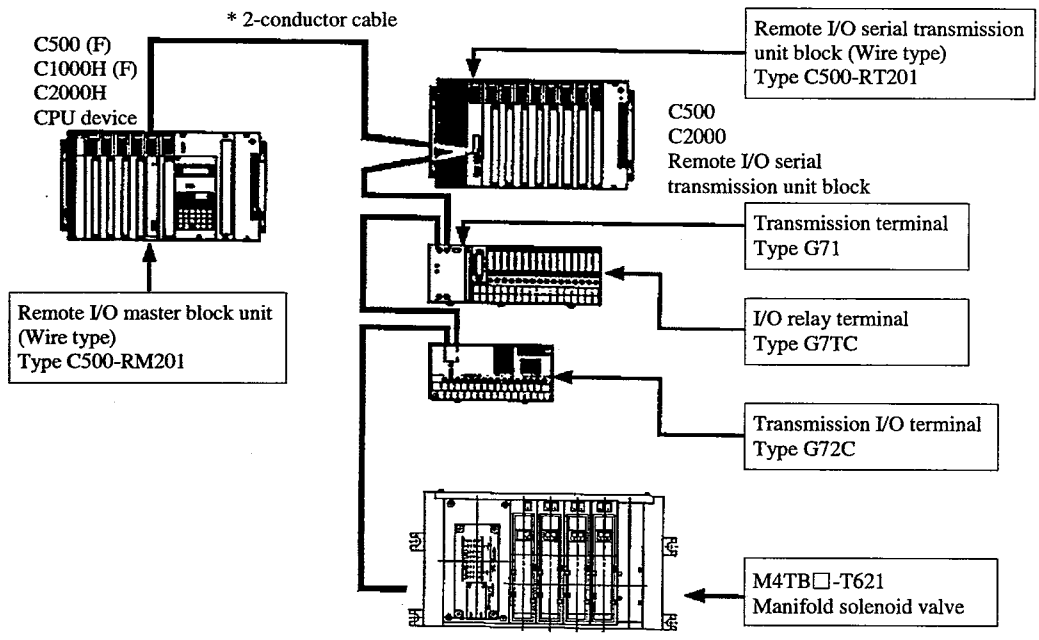
1) SYSBUS Wire System

This system is chiefly consists of the programmable controller main body, master block unit, M4TB□-T621 solenoid valve and peripheral equipment.

- Combinations of PLC and master block unit

PLC Type	Master Block Unit Type
CV500, CV1000 CVM1, C2000H C2000, C1000H C1000HF, C500 C500F, C120, C120F	Type C500-RM201 (Where this unit is used with C120 and C120F, mount it to the C500I/O extension unit before use.)
C200H, C200HS, C200HX/HG/HE	Type C200H-RM201

- Fundamental structure of system (Basic system configuration example using Type C500-RM201)



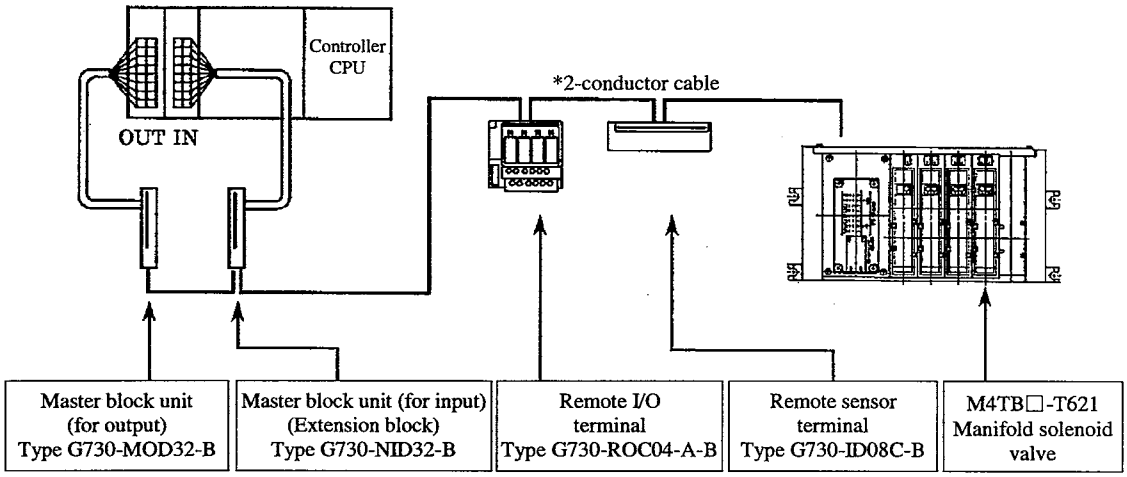
Transmission cable	VCT 0.75 x 2C (JIS)
Total cable extension	200 m max.

2) Multi-Link

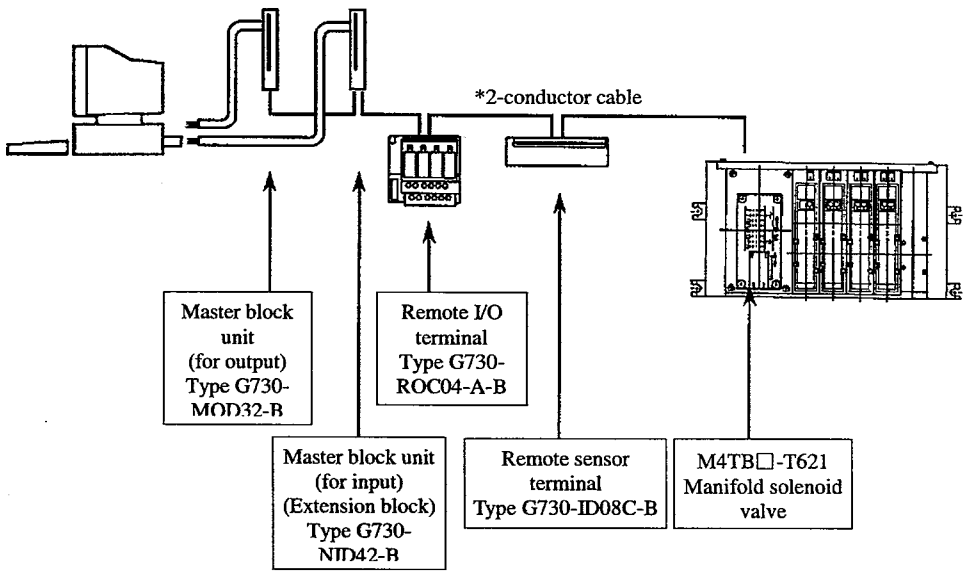
The multi-link is composed of various controllers, personal computers, master block (extension block), M4TB □-T62 Manifold specifications 1 solenoid valve and peripheral equipment.

- Basic system configuration

Example 1: More wire saving for various controllers



Example 2: Control by personal computer



Transmission cable	VCT 0.75 x 2C (JIS)
Total cable extension	200 m max.

1.3 Specifications

1) Solenoid valve specifications

(1) Manifold specifications

Item	SPEC			
	M4TB3 Series		M4TB4 Series	
Manifold system	Manifold block system		Manifold block system	
Applicable solenoid valve	4TB3 Series		4TB4 Series	
Number of stations	2 to 8 (16 max. for single solenoid)		2 to 8 (16 max. for single solenoid)	
Type of manifold	Common supply & common exhaust		Common supply & common exhaust	
Ambient temperature °C	5 - 50		5 - 50	
Ambient humidity	35 to 85% RH (No dew condensation allowed)		35 to 85% RH (No dew condensation allowed)	
Working atmosphere	No corrosive gas allowed		No corrosive gas allowed	
Fluid temperature °C	5 - 50		5 - 50	
Connection port size (diameter)	Supply port (P) Exhaust port (R)	Cylinder port (A/B)	Supply port (P) Exhaust port (R)	Cylinder port (A/B)
	Rc 1/2	Rc 1/4 · Rc 3/8	Rc 1/2	Rc 3/8 · Rc 1/2
	Pilot exhaust port (PR)	External pilot port (PA)	Pilot exhaust port (PR)	External pilot port (PA)
	Rc 1/8	Rc 1/8	Rc 1/8	Rc 1/8

(2) Solenoid valve specifications

Series Model No. / Position / Number of Solenoids / Item	M4TB3 Series				
	4TB310 2 positions Single	4TB320 2 positions Double	4TB330 3 positions All-port block	4TB340 3 positions ABR connection	4TB350 3 positions RAB connection
Working fluid	Compressed air				
Operating method	Pilot (Soft spool)				
Maximum working pressure MPa	1.0				
Minimum working pressure MPa	0.15	0.1	0.2		
Proof pressure MPa	1.5				
Effective sectional area mm^2	40		33		
Response time ms	30 max. (at 0.5 MPa)		50 max. (at 0.5 MPa)		
Manual override	Non-locking system; locking system (Optional)				
Lubrication	Not required (Where lubrication is required, use turbine oil class I ISO VG32 (#90).				
Protection structure	Dust-proof type – drip-proof type (optional)				

Series Model No. / Position / Number of Solenoids / Item	M4TB4 Series				
	4TB410 2 positions Single	4TB420 2 positions Double	4TB430 3 positions All-port block	4TB440 3 positions ABR connection	4TB450 3 positions RAB connection
Working fluid	Compressed air				
Operating method	Pilot (Soft spool)				
Maximum working pressure MPa	1.0				
Minimum working pressure MPa	0.15	0.1	0.2		
Proof pressure MPa	1.5				
Effective sectional area mm^2	70		60		
Response time ms	50 max. (at 0.5 MPa)		70 max. (at 0.5 MPa)		
Manual override	Non-locking system; locking system (Optional)				
Lubrication	Not required (Where lubrication is required, use turbine oil class I ISO VG32 (#90).				
Protection structure	Dust-proof type – drip-proof type (optional)				

(3) Electrical Specifications

Item	SPEC
	M4TB3, M4TB4 Series
Rated voltage (V)	DC 24 ± 10%
Current consumption (mA)	80
Power consumption (W)	1.9
Miscellaneous	Lamp and surge killer built in

2) Communication specifications

Item	SPEC
Communication system	2-wire type half duplex
Synchronizing system	Asynchronous system
Transmission line	2-conductor cable (VCTF0.75 x 2C recommendable)
Interface	RS-485
Transmission speed	187.5KBPS
Transmission distance	200 m (total extension)
Diagnostic function (See NOTE 1)	Transmission error check (BCC + reversing 2-station feed checking) and CPU error monitor

NOTE 1: This function is a function in SYSBUS Wire System.

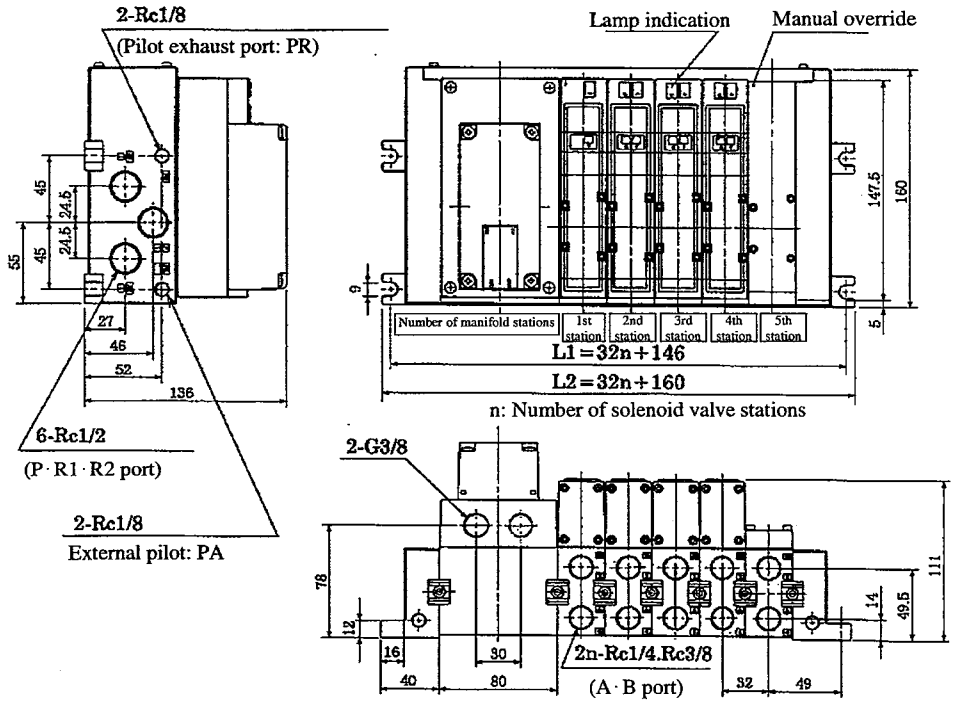
3) Serial transmission unit block specifications

Item		SPEC
Supply voltage (Unit side)		DC 24 V ±10%
Current consumption (Unit side)		100 mA max. (With 16 outputs ON)
Supply voltage (Valve side)		DC 24 V +10%, 5%
Current consumption (Valve side)		15 mA max. (With all outputs "OFF")
Insulation resistance		Between all external terminals and case – 20 MΩ min., with 500 V DC megger
Withstand voltage		500 V AC between all external terminals and case, for one minute
Noise resistance		1000 Vp-p pulse width 100 nsec, 1 μsec
Mechanical vibration-proof	Durability	15 sweeps each in X-, Y- and Z-axis directions at 10 - 150 - 10 Hz, 1 octave/min, half amplitude 0.75 mm or 10G, whichever is smaller
	Malfunction	4 sweeps each in X-, Y- and Z-axis directions at 10 - 150 - 10 Hz, 1 octave/min, half amplitude 0.5 mm or 7G, whichever is smaller
Mechanical shock proof		3 times at 30G in 3 directions
Ambient temperature		5 - 50°C
Ambient humidity		30 to 85% RH (No dew condensation allowed)
Working atmosphere		No corrosive gas allowed
Protection structure		IP64 (Dust-proof & drip-proof structure)
Communication object		SYSBUS wire system & multi-link (G730)
Number of outputs		16
Output insulation system		Photocoupler insulation
Maximum load current		100 mA/point
Leak current		0.1 mA max.
Residual voltage		0.5 V max.
Output type		NPN transistor open collector output
Fuse		48 V, 2A (LM20 – DAITO TSUSHINKI)
Operating indication		LED (Lighting up at "ON")
Number of occupied channels		SYSBUS: 1 channel – Multi-link: 4 channels (See NOTE 1)

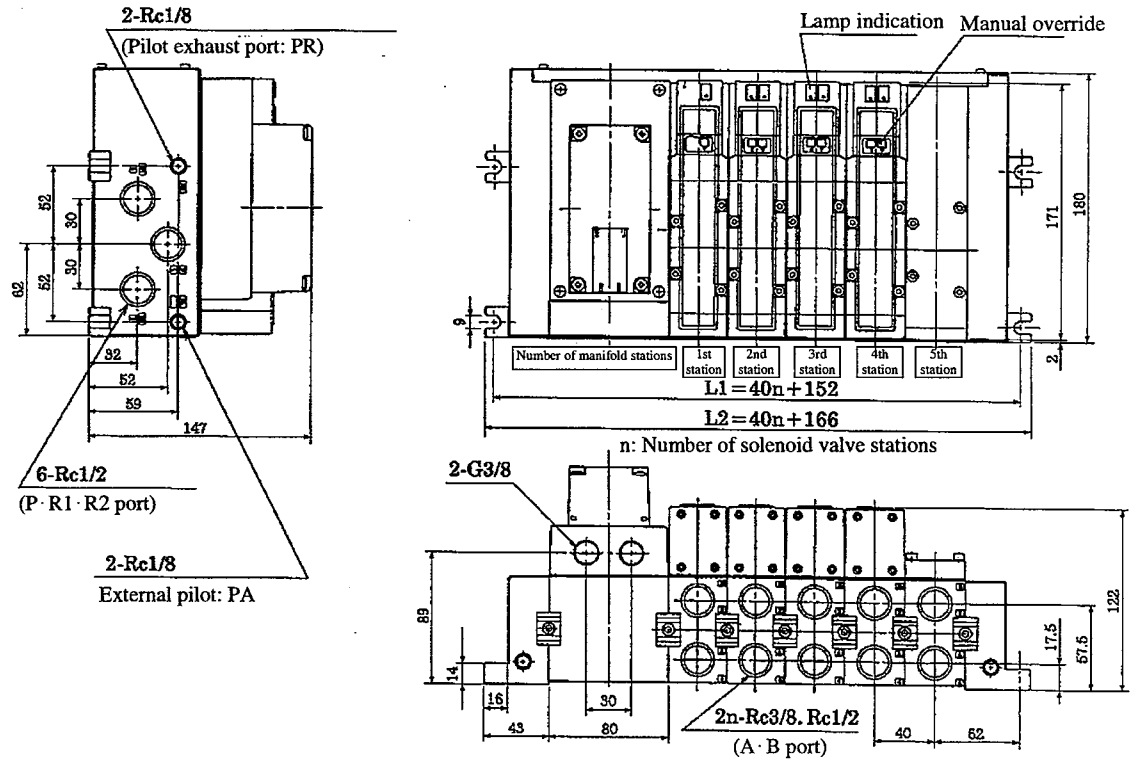
NOTE 1: Corresponding to 16-output unit by OMRON

1.4 Solenoid Valve External Dimensions

- M4TB3*0-*-*T621-*

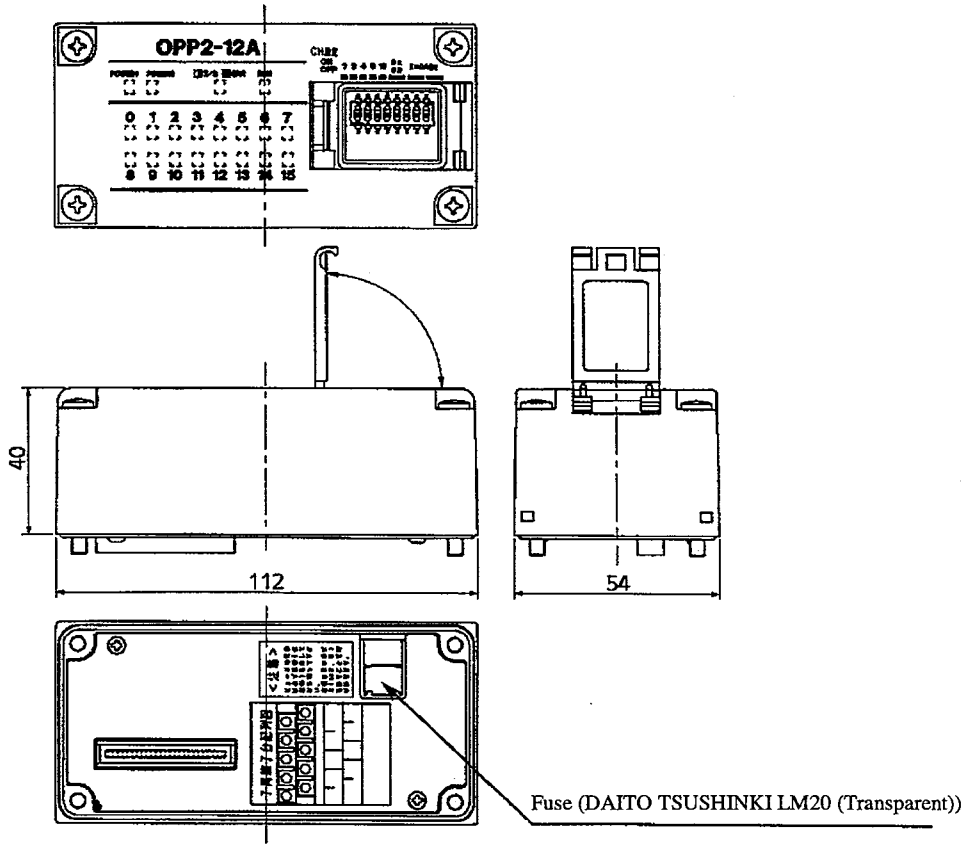


- M4TB4*0-*-*T621-*



1.5 Serial transmission unit block for valve

1) External shape of serial transmission unit block for valve



2) Fuse

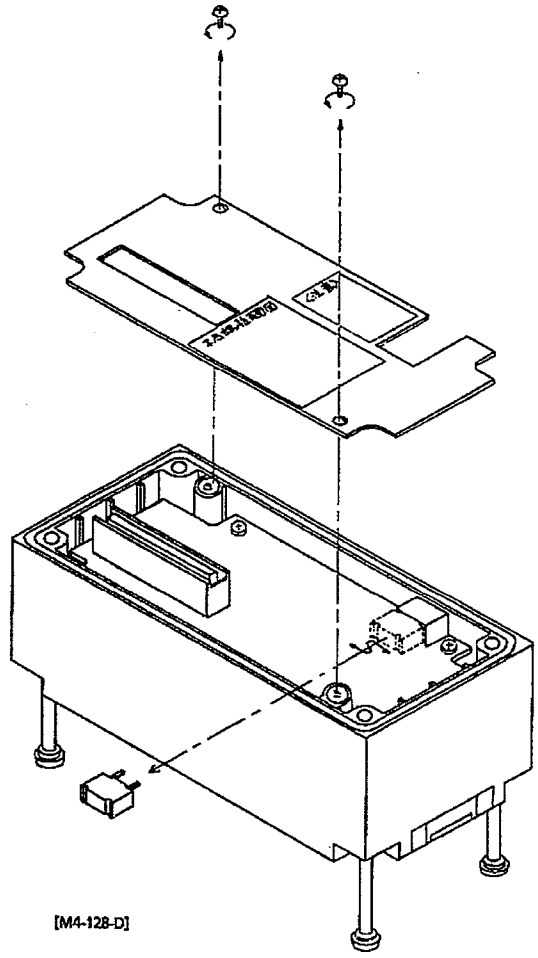
It is possible to check for a blown fuse from the lower part of the serial transmission unit block for valve. When replacing the fuse, be sure to remove the bottom plate (metallic plate), then insert the fuse straight into the fuse socket to the full depth. For a replacement fuse, use the following purchased one.
Also, never fail to dispose of the fuse thus replaced immediately to avoid mixture with the normal fuse.
To check the fuse for melting, use a tester or the like.

Fuse for replacement: LM20 (Transparent) made by DAITO TSUSHINKI K.K
CKD Model No. 4T9-LM20

A fuse may be blown because there occurred some abnormal condition in most cases, such as shortcircuit. If a blown fuse results from such an abnormality, be sure to remove the cause of its abnormality, then turn the power ON. (There may be some cases of the fuse being blown due to aging, which is rare.)

Fuse Replacement Procedure

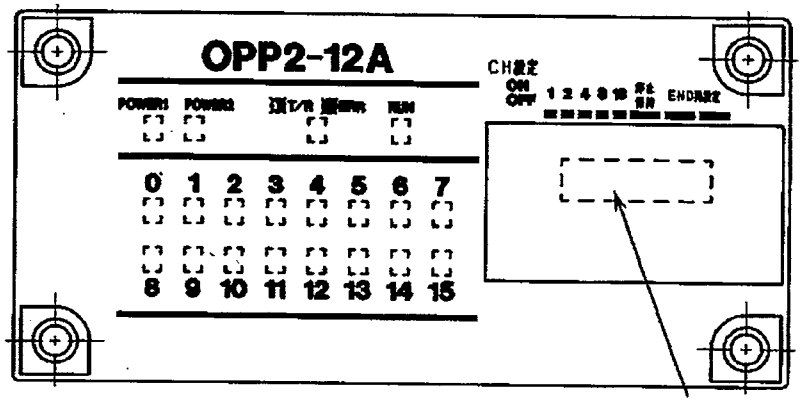
After ensuring that the fuse has been blown, replace it according to the procedure given in the figure below.



(1) Remove 2 screws (M2.5). Always use a screwdriver matching the screw tip profile.
(2) Detach the bottom plate.
(3) Pull out the fuse by hand. At that time, pull it out while moving it to the right and left: it can be pulled out with ease. In this case, avoid using a tool: if it is used when pulled out, damage may be caused to the wiring pattern on the printed circuit board: always pull it out "by hand".
(4) Insert the replacement fuse straight into the fuse socket to the full depth.
(5) Ensure that no foreign matter is intruding therein, such as chips, and return the bottom plate as it was.

3) Indication and Setting Switch

(1) The serial transmission unit block for valve is provided with different types of LED lamps so that the running condition can be checked from the outside. The lamp function indication is printed on the resin cover in the upper part. The running condition as shown below is indicated. During operation check or maintenance work, refer to these indications.

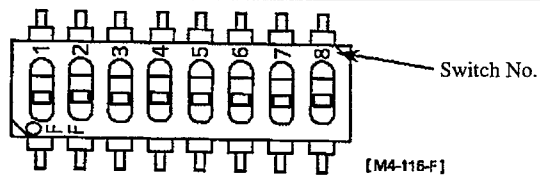


DIP switch for setting

LED Name	Indication Contents
POWER1	Lights up when the unit power is ON.
POWER2	Lights up when the valve power is ON and the fuse is normal.
T/R ERR	Flickers when the transmission is normal and lights up when it is not normal.
RUN	Lights up when the transmission is normal and the PLC main body is in the running mode. (See NOTE 1.)
0-15	The output condition is indicated. The LED lights up at "ON".

NOTE 1: This LED does not light up when the G730 interface unit (Type CQM1-G7M) for CQM1 is used for the master block in "Multi-link".

Switch Name	Setting Contents
CH (Channel) setting switch (Switch Nos. 1 to 5)	Allocates the serial transmission unit block channel (SYSBUS wire system) or address (multi-link) to PLC I/O.
Output mode setting switch (Switch No. 6)	Selects whether each output condition is maintained or all outputs are turned OFF (stopped) when the transmission became abnormal.
End station (block) setting switch (Switch Nos. 7 & 8)	When the serial transmission unit block is the end station (serial transmission unit block at the farthest end from the master block (station), both switches (Nos. 7 & 8) are turned "ON".



DIP SW for Setting

(2) The setting switch is used to set the channel (SYSBUS wire system) that the serial transmission unit block for valve has or the address (multi-link), output mode at abnormal transmission and end station. (Check this according to the "OPERATION" paragraph given in Section 3.)
Before supplying power to the serial transmission unit block for valve, these settings are always required.

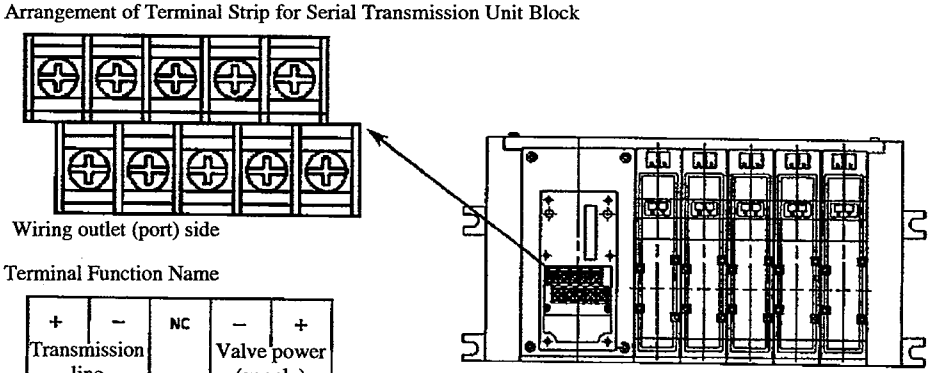
- The cover in the switch part of serial transmission unit block can be opened and closed at one touch. Be sure to keep this cover closed except when the switch is set; otherwise, some foreign matter intrudes into the internal circuit portion from the cover part, causing unexpected failure and giving rise to cover damage. Also, take utmost care so that no foreign matter enters the internal part during setting as well.
- The setting switch is extremely precision made; if handled roughly, therefore, this switch may be damaged. Also, absolutely avoid touching the internal circuit board during setting.

1.6 Mounting part of serial transmission unit block for valve

By removing four M4 screws of the OPP2-12A serial transmission unit block for valve, the serial transmission unit block for valve can be detached right above. In attaching the serial transmission unit block for valve, ensure that the connector on the bottom surface of serial transmission unit block for valve is connected correctly with that in the mounting part of serial transmission unit block, and that no cable or the like is caught between the serial transmission unit block and mounting part, then tighten the screw. (Tightening torque: 0.5 to 0.7N-m) Avoid storing it with only the connector connected, prying and applying unrequired force; otherwise, the serial transmission unit block will fall off, and damage will be caused to the connector. Also, avoid storing the valve manifold with the serial transmission unit block removed; otherwise, some dust or dirt and foreign matter may intrude into the connector part and electrical connection part, resulting in shortcircuit and poor contact. Similarly, during wiring work, avoid touching the connector part and wiring board, and putting dust and foreign matter therein.

The mounting part of serial transmission unit block is as shown in the figure below.

Arrangement of Terminal Strip for Serial Transmission Unit Block



Wiring outlet (port) side

Terminal Function Name

+	−	NC	−	+
Transmission line			Valve power (supply)	

NC	NC	NC	−	+
			Unit power (supply)	

The terminal strip is provided in the serial transmission unit block mounting part. For connection wiring to the serial transmission unit block, this terminal strip is used. Each terminal function is printed and indicated on the mounting surface of serial transmission unit block for valve.

- Use a 6 mm or less wide crimp terminal for M3 and fix it to the tightening torque of 0.3 to 0.5N-m.
- Since this mounting part is an extremely important place, take special care so that no water, dust or dirt and foreign matter, etc. do not intrude therein.

The following are the functional explanation of each terminal and main connecting destination.

Symbol		Function	Connected Mainly to:
Transmission line	+	Terminal for transmission	Connects the communication signal line. Connect [Transmission line +] & remote I/O signal line [+] and [Transmission line -] & signal line [-] with each other.
	-		
Unit power supply	+	Unit power supply	Use DC power supply 24 V +/- 10%, ripple 0.5 Vp-p with less noise. If the polarity is mistaken, no operation is carried out.
	-		
Valve power supply	+	Valve power supply	Use DC power supply 24 V + 10% - 5% with less noise. If the polarity is mistaken, the fuse of serial transmission unit block will be blown.
	-		
N・C		Not used.	No connection is allowed.

2
CAUTION

2. CAUTION

1) Output transmission delay time

- For SYSBUS wire system:

  The transmission time of this serial transmission unit block for valve is 2 ms/unit. (5 ms in the abnormal state)

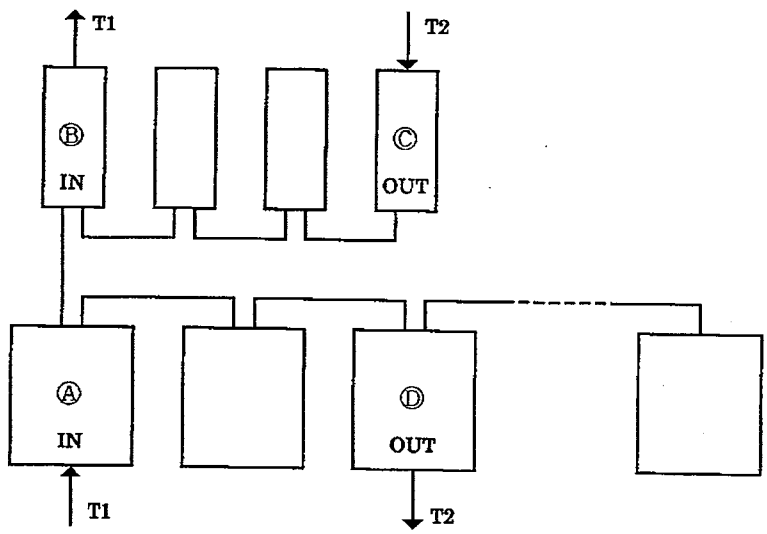
  Also, check the solenoid valve response time in the solenoid valve specifications since it differs among the models.

  Furthermore, the OFF time delays another 20 ms or so since a flywheel diode is used in the serial transmission unit block for valve as a surge absorbing circuit.

- For multi-link:

  Assume the time from serial transmission unit block (A) input to output to master block unit (B) to be "T1", and the time from master block unit (C) input to output to serial transmission unit block (D) to be "T2":

  Transmission delay time (T1 or T2) ≤ (Number of serial transmission unit blocks + number of extension blocks + 1) x 1.3 x 0.6 (ms)



The delay in transmission time as a system differs, depending on the PLC main body scanning time and other equipment connected to the same master block (station). In this connection, refer to the PLC main body and master block manuals.

Also, check the solenoid valve response time in the solenoid valve specifications since it differs among the models. Furthermore, the OFF time delays another 20 ms or so since a flywheel diode is used in the serial transmission unit block for valve as a surge absorbing circuit.

3. OPERATION

3.1 Switch Setting

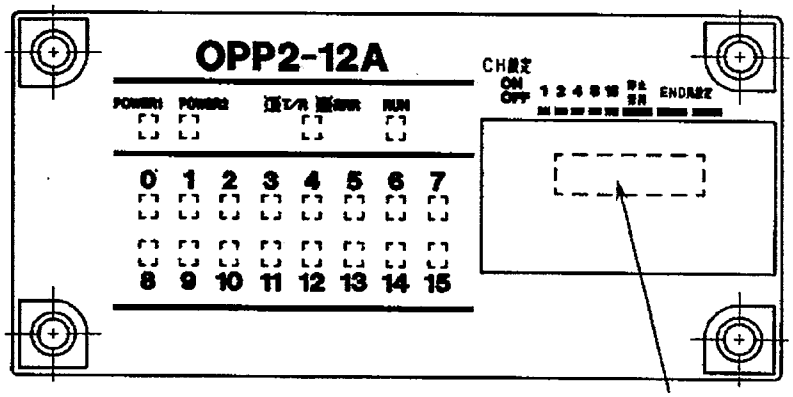
With this switch, the following functional settings are available:

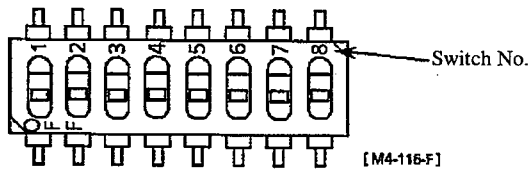
1) Channel No. (SYSBUS Wire System)

2) Address No. (Multi link)

3) Output mode end station (block) setting in the abnormal condition

Since the function differs, depending on the switch position, be sure to check this position, then start setting work. Prior to switch setting, never fail to turn the power "OFF".



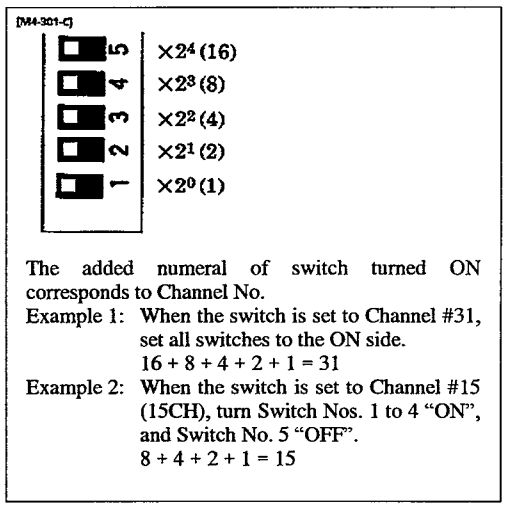


DIP SW for Setting

● Channel No. setting switch (SW Nos. 1 to 5)

(1) SYSBUS Wire System

Channel No. of transmission terminal connected to this serial transmission unit block for valve and the same signal line should be set sequentially to the smaller number starting with #31. (However, for C120(F), set Channel No. to the smaller number from #15.) The correspondence between Channel No. and switch is as shown in the table below: each switch is, however, weighted for easier calculation. No setting of Channel No. overlapped for one master block (station) is allowed.



The added numeral of switch turned ON corresponds to Channel No.

Example 1: When the switch is set to Channel #31, set all switches to the ON side.
16 + 8 + 4 + 2 + 1 = 31

Example 2: When the switch is set to Channel #15 (15CH), turn Switch Nos. 1 to 4 "ON", and Switch No. 5 "OFF".
8 + 4 + 2 + 1 = 15

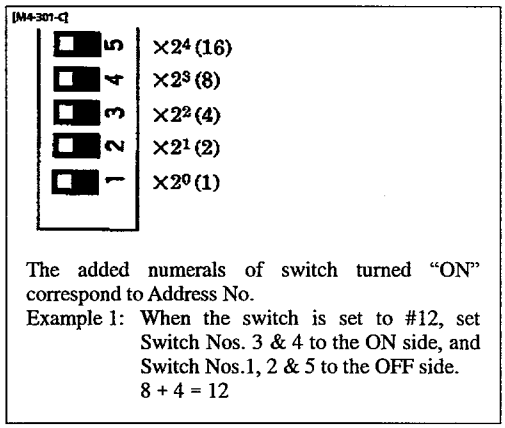
● Channel Setting (0: OFF – 1: ON)

Channel	Switch					Channel	Switch				
	1	2	3	4	5		1	2	3	4	5
#0	0	0	0	0	0	#16	0	0	0	0	1
#1	1	0	0	0	0	#17	1	0	0	0	1
#2	0	1	0	0	0	#18	0	1	0	0	1
#3	1	1	0	0	0	#19	1	1	0	0	1
#4	0	0	1	0	0	#20	0	0	1	0	1
#5	1	0	1	0	0	#21	1	0	1	0	1
#6	0	1	1	0	0	#22	0	1	1	0	1
#7	1	1	1	0	0	#23	1	1	1	0	1
#8	0	0	0	1	0	#24	0	0	0	1	1
#9	1	0	0	1	0	#25	1	0	0	1	1
#10	0	1	0	1	0	#26	0	1	0	1	1
#11	1	1	0	1	0	#27	1	1	0	1	1
#12	0	0	1	1	0	#28	0	0	1	1	1
#13	1	0	1	1	0	#29	1	0	1	1	1
#14	0	1	1	1	0	#30	0	1	1	1	1
#15	1	1	1	1	0	#31	1	1	1	1	1

(2) Multi Link

This serial transmission unit block for valve corresponds to OMRON's 16-output unit. Accordingly, among Address #0 to 27, the switch becomes settable to #0, 4, 8, 12, 16, 20, 24 and 26.

The correspondence between the address and switch is as shown in the table below. (Each switch is weighted.)



The added numerals of switch turned "ON" correspond to Address No.

Example 1: When the switch is set to #12, set Switch Nos. 3 & 4 to the ON side, and Switch Nos.1, 2 & 5 to the OFF side.
8 + 4 = 12

● Address Setting (0: OFF – 1: ON)

Address No.	Switch				
	1	2	3	4	5
#0	0	0	0	0	0
#4	0	0	1	0	0
#8	0	0	0	1	0
#12	0	0	1	1	0
#16	0	0	0	0	1
#20	0	0	1	0	1
#24	0	0	0	1	1
#26	0	1	0	1	1

- Output mode setting in abnormal condition (Switch No. 6)

  This switch is used to set whether the data outputted so far is continuously outputted or it is turned OFF in the abnormal condition. Also, there are cases of no data being able to be held according to the abnormal condition.

Switch No. 6	
ON	OFF
Holding mode	Stop mode
When the transmission is abnormal, the OUT channel maintains the state before the abnormal condition.	When the transmission is abnormal, all OUT channels are turned OFF.

- End block setting (Switch Nos. 7 & 8)

  Only when this serial transmission unit block becomes the last serial transmission unit block transmission terminal connected to signal wiring from the master block (station), both switches (Nos. 7 & 8) are turned ON. If not, these two switches are set to "OFF".

Also, this serial transmission unit block is not provided with a switch corresponding to "Output Inhibit Switch," but by turning the valve power ON and OFF, the same effect is obtained.

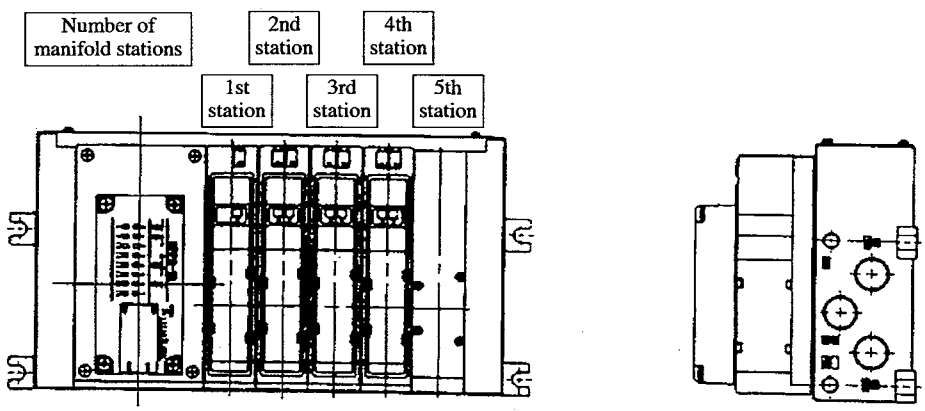
3.2 Correspondence Among Channel Data, Serial Transmission Unit Block Output No. and Internal Connector

Channel internal data No., serial transmission unit block output No. and connector pin No. correspond to one another as follows.

Channel data	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Output No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Internal connector pin No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

3.3 Correspondence between output of serial transmission unit block for valve and valve solenoid

1) The correspondence between connector pin No. and manifold solenoid is shown in the table below.
2) The number of manifold stations is set sequentially from the left with the piping port toward the operator side regardless of the position on the piping block side.



Manifold Wiring Row

- Single solenoid valve:

	Connector Pin No.															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1st station	○															
2nd station		○														
3rd station			○													
4th station				○												
5th station					○											
6th station						○										
7th station							○									
8th station								○								
9th station									○							
10th station										○						
11th station											○					
12th station												○				
13th station													○			
14th station														○		
15th station															○	
16th station																○
Symbol	○ SOL. (a) side / ● SOL. (b) side															

(The maximum number of manifold stations available is 16.)

- Double solenoid valve:

	Connector Pin No.															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1st station	○	●														
2nd station			○	●												
3rd station					○	●										
4th station							○	●								
5th station									○	●						
6th station											○	●				
7th station													○	●		
8th station															○	●
9th station																
10th station																
11th station																
12th station																
13th station																
14th station																
15th station																
16th station																
Symbol	○ SOL. (a) side / ● SOL. (b) side															

(The maximum number of manifold stations available is 8.)

- Mixed solenoid valves – single & double:

	Connector Pin No.															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1st station	○															
2nd station		○														
3rd station			○	●												
4th station					○	●										
5th station							○									
6th station								○								
7th station									○	●						
8th station											○					
9th station												○				
10th station													○	●		
11th station															○	●
12th station																
13th station																
14th station																
15th station																
16th station																
Symbol	○ SOL. (a) side / ● SOL. (b) side															

(The maximum number of solenoids available is 16.)

3) Since these valves are arranged and set in sequence, a vacant number may be produced in Output No. according to the number of manifold valve stations.
It is impossible to utilize the output not connected as a vacant number for drive of other equipment.

3.4 Programming

In the program, this serial transmission unit block for valve is handled in the same manner as with transmission terminal output by OMRON in the case of SYSBUS Wire System. For multi link, however, this is handled in the same manner as with OMRON's 16-output unit (Type G730). According to the communication system to be used, check this in OMRON Users Manual.

4. INSTALLATION

4.1 Wiring Method

To allow M4TB□-T621 to function, the communication line and power line must be connected with each other. If this connection is mistaken, Model T621 may not only cease to function but cause a serious trouble to another equipments as well as to this product. Before use, therefore, you are required to read this document and OMRON's Programmable Controller SYSMAC α/C/CV Series & applicable communication system (SYSBUS Wire System or Multi-Link) users manuals and use this system with proper connection.

1) Recommendable signal line

2-conductor VCTF (Vinyl cabtyre cable) 0.75 x 2C

The total cable length should be 200 m max.

Avoid the transmission line in parallel with and in close vicinity to the power line. (Using a shielding wire, keep this line at least 15 cm away from the power line.)

2) Signal line wiring

M4TB□-T621 is provided with two wiring outlets.

Use either one of the following wiring methods.

Make wiring connections in sequence from the master block (station), and set the end station (ON) to the unit at the final connection end.

In any case, connect signal terminals [+] with each other and [-] with each other. ("[+] & [-]" only indicate the discrimination of signal terminal. You should not make wrong connections to power supply or the like because [+] & [-] indication is present: such wrong connections may lead to product damage.)

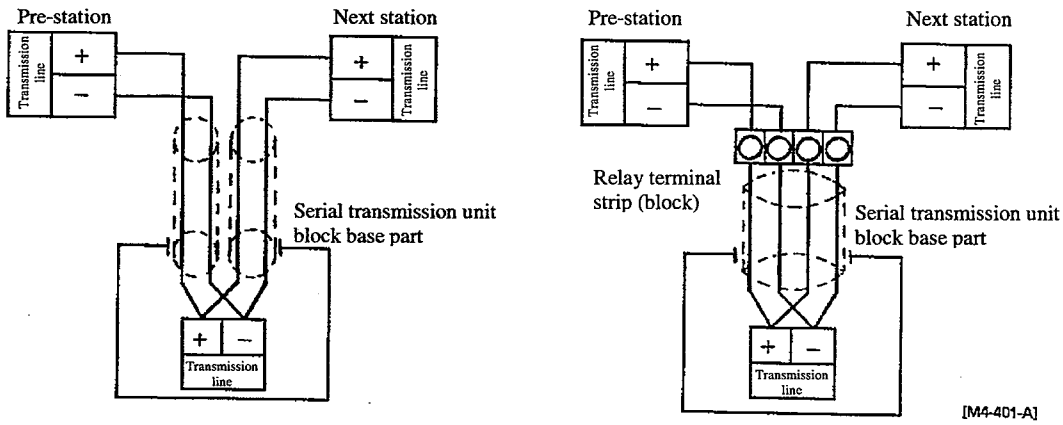
- Where the environment is relatively favorable and no dustproofness is required: (or where the wiring outlet can be protected by some method)

  Pass 2 signal lines through one wiring outlet and pass the power line through the other wiring outlet.

- Where dustproofness is required:

  Relay one wiring outlet with a 4-conductor cable for signal line and the other wiring outlet through the power line in a place with good surroundings near the solenoid valve (relay box, etc.).

  Protect the root with a cable clamp or the like.



3) Recommended power line

Select a wire material matching the wiring distance & energized current, and having sufficiently small voltage loss as a power line. Divide the power supply into several wiring systems as needed so that voltage loss in one wiring system is controlled. Also, the method of providing a power supply near the solenoid valve in the field is effective.

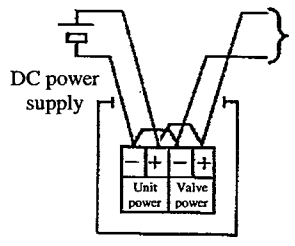
The voltage should be 24 V DC + 10% - 5% in the solenoid valve part.

4) Power line wiring

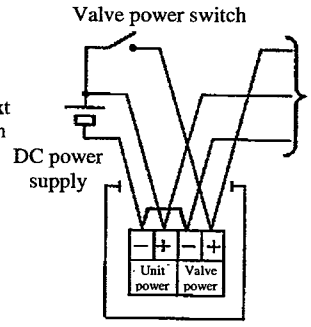
For the power line, use either one of the following wiring methods.

- Where the environment is relatively favorable and no dustproofness is required:

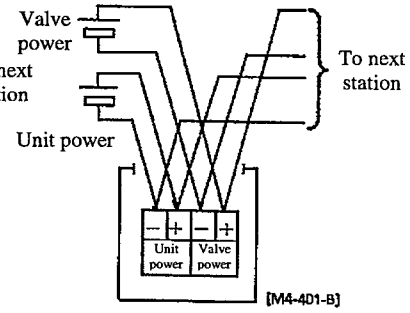
① Connection of unit power and valve power in common



② Connection for valve power ON/OFF



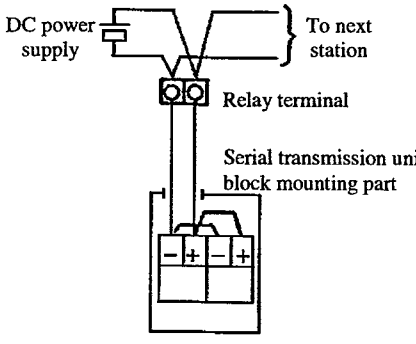
③ Connection for separating unit power and valve power



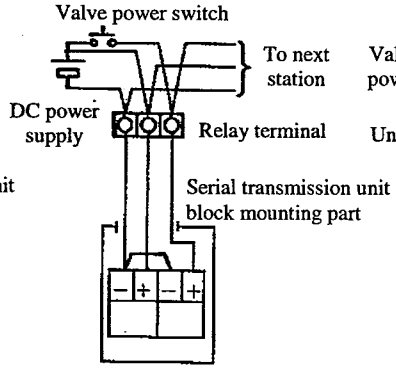
[M4-401-B]

- Where dustproofness is required:

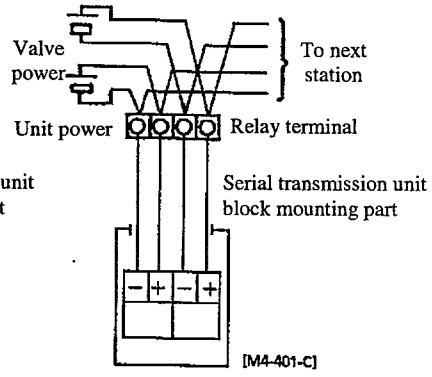
① Connection of unit power and valve power in common



② Connection for valve power ON/OFF



③ Connection for separating unit power and valve power



[M4-401-C]

NOTE: Where power is supplied to several serial transmission unit blocks and remote I/O from a single power supply, select a cable and make wiring connections with due consideration given to voltage drop caused by electric wires. When voltage drop caused by the power line of one system is unavoidable, take adequate measures; for example, arrange the power line of several systems or provide another power supply near the field equipment, and also secure the voltage within the rated voltage range.

5. MAINTENANCE

5.1 Troubleshooting

The troubleshooting of this serial transmission unit block for valve must be carried out not as a unit but as a system. This serial transmission unit block for valve is provided with the same LED indicators as in OMRON's transmission terminal and multi link terminal (output unit): based on this indication and master block indication, the error contents are judged to take proper action. In this connection, refer to the "Troubleshooting" paragraph given in the manual for communication system to be used (SYSBUS Wire System or Multi-link). Also, check the following items as the checking item unique to this serial transmission unit block for valve.

- PW1 LED does not light up:

  ..... Check for unit power and connection: there is a possibility of unit power "OFF" or reverse connection.

- PW2 LED does not light up and no valve is actuated:

  ..... Check for power and connection: there is a possibility of valve power OFF or reverse connection.

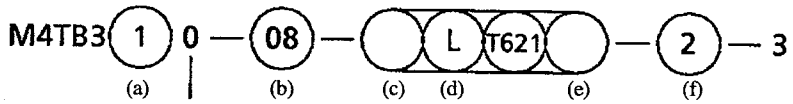
  Also, there is a possibility that a fuse on the bottom surface of serial transmission unit block for valve is blown; it is, therefore, necessary to read the "2) Fuse" paragraph given in "1.5 Serial Transmission Unit Block for Valve", and replace the fuse if necessary.

Discontinue

6. Model Coding

- Solenoid valve unit for manifold

- Block manifold



(a) Position type	
Symbol	Contents
1	2-position single operator
2	2-position double operator
3	3-position all-port closed (blocked)
4	3-position load ports open to exhaust ports (AB port connection)
5	3-position load ports open to center port (PAB port connection)
8	Mix manifold

(b) Connecting port diameter (size) (Cylinder port)	
Symbol	Contents
08	RC1/4
10	Rc3/8
08Y	Rc1/4 (Bottom porting)

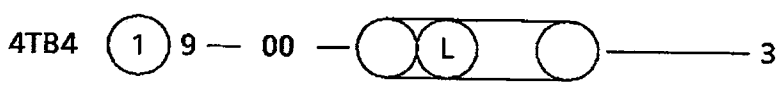
(c) Manual override	
Symbol	Contents
No code (marking)	Non-locking type manual override
M1	Locking type manual override (optional)

(d) Indication & protection circuit	
Symbol	Contents
L	With lamp surge killer
No code	Without lamp surge killer

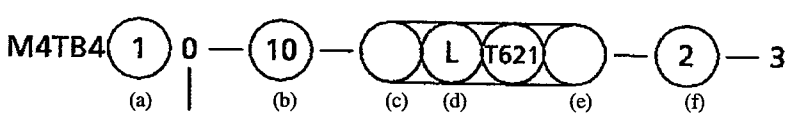
(e) Other options	
Symbol	Contents
No code	None
K	External pilot
P	Drip-proof

(f) Number of manifold solenoid valve stations	
Symbol	Contents
2	2 stations
¦	¦

- Solenoid valve unit for manifold



- Block manifold



(a) Position type	
Symbol	Contents
1	2-position single operator
2	2-position double operator
3	3-position all-port closed (blocked)
4	3-position load ports open to exhaust ports (AB port connection)
5	3-position load ports open to center port (PAB port connection)
8	Mix manifold

(b) Connecting port diameter (size) (Cylinder port)	
Symbol	Contents
10	RC3/8
15	Rc1/2
10Y	Rc3/8(Bottom porting)

(c) Manual override	
Symbol	Contents
No code (marking)	Non-locking type manual override
M1	Locking type manual override (optional)

(d) Indication & protection circuit	
Symbol	Contents
L	With lamp surge killer
No code	Without lamp surge killer

(e) Other options	
Symbol	Contents
No code	None
K	External pilot
P	Drip-proof

(f) Number of manifold solenoid valve stations	
Symbol	Contents
2	2 stations
¦	¦