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SM-276310-A

INSTRUCTION MANUAL

SERIAL TRANSMISSION TYPE

M4G-T6J0 / T6J1

(Compatible with Uniwire H System)

- 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.

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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.
- 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.

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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.

JUI.4.2001

1. PRODUCT

1.1 General outline of the system

1) M4G-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) 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 (M4G-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, M4G-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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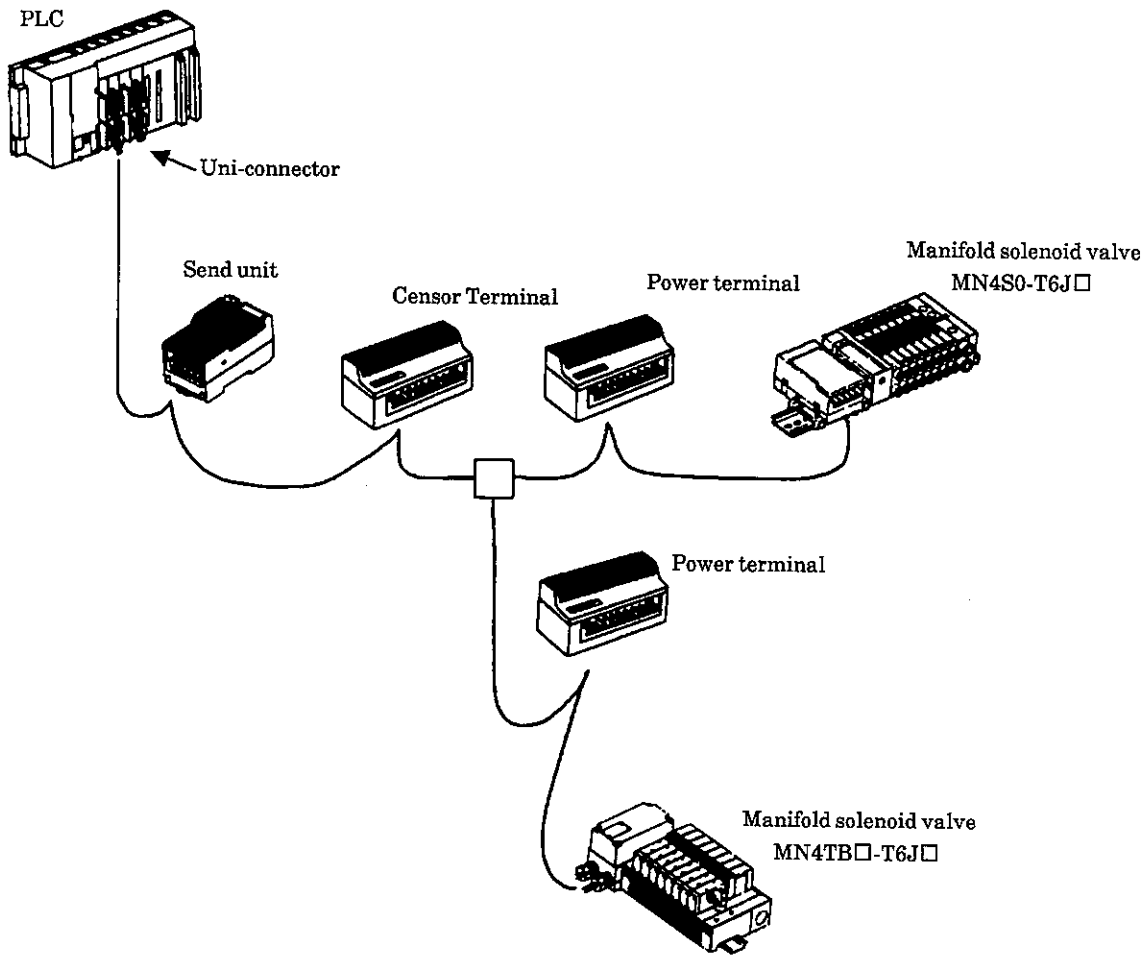
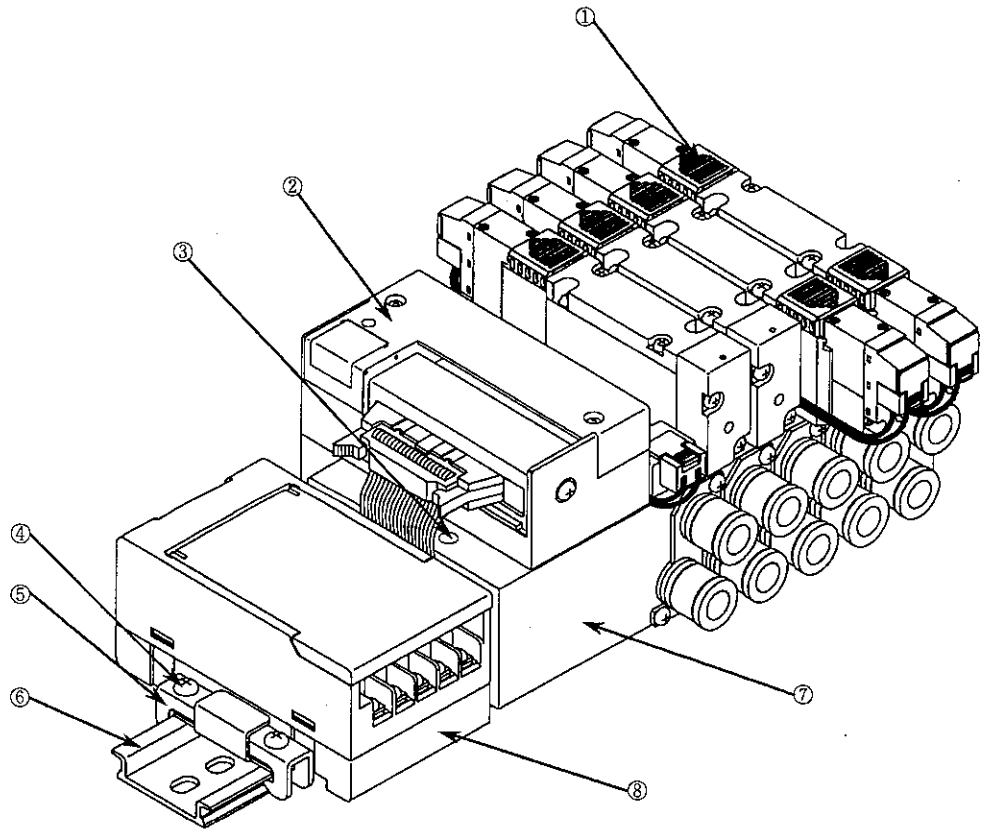
- Structure of a fundamental system



1.3 Part Name and Description



No.	Part name	Description
①	Solenoid valve for the base	
②	Electric component block	Includes and secures a printed circuit board with intermediate connectors.
③	DIN rail mounting screw	One screw (4G1) or two screws (4G2/3) are used at each of the two ends of the base for securing the entire manifold to the DIN rail. Use a flat-end screwdriver to tighten the screw.
④	Slave station mounting screw	Mounts the slave station on the DIN rail.
⑤	End retainer	
⑥	DIN rail	
⑦	Manifold base	
⑧	Serial transmission unit block	Serves as a remote I/O station in the communication network

1.4 Specifications

1) Specification of solenoid valve

(1) Specification of Manifold

Model coding / Item		M4G1 · M4G2 · M4G3
Installation using a manifold		DIN rail mounting type
Supply / Exhaust		Centralized supply/exhaust (with built-in exhaust-induced error prevention valve)
Media		Compressed air
Operating method		Pilot type
Valve configuration		Soft spool
Minimum working pressure MPa	2-position	0.2
	3-position	0.2
Maximum working pressure MPa		0.7
Proof pressure MPa		1.05
Ambient temperature °C		−5 - 55
Media temperature °C		5 - 55
Manual override		Allows a non-lock type operation (push and release) as well as a lock type (push and lock) operation.
Pilot air exhaust method	Internal pilot	Common exhaust for main and pilot valves
	External pilot	Individual exhaust for main and pilot valves
Lubrication (Note 1)		Not required
Protection rating (Note 2)		Dust proof
Vibration / Shock m/s^2		50 or less or 300 or less
Atmosphere		Operation in the presence of corrosive gas not allowed

Note 1 : If the user chooses to lubricate, Type 1 turbine oil (ISO VG32) should be used.
Excessive or intermittent lubrication may cause instability in operation.

Note 2 : The protection structure is dust-proof but not drip-proof.
Protect the unit from the drips or splashes of water and oil.

(2) Electrical specifications

Model Coding / Item	M4G1 · M4G2 · M4G3
Rated voltage V DC	24
Allowable fluctuation from rated voltage	±10%
Holding current A (Note 3) DC24V	0.025
Power consumption W (Note 3) DC24V	0.6
Heat-proof class	B
Temperature rise °C	50
Surge absorber	Zener diode type
Indicator	LED (Green)

Note 3 : (with lamp)

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

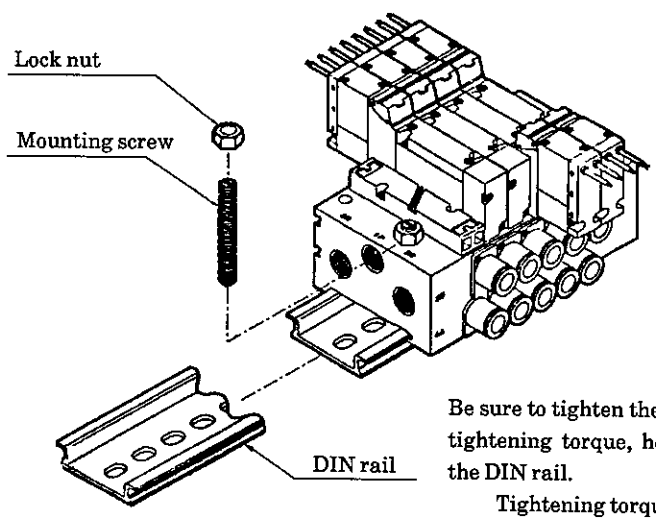
Item		Specification
Voltage of power		DC24V +10%, -5%
Current consumption		Less than 150mA (when all outputs are ON (do not connect valves))
Insulation resistance		Between case and total output terminals More than 20Ω DC500VΩ
Proof voltage		Between case and total output terminals AC500V for 1 minute
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
Object of transmission		Uniwire system
No.of output		OPP3-1J : 16 points OPP3-0J : 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
Actuation indicator		LED (Lit when power is ON)
No.of monopolization by satellite station		OPP3-1J : 16 points OPP3-0J : 8 points

1.5 Installing the Solenoid Valve Manifold

The solenoid valve manifold is installed mounted on a DIN rail. Refer to the installation procedure given below.Note, however, that if the system is not properly mounted to the DIN rail it may fall and break the manifold. If the manifold is to be used in an environment where it can be subjected to vibrations and shocks, secure the DIN rail to the mounting surface by applying screws at intervals of 50 - 100 mm, and check that it is securely mounted before using the manifold.

- Installation using a DIN rail

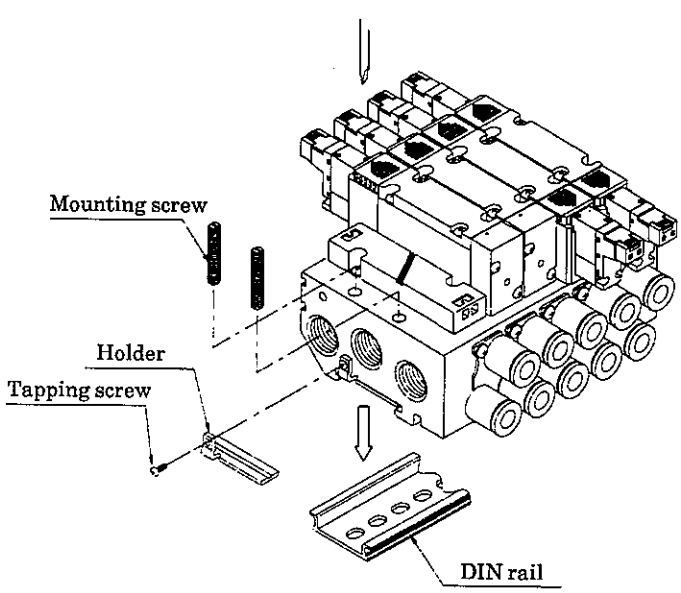
M4G1 Series



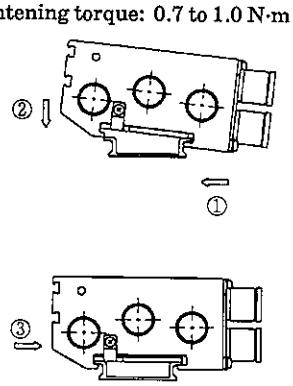
Be sure to tighten the lock nut. An excessive tightening torque, however, may disfigure the DIN rail.

Tightening torque: 0.3 to 0.5 N·m

M4G2 Series
M4G3 Series

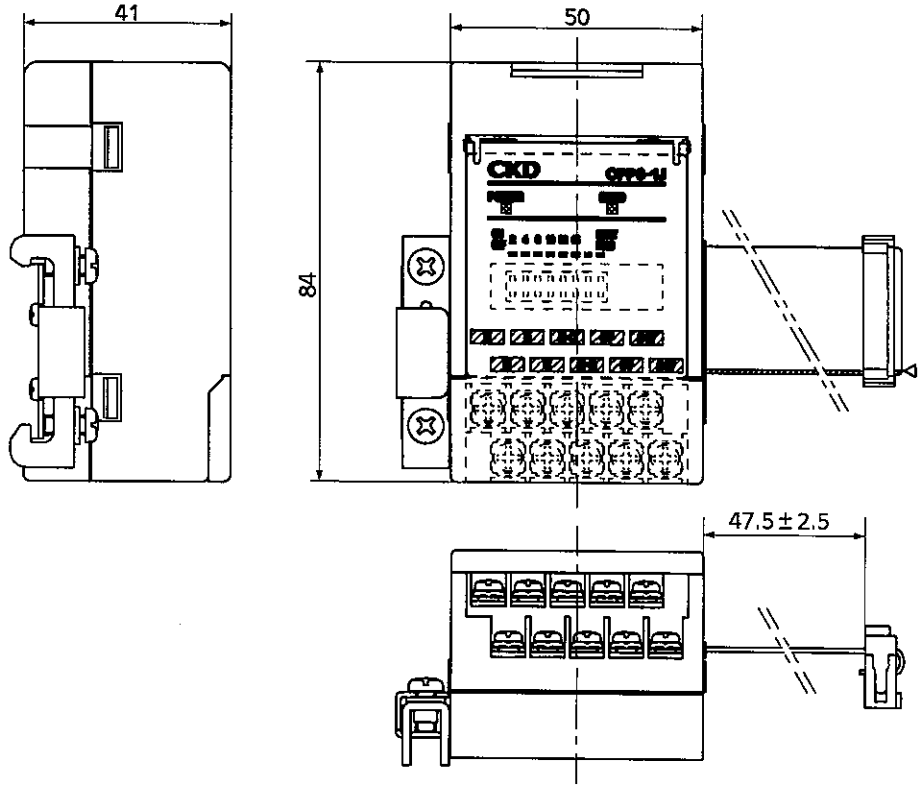


1. Install the holder.
   (And apply a tapping screw to keep it at the position.)
2. Lightly tighten the mounting screws.
3. Engage the jaws (first ① and then ②) with the DIN rail.
4. Press in the direction ③.
5. Tighten the mounting screws to the specified tightening torque.
   Tightening torque: 0.7 to 1.0 N·m



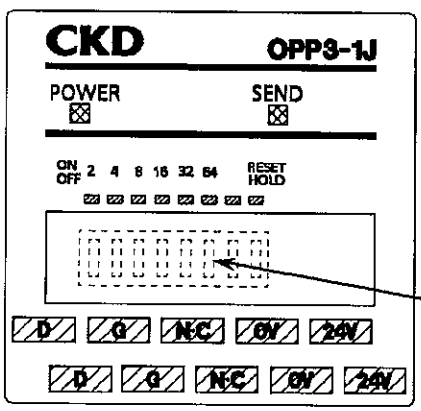
1.6 Slave station for valve

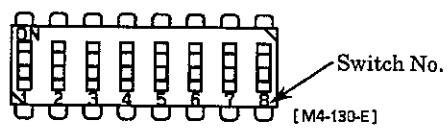
1) Appearance



2) Indicators and switches on Slave station

(1) Various LED lamps are installed in front of station to aid visual varification of operational conditions. Each function is printed on the sheet 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.





DIP switch for setting

Name of LED	Scope of indication
POWER	Lights up with power "ON".
SEND	Flickers when a signal is being transmitted normally, and lights up or goes out when this transmission is abnormal.

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.

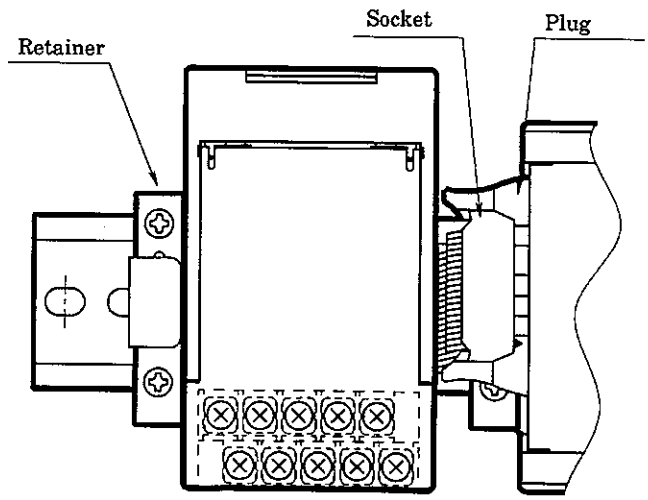
※Switch No. 7 is not used.

(2) The setting switch is used to set the address owned by its valve slave station and the presence or absence of output holding.(Refer to "Chapter 3. Operation".) Be sure to set it before turning power to valve slave station ON.

- The cover of the slave station unit for the solenoid valve system 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.

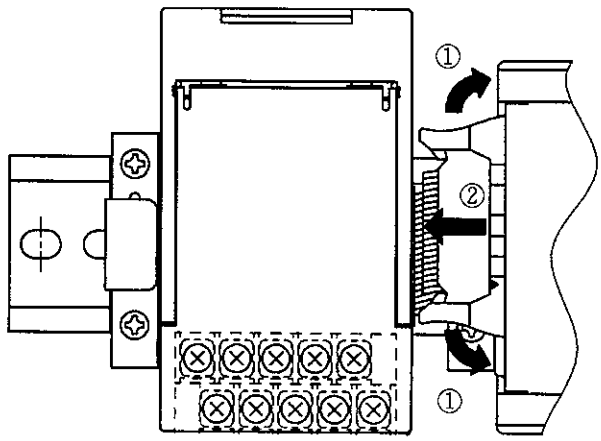
1.7 Mounting of Slave station for valve

The slave station unit OPP3-1J, 0J is normally secured by a retainer to the DIN rail (next to the solenoid valve manifold) and connected with the solenoid valve manifold by a connector (plug and socket). If you have to dismount the slave station unit from the DIN rail when you connect signal and power cables, for example, follow the procedure below:

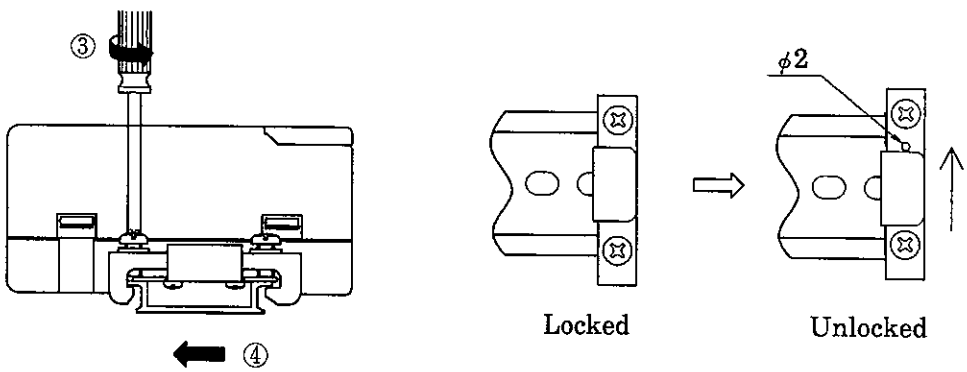


Slave station unit (OPP3-1J, 0J) Solenoid valve manifold

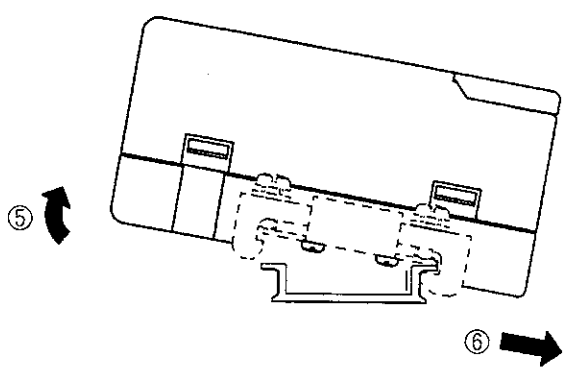
1) Spread the plug ends to remove the socket.
※ Spread the plug ends evenly.



2) Slacken the two mounting screws and then slide the retainer until you can see a perfect hole (dia. 2 mm) in the retainer surface.
※ The retainer is unlocked when you can see the hole (dia. 2 mm); locked when you cannot.



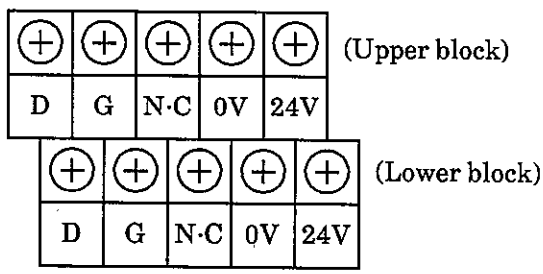
3) To disengage the slave station unit from the DIN rail, lift it at the rear end and pull toward the terminal block.
※ At this time, keep the retainer at the unlocked position by using your finger to hold the retainer at the end closer to you.



4) To reinstall the slave station unit, reverse the procedure; start with ⑥ and end with ①. Reverse the directions of arrows in the illustrations.
※ The distance between the slave station unit and the solenoid valve manifold depends on whether the connector is oriented vertically or horizontally. Be careful of this when reinstalling the slave station unit.

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 6.6mm wide or less of M3 crimp type terminal metal piece and tighten it with torque of 0.3~0.5N · m.



Terminal symbols and functions

Symbol	Function	Major objects to be connected
D	Data terminal "D"	Connection with terminal "D" of second unit or other I/O units
G	Data terminal "G"	Connection with terminal "G" of second unit or other I/O units
0V	Valve and slave station power supply	Apply source of power with less noise, such as DC24V ±10%, −5%.
24V		
N·C	Not used	Do not use this terminal.

NOTE: The terminal blocks with the same symbol that were arranged in the upper and lower stages are internally shortcircuited. Utilize these terminal blocks in such a manner that one and the other are wired from the fore station and to the aft station (except N.C) respectively, for example.

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 × {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 × {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

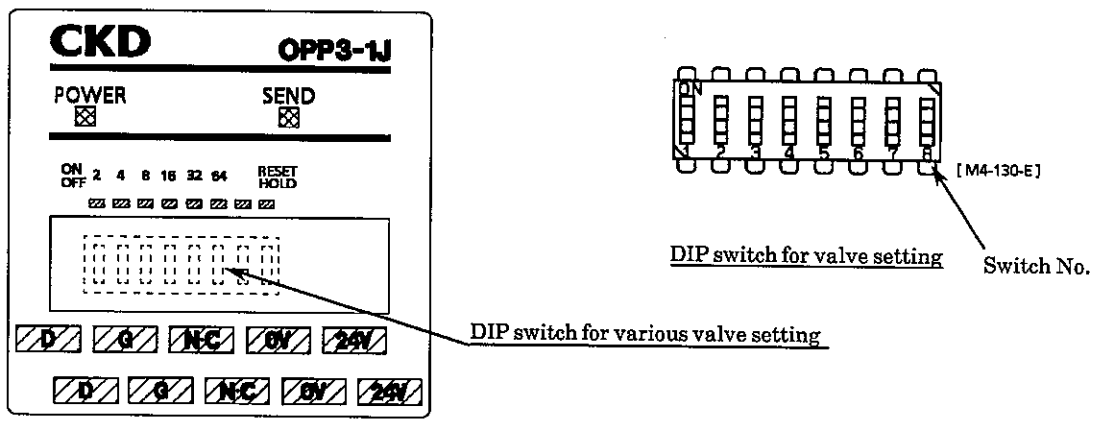
Uniwire system units can be connected to the uniwire H system. If the uniwire H system unit, such as this serial transmission slave station is connected to the uniwire system, this may cause the system to malfunction, resulting in incorrect output. To avoid such trouble, do not connect any uniwire H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

3. OPERATION

3.1 Switch setting

The switch is used to set 2 functions: address and output holding.

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.



	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, OPP3-0J possesses 8 points whereas OPP3-1J does 16 points.

  (Example 2)

  OPP3-0J : Address setting valve 4 → Possessed addresses 4 to 11
  OPP3-1J : 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.

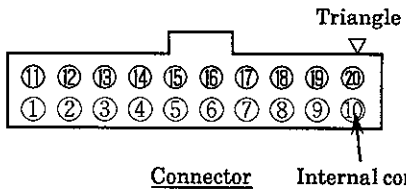
Switch No.8	
OFF	ON
HOLD	RESET
Output data are held in the previous state to abnormality.	All output data are turned OFF when abnormality takes place.

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.



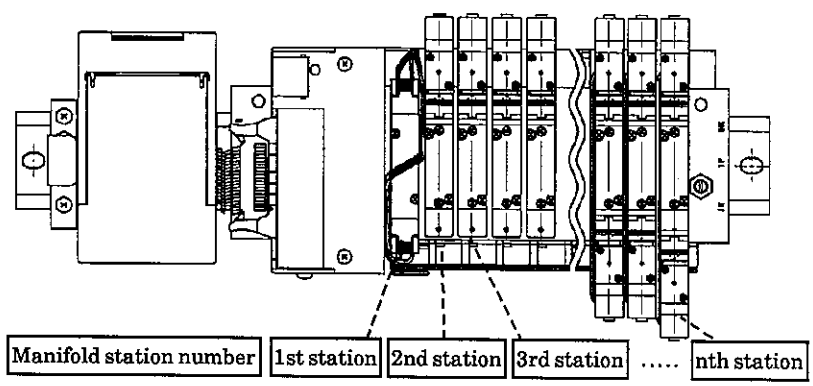
Output point No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Internal connector pin No.	1	2	3	4	5	6	7	8	11	12	13	14	15	16	17	18

※OPP3-OJ ranges 0 to 7

3.3 Correspondence between Output Nos. and Valve solenoid Nos.

(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.



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Manifold wiring example

◦ For Single solenoid valve

	Connector pin No.															
	0(1)	1(2)	2(3)	3(4)	4(5)	5(6)	6(7)	7(8)	8(11)	9(12)	10(13)	11(14)	12(15)	13(16)	14(17)	15(18)
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															

(Corresponds up to the 16th manifold blocks.) ※ OPP3-0J ranges up to the 8th manifold blocks.

◦ For Double solenoid valve

	Connector pin No.															
	0(1)	1(2)	2(3)	3(4)	4(5)	5(6)	6(7)	7(8)	8(11)	9(12)	10(13)	11(14)	12(15)	13(16)	14(17)	15(18)
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															

(Corresponds with up to the 8th manifold block.) ※ OPP3-0J ranges up to the 4th manifold block.

◦ For Mixed (Single and Double) solenoid valve

	Connector pin No.															
	0(1)	1(2)	2(3)	3(4)	4(5)	5(6)	6(7)	7(8)	8(11)	9(12)	10(13)	11(14)	12(15)	13(16)	14(17)	15(18)
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															

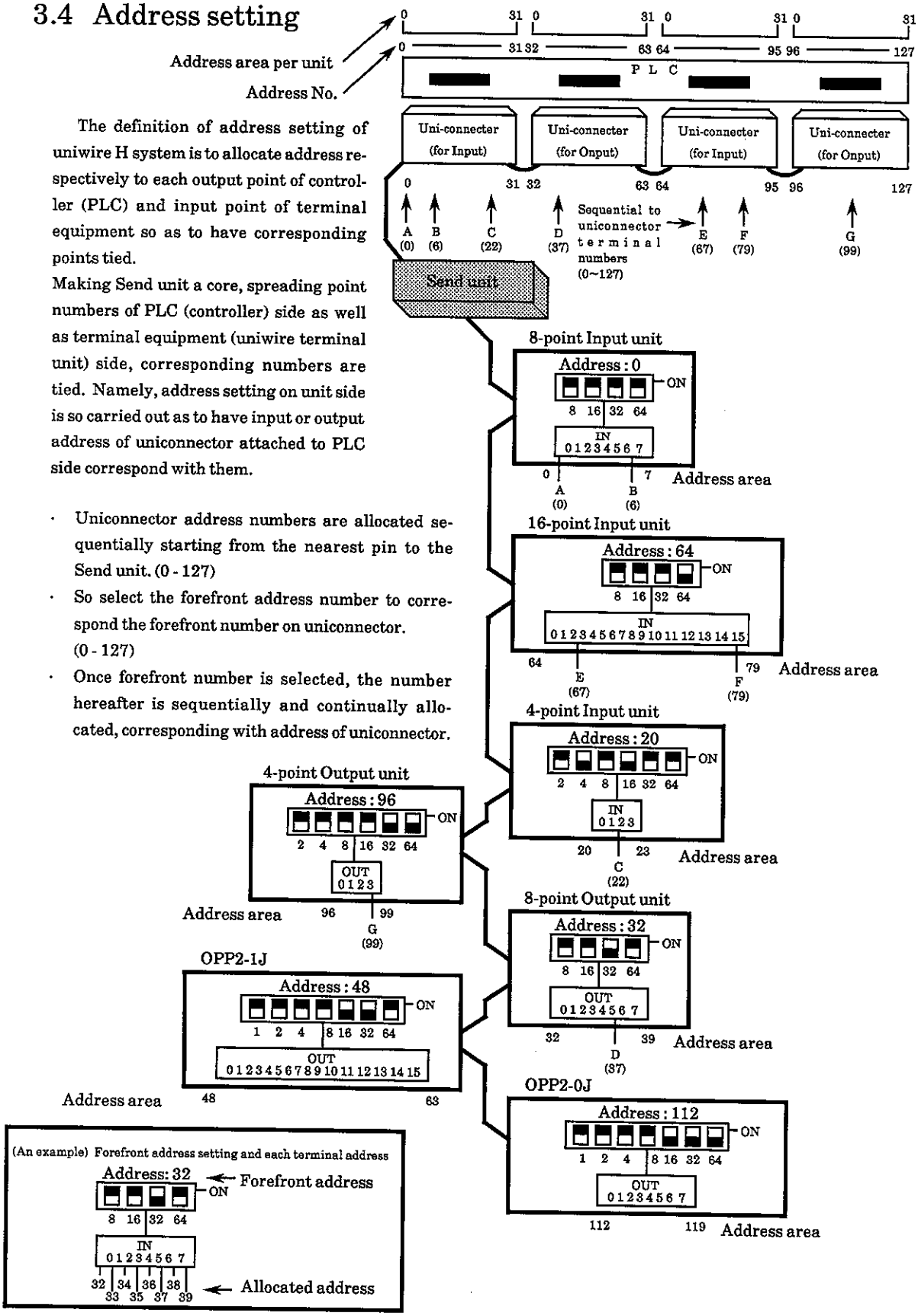
(Corresponds woth up to the 16th manifold block.) ※ OPP3-0J ranges up to the 8th manifold block.

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 M4G-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.

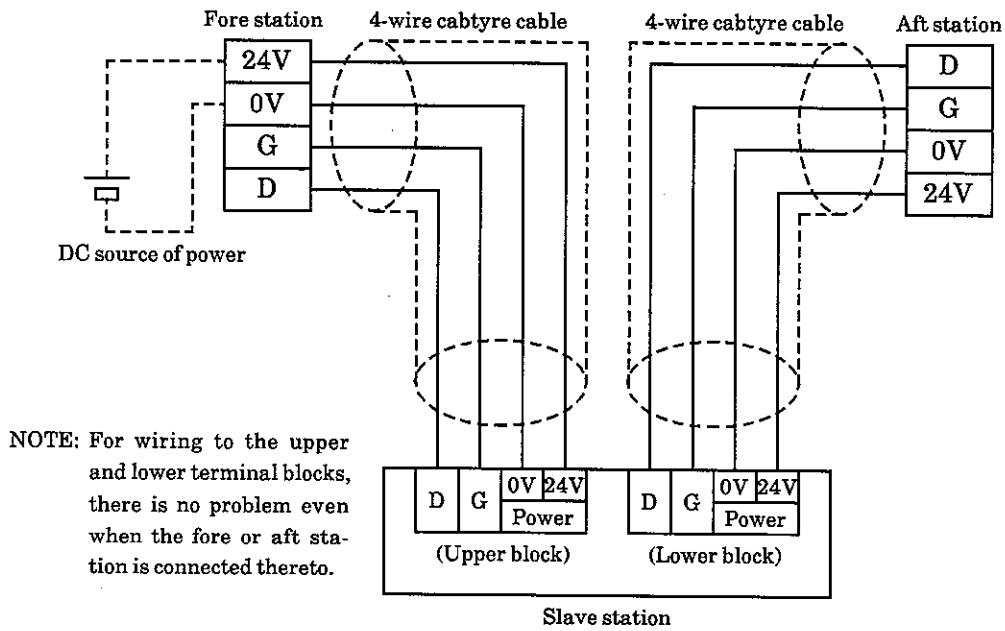
2) Wiring of concentrated power type

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

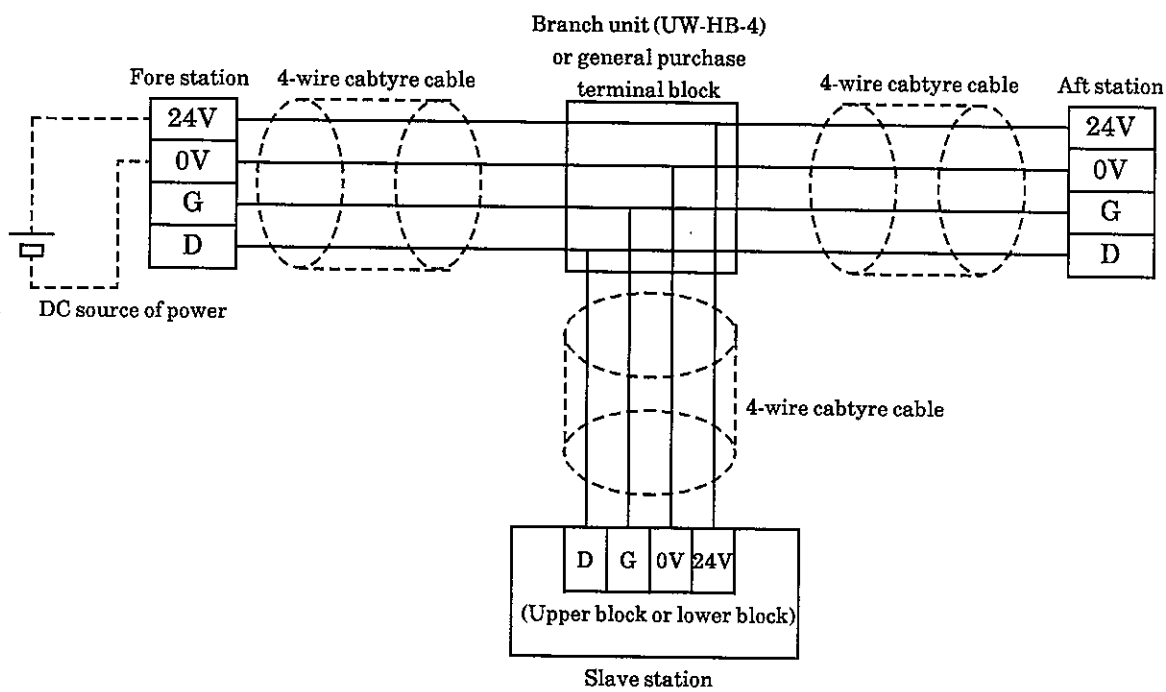
Attaching DC source of power (Main power) to Send unit, connect it to each unit with 4-core cabtyre cable which includs signal cables (D & G).

● In case of multi-drop connection

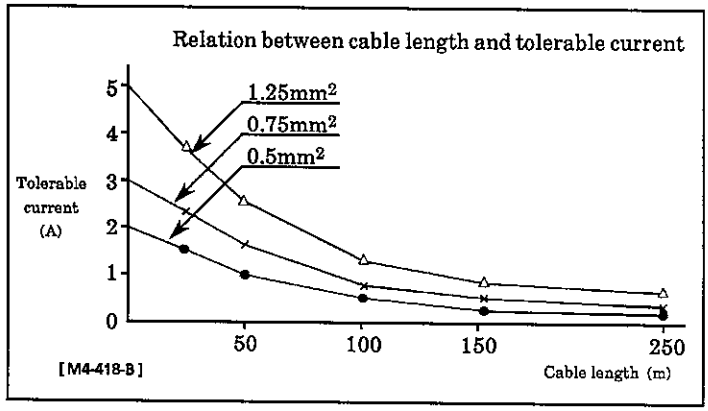


NOTE: For wiring to the upper and lower terminal blocks, there is no problem even when the fore or aft station is connected thereto.

● 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

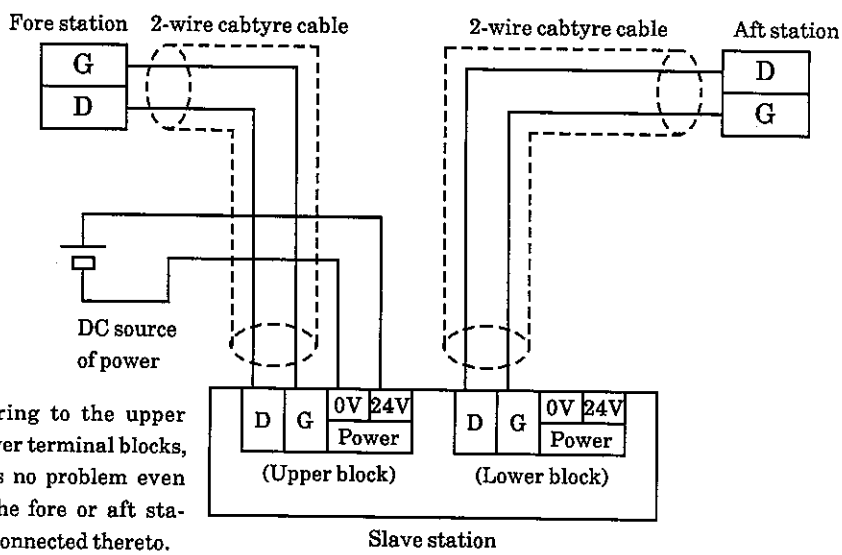
Make it local source type (independently devided) with short distance supply, in case it is the following circumstances.

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

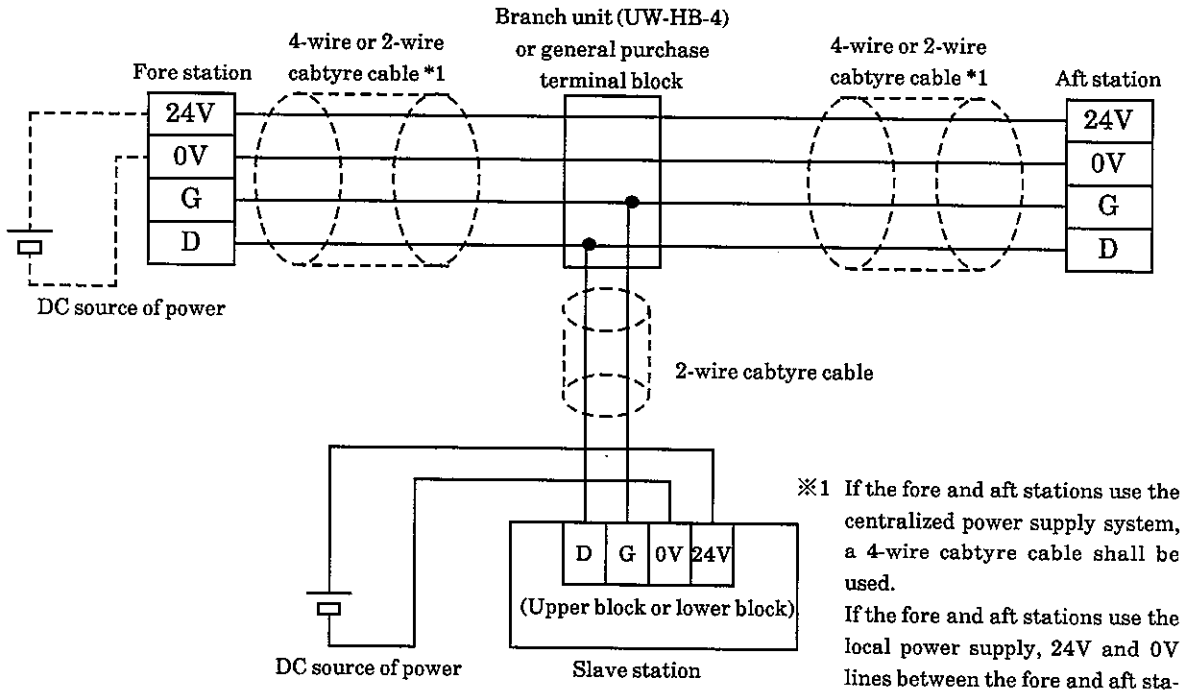
Prepare a DC source (local power) by a unit side independently from main power to Send unit. Wire it seperately with signal cable.

● In case of multi-drop connection



NOTE: For wiring to the upper and lower terminal blocks, there is no problem even when the fore or aft station is connected thereto.

● 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.

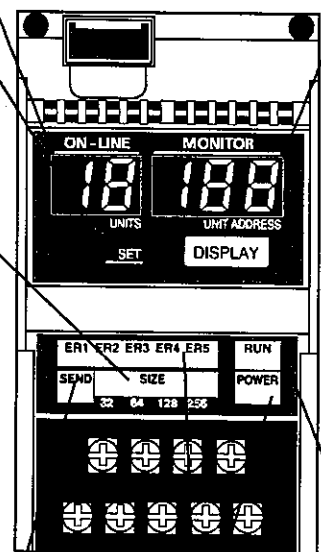
- Display for the number of connection units [ON-LINE]
  The sum of the number of terminal units for the H system and the number of end units (UW-ED-H2), which are connected from the send unit to the transmission line, is displayed automatically

- 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.

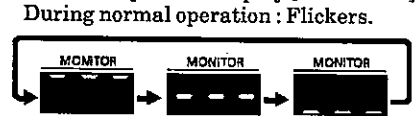
- Display for the number of points [SIZE]
  When uni-connectors are connected, the number of points is displayed automatically.

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

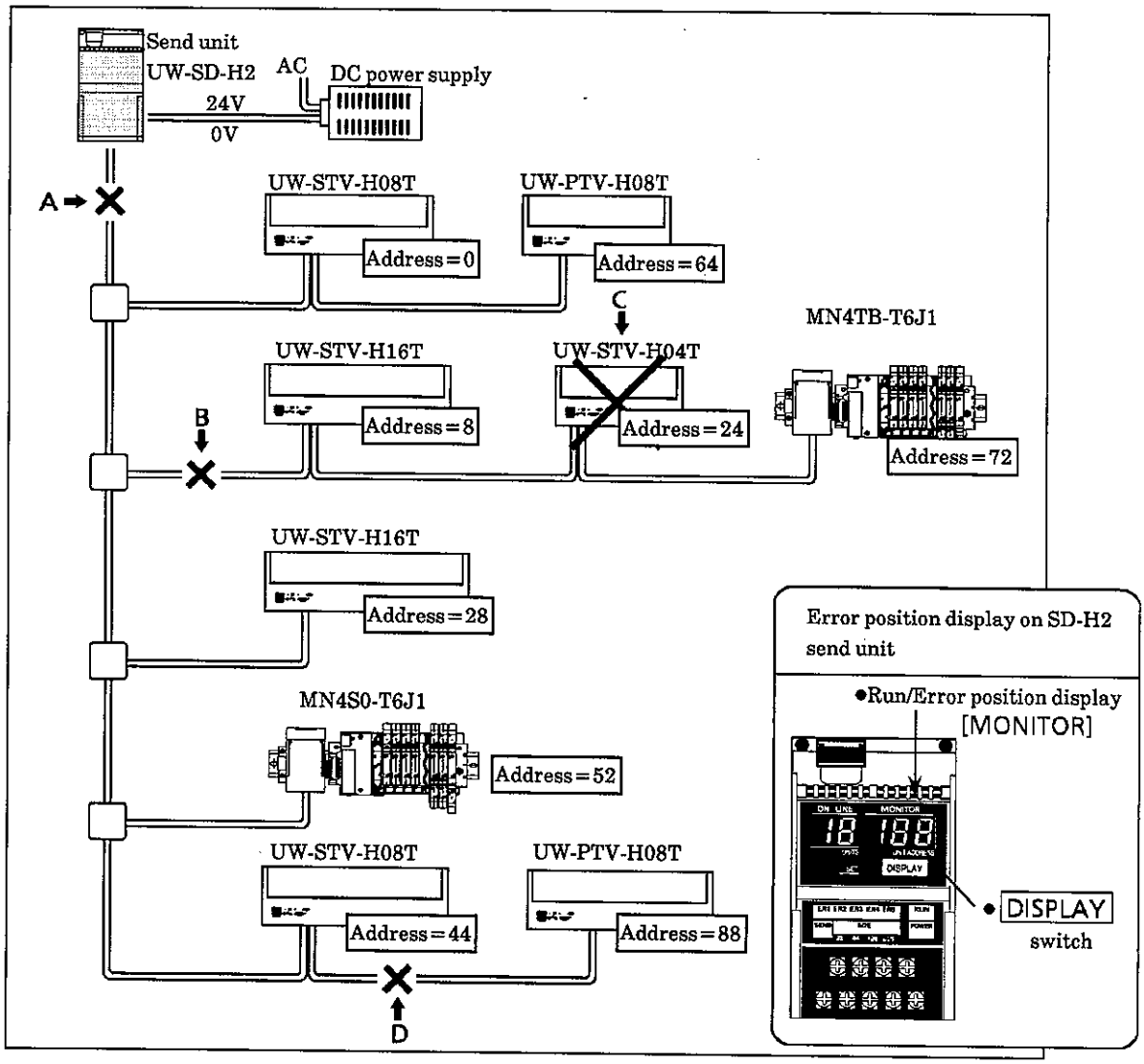
Power supply voltage	System operation	Display
19V or less	Not operated.	"ER2" and "32" are displayed alternately.
21V or less when the power is turned ON.	May not be operated.	The same display as described above occurs if not operated.

2) Error position display on send unit

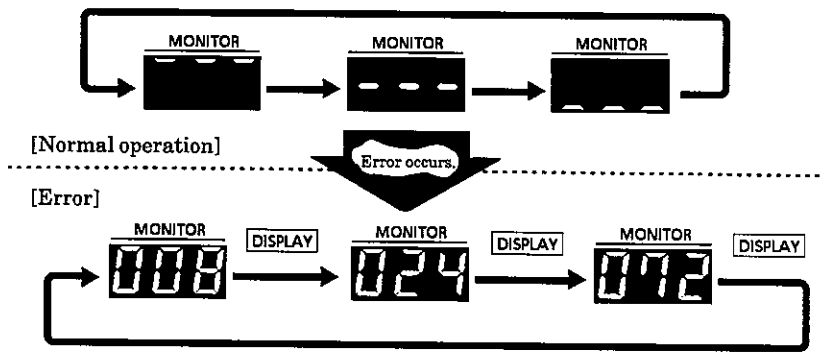
If a broken circuit shown in the Fig. below occurs, the MONITOR display on the send unit shows error numbers stated in the table shown to the right. The error position is also displayed when the DISPLAY switch is pressed.

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.