

ELECTRICAL DESIGN FEATURES:

Staco's 1010, 1020, 1210 and 1220 Series Variable Transformers are popular industrial and laboratory models used wherever variable AC voltage control is required.

The 1010/1210 Series operate on 120 volt input lines. The rated output for constant current loads is 10 amperes for the 1010 Series; 12 amperes for the 1210 Series. For constant impedance loads the maximum rated output current at line voltage is 13 amperes for the 1010 Series; 15 amperes for the 1210 Series.

The 1020 and 1220 Series operate on 240 volt input lines. The rated output for constant current loads is 3.5 amperes for the 1020 Series; 5 amperes for the 1220 Series. For constant impedance loads the maximum rated output current at line voltage is 5 amperes for 1020 Series; and 7 amperes for the 1220 Series.

Units of the 1010 and 1020 Series have coil tapping arrangements which allow for output voltage from 0 to line voltage or 17% above line voltage. The 1210 and 1220 Series are for line voltage operation only. All models can be connected to deliver an increasing output voltage in either clockwise or counter-clockwise rotation, see Fig. 1 and 2.

As shown in Fig. A, Staco variable transformers may be operated from 50 to 1500 Hertz with no reduction in maximum output current. A slight reduction in current is required from 1500 Hertz to 2000 Hertz with the exception of type 1020 and 1220 operating at the constant current rating.

Fig. B shows the regulation curves for the 1010/1020 and 1210/1220 Series operating at full load current. These curves show voltage drop when full load is applied for any brush setting. With less than full load applied, the voltage drop is proportional to the load. Driving torque, DC resistance per coil and power loss when operating at no load, are shown in Table 1.

MECHANICAL DESIGN FEATURES:

All single units are supplied with both 3 and 4 hole mounting arrangement. All manually operated units have a 4" diameter reversible dial graduated from 0 to 100 and 100 to 0. The angle of rotation from 0 to maximum output is 320 degrees.

OPEN CONSTRUCTION AND CASED DESIGNS:

Open construction or uncased types (no prefix or suffix in the type number) do not have covers, fuses, switches, pilot lamps, terminal enclosures, input cords or output receptacles. These types are equipped with a terminal board featuring terminals which offer screw-type or solder connections and terminal adapters for use with 1/4" push-on connectors. Uncased models have the shaft extending from the base end. This shaft is fully adjustable and can be extended from either end for general utility mounting or to accommodate varying panel thicknesses.

Cased, covered terminal models (suffix "CT" in type number) are designed primarily for bench top applications or general utility mounting. These units have a coil enclosure and a terminal box cover, with knock-outs to accept conduit. The shafts extend from the rotor end of these units and can be adjusted to suit the exact application.

SQ SERIES

Square base models (prefix "SQ") occupy less panel space and are available in single, open construction styles in the 1010, 1020, 1210 and 1220 Series. Electrical ratings are identical to corresponding standard open construction models. Dimensional drawings are shown on page 35.

PORTABLE CORD AND PLUG MODELS:

Cased plug-in models have ventilated steel case, line cord, receptacle, switch, pilot lamp, fuse and are connected for clockwise rotation. Three conductor grounded (3PN prefix) line cord and matching receptacle is included with these units. Models of the 1010 and 1020 Series are equipped with a dual-range output switch for either overvoltage or line voltage from the off position. Models of the 1210 and 1220 Series are equipped with a two position on-off switch and are limited to line voltage operation.

METERED MODELS:

Cased plug-in models of the 1010 and 1020 Series are also available with a high quality pivot and jewel AC voltmeter or ammeter (with 3% full scale accuracy) conveniently located atop the enclosure for easy, accurate readout. The 1010 type is equipped with a 0-150 V voltmeter or 0-10A ammeter and the 1020 type is equipped with 0-300 V voltmeter or 0-5A ammeter. Both models have identical electrical ratings to the non-metered cord and plug types.

GANGED ASSEMBLIES:

Staco variable transformers of the 1010, 1020, 1210 and 1220 Series are available in two (2) or three (3) ganged assemblies identified by -2 or -3 following the type number, either cased (CT types) or uncased units. The cased units have a steel housing with protective terminal enclosures and have shafts extending from the rotor end for general utility mounting. Manually operated, uncased types are supplied without enclosures and have the shaft extended from the base end for back-of-panel mounting. Adjustable shafts can be extended from either end of the units, permitting all ganged models to conform to bench or back-of-panel mounting and accommodate panels of varying thicknesses. Both open and cased types have slotted side brackets for convenient horizontal or against-the-wall mounting. Stand-offs for conventional mounting are provided in the 4-hole configuration. Terminals for either clockwise or counter-clockwise rotation for voltage increase are supplied.

MOTOR-DRIVEN MODELS:

Motor-Driven units of the 1010/1020 and 1210/1220 types are available in single, two and three-ganged assemblies; cased or uncased styles as identified by the prefix "M" in the type number. Motor-Driven units are rated identical to the corresponding manually operated type. Units are furnished with stand-offs for bench mounting and slotted side brackets for horizontal or wall mounting.

The synchronous stepper motor is designed for operation on 120 volts, 50/60 Hertz, single phase lines and draws approximately 0.3 amperes. Adjustable limit switches are provided at the upper and lower extremes of rotation to prevent over-travel. Standard motor speeds available are 5, 15, 30 and 60 seconds of travel from 0 to maximum output.

When ordering: Prefix the motor-driven type number with the motor speed in seconds. EXAMPLE: 5M1020CT.

TABLE 1

TYPE	PER COIL VALUE		
	DC Res. (Ohms)	Power Loss at 60 Hz. No. Load (Watts)	Torque (oz. in.)
1010	1.2	5.4	15 — 35
1010-2	1.2	5.4	30 — 75
1010-3	1.2	5.4	45 — 120
1020	11.4	5.2	15 — 35
1020-2	11.4	5.2	30 — 75
1020-3	11.4	5.2	45 — 120
1210	0.57	6.4	15 — 35
1210-2	0.57	6.4	30 — 75
1210-3	0.57	6.4	45 — 120
1220	4.4	6.4	15 — 35
1220-2	4.4	6.4	30 — 75
1220-3	4.4	6.4	45 — 120

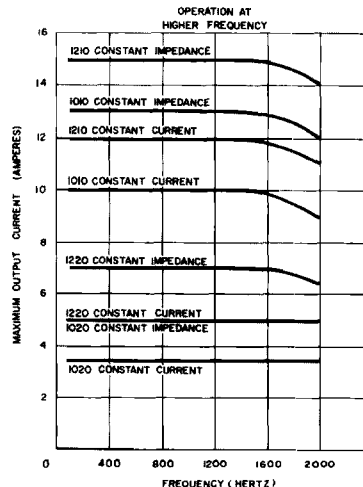


Fig. A

1010, 1020, 1210, 1220 SERIES OUTLINES

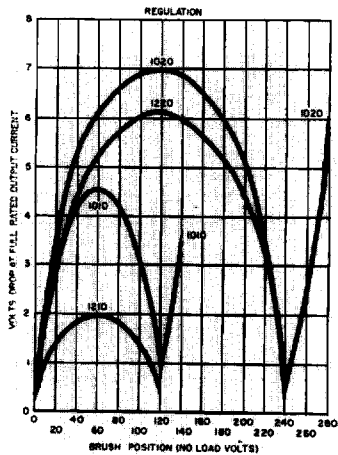


Fig. B

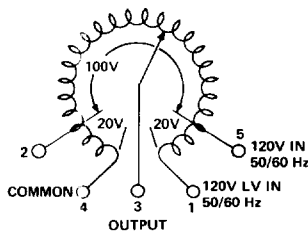


Fig. 1

VIEW FROM BASE END
For opposite rotation interchange external connections from 5 to 2, 4 to 1. Terminals 2 and 5 omitted on 1210.

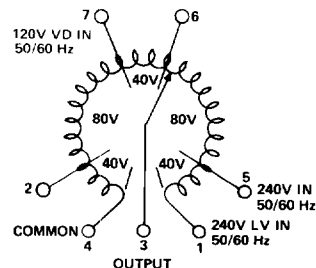
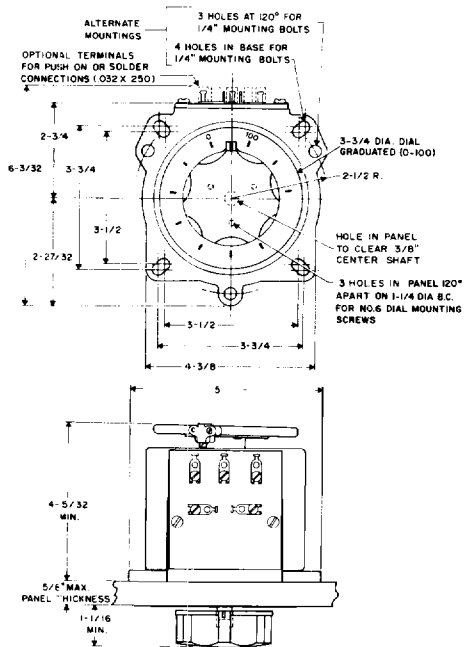
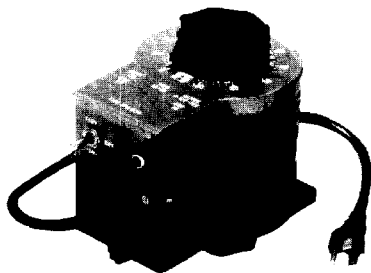


Fig. 2

VIEW FROM BASE END
For opposite rotation interchange external connections from 5 to 2, 4 to 1 and 7 to 6. Terminals 2, 5, 6 and 7 omitted on 1220.

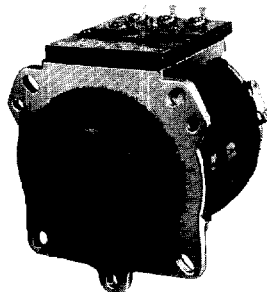


UNCASED MODEL

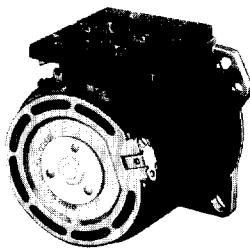


3PN1010

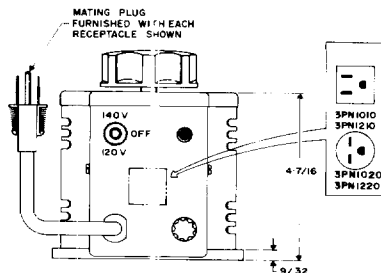
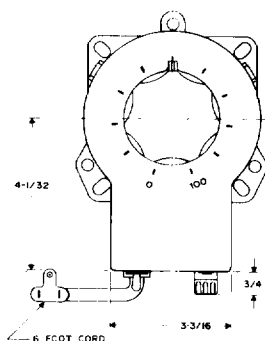
1010CT



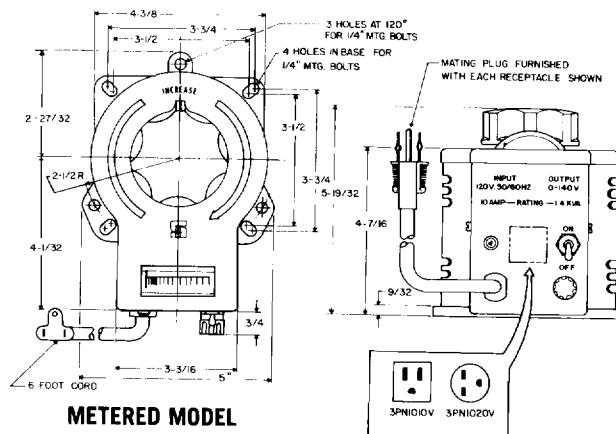
1010



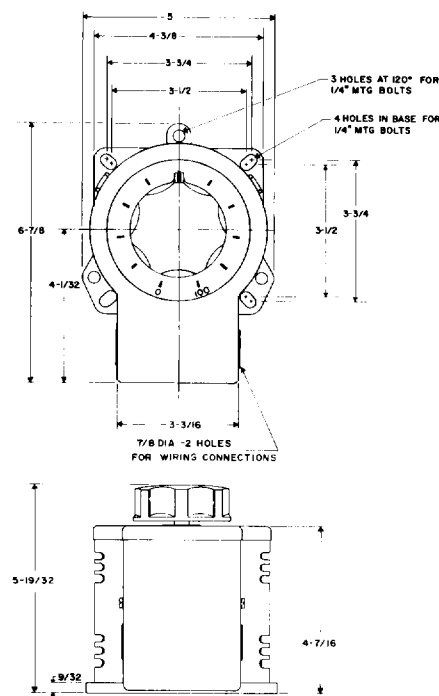
1010
VIEW FROM ROTOR END



CORD & PLUG MODEL

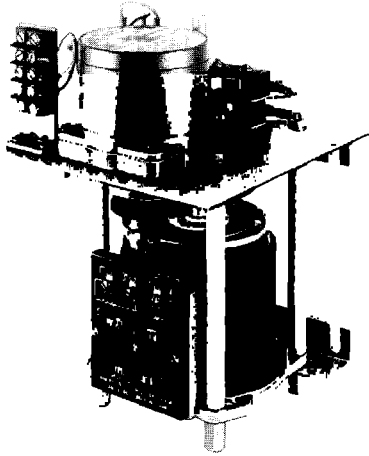


METERED MODEL

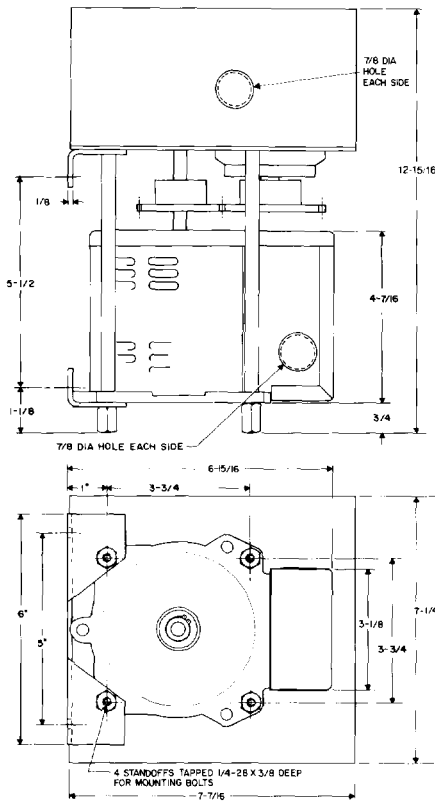


CASED MODEL

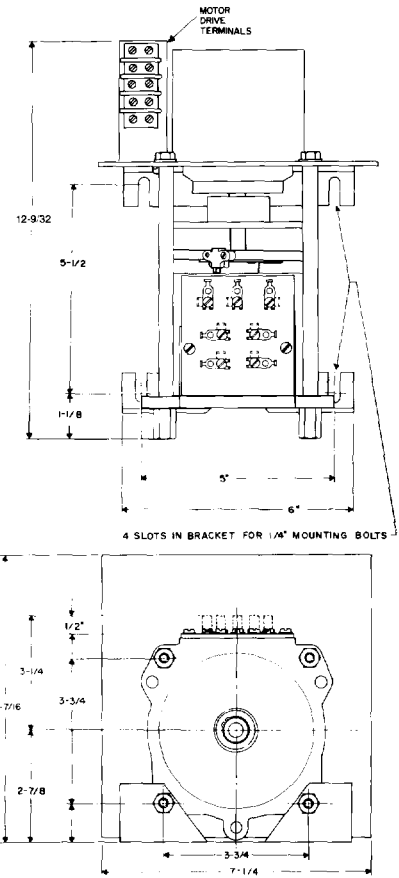
1010, 1020, 1210, 1220 SERIES OUTLINES



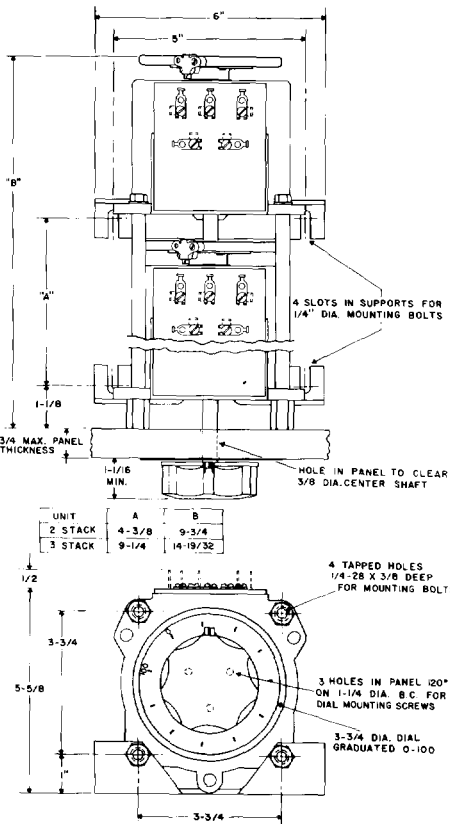
30M1010



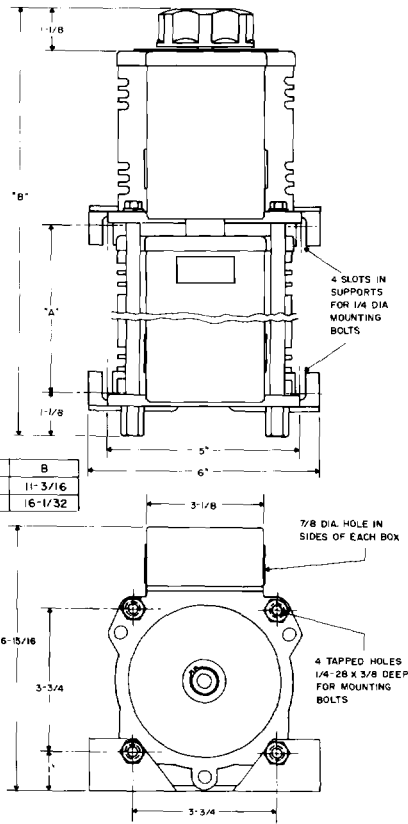
MOTOR-DRIVEN SINGLE
CASED MODEL



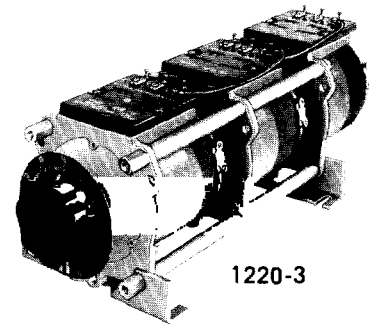
MOTOR-DRIVEN SINGLE
UNCASED MODEL



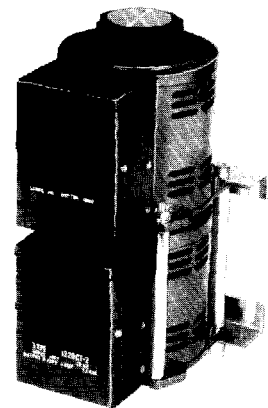
2 & 3 GANGED UNCASED MODEL



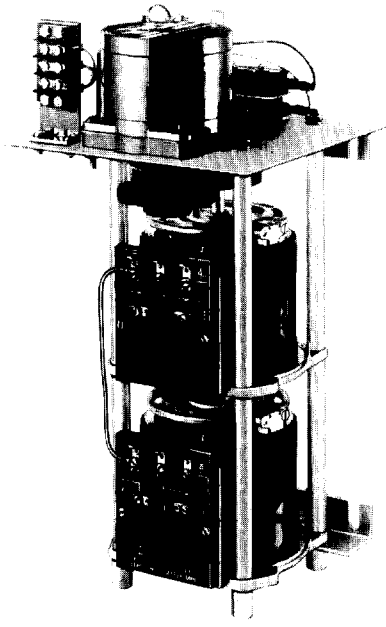
2 & 3 GANGED CASED MODEL



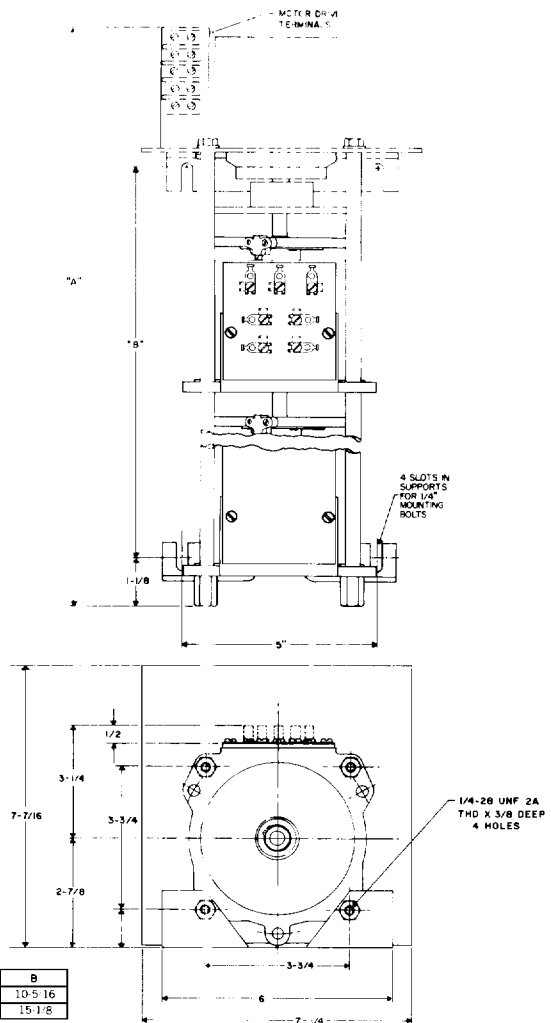
1220-3



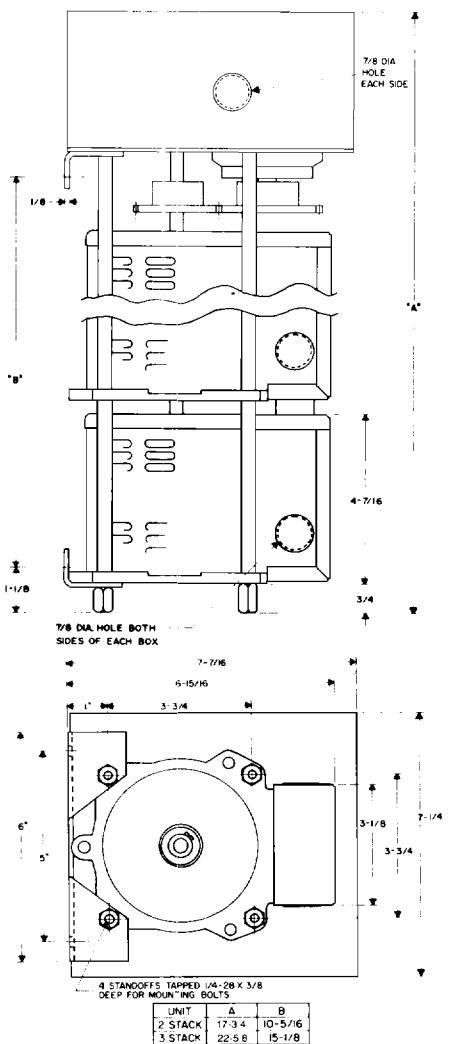
1220CT-2
(optional knob shown)



15M1010-2



MOTOR-DRIVEN UNCASSED GANGED MODEL



MOTOR-DRIVEN CASSED GANGED MODEL

1010 SERIES SPECIFICATIONS

TYPE	WIRING	INPUT		OUTPUT				SHAFT ROTATION For Voltage Increase	TERMINAL CONNECTIONS (For Increasing Voltage) As Viewed From Base End			SCHE-MATIC	NET WEIGHT		
		VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		Input	Jumper	Output		MAN.	MTR. DRV.	
					MAX. AMPS.	MAX. KVA	MAX. AMPS.								MAX. KVA
1010 1010CT M1010† M1010CT†	Single Phase	120	50/60	0-120	10	1.2	13	1.56	CW	1-4	—	4-3	10	10½	16¾
				0-140	10	1.4	—	—	CCW	1-4	—	1-3			
				—	—	—	—	—	CW	4-5	—	4-3			
1010-2 1010CT-2 M1010-2† M1010CT-2†	Single Phase Series	240	50/60	0-240	10	2.4	13	3.12	CW	1-1	4-4	3-3	10 & 4	22½	30¾
				0-280	10	2.8	—	—	CCW	4-4	1-1	3-3			
				—	—	—	—	—	CW	5-5	4-4	3-3			
	Three Phase Open Delta	120	50/60	0-120	10	2.08	13	2.70	CW	1-4-1	4-4	3-4-3			
				0-140	10	2.42	—	—	CCW	4-1-4	1-1	3-1-3			
				—	—	—	—	—	CW	5-4-5	4-4	3-4-3			
1010-3 1010CT-3 M1010-3† M1010CT-3†	Three Phase Wye	210	50/60	0-240	10	4.16	13	5.4	CW	1-1-1	4-4-4	3-3-3	10 & 6	34½	42¾
				0-280	10	4.85	—	—	CCW	4-4-4	1-1-1	3-3-3			
				—	—	—	—	—	CW	5-5-5	4-4-4	3-3-3			
	60	0-240	10	4.16	13	5.4	CW	1-1-1	4-4-4	3-3-3					
		0-280	10	4.85	—	—	CCW	4-4-4	1-1-1	3-3-3					
		—	—	—	—	—	CW	5-5-5	4-4-4	3-3-3					
3PN1010	Single Phase	120	50/60	0-120	10‡	1.2	13	1.56	CW	LINE CORD & RECEPTACLE			9	10½	—
			0-140	10‡	1.4	—	—								
3PN1010V, A	Single Phase	120	50/60	0-140	10‡	1.4	—	—	CW	LINE CORD & RECEPTACLE			11	10½	—

■ Jumper provided in the standard common position and should be moved or removed as required.

++ Line to line voltage

‡ Unit is fused for the constant current rating at the factory.

† Motor driven units use terminal connections for C.C.W. increasing voltage, as viewed from the base end. See Fig. 23 for motor wiring.

π If ganged units are used in a system that ordinarily has a common neutral or ground between source and load, the neutral or ground must be connected to the common terminals of the variable transformer assembly. If the system has no neutral, the load must be balanced or the transformers will be damaged.

1020 SERIES SPECIFICATIONS

TYPE	WIRING	INPUT		OUTPUT				SHAFT ROTATION For Voltage Increase	TERMINAL CONNECTIONS (For Increasing Voltage) As Viewed From Base End			SCHE-MATIC	NET WEIGHT		
		VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		Input	Jumper [■]	Output		MAN.	MAX. MTR. DRV.	
					MAX. AMPS.	MAX. KVA	MAX. AMPS.								MAX. KVA
1020 1020CT M1020† M1020CT†	Single Phase	240	50/60	0-240	3.5	0.84	5.0	1.20	CW	1-4	—	4-3	12	10%	16%
				0-280	3.5	0.98	—	—	CCW	1-4	—	1-3			
				0-280	3.5#	0.42§	—	—	CW	4-5	—	4-3			
		120	50/60	0-280	3.5#	0.42§	—	—	CCW	1-2	—	1-3			
				0-280	3.5#	0.42§	—	—	CW	4-7	—	4-3			
				0-280	3.5#	0.42§	—	—	CCW	1-6	—	1-3			
1020-2 1020CT-2 M1020-2† M1020CT-2†	Single Phase Series	480	50/60	0-480	3.5	1.68	5.0	2.4	CW	1-1	4-4	3-3	12 & 4	22½	30%
				0-560	3.5	1.96	—	—	CCW	4-4	1-1	3-3			
				0-560	3.5#	0.84§	—	—	CW	5-5	4-4	3-3			
		240	50/60	0-560	3.5#	0.84§	—	—	CCW	2-2	1-1	3-3			
				0-560	3.5#	0.84§	—	—	CW	7-7	4-4	3-3			
				0-560	3.5#	0.84§	—	—	CCW	6-6	1-1	3-3			
	Three Phase Open Delta ^π	240	50/60	0-240	3.5	1.45	5.0	2.08	CW	1-4-1	4-4	3-4-3	12 & 5	22½	30%
				0-280	3.5	1.70	—	—	CCW	4-1-4	1-1	3-1-3			
				0-280	3.5	1.70	—	—	CW	5-4-5	4-4	3-4-3			
		120	50/60	0-240	3.5	1.45	5.0	2.08	CCW	2-1-2	1-1	3-1-3			
				0-280	3.5#	0.73§	—	—	CW	7-4-7	4-4	3-4-3			
				0-280	3.5#	0.73§	—	—	CCW	6-1-6	1-1	3-1-3			
1020-3 1020CT-3 M1020-3† M1020CT-3†	Three Phase Wye π	480	50/60	0-480	3.5	2.91	5.0	4.16	CW	1-1-1	4-4-4	3-3-3	12 & 6	34½	42%
				0-560	3.5	3.40	—	—	CCW	4-4-4	1-1-1	3-3-3			
				0-560	3.5#	1.46§	—	—	CW	5-5-5	4-4-4	3-3-3			
		240	60	0-560	3.5#	1.46§	—	—	CCW	2-2-2	1-1-1	3-3-3			
				0-560	3.5#	1.46§	—	—	CW	7-7-7	4-4-4	3-3-3			
				0-560	3.5#	1.46§	—	—	CCW	6-6-6	1-1-1	3-3-3			
3PN1020	Single Phase	240	50/60	0-240	3.5†	0.84	5.0	1.20	CW	LINE CORD & RECEPTACLE			9	10%	—
				0-280	3.5†	0.98	—	—							
3PN1020V, A	Single Phase	240	50/60	0-280	3.5†	0.98	—	—	CW	LINE CORD & RECEPTACLE			11	10%	—

1210 SERIES SPECIFICATIONS

TYPE	WIRING	INPUT		OUTPUT				SHAFT ROTATION For Voltage Increase	TERMINAL CONNECTIONS (For Increasing Voltage) As Viewed From Base End			SCHE-MATIC	NET WEIGHT		
		VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		Input	Jumper [■]	Output		MAN.	MAX. MTR. DRV.	
					MAX. AMPS.	MAX. KVA	MAX. AMPS.								MAX. KVA
1210 1210CT M1210† M1210CT†	Single Phase	120	60	0-120	12	1.44	15	1.80	CW	1-4	—	4-3	13	10%	16%
									CCW	1-4	—	1-3			
1210-2 1210CT-2 M1210-2† M1210CT-2†	Single Phase Series	240	60	0-240	12	2.88	15	3.60	CW	1-1	4-4	3-3	13 & 4	22½	30%
									CCW	4-4	1-1	3-3			
	Three Phase Open Delta ^π	120	60	0-120	12	2.49	15	3.12	CW	1-4-1	4-4	3-4-3	13 & 5	22½	30%
									CCW	4-1-4	1-1	3-1-3			
		240	60	0-240	12	4.96	15	6.24	CW	1-1-1	4-4-4	3-3-3			
									CCW	4-4-4	1-1-1	3-3-3			
3PN1210	Single Phase	120	60	0-120	12†	1.44	15	1.80	CW	LINE CORD & RECEPTACLE			8	10%	—

■ Jumper provided in the standard common position and should be moved or removed as required.

— Line to line voltage

† Unit is used for the constant current rating at the factory.

‡ Motor driven units use terminal connections for C.C.W. increasing voltage, as viewed from the base end. See Fig. 23 for motor wiring.

§ Maximum KVA at maximum output voltage and corresponding derated output current. Maximum KVA for lower voltages may be calculated from derating curve Figure A, page 16.

π If ganged units are used in a system that ordinarily has a common neutral or ground between source and load, the neutral or ground must be connected to the common terminals of the variable transformer assembly. If the system has no neutral, the load must be balanced or the transformers will be damaged.

Maximum output current in output voltage range from 0 to 25% above line voltage. At higher output voltages, the output current must be reduced according to the derating curve Figure A, page 16.

1220 SERIES SPECIFICATIONS

TYPE	WIRING	INPUT		OUTPUT				SHAFT ROTATION For Voltage Increase	TERMINAL CONNECTIONS (For increasing Voltage) As Viewed From Base End			SCHE- MATIC	NET WEIGHT		
		VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		Input	Jumpers	Output		LBS. MAN.	MAX. MTR. DRV.	
					MAX. AMPS.	MAX. KVA	MAX. AMPS.								MAX. KVA
1220 1220CT M1220† M1220CT†	Single Phase	240	60	0-240	5.0	1.20	7.0	1.68	CW CCW	1-4 1-4	— —	4-3 1-3	13	10½	16¾
1220-2 1220CT-2 M1220-2† M1220CT-2†	Single Phase Series	480	60	0-480	5.0	2.40	7.0	3.36	CW CCW	1-1 4-4	4-4 1-1	3-3 3-3	13 & 4	22½	30¾
	Three Phase Open Delta	240 ++	60	0-240	5.0	2.08	7.0	2.91	CW CCW	1-4-1 4-1-4	4-4 1-1	3-4-3 3-1-3	13 & 5		
1220-3 1220CT-3 M1220-3† M1220CT-3†	Three Phase Wye π	480 ++	60	0-480	5.0	4.16	7.0	5.82	CW CCW	1-1-1 4-4-4	4-4-4 1-1-1	3-3-3 3-3-3	13 & 6	34½	42¾
	Single Phase	240	60	0-240	5.0†	1.20	7.0	1.68	CW	LINE CORD & RECEPTACLE			8	10½	—

■ Jumper provided in the standard common position and should be moved or removed as required.

++ Line to line voltage

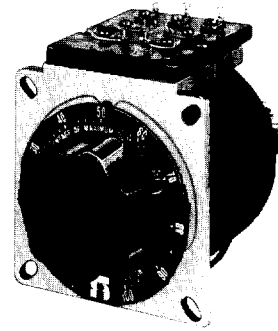
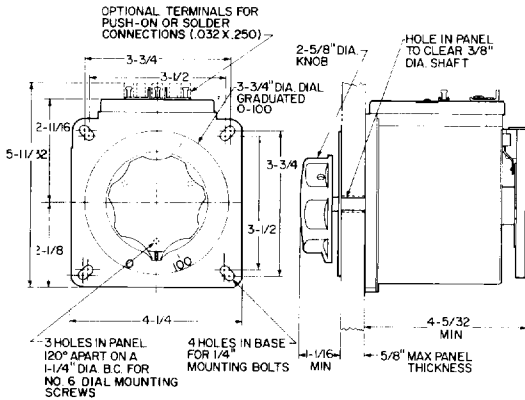
† Unit is fused for the constant current rating at the factory.

† Motor driven units use terminal connections for C.C.W. increasing voltage, as viewed from the base end. See Fig. 23 for motor wiring.

π If ganged units are used in a system that ordinarily has a common neutral or ground between source and load, the neutral or ground must be connected to the common terminals of the variable transformer assembly. If the system has no neutral, the load must be balanced or the transformers will be damaged.

SQ SERIES OUTLINE

SQ1010, SQ1020, SQ1210 and SQ1220



SQ1020

ACCESSORY KNOBS

A bar type knob, P/N 399-0141, is standard on all models of 171 to 291 Series. An optional pointer type knob is available on special order where panel appearance or product continuity may be required. Use P/N 399-0103 when ordering the pointer knob.

A low profile knob, P/N 399-0001, is standard on all models of the 371, 501, 1010, 1020, 1210 and 1220 Series. Where panel appearance or product continuity is important, a deluxe knob complete with an aluminum inlay, is available as an optional item. Use P/N 399-0162 when ordering the deluxe knob.

