YASKAWA

YASKAWA AC Drive T1000A

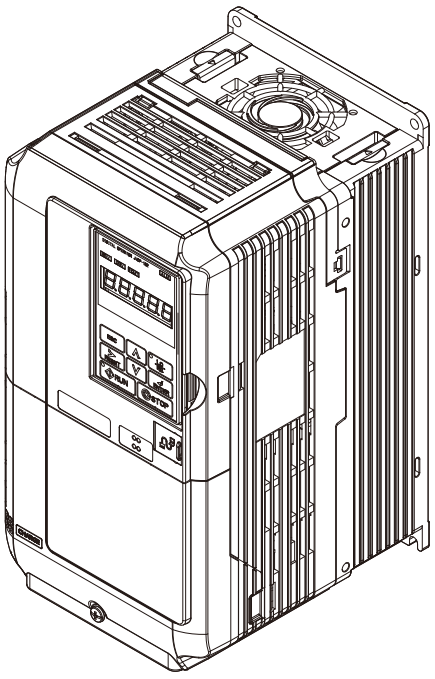
AC Drive for Textile Applications

Safety Precautions

Type: CIMR-TC□A □□□□□□□□

Models: 200 V Class, Three-Phase Input: 0.55 to 110 kW
400 V Class, Three-Phase Input: 0.55 to 185 kW

To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.



MANUAL NO. TOEP C710616 30B

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1 Preface and Safety

Yaskawa manufactures products used as components in a wide variety of industrial systems and equipment. The selection and application of Yaskawa products remain the responsibility of the equipment manufacturer or end user. Yaskawa accepts no responsibility for the way its products are incorporated into the final system design. Under no circumstances should any Yaskawa product be incorporated into any product or design as the exclusive or sole safety control. Without exception, all controls should be designed to detect faults dynamically and fail safely under all circumstances. All systems or equipment designed to incorporate a product manufactured by Yaskawa must be supplied to the end user with appropriate warnings and instructions as to the safe use and operation of that part. Any warnings provided by Yaskawa must be promptly provided to the end user. Yaskawa offers an express warranty only as to the quality of its products in conforming to standards and specifications published in the Yaskawa manual. NO OTHER WARRANTY, EXPRESSED OR IMPLIED, IS OFFERED. Yaskawa assumes no liability for any personal injury, property damage, losses, or claims arising from misapplication of its products.

This book covers safety precautions, areas to check upon receiving your new T1000A, and standards compliance. For instructions on using T1000A, including installation, wiring, operation, maintenance, and inspection, refer to the Technical Manual.

◆ Applicable Documentation

The following manuals are available for the T1000A drive:

<table>
<tr><td rowspan="4">  </td><td>T1000A Series AC Drive Technical Manual</td></tr>
<tr><td>This manual includes detailed explanation of the T1000A and usage instructions. Always refer to the Technical Manual whenever performing any installation, wiring, troubleshooting, and operation procedures. The Technical Manual is not packaged with T1000A. Contact a Yaskawa representative or the Yaskawa sales department directly to receive a copy of the Technical Manual.</td></tr>
<tr><td>T1000A Series AC Drive Safety Precautions (this book)</td></tr>
<tr><td>This guide is packaged together with the product. Covers safety precautions, model numbers, and wiring for the drive. It is meant to get the drive ready for a trial run with the application and for basic operation.</td></tr>
</table>

◆ Terms

Note: Indicates supplementary information that Yaskawa highly recommends be followed, even though equipment may not be at risk.

Drive: Yaskawa AC Drive-T1000A Series

◆ Registered Trademarks

Company names and product names listed in this book are registered trademarks of those companies.

◆ Supplemental Safety Information

General Precautions

- Any illustrations, photographs, or examples used in this book are provided as examples only and may not apply to all products to which this book is applicable.
- The products and specifications described in this book or the content and presentation of the book may be changed without notice to improve the product and/or the book.
- When ordering a new copy of the book due to damage or loss, contact your Yaskawa representative or the nearest Yaskawa sales office and provide the book number shown on the front cover.
- If nameplate becomes worn or damaged, order a replacement from your Yaskawa representative or the nearest Yaskawa sales office.

⚠ WARNING

Read and understand this book and the Technical Manual before installing, operating or servicing this drive. The drive must be installed according to this book, the Technical Manual, and local codes.

The following conventions are used to indicate safety messages in this book. Failure to heed these messages could result in serious or possibly even fatal injury or damage to the products or to related equipment and systems.

⚠ DANGER

Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

⚠ WARNING

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

WARNING! *will also be indicated by a bold key word embedded in the text followed by an italicized safety message.*

⚠ CAUTION

Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

CAUTION! *will also be indicated by a bold key word embedded in the text followed by an italicized safety message.*

NOTICE

Indicates a property damage message.

NOTICE: *will also be indicated by a bold key word embedded in the text followed by an italicized safety message.*

◆ Safety Messages

⚠ DANGER

Heed the safety messages in this book.

Failure to comply will result in death or serious injury.

The operating company is responsible for any injuries or equipment damage resulting from failure to heed the warnings in this book.

Electrical Shock Hazard

Do not connect or disconnect wiring while the power is on.

Failure to comply will result in death or serious injury.

Before servicing, disconnect all power to the equipment. The internal capacitor remains charged even after the power supply is turned off. After shutting off the power, wait for at least the amount of time specified on the drive before touching any components.

⚠ WARNING

Sudden Movement Hazard

System may start unexpectedly upon application of power, resulting in death or serious injury.

Clear all personnel from the drive, motor and machine area before applying power. Secure covers, couplings, shaft keys and machine loads before applying power to the drive.

Electrical Shock Hazard

Do not attempt to modify or alter the drive in any way not explained in this book or the Technical Manual.

Failure to comply could result in death or serious injury.

Yaskawa is not responsible for any modification of the product made by the user. This product must not be modified.

Do not allow unqualified personnel to use equipment.

Failure to comply could result in death or serious injury.

Maintenance, inspection, and replacement of parts must be performed only by authorized personnel familiar with installation, adjustment and maintenance of AC drives.

Do not remove covers or touch circuit boards while the power is on.

Failure to comply could result in death or serious injury.

Fire Hazard

Do not use an improper voltage source.

Failure to comply could result in death or serious injury by fire.

Verify that the rated voltage of the drive matches the voltage of the incoming power supply before applying power.

Crush Hazard

Do not use this drive in lifting applications without installing external safety circuitry to prevent accidental dropping of the load.

The drive does not possess built-in load drop protection for lifting applications.

Failure to comply could result in death or serious injury from falling loads.

Install electrical and/or mechanical safety circuit mechanisms independent of drive circuitry.

Do not carry the drive by the front cover.

Failure to comply may result in minor or moderate injury from the main body of the drive falling.

NOTICE

Observe proper electrostatic discharge procedures (ESD) when handling the drive and circuit boards.

Failure to comply may result in ESD damage to the drive circuitry.

Never connect or disconnect the motor from the drive while the drive is outputting voltage.

Improper equipment sequencing could result in damage to the drive.

Do not perform a withstand voltage test on any part of the drive.

Failure to comply could result in damage to the sensitive devices within the drive.

Do not operate damaged equipment.

Failure to comply could result in further damage to the equipment.

Do not connect or operate any equipment with visible damage or missing parts.

Install adequate branch circuit short circuit protection per applicable codes.

Failure to comply could result in damage to the drive.

The drive is suitable for circuits capable of delivering not more than 100,000 RMS symmetrical Amperes, 240 Vac maximum (200 V Class) and 480 Vac maximum (400 V Class).

Do not expose the drive to halogen group disinfectants.

Failure to comply may cause damage to the electrical components in the drive.

Do not pack the drive in wooden materials that have been fumigated or sterilized.

Do not sterilize the entire package after the product is packed.

◆ Drive Label Warnings

Always heed the warning information listed in ***Figure 1*** in the position shown in ***Figure 2***.

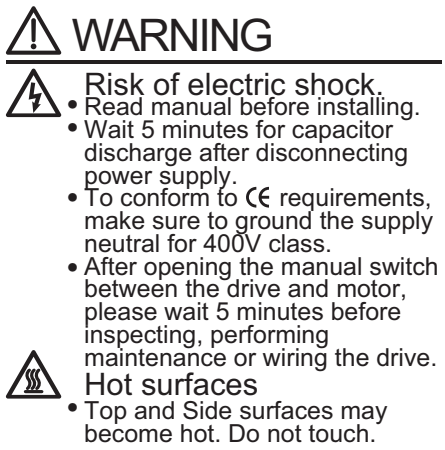


Figure 1 Warning Information

Figure 2 Warning Information Position

◆ Drive Faults and Troubleshooting

If a fault occurs and the drive stops, refer to the Technical Manual to find out what may have caused the problem before attempting to restart the drive.

2 Model Number and Nameplate Check

Please perform the following tasks after receiving the drive:

- Inspect the drive for damage. If the drive appears damaged upon receipt, contact the shipper immediately.
- Verify receipt of the correct model by checking the information on the nameplate.
- If you have received the wrong model or the drive does not function properly, contact your supplier.

◆ Nameplate

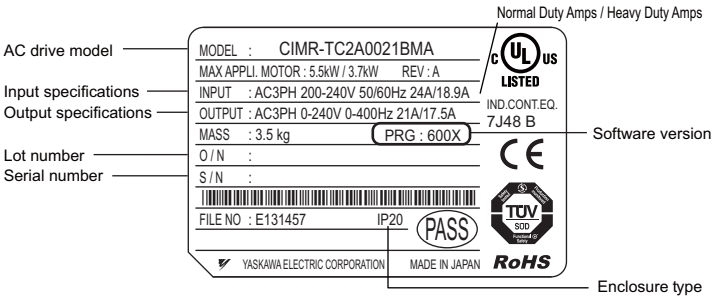


Figure 3 Nameplate Information

◆ Drive Model Identification

CIMR- T C 2 A 0021 B M A

Drive T1000A Series

Design Revision Order

No.	Region code
C	Europe

No.	Voltage Class
2	3-phase, 200-240 Vac
4	3-phase, 380-480 Vac

No.	Enclosure
B	IP20 <1> <2>
C	IP20 <3> <4>
J	Finless (IP20)

No.	Environmental Specification <5> <6>
M	Humidity-and dust-resistant

Three-Phase 200 V

Normal Duty		
No.	**Max. Motor Capacity kW**	**Rated Output Current A**
0004	0.75	3.5
0006	1.1	6.0
0010	2.2	9.6
0012	3.0	12
0021	5.5	21
0030	7.5	30
0040	11	40
0056	15	56
0069	18.5	69
0081	22	81
0110	30	110
0138	37	138
0169	45	169
0211	55	211
0250	75	250
0312	90	312
0360	110	360
0415	110	415

Heavy Duty		
No.	**Max. Motor Capacity kW**	**Rated Output Current A**
0004	0.55	3.2
0006	1.1	5
0010	1.5	8
0012	2.2	11
0021	4.0	17.5
0030	5.5	25
0040	7.5	33
0056	11	47
0069	15	60
0081	18.5	75
0110	22	85
0138	30	115
0169	37	145
0211	45	180
0250	55	215
0312	75	283
0360	90	346
0415	110	415

Three-Phase 400 V

Normal Duty		
No.	**Max. Motor Capacity kW**	**Rated Output Current A**
0002	0.75	2.1
0004	1.5	4.1
0005	2.2	5.4
0007	3.0	6.9
0009	4.0	8.8
0011	5.5	11.1
0018	7.5	17.5
0023	11	23
0031	15	31
0038	18.5	38
0044	22	44
0058	30	58
0072	37	72
0088	45	88
0103	55	103
0139	75	139
0165	90	165
0208	110	208
0250	132	250
0296	160	296
0362	185	362

Heavy Duty		
No.	**Max. Motor Capacity kW**	**Rated Output Current A**
0002	0.55	1.8
0004	1.1	3.4
0005	1.5	4.8
0007	2.2	5.5
0009	3.0	7.2
0011	4.0	9.2
0018	5.5	14.8
0023	7.5	18
0031	11	24
0038	15	31
0044	18.5	39
0058	22	45
0072	30	60
0088	37	75
0103	45	91
0139	55	115
0165	75	150
0208	90	180
0250	110	216
0296	132	260
0362	160	304

<1> IP20 (code B) is available for the following drive models: CIMR-T□2A0004 through 0138, CIMR-T□4A0002 through 0103.
<2> These units fulfill IP20 requirements and provide wire bending space (space between terminals and cable entry point) as recommended in the IEC61800-5.
<3> IP20 (code C) is available for the following drive models: CIMR-T□2A0169 through 0415, CIMR-T□4A0139 through 0362.
<4> These units fulfill IP20 requirements, but the wire bending space provided is lower than recommended in the IEC61800-5.
<5> Drives with these specifications do not guarantee complete protection for the specified environmental condition.
<6> Contact Yaskawa for information about using drives in environments other than specified in this manual.

Note: Current derating may be required depending on the environment where the drive is used. See the Technical Manual for instructions.

3 Standards Compliance

◆ Precautions for CE Low Voltage Directive Compliance

This drive has been tested according to European standard EN61800-5-1, and it fully complies with the Low Voltage Directive. The following conditions must be met to maintain compliance when combining this drive with other devices:

- Do not use drives in areas with pollution higher than severity 2 and overvoltage category 3 in accordance with IEC664.
- Ground the neutral point of the main power supply for 400 V Class drives.
- Always install input fuses to the input side of the drive to prevent damage to the drive if a short circuit occurs. Refer to the Technical Manual for details.

For conformity with the EMC directive, refer to the Technical Manual.

◆ Precautions for UL/cUL Standards Compliance

This drive is tested in accordance with UL standard UL508C and complies with UL requirements. The following conditions must be met to maintain compliance when using this drive in combination with other equipment:

- Do not install the drive to an area greater than pollution severity 2 (UL standard).
- Use UL-listed copper wires (rated at 75°C) and closed-loop connectors or CSA-certified ring connectors.
- A UL-approved fuse should be installed to the input side of the drive.
- Wire low voltage wires with NEC Class 1 circuit conductors. Refer to national state or local codes for wiring. Use a class 2 (UL regulations) power supply for the control circuit terminal.
- This drive is suitable for use on a circuit capable of delivering not more than 100,000 RMS symmetrical amperes for 240 V in 200 V class drives (up to 440 V for 400 V class drives) when protected by Bussmann Type FWH fuses as specified in the ***Table 1***.
- The drive internal motor overload protection is UL listed and in accordance with the NEC and CEC. The setup can be done using the parameters E2-01 and L1-01/02.

For a detailed description of wiring and overload protection functions, refer to the Technical Manual.

◆ Precautions for Using the Safe Disable Function

The Safe Disable feature in Yaskawa drives is a type of hardwire baseblock that shuts off output current. By interrupting power supplied to the motor so that torque can no longer be created, Safe Disable is an STO function (Safe Torque Off) as defined in IEC61800-5-2.

As an STO function, Safe Disable has two separate, independent input channels, each capable of blocking output to the motor and completely shutting of the power module.

Safe Disable terminal wiring should be kept under 30 m. See the Technical Manual for a more information.

◆ Wiring Specification

■ Main Circuit

Refer to the wiring specifications in *Table 1* when wiring the main circuit. Install a fuse to the input side of the drive for protection against problems that could result from a short circuit. Use the *Table 1* to select a UL-approved fuse capable of handling the maximum power input to the drive.
Make sure not to exceed the given tightening torque values in *Table 2*.

Wiring Specification

Table 1 Wiring Specification

Model CIMR-TC	Recommended Motor Cable mm²						Applicable Motor Cable mm²						Main Circuit Terminal Sizes			Main Fuse [Bussmann]
	R/L1, S/L2, T/L3	U/T1, V/T2, W/T3	-, +1, +2	+3	B1, B2	⏚	R/L1, S/L2, T/L3	U/T1, V/T2, W/T3	-, +1, +2	+3	B1, B2	⏚	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, +3	B1, B2	⏚	
2A0004	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V70
2A0006	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V70
2A0010	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V70
2A0012	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V70
2A0021	4	2.5	–	–	–	4 <1>	2.5 to 6	2.5 to 6	4 to 6	–	2.5 to 6	4 to 6	M4	M4	M4	FWH500V90
2A0030	6	6	–	–	–	6 <1>	4 to 16	4 to 16	6 to 16	–	4 to 6	6 to 10	M4	M4	M5	FWH500V100
2A0040	10	10	–	–	–	10 <2>	6 to 16	6 to 16	16	–	4 to 6	6 to 10	M4	M4	M5	FWH500V200
2A0056	16	16	–	–	–	16	16 to 25	16 to 25	16 to 25	–	6 to 10	10 to 16	M6	M5	M6	FWH500V200
2A0069	25	16	–	–	–	16	16 to 25	16 to 25	25	–	10 to 16	16 to 25	M8	M5	M6	FWH500V200
2A0081	35	25	–	–	–	16	25 to 35	25 to 35	25 to 35	–	16	16 to 25	M8	M5	M6	FWH500V300
2A0110	35	35	–	–	–	16	25 to 50	25 to 50	35 to 50	–	16 to 50	16 to 25	M8	M8	M8	FWH500V300
2A0138	50	50	–	–	–	25	35 to 70	35 to 70	50 to 70	–	25 to 70	25	M10	M10	M8	FWH500V350
2A0169	70	70	–	–	–	35	50 to 95	50 to 95	35 to 95	50 to 95	–	25 to 35	M10	–	M10	FWH-400A
2A0211	95	95	–	–	–	50	70 to 95	70 to 95	35 to 95	50 to 95	–	25 to 50	M10	–	M10	FWH-400A
2A0250	95×2P	95×2P	–	–	–	95	95 to 150	95 to 150	70 to 150	35 to 150	–	95 to 150	M12, M10 (+3)	–	M12	FWH-600A
2A0312	95×2P	95×2P	–	–	–	95	95 to 150	95 to 150	70 to 150	70 to 150	–	95 to 150	M12, M10 (+3)	–	M12	FWH-700A
2A0360	240	240	–	–	–	120	95 to 300	95 to 300	125 to 300	70 to 300	–	120 to 240	M12, M10 (+3)	–	M12	FWH-800A
2A0415	120× 2P	300	–	–	–	120	95 to 300	95 to 300	150 to 300	70 to 300	–	120 to 240	M12, M10 (+3)	–	M12	FWH-1000A
4A0002	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 4	M4	M4	M4	FWH500V40
4A0004	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 4	M4	M4	M4	FWH500V50
4A0005	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V70
4A0007	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V70
4A0009	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V90
4A0011	2.5	2.5	–	–	–	2.5 <1>	2.5 to 6	2.5 to 6	2.5 to 6	–	2.5 to 6	2.5 to 6	M4	M4	M4	FWH500V90
4A0018	2.5	2.5	–	–	–	2.5 <1>	2.5 to 16	2.5 to 16	4 to 16	–	4 to 6	2.5 to 6	M4	M4	M5	FWH500V80
4A0023	4	4	–	–	–	4 <1>	2.5 to 16	2.5 to 16	4 to 16	–	4 to 6	4 to 6	M4	M4	M5	FWH500V100
4A0031	6	6	–	–	–	6 <2>	6 to 16	6 to 16	6 to 16	–	6 to 10	6 to 10	M5	M5	M6	FWH500V125
4A0038	10	6	–	–	–	10	10 to 16	6 to 16	6 to 16	–	6 to 10	6 to 16	M5	M5	M6	FWH500V200
4A0044	16	16	–	–	–	16	16 to 25	16 to 25	16 to 25	–	6 to 10	10 to 16	M6	M5	M6	FWH500V250

Model CIMR-TC	Recommended Motor Cable mm²						Applicable Motor Cable mm²						Main Circuit Terminal Sizes			Main Fuse [Bussmann]
	R/L1, S/L2, T/L3	U/T1, V/T2, W/T3	-, +1, +2	+3	B1, B2	⏚	R/L1, S/L2, T/L3	U/T1, V/T2, W/T3	-, +1, +2	+3	B1, B2	⏚	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, +3	B1, B2	⏚	
4A0058	16	16	–	–	–	16	10 to 16	10 to 16	16 to 35	–	10 to 16	10 to 16	M8	M8	M8	FWH500V250
4A0072	16	25	–	–	–	16	16 to 25	16 to 25	25 to 35	–	16 to 25	16 to 25	M8	M8	M8	FWH500V250
4A0088	25	25	–	–	–	16	16 to 50	25 to 50	25 to 50	16 to 50	–	16 to 25	M8	–	M8	FWH500V250
4A0103	35	35	–	–	–	16	25 to 50	25 to 50	25 to 50	25 to 50	–	16 to 25	M8	–	M8	FWH500V250
4A0139	50	50	–	–	–	25	35 to 95	35 to 95	50 to 95	25 to 95	–	25	M10	–	M10	FWH-350A
4A0165	70	70	–	–	–	35	50 to 95	70 to 95	35 to 95	50 to 95	–	25 to 35	M10	–	M10	FWH-400A
4A0208	95	95	–	–	–	50	35 to 95	35 to 95	35 to 150	25 to 70	–	50 to 150	M10	–	M10	FWH-500A
4A0250	120	120	–	–	–	70	95 to 300	95 to 300	70 to 300	35 to 300	–	70 to 240	M10	–	M10	FWH-600A
4A0296	185	185	–	–	–	95	95 to 300	95 to 300	70 to 300	35 to 300	–	95 to 240	M12, M10 (+3)	–	M12	FWH-700A
4A0362	240	240	–	–	–	120	95 to 300	95 to 300	95 to 300	70 to 300	–	120 to 240	M12, M10 (+3)	–	M12	FWH-800A

<1> When this wire size is used for ground connection, according to IEC61800-5-1, a Residual Current Device (RCD) or Residual Current Monitoring (RCM) that interrupts the power supply in case of ground conductor discontinuity is required. Connect it to the ground terminal using an appropriate ring terminal.
<2> When this wire size is used for ground connection, according to IEC61800-5-1, a Residual Current Device (RCD) or Residual Current Monitoring (RCM) that interrupts the power supply in case of ground conductor discontinuity is required. Alternatively use a ground conductor with a cross section of 10 mm² (Cu) and connect it to the ground terminal using an appropriate ring terminal.

Tightening Torque Values

Table 2 Tightening Torque

Terminal Size	M4	M5	M6	M8	M10	M12
Tightening Torque (N·m)	1.2 to 1.5	2.0 to 2.5	4.0 to 6.0	9.0 to 11.0	18.0 to 23.0	32.0 to 40.0

Closed-Loop Crimp Terminal Recommendations

Yaskawa recommends using closed-loop crimp terminals on all drive models. UL approval requires the use of crimp terminals when wiring the drive main circuit terminals on models CIMR-T□2A0110 to 2A0415 and 4A0058 to 4A0362. Use only crimping tools as specified by the crimp terminal manufacturer. Yaskawa recommends crimp terminals made by JST and Tokyo DIP (or equivalent) for the insulation cap.

Table 3 matches the wire gauges and terminal screw sizes with Yaskawa - recommended crimp terminals, tools, and insulation caps. Refer to the appropriate Wire Gauge and Torque Specifications table for the wire gauge and screw size for your drive model. Place orders with a Yaskawa representatives the Yaskawa sales department.

Table 3 Closed-Loop Crimp Terminal Size

Wire Gauge	Terminal Screws	Crimp Terminal Model Number	Tool		Insulation Cap Model No.	Code <1>
			Machine No.	Die Jaw		
2 mm² 14 AWG	M4	R2-4	YA-4	AD-900	TP-003	100-054-028
3.5 / 5.5 mm² 12 / 10 AWG	M4	R5.5-4	YA-4	AD-900	TP-005	100-054-029
	M5	R5.5-5	YA-4	AD-900	TP-005	100-054-030
8 mm² 8 AWG	M4	8-4	YA-4	AD-901	TP-008	100-054-031
	M5	R8-5	YA-4	AD-901	TP-008	100-054-032
14 mm² 6 AWG	M4	14-NK4	YA-4	AD-902	TP-014	100-054-033
	M5	R14-5	YA-4	AD-902	TP-014	100-054-034
	M6	R14-6	YA-5	AD-952	TP-014	100-051-261
	M8	R14-8	YA-5	AD-952	TP-014	100-054-035
22 mm² 4 AWG	M6	R22-6	YA-5	AD-953	TP-022	100-051-262
	M8	R22-8	YA-5	AD-953	TP-022	100-051-263
30 / 38 mm² 3 / 2 AWG	M8	R38-8	YA-5	AD-954	TP-038	100-051-264
50 / 60 mm² 1 AWG 1/0 AWG 1/0 AWG × 2P	M8	R60-8	YA-5	AD-955	TP-060	100-051-265
	M10	R60-10	YF-1, YET-300-1	TD-321, TD-311	TP-060	100-051-266
1 AWG × 2P 2 AWG × 2P	M10	38-L10	YF-1, YET-150-1	TD-224, TD-212	TP-038	100-051-556
80 mm² 2/0 / 3/0 AWG 2/0 AWG × 2P	M10	80-10	YF-1, YET-300-1	TD-323, TD-312	TP-080	100-051-267
3/0 AWG × 2P 3/0 AWG × 4P	M10	80-L10	YF-1, YET-150-1	TD-227, TD-214	TP-080	100-051-557
	M12	80-L12	YF-1, YET-300-1	TD-323, TD-312	TP-080	100-051-558

Wire Gauge	Terminal Screws	Crimp Terminal Model Number	Tool		Insulation Cap Model No.	Code <1>
			Machine No.	Die Jaw		
100 mm² 4/0 AWG	M10	R100-10	YF-1, YET-300-1 YF-1, YET-150-1	TD-324, TD-312 TD-228, TD-214	TP-100	100-051-269
4/0 AWG × 2P 4/0 AWG × 4P	M10	100-L10	YF-1, YET-150-1	TD-228, TD-214	TP-100	100-051-559
	M12	100-L12	YF-1, YET-300-1	TD-324, TD-312	TP-100	100-051-560
150 mm² 250 / 300 kcmil	M10	R150-10	YF-1. YET-150-1	TD-229, TD-215	TP-150	100-051-272
	M12	R150-12	YF-1, YET-300-1	TD-325, TD-313	TP-150	100-051-273
250 kcmil × 2P 250 kcmil × 4P 300 kcmil × 2P 300 kcmil × 4P	M10	150-L10	YF-1, YET-150-1	TD-229, TD-215	TP-150	100-051-561
	M12	150-L12	YF-1, YET-300-1	TD-325, TD-313	TP-150	100-051-562
200 mm² 350 kcmil 400 kcmil	M10	200-10	YF-1, YET-300-1	TD-327, TD-314	TP-200	100-051-563
	M12	R200-12	YF-1, YET-300-1	TD-327, TD-314	TP-200	100-051-275
350 kcmil × 2P 400 kcmil × 2P	M12	200-L12	YF-1, YET-300-1	TD-327, TD-314	TP-200	100-051-564
325 mm² 500 kcmil 600 / 650 kcmil 500 kcmil × 2P 600 kcmil × 2P	M10	325-10	YF-1, YET-300-1	TD-328, TD-315	TP-325	100-051-565
	M12	325-12	YF-1, YET-300-1	TD-328, TD-315	TP-325	100-051-277

<1> Codes refer to a set of three crimp terminals and three insulation caps. Prepare input and output wiring using two sets for each connection.
Example 1: Models with 300 kcmil for both input and output require one set for input terminals and one set for output terminals, so the user should order two sets of [100-051-272].
Example 2: Models with 4/0 AWG × 2P for both input and output require two sets for input terminals and two sets for output terminals, so the user should order four sets of [100-051-560].

■ Control Circuit

Select appropriate wire type and size from ***Table 5*** for control circuit wiring. For simpler and more reliable wiring, crimp ferrules to the wire ends. Refer to the Technical Manual for details.

Table 4 Wire Size (Same for All Models)

Terminal	Bare Wire Terminal		Ferrule-Type Terminal		Wire Type
	Applicable wire size mm² (AWG)	Recommended wire size mm² (AWG)	Applicable wire size mm² (AWG)	Recommended wire size mm² (AWG)	
S1-S8, SC, SP, SN, RP, +V, -V, A1, A2, A3, AC, M1-M6, MA, MB, MC, MP, AM, FM, AC, S+, S-, R+, R-, IG, HC, H1, H2, DM+, DM-	Stranded wire: 0.2 to 1.0 (24 to 16) Solid wire: 0.2 to 1.5 (24 to 16)	0.75 (18)	0.25 to 0.5 (24 to 20)	0.5 (20)	Shielded line, etc.

◆ Drive Motor Overload Protection

Set parameter E2-01 (motor rated current) to the appropriate value to enable motor overload protection. The internal motor overload protection is UL listed and in accordance with the NEC and CEC.

Enable the motor overload protection (L1-01 = “1”, “2”, “3”, “4”, “5”, or “6”) when connecting the drive to a single motor unless there is another means of preventing motor thermal overload. The electronic thermal overload function causes an oL1 fault, which shuts off the output of the drive and prevents additional overheating of the motor. The motor temperature is continually calculated as long as the drive is powered up.

Disable the electronic overload protection (L1-01 = 0: Disabled) and wire each motor with its own motor thermal overload when connecting the drive to more than one motor for simultaneous operation.

■ E2-01 Motor Rated Current

Setting Range: Model Dependent

Default Setting: Model Dependent

If Auto-Tuning has been performed successfully, the motor data that was entered in T1-04 is automatically written into parameter E2-01. If Auto-Tuning has not been performed, manually enter the correct motor rated current in parameter E2-01.

■ L1-01 Motor Overload Protection Selection

This parameter selects the motor overload curve used according to the type of motor applied.

Table 5 Overload Protection Settings

Setting	Description
0	Disabled
1	Standard fan cooled motor (default)
2	Drive duty motor with a speed range of 1:10
3	Vector motor with a speed range of 1:100
4	Permanent Magnet motor with variable torque
5	Permanent Magnet motor with constant torque
6	Standard fan-cooled motor (50 Hz)

■ L1-02 Motor Overload Protection Time

Setting Range: 0.1 to 5.0 Minutes

Factory Default: 1.0 Minutes

The L1-02 parameter sets the allowed operation time before the oL1 fault occurs when the drive is running at 60 Hz and 150% of the full load amp rating (E2-01) of the motor.

◆ Precautionary Notes on External Heatsink (IP00 Enclosure)

When using an external heatsink, UL compliance requires that exposed capacitors in the main circuit are covered to prevent injury to surrounding personnel.

The portion of the external heatsink that projects out can either be protected with the enclosure, or with the appropriate capacitor cover after drive installation is complete. Use the table below to match drive models and capacitor cover. Capacitor covers can be ordered from a Yaskawa representative or directly from the Yaskawa sales department. The table below lists available capacitor covers.

Table 6 Capacitor Cover

Drive Model CIMR-T□	Code Number	Model	Figure
2A0110	100-061-273	ECAT31875-11	*Figure 4*
2A0138	100-061-274	ECAT31876-11	
2A0169	100-061-275	ECAT31877-11	
2A0211			
2A0250	100-061-277	ECAT31726-11	
2A0312			
2A0360	100-061-278	ECAT31698-11	
2A0415			
4A0058	100-061-273	ECAT31875-11	
4A0072	100-061-274	ECAT31876-11	
4A0088	100-061-276	ECAT31878-11	
4A0103			
4A0139	100-061-275	ECAT31877-11	
4A0165			
4A0208	100-061-277	ECAT31726-11	
4A0250	100-061-278	ECAT31698-11	
4A0296			
4A0362			

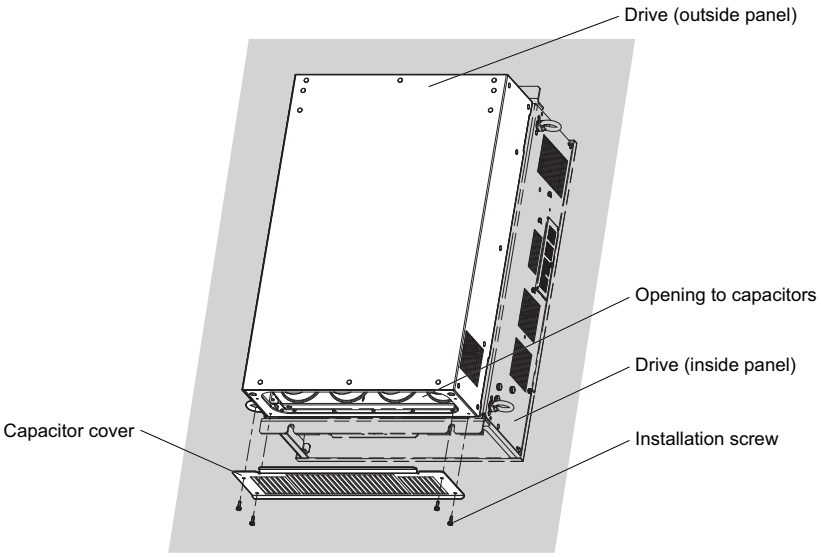
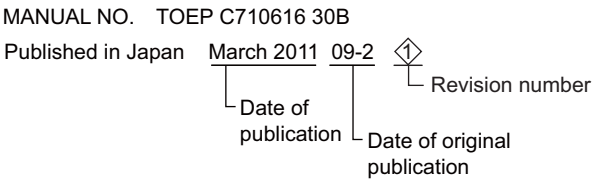


Figure 4 Capacitor Cover

◆ Revision History

The revision dates and numbers of the revised manuals are given on the bottom of the back cover.



Date of Publication	Revision Number	Section	Revised Content
March 2011	①	Front cover	Revision: Format
		All	Addition: Larger drive capacities added along with corresponding data Three-phase 200V: CIMR-TC2A0169 to 2A0415 Three-phase 400V: CIMR-TC4A0139 to 4A0362 Revision: Reviewed and corrected entire documentation
		Chapter 3	Addition: • Closed-Loop Crimp Terminal Recommendations • Precautionary Notes on External Heatsink (IP00 Enclosure) Correction: • Precautions for CE Low Voltage Directive Compliance • Precautions for UL/cUL Standards Compliance • Table 1 Wiring Specification • Main Fuse
		Back cover	Revision: Address, format
February 2009	–	–	First edition

YASKAWA AC Drive T1000A

AC Drive for Textile Applications

Safety Precautions

EUROPEAN HEADQUARTERS
YASKAWA EUROPE GmbH
Hauptstrasse 185, 65760 Eschborn, Germany
Phone: +49 (0)6196 569 300 Fax: +49 (0)6196 569 398
E-mail: info@yaskawa.de Internet: http://www.yaskawa.eu.com

YASKAWA ENGINEERING EUROPE GmbH
Hauptstrasse 185, 65760 Eschborn, Germany
Phone: +49 (0)6196 569 520 Fax: +49 (0)6196 888 598
E-mail: support@yaskawa.de Internet: http://www.yaskawa-eng.eu.com

MANUFACTURING FACILITY
YASKAWA ELECTRIC UK LTD.
1 Hunt Hill, Orchardton Woods, Cumbernauld G68 9LF, United Kingdom
Phone: +44 (0)12 36 735 000 Fax: +44 (0)12 36 458 182

U.S.A.
YASKAWA AMERICA, INC.
2121 Norman Drive South, Waukegan, IL 60085, U.S.A.
Phone: (800) YASKAWA (927-5292) or +1 847 887 7000 Fax: +1 847 887 7310
Internet: http://www.yaskawa.com

JAPAN
YASKAWA ELECTRIC CORPORATION
New Pier Takeshiba South Tower, 1-16-1, Kaigan, Minatoku, Tokyo, 105-6891, Japan
Phone: +81 (0)3 5402 4502 Fax: +81 (0)3 5402 4580
Internet: http://www.yaskawa.co.jp

DRIVE CENTER (INVERTER PLANT)
2-13-1, Nishimiyaichi, Yukuhashi, Fukuoka, 824-8511, Japan
Phone: 81-930-25-3844 Fax: 81-930-25-4369
Internet: http://www.yaskawa.co.jp

YASKAWA ELECTRIC CORPORATION

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