

**INSTRUCTIONS
for
STABILINE[®]
Automatic Voltage Regulators**

WHR12*S* Series**

**SINGLE Phase
208 X 240 Volt**

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.



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INSPECTION

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

SECTION 1.0: DESCRIPTION

1.1 GENERAL

WHR12*S*** Series STABILINE® Automatic Voltage Regulators are three-phase, 208 X 240 volt, fast acting electromechanical regulators with ratings from 2.5 to 400 kVA. These units have an analog electronic control section and a three phase power section consisting of wye connected, motor driven, limited range POWERSTAT® Variable Transformers. Units with the suffix-CB at the end of their model numbers are equipped with an input circuit breaker.

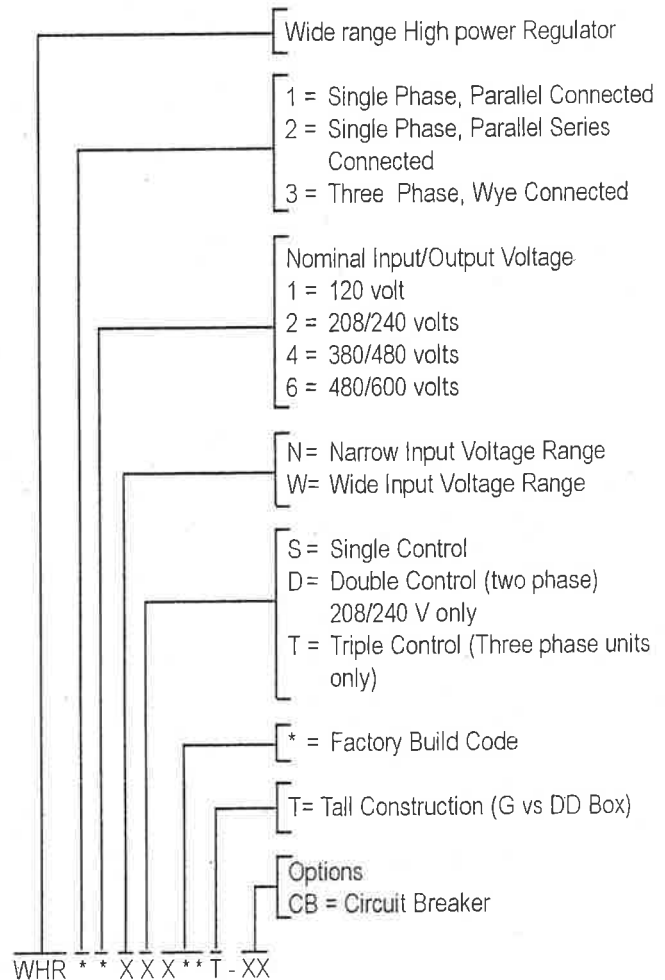
See the enclosed rating charts for complete specifications on each unit.

Advantages of all WHR series regulators include high efficiency (99% typical), high overload capacity and low impedance. They are insensitive to the magnitude and power factor of the load, and have no effect on system power factor. This means these regulators can be used with any type load.

1.2 TYPE NUMBER

The model number of each WHR series regulator identifies the various characteristics of that specific unit. The following table explains the meaning of each character in the model number.

WHR TYPE NUMBERING SYSTEM



1.3 THEORY OF OPERATION

These units regulate AC voltage by automatically adjusting limited range POWERSTAT Variable Transformers to maintain constant output voltage.

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

SECTION 2.0: INSTALLATION

2.1 TRANSPORTING THE REGULATOR

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 (660mm) wide units can also be lifted by removing the top cover and using the lifting eyes provided in the sides of the cabinet.

2.2 MECHANICAL INSTALLATION

The regulator is designed for floor mounting. When mounting the unit, allow a minimum clearance of 4 inches (100mm) behind the unit for proper ventilation.

2.3 ELECTRICAL INSTALLATION

All WHR regulators 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 output current. Maximum rated input and output currents for each unit are given in the enclosed ratings 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 of the regulator must be removed to allow access to the input and load terminals. To remove a panel, use a flat blade screw driver to release the 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 rear panel of the unit for wire entry and exit.

On units with an input circuit breaker, input power connections are made directly to the circuit breaker. On units without a circuit breaker, the input connections are located on the POWERSTAT Variable Transformer. The input power connections are labeled: L1, L2-NUET. Load connections are made to the POWERSTAT Variable Transformer, and are labeled: T1, T2-NEUT.

L2-NEUT and T2-NEUT are internally connected together. When one of the 208 X 240 volt input lines is a neutral (as is often the case on 50-Hz systems), the input and output neutrals should be connected to L2-NEUT and T2-NEUT, respectively. If neither of the 208 X 240 volt input lines is a neutral (as is often the case on 60-Hz systems) the input and output can be connected without regard to polarity.

The ground terminal is a ground stud on the cabinet wall, and must be connected to a suitable earth ground to reduce the chance of electrical shock.

SECTION 3.0: START UP

Set the Output Voltage Range toggle switch on the control module to match **your** application by placing the switch in the 208 or the 240 volt position. The Output Voltage Adjustment potentiometer and Sensitivity potentiometer are set at the factory for nominal output voltage and approximately 2% accuracy, and should not be readjusted until the regulator is initially energized.

After completing and checking all input and output connections, place the front panel(s) in the position and tighten fasteners.

Energize the regulator power source and, if provided, place the regulator's circuit breaker in the "ON" position. The voltmeter should indicate the output voltage (approx. 200 - 230 volts), and the POWER pilot lamp and the CONTROL pilot lamp should be lit. This indicates the voltage regulator is operating properly.

SECTION 4.0: OPERATION

4.1 OPERATING CONTROLS

4.1.1 Circuit Breaker, CB1

Only units with the suffix "-CB" at the end of the type number have a circuit breaker. The circuit breaker controls the input power to the regulator and is located on the front of the unit. Placing the circuit breaker in the "ON" position will energize the regulator.

4.1.2 POWER Pilot Lamp, A1-DS1 (On Front Panel)

The POWER lamp lights when power is present for the motor and indicates the regulator is energized.

4.1.3 CONTROL Pilot Lamp, A1-DS2 (On Front Panel)

This lamp will light whenever the control module sense voltage is energized. The control sense voltage must be energized for automatic correction of voltage changes to occur.

4.1.4 Analog Voltmeter, A1-M1 (On Front Panel)

This display shows the line-to-line output voltage on one phase.

4.1.5 Output Voltage Range Toggle Switch, A1-S1 (Behind Front Panel)

This is a three-position switch. When the switch is in the center (off) position, the control module sense voltage is disconnected, and automatic correction of voltage changes will not take place. Any change in input voltage will be reflected in output voltage. The upper and lower switch positions select the nominal output voltage. The switch should be placed in the position that corresponds with the desired nominal output voltage for YOUR application.

4.1.6 OUTPUT VOLTAGE Potentiometer A1-R1 (Behind Front Panel)

This potentiometer sets the output voltage. It's adjustment range is approximately $\pm 10\%$ of the selected nominal output voltage.

4.1.7 SENSITIVITY Potentiometer A1-R2 (Behind Front Panel)

This potentiometer adjusts the regulators output accuracy, i.e., sets how much the output voltage will change before the unit will correct. Follow the instructions in Section 4.2 to adjust the sensitivity.

4.2 SETTING THE OUTPUT VOLTAGE AND SENSITIVITY POTENTIOMETERS

Normally, the WHR regulator should not be operated without the front panel(s) of the cabinet in place. However, during the initial operation of the regulator the front panel can be removed to allow setting the OUTPUT VOLTAGE and SENSITIVITY potentiometers. To set these potentiometers:

4.2.1 Energize the regulator power source and if provided, place the regulator's circuit breaker in the "ON" position.

The pilot lamps should light, indicating that the regulator is energized and that the control unit is on. If necessary, move the OUTPUT VOLTAGE RANGE switch to the desired nominal output voltage position. Check the voltmeter: it will indicate the output voltage,

4.2.2 To adjust the output voltage, turn the OUTPUT VOLTAGE potentiometer clockwise to increase or counterclockwise to decrease the output voltage, as indicated on the regulator's voltmeter.

4.2.3 The sensitivity must be adjusted if the regulator hunts (the motor driven variable transformer section of the regulator 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 (1/2% to 1% output voltage accuracy). For maximum sensitivity, turn the SENSITIVITY control clockwise to the point where the regulator begins to hunt. Turn the control counterclockwise (CCW) until the hunting stops. Turn the control an additional 1/8 turn CCW.

For most applications the SENSITIVITY control can be set fully counterclockwise, which will provide approximately 3% accuracy. This setting will provide accurate control of output voltage and will eliminate operation of the regulator due to small voltage or load changes.

4.2.4 Replaces the front cover(s)

4.3 REMOTE SENSING

Normally, WHR regulators sense and regulate the voltage at the regulator's 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, remove the jumpers between terminals 6 and 7 and between terminals 8 and 9 on the control module terminal panel. This will disconnect the control module sense terminals from the output terminals of the regulator. Connect the wires for remote sensing to terminals 7 and 9 on the control module.

4.4 ALL-BUCK & ALL-BOOST OPERATION

All WHR Series regulators can be connected to provide all-buck (unit will only lower the input voltage) or all-boost (unit will only increase the input voltage) operation. This feature can be used to shift the nominal voltage or to correct input voltages that are always extremely high or extremely low.

4.4.1 All-Boost Operation

When connected for all-boost, these units will bring extra low voltages up to nominal, but will not correct high input voltages. Since operation in the all-boost mode will increase the voltage and heating in the WHR regulator, the rated load current, and in some cases the maximum rated nominal input voltage, must be reduced. The chart below shows the all-boost ratings.

For all-boost operation, the input line to each POWERSTAT Variable Transformer must be moved from terminal 2 to terminal 5.

4.4.2 All-Buck Operation

When connected for all-buck operation, these units will bring extra high input voltages down to nominal, but will not correct low input voltages. Since all-buck operation reduces the voltage in the regulator, the nominal input voltage can be increased. The current ratings remain the same. The chart on page 5 shows the all-buck ratings.

All-buck operation requires moving the input line to each POWER-STAT Variable Transformer from terminal 2 to terminal 4.

NORMAL INPUT VOLTAGE RANGE	NARROW	WIDE
	+7%, -15%	+12.5%, -25%
ALL BOOST OPERATION		
INPUT VOLTAGE RANGE	0%, -20%	0%, -33%
(% OF SET OUTPUT VOLTAGE)		
MAXIMUM LOAD CURRENT	77%	72%
(% OF NORMAL RATING)		
NOMINAL INPUT VOLTAGE	100 V, 50/60 HZ 120 V, 60 HZ	173 V, 50/60 HZ 208 V, 60 HZ
ALL BUCK OPERATION		
INPUT VOLTAGE RANGE	+25%, 0%	+50%, 0%
(% OF SET OUTPUT VOLTAGE)		
MAXIMUM LOAD CURRENT	100%	100%
(% OF NORMAL RATING)		
NOMINAL INPUT VOLTAGE	15%	25%
(MAX ALLOWABLE INCREASE)		

SECTION 5.0: MAINTENANCE

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

Warning: Deenergize unit before performing maintenance. Voltages are present inside this unit which can cause injury. Therefore, only persons qualified to service electrical equipment should perform maintenance on this unit.

5.1 Vacuum the regulator inside and out to remove accumulated dirt which could lead to overheating or insulation failure.

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

5.3 Inspect all brushes and commutators for signs of wear or pitting. Replace as required.

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.

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

5.5 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 set screws that hold the variable transformer center tube(s) to the shaft and the set screws that hold the radiator to the center tube. Adjust as required.

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

SECTION 6.0: TROUBLESHOOTING

These regulators 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 persons qualified to service electrical equipment should perform troubleshooting procedures on this unit.

If the regulator fails to operate correctly, the following checks will help locate and correct the problem. Refer to the enclosed schematic, replacement parts list and rating charts for further information on the unit.

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

6.2 See if the POWER pilot lamp is on. If the lamp is not on, there is no power to the regulator, or control module fuses F1 and F2 (POWER LIGHT-MOTOR) 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.

6.3 Check the output voltmeter. If the meter shows zero output voltage, check the input line, input circuit breaker, control module fuses F3 and F4 (CONTROL fuses), remote sense wiring if applicable (see section 4.3), and input connections.

6.4 Check the CONTROL pilot lamp. If it is not lit, check the control module 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 (see section 4.3).

6.5 If the motor hunts (cycles continuously), readjust the SENSITIVITY control per section 4.2.

6.6 If the motor drives the 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 regulator are reversed.

If the unit has been reworked or repaired check to see if the leads driving the motor have been reversed so that the motor runs in the wrong direction. If leads driving the motor are changed check to see that the limit switches turn the motor off in the proper direction, i.e., once a limit switch is actuated the motor should run only in the opposite direction from the one it was running in when it actuated the limit switch.

6.7 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. Deenergize the input line to the regulator and replace the plug-in control unit.

6.8 To see if the motor drive is functioning correctly: Refer to the unit's schematic diagram and : deenergize the input line to the regulator; place the output voltage RANGE switch in the center (off) position; and remove POWER LIGHT-MOTOR fuses F1 and F2.

Apply 115 volts between terminals 1 and 2 on the control or the variable transformer motor drive terminal board (TB1) (these terminal boards are connected point for point). The motor should turn the variable transformer so as to lower the output voltage (rotates it CCW when viewed from the top) until it reaches the end of its travel where the limit switch will prevent further rotation in the CCW direction. Applying 115 volts between terminals 1 and 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 unit.

6.9 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.

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.

brushes depends on the set screws that hold the variable transformer center tube(s) to the shaft and the set screws that hold the radiator to the center tube. Adjust as required.

Check the 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

Check the load connected to the unit to be sure the regulators output current rating is not being exceeded.

RATING CHART
SINGLE PHASE - 208 X 240 VOLTS - NARROW RANGE

INPUT/OUTPUT VOLTAGE (NOMINAL)	FREQUENCY	SELECTABLE OUTPUT VOLTAGE
LINE-LINE & LINE-NEUTRAL		
208 V	50/60	187 TO 229
220-230-240 V	50/60	216 TO 264

INPUT CORRECTION RANGE: +7%, -15% OF SELECTED OUTPUT VOLTAGE
OUTPUT ACCURACY: SELECTABLE 0.5% TO 3%

RATED OUTPUT AMPS	RATED KVA AT		MODEL NUMBER	MAX INPUT AMPS	RECOVERY TIME (SEC/% @ 60 HZ)	APPROXIMATE WEIGHT		CABINET		
	208 V	240 V				POUNDS NET	KILOGRAMS SHIP			
15	3.1	3.6	WHR12NSR11-CB	20	0.026	198	248	90	113	A
28	5.8	6.7	WHR12NSS11-CB	35	0.026	234	284	106	129	A
65	13	15	WHR12NST11-CB	80	0.110	225	275	102	125	A
130	25	30	WHR12NST12-CB	160	0.110	350	400	159	182	C
195	40	45	WHR12NST13	240	0.110	442	492	201	223	D
260	50	60	WHR12NST14	320	0.170	542	592	246	269	E
325	65	75	WHR12NST15	400	0.170	608	658	276	299	E
390	80	90	WHR12NST16	480	0.170	727	777	330	353	F
455	90	100	WHR12NST17	560	0.220	793	843	360	383	F
520	100	125	WHR12NST24	640	0.220	1079	1179	490	535	DD
650	125	150	WHR12NST25	800	0.340	1265	1365	574	620	EE
780	150	175	WHR12NST26	960	0.340	1495	1595	679	724	FF
910	175	200	WHR12NST27	1120	0.340	1627	1727	739	784	FF
1040	200	250	WHR12NST28	1280	0.670	1759	1859	799	844	FF
1170	225	275	WHR12NST36	1440	0.670	1891	1991	859	904	FF
1350	275	325	WHR12NST37	1680	0.670	2089	2189	948	994	FF
1550	300	350	WHR12NST38	1920	0.670	2287	2387	1038	1084	FF
1750	350	400	WHR12NST39	2160	0.670	2561	2661	1163	1208	GG

RATING CHART
SINGLE PHASE - 280 X 240 VOLTS - WIDE RANGE

INPUT/OUTPUT VOLTAGE (NOMINAL)	FREQUENCY	SELECTABLE OUTPUT VOLTAGE
LINE-LINE & LINE-NEUTRAL	50/60	187 TO 229
208 V	50/60	216 TO 264
220-230-240 V		

INPUT CORRECTION RANGE: +12.5%, -25% OF SELECTED OUTPUT VOLTAGE
OUTPUT ACCURACY: SELECTABLE 1% TO 3%

RATED OUTPUT AMPS	RATED KVA AT		MODEL NUMBER	MAX INPUT AMPS	RECOVERY TIME (SEC/% @ 60 HZ)	APPROXIMATE WEIGHT				CABINET
	208 V	240 V				POUNDS NET	POUNDS SHIP	KILOGRAMS NET	KILOGRAMS SHIP	
11	2.2	2.5	WHR12WSR11-CB	15	0.025	198	248	90	113	A
21	4.3	5.0	WHR12WSR11-CB	30	0.025	234	284	106	129	A
36	7.5	8.6	WHR12WST11-CB	50	0.066	225	275	102	125	A
72	15	17	WHR12WST12-CB	100	0.066	350	400	159	182	C
108	22	25	WHR12WST13	150	0.066	442	492	201	223	D
145	30	35	WHR12WST14	200	0.099	542	592	246	269	E
180	38	43	WHR12WST15	250	0.099	608	658	276	299	E
215	45	50	WHR12WST16	300	0.099	727	777	330	353	F
250	50	60	WHR12WSF17	350	0.130	793	843	360	383	F
290	60	70	WHR12WST24	400	0.130	1079	1179	390	535	DD
360	75	85	WHR12WST25	500	0.200	1265	1365	574	620	EE
430	90	100	WHR12WST26	600	0.200	1495	1595	679	724	FF
500	100	120	WHR12WST27	700	0.200	1627	1727	739	784	FF
575	120	135	WHR12WST28	800	0.390	1759	1859	799	844	FF
650	135	150	WHR12WST36	900	0.390	1891	1991	859	904	FF
750	150	175	WHR12WST37	1050	0.390	2089	2189	948	994	FF
860	175	200	WHR12WST38	1200	0.390	2287	2387	1038	1084	FF
950	200	225	WHR12WST39	1350	0.390	2561	2661	1163	1208	GG

REPLACEMENT PARTS SINGLE PHASE - 208 X 240 VOLT
REPLACEMENT PARTS FOR 208/240 VOLT, 1-PHASE
WHR SERIES STABILINE® AUTOMATIC VOLTAGE REGULATORS

The following parts are supplied on all models included in this instruction manual.

<u>Reference Symbol</u>	<u>Description</u>	<u>Part Number</u>
A1	Control Module	213243-002
A1-F1, F2, F3, F4	Fuse, 1 Ampere, 250 Volt	104364-003
A1-M1	Voltmeter, 0-150 Volt	212917-002
A1-R1	Potentiometer, 100 Ohm	103159-011
A1-R2	Potentiometer, 10k Ohm	103159-024
A1-S1	Switch, 3-Position	144665-001
A1-TB1	Terminal Strip, 9-Terminal	104051-009
A1-T1	Transformer, Power	006736-000

The following parts are supplied only on models having type numbers that end with the following characters: 27, 28, 36, 37, 38 and 39.

<u>Reference Symbol</u>	<u>Description</u>	<u>Part Number</u>
A2	Auxiliary Power Module	217487-002
A2-F1, F2	Fuse, 1 Ampere, 250 Volt	104364-003
A2-T1	Transformer, Power	006736-000
A2-TB1	Terminal Strip, 3-Terminal	007120-016
B2	Fan, 120 Volt	212137-001

REPLACEMENT PARTS, CONT'D.

Model Number	B1 Motor	C1, Motor Capacitor	CB1, Circuit Breaker	R1, Motor Resistor	S1, S2, Limit Switch	T1, POWERSTAT Variable Transformer	T2, Paralleling Choke	TB1, Terminal Strip	Replacement Brush
WHR12NSR11-CB	208168-027	207419-017	213927-007	102088-002	058743-001	216971-002	—	027375-007	176012-002
WHR12NSS11-CB	102154-027	207419-041	213927-001	103788-018	058743-001	216975-002	—	027375-007	017702-004
WHR12NST11-CB	102154-027	207419-041	213927-003	103788-018	058743-001	212995-003	—	027375-007	017702-011
WHR12NST12-CB	102154-027	207419-041	213757-002	103788-018	058743-001	212995-003	006724-000	027375-007	017702-011
WHR12NST13	102154-027	207419-041	—	103788-018	058743-001	212995-003	006724-000	027375-007	017702-011
WHR12NST14	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST15	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST16	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST17	400022-069	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST24	400022-069	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST25	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST26	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST27	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST28	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST36	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST37	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST38	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12NST39	400022-070	207419-041	—	103788-018	051214-000	212995-003	006724-000	007037-007	017702-011
WHR12WSR11-CB	208168-027	207419-017	213927-007	102088-002	058743-001	216971-001	—	027375-007	176012-002
WHR12WSS11-CB	102154-027	207419-041	213927-009	103788-018	058743-001	216975-001	—	027375-007	017702-004
WHR12WST11-CB	102154-027	207419-041	213927-001	103788-018	058743-001	212995-002	—	027375-007	017702-003
WHR12WST12-CB	102154-027	207419-041	213927-005	103788-018	058743-001	212995-002	005587-000	027375-007	017702-003
WHR12WST13-CB	102154-027	207419-041	213757-001	103788-018	058743-001	212995-002	005587-000	027375-007	017702-003
WHR12WST14-CB	400022-070	207419-041	213757-002	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST15	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST16	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST17	400022-069	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST24	400022-069	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST25	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST26	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST27	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST28	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST36	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST37	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST38	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003
WHR12WST39	400022-070	207419-041	—	103788-018	051214-000	212995-002	005587-000	007037-007	017702-003

SPECIFICATIONS

Electrical

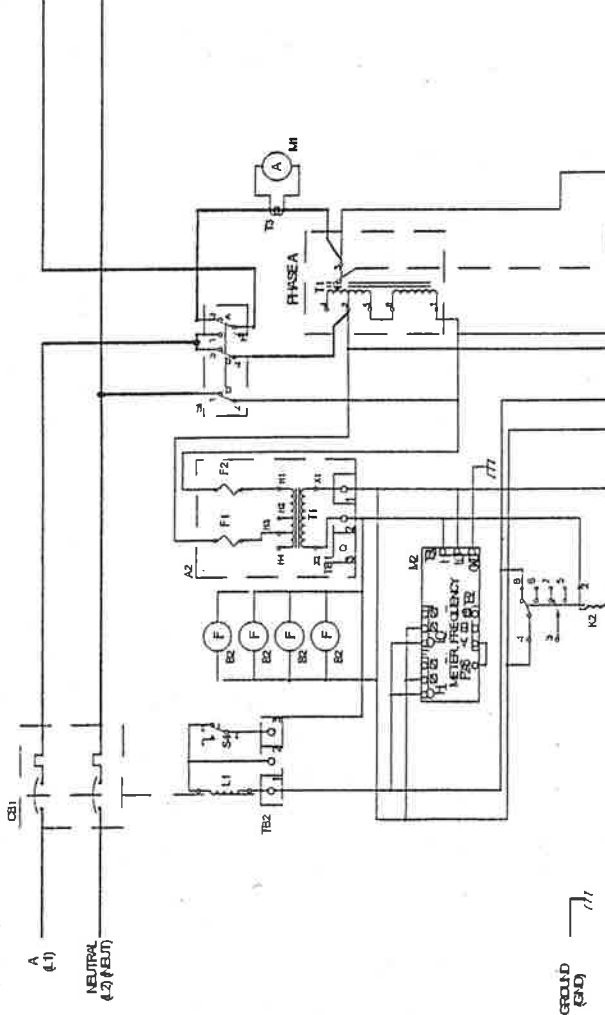
Efficiency	97% minimum, 99% typical @ full load
Distortion	less than 0.25% added total harmonic distortion
Surge Withstand Capability	6000 volts per IEEE 587-1980, Location Category B

Environmental

Temperature Operating	Average temperature for any 24 hour period not to exceed 30°C (86°C) and maximum temperature not to exceed 40°C (104°F). Average temperature for 24 hour period may be increased to 40°C (104°F) and maximum temperature may be increased to 50°C (122°F) if load is decreased to 90% of standard rating. Minimum temperature is -20°C (-4°F)
Storage	-40°C to +70°C (-40°F to 158°F).
Humidity, Operating and Storage	10% to 75% relative humidity continuous 75% TO 90% relative humidity intermittent, noncondensing
Altitude Operating	6,600 feet (2,000 meters) max.
Storage	50,000 feet (15,000 meters) max.

INPUT
SERIAL NO. 9

A (4)
NEUTRAL (12) (E, U)



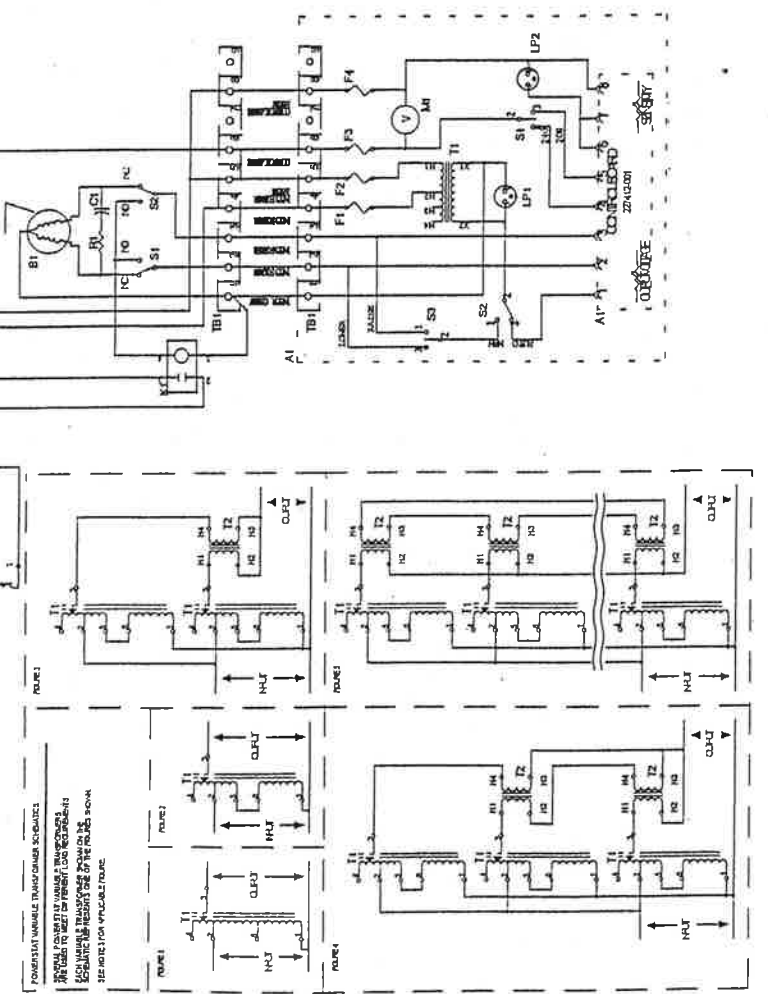
REFERENCE SYMBOL

REFERENCE SYMBOL	PART DESCRIPTION
A1	CONTROL MODULE
-A1	CONTROL BOARD
-F1, F4	FUSE, 250V AC/10A, 60A
-F2, F3	FUSE, 250V AC/10A, 60A
-S1	VOLTMETER
-S2	SWITCH, ROCKER SW/T ON/OFF/ON
-S3	SWITCH, MAN/AUTO
-T1	SWITCH, RAISE/LOWER
-T2	TERMINAL STRIP, 3 TERM.
A2	AUX. POWER MODULE
-F1, F2	FUSE, 250V
-T1	TRANSFORMER, STEPDOWN
-T2	TERMINAL STRIP, 3 TERM.
B1	WOUND, AC
B2	FAN, 110V
C1	CAPACITOR
C2	CAPACITOR
C3	CAPACITOR
E1	CIRCUIT BREAKER
E2	RELAY, 55 VOLTAGE LIMIT
E3	RELAY, PHASE LOSS ALARM
E4	RELAY, PHASE LOSS ALARM
E5	RELAY, PHASE LOSS ALARM
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E100	RELAY, PHASE LOSS ALARM

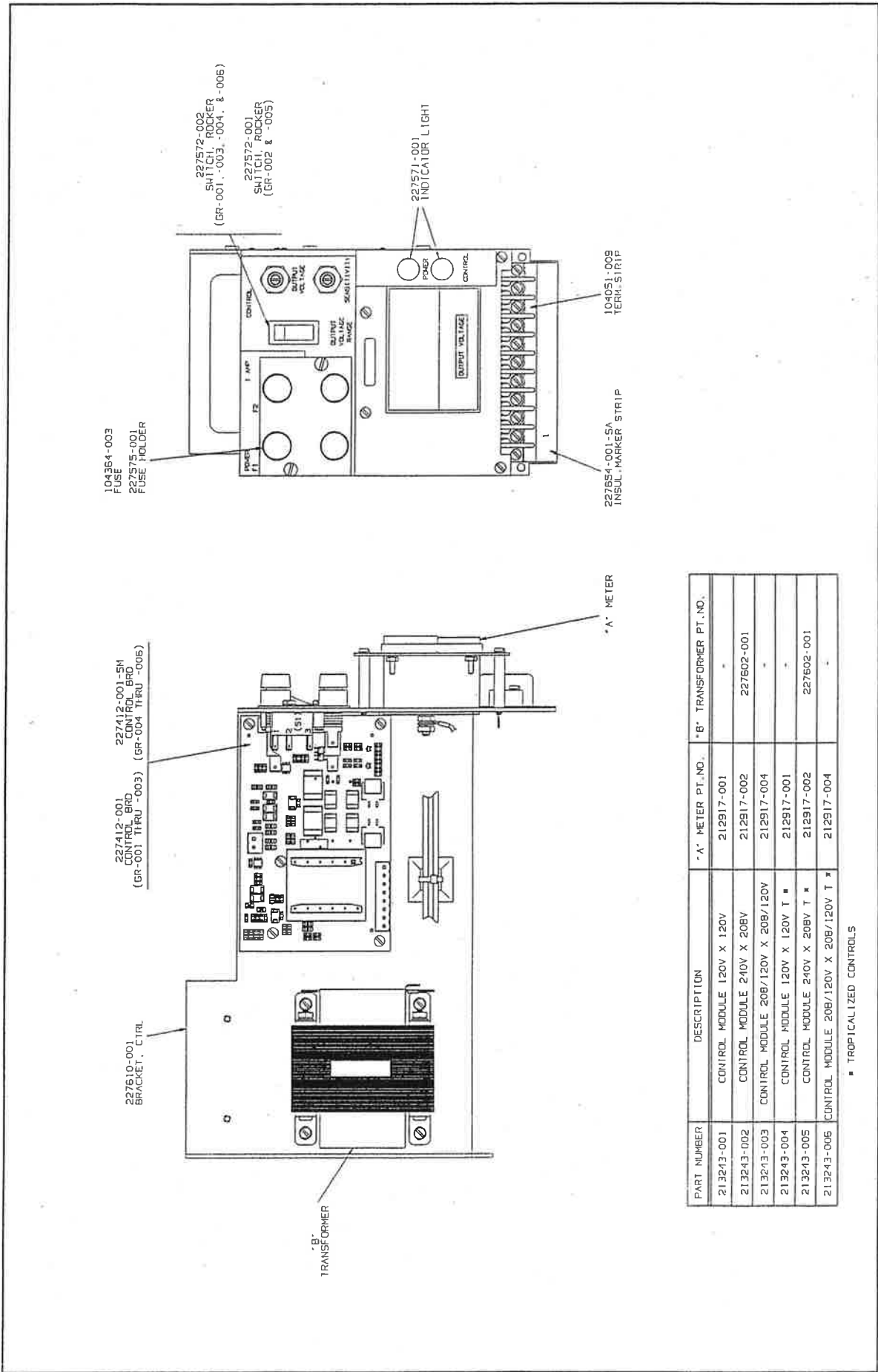
NOTES:

- 1) THIS SCHEMATIC REPRESENTS MINKI'S S... SERIES WITH THE FOLLOWING OPTIONS:
 INPUT CIRCUIT BREAKER
 WITH SHUNT TRIP
 MANUAL BYPASS SWITCH
 AMMETER
 PHASE LOSS ALARM
 MANUAL RAISE/LOWER SWITCH
 PHASE LOSS ALARM
 E2
- 2) AUXILIARY POWER MODULE "A2" AND FANS "B2" ARE SUPPLIED ONLY ON LARGER UNITS. THE QUANTITY OF EACH Varies.
- 3) APPROPRIATE FIGURES FOR POWERSTAT VARIABLE TRANSFORMER IS DETERMINED BY UNIT MODEL NUMBER AS SHOWN.

FIGURE NO.	DESCRIPTION
1	MINKI'S S...
2	MINKI'S S...
3	MINKI'S S...
4	MINKI'S S...
5	MINKI'S S...

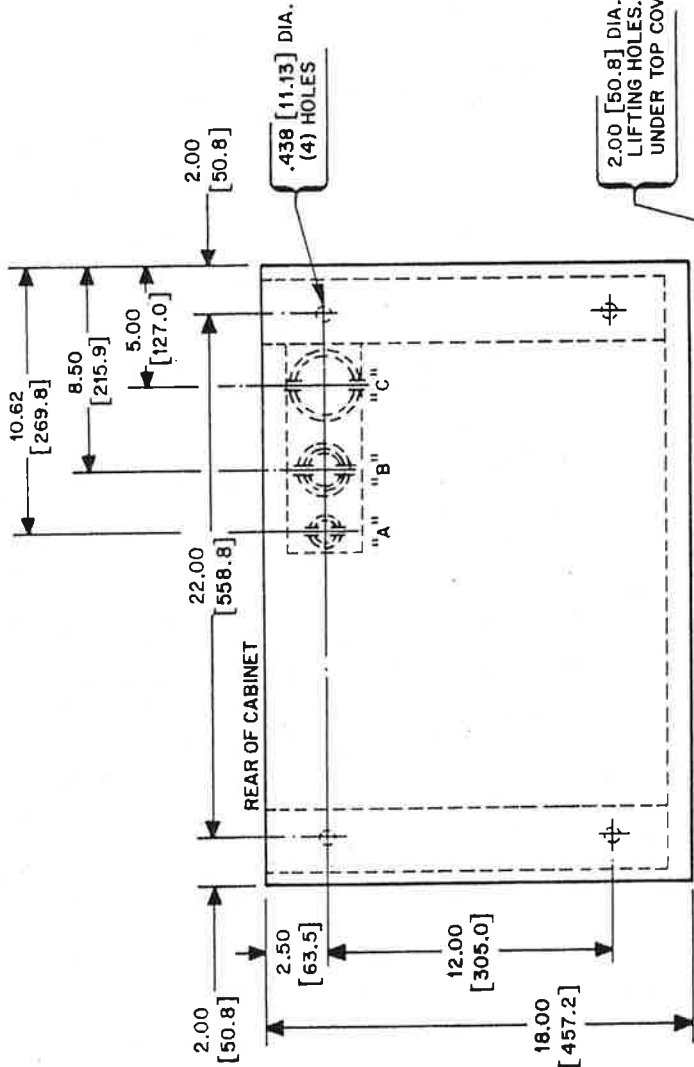


CONTROL MODULE ASSEMBLY

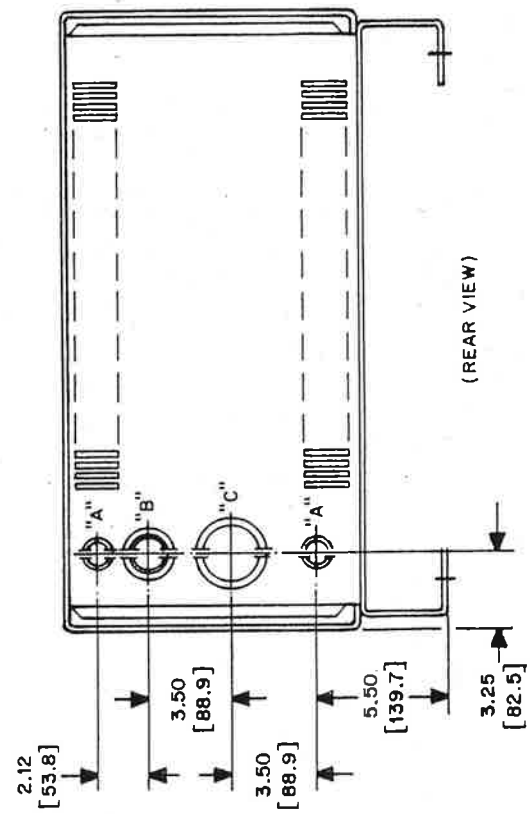
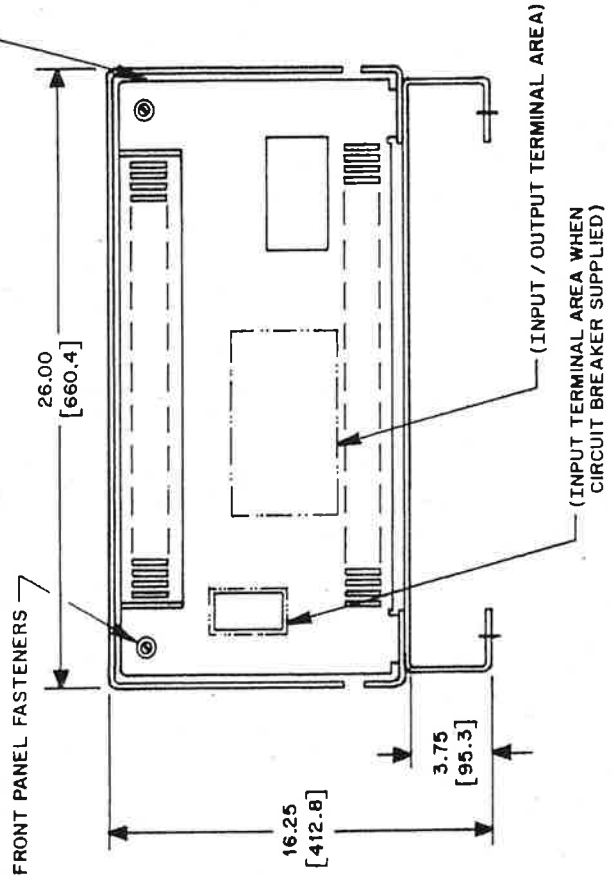


PART NUMBER	DESCRIPTION	*A* METER PT. NO.	*B* TRANSFORMER PT. NO.
213243-001	CONTROL MODULE 120V X 120V	212917-001	-
213243-002	CONTROL MODULE 240V X 208V	212917-002	227602-001
213243-003	CONTROL MODULE 208/120V X 208/120V	212917-004	-
213243-004	CONTROL MODULE 120V X 120V T *	212917-001	-
213243-005	CONTROL MODULE 240V X 208V T *	212917-002	227602-001
213243-006	CONTROL MODULE 208/120V X 208/120V T *	212917-004	-

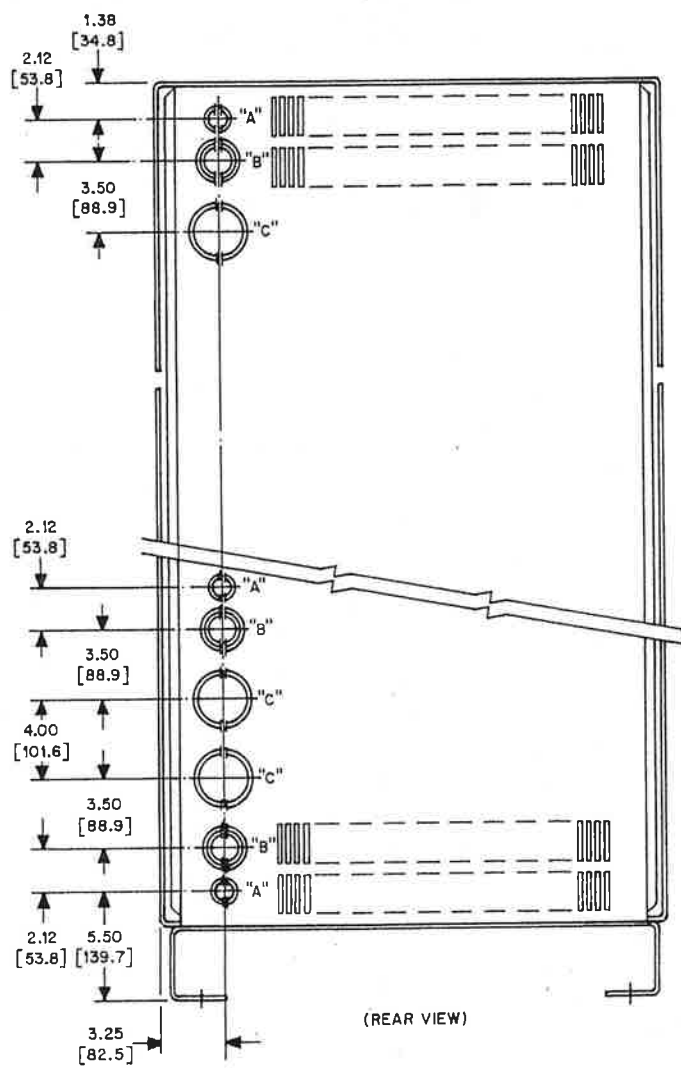
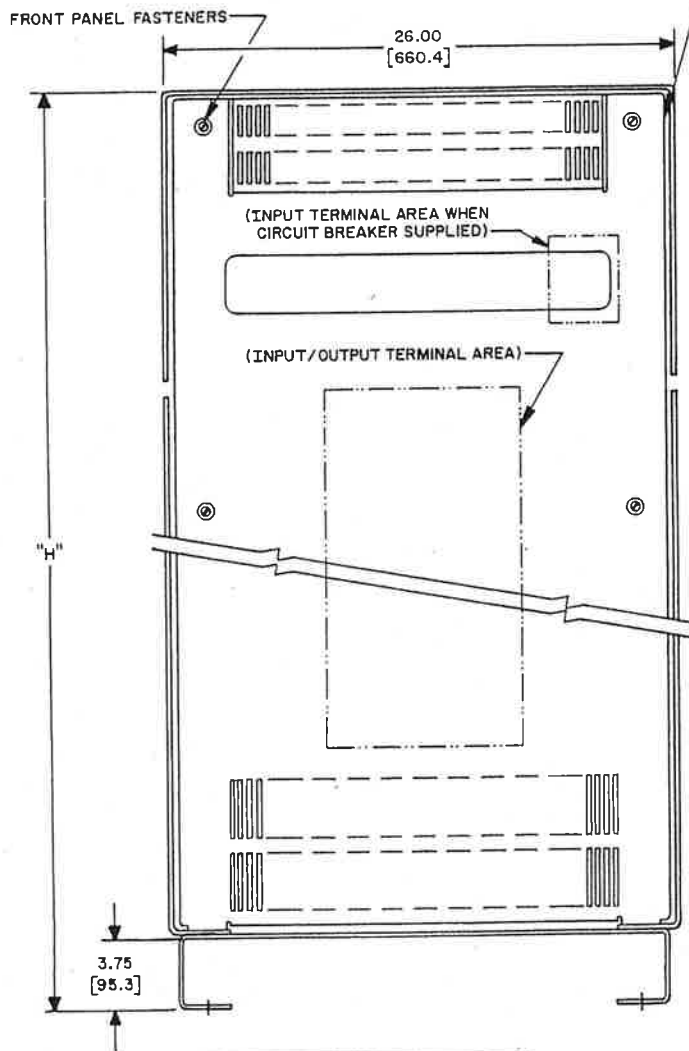
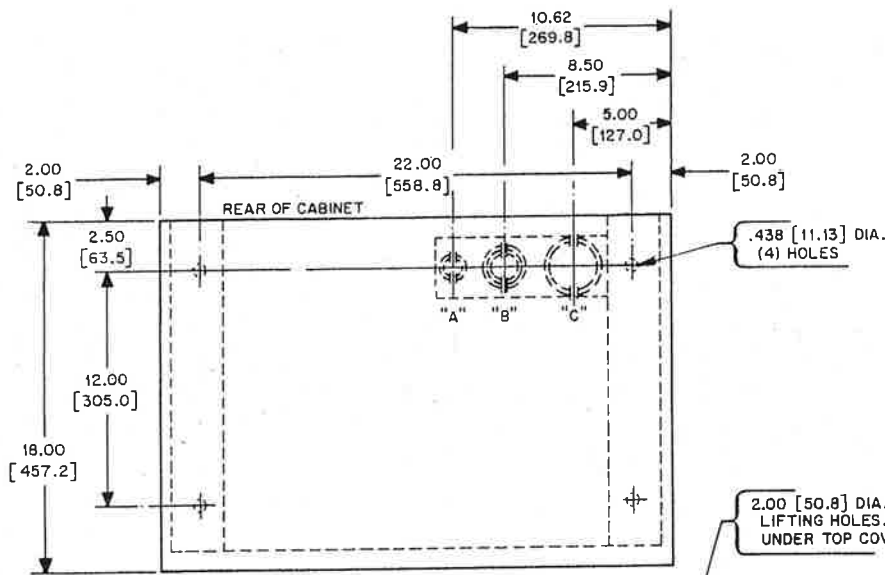
* TROPICALIZED CONTROLS



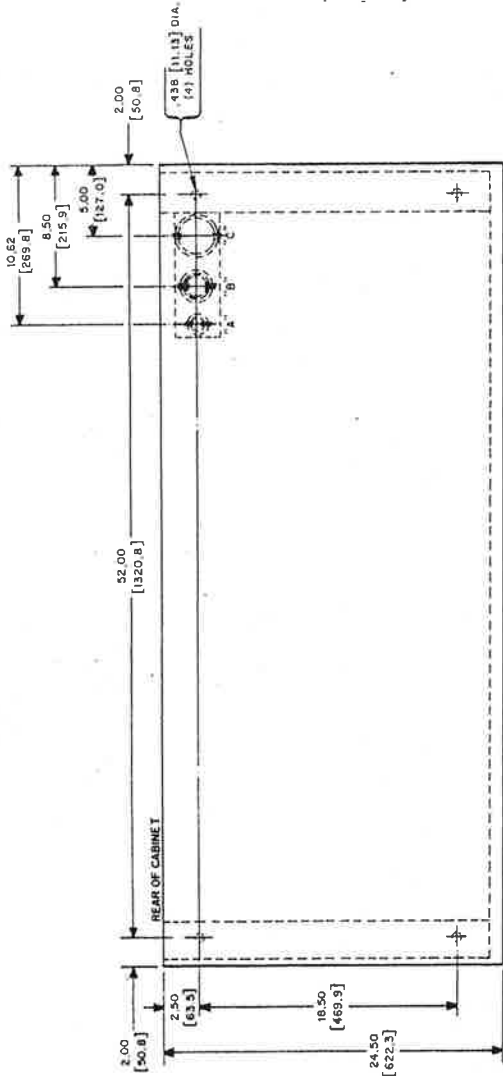
- "A" -- .88 [22.3] @ 1.12 [28.5] CONCENTRIC KNOCKOUTS
- "B" -- 1.38 [35.0], 1.75 [44.5] @ 2.00 [50.8] CONCENTRIC KNOCKOUTS
- "C" -- 2.50 [63.5] @ 3.00 [76.2] CONCENTRIC KNOCKOUTS



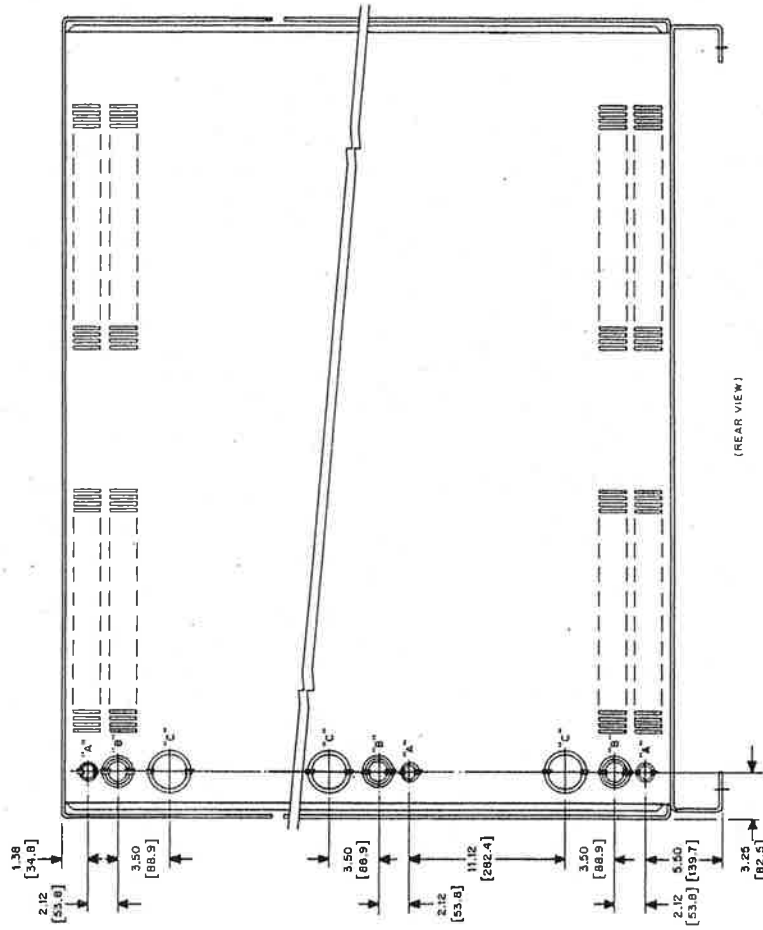
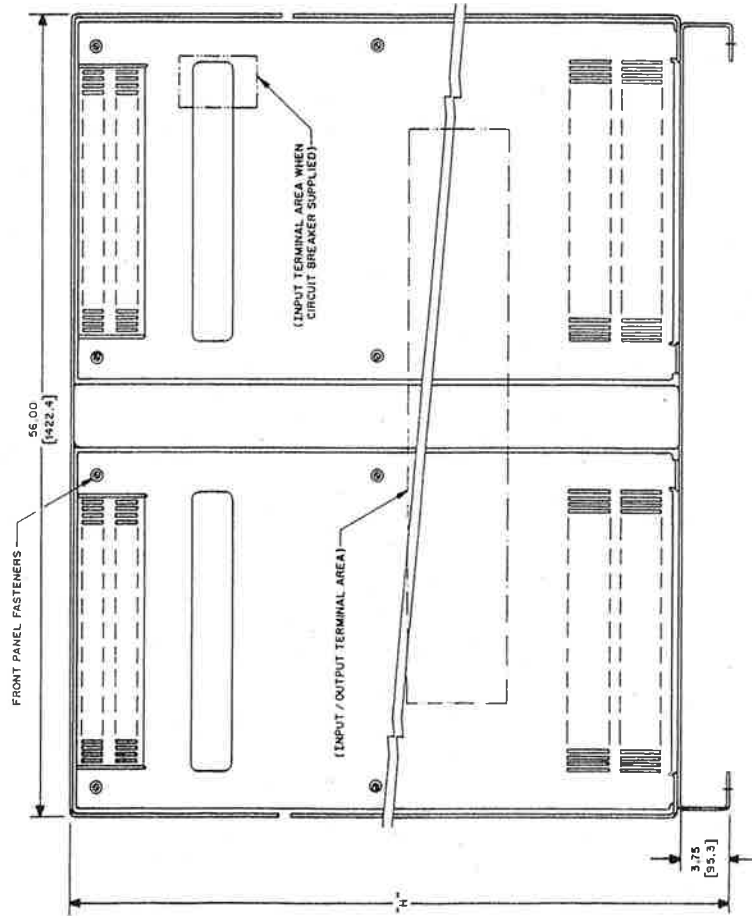
Cabinet A



CABINET DESIGNATION	"H"
B	24.25 [616.0]
C	34.25 [870.0]
D	46.25 [1174.8]
E	56.25 [1428.8]
F	74.25 [1886.0]
G	88.25 [2141.6]



- "A" - 88 [63.3] @ 1.15 [29.1] CONCENTRIC KNOCKOUTS
- "B" - 136 [35.0], 175 [44.5] @ 2.00 [50.8] CONCENTRIC KNOCKOUTS
- "C" - 250 [63.5] @ 3.00 [76.2] CONCENTRIC KNOCKOUTS



CABINET DESIGNATION	"H"
DD	46.25 [1174.8]
EE	56.25 [1428.8]
FF	74.25 [1896.0]
GG	86.25 [2141.6]

Cabinets DD through GG

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