

Hammond Transformers



Get years of reliable service from a quality transformer at a practical price

HPS Imperator™ control transformers for industrial applications

HPS Imperator control transformers from Hammond are specifically designed for high inrush applications requiring reliable output voltage stability. Designed to meet industrial applications where electromagnetic devices such as relays, solenoids, etc. are used, they maximize inrush capability and output voltage regulation when electromagnetic devices are initially energized.

HPS Imperator control transformers use Mylar, Nomex and other high-quality insulating materials. Insulation is used to electrically insulate turn-to-turn windings, layer-to-layer windings, primary-to-secondary windings and ground. These transformers are vacuum impregnated with VT polyester resin and oven-cured, which seals the surface and eliminates moisture. Filling the entire unit provides a strong mechanical bond and offers protection from the environment. This design utilizes superior insulation systems and is constructed with high quality silicon steel laminations, which provide optimum performance and reliability.

The custom injection-molded cover, with its unique fin-shaped design, provides excellent cooling properties while protecting the coils and terminations from moisture, dirt and other industrial airborne contaminants.

The heavy steel mounting feet are welded to the core, providing maximum strength and low noise in a compact design.

The HPS Imperator's unique terminal block design (patent pending) allows for the quick and easy installation of standard secondary or optional primary 13/32" x 1 1/2" midget/type CC fuse clips on every unit. This is the simplest and most inexpensive fusing installation provided on any industrial control transformer in the market today.

The windings and internal terminations of the HPS Imperator are encapsulated, which protects them from moisture, dirt and other airborne contaminants. The custom molded coil covers with their unique 'fin shaped' design combine superior transformer cooling properties with a clean bold look.



The HPS Imperator utilizes custom serrated terminals, in combination with standard SEMS washer screws making assembly easier and quicker to install; and provides superior connection strength when connecting with bare, solid, or stranded wire. It also allows for ring or spade termination connectors.

HPS Fortress™ commercial potted transformers

The HPS Fortress commercial potted transformers provide an innovative design with commercial applications where quality, ease of installation, and low cost are key.

All Fortress units are encapsulated with electrical grade silica sand and resin compounds, which completely enclose the core and coil to seal out moisture, airborne contaminants and eliminates corrosion and deterioration.

Superior quality and value

- Compact, efficient design
- Easy installation and hook-up
- Inexpensive while maintaining superior quality in materials and workmanship
- Wall mounting

Applications

- Shopping centers
- Schools
- Sports complexes
- Office buildings
- Lighting

Control Transformer Selection

Control transformer selection

To select the proper transformer, you must first determine three characteristics of the load circuit. They are: total steady-state (sealed) VA, total inrush VA, and inrush load power factor.

Total steady-state “sealed” VA is the total amount of VA that the transformer must supply to the load circuit for an extended length of time. Calculate by adding the total steady-state VA of all devices in your control circuit. *(The operating VA data for the devices should be available from the manufacturers.)*

The **inrush VA** is the amount of VA that the transformer must supply for all components in the control circuit that are energized together. Consideration for the start-up sequence may be required. *(Inrush VA data should be obtained from the device manufacturers.)*

The **inrush load power factor** is difficult to determine without detailed vector analysis of all the control components. In the absence of such information, we recommend that a 40% power factor be utilized.

Six easy steps

Once the three load circuit variables have been determined, follow these steps to select the proper transformer.

1. Determine your primary (supply) and secondary (output) voltage requirements, as well as the required frequency (i.e. 60 Hz).
2. Calculate the total sealed VA of your circuit by adding the total sealed VA of all devices in the control circuit.
3. Calculate the inrush VA by adding the inrush VA of all components being energized together. Remember to add the sealed VA of all components that do not have inrush VA (lamps, timers, etc.), as they do present a load to the transformer during maximum inrush. If the inrush for your components is unknown, assume a 40% inrush power factor.

$$A \quad \text{Total Inrush VA} = \sqrt{(VA \text{ sealed})^2 + (VA \text{ inrush})^2}$$

or

$$B \quad \text{Total Inrush VA} = VA \text{ Sealed} + VA \text{ Inrush}$$

4. Calculate the total inrush VA using one of two methods:
Method B will result in slightly larger transformer selected.
5. If the nominal supply voltage does not fluctuate more than 5%, then reference the 90% secondary voltage column in the Regulation Data Table for the correct VA rating.

If the supply voltage varies up to 10%, the 95% secondary voltage column should be used to size the transformer. The 85% secondary voltage column gives minimum values for proper electromagnetic device operation and should only be used as a reference.

6. Using the regulation data table below, select the appropriate VA rated transformer:

- A. With a continuous VA rating that is equal to or greater than the value in Step 2.
- B. With a maximum inrush VA equal to or greater than the value obtained in Step 4.

Note: See over-current protection chart for transformers at the end of this section.

HPS Imperator Transformer Regulation Data Table			
Continuous VA Transformer Nameplate	Inrush VA @ 40% Power Factor		
	85% Secondary Voltage	90% Secondary Voltage	95% Secondary Voltage
50	330	259	192
75	350	258	170
100	620	467	321
150	895	699	512
250	1596	1229	880
350	2464	1889	1345
500	3939	2854	1819
750	6422	4778	3228
1000	9842	7102	4530
1500	12797	9018	5489

Note: It is recommended that a control transformer be sized at a 40% power factor. Some components in a circuit, such as electromagnetic devices, typically operate at that level due to their inherently lower power factor. Selecting a transformer at 40% power factor will more than adequately size the unit for all the various loads in the circuit.

HPS Imperator™ 480x240 / 240x120 VAC Control Transformers Specifications

Features

- 600V class, machine tool rated industrial control transformers
- 50/60 Hertz
- VA range from 50 VA up to 1500 VA
- Constructed with high quality silicon steel laminations that provide optimum performance and reliability
- Encapsulated coils, encased in a custom injection molded cover, protect coils and terminations from moisture, dirt and other industrial airborne contaminants.

- Terminated with #8/32 slot/Phillips terminal screws complete with SEMS washer (suitable for 18 AWG to 14 AWG solid or 14 AWG stranded wire)
- Insulation system:
 - 50 - 150VA, temperature rise 55°C (131°F), insulation class 105°C (221°F),
 - 250 - 1500VA, temperature rise 80°C (176°F), insulation class 130°C (266°F)
- SEMS (standard machine screw with lock washer) standard
- Standard secondary fuse kits utilizing 13/32" x 1 1/2" midget class CC fuse clips included with all transformers.

Fuses are not included. (See Edison fuse section for HCTR fuses.)

- Optional primary fuse kits available utilizing 13/32" x 1 1/2" midget class CC fuse clips
- Optional finger-safe terminal covers
- LIFETIME warranty (limited to mfg. defects)

Agency Approvals

- UL Listed (approved for U.S. and Canada) File E50394
- CE Mark standard on all units
- RoHS Compliant



HPS Imperator 480x240/240x120 Control Transformer Specifications										
Part Number	Wt/Lbs	Volt-Amp Rating*	Mtg. Fig.	Output Current Amps	Primary Voltage (50/60Hz)	Secondary Voltage	Impedance %		Total Heat Dissipation (Watts)**	
							VA	%z		
PH50QMJ	3.50	50	A	0.42/0.21	240x480 230x460 220x440	120x240 115x230 110x220	50	8.3	11	
PH75QMJ	3.54	75	A	0.63/0.31			75	8.7	14	
PH100QMJ	4.50	100	A	0.83/0.42			100	8.4	14	
PH150QMJ	5.70	150	B	1.25/0.63			150	8.0	18	
PH250QMJ	7.50	250	B	2.08/1.04			250	7.8	29	
PH350QMJ	10.1	350	B	2.92/1.46			350	7.0	33	
PH500QMJ	14.2	500	B	4.17/2.08			500	5.0	40	
PH750QMJ	16.6	750	B	6.25/3.13			750	4.9	54	
PH1000QMJ	23.6	1000	B	8.33/4.17			1000	3.9	69	
PH1500QMJ	34.0	1500	B	12.5/6.25			1500	3.9	101	

Note: *VA capacity rated at the output of the transformer.
 ** Heat dissipation calculated based on full rated load on transformer.

Dimensions

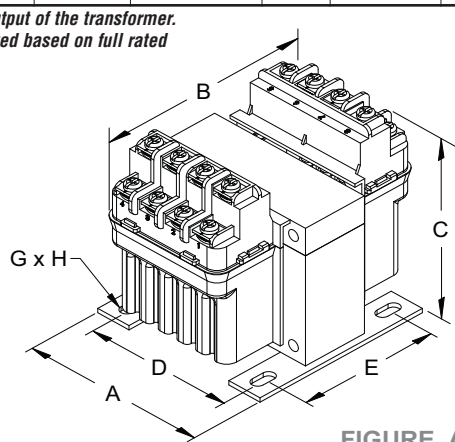


FIGURE A
(100VA and less)

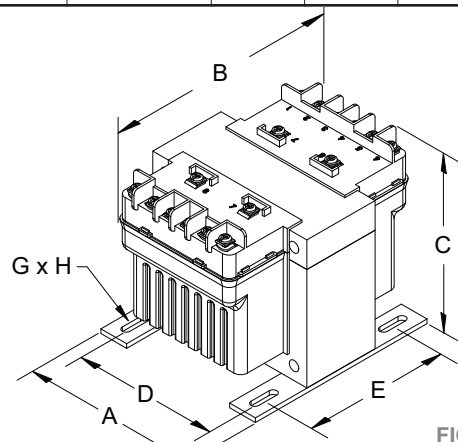


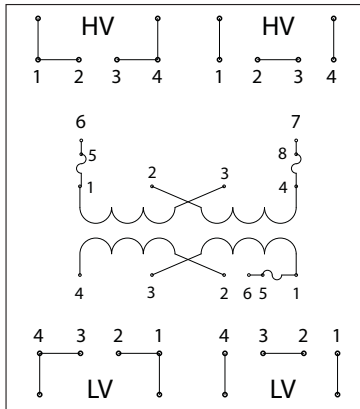
FIGURE B
(150VA to 1500VA)

HPS Imperator 480x240/240x120 Control Transformer Dimensions									
Part Number	Mtg. Fig.	Overall Dimensions inches (mm)			Mounting Centers inches (mm)		Mounting Slot inches (mm)	Height with Finger Guard inches (mm)	Depth with Finger Guard inches (mm)
		A	B	C	D	E			
PH50QMJ	A	3.00 (76.2)	4.38 (111.3)	3.19 (81.0)	2.50 (63.5)	2.25 (57.2)	0.22 x 0.44 (5.6 x 11.2)	4.00 (101.6)	5.82 (147.8)
PH75QMJ	A	3.25 (82.6)	3.88 (98.5)	3.56 (90.4)	2.63 (66.8)	2.50 (63.5)	0.22 x 0.44 (5.6 x 11.2)	4.37 (111.0)	5.32 (135.1)
PH100QMJ	A	3.25 (82.6)	4.19 (106.4)	3.63 (92.2)	2.63 (66.8)	2.63 (66.8)	0.22 x 0.44 (5.6 x 11.2)	4.44 (112.8)	5.63 (143.0)
PH150QMJ	B	4.00 (101.6)	4.94 (125.5)	3.81 (96.8)	3.38 (85.9)	2.75 (69.9)	0.22 x 0.75 (5.6 x 19.1)	4.31 (109.5)	6.44 (163.6)
PH250QMJ	B	4.50 (114.3)	5.44 (138.2)	3.81 (96.8)	3.75 (95.3)	3.13 (79.5)	0.22 x 0.75 (5.6 x 19.1)	4.31 (109.5)	6.94 (176.3)
PH350QMJ	B	4.50 (114.3)	5.19 (131.8)	4.44 (112.8)	3.75 (95.3)	3.75 (95.3)	0.22 x 0.75 (5.6 x 19.1)	4.94 (125.5)	6.69 (169.9)
PH500QMJ	B	4.75 (120.7)	5.94 (150.9)	4.31 (109.5)	4.06 (103.1)	3.81 (96.8)	0.31 x 0.94 (7.9 x 23.9)	4.81 (122.2)	7.44 (189.0)
PH750QMJ	B	5.13 (130.3)	6.69 (169.9)	4.31 (109.5)	4.38 (111.3)	4.31 (109.5)	0.31 x 0.81 (7.9 x 20.6)	4.81 (122.2)	8.19 (208.1)
PH1000QMJ	B	5.25 (133.4)	6.81 (173.0)	4.94 (125.5)	4.50 (114.3)	4.44 (112.8)	0.31 x 0.81 (7.9 x 20.6)	5.44 (138.2)	8.31 (211.1)
PH1500QMJ	B	5.25 (133.4)	8.19 (208.0)	4.94 (125.5)	4.50 (114.3)	6.06 (153.9)	0.38 x 1.00 (9.7 x 25.4)	5.44 (138.2)	9.69 (246.1)

Note: All dimensions are ±0.06 inches unless otherwise noted.

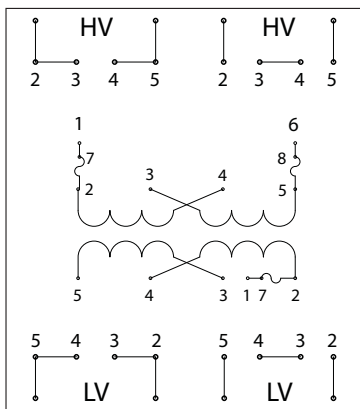
HPS Imperator™ 480x240 / 240x120 VAC Control Transformers Wiring Specifications

Wiring



PH***MQMJ Schematic for 50, 75 and 100VA Units

High Voltage (HV) (Primary Volts)	Install Jumpers/Links Between Lines	Supply Lines Connect To	Install Fuse Clips To
240 230 220	1-2, 3-4	1, 4	
480 460 440	2-3	1, 4	
240 230 220	1-2, 3-4	6, 7	1-5, 4-8
480 460 440	2-3	6, 7	1-5, 4-8
Low Voltage (LV) (Secondary Volts)	Install Jumpers/Links Between Lines	Load Lines Connect To	Install Fuse Clips To
120 115 110	3-4, 1-2	1, 4	
240 230 220	2-3	1, 4	
120 115 110	3-4, 1-2	4, 6	1-5
240 230 220	2-3	4, 6	1-5



PH***MQMJ Schematic for 150VA to 1500VA Units

High Voltage (HV) (Primary Volts)	Install Jumpers/Links Between Lines	Supply Lines Connect To	Install Fuse Clips To
240 230 220	2-3, 4-5	2, 5	
480 460 440	3-4	2, 5	
240 230 220	2-3, 4-5	1, 6	2-7, 5-8
480 460 440	3-4	1, 6	2-7, 5-8
Low Voltage (LV) (Secondary Volts)	Install Jumpers/Links Between Lines	Load Lines Connect To	Install Fuse Clips To
120 115 110	4-5, 2-3	2, 5	
240 230 220	3-4	2, 5	
120 115 110	4-5, 2-3	1, 5	2-7
240 230 220	3-4	1, 5	2-7

Notes

- FUSES NOT INCLUDED (see Edison fuse section for HCTR fuses).
- Secondary fuse clips supplied but not installed. Order fuses and primary fuse clips separately.
- Jumper links to make primary/secondary series/parallel connections supplied, but not installed.

HPS Imperator™ 380x277x208 / 240x120 VAC Control Transformers Specifications

Features

- 600V class, machine tool rated industrial control transformers
- 50/60 Hertz
- VA range from 50 VA up to 500 VA
- Constructed with high quality silicon steel laminations that provide optimum performance and reliability
- Encapsulated coils, encased in a custom injection molded cover, protect coils and terminations from moisture, dirt and other industrial airborne contaminants.

- Terminated with #8/32 slot/Phillips terminal screws complete with SEMS washer (suitable for 18 AWG to 14 AWG solid or 14 AWG stranded wire)
- Insulation system:
 - 50 - 150VA, temperature rise 55°C (131°F), insulation class 105°C (221°F),
 - 250 - 500VA, temperature rise 80°C (176°F), insulation class 130°C (266°F)
- SEMS (standard machine screw with lock washer) standard
- Standard secondary fuse kits utilizing 13/32" x 1 1/2" midget class CC fuse clips included with all transformers.

Fuses are not included. (See Edison fuse section for HCTR fuses.)

- Optional primary fuse kits available utilizing 13/32" x 1 1/2" midget class CC fuse clips
- Optional finger-safe terminal covers
- LIFETIME warranty (limited to mfg. defects)

Agency Approvals

- UL Listed (approved for U.S. and Canada) File E50394
- CE Mark standard on all units
- RoHS Compliant



HPS Imperator 380x277x208/240x120 Control Transformer Specifications										
Part Number	Wt/Lbs	Volt-Amp Rating*	Mtg. Fig.	Output Current Amps	Primary Voltage (50/60Hz)	Secondary Voltage	Impedance %		Total Heat Dissipation (Watts)**	
							VA	%z		
PH50MGJ	3.5	50	A	0.42/0.21	208x277x380	120x240	50	8.3	11	
PH75MGJ	4.5	75	A	0.63/0.31			75	8.7	14	
PH100MGJ	5.2	100	A	0.83/0.42			100	8.4	14	
PH150MGJ	7.6	150	B	1.25/0.63			150	8.0	18	
PH250MGJ	8.3	250	B	2.08/1.04			250	7.8	29	
PH350MGJ	11.0	350	B	2.92/1.46			350	7.0	33	
PH500MGJ	16.3	500	B	4.17/2.08			500	5.0	40	

Note: *VA capacity rated at the output of the transformer.
 ** Heat dissipation calculated based on full rated load on transformer.

Dimensions

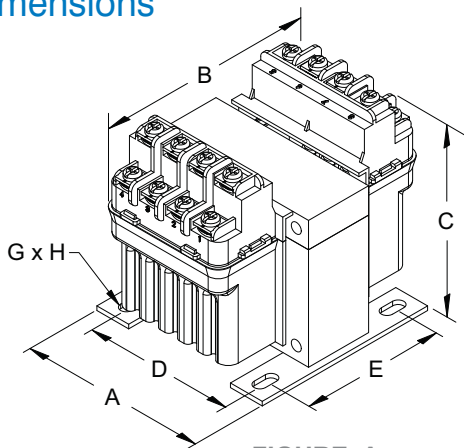


FIGURE A (100VA and less)

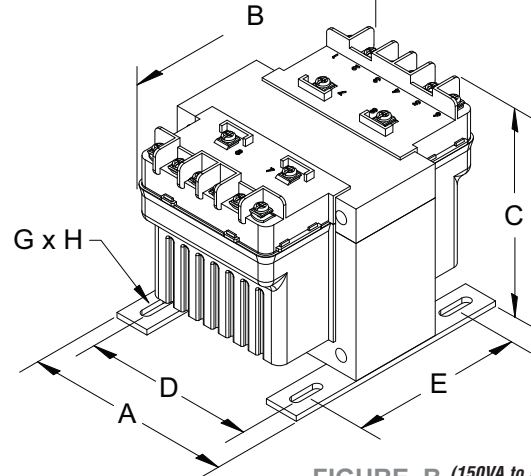


FIGURE B (150VA to 500VA)

HPS Imperator 380x277x208/240x120 Control Transformer Dimensions									
Part Number	Mtg. Fig.	Overall Dimensions inches (mm)			Mounting Centers inches (mm)		Mounting Slot inches (mm)	Height with Finger Guard, inches (mm)	Depth with Finger Guard inches (mm)
		A	B	C	D	E	G X H		
PH50MGJ	A	3.25 (82.6)	3.88 (98.6)	3.56 (90.4)	2.63 (66.8)	2.50 (63.5)	0.22 x 0.44 (5.6 x 11.2)	4.37 (111.0)	5.32 (135.1)
PH75MGJ	A	3.25 (82.6)	4.19 (106.4)	3.63 (92.2)	2.63 (66.8)	2.63 (66.8)	0.22 x 0.44 (5.6 x 11.2)	4.44 (112.8)	5.63 (143.0)
PH100MGJ	A	3.25 (82.6)	4.69 (119.1)	3.63 (92.2)	2.63 (66.8)	2.63 (66.8)	0.22 x 0.44 (5.6 x 11.2)	4.44 (112.8)	6.13 (155.7)
PH150MGJ	B	4.00 (101.6)	5.44 (138.2)	3.81 (96.8)	3.38 (85.9)	2.75 (69.9)	0.22 x 0.75 (5.6 x 19.1)	4.50 (114.3)	6.94 (176.3)
PH250MGJ	B	4.50 (114.3)	4.88 (124.0)	4.44 (112.8)	3.75 (95.3)	3.75 (95.3)	0.22 x 0.75 (5.6 x 19.1)	4.94 (125.5)	6.38 (162.1)
PH350MGJ	B	4.50 (114.3)	5.56 (141.2)	4.44 (112.8)	3.75 (95.3)	3.75 (95.3)	0.22 x 0.75 (5.6 x 19.1)	4.94 (125.5)	7.06 (179.3)
PH500MGJ	B	4.75 (120.7)	6.69 (169.9)	4.31 (109.5)	4.06 (103.1)	4.50 (114.3)	0.31 x 0.94 (7.9 x 23.9)	4.81 (122.2)	8.19 (208.0)

Note: All dimensions are ±0.06 inches unless otherwise noted.

Company Info.

PLCs

Field I/O

Software

C-more & other HMI

AC Drives

AC Motors

Power Transmiss.

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

Temp. Sensors

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

Pneumatics

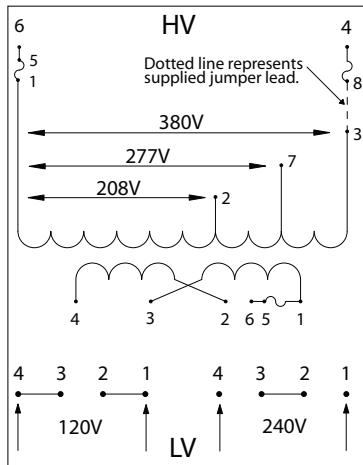
Appendix

Part Index

HPS Imperator™ 380x277x208 / 240x120 VAC Control Transformers Wiring Specifications

Wiring

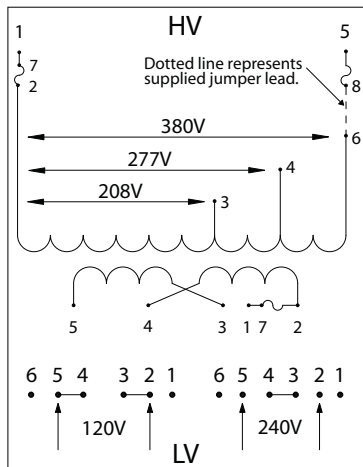
PH***MGJ Schematic for 50, 75 and 100VA Units



High Voltage (HV) (Primary Volts)	Install Supplied Jumpers Between Terminals	Supply Lines Connect To	Install Fuse Clips To
380	None	1, 3	Unfused
277	None	1, 7	Unfused
208	None	1, 2	Unfused
380	3-8	6, 4	1-5, 4-8
277	8-7	6, 4	1-5, 4-8
208	2-8	6, 4	1-5, 4-8

Low Voltage (LV) (Secondary Volts)	Install Supplied Links Between Terminals	Load Lines Connect To	Install Fuse Clips To
120	3-4, 1-2	1, 4	Unfused
240	2-3	1, 4	Unfused
120	3-4, 1-2	4, 6	1-5
240	2-3	4, 6	1-5

PH***MGJ Schematic for 150VA to 1000VA Units



High Voltage (HV) (Primary Volts)	Install Supplied Jumpers Between Terminals	Supply Lines Connect To	Install Fuse Clips To
380	None	2, 6	Unfused
277	None	2, 4	Unfused
208	None	2, 3	Unfused
380	8-6	1, 5	2-7, 5-8
277	4-8	1, 5	2-7, 5-8
208	3-8	1, 5	2-7, 5-8

Low Voltage (LV) (Secondary Volts)	Install Supplied Links Between Terminals	Load Lines Connect To	Install Fuse Clips To
120	4-5, 2-3	2, 5	Unfused
240	3-4	2, 5	Unfused
120	4-5, 2-3	1, 5	2-7
240	3-4	1, 5	2-7

Notes

- FUSES NOT INCLUDED (see Edison fuse section for HCTR fuses).
- Secondary fuse clips supplied but not installed. Order fuses and primary fuse clips separately.
- Jumper links to make primary/secondary series/parallel connections supplied, but not installed.

HPS Imperator™ 240x120 / 24x12 VAC Control Transformers Specifications

Features

- 600V class, machine tool rated industrial control transformers
- 50/60 Hertz
- VA range from 50 VA up to 1000 VA
- Constructed with high quality silicon steel laminations that provide optimum performance and reliability
- Encapsulated coils, encased in a custom injection molded cover, protect coils and terminations from moisture, dirt and other industrial airborne contaminants.

- Terminated with #8/32 slot/Phillips terminal screws complete with SEMS washer (suitable for 18 AWG to 14 AWG solid or 14 AWG stranded wire).
- Insulation system:
 - 50 - 150VA, temperature rise 55°C (131°F), insulation class 105°C (221°F),
 - 250 - 1000VA, temperature rise 80°C (176°F), insulation class 130°C (266°F)
- SEMS (standard machine screw with lock washer) standard (not on PH750PG or PH1000PG)
- Standard secondary fuse kits utilizing 13/32" x 1 1/2" midget class CC fuse clips included with all transformers.

Fuses are not included. (See Edison fuse section for HCTR fuses.)

- Optional primary fuse kits available utilizing 13/32" x 1 1/2" midget class CC fuse clips
- Optional finger-safe terminal covers
- LIFETIME warranty (limited to mfg. defects)

Agency Approvals

- UL Listed (approved for U.S. and Canada) File E50394
- CE Mark standard on all units
- RoHS Compliant



HPS Imperator 240x120/24x12 Control Transformer Specifications									
Part Number	Wt/Lbs	Volt-Amp Rating*	Mtg. Fig.	Output Current Amps	Primary Voltage (50/60Hz)	Secondary Voltage	Impedance %		Total Heat Dissipation (Watts)**
							VA	%z	
PH50PG	3.5	50	A	0.417/2.08	120x240 115x230 110x220	12x24 11.5x23 11x22	50	8.3	11
PH75PG	3.5	75	A	6.25/3.13			75	8.7	14
PH100PG	4.5	100	A	8.33/4.17			100	8.4	14
PH150PG	5.7	150	B	12.5/6.25			150	8.0	18
PH250PG	7.5	250	B	20.8/10.4			250	7.8	29
PH350PG	10.1	350	B	29.2/14.6			350	7.0	33
PH500PG	14.2	500	B	41.7/20.8			500	5.0	40
PH750PG	16.6	750	B	62.5/31.3			750	4.9	54
PH1000PG	23.6	1000	B	83.3/41.7			1000	3.9	69

Note: *VA capacity rated at the output of the transformer.
 ** Heat dissipation calculated based on full rated load on transformer.

Dimensions

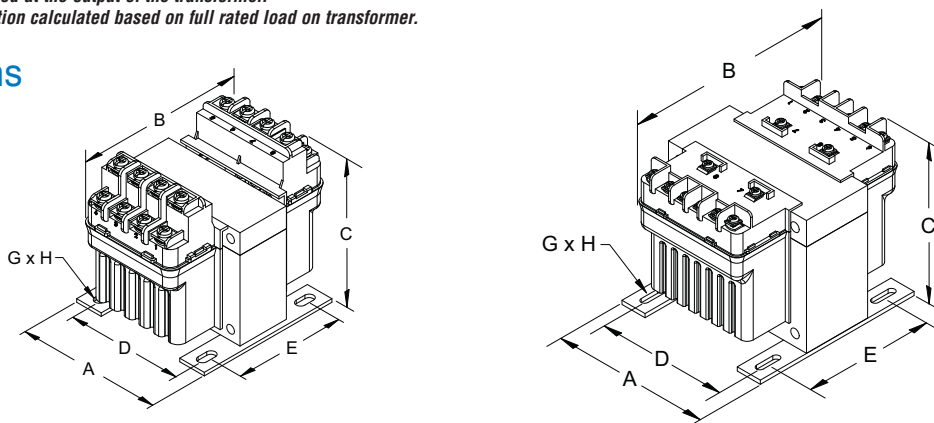


FIGURE A (100VA and less)

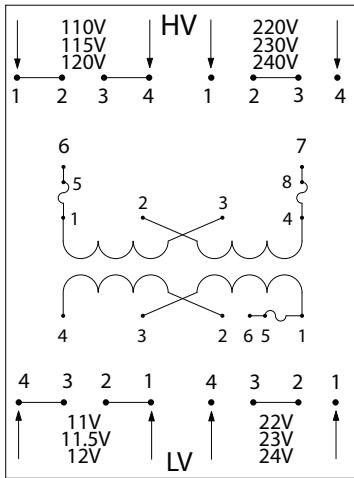
FIGURE B (150VA to 1000VA)

HPS Imperator 240x120/24x12 Control Transformer Dimensions									
Part Number	Mtg. Fig.	Overall Dimensions inches (mm)			Mounting Centers inches (mm)		Mounting Slot inches (mm)	Height with Finger Guard, inches (mm)	Depth with Finger Guard inches (mm)
		A	B	C	D	E	G X H		
PH50PG	A	3.00 (76.2)	4.38 (111.3)	3.19 (81.0)	2.50 (63.5)	2.25 (57.2)	0.22 x 0.44 (5.6 x 11.2)	4.00 (101.6)	5.82 (147.8)
PH75PG	A	3.25 (82.6)	3.88 (85.9)	3.56 (90.4)	2.63 (66.8)	2.50 (63.5)	0.22 x 0.44 (5.6 x 11.2)	4.37 (111.0)	5.32 (135.1)
PH100PG	A	3.25 (82.6)	4.19 (106.4)	3.63 (92.2)	2.63 (66.8)	2.63 (66.8)	0.22 x 0.44 (5.6 x 11.2)	4.44 (112.8)	5.63 (143.0)
PH150PG	B	4.00 (101.6)	4.94 (125.5)	3.81 (96.8)	3.38 (85.9)	2.75 (69.9)	0.22 x 0.75 (5.6 x 19.1)	4.31 (109.5)	6.44 (163.6)
PH250PG	B	4.50 (114.3)	5.44 (138.2)	3.81 (96.8)	3.75 (95.3)	3.13 (79.5)	0.22 x 0.75 (5.6 x 19.1)	4.31 (109.5)	6.94 (176.3)
PH350PG	B	4.50 (114.3)	5.19 (131.8)	4.44 (112.8)	3.75 (95.3)	3.75 (95.3)	0.22 x 0.75 (5.6 x 19.1)	4.94 (125.5)	6.69 (169.9)
PH500PG	B	4.75 (120.7)	5.94 (150.9)	4.31 (109.5)	4.06 (103.1)	3.81 (96.8)	0.31 x 0.94 (7.9 x 23.9)	4.81 (122.2)	7.44 (189.0)
PH750PG	B	5.13 (130.3)	6.69 (169.9)	4.31 (109.5)	4.38 (111.3)	4.31 (109.5)	0.31 x 0.81 (7.9 x 20.6)	4.81 (122.2)	8.19 (208.1)
PH1000PG	B	5.25 (133.4)	6.81 (173.0)	4.94 (125.5)	4.50 (114.3)	4.44 (112.8)	0.31 x 0.81 (7.9 x 20.6)	5.44 (138.2)	8.31 (211.1)

Note: All dimensions are ±0.06 inches unless otherwise noted.

HPS Imperator™ 240x120 / 24x12 VAC Control Transformers Wiring Specifications

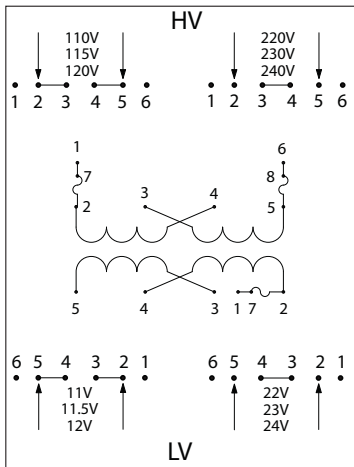
Wiring



PH***PG Schematic for 50, 75 and 100VA Units

High Voltage (HV) (Primary Volts)	Install Supplied Links Between Terminals	Supply Lines Connect To	Install Fuse Clips To
120 115 110	1-2, 3-4	1, 4	Unfused
240 230 220	2-3	1, 4	Unfused
120 115 110	1-2, 3-4	6, 7	1-5, 4-8
240 230 220	2-3	6, 7	1-5, 4-8

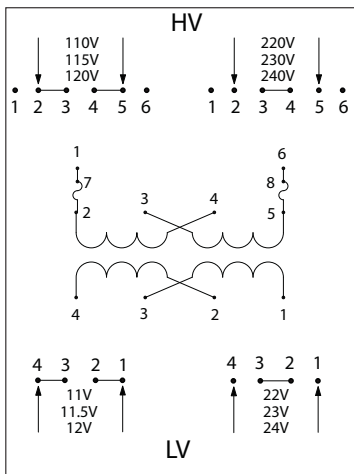
Low Voltage (LV) (Secondary Volts)	Install Supplied Links Between Terminals	Load Lines Connect To	Install Fuse Clips To
12 11.5 11	3-4, 1-2	1, 4	Unfused
24 23 22	2-3	1, 4	Unfused
12 11.5 11	3-4, 1-2	4, 6	1-5
24 23 22	2-3	4, 6	1-5



PH***PG Schematic for 150VA to 500VA Units

High Voltage (HV) (Primary Volts)	Install Supplied Links Between Terminals	Supply Lines Connect To	Install Fuse Clips To
120 115 110	2-3, 4-5	2, 5	Unfused
240 230 220	3-4	2, 5	Unfused
120 115 110	2-3, 4-5	1, 6	2-7, 5-8
240 230 220	3-4	1, 6	2-7, 5-8

Low Voltage (LV) (Secondary Volts)	Install Supplied Links Between Terminals	Load Lines Connect To	Install Fuse Clips To
12 11.5 11	4-5, 2-3	2, 5	Unfused
24 23 22	3-4	2, 5	Unfused
12 11.5 11	4-5, 2-3	1, 5	2-7
24 23 22	3-4	1, 5	2-7



PH***PG Schematic for 750VA and 1000VA Units

High Voltage (HV) (Primary Volts)	Install Supplied Links Between Terminals	Supply Lines Connect To	Install Fuse Clips To
120 115 110	2-3, 4-5	2, 5	Unfused
240 230 220	3-4	2, 5	Unfused
120 115 110	2-3, 4-5	1, 6	2-7, 5-8
240 230 220	3-4	1, 6	2-7, 5-8

Low Voltage (LV) (Secondary Volts)	Install Supplied Links Between Terminals	Load Lines Connect To	Install Fuse Clips To
12 11.5 11	3-4, 1-2	1, 4	Unfused
24 23 22	2-3	1, 4	Unfused

Note: secondary fuse clips not available on PH750PG or PH1000PG.

Notes

- FUSES NOT INCLUDED (see Edison fuse section for HCTR fuses).
- Jumper links to make primary/secondary series/parallel connections supplied, but not installed.
- Secondary fuse clips supplied but not installed. Order fuses and primary fuse clips separately.

HPS Imperator™ 480x240 / 120x25 VAC Control Transformers Specifications

Features

- 600V class, machine tool rated industrial control transformers
- 50/60 Hertz
- VA range from 50 VA up to 500 VA
- Constructed with high quality silicon steel laminations that provide optimum performance and reliability
- Encapsulated coils, encased in a custom injection molded cover, protect coils and terminations from moisture, dirt and other industrial airborne contaminants.

- Terminated with #8/32 slot/Phillips terminal screws complete with SEMS washer (suitable for 18 AWG to 14 AWG solid or 14 AWG stranded wire)
- Insulation system:
 - 50 - 150VA, temperature rise 55°C (131°F), insulation class 105°C (221°F),
 - 250 - 500VA, temperature rise 80°C (176°F), insulation class 130°C (266°F)
- SEMS (standard machine screw with lock washer) standard
- Standard secondary fuse kits utilizing 13/32" x 1 1/2" midget class CC fuse clips included with all transformers.

Fuses are not included. (See Edison fuse section for HCTR fuses.)

- Optional primary fuse kits available utilizing 13/32" x 1 1/2" midget class CC fuse clips
- Optional finger-safe terminal covers
- LIFETIME warranty (limited to mfg. defects)

Agency Approvals

- UL Listed (approved for U.S. and Canada) File E50394
- CE Mark standard on all units
- RoHS Compliant



HPS Imperator 480x240/120x25 Control Transformer Specifications									
Part Number	Wt/Lbs	Volt-Amp Rating*	Mtg. Fig.	Output Current Amps	Primary Voltage (50/60Hz)	Secondary Voltage	Impedance %		Total Heat Dissipation (Watts)**
							VA	%z	
PH50MLI	4.0	50	A	0.43/2.08	240x480 208x230x460 200x220x440	25x120 24x115 23x110	50	8.3	11
PH100MLI	5.2	100	A	0.87/4.17			100	8.4	14
PH250MLI	10.1	250	B	2.17/10.42			250	7.8	29
PH350MLI	11.0	350	B	3.04/14.58			350	7.0	33
PH500MLI	16.3	500	B	4.35/20.83			500	5.0	40

Note: *VA capacity rated at the output of the transformer.
 ** Heat dissipation calculated based on full rated load on transformer.

Dimensions

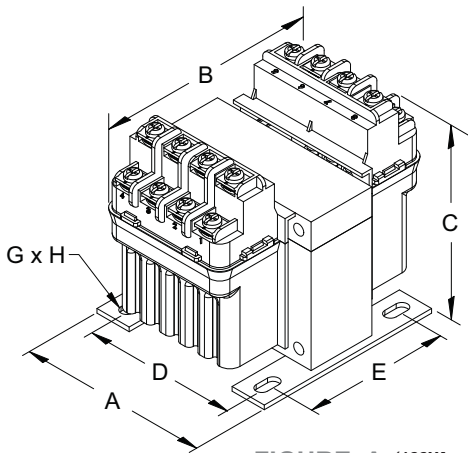


FIGURE A (100VA and less)

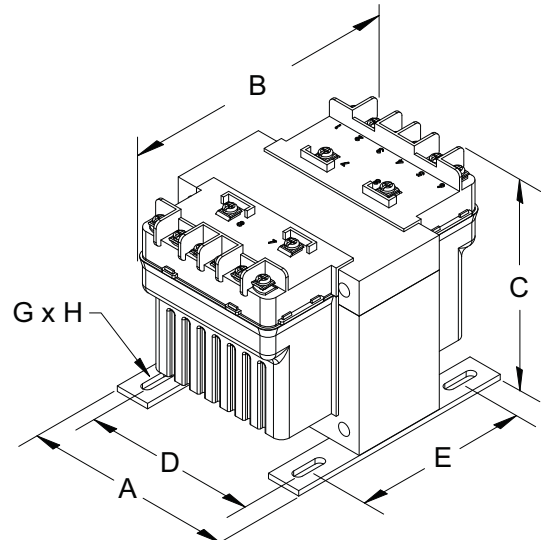


FIGURE B (150VA to 500VA)

HPS Imperator 480x240/120x25 Control Transformer Dimensions									
Part Number	Mtg. Fig.	Overall Dimensions inches (mm)			Mounting Centers inches (mm)		Mounting Slot inches (mm)	Height with Finger Guard, inches (mm)	Depth with Finger Guard inches (mm)
		A	B	C	D	E	G X H		
PH50MLI	A	3.25 (82.6)	4.06 (103.1)	3.56 (90.4)	2.63 (66.8)	2.50 (63.5)	0.22 x 0.44 (5.6 x 11.2)	4.37 (111.0)	5.32 (135.1)
PH100MLI	A	3.25 (82.6)	4.69 (119.1)	3.63 (92.2)	2.63 (66.8)	2.63 (66.8)	0.22 x 0.44 (5.6 x 11.2)	4.44 (112.8)	6.13 (155.7)
PH250MLI	B	4.50 (114.3)	5.19 (131.8)	4.44 (112.8)	3.75 (95.3)	3.75 (95.3)	0.22 x 0.75 (5.6 x 19.1)	4.94 (125.5)	6.38 (162.1)
PH350MLI	B	4.50 (114.3)	5.56 (141.2)	4.44 (112.8)	3.75 (95.3)	3.75 (95.3)	0.22 x 0.75 (5.6 x 19.1)	4.94 (125.5)	7.06 (179.3)
PH500MLI	B	4.75 (120.7)	6.69 (169.9)	4.31 (109.5)	4.06 (103.1)	4.50 (114.3)	0.31 x 0.94 (7.9 x 23.9)	4.81 (122.2)	8.19 (208.0)

Note: All dimensions are ±0.06 inches unless otherwise noted.

Company Info.

PLCs

Field I/O

Software

C-more & other HMI

AC Drives

AC Motors

Power Transmiss.

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

Temp. Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

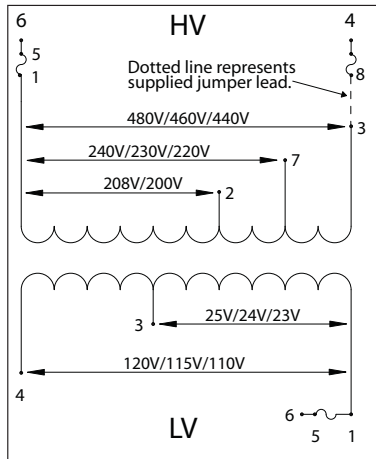
Pneumatics

Appendix

Part Index

HPS Imperator™ 480x240 / 120x25 VAC Control Transformers Wiring Specifications

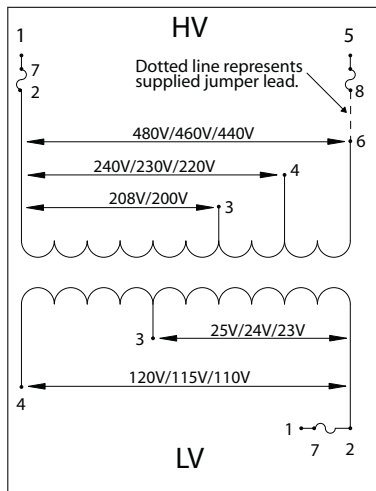
Wiring



PH***MLI Schematic for 50, 75 and 100VA Units

High Voltage (HV) (Primary Volts)	Install Supplied Jumpers Between Terminals	Supply Lines Connect To	Install Fuse Clips To
480 460 440	None	1, 3	Unfused
240 230 220	None	1, 7	Unfused
208 200	None	1, 2	Unfused
480 460 440	3-8	6, 4	1-5, 4-8
240 230 220	8-7	6, 4	1-5, 4-8
208 200	2-8	6, 4	1-5, 4-8

Low Voltage (LV) (Secondary Volts)	Install Supplied Jumpers Between Terminals	Load Lines Connect To	Install Fuse Clips To
120 115 110	None	1, 4	Unfused
25 24 23	None	1, 3	Unfused
120 115 110	None	4, 6	1-5
25 24 23	None	3, 6	1-5



PH***MLI Schematic for 150VA to 500VA Units

High Voltage (HV) (Primary Volts)	Install Supplied Jumpers Between Terminals	Supply Lines Connect To	Install Fuse Clips To
480 460 440	None	2, 6	Unfused
240 230 220	None	2, 4	Unfused
208 200	None	2, 3	Unfused
480 460 440	8-6	1, 5	2-7, 5-8
240 230 220	4-8	1, 5	2-7, 5-8
208 200	3-8	1, 5	2-7, 5-8

Low Voltage (LV) (Secondary Volts)	Install Supplied Jumpers Between Terminals	Load Lines Connect To	Install Fuse Clips To
120 115 110	None	2, 4	Unfused
25 24 23	None	2, 3	Unfused
120 115 110	None	1, 4	2-7
25 24 23	None	1, 3	2-7

Notes

- FUSES NOT INCLUDED (see Edison fuse section for HCTR fuses).
- Secondary fuse clips supplied but not installed. Order fuses and primary fuse clips separately.
- Jumper links to make primary/secondary series/parallel connections supplied, but not installed.
- Transformers secondary is NOT designed for dual voltages. Secondary voltage is either 25/24/23V or 120/115/110V.

HPS Imperator™ Transformers

Accessories – Terminal Covers and Fuse Kits

Finger-safe terminal covers

These one-piece molded terminal covers are a quick and easy way to provide safety and protection in the workplace. They protect operators from potential shock hazards and guard against accidental contact with the fuses.

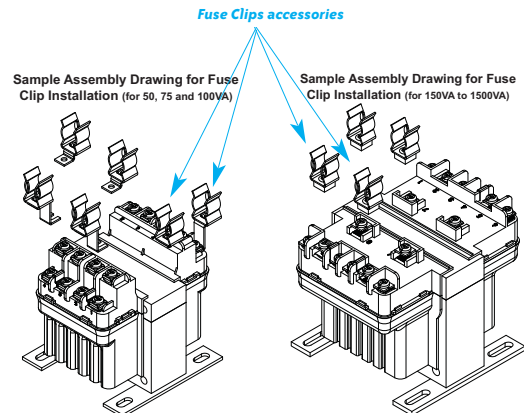
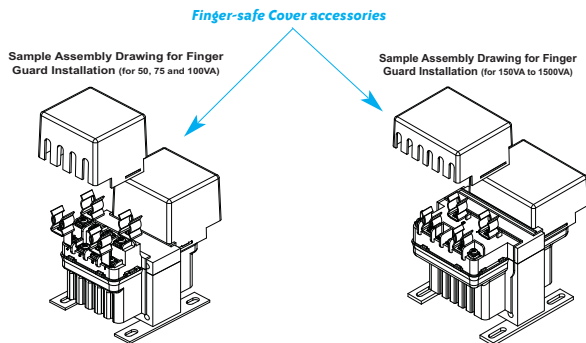
Fuse Kits

These optional primary side fuse kits contain four fuse clips, four mounting screws, and complete instructions.

The table below makes it easy to choose the correct terminal covers and fuse kits for your Hammond control transformer.

Transformer	Finger-Safe Terminal Covers			Primary Side Fuse Kits		
Part Number	Part Number	Pcs/Pkg	Description.	Part Number	Pcs/Pkg	
PH50MQMJ PH50PG	FG1	1 cover	Finger-safe cover for 50VA unfused control transformers. Cover fits primary side or secondary side.	PFK1	4 fuse clips, 4 mounting screws	
	FGF1	1 cover	Finger-safe cover for 50VA fused control transformers. Cover fits primary side or secondary side.			
PH75MQMJ PH75PG	FG2	1 cover	Finger-safe cover for 75VA and 100VA unfused control transformers. Cover fits primary side or secondary side.			
PH75MQMJ PH75PG PH100MQMJ PH100PG	FGF2	1 cover	Finger-safe cover for 75VA and 100VA fused control transformers. Cover fits primary side or secondary side.			
PH150MQMJ PH150PG PH250MQMJ PH250PG	FG3	1 cover	Finger-safe cover for 150VA and 250VA fused and unfused control transformers. Cover fits primary side or secondary side.			
PH350MQMJ PH350PG PH500MQMJ PH500PG PH750MQMJ	FG4	1 cover	Finger-safe cover for 350VA and 500VA fused and unfused control transformers. Also for use with PH750MQMJ. Cover fits primary side or secondary side.	PFK2	4 fuse clips, 4 mounting screws	
PH1000MQMJ PH750PG PH1500MQMJ PH1000PG	FG5	1 cover	Finger-safe cover for 750VA (PH750PG only), 1kVA and 1.5kVA fused and unfused control transformers. Cover fits primary side or secondary side.	PFK3	4 fuse clips, 4 mounting screws	
	FG1	1 cover	Finger-safe cover for 50VA unfused control transformers. Cover fits primary side or secondary side.	PFK4	4 fuse clips, 4 mounting screws 1 cover	
PH50MLI PH50MGJ	FGF1	1 cover	Finger-safe cover for 50VA fused control transformers. Cover fits primary side or secondary side.			
PH100MGJ PH100MLI	FG2	1 cover	Finger-safe cover for 75VA and 100VA unfused control transformers. Cover fits primary side or secondary side.	PFK5	4 fuse clips, 4 mounting screws 1 cover	
	FGF2	1 cover	Finger-safe cover for 75VA and 100VA fused control transformers. Cover fits primary side or secondary side.			
PH150MGJ PH250MGJ PH250MLI	FG3	1 cover	Finger-safe cover for 150VA and 250VA fused and unfused control transformers. Cover fits primary side or secondary side.	PFK6	4 fuse clips, 4 mounting screws	
PH350MJG PH500MJG PH350MLI PH500MLI	FG4	1 cover	Finger-safe cover for 350VA and 500VA fused and unfused control transformers. Also for use with PH750MQMJ. Cover fits primary side or secondary side.	PFK7	4 fuse clips, 4 mounting screws	

1. Torque all terminal screws between 12 and 14 in-lbs.
2. For all bare wire connections, the recommended wire size range is 18 AWG to 14 AWG for solid wire, and 14 AWG for stranded. A ring or spade connector must be used if using a wire size outside the range listed above.
3. Ensure mounting screws used for transformer installation (not supplied) are properly sized for transformer weight.
4. When mounting fuse clips, remove the appropriate captive washer screw(s) from terminal block and install fuse clip(s) and new terminal screw(s).
5. Please refer to wiring instructions included with the Hammond control transformer for connection details.



Standard secondary fuse kits utilizing 13/32" x 1 1/2" midget class CC fuse clips included with all transformers. Fuses are not included. (See Edison fuse section for HCTR fuses.)

Recommendations for Overcurrent Protection UL and CSA (North American) Standards

UL and CSA (North American) Standards

North American standards, including UL 508, National Electric Code 450, and the Canadian Electrical Code, Part 1, require overcurrent protection on all control circuit transformers. There are two options for overcurrent protection:

Option 1 (Primary only Protection)

Provide an overcurrent device in the primary circuit rated to the current of the transformer. The overcurrent limits are as follows:

- Primary 9 Amps or more: no more than 125% of rated current
- Primary 2 to 9 Amps: no more than 167% of rated current
- Primary less than 2 Amps: no more than 300% of rated current for power circuits; no more than 500% of rated current for control circuits

Note: This method is considered less desirable, as start-up inrush to the transformer can frequently surpass the current rating of the device and result in nuisance interruptions.

Option 2 (Primary and Secondary Protection)

The second option is to install overcurrent devices in both the primary and secondary circuits of the transformer. In this option, the secondary device must be rated no more than 125% of rated current of the transformer and the primary no more than 250%. The Canadian Electrical Code permits 300% overcurrent on the primary for this option.

In both options listed, it is recommended that time delay fuses be considered to avoid unnecessary interruptions.

REFERENCES:

UL 508
UL 845
NEC 430-72
NEC 450-3
CEC Part 1, 26-256

Recommendations for Overcurrent Protection UL and CSA (North American) Standards, continued

PRIMARY (UL and CSA)

To assist in the selection of fuses, the following chart recommends the maximum primary fuse rating in amperes. The first number shown is the maximum overcurrent protection when the primary current is less than 2 amps and the overcurrent protection device is rated for 300%. The second number (shown in brackets) is recommended when the primary is less than 2 amps and the overcurrent device is to be rated at 500% of rated current. Where only one number is indicated, the primary is 2 amps or more and one rating of overcurrent protection is shown as optimal. Choose the next higher fuse rating if these numbers do not correspond with standard fuse selections.

HCTR Current Limiting Class CC Fuses				
Part Number	AMP Rating	Pcs/Pkg	Weight	
HCTR-25	0.25	10/1	0.2 lb	
HCTR-5	0.5	10/1	0.2 lb	
HCTR-75	0.75	10/1	0.2 lb	
HCTR1	1	10/1	0.2 lb	
HCTR1-25	1.25	10/1	0.2 lb	
HCTR1-5	1.5	10/1	0.2 lb	
HCTR2	2	10/1	0.2 lb	
HCTR2-5	2.5	10/1	0.2 lb	
HCTR3	3	10/1	0.2 lb	
HCTR3-5	3.5	10/1	0.2 lb	
HCTR4	4	10/1	0.2 lb	
HCTR5	5	10/1	0.2 lb	
HCTR6	6	10/1	0.2 lb	
HCTR7-5	7.5	10/1	0.2 lb	
HCTR8	8	10/1	0.2 lb	
HCTR10	10	10/1	0.2 lb	
HCTR15	15	10/1	0.2 lb	
HCTR20	20	10/1	0.2 lb	
HCTR25	25	10/1	0.2 lb	
HCTR30	30	10/1	0.2 lb	

Recommended Maximum Primary Fuse Ratings in Amps Where Primary Current is less than 2 Amps.

Note: See HCTR fuse catalog page for characteristic curves.

Primary Voltage	Overload Protection	Hammond Transformers VA RATING												
		50	75	100	150	250	350	500	750	1000	1500	2000	3000	5000
115	300%	1.25	1.8	2.5	3.5	4.0	5.0	8.0	10.0	15.0	20.0	25.0	-	-
	500%	(2.0)	(3.2)	(4.0)	(6.5)	-	-	-	-	-	-	-	-	-
120	300%	1.25	1.8	2.25	3.5	4.0	5.0	8.0	10.0	15.0	15.0	20.0	-	-
	500%	(2.0)	(3.2)	(4.0)	(6.5)	-	-	-	-	-	-	-	-	-
220	300%	0.6	1.0	1.25	2.0	3.2	4.5	4.0	6.0	8.0	12.0	15.0	20.0	30.0
	500%	(1.125)	(1.6)	(2.25)	(3.2)	(5.6)	(7.5)	-	-	-	-	-	-	-
208	300%	0.6	1.0	1.4	2.0	3.5	5.0	4.0	6.0	8.0	12.0	15.0	20.0	30.0
	500%	(1.125)	(1.8)	(2.25)	(3.5)	(6.0)	(8.0)	-	-	-	-	-	-	-
230	300%	0.6	0.8	1.25	1.8	3.2	4.5	4.0	6.0	8.0	10.0	15.0	20.0	30.0
	500%	(1.0)	(1.6)	(2.0)	(3.2)	(5.0)	(7.5)	-	-	-	-	-	-	-
240	300%	0.6	0.8	1.25	1.8	3.0	4.0	3.5	5.0	7.0	10.0	15.0	15.0	30.0
	500%	(1.0)	(1.5)	(2.0)	(3.0)	(5.0)	(7.0)	-	-	-	-	-	-	-
277	300%	0.5	0.8	1.0	1.6	2.5	3.5	5.0	5.0	6.0	9.0	12.0	15.0	25.0
	500%	(0.8)	(1.25)	(1.8)	(4.5)	(6.25)	(9.0)	-	-	-	-	-	-	-
380	300%	0.3	0.5	0.75	1.125	1.8	2.5	3.5	5.6	4.5	6.25	9.0	15.0	20.0
	500%	(0.6)	(0.8)	(1.25)	(1.8)	(3.2)	(4.5)	(6.25)	(9.0)	-	-	-	-	-
440	300%	0.3	0.5	0.6	1.0	1.6	2.25	3.2	5.0	4.0	6.0	8.0	12.0	15.0
	500%	(0.5)	(0.8)	(1.125)	(1.6)	(2.8)	(3.5)	(5.6)	(8.0)	-	-	-	-	-
460	300%	0.3	0.4	0.6	0.8	1.6	2.25	3.2	4.5	3.5	6.0	8.0	12.0	15.0
	500%	(0.5)	(0.8)	(1.0)	(1.6)	(2.5)	(3.5)	(5.0)	(8.0)	-	-	-	-	-
480	300%	0.3	0.4	0.6	0.8	1.5	2.0	3.0	4.5	3.5	5.0	7.0	10.0	15.0
	500%	(0.5)	(0.75)	(1.0)	(1.5)	(2.5)	(3.5)	(5.0)	(7.5)	-	-	-	-	-

Recommendations for Overcurrent Protection UL and CSA (North American) Standards, continued

SECONDARY

The overcurrent protection listed below, in amperes, is 125% of the rated current of the transformer. Choose the next higher fuse rating if these numbers do not correspond with standard fuse selections.

MEN General Purpose Midget Class Fuses			
Part Number	AMP Rating	Pcs/Pkg	Weight
MEN-5	0.5	10/1	0.2 lb
MEN-6	0.6	10/1	0.2 lb
MEN1	1	10/1	0.2 lb
MEN1-4	1.4	10/1	0.2 lb
MEN1-5	1.5	10/1	0.2 lb
MEN2	2	10/1	0.2 lb
MEN2-5	2.5	10/1	0.2 lb
MEN3	3	10/1	0.2 lb
MEN3-5	3.5	10/1	0.2 lb
MEN4	4	10/1	0.2 lb
MEN5	5	10/1	0.2 lb
MEN6	6	10/1	0.2 lb
MEN7	7	10/1	0.2 lb
MEN8	8	10/1	0.2 lb
MEN10	10	10/1	0.2 lb
MEN12	12	10/1	0.2 lb
MEN15	15	10/1	0.2 lb
MEN20	20	10/1	0.2 lb
MEN25	25	10/1	0.2 lb
MEN30	30	10/1	0.2 lb

Note: See MEN fuse catalog page for characteristic curves.

Recommended Maximum Secondary Fuse Ratings in Amps.

Secondary Voltage	Overload Protection	Hammond Transformers VA RATING												
		50	75	100	150	250	350	500	750	1000	1500	2000	3000	5000
12	125%	5.3	7.9	11.0	16.0	27.0	–	–	–	–	–	–	–	–
24	125%	2.7	4.0	5.3	7.9	14.0	19.0	27.0	–	–	–	–	–	–
110	125%	0.6	0.9	1.2	1.8	2.9	4.0	5.7	8.6	12.0	18.0	23.0	–	–
115	125%	0.6	0.9	1.1	1.7	2.8	3.9	5.5	8.2	11.0	17.0	22.0	–	–
120	125%	0.6	0.8	1.1	1.6	2.7	3.7	5.3	7.9	11.0	16.0	21.0	–	–
220	125%	0.3	0.5	0.6	0.9	1.5	2.0	2.9	4.3	5.7	8.6	12.0	18.0	29.0
230	125%	0.3	0.5	0.6	0.9	1.4	2.0	2.8	4.1	5.5	8.2	11.0	17.0	28.0

HPS Fortress™ 480x240 / 240x120 VAC Commercial Potted Transformers Specifications

Features

- **Ratings:** 1 phase from 0.50kVA thru to 5kVA; 60 Hz
- **Electrostatic Shield:** Standard on all single phase units over 0.75kVA
- **Quality Design:** All units are encapsulated with electrical grade silica sand and resin compounds which completely enclose the core and coil to seal out moisture, airborne contaminants and eliminates corrosion and deterioration.
- **Insulation:** Offering UL class 130°C (266°F) insulation, 80°C (176°F) temperature rise up to 1kVA on single phase; 180°C (°F) insula-

tion, 115°C (°F) temperature rise on all units over 1kVA on single phase. Quiet operation with sound levels below NEMA standards.

- **Enclosures:** NEMA 3R enclosures meet or exceed listing criteria including NEMA, ANSI, and OSHA standards for indoor and outdoor service.
- **Rear and side entry** into an easily accessible and roomy wiring compartment.
- **Wiring compartment:** Provides tinned copper lead wire terminations and standard ground lug assembly for easy cable installation.

- **Installation made quick and easy:** Via keyhole mounting slots. Wall mounting available on single phase units from 0.50kVA to 5kVA. Lifting provisions are included on all single phase units.
- **10 year warranty** (limited to mfg. defects)

Agency Approvals

- UL Listed File No. E50394 (Type Q)
- CSA File No. LR3902 (Type Q)



C1FC50LE



C1F1C5LES



C1F005LES



HPS Fortress 480x240/240x120 Control Transformer Specifications										
Part Number	Wt/Lbs	Price	kVA Rating	Mtg. Fig.	Output Current Amps	Primary Voltage (50/60Hz)	Secondary Voltage	Impedance %		Total Heat Dissipation (Watts)*
								VA	%z	
C1FC50LE	15.0	<--->	0.50	A	4.17/2.08	240x480	120x240	500	7.6	35.8
C1FC75LES	18.0	<--->	0.75	A	6.25/3.13			750	5.6	57.2
C1F1C0LES	22.0	<--->	1.0	A	8.33/4.17			1000	4.8	75.3
C1F1C5LES	25.0	<--->	1.5	A	12.5/6.25			1500	4.1	100
C1F002LES	40.0	<--->	2.0	A	16.7/8.33			2000	4.3	121.6
C1F003LES	55.0	<--->	3.0	A	25.0/12.5			3000	3.7	160.8
C1F005LES	90.0	<--->	5.0	B	41.7/20.8			5000	4.2	314

Note: * Heat dissipation calculated based on full rated load on transformer.

HPS Fortress™ 480x240 / 240x120 VAC Commercial Potted Transformers Specifications and Wiring

Dimensions

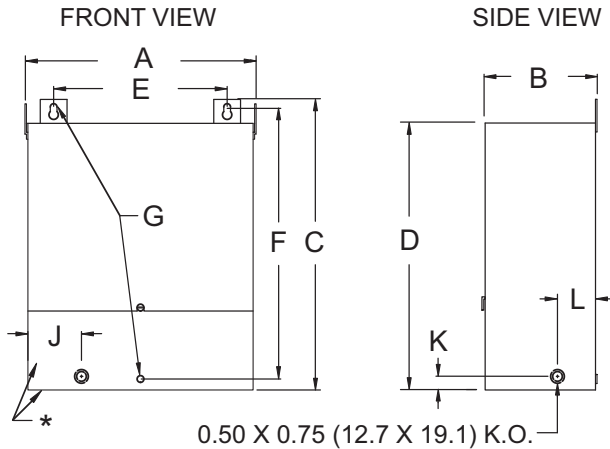


FIGURE A (300VA and less)

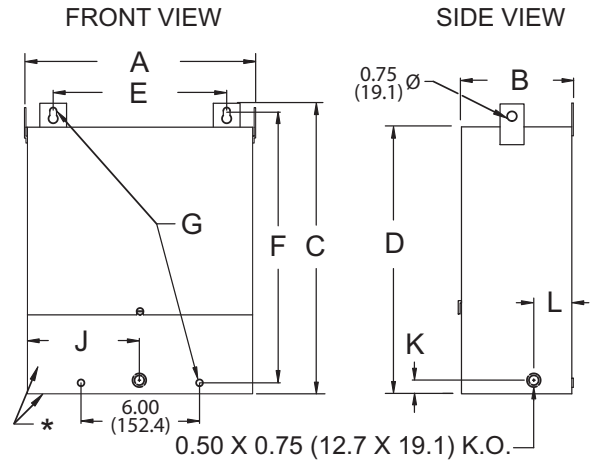


FIGURE B (500VA)

* Front & bottom panel is hinged for access to terminals,
bottom mounting holes and rear knockout.

HPS Fortress 480x240/240x120 Control Transformer Dimensions											
Part Number	Mtg. Fig.	Overall Dimensions inches (mm)				Mounting Holes inches (mm)		Mounting Hole Dia. inches (mm)	Knock Out Dimensions inches (mm)		
		A	B	C	D	E	F	G	J	K	L
C1FC50LE	A	5.00 (127.0)	4.75 (120.7)	9.25 (235.0)	8.25 (209.6)	3.88 (98.6)	7.75 (196.9)	0.22 (5.6)	1.00 (25.4)	1.50 (38.1)	2.00 (50.8)
C1FC75LES	A	5.00 (127.0)	4.75 (120.7)	9.25 (235.0)	8.25 (209.6)	3.88 (98.6)	7.75 (196.9)	0.22 (5.6)	1.00 (25.4)	1.50 (38.1)	2.00 (50.8)
C1F1C0LES	A	5.88 (149.4)	5.50 (139.7)	10.00 (254.0)	8.50 (215.9)	4.13 (104.9)	8.25 (209.6)	0.28 (7.1)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)
C1F1C5LES	A	5.88 (149.4)	5.50 (139.7)	10.00 (254.0)	8.50 (215.9)	4.13 (104.9)	8.25 (209.6)	0.28 (7.1)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)
C1F002LES	A	7.00 (177.8)	6.50 (165.1)	11.25 (285.8)	9.75 (247.7)	5.38 (136.7)	9.50 (241.3)	0.28 (7.1)	1.50 (38.1)	1.50 (38.1)	2.00 (50.8)
C1F003LES	A	7.00 (177.8)	6.50 (165.1)	11.25 (285.8)	9.75 (247.7)	5.38 (136.7)	9.50 (241.3)	0.28 (7.1)	1.50 (38.1)	1.50 (38.1)	2.00 (50.8)
C1F005LES	B	10.00 (254.0)	7.75 (196.9)	17.25 (438.2)	15.25 (387.4)	7.38 (187.5)	15.38 (390.7)	0.44 (11.2)	4.00 (101.6)	2.00 (50.8)	2.00 (50.8)

Note: All dimensions are ±0.06 inches unless otherwise noted.

Wiring

SCHEMATIC		CONNECTIONS		
		Primary Volts	Connect lines to	Inter-connect
		480	H1, H4	H2-H3
		240	H1, H4	H1-H3, H2-H4
		Secondary Volts	Connect lines to	Inter-connect
		240	X1, X4	X2-X3
		120/240	X1, X2, X4	X2-X3
		120	X1, X2	X2-X4, X1-X3

Note: Lower secondary voltages are not available, only 120/240 VAC.