Discontinue

CKD

SM-252986-A

INSTRUCTION MANUAL

SERIAL TRANSMISSION TYPE

MN4TB $\frac{1}{2}$-T6J0

MN4TB $\frac{1}{2}$-T6J1

- 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 safely, 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 instruction manual carefully for proper operation.

Observe the cautions on handling described in this manual, as well as the following instructions:

⚠ Precautions

- 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 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.

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NOTE : Letters & figures enclosed within Gothic style bracket (examples such as [C2-4PP07] · [V2-503-B] etc.) are editorial symbols being unrelated with contents of the book.

1. PRODUCT

1.1 General outline of System

1) MN4TB□-T6J0 and T6J1 Solenoid valves

This product is a manifold solenoid valve incorporating a serial transmission slave station to be connected to the uniwire H system.

(1) Wiring man-hour is economized as a single 2-core cabtyre cable only is required to connect send unit and manifold type solenoid valves. (Local electric power type)
It is also able to make use of 4-core cabtyre cable to connect together with electric power. (Centralized power line type)

(2) Since both the multi-drop wiring and T-type branch wiring can be performed, the cables can be run clearly when the valves are branch-located.

(3) The send unit can detect a broken circuit of the serial transmission slave station (address of the serial transmission slave station is shown on the LED).

(4) Up to 128 points are available to connect manifold type solenoid valves. It is also capable to be controlled devided into the group of 8-point or 16-point. (Max. sum of total cable length is 200cm)

(5) LED indicator lamps to aid visual varification of ON or OFF at a glance.

(6) It is selectable either "Hold" or "Off" of output signals in case of abnormal transmission, owing to the self holding switch of Output signal.

Note) Before using this manifold solenoid valve, thoroughly read this instruction manual to fully understand its function and performance.

2) What is the Uniwire H system ?

It is the system achieved remarkably economical wiring by connecting controller such as PLC and its devided equipment with 2-core signal cable and 2-core power cable. Its characteristic is as follows.

(1) Remarkably economical wiring

With a conventional connection of PLC Input/Output unit to censor, relay and/or motor of respective equipment, the number of wires required corresponds to the number of each Output and Input point, whereas by the uniwire system, those signals are able to be transmitted through only a 2-core cable (4-core cable including power line) .

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(2) No preferrence of PLC

Various type of interfaces (Uni-connector) are provided to make any PLC of any manufacturers serviceable to the system.

(3) Max. 128 points connectable (Input and Output mingled)

It is controllable Input and Output within the range from 1 to 2 points per unit up to 128 points. In the event controlled points are to exceed 128 point, only one additional Uni-wiring H system enables to build up multinumber connections.

(4) No professional knowledge required

No knowledge of transmission procedures nor programming is required owing to uniwire H system using no CPU.

(5) Max. distance of transmission is 200m and up to 20 devided units.

Transmission lagtime is in the range of 2 - 11 ms. Input unit or Output unit of uniwire system is capable of being devided and arranged up to 20 groups.

(6) Broken circuit detection

In the uniwire H system, the ID (identification No.) is exchanged through the transmission line between the send unit and each terminal to check whether or not the transmission is performed correctly. The send unit always monitors this ID. If the send unit cannot confirm the ID due to broken circuit, this is determined as broken circuit and relevant ID No. is displayed digitally.

Normally, the ID is the same as the address.

(7) Branch wiring possible

For wiring method, both the multi-drop wiring and branch wiring can be performed.

(8) Uniwire system unit connection possible

Uniwire system units (MN4TB-T6A1, etc.) can be connected to the uniwire H system. If the uniwire system unit is located at the end position of the transmission line, the broken circuit detection can be performed by connecting it to the end unit for the H system.

Note) Do not connect this serial transmission slave station or uniwire H system unit to the uniwire system. Doing so may cause the system to malfunction.

1.2 Structure of System

This system is constructed chiefely with PLC, Input / Out units, Uniconnector, Send unit, MN4TB□-T6J□ Solenoid valve and peripheral equipment. Additionally, it is also possible to directly control the uniwire transmission line through the interface without connection of the uni-connector and send unit. For details of interface related units, refer to the catalog.

● Table of PLCs serviceable and model coding

PLC maker	PLC input unit	PLC output unit
MITSUBISHI ELECTRIC CORP.	AX42, AH42(X side) A1SX41 A1SX42 A1SH42(F side)	AY42, AH42(Y side) A1SY41 A1SY42 A1SH42(L side)
OMRON CORP.	C500-ID219 C200H-ID216 C200H-ID217 C200H-ID215 CQM1-ID213	C500-OD213 C200H-OD218 C200H-OD219 C200H-OD215 CQM1-OD213
YASUKAWA ELECTRIC CORP.	B2605 B1061 JEPMC-IO050(R side) JEPMC-IO050(L side)	B2604 B1060 JEPMC-IO050(R side)
FUJI ELECTRIC CO.,LTD.	FTU126A NJ-X32-1D	FTU222A NJ-Y32-T1D
KOYO ELECTRIC CO.,LTD.	G-08N U-08N	G-18T U-18T
HITACHI, LTD.	XDC24D2H	YTR24DH
SHARP CORP.	JW-64NC JW-34NC JW-234N	JW-62SC JW-32SC JW-232S
YOKOGAWA ELECTRIC CORP.	XD64-6N WD64-6N(Input) ST-6(ST-5)	YD64-1A WD64-6N(Output) ST-7(ST-5)
TOSHIBA CORP.	DI-335 DI-6241/6241H B20064DI	DO-335 DO-6242 B20064DON
YAMATAKE-HONEYWELL CO.,LTD	MA-511-5000	MA-511-5600
TOYODA MACHINE WORKS,LTD.	ID32D	OUT38D
MATSUSHITA ELECTRIC WORKS,LTD.	AFP33027 AFP53027	AFP33487 AFP53487

※ For PLCs other than those mentioned above, contact CKD.

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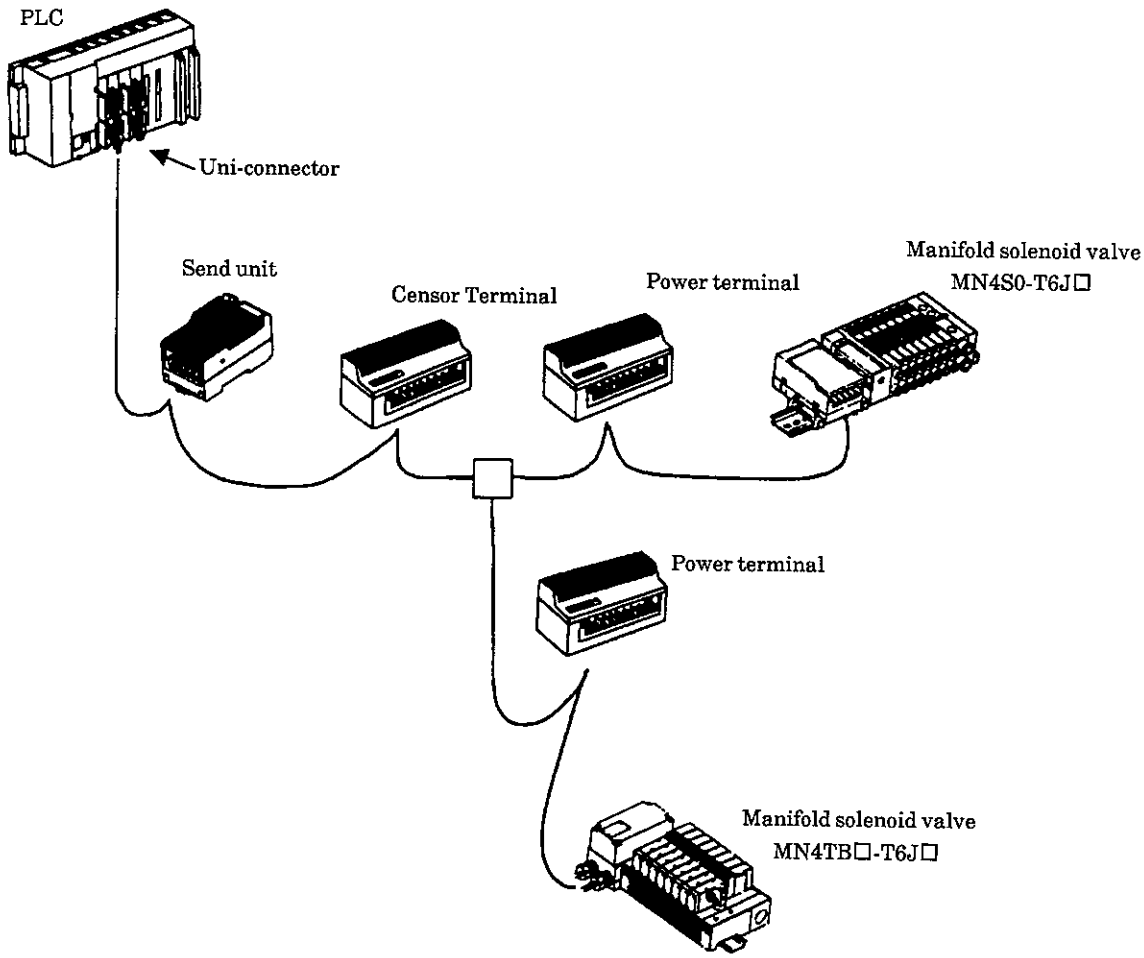
- Structure of a fundamental system



1.3 Specification

1) Specification of solenoid valves

(1) Specification of manifolds

Item	Specification			
	MN4TB1 series		MN4TB2 series	
Type of manifold	Manifold block type		Manifold block type	
Applicable solenoid valve	4TB1 series		4TB2 series	
No. of blocks	2 to 8 (Max.16 blocks in case of single type)		2 to 8 (Max.16 blocks in case of single type)	
Kind of manifold	Central air supply, central lubrication		Central air supply, central lubrication	
Ambient temperature °C	5 to 50		5 to 50	
Ambient humidity	35 to 85%RH (No dewfall)		35 to 85%RH (No dewfall)	
Working emvironment	No corrosive gas		No corrosive gas	
Working media temperature °C	5 to 50		5 to 50	
Port size	Pressure port (P) Return port (R)	Cylinder port (A · B)	Pressure port (P) Return port (R)	Cylinder port (A · B)
	Push-in joint (ϕ6, ϕ8)	Push-in joint (ϕ4, ϕ6, ϕ8)	Push-in joint (ϕ8, ϕ10, ϕ12)	Push-in joint (ϕ6, ϕ8, ϕ10)

(2) Specification of solenoid valve

Item \ Series model code, No.of positions, No. of solenoid	M4TB1 series				
	4TB110 2-pos. Single	4TB120 2-pos. Double	4TB130 3-pos. All ports blocked	4TB140 3-pos. A·B·R connection	4TB150 3-pos. P·A·B connection
Working media	Compressed air				
Actuating type	Pilot (Soft spool)				
Max.working pressure MPa	0.7				
Min.working pressure MPa	0.15	0.1	0.2		
Proof pressure MPa	1.05				
Effective sectional area mm^2	7		4		3
Responce time ms	Less than 20 (at 0.5MPa)		Less than 30 (at 0.5MPa)		
Manual operating device	Non-lock type (Standard)				
Lubrication	Not required				
Protective structure	Dust proof				

Item \ Series model code, No.of positions, No. of solenoid	MN4TB2 series				
	4TB210 2-pos. Single	4TB220 2-pos. Double	4TB230 3-pos. All ports blocked	4TB240 3-pos. A·B·R connection	4TB250 3-pos. P·A·B connection
Working media	Compressed air				
Actuating type	Pilot (Soft spool)				
Max.working pressure MPa	0.7				
Min.working pressure MPa	0.15	0.1	0.2		
Proof pressure MPa	1.05				
Effective sectional area mm^2	14.5		12		
Responce time ms	Less than 20 (at 0.5MPa)		Less than 30 (at 0.5MPa)		
Manual operating device	Non-lock type (Standard)				
Lubrication	Not required				
Protective structure	Dust proof				

(3) Electric specification

Item		Specification
		MN4TB1 and MN4TB2 series
Rated voltage	(V)	DC24±10%
Current consumption	(mA)	80
Power consumption	(W)	1.9
Miscellaneous		Lamp and Surge absorber built-in

2) Transmission specification

Item	Specification
Method of transmission	Dual directions simultaneous split multiplex communication type
Method of synchronization	Bit synchronizing method
Protocol of transmission	Uniwire protocol
Speed of transmission	29.4kbps(Standard)
Method of connection	Branch connection
Distance of transmission	Max. 200m

3) Specification of satellite station

Item		Specification
Voltage of power		DC24V +10%, -5%
Current consumption		Less than 150mA (when all outputs are ON (do not connect valves))
Insulation resistance		Between case and total output terminals More than 20Ω DC500VΩ
Proof voltage		Between case and total output terminals AC500V for 1 minute
Noise Resistance		1000Vp-p pulse length 100nsec, 1μsec
Vibrtion resistance	Duration	10 to 150 to 10Hz, 1 octave/min Sweep 15 in each axis of X, Y and Z with half amplitude 0.75mm or 10G whichever smaller,
	Malfunction	10 to 150 to 10Hz, 1 octave/min Sweep 4 in each axis of X, Y and Z with half amplitude 0.5mm or 7G whichever smaller, 10 150 10Hz, 1 octave/min
Shock resistance		30G, 3 axes, 3 times
Ambient temperature		0 to 50°C
Ambient humidity		30 to 85%RH (No dewfall)
Working environment		No corrosive gas
Protective structure		IP64 (Dust proof and drip water proof)
Object of transmission		Uniwire system
No.of output		OPP2-1J : 16 points OPP2-0J : 8 points
Max.load current		100mA/1 point
Leak current		Less than 0.1mA
Residual voltage		Below 0.5V
Form of output		NPN transistor open collecter output
Fuse		48V, 2A (LM20) Daito tsushinki K.K.
Actuation indicator		LED (Lit when power is ON)
No.of monopolization by satellite station		OPP2-1J : 16 points OPP2-0J : 8 points

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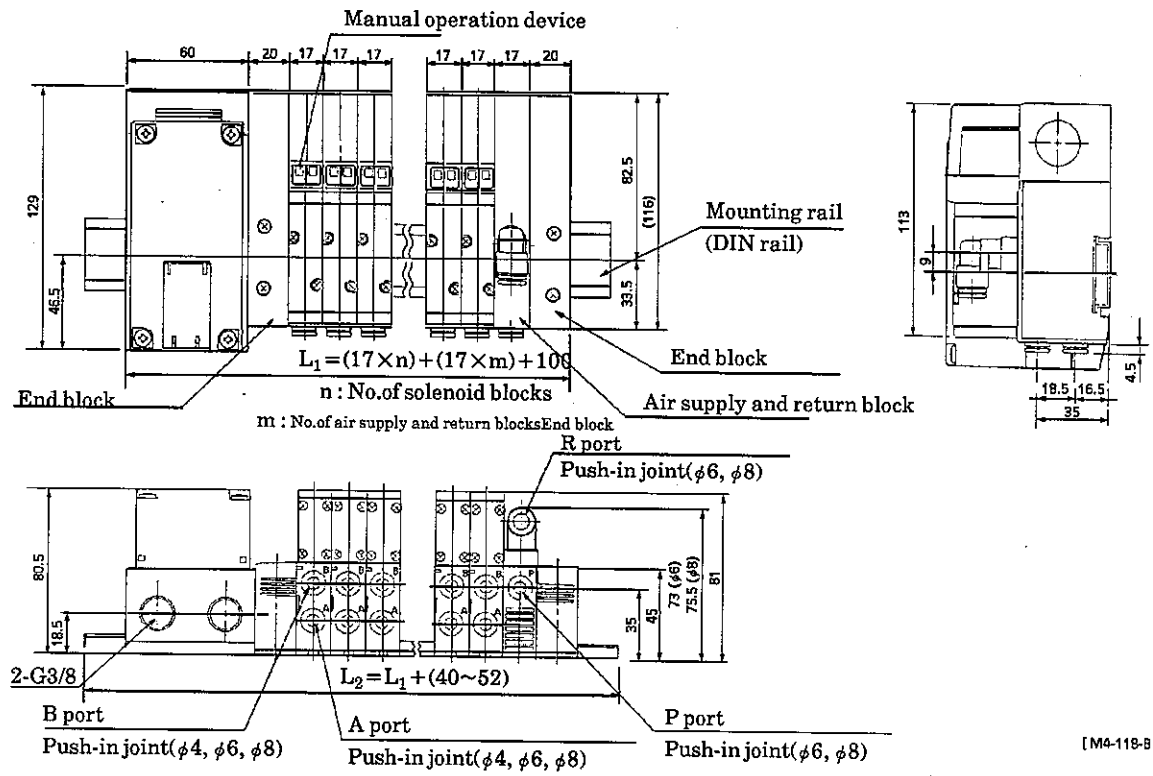
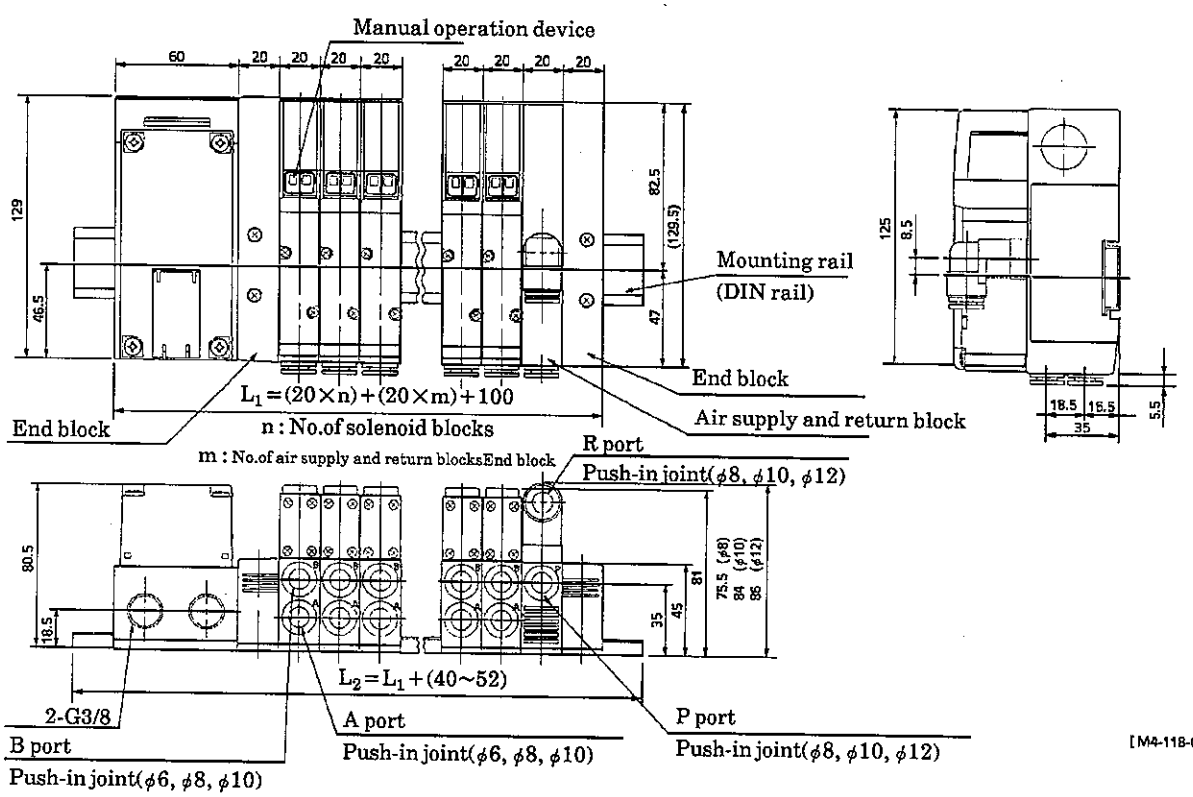
1.4 External dimensions of Solenoid valve

● MN4TB1※0-※-※T6J□-※



[M4-118-B]

● MN4TB2※0-※-※T6J□-※



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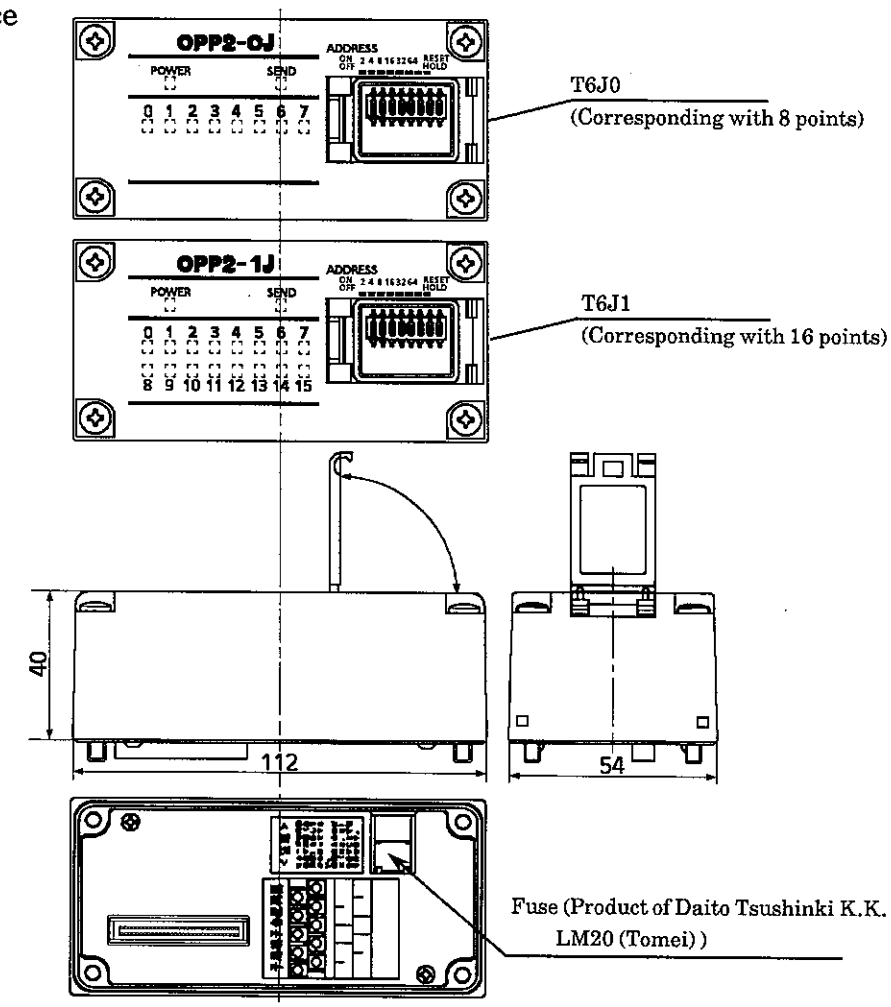
1.5 Satellite station for valve

1) Appearance



2) Fuse

Whether or not the fuse is blown up is checked through the bottom of the serial transmission slave station for the valve. To replace the fuse, remove the bottom plate (metallic plate) and firmly insert a new fuse into the fuse socket straight. For replacement fuse, purchase the fuse shown below and use it. Additionally, immediately dispose of the fuse, which has been taken out, to prevent it from being mixed with new fuses.

Whether or not the fuse is blown up is checked with a multi-meter.

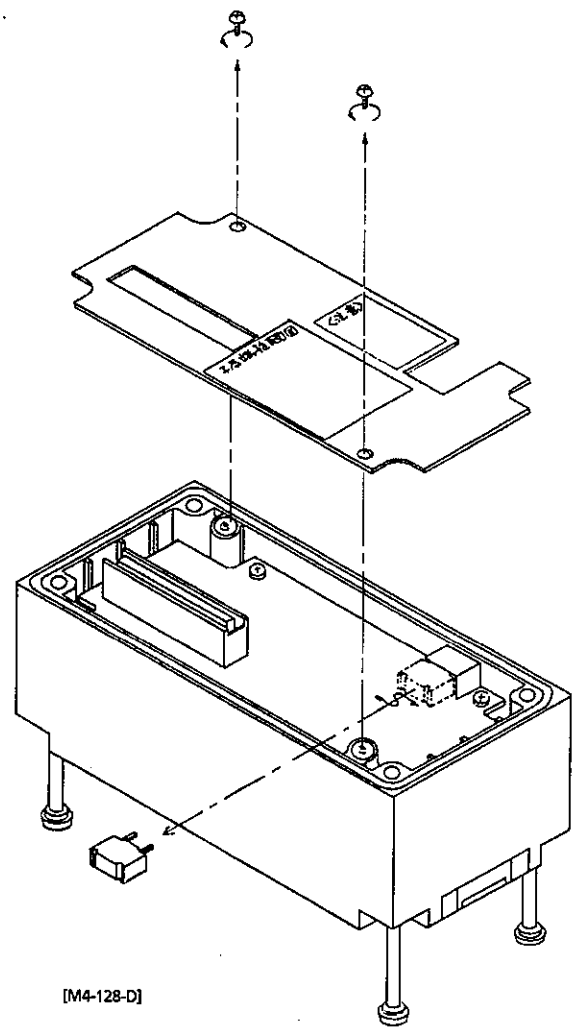
Recommended : LM20 (Tomei) Daito Tsushinki K.K.

CKD model No. : 4T9-LM20

Push it into fuse socket properly straight. Discard replaced fuse immediately because it is hard to distinguish with new one. There are various causes of fuse burning such as short circuited or somethingelse. Be sure to give the remedy of the cause before turning power ON, again. (Secular change, sometimes, may be the cause although it is rare.)

Procedure for replacing fuse

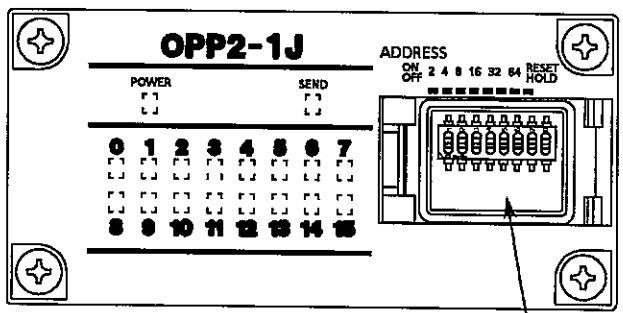
If a blown fuse is discovered, follow the procedure below to replace it.



(1) Remove the two M2.5 screws with an appropriate screwdriver.
(2) Remove the base plate.
(3) Grasp the blown fuse with your fingers and pull it out. (Do not use a tool to avoid damaging the wireing pattern on the printed board.) The fuse will come out easily if you wiggle it sideways as you pull on it.
(4) Insert a new fuse straight and fully into the fuse socket.
(5) Make sure that there are no particles or other foreign matter on the print board. Remove them if there are any.

3) Indicators and switches on Satellite station

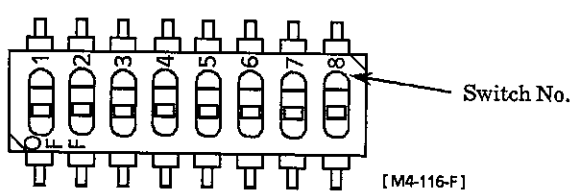
(1) Various LED lamps are installed in front of station to aid visual varification of operational conditions. Each function is printed on the cover made of resin. The content of each function is posted in the table below. Make use of them during maintenance works or for varification of operation.



Name of LED	Scope of indication
POWER	Lights up with power "ON" and normal condition of fuse.
SEND	Flickers when a signal is being transmitted normally, and lights up or goes out when this transmission is abnormal.
0 to 15	Indicates the condition of output signal Lights up with power "ON" (No.0 - 7 only for OPP2-0J)

Name of switch	Scope of setting
Address setting switch (Switch Nos. 1 to 6)	It allocates the address No. of station
Abnormal output selective switch (Switch No. 8)	It selects either "Hold" each output status or "Reset" all outputs when abnormal.

※ Switch No. 7 is not used.



DIP switch for setting

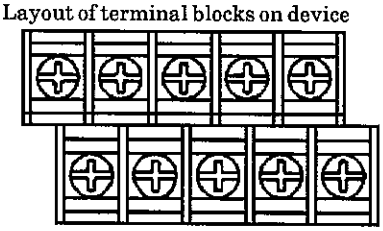
(2) Set the address of satellite and whether hold or not of output signals by means of setting switches. (Refer to "Chapter 3. Operation in detail) Be sure to do so prior to turning power to station ON.

- Cover plate for switches on the station for valve snap opens. Keep it closed always except when setting switches. Otherwise, foreign particle may penetrate into internal circuit causing unforeseen trouble. Be careful to keep foreign particle from falling into during setting process.
- Setting switches are very much sensitive. Handle with care to avoid from damages. Also absolutely keep fingers off the internal printed circuit board.

1.6 Mounting device of sattellite station for valve

Station for valve can be pulled away upward after removing 4 mounting screws (M4). Tighten 4 screws with the torque of 0.5 to 0.7N · m to install station while ascertaining that the connectors on the bottom face of station is inserted properly and also no cable is pinched in between station bottom and mounting device. Avoid leaving station without placing screws, wrenching body or applying excessive jerking force, as it may cause station to fall out of device or damage to connecter. Also, avoid leaving manifold blocks alone after pulling station away as it may allow foreign particles or dusts to fall into connecter slits or contacting part causing short circuit or insufficient contact. Likewise avoid touching connecter or printed circuit board while keeping them away from dusts or foreign particls.
Structure of mounting device is illustrated below.

Layout of terminal blocks on device

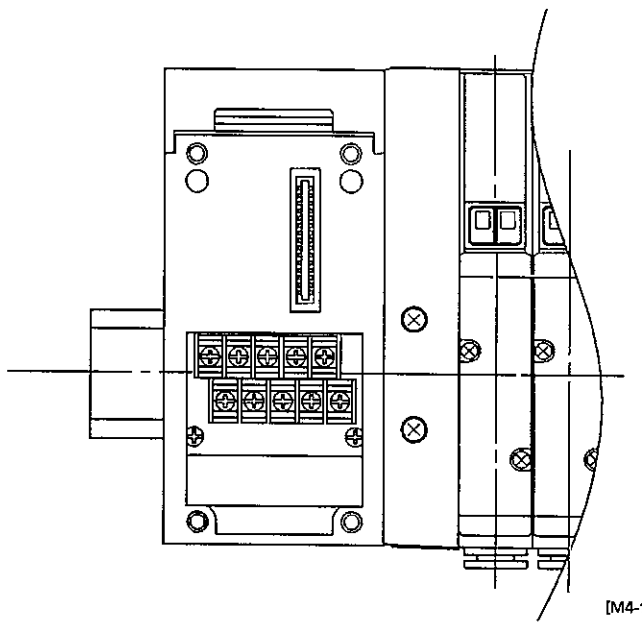


Wiring lead out opening

Printed function of each terminal

D	G	NC	−	+
Transfer circuit			Source of power	

NC	NC	NC	NC	NC



[M4-118-F]

There are terminal blocks provided on the mounting device. Wiring connection to station is accomplished through these terminal blocks. Function of each terminal is printed on the face of station mounting device.

- Choose 6 mm wide or less of M3 crimp type terminal metal piece and tighten it with torque of 0.3 to 0.5N · m.
- Be ware that this mounting device is of vitally important. Carefully avoid water drop, dusts or foreign particle from falling into this device.

Symbol		Function	Main object of connection
Transfer circuit	D	Transfer signal "D"	To be connected to "D" terminal on Send unit or other I/O unit
	G	Transfer signal "G"	To be connected to "G" terminal on Send unit or other I/O unit
Source of Power	+	Source of power for both valve and satellite station	Apply the source of power, DC24V +10% and -5%, with least noise.
	−		
NC		Not used	Do not connect anything.

※ Carefully select the correct polarity of power. Otherwise the fuse may be burnt out.

2
CAUTION

2. CAUTION

1) Lag time of transmission

There are some lag time of Input/Output signals due to it being a uniwire system and sereal transmission. The range of lag time is somewhat 1.4ms to 10.7ms varying depending on the number of connecting points as posted in the table below.

Number of points	Refreshing time	Lag time
32	1.6ms	1.6 to 4.2ms
64	2.7ms	2.7 to 6.4ms
96	3.8ms	3.8 to 8.6ms
128	4.9ms	4.9 to 10.8ms

Note) The above values are obtained at a transmission speed of 29.4 kbps.

Varify on the solenoid valve specification as for its responce time because it varies depending upon model. OFF time lag is approximately 20 ms longer in addition to the above because a flywheel diode is used for surge absorbver on satellite station for valve.

2) Broken circuit detection time

In the uniwire H system, the response sent from each terminal unit or end unit is checked one-unit by one-unit at intervals of refresh cycle. Therefore, the following time is required to check the response sent from all terminals.

[Refresh cycle time x {number of terminal connection units + (0 - 4)}]

Additionally, even if no response is detected once, it is not determined as broken circuit. The same ID is sent once gain. If no response is detected continuously twice, it is determined as broken circuit. Therefore, a period of time to detect the broken circuit becomes that shown below.

[Refresh cycle time] - [Refresh cycle time x {Number of terminal connection units + (1 - 5)}]

The above time becomes 4.9 - 122.5 ms with the standard specifications, 128 points, and 20 terminal connection units.

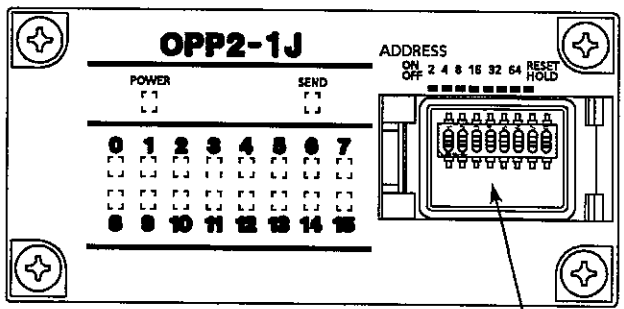
3) Compatibility with uniwire system

Uniwire system units can be connected to the uniwire H system. If the uniwire H system unit, such as this serial transmission slave station is connected to the uniwire system, this may cause the system to malfunction, resulting in incorrect output. To avoid such trouble, do not connect any uniwire H system unit to the uniwire system.

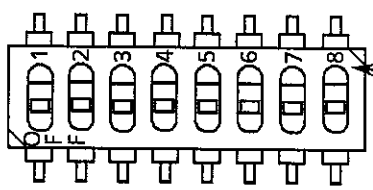
3. OPERATION

3.1 Switch setting

Those switches enable to set either "Hold" or "Reset" of all addresses and outputs. Varify the sequence No. of setting switch for respective function because all switches look alike. Enssure that power is OFF prior to setting switches.



DIP switch for various valve setting



Switch No.

[M4-116-F]

DIP switch for valve setting

	State of Switch								
	Significant coefficient	2	4	8	16	32	64		RESET HOLD
	Switch No.	1	2	3	4	5	6	7	8
Address setting	0	○	○	○	○	○	○	○	
	2	●	○	○	○	○	○	○	
	4	○	●	○	○	○	○	○	
	6	●	●	○	○	○	○	○	
	⌇	⌇							
	124	○	●	●	●	●	●	○	
	126	●	●	●	●	●	●	○	
Output selection	RESET								●
	HOLD								○

● : Switch ON ○ : Switch OFF

Note) Switch No. 7 is not used.
The address setting of the serial transmission slave station can be performed in units of two points.

- Address setting switches (Switch No.1 to 6)
  Significant coefficient is allocated to each setting switch (Printed on a case) and sum of ON switches designates the address set value.
  The address setting of the serial transmission slave station can be performed in units of two points. (The setting cannot be performed in units of odd numbers.)

  (Example 1) When anticipate to set value 30: Turn switche Nos. 1 to 4 ON and keep switche Nos. 5 to 6 OFF.

  16+8+4+2=30

  Still more, OPP2-0J possesses 8 points whereas OPP2-1J does 16 points.

  (Example 2)

  OPP2-0J : Address setting valve 4 → Possessed addresses 4 to 11
  OPP2-1J : Address setting valve 4 → Possessed addresses 4 to 19

- Output selective switch under abnormal (Switch No.8)
  With this switch, it is possible to set whether the data output is held or turned OFF if an abnormality occurs. Note that the output status may not be held depending on the conditions of the abnormality.

Switch No.8	
OFF	ON
HOLD	RESET
Output data are held in the previous state to abnormality.	All output data are turned OFF when abnormality takes place.

Note 1) If a broken circuit occurs in the transmission line located after this serial transmission slave station with the send unit determined as start point, the serial transmission slave station continues the output operation.

Note 2) After the cause of the trouble has been removed, the serial transmission slave station immediately starts the normal operation.

3.2 Correspondence between Output Nos. and internal connector Nos.

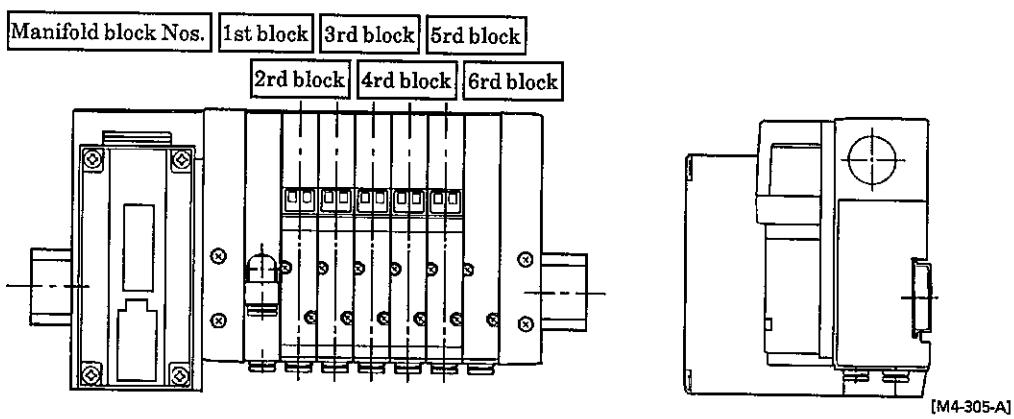
Those Numbers correspond as per table, posted below.

Output point 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

※ OPP2-0J ranges 0 to 7

3.3 Correspondence between Output Nos. and valve solenoid

1) Connector pin Nos. and manifold solenoid correspond with each other as per tables posted below.
2) Manifold block number is allocated from leftmost block toward right while holding piping port facing to you, regardless the location of wiring block.



Manifold wiring example

◦ For Single solenoid valve

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

(Corresponds with up to the 16th manifold blocks.) ※ OPP2-0J ranges up to the 8th manifold blocks.

◦ For Double solenoid valve

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

(Corresponds with up to the 8th manifold block.) ※ OPP2-0J ranges up to the 4th manifold block.

◦ For Mixed (Single and Double) solenoid valve

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

(Corresponds with up to the 16th solenoid valve.) ※ OPP2-0J ranges up to the 8th manifold block.

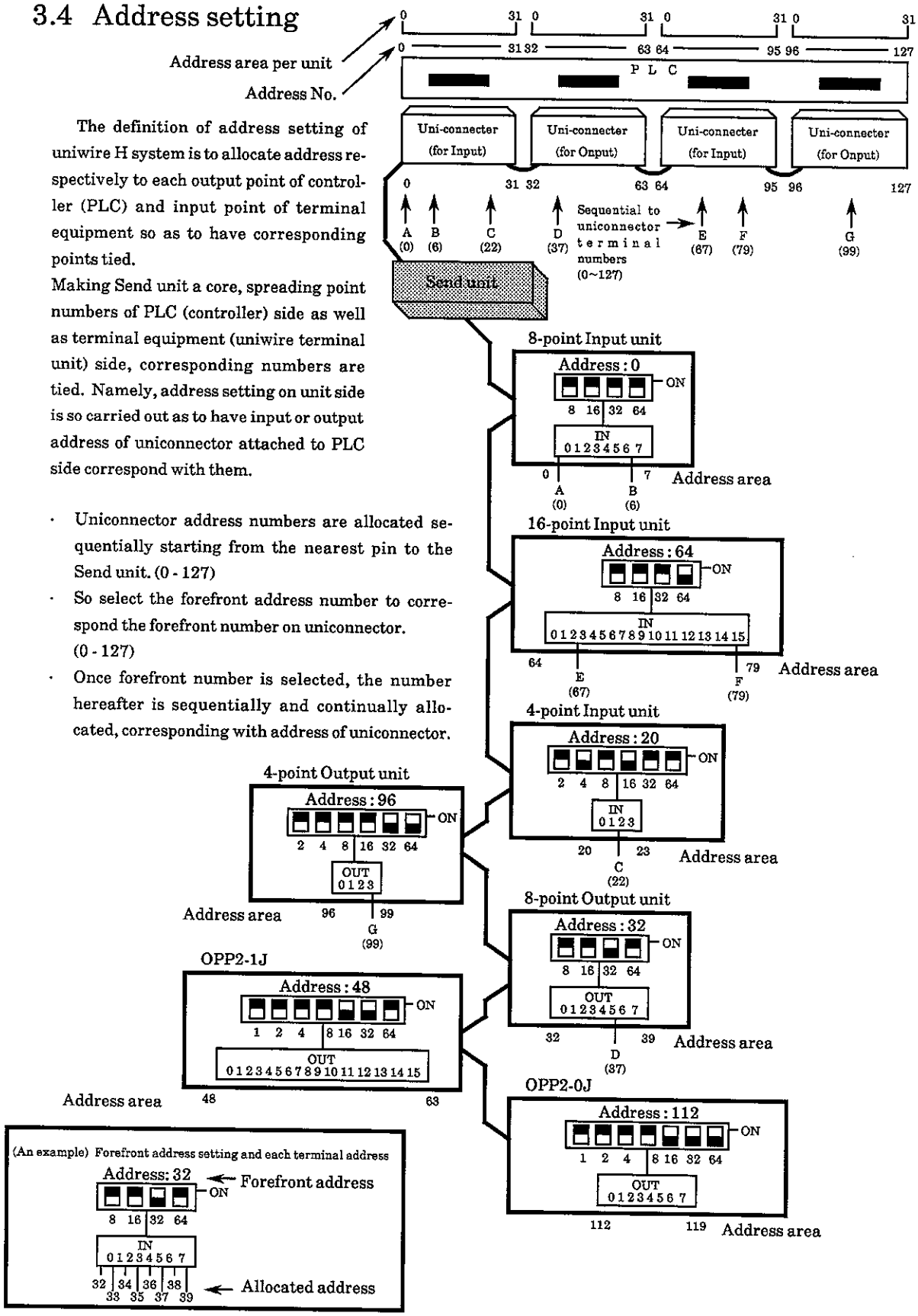
3) Output pin No. sometimes become vacant depending upon manifold valve block number due to the sequential wiring. Such vacant pin is not available to be used for driving any other equipment.

3.4 Address setting

The definition of address setting of uniwire H system is to allocate address respectively to each output point of controller (PLC) and input point of terminal equipment so as to have corresponding points tied.

Making Send unit a core, spreading point numbers of PLC (controller) side as well as terminal equipment (uniwire terminal unit) side, corresponding numbers are tied. Namely, address setting on unit side is so carried out as to have input or output address of uniconnector attached to PLC side correspond with them.

- Uniconnector address numbers are allocated sequentially starting from the nearest pin to the Send unit. (0 - 127)
- So select the forefront address number to correspond the forefront number on uniconnector. (0 - 127)
- Once forefront number is selected, the number hereafter is sequentially and continually allocated, corresponding with address of uniconnector.



4. INSTALLATION

4.1 Wiring peocedures

Signal cord and power line cord have to be connected to make this unit MN4TB□-T6J□ function. Improper wiring not only hinder its function but, in some case, it may lead to vital troubles of this unit as well as peripheral equipment. Please read this manual as well so as to maximize the proper connection.

1) Recommendable signal cable

Select cable within the range of 0.5mm^2 1.25mm^2. No trouble is foreseen with 2-core and over 0.5mm^2 cable for transmission signals (D & G).

Note) Prohibition of common use with other cables

Do not use some wires of the multi-core cable for other application as uniwire transmission line. Doing so may cause a malfunction.

Additionally, if a high-frequency cable, such as that for the inverter is installed close to the uniwire transmission line, a shielded cabtyre cable or twist pair cable must be used for the transmission cable.

2) Wiring of concentrated power type

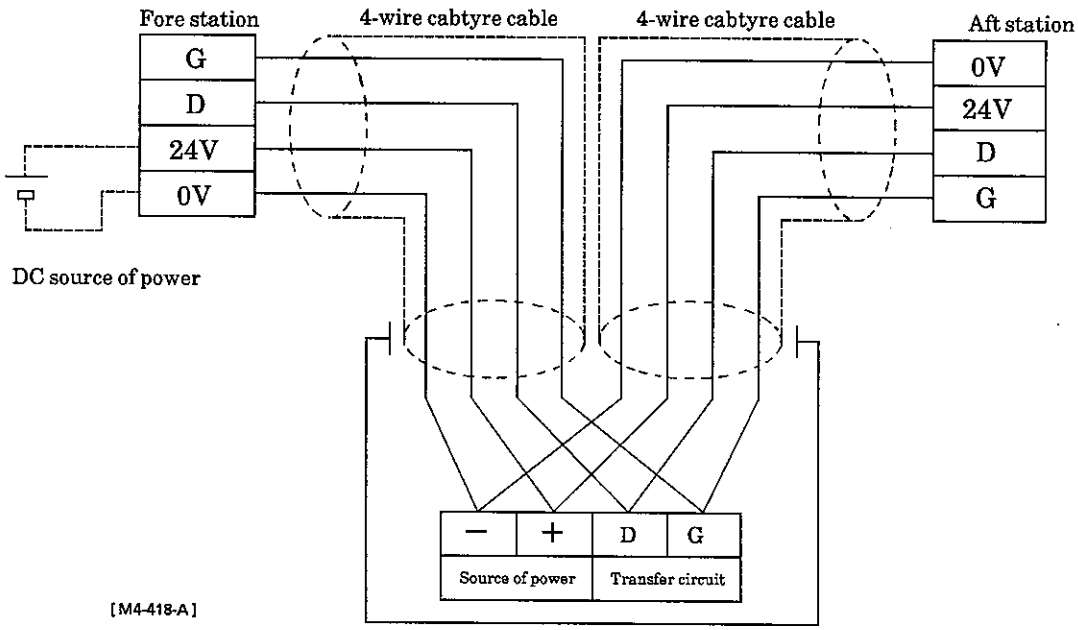
Select this type of wiring when voltage loss of cable is considered not remarkable in comparrison with power consumption of each unit due to length of transmission line (cable), core diameter etc.

(1) Connection to this serial transmission slave station

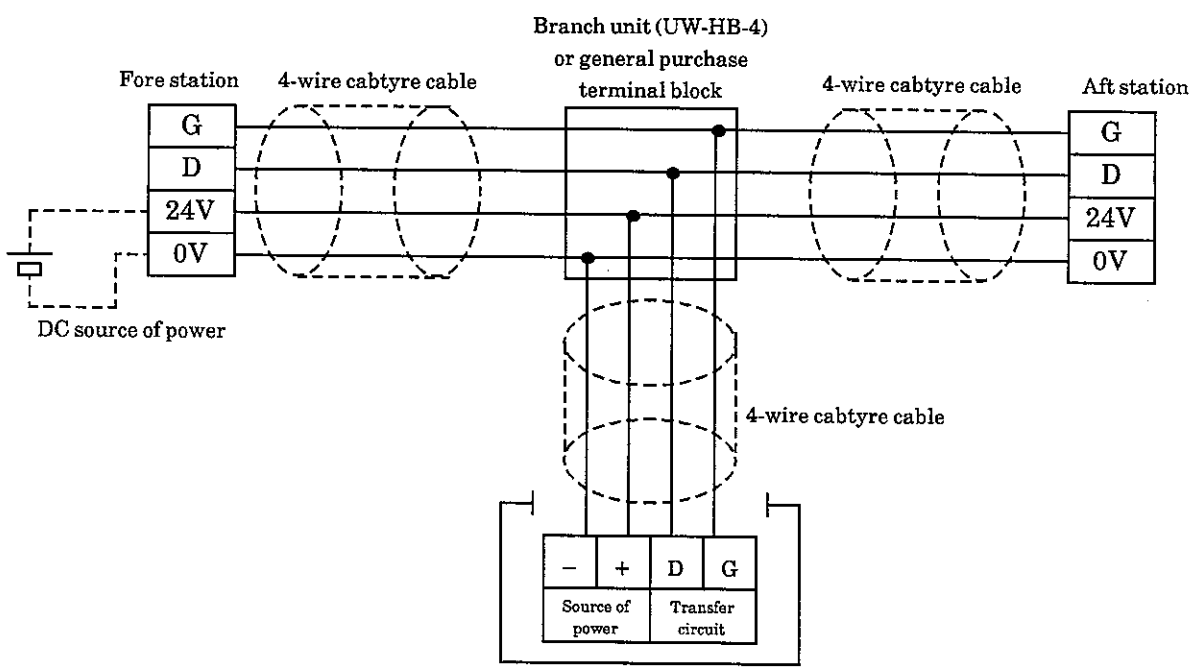
Attaching DC source of power (Main power) to Send unit, connect it to each unit with 4-core cabtyre cable which includs signal cables (D & G).

[SM-252986-A]

● In case of multi-drop connection

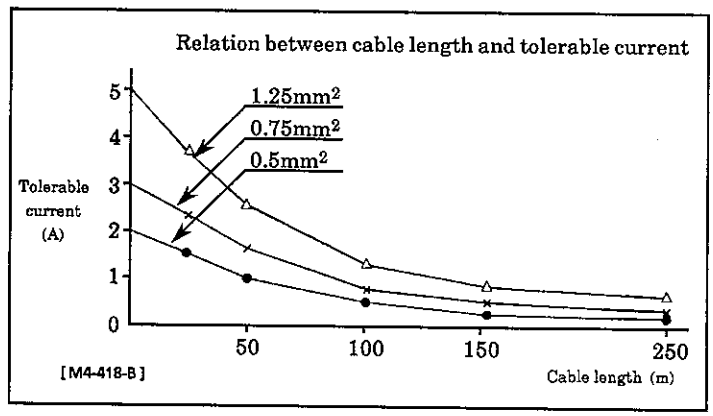


● In case of branch connection



≪Note≫

It is mandatory to select an appropriate cable with enough consideration to load variation and voltage drop of cable in case of planning to supply 24V DC to each terminal equipment through 4-core cable as a form of consolidated power system. The chart posted to the right shows the relation between cable length and tolerable current with consideration of tolerable voltage (lowest limit) of uniwire.



3) Local source of power type

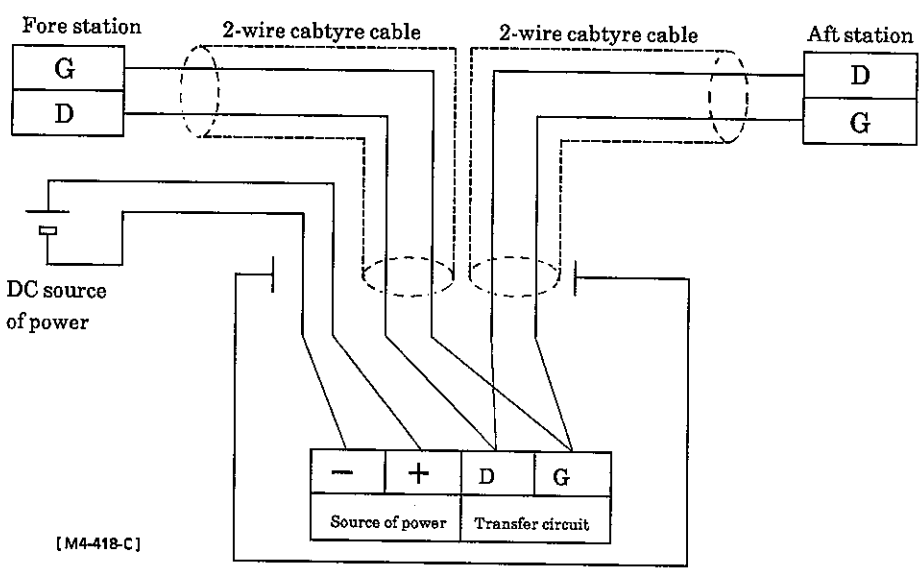
Make it local source type (independently devided) with short distance supply, in case it is the following circumstances.

1. Transmission distance is long.
2. Voltage drop is significant.
3. DC 24V, more than 7A is required for Send unit.

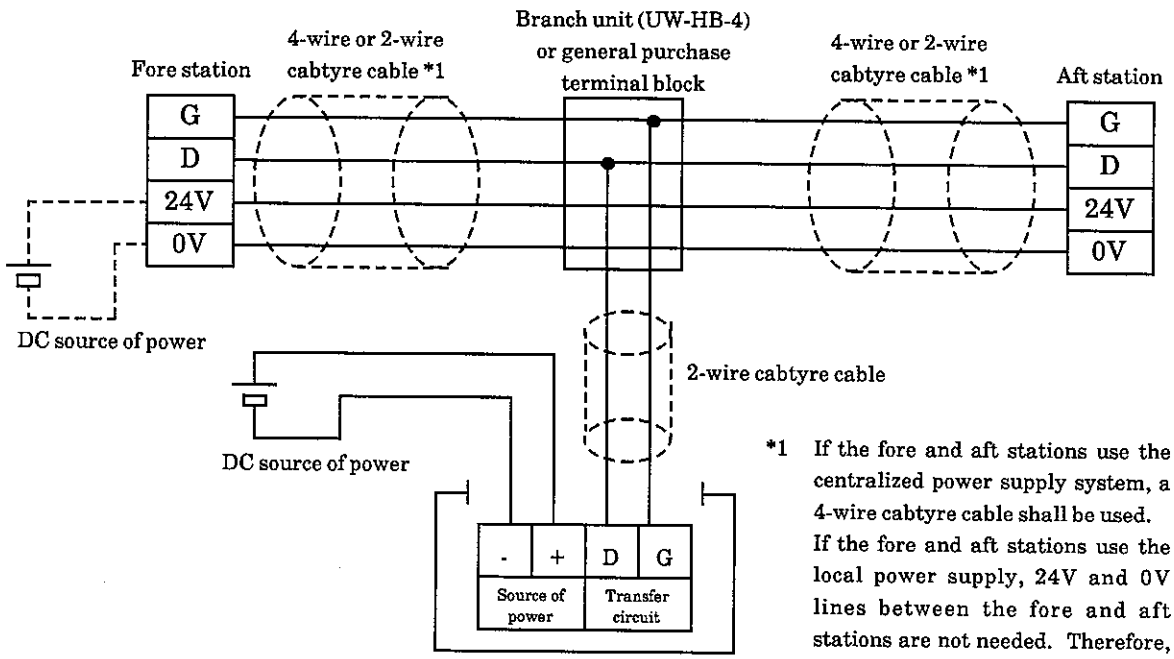
(1) Connection to this serial transmission slave station

Prepare a DC source (local power) by a unit side independently from main power to Send unit. Wire it seperately with signal cable.

● In case of multi-drop connection



- In case of branch connection



*1 If the fore and aft stations use the centralized power supply system, a 4-wire cabtyre cable shall be used. If the fore and aft stations use the local power supply, 24V and 0V lines between the fore and aft stations are not needed. Therefore, a 2-wire cabtyre cable shall be used.

4) Caution when Wiring

To avoid any problems due to noise, observe the following when wiring:

① In cases where noise influence is a consideration, provide a power source for every manifold solenoid valve wherever possible, and provide wiring individually.

② Minimize the wiring distance whenever possible.

③ Do not share a common power source with equipment such as an inverter or motor, etc. which can be a possible source of noise.

④ Do not wire the power line and signal line in parallel with another power line.

5. MAINTENANCE

5.1 Trouble shooting

1) Display on send unit

In the uniwire H system, the send unit has the transmission status monitoring function and fault diagnostic function detecting the short-circuit or broken circuit.

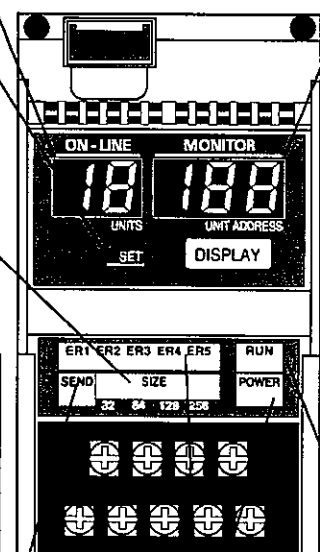
- Display for the number of connection units [ON-LINE]
  The sum of the number of terminal units for the H system and the number of end units (UW-ED-H2), which are connected from the send unit to the transmission line, is displayed automatically

- Initial setting switch [SET]
  This switch is used to store the connected terminal units for the H system into the memory. When installing the system, the ID (identification number) of each terminal unit is stored into the memory by pressing the switch with a sharp pin.

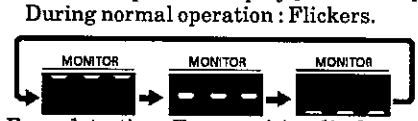
- Display for the number of points [SIZE]
  When uni-connectors are connected, the number of points is displayed automatically.

Number of connections	Display					
	32	61	128	256	RUN	ER2
0						○
1	○				○	
2		○			○	
3	○	○			○	
4			○		○	

Note 1) mark shows the lit status while no mark shows the off status.
Note 2) The display is off when the end connector of the uni-connector is not connected.



- Run/Error position display [MONITOR]
  During normal operation : Flickers.



Error detection : Error position display (Error address)

DISPLAY : If an error occurs, the error address is displayed every time this switch is pressed.The display is returned to the first error after the last error has been displayed. This display does not function in a state other than the error state.
(The number shown on the display is expressed in the decimal notation.)

- Run indicator [RUN]
  This indicator is lit during normal operation.
  The RUN contact is closed when this indicator is lit.

- Power indicator [POWER]
  This indicator is lit while the power is being supplied.

- Error indicator [ER1, ER2, ER3, ER4, ER5]

- Transmission indicator [SEND]
  Flickers during normal transmission operation.

Cause of error	Lamp of Send unit						
	ER1	ER2	ER3	ER4	ER5	RUN	SEND
(When normal)						○	◎
Reverse wiring of D/G cables or short circuit	◎						×
Short circuit between 24V & D		○	○	○			×
Without End connector *		○					◎
No response unit				○			◎
D/G line display			○	○			◎
Abnormal of ON data itself			○	○			◎
Abnormal of OFF data itself				○	○	×	◎
Power voltage dropped below 19V		◎					×

Note 1) ○, no, ◎, and × marks show the lit, off, flicker, and unknown (on or off) statuses, respectively.
Note 2) The lamp flickers in the normal status of the SEND lamp (flickering: ◎mark).
Note 3) Maximum connecting points indicator is put out when any Error lamp is lit.
Note4) In circumstance with * marked abnormality, system keeps its operation but speed drops.

- Power supply voltage detection operation

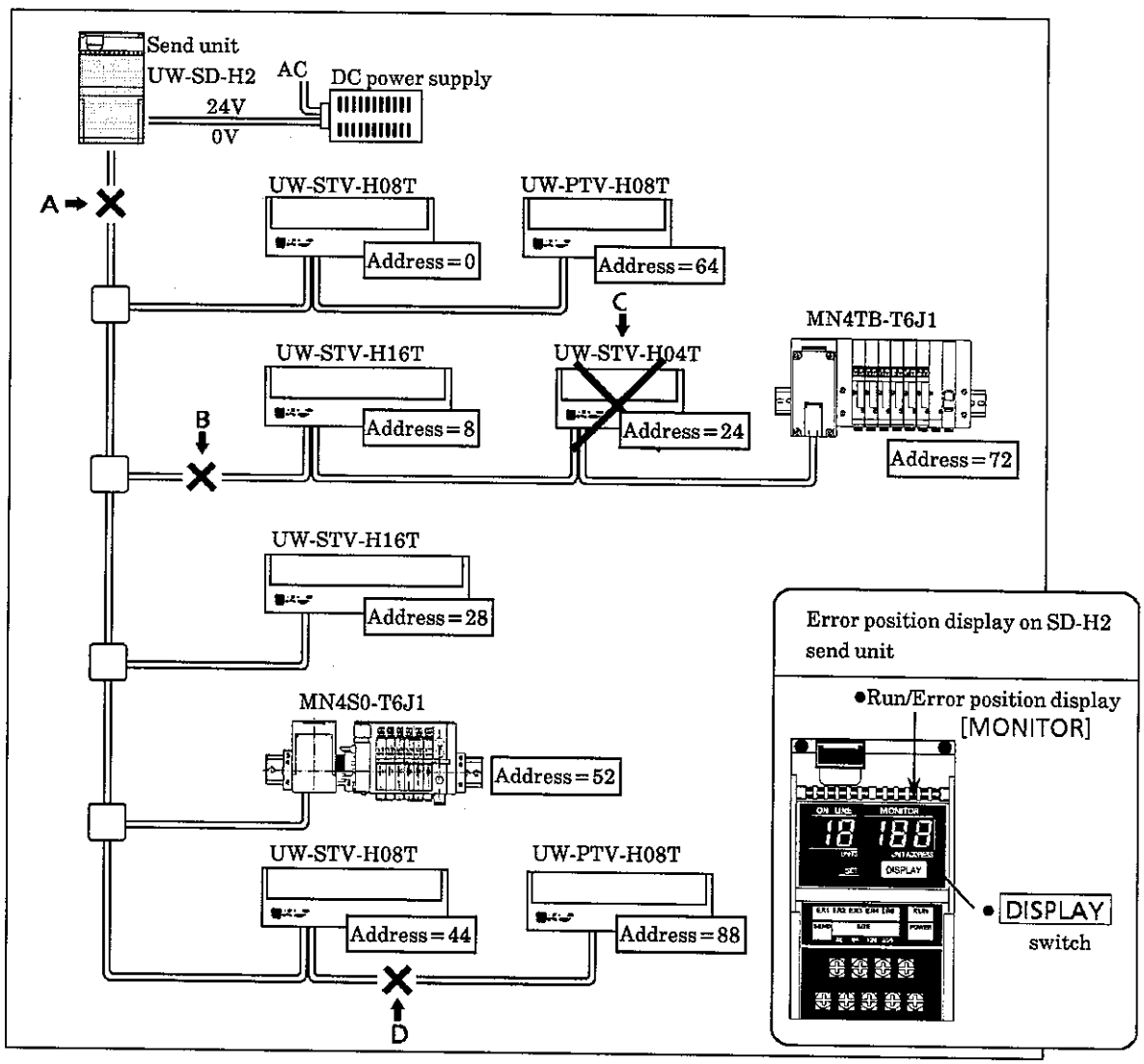
Power supply voltage	System operation	Display
19V or less	Not operated.	"ER2" and "32" are displayed alternately.
21V or less when the power is turned ON.	May not be operated.	The same display as described above occurs if not operated.

2) Error position display on send unit

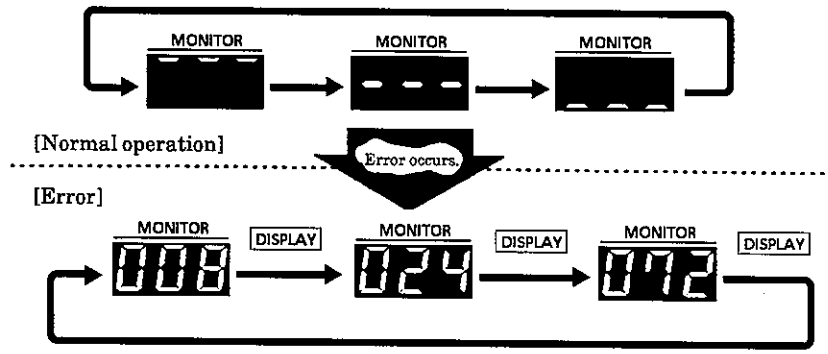
If a broken circuit shown in the Fig. below occurs, the MONITOR display on the send unit shows error numbers stated in the table shown to the right. The error position is also displayed when the DISPLAY switch is pressed.

Error location	Display (ID No.)
Broken circuit occurs only in the transmission line at position A.	0,8, 24, 28, 44, 52, 64, 72, 88
Broken circuit occurs only in the transmission line at position A.	0,8, 24, 28, 44, 52, 64, 72, 88
Broken circuit occurs in the transmission line at position B.	8, 24, 72
Unit C is faulty.	24
Broken circuit occurs in the transmission line at position D.	88

Note) Even if a broken circuit occurs, the send unit does not stop the data transmission.



● Example of error display
If a broken circuit occurs in the transmission line at position B shown in the previous Fig., the DISPLAY switch and MONITOR display function as shown in the example of the Fig. shown to the right.



If the DISPLAY switch is pressed sequentially, the display is returned to the first numeric value.

3) Display on serial transmission slave station

Item	Lamps on slave station		Contents of error	Remedy
	POWER	SEND		
Normal operation	○	◎	—	—
Power OFF	●	●	Power is OFF.	Turn ON the power.
Send unit power OFF	○	○	Power to the send unit is OFF.	Turn ON the power to the send unit.
Communication error	○	×	Error occurs in the transmission line or send unit.	Check the display on the send unit and remove the cause of the error.
Power supply voltage drop	◎	×	Power supply voltage may become approximately 19V or less.	Check the power supply capacity when the maximum load is applied.

○ : Lit ● : Off ◎ : Flicker × : Unknown

Note) To return the POWER lamp flickering status to the normal status, turn OFF the power, and then turn it ON after approximately 3 sec.

4) Troubleshooting

- Transition to normal operation
  When the cause of the trouble is removed, the H system immediately starts the normal operation. No particular reset operations are required.
- Error position display record
  When the operation is returned to normal operation, error position records are not remained.

Note) Do not press the SET switch on the send unit if an error occurs. Doing so may cause incorrect ID to be stored into the memory, resulting in improper broken circuit detection.

5) Varification

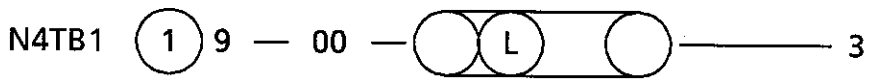
Varify the following items first, in any event that any trouble takes place in uniwire H system.

Items :

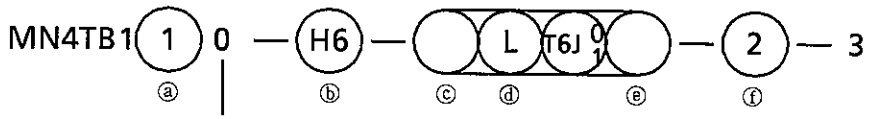
① All "Power" lamps on every equipment are ON.
② All "Send" lamps on every equipment are flickering
③ Error is indicated on Send unit.
④ The voltage of source of power to every equipment is DC 24V.
⑤ Wiring and connection is ensured.
⑥ Address setting is correct and no duplications.

6. HOW TO ORDER

● Solenoid valve alone for manifold use



● Block manifold



Operational distinction of solenoid valve

ⓐ Distinction of shifting positions	
Symbol	description
1	2-pos. single
2	2-pos. double
3	3-pos. all ports blocked
4	3-pos. ABR connection
5	3-pos. PAB connection
8	Mixed manifold

ⓑ Port diameter (Cylinder port)	
Symbol	description
H4	ϕ4, push-in joint
H6	ϕ6, push-in joint
H8	ϕ8, push-in joint
HX	Mixed, push-in joint

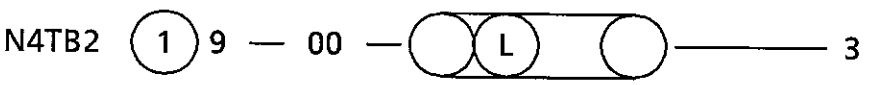
ⓒ Manual operation device	
Symbol	description
No cord	Non-lock type, Manual operation device
M1	Lock type Manual operation device (Optional)

ⓓ Indicator lamp and protective circuit	
Symbol	description
L	w/Lamp surge absorber
No cord	wo/Lamp surge absorber

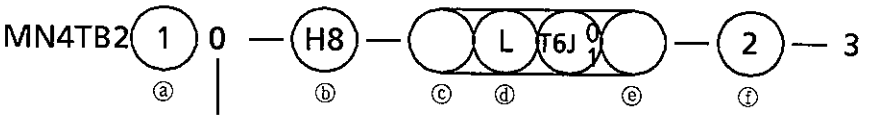
ⓔ Other options	
Symbol	description
No cord	None
K	External pilot

ⓕ No. of blocks, manifold type solenoid valve	
Symbol	description
2	2 blocks
5	5

● Solenoid valve alone for manifold use



● Block manifold



Operational distinction of solenoid valve

ⓐ Distinction of shifting positions	
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3	3-pos. all ports blocked
4	3-pos. ABR connection
5	3-pos. PAB connection
8	Mixed manifold

ⓑ Port diameter (Cylinder port)	
Symbol	description
H6	ϕ6, push-in joint
H8	ϕ8, push-in joint
H10	ϕ10, push-in joint
HX	Mixed, push-in joint

ⓒ Manual operation device	
Symbol	description
No cord	Non-lock type, Manual operation device
M1	Lock type Manual operation device (Optional)

ⓓ Indicator lamp and protective circuit	
Symbol	description
L	w/Lamp surge absorber
No cord	wo/Lamp surge absorber

ⓔ Other options	
Symbol	description
No cord	None
K	External pilot

ⓕ No. of blocks, manifold type solenoid valve	
Symbol	description
2	2 blocks
5	5