

# 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.

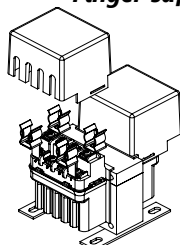


Hammond  
Power Solutions

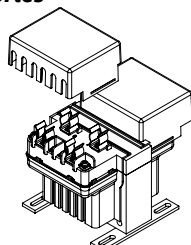
Transformer		Finger-Safe Terminal Covers			Primary Side Fuse Kits		
Part Number	Part #	Pcs/Pkg	Price	Description	Part #	Pcs/Pkg	Price
<a href="#">PH50MQMJ</a> <a href="#">PH50PG</a>	<a href="#">FG1</a>	1 cover	\$esn:	Finger-safe cover for MQMJ and PG series 50VA <b>unfused</b> control transformers. Cover fits primary side or secondary side.	<a href="#">PFK1</a>	4 fuse clips, 4 mounting screws	\$0ebe:
	<a href="#">FGF1</a>	1 cover	\$;est:	Finger-safe cover for MQMJ and PG series 50VA <b>fused</b> control transformers. Cover fits primary side or secondary side.			
<a href="#">PH75MQMJ</a> <a href="#">PH75PG</a> <a href="#">PH100MQMJ</a> <a href="#">PH100PG</a>	<a href="#">FG2</a>	1 cover	\$eso:	Finger-safe cover for all 75VA, all 100VA, PH50MLI and PH50MGJ <b>unfused</b> control transformers. Cover fits primary or secondary side.			
	<a href="#">FGF2</a>	1 cover	\$esu:	Finger-safe cover for 75VA, all 100VA, PH50MLI and PH50MGJ <b>fused</b> control transformers. Cover fits primary or secondary side.			
<a href="#">PH150MQMJ</a> <a href="#">PH150PG</a> <a href="#">PH250MQMJ</a> <a href="#">PH250PG</a>	<a href="#">FG3</a>	1 cover	\$esp:	Finger-safe cover for all 150VA, PH250MQMJ and PH250PG <b>fused and unfused</b> control transformers. Cover fits primary or secondary side.	<a href="#">PFK2</a>	4 fuse clips, 4 mounting screws	\$;0ebf:
<a href="#">PH350MQMJ</a> <a href="#">PH350PG</a> <a href="#">PH500MQMJ</a> <a href="#">PH500PG</a> <a href="#">PH750MQMJ</a>	<a href="#">FG4</a>	1 cover	\$esq:	Finger-safe cover for all 350VA, 500VA, PH250MLI, PH250MGJ, and PH750MQMJ <b>fused and unfused</b> control transformers. Cover fits primary or secondary side.	<a href="#">PFK3</a>	4 fuse clips, 4 mounting screws	\$0ebg:
<a href="#">PH1000MQMJ</a> <a href="#">PH750PG</a> <a href="#">PH1500MQMJ</a> <a href="#">PH1000PG</a>	<a href="#">FG5</a>	1 cover	\$ess:	Finger-safe cover for all 750VA, 1000VA, 1500VA <b>fused and unfused</b> control transformers. Cover fits primary or secondary side.	<a href="#">PFK4</a>	4 fuse clips, 4 mounting screws 1 cover 1 jumper wire	\$0eba:
<a href="#">PH50MLI</a> <a href="#">PH50MGJ</a>	<a href="#">FG2</a>	1 cover	\$eso:	Finger-safe cover for all 75VA, all 100VA, PH50MLI and PH50MGJ <b>unfused</b> control transformers. Cover fits primary or secondary side.			
<a href="#">PH100MLI</a> <a href="#">PH75MGJ</a> <a href="#">PH100MGJ</a>	<a href="#">FGF2</a>	1 cover	\$esu:	Finger-safe cover for 75VA, all 100VA, PH50MLI and PH50MGJ <b>fused</b> control transformers. Cover fits primary or secondary side.	<a href="#">PFK5</a>	4 fuse clips, 4 mounting screws 1 cover 1 jumper wire	\$0ebb:
	<a href="#">FG2</a>	1 cover	\$eso:	Finger-safe cover for all 75VA, all 100VA, PH50MLI and PH50MGJ <b>unfused</b> control transformers. Cover fits primary or secondary side.			
<a href="#">PH150MGJ</a> <a href="#">PH150MLI</a>	<a href="#">FG3</a>	1 cover	\$esp:	Finger-safe cover for all 150VA, PH250MQMJ and PH250PG <b>fused and unfused</b> control transformers. Cover fits primary or secondary side.	<a href="#">PFK6</a>	4 fuse clips, 4 mounting screws 1 jumper wire	\$0ebc:
<a href="#">PH250MLI</a> <a href="#">PH250MGJ</a>	<a href="#">FG4</a>	1 cover	\$esq:	Finger-safe cover for all 350VA, 500VA, PH250MLI, PH250MGJ, and PH750MQMJ <b>fused and unfused</b> control transformers. Cover fits primary or secondary side.			
<a href="#">PH350MLI</a> <a href="#">PH350MGJ</a> <a href="#">PH500MLI</a> <a href="#">PH500MGJ</a>			\$esq:	Finger-safe cover for all 350VA, 500VA, PH250MLI, PH250MGJ, and PH750MQMJ <b>fused and unfused</b> control transformers. Cover fits primary or secondary side.	<a href="#">PFK7</a>	4 fuse clips, 4 mounting screws 1 jumper wire	\$0ebd:
<a href="#">PH750MLI</a> <a href="#">PH1000MLI</a> <a href="#">PH1000MGJ</a>	<a href="#">FG5</a>	1 cover	\$ess:	Finger-safe cover for all 1000VA, 1500VA, PH750PG, and PH750MLI <b>fused and unfused</b> control transformers. Cover fits primary or secondary side.			

1. Torque all terminal screws between 12 and 14 lb•in (1.36 and 1.58 N•m)
2. For all bare wire connections, the recommended wire size range is 18AWG to 14AWG for solid wire and 14AWG for stranded. A ring or spade connector (maximum width 0.37 in [9.4 mm]) 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.

#### Finger-safe Cover accessories

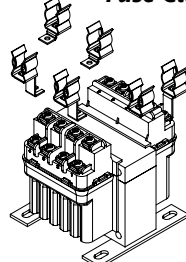


Sample Assembly Drawing for Finger Guard Installation (for 50, 75 and 100VA)

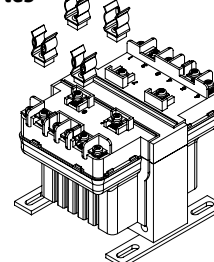


Sample Assembly Drawing for Finger Guard Installation (for 150VA to 1500VA)

#### Fuse Clips accessories



Sample Assembly Drawing for Fuse Clip Installation (for 50, 75 and 100VA)



Sample Assembly Drawing for Fuse Clip Installation (for 150VA to 1500VA)

Standard secondary fuse kits utilizing 13/32" x 1 1/2" fuse clips included with all transformers. Fuses are not included. (See Edison fuse section for MEN 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

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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.

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### 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	Price
<a href="#">HCTR-25</a>	0.25	10/1	0.2 lb	\$;00efk:
<a href="#">HCTR-5</a>	0.5	10/1	0.2 lb	\$;00eft:
<a href="#">HCTR-75</a>	0.75	10/1	0.2 lb	\$;00efv:
<a href="#">HCTR1</a>	1	10/1	0.2 lb	\$;00efc:
<a href="#">HCTR1-25</a>	1.25	10/1	0.2 lb	\$;00efe:
<a href="#">HCTR1-5</a>	1.5	10/1	0.2 lb	\$;00efg:
<a href="#">HCTR2</a>	2	10/1	0.2 lb	\$;00efh:
<a href="#">HCTR2-5</a>	2.5	10/1	0.2 lb	\$;00efi:
<a href="#">HCTR3</a>	3	10/1	0.2 lb	\$;00efn:
<a href="#">HCTR3-5</a>	3.5	10/1	0.2 lb	\$;00efp:
<a href="#">HCTR4</a>	4	10/1	0.2 lb	\$;00efq:
<a href="#">HCTR5</a>	5	10/1	0.2 lb	\$;00efs:
<a href="#">HCTR6</a>	6	10/1	0.2 lb	\$;00efu:
<a href="#">HCTR7-5</a>	7.5	10/1	0.2 lb	\$;00efx:
<a href="#">HCTR8</a>	8	10/1	0.2 lb	\$;00efy:
<a href="#">HCTR10</a>	10	10/1	0.2 lb	\$;00efd:
<a href="#">HCTR15</a>	15	10/1	0.2 lb	\$;00eff:
<a href="#">HCTR20</a>	20	10/1	0.2 lb	\$;00efi:
<a href="#">HCTR25</a>	25	10/1	0.2 lb	\$;00efj:
<a href="#">HCTR30</a>	30	10/1	0.2 lb	\$;00efo:

Note: See HCTR fuse catalog page for characteristic curves.

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

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	Price
<u>MEN-5</u>	0.5	10/1	0.2 lb	\$0eg7:
<u>MEN-6</u>	0.6	10/1	0.2 lb	\$0eg9:
<u>MEN1</u>	1	10/1	0.2 lb	\$.0efz:
<u>MEN1-4</u>	1.4	10/1	0.2 lb	\$.00ef_:
<u>MEN1-5</u>	1.5	10/1	0.2 lb	\$.;00ef!:
<u>MEN2</u>	2	10/1	0.2 lb	\$.0ef?:
<u>MEN2-5</u>	2.5	10/1	0.2 lb	\$0eg1:
<u>MEN3</u>	3	10/1	0.2 lb	\$0eg2:
<u>MEN3-5</u>	3.5	10/1	0.2 lb	\$0eg4:
<u>MEN4</u>	4	10/1	0.2 lb	\$0eg5:
<u>MEN5</u>	5	10/1	0.2 lb	\$0eg6:
<u>MEN6</u>	6	10/1	0.2 lb	\$0eg8:
<u>MEN7</u>	7	10/1	0.2 lb	\$0ega:
<u>MEN8</u>	8	10/1	0.2 lb	\$0egb:
<u>MEN10</u>	10	10/1	0.2 lb	\$.;0ef]:
<u>MEN12</u>	12	10/1	0.2 lb	\$.;0ef]:
<u>MEN15</u>	15	10/1	0.2 lb	\$.0ef#:
<u>MEN20</u>	20	10/1	0.2 lb	\$.;0ef,:
<u>MEN25</u>	25	10/1	0.2 lb	\$0eg0:
<u>MEN30</u>	30	10/1	0.2 lb	\$0eg3:

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
<b>12</b>	125%	5.3	7.9	11.0	16.0	27.0	–	–	–	–	–	–	–	–
<b>24</b>	125%	2.7	4.0	5.3	7.9	14.0	19.0	27.0	–	–	–	–	–	–
<b>110</b>	125%	0.6	0.9	1.2	1.8	2.9	4.0	5.7	8.6	12.0	18.0	23.0	–	–
<b>115</b>	125%	0.6	0.9	1.1	1.7	2.8	3.9	5.5	8.2	11.0	17.0	22.0	–	–
<b>120</b>	125%	0.6	0.8	1.1	1.6	2.7	3.7	5.3	7.9	11.0	16.0	21.0	–	–
<b>220</b>	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
<b>230</b>	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