

5010, 5020 SERIES

VARIABLE TRANSFORMERS

ELECTRICAL DESIGN FEATURES:

The 5010/5020 Series Variable Transformers are designed to control large KVA requirements. The 5010 Series operates from 120V input voltage lines and is rated 50 amperes on constant current loads. The 5020 Series operates from 240V input lines and is rated 28 amperes on constant current loads.

The 5010 Series units have a coil tapping arrangement which allows output voltage from 0 to 117% of line voltage, see Figure 1.

The 5020 Series single units have a coil tapping arrangement which allows output voltage from 0 to line voltage or 17% above line voltage, and can be connected to deliver increased output voltage in either clockwise or counter-clockwise rotation, see Figure 2. Ganged models of the 5020 Series have some terminals deleted since these models are wired for specific applications. Figure 3 shows the coil tapping arrangement used on the ganged models of the 5020 Series.

Figure A shows regulation curves when operating at full load current. These curves show voltage drop when full load is applied for any brush setting. When less than full load is applied, the voltage drop is proportional to the load. Driving torque, DC resistance and power loss when operating at no load is shown in Table No. 1.

MECHANICAL DESIGN FEATURES:

All manually operated units have a 7" diameter reversible dial, graduated from 0-100 and 100-0. The angle of rotation from 0 to maximum voltage is 322 degrees.

OPEN CONSTRUCTION MODELS:

The basic models of the 5010 and 5020 Series are uncased designs and the type number contains no prefix or suffix numbers. These models do not have a protective housing for coil or terminal board. Adjustable shaft design on manually operated models permits back-of-panel or bench mounting. Terminals are 1/4" screw-type.

CASED MODELS:

All 5010 and 5020 Series models are available in cased designs (identified by the suffix "C" or "CT" in the type number). "C" styles enclose only the coil while the "CT" models provide protective housing for both coil and terminal board. Knock-outs are provided in the terminal board housing to accommodate conduit or cable connections. Adjustable shaft design on manually operated models permits back-of-panel or bench mounting.

GANGED ASSEMBLIES:

STACO Variable Transformers are available in 2, 3, 4, 5, 6, 7, 8 and 9 gang assemblies, manually operated or motor driven. Also 10, 12, 14, 15, 16, 18, 21, 24 and 27 gang assemblies are available in motor-driven types only. All can be bench or floor mounted. Single units, 2 and 3 gang manually operated or motor-driven assemblies can also be wall or back-of-panel mounted.

MOTOR-DRIVEN MODELS

5010/5020 motor-driven models are available from single thru 27 ganged assemblies, cased or uncased (identified with the prefix "M" in the type number). All motor-driven units are identical in rating to corresponding manually operated types.

The synchronous stepper motor is designed for operation on 120V, 50/60Hz, single phased lines and draws approximately 0.3 amperes. Adjustable limit switches are provided at the upper and lower

extremes of rotation to prevent overtravel. To meet a wide range of applications, standard motor speeds are 5, 15, 30 and 60 seconds of travel from 0 to maximum output. Motor-driven models are available in speeds of 5, 15, 30 or 60 seconds for single, 2 or 3 ganged assemblies; 15, 30 or 60 seconds for 4, 5 and 6 ganged assemblies; 30 or 60 seconds for 7, 8, 9, 10 and 12 ganged assemblies; and 60 seconds for 14 ganged assemblies and larger. When ordering, prefix the motor-driven type number with the motor speed in seconds, for example 30M5010CT-3Y.

TABLE 1

Number of Ganged Units	D C Resistance # Per Coil (Ohms)		No Load Loss at 60 Hertz (Watts)	Approximate Driving Torque (Ounce-Inches)
	5010 Series	5020 Series		
Single	.090	.353	28.	105-160 oz. in.
2	.090	.353	56.	210-325 oz. in.
3	.090	.353	84.	315-485 oz. in.
4	.090	.353	112.	420-645 oz. in.
5	.090	.353	140.	525-805 oz. in.
6	.090	.353	168.	630-965 oz. in.
7	.090	.353	196.	735-1130 oz. in.
8	.090	.353	224.	840-1290 oz. in.
9	.090	.353	252.	945-1450 oz. in.
10	.090	.353	280.	Motor-Driven
12	.090	.353	336.	Motor-Driven
14	.090	.353	392.	Motor-Driven
15	.090	.353	420.	Motor-Driven
16	.090	.353	448.	Motor-Driven
18	.090	.353	504.	Motor-Driven
21	.090	.353	588.	Motor-Driven
24	.090	.353	672.	Motor-Driven
27	.090	.353	756.	Motor-Driven

Measured from start to end of winding

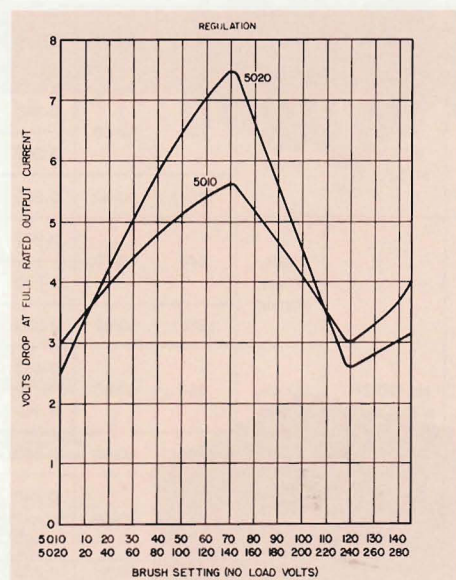


Fig. A

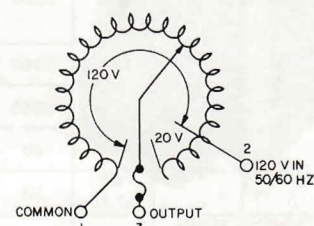


Fig. 1
5010

VIEW FROM ROTOR END

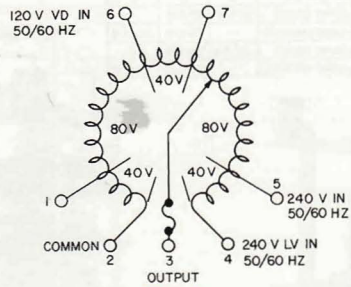


Fig. 2

5020 SINGLE UNIT

VIEW FROM ROTOR END

For opposite rotation interchange external connections from 5 to 1, 2 to 4 and 6 to 7.

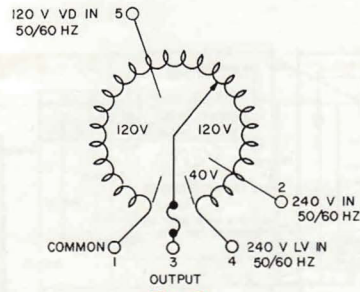


Fig. 3

5020 GANGED UNIT

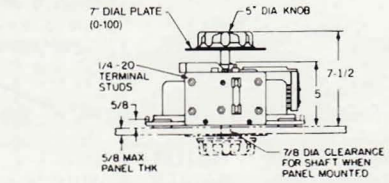
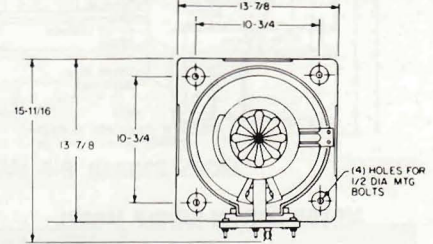
VIEW FROM ROTOR END



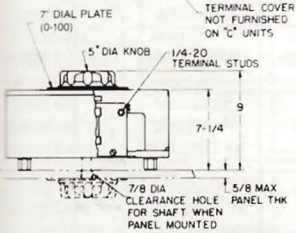
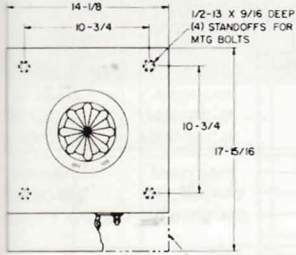
5010



5020



UNCASED SINGLE MODEL

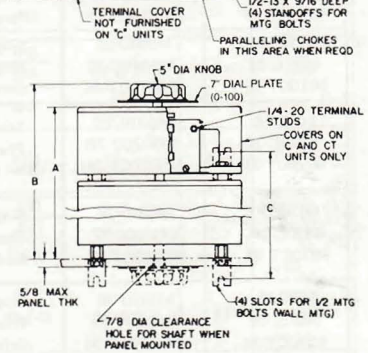
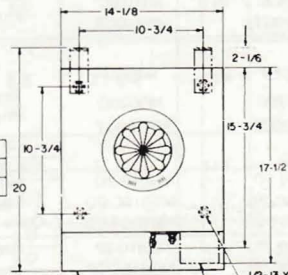


CASED SINGLE MODEL

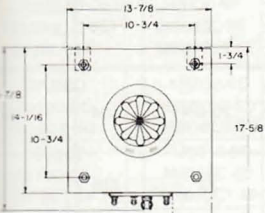


5010C

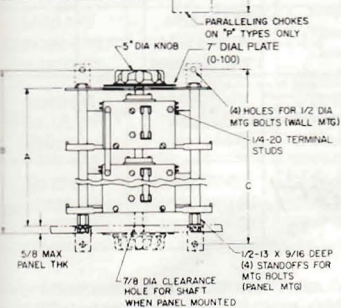
MANUAL UNIT	A	B	C
2-GANG CASED	13-1/4	15	10-7/8
3-GANG CASED	19-3/8	21-1/8	17



MANUAL 2&3 GANGED CASED MODEL



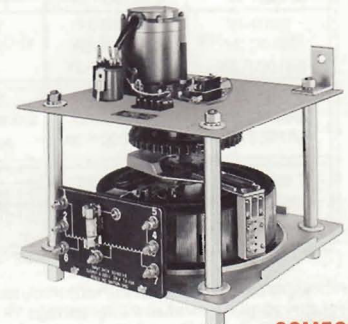
MANUAL UNIT	A	B	C
2-GANG UNCASED	13-9/16	15-1/8	17-1/16
3-GANG UNCASED	19-5/8	21-3/16	23-1/8



5020CT-2



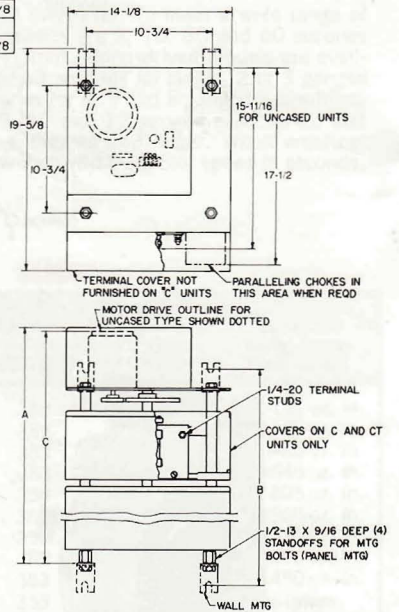
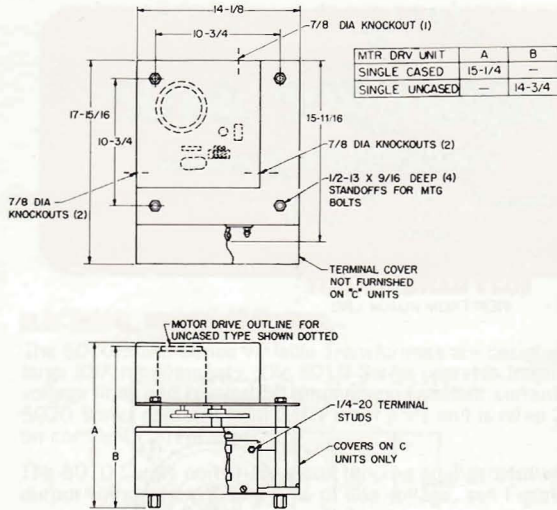
5020-3Y



60M5020

2 & 3 GANGED MODEL

MTR DRV UNIT	A	B	C
2-GANG CASED	21-1/4	19-3/8	—
2-GANG UNCASD	—	19-3/8	20-7/8
3-GANG CASED	27-3/8	25-3/8	—
3-GANG UNCASD	—	25-3/8	26-7/8



MOTOR-DRIVEN SINGLE MODEL

30M5020-3Y
5010, 5020 SERIES SPECIFICATIONS

MOTOR-DRIVEN 2&3 GANGED MODEL

TYPE		WIRING	INPUT		OUTPUT			SHAFT ROTATION For Voltage Increase	TERMINAL CONNECTIONS For Increasing Voltage As Viewed From Rotor End		SCHE-MATIC	NET WEIGHT (IN LBS) (MAX.)	
MANUALLY OPERATED	MOTOR DRIVEN		VOLTS	HERTZ	VOLTS	MAX AMPS	MAX KVA		Input	Output		Man.	Mtr.Drv.
5010 5010C 5010CT	M5010 M5010C M5010CT	Single Phase	120	50/60	0-140	50	7.0	CW	1-2	1-3	1	57	78
5020 5020C 5020CT	M5020 M5020C M5020CT	Single Phase	240	50/60	0-240	28	6.7	CW	2-4	2-3	2	57	78
					0-280	28	7.8	CCW	4-2	4-3			
			120	50/60	0-280	28* -12 V.D.	3.4*	CW	2-5	2-3			
								CCW	4-1	4-3			
5010-2D 5010C-2D 5010CT-2D	M5010-2D M5010C-2D M5010CT-2D	Three Phase Open Delta	120	50/60	0-140	50	12.1	CW	2-1-2	3-1-3	20 & 5	134	155
5010-2P 5010C-2P 5010CT-2P	M5010-2P M5010C-2P M5010CT-2P	Single Phase Parallel	120	50/60	0-140	100	14.0	CW	1-2	1-B	21	136	157
5010-2S 5010C-2S 5010CT-2S	M5010-2S M5010C-2S M5010CT-2S	Single Phase Series	240	50/60	0-280	50	14.0	CW	2-2	3-3	20 & 4	134	155
5020-2D 5020C-2D 5020CT-2D	M5020-2D M5020C-2D M5020CT-2D	Three Phase Open Delta	240	50/60	0-240	28	11.6	CW	4-1-4	3-1-3	20 & 5	134	155
			120	50/60	0-280	28	13.6	CW	2-1-2	3-1-3			
5020-2P 5020C-2P 5020CT-2P	M5020-2P M5020C-2P M5020CT-2P	Single Phase Parallel	240	50/60	0-240	56	13.4	CW	1-4	1-B	21	136	157
					0-280	56	15.7	CW	1-2	1-B			
			120	50/60	0-280	56* -24 V.D.	6.8*	CW	1-5	1-B			
5020-2S 5020C-2S 5020CT-2S	M5020-2S M5020C-2S M5020CT-2S	Single Phase Series	480	50/60	0-480	28	13.5	CW	4-4	3-3	20 & 4	134	155
			240	50/60	0-560	28	15.7	CW	2-2	3-3			
5010-3P 5010C-3P 5010CT-3P	M5010-3P M5010C-3P M5010CT-3P	Single Phase Parallel	120	50/60	0-140	150	21.0	CW	1-2	1-D	22	216	237
5010-3Y 5010C-3Y 5010CT-3Y	M5010-3Y M5010C-3Y M5010CT-3Y	Three Phase Wye	240	60	0-280	50	24.2	CW	2-2-2	3-3-3	20 & 5	212	233
5020-3P 5020C-3P 5020CT-3P	M5020-3P M5020C-3P M5020CT-3P	Single Phase Parallel	240	50/60	0-240	84	20.2	CW	1-4	1-D	22	216	237
					0-280	84	23.5	CW	1-2	1-D			
			120	50/60	0-280	84* -36 V.D.	10.2*	CW	1-5	1-D			
5020-3Y 5020C-3Y 5020CT-3Y	M5020-3Y M5020C-3Y M5020CT-3Y	Three Phase Wye	480	50/60	0-480	28	23.3	CW	4-4-4	3-3-3	20 & 6	212	233
				60	0-560	28	27.2	CW	2-2-2	3-3-3			
			240	60	0-560	28* -12 V.D.	11.8*	CW	5-5-5	3-3-3			

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

† Maximum KVA at maximum output and corresponding de-rated current. Maximum KVA at lower output voltages may be calculated from rating curve, Figure A, page 16.
V.D. Voltage Doubler.