INSTRUCTIONS
for
STABILINE ®
Power Conditioner

CRA141S010

Single Phase
480 Volt Input
120 Volt Output
Single Control

Superior Electric reserves the right to make engineering changes on all its products. Such refinements may affect information given in the instructions. Therefore, USE ONLY THE INSTRUCTIONS THAT ARE PACKED WITH THE PRODUCT.

WARNING: **High voltages are present inside this unit during operation. Do not operate this unit unless all covers are in place.** Installation and servicing should only be done by qualified personnel.

Superior Electric

213709-264 Rev. A
EC99741

TABLE OF CONTENTS

1.0. INSPECTION

1.1. UNPACKING

When unpacking the unit, examine it carefully for any shipping damage. The "Damage and Shortage" instructions packed with the unit outlines the procedure to follow if any parts are missing or damaged.

2.0. DESCRIPTION

2.1. GENERAL

CRA141S Series STABILINE® Power Conditioners are fast acting, fully isolated power conditioners that provide filtered and regulated power for sensitive loads. These power conditioners are designed for a 480 volt, single phase input and a 120 volt, single phase output. These voltage conditioners incorporate an analog electronic control section and a power section consisting of one or more motor driven POWERSTAT® Variable Transformers. The units can be equipped with a number of standard options. Refer to the CRA model numbering system in the next section for more details. See the rating sections and unit nameplate for complete specifications.

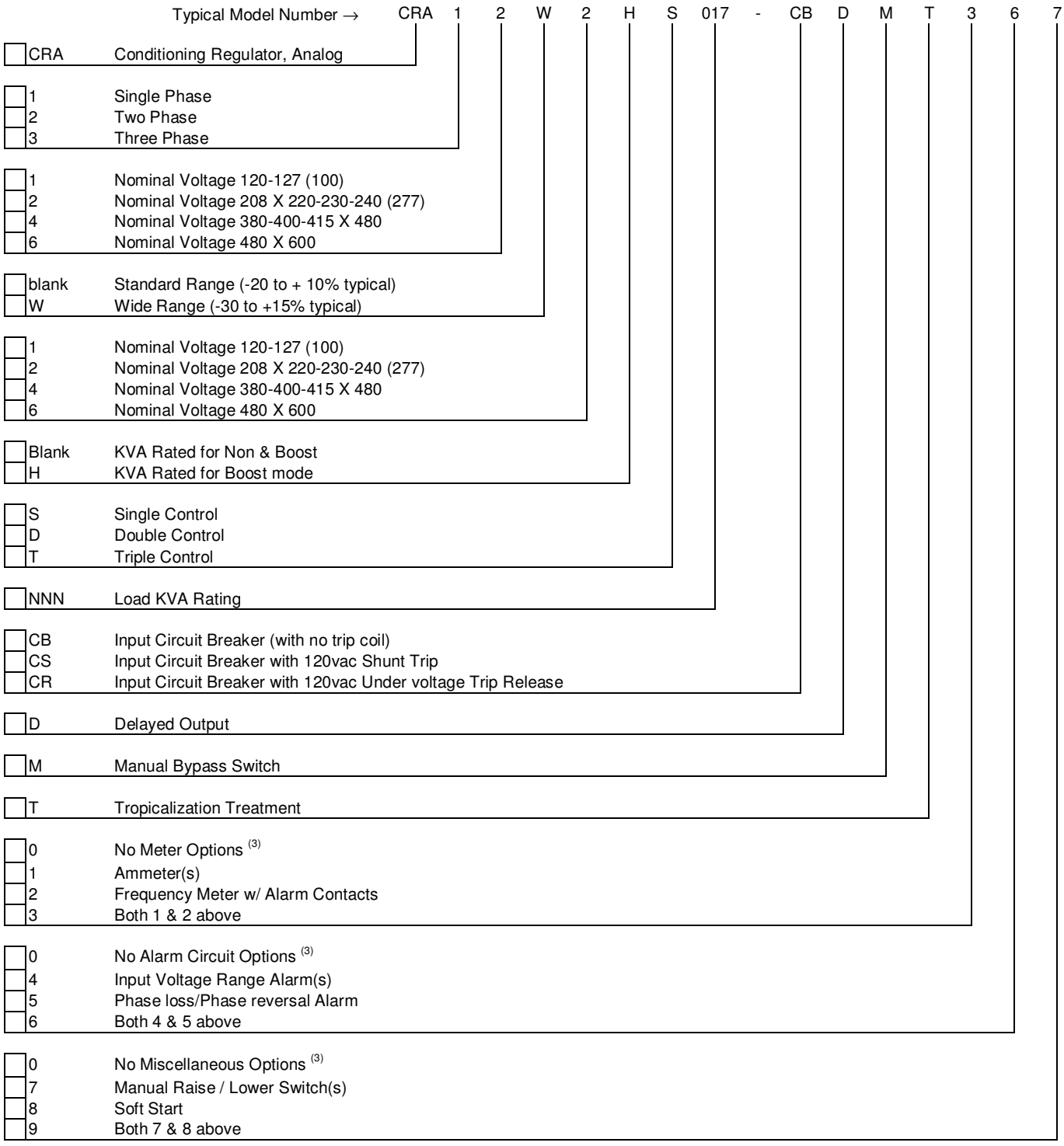
Advantages of all CRA Series power conditioners include high efficiency (97% typical), high overload capacity and low impedance. These power conditioners are insensitive to the magnitude and power factor of the load, and have little to no effect on system power factor. This means these units can be used with any type load.

2.2. MODEL NUMBER ASSIGNED

The model number for each CRA Series Power Conditioner identifies the various characteristics of that specific unit. Refer to the Standard Model Number System table to determine a unit's characteristics and options.

2.3. STANDARD MODEL NUMBER SYSTEM

The model number for each CRA Series conditioning voltage regulator identifies the various characteristics of that specific unit. The following table explains the meaning of each character in a standard model number.



(1) Base model numbers (no options) as shown in catalog include the characters up to the hyphen (-).
(2) For lettered options not selected the letters and spaces are omitted from the model number.
(3) The last three numbers in the model number are all used unless all three are zero then they are omitted.

2.4. THEORY OF OPERATION

CRA Series STABILINE® Power Conditioners maintain a constant regulated output AC voltage by simulating an infinite number of taps, between two real taps, on the input of an isolation transformer. This is accomplished automatically by adjusting a POWERSTAT® Variable Transformers connected between a boost tap and a buck tap of the isolation transformer. Using the brush of the POWERSTAT as the input point, the "input tap" and thus the output voltage can be controlled with great accuracy.

A solid-state control unit detects the output voltage and continually compares it with output and accuracy settings selected by the user. If the voltage is out of specifications, the control unit drives the POWERSTAT variable transformer, by means of a synchronous motor, to the required new position.

These units attenuate transverse-mode (line-to-line) transients by 60 dB (1,000 to 1). This is accomplished with a low-pass filter that attenuates regardless of where on the sine wave or in which direction the transient is applied, and does not rely on an absolute amplitude before attenuation occurs. Peak clipping devices are also included to assist in handling larger transients.

Voltage transformation and common-mode (line and neutral to ground) noise attenuation of 120 dB (1,000,000 to 1) is provided by the double shielded isolation transformer. Shield 1 in the isolation transformer should be connected to the secondary ground and increases the common mode noise rejection. Shield 2 is between the primary and the grounded shield, need not be connected, and is used to reduce the conversion of common mode input noise to normal mode output noise.

3.0. INSTALLATION

3.1. TRANSPORTING THE POWER CONDITIONER

Due to its weight and size, proper lifting procedures must be followed when transporting the unit and moving it into the location where it is to be installed.

The proper method for moving these units is to place a forklift under the base. A heavy frame is provided in this area to allow lifting the unit in this manner without damage. The 26 inch (559 mm) wide enclosures can also be lifted by removing the top cover and using the lifting eyes provided in the sides of the cabinet.

3.2. MECHANICAL INSTALLATION

The power conditioner is designed for floor mounting. When mounting the unit, allow a minimum clearance of 4 inches (100 mm) behind the unit for proper ventilation. All internal components and wiring connections are accessible through the front panels. A 3 foot (1000 mm) area in front of the unit should be kept clear for installation and service.

3.3. ELECTRICAL INSTALLATION

All CRA Series Power Conditioners are designed to be hard-wired to the input power and the load using copper wire. When these units increase low input voltage to give nominal output voltage, the input current is substantially higher than the nominal input current. Maximum rated input and output currents for each unit are given in the enclosed rating charts. Select a wire size that is adequate to carry the maximum rated current as specified by local and national code requirements.

The front panel(s) of the power conditioner must be removed to allow access to the input and load terminals. To remove a panel, use a screwdriver to release the ¼ turn fasteners, which hold the front panel in place, and lift the panel off the base. A full range of knockouts is provided in the base and the rear panel of the unit for wire entry and exit.

The location of the power connections varies depending on the options provided. On units with an input circuit breaker, input connections are made directly to the circuit breaker. The input connection for other options or no options varies. **Input connections are labeled L1 and L2**. Load connections are made directly to the isolation transformer on units without any options. These **output connections are labeled X1 and X2.** Units that have output options (ex. ammeters) will not have the output connections on the isolation transformer. **These output connections are labeled T1 and T2.**

The outputs of the CRA Series Power Conditioners are floating (not referenced grounded). If the unit's output is to be grounded the **installer must make the ground connection** to the proper terminal.

For optimum common mode noise attenuation, it is usually best to ground the shield 1 connection and allow shield 2 to float. The unit is shipped with shield 1 connected to X1. If the installation's ground is on X1 this is fine. If the installation requires the ground on X2, the shield 1 connection should also be moved from X1 to X2.

The safety ground terminals are a ground stud on the cabinet wall, or a lug on the base, and **must** be connected to a suitable earth ground to reduce the chance of electrical shock.

4.0. START UP

Set the Output Voltage Range toggle switch on each control module to the 120 volt position to turn on the control. The Output Voltage Adjustment and the Sensitivity potentiometers are set at the factory for a nominal output voltage and approximately 2% accuracy, and should not be readjusted until the power conditioner is initially energized.

After all input and output connections are completed and checked, place the front panel(s) in position and tighten the fasteners.

Energize the regulator power source and, if provided, place the unit's circuit breaker in the "ON" position. The voltmeter should indicate the output voltage (approx. 120 volts), and the POWER pilot lamps and the CONTROL pilot lamps should be lit. This indicates the voltage conditioner is operating properly.

5.0. OPERATION

5.1. CONTROL MODULE ASSEMBLY

5.1.1. General
The control modules contain the circuitry that sense the output voltage and determine if correction is needed. When correction is required this circuit sends a raise or lower signal to the motor driven variable transformers. To eliminate unauthorized tampering of the control module the items marked (♦) below are located behind the front panel.

5.1.2. Power Pilot Lamps (A1-LP1)
The POWER lamp on each control assembly lights when power is present for the motor on that phase. This indicates the voltage regulator is energized.

5.1.3. Control Pilot Lamps (A1-LP2)
The CONTROL lamp lights when the control assembly sense voltage for that phase is energized. The control sense voltage must be energized for automatic correction of voltage changes to occur.

5.1.4. Analog Voltmeters (A1-M1)
These meters show the output voltage that is sensed and controlled by the control module. For the CRA141 series units this is the 120 volt output.

5.1.5. Output Voltage Range Toggle Switches (A1-S1)♦
With these switches in the OFF position, the control sense voltage for that phase is disconnected and the control pilot lamp is not illuminated. In this position automatic correction for voltage changes will not take place and any change in input voltage will be reflected in output voltage. The switch should be placed in either the "120" position to energize the control assembly sense voltage and allow automatic correction of voltage changes.

5.1.6. Output Voltage Potentiometers ♦
This potentiometer sets the output voltage (X1-X2). The adjustment range is approximately ± 10% of nominal output voltage.

5.1.7. Sensitivity Potentiometers ♦
This potentiometer adjusts the output voltage accuracy and therefore set how much the output voltage will change before the unit will correct. The accuracy is increase with clockwise rotation of the SENSITIVITY potentiometer.

5.1.8. Fuses (A1-F1 to A1-F4) ♦
The four fuses located on the control module protect the motor and sense power lines. If the POWER or CONTROL lights are not lit, and all control settings are proper, check for a blown fuse.

5.2. SETTING OUTPUT VOLTAGE AND SENSITIVITY POTENTIOMETERS
Normally, the CRA Series power conditioner should not be operated without the front panel(s) of the cabinet in place. However, during the initial operation the front panels can be removed to allow setting the OUTPUT VOLTAGE and SENSITIVITY potentiometers.

5.2.1. Energize Regulator
On units equipped with a manual bypass switch ensure it is in the regulator position. Energize the conditioner's power source and place the input circuit breaker, if so equipped, in the "ON" position. The pilot lamps should light, indicating that the CRA Series Power Conditioner is energized and that the control unit is on. If necessary, move the OUTPUT VOLTAGE RANGE switch to the desired nominal output voltage position. The voltmeter will indicate the output voltages.

5.2.2. Set Output
To adjust the output voltage on any phase, turn the OUTPUT VOLTAGE potentiometer clockwise to increase or counterclockwise to decrease the output voltage, as indicated on the voltmeter for that phase.

5.2.3. Set Sensitivity
The sensitivity must be adjusted if the voltage regulator hunts (motor driven variable transformer section of the voltage conditioner continually cycles back and forth) or if the regulator allows too great a change from the set voltage before correction occurs.

Turning the SENSITIVITY control clockwise increases the sensitivity to maximum (± 0.75% to 1% output voltage accuracy). For maximum sensitivity, turn the SENSITIVITY control clockwise to the point where the POWERSTAT begins to hunt. Turn the control counterclockwise (CCW) until the hunting stops. Turn the control an additional 1/8 turn CCW.

5.2.4. Close
Replace the front cover(s).

5.3. REMOTE SENSING
Normally, these voltage conditioners sense and regulate the voltage at the output terminals, In some cases better control can be obtained by regulating the voltage at another point, such as at the end of long lines between the regulator and the load. This is known as remote sensing.

If remote sensing is desired, move the wire connected to terminal 6 to terminal 7 and the wire connected to terminal 8 to terminal 9 on the control module terminal panel. This will disconnect the control module sense terminals from the output terminals of the regulator. Connect remote sensing wires to terminals 6 and 8 on the control modules.

6.0. OPTIONS

6.1. NON DESIGNATED OPTIONS

6.1.1. **Auxiliary Power Modules** (A2)

These modules are provided on units where a 120 volt AC source is required to operate internal circuitry. The output voltage of these modules is on terminals 1 and 2 of the terminal strip. If there is no output on these terminals check the two fuses mounted on the same bracket. The output of the auxiliary power modules are used to operate fans, trip or hold on circuit breakers, and on any other applications where 120 volts is required.

6.1.2. **Fans** (B2)

On larger units fans are provided to help efficiently remove heat generated in the cabinet. An auxiliary power module supplies the fan operating voltage. If the fans do not operate insure the auxiliary power module output voltage is present.

6.2. MODEL NUMBER SPECIFIED OPTIONS

6.2.1. **Circuit Breaker** (CB1)

An input circuit breaker provides short circuit and overload protection for the CRA Series Power Conditioners. Industrial circuit breakers with high interrupting capacity are used. These breakers also serve as an on/off switch for the regulator and any load attached.

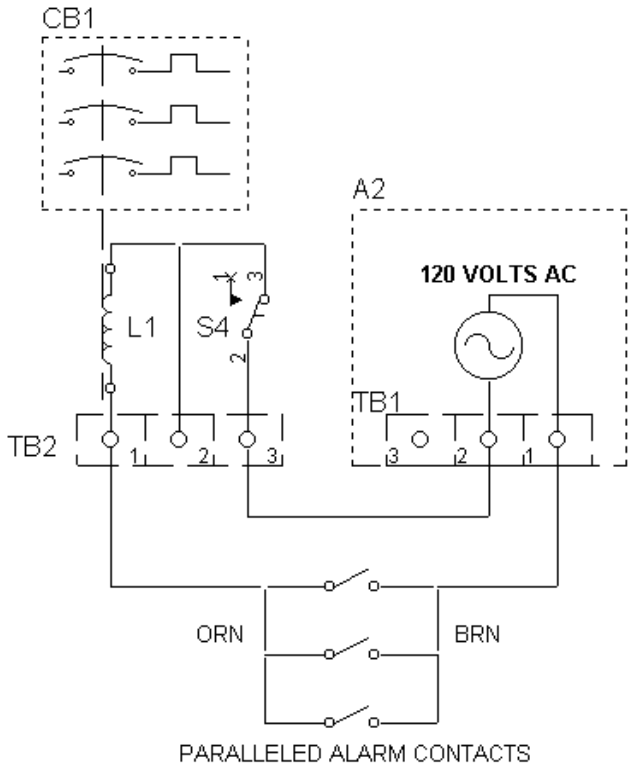
6.2.1.1. Shunt Trip

In units where the model number designates the circuit breaker as “CS” the circuit breaker is equipped with a shunt trip. A shunt trip causes the breaker to open when voltage is applied to the shunt trip coil. The trip coil is rated 120 volt, AC and is de-energized when the breaker opens.

When alarm contact options and a circuit breaker trip option are ordered together, the unit is furnished with 120 volt AC, auxiliary power module (A2) and the alarm circuit contacts are wired to trip the input breaker. The Shunt Trip Connections Diagram shows the typical connections.

If you do not want the alarm contacts to trip the input breaker, the unit can easily be re-configured to not trip the breaker and to perform other control functions. The 120 volts supplied by the auxiliary power module to trip the shunt coil can be replaced by an external source if desired, but do not disconnect any other devices from this source. A momentary push button switch (S4) is provided to disable any alarm contacts from activating the trip coil. This allows turn on of the system so alarm options can reset. Hold switch in while turning on the circuit breaker.

Shunt Trip Connections Diagram



6.2.2. **Manual Bypass Switch** (S3)

A two-position, non-load break, manual bypass switch provides a nominal output voltage in the even of an internal component failure. In the "REGULATOR" position, the units regulating and transient suppression components are active providing a conditioned output. In the "BYPASS" position the regulating variable transformer, motor power and transient suppression circuits are disconnected from the isolation transformer. The input power is connected to the nominal input tap on the isolation transformer’s primary. This provides nominal isolated voltage to the load. The neutral or second input line, having no control components in series, is not switched. The circuit breaker and isolation transformer remain in line regardless of the bypass switch position, since they are always needed. The control unit’s voltmeter will continue to show the output voltage, as long as the range switch is not in the off position, but no correction is performed.

6.2.3. **Ammeters** (M1)

An analog ammeter displays load current for each phase. Each meter indicates the load current within 2% of the meters full range.

6.2.4. **Frequency meter with alarm contacts** (M2)

Frequency meter displays the source frequency and provides alarm contacts for values outside the user's settable limits. Lower and upper limit trip relays are factory set at 45 Hz and 65 Hz respectively. If the frequency becomes lower or higher than user selected values, an output relay is energized. The relay is equipped with a form “C ” normally open / normally closed contact available for customer use.

If a circuit breaker with a trip coil is ordered with the frequency meter, the system is configured to automatically trip the breaker when a limit is exceeded.

6.2.4.1. Frequency Meter Instructions

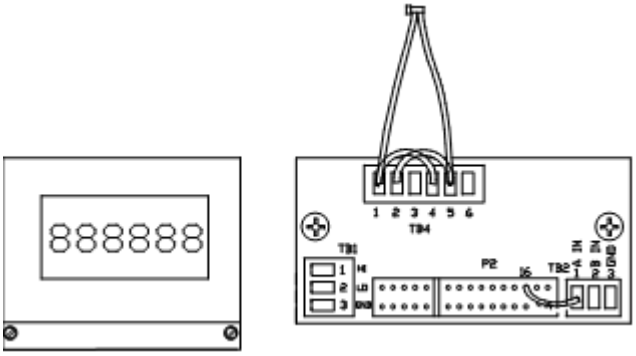
The frequency meter owner’s manual is included with the literature sent with the unit. If no user setting were stored, pressing both RECALL buttons at the same time can reinstate the stored factory setting.

The stored factory settings are shown in the table below. To return stored setting to the factory default, tap the ENTER key to go to the next feature then use SET and ADVANCE keys to change the setting to those shown. When the display shows Store tap the Enter key to lock the setting into memory. To return to these setting both RECALL keys must be depressed at the same time.

Feature	Setting	
Func	Freq	
Scale	A / SC	2.00000
Offset	000000.	
Range	FFFF.FF	
Slope	A Pos	
Sp lo	000045	
Sp hi	000065	
Gate t	01.30	
Conf 1	no setting required	
Conf 2	no setting required	
No store	Store	

A front and rear view of the frequency meter is shown below with the N.O. alarm contacts in parallel. The alarm contacts are connected to TB4 as follows:

1 – HI relay Com
2 – HI relay N.O.
3 – HI relay N.C.
4 - LO relay COM
5 - LO relay N.O.
6 - LO relay N.C.



Frequency Meter

6.2.5. Alarm Contact Ratings

Alarm circuit contacts provided with the Frequency Trip Meter, Input Voltage Range Alarm and Phase Loss - Phase Reversal options are rated 5 amps 240 volts AC.

7.0. MAINTENANCE

To ensure maximum life of the equipment, the following should be part of an **annual** maintenance program.

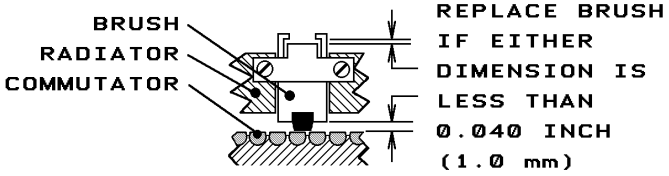
Warning

De-energize unit before performing maintenance. Voltages are present inside this unit which can cause injury. Therefore, only personnel qualified to service electrical equipment should perform maintenance on this unit.

7.1. Vacuum the voltage conditioner inside and out to remove accumulated dirt, which could lead to overheating or insulation failure.

7.2. Tighten all electrical connections, particularly all power wiring to, and in, the unit.

7.3. Inspect all variable transformer brushes and commutators for signs of wear or pitting. Replace as required. See diagram below.



Do not attempt to clean a commutator with an abrasive such as sandpaper or a file. This will ruin the soft precious metal plating on the commutator and will shorten the life of the unit. It is normal for commutators to become black due to carbon brush tracking. If a commutator is to be cleaned, use denatured alcohol and a soft cloth.

7.4. Inspect the variable transformer drive belts, sprockets, gears, cams, etc. for signs of slippage or wear and adjust as required.

7.5. Check the variable transformer radiator(s) (the die cast part that holds the brush assembly) for signs of slippage, and see if all brushes driven by the same motor are aligned with each other. The alignment of the radiator and brushes depends on the setscrews that hold the variable transformer center tube(s) to the shaft and the setscrews that hold the radiator to the center tube. Adjust and tighten as needed.

7.6. Lubrication of the WHR Series voltage regulator is not required since it has been lubricated at the factory for its lifetime.

8.0. TROUBLESHOOTING

CRA Series Power Conditioner will provide long, reliable service with little attention. Unless the unit is overloaded, there is little likelihood of component failure.

Warning

Voltages are present inside this unit which can cause injury. Therefore, only personnel qualified to service electrical equipment should perform trouble-shooting procedures on this unit.

If the conditioner fails to operate correctly, the following checks will help locate and correct the problem. Refer to the schematic, rating chart and replacement parts list for further information.

8.1. Check the load connected to the voltage regulator to be sure the unit's output current rating is not being exceeded.

8.2. See if the POWER pilot lamps are on. If a lamp is not on, there is no power to the voltage regulator, or fuses F1 & F2 (POWER LIGHT MOTOR) on that control module are blown, or the lamp has burned out. Check the POWER LIGHT MOTOR fuses (F1 and F2). Check the power input to the unit, to be sure the voltage is within the range specified for the selected output voltage.

8.3. Check the output voltmeters. If a meter shows zero output voltage, check the input line, control module fuses F3 and F4 (CONTROL fuses), remote sense wiring if applicable, and input connections. If so equipped, check position of input circuit breaker and manual bypass switch.

8.4. Check the CONTROL pilot lamps. If one is not lit, check it's VOLTAGE RANGE switch to be sure it is on and check for blown CONTROL fuses (F3 and F4). If applicable, check the remote sense wiring.

8.5. If the motor hunts (cycles continuously), readjust the SENSITIVITY control.

8.6. If a motor drives a POWERSTAT variable transformer to one end of its travel, and the voltage decreases when it should increase or increases when it should decrease, check to see if the input and output power connections to the voltage conditioner are reversed. If applicable, check the remote sense wiring.

8.7. If the unit has been reworked or repaired, check to see if the leads driving the motor have been reversed. A1-TB1-2 and A1-TB1-3 provide the motor power to lower and raise the motor with A1-TB1-1 being the common for both AC voltages.

8.8. If the motor continues to hum or buzz after the OUTPUT VOLTAGE RANGE switch is turned off, the solid-state switch controlling the motor may be defective. De-energize the input line to the voltage regulator, and replace the control board.

8.9. If the motor has driven to one end or does not drive at all, check to ensure the motor drive is

functioning correctly. Refer to the unit's schematic diagram to complete the following steps:

De-energize the input line to the voltage regulator; place the OUTPUT VOLTAGE RANGE switch in the center (off) position, and remove POWER LIGHT-MOTOR fuses F1 and F2 on each control module.

Apply 115 volts AC between terminals A1-TB1-1 and A1-TB1-2 on the control module, or to the corresponding terminals at the motor board terminal strip (TB1). The motor should turn the variable transformer counter clockwise (viewed from top) so as to lower the output voltage until it reaches the end of its travel, where the limit switch will prevent further rotation in that direction.

Apply 115 volts between terminals A1-TB1-1 and A1-TB1-3 should run the motor in the opposite direction until a limit switch stops the motor at the end of travel.

If the motor operates successfully in this test the problem may be with the control board.

8.10. Inspect the POWERSTAT Variable Transformer brush(s) and commutator(s) for signs of wear or damage. The brush assemblies on the variable transformer section will not need replacement under normal conditions. When excessive brush wear or commutator damage occurs, it is usually the result of an overload. If either condition exists, the POWERSTAT Variable Transformer section or the brush must be replaced or repaired. Check the load to be sure the output current rating of the voltage conditioner is not being exceeded.

Do not attempt to clean a commutator with an abrasive such as sandpaper or a file. This will ruin the soft precious metal plating on the commutator surface and will shorten the life of the unit. It is normal for commutators to become black due to carbon brush tracking. If a commutator is to be cleaned, use denatured alcohol and a soft cloth.

8.11. Check the variable transformer radiator(s) (the die cast part that holds the brush assembly) for signs of slippage, and see if all brushes driven by the same motor are aligned with each other. The alignment of the radiator and brushes depends on the setscrews that hold the variable transformer center tube(s) to the shaft and the setscrews that hold the radiator to the center tube. Adjust and tighten as needed.

9.0. RATING

9.1. POWER RATINGS

INPUT:

VOLTAGE:	480 VOLTS
FREQUENCY:	60 Hz
CONNECTION:	1 Phase, 2 Wire, plus safety ground
RANGE:	-20%, +10%

OUTPUT:

VOLTAGE:	120 VOLTS
CURRENT:	84 Amps Max.
CONNECTION:	1 Phase, 2 Wire

9.2. GENERAL SPECIFICATIONS

Electrical:

Output Accuracy	Adjustable from ±1% to 3%
Load Capacity	100% rated continuous 200% rated 60 seconds 400% rated 3 seconds 600% rated 1 second 800% rated 0.5 second 1000% to 2500% 1/2 cycle inrush
Load Power Factor	0 lagging to 0 leading
Load Crest Factor	6 Max (I peak / I RMS)
Efficiency	97% typical, at full load
Heat Generated	BTU (typical) = 106 x rated kVA
Harmonic Distortion	Less than 1% added
Surge Withstand Capability	6000 volts per IEEE C62.41, location category B
Impedance	4% (typical)
Common-mode Attenuation	120 dB
Transverse-Mode Noise Attenuation	60 dB

Environmental:

Service Conditions	Units are housed in NEMA 1 ventilated enclosures, intended for indoor use under usual service conditions.
Temperature	
Operating	Average ambient temperature for any 24 hour period not to exceed 30℃ (86℉), and maximum temperature not to exceed 40℃ (104℉). Average ambient temperature for any 24 hour period may be increased to 40℃ (104℉),and the maximum temperature may be increased to 50℃ (122℉),if the load is decreased to 90%of standard rating. Minimum temperature is 0℃ (32℉).
Storage	-40℃ to +70℃ (-40℉ to +158℉)
Humidity (Operating and Storage)	
Units without tropicalization	10 to 75% average relative humidity for any 7 day period, and maximum relative humidity not to exceed 95% non-condensing.
Units with tropicalization	10 to 95% average relative humidity and maximum relative humidity not to exceed 95% non-condensing.
Altitude	
Operating	

Maximum Altitude	Derating
6,600 Ft.(2,000 meters)	No de-rating
10,000 Ft.(3,000 meters)	load to 95%,ambient 30℃ (86℉)
15,000 Ft.(4,500 meters)	load to 90%,ambient 20℃ (68℉)

Storage	50,000 Ft.(15,000 meters)max

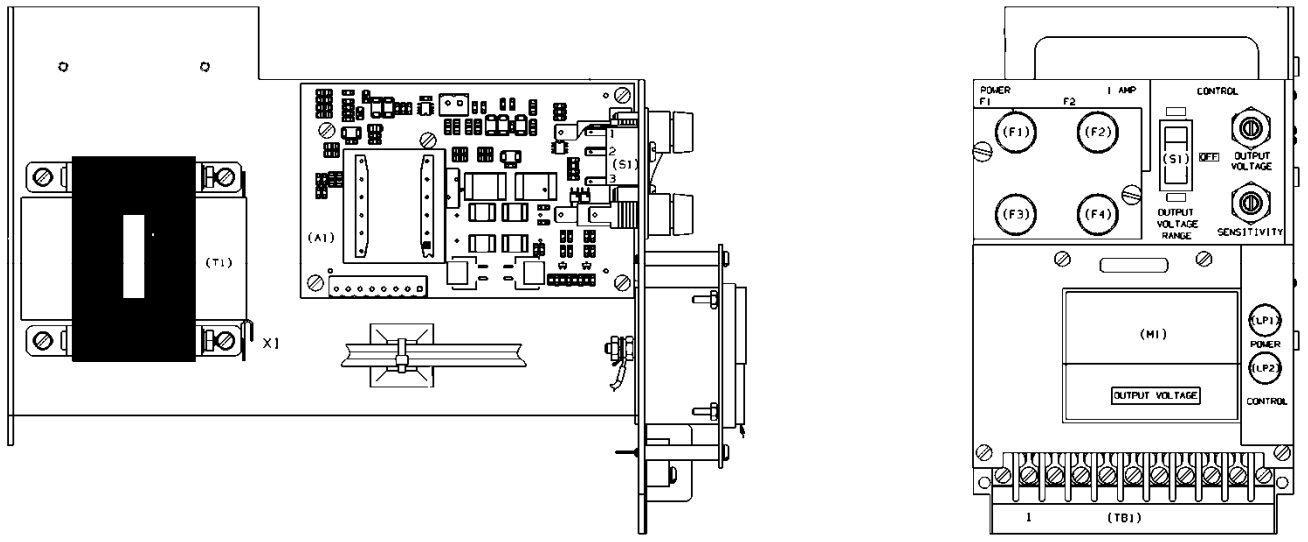
10.0. REPLACEMENT PARTS

10.1. ORDERING

Because this manual covers a full series of units it is impractical to provide a full list of replacement parts. To order a part not listed in this manual, provide the unit model number, serial number, and date code. Reference the part by schematic reference symbol, description and part number if available.

10.2. CONTROL MODULE ASSEMBLY

The same control modules are used throughout this standard CRA Series STABILINE® Power Conditioners and are shown below. **Tropicalized units** have a similar control module but some of the parts are specially treated and therefore have a **different part number**.



FLOOR MOUNT CONTROL MODULE ASSEMBLY (A1)

Reference Symbol	Part Description	Part Number
A1	CONTROL MODULE	213243-010
A1-A1	CONTROL BOARD	227412-001
A1-F1,F2,F3,F4	FUSE, 1A, 600V	213274-001
A1-LP1,LP2	LIGHT, INDICATOR, GREEN	227571-001
A1-M1	VOLTMETER	212917-001
A1-S1	SWITCH, ROCKER ON/ - /ON	227572-002
A1-T1	TRANSFORMER, POWER	227608-001

10.3. POWER COMPONENTS

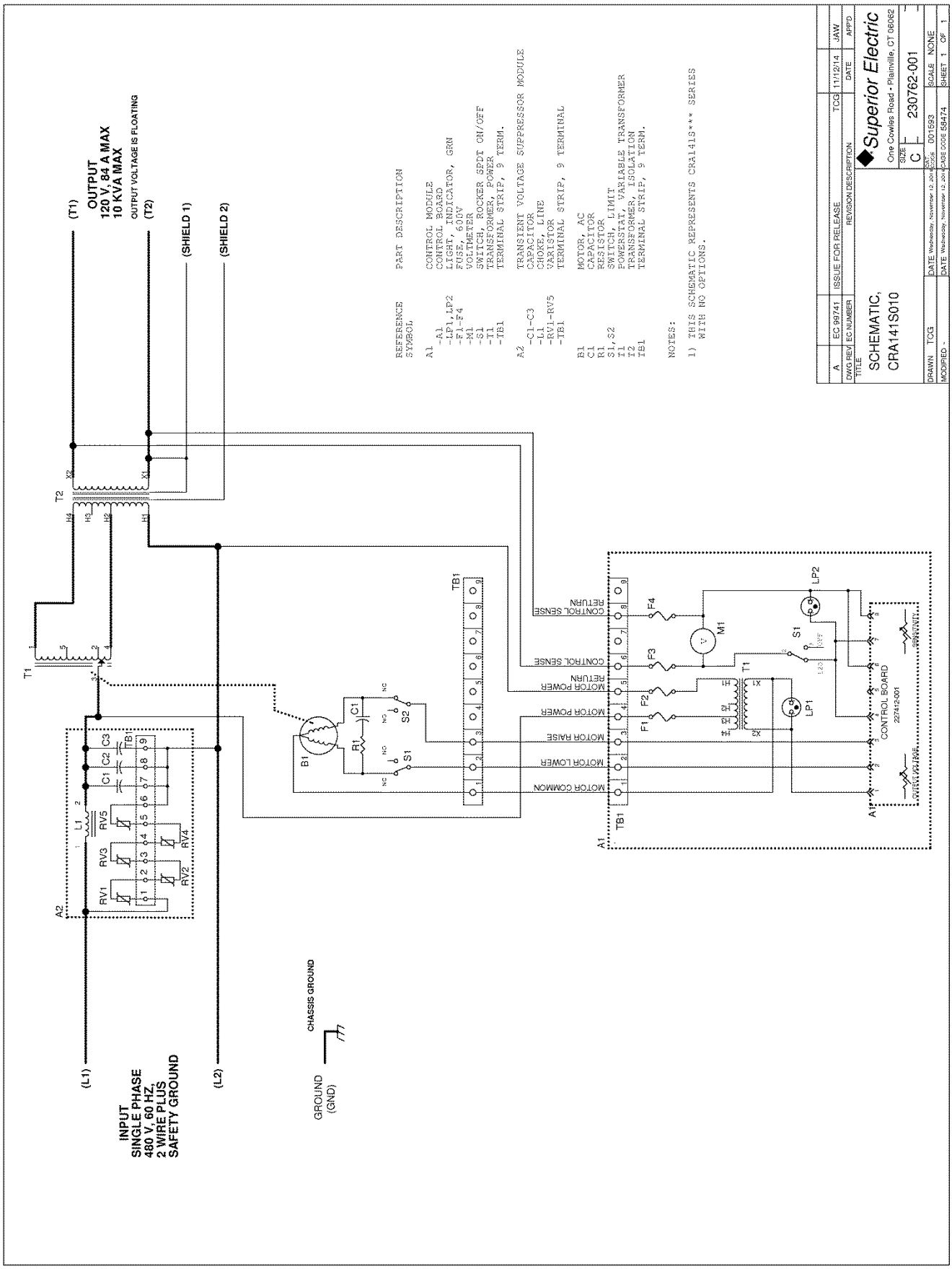
The following parts are specific to each model number.

MODEL NUMBER	T1 (EACH DECK) POWERSTAT, VARIABLE TRANSFORMER	REPLACEMENT BRUSH ASSEMBLY FOR T1
CRA141S010	150548-002	017702-004

10.4. REPLACEMENT BRUSH ASSEMBLY

Each POWERSTAT® Variable Transformer contains a durable brush assembly. These assemblies are designed to reduce the need for attention or replacement; however, because these are moving parts that rely on contact friction to operate properly, an annual inspection is suggested. Refer to the maintenance section of this manual for details. Part number for a replacement brush assembly is listed in the table above.

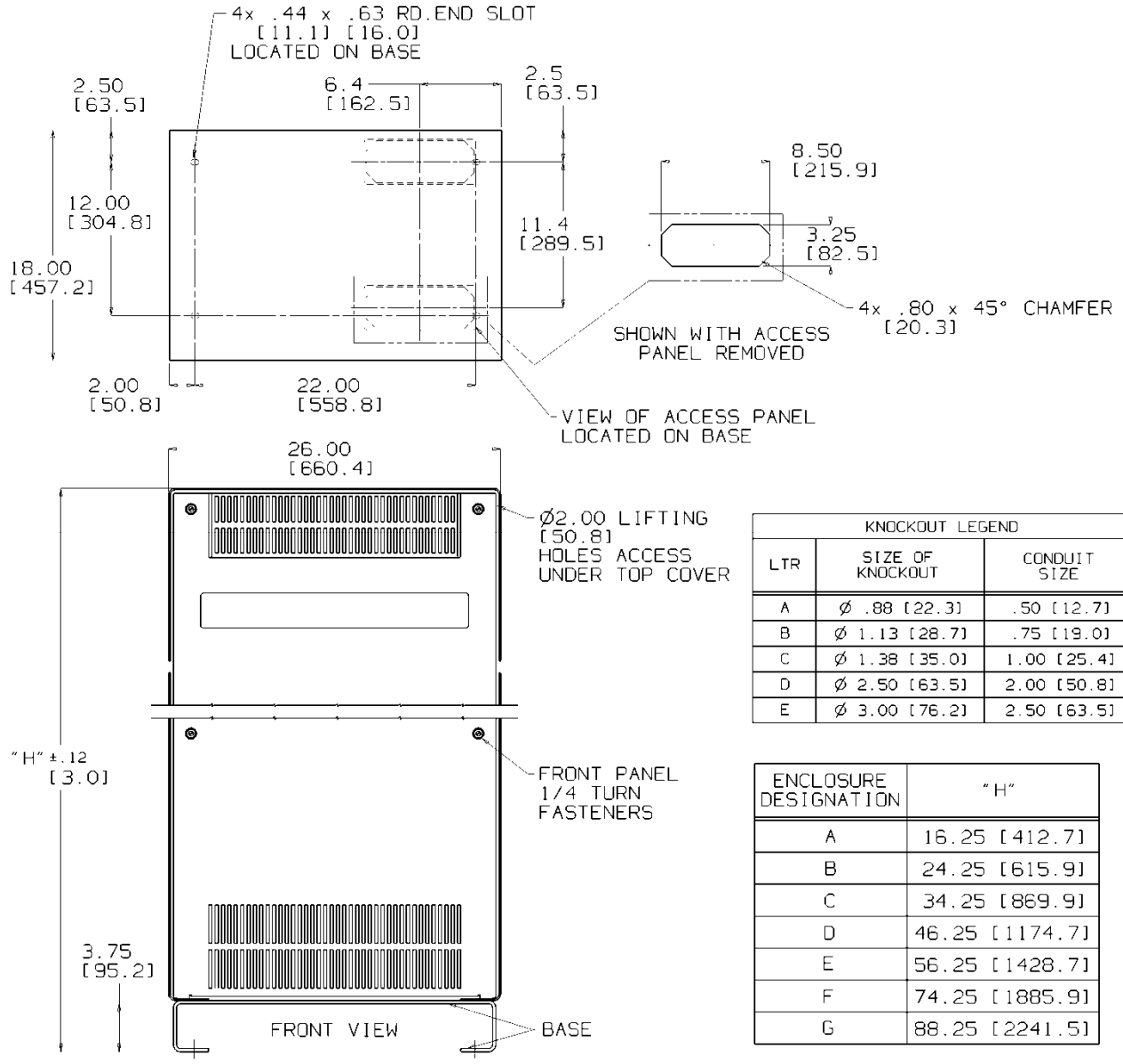
11.0. SCHEMATIC (For reference only, use full size supplied with unit)



12.0. FLOOR MOUNT DIMENSIONS

Enclosures A through G

Note: All dimensions are inches [millimeters]

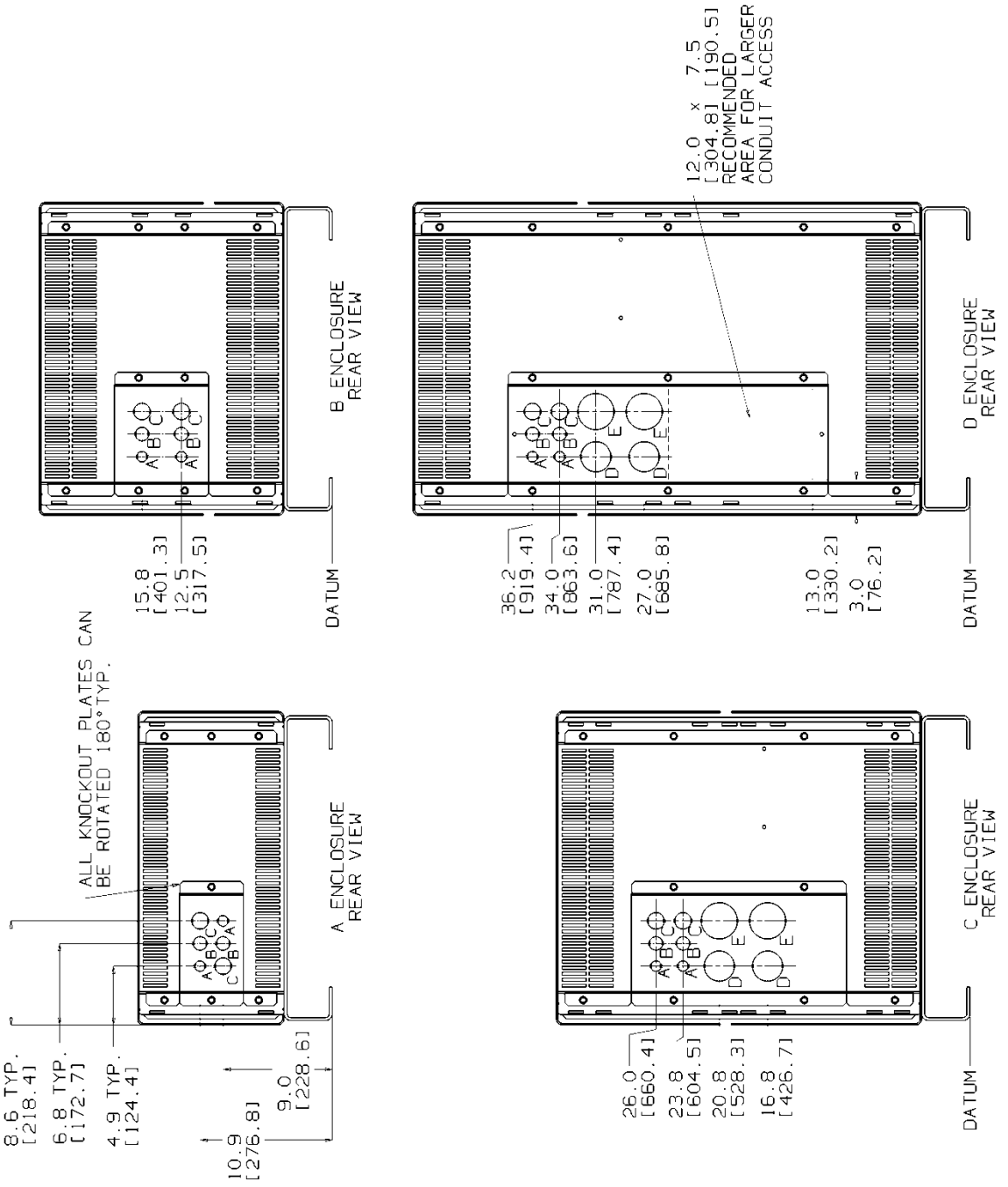


KNOCKOUT LEGEND		
LTR	SIZE OF KNOCKOUT	CONDUIT SIZE
A	Ø .88 [22.3]	.50 [12.7]
B	Ø 1.13 [28.7]	.75 [19.0]
C	Ø 1.38 [35.0]	1.00 [25.4]
D	Ø 2.50 [63.5]	2.00 [50.8]
E	Ø 3.00 [76.2]	2.50 [63.5]

ENCLOSURE DESIGNATION	"H"
A	16.25 [412.7]
B	24.25 [615.9]
C	34.25 [869.9]
D	46.25 [1174.7]
E	56.25 [1428.7]
F	74.25 [1885.9]
G	88.25 [2241.5]

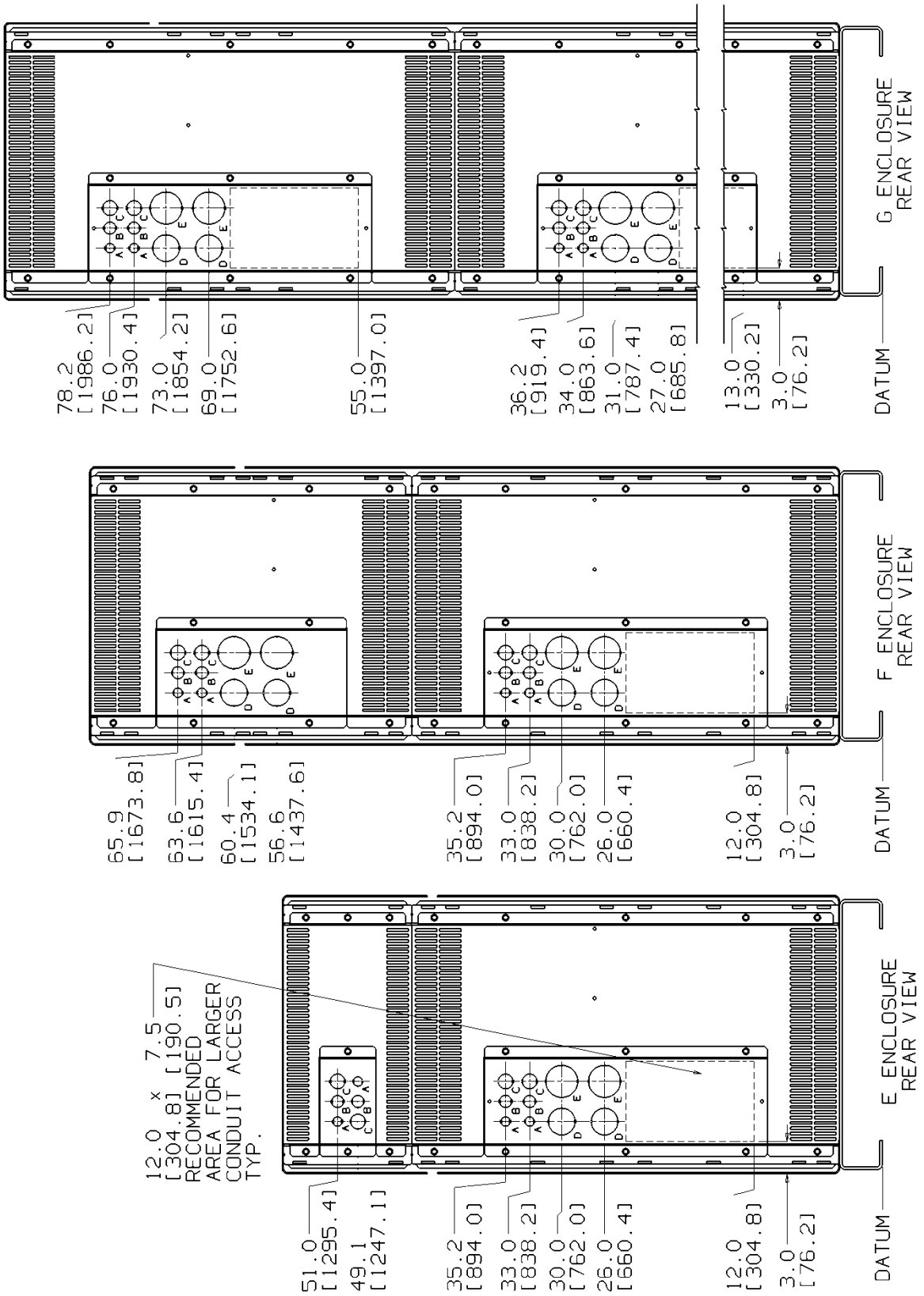
Enclosures A through G continues

Note: All dimensions are inches [millimeters]



Enclosures A through G continues

Note: All dimensions are inches [millimeters]



Available Coast-To-Coast and Internationally

Voltage Control Components

POWERSTAT ®	Variable Transformers
VOLT-PAC ®	Variable Transformers
LUXTROL ®	Lighting Controls
5-WAY ®	Binding Posts
SUPERCON ®	Electrical Connectors

Voltage Control Components are available worldwide through an extensive Authorized Stocking Distributor network. These Distributors offer literature, technical assistance and a wide range of models off-the-shelf for fastest possible delivery and service.

Power Quality Solutions

STABILINE ®	Automatic Voltage Regulators
STABILINE ®	Transient Voltage Surge Suppressors
STABILINE ®	Uninterruptible Power Supplies
STABILINE ®	Power Conditioners

STABILINE Power Quality Solutions are available worldwide through an extensive Authorized Distributor and Reseller network, which offer literature, technical assistance and a select range of models off-the-shelf for fastest possible delivery and service.

In addition, Superior Electric Manufacturer's Representatives are available to provide prompt attention to customer needs. Call or fax for ordering and application information or for the address of the closest Manufacturer's Representative, Authorized Distributor or Reseller.

Superior Electric

An ISO9000
Registered Company

Telephone and Fax Numbers

Telephone	860-507-2025
Fax:	860-507-2050
Customer Service:	860-507-2025 Ext. 70782
Product Application	860-507-2025 Ext. 72058

Toll-Free (in U.S.A. and Canada only)

Telephone	1-800-787-3532
Fax:	1-800-821-1369
Customer Service:	1-800-787-3532 Ext. 70782
Product Application:	1-800-787-3532 Ext. 70058

1 Cowles Road • Plainville, CT 06062
www.superiorelectric.com

213709-264_1_A_CRA141S010 MNL.DOCX

17-Nov-14