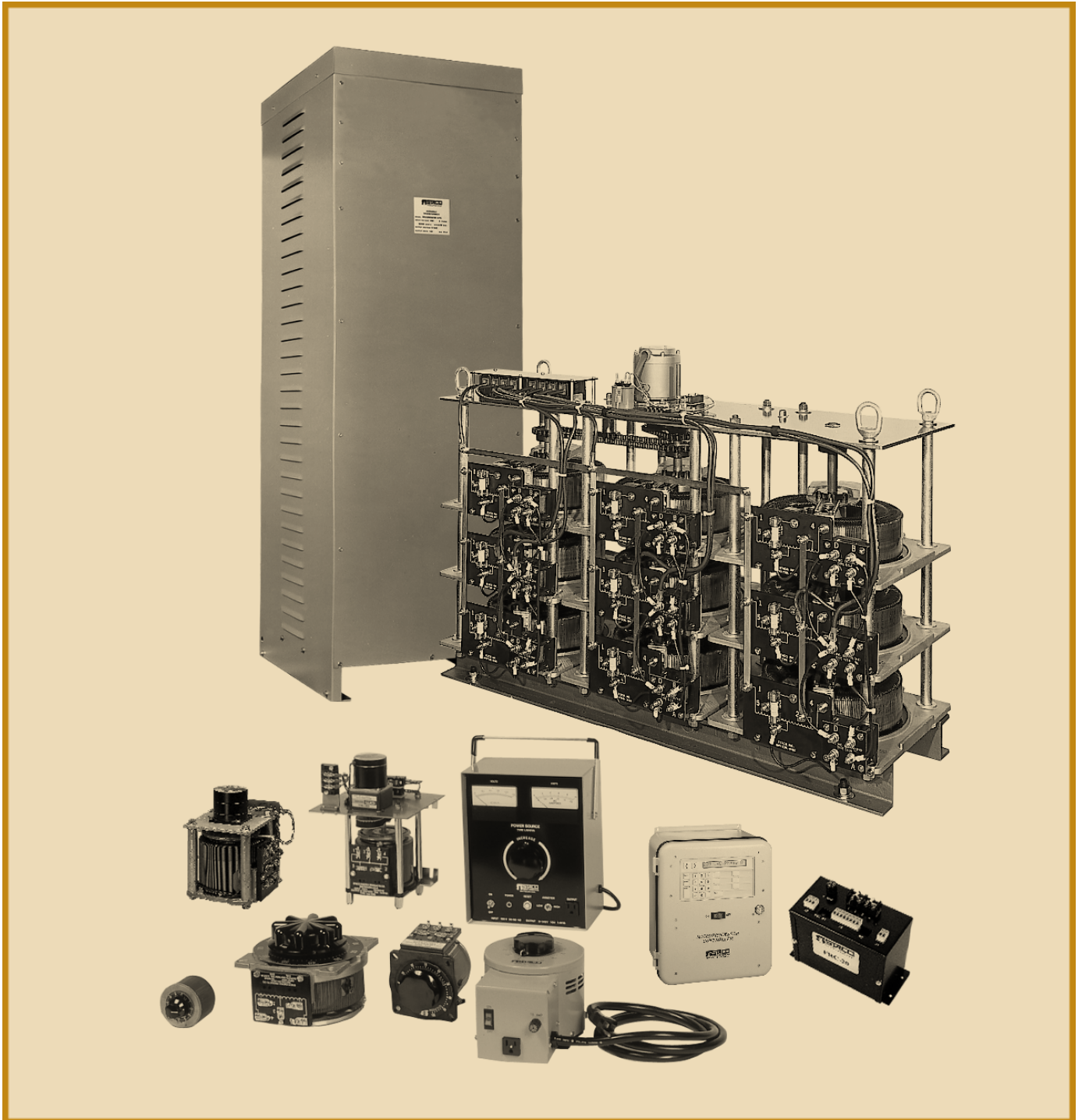


# Product Guide • AC Voltage Control Devices

## Popular Variable Transformers & AC Power Supplies



Staco Energy Products Co. has been a leading manufacturer of variable transformers for over 60 years, building standard as well as custom-designed products for industrial, commercial and military applications. Variable transformers have many industrial and laboratory applications as basic components to control voltage, current, power, heat, speed, light and electromechanical force.

A basic Staco variable transformer consists of a single layer, magnet wire, winding on a toroidal core of laminated silicon steel. A carbon brush, connected to an output lead, is rotated over a precision ground, plated commutator track to tap off voltage at any turn from zero to the maximum output voltage of the winding.

Staco research has developed design features and proprietary processes providing longer lasting, more reliable products. Particularly important is the high-temperature foundation material bonding the coil securely to the core assembly. This material, which has a high thermal transfer characteristic, dissipates heat from the brush contact area, increases the heat-distribution of the core itself and provides the transformer with greater tolerance to transients and short-term overloads.

In addition to the basic styles illustrated, Staco can meet your specific requirements with hundreds of additional standard model variations

and configurations from 0.8 to 450 amps, 120 to 560 volts, 50 Hz and up. **480 volt units shown on page 8 and in our Variable Transformer Voltage Control Catalog (VT-5).** These models include cased and uncased, single and three-phase, manual and motor-driven models and complete voltage control systems. Complete information is contained in our Variable Transformer Voltage Control Catalog (VT-5).

To serve your needs promptly, Staco has a national network of stocking distributors to assure immediate off-the-shelf delivery. Your local Staco distributors and representatives are factory trained personnel capable of assisting you in selecting the particular Staco transformer best suited for your application.

Contact our factory for the name of the distributors and representative in your area.

For non-standard products (to meet your special application) Staco's engineering staff will quickly respond with solutions to your application requirements. Most of the time, it merely requires minor revisions to standard components, enabling Staco to keep your costs at a minimum.

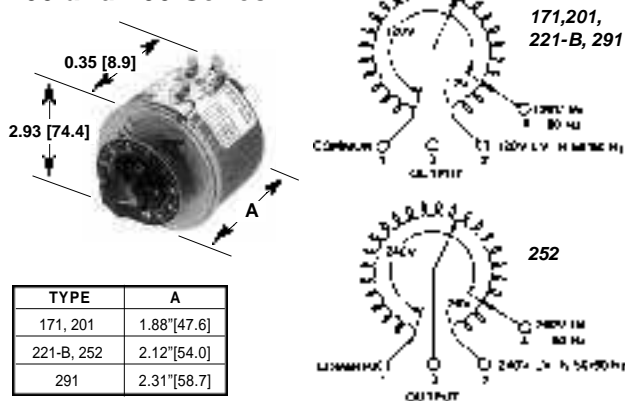


Listed by the Canadian Standards Association  
File No. LR18948

## Panel Mount, Single Phase — 120 and 240 Volt

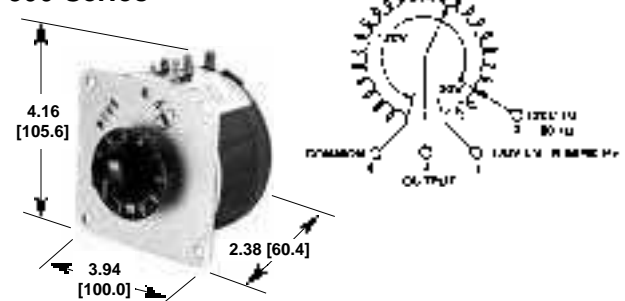
**Fixed Shaft** (click blue text for more details)

### 100 and 200 Series



PART NO.	INPUT		OUTPUT				NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		
				MAX. AMPS.	MAX. KVA	MAX. AMPS.		MAX. KVA
171	120	50/60	0-120	1.75	0.21	2.2	0.26	2
			60	0-132	1.75	0.23	—	
201	120	50/60	0-120	2.0	0.24	2.5	0.30	2
			60	0-132	2.0	0.26	—	
221-B	120	50/60	0-120	2.50	0.30	3.2	0.38	2 1/2
			60	0-132	2.50	0.30	—	
291	120	50/60	0-120	3.0	0.36	3.5	0.42	2 1/2
			60	0-132	3.0	0.40	—	
252	240	50/60	0-240	0.8	0.19	1.0	0.24	2 1/2
			60	0-264	0.8	0.21	—	

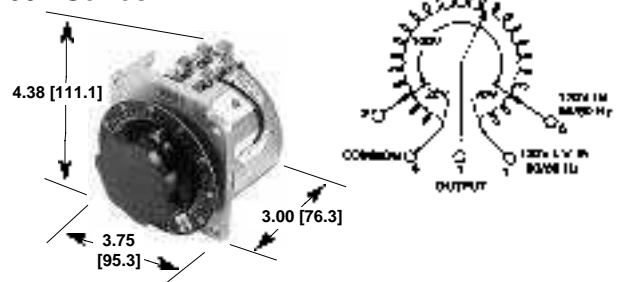
### 500 Series



PART NO.	INPUT		OUTPUT				NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		
				MAX. AMPS.	MAX. KVA	MAX. AMPS.		MAX. KVA
511	120	50/60	0-120	5.0	0.60	7.0	0.84	4 1/4
			0-140	5.0	0.70	—	—	

**Adjustable Shaft** (click blue text for more details)

### 501 Series



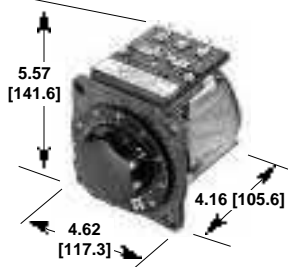
PART NO.	INPUT		OUTPUT				NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		
				MAX. AMPS.	MAX. KVA	MAX. AMPS.		MAX. KVA
501C	120	50/60	0-120	5.0	0.60	7.0	0.84	5 1/4
			0-140	5.0	0.70	—	—	

#### Dimensions

Dimensions are provided throughout this catalog in inches [millimeters].

# Adjustable Shaft (click blue text for more details)

## 1000 and 1200 Series



1010 & 1210

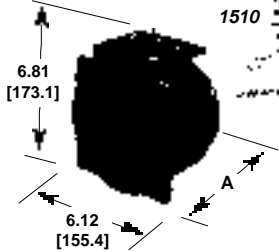
1020 & 1220



Types 1210B and 1220B include terminals 1, 3 and 4 only.

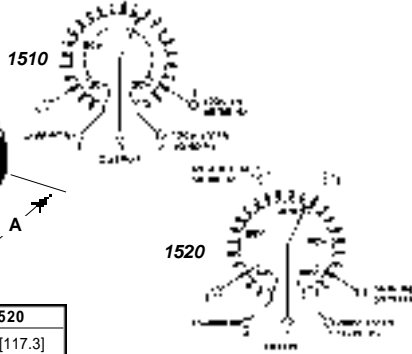
PART NO.	INPUT		OUTPUT				NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		
				MAX. AMPS.	MAX. KVA	MAX. AMPS.		MAX. KVA
1010B	120	50/60	0-120	10.0	1.20	13.0	1.56	10 1/4
1210B			0-140	10.0	1.40	—	—	
1020B	240	50/60	0-240	3.5	0.84	5.0	1.20	10 1/4
	120		0-280	3.5	0.98	—	—	
1220B	240	60	0-240	3.5*	0.42*	—	—	10 1/4

## 1500 Series



1510

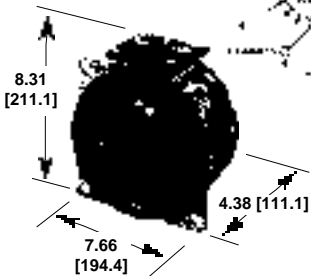
1520



	1510	1520
A	4.25" [108.0]	4.62" [117.3]

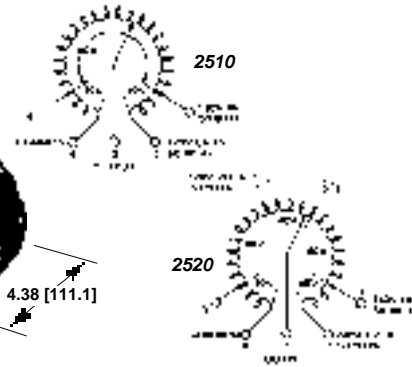
PART NO.	INPUT		OUTPUT				NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		
				MAX. AMPS.	MAX. KVA	MAX. AMPS.		MAX. KVA
1510	120	50/60	0-120	15.0	1.80	20.0	2.40	15 3/4
			0-140	15.0	2.10	—	—	
1520	240	50/60	0-240	9.5	2.28	12.0	2.88	19 1/4
	120		0-280	9.5*	1.14*	—	—	

## 2500 Series



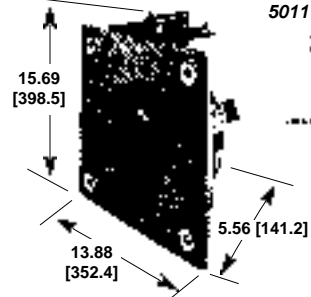
2510

2520



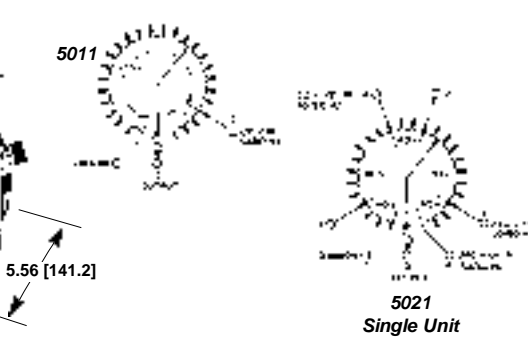
PART NO.	INPUT		OUTPUT				NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD		
				MAX. AMPS.	MAX. KVA	MAX. AMPS.		MAX. KVA
2510	120	50/60	0-120	25.0	3.00	30.0	3.60	21
			0-140	25.0	3.50	—	—	
2520	240	50/60	0-240	10.0	2.40	13.0	3.12	21
	120		0-280	10.0*	1.20*	—	—	

## 5000 Series



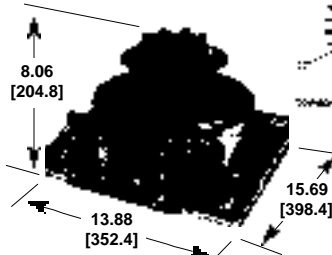
5011

5021  
Single Unit



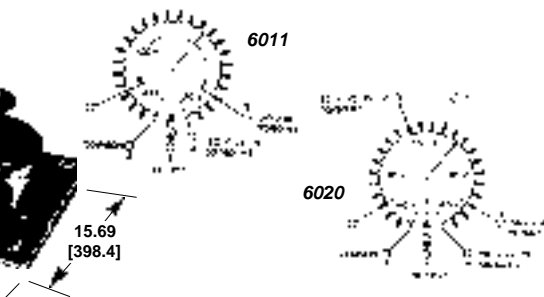
PART NO.	INPUT		OUTPUT		NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		
				MAX. AMPS.		MAX. KVA
5011	120	50/60	0-140	50.0	7.00	57
5021	240	50/60	0-240	28.0	6.70	57
	120		0-280	28.0*	3.40*	

## 6000 Series



6011

6020



PART NO.	INPUT		OUTPUT		NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		
				MAX. AMPS.		MAX. KVA
6011	120	50/60	0-120	60.0	7.20	67
			0-140	60.0	8.40	
6020	240	50/60	0-240	35.0	8.40	63
	120		0-280	35.0*	4.20*	

\* Voltage Doubler operation, refer to Variable Transformer Voltage Control Catalog (VT-5).

## Enclosed Cord and Plug Series

### 3PN Series

The cased plug-in models feature a ventilated steel case, input line cord and plug, fused NEMA rated output receptacle, and an illuminated on/off switch. They are connected for output voltage increase with a clockwise rotation, and the dials are graduated from 0-100 percent of the voltage setting.

For application flexibility, two field modification kits have been added. The 3PN-MK kit allows either the 3PN221B or 3PN501B to be wall,

bench top, or machine mounted. The 3PN-SK kit provides an adjustable voltage stop for either the 3PN1000, 3PN1200, or 3PN1500 series.

Cased plug-in models are also available with a pivot and jewel AC voltmeter or ammeter (with  $\pm 5$  percent full scale accuracy) conveniently located atop the enclosure for easy readout.

### 200 and 500 Series



PART NO.	INPUT		OUTPUT				HEIGHT	WIDTH	DEPTH	NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD					
				MAX. AMPS.	MAX. KVA	MAX. AMPS.					MAX. KVA
3PN221B	120	60	0-132	2.50	0.33	—	—	5.31	6.06	4.10	3
3PN501B		50/60	0-140	5.0*	0.70	—	—	[134.9]	[154.0]	[104.2]	7 3/4

### 1000 and 1200 Series



PART NO.	INPUT		OUTPUT				HEIGHT	WIDTH	DEPTH	NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD					
				MAX. AMPS.	MAX. KVA	MAX. AMPS.					MAX. KVA
3PN1010B	120	50/60	0-140	10.0	1.40	—	—	5.50 [139.7]	4.62 [117.4]	6.96 [176.8]	10 1/4
3PN1210B	120	60	0-120	12.0	1.44	15.0	1.80	5.50 [139.7]	4.62 [117.4]	6.96 [176.8]	10 1/4
3PN1020B	240	50/60	0-280	3.5	0.98	—	—	5.50 [139.7]	4.62 [117.4]	6.96 [176.8]	10 1/4
3PN1220B	240	60	0-240	5.0	1.20	7.0	1.68	5.50 [139.7]	4.62 [117.4]	6.96 [176.8]	10 1/4

### 1500 Series



PART NO.	INPUT		OUTPUT				HEIGHT	WIDTH	DEPTH	NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD					
				MAX. AMPS.	MAX. KVA	MAX. AMPS.					MAX. KVA
3PN1510B	120	50/60	0-140	15.0	2.10	—	—	6.00 [152.4]	6.24 [158.4]	9.35 [237.4]	18
3PN1520B	240	50/60	0-280	9.5	2.66	—	—	6.00 [152.4]	6.24 [158.4]	9.35 [237.4]	22

### 2200 and 2500 Series



PART NO.	INPUT		OUTPUT				HEIGHT	WIDTH	DEPTH	NET WT. LBS.	
	VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		CONSTANT IMPEDANCE LOAD					
				MAX. AMPS.	MAX. KVA	MAX. AMPS.					MAX. KVA
3PN2210B	120	50/60	0-140	22.0	3.08	—	—	6.31 [160.3]	7.95 [202.1]	10.85 [275.6]	24 1/4
3PN2520B	240	50/60	0-280	10.0	2.80	—	—				

## Metered Models

Cased plug-in models of the 1010B, 1020B, 1510 and 1520 series are also available with a pivot and jewel AC voltmeter or ammeter ( $\pm 5$  percent full scale accuracy) conveniently located atop the enclosure for easy, accurate readout. Ideal for applications where voltage control is

necessary. 120 volt types have 0-150V voltmeters and 240 volt types have 0-300V voltmeters. Units with voltmeters have suffix "V" and with ammeters suffix "A."

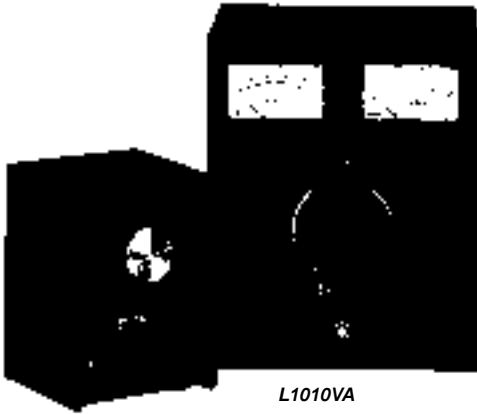


PART NO.	INPUT		OUTPUT		DIMENSIONS			NET WT. LBS.
	VOLTS	HERTZ	VOLTS	CURRENT	HEIGHT	WIDTH	DEPTH	
3PN1010BV	120	50/60	0-140	10.0	5.50 [139.7]	4.62 [117.4]	6.96 [176.8]	10 1/4
3PN1010BA	120	50/60	0-140	10.0				
3PN1510BV	120	50/60	0-140	15.0	6.00 [152.4]	6.24 [158.4]	9.35 [237.4]	18
3PN1510BA	120	50/60	0-140	15.0	6.00 [152.4]	6.24 [158.4]	9.35 [237.4]	22
3PN1020BV	240	50/60	0-280	3.5	5.50 [139.7]	4.62 [117.4]	6.96 [176.8]	10 1/4
3PN1020BA	240	50/60	0-280	3.5				
3PN1520BV	240	50/60	0-280	9.5	6.00 [152.4]	6.24 [158.4]	9.35 [237.4]	22
3PN1520BA	240	50/60	0-280	9.5	6.00 [152.4]	6.24 [158.4]	9.35 [237.4]	22

## Fully Enclosed Models

This new enclosure design surrounds and protects the control from physical abuse, chemical spills or other hazards. All holes have been eliminated to prevent entry of small items (screws, metal shavings, etc.) that may cause damage to conventional cased models.

The small portable size makes this series ideal for virtually every laboratory application. In addition to portable use, the housing provides for custom mounting from either side, top, bottom or rear for wall mounting or incorporation into new or existing equipment.



L1010VA

L221, L501, L1010

PART NO.	INPUT		OUTPUT		DIMENSIONS			NET WT. LBS.
	VOLTS	HERTZ	VOLTS	CURRENT	HEIGHT	WIDTH	DEPTH	
L221	120	60	0-132	1.75	6.31 [160.4]	5.00 [127.0]	4.25 [108.0]	3 1/2
L501	120	50/60	0-140	4.5	7.75 [197.0]	5.38 [136.7]	5.62 [142.9]	7 1/4
L1010	120	50/60	0-140	10.0	9.41 [239.0]	6.50 [165.1]	6.25 [158.8]	12 1/4

### With Voltmeter/Ammeter

PART NO.	INPUT		VOLTS	OUTPUT		DIMENSIONS			NET WT. (LBS.)
	VOLTS	HERTZ		CONSTANT CURRENT LOAD		HEIGHT	WIDTH	DEPTH	
				MAX.AMPS	MAX. kVA				
L1010VA	120	50/60	0-140	10.0	1.4	12.38 [314.5]	10.75 [273.1]	6.25 [158.8]	17 3/4

## Plug and Receptacle Styles

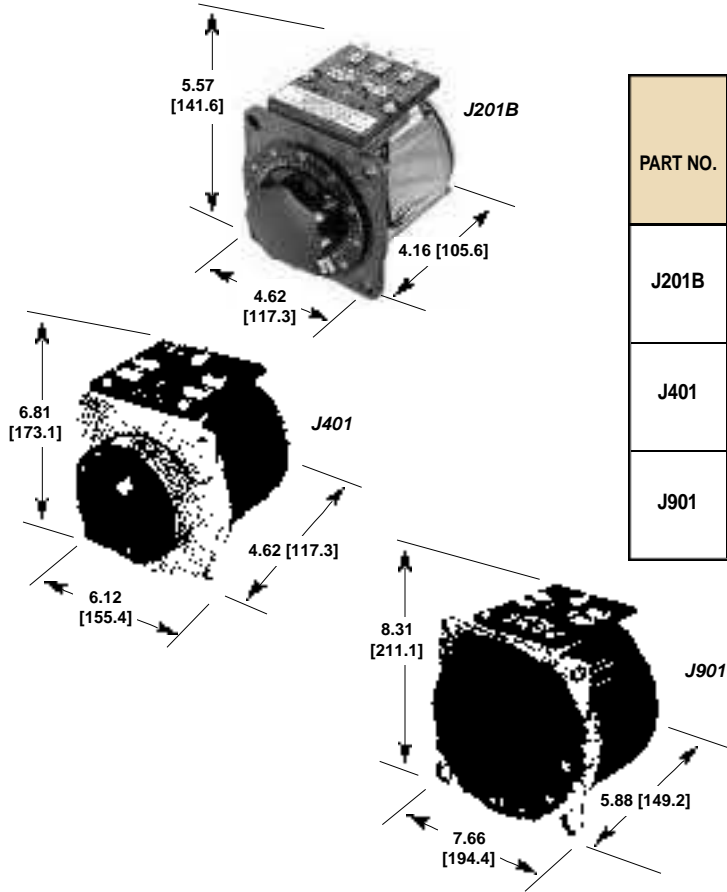




## Isolated Series

The isolated variable transformer has a separate primary winding which is electrically isolated from the secondary or output winding. Either side of the output can be grounded independently of the supply line, making them safe for all industrial, classroom, and laboratory applications where an isolated output without a common ground connection is required.

The isolated units are designed for 120V, 50/60Hz input, and the output voltages will vary from 0 - 122% of the input for a 0-140 volt output. Three sizes are available — J201B rated at 2 amps, J401 rated at 4 amps, and J901 rated at 9 amps. These units are each available in the uncased design for bench or back-of-panel mounting, and the shaft is adjustable to accommodate various panel thicknesses. Dial plates supplied are 0-100%. The J201B and J401 are also provided in the 3PN plug and cord series with and without voltmeter or ammeter.



PART NO.	WIRING	INPUT		OUTPUT			NET WT. (LBS.)
		VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		
					MAX. AMPS	MAX. KVA	
J201B	Isolated	120	50/60	0-140	2.0	0.28	8 1/2
	Non-Isolated			0-120	5.0	0.60	
	Voltage Doubler			120-260	4.5	0.52	
	Series			240	110-240	4.5	
J401	Isolated	120	50/60	0-140	4.0	0.56	14 3/4
	Non-Isolated			0-120	10.0	1.20	
	Voltage Doubler			120-260	9.0	1.04	
	Series			240	110-240	9.0	
J901	Isolated	120	50/60	0-140	9.0	1.26	26 1/4
	Non-Isolated			0-120	25.0	3.00	
	Voltage Doubler			120-260	20.0	2.34	
	Series			240	110-240	20.0	



## Isolated Portable Cord and Plug Models



PART NO.	INPUT		OUTPUT		DIMENSIONS			NET WT. LBS.
	VOLTS	HERTZ	VOLTS	CURRENT	HEIGHT	WIDTH	DEPTH	
3PNJ201B	120	50/60	0-140	2.0	5.50 [139.7]	4.62 [117.4]	6.96 [176.8]	9
3PNJ401B	120	50/60	0-140	4.0	6.00 [152.4]	6.24 [158.4]	9.35 [237.4]	17

# “Quick-Step” Motorized Variable Transformers

3 to 25 Amperes, 1Ø, 120 VAC, 50/60 Hz

## The “Staco-Plus” ...

- Stepper Motor Driven
- Microprocessor Controlled
- Self-contained, Factory Wired and Assembled
- Local or Remote Adjustable Output Voltage Range
- Regulated Output Voltage,  $\pm 0.50$  percent of Full Voltage Range
- Low Installed Cost

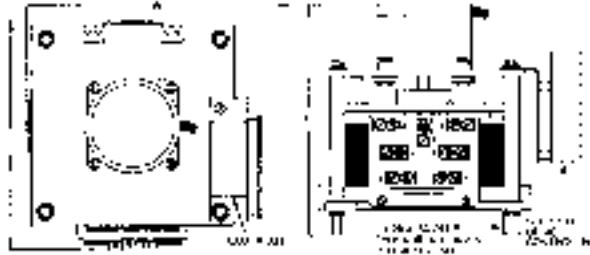
The “Quick-Step” is self-contained and consists of a stepper motor driven, microprocessor controlled, full range variable transformer with a 0 to 100 percent adjustable output voltage range. The “Quick-Step” is shipped fully assembled, factory wired and tested ready to be installed ... two wires in, two wires out. The “Quick-Step” is named for

its fast full range output voltage correction rate which is less than one second. The microprocessor controlled stepper motor provides a quick output voltage adjustment without over shoot. The output voltage can be controlled remotely with a 1K potentiometer or a 0 to 5 volt DC process control set point signal. A single output voltage can be maintained and controlled locally with a fixed resistor network wired across the controller set point terminals.

The “Quick-Step” Variable Transformer is available in ratings of 3 to 25 amperes with output voltage ranges of either 0 to 120 volts or 0 to 140 volts. Full range output regulation is better than  $\pm 0.50$  percent. Limited output voltage range “Quick-Step” units are available with an output regulation of better than  $\pm 0.25$  percent. Being self-contained, providing a low installed cost makes the “Quick-Step” a real ... “Staco-Plus.”



TYPE	STYLE	INPUT VOLTAGE	OUTPUT			DIMENSIONS (IN)			WEIGHT (LBS)
			VOLTAGE	AMPS	kVA	H	W	D	
SD291	Open Frame	120V 50/60 Hz	0-120/132	3.0	0.40	4.94 [125.5]	5.00 [127.0]	3.75 [95.3]	13
SD511				5.0	0.70	5.00 [127.0]	5.84 [148.3]	4.16 [105.7]	15
SD1010			0-120/140	10.0	1.40	8.06 [204.7]	6.62 [168.1]	5.34 [135.6]	20
SD1510				15.0	2.10	8.41 [213.6]	7.88 [200.2]	6.80 [172.7]	22
SD2510				25.0	3.50	8.40 [213.4]	9.39 [238.5]	8.29 [210.6]	26



**Note:** Limited output range and 240 volt input models are available in designs to meet special application needs. Contact factory for specifications and application information.

## Other Configurations of Standard Models and Accessories



Cased Model



Motor-driven Model



Microprocessor Controller



FRC-20 Controller

### Cased Models (C and CT Types)

Transformers of the 1010B through 6011 series are available in either “C” style (featuring protective screening over the coil assembly only) or the “CT” style (which also includes a terminal box cover with knockouts to accept conduit). Examples: 1510C, 2510CT.

### Motor-Driven Models

For applications requiring remote or automatic voltage control, a driving motor can be added to all models of the 501C through 6011 series. Standard motor speeds available are 5, 15, 30 and 60 seconds of travel and are designated by the prefix “5M,” “15M,” etc. Example: 30M1510.

### Microprocessor Controller

MP Series Microprocessor Based Controller provides for easy interface of computer and process controller to Staco’s motor driven Variable Transformers. Custom options are available.

### FRC-20 Controller

The Staco FRC-20 Controller is designed to position and regulate any Staco motor driven variable transformer and can be controlled with a 0-5 VDC or 4-20 Ma set point, a 1k ohm potentiometer, or a fixed resistor network. It maintains a full range regulation of 0.5 percent and a limited range regulation of 0.25 percent.

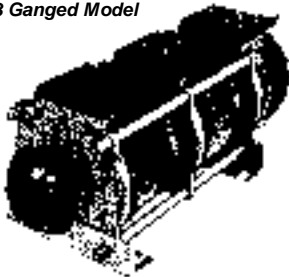
Complete details of all standard Staco products are contained in our Variable Transformer Voltage Control Catalog (VT-5).

# Ganged Variable Transformer Assemblies

## High Current Models

By ganging the variable transformers with a common rotor shaft, and wiring the outputs in parallel, the output current can be greatly increased. The models listed below are capable of output currents up to 315 amp. Other models are available in a variety of ranges. Refer to our Variable Transformer Voltage Control Catalog (VT-5) for additional information.

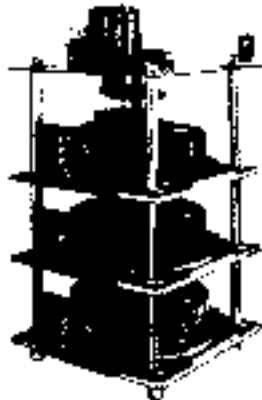
3 Ganged Model



30M6020-9Y Model



5000/6000 Series Enclosed Unit



30M5011-3Y Model



A COMPONENTS CORPORATION OF AMERICA COMPANY

301 Gaddis Blvd. • Dayton, OH 45403  
(937) 253-1191 • FAX: (937) 253-1723  
website: [www.stacoenergy.com](http://www.stacoenergy.com)

## Three Phase Models

All models of Staco variable transformers can be ganged with a common rotor shaft and wired for three phase operation in either open Delta or Wye configuration. The table below lists a few typical 240 and 480 volt models. Refer to our Variable Transformer Voltage Control Catalog (VT-5) for additional models.

### Single Phase Models

PART NO.	INPUT	OUTPUT	CURRENT (AMPS)	kVA
6011-2P	120	0-120 or 0-140	120.0	16.8
6011-3P			180.0	25.2
6011-4P			240.0	33.6
6011-5P			300.0	42.0
6011-6P			360.0	50.4
6011-7P			420.0	58.8
6011-8P			480.0	67.2
6011-9P			540.0	75.6
6020-2P			240	0-240 or 0-280
6020-3P	105.0	29.4		
6020-4P	140.0	39.2		
6020-5P	175.0	49.0		
6020-6P	210.0	58.8		
6020-7P	245.0	68.6		
6020-8P	280.0	78.4		
6020-9P	315.0	88.2		

### Three Phase Models

PART NO.	INPUT	OUTPUT	CURRENT (AMPS)	kVA
221B-3	208/120 or 240	0-208/120 or 0-240/140 with 208/120 input or 240 input	2.5	1.0
291-3			3.0	1.25
501C-3			5.0	2.1
1010B-3			10.0	4.2
1510-3			15.0	6.2
2510-3			25.0	10.4
6011-3Y			60.0	24.9
6011-6Y			120.0	49.8
6011-9Y			180.0	74.7
M6011-12Y			240.0	99.6
M6011-15Y			300.0	124.5
M6011-18Y			360.0	149.4
M6011-21Y			420.0	174.3
M6011-24Y			480.0	199.2
M6011-27Y			540.0	224.1
M6011-30Y			600.0	249.0
M6011-33Y	660.0	273.9		
M6011-36Y	720.0	298.8		
1020B-3	480/277 or 480	0-480 or 0-480/277 or 0-560	3.5	3.4
1520-3			9.5	9.2
2520-3			10.0	9.7
6020-3Y*			35.0	33.9
6020-6Y			70.0	67.8
6020-9Y			105.0	101.7
M6020-12Y			140.0	135.6
M6020-15Y			175.0	169.5
M6020-18Y			210.0	203.5
M6020-21Y			245.0	237.4
M6020-24Y			280.0	271.3
M6020-27Y			315.0	305.1
M6020-30Y			350.0	339.1
M6020-33Y			385.0	373.0
M6020-36Y			420.0	406.9

\* All 6020 Three-Phase Models are rated for 575 volts 60 Hertz input, 0-575 volts output.