CONTROLLED POWER COMPANY

TROY, MICHIGAN

SERIES 900 POWER COMMANDER AND POWER COMMANDER PLUS

OWNERS MANUAL

15KVA - 150KVA
SINGLE PHASE, 50Hz and 60Hz

15KVA - 300KVA
THREE PHASE, 50Hz and 60Hz

IMPORTANT - SAVE THESE INSTRUCTIONS - PLEASE READ THIS MANUAL
BEFORE USING EQUIPMENT

107861-Rev 3

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ABOUT THIS MANUAL

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Caution

The following symbol indicates that caution should be taken when performing the process required in this manual. Damage to the unit or personal harm could happen if proper precautions are not taken.

Shock Hazard

The following symbol indicates that there is a risk of electrical shock if proper precautions are not followed. Only qualified personnel should perform the actions required in this manual.

FEATURES AND SPECIFICATIONS

PRODUCT FUNCTION AND DESCRIPTION

The overall function of both the “Series 900 Power Commander” and the “Series 900 / 200A Power Commander Plus” is to maintain the output line voltage to very tight tolerances when the input voltage varies over or under nominal voltage. Offered in a wide range of kVA sizes, both single- and three-phase configurations are designed and manufactured to assure maximum reliability, flexibility, serviceability, and performance. The Power Commander and Power Commander Plus use seamless electronic control to provide output voltage regulation within 1% of nominal. The output is adjustable + 10% from nominal with an internal potentiometer. If a voltage transformation is required, the Power Commander Plus is selected which includes an integral, computer-grade, shielded isolation transformer. This integral transformer will step the voltage up or down to the desired nominal level, and provide transient and noise attenuation.

PERFORMANCE CHARACTERISTICS

BUCK-BOOST REGULATION SYSTEM - The Power Commander and Power Commander Plus use an electro-magnetically regulated transformer that is buck-boost dry type, convection-cooled, and 600v class.

NO MOVING PARTS - Electronically and magnetically regulated. Virtually no preventive maintenance is required.

FAST RESPONSE - Response starts immediately, and is complete in 5 to 9 cycles (worst case conditions).

REMOTE SENSING - Voltage to be regulated is sensed at the load, and automatically compensates for line and wire losses to the load.

WIDE INPUT VOLTAGE RANGE - +10% to -20% of nominal.

EXCELLENT OUTPUT VOLTAGE REGULATION - + 1% or better for input voltage fluctuations of +10% to -20% of nominal, and from no load to full load.

HARMONIC FILTERED OUTPUT - Reduces harmonic distortion.

BROAD PRODUCT LINE - Available in single and three phase configurations, 50 and 60 Hz models, and a wide range of kVA sizes.

HIGHLY RELIABLE - Exceeds 100,000 MTBF, and 20-year product lifespan.

TRANSFORMER CHARACTERISTICS - The Power Commander and the Power Commander Plus transformers use a Class N (200 degrees C) insulation system, with an operating temperature that does not to exceed 115 degrees C over a 40 degree ambient temperature. The transformer cores are manufactured using M-6 grade, grain-oriented, stress relieved silicon transformer steel. Interface terminals include input and output conductors. All leads, wires, and terminals are labeled to correspond with the circuit wiring diagram. The buck-boost regulating transformers are vacuum-impregnated with an epoxy resin. The Power Commander Plus isolation transformers are static dipped in clear varnish.

COMPUTER-GRADE ISOLATION TRANSFORMER – The Power Commander Plus isolation transformer provides a necessary neutral for the regulator in a delta-configured distribution system, thereby allowing the customer to change voltages throughout the system. For example, a 480 VAC input, with a 208 / 120Y output.

With the added benefits of isolation and an established new ground to neutral bond, the Power Commander Plus has both impressive power conditioning and voltage regulation capabilities.

“PLUS” INPUT AND OUTPUT TRANSFORMER DIFFERENCES - Power configurations change with location, application, and power availability. The Power Commander Plus is a configurable system, placing the computer-grade isolation transformer either ahead of or behind the regulator. This approach provides the versatility for the best electrical configurations at the most-economical cost.

PERFORMANCE SPECIFICATIONS

Nominal Input Voltage
Power Commander - 208 or 480 Single Phase; 208/120Y or 480/277Y Three Phase.
Power Commander “Plus” - 208 or 480 Single Phase; 208 or 480 Three Phase.

Nominal Output Voltage
Power Commander - Same as input, adjustable by ± 10%.
Power Commander “Plus” - 120/240 Single Phase; 208/120Y or 480/277Y Three Phase, adjustable by ± 10%.

Output Voltage Regulation - + 1% or better for input voltage fluctuations of +10% to -20% of nominal, and from no load to full load.

Remote Sensing - The output voltage can be sensed and regulated at the load, automatically compensating for line and wire losses due to long distances to the load.

Frequency Range - 57 to 63 Hz for 60 Hertz models. 48 to 52 Hz for 50 Hertz models.

Output Voltage Adjustment Range - Adjustable to + 10% with internally located potentiometer.

Correction Time - 5 to 9 cycles under worst case conditions.

Power Commander Efficiency - 91% to 94%, KVA size dependent.

Power Commander “Plus” Efficiency - 89% to 92%, KVA size dependent.

Power Factor - 0.95 typical at full load.

Harmonic Content - Less than 5% THD added under linear load.

Overload Capability - 500% for 10 seconds, 1000% for one cycle. Conforms to IEEE 597.

Audible Noise - Less than 60dBA @ 1 meter.

RECEIVING, INSPECTING AND STORING THE UNIT

INSPECTING THE POWER COMMANDER

Upon receipt of the unit, visually inspect for shipping damage. If any damage is found, the Purchaser must contact the Carrier immediately and file a shipping damage claim.

NOTE: Be sure to remove the front, back or side panels as required, and inspect the inside of the unit for shipping damage.

If any internal damage has occurred or any external damage that could affect the operation of the unit, please contact Controlled Power Company.

FOR ASSISTANCE CALL 1-800-521-4792 X222 or 1-248-528-3700 X 222

IMPORTANT NOTICE

This shipment has been carefully inspected, checked and properly packaged at our company.

When it was delivered to the carrier it was in good condition and technically it became your property at that time. Thus, any damage, whether obvious or hidden, must be reported to the transportation company within FIVE days of receipt of the shipment at your premises to avoid forfeiting claims for damages.

FOR ALL SHIPMENTS DAMAGED IN TRANSIT

Leave the items, packing material and carton “AS IS”. Notify your carrier’s local office and ask for immediate inspection of the carton and contents.

After inspection has been made by the carrier, and you have received acknowledgment in writing as to the damage, notify our Customer Service Department to make any required repair arrangements.

It is your responsibility to follow the above instructions or the carrier will not honor any claims for damage. Also, if there are any shortages or questions regarding this shipment, please notify us within FIVE days.

Please note that we cannot be responsible for any service work or back-charges unless authorized by us in writing, before the work is performed.

STORING

If it is necessary to store the unit for a period of time before it is installed, be sure to place the unit in a clean, dry area. To prevent excessive dust from accumulating on the unit, it is advisable to protect it by replacing it in the original container (if possible). If the original container is not available it is recommended that all openings that lead internally into the unit are covered so that dust, water or any other substance cannot come in contact with the internal components of the system. The unit must be handled at all times with the same care you would give to any piece of precision industrial equipment.

REMOVING THE POWER PROCESSOR FROM PALLET

Please take special care when removing the unit from the pallet. Proper equipment must be used for lifting and moving, and all safety precautions should be taken. Each unit is bolted to a wooden pallet. In order to properly remove the cabinet from the pallet, all bolts connecting the unit to the pallet must be removed completely. The unit can then be lifted off the skid using a pallet jack or fork lift. When lifting the unit off of the pallet, be sure to take proper safety precautions. Serious injury and/or unit damage can result otherwise.

****** WARNING ******

THERE ARE DANGEROUSLY HIGH VOLTAGES PRESENT WITHIN THE ENCLOSURE OF THE POWER SUPPLY SYSTEM.

CAUTION MUST BE TAKEN WHEN WORKING WITH THE SYSTEM.

IT IS RECOMMENDED THAT ALL WORK BE PERFORMED BY QUALIFIED ELECTRICAL PERSONNEL ONLY.

****** CAUTION ******

RISK OF ELECTRICAL SHOCK AND HIGH SHORT CIRCUIT CURRENT. THE FOLLOWING PRECAUTIONS SHOULD BE OBSERVED WHEN WORKING ON THE UNIT:

1) REMOVE WATCHES, RINGS, OR OTHER METAL OBJECTS.
2) USE TOOLS WITH INSULATED HANDLES.
3) WEAR RUBBER GLOVES AND BOOTS.

****** CAUTION ******

- FOLLOW ALL STANDARD AND LOCAL ELECTRICAL CODES.
- DO NOT ALLOW WATER OR FOREIGN OBJECTS TO GET INSIDE THE UNIT.
- DO NOT PLACE OBJECTS OR LIQUIDS ON TOP OF THE UNIT.
- DO NOT LOCATE THE UNIT NEAR RUNNING WATER.

INSTALLATION CONSIDERATIONS

Prior to installing the Series 900, be sure to take into consideration the installation site you have selected. The Power Commander can produce heat and therefore it requires ventilation as well as accessibility. Consider these factors:

- Ventilation
- Size of the Power Commander
- Weight Load
- Audible Noise Requirements
- Remote Emergency Power Off (Repo)
- Monitors
- Options
- Clean Environment
- Input Source Voltage
- Receiving Facilities
- Distribution of Power
- Room Temperature
- Clearances
- Accessibility
- Excessively Long Power Runs
- Proper Ground Techniques

CHOICE OF LOCATION

The unit has been completely inspected and extensively tested under various load conditions prior to shipment. Care to install it at a proper location will assure long trouble-free operation.

The unit is air cooled with the air intake at the bottom and exhausts at the top, front or at the sides. Therefore, it should be installed in a clean, dry place with enough clearance to allow a free flow of air. Allow at least 4 inches of space between the unit and the wall or other equipment. Allow enough space for maintenance on all four sides of the unit. (See *"Appendix A - Cabinet Outlines"* for clearances).

POWER COMMANDER CABINET DIMENSIONS AND WEIGHTS

SINGLE PHASE, 60 Hz — 15 kVA TO 150 kVA						
MODEL NUMBER	OUTPUT POWER RATING (kVA)	NOMINAL INPUT (1) & OUTPUT VOLTAGE	INPUT VOLTAGE RANGE (2)	OUTPUT VOLTAGE ADJUSTABILITY	WEIGHT (LBS.)	CABINET DIMENSIONS (W x D x H INCHES)
5BBX-15K-9	15	208	+10%, -25%	188 - 228	1000	35" x 25" x 39.5"
5DDX-15K-9	15	480	+10%, -25%	432 - 528	1000	35" x 25" x 39.5"
5BBX-25K-9	25	208	+10%, -25%	188 - 228	1400	41.5" x 27.5" x 39"
5DDX-25K-9	25	480	+10%, -25%	432 - 528	1400	41.5" x 27.5" x 39"
5BBX-37.5K-9	37.5	208	+10%, -25%	188 - 228	1800	56.5" x 32.5" x 48"
5DDX-37.5K-9	37.5	480	+10%, -25%	432 - 528	1800	56.5" x 32.5" x 48"
5BBX-50K-9	50	208	+10%, -25%	188 - 228	2000	56.5" x 32.5" x 48"
5DDX-50K-9	50	480	+10%, -25%	432 - 528	2000	56.5" x 32.5" x 48"
5BBX-75K-9	75	208	+10%, -25%	188 - 228	3100	56.5" x 32.5" x 48"
5DDX-75K-9	75	480	+10%, -25%	432 - 528	3100	56.5" x 32.5" x 48"
5BBX-100K-9	100	208	+10%, -25%	188 - 228	3680	56.5" x 32.5" x 48"
5DDX-100K-9	100	480	+10%, -25%	432 - 528	3680	56.5" x 32.5" x 48"
5DDX-150K-9	150	480	+10%, -25%	432 - 528	4200	79" x 41.5" x 48"

THREE PHASE, 60 Hz — 15 kVA TO 300 kVA						
MODEL NUMBER	OUTPUT POWER RATING (kVA)	NOMINAL INPUT (1) & OUTPUT VOLTAGE	INPUT VOLTAGE RANGE (2)	OUTPUT VOLTAGE ADJUSTABILITY	WEIGHT (LBS.)	CABINET DIMENSIONS (W x D x H INCHES)
8LLX-15K-9	15	208 / 120Y	+10%, -25%	108 - 132	1800	41.5" x 27.5" x 39"
8NNX-15K-9	15	480 / 277Y	+10%, -25%	250 - 304	1800	41.5" x 27.5" x 39"
8LLX-22.5K-9	22.5	208 / 120Y	+10%, -25%	108 - 132	2400	41.5" x 27.5" x 39"
8NNX-22.5K-9	22.5	480 / 277Y	+10%, -25%	250 - 304	2400	41.5" x 27.5" x 39"
8LLX-30K-9	30	208 / 120Y	+10%, -25%	108 - 132	2600	41.5" x 27.5" x 39"
8NNX-30K-9	30	480 / 277Y	+10%, -25%	250 - 304	2600	41.5" x 27.5" x 39"
8LLX-45K-9	45	208 / 120Y	+10%, -25%	108 - 132	3300	56.5" x 32.5" x 48"
8NNX-45K-9	45	480 / 277Y	+10%, -25%	250 - 304	3300	56.5" x 32.5" x 48"
8LLX-75K-9	75	208 / 120Y	+10%, -25%	108 - 132	4100	56.5" x 41.5" x 48"
8NNX-75K-9	75	480 / 277Y	+10%, -25%	250 - 304	4100	56.5" x 41.5" x 48"
8LLX-112.5K-9	112.5	208 / 120Y	+10%, -25%	108 - 132	5700	56.5" x 41.5" x 48"
8NNX-112.5K-9	112.5	480 / 277Y	+10%, -25%	250 - 304	5700	56.5" x 41.5" x 48"
8LLX-150K-9	150	208 / 120Y	+10%, -25%	108 - 132	6700	79" x 41.5" x 48"
8NNX-150K-9	150	480 / 277Y	+10%, -25%	250 - 304	6700	79" x 41.5" x 48"
8LLX-225K-9	225	208 / 120Y	+10%, -25%	108 - 132	8800	110" x 48" x 56"
8NNX-225K-9	225	480 / 277Y	+10%, -25%	250 - 304	8800	110" x 48" x 56"
8LLX-300K-9	300	208 / 120Y	+10%, -25%	108 - 132	9200	110" x 48" x 56"
8NNX-300K-9	300	480 / 277Y	+10%, -25%	250 - 304	9200	110" x 48" x 56"

POWER COMMANDER PLUS CABINET DIMENSIONS AND WEIGHTS

SINGLE PHASE, 60 Hz — 15 kVA TO 150 kVA						
MODEL NUMBER	OUTPUT POWER RATING (kVA)	NOMINAL INPUT VOLTAGE (1)	NOMINAL OUTPUT VOLTAGE (2)	OUTPUT VOLTAGE ADJUSTABILITY	WEIGHT (LBS.)	CABINET DIMENSIONS (W x D x H INCHES)
5BGX-15K-9/2	15	208	120 / 240	108 - 132	1300	41.5" x 27.5" x 39"
5DGX-15K-9/2	15	480	120 / 240	108 - 132	1300	41.5" x 27.5" x 39"
5BGX-25K-9/2	25	208	120 / 240	108 - 132	1700	41.5" x 27.5" x 39"
5DGX-25K-9/2	25	480	120 / 240	108 - 132	1700	41.5" x 27.5" x 39"
5BGX-37.5K-9/2	37.5	208	120 / 240	108 - 132	2170	56.5" x 32.5" x 48"
5DGX-37.5K-9/2	37.5	480	120 / 240	108 - 132	2170	56.5" x 32.5" x 48"
5BGX-50K-9/2	50	208	120 / 240	108 - 132	2600	56.5" x 32.5" x 48"
5DGX-50K-9/2	50	480	120 / 240	108 - 132	2600	56.5" x 32.5" x 48"
5BGX-75K-9/2	75	208	120 / 240	108 - 132	3400	79" x 41.5" x 48"
5DGX-75K-9/2	75	480	120 / 240	108 - 132	3400	79" x 41.5" x 48"
5BGX-100K-9/2	100	208	120 / 240	108 - 132	3900	79" x 41.5" x 48"
5DGX-100K-9/2	100	480	120 / 240	108 - 132	3900	79" x 41.5" x 48"
5DGX-150K-9/2	150	480	120 / 240	108 - 132	4500	79" x 41.5" x 48"

THREE PHASE, 60 Hz — 15 kVA TO 300 kVA						
MODEL NUMBER	OUTPUT POWER RATING (kVA)	NOMINAL INPUT VOLTAGE (1)	NOMINAL OUTPUT VOLTAGE (2)	OUTPUT VOLTAGE ADJUSTABILITY	WEIGHT (LBS.)	CABINET DIMENSIONS (W x D x H INCHES)
8DLX-15K-9/2	15	480	208 / 120Y	108 - 132	2180	56.5" x 32.5" x 48"
8DNX-15K-9/2	15	480	480 / 277Y	250 - 304	2180	56.5" x 32.5" x 48"
8DLX-22.5K-9/2	22.5	480	208 / 120Y	108 - 132	2600	56.5" x 41.5" x 48"
8DNX-22.5K-9/2	22.5	480	480 / 277Y	250 - 304	2600	56.5" x 41.5" x 48"
8DLX-30K-9/2	30	480	208 / 120Y	108 - 132	2800	56.5" x 41.5" x 48"
8DNX-30K-9/2	30	480	480 / 277Y	250 - 304	2800	56.5" x 41.5" x 48"
8DLX-45K-9/2	45	480	208 / 120Y	108 - 132	3500	79" x 41.5" x 48"
8DNX-45K-9/2	45	480	480 / 277Y	250 - 304	3500	79" x 41.5" x 48"
8DLX-75K-9/2	75	480	208 / 120Y	108 - 132	4400	79" x 41.5" x 48"
8DNX-75K-9/2	75	480	480 / 277Y	250 - 304	4400	79" x 41.5" x 48"
8DLX-112.5K-9/2	112.5	480	208 / 120Y	108 - 132	6000	110" x 41.5" x 48"
8DNX-112.5K-9/2	112.5	480	480 / 277Y	250 - 304	6000	110" x 41.5" x 48"
8DLX-150K-9/2	150	480	208 / 120Y	108 - 132	7000	110" x 41.5" x 48"
8DNX-150K-9/2	150	480	480 / 277Y	250 - 304	7000	110" x 41.5" x 48"
8DLX-225K-9/2	225	480	208 / 120Y	108 - 132	8250	110" x 48" x 56"
8DNX-225K-9/2	225	480	480 / 277Y	250 - 304	8250	110" x 48" x 56"
8DLX-300K-9/2	300	480	208 / 120Y	108 - 132	9600	110" x 48" x 56"
8DNX-300K-9/2	300	480	480 / 277Y	250 - 304	9600	110" x 48" x 56"

Before installing the Power Commander make sure that the input voltage and the output voltages match the unit's specification plate.

1. Locate and remove access panels to the input and output connections. See *"Appendix A - Cabinet Outlines"* for input and output conduit locations and terminals".

2. If your regulator is **not** a Power Commander Plus this means that it does not have an Isolation Transformer, you **must** supply an input neutral wire rated for the unit's full current capacity.

3. Verify that the input voltage to the unit matches the units specification plate. Refer to the circuit diagram supplied with your unit.

4. Verify that all output breakers and receptacles are properly sized for the loads to be connected.

5. Assure the wire and protection devices are sized correctly in accordance with NEC and any local electrical codes.

6. Re-install all panels that may have been removed.

The unit is constructed using an isolation transformer and is considered to be a "separately derived system" It should be grounded in accordance with the NFPA 70 article 250.20 "Alternating-Current Circuits and Systems to Be Grounded", article 250.20(D) "Separately Derived Systems" and article 250.30 "Grounding Separately Derived Alternating-Current Systems"

REFER TO THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE REQUIREMENTS FOR OVER-CURRENT PROTECTION AND WIRE SIZING.

***** CAUTION *****

To reduce the risk of fire, use only on circuits provided with ampere branch circuit protection, in accordance with the National Electric Code, ANSI/NFPA 70.

START UP

***** WARNING *****

THERE ARE DANGEROUSLY HIGH VOLTAGES PRESENT WITHIN THE ENCLOSURE OF THE POWER SUPPLY SYSTEM. CAUTION MUST BE TAKEN WHEN WORKING WITH THE ENCLOSURE. IT IS RECOMMENDED THAT ALL WORK BE PERFORMED BY QUALIFIED ELECTRICAL PERSONNEL ONLY.

NOTE: INITIAL START-UP SHOULD BE PERFORMED WITH NO LOAD ON SYSTEM.

1. Make sure all circuit breakers are in the off position.
2. Energize the primary building power.
3. Turn on the A.C. input breaker (if applicable).
4. Turn on the A.C.output breakers and wait 30 seconds and then verify that the output voltage is within the specified range.

   NOTE: ALL ELECTRICAL ADJUSTMENTS ARE MADE AT THE FACTORY. NORMALLY NO FURTHER ADJUSTMENTS ARE NECESSARY.

5. If output voltages are not within specified range, see the *"Troubleshooting Guide"*.
6. System is ready for use.

***** WARNING *****

DANGER OF ELECTRICAL SHOCK, TURN OFF ALL POWER SUPPLYING THIS EQUIPMENT PRIOR TO MAINTENANCE.

***** WARNING *****

THERE ARE DANGEROUSLY HIGH VOLTAGES PRESENT WITHIN THE ENCLOSURE OF THE POWER SUPPLY SYSTEM. CAUTION MUST BE TAKEN WHEN WORKING WITH THE ENCLOSURE. IT IS RECOMMENDED THAT ALL WORK BE PERFORMED BY QUALIFIED ELECTRICAL PERSONNEL ONLY.

The Series 900 Power Commander is designed and manufactured to assure maximum reliability, flexibility, serviceability and performance.

To ensure longer component life and trouble-free operation, minor preventive maintenance procedures should be performed annually. More frequent inspection intervals are recommended for severe operating conditions.

1. Turn off all power to the unit. Remove the top panel for access into the unit.
2. At each service inspection, any accumulated dust, dirt or foreign particles should be carefully removed. Special care should be exercised in cleaning the thyristors, heat sinks and the control assembly.
3. Assure all cooling fans (if applicable) are operational, clean and free of dust and debris.
4. Inspect all wiring for loose connections, burnt, frayed or broken wires. Check for burned semi-conductor components and circuit boards.
5. Re-torque all high current connections and correct any loose connections. Replace any physically burned or broken components.
6. Remove all output loads and turn on the input power.
7. Verify output voltage and be sure it is within specifications. If it is not, contact the factory.
8. Turn off all power to the unit. Replace panels.
9. Turn on the power and verify output voltage with the loads on the unit.
10. Maintenance is complete.

GENERAL TROUBLESHOOTING

***** WARNING *****

THERE ARE DANGEROUSLY HIGH VOLTAGES PRESENT WITHIN THE ENCLOSURE OF THE POWER SUPPLY SYSTEM. CAUTION MUST BE TAKEN WHEN WORKING WITH THE ENCLOSURE. IT IS RECOMMENDED THAT ALL WORK BE PERFORMED BY QUALIFIED ELECTRICAL PERSONNEL ONLY.

SYMPTOM	PROBABLE CAUSES
Output voltage too high.	A. Input voltage is out of range.
	B. Control board is out of adjustment. Contact Factory.
	C. Defective SCR or Power Mod. Contact Factory.
	D. Defective Control Card. Contact Factory.
Output voltage is too low.	A. Input voltage is out of range.
	B. Control board is out of adjustment. Contact Factory.
	C. Blown bridge supply fuses. Contact Factory
	E. Defective SCR or Power Mod. Contact Factory
Incorrect line to line voltage on three phase unit	A. No input neutral to regulator.
	B. Extreme unbalanced loads.
	C. Defective harmonic output filter component.
Excessive output distortion.	A. Defective filter capacitor. Contact Factory.
	B. Extreme non linear loading.

Individual components are available upon request, please contact the factory for specific part numbers and prices. When contacting the Parts Department, please have the unit's full model number and serial or system number. Call 1-800-521-4792 or 1-248-528-3700.

This Warranty applies only to the original purchaser who must properly register the product within thirty (30) days of receipt.

https://controlledpwr.com/customer-support/warranty-registration/

Controlled Power Company warrants that our products and their components will remain free from defects in material and workmanship for the duration of the respective warranty period* from the date of shipment and agrees to replace, F.O.B. its factory, any parts which fault through defect in material or workmanship during such period. Non payment for the product to either the reseller, rep, distributor or the factory direct will result in revocation of warranty, technical support and service contracts. **Warranty begins from date of shipment unless a factory start-up is purchased, then the warranty begins from date of Start Up or 90 days from ship date; whichever comes first.**

If a Start-Up is purchased with the unit(s) or within 30 days from original ship date, the 1st year warranty is upgraded to include onsite labor and expenses during normal business hours (Monday - Friday, 8AM - 4PM). Start up includes all travel and living expenses. Start up description: Testing all emergency circuitry - Calibration - Inspection - Exercising all circuit breakers - Cooling fan check - Input and output parameter check - Air intake / exhaust check - Re-torque all high current terminals - Input/Output verification - Written report. User training to be done at time of start up (no return visits). Product installation is required to be complete before start up can be scheduled.

Products:

- Power Commander and Power Commander Plus (900) / 1 Year parts only.*

  * From original shipment date / Excludes on site labor and expenses unless otherwise noted.

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1. This Warranty shall be effective only if and so long as the system is installed and operated in the manner specified in the manual which accompanied the product, and is operated within the ratings on the nameplate of the system.

2. This Warranty shall be effective provided the purchaser pays the cost of transporting the faulty component(s) to and from Controlled Power Company's factory at the purchaser's own expense, unless the item covered under service contract with Controlled Power Company. There is no cost for installation of the replacement component(s) when done at the factory. Otherwise installation of the replacement component(s) are the responsibility of the purchaser, unless the item is covered under service contract with Controlled Power Company. If after inspection the faulty component has been caused by misuse or abnormal conditions in the judgment of Controlled Power Company, the purchaser will be charged for repairs based on parts and labor required. This Warranty does not cover fuses, light bulbs, and other normally expendable items. Controlled Power Company service personnel are not included in this warranty unless covered by a Controlled Power Company service contract.

3. This Warranty shall be void if any alteration is made to the system, or any of its components are altered by anyone other than an authorized Controlled Power Company service person, without the written permission of Controlled Power Company.

4. This Warranty is in lieu of all other warranties, expressed or implied. Controlled Power Company neither assumes, nor authorizes any person to assume for it, any liability other than that specifically set forth in this Warranty. Except for its obligations, Controlled Power Company assumes no liability or responsibility for personal injury, loss of life, consequential or other damages resulting from defects in, or failure of, the system or any of its components.

https://controlledpwr.com/customer-support/warranty-registration/

SERIES 900 POWER COMMANDER PRODUCT SUPPORT SERVICES

Contact Controlled Power Company.

CONTROLLED POWER NATIONWIDE CUSTOMER SUPPORT

Controlled Power offers total customer support that assures your critical equipment is maintained properly for trouble-free operation.

WHAT A CUSTOMER SUPPORT PLAN OFFERS

HOT LINE: Call 24 Hours 1-800- 521-4792 or 1-248-528-3700

RESPONSE TIME: Immediate 24 hour phone support. If problem is not solved, we will make every effort to have your system running within 48 hours.

***START-UP:** On site start-up assures equipment is installed and operating properly.

FIELD REPAIRS: Customer Support Plans cover parts, labor, travel, living and freight expenses.

PREVENTIVE MAINTENANCE: Optional scheduled preventive maintenance includes the following:

-Inspection
-Exercising all circuit breakers.
-Re-torquing all high current terminals and connectors.
-Testing all emergency circuitry.
-Calibration
-Clean internal and external
-Verify Cooling System
-Written Report

*Start up may be substituted for preventive maintenance on new units.

PLAN	ON SITE COVERAGE	PARTS COVERED	FIELD REPAIR LABOR COVERED	FACTORY REPAIR LABOR COVERED	FREIGHT COVERED	TRAVEL EXPENSES COVERED
SILVER	NONE	YES	NO	YES	NO	NO
GOLD	M-F 8AM-4PM	YES	YES	YES	YES	YES
PLATINUM	24-7	YES	YES	YES	YES	YES

TRAINING AND PARTS

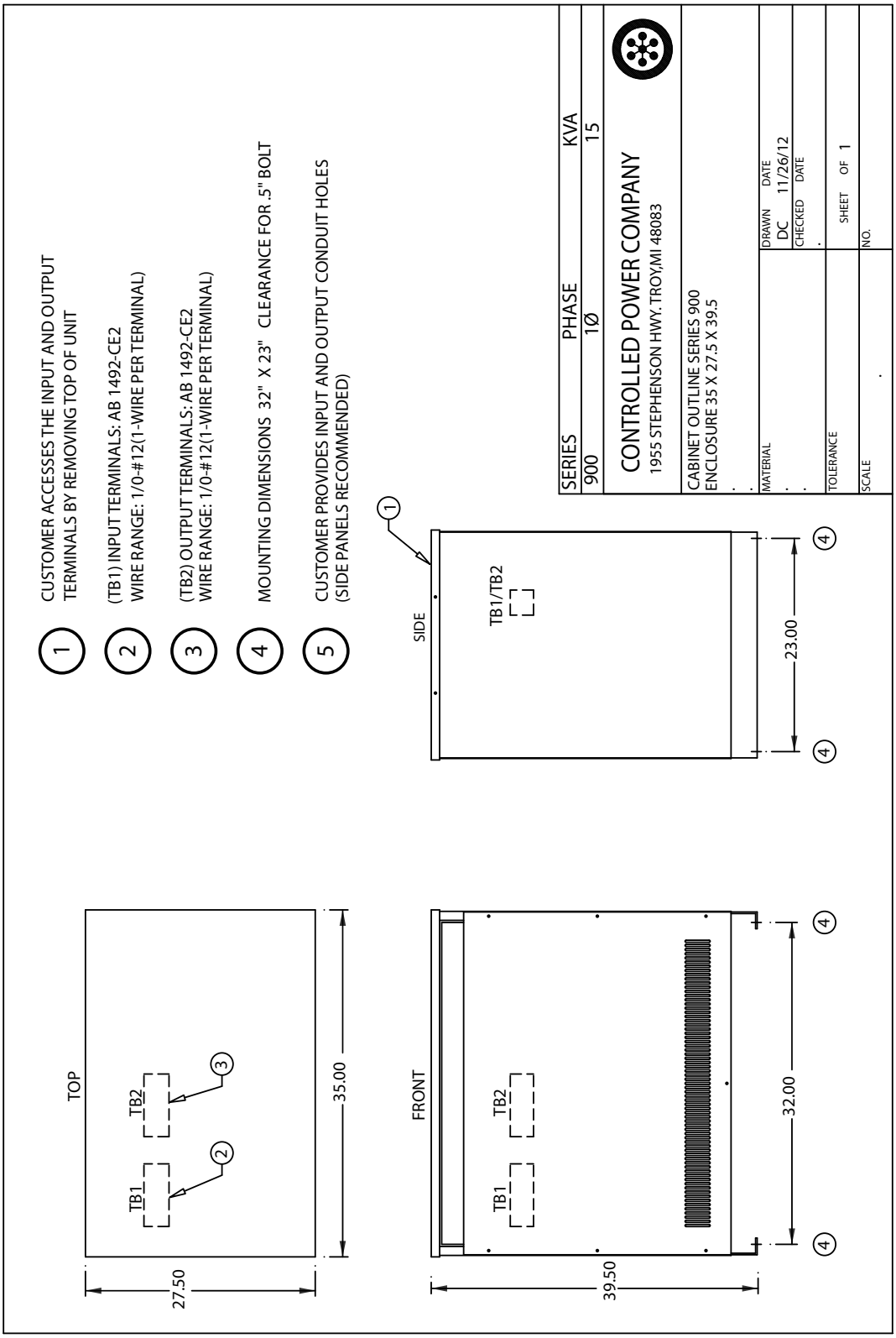
For customers who maintain their own equipment, Controlled Power offers hands on training at our facility and part kits. For more information, contact Controlled Power Customer Support Department at 1-800-521-4792 or 1-248-528-3700.

Individual components are available upon request, please contact the factory for specific part numbers and prices. When contacting the Parts Department, please have the unit's full model number and serial or system number. Call 1-800-521-4792 or 1-248-528-3700.

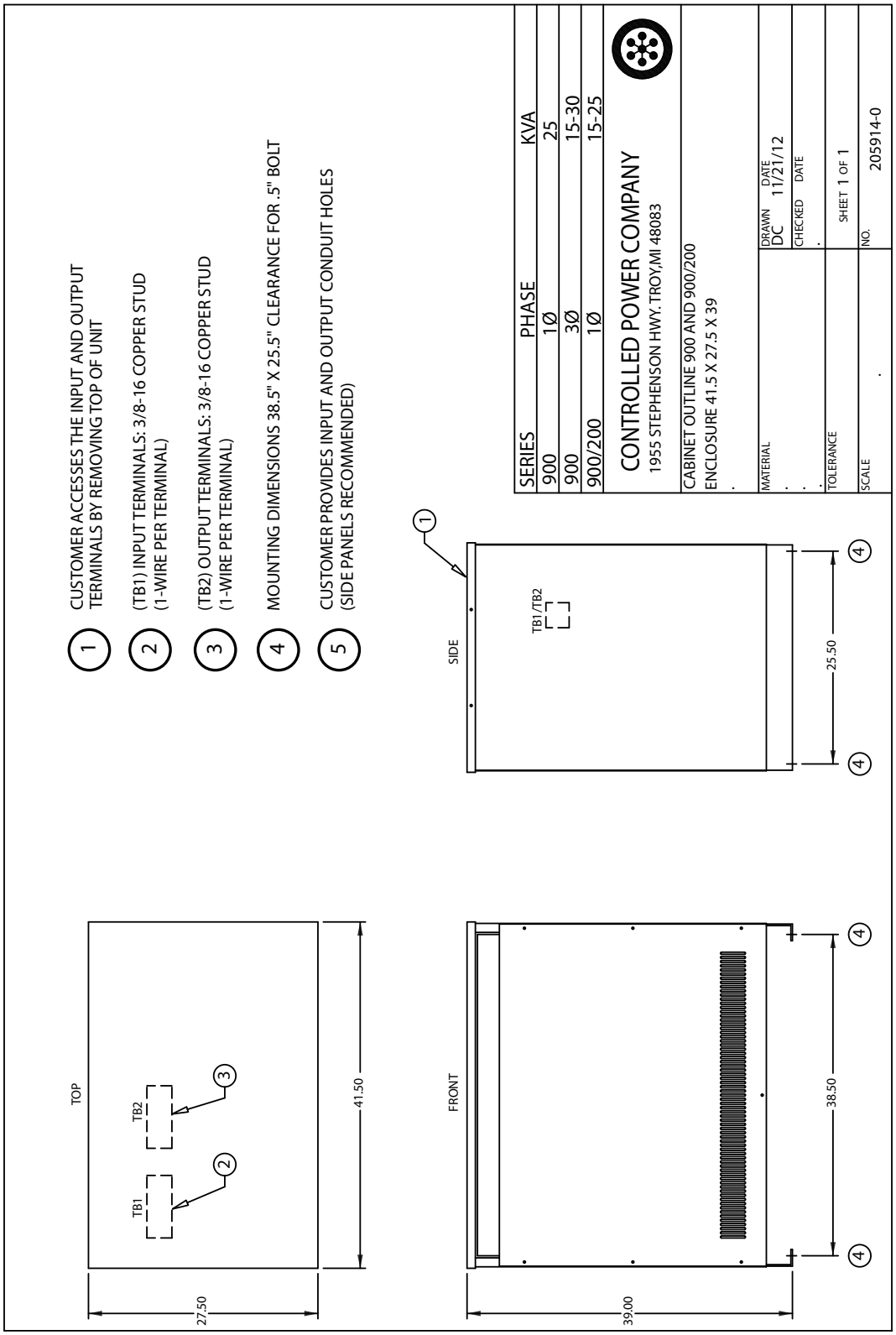
APPENDIX A

RELATIVE DRAWINGS

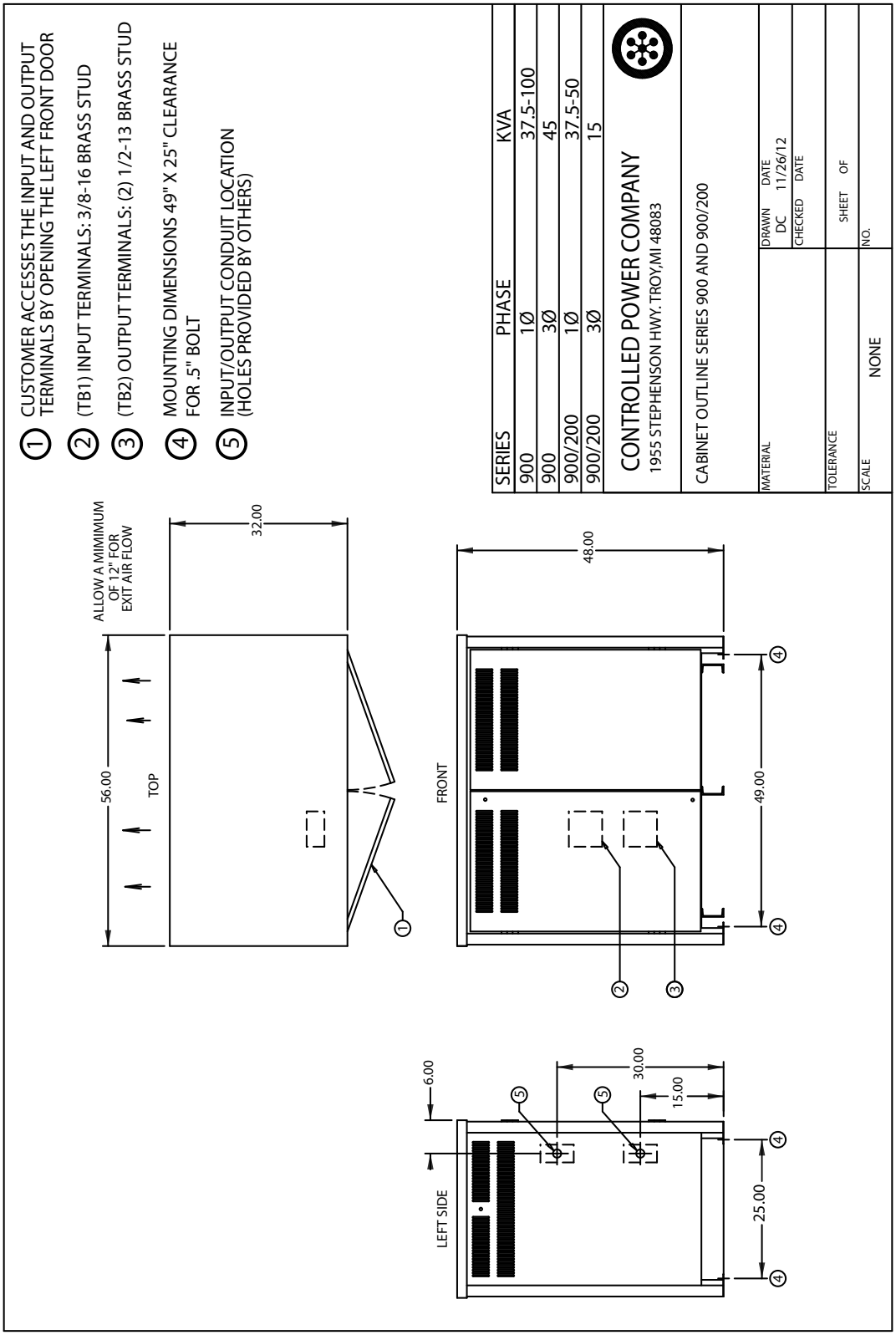
900 SINGLE PHASE 15KVA



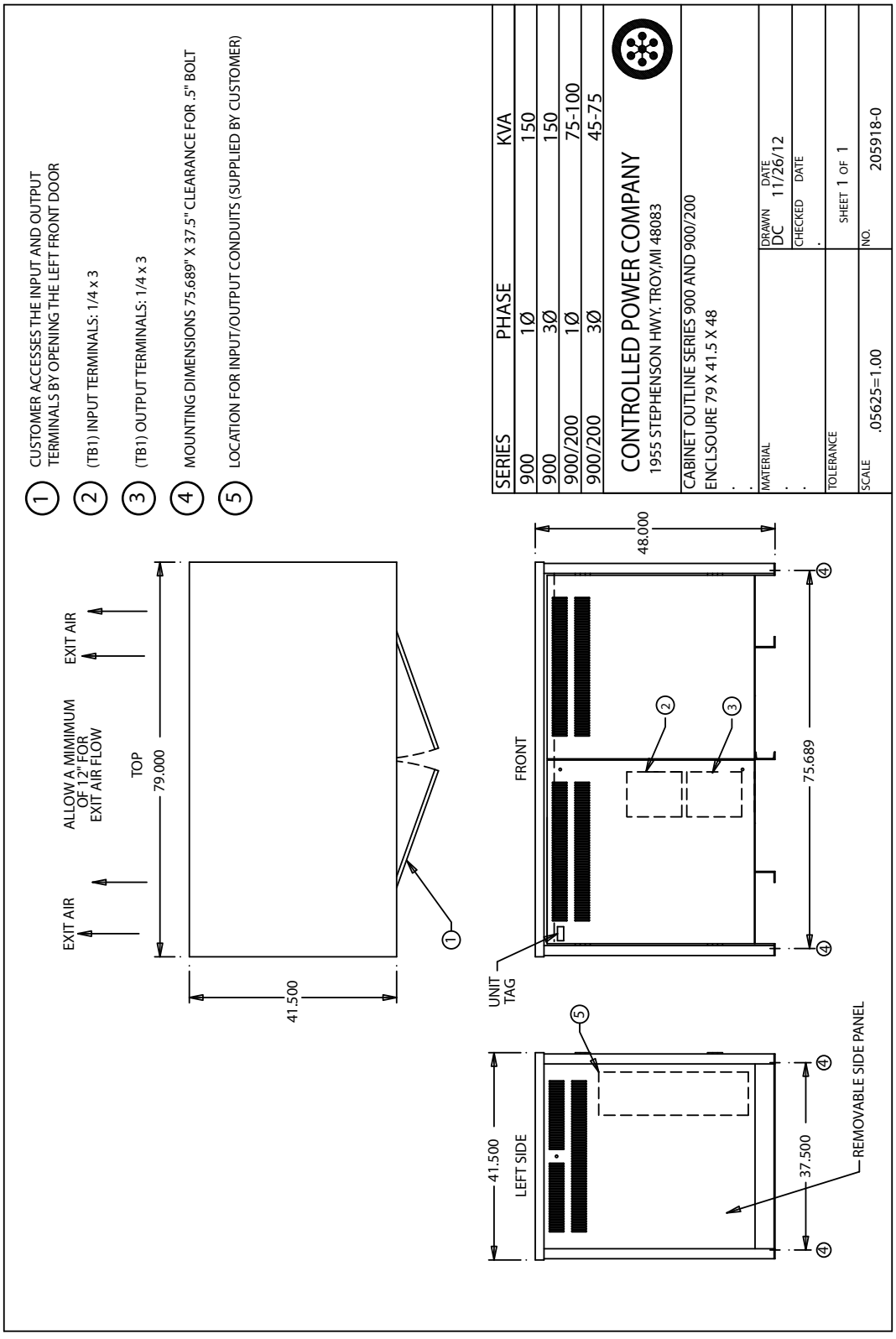
900 SINGLE PHASE 25KVA, THREE PHASE 15-30KVA
900/200 SINGLE PHASE 15-25KVA



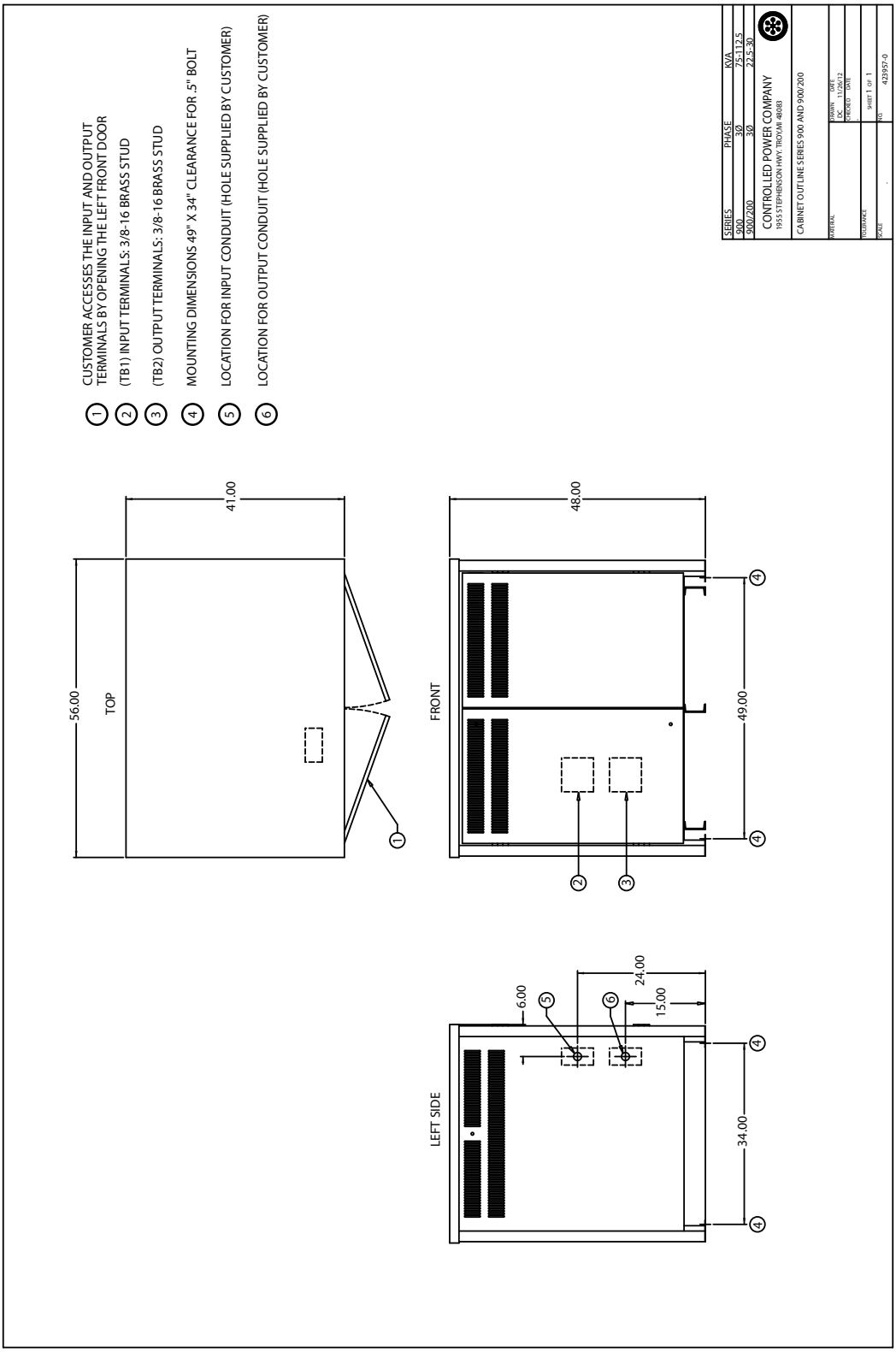
900 SINGLE PHASE 37.5-100KVA, THREE PHASE 45KVA
900/200 SINGLE PHASE 37.5-50KVA, THREE PHASE 15KVA



900 SINGLE PHASE 150KVA, THREE PHASE 150KVA
900/200 SINGLE PHASE 75-100KVA, THREE PHASE 45-75KVA



900 THREE PHASE 75-112.5KVA
900/200 THREE PHASE 22.5-30KVA



900 THREE PHASE 225-300KVA
900/200 THREE PHASE 112.5-300KVA