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# SYSMAC CS/CJ-series Programmable Controllers

## CS1W-AT□□□ Terminal Block Conversion Unit

### Instruction Sheet

#### OMRON Corporation

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Thank you for purchasing an OMRON Programmable Controller (PLC). To ensure safe operation, please be sure to read the instructions provided in this document along with all of the user manuals for the Programmable Controller. Please be sure you are using the most recent versions of the user manuals. Contact your nearest OMRON representative to obtain manuals. Keep this Instruction Sheet and all user manuals in a safe location and be sure that they are readily available to the final user of the products.

#### ■ General Precautions


The user must operate the product according to the performance specifications described in the operation manuals.


Before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, petrochemical plants, and other systems, machines, and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.

Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.


#### ■ Safety Precautions


##### Definition of Precautionary Information


 **WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **Caution** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.


##### Warnings and Cautions


 **WARNING** Do not attempt to take any Unit apart and do not touch any internal parts while the power is being supplied. Doing so may result in electric shock.

 **WARNING** Do not touch any of the terminals or terminal blocks while the power is being supplied. Doing so may result in electric shock.


 **WARNING** Provide safety measures in external circuits, i.e., not in the Programmable Controller (CPU Unit including associated Units; referred to as "PLC"), in order to ensure safety in the system if an abnormality occurs due to malfunction of the PLC or another external factor affecting the PLC operation. Not doing so may result in serious accidents.

- Emergency stop circuits, interlock circuits, limit circuits, and similar safety measures must be provided in external control circuits.
- The PLC will turn OFF all outputs when its self-diagnosis function detects any error or when a severe failure alarm (FALS) instruction is executed. As a countermeasure for such errors, external safety measures must be provided to ensure safety in the system.
- The PLC outputs may remain ON or OFF due to deposition or burning of the output relays or destruction of the output transistors. As a countermeasure for such problems, external safety measures must be provided to ensure safety in the system.


 **Caution** Processing speed at the CPU Unit will be different before and after replacement. This may result in inputs caused by noise. If necessary, increase the response time while making sure that it does not interfere with operation.

 **Caution** Processing speed at the CPU Unit will be different before and after replacement. Operation may not be identical to that before replacement. Confirm that no problems will occur due to operation timing.


#### ■ Operating Environment Precautions

 **Caution** Do not operate the control system in the following places:


- Locations subject to direct sunlight
- Locations subject to temperatures or humidity outside the range specified in the specifications
- Locations subject to condensation as the result of severe changes in temperature
- Locations subject to corrosive or flammable gases
- Locations subject to dust (especially iron dust) or salts
- Locations subject to exposure to water, oil, or chemicals
- Locations subject to shock or vibration

 **Caution** Take appropriate and sufficient countermeasures when installing systems in the following locations:


- Locations subject to static electricity or other forms of noise
- Locations subject to strong electromagnetic fields
- Locations subject to possible exposure to radioactivity
- Locations close to power lines or power supply lines.

 **Caution** The operating environment of the PLC System can have a large effect on the longevity and reliability of the system. Improper operating environments can lead to malfunction, failure, and other unforeseeable problems with the PLC System. Be sure that the operating environment is within the specified conditions at installation and remains within the specified conditions during the life of the system.

#### ■ Application Precautions

 **WARNING** Always heed these precautions. Failure to abide by the following precautions could lead to serious or possibly fatal injury.

- Do not attempt to disassemble, repair, or modify any Units. Any attempt to do so may result in malfunction, fire, or electric shock.

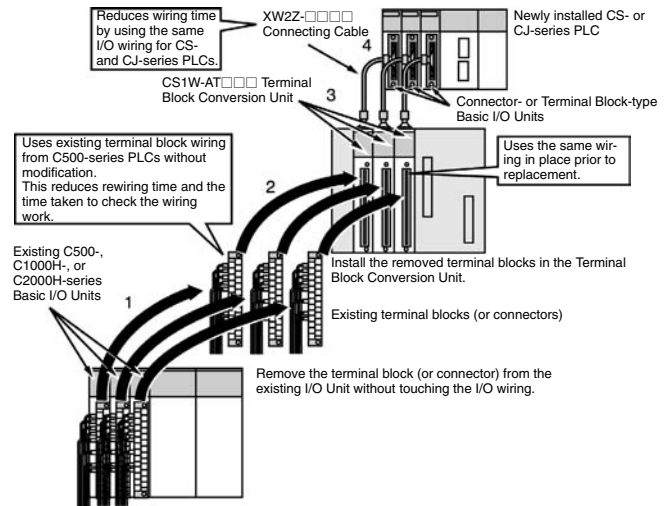
 **Caution** Failure to abide by the following precautions could lead to faulty operation of the PLC or the system, or could damage the PLC or PLC Units. Always heed these precautions.

- The Terminal Block Conversion Unit (this Unit) is designed specifically for converting input and output signals from a C500 I/O Unit to those of a CS/CJ-series I/O Unit. Do not use this Unit for any other purpose.
- Confirm that no problems will occur due to differences in specifications between the I/O Unit prior to replacement and the I/O Unit after replacement. Otherwise, malfunction may result.
- Before mounting the Unit to the control panel, connect the cable between the CS/CJ-series I/O Unit and this Unit to prevent foreign particles entering the top connector. Foreign particles may cause malfunction or damage to the Unit.
- Confirm that the Unit to be connected at the conversion destination is correct before connecting the cables. Using incompatible Units may result in malfunction or damage to the Units.
- Mount the Unit only after checking the connectors and terminal blocks completely. Otherwise malfunction or damage to the Units may result.
- Be sure that all the terminal screws and cable connector screws are tightened to the torque specified in the relevant manuals. Incorrect tightening torque may result in malfunction.
- Use the specified connecting cables to connect the Units. Make sure that any user-prepared cables are correctly wired. Incorrectly wired cables may cause failures in external devices or the I/O Unit at the conversion destination.
- Always use the power supply voltage specified in the operation manuals. An incorrect voltage may result in malfunction or burning.
- Take appropriate measures to ensure that the specified power with the rated voltage and frequency is supplied. Be particularly careful in places where the power supply is unstable. An incorrect power supply may result in malfunction.
- Use crimp terminals for wiring. Do not connect bare stranded wires directly to terminals. Connection of bare stranded wires may result in burning.
- Do not apply voltages to the Input Units in excess of the rated input voltage. Excess voltages may result in burning.
- Do not apply voltages or connect loads to the Output Units in excess of the maximum switching capacity. Excess voltage or loads may result in burning.
- Be sure that the terminal blocks, connectors, and other items with locking devices are properly locked into place. Improper locking may result in malfunction.
- Wire correctly and double-check all the wiring before turning ON the power supply. Incorrect wiring may result in burning.
- Make sure that the lengths of cables are adequate, and provide sufficient space for wiring. Undue strain on cables may cause the cables to break.
- Do not pull on the cables or bend the cables beyond their natural limit. Doing either of these may break the cables.
- Before touching the Unit, be sure to first touch a grounded metallic object in order to discharge any static electricity build-up. Not doing so may result in malfunction or damage.

## ■ Using the Terminal Block Conversion Unit

The CS1W-AT□□□ Terminal Block Conversion Unit is used when replacing a SYSMAC C500, C1000H, or C2000H PLC with a CS- or CJ-series PLC to allow continued use of terminal block wiring for the existing I/O Units without modification. When this Unit is used, rewiring of I/O is not required, significantly reducing the time taken to check wiring work and conduct test runs.

1. Remove the terminal block (or connector) from the existing C500 I/O Unit without touching the I/O wiring.
2. Install the removed terminal block (or connector) in the Terminal Block Conversion Unit, and secure the top and bottom with two fixing screws.
3. Connect the connecting cable to the connector on the top of the Terminal Block Conversion Unit, and lock it. (Before installing this Unit on the control panel, connect this connector so that foreign particles do not enter the connector.)
4. Connect the connecting cable connector to the newly installed CS/CJ-series I/O Unit and secure with screws.



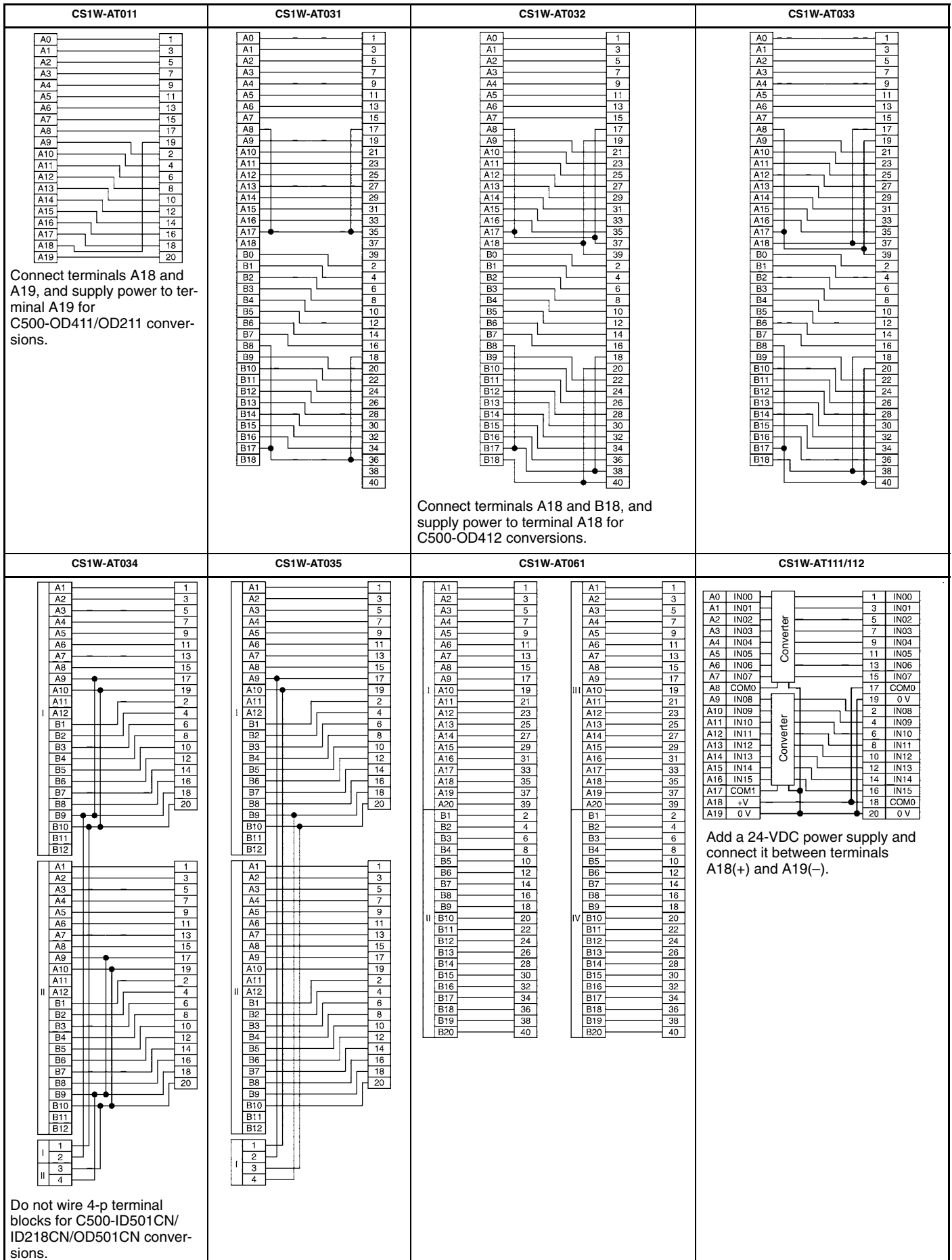
## ■ Terminal Block Conversion Unit Models

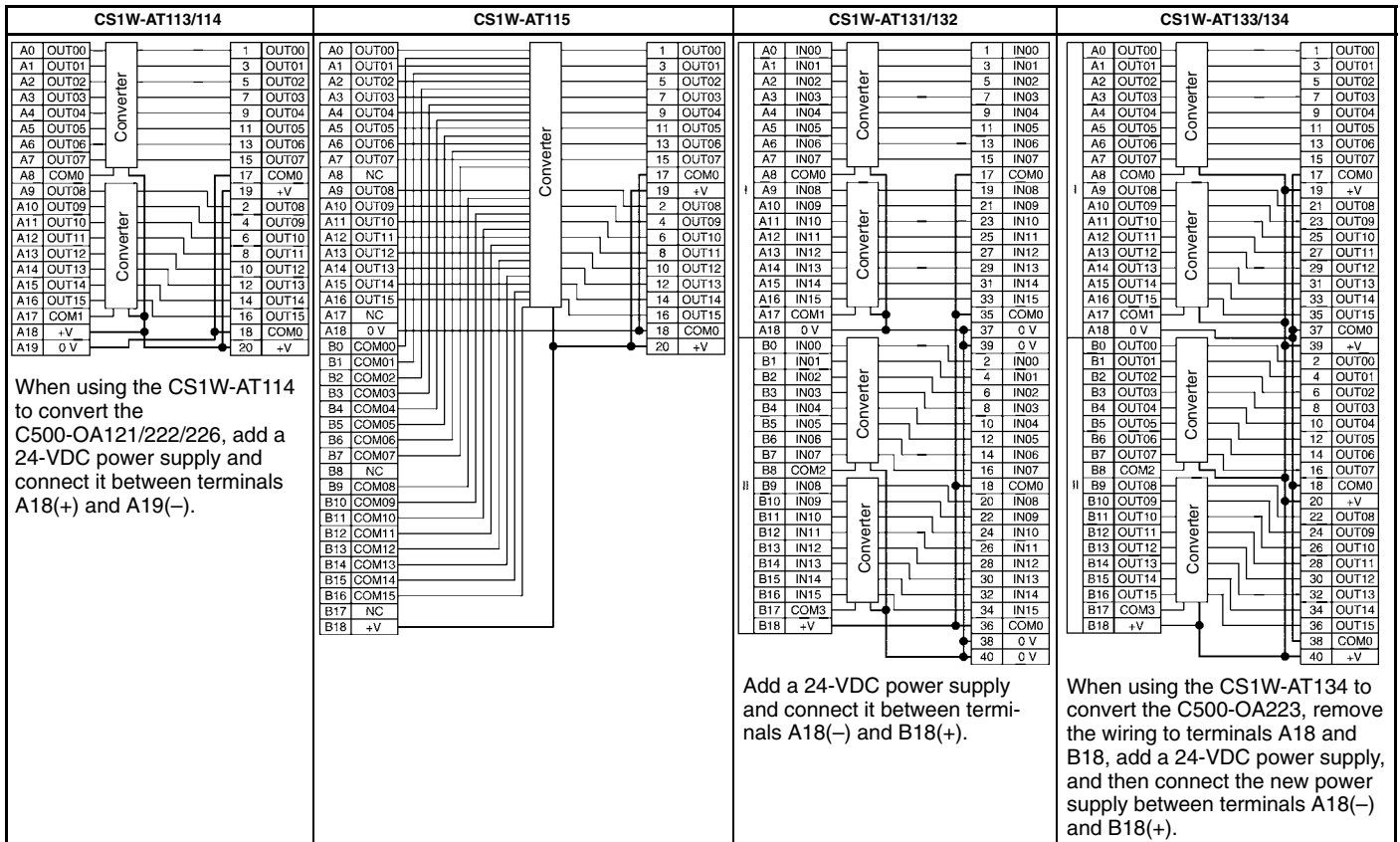
Always consult the operation manuals of the Unit prior to conversion and the Unit after conversion, and check that differences in specifications will not cause any problems in operations.

Terminal Block Conversion Units (CS1W-)	Unit to be converted (C500-)	Unit at conversion destination	Connecting Cable (XW2Z-)
AT011	16-point DC Input Conversion Unit	ID112 16 DC inputs	CS1W-MD561 32 TTL inputs/32 TTL outputs □□□D
		CJ1W-MD563 32 TTL inputs/32 TTL outputs	□□□N
	ID213 16 DC inputs	C200-ID501 32 TTL inputs	□□□A
		CS1W-ID231 CJ1W-ID231 32 DC inputs	□□□D
IM211 16 AC/DC inputs Note: Can only convert DC inputs.	CS1W-ID211 CJ1W-ID211 16 DC inputs	□□□F	
	CS1W-ID231 CJ1W-ID231 32 DC inputs	□□□D	
CS1W-ID211 CJ1W-ID211 16 DC inputs	CS1W-ID211 CJ1W-ID211 16 DC inputs	□□□F	
	CS1W-ID231 CJ1W-ID231 32 DC inputs	□□□D	
8-point DC Input Conversion Unit	C200-ID216 8 DC inputs	CS1W-INT01 CJ1W-INT01 16 DC inputs	□□□F
16-point Transistor Output Conversion Unit	OD217/OD411/OD219 16 transistor outputs	CS1W-OD231 CJ1W-OD231 32 transistor outputs	□□□L
		CS1W-OD211 CJ1W-OD211 16 transistor outputs	□□□F
64-point Transistor Output Conversion Unit	OD211 64 transistor outputs	C200H-OD215 In 128-point Dynamic Output Mode	□□□A
AT031	32-point DC Input Conversion Unit	ID215/ID218 32 DC inputs	CS1W-ID231 CJ1W-ID231 32 DC inputs
		IM212 32 AC/DC inputs Note: Can only convert DC inputs.	CS1W-ID231 CJ1W-ID231 32 DC inputs
AT032	32-point Transistor Output Conversion Unit	OD218/OD412/OD414 32 transistor outputs	CS1W-OD231 CJ1W-OD231 32 transistor outputs
AT033	32-point Transistor Output Conversion Unit (PNP)	OD212 32 transistor outputs (PNP)	CS1W-OD232 32 transistor outputs (PNP)
AT034	32-point DC Input Conversion Unit	ID501CN 32 TTL inputs	CS1W-MD561 32 TTL inputs/32 TTL outputs □□□D
		CJ1W-MD563 32 TTL inputs/32 TTL outputs	□□□N
		C200H-ID501 32 TTL inputs	□□□A
	ID218CN 32 DC inputs	CS1W-ID231 CJ1W-ID231 32 DC inputs	□□□D
32-point Transistor Output Conversion Unit	OD501CN 32 TTL outputs	CS1W-MD561 32 TTL inputs/32 TTL outputs	□□□L

Terminal Block Conversion Units (CS1W-)	Unit to be converted (C500-)	Unit at conversion destination	Connecting Cable (XW2Z-)
AT034	32-point Transistor Output Conversion Unit	OD501CN 32 TTL outputs	CJ1W-MD563 32 TTL inputs/32 TTL outputs □□□N
		C200H-OD501 32 TTL outputs	□□□A
		OD415CN 32 transistor outputs	CS1W-OD231 CJ1W-OD231 32 transistor outputs
AT035	16-point DC Input/16-point Transistor Output Conversion Units	MD211CN 16 DC inputs/ 16 transistor outputs	CS1W-MD261 32 DC inputs/32 transistor outputs Input: □□□D and output: □□□L x 1 each
AT061	64-point DC Input Conversion Unit	ID219 64 DC inputs	CS1W-ID261 CJ1W-ID261 64 DC inputs
		ID114 64 DC inputs	C200H-ID111 64 DC inputs
64-point Transistor Output Conversion Unit	OD213 64 transistor outputs	CS1W-OD261 CJ1W-OD261 64 transistor outputs	□□□B x 2
		CS1W-OD261 CJ1W-OD261 64 transistor outputs	□□□B x 2
AT111	16-point 100 VAC inputs conversion to DC inputs	IA121 16-point 100 VAC inputs	CS1W-ID231 CJ1W-ID231 32 DC inputs
AT112	16-point 200 VAC inputs conversion to DC inputs	IA222 16-point 200 VAC inputs	CS1W-ID231 CJ1W-ID231 32 DC inputs
			CS1W-ID211 CJ1W-ID211 16 DC inputs
AT113	16 relay contact outputs conversion to transistor outputs	OC221 16 relay contact outputs	CS1W-OD231 CJ1W-OD231 32 outputs
AT114	16 triac outputs conversion to transistor outputs	OA121/OA222/ OA226 16 triac outputs	CS1W-OD211 CJ1W-OD211 16 DC inputs
			CS1W-OD231 CJ1W-OD231 32 transistor outputs
AT115	16 relay contact (independent) outputs conversion to transistor outputs	OC223 16 relay contact (independent) outputs	CS1W-OD231 CJ1W-OD231 32 transistor outputs
AT131	32-point 100 VAC inputs conversion to DC inputs	IA122 32-point 100 VAC inputs	CS1W-OD211 CJ1W-OD211 16 transistor outputs
			CS1W-OD231 CJ1W-OD231 32 transistor outputs
AT132	32-point 200 VAC inputs conversion to DC inputs	IA223 32-point 200 VAC inputs	CS1W-ID231 CJ1W-ID231 32 DC inputs
AT133	32 relay contact outputs conversion to transistor outputs	OC224 32 relay contact outputs	CS1W-OD231 CJ1W-OD231 32 transistor outputs
AT134	32 triac outputs conversion to transistor outputs	OA223 24 triac outputs	CS1W-OD231 CJ1W-OD231 32 transistor outputs
			CS1W-OD231 CJ1W-OD231 32 transistor outputs

■ Diagram of Internal Wiring

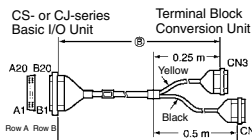




### ■ Connecting Cable

The same connecting cable is used for CS- and CJ-series I/O Units.

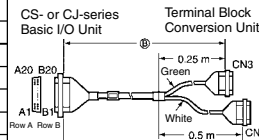
#### XW2Z-□□□D



CN2 (black side) corresponds to row A on CN1 and CN3 (yellow side) corresponds to row B on CN1.

Cable model	A	B
XW2Z-100D	1 m	0.75 m
XW2Z-150D	1.5 m	1.25 m
XW2Z-200D	2 m	1.75 m
XW2Z-300D	3 m	2.75 m
XW2Z-500D	5 m	4.75 m
XW2Z-010D	10 m	9.75 m
XW2Z-15MD	15 m	14.75 m
XW2Z-20MD	20 m	19.75 m

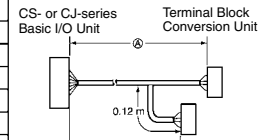
#### XW2Z-□□□L



CN2 (white side) corresponds to row A on CN1 and CN3 (green side) corresponds to row B on CN1.

Cable model	A	B
XW2Z-100L	1 m	0.75 m
XW2Z-150L	1.5 m	1.25 m
XW2Z-200L	2 m	1.75 m
XW2Z-300L	3 m	2.75 m
XW2Z-500L	5 m	4.75 m
XW2Z-010L	10 m	9.75 m
XW2Z-15ML	15 m	14.75 m
XW2Z-20ML	20 m	19.75 m

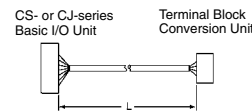
#### XW2Z-□□□N



Length of straight wire (no bends)

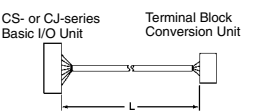
Cable model	A	B
XW2Z-100N	1 m	0.75 m
XW2Z-150N	1.5 m	1.25 m
XW2Z-200N	2 m	1.75 m
XW2Z-300N	3 m	2.75 m
XW2Z-500N	5 m	4.75 m
XW2Z-010N	10 m	9.75 m
XW2Z-15MN	15 m	14.75 m
XW2Z-20MN	20 m	19.75 m

#### XW2Z-□□□B



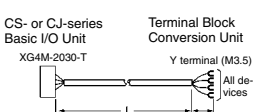
Cable model	L
XW2Z-050B	0.5 m
XW2Z-100B	1.0 m
XW2Z-150B	1.5 m
XW2Z-200B	2.0 m
XW2Z-300B	3.0 m
XW2Z-500B	5.0 m
XW2Z-010B	10 m
XW2Z-15MB	15 m
XW2Z-20MB	20 m

#### XW2Z-□□□A



Cable model	L
XW2Z-050A	0.5 m
XW2Z-100A	1.0 m
XW2Z-150A	1.5 m
XW2Z-200A	2.0 m
XW2Z-300A	3.0 m
XW2Z-500A	5.0 m
XW2Z-010A	10 m
XW2Z-15MA	15 m
XW2Z-20MA	20 m

#### XW2Z-□□□F



Cable model	L
XW2Z-050F	0.5 m
XW2Z-100F	1.0 m
XW2Z-150F	1.5 m
XW2Z-200F	2.0 m
XW2Z-300F	3.0 m
XW2Z-500F	5.0 m
XW2Z-010F	10 m
XW2Z-15MF	15 m
XW2Z-20MF	20 m

### ■ Reference Manuals

Please be sure to read the related user manuals in order to use the Terminal Block Conversion Unit and PLC safely and properly. Be sure you are using the most current version of the manual.

Name	Cat No.
SYSMAC CS-series CS1G/H-CPU□□H, CS1G/H-CPU□□-EV1 Programmable Controllers Operation Manual	W339
SYSMAC CS-series CS1D-CPU□□H/S Programmable Controllers Duplex System Operation Manual	W405
SYSMAC CJ-series CJ1G-CPU□□, CJ1G/H-CPU□□H, CJ1M-CPU□□ Programmable Controllers Operation Manual	W393
SYSMAC CVM1/CV500/CV1000/CV2000 Programmable Controllers Installation Guide	W195
SYSMAC CVM1D Programmable Controllers Duplex System Installation Guide	W350
SYSMAC C1000H/C2000H Programmable Controllers Installation Guide	W139

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