INSTRUCTIONS

for INSTALLATION OPERATION and MAINTENANCE

POWERSTAT® VARIABLE TRANSFORMERS

The right to make engineering refinements or all products is reserved. Dimensions and other details are subject to change.

WITH POWERKOTE® COILS 126-226 Series



Product Application 860-507-2025, Ext. 72058

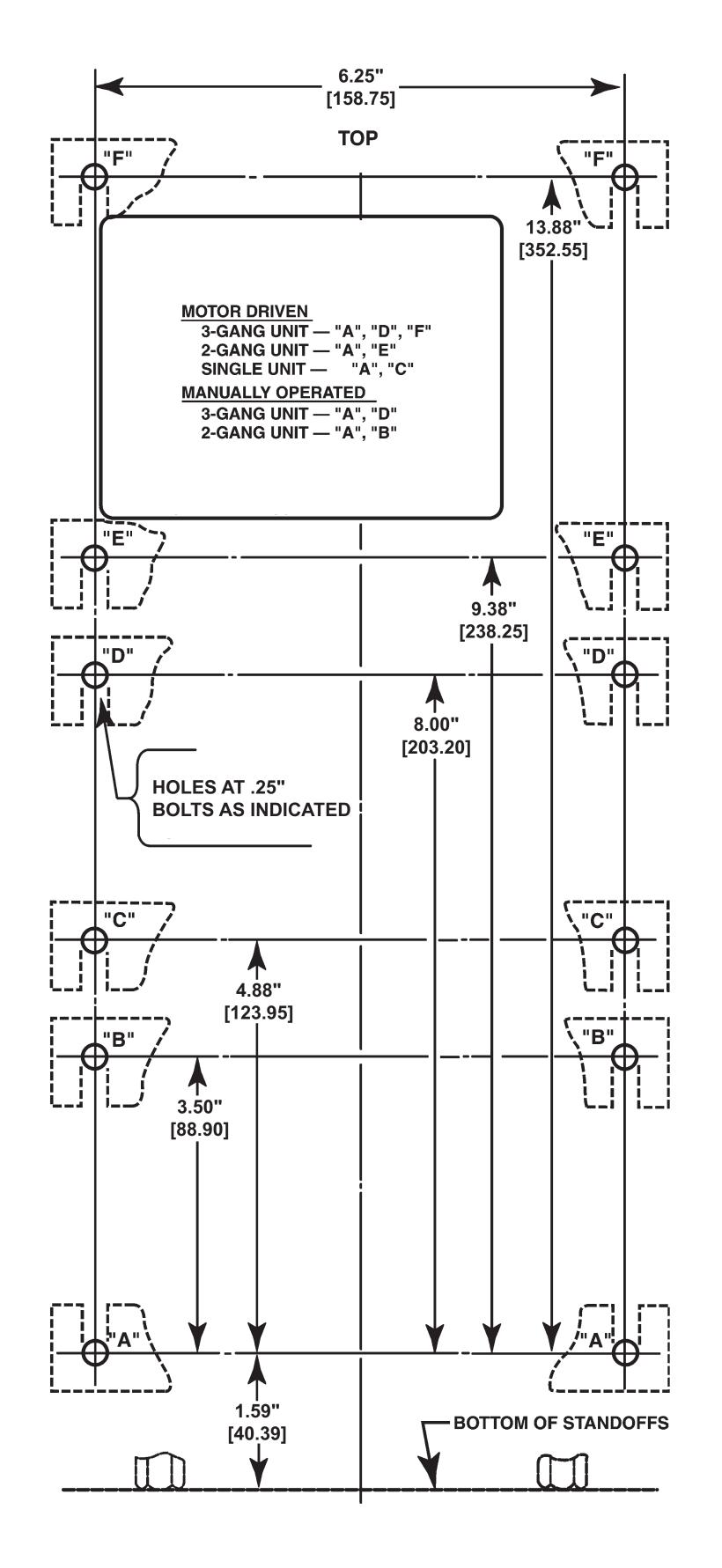
Telephone Fax Customer Service Product Application

Toll-Free (in USA and Canada only) 1-800-787-3532 1-800-821-1369 1-800-787-3532, Ext. 70782 1-800-787-3532, Ext. 72058

Printed in USA

TEMPLATE NO. 2

NOTE: All dimensions are in inches [millimeters]



INSPECTION

A POWERSTAT Variable Transformer is a precision product packed with care. When unpacking, examine carefully for any shipping damage. Inspect the brush contact with particular care. The "Damage and Shortage" Instructions packed with the unit outline the proper procedure to follow if any parts are damaged or missina.

INSTALLATION

NOTE- The unit should be protected from any dust or debris that may be encountered while drilling holes, installing wiring, etc., during installation.

MANUALLY OPERATED ASSEMBLIES

POWERSTAT Variable Transformer types 126 and 226 have two sets of mounting holes to facilitate installation in new or existing layouts. Use the set that is most convenient for the application. All models are designed so that the same unit can be either bench or back-of-panel mounted as desired. The units as shipped are arranged for bench mounting. To change to back-of-panel mounting, proceed as outlined.

SINGLE UNITS

The 3PN model, has a cord and plug input and a receptacle output, and is usually used as a portable source of variable a-c voltage. If desired they may be mounted in the same manner as other manually operated single units.

BENCH OR WALL MOUNTING

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- 1. Locate and drill for mounting bolt holes "A" using Drilling Template No. 1. Three pilot holes in the base (identified as "B" on template) may also be used if desired. These pilot holes are .157"/.167" in diameter by 13/32" deep to accommodate #10 self-tapping screws. When these holes are used, it is necessary to have access to the rear of the mounting surface.
- 2. Place the unit in position. Insert and tighten the mounting bolts. For mounting holes "B", the length of the bolts must not exceed the thickness of the mounting surface plus 3/8".

BACK-OF-PANEL MOUNTING

- 1. Using Drilling Template No. 1, locate and drill the four mounting bolt holes "A", the dial screw holes "C" and the center shaft hole. Maximum panel thickness is 3 inches. The dial screw holes must be tapped to accommodate the 6-32 screws supplied. Three pilot holes in the base (holes "B" on template) may also be used if desired. The holes are .157"/.167" in diameter by 13/32" deep to accommodate #10 self-tapping screws. Flat head screws must be used, since they will be partially covered by the dial.

4. Place the unit in position, insert and tighten the mounting bolts. Be sure that the mounting bolt length does not exceed the panel thickness plus 3/8" when using holes "B". Place the knob on the shaft and position the pointer correctly with respect to the brush position and the dial indications. Tighten the knob setscrews.

GANGED ASSEMBLIES

BENCH OR WALL MOUNTING

- A. On Standoffs
- 1. Locate and drill the mounting bolt holes (four holes "A") using Drilling Template No. 1.
- 2. Place the unit in position. Insert and tighten the mounting bolts. When access to the rear of the mounting panel is not possible, the unit may be mounted to an adapter plate and the adapter plate mounted to the panel using lag screws. Additional support in the form of a shelf or cradle should be provided when wall mounting these units.
- B. On Side Brackets
- 1. Locate and drill the four mounting bolt holes using Drilling Template No. 2. BE SURE TO USE THE PROPER SET OF HOLES.
- 2. Insert and screw in part way the two top mounting bolts.
- 3. Place the unit in position and insert the two bottom bolts. Tighten all bolts

BACK-OF-PANEL MOUNTING

- 1. Locate and drill the four mounting bolt holes "A", the three dial screw holes "C" and the center shaft hole using Drilling Template No. 1. Maximum panel thickness is 3". The three dial screw holes must be tapped to accommodate the 6-32 screws supplied.
- 2. Remove the knob and dial. Loosen the shaft setscrews (at the base end of each unit) and slide the shaft through so it will project about 13/16" through the panel after installation. Turn the radiators of the units to the extreme counterclockwise position and tighten the shaft setscrews.
- Mount the dial to the panel with the 6-32 screws supplied.
- 4. Place the unit in position. Insert and tighten four 1/4-28 mounting bolts. Mounting bolts are supplied with the unit for use with panels to $\frac{3}{4}$ " thick. For thicker panels use 1/4-28 bolts 3/8" longer than the panel thickness. A ganged assembly, because of its added length and weight, requires extra support in the form of a shelf or cradle.
- Place the knob on the shaft and position the pointer correctly with respect 5 to the brush position and the dial indications. Tighten the setscrews.

MOTOR-DRIVEN ASSEMBLIES

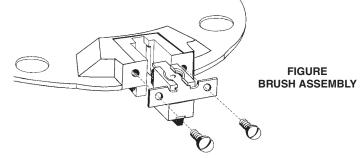
- 2. Loosen the knob setscrews and remove the knob. Remove the dial and mount it to the panel with the three 6-32 screws.
- 3. Loosen the shaft setscrews (at the base end of the shaft) and slide the shaft through so it will project about 13/16" through the panel after installation. Tighten the setscrews.

Motor-driven POWERSTAT Variable Transformers of the 126-226 Series, both single units and ganged assemblies, may be bench or wall mounted in the same manner as manually operated ganged assemblies. Three-gang assemblies, however, have three side brackets requiring six bolts.

MAINTENANCE

With ordinary care, a POWERSTAT Variable Transformer should require no servicing except possible replacement of the brush assembly. The brush should be inspected periodically and replaced if arcing takes place or if it is badly worn. Because the brush must be of a special material, replace only with a Superior Electric brush assembly listed below. The assembly is designed to assure perfect contact of the brush to the commutator regardless of brush position and length of time in use. Take care to avoid scraping, scratching or marring the commutator surface. Follow these steps to install a new brush assembly:

- 1. Remove the plate block above the terminal panel.
- 2. Unfasten the brush assembly anchor screws, remove and discard the old brush assembly
- 3. Insert the new brush assembly in the radiator slot, replace the anchor screws and tighten to the radiator. Be sure that the back end of the brush strap is under the projections at the rear of the radiator brush slot.
- 4. Raise the brush and place a piece of sandpaper (grit #400 or finer) between the commutator surface and the brush so that the smooth side is on the commutator and the abrasive side is against the carbon brush.
- 5. While holding the sandpaper in place (flat), rotate the radiator through a short arc. Remove the sandpaper and blow out the excess carbon particles.
- 6. Rotate the radiator several times to check for smooth travel of the brush over the commutator surface. The brush should fit flat over the entire commutator surface. No space should be visible between the brush and the surface.



REPLACEMENT BRUSH ASSEMBLIES

MODEL NUMBER	PART NUMBER	DESCRIPTION				
126	122819-001	RB126				
226	122819-002	RB226				

Whenever unusual mechanical or electrical difficulties are encountered in the operation or installation of your POWERSTAT Variable Transformer, consult Superior Electric.

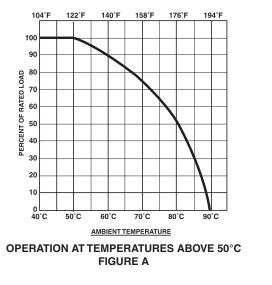
CONNECTIONS AND RATINGS

Important connection notes. Please read carefully.

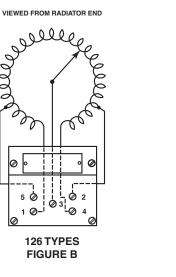
- CONNECTIONS AND RATINGS given in these instructions are those most commonly used. In addition, all ganged units may be connected so that the units operate electrically independent on a common shaft. When this is desired, connections and ratings for a single deck unit should be used.
- For ambient temperatures between -20°C and +50°C use current ratings given in the charts. Figure A shows the output current de-rating required above 50°C.
- · Coil to terminal connections for all 126 and 226 Series units are shown in Figures B, C, and D.
- The connection diagrams are labeled "L" for Line Connections, "B" for Boost
- Connections and "S" for Step-Up Connections. The F226 Series POWERSTAT® Variable Transformers do not have terminals 6 & 7 available and therefore do not have a Step-Up ("S") Connection. Terminal #3 is after the fuse on all F models.
- For the Step-Up Connections the tables show maximum output current rating for output voltages up to 125% of the input voltage, and maximum KVA at maximum output voltage. The output current must be reduced according to

the curve in Figure E for output voltages greater then 125% of input voltage. Maximum KVA may be calculated using the rating curve in Figure E for voltages less then maximum.

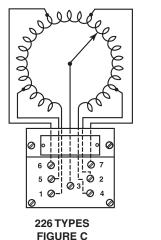
- Clockwise (CW) and counterclockwise (CCW) rotation connections shown in the tables and diagrams are for motor driven units and units with the knob on the radiator end. For connections with the knob on the base end, use the shown CCW connection for CW operation, and shown CW connection for CCW operation.
- Fuses are recommended on all units as shown (§) and are supplied on F and 3PN models. Supplied fuses are 15 ampere on 126 types, and 8 ampere on 226 types.
- COMMON shown in the connection diagrams is used as third leg in 3phase open delta, or neutral in single-phase 3-wire and 3-phase 4-wire wye configurations. COMMON is not used in single-phase 2-wire or 3- phase 3-wire wye configurations. Jumper(s) provided in standard common position should be moved or removed as required.
- Motor drive wiring is shown in Figure F.
- when shipped.



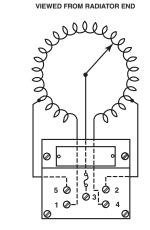
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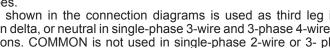


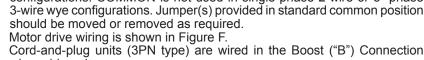
VIEWED FROM RADIATOR END

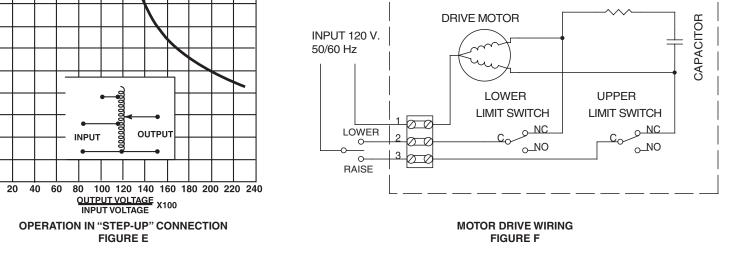


F126 AND F226 TYPES FIGURE D





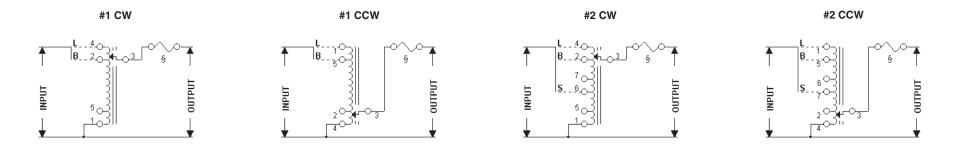


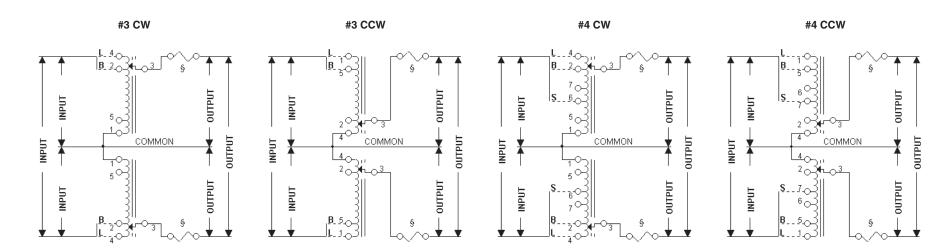


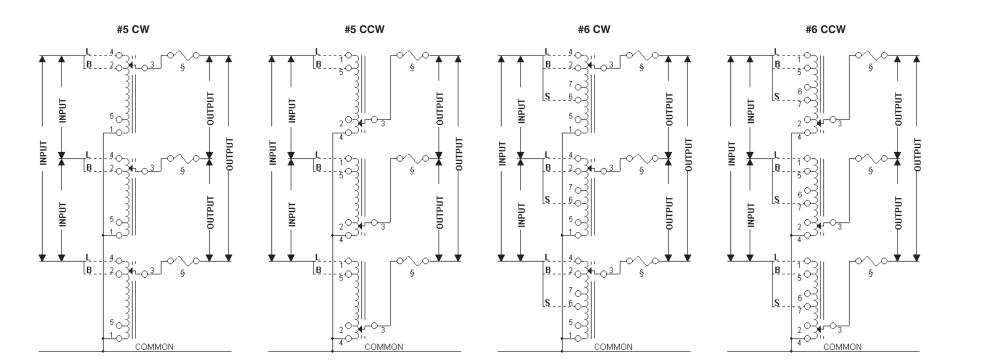
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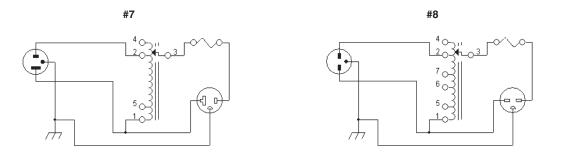
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CONNECTION DIAGRAMS











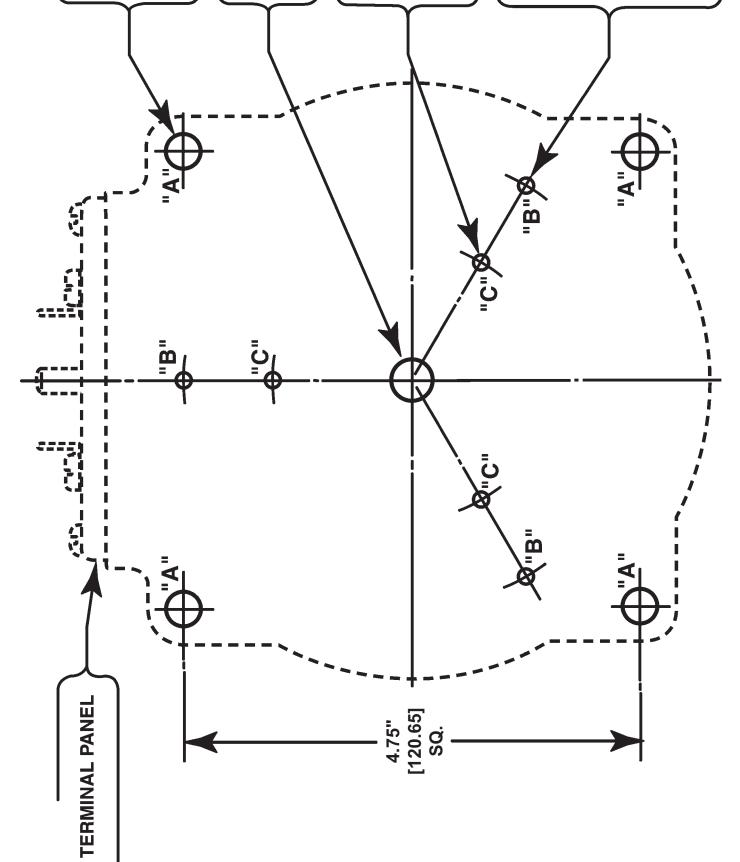
NOTE: All dimensions are in inches [millimeters]

STANDARD MOUNTING - -4-HOLES ("A") IN PANEL FOR .31" MOUNTING BOLTS

HOLES IN PANEL TO CLEAR .38" [9.65] CENTER SHAFT 3-HOLES ("C") IN PANEL AT 120° (2.88" [73.15] BOLT CIRCLE) FOR NO. 6 DIAL MOUNTING SCREWS ALTERNATE MOUNTING - -(SINGLE MANUAL UNIT ONLY) 3-HOLES ("B") IN PANEL AT 120° (4.75" [120.65] BOLT CIRCLE) FOR #10 MOUNTING SCREWS

RATINGS CHART

									-													
													ILE PH	IASE								
Ini	put Voltag		"LINE" C	ONNECT		<u> </u>		120	"	BOOST"		TION		N/A	"8	TEP-UP'	CONNE	CTION				
	tput Volta	ige:	0-120					0-140	_						-							
	Cons Curren	stant t Load		stant nce Load	Terr	ninals &	Rotation			stant 1t Load	Tern	ninals &	Rotation			stant nt Load	Tern		Rotation	Model	Numbers	
Freq. (Hz)	Max. Amps	Max. KVA	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	Jumper CW CCW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	Jumper CW CCW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	Jumper CW CCW	Manually Operated	Motor Driven	Conn. Diag.
50/60	15	1.8	20	2.4	1-4 1-4	1-3 3-4		50/60	15	2.1	1-2 4-5	1-3 3-4								126 126T 126U F126	MC126 MC126T MC126U MCF126	1
																				3PN126		7
											-		ILE PH	IASE								
In	put Voltag		"LINE" C	ONNECT	1ON 208	1		240	"	BOOST" 208				120	"5	TEP-UP	CONNE	CTION	i			┨┝───
	tput Volta	ige:	0-240		0-208			0-280		0-242				0-280								
	Cons Curren	stant t Load	Con Impedar	stant nce Load	Terr	ninals &	Rotation			stant nt Load	Tern	ninals &	Rotation			stant nt Load	Tern	ninals &	Rotation	Model	Numbers	
Freq. (Hz)	Max. Amps	Max. KVA	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	Jumper CW CCW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	Jumper CW CCW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	Jumper CW CCW	Manually Operated 226	Motor Driven MC226	Conn. Diag.
50/60	7.5	1.8	10	2.4	1-4 1-4	1-3 3-4		50/60	7.5	2.1	1-2 4-5	1-3 3-4		50/60	7.5	0.91	1-6 4-7	1-3 3-4		226T 226U F226 3PN226	MC226 MC226T MC226U MCF226	2
50/60	15	3.6	20	4.8	4-4 1-1	3-3 3-3	1-1 4-4	50/60	15	4.2	2-2 5-5	3-3 3-3	1-1 4-4							126U-2	MC126U-2	3
					1-1	5-5	4-4		48	0 VO				IASE					I			
			"LINE" O	ONNECT	TION					BOOST"	· ·					TEP-UP	CONNE	CTION				
	put Voltag		480 0-480		380 0-380			480 0-560		380 0-443				240 0-560		208 0-485						
Uu	tput Volta	stant	Con	stant	Torr	ninals &	Rotation	0-300		stant	Tern	ninals &	Rotation	000-0		stant	Term	ninals &	Rotation	Model	Numbers	
Freq.	Curren Max.	t Load Max.	Impedar Max.	nce Load Max.	Input	Output	Jumper	Freq.	Currer Max.	nt Load Max.	Input	Output	Jumper	Freg.	Currer Max.	nt Load Max.	Input	Output	Jumper	Manually	Motor	Conn.
(Hz)	Amps	KVA	Amps	KVA	ĊW CCW	CŴ CCW	CŴ CCW	(Hz)	Amps	KVA	ĊW CCW	CŴ CCW	CŴ CCW	(Hz)	Amps	KVA	ĊW CCW	CŴ CCW	CŴ CCW	Operated	Driven	Diag.
50/60	7.5	3.6	10	4.8	4-4 1-1	3-3 3-3	1-1 4-4	50/60	7.5	4.2	2-2 5-5	3-3 3-3	1-1 4-4	50/60	7.5	1.8	6-6 7-7	3-3 3-3	1-1 4-4	226U-2	MC226U-2	4
				1				•	60	o vo	LT, S			IASE		1						
			"LINE" C	ONNECT	ION					BOOST"	· · · · ·		I		"S	TEP-UP	CONNE	CTION	I			
	put Voltag tput Volta	-	600 0-600																			{├──
	Cons	stant		stant	Terr	ninals &	Rotation			stant nt Load	Tern	ninals &	Rotation			stant nt Load	Tern	ninals &	Rotation	Model	Numbers	
Freq.	Max.	Max.	Max.	Max.	Input	Output CW	Jumper	Freq.	Max.	Max.	Input	Output	Jumper	Freq.	Max.	Max.	Input	Output	Jumper	Manually	Motor	Conn.
(Hz)	Amps	KVA	Amps	KVA	CW CCW	CCW	CW CCW	(Hz)	Amps	KVA	CW CCW	CŴ CCW	CW CCW	(Hz)	Amps	KVA	ĊW CCW	ĊŴ CCW	CW CCW	Operated	Driven	Diag.
60	7.5	4.5	10	6	4-4 1-1	3-3 3-3	1-1 4-4													226U-2	MC226U-2	4
							1	20 V	/OLT	, тн	REE	PH/	ASE O	PENI	DELT	ΓΑ						
In	nut Valta		"LINE" C		10N	r		120	"	BOOST"	CONNEC		1	N/A	"5	TEP-UP	CONNE	CTION				
-	put Voltag tput Volta		0-120					0-140						N/A								
	Cons Curren	stant t Load	Con Impedar	stant ice Load	Terr	ninals &	Rotation			stant nt Load	Tern	ninals &	Rotation			stant nt Load	Tern	ninals &	Rotation	Model	Numbers	
Freq.	Max.	Max.	Max.	Max.	Input CW	CŴ	Jumper CW	Freq.	Max.	Max.	Input CW	Output CW	Jumper CW	Freq.	Max.	Max.	Input CW	Output CW	Jumper CW	Manually	Motor	Conn.
(Hz)	Amps	KVA	Amps	KVA	CCW 4-1-4	CCW 3-1-3	CCW 1-1	(Hz)	Amps	KVA	CCW	CCW 3-1-3	CCW 1-1	(Hz)	Amps	KVA	CCW	CCW	CCW	Operated	Driven	Diag.
50/60	15	3.1	20	4.2	1-4-1	3-4-3	4-4	50/60	15	3.6	2-1-2 5-4-5	3-4-3	4-4							126U-2	MC126U-2	3
							2	240 V					ASE OI	PENI								
In	put Voltag		"LINE" C	ONNECT	10N 208			240	"	BOOST" 208				120	"5	TEP-UP'	CONNE	CTION				
	tput Volta	ige:	0-240		0-208			0-280		0-242				0-280								
	Cons Curren	stant t Load	Con Impedar	stant	Terr	ninals &	Rotation			stant t Load	Tern	ninals &	Rotation			stant t Load	Tern	ninals &	Rotation	Model	Numbers	
Freq. (Hz)	Max. Amps	Max. KVA	Max. Amps	Max. KVA	Input CW	CŴ	Jumper CW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW	Output CW	Jumper CW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW	Output CW	Jumper CW	Manually Operated	Motor Driven	Conn. Diag.
	· ·		· ·		CCW 4-1-4	CCW 3-1-3	CCW 1-1	. ,			2-1-2	CCW 3-1-3	1-1		· ·		CCW 6-1-6	CCW 3-1-3	1-1			
50/60	7.5	3.1	10	4.2	1-4-1	3-4-3	4-4	50/60	7.5	3.6	2-1-2 5-4-5	3-4-3	1-1 4-4	50/60	7.5	1.6	7-4-7	3-4-3	4-4	226U-2	MC226U-2	4
			"LINE" C					240		8 VC	-		EE PH	ASE			CONNE	CTION				
Inj	put Voltag		240	ONNECT	208			240		208	CONNEC			120		TEP-UP	CONNEG	STION				
Out	tput Volta	ige: stant	0-240	stant	0-208			0-280	Con	0-242 stant				0-280	Con	stant						
		t Load	Impedar			ninals &				nt Load		ninals &	·			nt Load			Rotation	Model	Numbers	
Freq. (Hz)	Max. Amps	Max. KVA	Max. Amps	Max. KVA	Input CW CCW	CŴ CCW	CCW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	CŴ CCW	Freq. (Hz)	Max. Amps	Max. KVA	Input CW CCW	Output CW CCW	Jumper CW CCW	Manually Operated	Motor Driven	Conn. Diag.
50/60	15	6.2	20	8.3	4-4-4 1-1-1	3-3-3 3-3-3	1-1-1 4-4-4	60	15	7.3	2-2-2 5-5-5	3-3-3 3-3-3	1-1-1 4-4-4							126U-3	MC126U-3	5
								480	Y/27	7 VC)LT, '	THR	EE PH	IASE	WYE							
			"LINE" C	ONNECT	i	i			" i	BOOST"	CONNEC	TION			"S	· · ·	CONNE	CTION	i			
				1	380	I.		480		380				240 0-560		208 0-485						
	put Voltag tput Volta		480 0-480		0-380			0-560		0-443				0000		0-400						
	tput Volta Cons	ige: stant	0-480 Con	stant	Torr	ninals &	Rotation	0-560		stant	Tern	ninals &	Rotation			stant	Tern	ninals &	Rotation	Model	Numbers	
	tput Volta Cons	ige: stant	0-480	nce Load	Terr Input				Currer	stant nt Load	Input	Output			Currer		Input	Output	1			Conn.
Out	tput Volta Cons Curren	ige: stant t Load	0-480 Con Impedar		Terr Input CW CCW	Output CW CCW	Jumper CW CCW	0-560 Freq. (Hz)		stant	Input CW CCW	Output CW CCW	Jumper CW CCW	Freq. (Hz)		stant nt Load	Input CW CCW	Output CW CCW	Jumper CW CCW	Model Manually Operated	Numbers Motor Driven	Conn. Diag.
Out Freq.	tput Volta Cons Curren Max.	ige: stant t Load Max.	0-480 Con Impedar Max.	nce Load Max.	Terr Input CW	Output CW	Jumper CW	Freq.	Currer Max.	stant nt Load Max.	Input CW	Output CW	Jumper CW	Freq.	Currer Max.	stant nt Load Max.	Input CW	Output CW	Jumper CW	Manually	Motor	
Out Freq. (Hz)	tput Volta Cons Curren Max. Amps	ige: stant t Load Max. KVA	0-480 Con Impedar Max. Amps	nce Load Max. KVA	Terr Input CW CCW 4-4-4	Output CW CCW	Jumper CW CCW 1-1-1	Freq. (Hz) 60	Currer Max. Amps 7.5	stant nt Load Max. KVA 7.3	Input CW CCW 2-2-2 5-5-5	Output CW CCW 3-3-3 3-3-3	Jumper CW CCW 1-1-1	Freq. (Hz) 60	Currer Max. Amps 7.5	stant nt Load Max. KVA 3.2	Input CW CCW 6-6-6	Output CW CCW 3-3-3	Jumper CW CCW 1-1-1	Manually Operated	Motor Driven	Diag.
Out Freq. (Hz) 50/60	tput Volta Cons Curren Max. Amps 7.5	stant t Load Max. KVA 6.2	0-480 Con Impedar Max. Amps 10	NCE Load Max. KVA 8.3	Terr CW CCW 4-4-4 1-1-1	Output CW CCW	Jumper CW CCW 1-1-1	Freq. (Hz) 60	Currer Max. Amps 7.5 Y/34	stant nt Load Max. KVA 7.3	Input CW CCW 2-2-2 5-5-5 DLT,	Output CW CCW 3-3-3 3-3-3 THE	Jumper CW CCW 1-1-1 4-4-4	Freq. (Hz) 60	Currer Max. Amps 7.5	stant ht Load Max. KVA 3.2	Input CW CCW 6-6-6	Output CW CCW 3-3-3 3-3-3	Jumper CW CCW 1-1-1	Manually Operated	Motor Driven	Diag.
Out Freq. (Hz) 50/60	tput Volta Cons Curren Max. Amps	ge: stant t Load Max. KVA 6.2 6.2	0-480 Con Impedar Max. Amps 10	NCE Load Max. KVA 8.3	Terr CW CCW 4-4-4 1-1-1	Output CW CCW	Jumper CW CCW 1-1-1	Freq. (Hz) 60	Currer Max. Amps 7.5 Y/34	stant nt Load Max. KVA 7.3 6 VC	Input CW CCW 2-2-2 5-5-5 DLT,	Output CW CCW 3-3-3 3-3-3 THE	Jumper CW CCW 1-1-1 4-4-4	Freq. (Hz) 60	Currer Max. Amps 7.5	stant ht Load Max. KVA 3.2	Input CW CCW 6-6-6 7-7-7	Output CW CCW 3-3-3 3-3-3	Jumper CW CCW 1-1-1	Manually Operated	Motor Driven	Diag.



Please read important connection notes on other side.

Terminals & Rotation

Jumper CW CCW

1-1-1 4-4-4 Freq. (Hz)

Input Output CW CW CCW CCW Constant Current Load

Max. Amps

Max. KVA Terminals & Rotation

Jumper CW CCW

Input Output CW CW CCW CCW Constant Current Load

Max. Max. Amps KVA

Freq. (Hz) Terminals & Rotation

Jumper CW CCW

Input Output CW CW CCW CCW Model Numbers

226U-3 MC226U-3

Motor Driven Conn. Diag.

6

Manually Operated

Constant Impedance Load

 7.5
 7.8
 10
 10.4
 4-4-4 1-1-1
 3-3-3 3-3-3

Max. Max. Max. Max. Amps KVA Amps KVA

Constant Current Load

Freq. (Hz)

60

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