YASKAWA

YASKAWA AC Drive 1000-Series
A1000 HHP Modular Drive
Component Selection Guide

Type: A1000 HHP Modular Drive System

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. BL.A1000HHP.01

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A1000 HHP
Component Selection Guide

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1 Preface

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, EXPRESS OR IMPLIED, IS OFFERED.

Yaskawa assumes no liability for any personal injury, property damage, losses, or claims arising from misapplication of its products.

2 General Safety

◆ Supplemental Safety Information

General Precautions
• The diagrams in this manual may be indicated without covers or safety shields to show details. Replace the covers or shields before operating the drive and run the drive according to the instructions described in this manual. • Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all products to which this manual is applicable. • The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual. • When ordering a new copy of the manual due to damage or loss, contact your Yaskawa representative or the nearest Yaskawa sales office and provide the manual 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 manual before installing, operating or servicing this drive. The drive must be installed according to this manual and local codes

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

⚠ DANGER

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

⚠ WARNING

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

WARNING! *may 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! *may 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: *may 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 manual.

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 manual.

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 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.

3 Receiving

◆ General

This A1000 HHP Modular System Component Selection Guide is intended to assist in the selection of components and assembly of the modular inverter A1000 HHP series drives models AUXH0466, AUXH0900, AUXHX1350, AUXH1800, AUXH2250. The (X) in the model number refers to 480 Volt (4) or 575/690 Volt (6).

This guide will provide the necessary information to properly select the necessary components for a complete functioning inverter drive system, and should be undertaken only by qualified electrical and mechanical design personnel familiar with the principles of drive system application and design. Improper design could result in bodily injury and/or non-warrantable equipment damage

◆ Handling

Carefully and thoroughly unpack and inspect the individual components, which make up the modular drive system, for any damage which may have been sustained during shipment. If any obvious damage is noticed, do not accept shipment until you have contacted the freight company or agent. Have the agent note the damage on the freight bill before accepting the shipment. If you should happen to find any concealed damage during unpacking, you should again contact the freight company. Yaskawa Electric America, Inc. is not responsible for any damage which may have resulted during shipment.

CAUTION! *The A1000 modular drive system components contain Electrostatic Discharge (ESD) sensitive CMOS ICs. Special static control measures must be followed to prevent damage to the equipment. Equipment in excess of 20kg (45 pounds) should be moved by lifting apparatus by qualified personnel. Failure to observe the preceding may result in personal injury and/or equipment damage.*

◆ Storage

If the drive system components are to be stored for an extended period of time, it is recommended to observe the following precautions:

Store within an ambient temperature range of -4 to 140° F (-20 to 60° C)

Avoid direct sunlight (not outdoors)

Store in an area free from moisture, dust, vibration, and corrosive gases

Relative Humidity should not exceed 95%, non-condensing

By observing the above precautions, the A1000 modular drive system components will be maintained with no degradation in performance.

◆ Description of Operation

The A1000 HHP Modular Drive System incorporates a modular design style approach for inverter drive system designers. This enables the system designer the capability to provide an economical, flexible, compact, non-complex, user friendly, high performance solution for applications involving drive loads requiring constant torque amp ratings of 414 to 2000 Amps ac, and variable torque amp ratings of 466 to 2250 Amps ac. These modular drive systems are offered in two voltage categories; 480Volt and 575/690Volt.

Each system incorporates at least one inverter module capable of delivering 400A, 3-phase continuous output. This system has the capability to be expanded by paralleling up to five total inverter modules for a maximum continuous output current rating of 2000A, 3-phase. This is made possible by the use of specially designed output reactors along with the adoption of new technologies for parallel processing for synchronization of IGBT gate pulses minimizing the cross current flow between the inverter modules. By improving gating techniques, improved cooling techniques, and an optimized cross current or current balance control method, not only has the overall size of the inverter been decreased but the output current balance factor has increased to over 98 percent.

The converter module converts the incoming 3 phase voltage to a dc bus voltage. Depending on the designer's requirements each drive system may incorporate a converter module supplying the necessary energy required for the inverter module(s). The converter module provides the necessary DC rectified voltage to meet the performance specification for the inverter module. The converter module design has also taken into consideration the requirements for input current harmonic distortion reduction and can be configured for up to 24 pulse operation.

A single main control module, consisting of a control power supply PCB, a main control board and a digital operator interface provide the necessary control functions and I/O interface for all drive system configurations whether it uses one, two, three, four, or five modules, 480V or 575/690V. The software features and functions are similar to the standard A1000 chassis style drives with the exception of a some additional parameters and control features.

The last essential item to complete the drive system design is the power supply module. A single transformer provides all power to the control logic circuits as well all cooling fans for the converter and inverter module(s). A voltage tap change PCB, power fluctuation ride thru capacitors, and a voltage detection board complete the assembly.

Minimal interconnect low power wiring for all drive system modules is required but has been optimized and made simple and can be furnished by Yaskawa Electric America, Inc. in complete cable harness packaged assemblies. Main circuit and high power connections have been designed for quick and easy installation of wire conductors/cabling and bus bars.

◆ Model Number

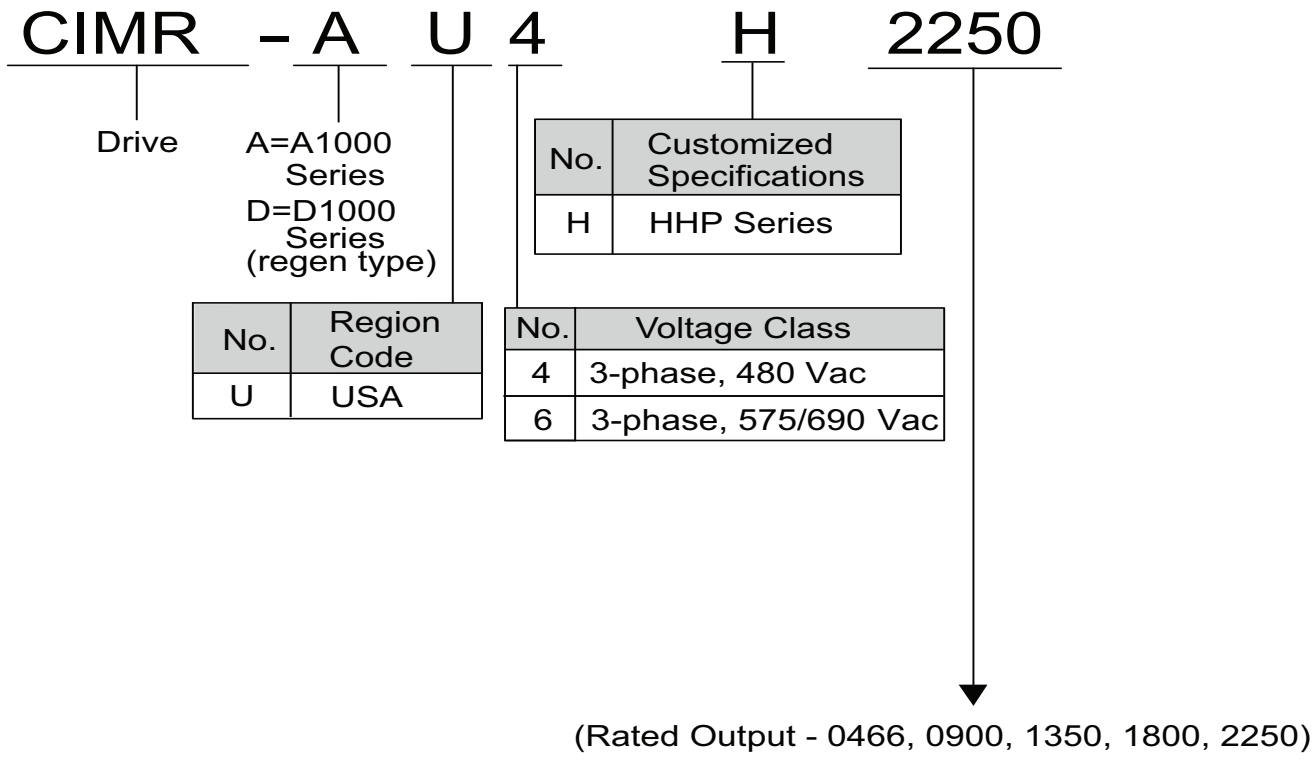


Figure 1 Example CIMR-AU4H2250

4 Mechanical Installation

Dimension diagrams of components Inverter, Converter, Power Supply, and Control Modules.

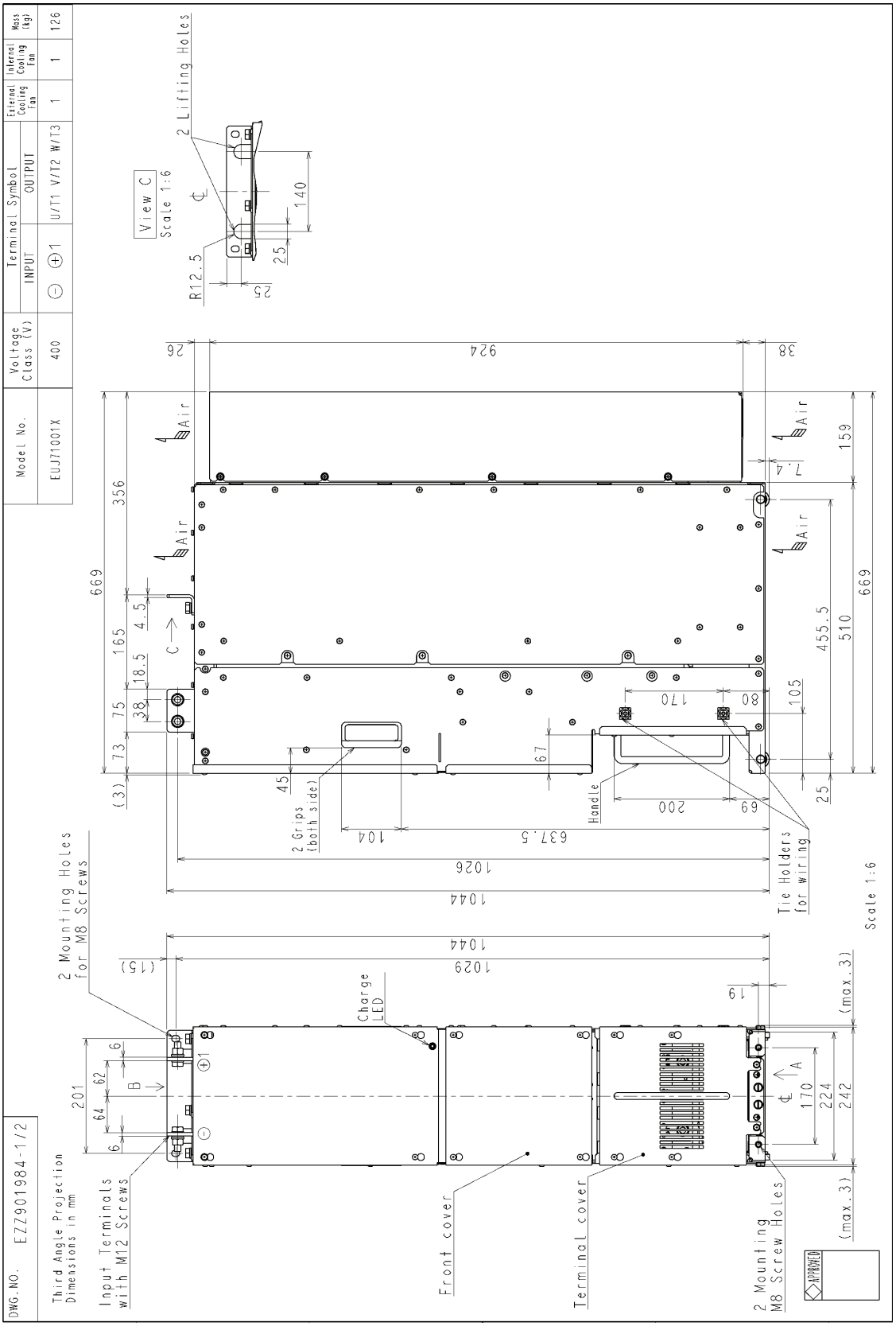


Figure 2 480V Inverter, sheet 1 of 2

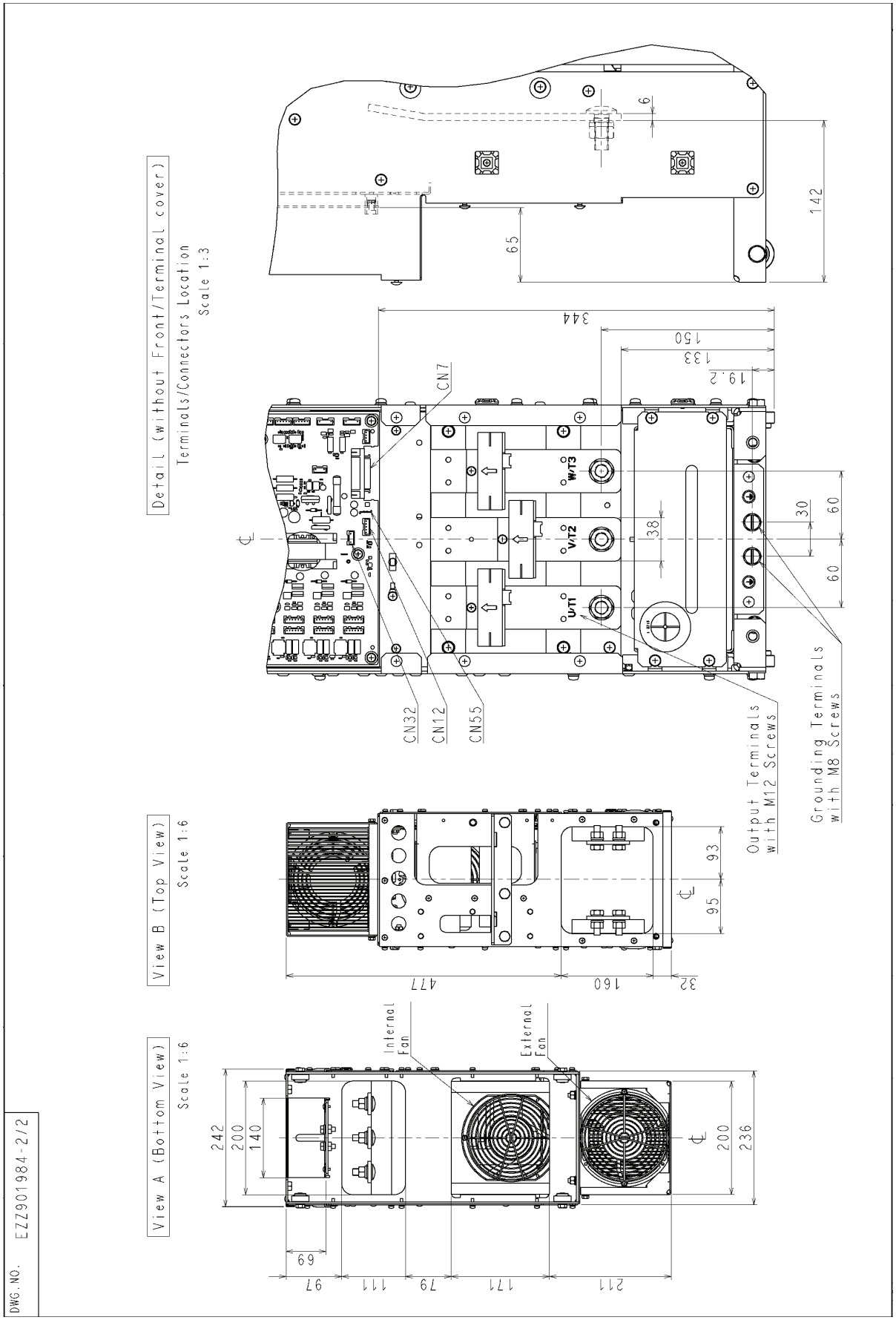


Figure 3 480V Inverter, sheet 2 of 2

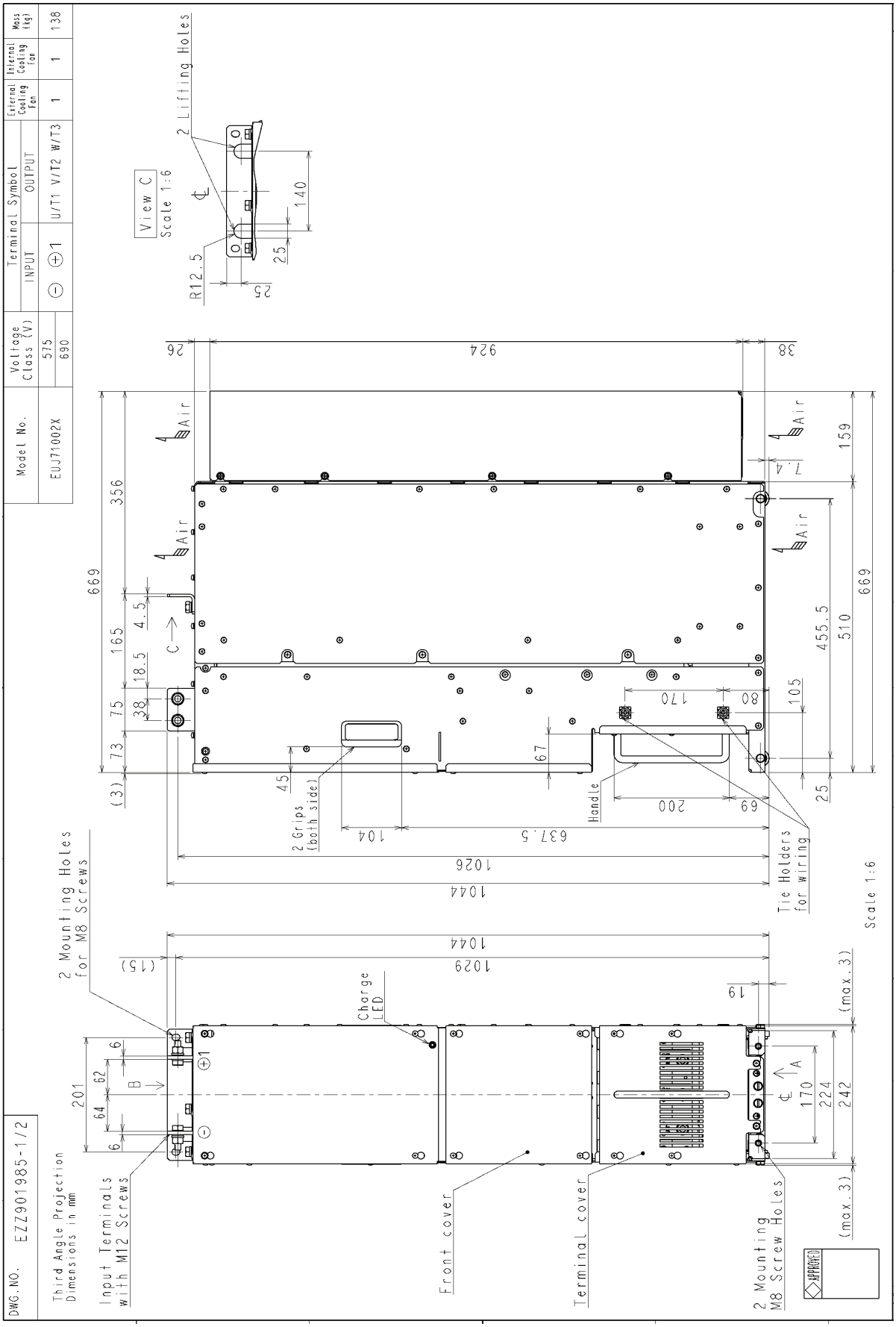


Figure 4 575/690V Inverter, sheet 1 of 2

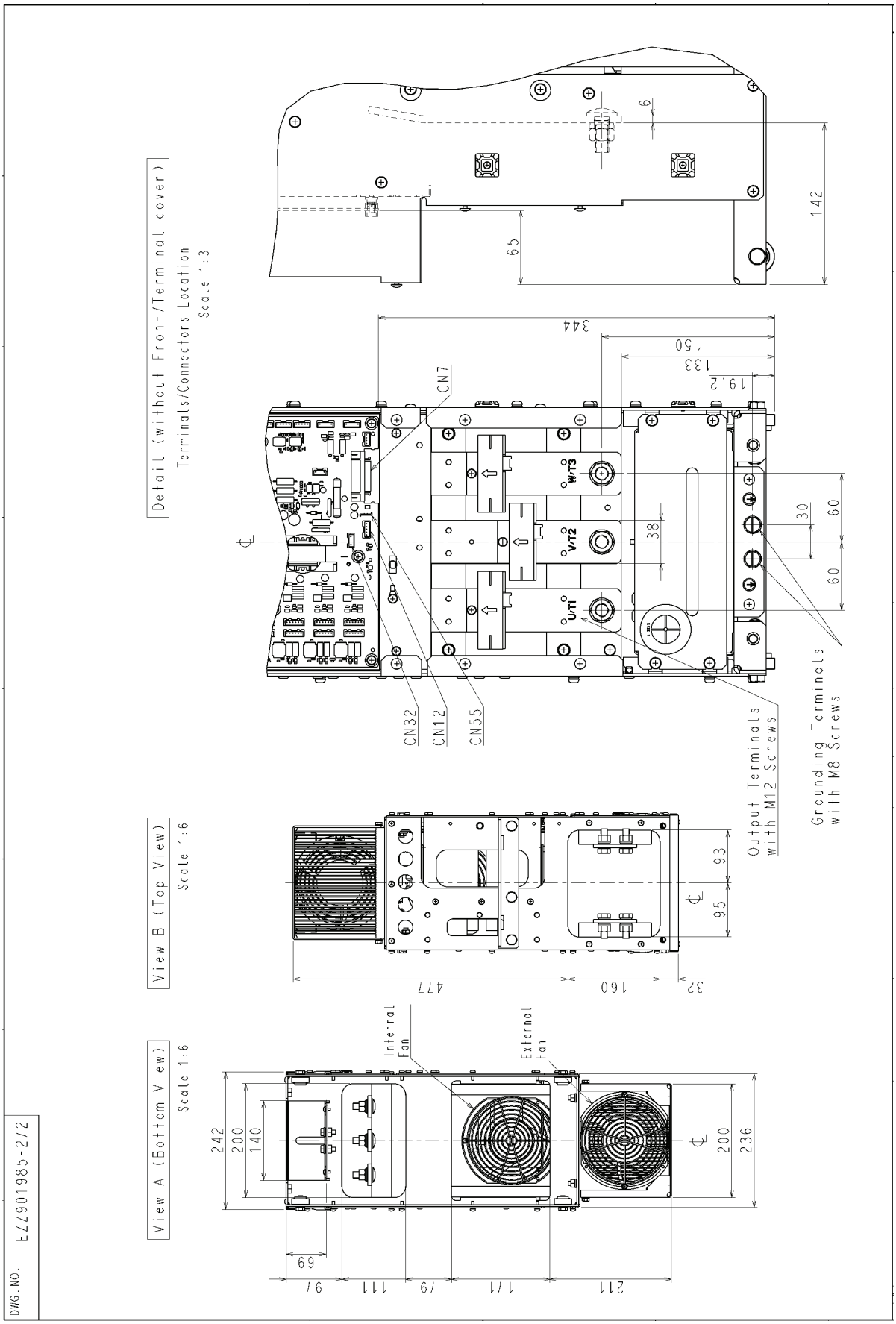


Figure 5 575/690V Inverter, sheet 2 of 2

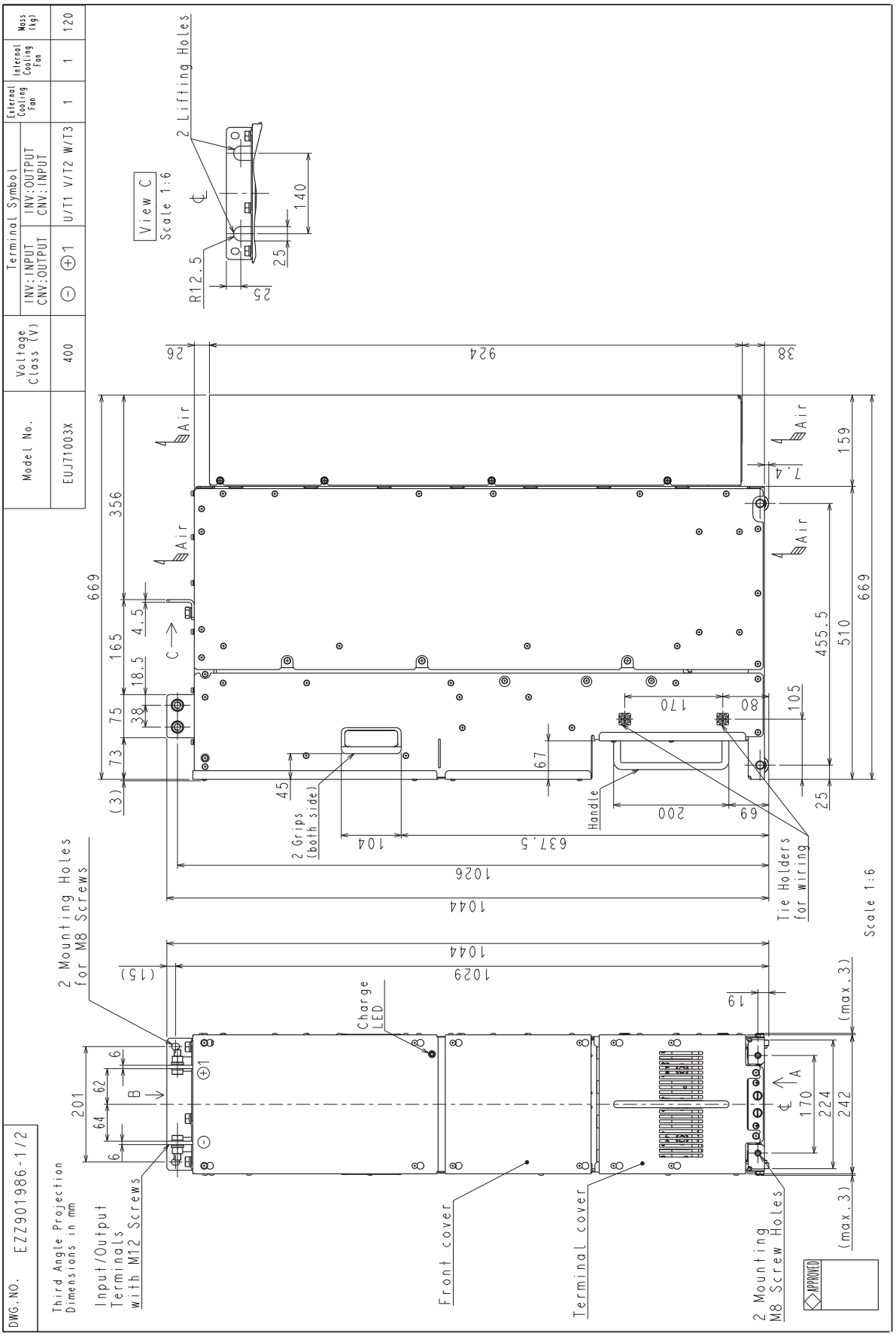


Figure 6 480V Regen Inverter Module, sheet 1 of 2

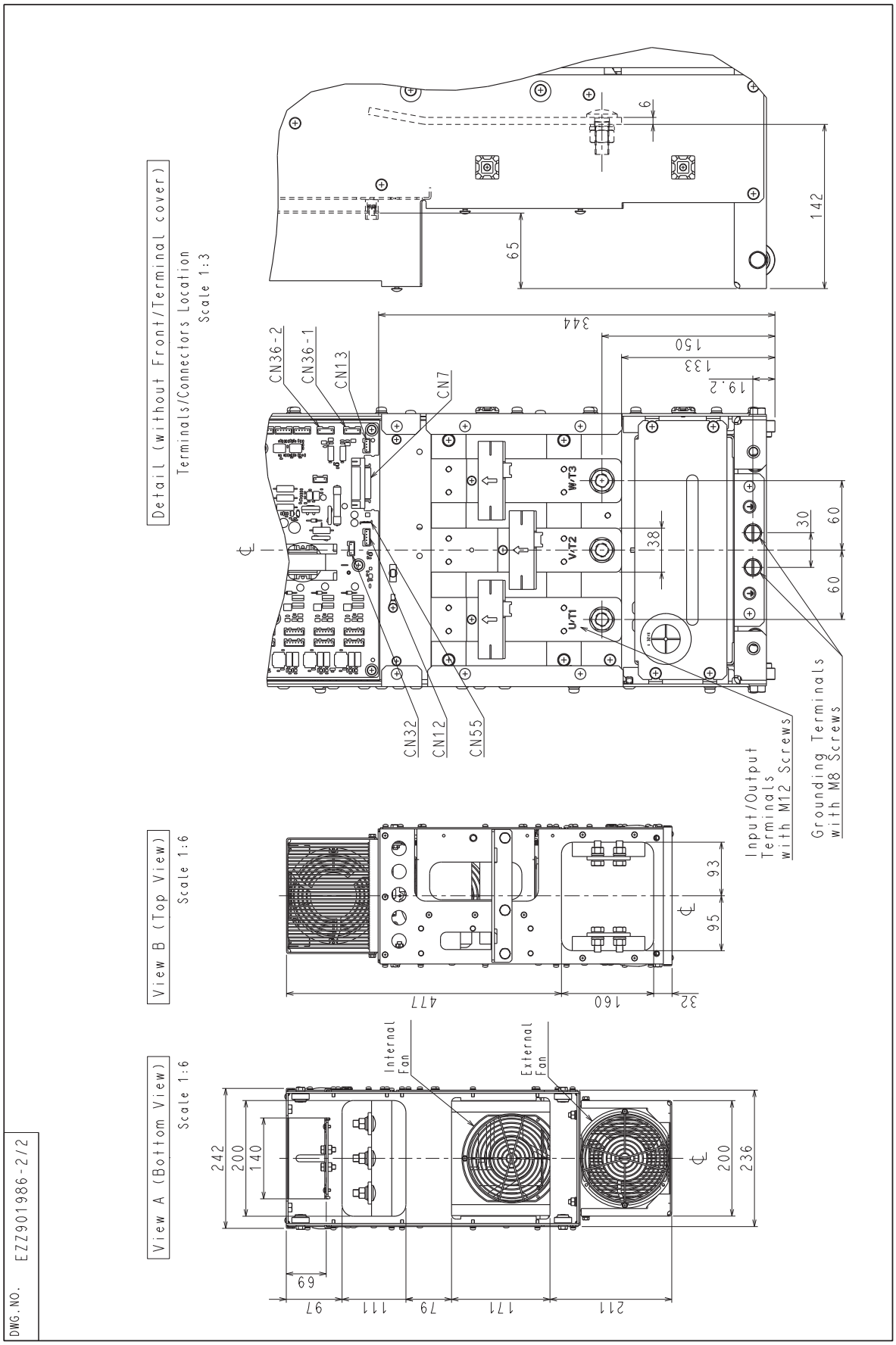


Figure 7 480V Regen Inverter Module, sheet 2 of 2

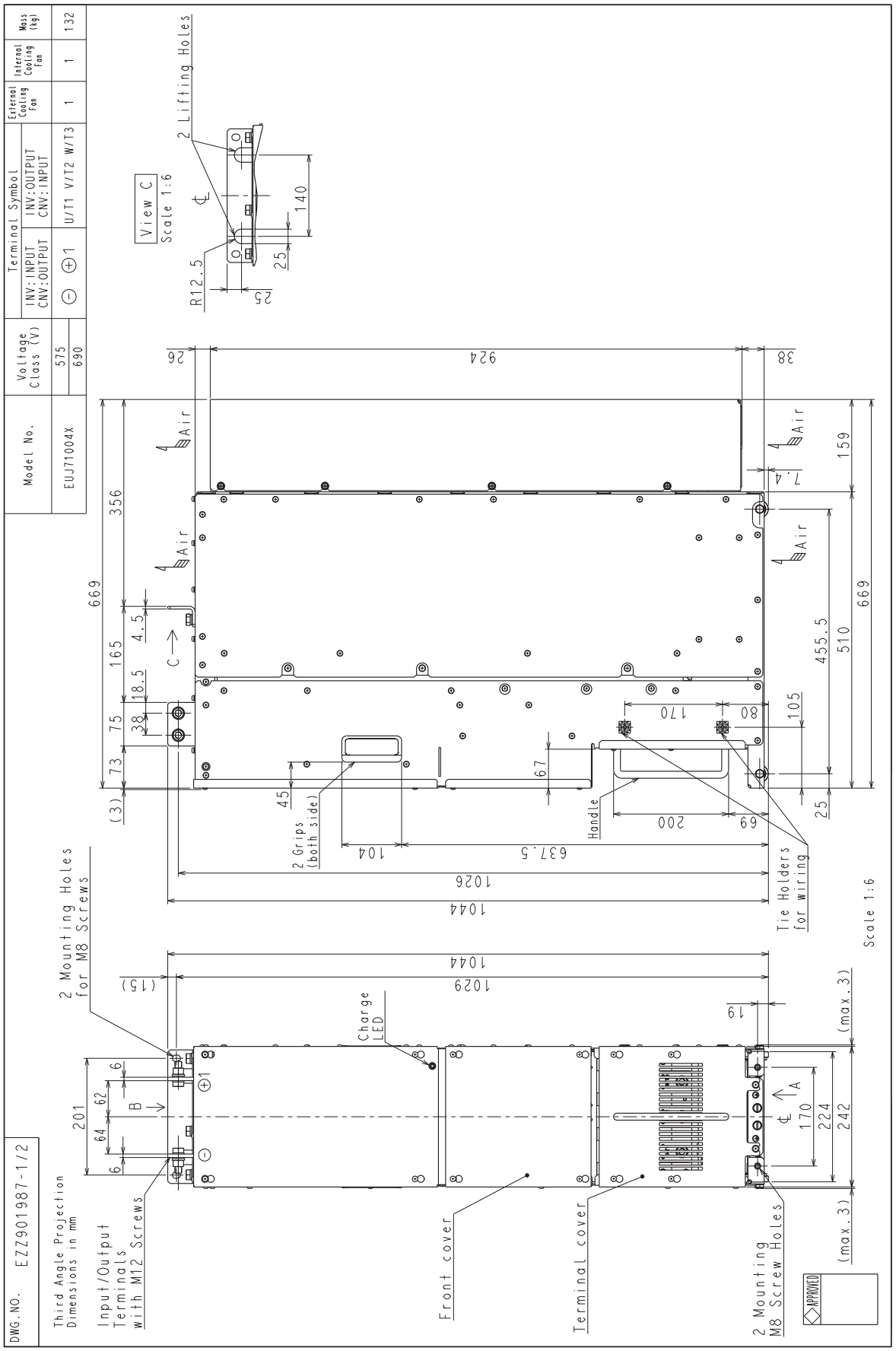


Figure 8 575/690V Regen Inverter Module, sheet 1 of 2

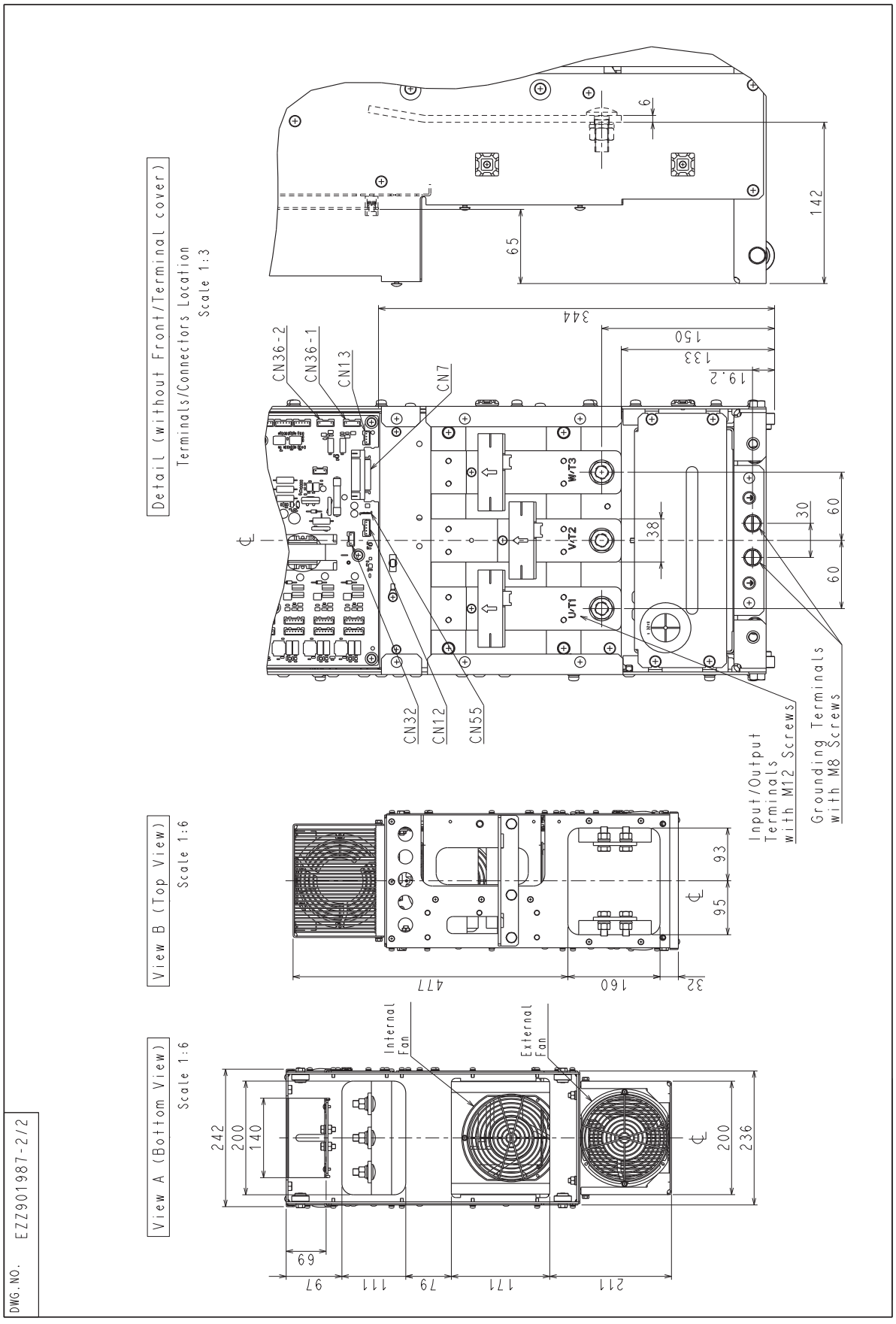


Figure 9 575/690V Regen Inverter Module, sheet 2 of 2

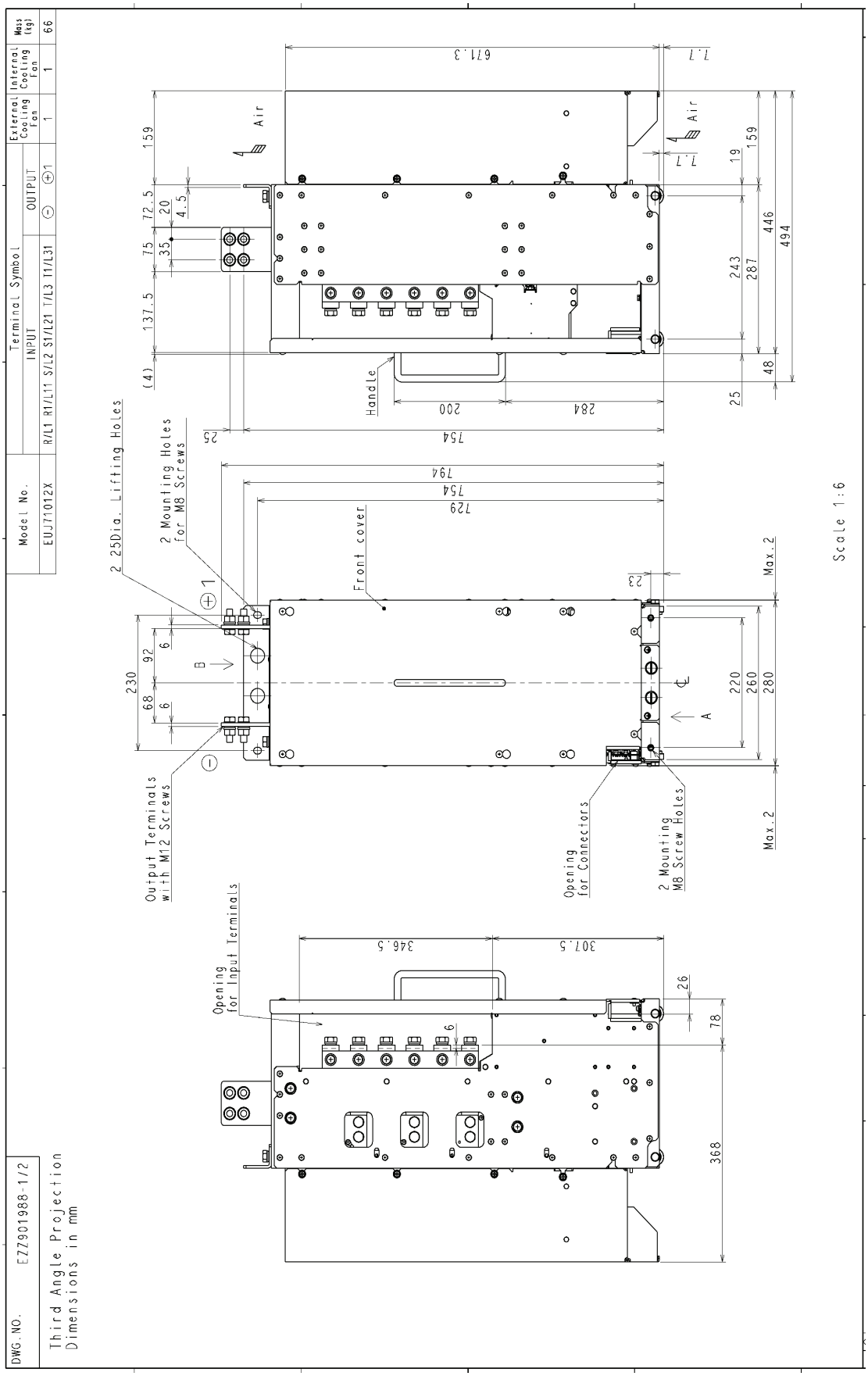


Figure 10 Converter Module (1P-2P), sheet 1 of 2

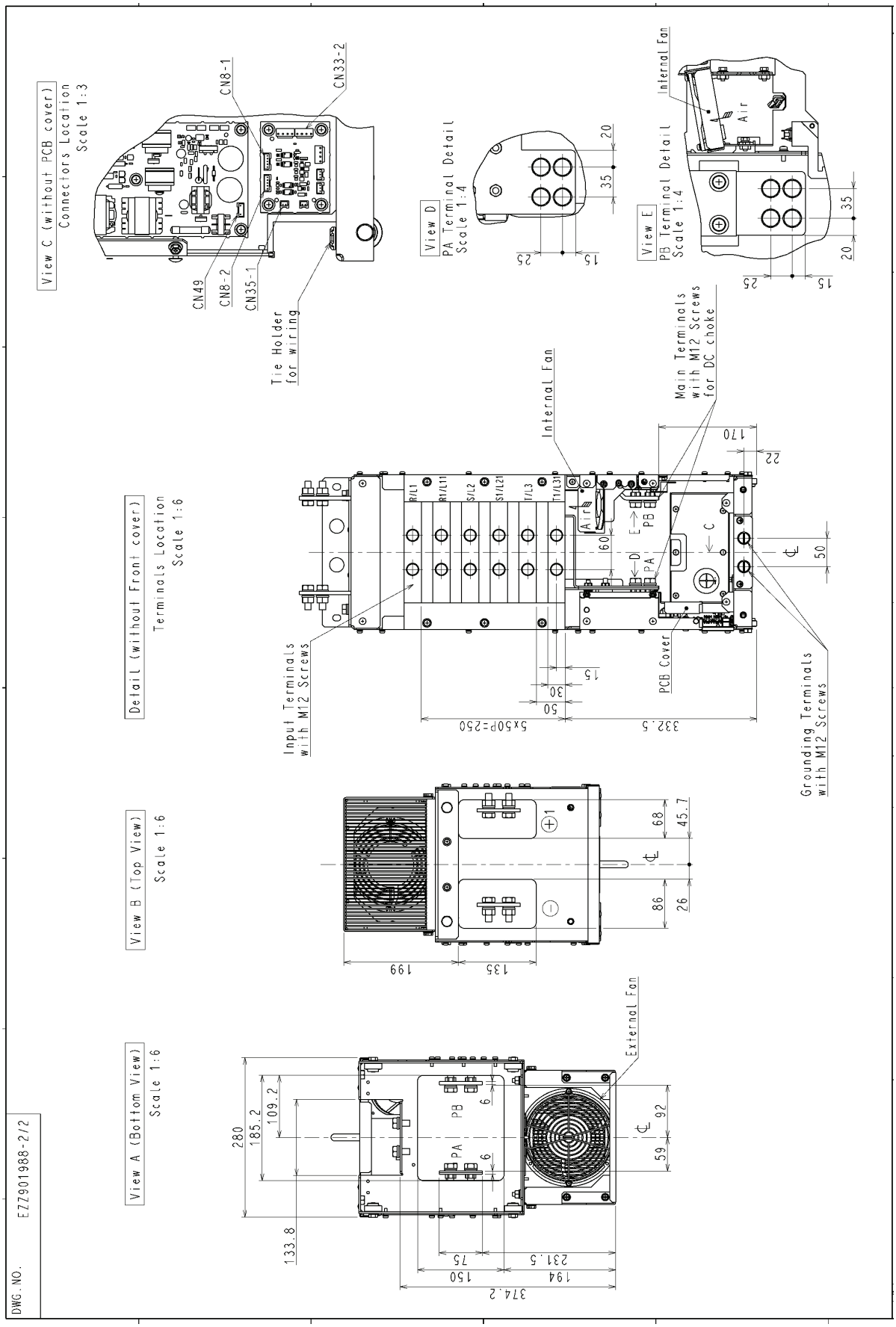


Figure 11 Converter Module (1P-2P), sheet 2 of 2

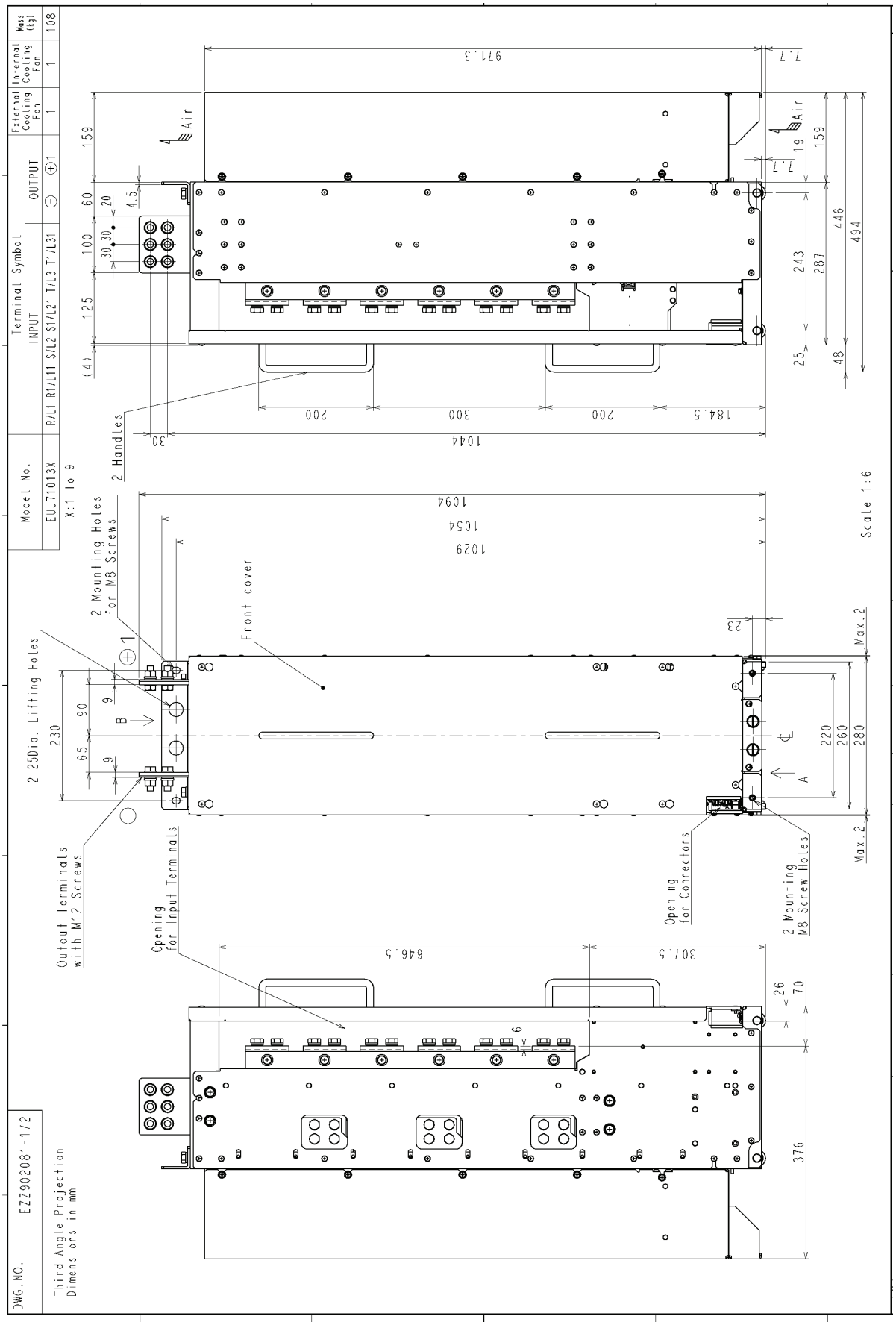


Figure 12 Converter Module (3P-4P), sheet 1 of 2

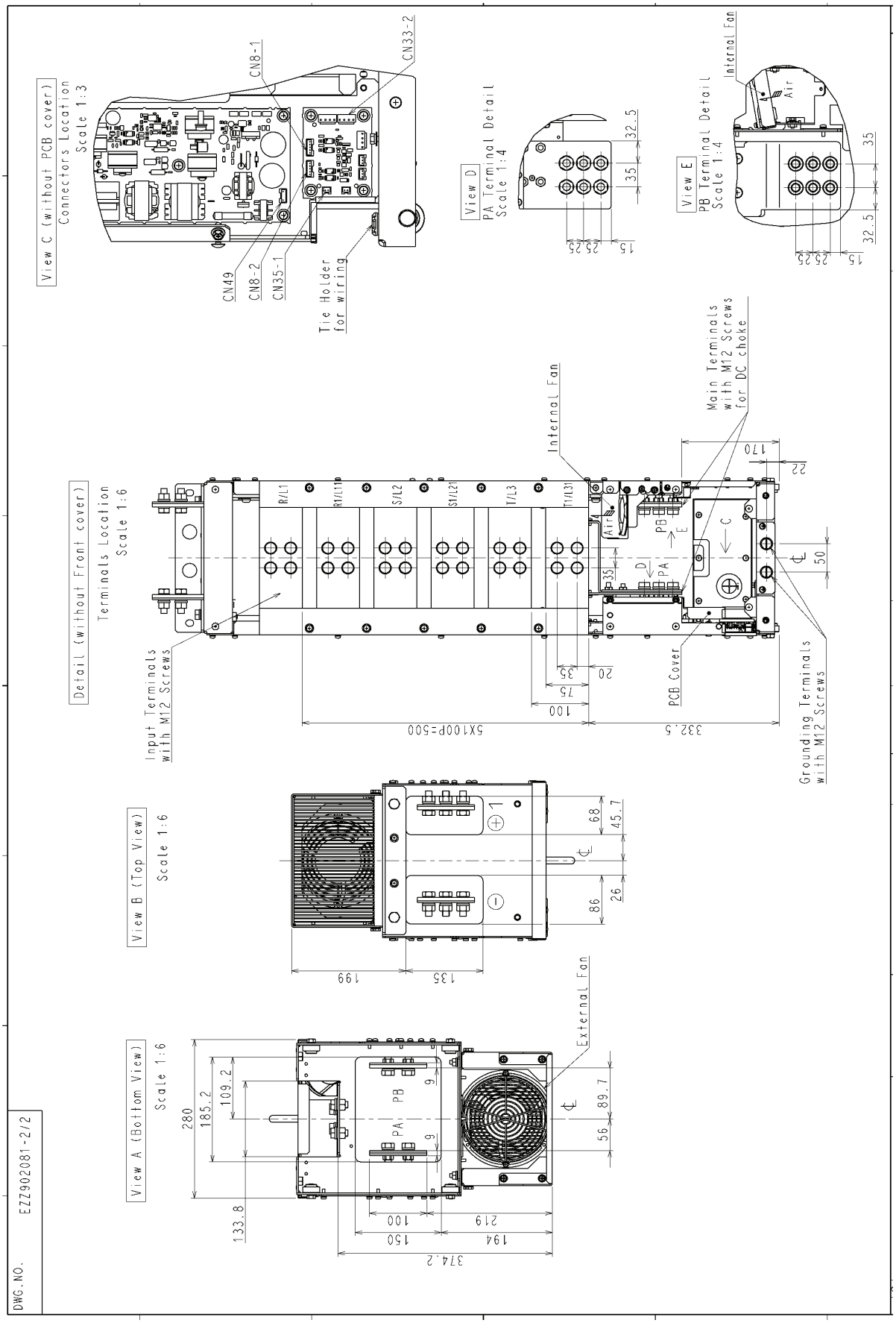


Figure 13 Converter Module (3P-4P), sheet 2 of 2

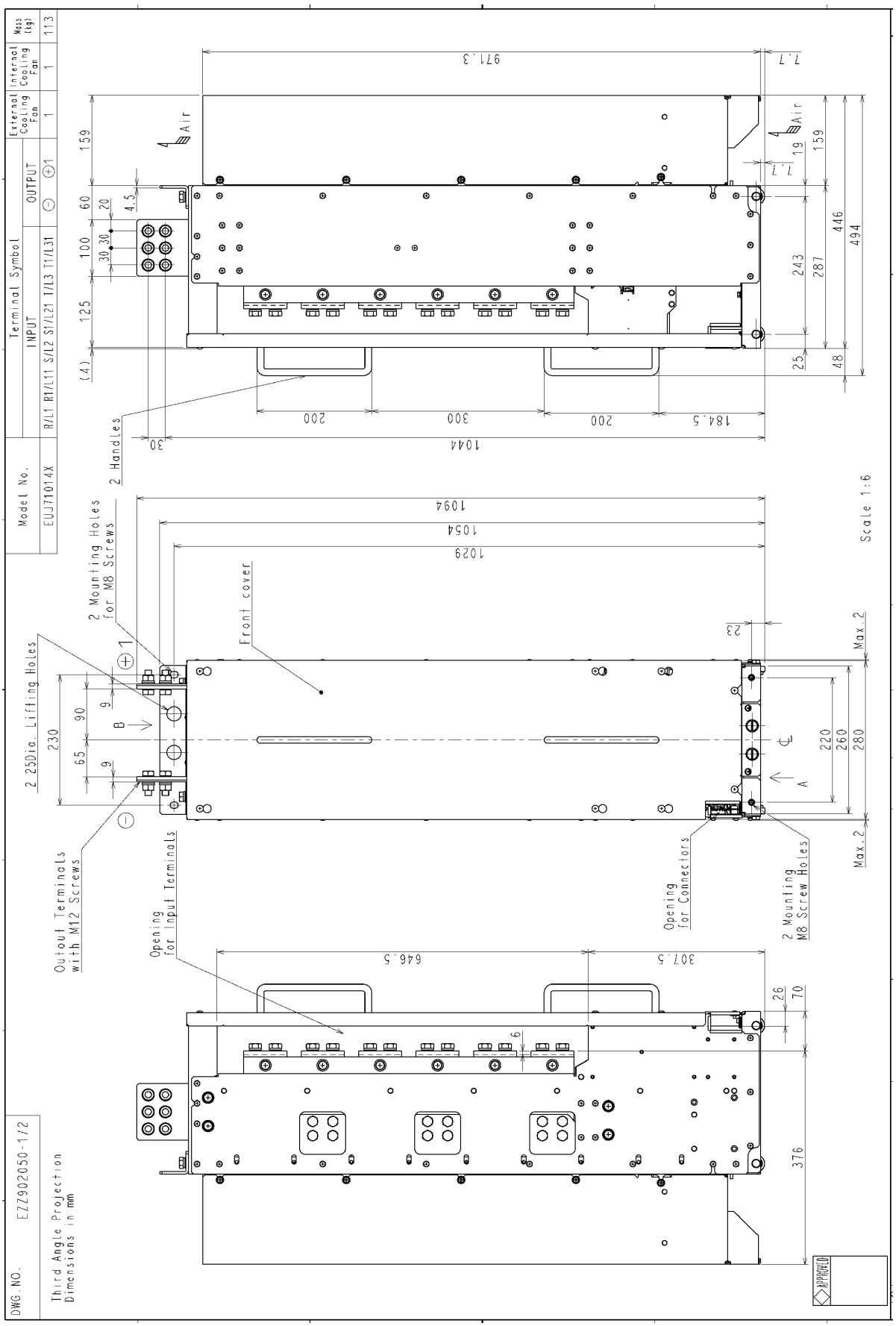


Figure 14 Converter Module (5P), sheet 1 of 2

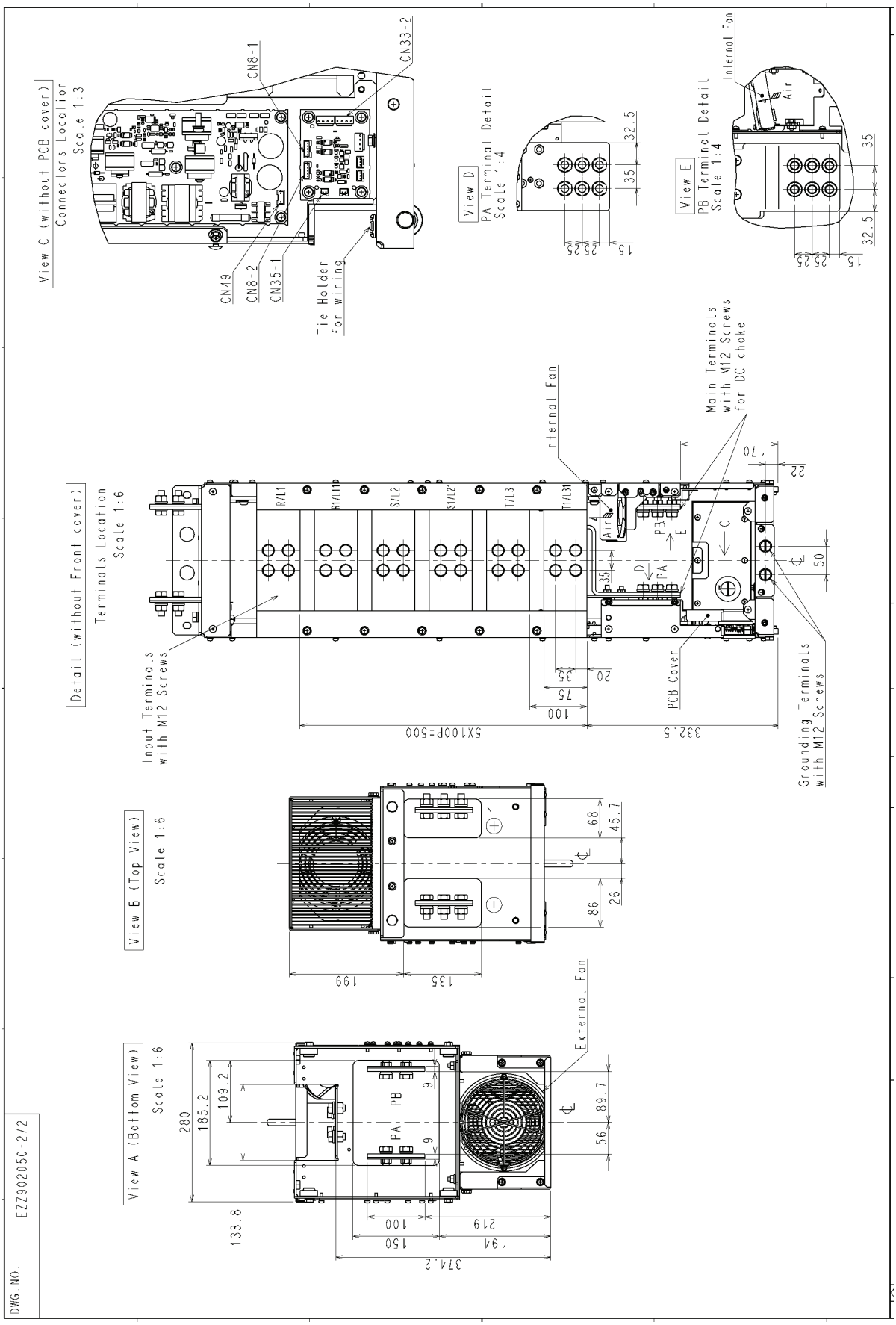


Figure 15 Converter Module (5P), sheet 2 of 2

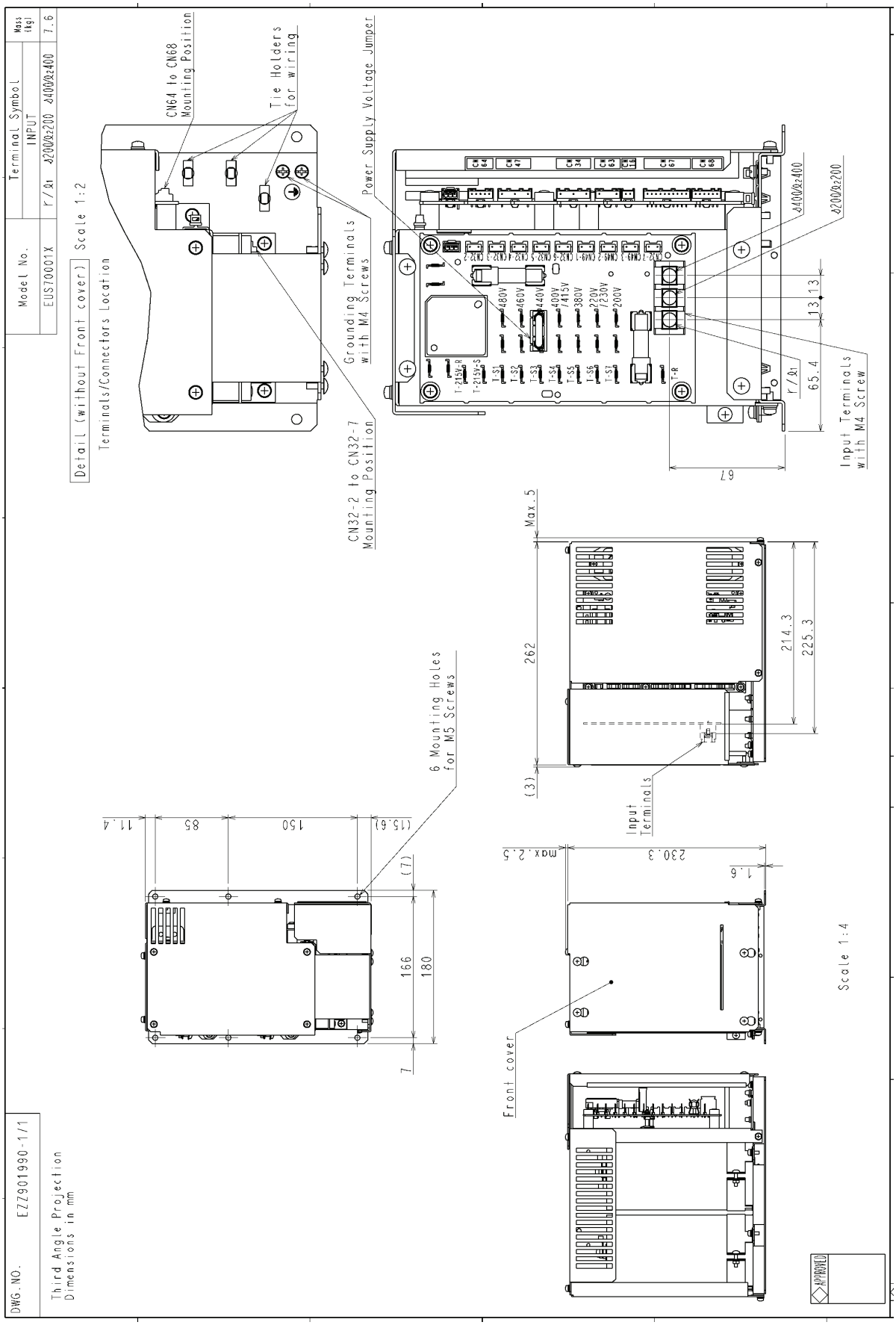


Figure 16 Power Supply Module 480 Volts

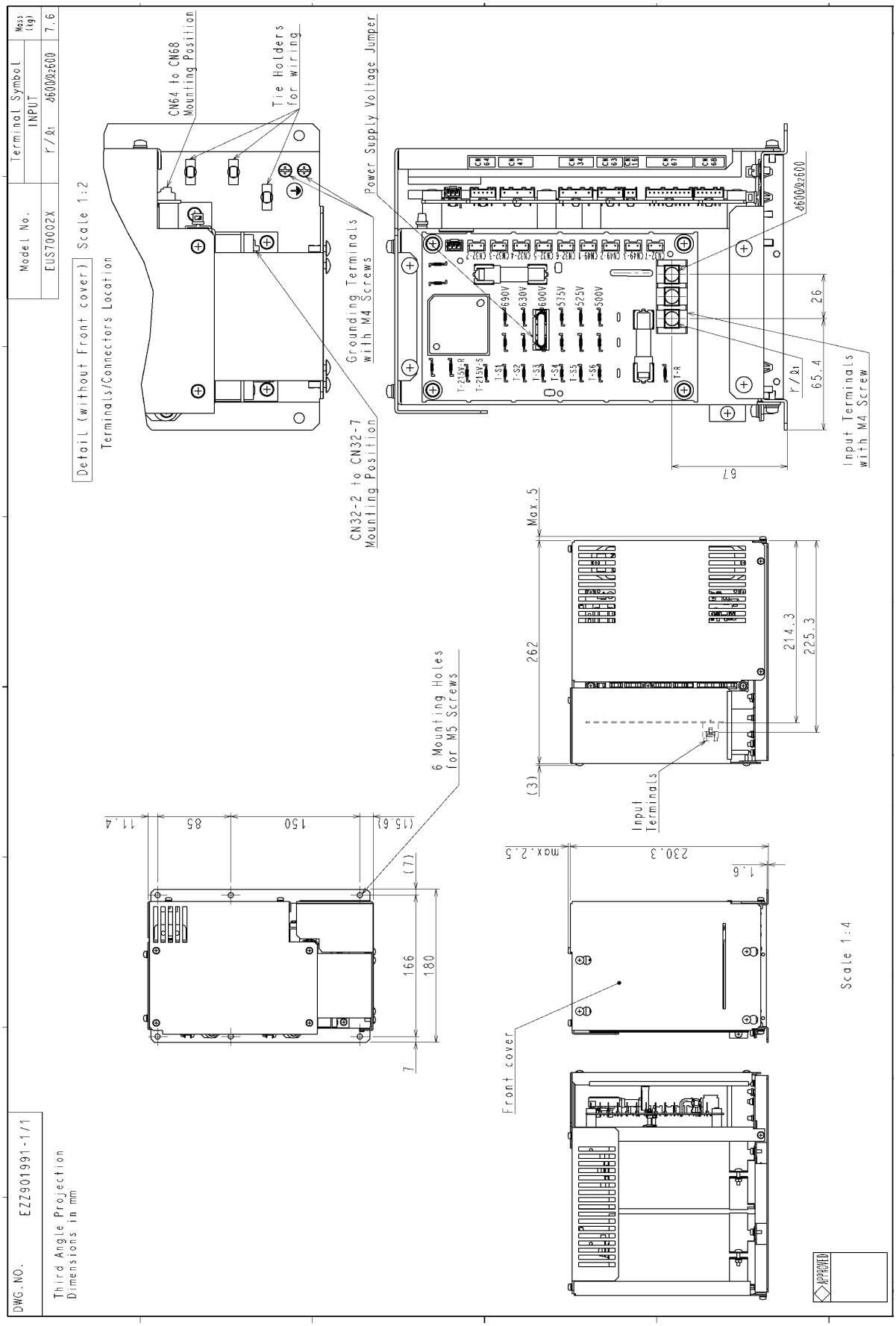


Figure 17 Power Supply Module 575/690 Volts

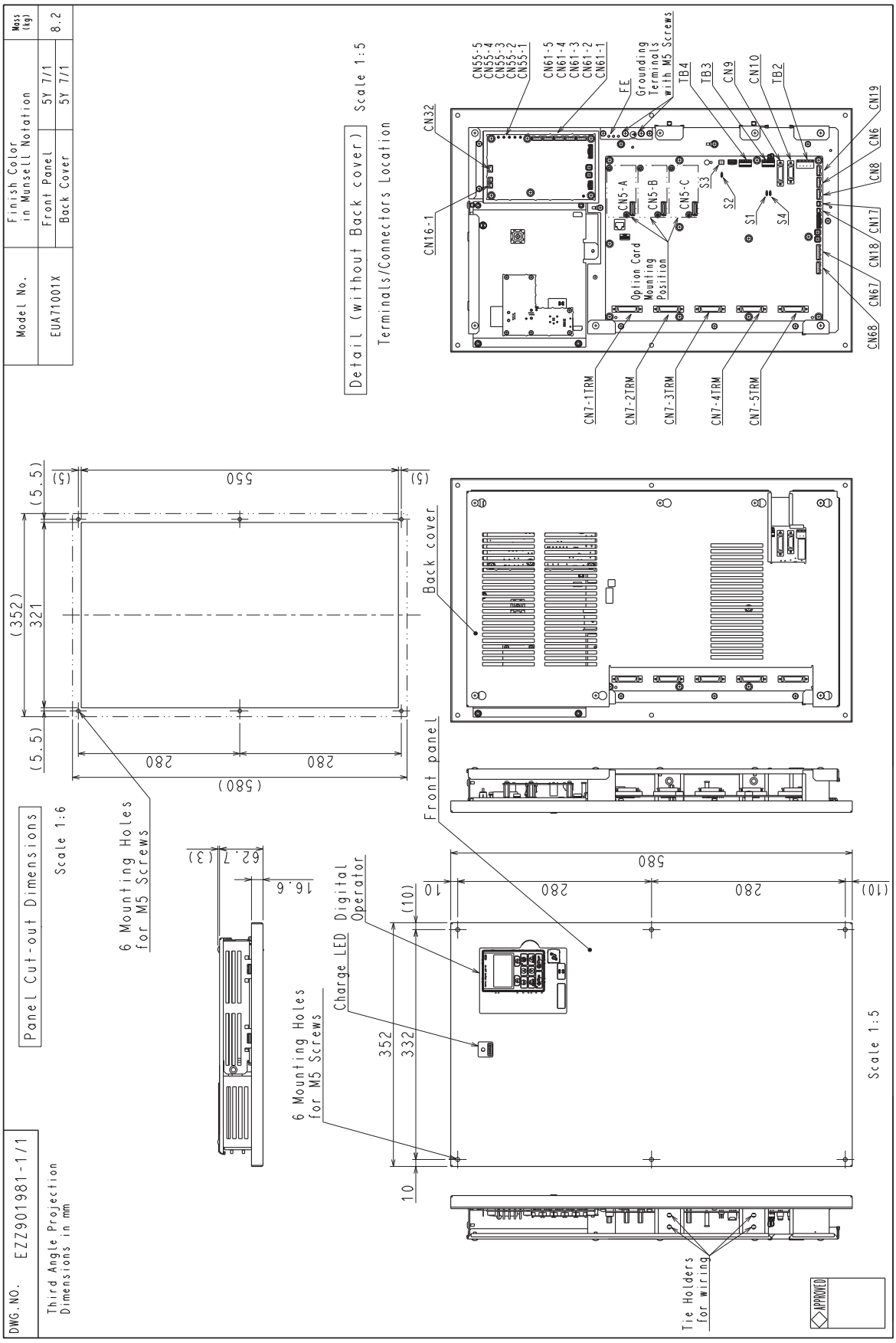


Figure 18 Control Module, A1000

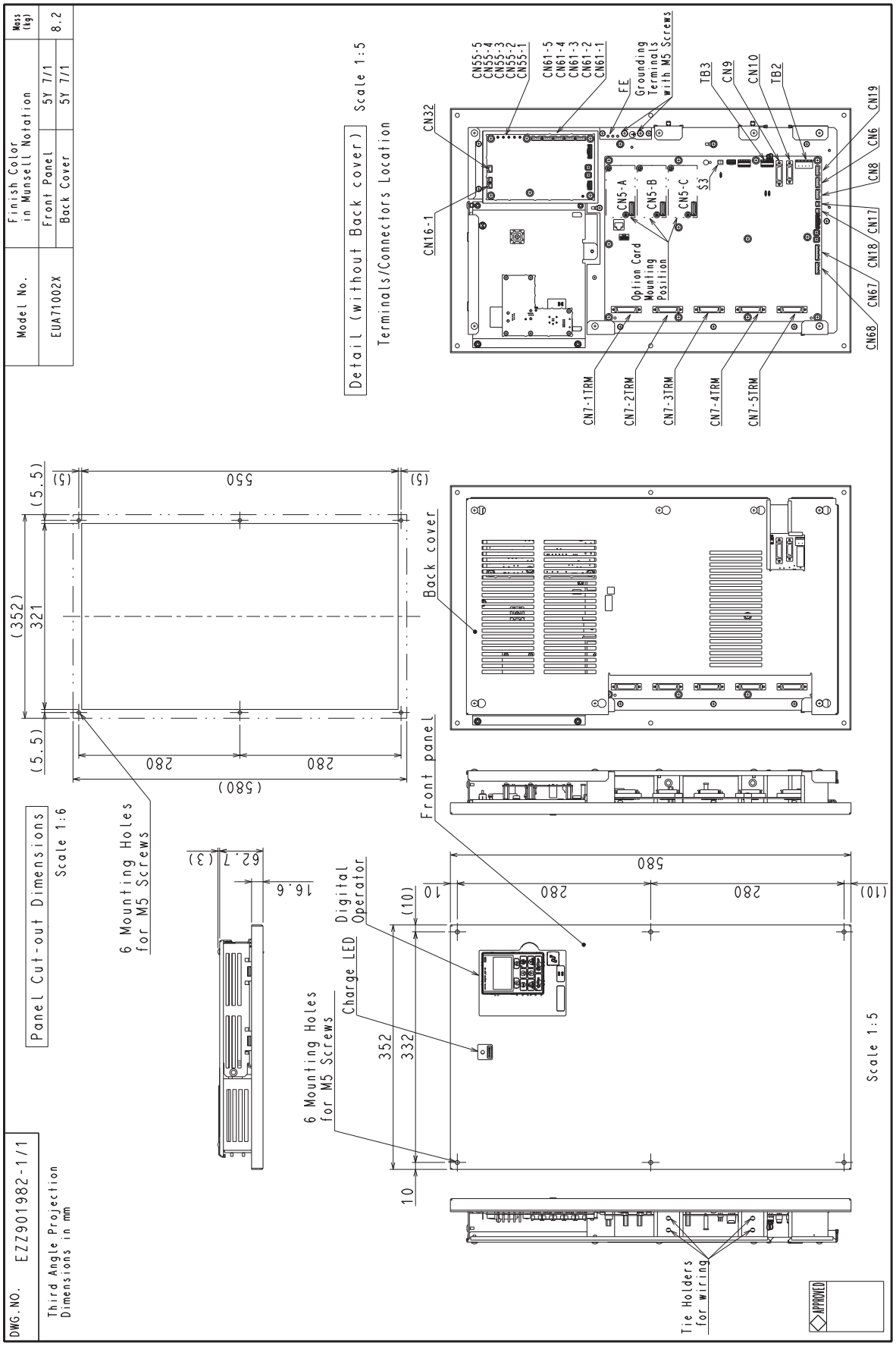


Figure 19 Control Module, D1000 for Regen System

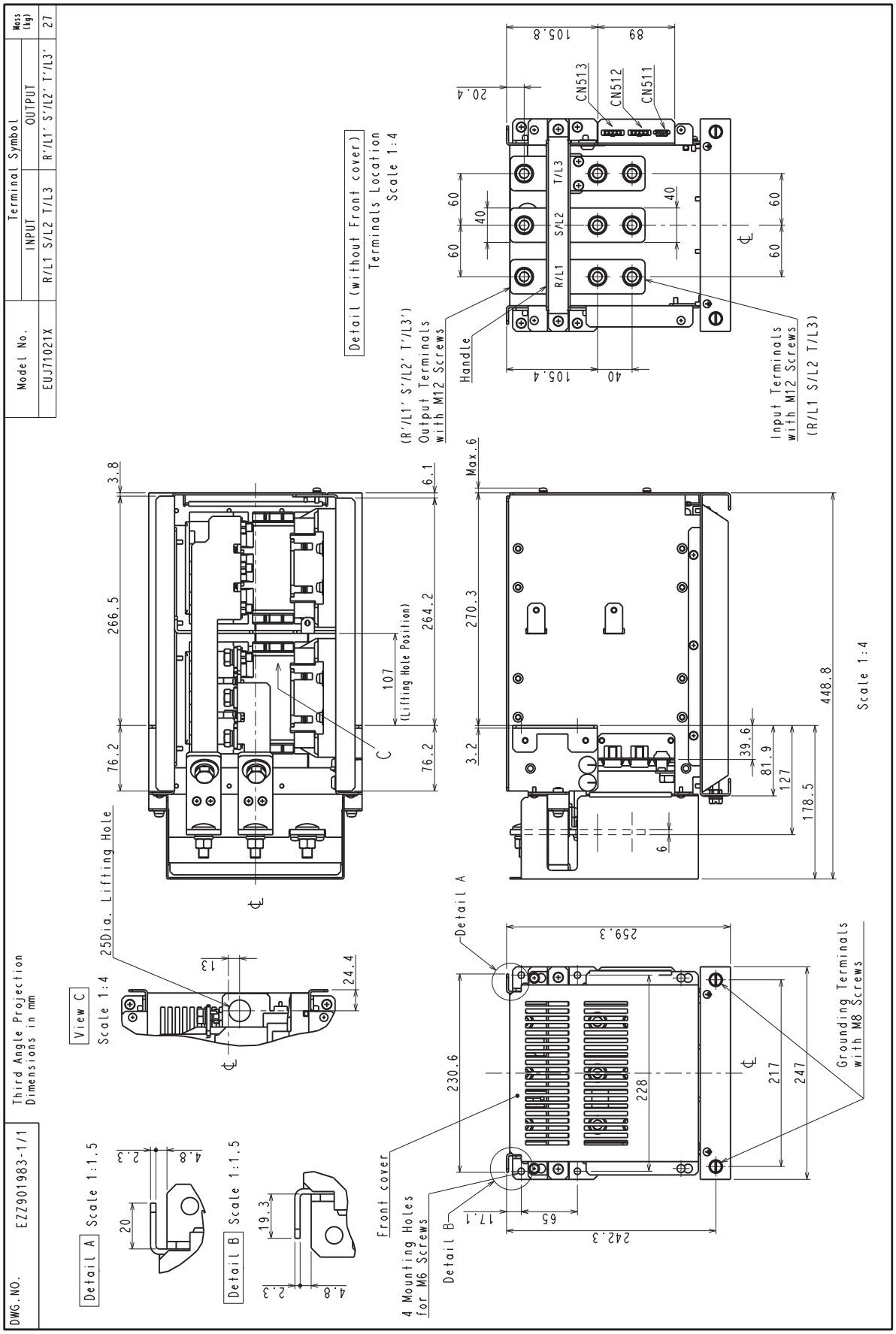
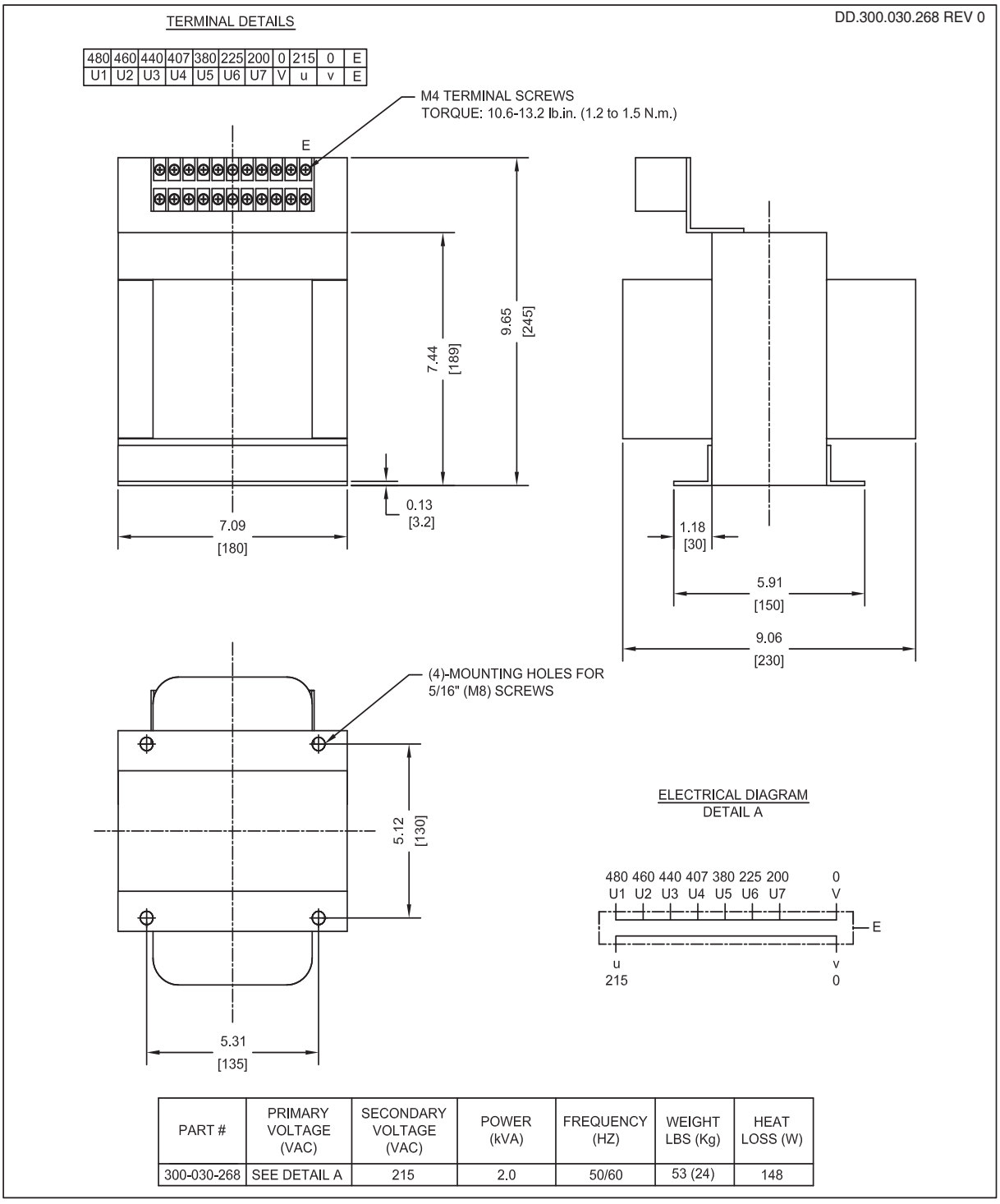


Figure 20 Pre Charge Module, for Regen System

◆ Power Supply Transformers for 480 V systems

All 1P - 5P systems use 380/480V, 2.0 kVA transformer, (Part Number 300-030-268), (USN-BM).

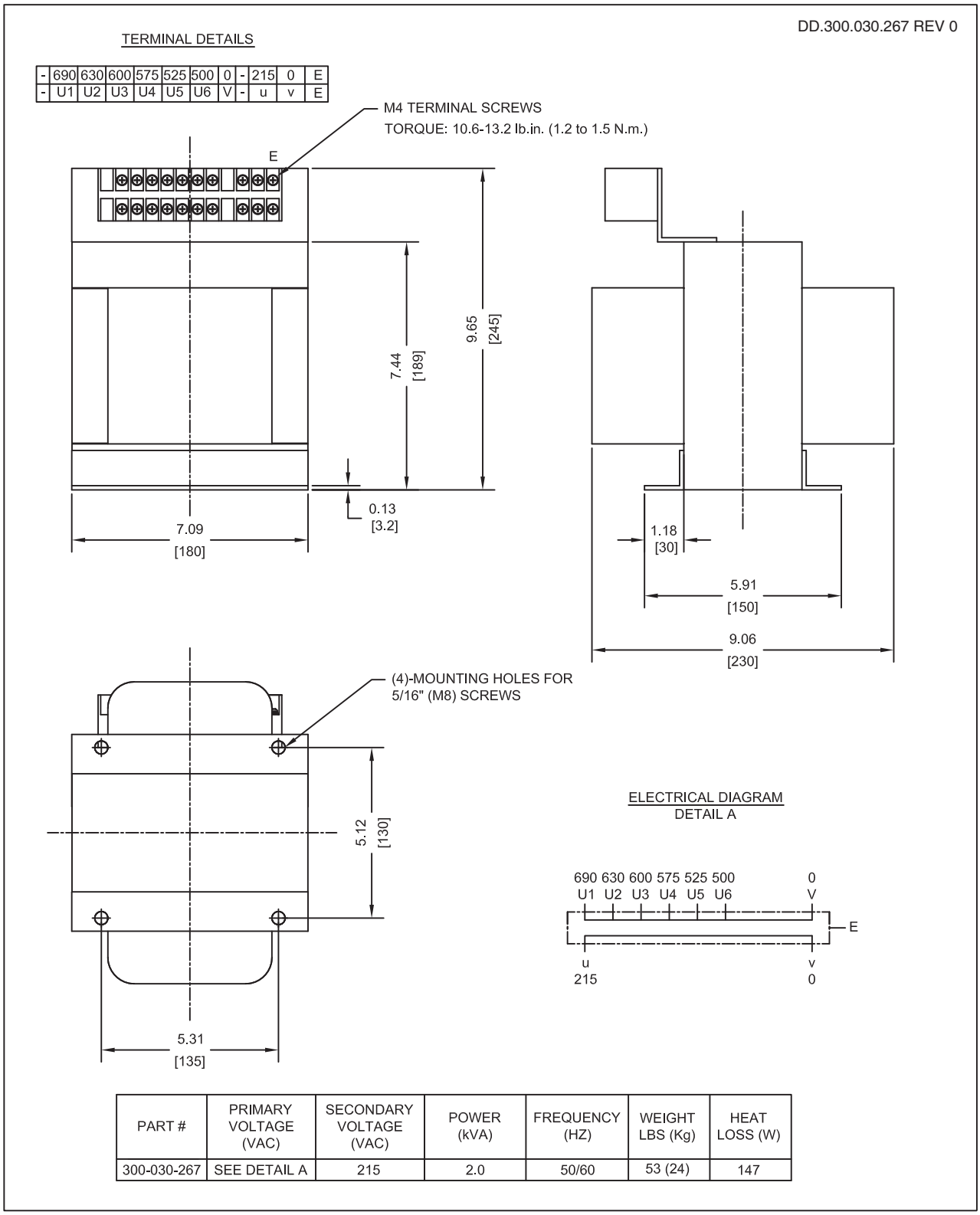


PART #	PRIMARY VOLTAGE (VAC)	SECONDARY VOLTAGE (VAC)	POWER (kVA)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-268	SEE DETAIL A	215	2.0	50/60	53 (24)	148

Figure 21 1P- 5P systems use 380/480V, 2.0kVA (Part Number 300-030-268, USN-BM)

◆ Power Supply Transformers for 575/690 V systems

All 1P - 5P systems use 575/690V, 2.0 kVA transformer, (Part Number 300-030-267), (USN-BM).



PART #	PRIMARY VOLTAGE (VAC)	SECONDARY VOLTAGE (VAC)	POWER (kVA)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-267	SEE DETAIL A	215	2.0	50/60	53 (24)	147

Figure 22 1P- 5P systems use 575/690V, 2.0kVA (Part Number 300-030-267, USN-BM)

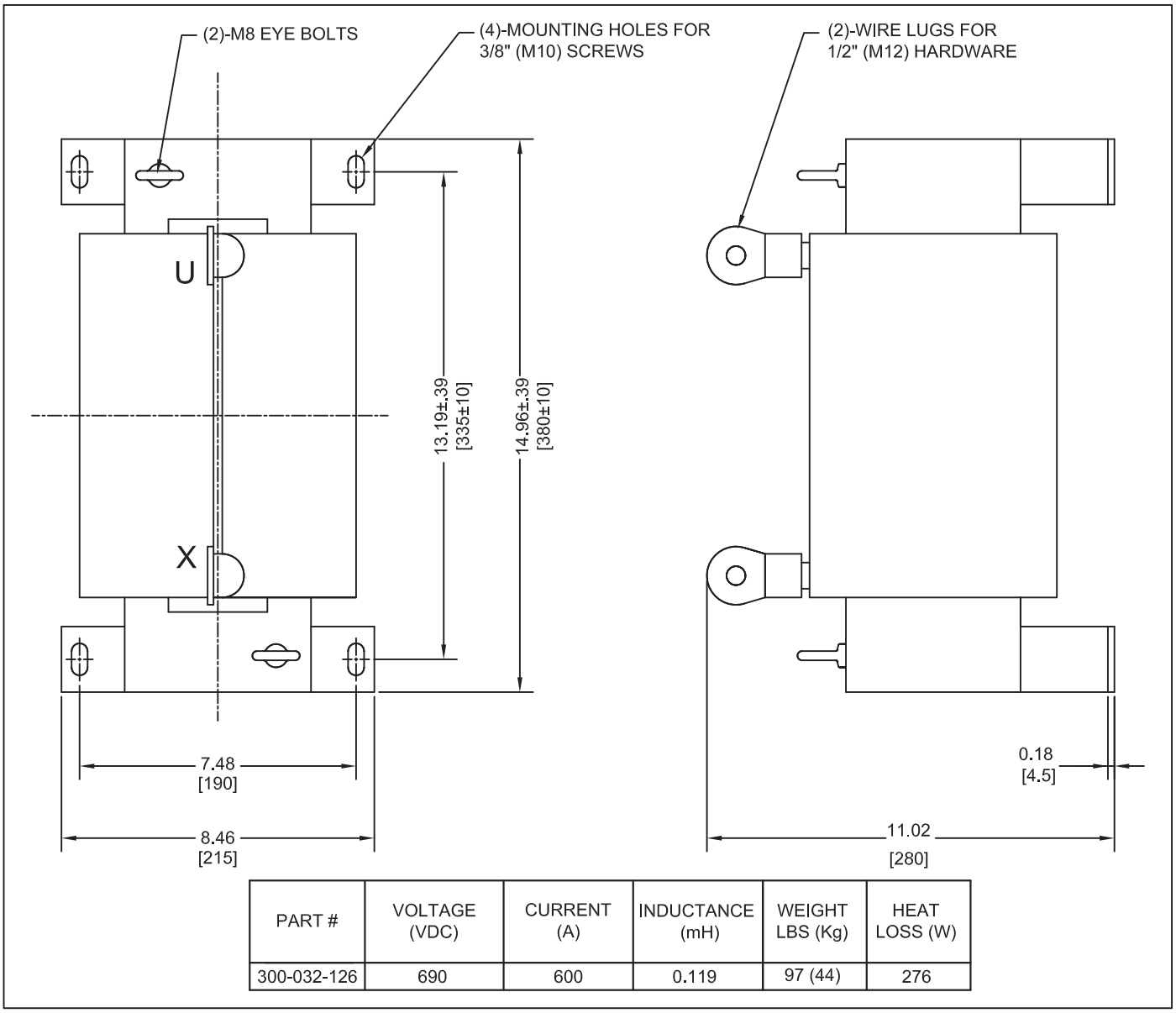
■ DC Link Reactors

The DC link reactor is used on the converter module.

Various reactors are used for different configurations.

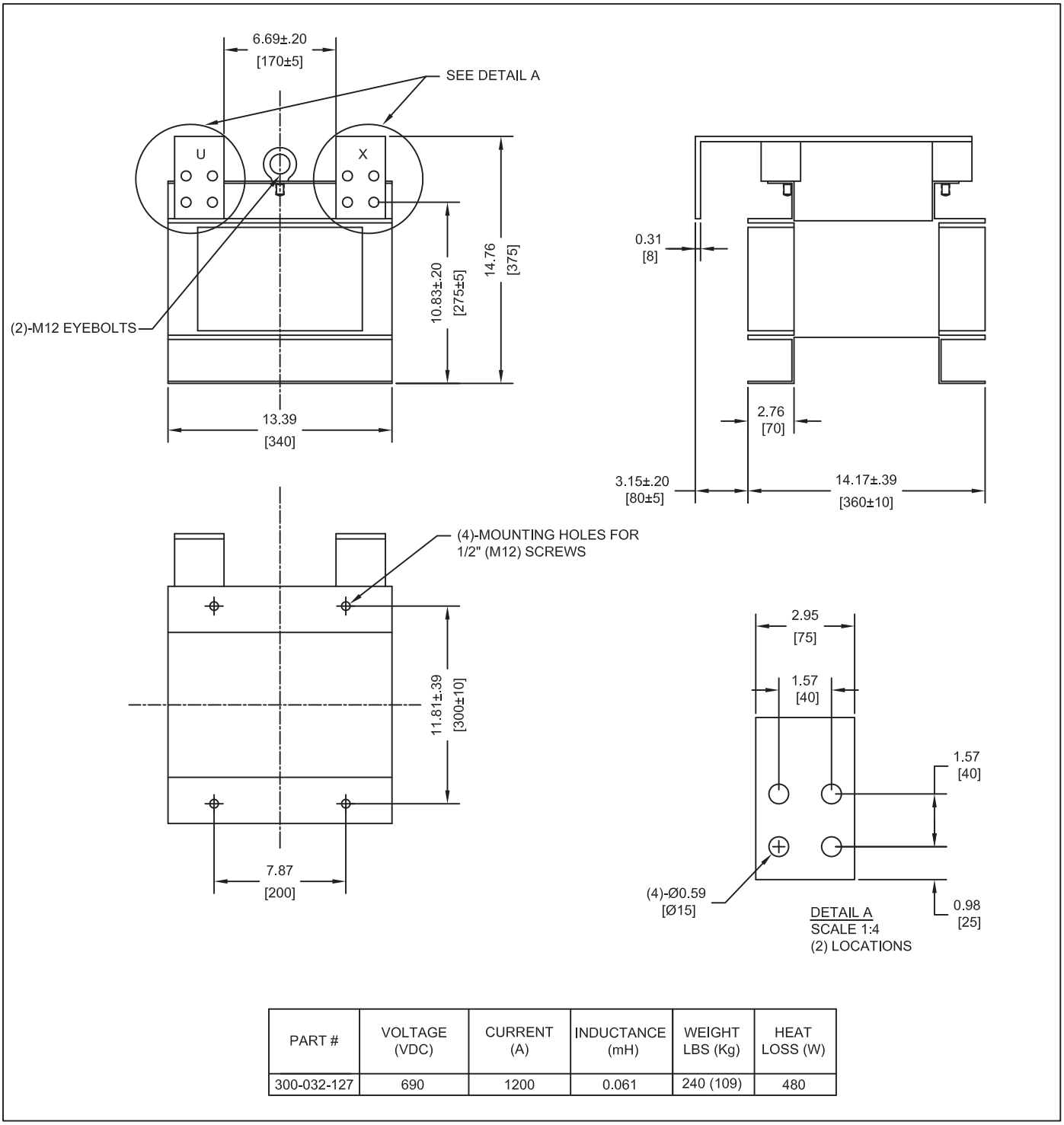
Both the 480V and the 575/690Vsystems use same reactors as listed below.

- 1P system requires (1) reactor, p/n 300-032-126, rated at 600A, 0.119mH, 690V (see ***Figure 23***)
- 2P system requires (1) reactor, p/n 300-032-127, rated at 1200A, 0.061mH, 690V (see ***Figure 24***)
- 3P system requires (1) reactor, p/n 300-032-125, rated at 1800A, 0.041mH, 690V (see ***Figure 25***)
- 4P system requires (2) reactors, p/n 300-032-127, in parallel rated at 1200A, 0.061mH, 690V (see ***Figure 24***)
- 5P system requires (2) reactors, p/n 300-032-125, in parallel rated at 1800A, 0.041mH, 690V (see ***Figure 25***)



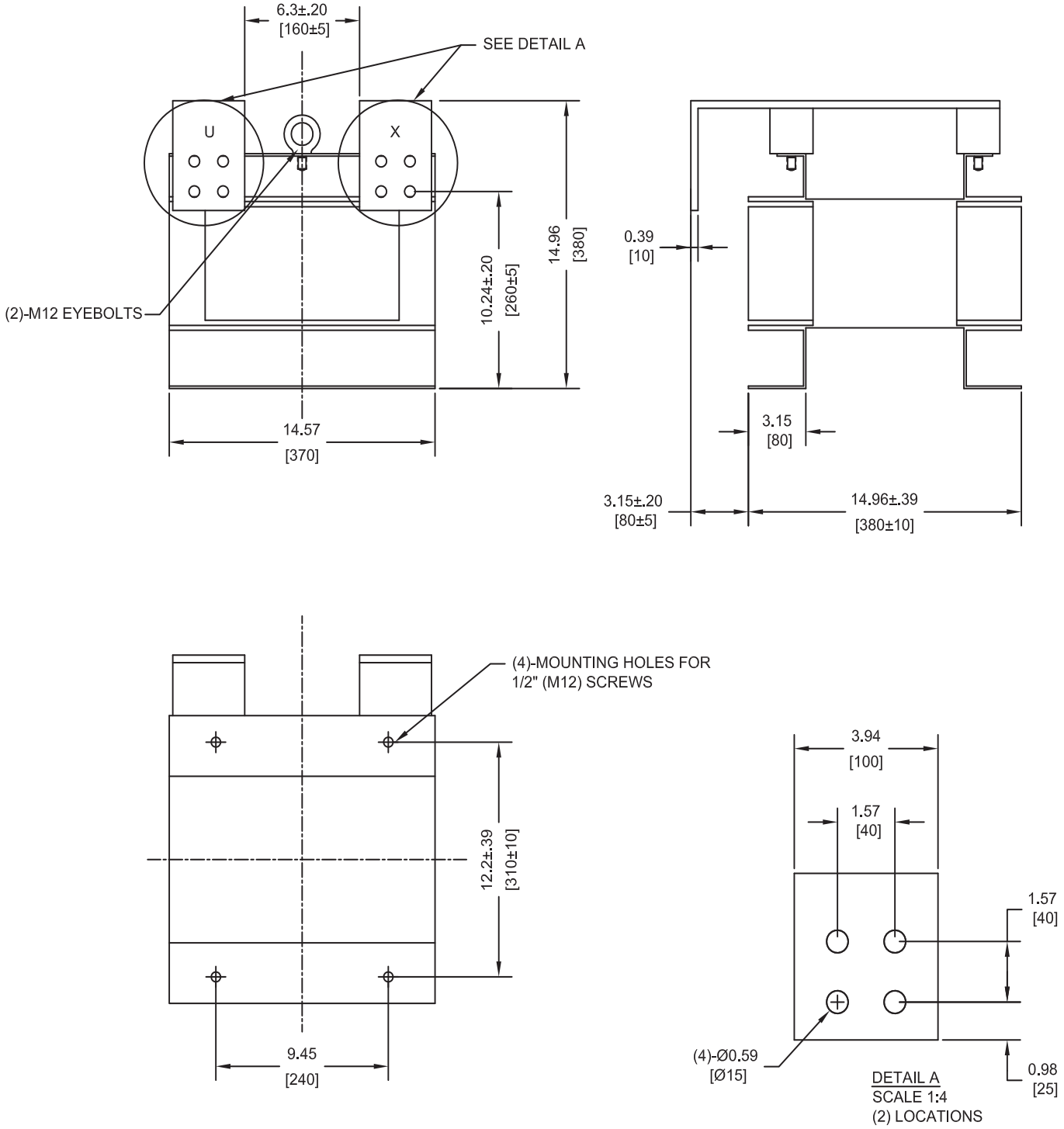
PART #	VOLTAGE (VDC)	CURRENT (A)	INDUCTANCE (mH)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-032-126	690	600	0.119	97 (44)	276

Figure 23 Dimensions for Part Number 300-032-126



PART #	VOLTAGE (VDC)	CURRENT (A)	INDUCTANCE (mH)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-032-127	690	1200	0.061	240 (109)	480

Figure 24 Dimensions for Part Number 300-032-127 (UZDA-B)



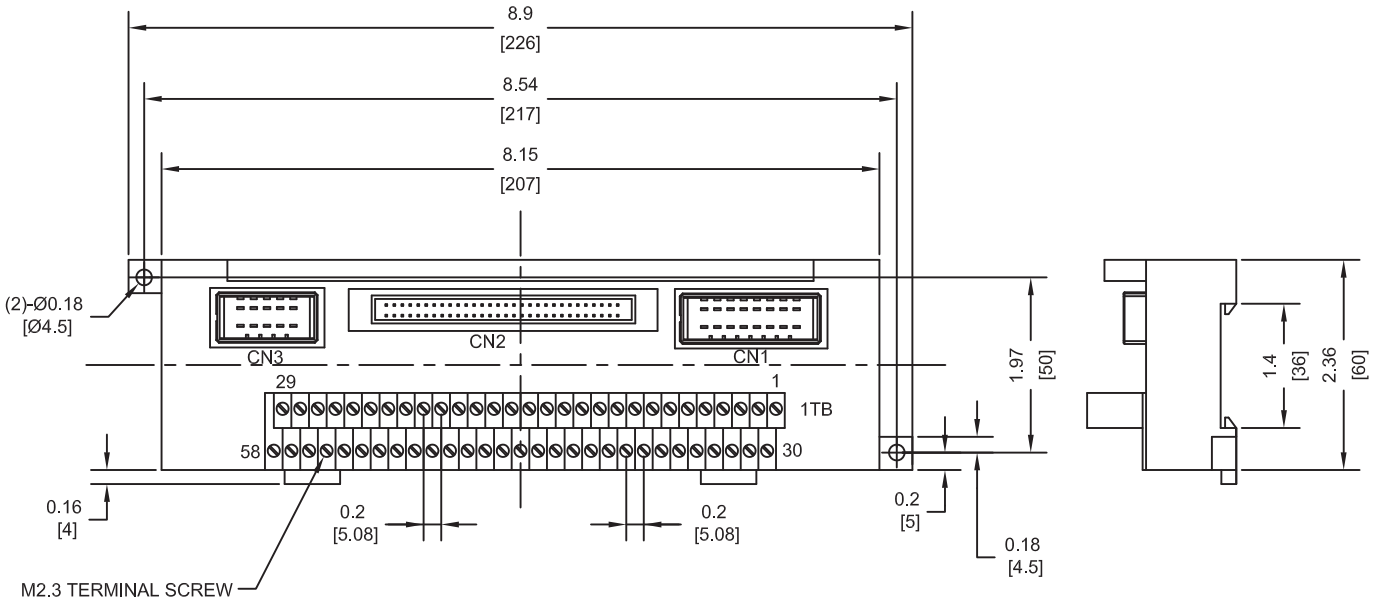
PART #	VOLTAGE (VDC)	CURRENT (A)	INDUCTANCE (mH)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-032-125	690	1800	0.041	297 (135)	532

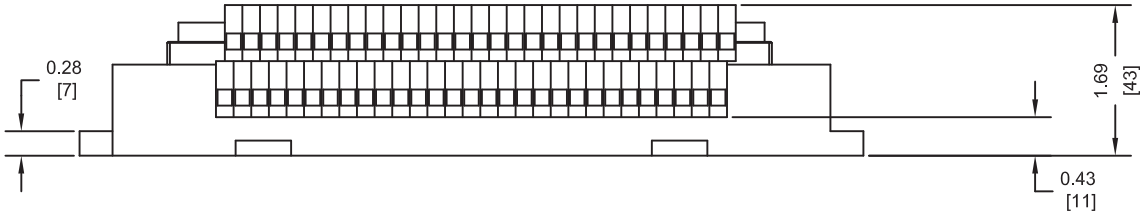
Figure 25 Dimensions for Part Number 300-032-125 (UZDA-B)

■ Control Terminal Block, 1TB , TBET31094-A

The dimensions for the control terminal block are shown below.

Note: This item is also labeled as PS5D-INV-LA





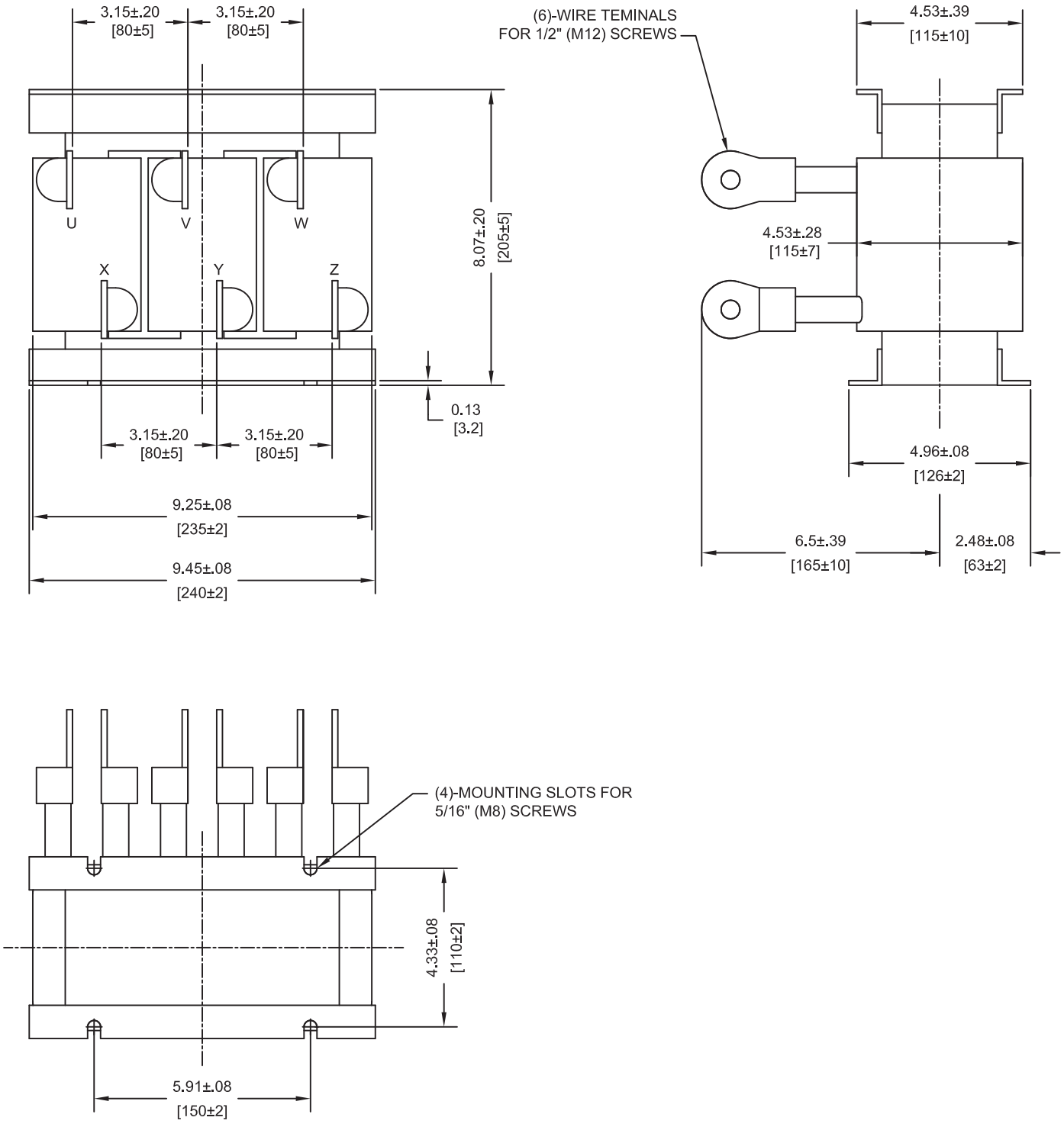
PART #	TERMINAL SCREW (1TB)	CLAMPING TORQUE lb.in. (N.m.)	WIRE RANGE AWG(mm²)
TBET31094-A	M2.3	MAX. 2.7 (0.3)	20-14 (0.5-2.5)

NOTE: REFER TO APPLICABLE CODES FOR PROPER WIRE TYPE AND SIZE

Figure 26 Dimensions for Part Number TBET31094-A

■ AC Output Reactors

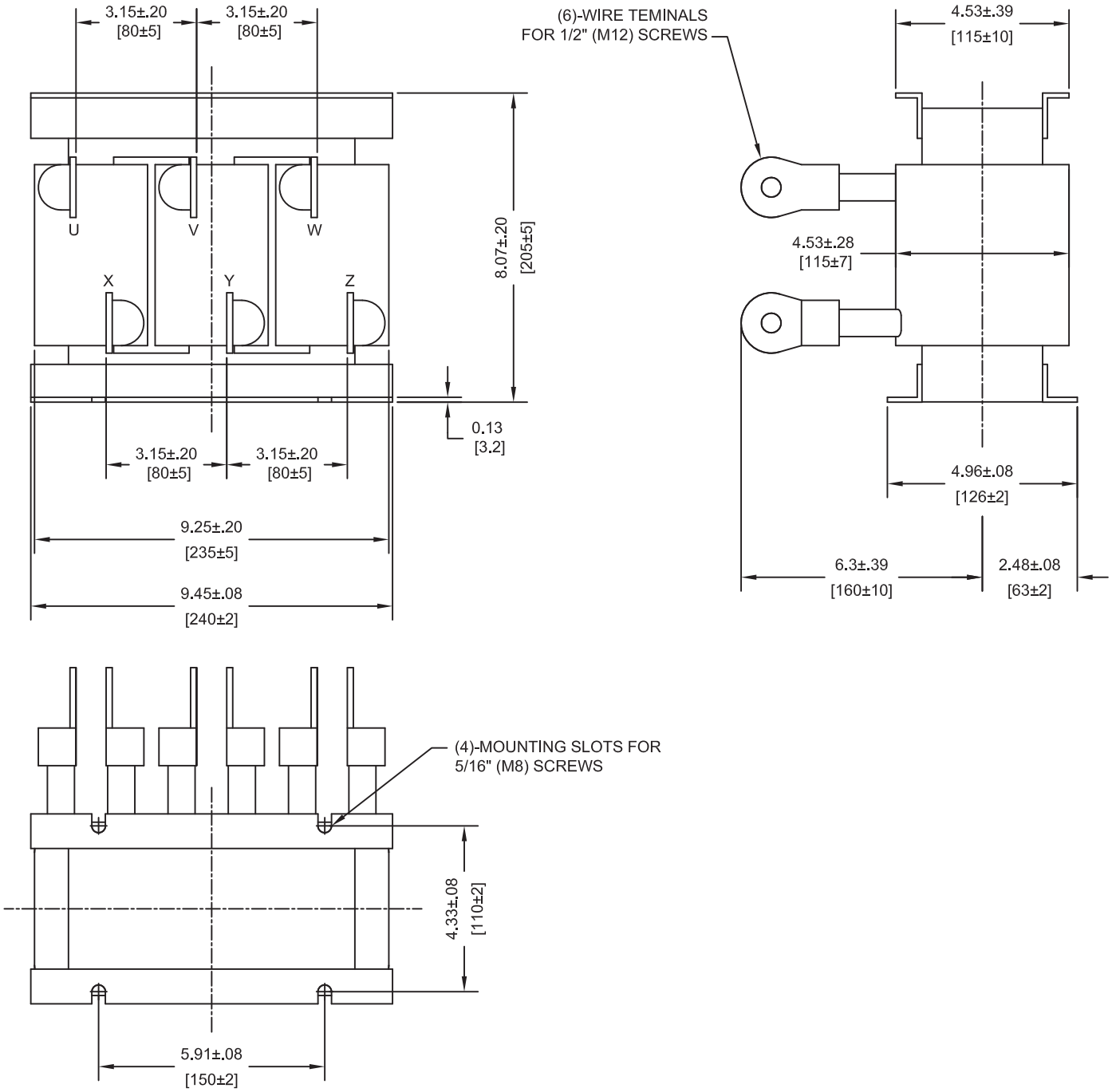
The 480V Systems use part number 300-030-428 (UZBA-B). This reactor is rated at 466A, 0.01mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-428	480	466	0.01	50/60	57 (26)	150

Figure 27 480V Systems Part Numer 300-030-428

The 575/690V Systems use part number 300-030-429 (UZBA-B). This reactor is rated at 466A, 0.01mH, 690V

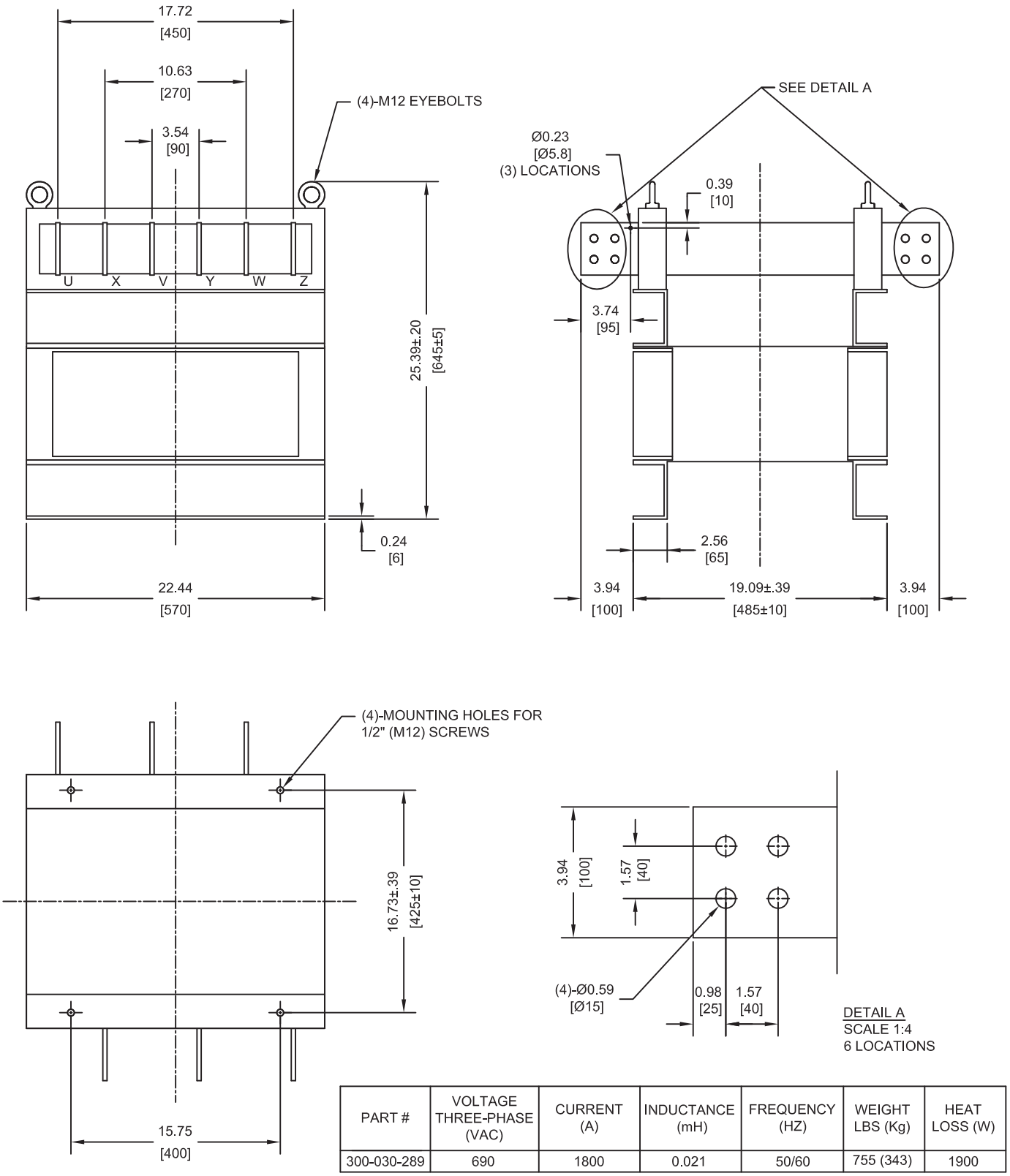


PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-429	690	466	0.01	50/60	57 (26)	150

Figure 28 575/690V Systems Part Number 300-030-429

■ AC Input Reactors for Regen Systems

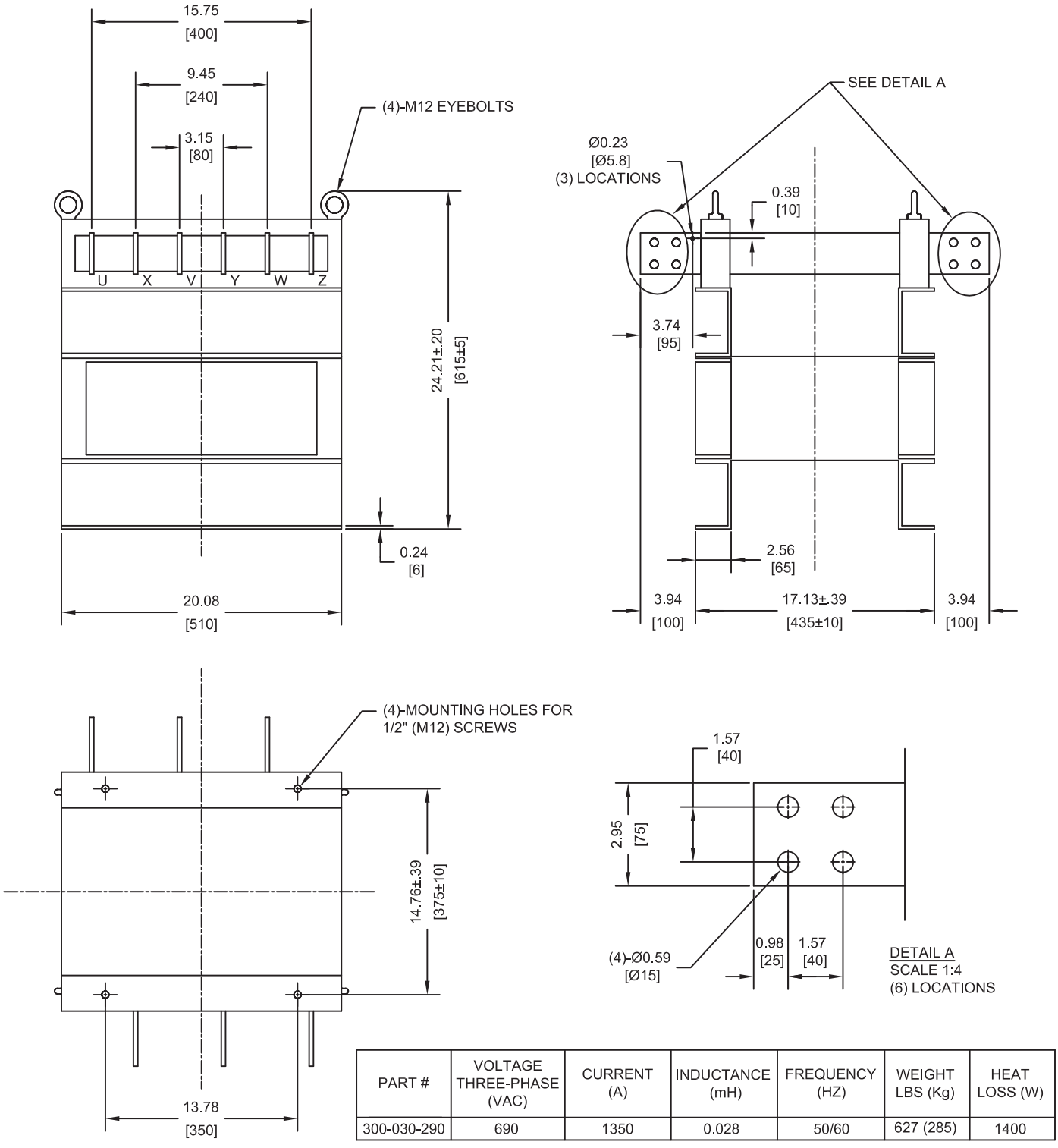
The 575/690V 4P Regen Systems use part number 300-030-289 (UZBA-B). This reactor is rated at 1800A, 0.021mH, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-289	690	1800	0.021	50/60	755 (343)	1900

Figure 29 575/690V 4P Regen Systems Part Numer 300-030-289

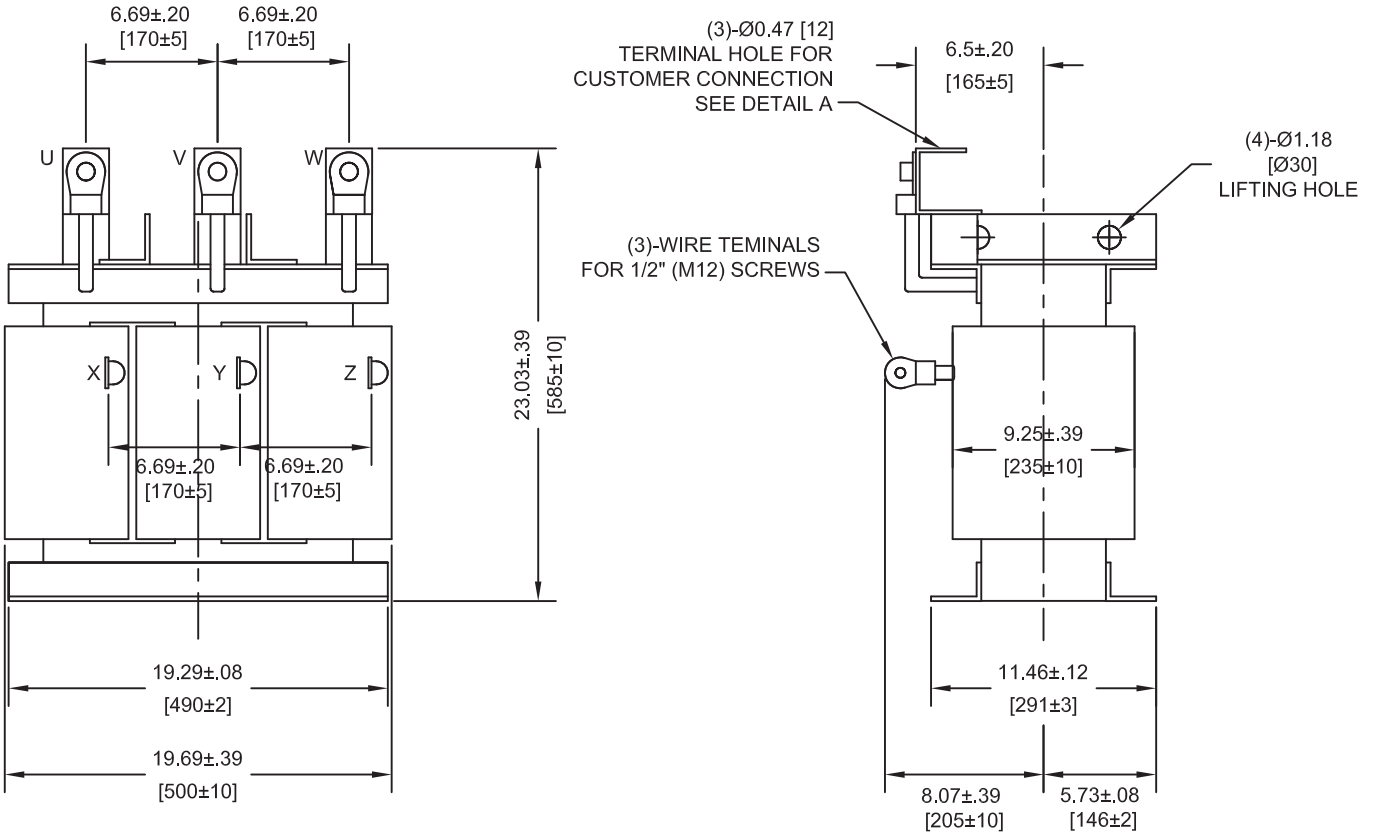
The 575/690 3P Regen Systems use part number 300-030-290 (UZBA-B). This reactor is rated at 1350A, 0.028mH, 690V



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-290	690	1350	0.028	50/60	627 (285)	1400

Figure 30 575/690V 3P Regen Systems Part Number 300-030-290

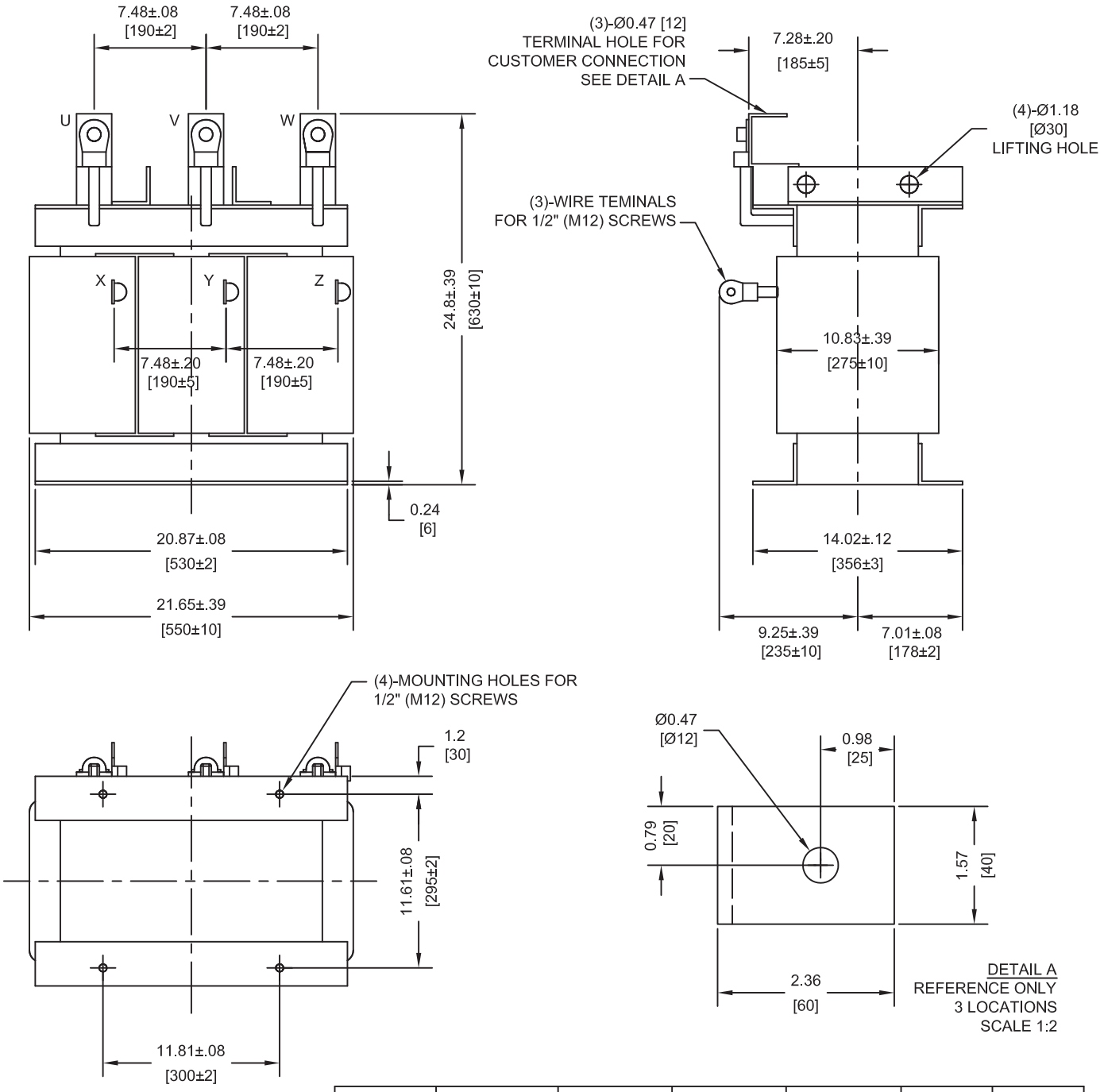
The 480V 1P Regen Systems use part number 300-030-291 (UZBA-B). This reactor is rated at 466A, 0.19mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-291	480	466	0.19	50/60	429 (195)	1600

Figure 31 480V 1P Regen Systems Part Number 300-030-291

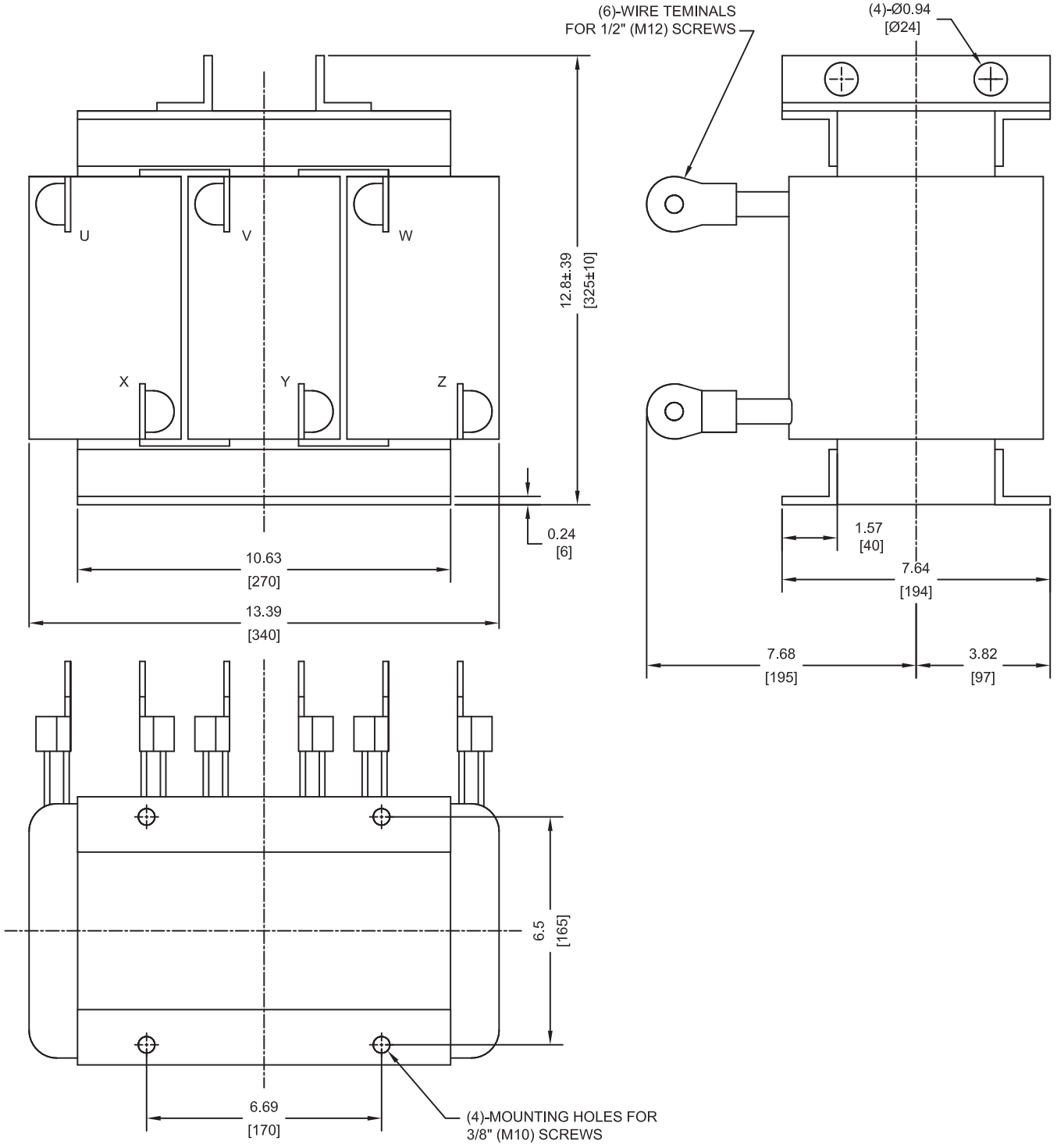
The 575/690V 1P Regen Systems use part number 300-030-292 (UZBA-BA). This reactor is rated at 466A, 0.27mH, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-292	690	466	0.27	50/60	711 (323)	1850

Figure 32 575/690V 1P Regen Systems Part Number 300-030-292

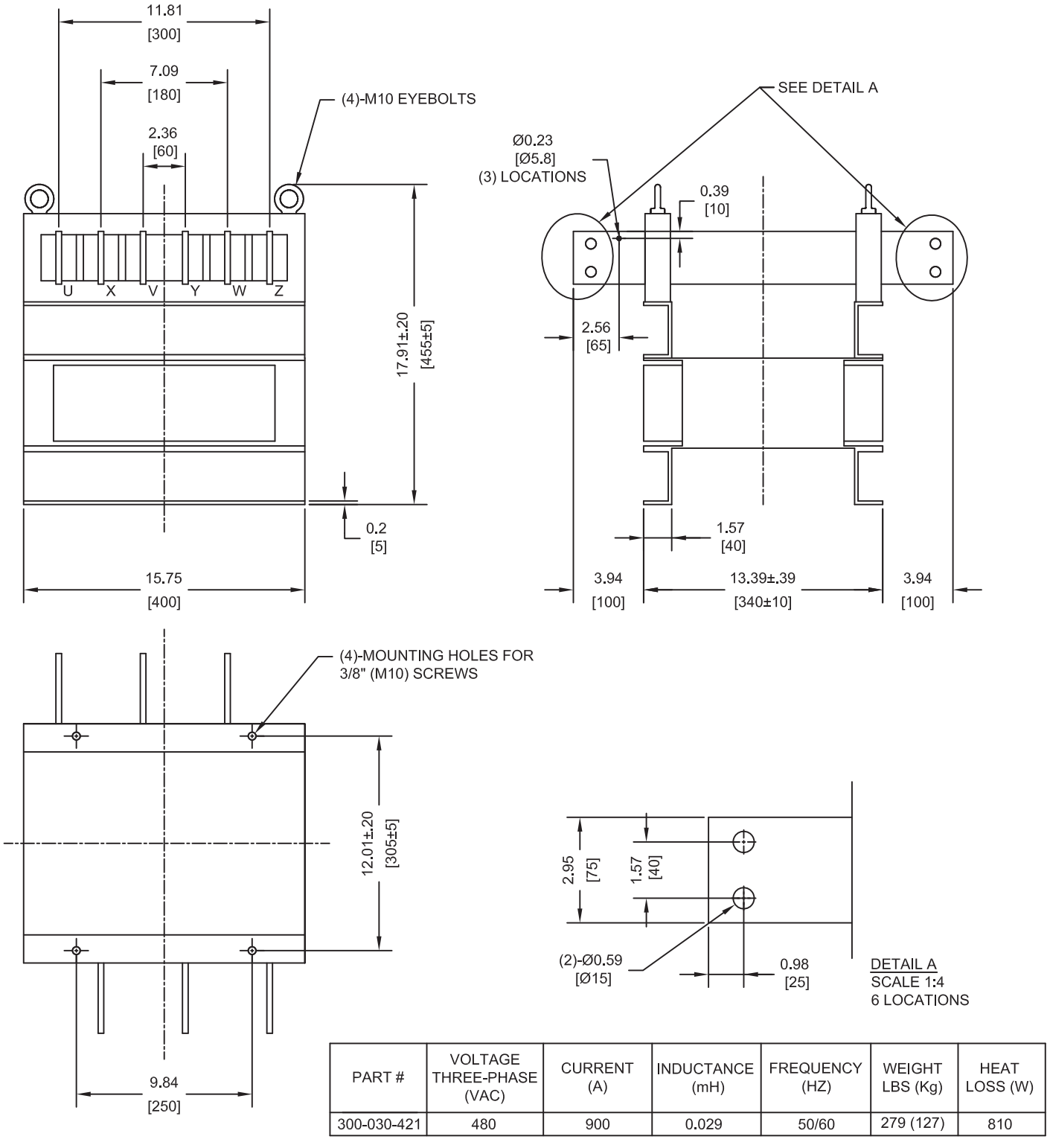
The 480V 1P Regen Systems use part number 300-030-420 (UZBA-BA). This reactor is rated at 466A, 0.057mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-420	480	466	0.057	50/60	147 (67)	430

Figure 33 480V 1P Regen Systems Part Number 300-030-420

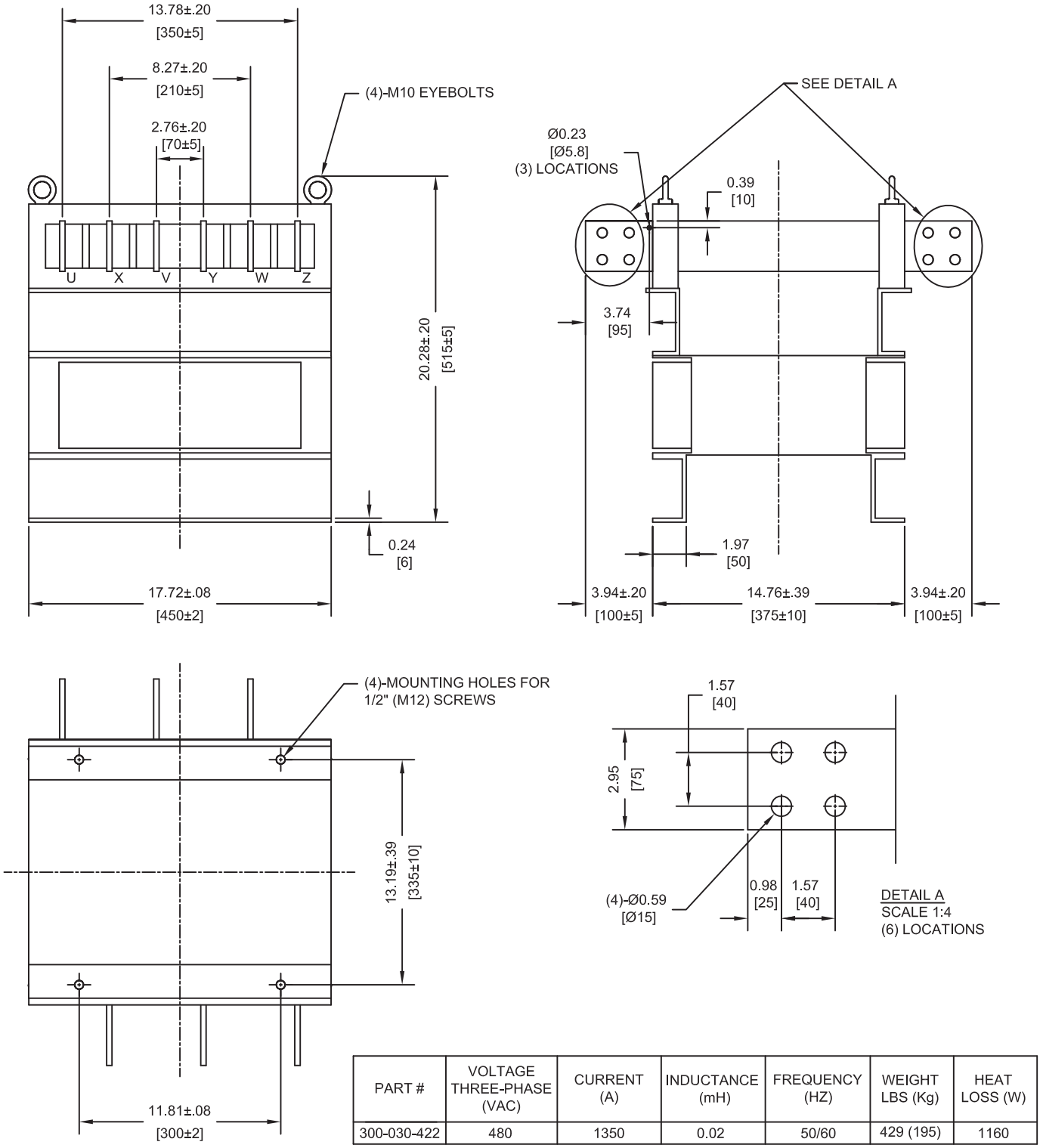
The 480V 2P Regen Systems use part number 300-030-421 (UZBA-B). This reactor is rated at 900A, 0.029mH, 480V



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-421	480	900	0.029	50/60	279 (127)	810

Figure 34 480V 2P Regen Systems Part Number 300-030-421

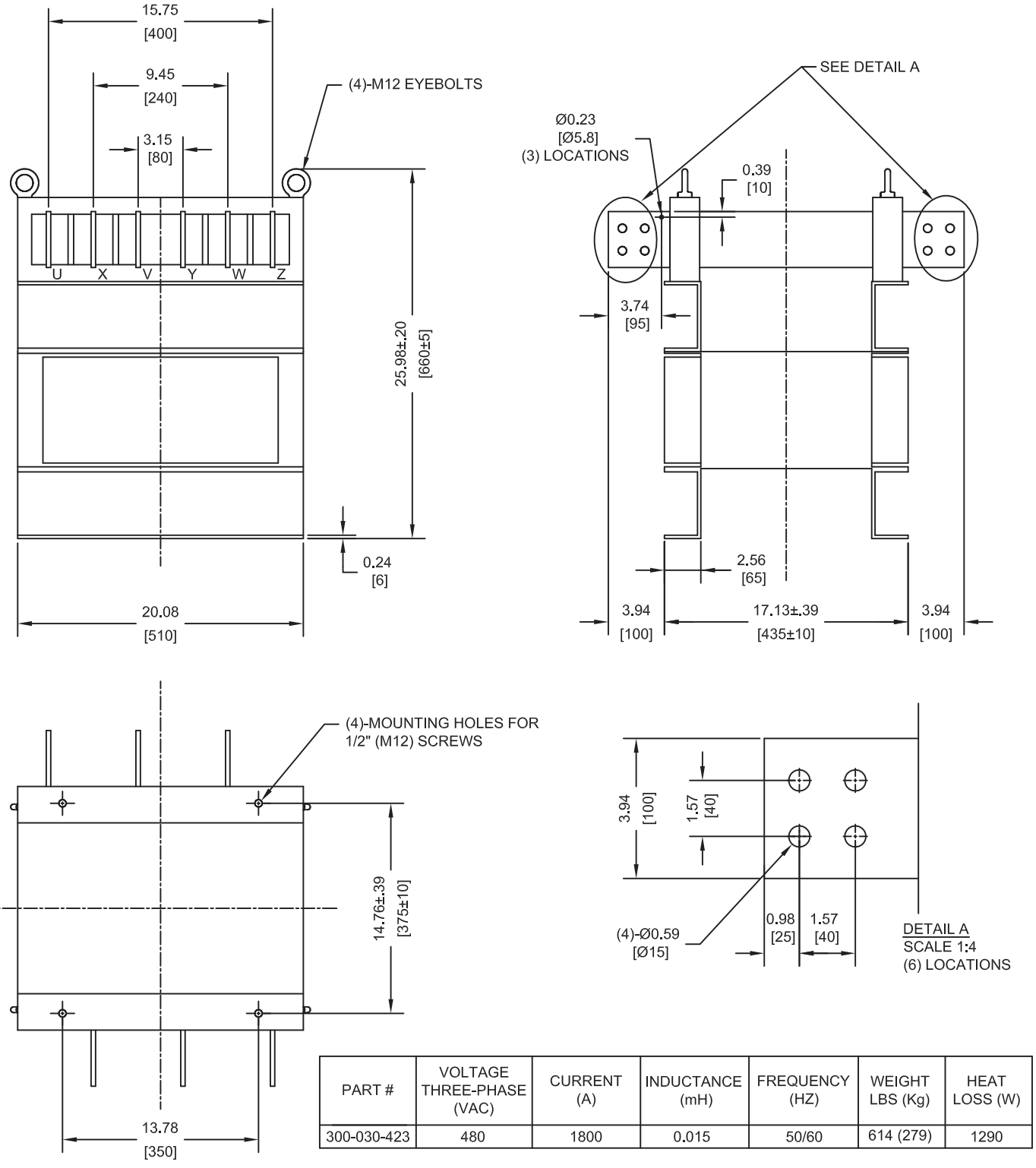
The 480V 3P Regen Systems use part number 300-030-422 (UZBA-B). This reactor is rated at 1350A, 0.02mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-422	480	1350	0.02	50/60	429 (195)	1160

Figure 35 480V 3P Regen Systems Part Number 300-030-422

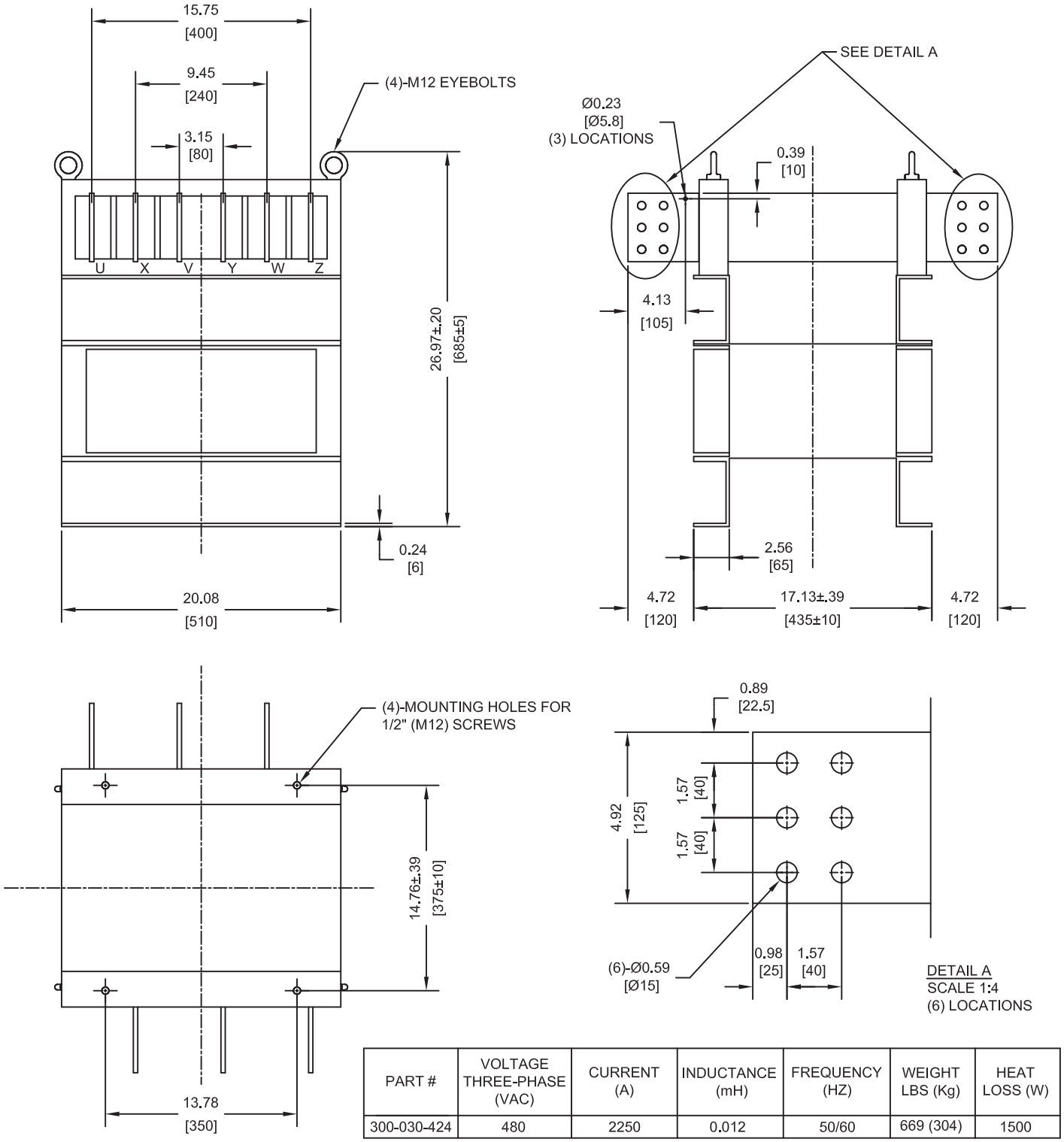
The 480V4P Regen Systems use part number 300-030-423 (UZBA-B). This reactor is rated at 1800A, 0.015mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-423	480	1800	0.015	50/60	614 (279)	1290

Figure 36 480V 4P Regen Systems Part Number 300-030-423

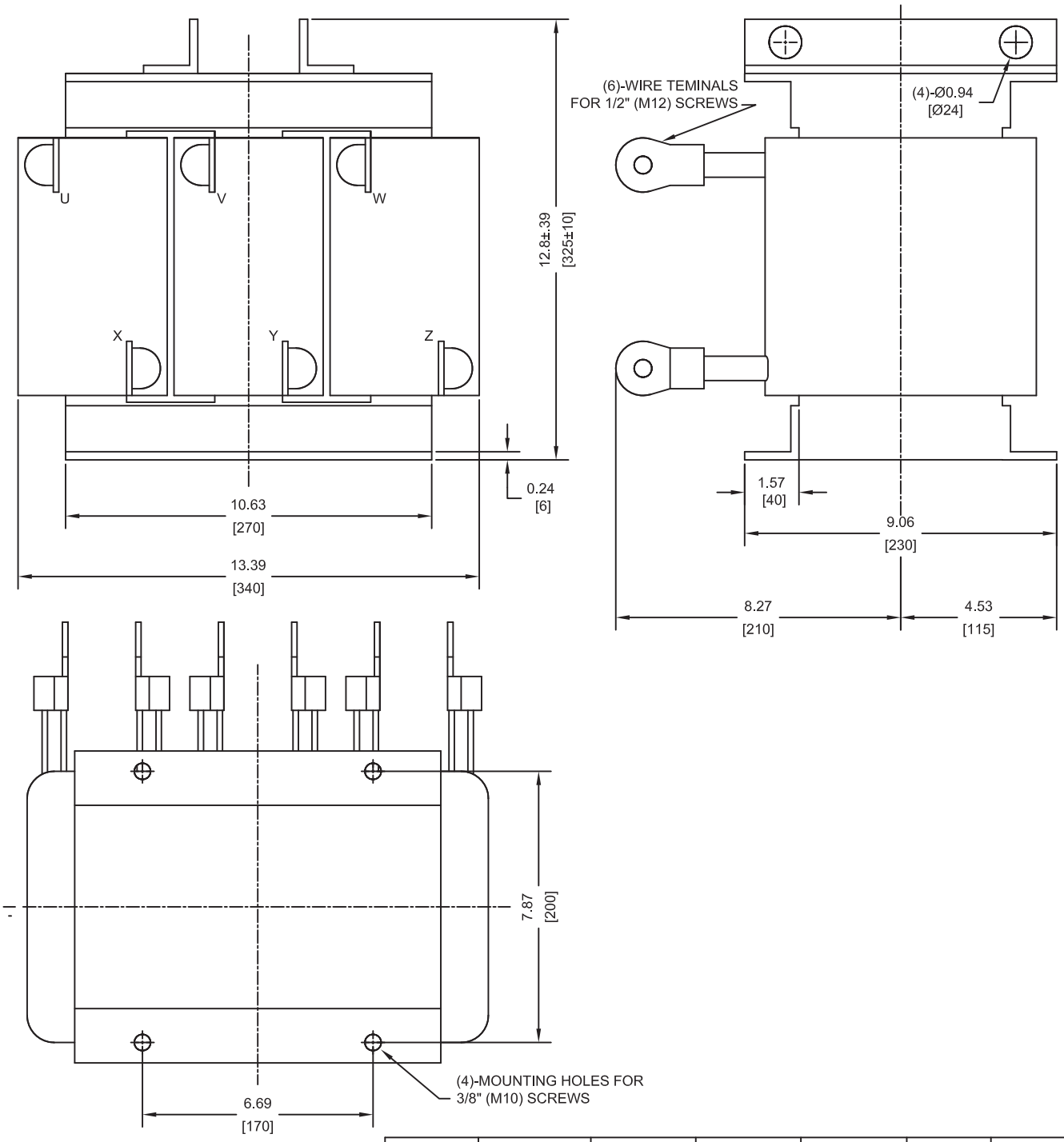
The 480V 5P Regen Systems use part number 300-030-424 (UZBA-B). This reactor is rated at 2250A, 0.012mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-424	480	2250	0.012	50/60	669 (304)	1500

Figure 37 480V 5P Regen Systems Part Number 300-030-424

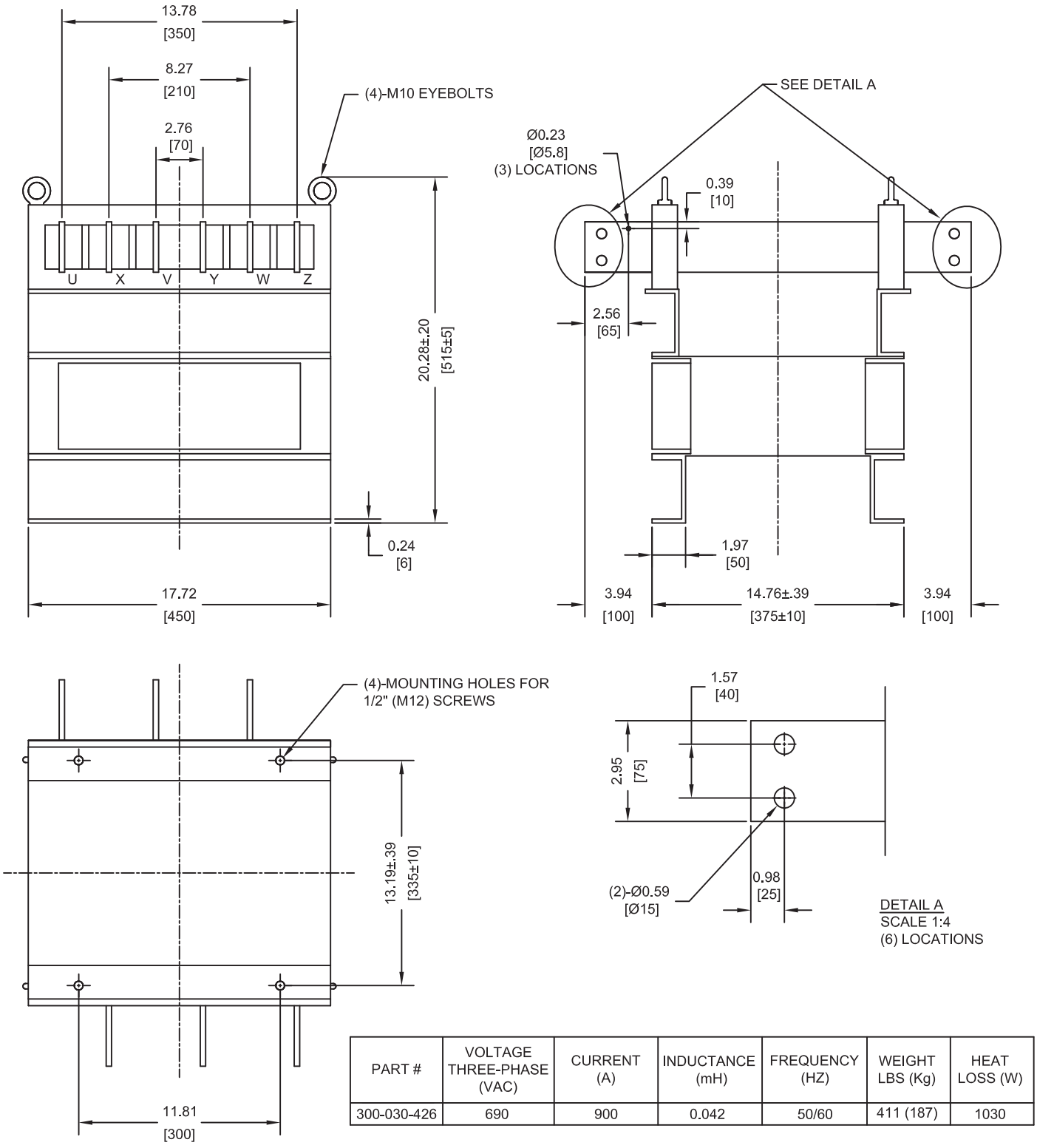
The 575/690V 1P Regen Systems use part number 300-030-425 (UZBA-B). This reactor is rated at 466A, 0.082mH, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-425	690	466	0.082	50/60	194 (88)	520

Figure 38 575/690V 1P Regen Systems Part Number 300-030-425

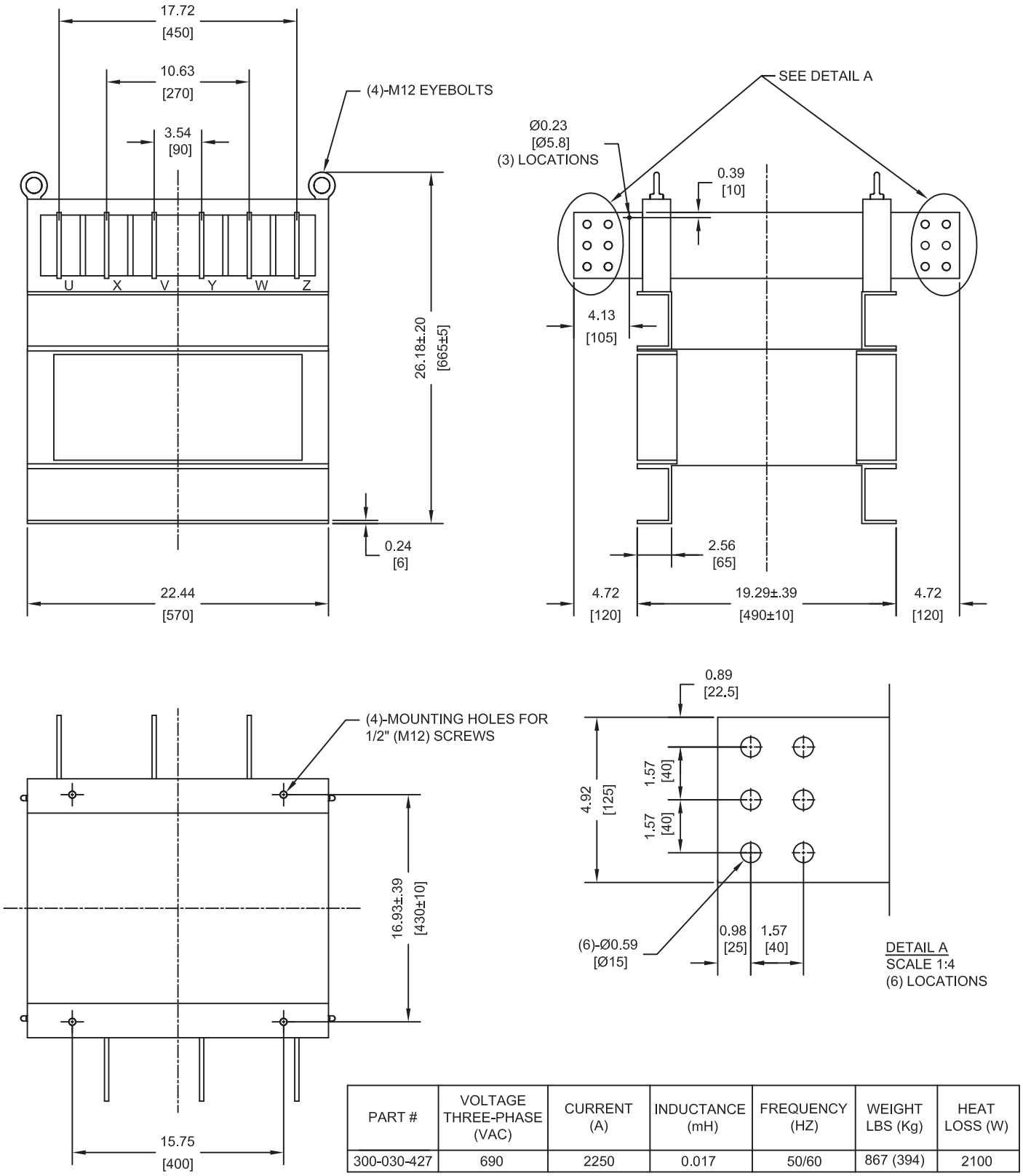
The 575/690V 2P Regen Systems use part number 300-030-426 (UZBA-B). This reactor is rated at 900A, 0.042mH, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-426	690	900	0.042	50/60	411 (187)	1030

Figure 39 575/690V 2P Regen Systems Part Number 300-030-426

The 575/690V 5P Regen Systems use part number 300-030-427 (UZBA-B). This reactor is rated at 2250A, 0.017mH, 690V.

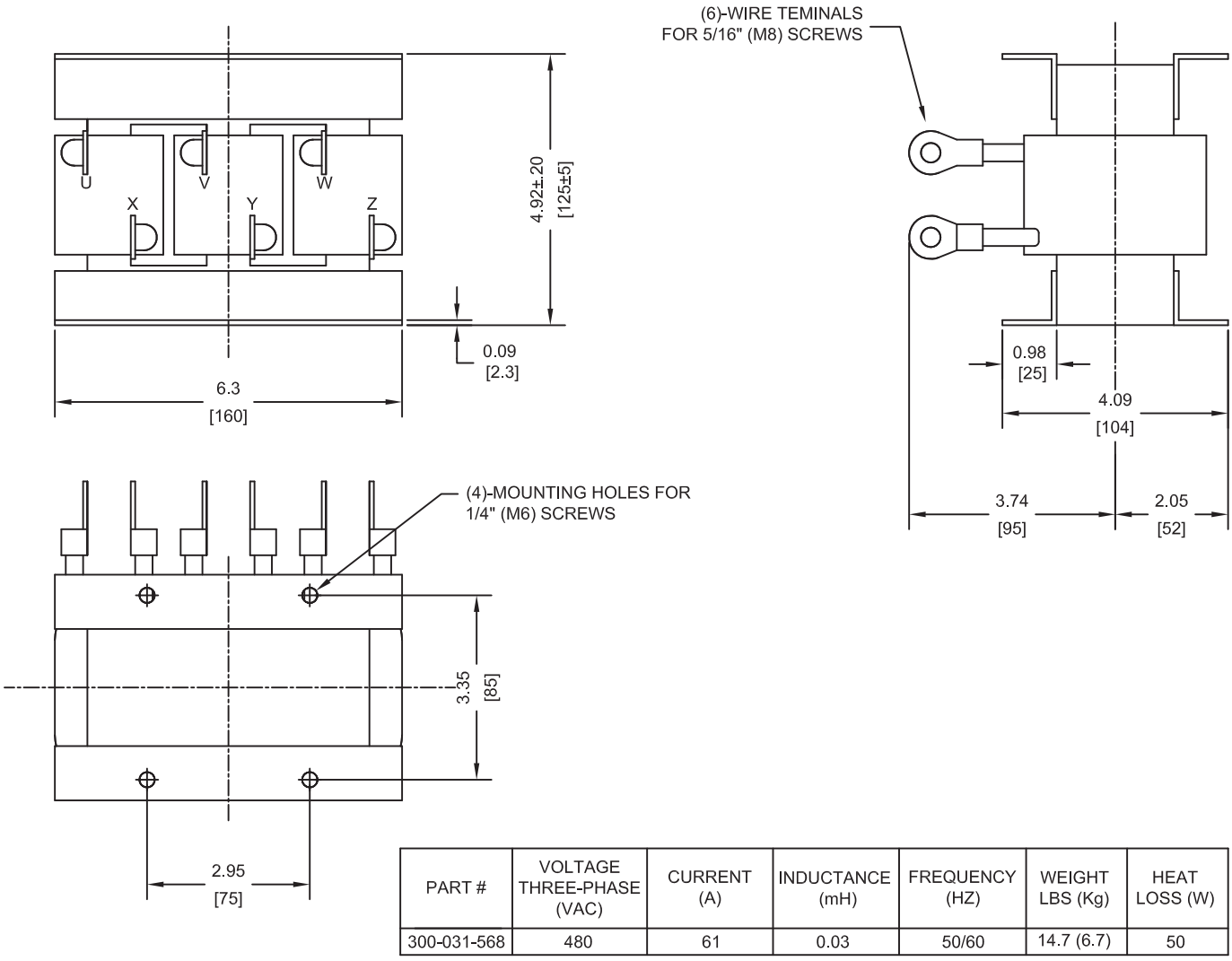


PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-030-427	690	2250	0.017	50/60	867 (394)	2100

Figure 40 575/690V 5P Regen Systems Part Number 300-030-427

■ AC Input Filter Reactors, for Regen Sysytems

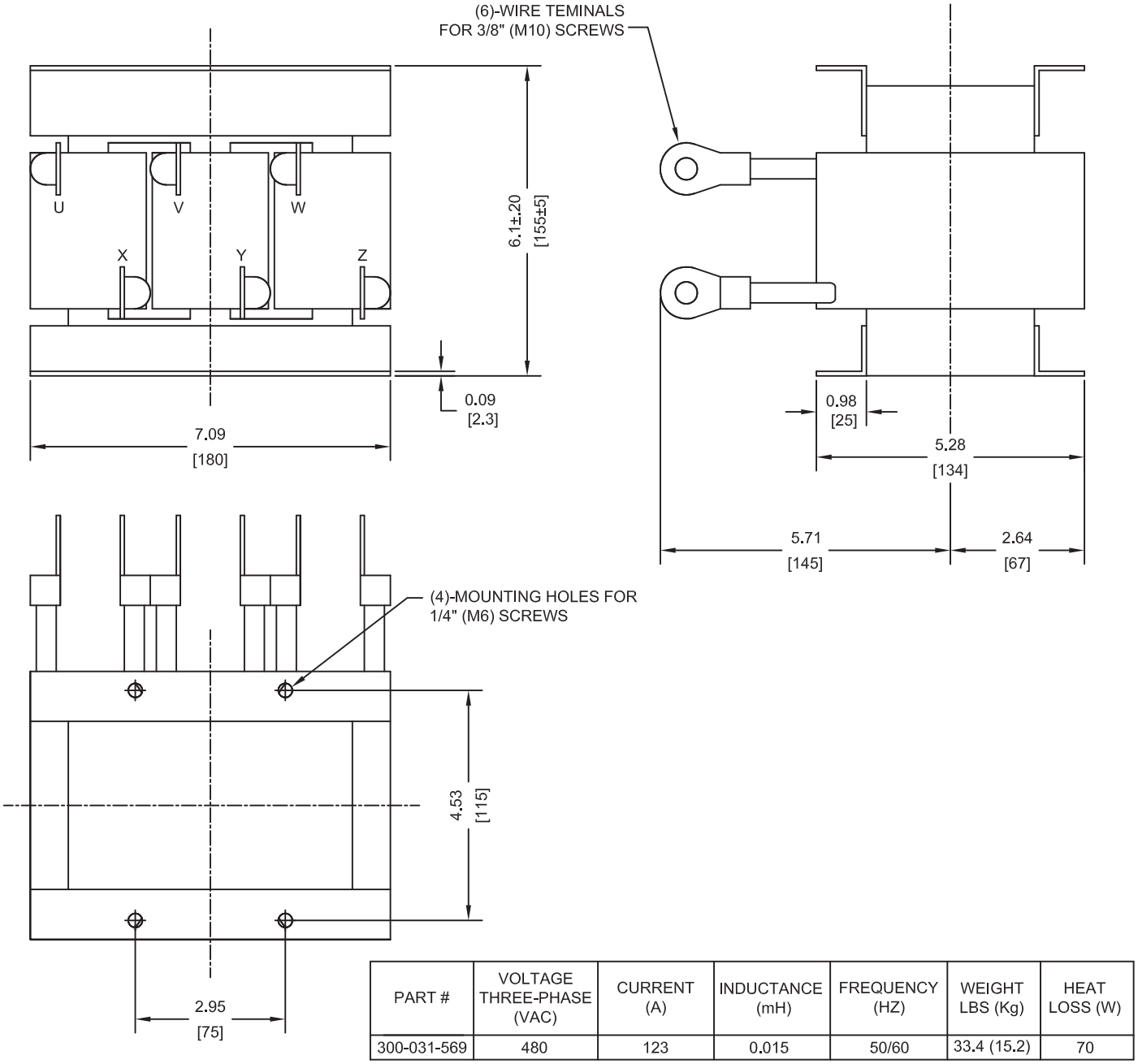
The 480V 1P Regen Systems use part number 300-031-568 (UZBA-B). This reactor is rated at 61A, 0.03mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-568	480	61	0.03	50/60	14.7 (6.7)	50

Figure 41 480V 1P Regen Systems Part Number 300-031-568

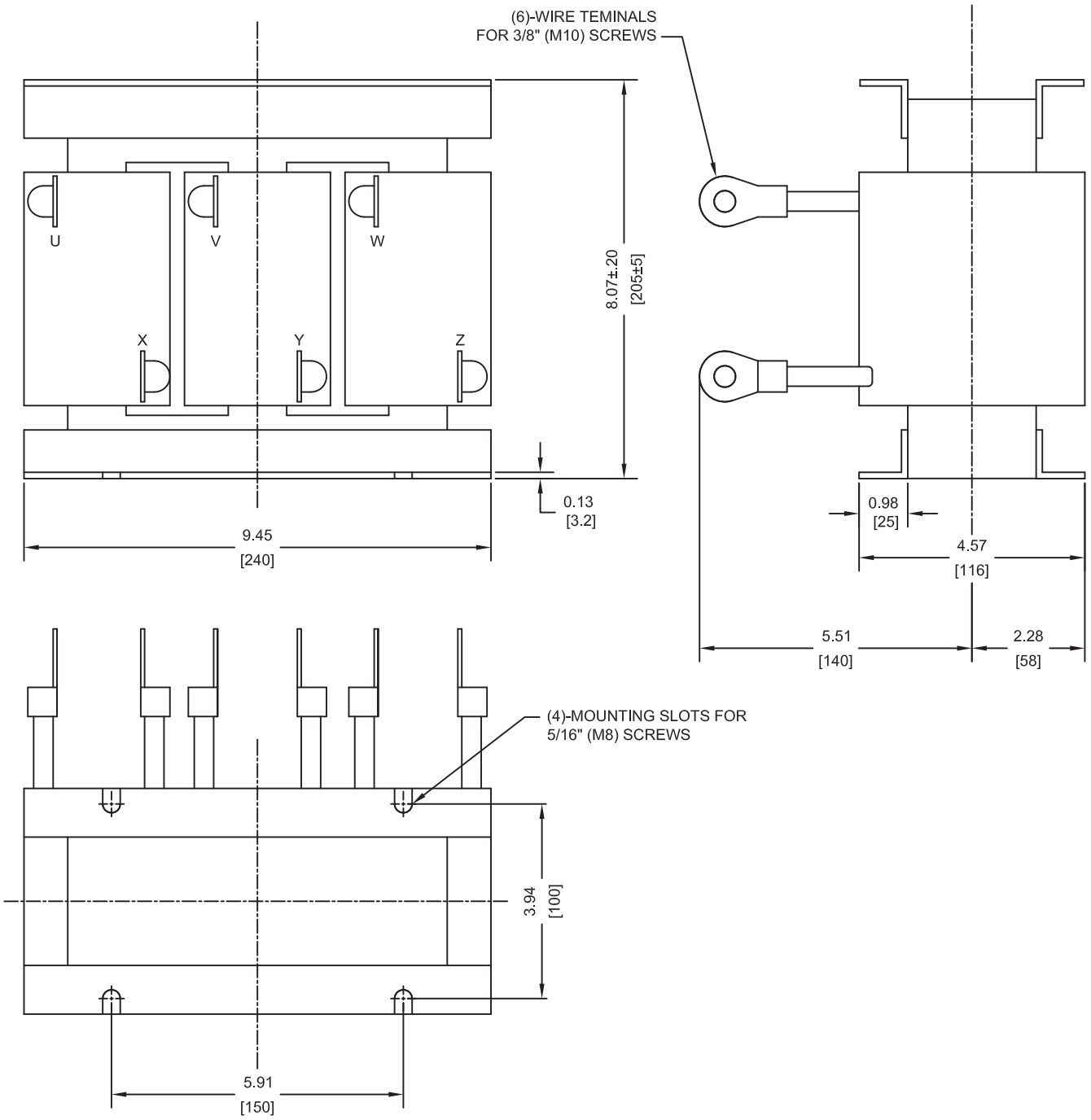
The 480V 2P Regen Systems use part number 300-031-569 (UZBA-B). This reactor is rated at 123A, 0.015mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-569	480	123	0.015	50/60	33.4 (15.2)	70

Figure 42 480V 2P Regen Systems Part Number 300-031-569

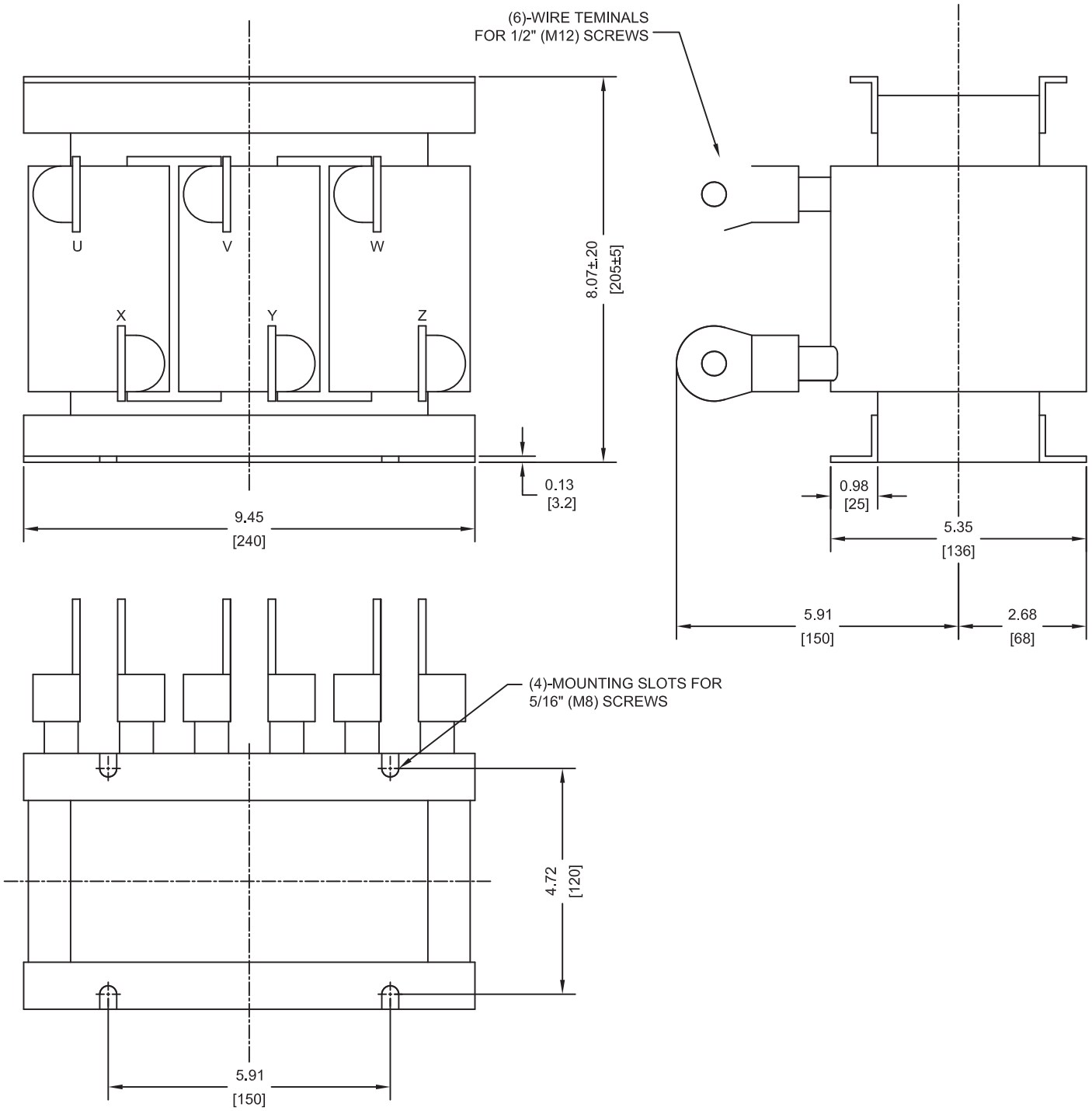
The 480V 3P Regen Systems use part number 300-031-570 (UZBA-B). This reactor is rated at 184A, 0.01mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-570	480	184	0.01	50/60	46 (21)	95

Figure 43 480V 3P Regen Systems Part Number 300-031-570

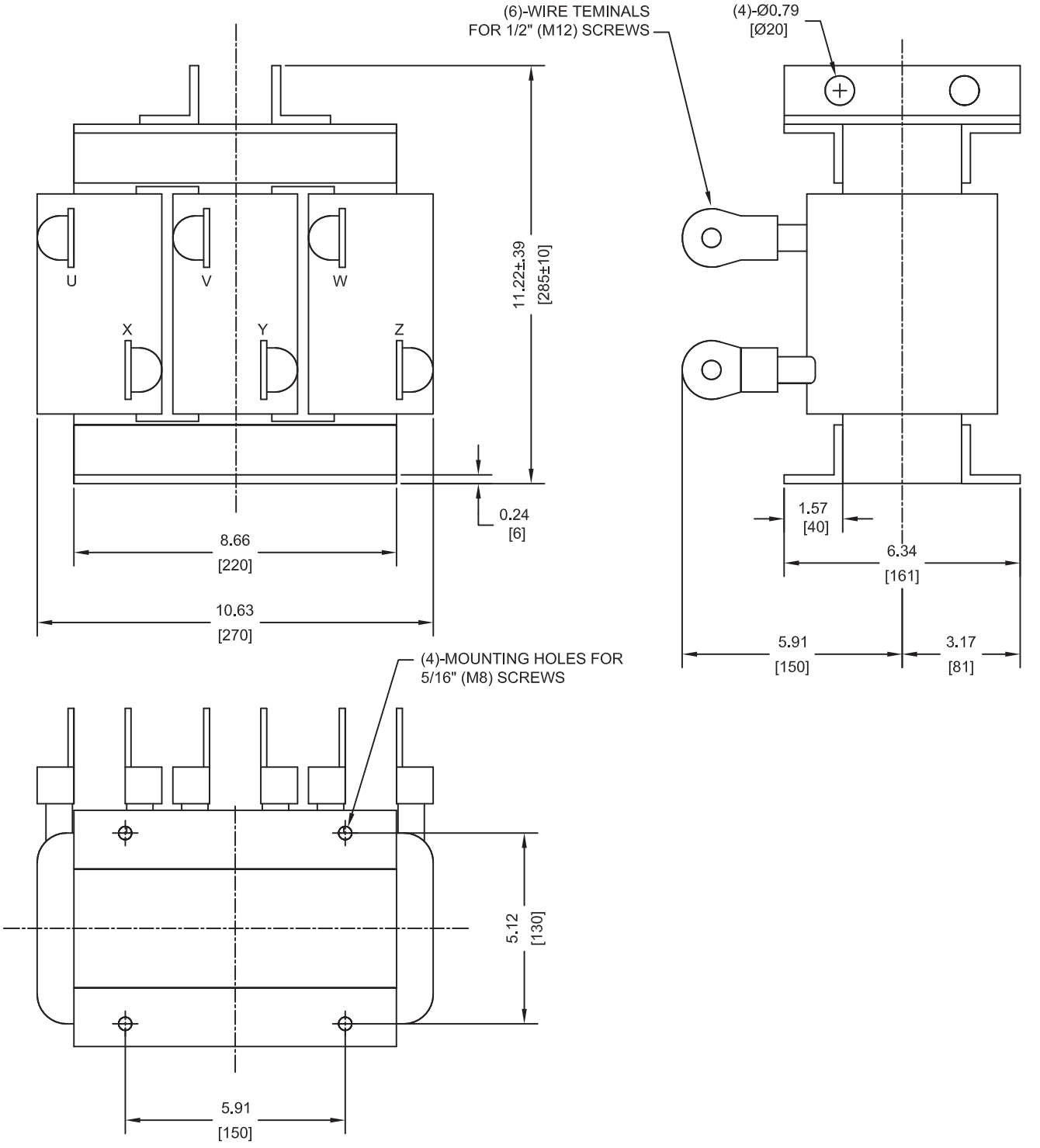
The 480V 4P Regen Systems use part number 300-031-571 (UZBA-B). This reactor is rated at 246A, 0.075mH, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	OUTPUT CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-571	480	246	0.0075	50/60	57 (26)	135

Figure 44 480V 4P Regen Systems Part Number 300-031-571

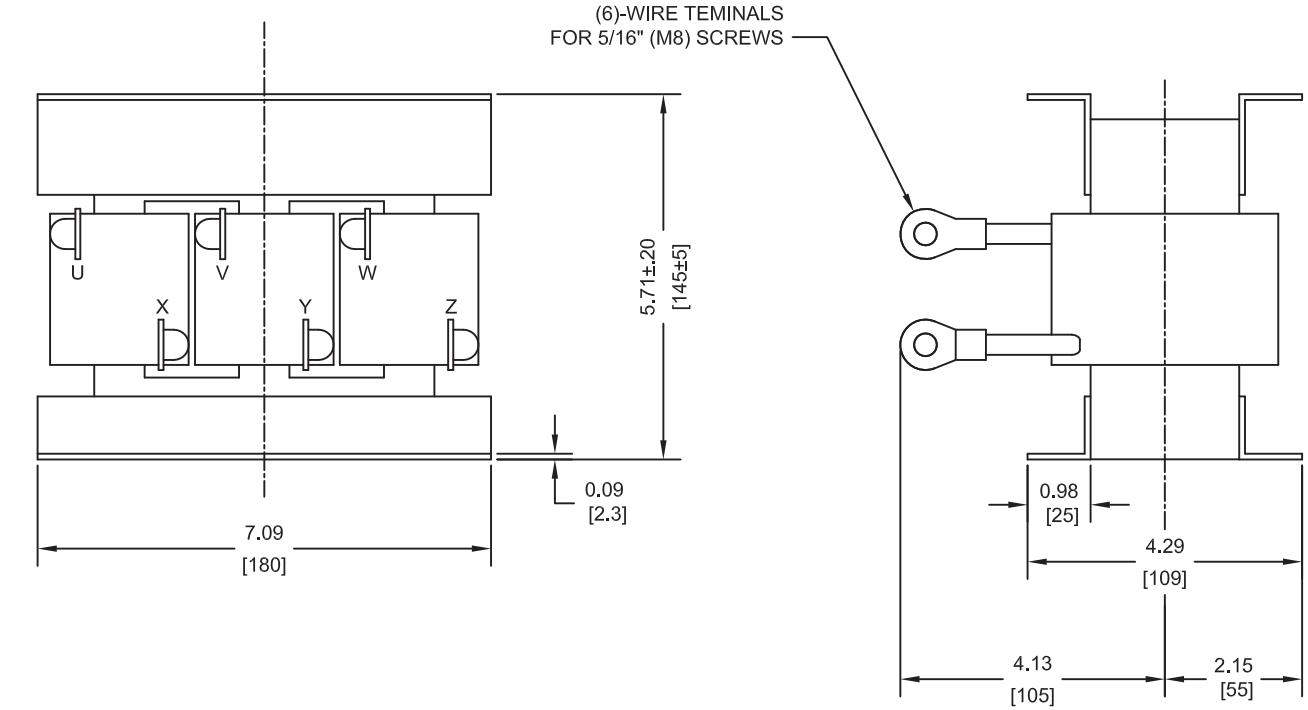
The 480V 5P Regen Systems use part number 300-031-720 (UZBA-B). This reactor is rated at 307A, 0.006mH, 480V.

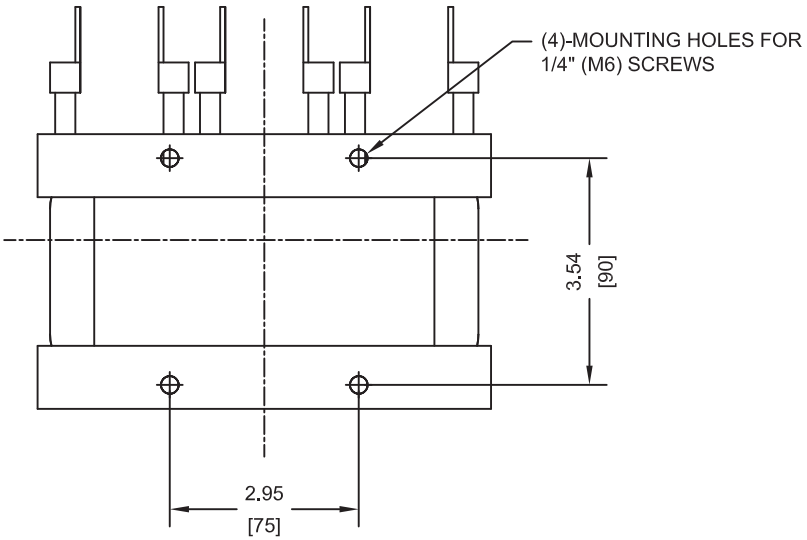


PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-720	480	307	0.006	50/60	66 (30)	165

Figure 45 480V 5P Regen Systems Part Number 300-031-720

The 575/690V 1P Regen Systems use part number 300-031-721 (UZBA-B). This reactor is rated at 63A, 0.0417mH, 690V.

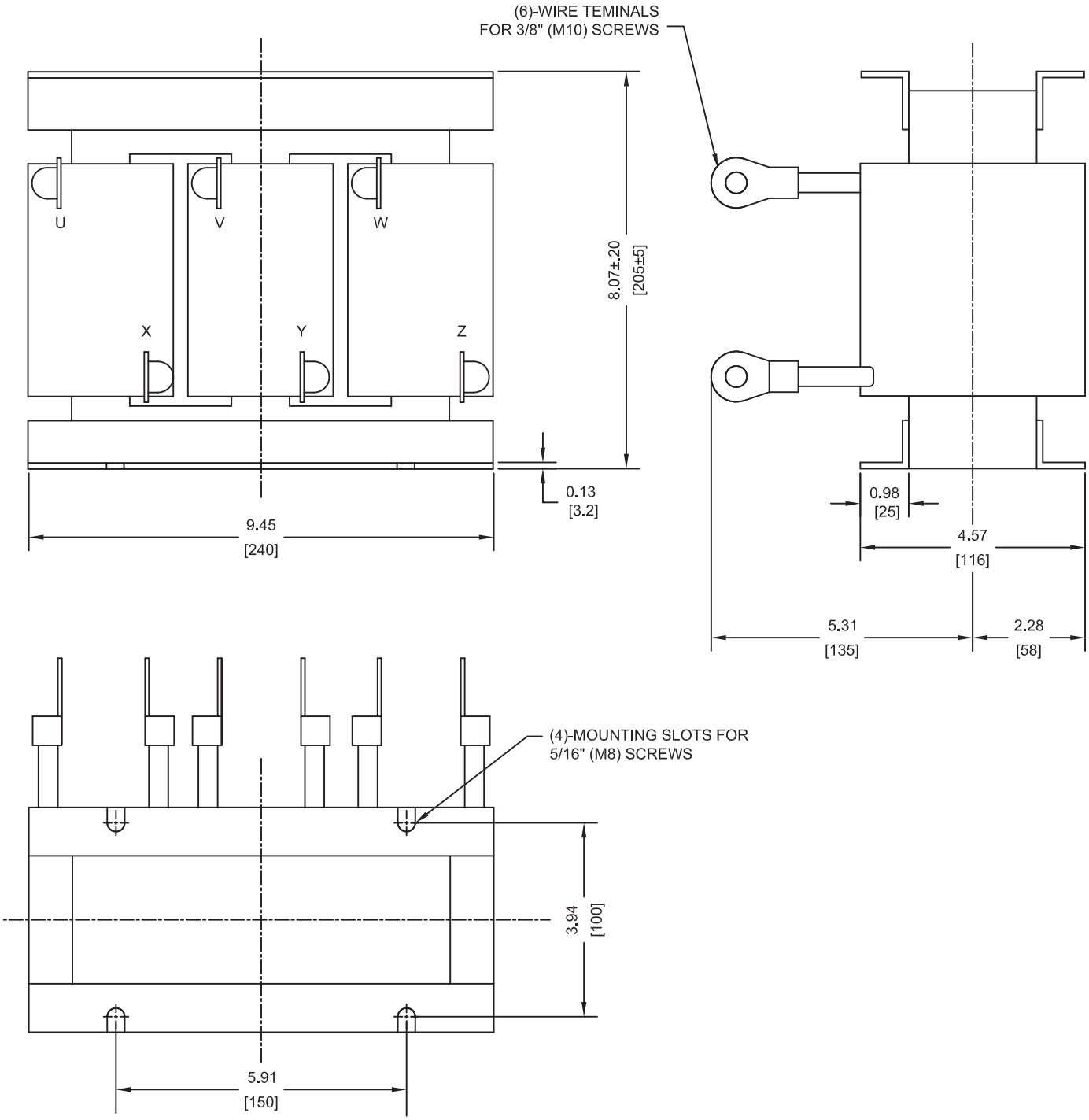




PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-721	690	63	0.0417	50/60	21 (9.5)	65

Figure 46 575/690V 1P Regen Systems Part Number 300-031-721

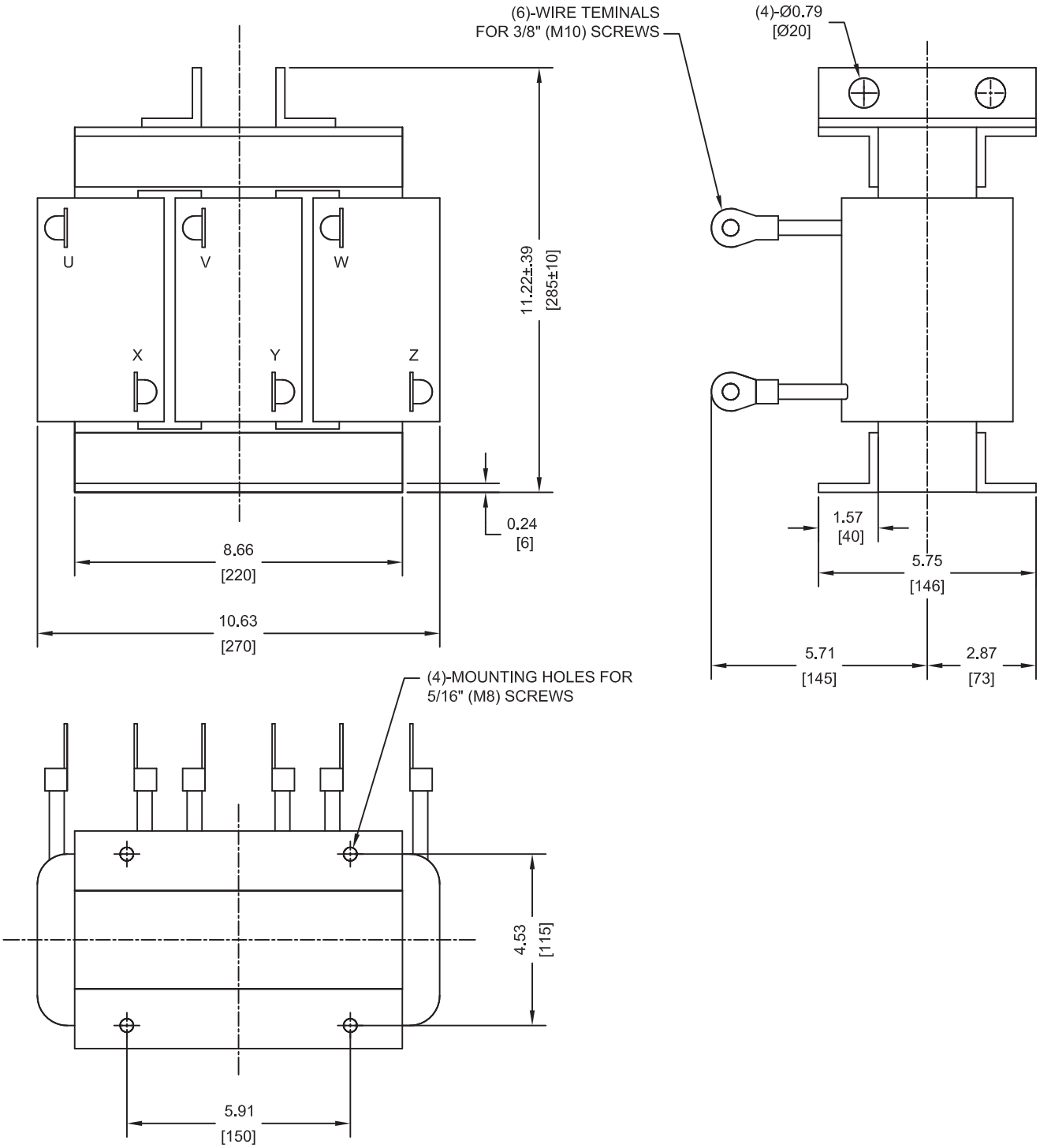
The 575/690V 2P Regen Systems use part number 300-031-722 (UZBA-B). This reactor is rated at 127A, 0.0208mH, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-722	690	127	0.0208	50/60	46 (21)	105

Figure 47 575/690V 2P Regen Systems Part Number 300-031-722

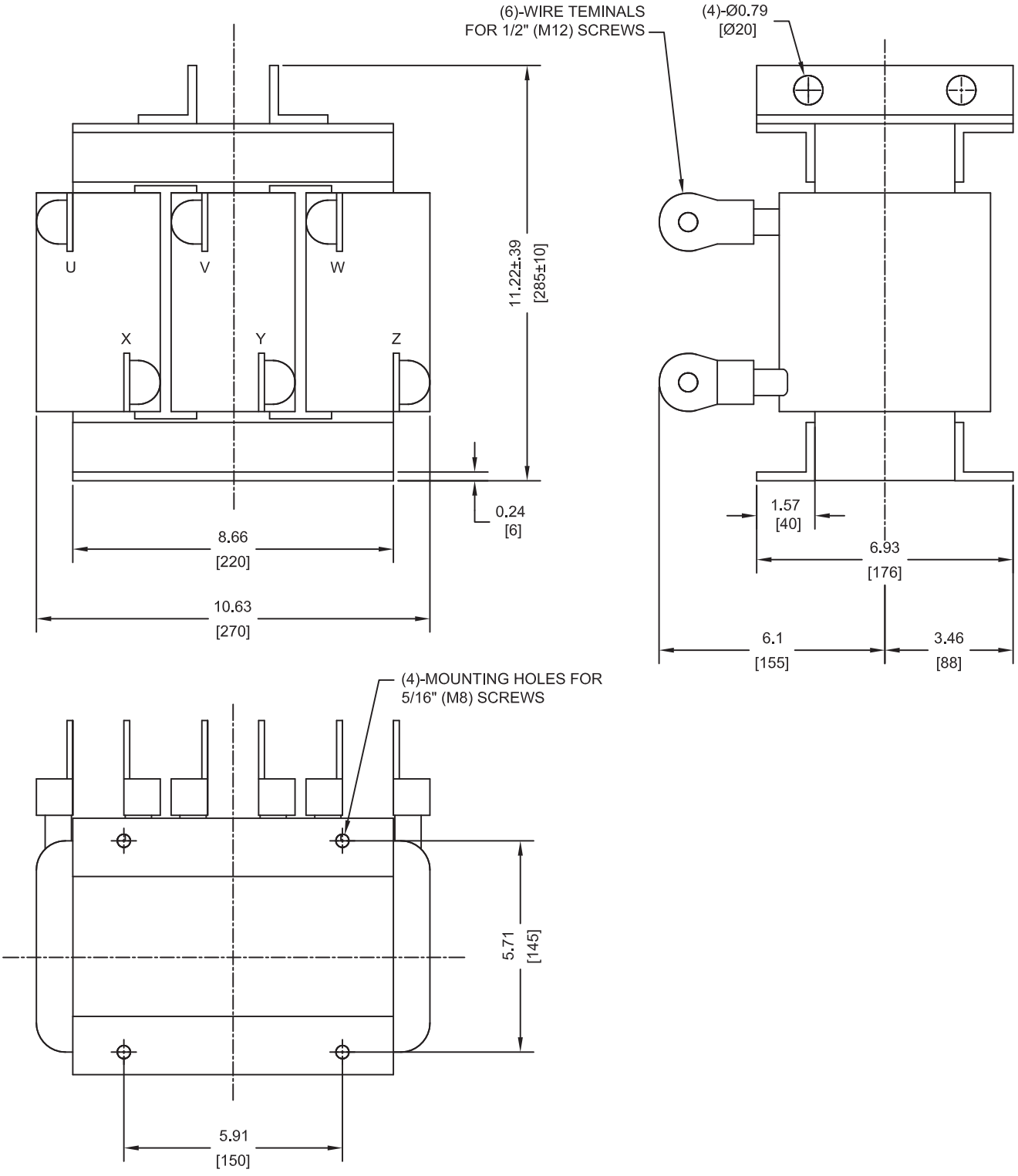
The 575/690V 3P Regen Systems use part number 300-031-723 (UZBA-B). This reactor is rated at 190A, 0.0139mH, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-723	690	190	0.0139	50/60	57 (26)	135

Figure 48 575/690V 3P Regen Systems Part Number 300-031-723

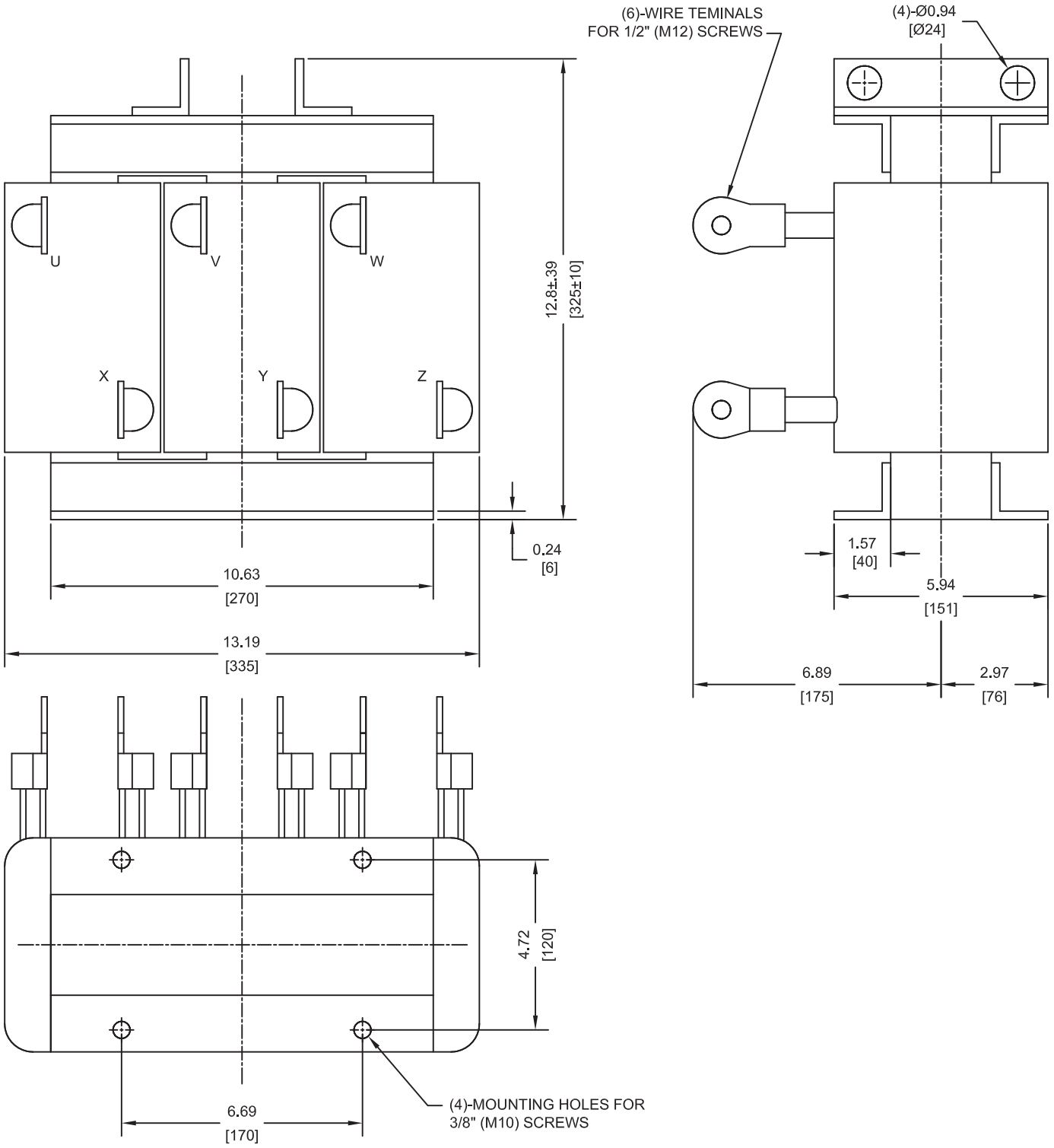
The 575/690V 4P Regen Systems use part number 300-031-724. This reactor is rated at 254A, 0.0104mH, 690V



PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-724	690	254	0.0104	50/60	81 (37)	175

Figure 49 575/690V 4P Regen Systems Part Number 300-031-724

The 575/590V 5P Regen Systems use part number 300-031-725 (UZBA-B). This reactor is rated at 317A, 0.0083mH, 690V.

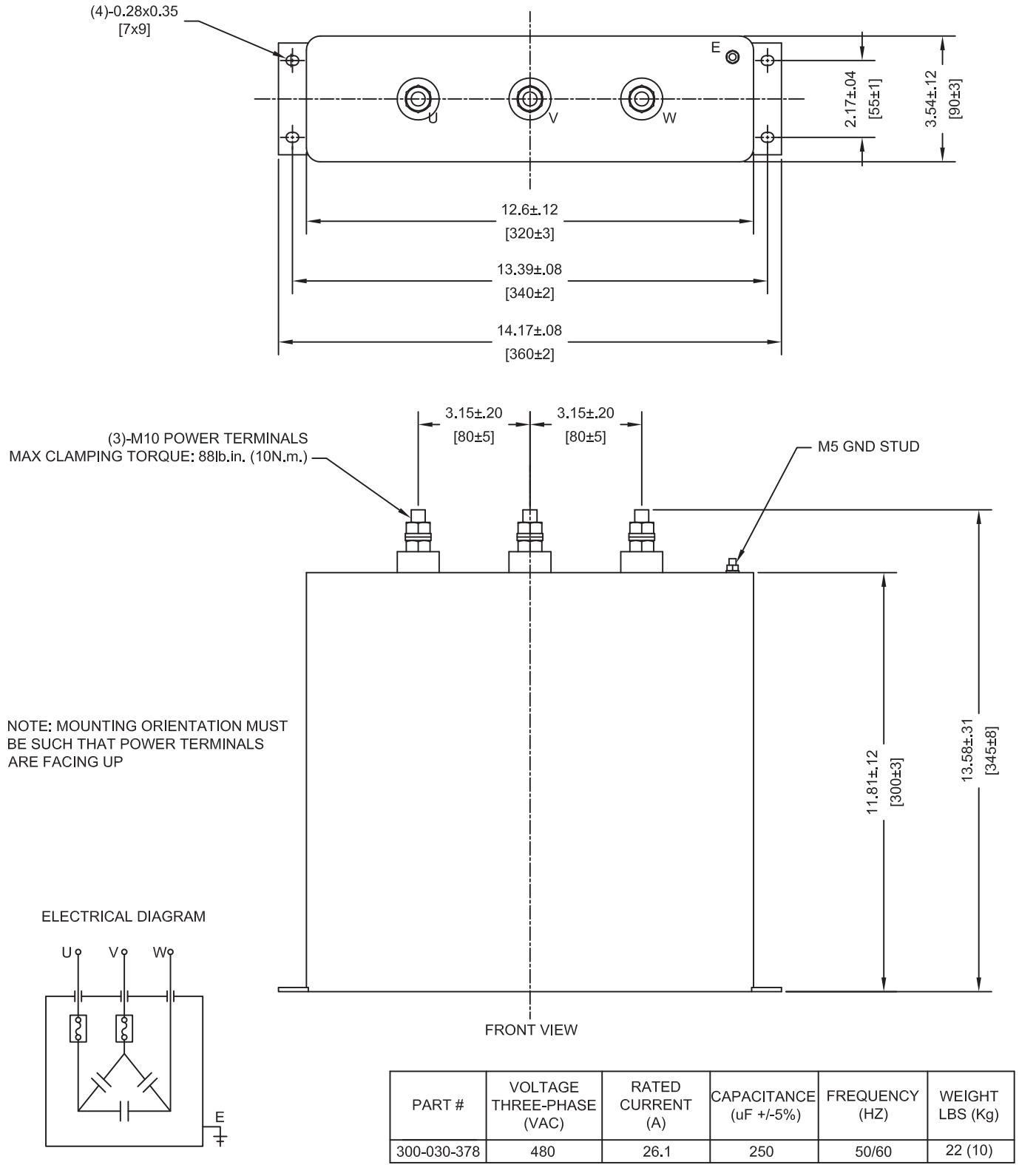


PART #	VOLTAGE THREE-PHASE (VAC)	CURRENT (A)	INDUCTANCE (mH)	FREQUENCY (HZ)	WEIGHT LBS (Kg)	HEAT LOSS (W)
300-031-725	690	317	0.0083	50/60	95 (43)	170

Figure 50 575/690V 5P Regen Systems Part Number 300-031-725

■ Regen Filter Capacitor Assemblies

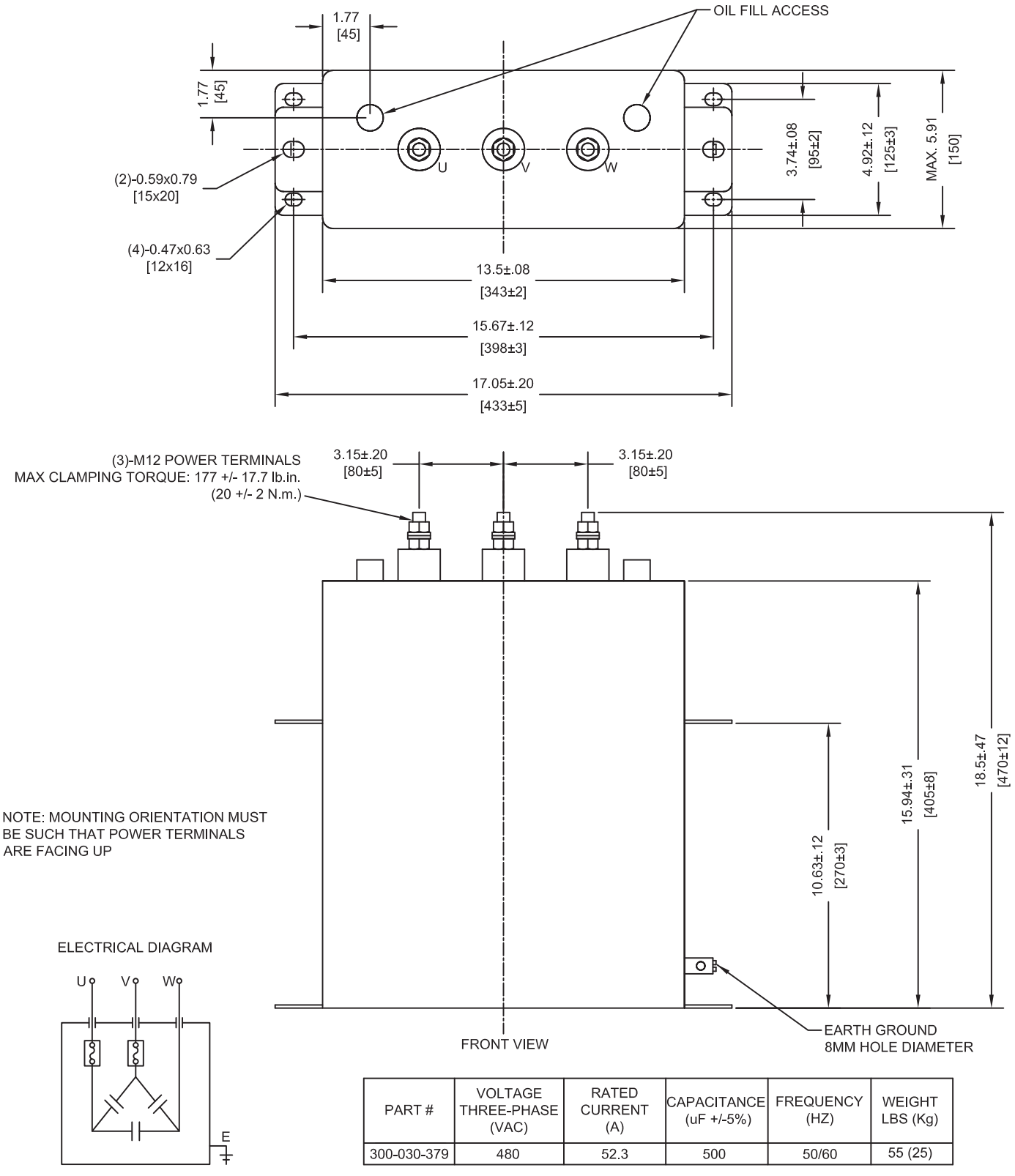
The 480V 1P Regen Systems use part number 300-030-378. This filter capacitor assembly is rated at 26.1A, 250uF, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-378	480	26.1	250	50/60	22 (10)

Figure 51 480V 1P Regen Systems Part Number 300-030-378

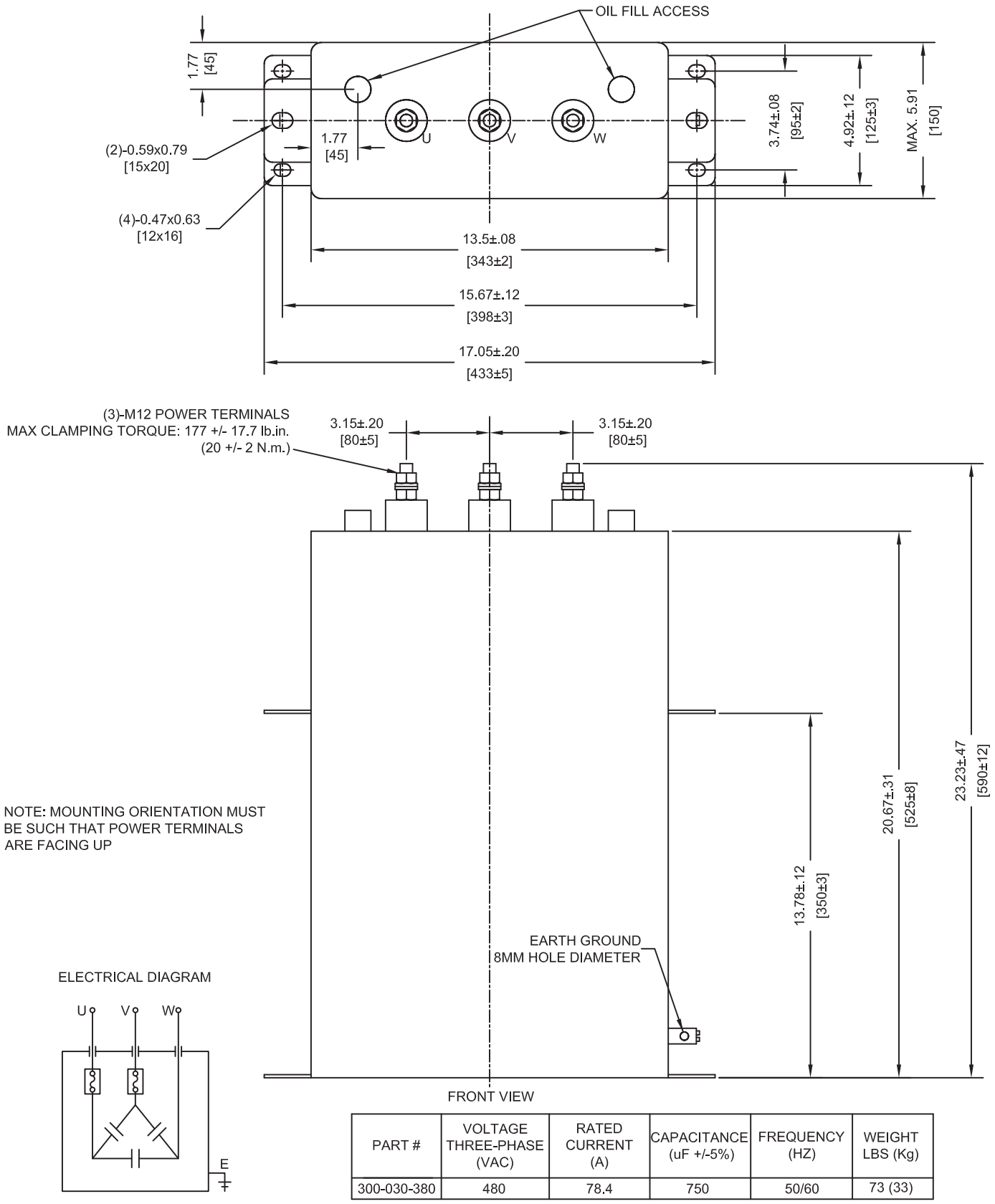
The 480V 2P Regen Systems use part number 300-030-379. This filter capacitor assembly is rated at 53.2A, 500uF, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-379	480	52.3	500	50/60	55 (25)

Figure 52 480V 2P Regen Systems Part Number 300-030-379

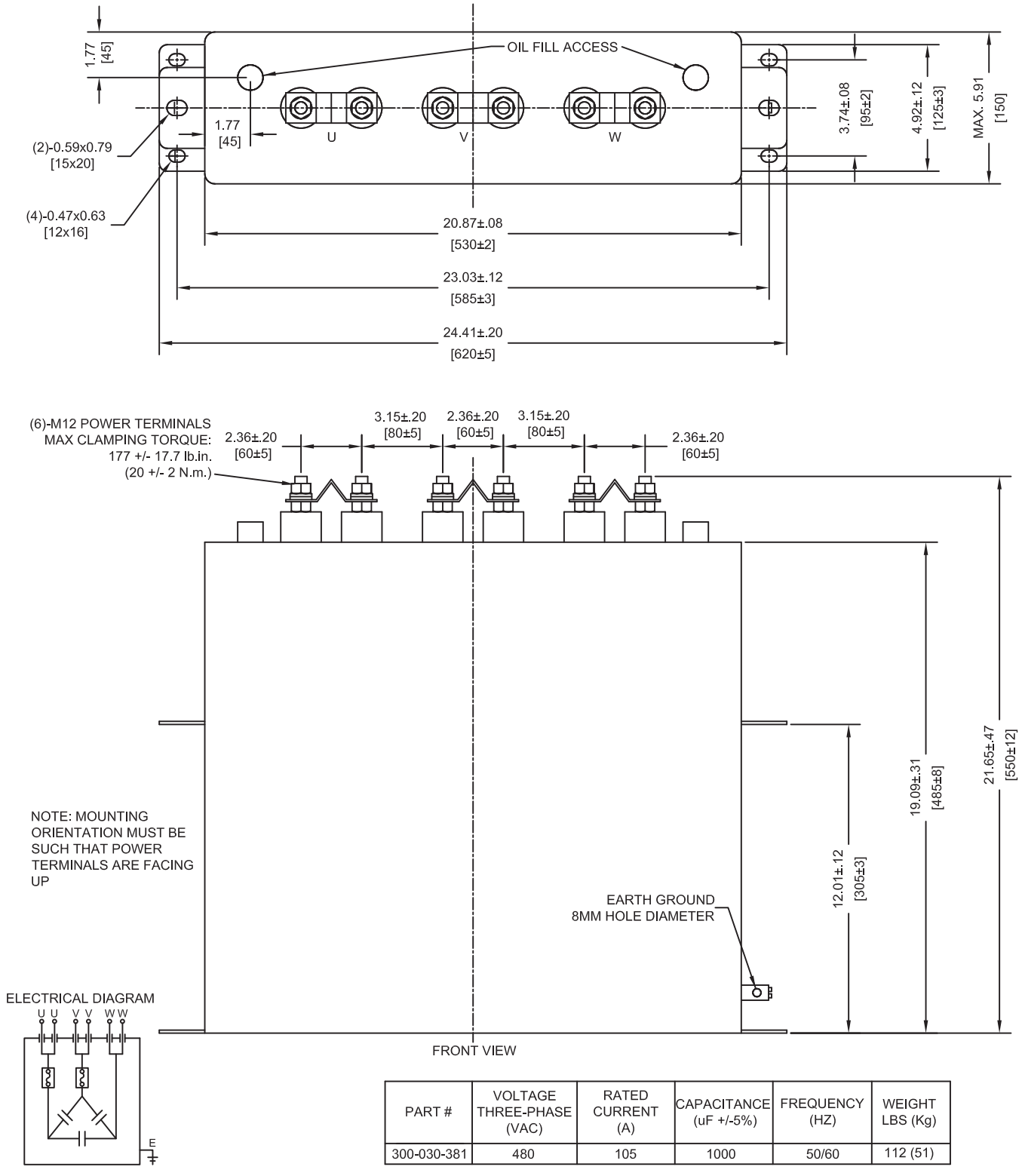
The 480V 3P Regen Systems use part number 300-030-380. This filter capacitor assembly is rated at 78.4A, 750uF, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-380	480	78.4	750	50/60	73 (33)

Figure 53 480V 3P Regen Systems Part Number 300-030-380

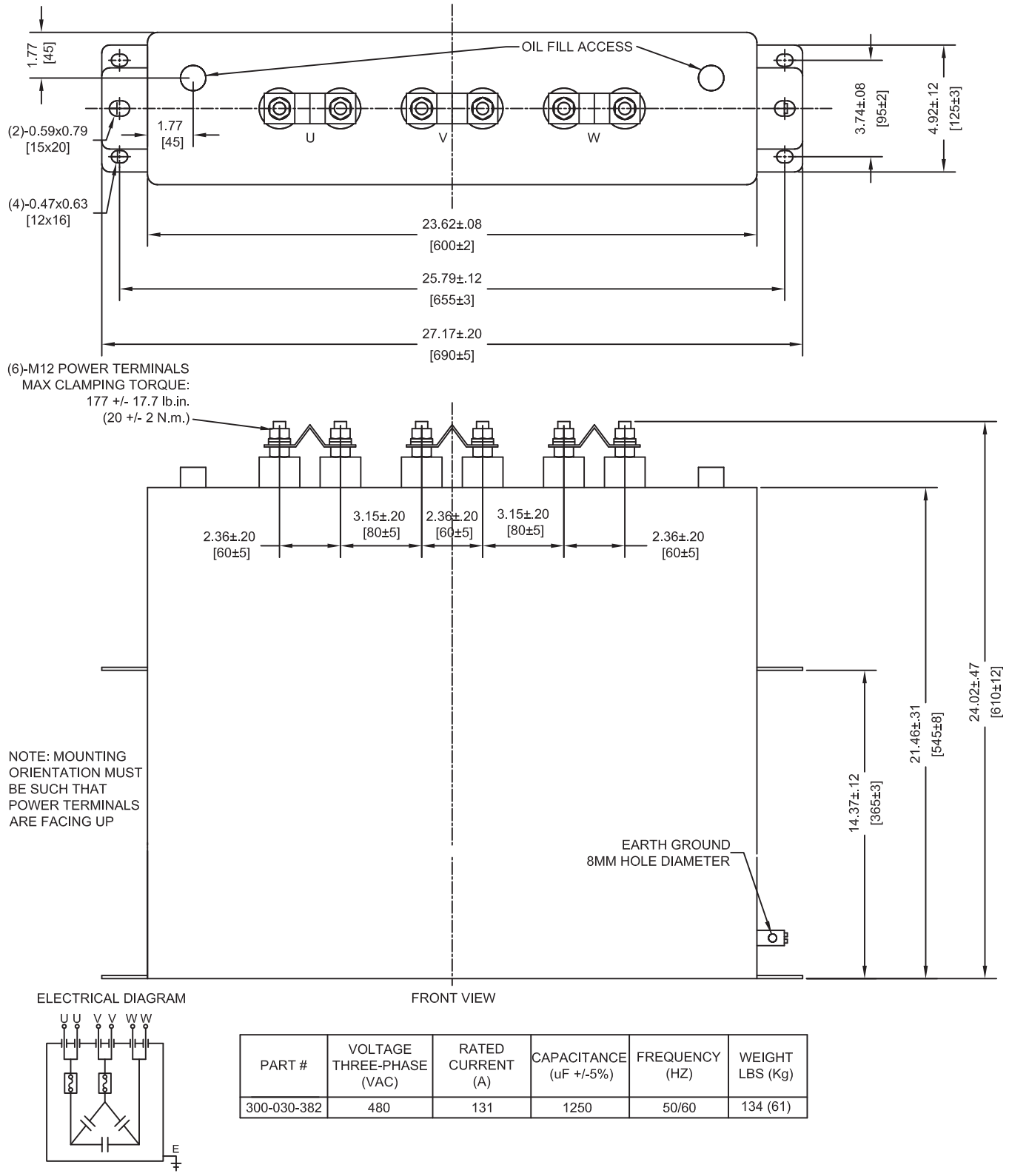
The 480V 4P Regen Systems use part number 300-030-381. This filter capacitor assembly is rated at 105A, 1000uF, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-381	480	105	1000	50/60	112 (51)

Figure 54 480V 4P Regen Systems Part Number 300-030-381

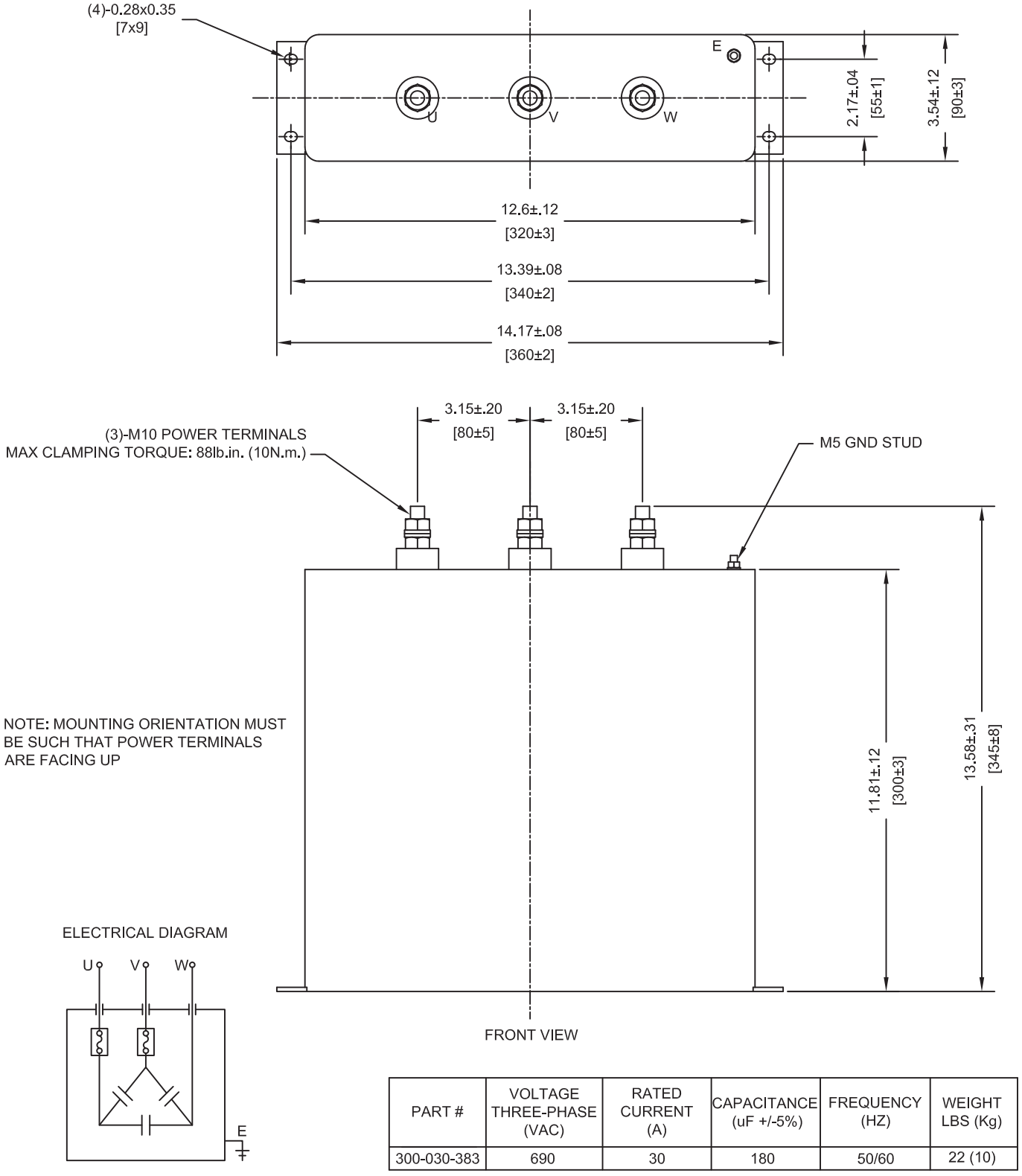
The 480V 5P Regen Systems use part number 300-030-382. This filter capacitor assembly is rated at 131A, 1250uF, 480V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-382	480	131	1250	50/60	134 (61)

Figure 55 480V 5P Regen Systems Part Number 300-030-382

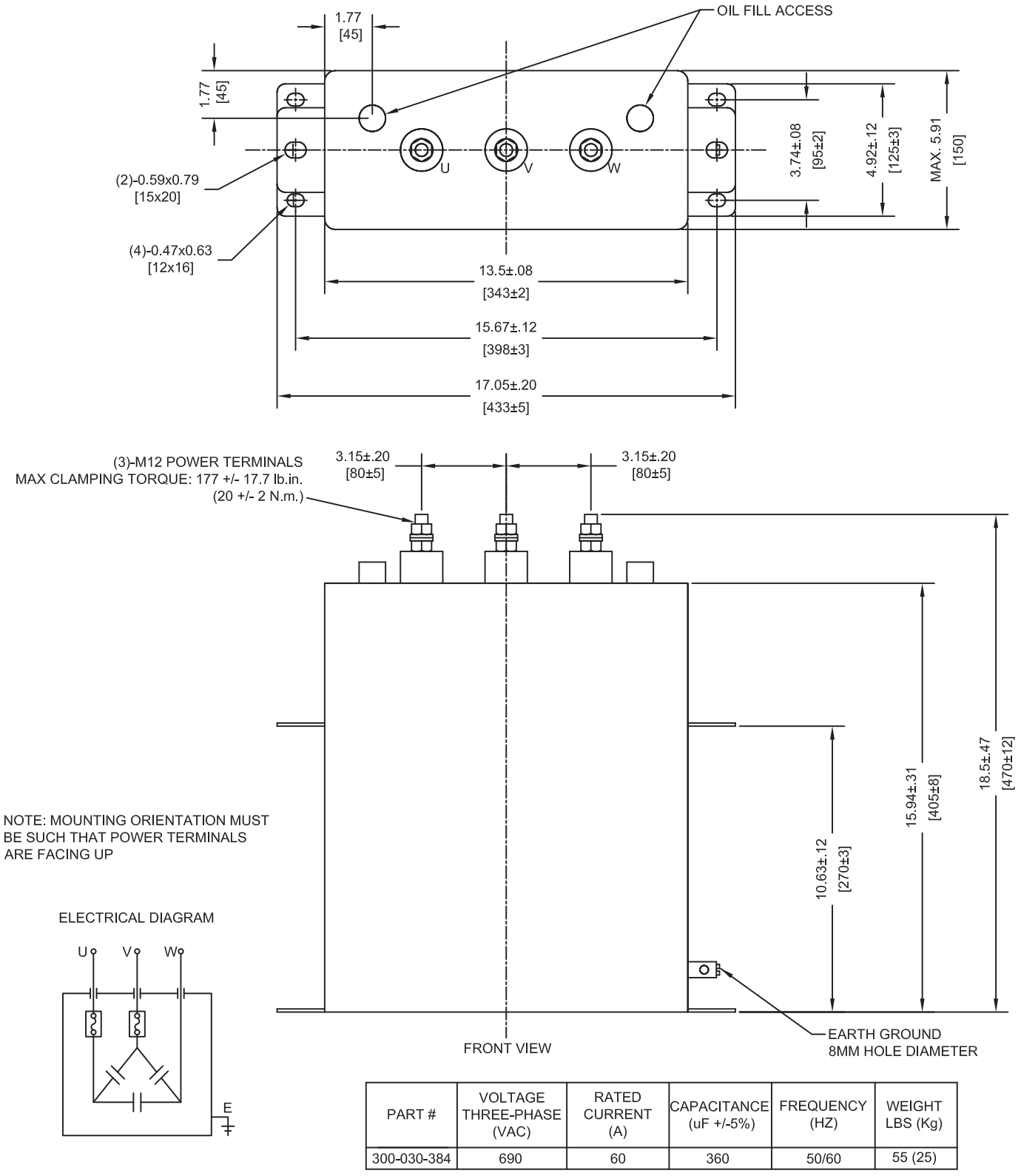
The 575/690V 1P Regen Systems use part number 300-030-383. This filter capacitor assembly is rated at 30A, 180uF, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-383	690	30	180	50/60	22 (10)

Figure 56 575/690V 1P Regen Systems Part Number 300-030-383

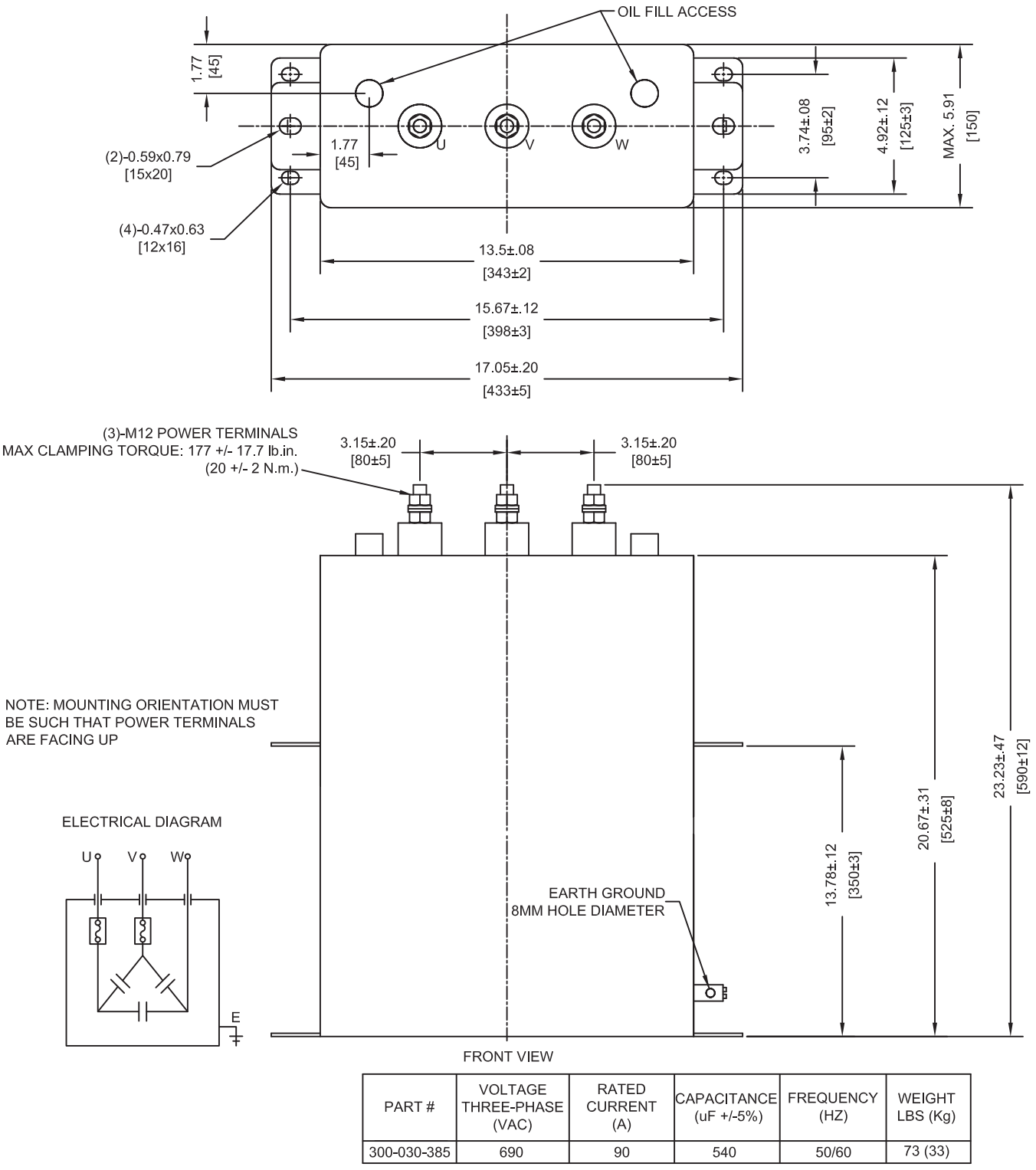
The 575/690V 2P Regen Systems use part number 300-030-384. This filter capacitor assembly is rated at 60A, 360uF, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-384	690	60	360	50/60	55 (25)

Figure 57 575/690V 2P Regen Systems Part Number 300-030-384

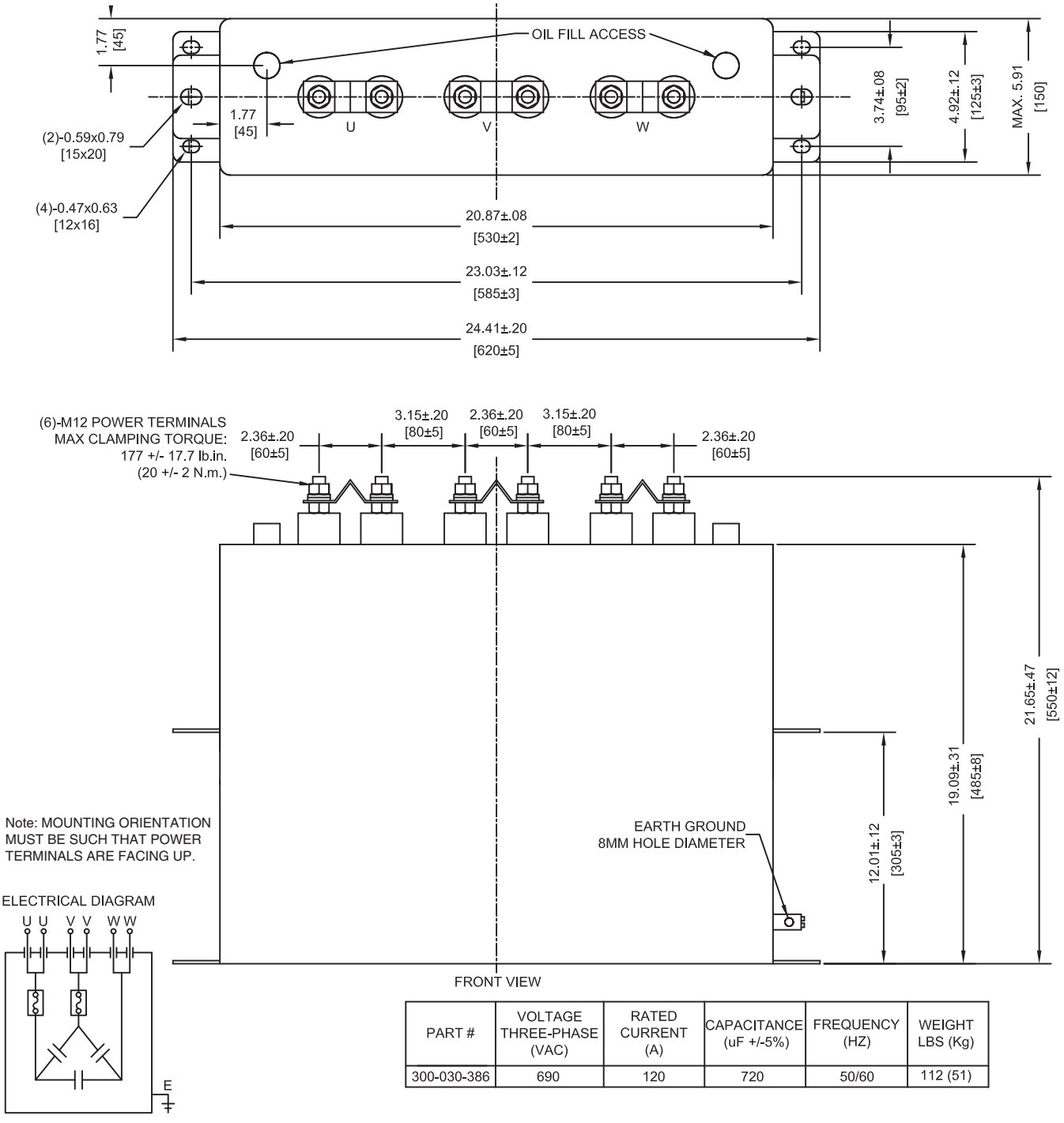
The 575/690V 3P Regen Systems use part number 300-030-385. This filter capacitor assembly is rated at 90A, 540uF, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-385	690	90	540	50/60	73 (33)

Figure 58 575/690V 3P Regen Systems Part Number 300-030-385

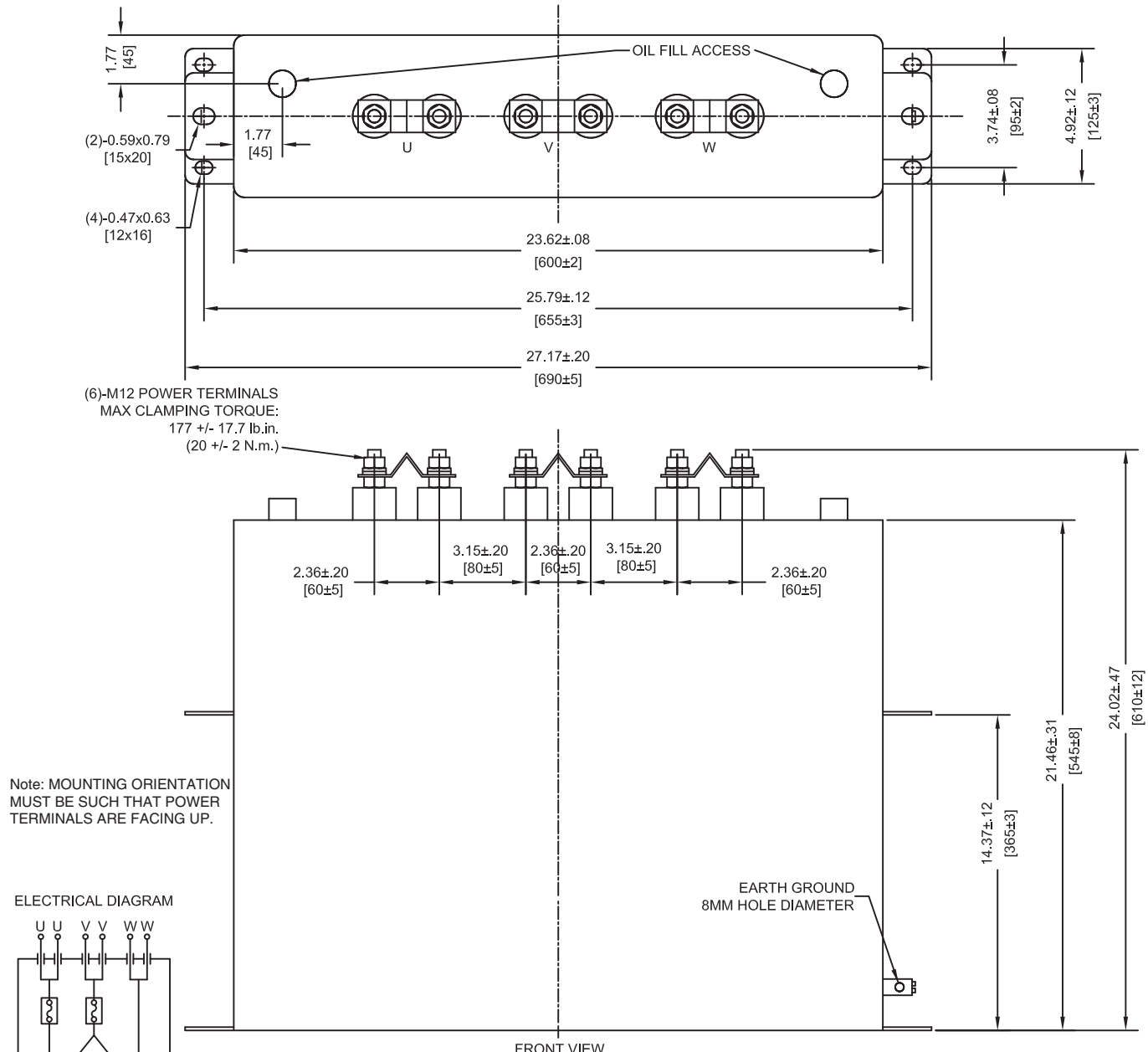
The 575/690V 4P Regen Systems use part number 300-030-386. This filter capacitor assembly is rated at 120A, 720uF, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-386	690	120	720	50/60	112 (51)

Figure 59 575/690V 4P Regen Systems Part Number 300-030-386

The 575/690V 5P Regen Systems use part number 300-030-387. This filter capacitor assembly is rated at 150A, 900uF, 690V.



PART #	VOLTAGE THREE-PHASE (VAC)	RATED CURRENT (A)	CAPACITANCE (uF +/-5%)	FREQUENCY (HZ)	WEIGHT LBS (Kg)
300-030-387	690	150	900	50/60	134 (61)

Figure 60 575/690V 5P Regen Systems Part Number 300-030-387

5 Electrical Installation

◆ Main Circuit Wiring

Refer to Appendix-F Elementary Drawings on page 137 for all elementary drawings.

Converter Module

- On the converter module, the main input terminals are R/L1, S/L2, T/L3, R1/L11, S1/L21, T1/ L31 for the three phase input power.
- On the converter module, the main output terminals are the +1 and — for the DC bus output power.

Inverter Module

- On the inverter module the main input terminals are +1, and — for the DC bus input power.
- On the inverter module, the main output terminals are U/T1, V/T2, W/T3 for the motor lead connections.

◆ Control Circuit Wiring

■ Control Module

- On the control module, the signals for the user external I/O conections are generated on the main control card and output through CN9, CN10, TB2, and TB3 as shown in the figure below. Connector TB4 is used for RS232 serial communications. Refer to ***Figure 61***.
- The actual customer connections are made on control terminal block 1TB on part number TBET31094-A as shown in the figure below. This item is also labeled as PS5D-INV-LA. This 1TB is connected to the main control card by two cables. Cable WRMT31381-D connects CN2 to CN9 and CN10 on the control module. Connect the green shield wire on this cable to 1TB pin 51.

Cable WRMT31396-D connects CN3 to TB2 on the control module. These are the relay outputs. Refer to ***Figure 61***.

Note: Connector CN3, relay outputs, on the 1TB terminal block is for class 2 circuit or less only. For non class 2 circuit, connect directly to terminal TB2 on the control module using Phoenix connector MSTB2 5/5 ST. This Phoenix connector is not supplied by Yaskawa and must be purchased separately.

Note: Do not exceed the maximum tightening torque value of 2.7 in-lb when tightening down the M2 size screws on the 1TB terminal block part number TBET31094-A. Use wire size 20-14 AWG in the terminals.

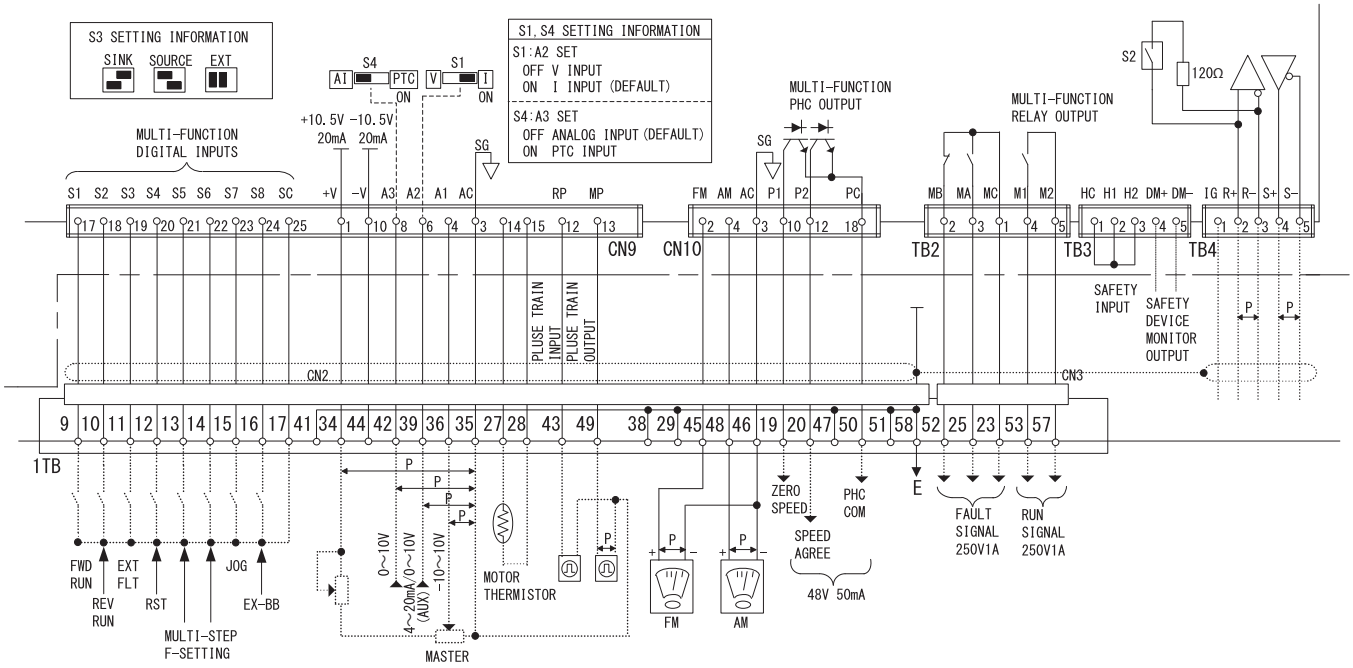


Figure 61 Control Circuit Wiring Diagram

6 System Bills of Material

In the following section, the parts listed are the major components of the 480 volt system (AU4H) and the 575/690 volt system (AU6H) modular inverter system. The listed parts are supplied by Yaskawa. The enclosure, input disconnect, etc. are not listed and are the responsibility of the system designer. The BOM's are broken down into power components tables and control components and cables tables for each model type, 1P through 5P. Diode converter systems and regen system components are also listed in this section. *Refer to Appendix-D Material Number Cross Reference on page 132* if needed.

◆ Power and Control Components

■ 480V Models Power and Control Components

Table 1 480V 1P AU4H0466 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71012X	1
2	DC Link Reactor, 600A, 0.119mH, 690V	300-032-126	1
3	Inverter Drive Module	EUJ71001X	1
4	Control Module, A1000	EUA71001X	1
5	Power Supply Module	EUS70001X	1
6	Transformer, 480 V , 2.0 kVA	300-030-268	1
7	Control Terminal Block, (1TB)	TBET31094-A	1

Table 2 480V 2P AU4H0900 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71012X	1
2	DC Link Reactor, 1200A, 0.061mH, 690V	300-032-127	1
3	Inverter Drive Module	EUJ71001X	2
4	AC Output Reactor, 466A, 0.01mH, 480V	300-030-428	2
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70001X	1
7	Transformer, 480 V , 2.0 kVA	300-030-268	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

Table 3 480V 3P AU4H1350 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71013X	1
2	DC Link Reactor, 1800A, 0.041mH, 690V	300-032-125	1
3	Inverter Drive Module	EUJ71001X	3
4	AC Output Reactor, 466A, 0.01mH, 480V	300-030-428	3
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70001X	1
7	Transformer, 480 V , 2.0 kVA	300-030-268	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

Table 4 480V 4P AU4H1800 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71013X	1
2	DC Link Reactor, 1200A, 0.061mH, 690V	300-032-127	2
3	Inverter Drive Module	EUJ71001X	4
4	AC Output Reactor, 466A, 0.01mH, 480V	300-030-428	4

Item No.	Description	Part Number	QTY
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70001X	1
7	Transformer, 480 V , 2.0 kVA	300-030-268	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

Table 5 480V 5P AU4H2250 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71014X	1
2	DC Link Reactor, 1800A, 0.041mH, 690V	300-032-125	2
3	Inverter Drive Module	EUJ71001X	5
4	AC Output Reactor, 466A, 0.01mH, 480V	300-030-428	5
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70001X	1
7	Transformer, 480 V , 2.0 kVA	300-030-268	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

■ 575/690V Models Power and Control Components

Table 6 575/690V 1P AU6H0466 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71012X	1
2	DC Link Reactor, 600A, 0.119mH, 690V	300-032-126	1
3	Inverter Drive Module	EUJ71002X	1
4	Control Module, A1000	EUA71001X	1
5	Power Supply Module	EUS70002X	1
6	Transformer, 690 V , 2.0 kVA	300-030-267	1
7	Control Terminal Block, (1TB)	TBET31094-A	1

Table 7 575/690V 2P AU6H0900 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71012X	1
2	DC Link Reactor, 1200A, 0.061mH, 690V	300-032-127	1
3	Inverter Drive Module	EUJ71002X	2
4	AC Output Reactor, 466A, 0.01mH, 690V	300-030-429	2
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70002X	1
7	Transformer, 690 V , 2.0 kVA	300-030-267	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

Table 8 575/690V 3P AU6H1350 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71013X	1
2	DC Link Reactor, 1800A, 0.041mH, 690V	300-032-125	1
3	Inverter Drive Module	EUJ71002X	3
4	AC Output Reactor, 466A, 0.01mH, 690V	300-030-429	3
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70002X	1
7	Transformer, 690V , 2.0 kVA	300-030-267	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

Table 9 575/690V 4P AU6H1800 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71013X	1
2	DC Link Reactor, 1200A, 0.061mH, 690V	300-032-127	2
3	Inverter Drive Module	EUJ71002X	4
4	AC Output Reactor, 466A, 0.01mH, 690V	300-030-429	4
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70002X	1
7	Transformer, 690 V , 2.0 kVA	300-030-267	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

Table 10 575/690V 5P AU6H2250 Power and Control Components

Item No.	Description	Part Number	QTY
1	Converter Rectifier Module	EUJ71014X	1
2	DC Link Reactor, 1800A, 0.041mH, 690V	300-032-125	2
3	Inverter Drive Module	EUJ71002X	5
4	AC Output Reactor, 466A, 0.01mH, 690V	300-030-429	5
5	Control Module, A1000	EUA71001X	1
6	Power Supply Module	EUS70002X	1
7	Transformer, 690 V , 2.0 kVA	300-030-267	1
8	Control Terminal Block, (1TB)	TBET31094-A	1

◆ Cable Components

■ 480V Cable Components for Models: 1P AU4H0466, 2P AU4H0900, 3P AU4H1350, 4P AU4H1800, 5P AU4H2250

Table 11 480V Cable Components

Item #	Description	Part Number	Cable Length (mm)	QTY	1P	2P	3P	4P	5P
1	Power Supply [CN32-7] to control mod [CN32]	WRMT31383-C	3.00	1	x	x	x	x	x
2	Power Supply [T-215V-R] to transformer (v)	WRMT31390-2	0.65	1	x	x	x	x	x
3	Power Supply [T-215V-S] to transformer (u)	WRMT31390-3	0.63	1	x	x	x	x	x
4	Power Supply [T-S1] to transformer U1	WRMT31389-1	0.70	1	x	x	x	x	x
5	Power Supply [T-S2] to transformer U2	WRMT31389-2	0.68	1	x	x	x	x	x
6	Power Supply [T-S3] to transformer U3	WRMT31389-3	0.66	1	x	x	x	x	x
7	Power Supply [T-S4] to transformer U4	WRMT31389-4	0.64	1	x	x	x	x	x
8	Power Supply [T-S5] to transformer U5	WRMT31389-5	0.62	1	x	x	x	x	x
9	Power Supply [T-S6] to transformer U6	WRMT31389-6	0.60	1	x	x	x	x	x
10	Power Supply [T-R] to transformer V	WRMT31390-1	0.54	1	x	x	x	x	x
11	Control Mod [CN9 and CN10] to 1TB [CN2]	WRMT31381-D	3.50	1	x	x	x	x	x
12	Control Mod [TB2] to 1TB [CN3]	WRMT31396-D	3.50	1	x	x	x	x	x
13	Power Supply [CN49-1] to Conv Mod [CN49]	WRMT31384-1	3.50	1	x	x	x	x	x
14	Control Mod [CN17] to Conv Mod [CN35-1]	WRMT31376-1	4.50	1	x	x	x	x	x
15	Control Mod [CN8] to Conv Mod [CN8-1]	WRMT31377-1	4.50	1	x	x	x	x	x
16	Power Supply [CN32-2 1TRM] to Inv Mod1 [CN32]	WRMT31371-V	3.60	1	x	x	x	x	x

Item #	Description	Part Number	Cable Length (mm)	QTY	1P	2P	3P	4P	5P
17	Control Mod [CN7-1TRM] to Inv Mod1 [CN7]	WRMT31361-V	3.30	1	x	x	x	x	x
18	Control Mod [CN61-1] to Inv Mod1 [CN12]	WRMT31366-V	3.80	1	x	x	x	x	x
19	Power Supply [CN32-3 2TRM] to Inv Mod2 [CN32]	WRMT31371-X	3.30	1	—	x	x	x	x
20	Control Mod CN7-2TRM] to Inv Mod2 [CN7]	WRMT31361-X	3.00	1	—	x	x	x	x
21	Control Mod [CN61-2] to Inv Mod2 [CN12]	WRMT31366-X	3.50	1	—	x	x	x	x
22	Power Supply [CN32-4 3TRM] to Inv Mod3 [CN32]	WRMT31371-Z	2.90	1	—	—	x	x	x
23	Control Mod [CN7-3TRM] to Inv Mod3 [CN7]	WRMT31361-Z	2.60	1	—	—	x	x	x
24	Control Mod [CN61-3] to Inv Mod3 [CN12]	WRMT31366-Z	3.10	1	—	—	x	x	x
25	Power Supply [CN32-5 4TRM] to Inv Mod4 [CN32]	WRMT31371-AB	2.60	1	—	—	—	x	x
26	Control Mod [CN7-4TRM] to Inv Mod4 [CN7]	WRMT31361-AB	2.30	1	—	—	—	x	x
27	Control Mod [CN61-4] to Inv Mod4 [CN12]	WRMT31366-AB	2.80	1	—	—	—	x	x
28	Power Supply [CN32-6 5TRM] to Inv Mod5 [CN32]	WRMT31371-AD	2.30	1	—	—	—	—	x
29	Control Mod [CN7-5TRM] to Inv Mod5 [CN7]	WRMT31361-AD	2	1	—	—	—	—	x
30	Control Mod [CN61-5] to Inv Mod5 [CN12]	WRMT31366-AD	2.50	1	—	—	—	—	x
31	Control Mod [CN67 and CN68]	WRMT31409-C	2.50	1	x	x	x	x	x
32	Control Mod [CN16-1] to Power supply VDB [CN16]	WRMT31408-1	3.00	1	x	x	x	x	x
33	Control Mod [CN55-1] to Inv Mod1 [CN55]	WRMT31392-1	4.00	1	x	x	x	x	x
34	Control Mod [CN55-2] to Inv Mod2 [CN55]	WRMT31392-2	3.70	1	—	x	x	x	x
35	Control Mod [CN55-3] to Inv Mod3 [CN55]	WRMT31392-3	3.25	1	—	—	x	x	x
36	Control Mod [CN55-4] to Inv Mod4 [CN55]	WRMT31392-4	2.95	1	—	—	—	x	x
37	Control Mod [CN55-5] to Inv Mod5 [CN55]	WRMT31392-5	2.65	1	—	—	—	—	x
38	Power Supply VDB [CN34] to L1, L2, L3 input	WRMT31385-E	2.70	1	x	x	x	x	x
39	Power Supply VDB [CN63] to DC Bus, (+1, -)	WRMT31386-C	3.10	1	x	x	x	x	x
40	Power Supply VDB [CN47] to U, V, W output	WRMT31387-B	2.00	1	x	x	x	x	x

■ 575/690V Cable Components for Models: 1P AU6H0466, 2P AU6H0900, 3P AU6H1350, 4P AU6H1800, 5P AU6H2250

Table 12 575/690V Cable Components

Item #	Description	Part Number	Cable Length (mm)	QTY	1P	2P	3P	4P	5P
1	Power Supply [CN32-7] to control mod [CN32]	WRMT31383-C	3.00	1	x	x	x	x	x
2	Power Supply [T-215V-R] to transformer (v)	WRMT31390-2	0.65	1	x	x	x	x	x
3	Power Supply [T-215V-S] to transformer (u)	WRMT31390-3	0.63	1	x	x	x	x	x
4	Power Supply [T-S1] to transformer U1	WRMT31389-1	0.70	1	x	x	x	x	x
5	Power Supply [T-S2] to transformer U2	WRMT31389-2	0.68	1	x	x	x	x	x
6	Power Supply [T-S3] to transformer U3	WRMT31389-3	0.66	1	x	x	x	x	x
7	Power Supply [T-S4] to transformer U4	WRMT31389-4	0.64	1	x	x	x	x	x

Item #	Description	Part Number	Cable Length (mm)	QTY	1P	2P	3P	4P	5P
8	Power Supply [T-S5] to transformer U5	WRMT31389-5	0.62	1	x	x	x	x	x
9	Power Supply [T-S6] to transformer U6	WRMT31389-6	0.60	1	x	x	x	x	x
10	Power Supply [T-R] to transformer V	WRMT31390-1	0.54	1	x	x	x	x	x
11	Control Mod [CN9 and CN10] to 1TB [CN2]	WRMT31381-D	3.50	1	x	x	x	x	x
12	Control Mod [TB2] to 1TB [CN3]	WRMT31396-D	3.50	1	x	x	x	x	x
13	Power Supply [CN49-1] to Conv Mod [CN49]	WRMT31384-1	3.50	1	x	x	x	x	x
14	Control Mod [CN17] to Conv Mod [CN35-1]	WRMT31376-1	4.50	1	x	x	x	x	x
15	Control Mod [CN8] to Conv Mod [CN8-1]	WRMT31377-1	4.50	1	x	x	x	x	x
16	Power Supply [CN32-2 1TRM] to Inv Mod1 [CN32]	WRMT31371-V	3.60	1	x	x	x	x	x
17	Control Mod [CN7-1TRM] to Inv Mod1 [CN7]	WRMT31361-V	3.30	1	x	x	x	x	x
18	Control Mod [CN61-1] to Inv Mod1 [CN12]	WRMT31366-V	3.80	1	x	x	x	x	x
19	Power Supply [CN32-3 2TRM] to Inv Mod2 [CN32]	WRMT31371-X	3.30	1	—	x	x	x	x
20	Control Mod CN7-2TRM] to Inv Mod2 [CN7]	WRMT31361-X	3.00	1		x	x	x	x
21	Control Mod [CN61-2] to Inv Mod2 [CN12]	WRMT31366-X	3.50	1	—	x	x	x	x
22	Power Supply [CN32-4 3TRM] to Inv Mod3 [CN32]	WRMT31371-Z	2.90	1	—	—	x	x	x
23	Control Mod [CN7-3TRM] to Inv Mod3 [CN7]	WRMT31361-Z	2.60	1	—	—	x	x	x
24	Control Mod [CN61-3] to Inv Mod3 [CN12]	WRMT31366-Z	3.10	1	—	—	x	x	x
25	Power Supply [CN32-5 4TRM] to Inv Mod4 [CN32]	WRMT31371-AB	2.60	1	—	—	—	x	x
26	Control Mod [CN7-4TRM] to Inv Mod4 [CN7]	WRMT31361-AB	2.30	1	—	—	—	x	x
27	Control Mod [CN61-4] to Inv Mod4 [CN12]	WRMT31366-AB	2.80	1	—	—	—	x	x
28	Power Supply [CN32-6 5TRM] to Inv Mod5 [CN32]	WRMT31371-AD	2.30	1	—	—	—	—	x
29	Control Mod [CN7-5TRM] to Inv Mod5 [CN7]	WRMT31361-AD	2.00	1	—	—	—	—	x
30	Control Mod [CN61-5] to Inv Mod5 [CN12]	WRMT31366-AD	2.50	1	—	—	—	—	x
31	Control Mod [CN67 and CN68]	WRMT31409-C	2.50	1	x	x	x	x	x
32	Control Mod [CN16-1] to Power supply VDB [CN16]	WRMT31408-1	3.00	1	x	x	x	x	x
33	Control Mod [CN55-1] to Inv Mod1 [CN55]	WRMT31392-1	4.00	1	x	x	x	x	x
34	Control Mod [CN55-2] to Inv Mod2 [CN55]	WRMT31392-2	3.70	1	—	x	x	x	x
35	Control Mod [CN55-3] to Inv Mod3 [CN55]	WRMT31392-3	3.25	1	—		x	x	x
36	Control Mod [CN55-4] to Inv Mod4 [CN55]	WRMT31392-4	2.95	1	—	—	—	x	x
37	Control Mod [CN55-5] to Inv Mod5 [CN55]	WRMT31392-5	2.65	1	—	—	—	—	x
38	Power Supply VDB [CN34] to L1, L2, L3 input	WRMT31385-E	2.70	1	x	x	x	x	x
39	Power Supply VDB [CN63] to DC Bus, (+1, -)	WRMT31386-C	3.10	1	x	x	x	x	x
40	Power Supply VDB [CN47] to U, V, W output	WRMT31387-B	2.00	1	x	x	x	x	x

◆ REGEN (480V, 1P) DU4H0466 POWER AND CONTROL COMPONENTS

Table 13 Components for ACL Input Section for D1000 HHP, 1P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-420	1	480V, 466A, 0.057mH
2	Input Reactors	300-030-291	1	480V, 466A, 0.19mH
3	Input Fuses	300-030-872	3	480V, 700A
4	Filter Reactor	300-031-568	1	480V, 61A, 0.03mH
5	Filter Capacitor Assembly	300-030-378	1	480V, 250uF, 5%

Table 14 Modules and Components for D1000 HHP, Regen Section, for 1P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	1	—
5	Pre Charge Module	EUJ71021X	1	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 15 Modules and Components for D1000 HHP, Inverter Section, for 1P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	1	—
5	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (480V, 1P) DU4H0466 CABLES

Table 16 Cables for D1000 HHP, Regen Section, for 1P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
3	WRMT31371-U	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
4	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70001X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70001X	1	zz	2.30
5	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50
6	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
7	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71002X	1	none	3.00
8	WRMT31385-E	CN34	21PCB EUS70001X	N/A	L1, L2, L3	1	p	2.70
9	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
10	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
11	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
12	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
13	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
14	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
15	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
16	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
17	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
18	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
19	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
20	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70001X	1	none	3.00
21	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
22	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
23	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
20	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70001X	1	none	3.00
21	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
22	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
23	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 17 Cables for D1000 HHP, Inverter Section, for 1P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31366-U	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
3	WRMT31371-U	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
4	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70001X	1	z	2.30
		CN68	1PCB EUA71001X	CN68	21PCB EUS70001X	1	zz	2.30
5	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection		none	3.50
6	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
7	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71001X	1	none	3.00
8	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
9	WRMT31387-B	CN47	21PCB EUS70001X	N/A	U, V, W	1	y	2.00
10	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
11	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
12	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
13	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
14	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
15	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
16	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
17	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
18	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
19	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
20	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70001X	1	none	3.00

◆ REGEN (480V, 2P) DU4H0900 POWER AND CONTROL COMPONENTS

Table 18 Components for ACL Input Section for D1000 HHP, 2P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-421	1	480V, 900A, 0.029mH
2	Input Reactors	300-030-291	2	480V, 466A, 0.19mH
3	Input Fuses	300-030-872	6	480V, 700A
4	Filter Reactor	300-031-569	1	480V, 123A, 0.015mH
5	Filter Capacitor Assembly	300-030-379	1	480V, 500uF, 5%

Table 19 Modules and Components for D1000 HHP, Regen Section, for 2P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	2	—
5	Pre Charge Module	EUJ71021X	2	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 20 Modules and Components for D1000 HHP, Inverter Section, for 2P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	2	—
5	Output Reactor	300-030-428	2	480V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (480V, 2P) DU4H0900 CABLES

Table 21 Cables for D1000 HHP, Regen Section, for 2P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
4	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
5	WRMT31371-U	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
6	WRMT31371-W	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
7	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70001X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70001X	1	zz	2.30
8	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
9	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
10	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71002X	1	none	3.00
11	WRMT31385-E	CN34	21PCB EUS70001X	N/A	L1, L2, L3	1	p	2.70
12	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
13	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
14	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
15	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
16	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
17	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
18	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
19	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
20	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
21	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
22	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
23	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
24	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70001X	1	none	3.00
25	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
26	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
27	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
28	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
29	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
30	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 22 Cables for D1000 HHP, Inverter Section, for 2P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
4	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
5	WRMT31371-V	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
6	WRMT31371-X	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30
7	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70001X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70001X	1	zz	2.50
8	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2			none	3.50
9	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
10	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71001X	1	none	3.00
11	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
12	WRMT31387-B	CN47	21PCB EUS70001X	N/A	U, V, W	1	y	2.00
13	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
14	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
15	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
16	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
17	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
18	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
19	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
20	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
21	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
22	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
23	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
24	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70001X	1	none	3.00

◆ REGEN (480V, 3P) DU4H1350 POWER AND CONTROL COMPONENTS

Table 23 Components for ACL Input Section for D1000 HHP, 3P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-422	1	480V, 1350A, 0.02mH
2	Input Reactors	300-030-291	3	480V, 466A, 0.19mH
3	Input Fuses	300-030-872	9	480V, 700A
4	Filter Reactor	300-031-570	1	480V, 184A, 0.01mH
5	Filter Capacitor Assembly	300-030-380	1	480V, 750uF, 5%

Table 24 Modules and Components for D1000 HHP, Regen Section, for 3P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	3	—
5	Pre Charge Module	EUJ71021X	3	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 25 Modules and Components for D1000 HHP, Inverter Section, for 3P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	3	—
5	Output Reactor	300-030-428	3	480V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (480V, 3P) DU4H1350 CABLES

Table 26 Cables for D1000 HHP, Regen Section, for 3P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Y	CN7-3TRM	1PCB EUA71002X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
5	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
6	WRMT31366-Y	CN61-3	20PCB EUA71002X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
7	WRMT31371-U	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
8	WRMT31371-W	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
9	WRMT31371-Y	CN32-4	19PCB EUS70001X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	3.10
10	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70001X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70001X	1	zz	2.30
11	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
12	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
13	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71002X	1	none	3.00
14	WRMT31385-E	CN34	21PCB EUS70001X	N/A	L1, L2, L3	1	p	2.70
15	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
16	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
17	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
18	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
19	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
20	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
21	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
22	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
23	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
24	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
25	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
26	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
27	WRMT31392-13	CN55-3	20PCB EUA71002X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
28	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70001X	1	none	3.00
29	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
30	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
31	WRMT31413-A	CN511	3 PRECHARGE MODULE	CN13	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
32	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
33	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
34	WRMT31414-A	CN512	3 PRECHARGE MODULE	CN36-1	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
35	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
36	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
37	WRMT31415-A	CN513	3 PRECHARGE MODULE	CN36-2	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 27 Cables for D1000 HHP, Inverter Section, for 3P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Z	CN7-3TRM	1PCB EUA71001X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
5	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
6	WRMT31366-Z	CN61-3	20PCB EUA71001X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
7	WRMT31371-V	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
8	WRMT31371-X	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30
9	WRMT31371-Z	CN32-4	19PCB EUS70001X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	2.90
10	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70001X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70001X	1	zz	2.50
11	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection		none	3.50
12	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
13	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71001X	1	none	3.00
14	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
15	WRMT31387-B	CN47	21PCB EUS70001X	N/A	U, V, W	1	y	2.00
16	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
17	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
18	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
19	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
20	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
21	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
22	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
23	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
24	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
25	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
26	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
27	WRMT31392-3	CN55-3	20PCB EUA71001X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
28	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70001X	1	none	3.00

◆ REGEN (480V, 4P) DU4H1800 POWER AND CONTROL COMPONENTS

Table 28 Components for ACL Input Section for D1000 HHP, 4P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-423	1	480V, 1800A, 0.015mH
2	Input Reactors	300-030-291	4	480V, 466A, 0.19mH
3	Input Fuses	300-030-872	12	480V, 700A
4	Filter Reactor	300-031-571	1	480V, 246A, 0.0075mH
5	Filter Capacitor Assembly	300-030-381	1	480V, 1000uF, 5%

Table 29 Modules and Components for D1000 HHP, Regen Section, for 4P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	4	—
5	Pre Charge Module	EUJ71021X	4	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 30 Modules and Components for D1000 HHP, Inverter Section, for 4P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	4	—
5	Output Reactor	300-030-428	4	480V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (480V, 4P) DU4H1800 CABLES

Table 31 Cables for D1000 HHP, Regen Section, for 4P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Y	CN7-3TRM	1PCB EUA71002X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AA	CN7-4TRM	1PCB EUA71002X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
6	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
7	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Y	CN61-3	20PCB EUA71002X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AA	CN61-4	20PCB EUA71002X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80
11	WRMT31371-U	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
12	WRMT31371-W	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
13	WRMT31371-Y	CN32-4	19PCB EUS70001X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	3.10
14	WRMT31371-AA	CN32-5	19PCB EUS70001X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.80
16	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70001X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70001X	1	zz	2.30
17	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50
18	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71002X	1	none	3.00
20	WRMT31385-E	CN34	21PCB EUS70001X	N/A	L1, L2, L3	1	p	2.70
21	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
22	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
31	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-13	CN55-3	20PCB EUA71002X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
34	WRMT31392-14	CN55-4	20PCB EUA71002X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
36	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70001X	1	none	3.00
37	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
38	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
39	WRMT31413-A	CN511	3 PRECHARGE MODULE	CN13	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
40	WRMT31413-A	CN511	4 PRECHARGE MODULE	CN13	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
42	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
43	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
44	WRMT31414-A	CN512	3 PRECHARGE MODULE	CN36-1	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
45	WRMT31414-A	CN512	4 PRECHARGE MODULE	CN36-1	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
47	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
48	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
49	WRMT31415-A	CN513	3 PRECHARGE MODULE	CN36-2	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
50	WRMT31415-A	CN513	4 PRECHARGE MODULE	CN36-2	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 32 Cables for D1000 HHP, Inverter Section, for 4P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Z	CN7-3TRM	1PCB EUA71001X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AB	CN7-4TRM	1PCB EUA71001X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
6	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
7	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Z	CN61-3	20PCB EUA71001X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AB	CN61-4	20PCB EUA71001X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80
11	WRMT31371-V	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
12	WRMT31371-X	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30
13	WRMT31371-Z	CN32-4	19PCB EUS70001X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	2.90
14	WRMT31371-AB	CN32-5	19PCB EUS70001X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.60
16	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70001X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70001X	1	zz	2.50
17	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
18	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71001X	1	none	3.00
20	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
21	WRMT31387-B	CN47	21PCB EUS70001X	N/A	U, V, W	1	y	2.00
22	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
31	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-3	CN55-3	20PCB EUA71001X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
34	WRMT31392-4	CN55-4	20PCB EUA71001X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
36	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70001X	1	none	3.00

◆ REGEN (480V, 5P) DU4H2250 POWER AND CONTROL COMPONENTS

Table 33 Components for ACL Input Section for D1000 HHP, 5P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-424	1	480V, 2250A, 0.012mH
2	Input Reactors	300-030-291	5	480V, 466A, 0.19mH
3	Input Fuses	300-030-872	15	480V, 700A
4	Filter Reactor	300-031-720	1	480V, 307A, 0.006mH
5	Filter Capacitor Assembly	300-030-382	1	480V, 1250uF, 5%

Table 34 Modules and Components for D1000 HHP, Regen Section, for 5P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	5	—
5	Pre Charge Module	EUJ71021X	5	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 35 Modules and Components for D1000 HHP, Inverter Section, for 5P Regen System, 480V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70001X	1	—
3	Transformer	300-030-268	1	480V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71003X	5	—
5	Output Reactor	300-030-428	5	480V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (480V, 5P) DU4H2250 CABLES

Table 36 Cables for D1000 HHP, Regen Section, for 5P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Y	CN7-3TRM	1PCB EUA71002X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AA	CN7-4TRM	1PCB EUA71002X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
5	WRMT31361-AC	CN7-5TRM	1PCB EUA71002X	CN7	5 INVERTER/REGEN CONVERTER MODULE	1	e	2.00

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
6	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
7	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Y	CN61-3	20PCB EUA71002X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AA	CN61-4	20PCB EUA71002X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80
10	WRMT31366-AC	CN61-5	20PCB EUA71002X	CN12	5 INVERTER/REGEN CONVERTER MODULE	1	ee	2.50
11	WRMT31371-U	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
12	WRMT31371-W	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
13	WRMT31371-Y	CN32-4	19PCB EUS70001X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	3.10
14	WRMT31371-AA	CN32-5	19PCB EUS70001X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.80
15	WRMT31371-AC	CN32-6	19PCB EUS70001X	CN32	5 INVERTER/REGEN CONVERTER MODULE	1	j	2.50
16	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70001X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70001X	1	zz	2.30
17	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50
18	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71002X	1	none	3.00
20	WRMT31385-E	CN34	21PCB EUS70001X	N/A	L1, L2, L3	1	p	2.70
21	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
22	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
31	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-13	CN55-3	20PCB EUA71002X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
34	WRMT31392-14	CN55-4	20PCB EUA71002X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
35	WRMT31392-15	CN55-5	20PCB EUA71002X	CN55	5 INVERTER/REGEN CONVERTER MODULE	1	none	2.65
36	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70001X	1	none	3.00

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
37	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
38	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
39	WRMT31413-A	CN511	3 PRECHARGE MODULE	CN13	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
40	WRMT31413-A	CN511	4 PRECHARGE MODULE	CN13	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
41	WRMT31413-A	CN511	5 PRECHARGE MODULE	CN13	5 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
42	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
43	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
44	WRMT31414-A	CN512	3 PRECHARGE MODULE	CN36-1	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
45	WRMT31414-A	CN512	4 PRECHARGE MODULE	CN36-1	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
46	WRMT31414-A	CN512	5 PRECHARGE MODULE	CN36-1	5 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
47	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
48	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
49	WRMT31415-A	CN513	3 PRECHARGE MODULE	CN36-2	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
50	WRMT31415-A	CN513	4 PRECHARGE MODULE	CN36-2	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
51	WRMT31415-A	CN513	5 PRECHARGE MODULE	CN36-2	5 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 37 Cables for D1000 HHP, Inverter Section, for 5P Regen System, 480V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Z	CN7-3TRM	1PCB EUA71001X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AB	CN7-4TRM	1PCB EUA71001X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
5	WRMT31361-AD	CN7-5TRM	1PCB EUA71001X	CN7	5 INVERTER/REGEN CONVERTER MODULE	1	e	2.00
6	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
7	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Z	CN61-3	20PCB EUA71001X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AB	CN61-4	20PCB EUA71001X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
10	WRMT31366-AD	CN61-5	20PCB EUA71001X	CN12	5 INVERTER/REGEN CONVERTER MODULE	1	ee	2.50
11	WRMT31371-V	CN32-2	19PCB EUS70001X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
12	WRMT31371-X	CN32-3	19PCB EUS70001X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30
13	WRMT31371-Z	CN32-4	19PCB EUS70001X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	2.90
14	WRMT31371-AB	CN32-5	19PCB EUS70001X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.60
15	WRMT31371-AD	CN32-6	19PCB EUS70001X	CN32	5 INVERTER/REGEN CONVERTER MODULE	1	j	2.30
16	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70001X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70001X	1	zz	2.50
17	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
18	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70001X	CN32	20PCB EUA71001X	1	none	3.00
20	WRMT31386-C	CN63	21PCB EUS70001X	N/A	DC BUS	1	q	3.10
21	WRMT31387-B	CN47	21PCB EUS70001X	N/A	U, V, W	1	y	2.00
22	WRMT31389-1	T-S1	19PCB EUS70001X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70001X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70001X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70001X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70001X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70001X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70001X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70001X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70001X	u	T1 Transformer	1	none	0.63
31	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-3	CN55-3	20PCB EUA71001X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
34	WRMT31392-4	CN55-4	20PCB EUA71001X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
35	WRMT31392-5	CN55-5	20PCB EUA71001X	CN55	5 INVERTER/REGEN CONVERTER MODULE	1	none	2.65
36	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70001X	1	none	3.00

◆ REGEN (575/690V, 1P) DU6H0466 POWER AND CONTROL COMPONENTS

Table 38 Components for ACL Input Section for D1000 HHP, 1P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-425	1	690V, 466A, 0.082mH
2	Input Reactors	300-030-292	1	690V, 466A, 0.27mH
3	Input Fuses	300-030-444	3	1100V, 800A
4	Filter Reactor	300-031-721	1	690V, 63A, 0.0417mH
5	Filter Capacitor Assembly	300-030-383	1	690V, 180uF, 5%

Table 39 Modules and Components for D1000 HHP, Regen Section, for 1P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	1	—
5	Pre Charge Module	EUJ71021X	1	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 40 Modules and Components for D1000 HHP, Inverter Section, for 1P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	1	—
5	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (575/690V, 1P) DU6H0466 CABLES

Table 41 Cables for D1000 HHP, Regen Section, for 1P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
3	WRMT31371-U	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
4	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70002X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70002X	1	zz	2.30
5	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
6	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
7	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71002X	1	none	3.00
8	WRMT31385-E	CN34	21PCB EUS70002X	N/A	L1, L2, L3	1	p	2.70
9	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
10	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
11	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
12	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
13	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
14	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
15	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
16	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
17	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
18	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
19	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
20	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70002X	1	none	3.00
21	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
22	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
23	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 42 Cables for D1000 HHP, Inverter Section, for 1P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
3	WRMT31371-V	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
4	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70002X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70002X	1	zz	2.50
5	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
6	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
7	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71001X	1	none	3.00
8	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
9	WRMT31387-B	CN47	21PCB EUS70002X	N/A	U, V, W	1	y	2.00
10	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
11	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
12	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
13	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
14	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
15	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
16	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
17	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
18	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
19	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
20	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70002X	1	none	3.00

◆ REGEN (575/690V, 2P) DU6H0900 POWER AND CONTROL COMPONENTS

Table 43 Components for ACL Input Section for D1000 HHP, 2P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-426	1	690V, 900A, 0.042mH
2	Input Reactors	300-030-292	2	690V, 466A, 0.27mH
3	Input Fuses	300-030-444	6	1100V, 800A
4	Filter Reactor	300-031-722	1	690V, 127A, 0.0208mH
5	Filter Capacitor Assembly	300-030-384	1	690V, 360uF, 5%

Table 44 Modules and Components for D1000 HHP, Regen Section, for 2P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	2	—
5	Pre Charge Module	EUJ71021X	2	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 45 Modules and Components for D1000 HHP, Inverter Section, for 2P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	2	—
5	Output Reactor	300-030-429	2	690V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (575/690V, 2P) DU6H0900 CABLES

Table 46 Cables for D1000 HHP, Regen Section, for 2P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
4	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
5	WRMT31371-U	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
6	WRMT31371-W	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
7	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70002X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70002X	1	zz	2.30
8	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50
9	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
10	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71002X	1	none	3.00
11	WRMT31385-E	CN34	21PCB EUS70002X	N/A	L1, L2, L3	1	p	2.70
12	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
13	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
14	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
15	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
16	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
17	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
18	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
19	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
20	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
21	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
22	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
23	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
24	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70002X	1	none	3.00
25	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
26	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
27	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
28	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
29	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
30	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 47 Cables for D1000 HHP, Inverter Section, for 2P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
4	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
5	WRMT31371-V	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
6	WRMT31371-X	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30
7	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70002X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70002X	1	zz	2.50
8	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
9	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
10	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71001X	1	none	3.00
11	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
12	WRMT31387-B	CN47	21PCB EUS70002X	N/A	U, V, W	1	y	2.00
13	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
14	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
15	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
16	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
17	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
18	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
19	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
20	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
21	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
22	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
23	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
24	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70002X	1	none	3.00

◆ REGEN (575/690V, 3P) DU6H1350 POWER AND CONTROL COMPONENTS

Table 48 Components for ACL Input Section for D1000 HHP, 3P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-290	1	690V, 1350A, 0.028mH
2	Input Reactors	300-030-292	3	690V, 466A, 0.27mH
3	Input Fuses	300-030-444	9	1100V, 800A
4	Filter Reactor	300-031-723	1	690V, 190A, 0.0139mH
5	Filter Capacitor Assembly	300-030-385	1	690V, 540uF, 5%

Table 49 Modules and Components for D1000 HHP, Regen Section, for 3P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	3	—
5	Pre Charge Module	EUJ71021X	3	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 50 Modules and Components for D1000 HHP, Inverter Section, for 3P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	3	—
5	Output Reactor	300-030-429	3	690V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (575/690V, 3P) DU6H1350 CABLES

Table 51 Cables for D1000 HHP, Regen Section, for 3P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Y	CN7-3TRM	1PCB EUA71002X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
5	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
6	WRMT31366-Y	CN61-3	20PCB EUA71002X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
7	WRMT31371-U	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
8	WRMT31371-W	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
9	WRMT31371-Y	CN32-4	19PCB EUS70002X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	3.10
10	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70002X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70002X	1	zz	2.30
11	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50
12	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
13	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71002X	1	none	3.00
14	WRMT31385-E	CN34	21PCB EUS70002X	N/A	L1, L2, L3	1	p	2.70
15	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
16	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
17	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
18	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
19	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
20	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
21	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
22	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
23	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
24	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
25	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
26	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
27	WRMT31392-13	CN55-3	20PCB EUA71002X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
28	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70002X	1	none	3.00
29	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
30	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
31	WRMT31413-A	CN511	3 PRECHARGE MODULE	CN13	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
32	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
33	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
34	WRMT31414-A	CN512	3 PRECHARGE MODULE	CN36-1	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
35	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
36	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
37	WRMT31415-A	CN513	3 PRECHARGE MODULE	CN36-2	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 52 Cables for D1000 HHP, Inverter Section, for 3P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Z	CN7-3TRM	1PCB EUA71001X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
5	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
6	WRMT31366-Z	CN61-3	20PCB EUA71001X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
7	WRMT31371-V	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
8	WRMT31371-X	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30
9	WRMT31371-Z	CN32-4	19PCB EUS70002X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	2.90
10	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70002X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70002X	1	zz	2.50
11	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
12	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
13	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71001X	1	none	3.00
14	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
15	WRMT31387-B	CN47	21PCB EUS70002X	N/A	U, V, W	1	y	2.00
16	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
17	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
18	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
19	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
20	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
21	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
22	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
23	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
24	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
25	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
26	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
27	WRMT31392-3	CN55-3	20PCB EUA71001X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
28	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70002X	1	none	3.00

◆ REGEN (575/690V, 4P) DU6H1800 POWER AND CONTROL COMPONENTS

Table 53 Components for ACL Input Section for D1000 HHP, 4P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-289	1	690V, 1800A, 0.021mH
2	Input Reactors	300-030-292	4	690V, 466A, 0.27mH
3	Input Fuses	300-030-444	12	1100V, 800A
4	Filter Reactor	300-031-724	1	690V, 254A, 0.0104mH
5	Filter Capacitor Assembly	300-030-386	1	690V, 720uF, 5%

Table 54 Modules and Components for D1000 HHP, Regen Section, for 4P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	4	—
5	Pre Charge Module	EUJ71021X	4	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 55 Modules and Components for D1000 HHP, Inverter Section, for 4P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	4	—
5	Output Reactor	300-030-429	4	690V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (575/690V, 4P) DU6H1800 CABLES

Table 56 Cables for D1000 HHP, Regen Section, for 4P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Y	CN7-3TRM	1PCB EUA71002X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AA	CN7-4TRM	1PCB EUA71002X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
6	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
7	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Y	CN61-3	20PCB EUA71002X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AA	CN61-4	20PCB EUA71002X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80
11	WRMT31371-U	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
12	WRMT31371-W	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
13	WRMT31371-Y	CN32-4	19PCB EUS70002X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	3.10
14	WRMT31371-AA	CN32-5	19PCB EUS70002X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.80
16	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70002X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70002X	1	zz	2.30
17	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50
18	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71002X	1	none	3.00
20	WRMT31385-E	CN34	21PCB EUS70002X	N/A	L1, L2, L3	1	p	2.70
21	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
22	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
31	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-13	CN55-3	20PCB EUA71002X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
34	WRMT31392-14	CN55-4	20PCB EUA71002X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
36	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70002X	1	none	3.00
37	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
38	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
39	WRMT31413-A	CN511	3 PRECHARGE MODULE	CN13	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
40	WRMT31413-A	CN511	4 PRECHARGE MODULE	CN13	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
42	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
43	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
44	WRMT31414-A	CN512	3 PRECHARGE MODULE	CN36-1	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
45	WRMT31414-A	CN512	4 PRECHARGE MODULE	CN36-1	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
47	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
48	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
49	WRMT31415-A	CN513	3 PRECHARGE MODULE	CN36-2	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
50	WRMT31415-A	CN513	4 PRECHARGE MODULE	CN36-2	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 57 Cables for D1000 HHP, Inverter Section, for 4P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Z	CN7-3TRM	1PCB EUA71001X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AB	CN7-4TRM	1PCB EUA71001X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
6	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
7	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Z	CN61-3	20PCB EUA71001X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AB	CN61-4	20PCB EUA71001X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80
11	WRMT31371-V	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
12	WRMT31371-X	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
13	WRMT31371-Z	CN32-4	19PCB EUS70002X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	2.90
14	WRMT31371-AB	CN32-5	19PCB EUS70002X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.60
16	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70002X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70002X	1	zz	2.50
17	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
18	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71001X	1	none	3.00
20	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
21	WRMT31387-B	CN47	21PCB EUS70002X	N/A	U, V, W	1	y	2.00
22	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
31	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-3	CN55-3	20PCB EUA71001X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
34	WRMT31392-4	CN55-4	20PCB EUA71001X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
36	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70002X	1	none	3.00

◆ REGEN (575/690V, 5P) DU6H2250 POWER AND CONTROL COMPONENTS

Table 58 Components for ACL Input Section for D1000 HHP, 5P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Main Input Reactor	300-030-427	1	690V, 2250A, 0.017mH
2	Input Reactors	300-030-292	5	690V, 466A, 0.27mH
3	Input Fuses	300-030-444	15	1100V, 800A
4	Filter Reactor	300-031-725	1	690V, 317A, 0.0083mH
5	Filter Capacitor Assembly	300-030-387	1	690V, 900uF, 5%

Table 59 Modules and Components for D1000 HHP, Regen Section, for 5P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Regen Control Module	EUA71002X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	5	—
5	Pre Charge Module	EUJ71021X	5	—
6	I/O Terminal Block	TBET31094-A	1	—

Table 60 Modules and Components for D1000 HHP, Inverter Section, for 5P Regen System, 575/690V

Item #	Description	Part Number	QTY	Comment
1	Control Module	EUA71001X	1	—
2	Power Supply Module	EUS70002X	1	—
3	Transformer	300-030-267	1	690V, 2.0 kVa
4	Inverter/Regen Converter Module	EUJ71004X	5	—
5	Output Reactor	300-030-429	5	690V, 466A, 0.01mH
6	I/O Terminal Block	TBET31094-A	1	—

◆ REGEN (575/690V, 5P) DU6H2250 CABLES

Table 61 Cables for D1000 HHP, Regen Section, for 5P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-U	CN7-1TRM	1PCB EUA71002X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-W	CN7-2TRM	1PCB EUA71002X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Y	CN7-3TRM	1PCB EUA71002X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AA	CN7-4TRM	1PCB EUA71002X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
5	WRMT31361-AC	CN7-5TRM	1PCB EUA71002X	CN7	5 INVERTER/REGEN CONVERTER MODULE	1	e	2.00

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
6	WRMT31366-U	CN61-1	20PCB EUA71002X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
7	WRMT31366-W	CN61-2	20PCB EUA71002X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Y	CN61-3	20PCB EUA71002X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AA	CN61-4	20PCB EUA71002X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80
10	WRMT31366-AC	CN61-5	20PCB EUA71002X	CN12	5 INVERTER/REGEN CONVERTER MODULE	1	ee	2.50
11	WRMT31371-U	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.80
12	WRMT31371-W	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.50
13	WRMT31371-Y	CN32-4	19PCB EUS70002X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	3.10
14	WRMT31371-AA	CN32-5	19PCB EUS70002X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.80
15	WRMT31371-AC	CN32-6	19PCB EUS70002X	CN32	5 INVERTER/REGEN CONVERTER MODULE	1	j	2.50
16	WRMT31412-C	CN67	1PCB EUA71002X	CN67	21PCB EUS70002X	1	z	2.30
		CN68	1PCB EUA71002X	CN68	21PCB EUS70002X	1	zz	2.30
17	WRMT31381-D	CN9	1PCB EUA71002X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71002X	CN2	1TB Customer terminal connection		none	3.50
18	WRMT31396-D	TB2	1PCB EUA71002X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71002X	1	none	3.00
20	WRMT31385-E	CN34	21PCB EUS70002X	N/A	L1, L2, L3	1	p	2.70
21	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
22	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
31	WRMT31392-11	CN55-1	20PCB EUA71002X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-12	CN55-2	20PCB EUA71002X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-13	CN55-3	20PCB EUA71002X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
34	WRMT31392-14	CN55-4	20PCB EUA71002X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
35	WRMT31392-15	CN55-5	20PCB EUA71002X	CN55	5 INVERTER/REGEN CONVERTER MODULE	1	none	2.65
36	WRMT31408-1	CN16-1	20PCB EUA71002X	CN16	21PCB EUS70002X	1	none	3.00

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
37	WRMT31413-A	CN511	1 PRECHARGE MODULE	CN13	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
38	WRMT31413-A	CN511	2 PRECHARGE MODULE	CN13	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
39	WRMT31413-A	CN511	3 PRECHARGE MODULE	CN13	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
40	WRMT31413-A	CN511	4 PRECHARGE MODULE	CN13	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
41	WRMT31413-A	CN511	5 PRECHARGE MODULE	CN13	5 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
42	WRMT31414-A	CN512	1 PRECHARGE MODULE	CN36-1	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
43	WRMT31414-A	CN512	2 PRECHARGE MODULE	CN36-1	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
44	WRMT31414-A	CN512	3 PRECHARGE MODULE	CN36-1	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
45	WRMT31414-A	CN512	4 PRECHARGE MODULE	CN36-1	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
46	WRMT31414-A	CN512	5 PRECHARGE MODULE	CN36-1	5 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
47	WRMT31415-A	CN513	1 PRECHARGE MODULE	CN36-2	1 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
48	WRMT31415-A	CN513	2 PRECHARGE MODULE	CN36-2	2 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
49	WRMT31415-A	CN513	3 PRECHARGE MODULE	CN36-2	3 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
50	WRMT31415-A	CN513	4 PRECHARGE MODULE	CN36-2	4 INVERTER/REGEN CONVERTER MODULE	1	none	1.10
51	WRMT31415-A	CN513	5 PRECHARGE MODULE	CN36-2	5 INVERTER/REGEN CONVERTER MODULE	1	none	1.10

Table 62 Cables for D1000 HHP, Inverter Section, for 5P Regen System, 575/690V

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
1	WRMT31361-V	CN7-1TRM	1PCB EUA71001X	CN7	1 INVERTER/REGEN CONVERTER MODULE	1	a	3.30
2	WRMT31361-X	CN7-2TRM	1PCB EUA71001X	CN7	2 INVERTER/REGEN CONVERTER MODULE	1	b	3.00
3	WRMT31361-Z	CN7-3TRM	1PCB EUA71001X	CN7	3 INVERTER/REGEN CONVERTER MODULE	1	c	2.60
4	WRMT31361-AB	CN7-4TRM	1PCB EUA71001X	CN7	4 INVERTER/REGEN CONVERTER MODULE	1	d	2.30
5	WRMT31361-AD	CN7-5TRM	1PCB EUA71001X	CN7	5 INVERTER/REGEN CONVERTER MODULE	1	e	2.00
6	WRMT31366-V	CN61-1	20PCB EUA71001X	CN12	1 INVERTER/REGEN CONVERTER MODULE	1	aa	3.80
7	WRMT31366-X	CN61-2	20PCB EUA71001X	CN12	2 INVERTER/REGEN CONVERTER MODULE	1	bb	3.50
8	WRMT31366-Z	CN61-3	20PCB EUA71001X	CN12	3 INVERTER/REGEN CONVERTER MODULE	1	cc	3.10
9	WRMT31366-AB	CN61-4	20PCB EUA71001X	CN12	4 INVERTER/REGEN CONVERTER MODULE	1	dd	2.80

Cable #	Part Number	From		To		Qty	Designator on Panel Elementary Drawing	Length (m)
		Connector No.	Component	Connector No.	Component			
10	WRMT31366-AD	CN61-5	20PCB EUA71001X	CN12	5 INVERTER/REGEN CONVERTER MODULE	1	ee	2.50
11	WRMT31371-V	CN32-2	19PCB EUS70002X	CN32	1 INVERTER/REGEN CONVERTER MODULE	1	f	3.60
12	WRMT31371-X	CN32-3	19PCB EUS70002X	CN32	2 INVERTER/REGEN CONVERTER MODULE	1	g	3.30
13	WRMT31371-Z	CN32-4	19PCB EUS70002X	CN32	3 INVERTER/REGEN CONVERTER MODULE	1	h	2.90
14	WRMT31371-AB	CN32-5	19PCB EUS70002X	CN32	4 INVERTER/REGEN CONVERTER MODULE	1	i	2.60
15	WRMT31371-AD	CN32-6	19PCB EUS70002X	CN32	5 INVERTER/REGEN CONVERTER MODULE	1	j	2.30
16	WRMT31409-C	CN67	1PCB EUA71001X	CN67	21PCB EUS70002X	1	z	2.50
		CN68	1PCB EUA71001X	CN68	21PCB EUS70002X	1	zz	2.50
17	WRMT31381-D	CN9	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
		CN10	1PCB EUA71001X	CN2	1TB Customer terminal connection	1	none	3.50
18	WRMT31396-D	TB2	1PCB EUA71001X	CN3	1TB Customer terminal connection	1	none	3.50
19	WRMT31383-C	CN32-7	19PCB EUS70002X	CN32	20PCB EUA71001X	1	none	3.00
20	WRMT31386-C	CN63	21PCB EUS70002X	N/A	DC BUS	1	q	3.10
21	WRMT31387-B	CN47	21PCB EUS70002X	N/A	U, V, W	1	y	2.00
22	WRMT31389-1	T-S1	19PCB EUS70002X	U1	T1 Transformer	1	none	0.70
23	WRMT31389-2	T-S2	19PCB EUS70002X	U2	T1 Transformer	1	none	0.68
24	WRMT31389-3	T-S3	19PCB EUS70002X	U3	T1 Transformer	1	none	0.66
25	WRMT31389-4	T-S4	19PCB EUS70002X	U4	T1 Transformer	1	none	0.64
26	WRMT31389-5	T-S5	19PCB EUS70002X	U5	T1 Transformer	1	none	0.62
27	WRMT31389-6	T-S6	19PCB EUS70002X	U6	T1 Transformer	1	none	0.60
28	WRMT31390-1	T-R	19PCB EUS70002X	V	T1 Transformer	1	none	0.54
29	WRMT31390-2	T-215V-R	19PCB EUS70002X	v	T1 Transformer	1	none	0.65
30	WRMT31390-3	T-215V-S	19PCB EUS70002X	u	T1 Transformer	1	none	0.63
31	WRMT31392-1	CN55-1	20PCB EUA71001X	CN55	1 INVERTER/REGEN CONVERTER MODULE	1	none	4.00
32	WRMT31392-2	CN55-2	20PCB EUA71001X	CN55	2 INVERTER/REGEN CONVERTER MODULE	1	none	3.70
33	WRMT31392-3	CN55-3	20PCB EUA71001X	CN55	3 INVERTER/REGEN CONVERTER MODULE	1	none	3.25
34	WRMT31392-4	CN55-4	20PCB EUA71001X	CN55	4 INVERTER/REGEN CONVERTER MODULE	1	none	2.95
35	WRMT31392-5	CN55-5	20PCB EUA71001X	CN55	5 INVERTER/REGEN CONVERTER MODULE	1	none	2.65
36	WRMT31408-1	CN16-1	20PCB EUA71001X	CN16	21PCB EUS70002X	1	none	3.00

7 System Components Details

◆ Inverter Module

The inverter module is a metal chassis equipped with bottom rollers for rack-out of the panel enclosure. Enclosed in the chassis are the following main components:

A DC bus capacitors

B DC bus capacitor softcharge resistor

C Softcharge resistor bypass contactor

D IGBTs with associated snubber circuits

E DCCTs for output phase current sensors

F Gate drive PCB

G DC bus fuses

H Heatsink temperature monitoring device (thermistor)

I Cooling fans for circuit board and for heatsink

Table 63 Applicable Drawings

Number	Name	Refer To
EUJ71001☐	480V Inverter Drive Module	*Appendix-F Elementary Drawings on page 137*
EUJ71002☐	575/690V Inverter Drive Module	
EUJ71003☐	Inverter/Regen Converter Module	
EUJ71004☐	575/690V Inverter/Regen Converter Module	

Cooling the inverter module is accomplished by the use of two separate cooling fans. The internal cooling fan blows air over the main circuit boards. The external cooling fan blows air over the heat sink assembly. Each fan can be set by a parameter to be On Continuously or On During Run. The IGBTs are mounted on a large aluminum block to which the heat is transferred. This block is cooled by the external cooling fan.

DC bus caps are different for each voltage rating:

- The 480 Volt modules use Qty (8) caps rated at 12,300 µF, 400 Volts each wired as 4 parallel sets of 2 each in series, total capacitance of 24,600 µF
- The 575/690 Volt modules use Qty (16) caps rated at 4,400 µF, 600 Volts each wired as 8 parallel sets of 2 each in series, total capacitance of 17,600 µF
- DC bus cap charging time is approximately 200 ms

DC bus fuses are different for each voltage rating:

- The 480 Volt modules use Qty (2) fuses in parallel rated at AC1000V, 630 Amps each
- The 575/690 Volt modules use Qty (2) fuses in parallel rated at AC1100V, 630 Amps each

Each inverter model contains:

- One soft charge resistor rated at 1 Ohm, 500 Watts. Master contactor (MC) closes in approximately 1.5 to 2.0 seconds after main power is applied.

  Note: A soft charge resistor is not installed inside the regen inverter modules. The regen inverter modules need to use additional, separate pre charge modules.
- Two DC bus balancing resistors rated at 6 kOhms, 120 Watts each
- Two DC bus discharge resistors rated at 15 kOhms, 220 Watts each

◆ Converter Module

The converter module is a metal chassis equipped with bottom rollers for rack-out of the panel enclosure. Its purpose is to rectifiy 3 phase AC input to DC bus power. Enclosed in the chassis are the following main components:

A Diode modules

B Surge suppressors (MOVs)

C Heatsink temperature monitoring device (thermistor)

D Cooling fans for circuit board and for heatsink

Table 64 Applicable Drawings

Number	Name	Refer To
EUJ71012☐	Converter for 1P and 2P systems	*Appendix-F Elementary Drawings on page 137*
EUJ71013☐	Converter for 3P and 4P systems	
EUJ71014☐	Converter for 5P systems	

Cooling of the converter module is accomplished by use of two separate cooling fans. One cooling fan, the internal cooling fan, blows air over the main circuit boards. The other cooling fan, the external cooling fan, blows air over the heat sink assembly. Each fan can be set by a parameter to be On Continuously or On During Run. The diode modules are mounted on a large aluminum block to which the heat is transferred. The block is cooled by the external cooling fan.

◆ Power Supply Module

The power supply module consists of a power supply assembly which has a tap change card printed circuit board, a dc bus capacitor bank assembly, and a voltage detection card. The tap change card converts the incoming ac voltage to the appropriate level for the input side of the power supply transformer. The output side of the transformer always outputs 215 VAC. The power supply module then converts this 215 VAC into an unregulated 300 VDC. There are multiple connectors on the DC side of the power supply to be wired to various components in the system that require 300 VDC. Refer to ***Table 65***, Input/Output Power VA table, below for details on specific power usage in the system.

The tap charge board of the power supply module can accommodate various input power supply ratings ranging from 200 thru 480VAC for the 480 volt systems and 500 thru 690VAC for the 575/600V systems.

The dc bus capacitor bank assembly, (two capacitors rated at 12,300uF, 400V each), holds the 300 VDC output steady in case of fluctuations on the incoming ac voltage.

A soft charge resistor, 0.3Ohm, 120 Watts, is connected to charge the capacitors efficiently on power up.

Two fuses on the tap change board protect the power supply from short circuits. The fuse for the incoming ac voltage, fuse model number LP-CC-30, is rated at 600 VAC, 30 amps. The fuse for the outgoing dc voltage, fuse model number LP-CC-25, is rated at 600 VAC, 25 amps.

The voltage detection card is used to track the voltage levels of the main 3 phase ac input voltage, the dc bus for the inverter module, and the 3 phase inverter output voltage to the motor. It also checks various voltage levels on the main control card.

A regen system requires two separate power supply modules. One power supply module for the inverter section side and one power supply module for the regen converter section side. One single power supply cannot be used for both sides of a regen type system.

Table 65 A1000 HHP Modules Input/Output Control Power VA

Model Number	Description	300 VDC	
		Input Power VA	Output Power VA
EUS70001☐	Power supply module, 480V system	—	145 max. per connector, 920 max. total
EUS70002☐	Power supply module, 575/690V system	—	145 max. per connector, 920 max. total
EUJ71001☐	Inverter Module, 480V	145	—
EUJ71002☐	Inverter Module, 575/690V	145	—
EUJ71003☐	Inverter Module, regen, 480V	140	—
EUJ71004☐	Inverter Module, regen, 575/690V	140	—
EUJ71012☐	Converter Module, 1P-2P system	135	—
EUJ71013☐	Converter Module, 3P-4P system	135	—
EUJ71014☐	Converter Module, 5P system	135	—
EUA71001☐	Control Module, A1000HHP	60	—
EUA71002☐	Control Module, D1000HHP, Regen	60	—

Table 66 Applicable Drawings

Number	Name	Refer To
EUS70001☐	480V Power Supply Module	*Appendix-F Elementary Drawings on page 137*
EUS70002☐	575/690V Power Supply Module	

◆ Power Supply Transformer

■ Power Supply Transformers for 480 V Systems

380/480V, 2.0 kVA (Part Number 300-030-268), used for all 480 volt systems 1P - 5P

■ Power Supply Transformers for 575/600 V Systems

575/690V, 2.0 kVA (Part Number 300-030-267), used for all 575/690 volt systems 1P - 5P

Note: A larger size transformer (kVA) can be used in place of the recommended transformer for that size drive if needed for reasons of availability or otherwise.

◆ Control Module

The Control Module is a large, single panel which is ready to be mounted on the door of the inverter enclosure. The panel contains a control power supply card, main control card, and the digital operator interface card. The actual digital operator keypad and LED display are mounted to be easily accessed on the outside of the inverter enclosure when the door is closed. This design provides DC bus charge display outside of the enclosure cabinet when the door is closed. There are connectors on the main control card used to attach the various option cards that may include: motor encoder feedback, Profibus, Ethernet, etc.

The main control card is the heart of the inverter. The main control card provides all of the control, protection, and sequencing of the inverter and converter modules. The main control card is connected to the power supply, converter module and all inverter modules with cables. The customer I/O terminals are also connected to the main control module using a separate control terminal block.

Table 67 Applicable Drawings

Number	Name	Refer To
EUA71001☐	A1000 Control Module for Inverter Control	*Appendix-F Elementary Drawings on page 137*
EUA71002☐	D1000 Control Module for Regen Converter Control	

◆ Pre Charge Module for Regen Systems

The pre charge module is used on regen systems. The pre charge circuit is removed from the regen system inverter power module and is connected externally in the pre charge module. It is placed in series with the incoming 3 phase ac power before each of the regen inverter modules. A 1P system uses one pre charge module, a 2P system uses two pre charge modules, a 3P system uses three pre charge modules, a 4P system uses 4 pre charge modules, and a 5P system uses 5 pre charge modules.

The same model pre charge module is used for all regen system configurations including 1P - 5P, 480 Volt and 1P - 5P, 575/690 Volt systems.

The resistors, (R1-R4), used in the module, are each rated at 1 Ohm, 500 Watts.

CN511 has the control signals for the contactors in the pre charge circuit.

CN512 has the answer back signal that contactor K1 is open or closed in line R/L1.

CN513 has the answer back signal that contactor K2 is open or closed in line S/L2.

Table 68 Applicable Drawings

Number	Name	Refer To
EUJ71021☐	Pre Charge Module	*Appendix-F Elementary Drawings on page 137*

◆ DC LINK REACTOR

The DC link reactor is used on the diode converter module. It is connected to PA and PB which are located at the bottom of the converter module.

Various reactors are used for different configurations.

The 480V and the 575/690Vsystems use the same reactors as listed below.

- 1P system requires (1) reactor, p/n 300-023-126, rated at 600A, 0.119mH, 690V
- 2P system requires (1) reactor, p/n 300-032-127, rated at 1200A, 0.061mH, 690V
- 3P system requires (1) reactor, p/n 300-032-125, rated at 1800A, 0.041mH, 690V
- 4P system requires (2) reactors, p/n 300-032-127, in parallel rated at 1200A, 0.061mH, 690V
- 5P system requires (2) reactors, p/n 300-032-125, in parallel rated at 1800A, 0.041mH, 690V

◆ AC OUTPUT REACTOR

The AC Output Reactor acts as a load balancing impedance in concert with the active load balancing software in the inverter. The reactor itself is about 0.5 % PU impedance to the output circuit so this reactor does not provide any significant help with dv/dt issues. For improvement in dv/dt specifications, use a dv/dt filter in place of the output reactor. The reactor is physically designed to mount below the inverter module.

480V Systems use part number 300-030-428. This reactor is rated at 466A, 0.01mH, 480V

- 1P system requires (0) reactors
- 2P system requires (2) reactors
- 3P system requires (3) reactors
- 4P system requires (4) reactors
- 5P system requires (5) reactors

575/690V Systems use part number 300-030-429. This reactor is rated at 466A, 0.01mH, 690V

- 1P system requires (0) reactors
- 2P system requires (2) reactors
- 3P system requires (3) reactors
- 4P system requires (4) reactors
- 5P system requires (5) reactors

8 Power Circuits

◆ Branch Protection and Fuses

■ MCCB

Each system must have the appropriately rated MCCB and fuse protection from the incoming three phase power.

Install an MCCB for line protection between the power supply and the main circuit power supply input terminals R/L1, S/L2, T/L3.

This protects the main circuit and devices wired to the main circuit while also providing overload protection.

The capacity of the MCCB should be 1.5 to 2.0 times the rated output current of the drive.

■ Input Fuses

Always install input fuses at the input side of the drive to prevent damage from short circuits.

These fuses are connected in series with the inputs R, S, and T of the converter module.

This drive assembly design is based on 3 phase voltage input, therefore, 3 fuses are required for each drive assembly.

Select the appropriate fuse from *Table 69* . The fuse models listed are made by Cooper Busmann.

Table 69 Input Fuses

Drive Model	Fuse Model, Square Body - Flush End Contact Style	Fuse Model, Square Body - US Style	Qty	Fuse Rating
CIMR-AUXH0466 (1P)	170M7100G	170M6717	3	1400 Amps, 690 Volts
CIMR-AUXH0900 (2P)	170M7102G	170M6721	3	2000 Amps, 690 Volts
CIMR-AUXH1350 (3P)	170M7103G	Not available	3	2500 Amps, 690 Volts
CIMR-AUXH1800 (4P)	170M7104G	Not available	3	3000 Amps, 690 Volts
CIMR-AUXH2250 (5P)	170M7105G	Not available	3	3500 Amps, 690 Volts

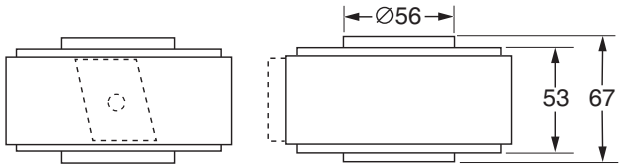


Figure 62 Square Body - Flush End Contact Style

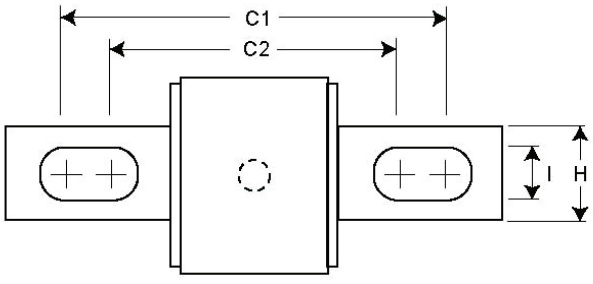


Figure 63 Square Body - US Style

9 Appendix-A Specifications

◆ 460V Specifications

Table 70 460V Specifications

Item			Specification				
Number of Inverter Modules			1	2	3	4	5
Max motor capacity (kW) <1> <6>		Heavy Duty	263	525	750	938	1200
		Normal Duty	300	600	750	1125	1350
Input	Rated input current (A) <2>	Heavy Duty	452	894	1272	1588	2027
		Normal Duty	514	1020	1272	1901	2278
Output	Rated output capacity (kVA) <3>	Heavy Duty	330	640	960	1280	1600
		Normal Duty	380	720	1080	1440	1800
	Rated output current <4>	Heavy Duty	414	800	1200	1600	2000
		Normal Duty	466	900	1350	1800	2250
	Overload tolerance	Heavy Duty	150% of rated output current for 60 seconds				
		Normal Duty	120% of rated output current for 60 seconds				
	Carrier Frequency		2kHz				
	Max output voltage (V) <5>		3 phase 380V~480V (relative to input voltage)				
	Max output frequency (Hz)		150Hz				
Motor Power	H P <7>	Heavy Duty	350	700	1000	1450	1800
		Normal Duty	400	800	1200	1600	2000
Motor Average Current Rating	Amps	Heavy Duty	397	747	1067	1450	1920
		Normal Duty	451	800	1281	1708	2135
Power Supply Characteristics	Rated voltage / Rated frequency		AC: 380~480 V 50/60 Hz DC: 510~680 V				
	Allowable voltage fluctuation		-15~ +10%				
	Allowable frequency fluctuation		±5%				
	Power Supply kVA	Heavy Duty	420	820	1170	1460	1860
		Normal Duty	480	940	1170	1740	2090

<1> The motor capacity (kW) refers to a 60 Hz, 4 pole, 460 volt motor. The rated output current of the drive should be equal to or greater than the motor rated current.
<2> The value displayed is for operating at the rated output current. This value may fluctuate based on the power supply side impedance as well as input current, power supply transformer, input side reactor, and wiring conditions.
<3> Rated output capacity is calculated with a rated output voltage of 460 volts.
<4> This value assumes a carrier frequency of 2 kHz (default).
<5> Max output voltage may fluctuate based on input voltage. In case of AC input voltage, max output voltage is approximately 0.85 * input voltage.In case of DC input voltage, max output voltage is approximately (DC input voltage /1.35) * max input voltage.
<6> Motor capacity is indicated with input voltage greater than or equal to 460 VAC . In case of input voltage less than 460 VAC, max motor capacity will be limited by input voltage.
<7> The values displayed use 460 Volt, 4 pole, 1800 rpm motor data for HP rating. Actual HP rating can be different depending on induction motor design.

◆ 575/690V Specifications

Table 71 575/690V Specifications

Item			Specification				
Number of Inverter Modules			1	2	3	4	5
Max motor capacity (kW) <1>		Heavy Duty	300	600	938	1200	1500
		Normal Duty	335	675	1050	1350	1688
Input	Rated input current (A) <2>	Heavy Duty	473	939	1461	1864	2326
		Normal Duty	528	1054	1633	2095	2615
Output	Rated output capacity (kVA) <3>	Heavy Duty	500	960	1440	1920	2400
		Normal Duty	560	1080	1620	2160	2690
	Rated output current <4>	Heavy Duty	414	800	1200	1600	2000
		Normal Duty	466	900	1350	1800	2250
	Overload tolerance	Heavy Duty	150% of rated output current for 60 seconds				
		Normal Duty	120% of rated output current for 60 seconds				
	Carrier Frequency		2kHz				
	Max output voltage (V) <5>		3 phase 500V~690V (relative to input voltage)				
	Max output frequency (Hz)		150Hz				
Motor Power	H P <6>	Heavy Duty	500	1050	1550	2100	2600
		Normal Duty	600	1150	1750	2350	2950
Motor Average Current Rating	Amps	Heavy Duty	400	800	1105	1533	1924
		Normal Duty	450	890	1280	1740	2212
Power Supply Characteristics	Rated voltage / Rated frequency		AC: 500~690 V 50/60 Hz D: 675 ~975 V				
	Allowable voltage fluctuation		-15~ +10%				
	Allowable frequency fluctuation		±5%				
	Power Supply kVA	Heavy Duty	630	1240	1930	2460	3060
		Normal Duty	700	1390	2150	2760	3440

<1> The motor capacity (kW) refers to a 60 Hz, 4 pole, 690 volt motor. The rated output current of the drive should be equal to or greater than the motor rated current.
<2> The value displayed is for operating at the rated output current. This value may fluctuate based on the power supply side impedance as well as input current, power supply transformer, input side reactor, and wiring conditions.
<3> Rated output capacity is calculated with a rated output voltage of 690 volts.
<4> This value assumes a carrier frequency of 2 kHz (default).
<5> Max output voltage may fluctuate based on input voltage. In case of AC input voltage, max output voltage is approximately 0.85 * input voltage.In case of DC input voltage, max output voltage is approximately (DC input voltage /1.35) * max input voltage.
<6> The values displayed use 660 Volt, 4 pole, 1800 rpm motor data for HP rating. Actual HP rating can be different depending on induction motor design.

◆ Diode Converter Specifications

Table 72 Diode Converter Specifications

Item			Specification		
Product Code			EUJ71012X	EUJ71013X	EUJ71014X
Input	Rated input current (Amps)	Heavy Duty	996	1732	-
		Normal Duty	1169	1992	2295
Output	I^2 T rating		1445000	5445000	12005000
	Rated output capacity (kVA) @ 690V	Heavy Duty	1080	1870	-
		Normal Duty	1260	2150	2470
	Output Average current (Amps) (Idc ave)	Heavy Duty	1150	2000	-
		Normal Duty	1350	2300	2650
	Rated output RMS current (Amps) (Idc RMS) @ PF = 0.9	Heavy Duty	1278	2222	-
		Normal Duty	1500	2556	2944
	Overload Capacity	Heavy Duty	150% of rated output current for 60 s		None
		Normal Duty	120% of rated output current for 60 s		None
	Max number of inverter modules	460 V	2	4	5
		575/690 V	2	4	5
Power Supply	Rated input voltage and frequency		AC: 3 Ph 380 - 690 V 50/60 Hz		
	Voltage tolerance		-15~+10%		
	Frequency tolerance		±5%		
	Input power factor		0.9 or more		
	Source min capacity (kVA)	Heavy Duty	1310	2280	-
		Normal Duty	1540	2620	3020
Environment	Ambient temperature		-10~45°		
	Humidity		95% or less (non condensing)		
	Preservation temperature		-20-60°		
	Altitude		Up to 1000 meters		
	Vibration		10 Hz~55 Hz , 2.0m/s2		
Protective Construction			IP00		
Standard for Insulation Design			UL508C Conforming EN50178 and (IEC61800-5-1 Category 3 in overvoltage and reinforced insulation)		

◆ Common Specifications

Table 73 Common Specifications

Item		Specification
Control Method		V/F Control , V/F Control with PG Open Loop Vector Control Closed Loop Vector Control with PG Advanced Closed Loop Vector Control
Frequency Control Range		0.01 Hz to 150 Hz
Frequency Accuracy (temperature fluctuation)		Digital Reference Input: +/- 0.01 % of the max. output frequency (-10 to +40 degrees C)
		Analog reference Input: +/- 0.1 % of the max. output frequency (-10 to +40 degrees C)
Frequency Setting Resolution		Digital Reference Input: 0.01 Hz Analog Reference Input: 0.03 Hz at 60 Hz (1/2048 of max. output frequency setting , 11 bit plus sign)
Output Frequency Resolution		0.001 Hz
Frequency Reference Setting Signal		-10 to +10 Volts, 0 to +10 Volts, 4 to 20 mAmps, pulse train
Starting Torque		V/F , V/F with PG: 150 % at 3 Hz Open Loop Vector , Advanced Open Loop Vector: 200 % at 0.3 Hz Closed Loop Vector: 200 % at 0 RPM
Speed Control Range		V/F , V/F with PG: (1:40) Open Loop Vector , Advanced Open Loop Vector: (1:200) Closed Loop Vector: (1:1500)
Speed Control Accuracy		Open Loop Vector : +/- 0.2 % (25 degrees C +/- 10 degrees C) Closed Loop Vector: +/- 0.02 % (25 degrees C +/- 10 degrees C)
Speed Response		Open Loop Vector : 10 Hz (25 degrees C +/- 10 degrees C) Closed Loop Vector: 50 Hz (25 degrees C +/- 10 degrees C)
Torque Limit		Separate limit settings in four quadrants for OLC, CLV, Advanced CLV
Accel / Decel Time		0.00 to 6000.0 seconds (4 selectable combinations of independent accel and decel settings)
Braking Torque		Based on external braking or regenerative system
V / F Characteristics		User selected programs and pre set V / F patterns are available
Main Control Functions		Torque Control, Droop Control, Speed/torque Control Switching, Feed Forward Control, Zero ServoFunction, Momentary Power Loss Ride-Thru, Speed Search, Overtorque/Undertorque Detection,Torque Limit, 17 Step Speed (max), Accel/decel Switch, S-curve Accel/decel, 3-wire Sequence, Auto-tuning (rotational, stationary tuning), Dwell, Cooling Fan on/off Switch, Slip Compensation, TorqueCompensation, Frequency Jump, Upper/lower Limits for Frequency Reference, DC Injection Brakingat Start and Stop, Overexcitation Braking, High Slip Braking, PID Control (with sleep function), EnergySaving Control, MEMOBUS/Modbus Comm. (RS-422/485 max, 115.2 kbps), Fault Restart, Application Presets, DriveWorksEZ (customized function), Overexcitation Deceleration, Inertia (ASR) Tuning, Overvoltage Suppression, High Frequency Injection
Motor Protection		Motor overheat protection based on output current
Instantaneous Overcurrent Protection		Drive stops when output current exceeds 200 % of rated output current (heavy duty rating)
Overcload Protection		Drive stops after 60 seconds at 150 % of rated output current (heavy duty rating)
DC Bus Overvoltage Protection	**460V input**	Stops when the DC bus is higher than approximately 820 VDC
	575V input	Stops when the DC bus is higher than approximately 1040 VDC
	690V input	Stops when the DC bus is higher than approximately 1196 VDC
DC Bus Under Voltage Protection	**460V input**	Stops when the DC bus is lower than approximately 380 VDC
	575V input	Stops when the DC bus is lower than approximately 475 VDC
	690V input	Stops when the DC bus is lower than approximately 570 VDC
Momentary Power Loss Ride Through		Immediately stops after a 15 mSecs or longer power loss (default). Continuous operation during a power loss shorter than 2 seconds (standard)
Heatsink Overheat Protection		Thermistor
Stall Prevention		Stall prevention is available during acceleration/deceleration and during constant speed operation
Ground Fault Protection		Protection by electronic circuit
Charge LED Indicator		Charge LED remains on until DC bus voltage becomes 50 V or less
Discharging Time		Approximately 10 minutes or until DC bus voltage becomes 50 V or less

Item		Specification
Environment	Area of Use	Indoors, Inside a cabinet or panel
	Ambient Operating Temperature	-10~45° c
	Humididty	95% or less (non condensing)
	Storage Temperature	-20~60°
	Altitude	Up to 1000 meters
	Vibration	10 Hz~55 Hz , 2.0m/s2
Protection Design		IP00
Safety Standard		UL 508C

◆ WIRE SIZES AND TIGHTENING TORQUES

Model CIMR-AUXH□□□□	Terminal	Recommended Wire Size, AWG or kcmil	Recommended Wire Size, mm2	Screw Size	Tightening Torque Nm (Lb-In)
1P, 0466 Amps	R/L1,S/L2, T/L3	2/0 X 2	125 X 2	M16	79-89 (699-867)
	R1/L11, S1/L21, T1/L31	2/0 X 1	125 X 1	M16	79-89 (699-867)
	U/T1, V/T2, W/T3	2/0 X 2	125 X 2	M16	79-89 (699-867)
	Ground	2 AWG	38	M12	32-40 (283-354)
	r / l1	14 AWG	2	M4	1.4-1.6 (12-14)
	s 600 / l2 600	14 AWG	2	M4	1.4-1.6 (12-14)
2P, 0900 Amps	R/L1,S/L2, T/L3	2/0X4 or 300X2	125 X 4	M16	79-89 (699-867)
	R1/L11, S1/L21, T1/L31	2/0X2 or 300X1	125 X 2	M16	79-89 (699-867)
	U/T1, V/T2, W/T3	2/0X4 or 300X2	125 X 4	M16	79-89 (699-867)
	Ground	2/0 X 1	60	M12	32-40 (283-354)
	r / l1	14 AWG	2	M4	1.4-1.6 (12-14)
	s 600 / l2 600	14 AWG	2	M4	1.4-1.6 (12-14)
3P, 1350 Amps	R/L1,S/L2, T/L3	4/0X4 or 777X2	250 X 4	M16	79-89 (699-867)
	R1/L11, S1/L21, T1/L31	4/0X2 or 777X1	250 X 2	M16	79-89 (699-867)
	U/T1, V/T2, W/T3	4/0X4 or 777X2	250 X 4	M16	79-89 (699-867)
	Ground	4/0 X 1	100	M12	32-40 (283-354)
	r / l1	14 AWG	2	M4	1.4-1.6 (12-14)
	s 600 / l2 600	14 AWG	2	M4	1.4-1.6 (12-14)
4P, 1800 Amps	R/L1,S/L2, T/L3	3/0X6 or 444X3	200 X 6	M16	79-89 (699-867)
	R1/L11, S1/L21, T1/L31	3/0X3 or 444X2	125 X 4	M16	79-89 (699-867)
	U/T1, V/T2, W/T3	3/0X6 or 444X3	200 X 6	M16	79-89 (699-867)
	Ground	2/0 X 2	60 X 2	M12	32-40 (283-354)
	r / l1	14 AWG	2	M4	1.4-1.6 (12-14)
	s 600 / l2 600	14 AWG	2	M4	1.4-1.6 (12-14)
5P, 2250 Amps	R/L1,S/L2, T/L3	4/0X7 or 777X3	325 X 6	M16	79-89 (699-867)
	R1/L11, S1/L21, T1/L31	4/0X4 or 777X2	200 X 4	M16	79-89 (699-867)
	U/T1, V/T2, W/T3	4/0X7 or 777X3	250 X 6	M16	79-89 (699-867)
	Ground	4/0 X 2	100 X 2	M12	32-40 (283-354)
	r / l1	14 AWG	2	M4	1.4-1.6 (12-14)
	s 600 / l2 600	14 AWG	2	M4	1.4-1.6 (12-14)

10 Appendix-B Enclosures

◆ Watt Loss Data - Non-regen Systems

Conditions	Heavy Duty	Normal Duty
Fc (kHz)	2	2
Mod	3	3
Vin (480)	480	480
Vout (480)	480	480
Vin (575/690)	690	690
Vout 575/690)	690	690
Iout (%)	100%	100%

Input Voltage	HD / ND	Loss Type	1P	2P	3P	4P	5P
480V	Heavy Duty	Internal loss	1526	2995	4127	5603	6881
		External loss	3135	6221	9081	12036	15296
		Total loss	4661	9216	13208	17639	22178
	Normal Duty	Internal loss	1684	3372	4478	6400	7735
		External loss	3615	7196	10143	14094	17622
		Total loss	5300	10567	14621	20494	25357
575/690V	Heavy Duty	Internal loss	1846	3616	5179	7026	8654
		External loss	4326	8484	12713	16948	21330
		Total loss	6172	12100	17892	23973	29984
	Normal Duty	Internal loss	2036	4053	5834	7898	9751
		External loss	4933	9691	14500	19359	24386
		Total loss	6969	13744	20333	27257	34137

Unit = Watts

◆ Watt Loss Data - Regen Systems (not including ACL panel component losses)

Conditions	Heavy Duty	Normal Duty
Fc (kHz)	2	2
Mod	3	3
Vin (480)	480	480
Vout (480)	480	480
Vin (575)	600	600
Vout (575)	600	600
Vin (690)	690	690
Vout (690)	690	690
Iout (%)	100%	100%

Heavy Duty Operation Losses							
Input Voltage	**Inverter / Regen**	**Loss Type**	**1P**	**2P**	**3P**	**4P**	**5P**
480V	Inverter	Internal loss	1014	2044	2990	3925	4830
		External loss	2449	4702	7053	9404	11754
		Total loss	3463	6746	10042	13328	16585
	Regen Converter	Internal loss	1116	1996	2918	3829	4710
		External loss	2449	4702	7053	9404	11754
		Total loss	3565	6698	9970	13232	16465
575V	Inverter	Internal loss	1408	2814	4137	5449	6777
		External loss	3736	7191	10786	14382	17977
		Total loss	5143	10005	14924	19831	24754
	Regen Converter	Internal loss	1510	2766	4065	5353	6657
		External loss	3736	7191	10786	14382	17977
		Total loss	5246	9957	14852	19735	24634
690V	Inverter	Internal loss	1285	2592	3804	5005	6223
		External loss	3201	6209	9313	12418	15522
		Total loss	4486	8801	13117	17423	21745
	Regen Converter	Internal loss	1362	2499	3665	4819	5990
		External loss	3201	6209	9313	12418	15522
		Total loss	4564	8708	12978	17237	21512

Unit = Watts

Normal Duty Operation Losses							
Input Voltage	**Inverter / Regen**	**Loss Type**	**1P**	**2P**	**3P**	**4P**	**5P**
480V	Inverter	Internal loss	1144	2353	3453	4542	5601
		External loss	2821	5410	8115	10820	13525
		Total loss	3965	7764	11568	15362	19126
	Regen Converter	Internal loss	1274	2296	3367	4428	5458
		External loss	2821	5410	8115	10820	13525
		Total loss	4095	7707	11482	15248	18984
575V	Inverter	Internal loss	1580	3203	4720	6226	7747
		External loss	4267	8204	12305	16407	20509
		Total loss	5847	11407	17025	22633	28256
	Regen Converter	Internal loss	1710	3146	4634	6112	7605
		External loss	4267	8204	12305	16407	20509
		Total loss	5977	11350	16940	22519	28114
690V	Inverter	Internal loss	1460	2978	4383	5776	7185
		External loss	3736	7191	10786	14382	17977
		Total loss	5196	10169	15169	20158	25162
	Regen Converter	Internal loss	1563	2870	4221	5560	6915
		External loss	3736	7191	10786	14382	17977
		Total loss	5298	10061	15007	19942	24892

Unit = Watts

◆ Watt Loss Data - Regen Systems, Total ACL Panel Component Losses

Heavy Duty Operation Losses					
Input Voltage	**1P**	**2P**	**3P**	**4P**	**5P**
480V	2080	4080	6060	7830	9670
575/690V	2440	4840	7090	9480	11520

Unit = Watts

◆ Enclosure Fan Control

■ Fan Data

The inverter drive modules have an internal fan and an external heat sink fan. The internal fan is set to one speed.

The external fan for the heat sink is variable speed. The fan speed is set in parameter L8-83 (factory mode only).

For details on the wiring of the fans, refer to the drawings found in *Appendix-F Elementary Drawings on page 137* of this document.

Fan Type	Model	RPM max	Air Flow	Voltage	Amps
Internal fan 300-030-113	NMB-MAT, 5920P-05W-B49-DQ1	3350	6.5 m3/min	24 VDC	0.73
External heat sink fan 300-030-131	Japan Servo, D1751P24B9DP321	6800	14.2 m3/min	24 VDC	4.60

■ Fan Parameters

The fans are separated into two fan types. The Efan is the enclosure fan. These are the fans mounted in the top of the drive cabinet for heat exhaust. No enclosure fans are monitored by the drive. Set parameter L8=86 to disable; L8-86=5, for all systems.

The Dfan is the diode converter module fan. If the system is a regen type, no diode converter module is used, therfore, no Dfan is used. For all regen systems, set parameter L8-87 to disable; L8-87=5.

Parameters and Settings that Affect Fan Performance

Parameter L8-10 Fan on/off select. This parameter controls both the efan and dfan together the same.

- 0 = on during run only
- 1 = always on.

Parameter L8-11 Fan delay time. This parameter controls both the efan and dfan together the same.

- Sets the time the fan continues to run after run command is off when L8-10=0.
- The time can be set from 0 - 300 seconds, default is 60 seconds.

Parameter L8-83 Fan speed (factory mode only).

- Sets the speed that both the efan and dfan run when they are on.
- The speed can be set for 5% - 95%. Default is 95%.

Parameter L8-86 E Fan error select. Determines how the drive reacts when an enclosure fan failure is detected.

- 0 = ramp to stop
- 1 = coast to stop
- 2 = fast stop
- 3 = alarm only
- 4 = run drive at L8-19 rate. Drive runs at reduced capacity. Default L8-19 is 80%.
- 5 = disabled. Drive continues to run normally.

Parameter L8-87 D Fan error select. Determines how the drive reacts when a diode converter module fan failure is detected.

- 0 = ramp to stop
- 1 = coast to stop
- 2 = fast stop
- 3 = alarm only
- 4 = run drive at L8-19 rate. Drive runs at reduced capacity. Default L8-19 is 80%.
- 5 = disabled. Drive continues to run normally.

11 Appendix-C Panel Thermal Design Verification

◆ Introduction

This appendix specifies the placement, measurement, and results tabulation required for verifying the thermal design of an A1000 HHP System Integrator panel design. The end result of this test is to insure that the panel design meets all of Yaskawa Electric's design criteria for quality and the design life of 10+ years.

◆ Scope

The scope of this procedure is to outline the location of the thermocouples, testing procedure, and tabulating the results to verify that the panel design maintains the correct temperatures on the A1000 HHP drive components. This procedure does not cover any testing related to special ratings of the drive components outside of the published ratings.

◆ Thermocouple Locations in the Panel

In order to verify the correct thermal design, the temperatures inside the drive panel and the temperatures of the components themselves have to be measured. ***Table 74*** contains a summary of the locations and maximum temperatures.

Table 74 Thermocouple Locations and Maximum Temperature Summary

No	Component	Location	Figure No.	Max Temp
1	EUJ71002x Inverter Module	Lower heat sink fan	***Figure 63***	80 deg C
2	EUJ71002x Inverter Module	Top of heat sink	***Figure 63*** and ***Figure 64***	80 deg C
3	EUJ71002x Inverter Module	Top of module over cap bank	***Figure 63*** and ***Figure 64***	80 deg C
4	EUJ71002x Inverter Module	Top DC bus cap surface	***Figure 64***	85 deg C
5	EUJ710120 Converter Module EUJ710130 Converter Module	Lower heat sink fan	***Figure 65***	70 deg C
6	EUJ710120 Converter Module EUJ710130 Converter Module	Top of heat sink	***Figure 65***	70 deg C
7	EUJ710120 Converter Module EUJ710130 Converter Module	Top of module over interior	***Figure 65***	70 deg C
8	EUJ710120 Converter Module EUJ710130 Converter Module	Top of + 1 Output bus bar	***Figure 66***	115 deg C
9	EUJ710120 Converter Module EUJ710130 Converter Module	Bottom of +1 Output bus bar	***Figure 66***	115 deg C
10	Inverter Output Reactor	Top middle of reactor core	***Figure 67***	155 deg C
11	Inverter Output Reactor	Middle of reactor coil	***Figure 67***	155 deg C
12	Power Supply Module	Top of module	***Figure 68***	55 deg C
13	Control Assembly	Middle of metal cover	***Figure 69***	55 deg C
14	Drive Panel	Bottom inside of enclosure	***Figure 70***	50 deg C
15	Drive Panel	Top inside of enclosure	***Figure 70***	50 deg C
16	Ambient	Outside of enclosure	N/A	40 deg C

To view required locations of the thermocouples on the actual modules, see ***Figure 63*** through ***Figure 70*** on the following pages.

■ Thermocouple Locations on Modules

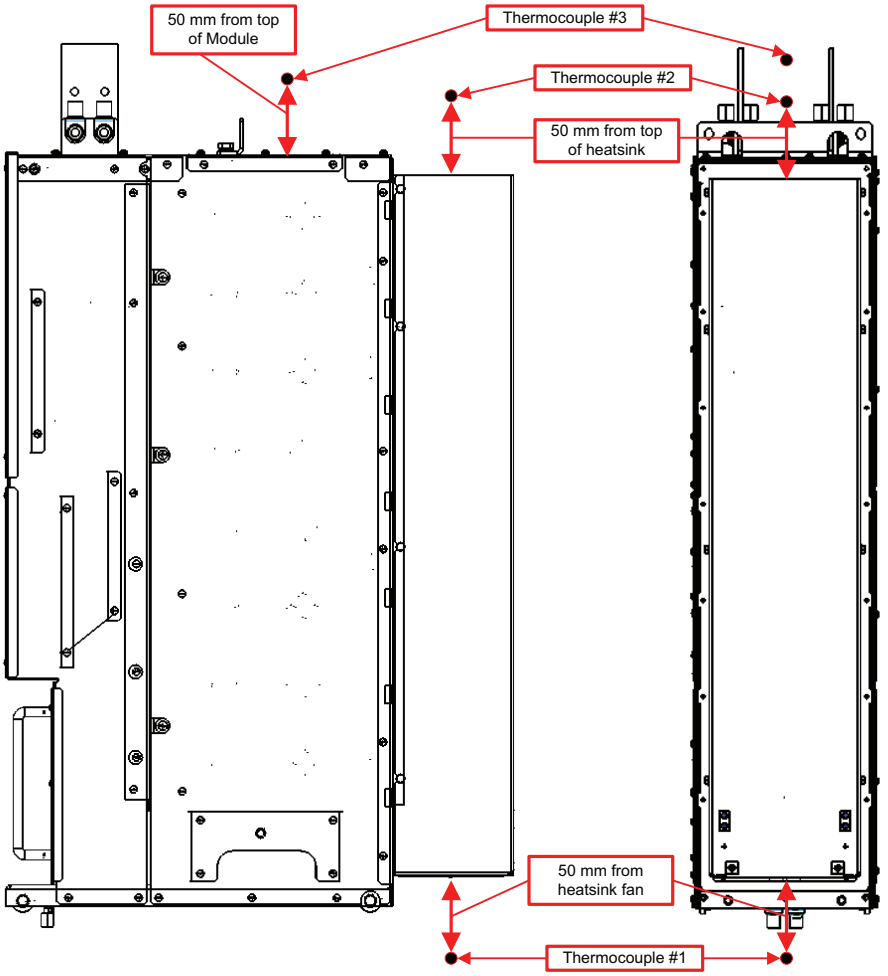


Figure 64 Thermocouple Locations - Inverter Module EUJ7100□□

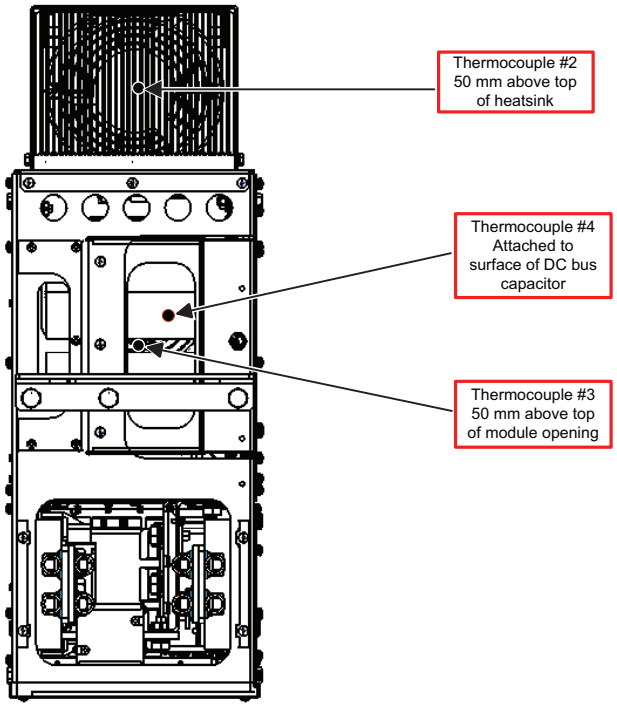


Figure 65 Thermocouple Locations - Inverter Module EUJ7100□□

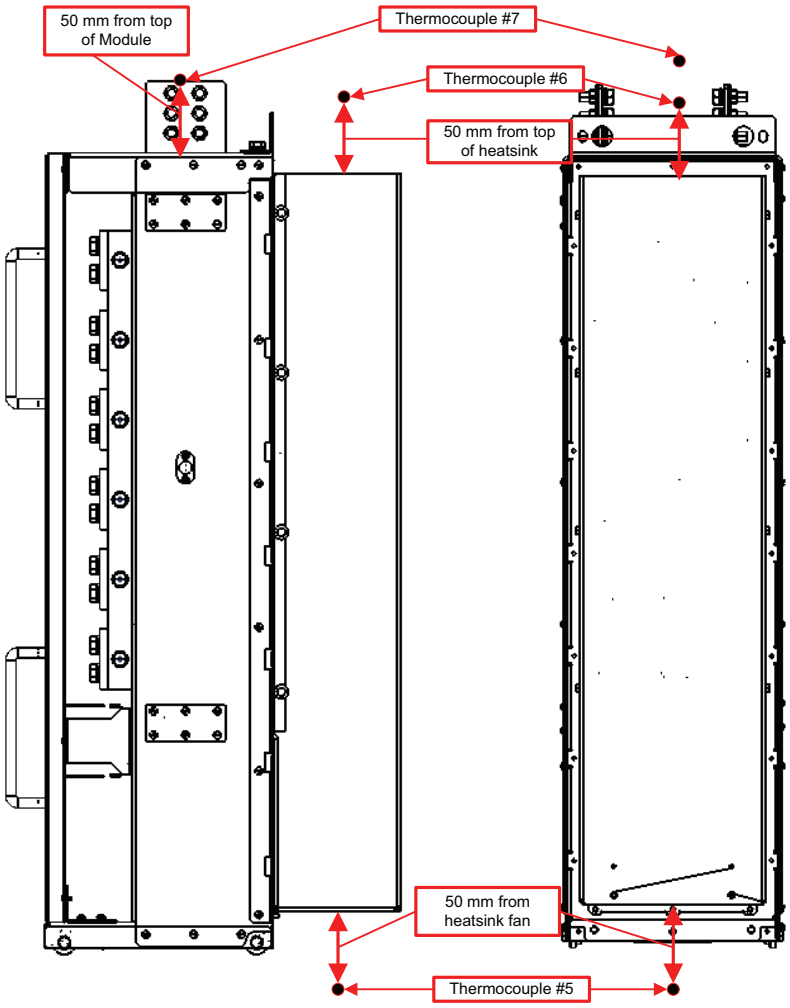


Figure 66 Thermocouple Locations - Converter Module EUJ7101□□

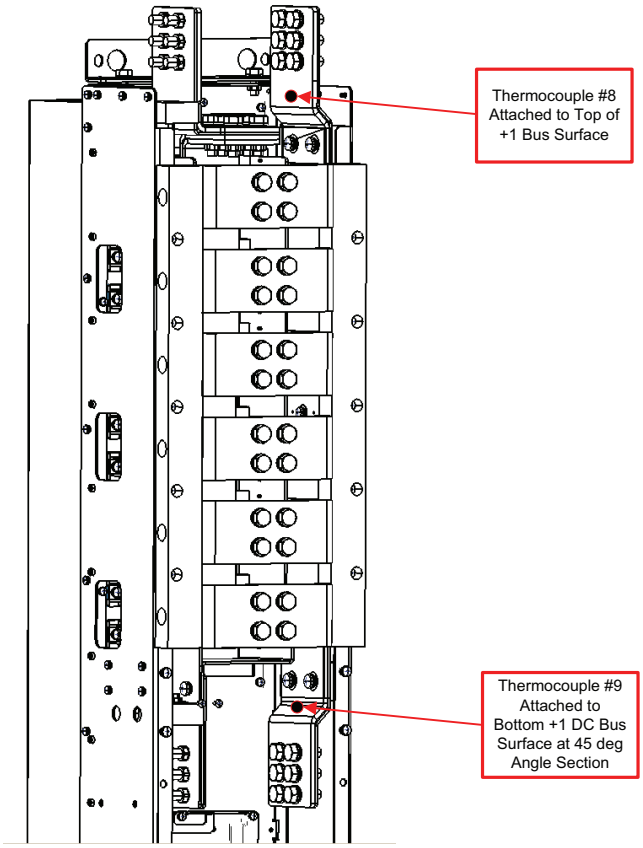


Figure 67 Thermocouple Locations - Converter Module EUJ7101□□

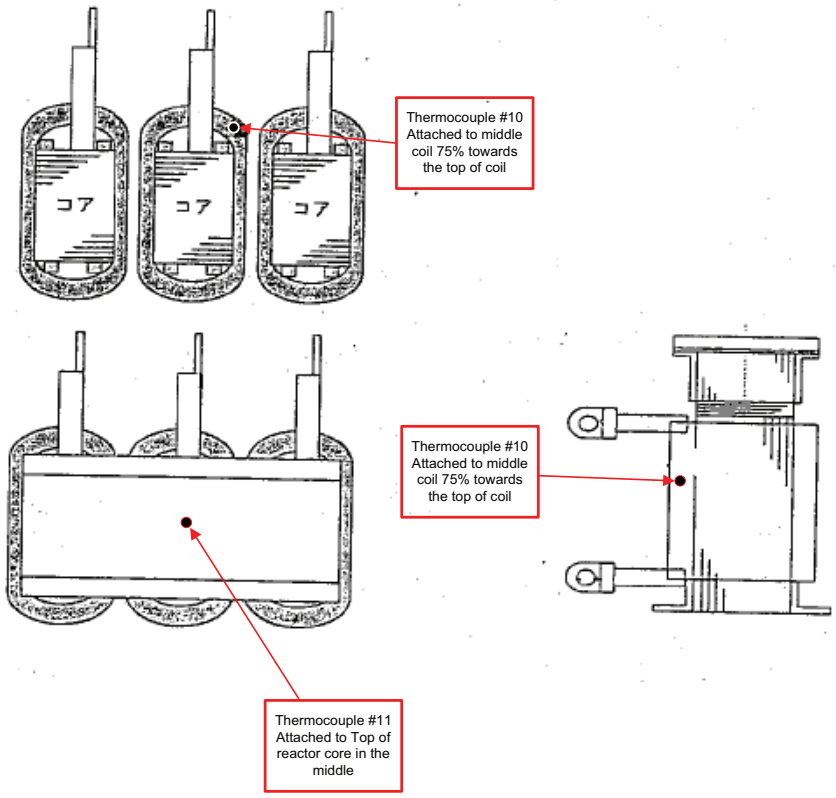


Figure 68 Thermocouple Locations - Inverter Output Reactor

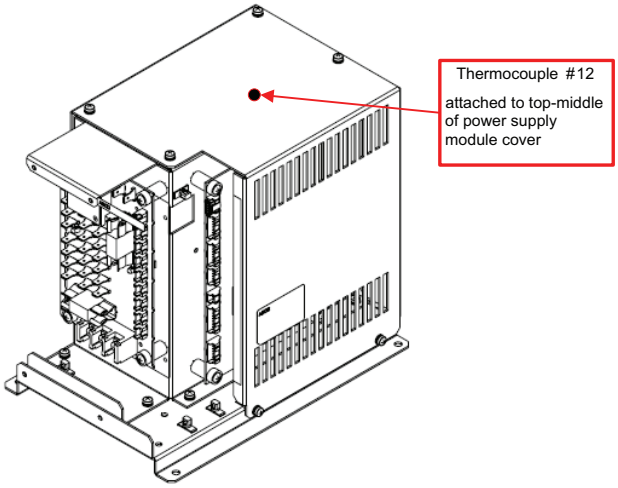


Figure 69 Thermocouple Location - Power Supply Module EUJ7100□□

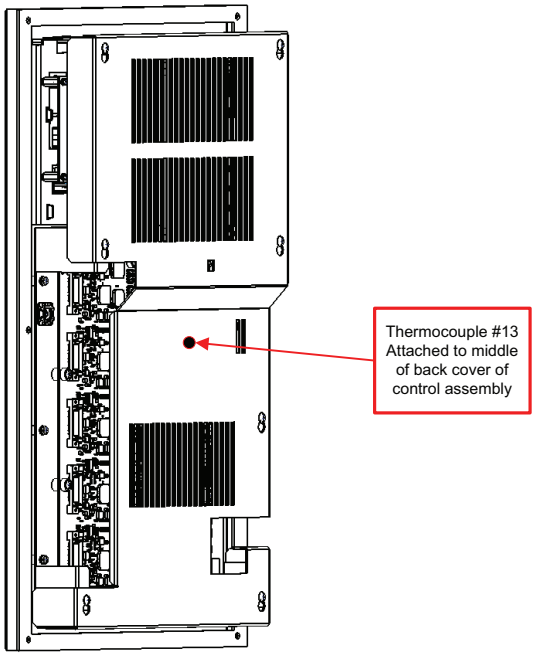


Figure 70 Thermocouple Location - Control Assembly EUJ7100□□

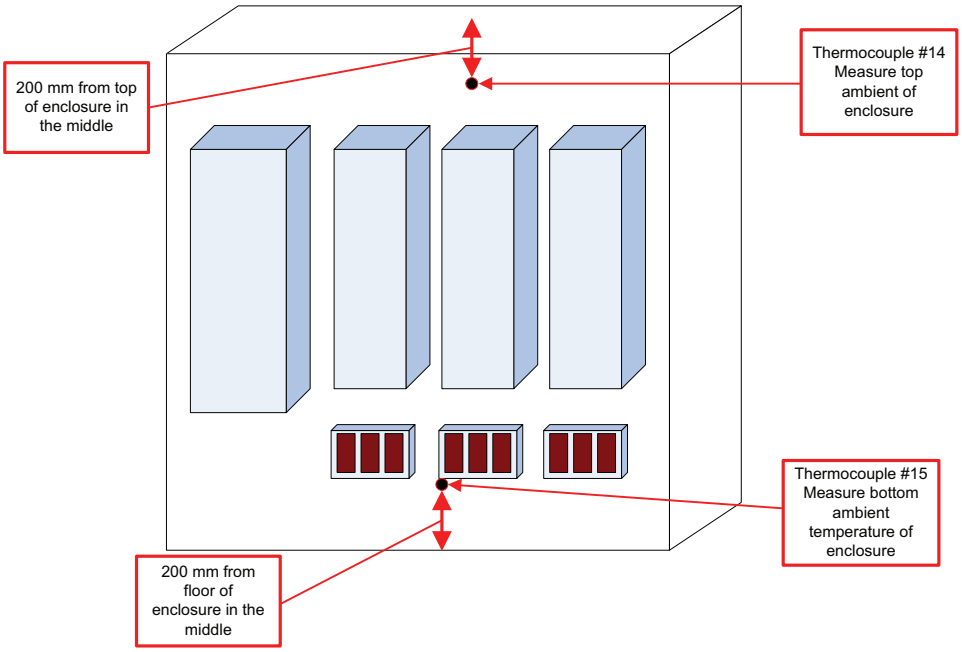


Figure 71 Thermocouple Locations - Drive Panel

■ Temperature Measurement Example

Each module within the drive panel needs to be measured and monitored to make sure all modules are within their limits. *Table 75* shows an example of a typical chart of all thermocouples required to test a panel that is a 3P system with a converter module.

Table 75 Example: Temperature Measurement List - 3P System with Converter

TC Number	TC Location Number	Component	Actual Temp	Corr. for Ambient	Corr. Temp	Max Temp	Result OK/NG
1	1	Inverter Module #1	—	—	—	80 deg C	—
2	2	Inverter Module #1	65	12	77	80 deg C	OK
3	3	Inverter Module #1	—	—	—	80 deg C	—
4	4	Inverter Module #1	—	—	—	85 deg C	—
5	1	Inverter Module #2	—	—	—	80 deg C	—
6	2	Inverter Module #2	—	—	—	80 deg C	—
7	3	Inverter Module #2	—	—	—	80 deg C	—
8	4	Inverter Module #2	—	—	—	85 deg C	—
9	1	Inverter Module #3	—	—	—	80 deg C	—
10	2	Inverter Module #3	—	—	—	80 deg C	—
11	3	Inverter Module #3	—	—	—	80 deg C	—
12	4	Inverter Module #3	—	—	—	85 deg C	—
13	Drive Keypad	Heat sink Temp. U4-08	—	—	—	85 deg C	—
14	5	Converter Module	—	—	—	70 deg C	—
15	6	Converter Module	—	—	—	70 deg C	—
16	7	Converter Module	—	—	—	70 deg C	—
17	8	Converter Module	—	—	—	115 deg C	—
18	9	Converter Module	—	—	—	115 deg C	—
19	10	Inv Mod #1 Output Reactor	—	—	—	155 deg C	—
20	11	Inv Mod #1 Output Reactor	—	—	—	155 deg C	—
21	10	Inv Mod #2 Output Reactor	—	—	—	155 deg C	—
22	11	Inv Mod #2 Output Reactor	—	—	—	155 deg C	—
23	10	Inv Mod #3 Output Reactor	—	—	—	155 deg C	—
24	11	Inv Mod #3 Output Reactor	—	—	—	155 deg C	—
25	12	Power Supply Module	—	—	—	55 deg C	—
26	13	Control Assembly	—	—	—	55 deg C	—
27	14	Drive Panel	—	—	—	50 deg C	—
28	15	Drive Panel	—	—	—	50 deg C	—
29	16	Ambient	28	0	28	40 deg C	—

■ Test Preparation

- A method of loading the drive to its maximum output power and current rating will need to be developed in order to properly evaluate the temperatures. The heat run should be done at the maximum continuous output power and current. The output current and output kilowatts can be measured on the drive's operator keypad. Please refer to ***Table 76*** for ratings.
- The temperature measuring equipment must be within manufacturer's calibration period to ensure proper results. Only use calibrated equipment.
- The space surrounding the drive should have adequate ventilation so that the maximum ambient temperature for the drive enclosure is not exceeded.

Table 76 Maximum Continuous Ratings for Heat Run Drive Loading

	Number of Inv Modules	1	2	3	4	5	Notes
460 V	HD Rated Output Amps	414	800	1200	1600	2000	
	ND Rated Output Amps	466	900	1350	1800	2250	
	HD Motor HP Rating	350 HP	700 HP	1000 HP	1250 HP	1600 HP	<1>
	ND Motor HP Rating	400 HP	800 HP	1000 HP	1500 HP	1800 HP	<1>
	HD Drive Output kW	284	568	810	1013	1296	<2>
	ND Drive Output kW	324	648	810	1215	1458	<2>
575 V/690 V	Number of Inv Modules	1	2	3	4	5	
	HD Rated Output Amps	414	800	1200	1600	2000	
	ND Rated Output Amps	466	900	1350	1800	2250	
	HD Motor HP Rating	400 HP	800 HP	1250 HP	1600 HP	2000 HP	<1>
	ND Motor HP Rating	450 HP	900 HP	1400 HP	1800 HP	2250 HP	<1>
	HD Drive Output kW	324	648	1013	1296	1620	<2>
	ND Drive Output kW	365	729	1094	1458	1823	<2>

<1> HP rating is maximum applicable motor rating or mechanical motor power.
<2> kW is drive output kilowatts by monitor U1-08. Motor efficiency of 92% is assumed.

■ Test Execution

1. Set up the load and check that at rated output amps, the drive power is within 3% of published output kW in ***Table 76***.
2. Run the drive at rated load, monitoring the temperatures so that no maximums are exceeded during the test.
3. Wait until all of the measuring temperatures have stabilized and are following the ambient (temperature rise becomes constant). This typically takes 2.5 to 4 hrs depending on the cabinet design, etc.
4. Record the final temperatures in the recording chart and calculate the corrected temperatures for 40 deg C. The corrected for ambient temperature is compared to the maximum.
   Example: The top of heat sink temperature (location #2) of Inverter module #1 was recorded as 65 deg C with a 28 deg C ambient temperature (location 16). Correction for ambient is 40 - 28 = 12 deg C.
5. If any temperatures are outside the limit, investigate the root cause, correct, and re-run the test until all temperatures are checked OK.

12 Appendix-D Material Number Cross Reference

The A1000 HHP inverter modules and converter modules are manufactured in two locations. They are manufactured in Japan by YEC and they are manufactured in the USA by YAI at the Oak Creek facility. The form, fit, and function of these modules are the same regardless of place of manufacture.

The table *Table 77* below lists the cross reference between the two material numbers.

Table 77 Material Number Cross Reference Table

YEC MaterialNumber	Description	YAI Material Number	Description
EUJ71001☐	INVERTER MDL, HHP, 450A, 460V, VT, A1000	EUJ71069☐	INVERTER MDL,HHP, 450A, 460V, A1000
EUJ71002☐	INVERTER MDL, HHP, 450A, 690V, VT, A1000	EUJ71070☐	INVERTER MDL, HHP, 450A, 690V, A1000
EUJ71003☐	INVERTER/CONVERTER REGEN 400V HHP A1000	EUJ71071☐	INVERTER/CONVERTER MDL, HHP, 450A, 460V, A1000, REGEN
EUJ71004☐	INVERTER/CONVERTER REGEN 600/690V HHP A1000	EUJ71072☐	INVERTER/CONVERTER MDL,HHP, 450A, 690V, A1000, REGEN
EUJ71012☐	CONVERTER MDL, HHP, 600KW, A1000, 1P-2P	EUJ71073☐	CONVERTER MDL, HHP, 1350 A, A1000, 1P-2P
EUJ71013☐	CONVERTER MDL, HHP, 1500KW, A1000, 3P-4P	EUJ71074☐	CONVERTER MDL, HHP, 2300 A, A1000, 3P-4P
EUJ71014☐	CONVERTER MDL, HHP, 2650A, A1000, 5P	EUJ71075☐	CONVERTER MDL, HHP, 2650 A, A1000, 5P

Note: ☐= Minor revision number 0-9.

13 Appendix-E Voltage Signal Points

◆ Converter Module

Components: diodes, capacitors, thermistors and fans
All models have the following:

1. Input voltage range from 380 Vac - 690 Vac , 50/60 Hz, 3 phase.
   Input voltage connects to R/L1, S/L2, T/L3 and R1/L11, S1/L21, T1/L31 at the bottom of the module.
2. Output voltage is DC bus to the inverter modules.
   Output voltage connects to +1 and - bus bars at top of the module.
3. DC link reactor connects to PA and PB located at bottom of the module.
4. Cooling Fans

- External Fan for heat sink cooling, 24 VDC, 4.6 amps, variable speed up to 6800 RPM adjustable by factory access parameter L8-83
- Internal Fan for circuit board cooling, 24 VDC, 0.73 amps, fixed speed of 3350 RPM
- ETX711350 is dc/dc card from PS module to Fan on/off card
- CN49 is power from PS module, 300 VDC, pin 1, 300V, pin 4, 0V
- CN33 is power to Fan on/off card, CN33-1, 24 VDC, pin1and 2, 24V, red, pin 3 and 4, 0V, white
- ETX711300 is Fan on/off card.
- CN8-1 is control signals from and feedback to control module, pin1, 5V, pin5, 0V
- CN6-1 is power and speed control and feedback from external fan, pin1, 24V, pin2, 0V CN6-2 is power to and feedback from internal fan, pin1, 24V, pin3, 0V
- CN35-1 is temperature feedback to control module
- CN35-2 is temperature information from thermistor

5. Differences:

- EUJ710120 is used for 1P and 2 P systems (24 diodes and 12 capacitors)
- EUJ710131 is used for 3P and 4P systems (48 diodes and 24 capacitors)
- EUJ710140 is used for 5P systems (72 diodes and 36 capacitors)

◆ Inverter Module

Components: bus caps, soft charge resistor, bypass contactor, IGBTs, DCCTs, DC bus fuses, balance resistors, discharge resistors, and fans
All models have the following:

1. Input voltage to DC bus connections, +1 and — at top of the module.
2. Output voltage is PWM signal to motor on U/T1, V/T2, W/T3 connections at the bottom of the module. DCCT's monitor the current of each output phase.

- U phase DCCT is connected to CN15-1 on gate drive card
- V phase DCCT is connected to CN15-2 on gate drive card
- W phase DCCT is connected to CN15-3 on gate drive card

3. DC bus fuses are connected between the negative side of IGBTs and negative bus. There are two fuses (Ferraz type) in parallel. The 480 Volt inverter module uses catalog number 10URD71D11A0630, rated at AC1000V and 630 amps each. The 575/690 Volt inverter module uses catalog number 11URD72D11A0630, rated at AC1100V and 630 amps each. Parameter CN58 on the gate drive card is the sensor input to determine if fuses are blown.
4. Cooling Fans

- External Fan for heat sink cooling, 24 VDC, 4.6 amps, variable speed up to 6800 RPM adjustable by factory access parameter L8-83
- Internal Fan for circuit board cooling, 24 VDC, 0.73 amps, fixed speed of 3350 RPM
- ETX711350 is power supply card to and from gate drive card
- CN49 is power from gate drive, 300 VDC, pin 1, 300V, pin4, 0V
- CN33 is power to gate drive, CN33-1, 24 VDC pin1 and 2, 24V, red, pin 3 and 4, 0V, white

• Gate drive card controls both the external and internal fans directly.
• CN6-1 is power and speed control and feedback from external fan, pin1, 24V, pin2, 0V
• CN6-4 is power to and feedback from internal fan, pin1, 24V, pin3, 0V
5. DC bus capacitors
Bus caps are connected between +1 and — bus connections.
• 480 Volt inverter modules have 8 DC bus caps, (4 pairs), 12,300uF, 400V each
• 575/690 Volt inverter modules have 16 DC bus caps, (8 pairs), 4,400uF, 600V each
6. Soft charge resistor and bypass contactor (not in regen modules).
• The soft charge resistor value is 1 Ohm, 500 Watts
• CN13 on gate drive card is control signal output to bypass contactor
• CN 36-1 on gate drive card is answerback that contactor is on or off
7. There are two DC bus balance resistors, 6kOhms, 120 Watts each.
• CN58 on gate drive board is the R3 resistor, between the P side and caps middle
• CN59 on gate drive board is the R2 resistor, between the caps middle and N side
8. There are two DC bus discharge resistors, 15kOhms, 220 Watts each.
• CN37 on gate drive board is the R5 resistor
• CN38 on gate drive board is the R4 resistor
9. Differences:
• EUJ710010 inverter module is used for 480 Volt systems
• EUJ710020 inverter module is used for 575/690 Volt systems
• EUJ710030 regen inverter/converter module is used for 480 Volt regen systems (Does not have soft charge resistor or bypass contactor in it)
• EUJ710040 regen inverter/converter module is used for 575/690 Volt regen systems (Does not have soft charge resistor or bypass contactor in it)

◆ Power Supply Module, Tap Change PCB

This board takes the incoming single phase AC voltage and converts it to 300 VDC for various uses in the system.

All models have the following:

1. Input voltage is always single phase to terminal TB1. For 200-230 volt input, use T1 and T2. For 380-480 volt input, use T1 and T3. For 500-690 volt input, use T1 and T3.
2. There are two fuses on the board. They are Bussmann fuses. Fuse F1 is for the incoming AC voltage, model LP-CC-30, rated 600 Volts at 30 amps. Fuse F2 is for the outgoing DC voltage, model LP-CC-25 and is rated 600 Volts at 25 amps.
3. DC voltage outputs.
The tap change board generates 300 VDC to be used in various parts of the system.
• CN32-1 is connected to CN32 of the voltage detection board. Pin1, 300V, pin3, 0V
• CN32-2 through CN32-6 are connected to inverter modules 1-5. Pin1, 300V, pin3, 0V
• CN32-7 is connected to CN32 control module power supply card. Pin1, 300V, pin3, 0V
• CN49-1 is connected to the CN49 on the converter module. Pin1, 300V, pin3, 0V
• CN49-2 and CN49-3 are not used
4. Ride through capacitors
• There are two capacitors, 12,300uF, 400V each, that keep 300VDC output voltage level steady in the event of a momentary power loss to the input of the power supply module
• The capacitors are connected to CN62-1, P, and CN62-2, N, terminals
5. Soft charge resistor
• There is a resistor, 0.3 Ohm, 120 Watts, connected to REG-1 and REG-2 terminals to charge the capacitors efficiently on power up
6. Differences:
• EUS700010 is the power supply module for 480 volt systems
• EUS700020 is the power supply module for 575/690 volt systems

◆ Power Supply Module, Voltage Detection Card

This board is used to monitor voltage and phase in various parts of the system.

All models have the following:

1. CN64 is not used.
2. CN47 monitors the pwm output signal on U, V, W inverter module outputs.
3. CN34 monitors the 3 phase incoming voltage amplitude and phase on R, S, and T.
4. CN63 monitors the DC bus level, pin1, DC+, pin5, DC-
5. CN16 supplies the output signal to be used for the charge LED. The LED is Off when the DC bus level is below 50 Volts. pin1, LED+, pin2, LED -
6. CN67 sends the amplitude of the incoming voltage, R, S, T, and outgoing PWM on U, V, W out to the control module as well as 5 Volts, +5 Volts, and 15- Volts.
7. CN68 sends the phase of the incoming voltage R, S, T out to the control module.

◆ Control Module, Control PCB

Components: digital I/O, analog I/O, relay outputs, safety inputs and outputs, RS232, operator interface, option cards interface, control signals for inverter modules, converter fan control, voltage detection card interface, voltage supplies from power supply card

All models have the following:

1. Digital I/O and analog I/O on connectors CN9 and CN10
2. Relay outputs on TB2.
3. Safety input and safety monitor output on TB3.
4. RS232 connections on TB4.
5. Digital Operator interface card connects to CN3. Digital operator plugs in to interface card on CN2-1.
6. Option cards plug in to CN5-A, CN5-B, CN5-C.
7. Control signals and feedback signals for inverter modules 1-5 connect to CN7-1TRM through CN7-5TRM.
8. Converter fan control is output on CN8.
9. Converter temperature monitor is on CN17.
10. Voltage detection card interfaces on CN67 and CN68 to provide amplitude and phase information for AC inputs, DC bus, and PWM outputs to control module.
11. Voltages from power supply card are on CN11 and CN12 for 5V, 24V, +15V, and -15V.
12. Differences:

- EUA710010 control module is used for A1000 systems
- EUA710020 control module is used for D1000 regen systems (It does not have analog inputs available)

◆ Control Module, Power Supply Card

The control module has a power supply card on it for voltages needed on the control PCB as well as the gate drive boards on the various inverter modules.

All models have the following:

1. Voltages to control PCB are on CN11 and CN12 for 5V, 24V, +15V, and -15V.
2. Voltages are supplied to the gate drive boards of each inverter module on CN61-1 through CN61-5. These voltages are 5 Volts, +15 Volts and -15 Volts.
3. Separate ground connections are supplied to the gate drive boards of each inverter module on CN55-1 through CN55-5.
4. Incoming 300 VDC is supplied on connector CN32 from the power supply module tap change pcb connector CN32-7.
5. The charge LED is powered by connector CN16-2. The signal for the LED comes to connector CN16-1 from the voltage detection card connector CN16.

◆ Voltage Signal Points

■ Pre Charge Module (Regen Systems Only)

The pre charge module is used to regulate the charging of the DC bus on power up of the system. In regen HHP systems, it is a separate module that is mounted under the regen converter module. Each regen converter module has its own pre charge module connected to it. The pre charge module model number is EUJ710210.

All models have the following:

1. CN511 has the control signals for the contactors in the pre charge circuit. Pin 1, 24V, and pin 2, 0V is the control signal for contactor, K1, in line R/L1 of the incoming three phase voltage. Pin 3, 24V, and pin 4, 0V, is the control signal for contactor, K2, in line S/L2 of the incoming three phase voltage. This wiring cable connects back to CN13 on the inverter module.
2. CN512 has the answer back signal that contactor K1 is open or closed in line R/L1 of the incoming three phase voltage. Pin1 is the red wire and Pin 4 is black wire. This wiring cable connects back to CN36-1 on the inverter module.
3. CN513 has the answer back signal that contactor K2 is open or closed in line S/L2 of the incoming three phase voltage. Pin1 is the red wire and Pin 4 is black wire. This wiring cable connects back to CN36-2 on the inverter module.
4. There are two pre charge resistors rated at 1 Ohm, 500 Watts each, in series across K1 contacts and two pre charge resistors in series across K2 contacts. These resistors are in circuit on power up to limit current flow to the charging DC bus capacitors and are removed from the circuit when DC bus voltage reaches the under voltage detection level, set in parameter L2-05. The level is dependent on the input voltage. The level for 480 V input is 380 VDC. The level for 575/600 V input is 475 VDC and the level for 690 V input is 570 VDC.

14 Appendix-F Elementary Drawings

Table 78 Index of Panel Elementary Drawings (Non-Regen Systems)

Drawing Number	Model No.	Drawing Name
EPJ011710U	CIMR-AU4H0466	(480V, 1P) A1000 HHP AC Input w/Rectifier
EPJ011720U	CIMR-AU4H0900	(480V, 2P) A1000 HHP AC Input w/Rectifier
EPJ011730U	CIMR-AU4H1350	(480V, 3P) A1000 HHP AC Input w/Rectifier
EPJ011740U	CIMR-AU4H1800	(480V, 4P) A1000 HHP AC Input w/Rectifier
EPJ011750U	CIMR-AU4H2250	(480V, 5P) A1000 HHP AC Input w/Rectifier
EPJ011760U	CIMR-AU6H0466	(575/690V, 1P) A1000 HHP AC Input w/Rectifier
EPJ011770U	CIMR-AU6H0900	(575/690V, 2P) A1000 HHP AC Input w/Rectifier
EPJ011780U	CIMR-AU6H1350	(575/690V, 3P) A1000 HHP AC Input w/Rectifier
EPJ011790U	CIMR-AU6H1800	(575/690V, 4P) A1000 HHP AC Input w/Rectifier
EPJ011800U	CIMR-AU6H2250	(575/690V, 5P) A1000 HHP AC Input w/Rectifier

Table 79 Index of Panel Elementary Drawings (Regen Systems)

Drawing Number	Model No.	Drawing Name
EPJ011810U	CIMR-DU4H0466	(480V, 1P, Regen) Overview
EPJ011910U	CIMR-DU4H0466	(480V, 1P, Regen) ACL Regen Filter Panel
EPJ012010U	CIMR-DU4H0466	(480V, 1P, Regen) D1000 Regen Panel
EPJ012110U	CIMR-DU4H0466	(480V, 1P, Regen) A1000 Inverter Panel
EPJ011820U	CIMR-DU4H0900	(480V, 2P, Regen) Overview
EPJ011920U	CIMR-DU4H0900	(480V, 2P, Regen) ACL Regen Filter Panel
EPJ012020U	CIMR-DU4H0900	(480V, 2P, Regen), D1000 Regen Panel
EPJ012120U	CIMR-DU4H0900	(480V, 2P, Regen), A1000 Inverter Panel
EPJ011830U	CIMR-DU4H1350	(480V, 3P, Regen) Overview
EPJ011930U	CIMR-DU4H1350	(480V, 3P, Regen) ACL Regen Filter Panel
EPJ012030U	CIMR-DU4H1350	(480V, 3P, Regen), D1000 Regen Panel
EPJ012130U	CIMR-DU4H1350	(480V, 3P, Regen), A1000 Inverter Panel
EPJ011840U	CIMR-DU4H1800	(480V, 4P, Regen) Overview
EPJ011940U	CIMR-DU4H1800	(480V, 4P, Regen) ACL Regen Filter Panel
EPJ012040U	CIMR-DU4H1800	(480V, 4P, Regen), D1000 Regen Panel
EPJ012140U	CIMR-DU4H1800	(480V, 4P, Regen), A1000 Inverter Panel
EPJ011850U	CIMR-DU4H2250	(480V, 5P, regen) Overview
EPJ011950U	CIMR-DU4H2250	(480V, 5P, regen) ACL regen filter panel
EPJ012050U	CIMR-DU4H2250	(480V, 5P, Regen), D1000 Regen Panel
EPJ012150U	CIMR-DU4H2250	(480V, 5P, Regen), A1000 Inverter Panel
EPJ011860U	CIMR-DU6H0466	(575/690V, 1P, regen) Overview
EPJ011960U	CIMR-DU6H0466	(575/690V, 1P, Regen) ACL Regen Filter Panel
EPJ012060U	CIMR-DU6H0466	(575/690V, 1P, Regen), D1000 Regen Panel
EPJ012160U	CIMR-DU6H0466	(575/690V, 1P, Regen), A1000 Inverter Panel
EPJ011870U	CIMR-DU6H0900	(575/690V, 2P, Regen) Overview
EPJ011970U	CIMR-DU6H0900	(575/690V, 2P, Regen) ACL Regen Filter Panel
EPJ012070U	CIMR-DU6H0900	(575/690V, 2P, Regen), D1000 Regen Panel
EPJ012170U	CIMR-DU6H0900	(575/690V, 2P, Regen), A1000 Inverter Panel
EPJ011880U	CIMR-DU6H1350	(575/690V, 3P, Regen) Overview
EPJ011980U	CIMR-DU6H1350	(575/690V, 3P, Regen) ACL Regen Filter Panel

Drawing Number	Model No.	Drawing Name
EPJ012080U	CIMR-DU6H1350	(575/690V, 3P, Regen), D1000 Regen Panel
EPJ012180U	CIMR-DU6H1350	(575/690V, 3P, Regen), A1000 Inverter Panel
EPJ011890U	CIMR-DU6H1800	(575/690V, 4P, Regen) Overview
EPJ011990U	CIMR-DU6H1800	(575/690V, 4P, Regen) ACL Regen Filter Panel
EPJ012090U	CIMR-DU6H1800	(575/690V, 4P, Regen), D1000 Regen Panel
EPJ012190U	CIMR-DU6H1800	(575/690V, 4P, Regen), A1000 Inverter Panel
EPJ011900U	CIMR-DU6H2250	(575/690V, 5P, Regen) Overview
EPJ012000U	CIMR-DU6H2250	(575/690V, 5P, Regen) ACL Regen Filter Panel
EPJ012100U	CIMR-DU6H2250	(575/690V, 5P, Regen), D1000 Regen Panel
EPJ012200U	CIMR-DU6H2250	(575/690V, 5P, Regen), A1000 Inverter Panel

Table 80 Index of Inverter (Power) Module Drawings

Drawing Number	Drawing Name
EUJ710010R	480V Inverter Drive Module
EUJ710020R	575/690V Inverter Drive Module
EUJ710030R	480V Inverter/Regen Converter Module
EUJ710040R	575/690V Inverter/Regen Converter Module

Table 81 Index of Converter Module Drawings

Drawing Number	Drawing Name
EUJ710120R	Converter for 1P and 2P Systems
EUJ710131R	Converter for 3P and 4P Systems
EUJ710140R	Converter for 5P Systems

Table 82 Index of Power Supply Module Drawings

Drawing Number	Drawing Name
EUS700010R	480V Power Supply Module
EUS700020R	575/690V Power Supply Module

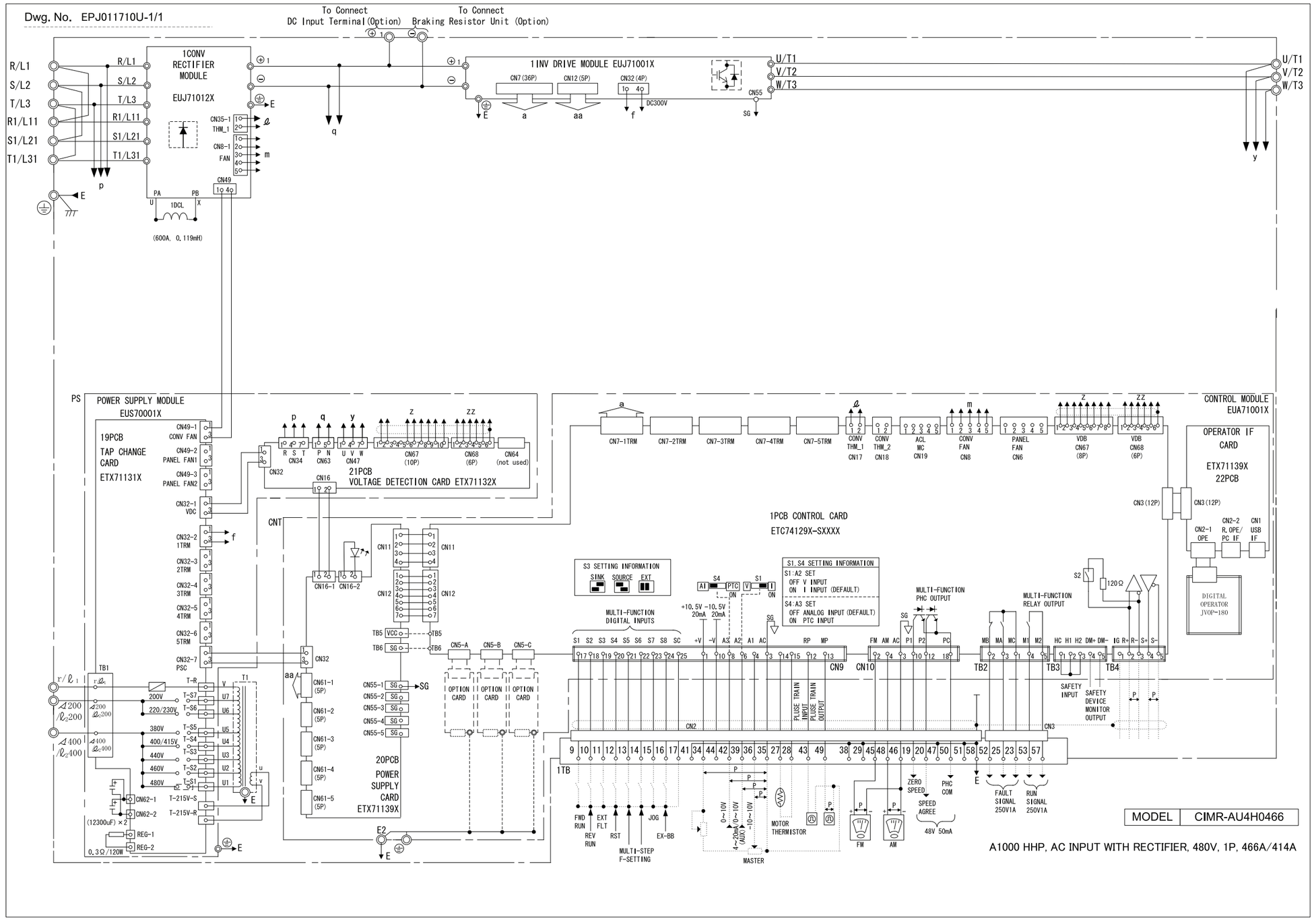
Table 83 Index of Control Module Drawings

Drawing Number	Drawing Name
EUA710010R	A1000 Control Module for Inverter Control
EUA710020R	D1000 Regen Control Module for Regen Converter Control

Table 84 Pre Charge Module Drawing for Regen Systems

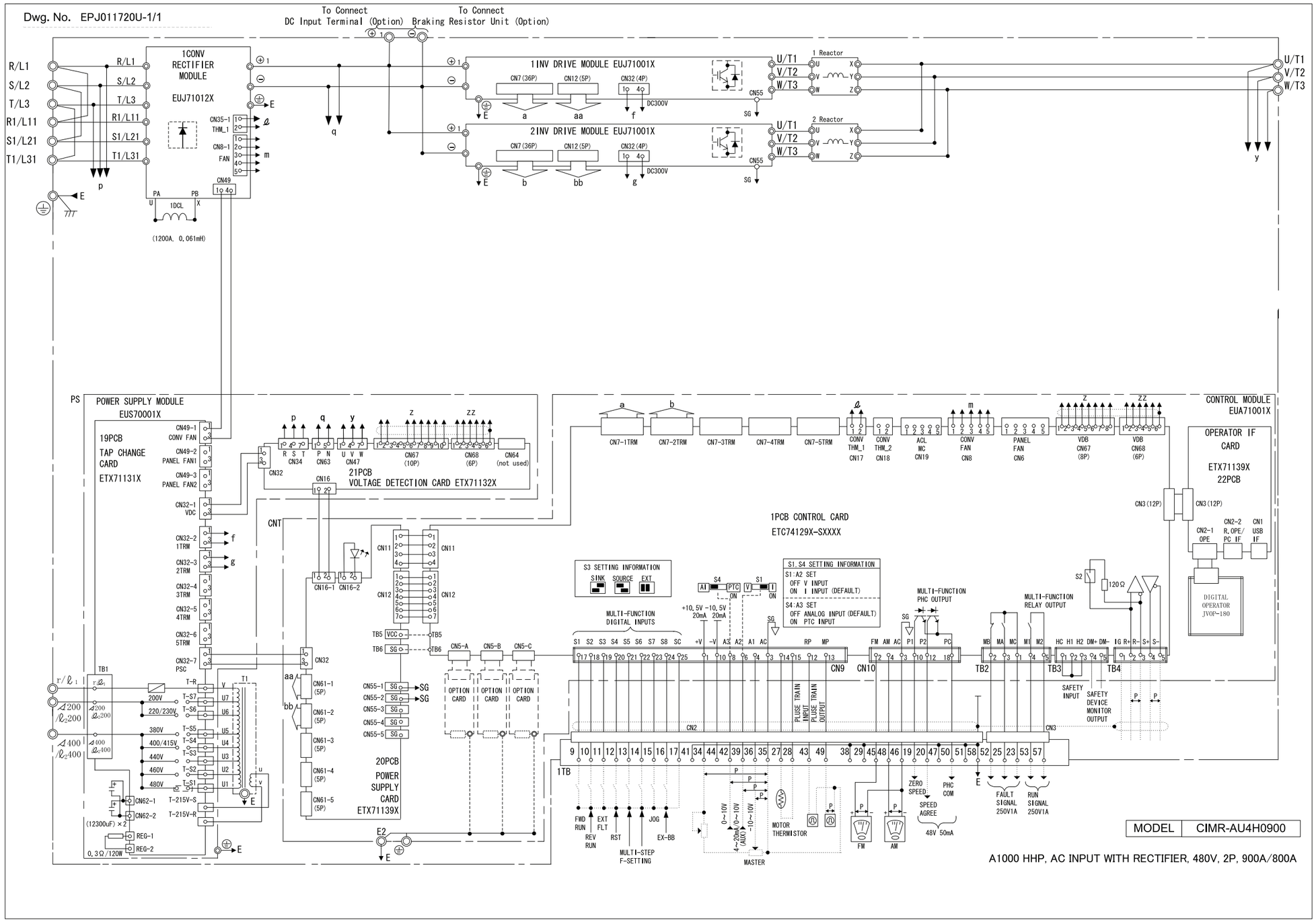
Drawing Number	Drawing Name
EUJ710210R	Pre Charge Module for Regen Systems

Model No. CIMR-AU4H0466 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 480V, 1P, 466A/414A
Dwg. No. EPJ011710U 1/1



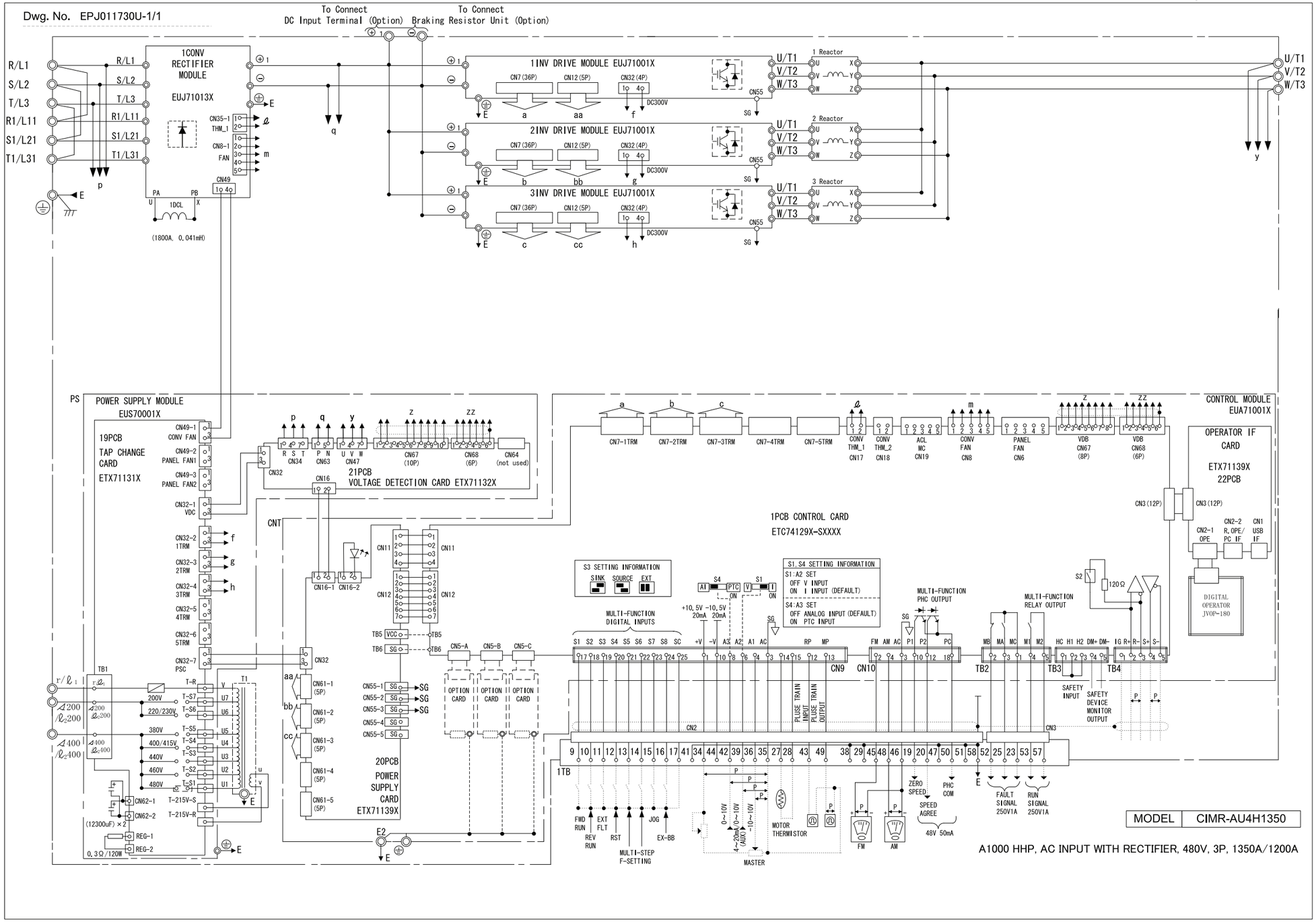
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Model No. CIMR-AU4H0900 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 480V, 2P, 900A/800A
Dwg. No. EPJ011720U 1/1



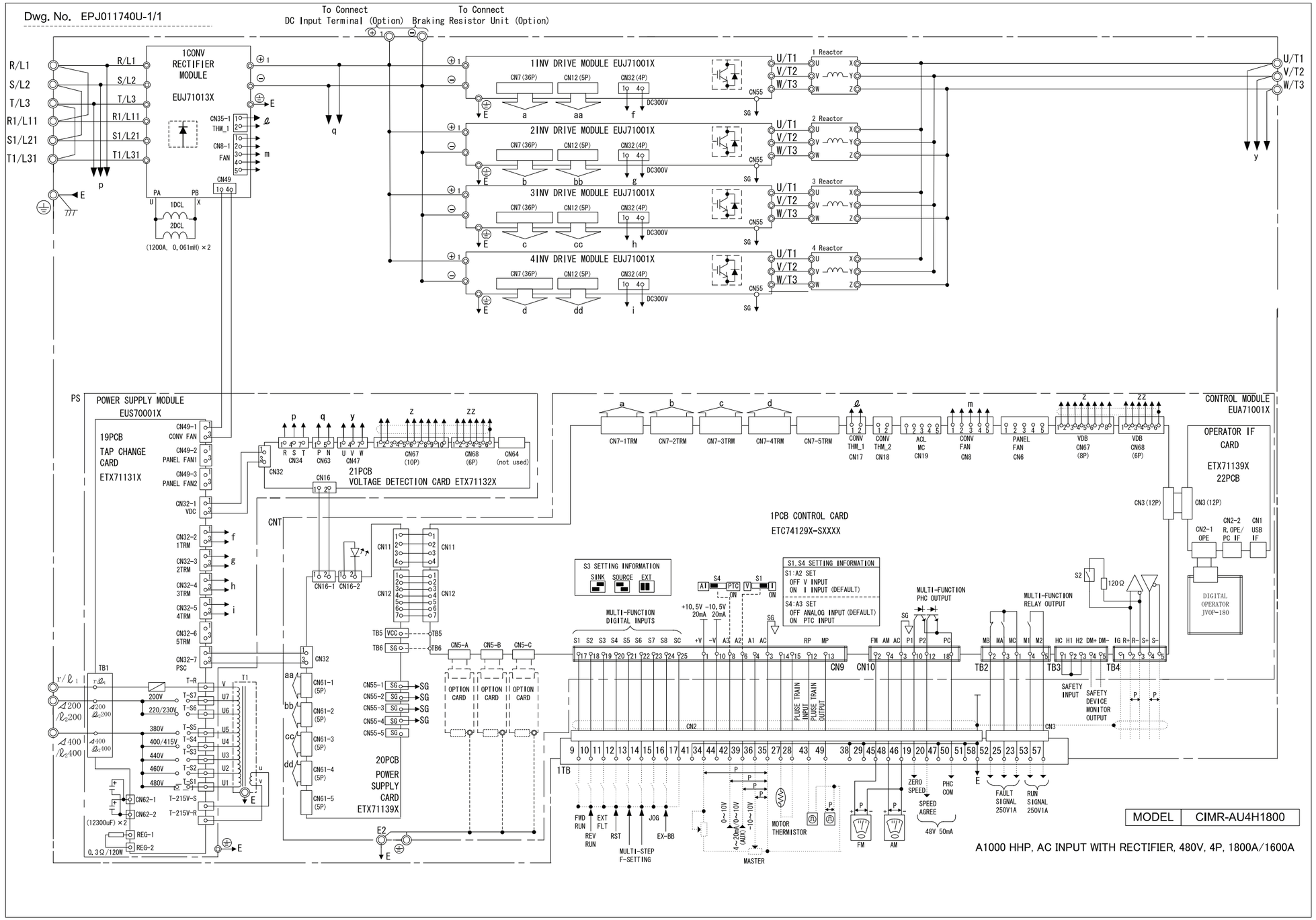
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Model No. CIMR-AU4H1350 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 480V, 3P, 1350A/1200A
Dwg. No. EPJ011730U 1/1



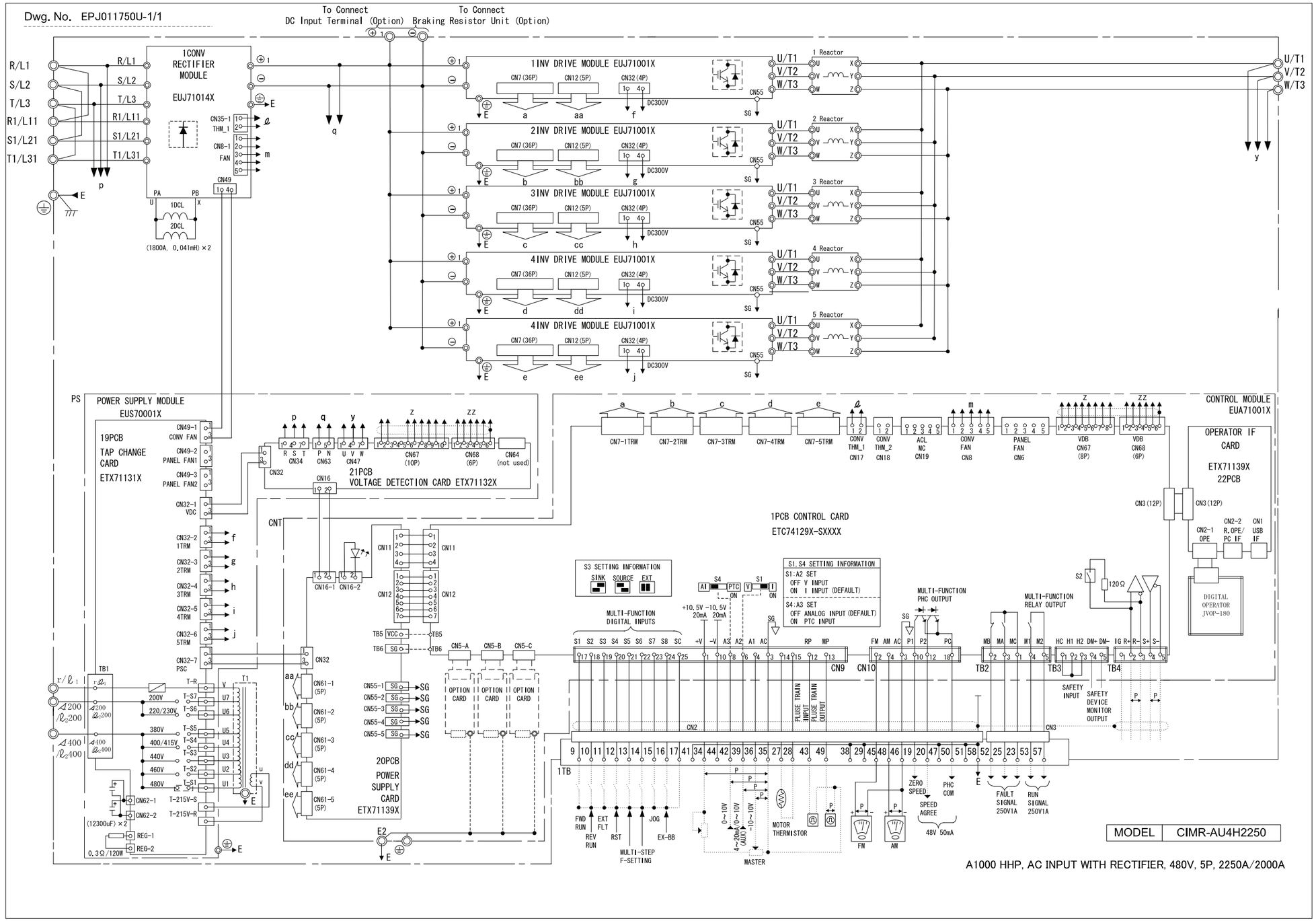
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Model No. CIMR-AU4H1800 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 480V, 4P, 1800A/1600A
Dwg. No. EPJ011740U 1/1



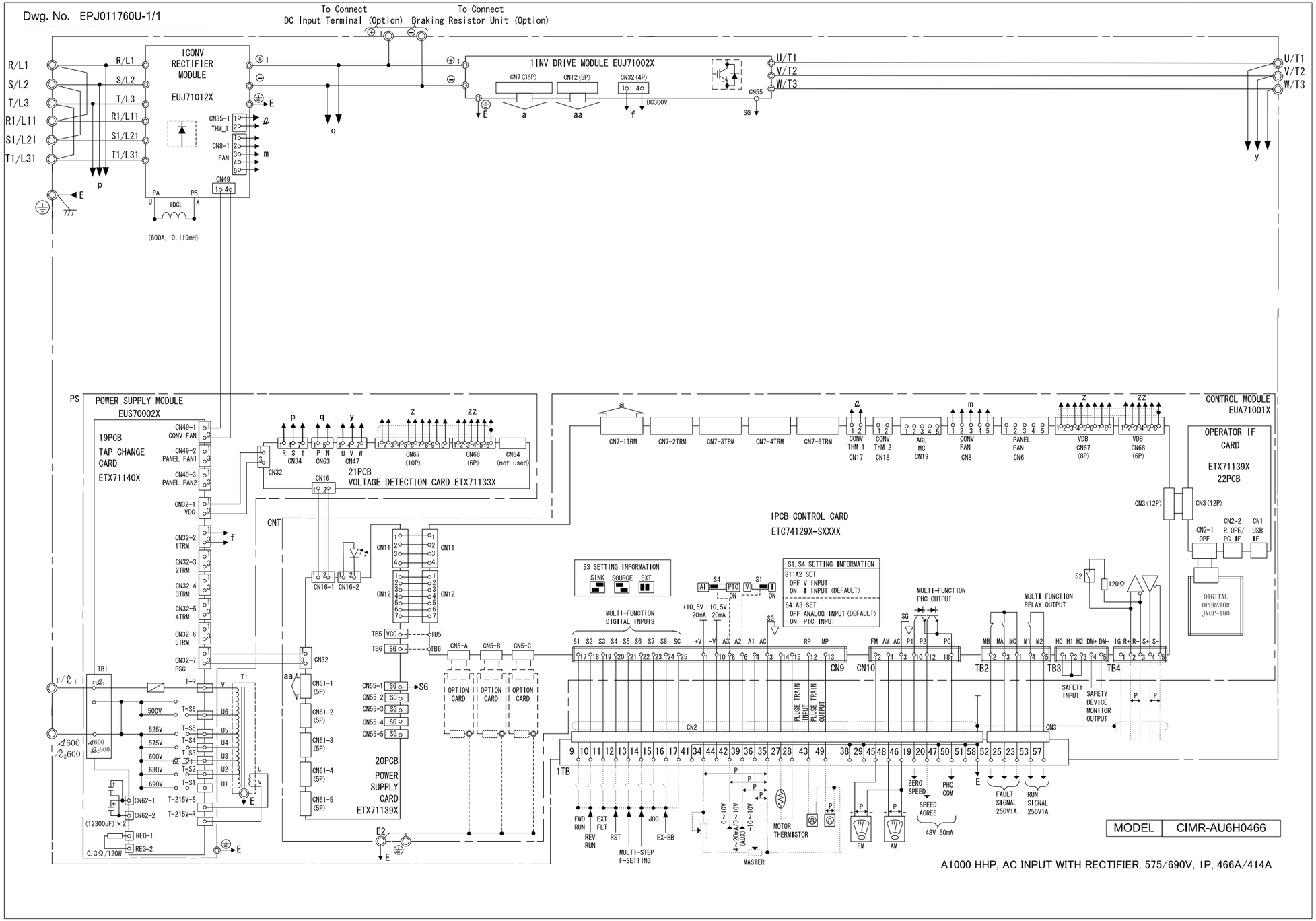
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Model No. CIMR-AU4H2250 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 480V, 5P, 2250A/2000A
Dwg. No. EPJ011750U 1/1



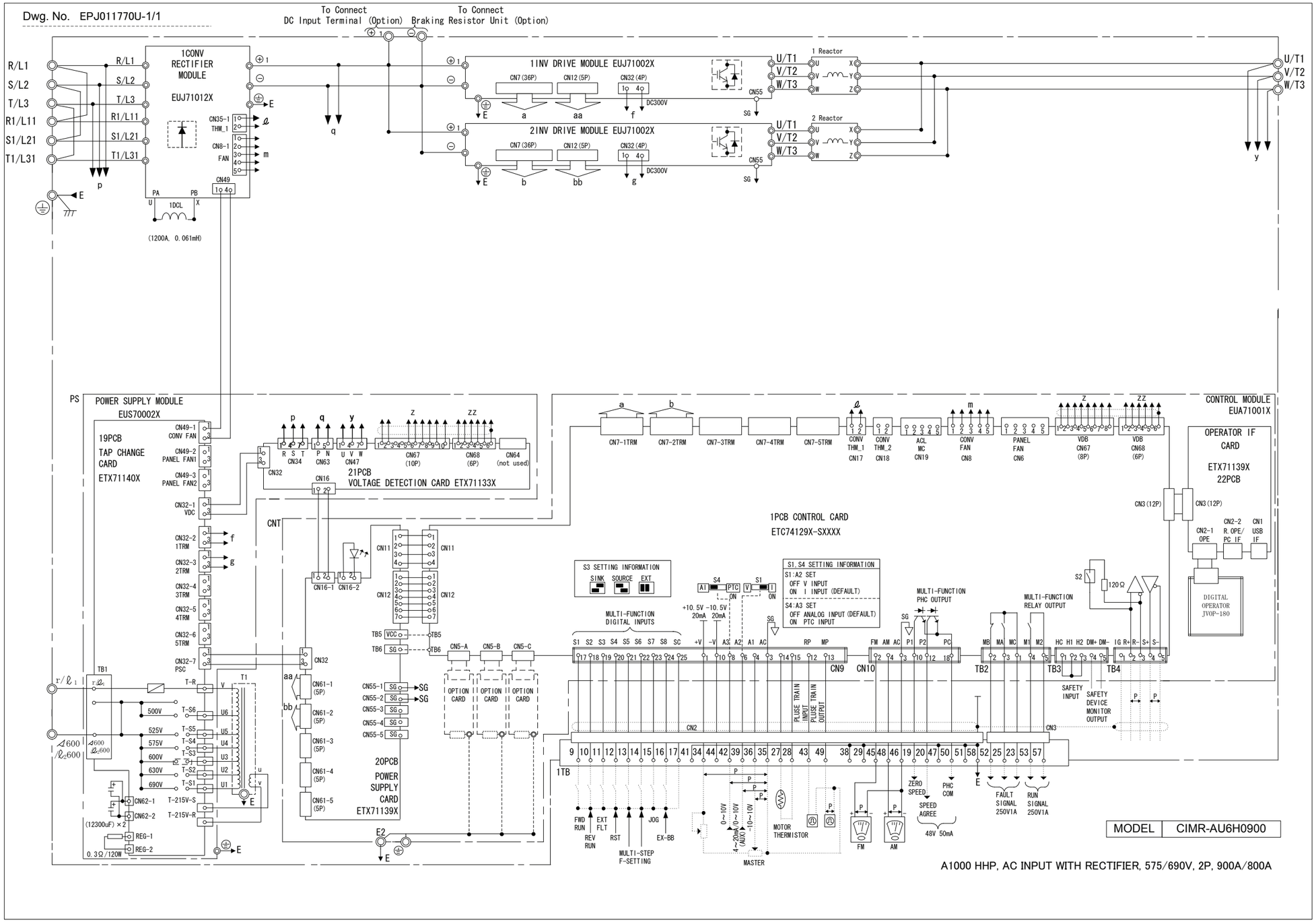
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Model No. CIMR-AU6H0466 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 575/690V, 1P, 466A/414A
Dwg. No. EPJ011760U 1/1



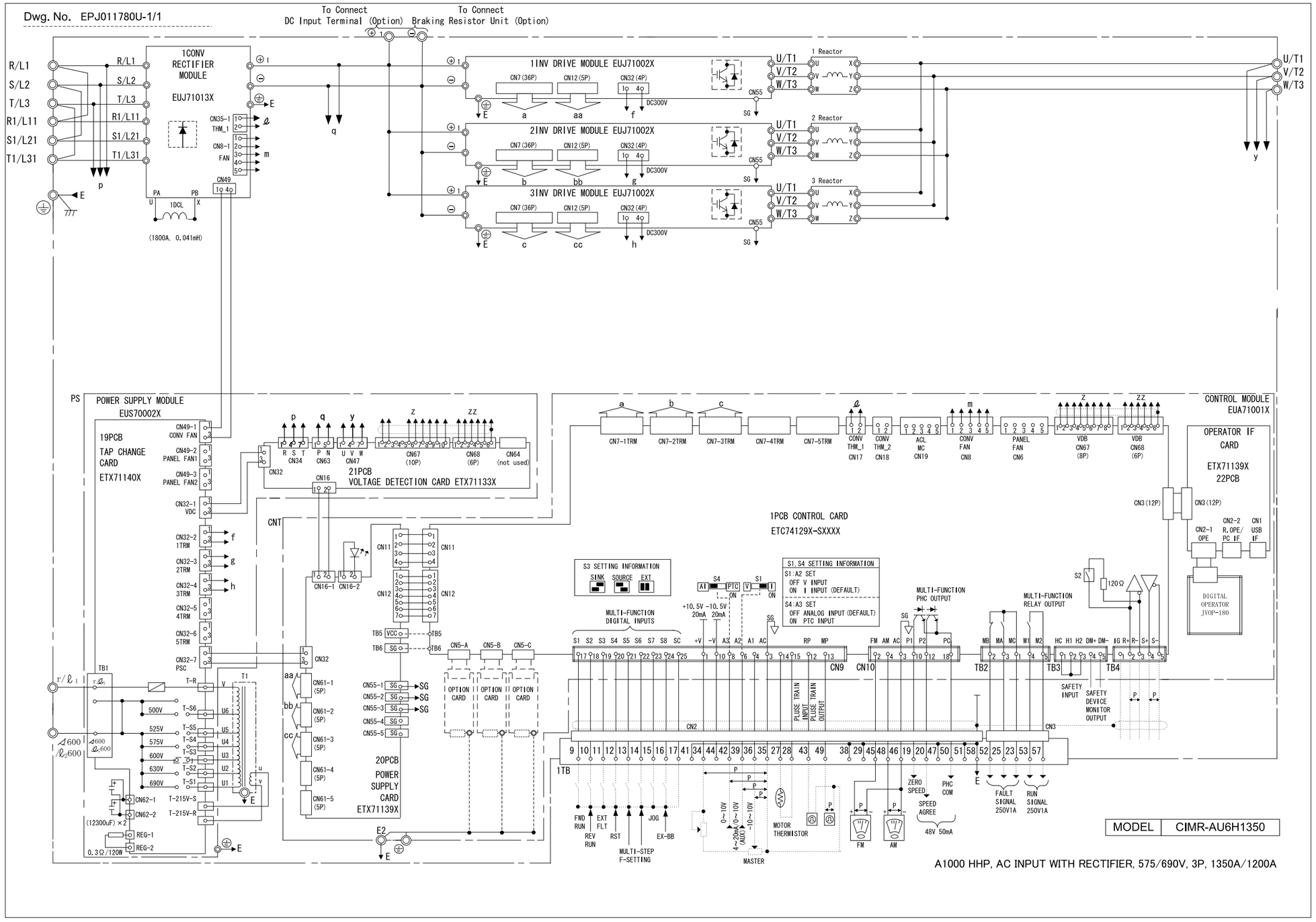
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Model No. CIMR-AU6H0900 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 575/690V, 2P, 900A/800A
Dwg. No. EPJ011770U 1/1



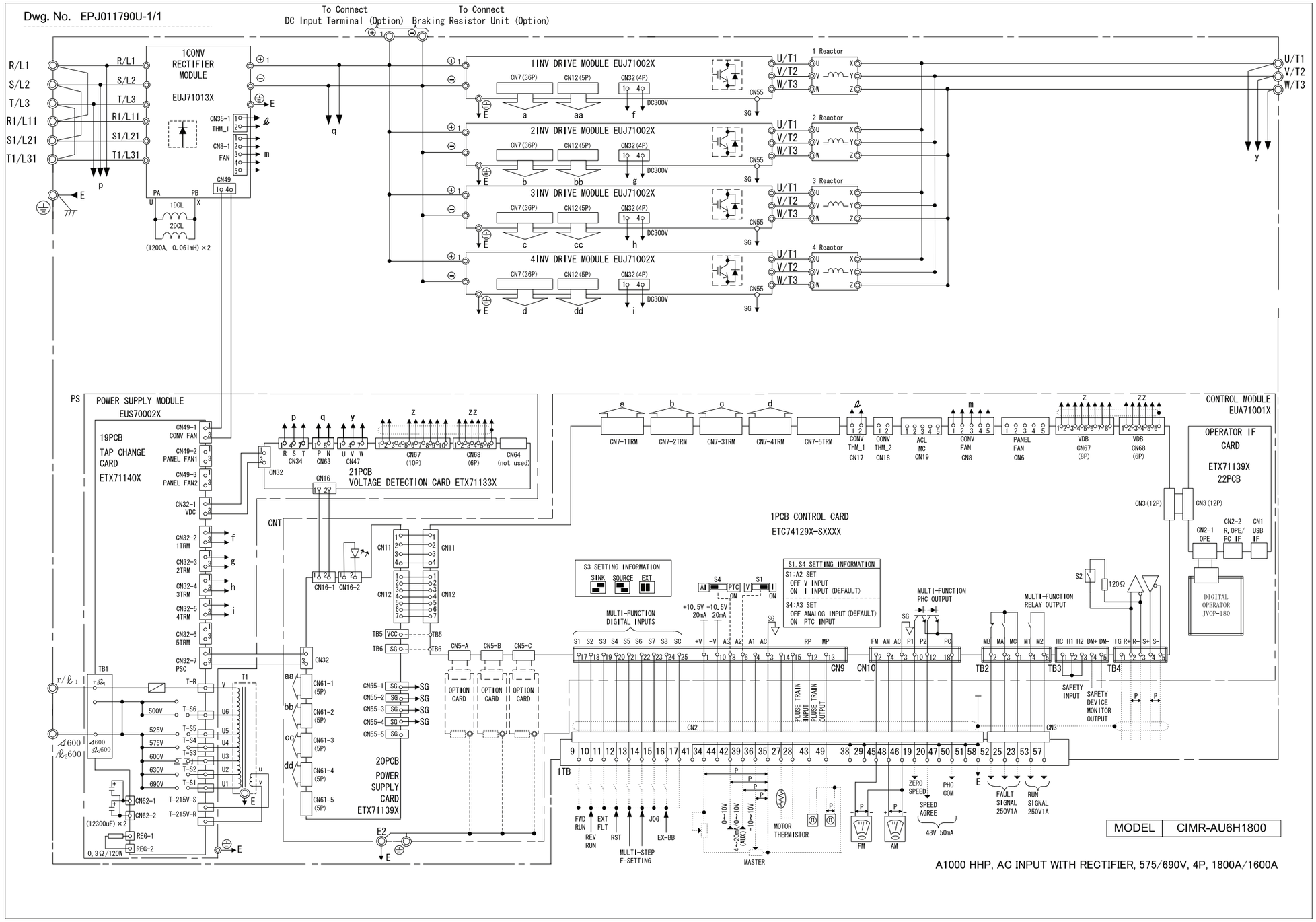
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Model No. CIMR-AU6H1350 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER,
575/690V, 3P, 1350A/1200A
Dwg. No. EPJ011780U 1/1



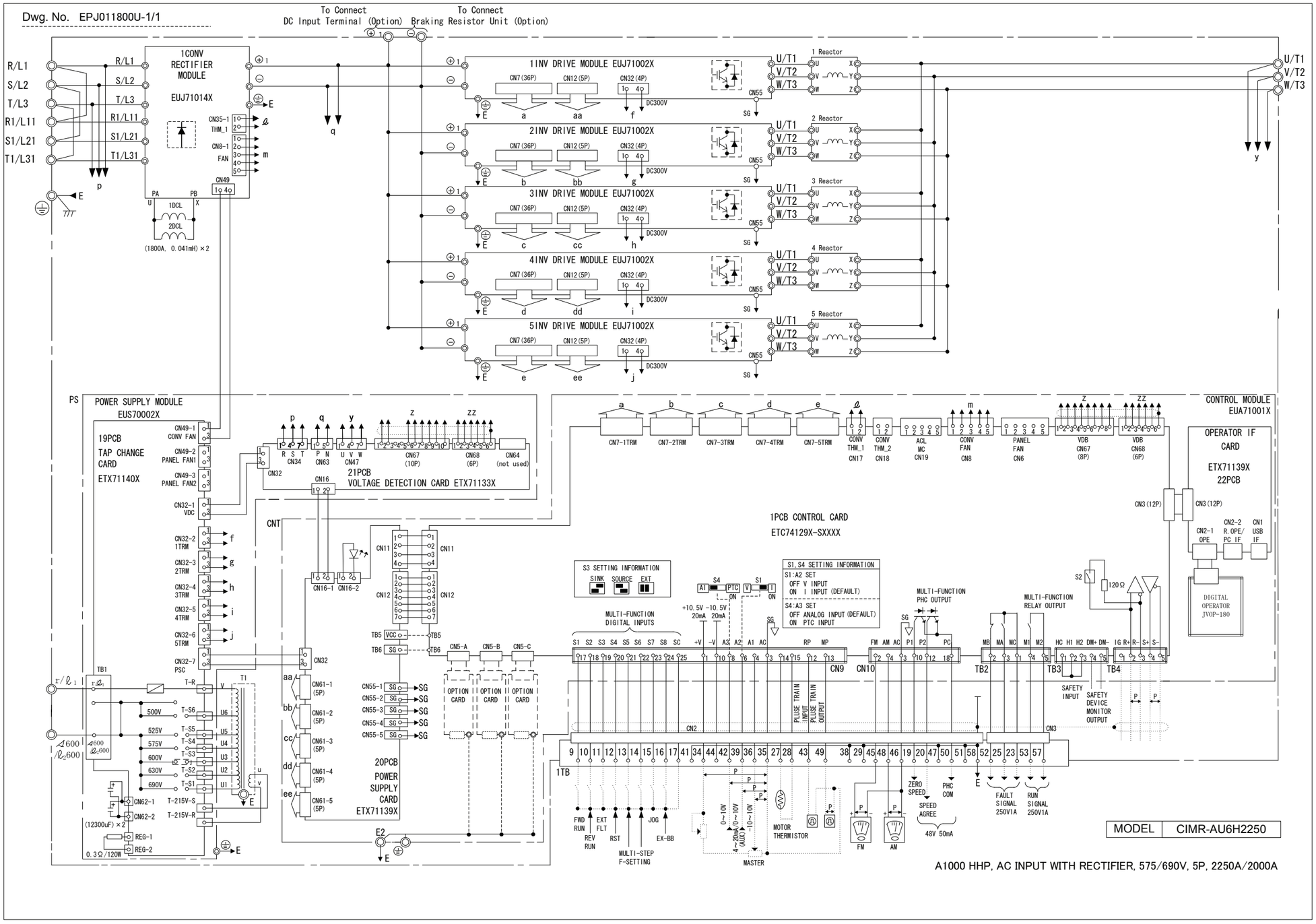
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Model No. CIMR-AU6H1800 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER, 575/690V, 4P, 1800A/1600A
Dwg. No. EPJ011790U 1/1



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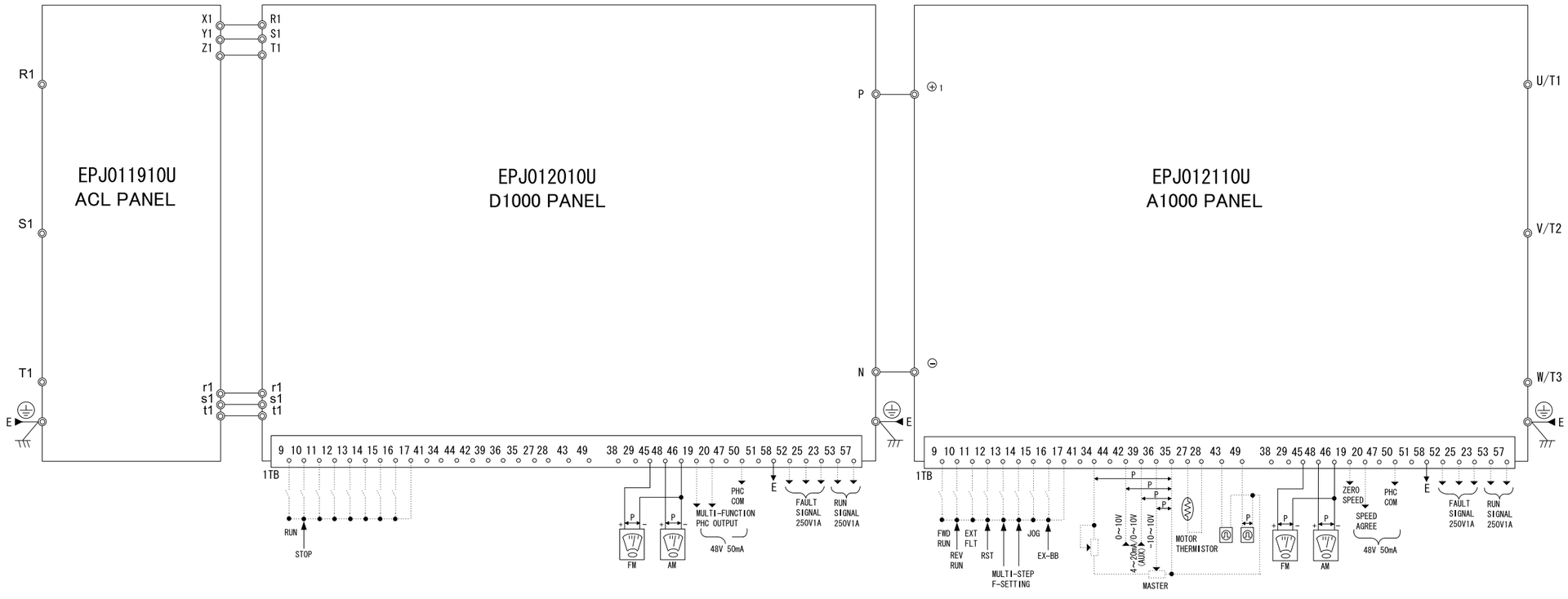
Model No. CIMR-AU6H2250 (Non-Regen)
A1000 HHP, AC INPUT WITH RECTIFIER,
575/690V, 5P, 2250A/2000A
Dwg. No. EPJ011800R 1/1



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Model No. CIMR-DU4H0466 Regen Systems
A1000 HHP, AC INPUT WITH D1000,
480V, 1P, 466A/414A
Dwg. No. EPJ011810U 1/1

Dwg. No. EPJ011810U-1/1



A1000HHP, AC INPUT WITH D1000, 480V, 1P, 466A/414A

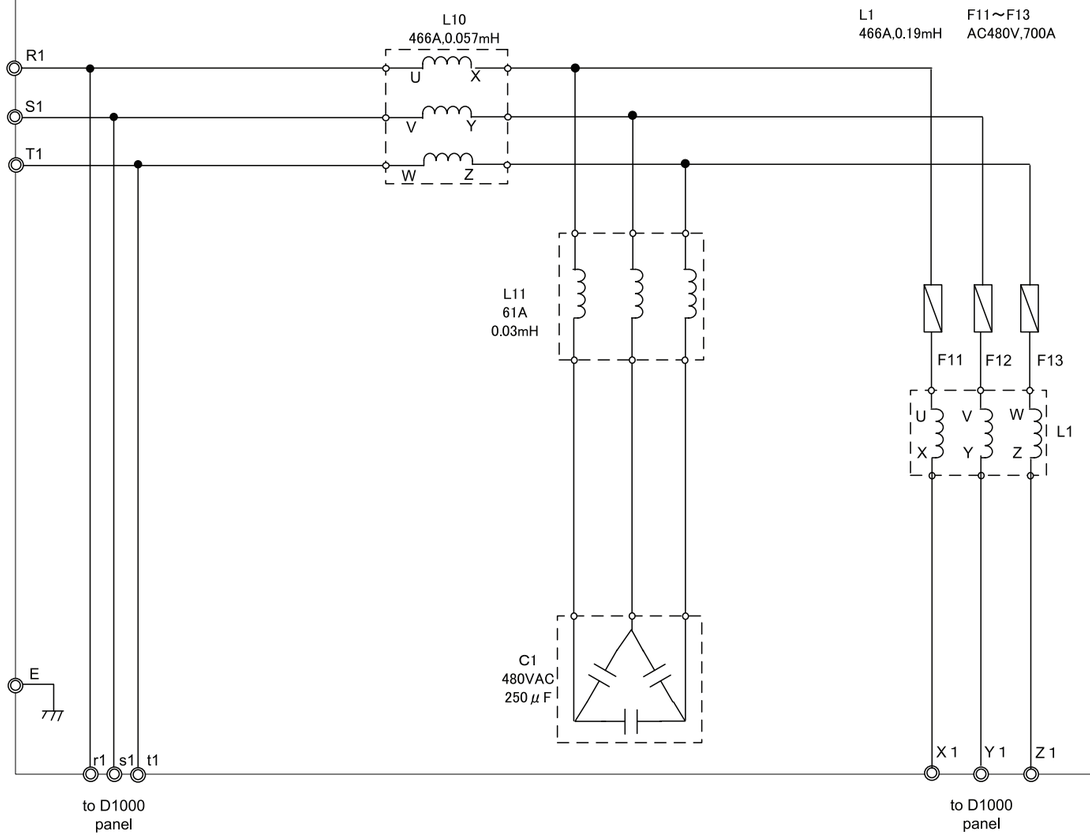
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU4H0466

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Model No. CIMR-DU4H0466 Regen Systems
D1000 HHP, ACL Regen Filter Panel,
480V, 1P, 466A/414A
Dwg. No. EPJ011910U 1/1

Dwg. No. EPJ011910U-1/1

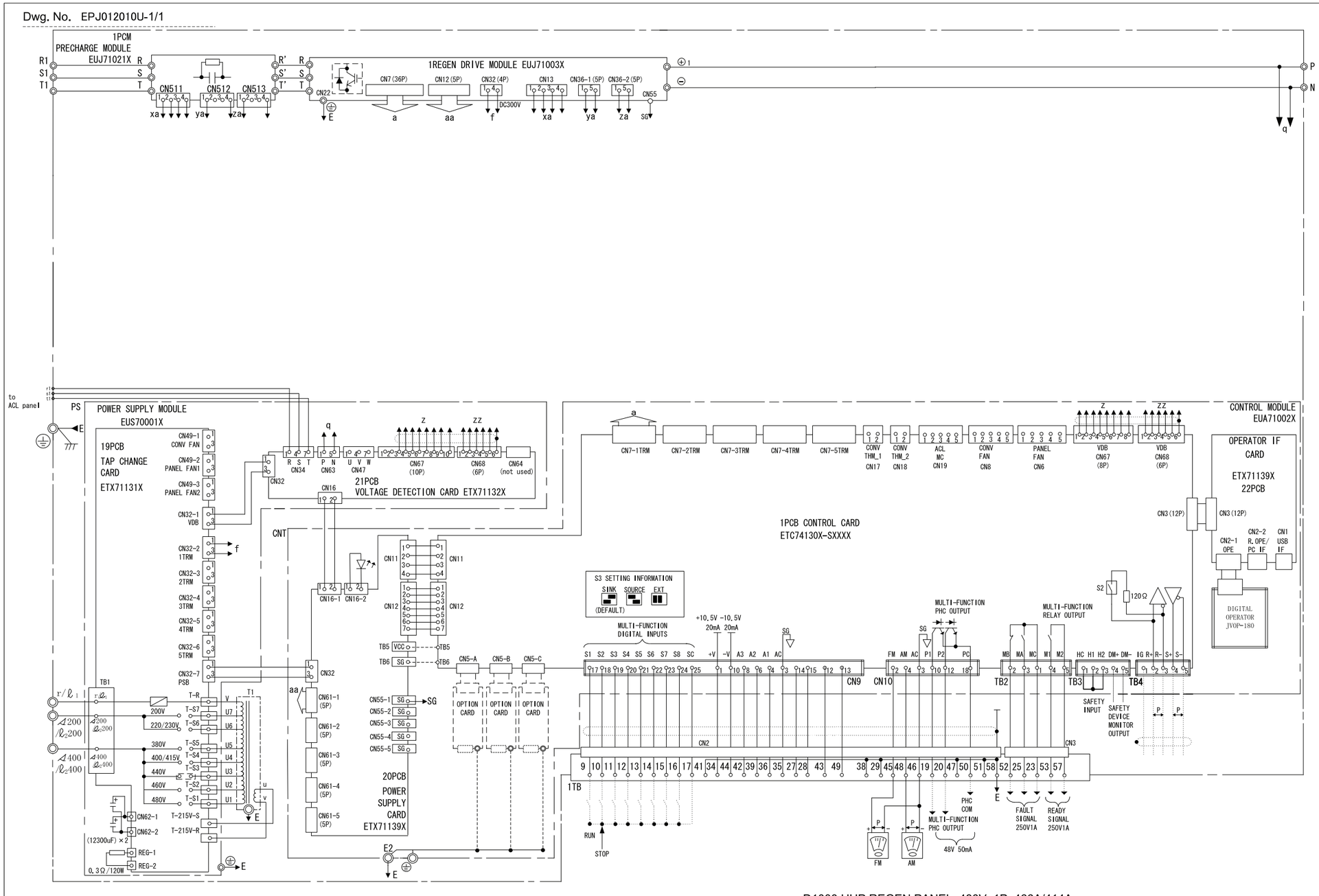


ACL PANEL FOR D1000 HHP, 480V, 1P, 466A/414A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H0466 Regen Systems
D1000 HHP, Regen Panel,
480V, 1P, 466A/414A
Dwg. No. EPJ012010U 1/1

Dwg. No. EPJ012010U-1/1

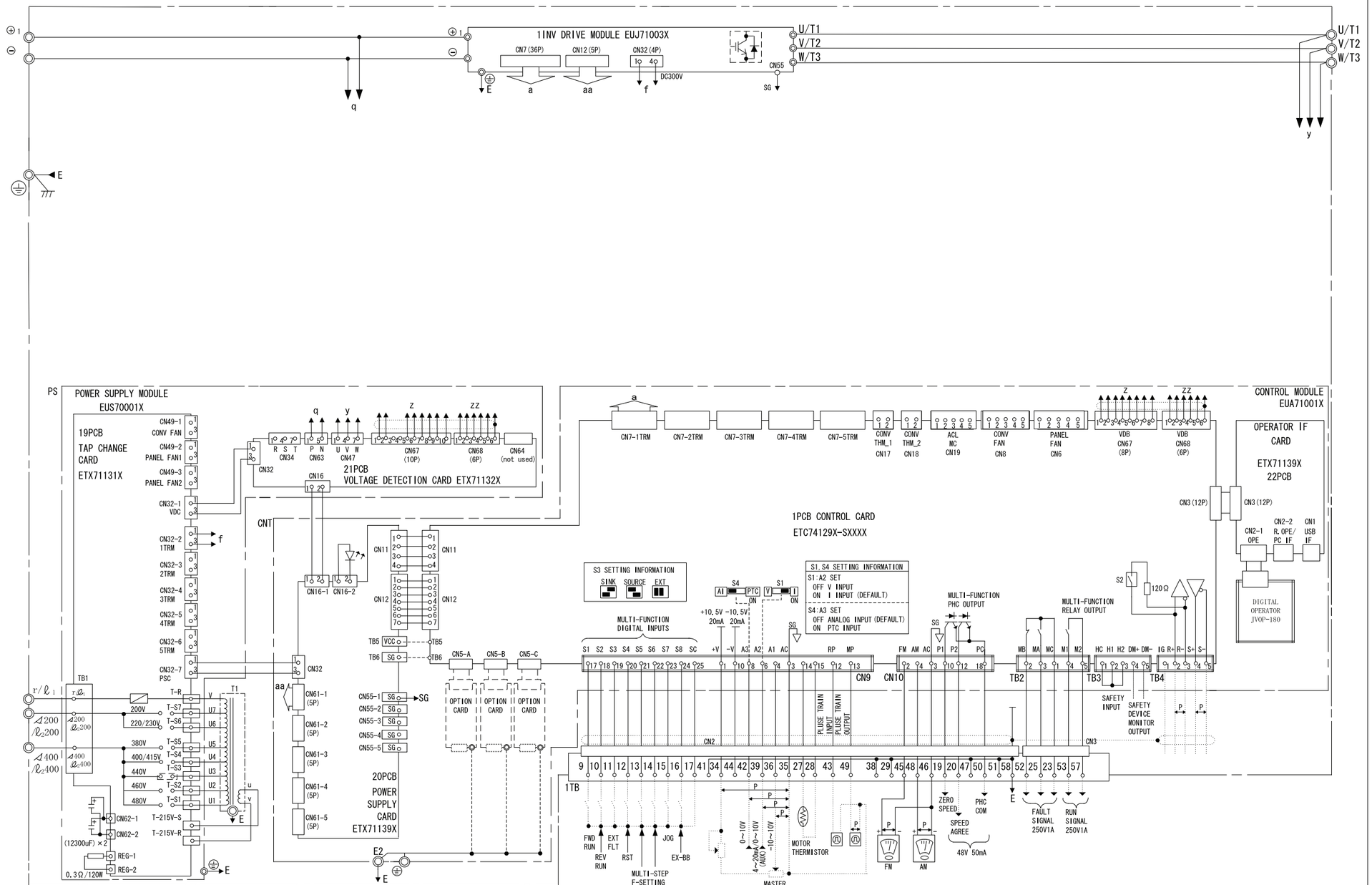


D1000 HHP REGEN PANEL, 480V, 1P, 466A/414A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H0466 Regen Systems
A1000 HHP, DC Input Inverter Panel,
480V, 1P, 466A/414A
Dwg. No. EPJ012110U 1/1

Dwg. No. EPJ012110U-1/1



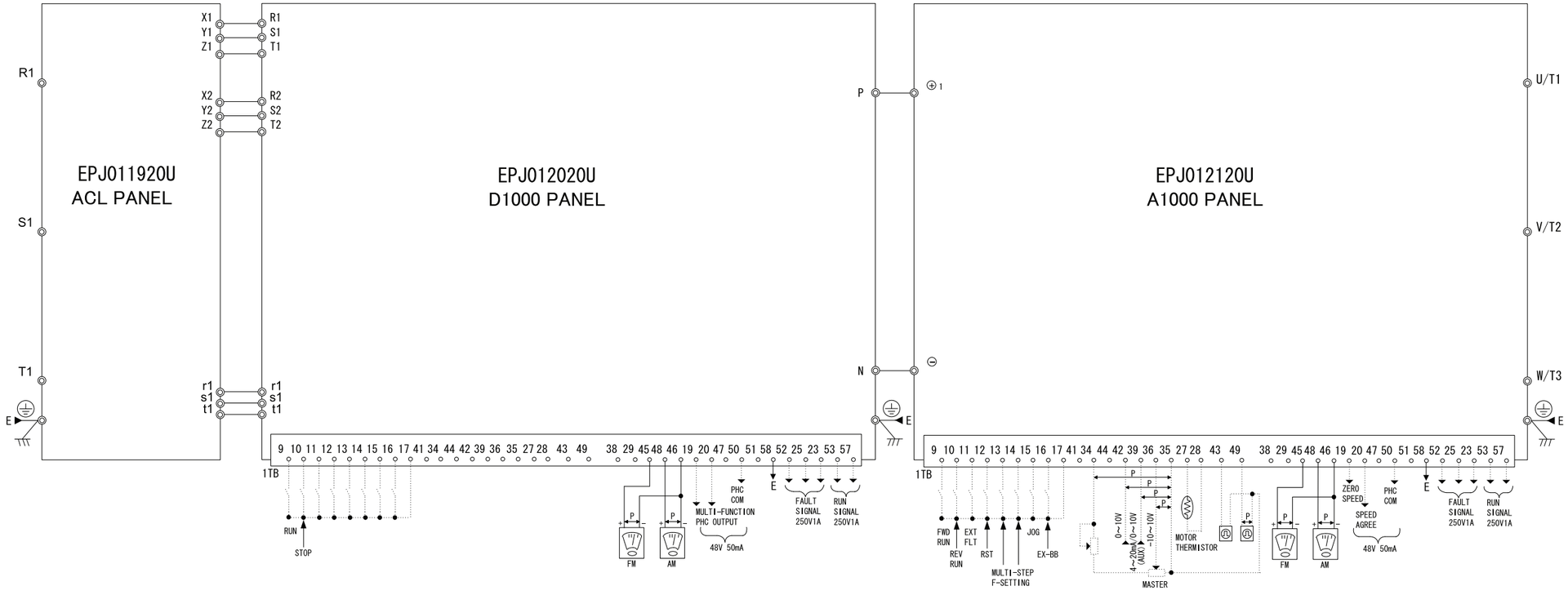
A1000 HHP, DC INPUT INVERTER PANEL, 480V, 1P, 466A/414A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H0900 Regen Systems
D1000 HHP, AC Input Panel Overview,
480V, 2P, 900A/800A

Dwg. No. EPJ011820U 1/1

Dwg. No. EPJ011820U-1/1



A1000HHP, AC INPUT WITH D1000, 480V, 2P, 900A/800A

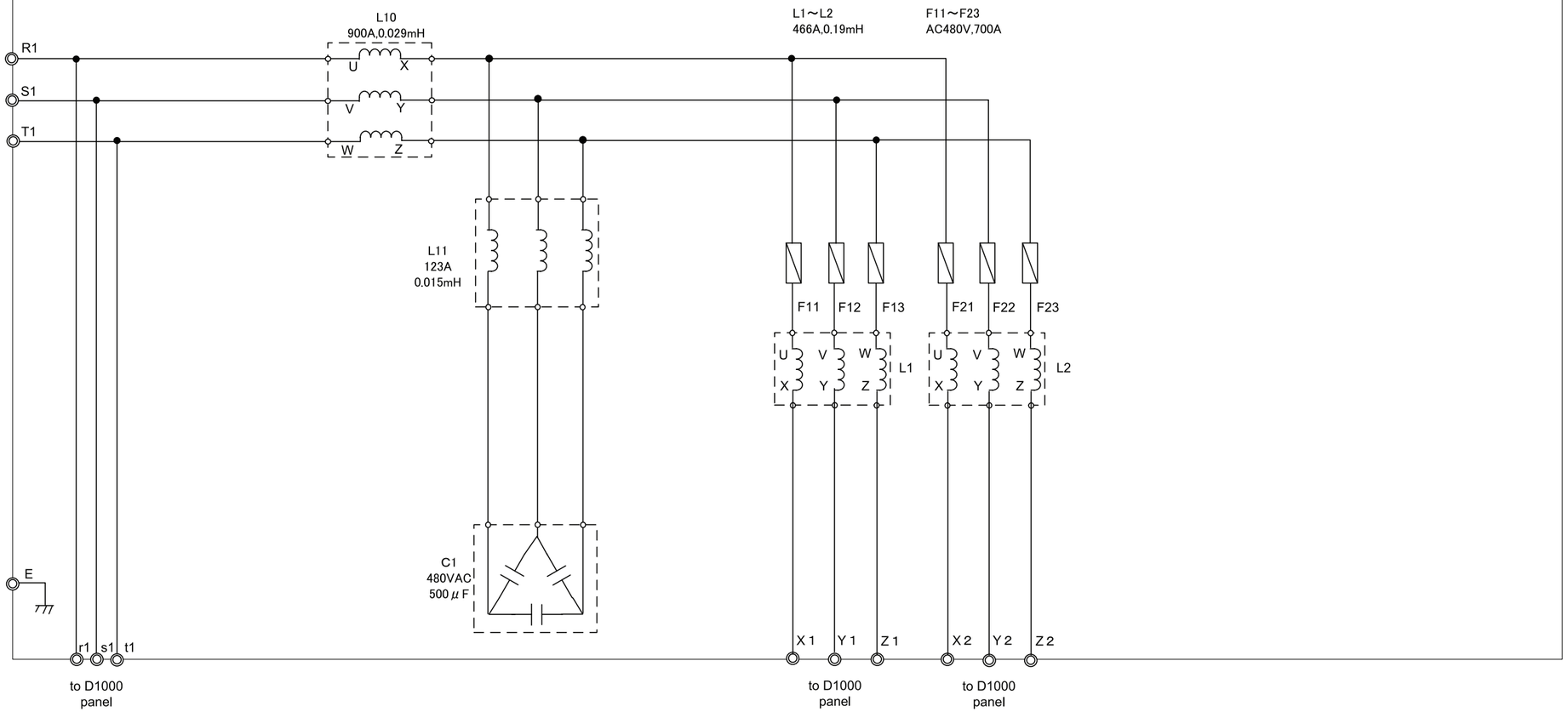
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU4H0900

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Model No. CIMR-DU4H0900 Regen Systems
D1000 HHP, ACL Filter Panel,
480V, 2P, 900A/800A
Dwg. No. EPJ011920U 1/1

Dwg. No. EPJ011920U-1/1

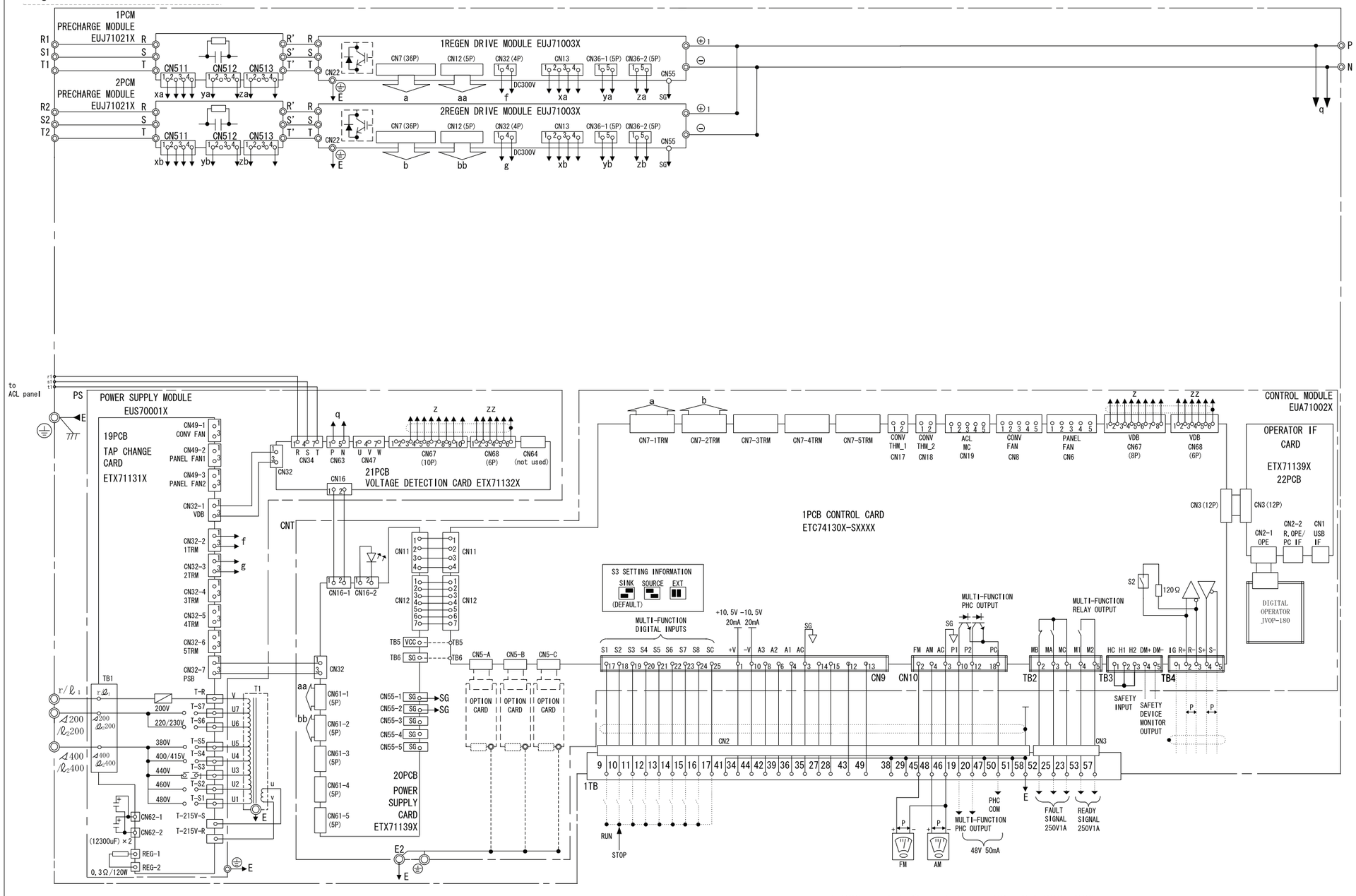


ACL PANEL FOR D1000 HHP, 480V, 2P, 900A/800A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H0900 Regen Systems
D1000 HHP, Regen Panel,
480V, 2P, 900A/800A
Dwg. No. EPJ012020U 1/1

Dwg. No. EPJ012020U-1/1

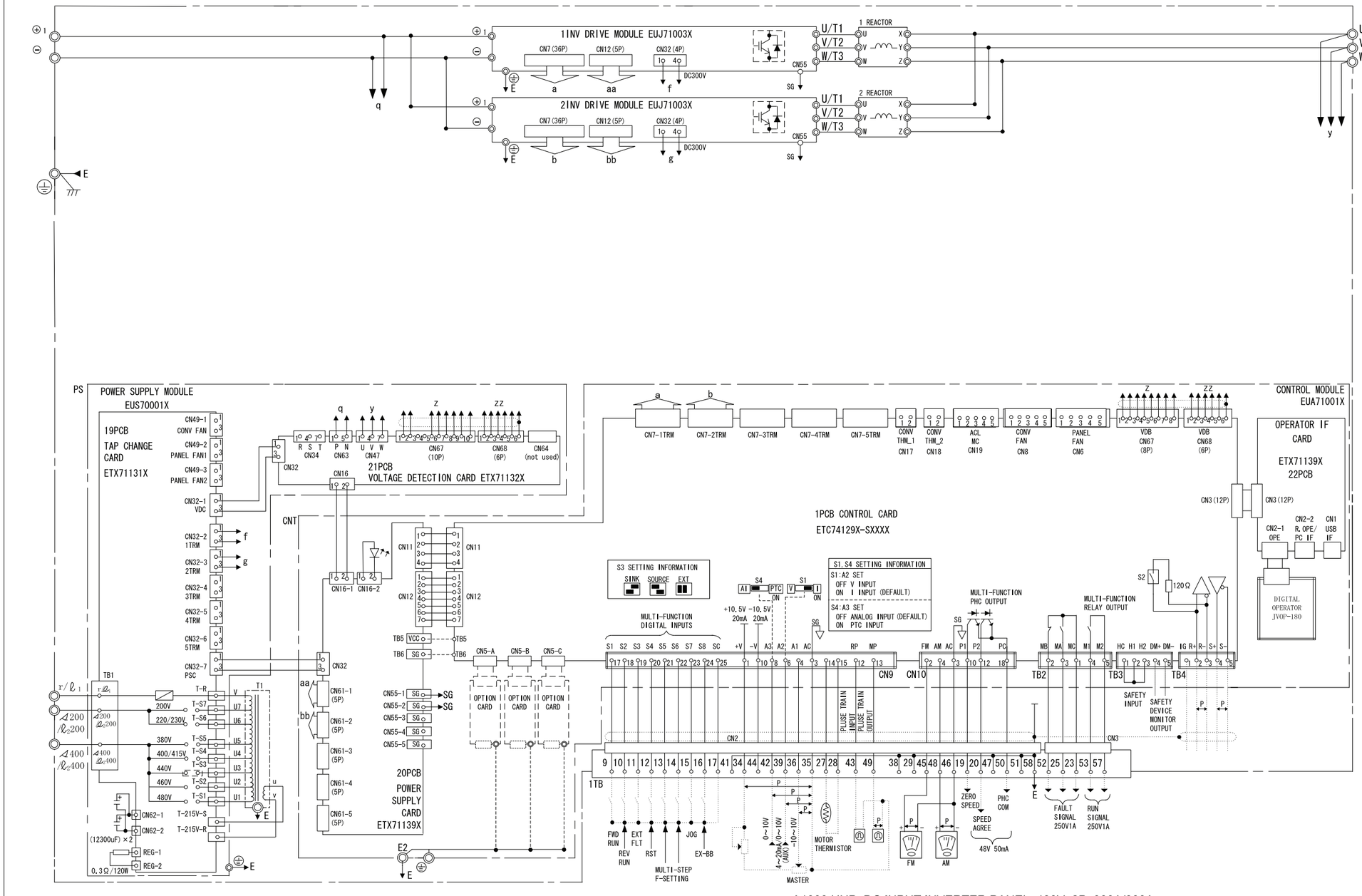


D1000 HHP REGEN PANEL, 480V, 2P, 900A/800A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H0900 Regen Systems
A1000 HHP, DC Input, Regen Inverter
Panel, 480V, 2P, 900A/800A
Dwg. No. EPJ012120U 1/1

Dwg. No. EPJ012120U-1/1

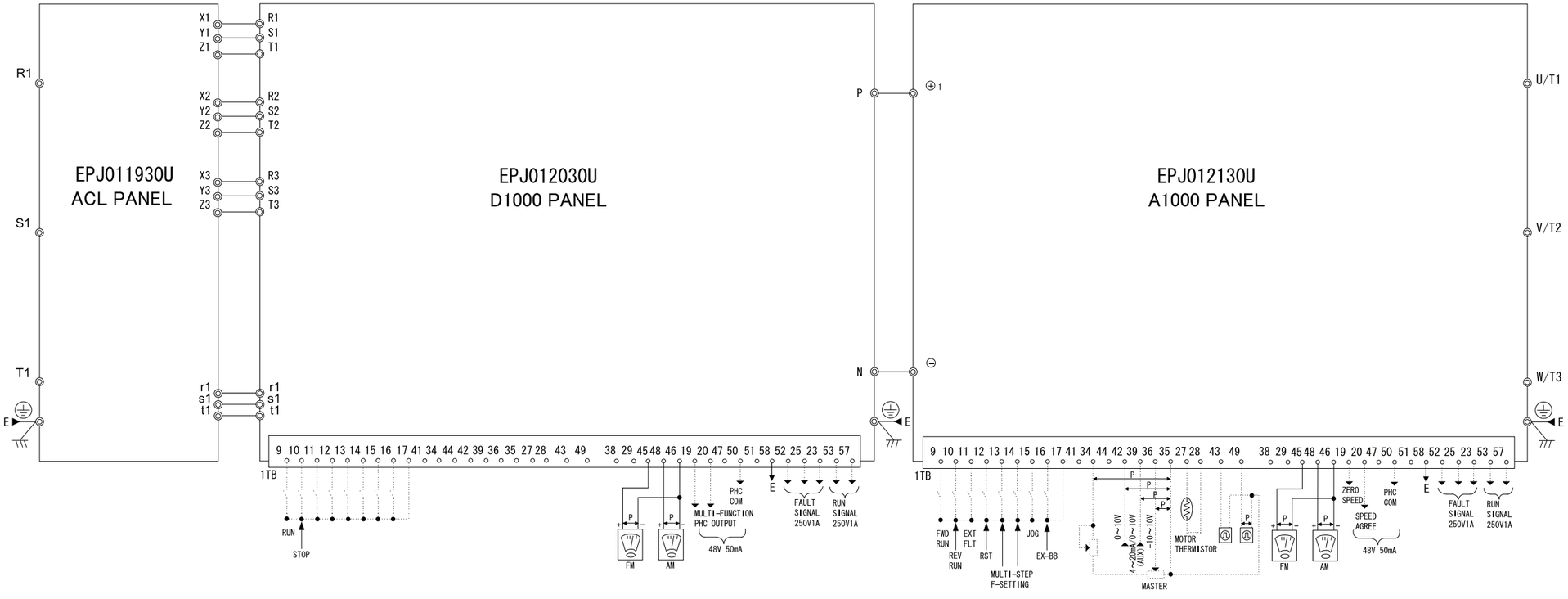


A1000 HHP, DC INPUT INVERTER PANEL, 480V, 2P, 900A/800A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H1350 Regen Systems
A1000 HHP, AC Input, With D1000,
Overview, 480V, 2P, 900A/800A
Dwg. No. EPJ011830U 1/1

Dwg. No. EPJ011830U-1/1



A1000HHP, AC INPUT WITH D1000, 480V, 3P, 1350A/1200A

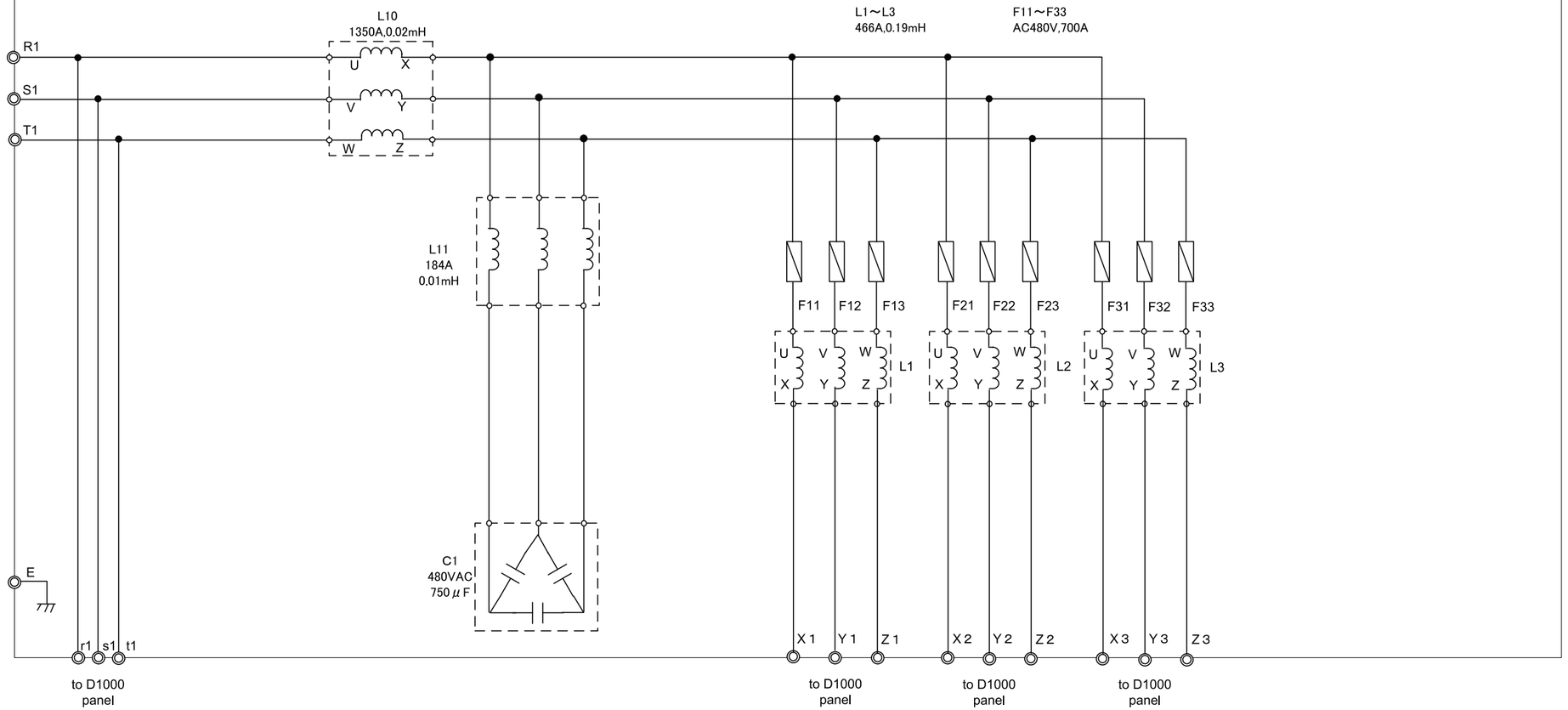
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU4H1350

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Model No. CIMR-DU4H1350 Regen Systems
D1000 HHP, ACL Regen Filter Panel,
480V, 3P, 1350A/1200A
Dwg. No. EPJ011930U 1/1

Dwg. No. EPJ011930U-1/1

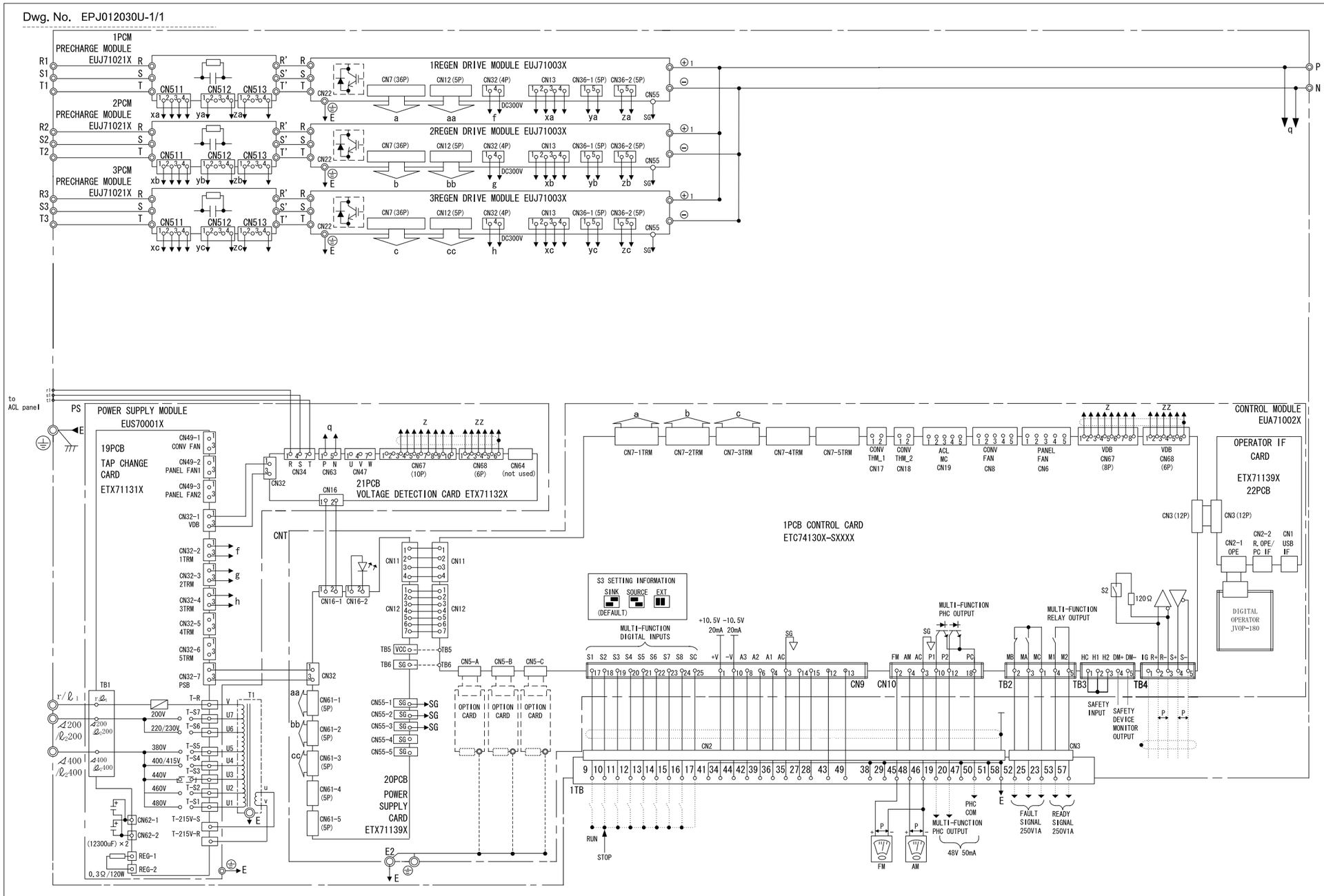


ACL PANEL FOR D1000 HHP, 480V, 3P, 1350A/1200A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H1350 Regen Systems
D1000 HHP, Regen Panel,
480V, 3P, 1350A/1200A
Dwg. No. EPJ012030U 1/1

Dwg. No. EPJ012030U-1/1

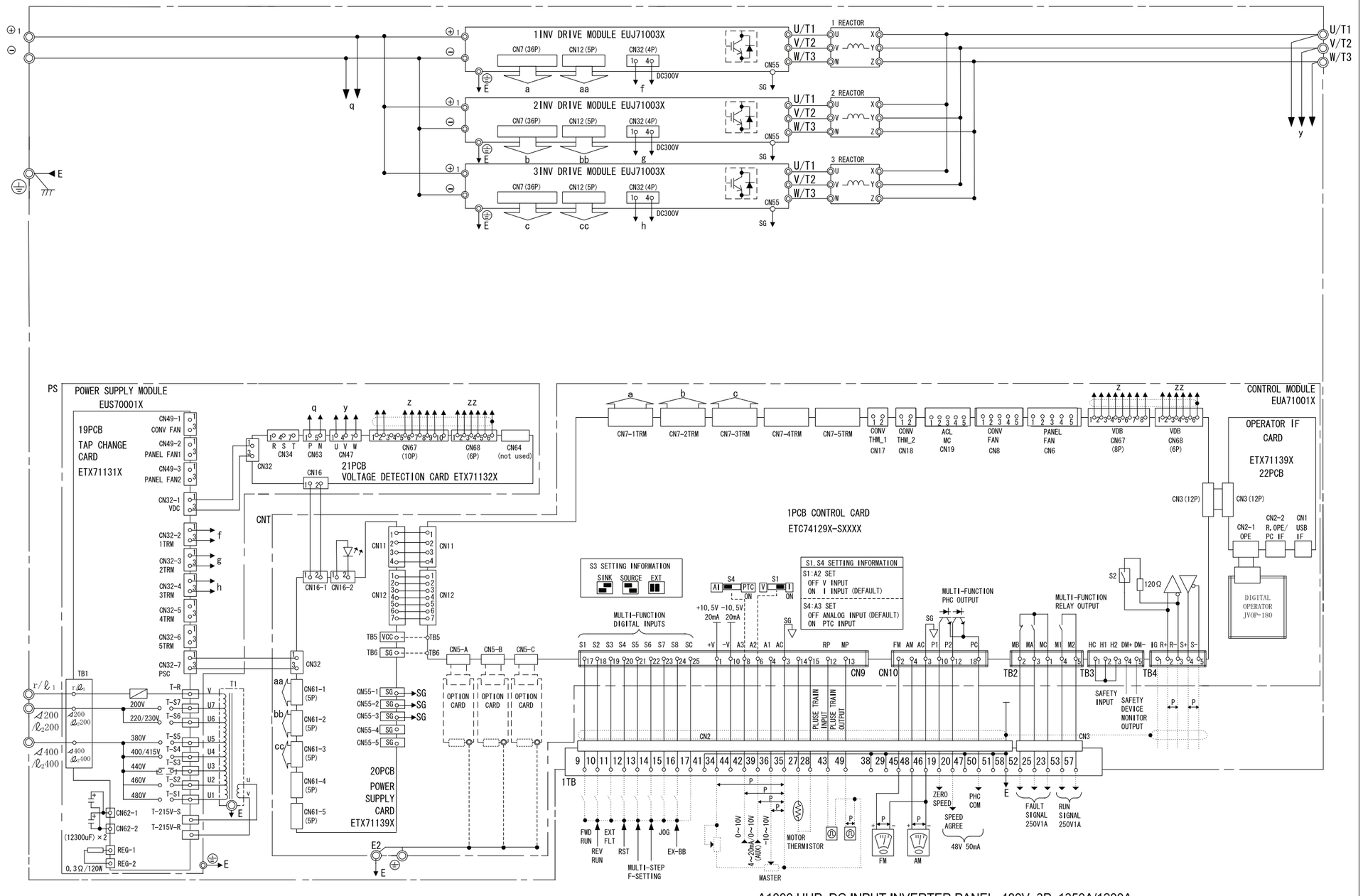


D1000 HHP REGEN PANEL, 480V, 3P, 1350A/1200A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H1350 Regen Systems
A1000 HHP, DC Input Inverter Panel,
480V, 3P, 1350A/1200A
Dwg. No. EPJ012130U 1/1

Dwg. No. EPJ012130U-1/1

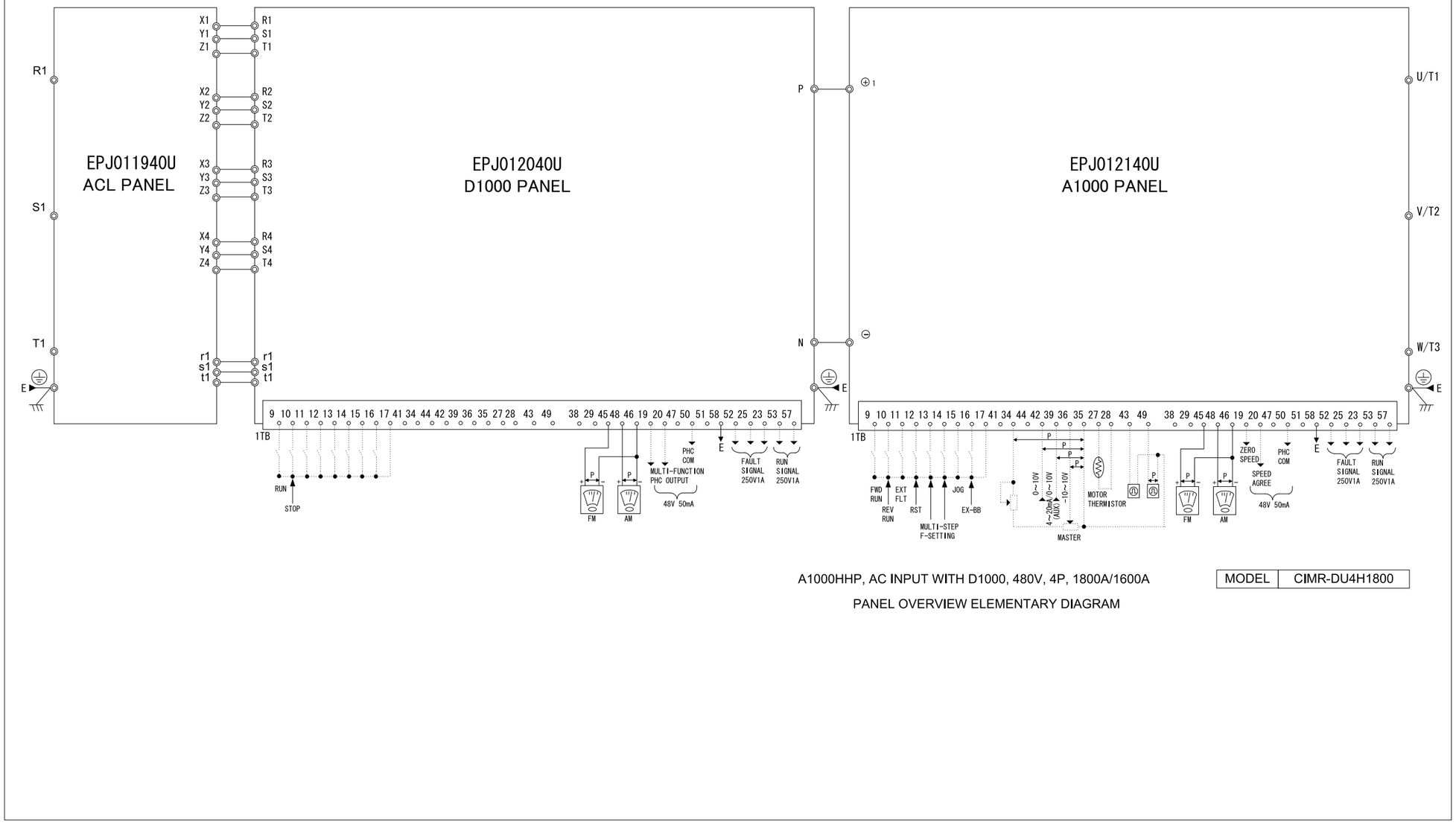


A1000 HHP, DC INPUT INVERTER PANEL, 480V, 3P, 1350A/1200A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H1800 Regen Systems
A1000 HHP, AC Input with D1000,
Overview, 480V, 4P, 1800A/1600A
Dwg. No. EPJ011840U 1/1

Dwg. No. EPJ011840U-1/1



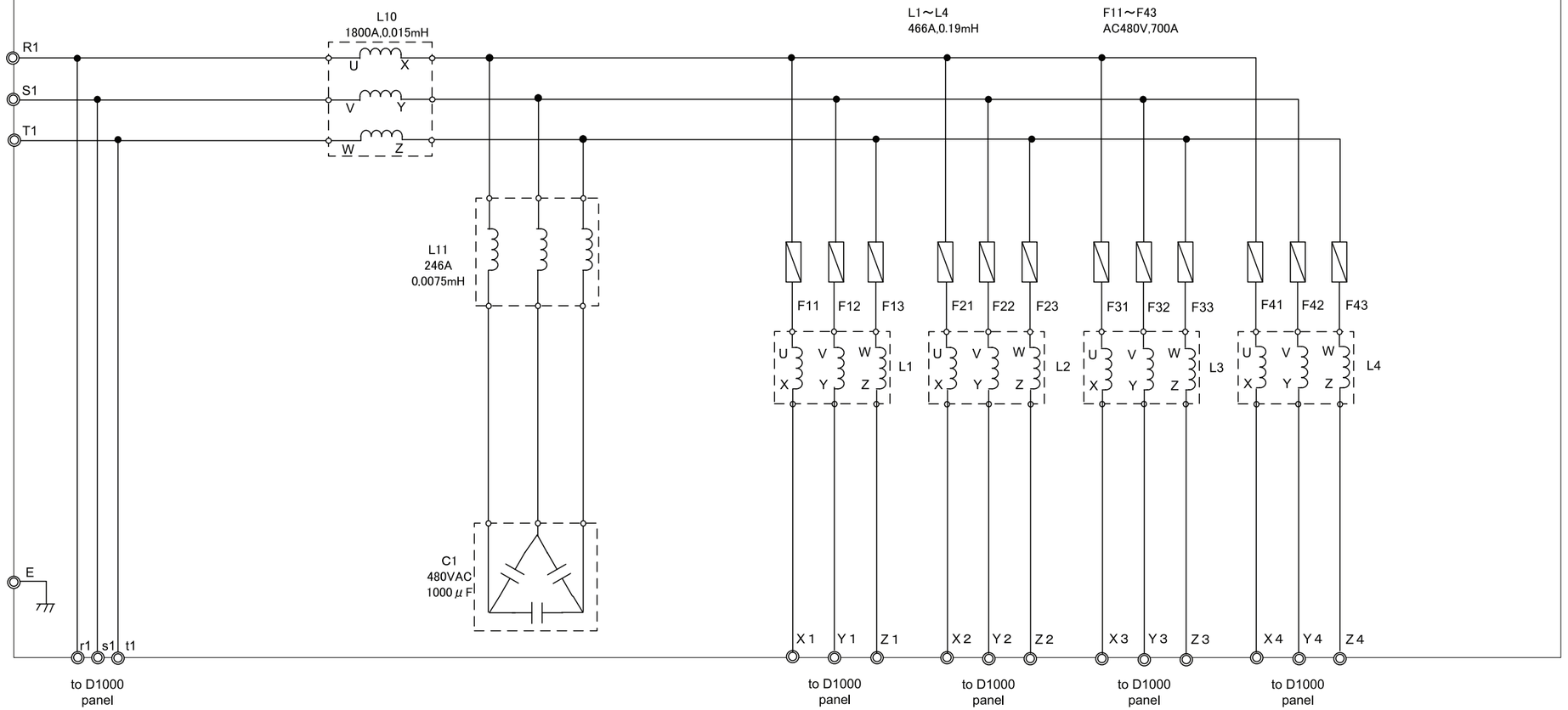
A1000HHP, AC INPUT WITH D1000, 480V, 4P, 1800A/1600A
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU4H1800

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Model No. CIMR-DU4H1800 Regen Systems
D1000 HHP, ACL Regen Filter Panel,
480V, 4P, 1800A/1600A
Dwg. No. EPJ011940U 1/1

Dwg. No. EPJ011940U-1/1

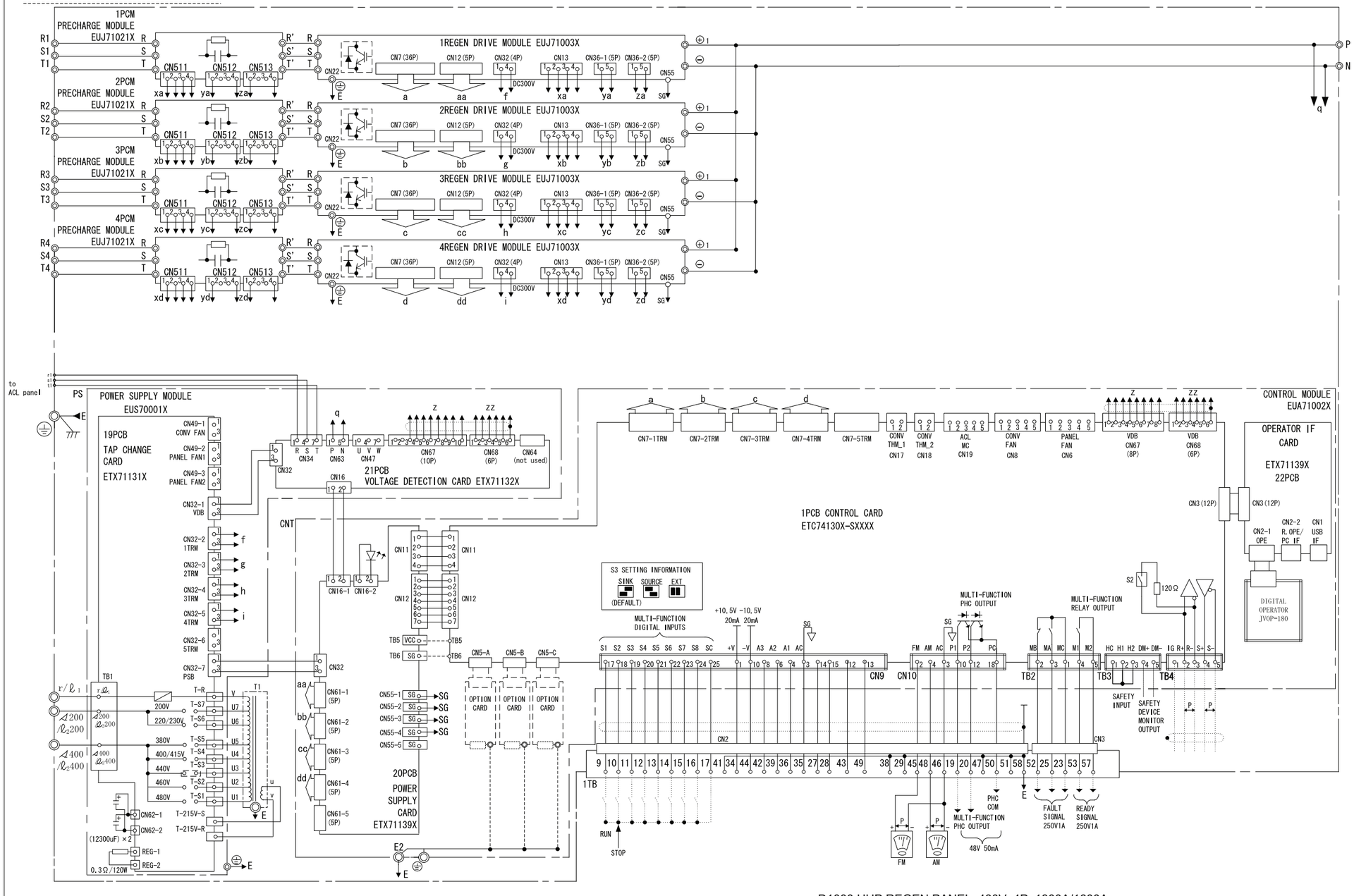


ACL PANEL FOR D1000 HHP, 480V, 4P, 1800A/1600A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H1800 Regen Systems
D1000 HHP, Regen Panel,
480V, 4P, 1800A/1600A
Dwg. No. EPJ012040U 1/1

Dwg. No. EPJ012040U-1/1

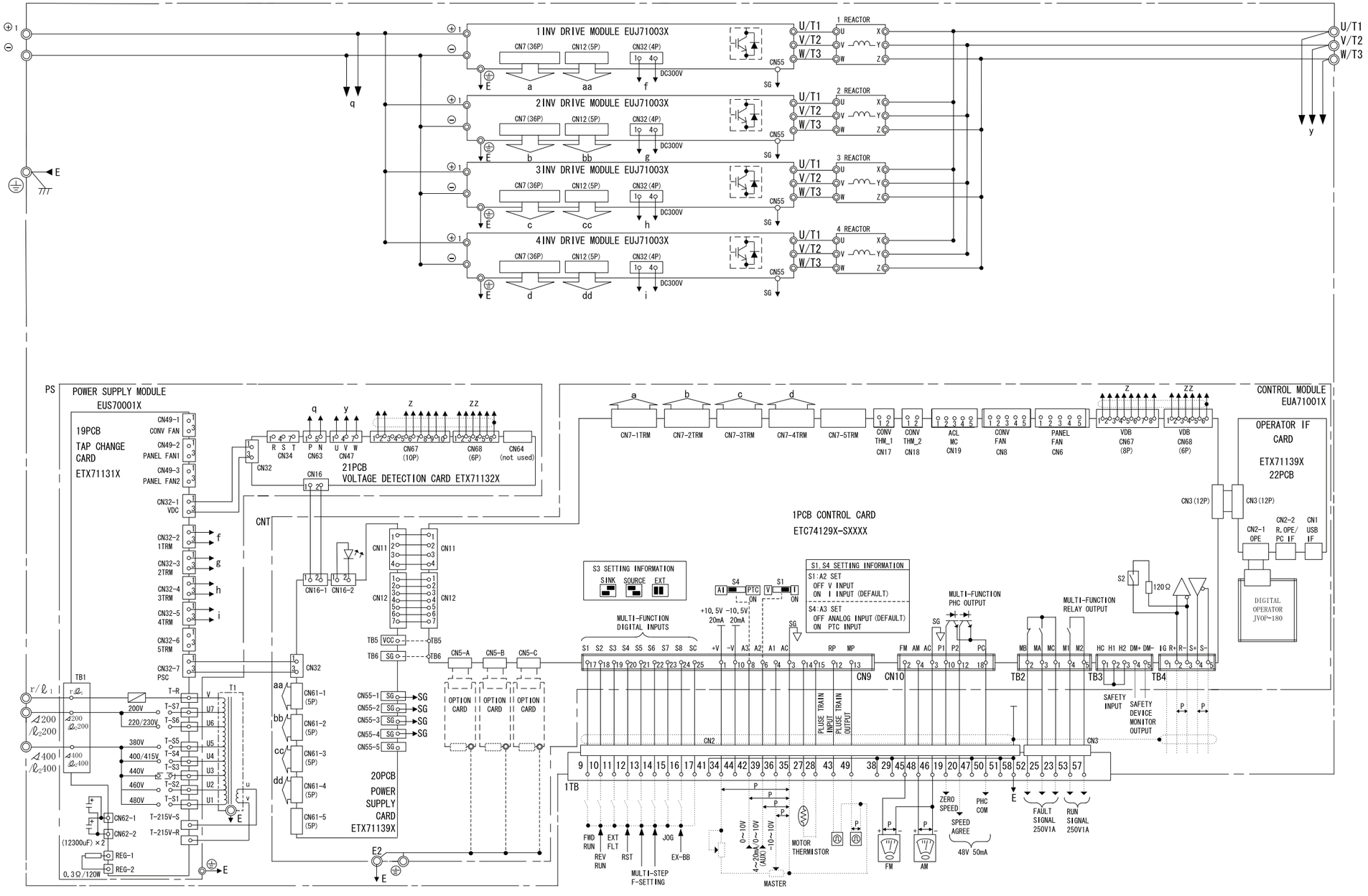


D1000 HHP REGEN PANEL, 480V, 4P, 1800A/1600A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H1800 Regen Systems
A1000 HHP, DC Input Inverter Panel,
480V, 4P, 1800A/1600A
Dwg. No. EPJ012140U 1/1

Dwg. No. EPJ012140U-1/1

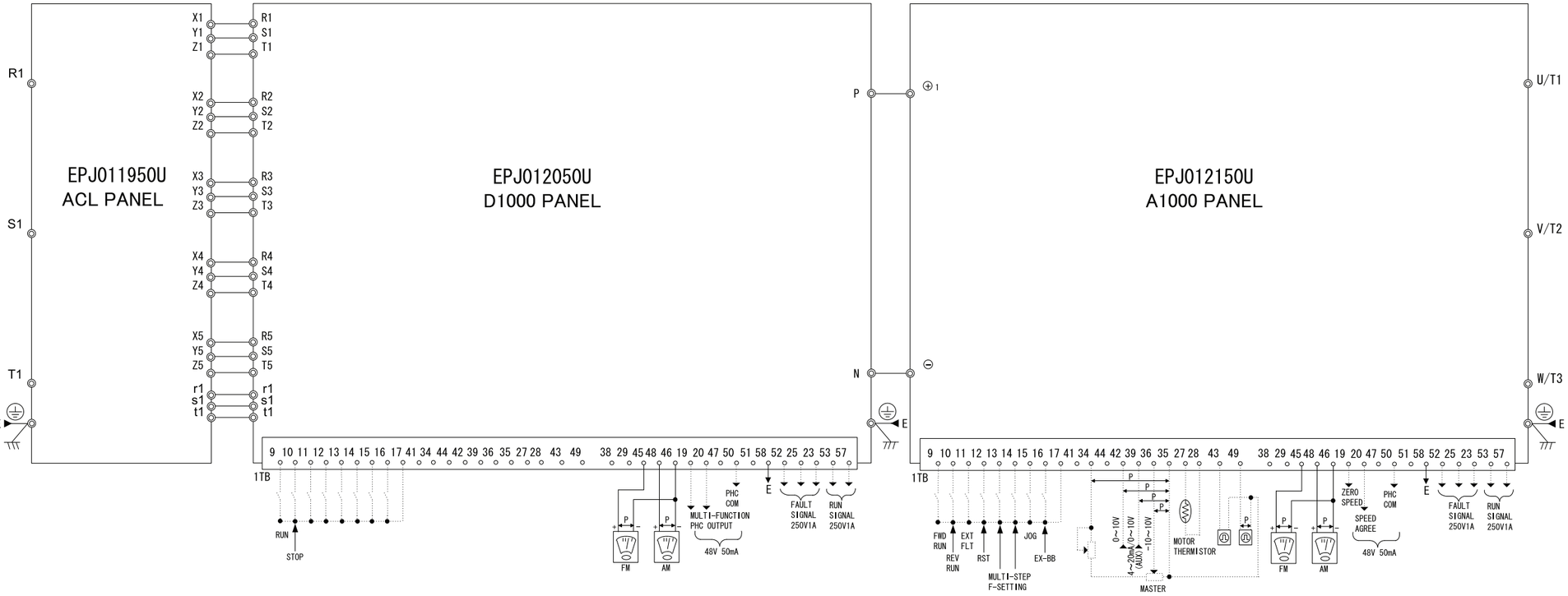


A1000 HHP, DC INPUT INVERTER PANEL, 480V, 4P, 1800A/1600A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H2250 Regen Systems
A1000 HHP, AC Input with D1000, Panel Overview, 480V, 5P, 2250A/2000A
Dwg. No. EPJ011850U 1/1

Dwg. No. EPJ011850U-1/1



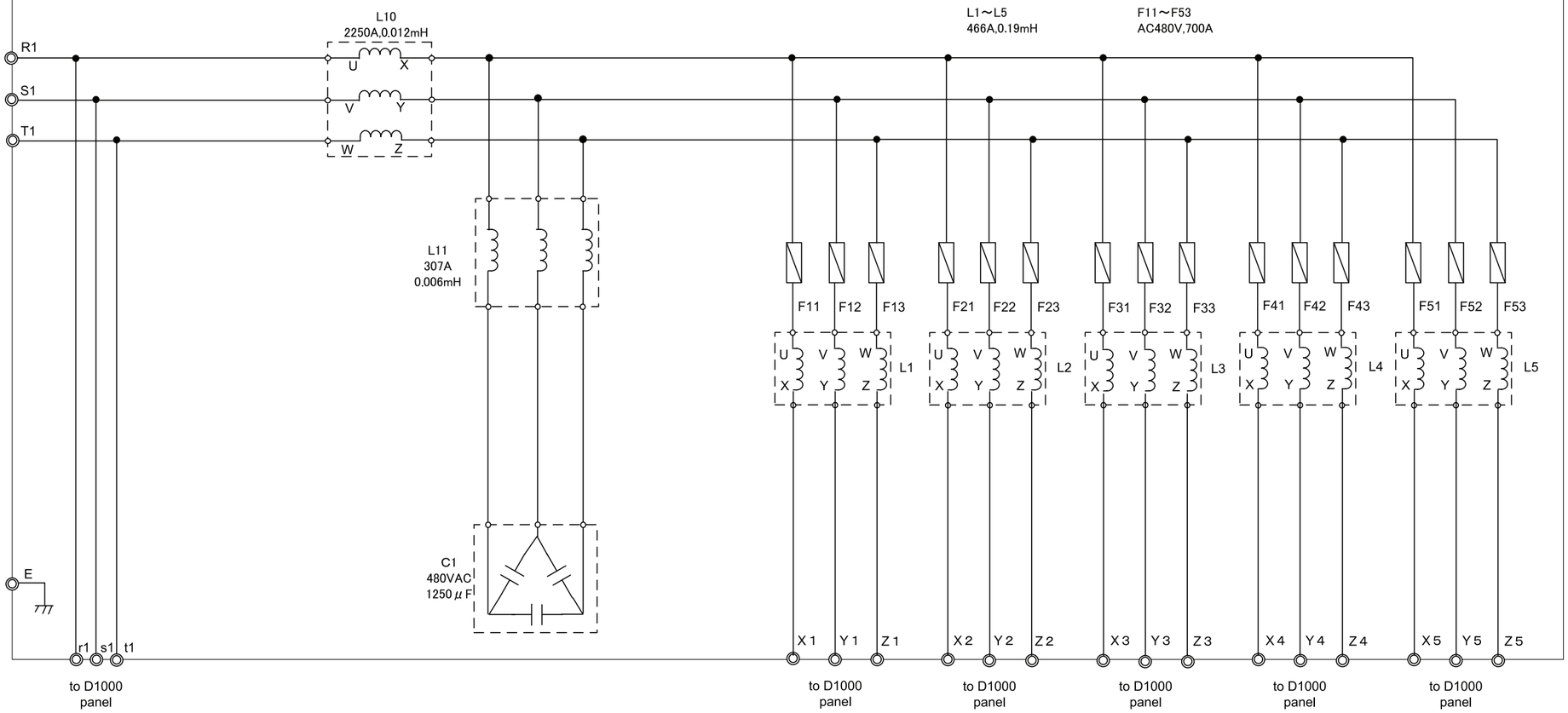
A1000HHP, AC INPUT WITH D1000, 480V, 5P, 2250A/2000A
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU4H2250

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Model No. CIMR-DU4H2250 Regen Systems
D1000 HHP, ACL Panel
480V, 5P, 2250A/2000A
Dwg. No. EPJ011950U 1/1

Dwg. No. EPJ011950U-1/1

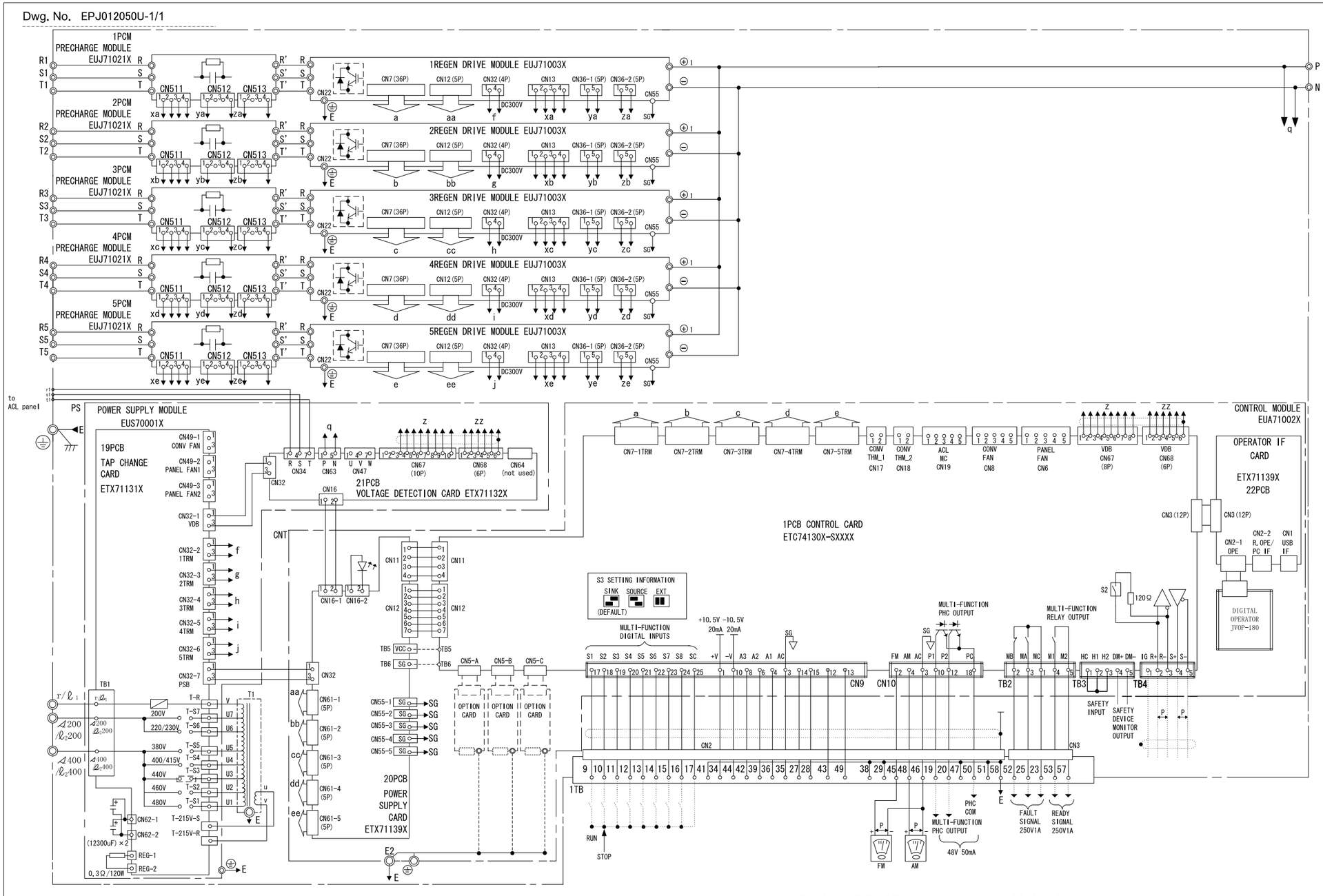


ACL PANEL FOR D1000 HHP, 480V, 5P, 2250A/2000A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H2250 Regen Systems
D1000 HHP, Regen Panel
480V, 5P, 2250A/2000A
Dwg. No. EPJ012050U 1/1

Dwg. No. EPJ012050U-1/1

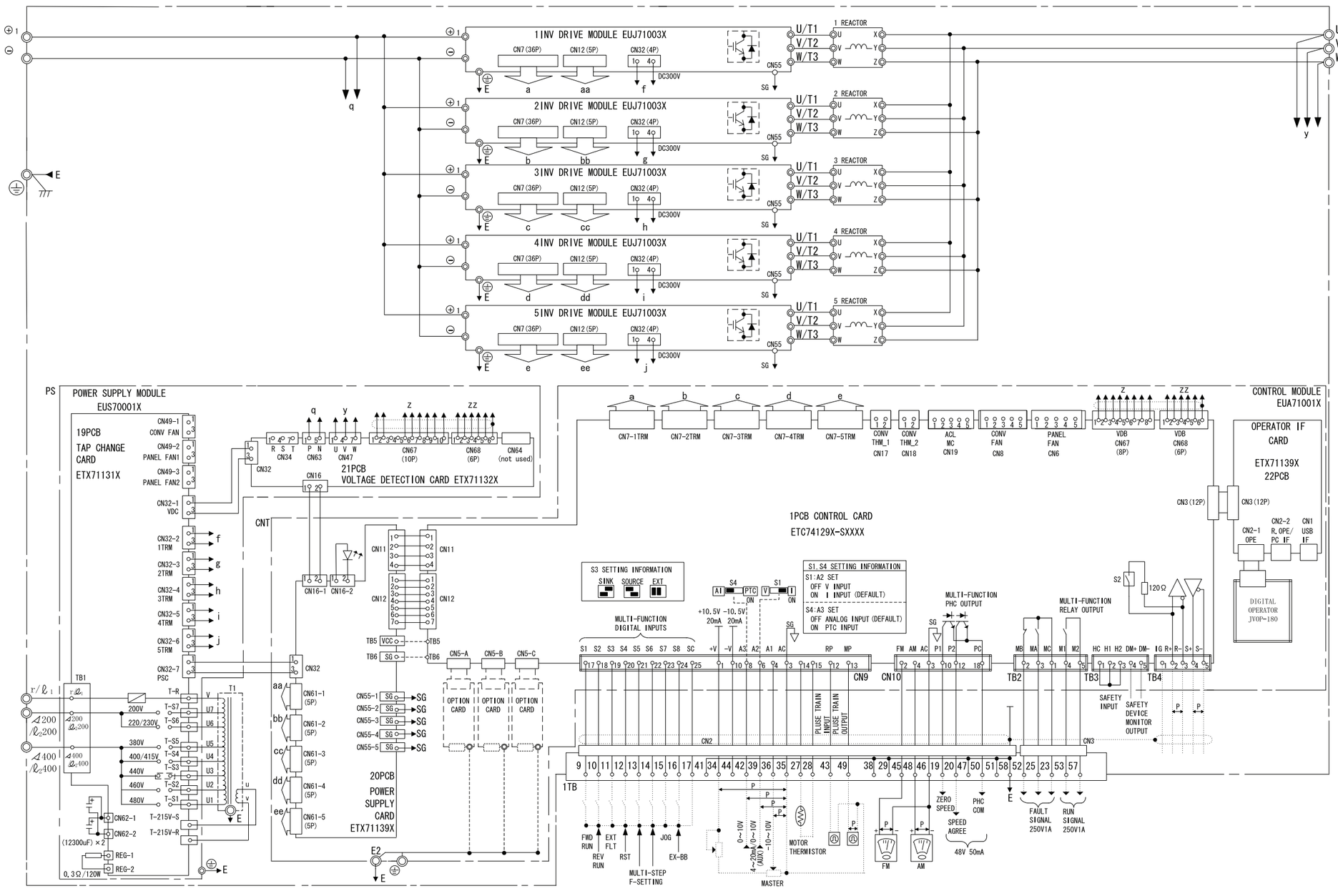


D1000 HHP REGEN PANEL, 480V, 5P, 2250A/2000A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU4H2250 Regen Systems
A1000 HHP, DC Input Inverter Panel
480V, 5P, 2250A/2000A
Dwg. No. EPJ012150U 1/1

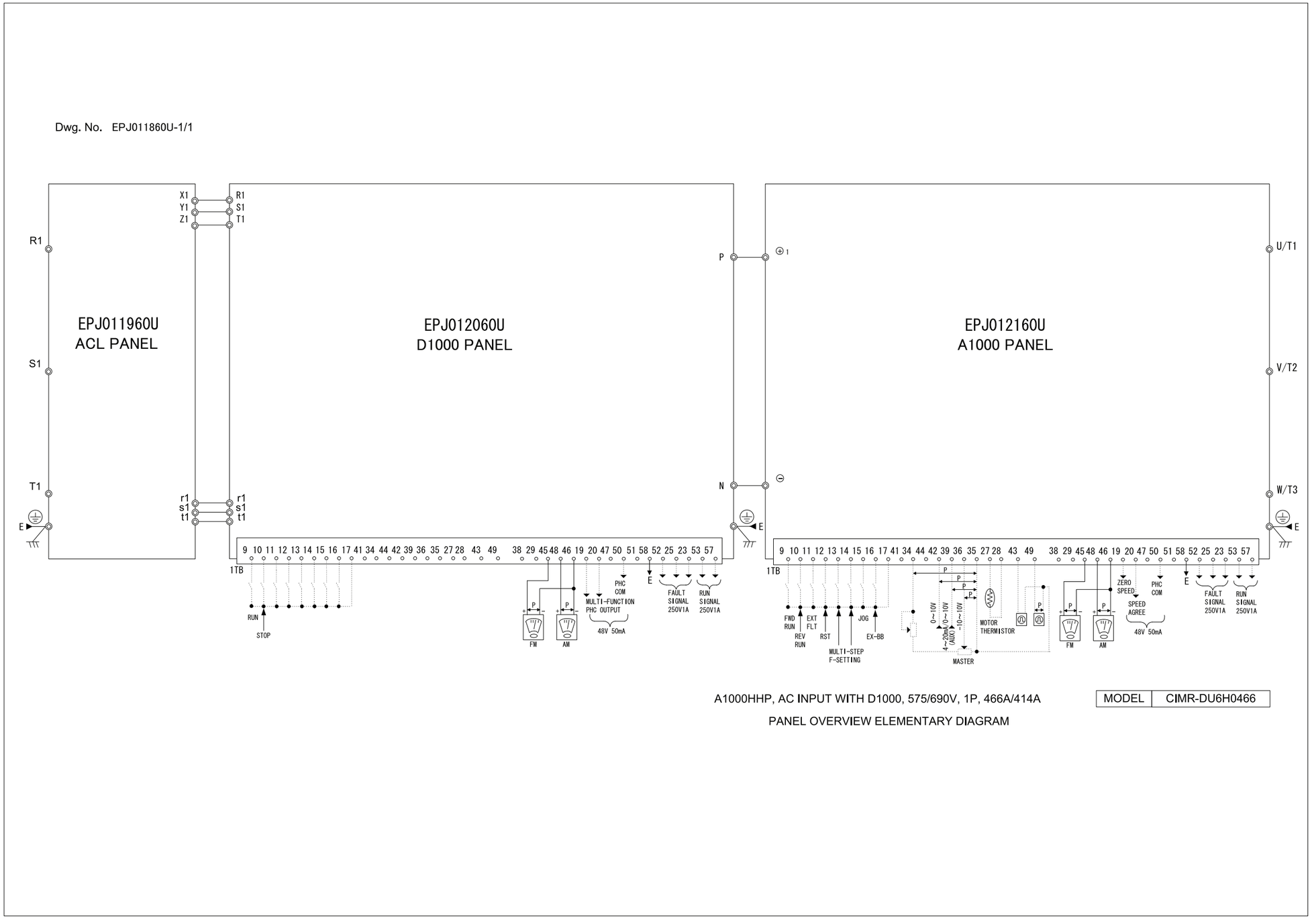
Dwg. No. EPJ012150U-1/1



A1000 HHP, DC INPUT INVERTER PANEL, 480V, 5P, 2250A/2000A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H0466 Regen Systems
A1000 HHP, AC Input with D1000
Overview, 575/690V, 1P, 466A/414A
Dwg. No. EPJ011860U 1/1



A1000HHP, AC INPUT WITH D1000, 575/690V, 1P, 466A/414A

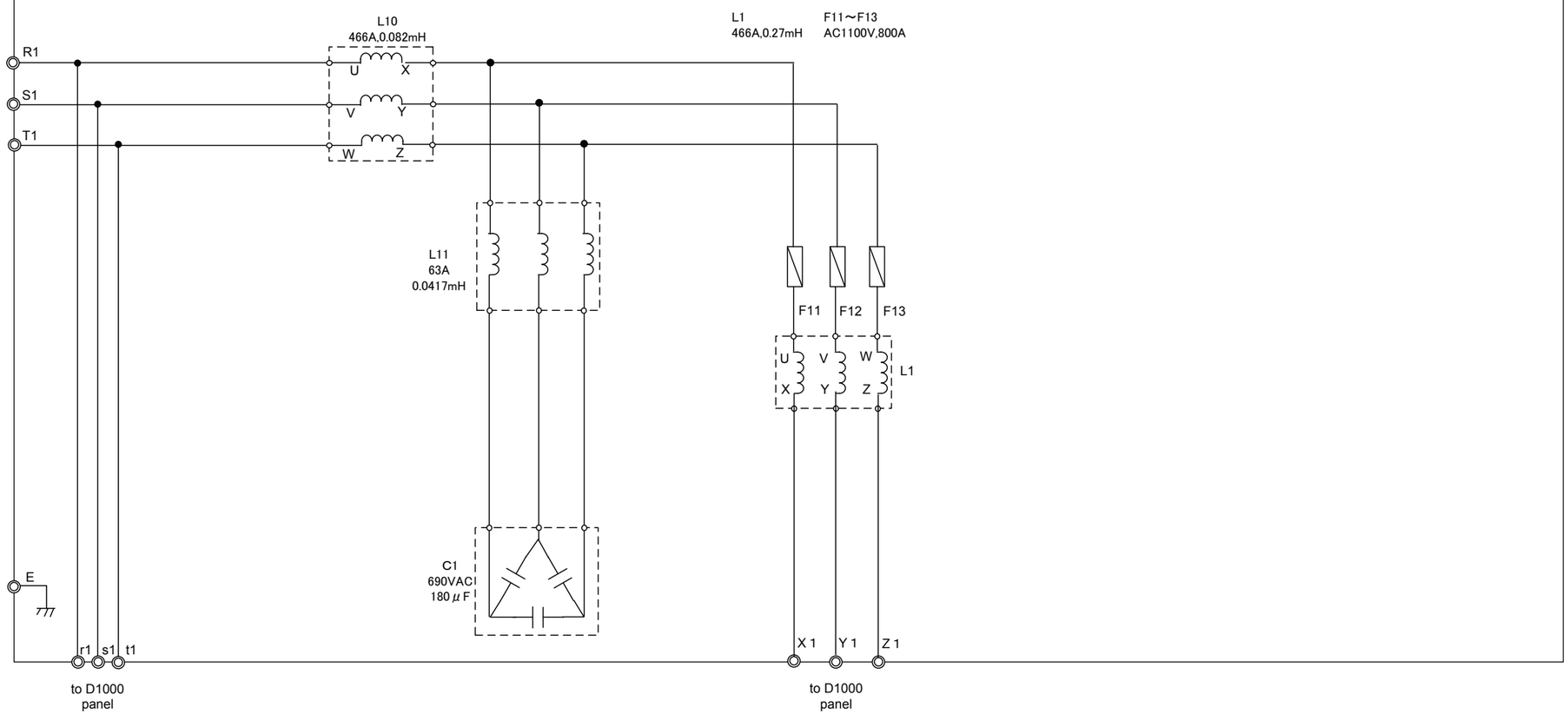
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU6H0466

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Model No. CIMR-DU4H0466 Regen Systems
D1000 HHP, ACL Panel
575/690V, 1P, 466A/414A
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Dwg. No. EPJ011960U-1/1

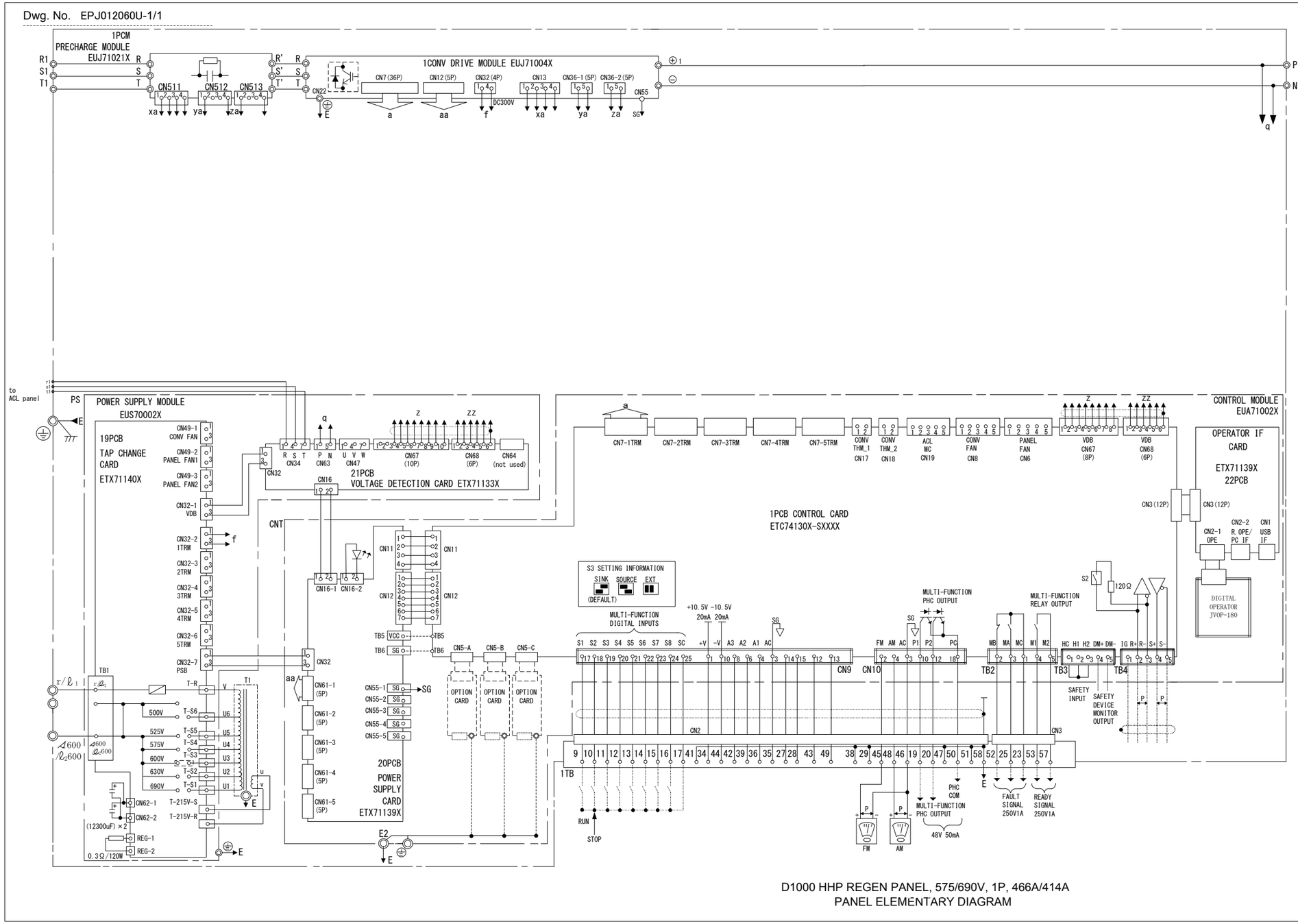


ACL PANEL FOR D1000 HHP, 575/690V, 1P, 466A/414A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H0466 Regen Systems
D1000 HHP, Regen Panel
Overview, 575/690V, 1P, 466A/414A
Dwg. No. EPJ012060U 1/1

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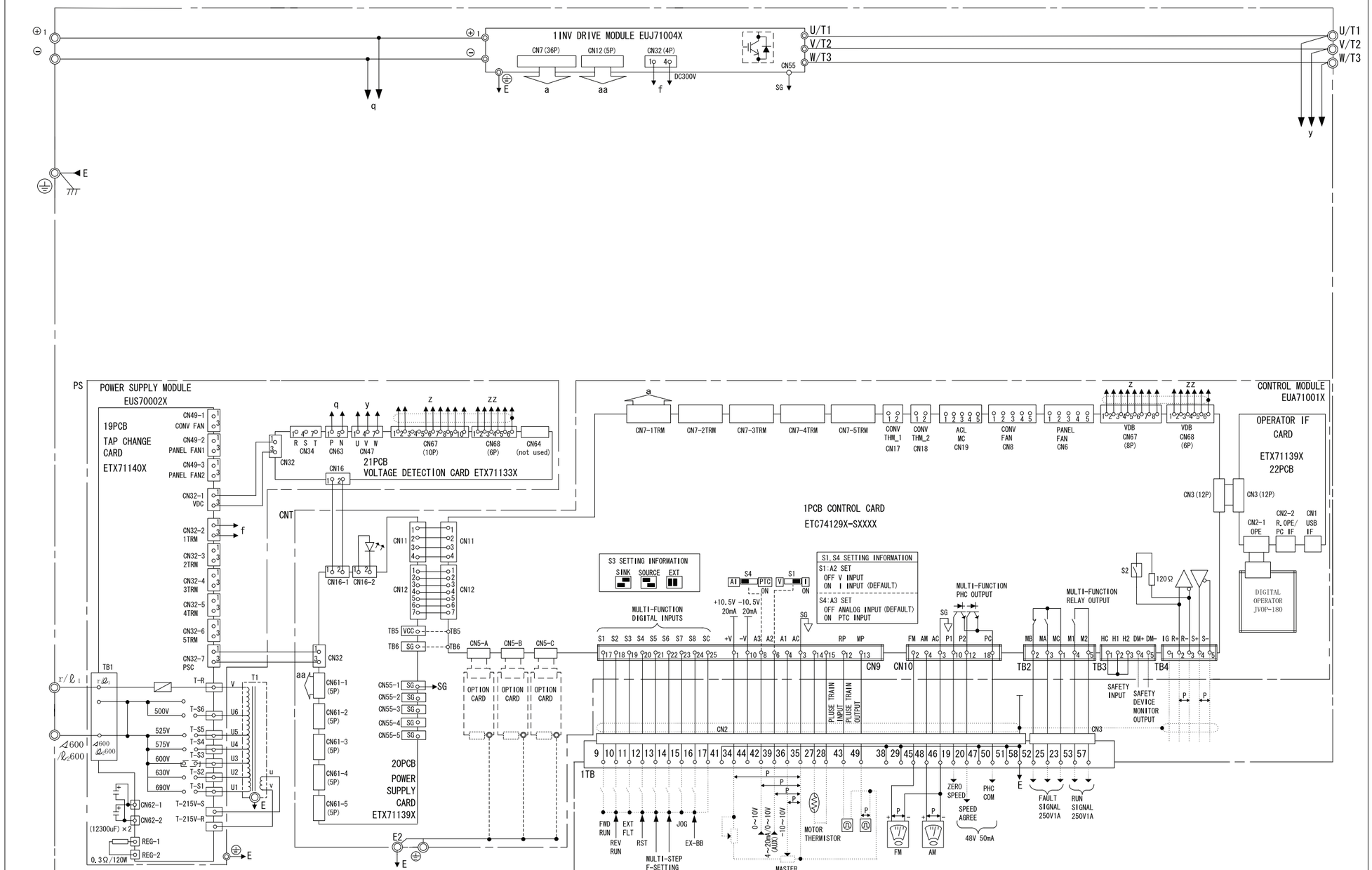


D1000 HHP REGEN PANEL, 575/690V, 1P, 466A/414A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H0466 Regen Systems
A1000 HHP, Inverter Panel
Overview, 575/690V, 1P, 466A/414A
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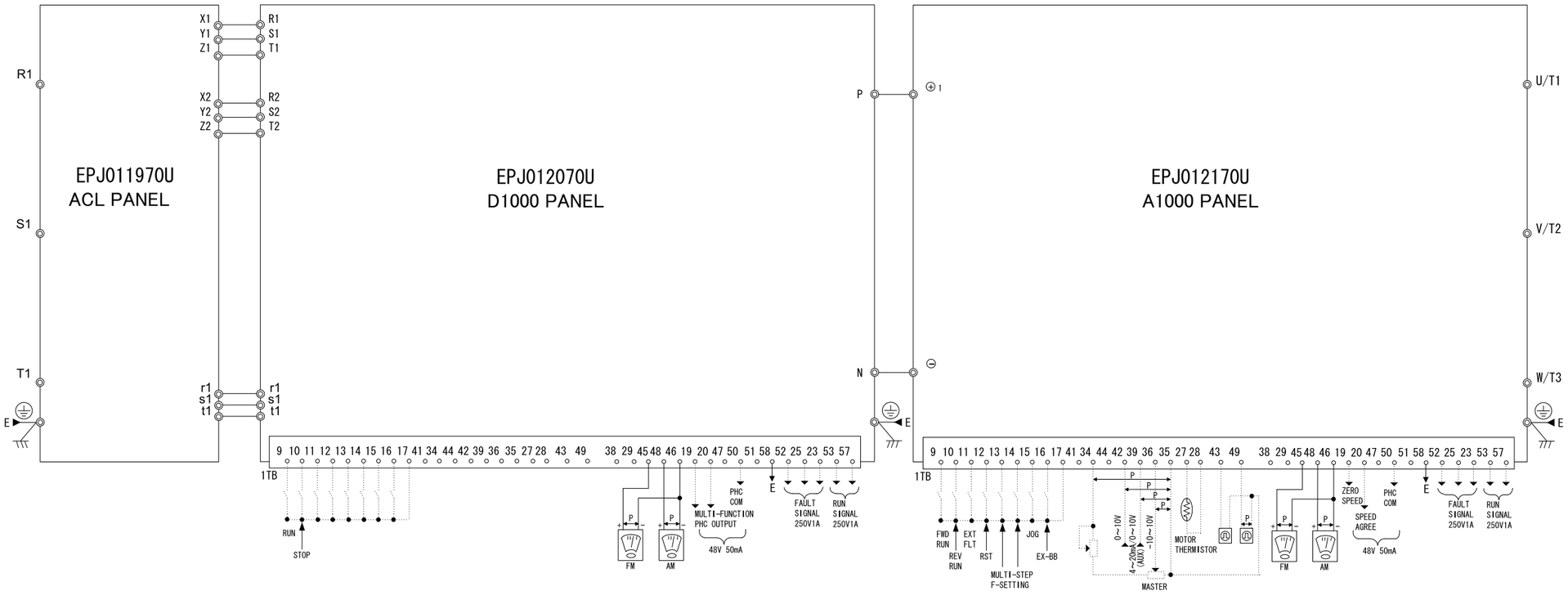


A1000 HHP, DC INPUT INVERTER PANEL, 575/690V, 1P, 466A/414A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H0900 Regen Systems
A1000 HHP, AC Input with D1000
Overview, 575/690V, 2P, 900A/800A
Dwg. No. EPJ011870U 1/1

Dwg. No. EPJ011870U-1/1



A1000HHP, AC INPUT WITH D1000, 575/690V, 2P, 900A/800A

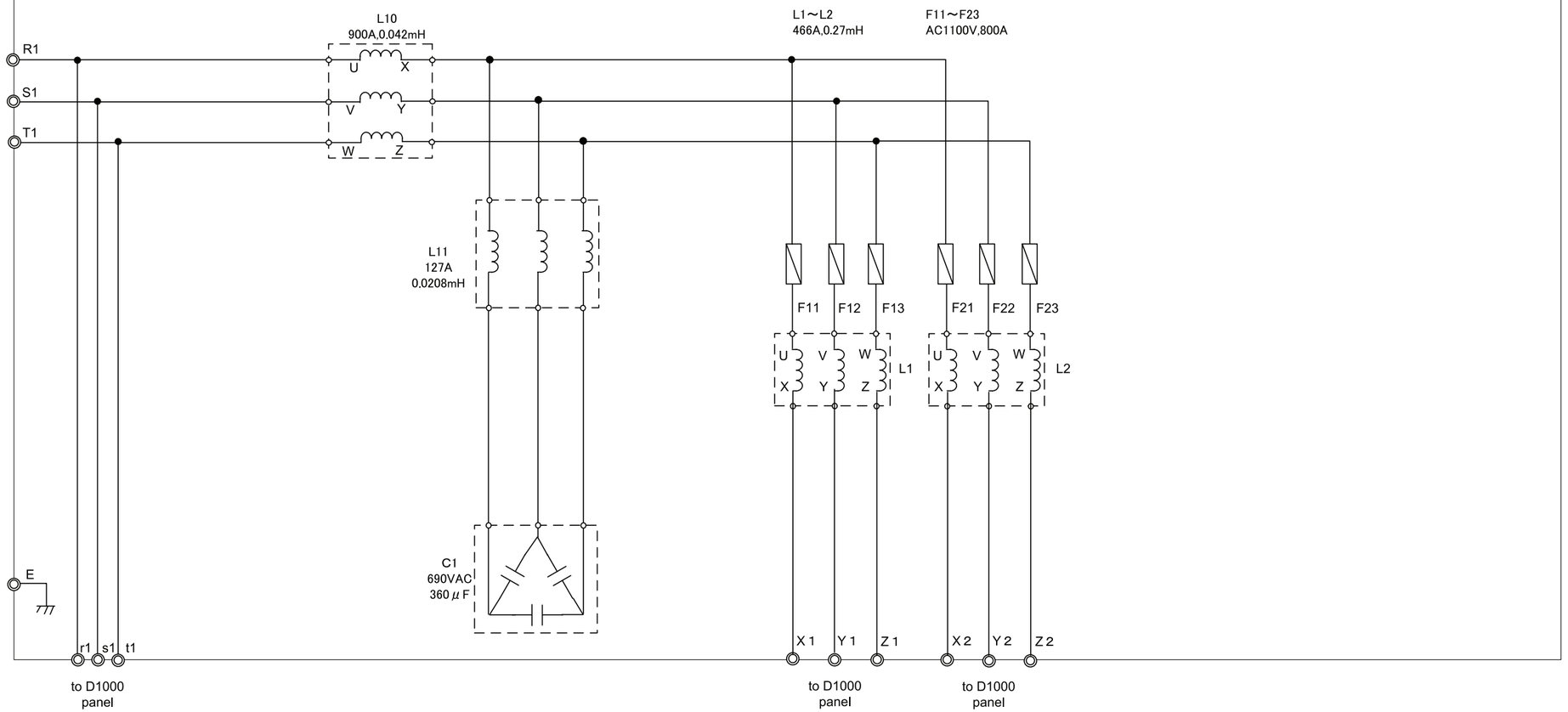
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU6H0900

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Model No. CIMR-DU6H0900 Regen Systems
D1000 HHP, ACL Panel
575/690V, 2P, 900A/800A
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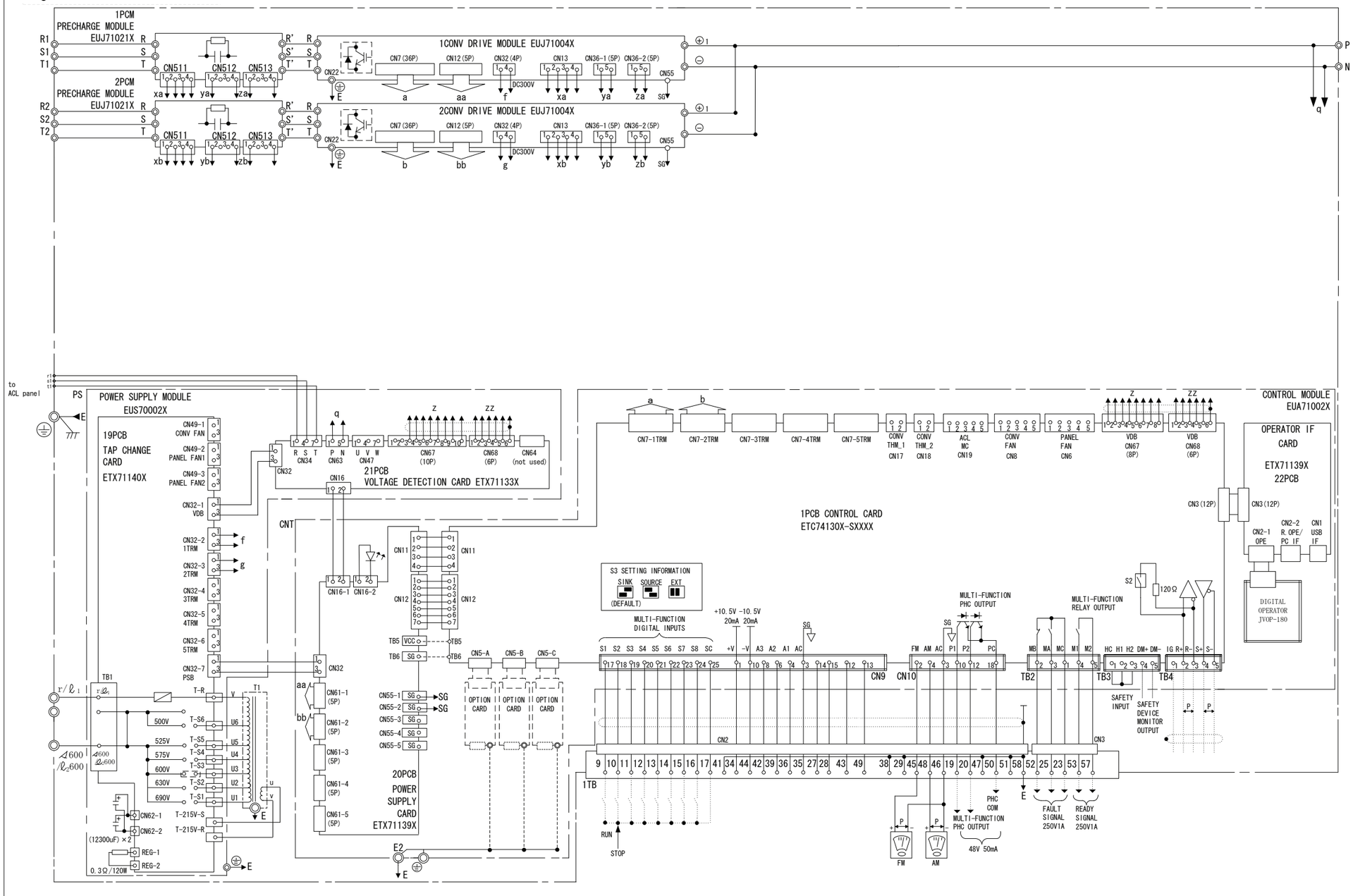


ACL PANEL FOR D1000 HHP, 575/690V, 2P, 900A/800A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H0900 Regen Systems
D1000 HHP, Regen Panel
575/690V, 2P, 900A/800A
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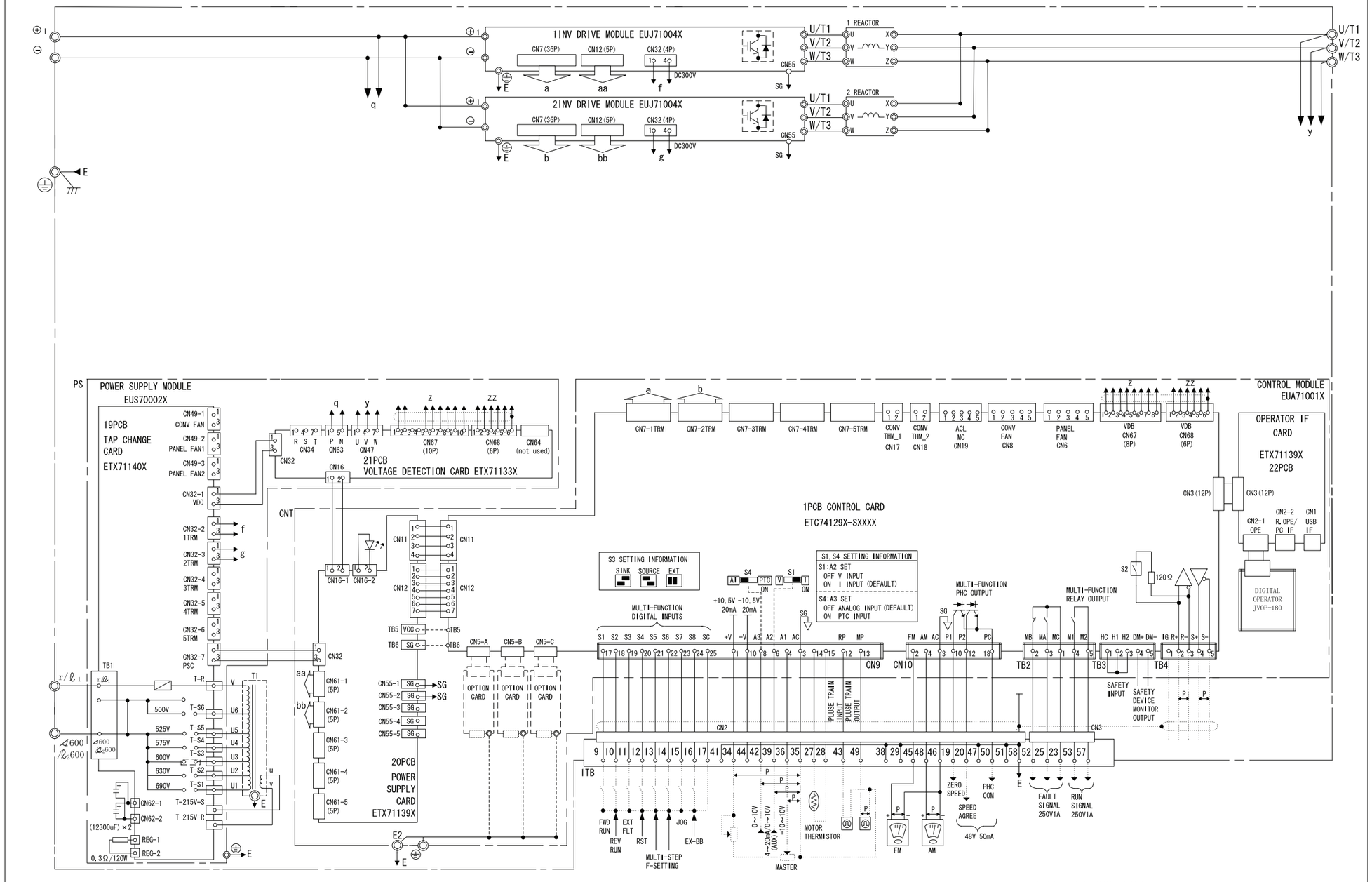


D1000 HHP REGEN PANEL, 575/690V, 2P, 900A/800A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H0900 Regen Systems
A1000 HHP, DC Input Inverter Panel
575/690V, 2P, 900A/800A
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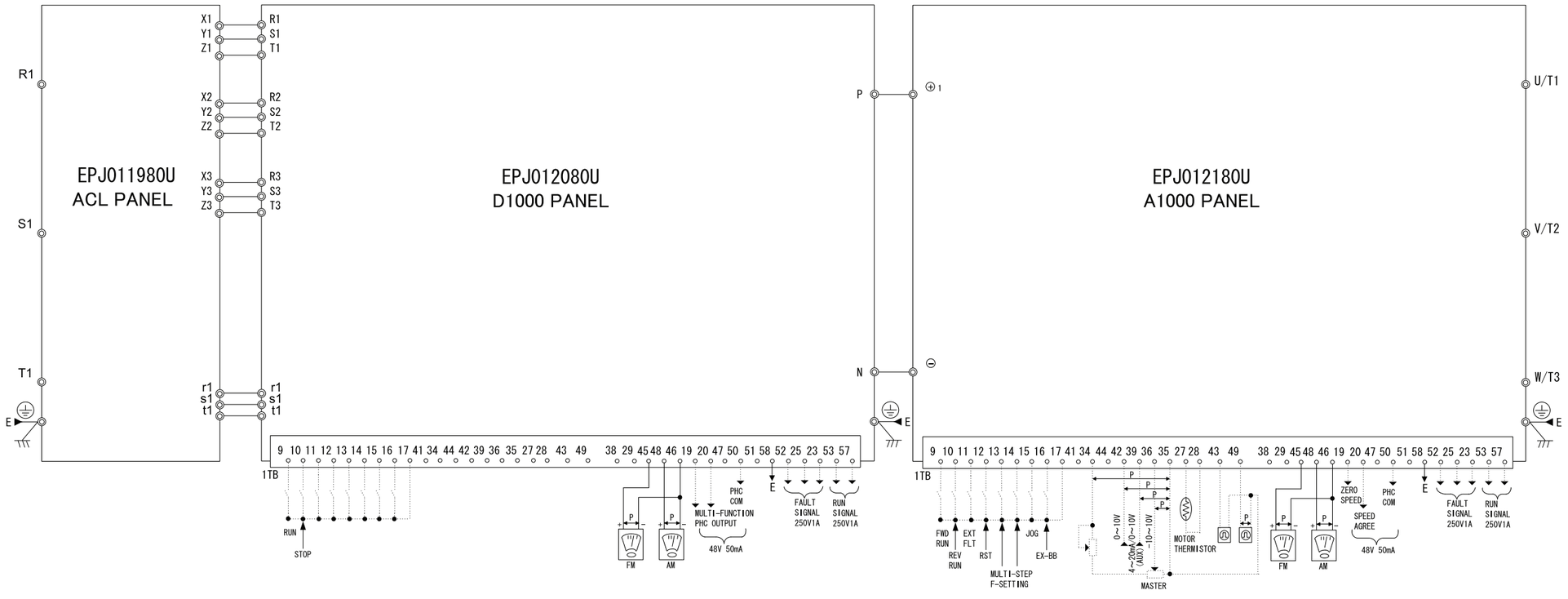


A1000 HHP, DC INPUT INVERTER PANEL, 575/690V, 2P, 900A/800A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H1350 Regen Systems
A1000 HHP, AC Input with D1000,
Overview, 575/690V, 3P, 1350A/1200A
Dwg. No. EPJ011880U 1/1

Dwg. No. EPJ011880U-1/1



A1000HHP, AC INPUT WITH D1000, 575/690V, 3P, 1350A/1200A

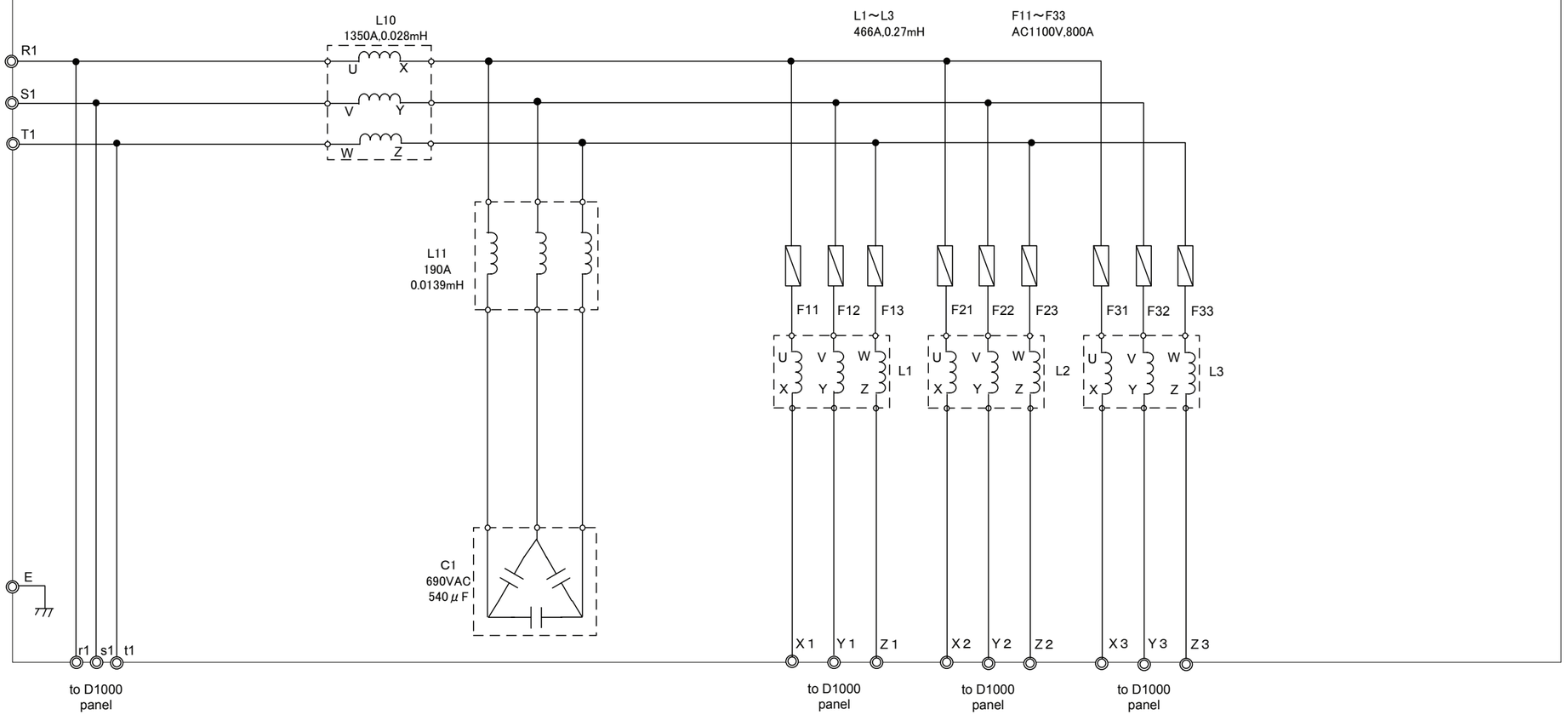
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU6H1350

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Model No. CIMR-DU6H1350 Regen Systems
D1000 HHP, ACL Filter Panel,
575/690V, 3P, 1350A/1200A
Dwg. No. EPJ011980U 1/1

Dwg. No. EPJ011980U-1/1

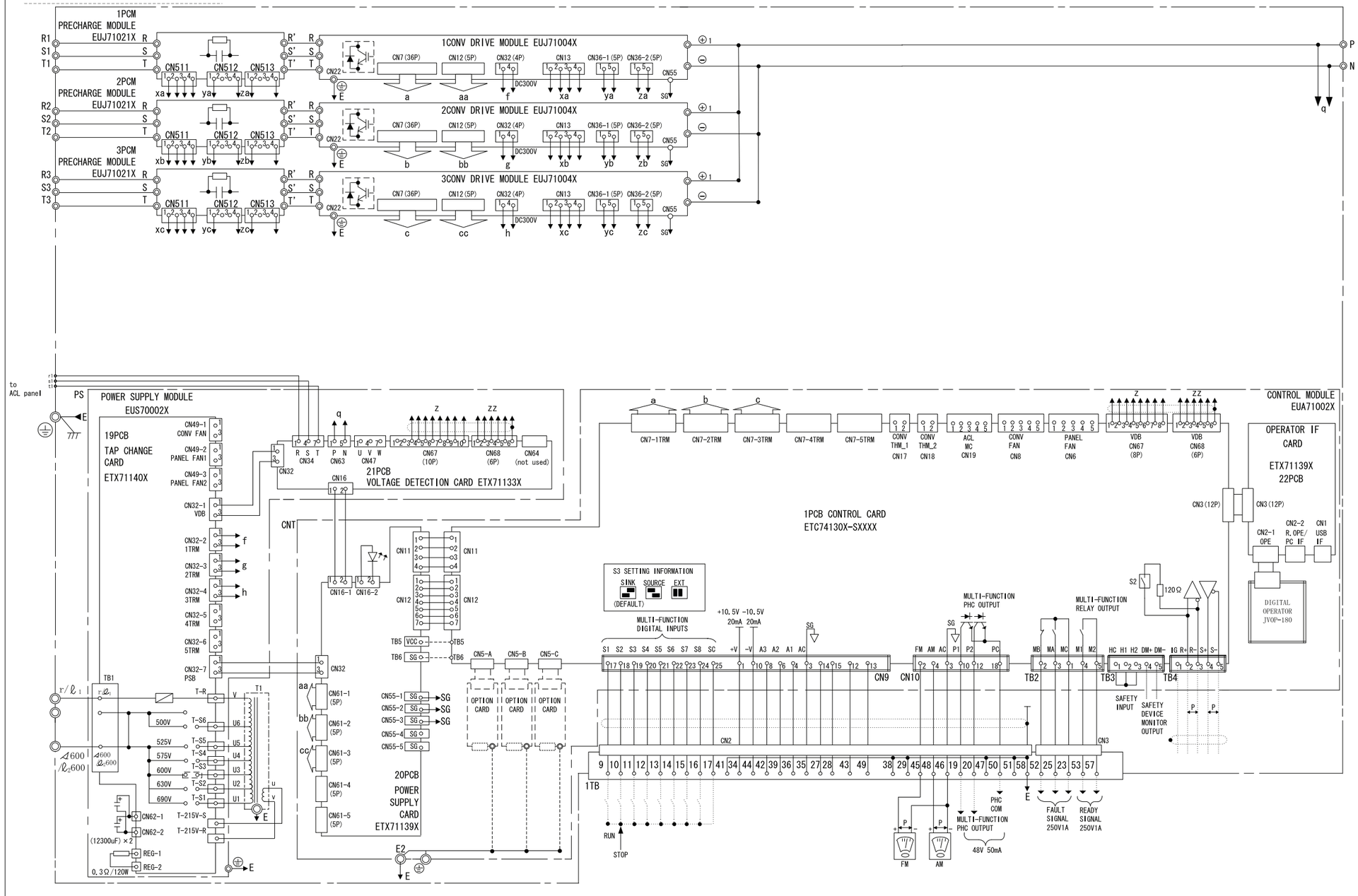


ACL PANEL FOR D1000 HHP, 575/690V, 3P, 1350A/1200A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H1350 Regen Systems
D1000 HHP, Regen Panel,
575/690V, 3P, 1350A/1200A
Dwg. No. EPJ012080U 1/1

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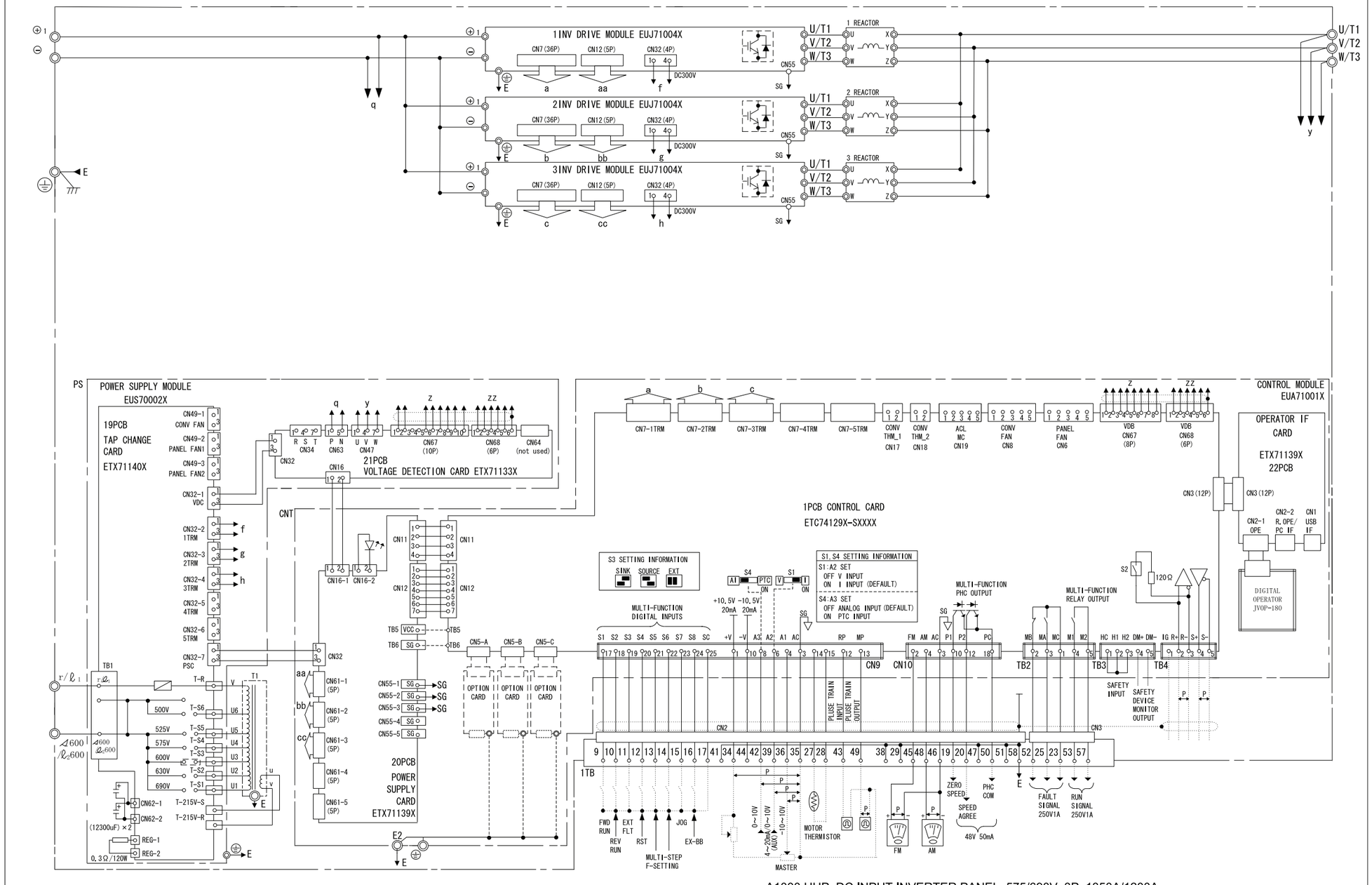


D1000 HHP REGEN PANEL, 575/690V, 3P, 1350A/1200A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H1350 Regen Systems
A1000 HHP, DC Input Inverter Panel,
575/690V, 3P, 1350A/1200A
Dwg. No. EPJ012180U 1/1

Dwg. No. EPJ012180U-1/1

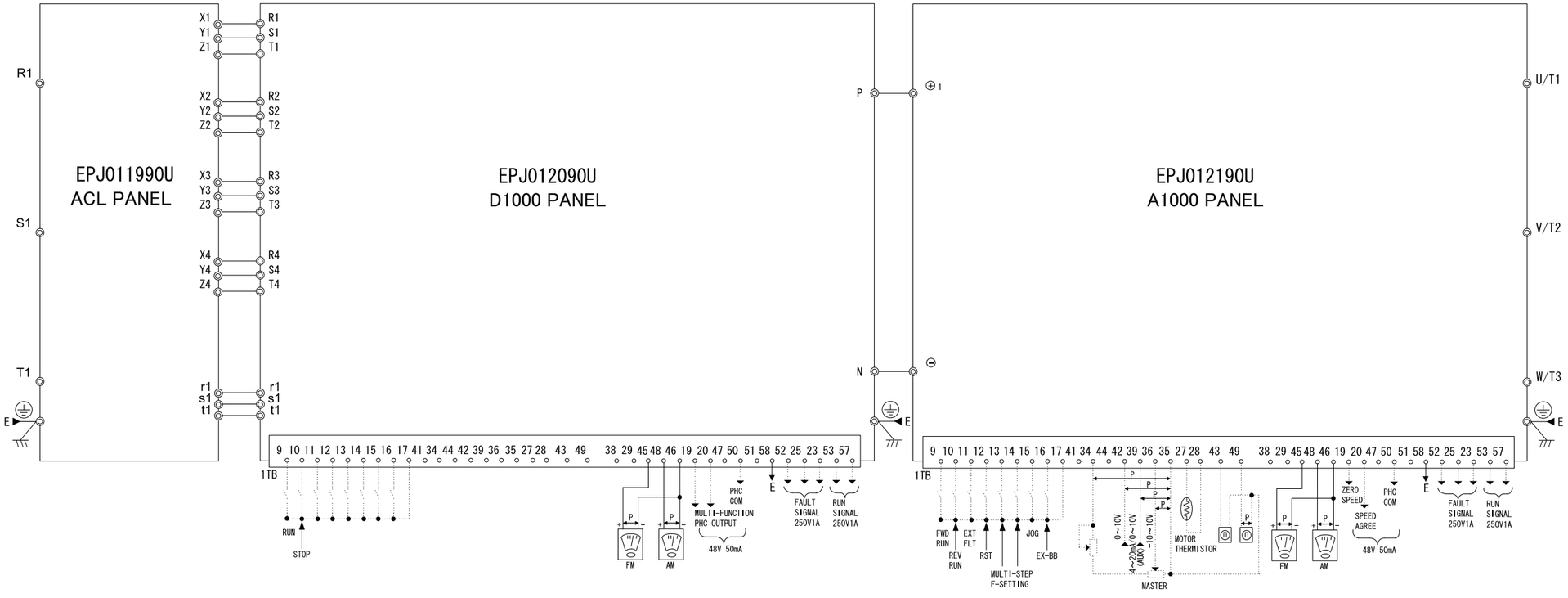


A1000 HHP, DC INPUT INVERTER PANEL, 575/690V, 3P, 1350A/1200A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H1800 Regen Systems
A1000 HHP, AC Input with D1000,
Overview, 575/690V, 4P, 1800A/1600A
Dwg. No. EPJ011890U 1/1

Dwg. No. EPJ011890U-1/1



A1000HHP, AC INPUT WITH D1000, 575/690V, 4P, 1800A/1600A

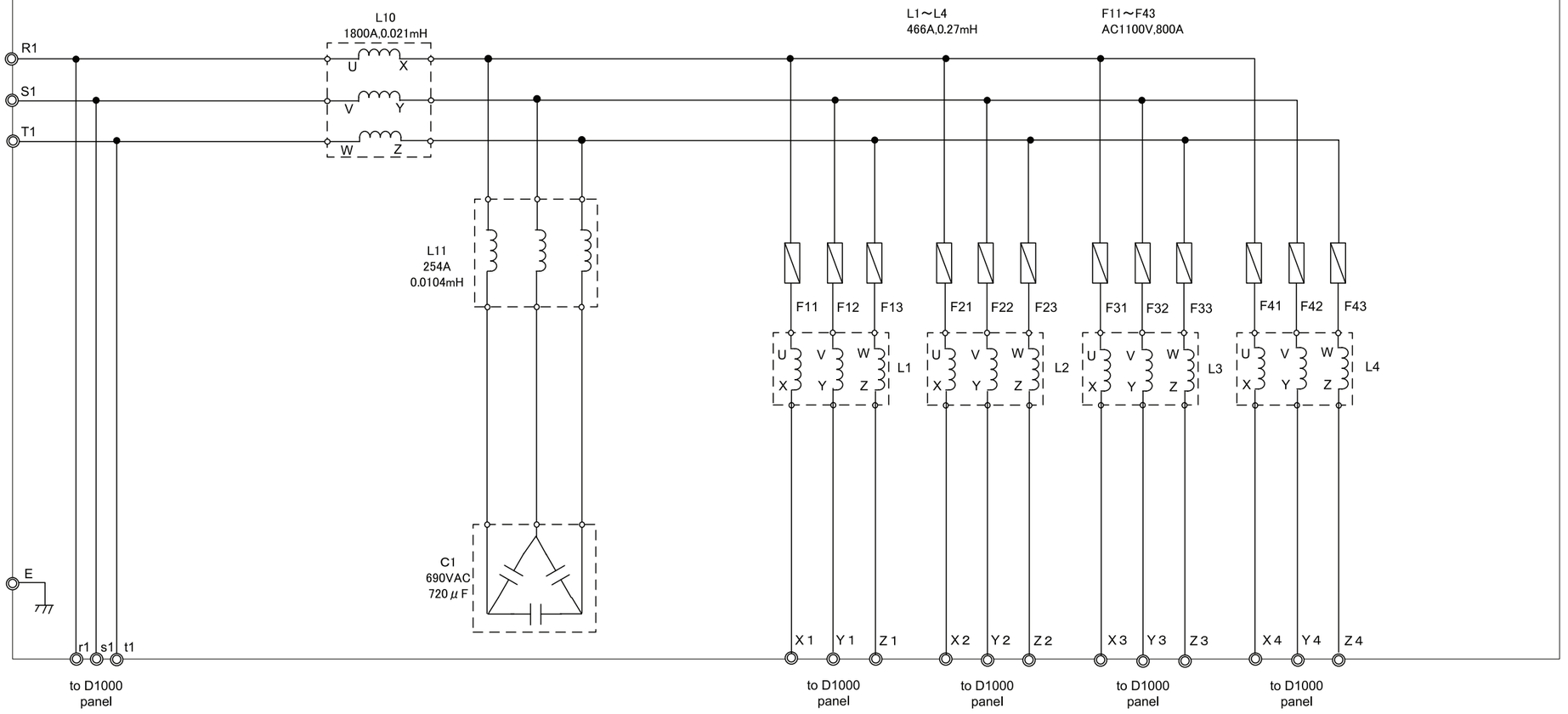
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU6H1800

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Model No. CIMR-DU6H1800 Regen Systems
D1000 HHP, ACL Panel,
575/690V, 4P, 1800A/1600A
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Dwg. No. EPJ011990U-1/1

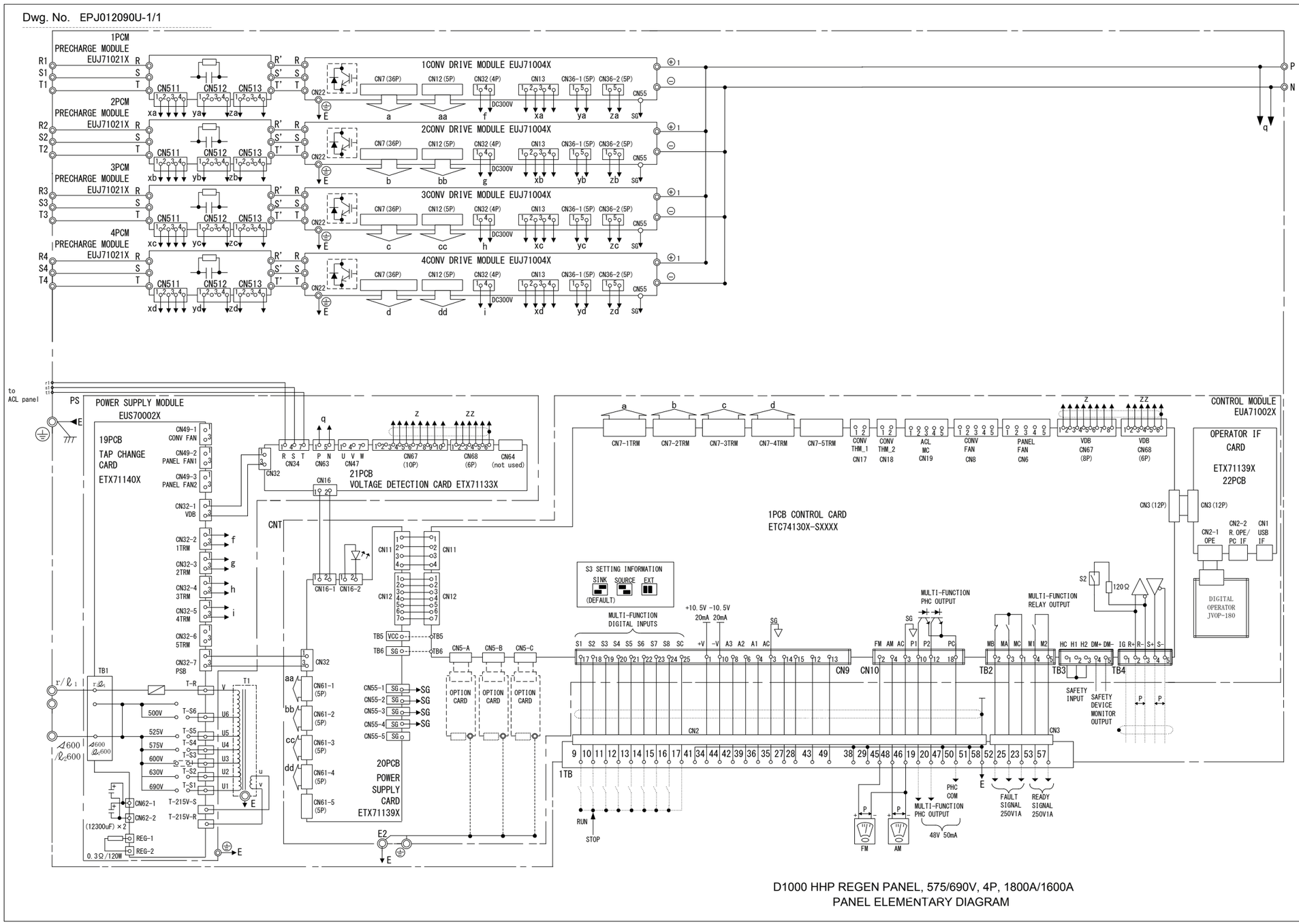


ACL PANEL FOR D1000 HHP, 575/690V, 4P, 1800A/1600A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H1800 Regen Systems
D1000 HHP, Regen Panel
575/690V, 4P, 1800A/1600A
Dwg. No. EPJ012090U 1/1

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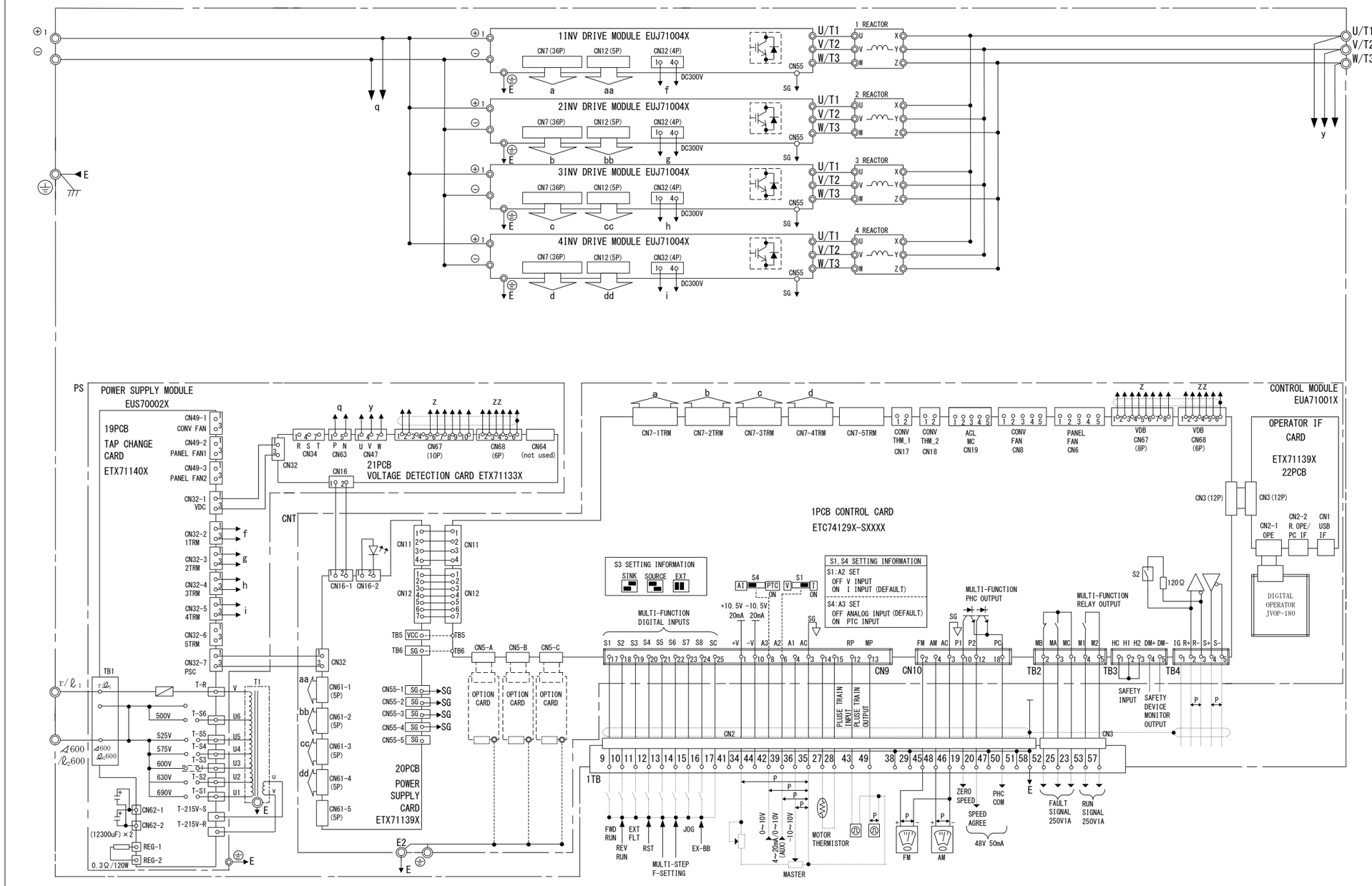


D1000 HHP REGEN PANEL, 575/690V, 4P, 1800A/1600A
PANEL ELEMENTARY DIAGRAM

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A1000 HHP, Inverter Panel
575/690V, 4P, 1800A/1600A
Dwg. No. EPJ012190U 1/1

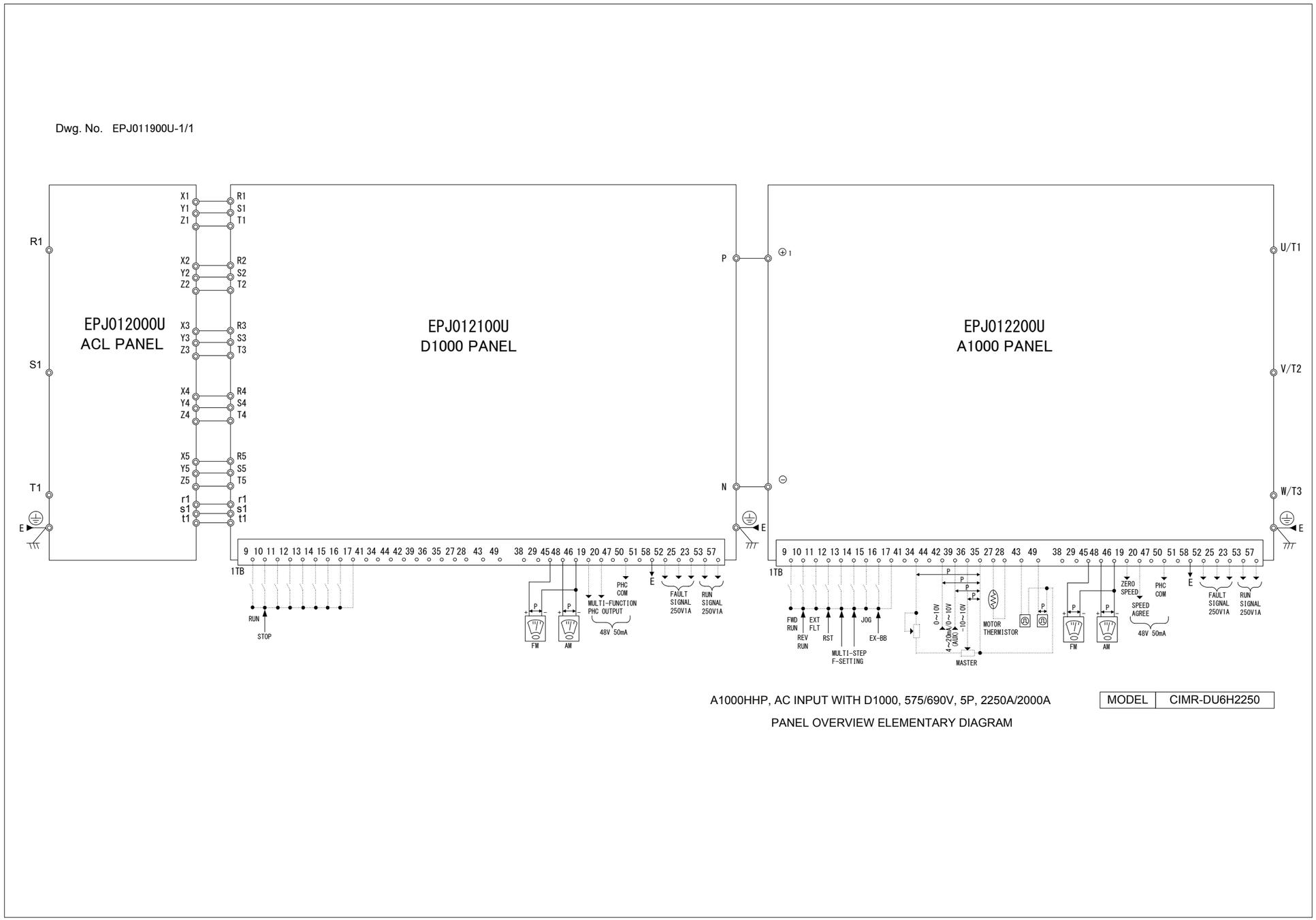
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A1000 HHP, DC INPUT INVERTER PANEL, 575/690V, 4P, 1800A/1600A
PANEL ELEMENTARY DIAGRAM

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Model No. CIMR-DU6H2250 Regen Systems
A1000 HHP, DC Input Panel, Overview,
575/690V, 5P, 2250A/2000A
Dwg. No. EPJ011900U 1/1



A1000HHP, AC INPUT WITH D1000, 575/690V, 5P, 2250A/2000A

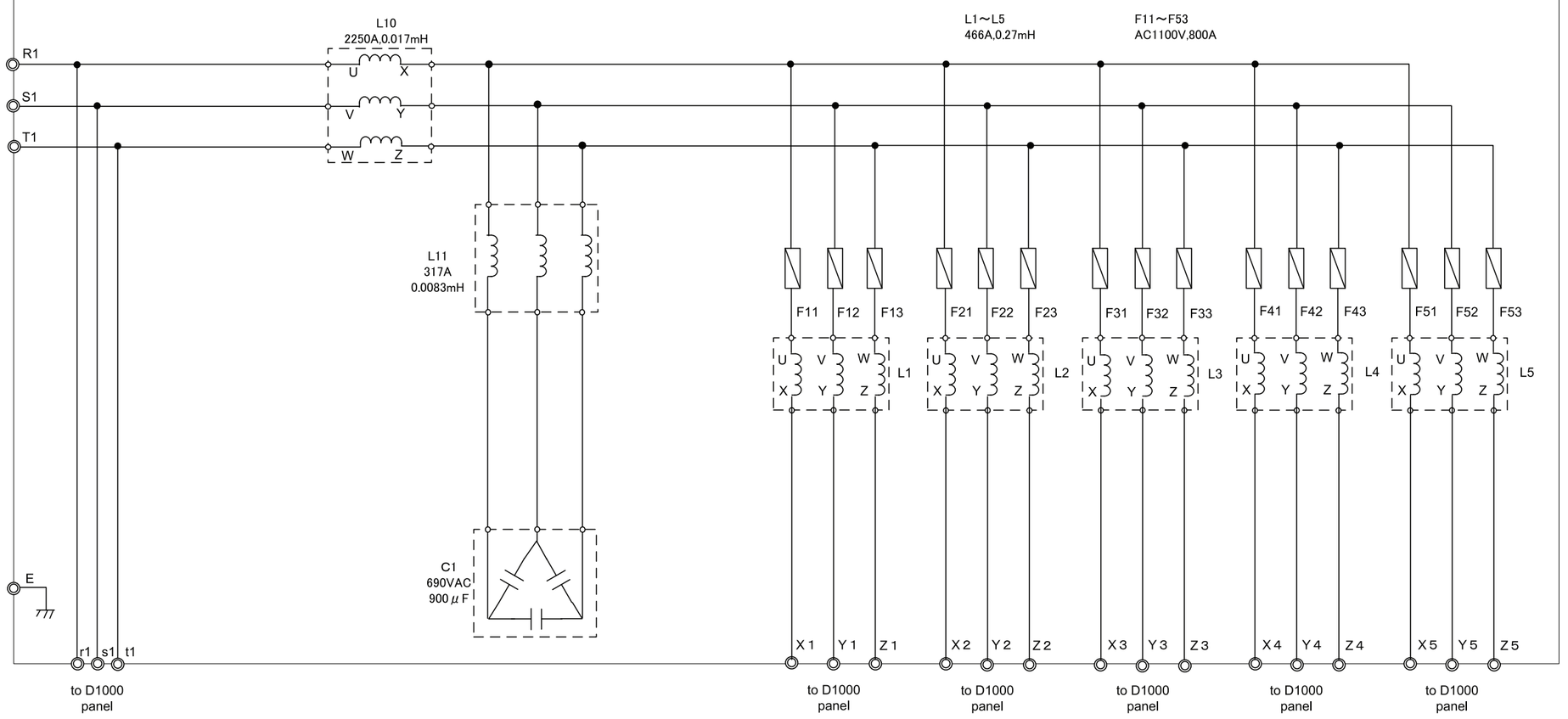
PANEL OVERVIEW ELEMENTARY DIAGRAM

MODEL	CIMR-DU6H2250

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Model No. CIMR-DU6H2250 Regen Systems
D1000 HHP, ACL Regen Filter Panel,
575/690V, 5P, 2250A/2000A
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Dwg. No. EPJ012000U-1/1

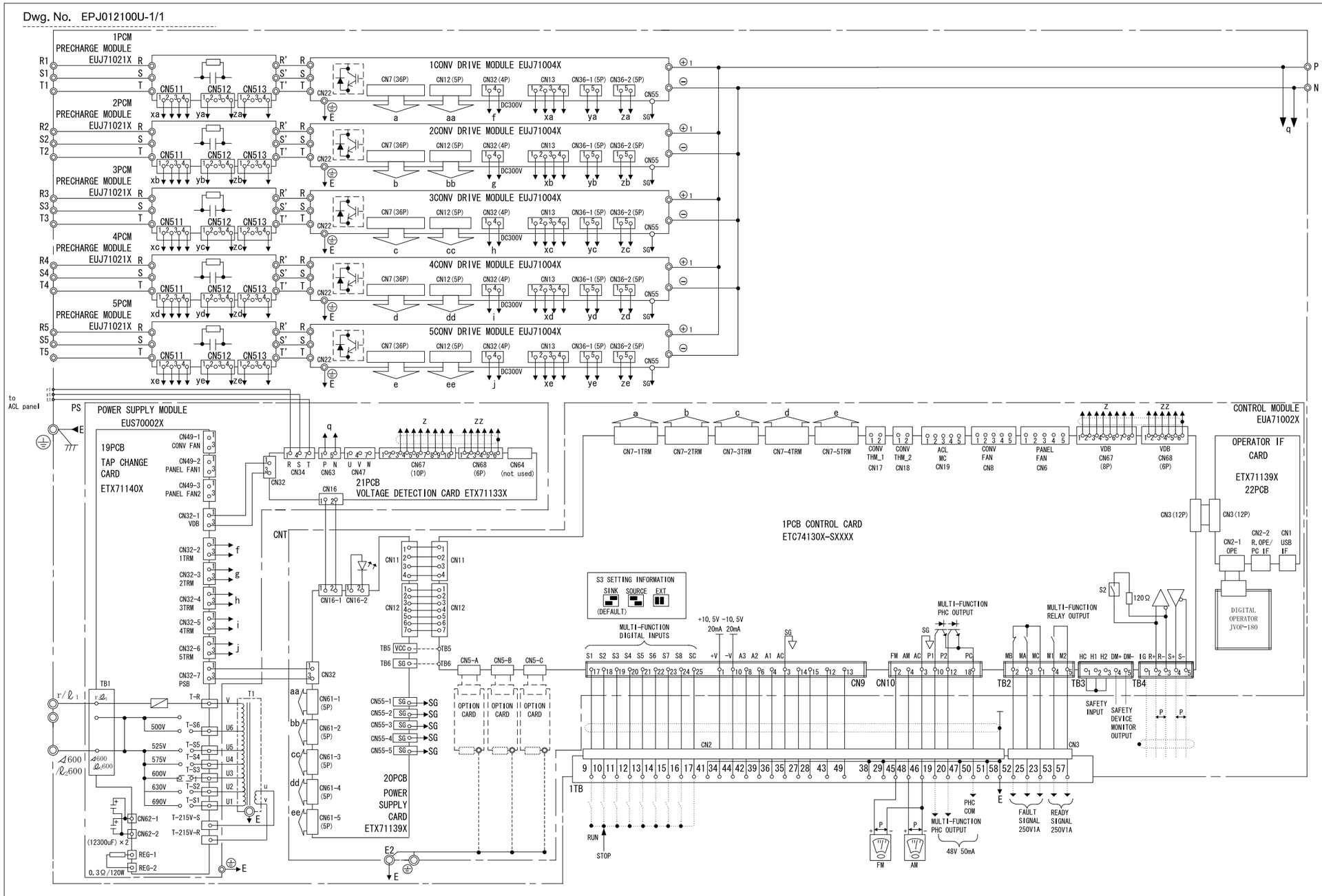


ACL PANEL FOR D1000 HHP, 575/690V, 5P, 2250A/2000A
PANEL ELEMENTARY DIAGRAM

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D1000 HHP, Regen Panel,
575/690V, 5P, 2250A/2000A
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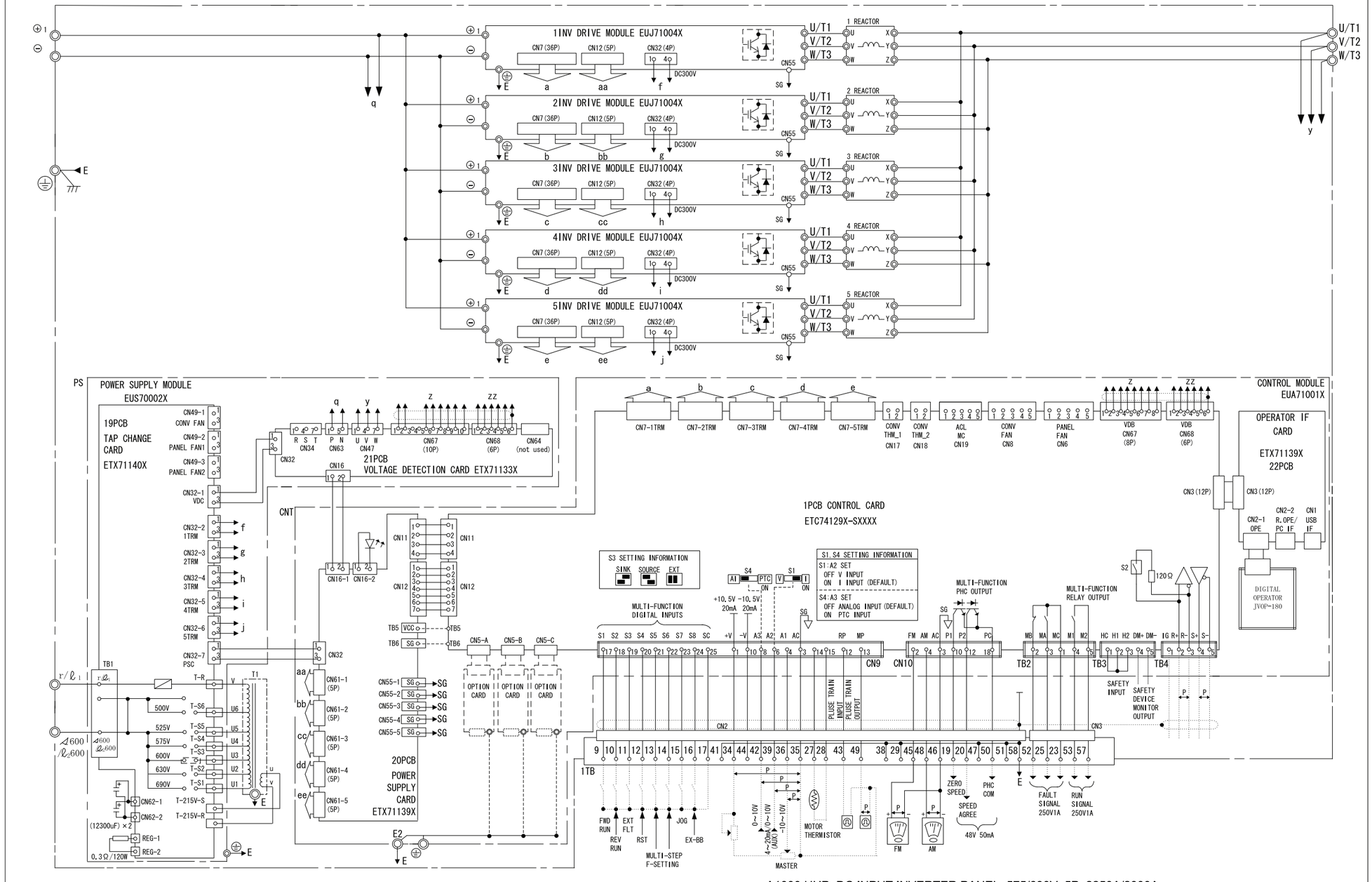
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Model No. CIMR-DU6H2250 Regen Systems
A1000 HHP, DC Input Inverter Panel,
575/690V, 5P, 2250A/2000A
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Dwg. No. EPJ012200U-1/1

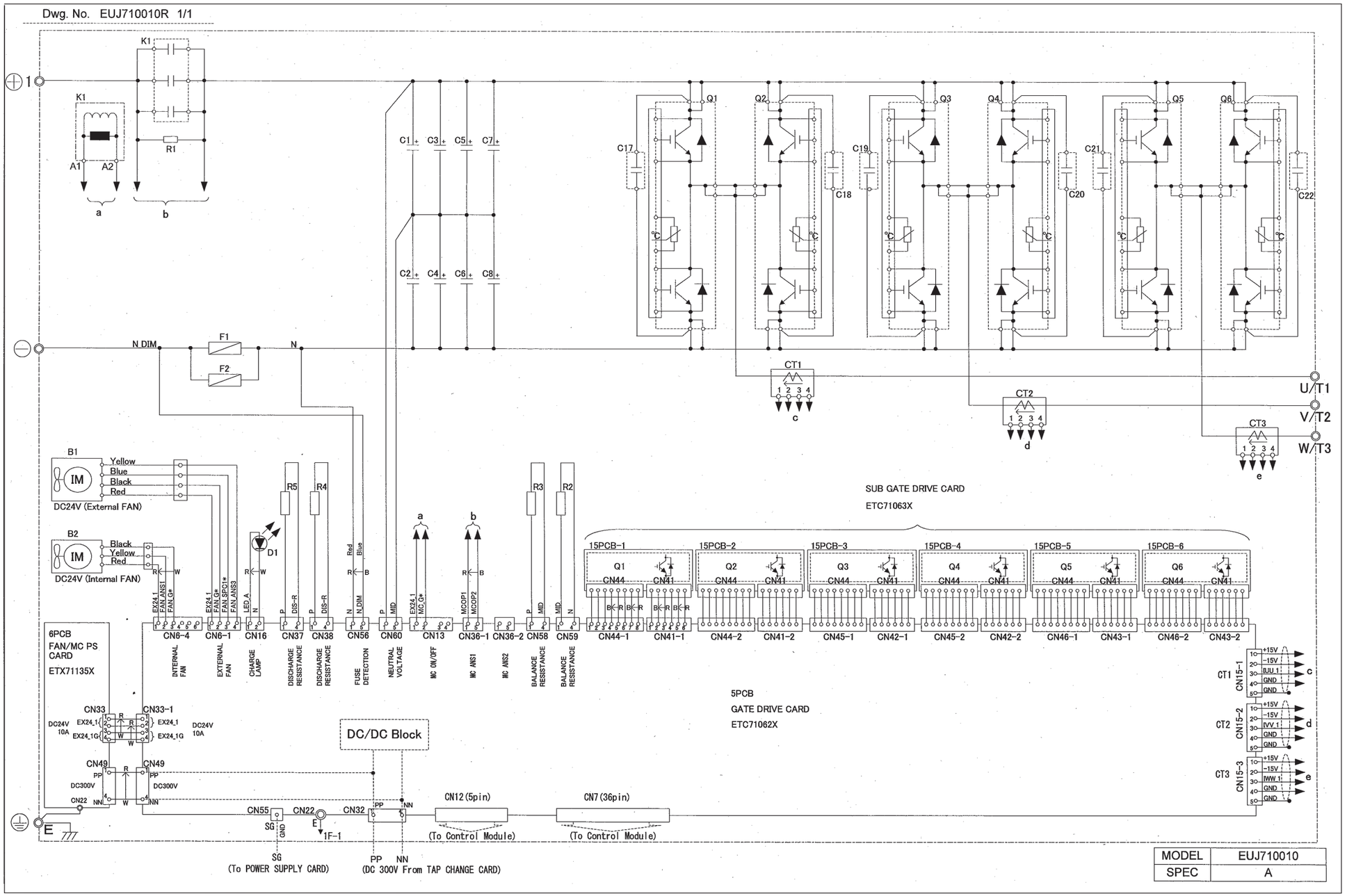


A1000 HHP, DC INPUT INVERTER PANEL, 575/690V, 5P, 2250A/2000A
PANEL ELEMENTARY DIAGRAM

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Model No. EUJ710010R 1/1
480V Inverter Drive Module

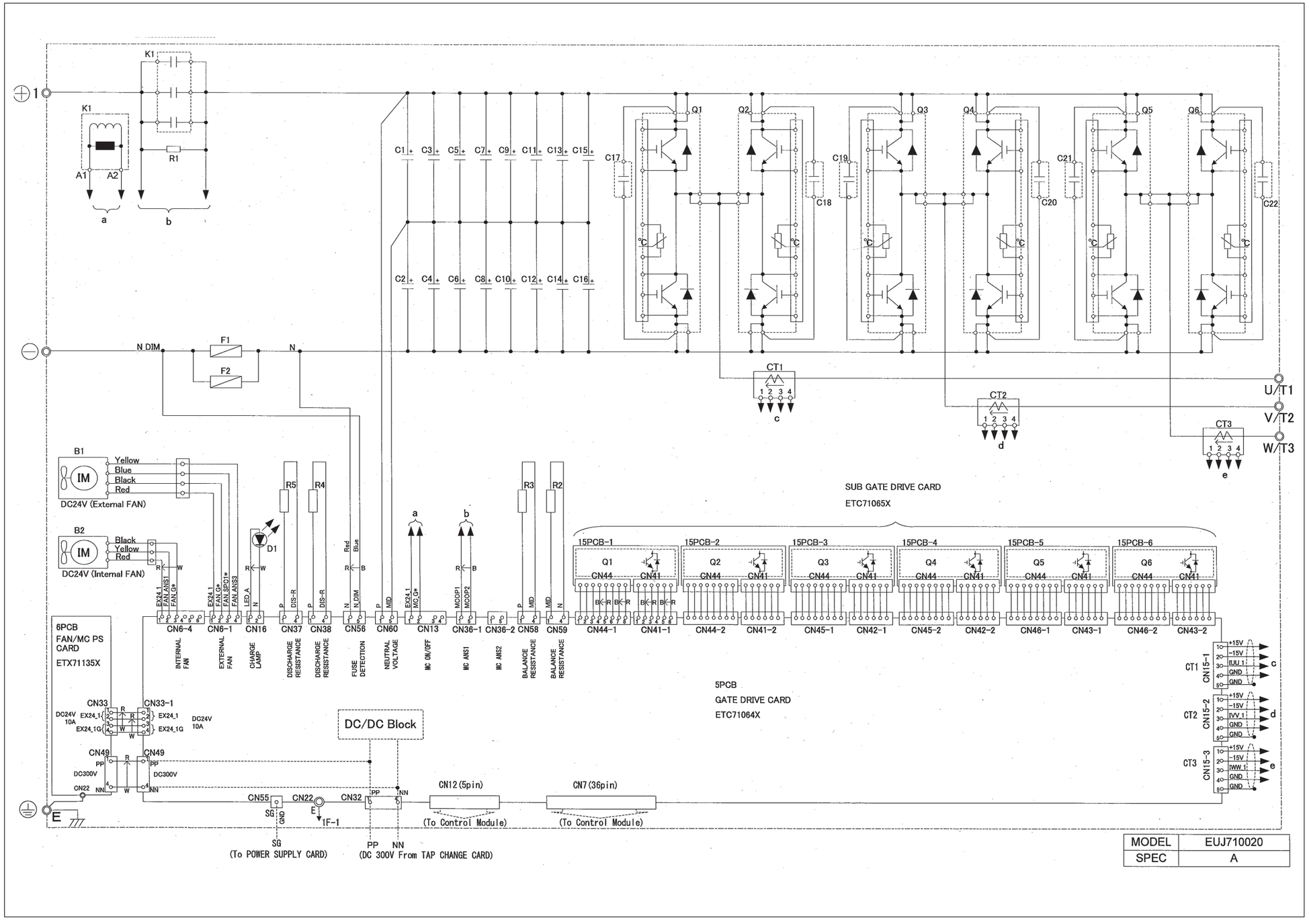
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Model No. EUJ710020R 1/1
575/690V Inverter Drive Module

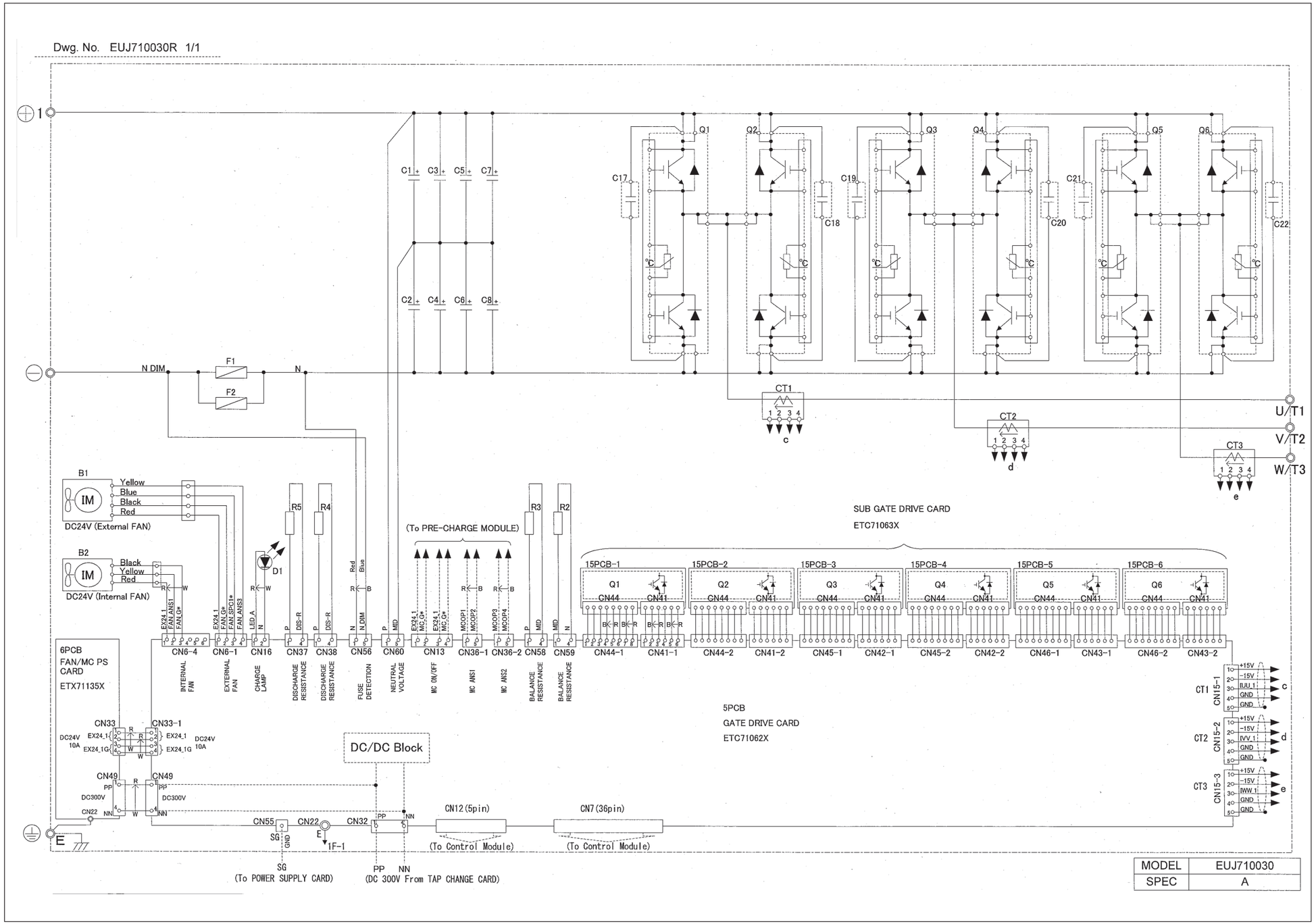
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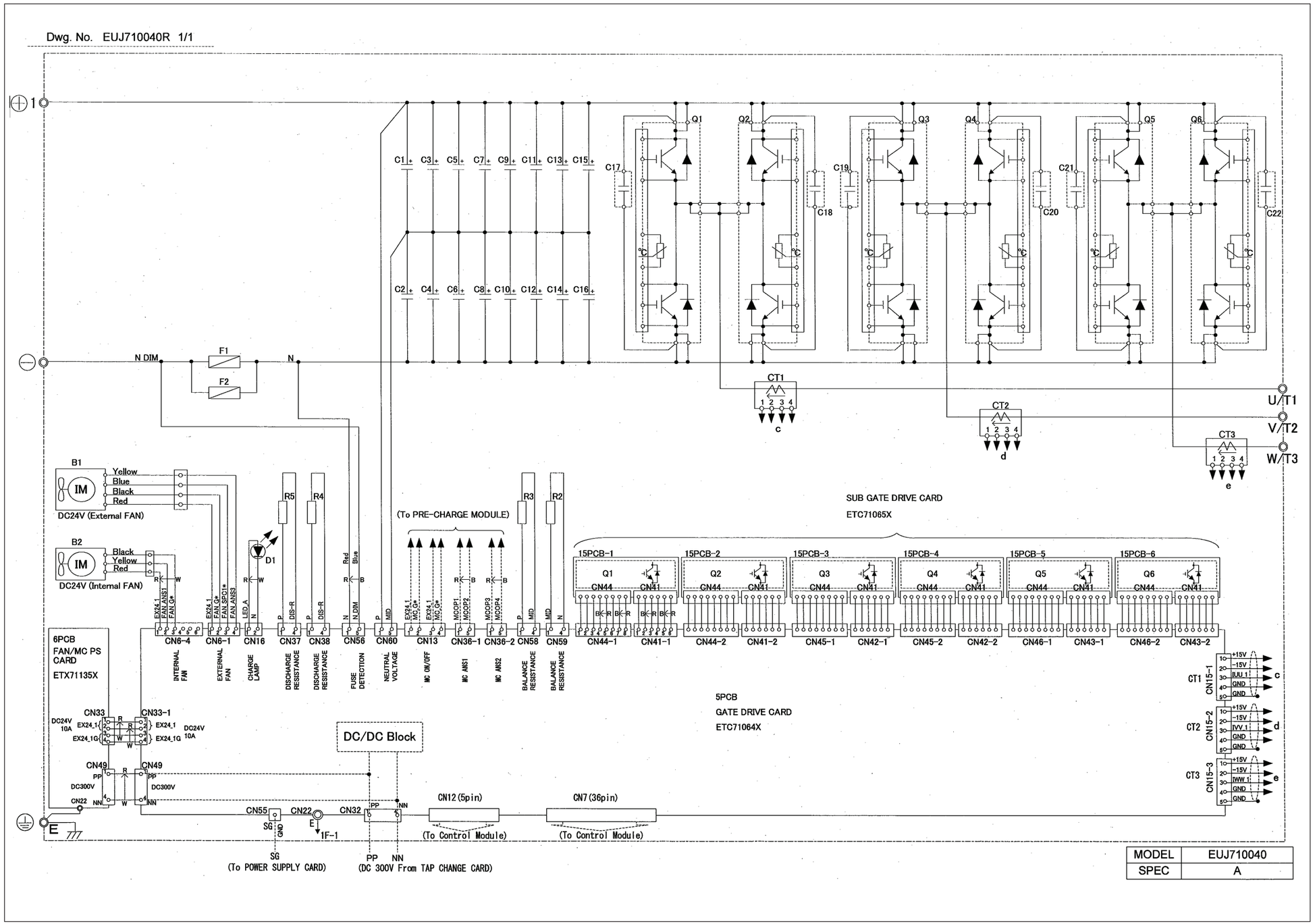
Model No. EUJ710030R 1/1
480V Inverter/Regen Converter Module

Dwg. No. EUJ710030R 1/1



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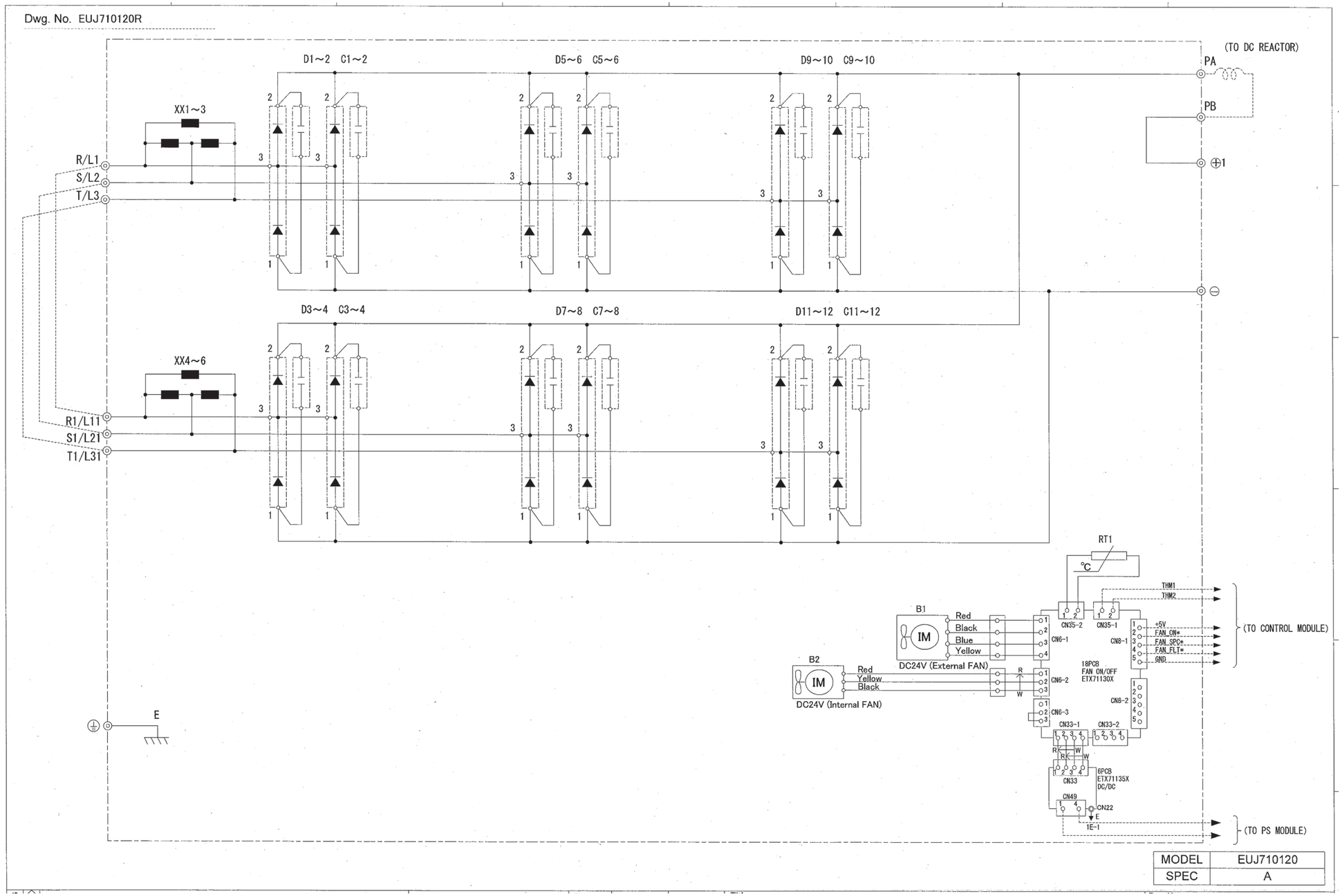
Model No. EUJ710040R 1/1
575/690V Inverter/Regen
Converter Module
Dwg. No. EUJ710040R 1/1



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Model No.
A1000 HHP, Converter Module
480V, 575/690V, 2P Systems
Dwg. No. EUJ710120R 1/1

Dwg. No. EUJ710120R

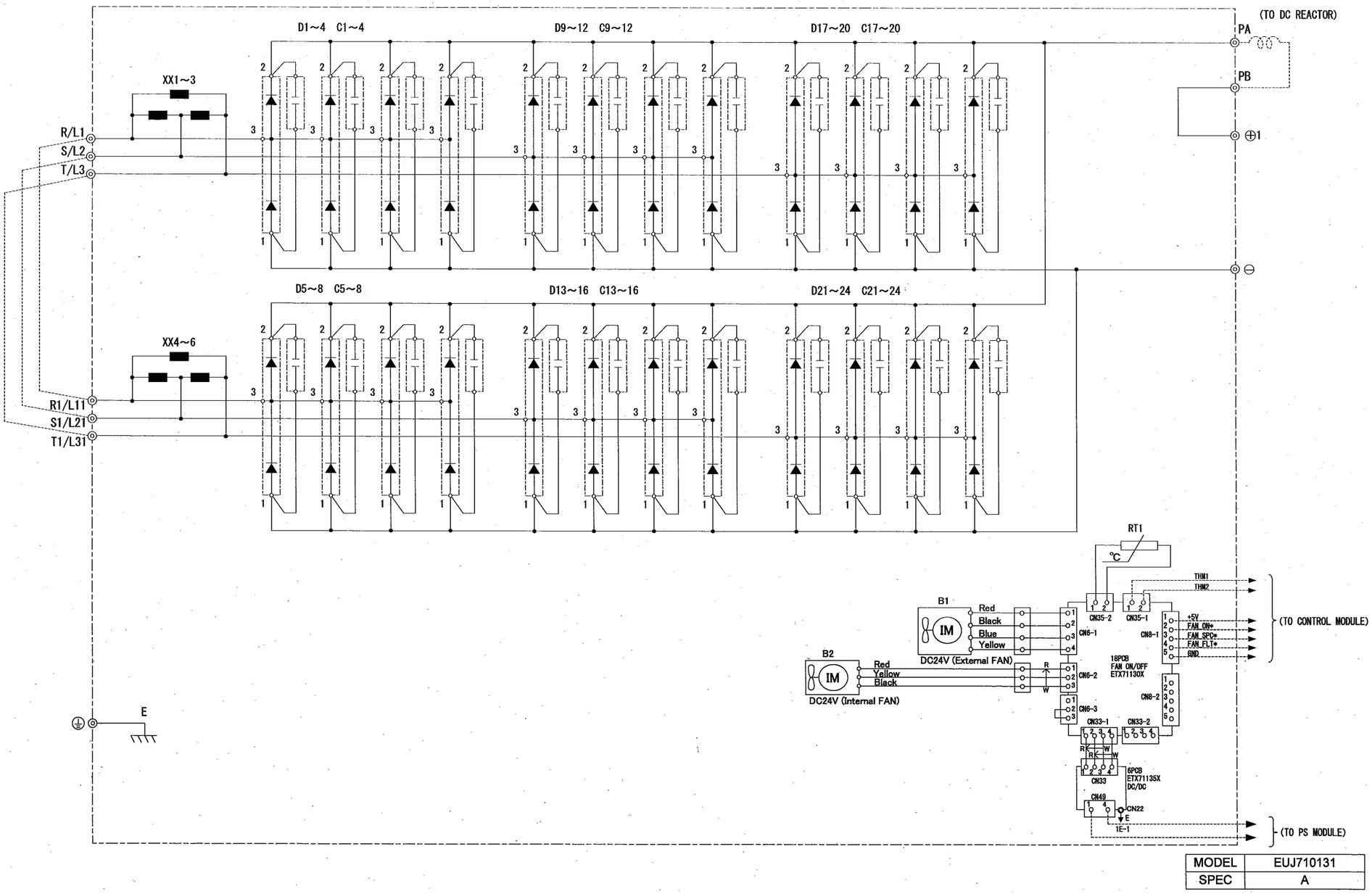


MODEL	EUJ710120
SPEC	A

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Model No. EUJ710131R 1/1
480/575/690V
Converter Module -3p & 4P Systems
Dwg. No. EUJ710131R 1/1

Dwg. No. EUJ710131R

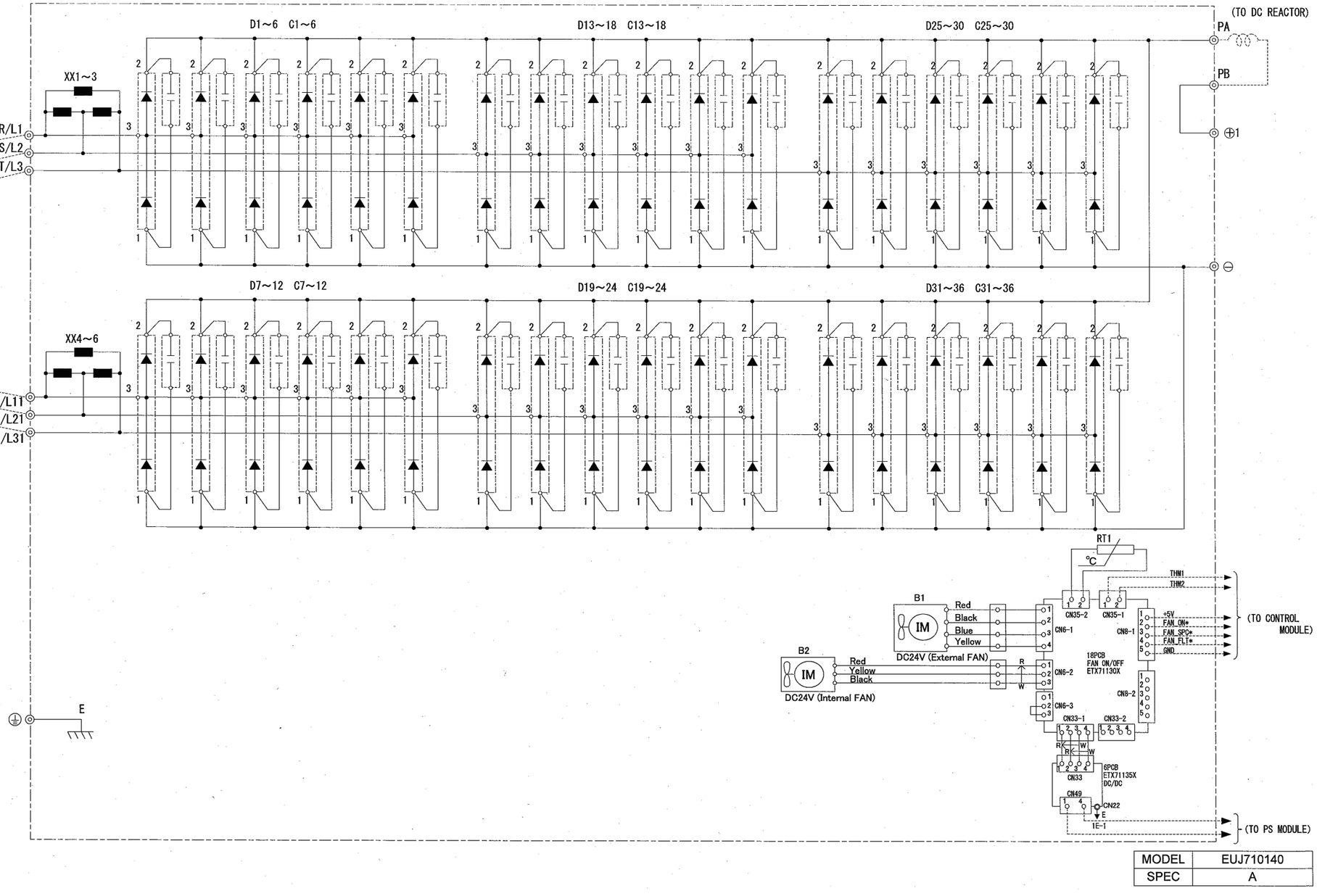


MODEL	EUJ710131
SPEC	A

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Model No. EUJ710140R 1/1
480/575/690V
Converter Module - 5P Systems
Dwg. No. EUJ710140R 1/1

Dwg. No. EUJ710140R



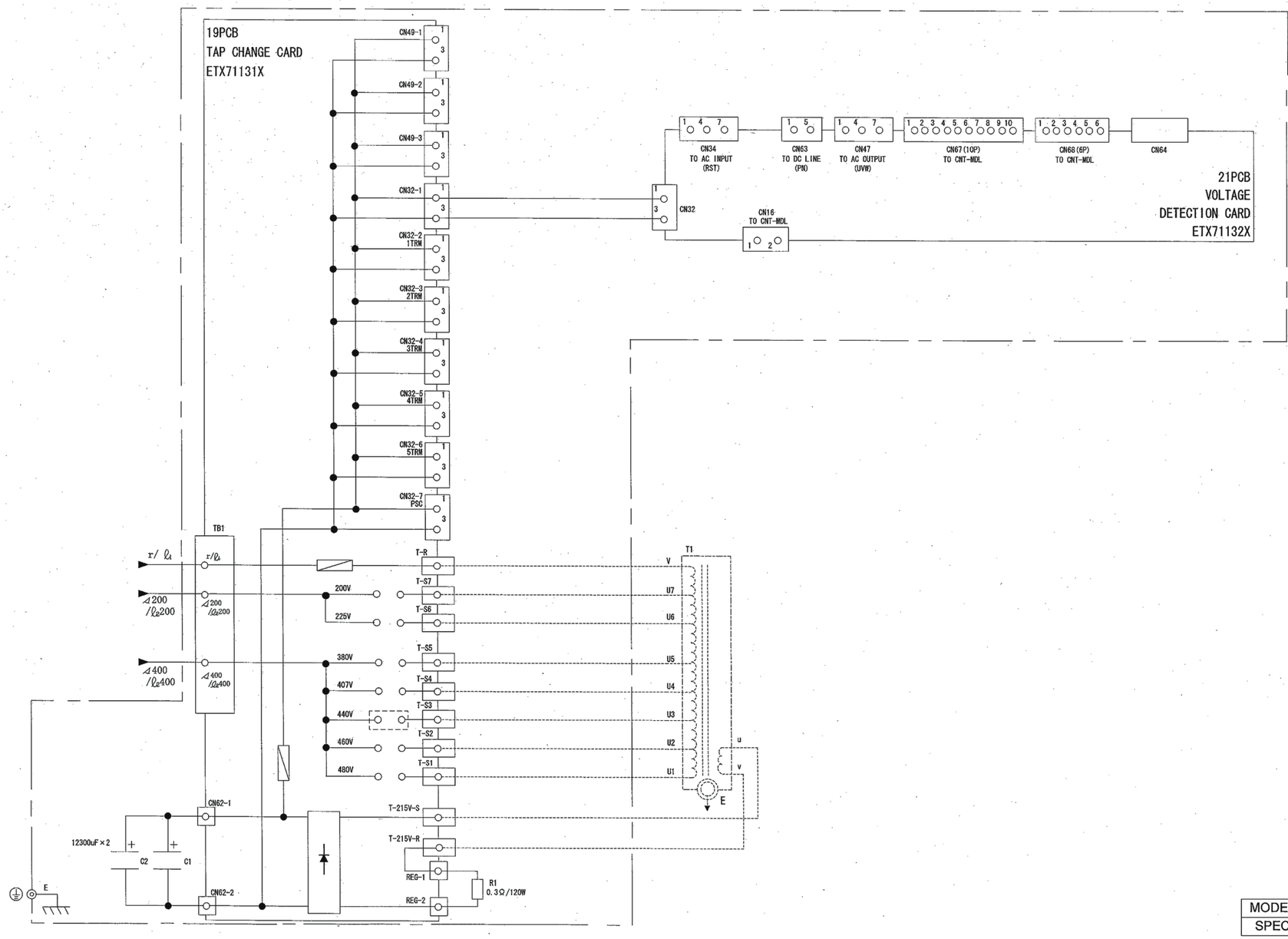
MODEL	EUJ710140
SPEC	A

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Model No. EUS700010R 1/1
480V Power Supply Module

Dwg. No. EUS700010R 1/1

Dwg. No. EUS700010R-1/1



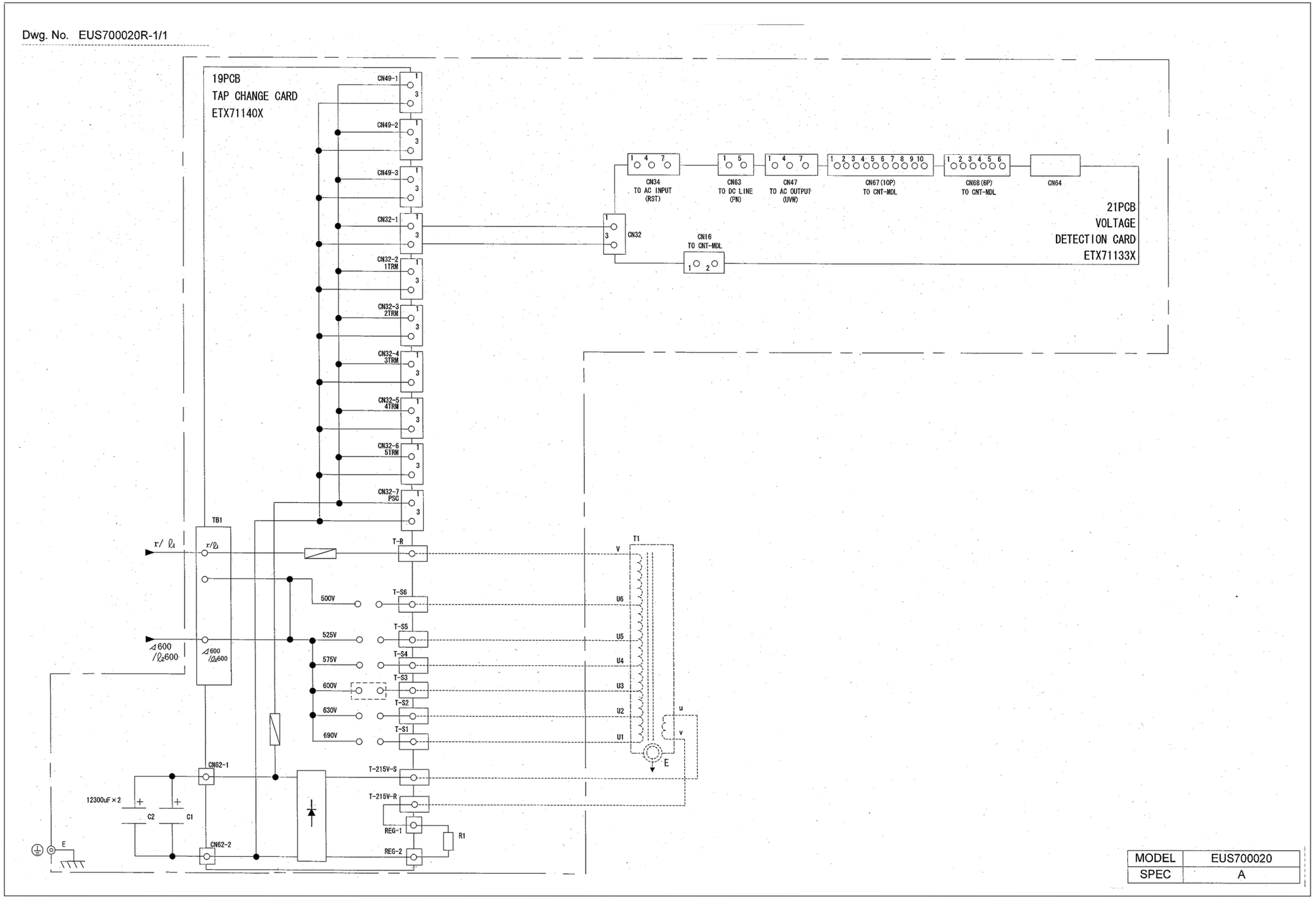
MODEL	EUS700010
SPEC	A

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Model No. EUS700020R 1/1
575/690V Power Supply Module

Dwg. No. EUS700020R 1/1

Dwg. No. EUS700020R-1/1

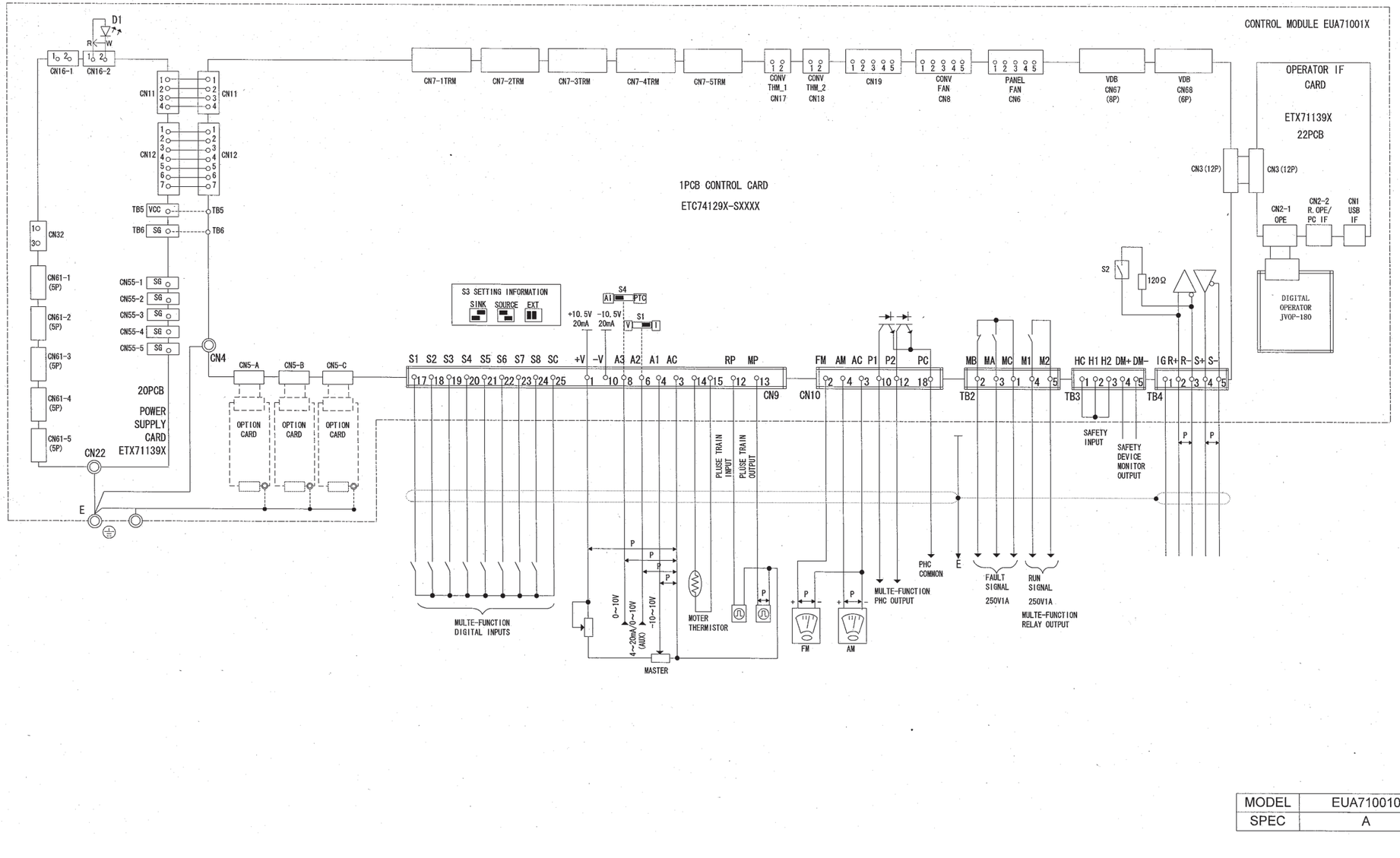


MODEL	EUS700020
SPEC	A

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Model No. EUA710010R 1/1
A1000 Control Module
for Inverter Control
Dwg. No. EUA710010R 1/1

Dwg. No. EUA710010R -1/1

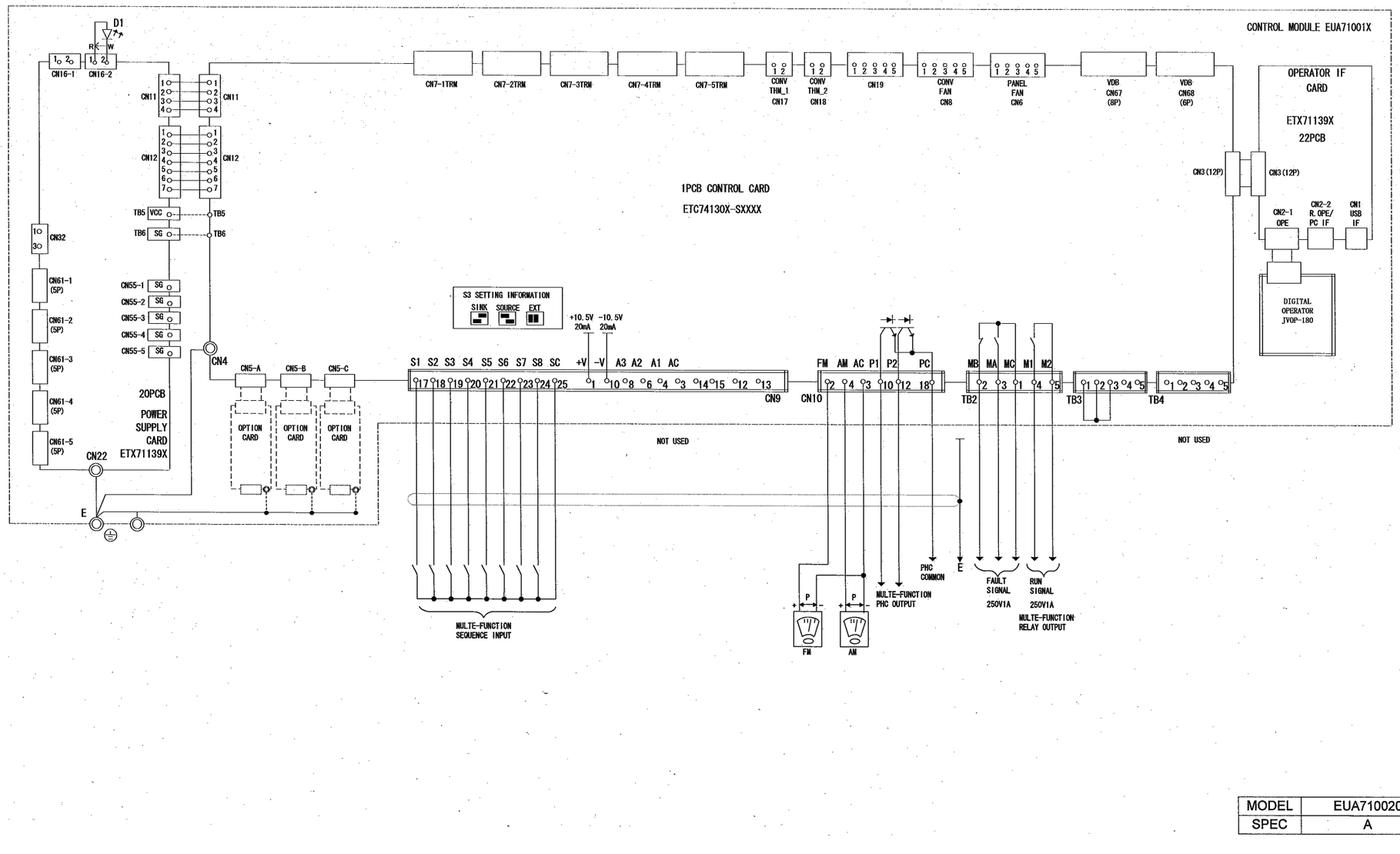


MODEL	EUA710010
SPEC	A

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Model No. EUA710020R 1/1
D1000 Regen Control Module
for Regen Converter Control
Dwg. No. EUA710020R 1/1

Dwg. No. EUA710020R -1/1

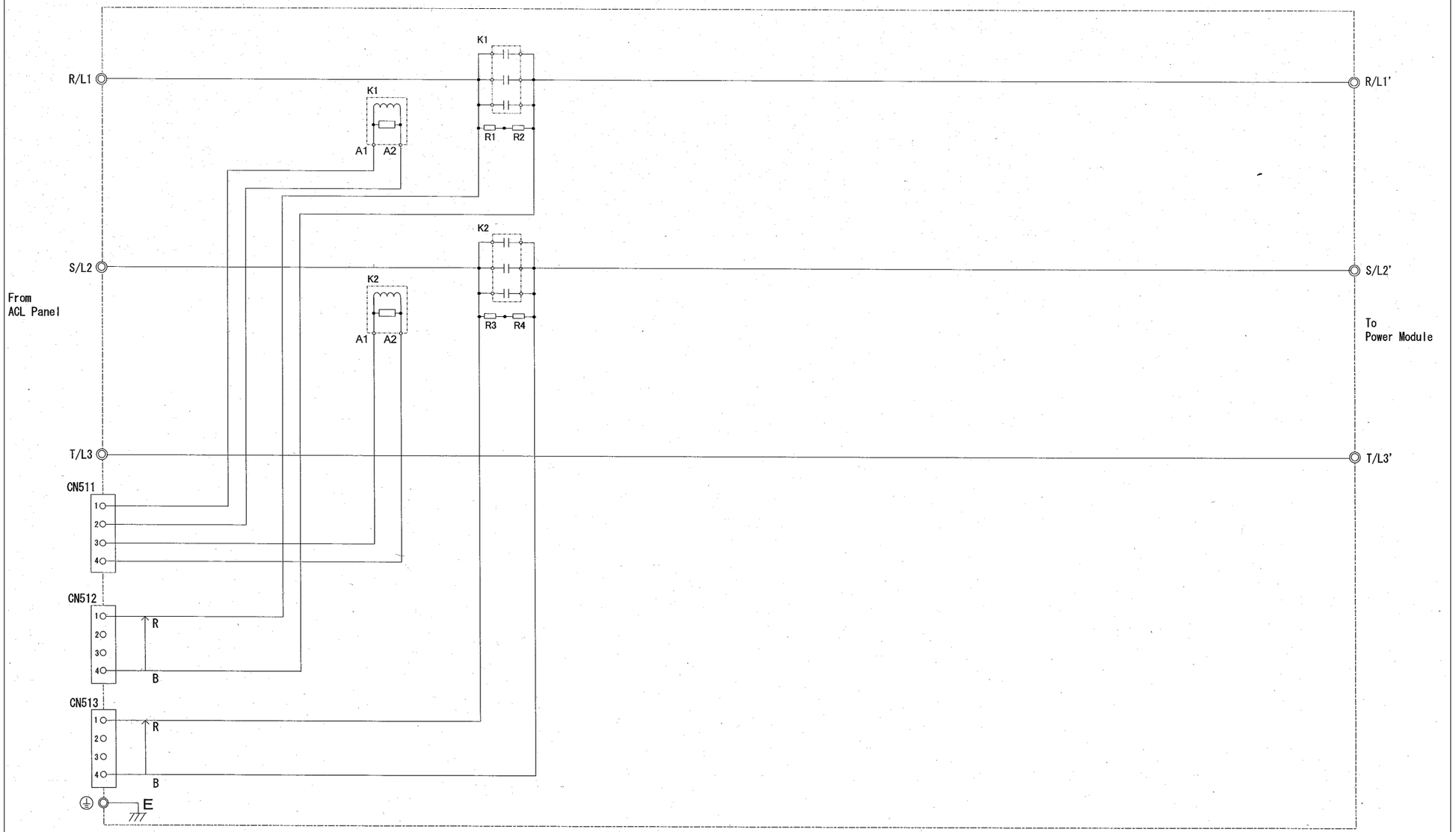


MODEL	EUA710020
SPEC	A

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Model No. EUJ710210R 1/1
Pre Charge Module
for Regen Systems
Dwg. No. EUJ710210R 1/1

Dwg. No. EUJ 710210 R-1/1



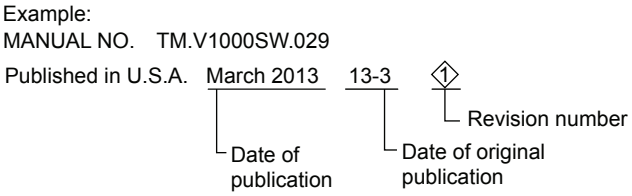
MODEL	EUJ710210
SPEC	A

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15 Revision History

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



Date of Publication	Revision Number	Section	Revised Content
January 2014	6	All	Revision: Updated technical content and terminology.
July 2013	5	All	YEA-A1000HHP-01. This document replaces YEA-A1000HHP-01.
February 2013	4	All	Revision: Applied standard formatting.

YASKAWA AC Drive 1000-Series
A1000 HHP Modular Drive
Component Selection Guide

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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.

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