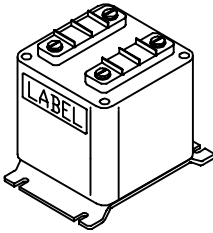
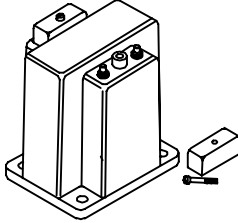
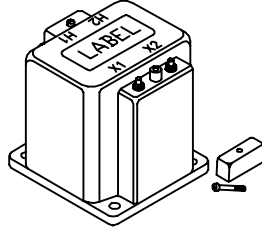
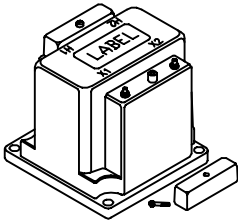
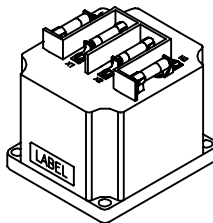
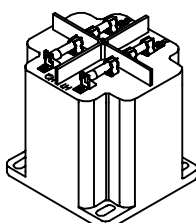


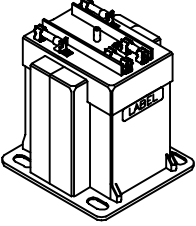
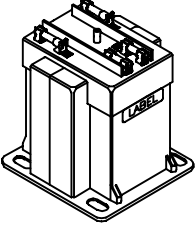
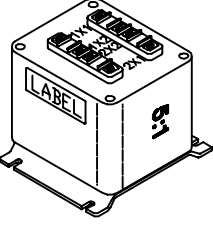
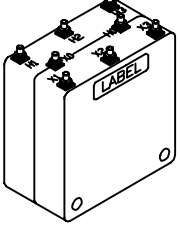
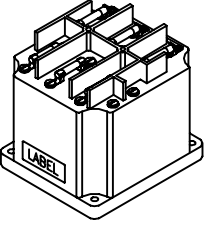
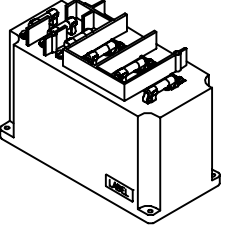
VOLTAGE TRANSFORMERS

**600 VOLT
CLASS**

Application Data			4
MODEL NUMBER	ACCURACY CLASS THERMAL RATING	OVERALL SIZE Width Height Depth	PAGE
Single Phase			
467	 <p>± 1% @ 5VA 40VA @ 30° C.</p>	3.00 x 3.63 x 3.50	5
468	 <p>± 0.6% @ 7.5VA 75VA @ 30° C.</p>	3.63 x 4.06 x 2.81	6
465	 <p>0.6W & 1.2X 150VA @ 30° C.</p>	3.63 x 4.25 x 3.75	7
460	 <p>0.6W & 1.2X 150VA @ 30° C.</p>	4.50 x 3.88 x 4.75	8
460 F & FF	 <p>0.6W & 1.2X 150VA @ 30° C.</p>	4.57 x 4.75 x 4.32	9
475	 <p>0.3W, 0.6X & 1.2M 300VA @ 30° C.</p>	4.38 x 4.63 x 4.75	10

VOLTAGE TRANSFORMERS

**600 VOLT
CLASS**

MODEL NUMBER	ACCURACY CLASS THERMAL RATING	OVERALL SIZE			PAGE
		Width	Height	Depth	
Single Phase					
456, F & FF	0.3W, X, M & 0.6Y 500VA @ 30°C.	6.00	6.10	6.50	11
					
450, F & FF	0.3W, X, M, Y & 1.2Z 750VA @ 30°C.	6.00	6.10	6.50	12
					
Three Phase					
2VT469	± 1% @ 5VA 40VA Per phase @ 30°C.	4.19	3.63	4.38	13
					
3VT471	± 1% @ 5VA 40VA Per phase @ 30°C.	4.59	5.57	3.00	14
					
3VT472	± 1% @ 5VA 40VA Per phase @ 30°C.	5.00	4.13	4.38	15
					
3VT468	± 0.6% @ 7.5VA 75VA @ 30°C. Per phase	7.68	5.38	3.75	16
					

VOLTAGE TRANSFORMERS

**600 VOLT
CLASS**

MODEL NUMBER	ACCURACY CLASS THERMAL RATING	OVERALL SIZE Width Height Depth	PAGE
Three Phase			
2VT460	0.6W & 1.2X Per Phase 150VA Per phase @ 30°C.	7.68 x 5.38 x 3.75	17
3VTN460	0.6W & 1.2X Per Phase 150VA Per phase @ 30°C. LINE TO NEUTRAL CONNECTION	10.25 x 4.75 x 4.75	18
3VTL460	0.6W & 1.2X Per Phase 150VA Per phase @ 30°C. LINE TO LINE CONNECTION	10.25 x 4.75 x 4.75	19
CIRCLE DIAGRAM METHODS FOR THE ESTIMATION OF VOLTAGE TRANSFORMER ACCURACY CLASSES			20 & 21

VOLTAGE TRANSFORMER GROUPS

GROUP 1. Transformers for application with 100% of rated primary voltage connected to the primary terminals either line-to-line or line-to-ground. These transformers are capable of operating at 125% of rated volts in emergency conditions, but cannot exceed 65% of their thermal burden rating, with a limit of 75°C. temperature rise. This will result in a reduced life expectancy. Consult the factory for details. Continuous operation at 110% of rated voltage is permissible, provided that the thermal burden rating is not exceeded.

PRIMARY VOLTAGE RATING	TURNS RATIO	B.I.L. (kV PEAK)
120 for 208Y	1:1	10
240 for 416Y	2:1	10
300 for 520Y	2.5:1	10

GROUP 2. Transformers are for line-to-line connection, but may be connected line-to-neutral at a voltage of the rated line volts divided by the square root of 3. Continuous operation at 110% of rated voltage is permissible, provided that the thermal burden rated volt-amperes is not exceeded.

PRIMARY VOLTAGE RATING	TURNS RATIO	B.I.L. (kV PEAK)
120 for 120Y	1:1	10
240 for 240Y	2:1	10
300 for 300Y	2.5:1	10
480 for 480Y	4:1	10
600 for 600Y	5:1	10

VOLTAGE TRANSFORMER FUSES

This Voltage Transformer section contains some models that can be fitted with primary fuses. The fuse style is the CC class having a rejection feature. These fuses are rated as current limiting with a 200,000 ampere (RMS symmetrical) interrupting rating, for BRANCH circuits of 600 volts or less. The fuses are contained in a fuseblock that will accept only class CC, UL approved fuses. This prevents other fuse types of the same size being fitted that would have a lower interrupting capacity and/or a non-current limiting capability. It is possible to fit the fuse carrier and fuseblock to our models 450, 456 and 475 after manufacture so that a field retro-fit can be made.

The National Electric Code requires that all voltage transformers installed indoors or in an enclosure shall be fused in the primary circuit with devices rated 15 amperes or less. This arrangement will protect the supply from faults internally in the transformer, but faults in the secondary circuit may not rupture the primary fuse. It is suggested that the user fit secondary circuit fuses to protect the transformer from such faults. The recommended fuse rating is 125% of rated full load amperes, with a maximum of 167%, again referring to the National Electric Code.

When fusing either the primary or the secondary circuits of voltage transformers that are connected line-to-ground, only one fuse should be fitted line side so that the transformer cannot remain energized from a line connection while the grounded neutral fuse is ruptured. The selection of fuses as listed with each model that can accept fuses, is based upon magnetizing inrush considerations and not necessarily upon the VA rating of the transformer. In cases where the user wishes to select and mount fuses elsewhere in equipment, we recommend that the ratings given be adhered to. If no fuses are listed, consult the factory engineers for a recommendation.

VOLTAGE TRANSFORMER BURDEN DATA

BURDEN	VOLT AMPERES	POWER FACTOR	P.F. ANGLE
W	12.5	0.10	84.3°
X	25	0.70	45.6°
M	35	0.20	78.5°
Y	75	0.85	31.8°
Z	200	0.85	31.8°
ZZ	400	0.85	31.8°

VOLTAGE TRANSFORMER

Model 467

FREQUENCY:
60 Hz

STANDARD SECONDARY VOLTAGE:
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
± 1% at all burdens up to 5 VA at 1.0 and 0.95 P.F.

THERMAL RATING:
40 VA at 30°C. amb.,
27 VA at 55°C. amb.

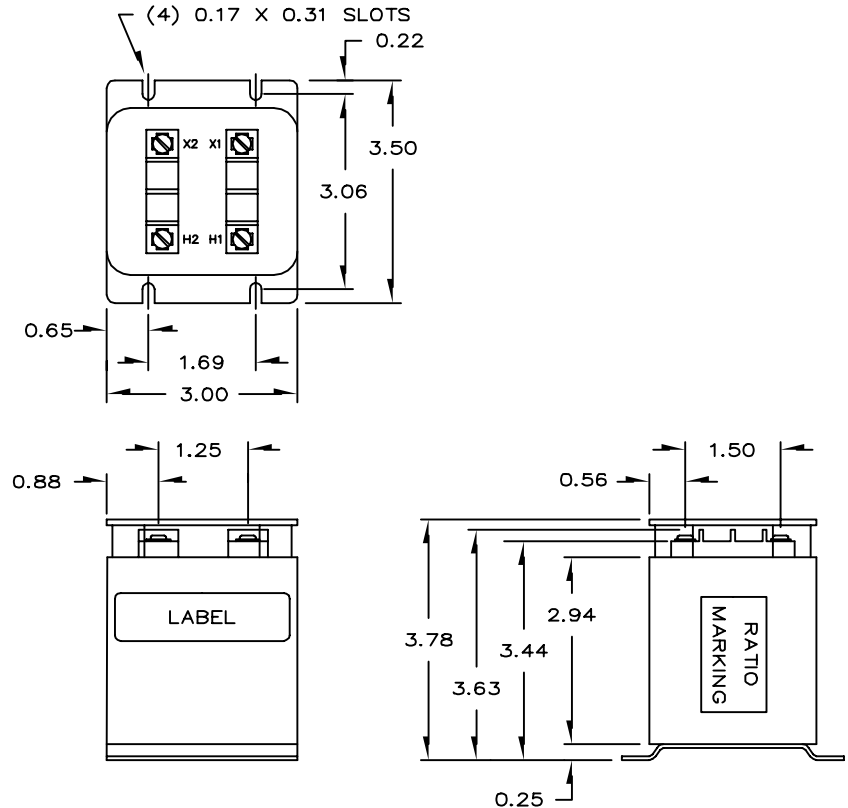
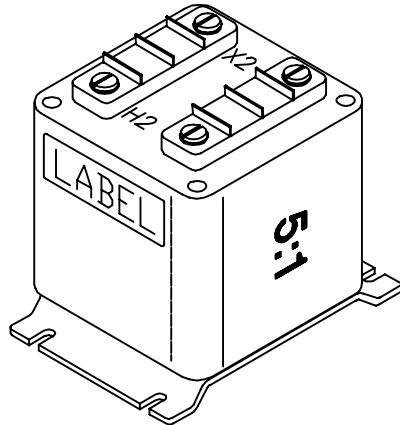
REGULATORY AGENCY APPROVALS



Manufactured to meet the requirements of ANSI/IEEE C57.13.
Classified by U.L. in accordance with IEC 44-2

See page 14 & 15 for 3 phase 4 wire connected version.

- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- Terminals are No. 6-32 screws with one lockwasher and one flatwasher.
- It is desirable to use a 0.40 amp fuse in the secondary to protect the transformer.
- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Models designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- Each transformer has a clear plastic terminal cover.
- Approximate weight: 2.5 lbs.



CATALOG NUMBER	VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
467-069	69.3:120	0.58:1	1.5
467-120	120:120	1:1	1.0
467-208	208:120	1.73:1	0.5
467-240	240:120	2:1	0.5
467-277	277:120	2.31:1	0.5
467-288	288:120	2.4:1	0.4
467-300	300:120	2.5:1	0.4
467-346	346:120	2.88:1	0.4
*467-480	*480:120	4:1	0.25
*467-600	*600:120	5:1	0.25

VOLTAGE TRANSFORMER

Model 468

FREQUENCY:
60 Hz

STANDARD SECONDARY VOLTAGE:
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
± 0.6% at all burdens up to 7.5 VA
and ± 1.5% with 20 VA burden.

THERMAL RATING:
75 VA at 30°C amb.,
50 VA at 55°C amb.

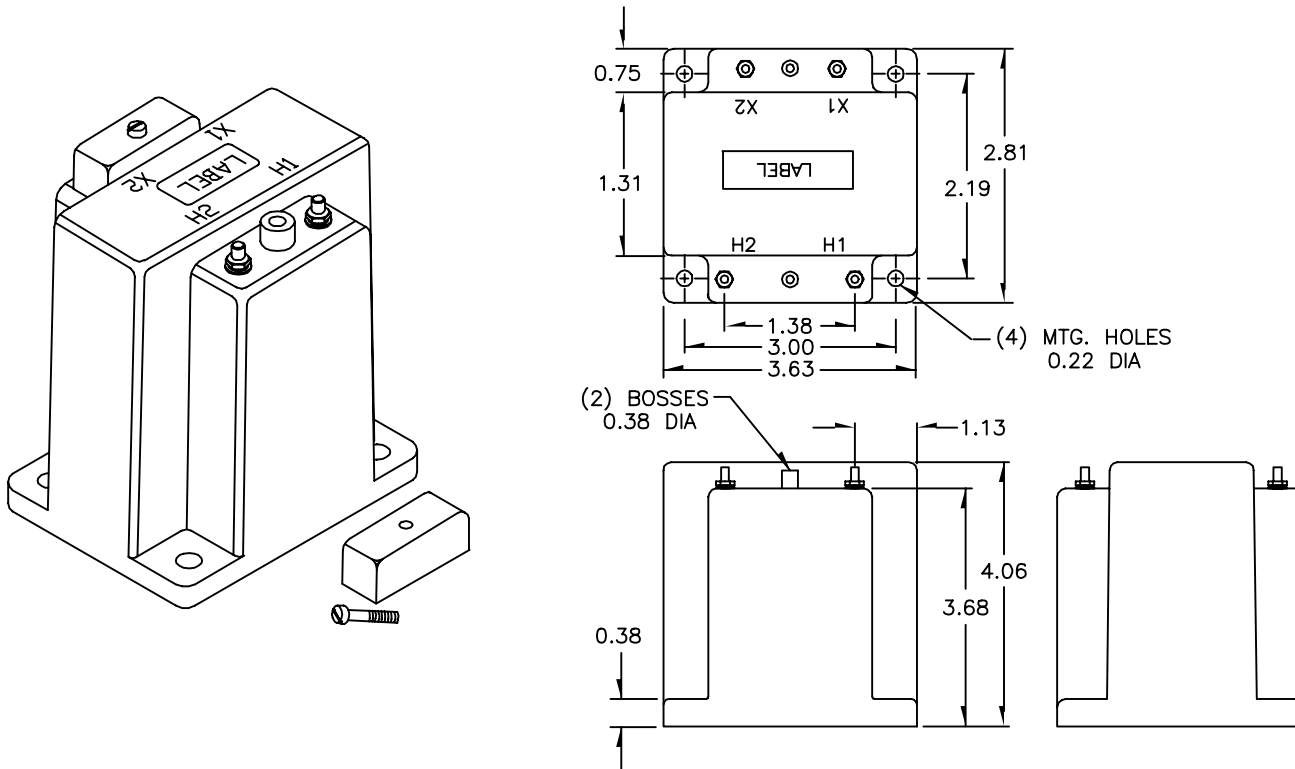
REGULATORY AGENCY APPROVALS



Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

See page 16 for 3 phase version.

- Terminals are brass studs No. 10-32 with one lockwasher, flatwasher and regular nut.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- It is desirable to use a 0.80 amp fuse in the secondary to protect the transformer.
- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Models 468-380, 468-400, 468-416 designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- Each transformer has two plastic terminal covers.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- Approximate weight: 4 lbs.



CATALOG NUMBER	VOLTAGE RATING	URNS RATIO	REC. PRIMARY FUSE RATING
468-069	69.3:120	0.58:1	3.0
468-120	120:120	1:1	2.0
468-208	208:120	1.73:1	1.0
468-240	240:120	2:1	1.0
468-277	277:120	2.31:1	1.0
468-288	288:120	2.4:1	0.75
468-300	300:120	2.5:1	0.75
468-346	346:120	2.88:1	0.75
*468-480	*480:120	4:1	0.50
*468-600	*600:120	5:1	0.40

VOLTAGE TRANSFORMER

Model 465

FREQUENCY:
60 Hz

STANDARD SECONDARY VOLTAGE:
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
0.6 W, 1.2 X at 60 Hz.

THERMAL RATING:
150 VA at 30°C. amb.,
100 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

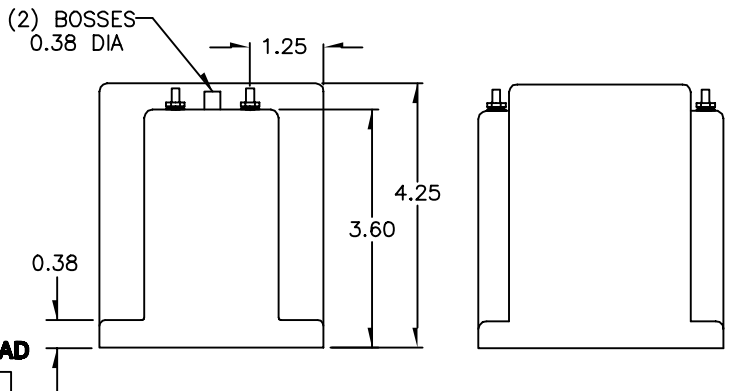
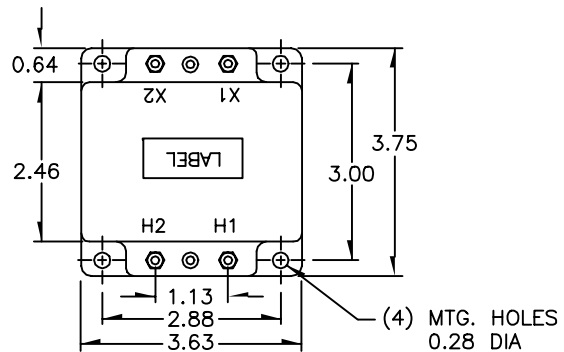
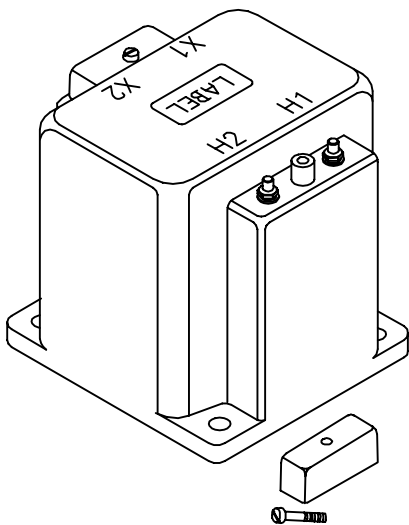


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

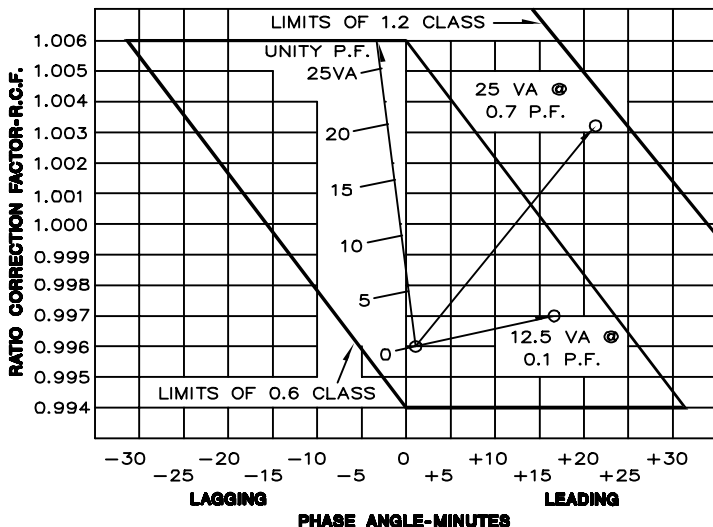
- Terminals are brass studs No. 10-32 with one lockwasher, flatwasher and regular nut.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).

- It is desirable to use a 1.6 amp fuse in the secondary to protect the transformer.
- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Models designed specifically for 50 Hz operation are available with reduced performance consult factory for details.

- This page contains a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- Each transformer has two plastic terminal covers.
- Approximate weight: 7.75 lbs.



VOLTAGE TRANSFORMER CIRCLE DIAGRAM
THIS GRAPH IS DRAWN FOR A 60Hz 0.6 P.F. SYSTEM LOAD



CATALOG NUMBER	VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
465-069	69.3:120	0.58:1	5.0
465-120	120:120	1:1	4.0
465-208	208:120	1.73:1	2.0
465-240	240:120	2:1	2.0
465-277	277:120	2.31:1	2.0
465-288	288:120	2.4:1	1.5
465-300	300:120	2.5:1	1.5
465-346	346:120	2.88:1	1.5
*465-480	*480:120	4:1	1.0
*465-600	*600:120	5:1	0.75

VOLTAGE TRANSFORMER

Model 460

FREQUENCY:
60 Hz

STANDARD SECONDARY VOLTAGE:
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
0.6 W, 1.2 X at 60 Hz.

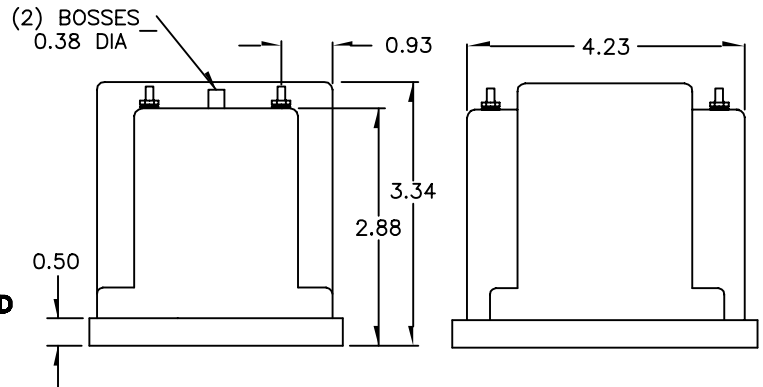
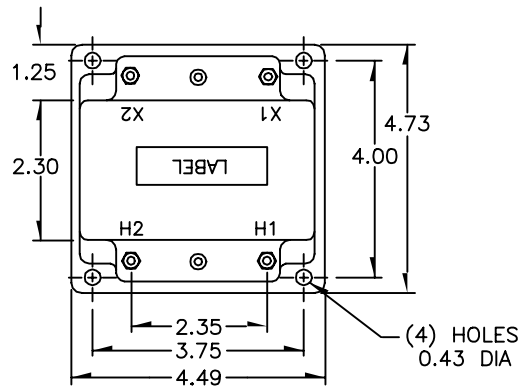
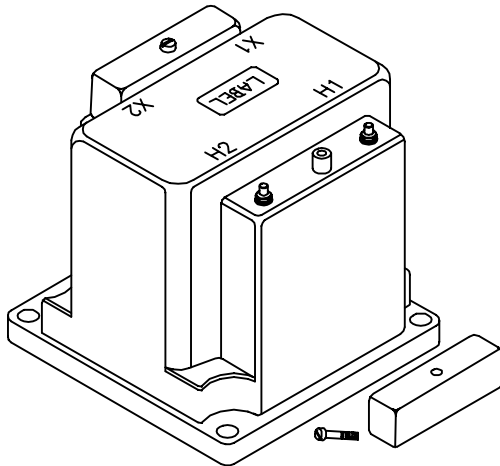
THERMAL RATING:
150 VA at 30°C. amb.,
100 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

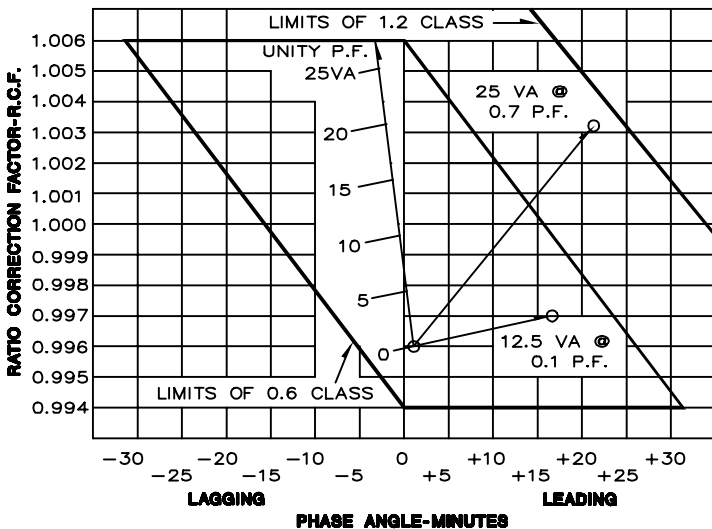


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- Terminals are brass studs No. 10-32 with one lockwasher, flatwasher and regular nut.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- It is desirable to use a 1.6 amp fuse in the secondary to protect the transformer.
- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Models designed specifically for 50 Hz operation are available with reduced performance consult factory for details.
- This page contains a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- Each transformer has two plastic terminal covers.
- Approximate weight: 7.75 lbs.



VOLTAGE TRANSFORMER CIRCLE DIAGRAM
THIS GRAPH IS DRAWN FOR A 60Hz 0.6 P.F. SYSTEM LOAD



CATALOG NUMBER	VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
460-069	69.3:120	0.58:1	5.0
460-120	120:120	1:1	4.0
460-208	208:120	1.73:1	2.0
460-240	240:120	2:1	2.0
460-277	277:120	2.31:1	2.0
460-288	288:120	2.4:1	1.5
460-300	300:120	2.5:1	1.5
460-346	346:120	2.88:1	1.5
*460-480	*480:120	4:1	1.0
*460-600	*600:120	5:1	0.75

VOLTAGE TRANSFORMER

Model 460 F & FF

FREQUENCY:
60 Hz

STANDARD SECONDARY VOLTAGE:
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
0.6 W, 1.2 X at 60 Hz.

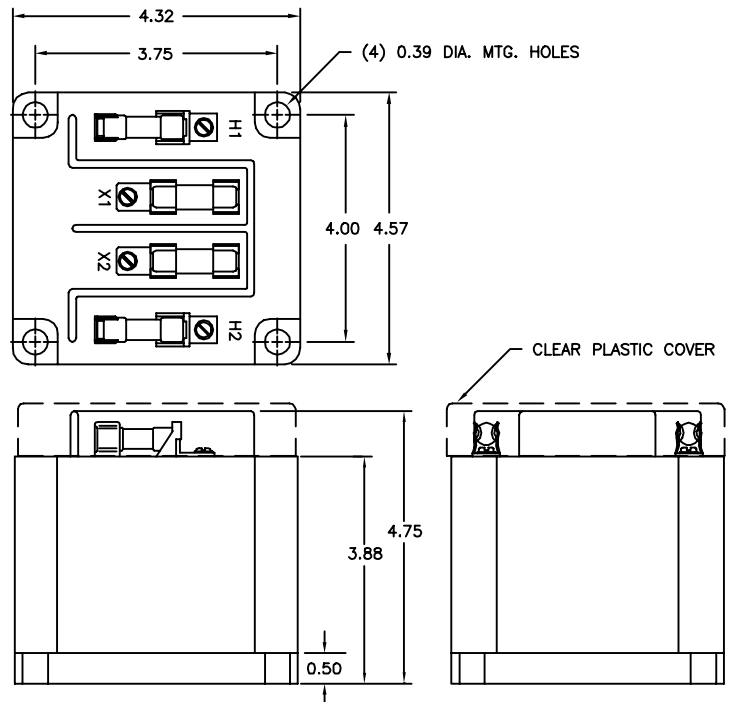
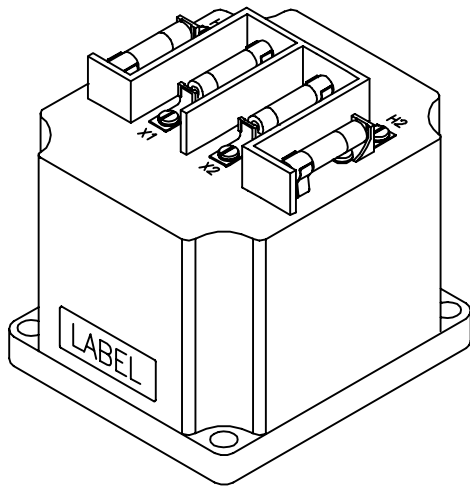
THERMAL RATING:
150 VA at 30°C. amb.,
100 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

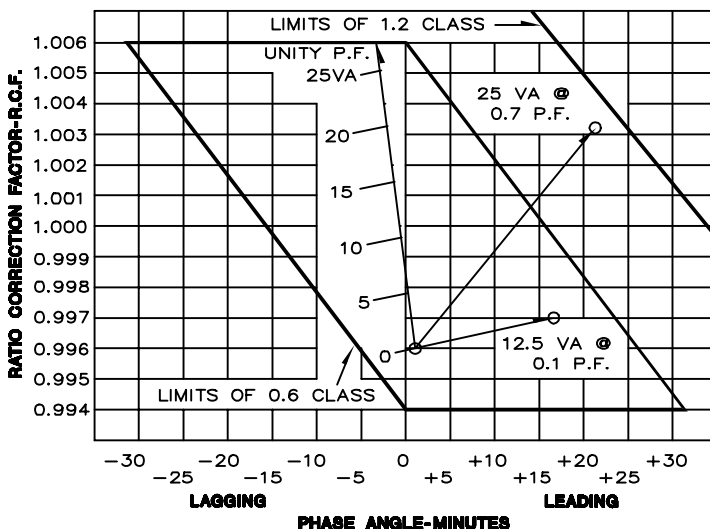


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- Terminals are brass screws No. 8-32 with one lockwasher, flatwasher.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- It is desirable to use a 1.6 amp BBS type or equal fuse in the secondary to protect the transformer.
- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Primary fuses are class CC rejection type.
- Models designed specifically for 50 Hz operation are available with reduced performance consult factory for details.
- This page contains a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- Approximate weight: 7.75 lbs.



VOLTAGE TRANSFORMER CIRCLE DIAGRAM
THIS GRAPH IS DRAWN FOR A 60Hz 0.6 P.F. SYSTEM LOAD



CATALOG NUMBER		VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES			
460-069F	460-069FF	69.3:120	0.58:1	5.0
460-120F	460-120FF	120:120	1:1	4.0
460-208F	460-208FF	208:120	1.73:1	2.0
460-240F	460-240FF	240:120	2:1	2.0
460-277F	460-277FF	277:120	2.31:1	2.0
460-288F	460-288FF	288:120	2.4:1	1.5
460-300F	460-300FF	300:120	2.5:1	1.5
460-346F	460-346FF	346:120	2.88:1	1.5
*460-480F	*460-480FF	*480:120	4:1	1.0
*460-600F	*460-600FF	*600:120	5:1	0.75

VOLTAGE TRANSFORMER

Model 475

FREQUENCY:
60 Hz

STANDARD SECONDARY VOLTAGE:
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
0.3 W, 0.6 X, 1.2 M at 60 Hz.

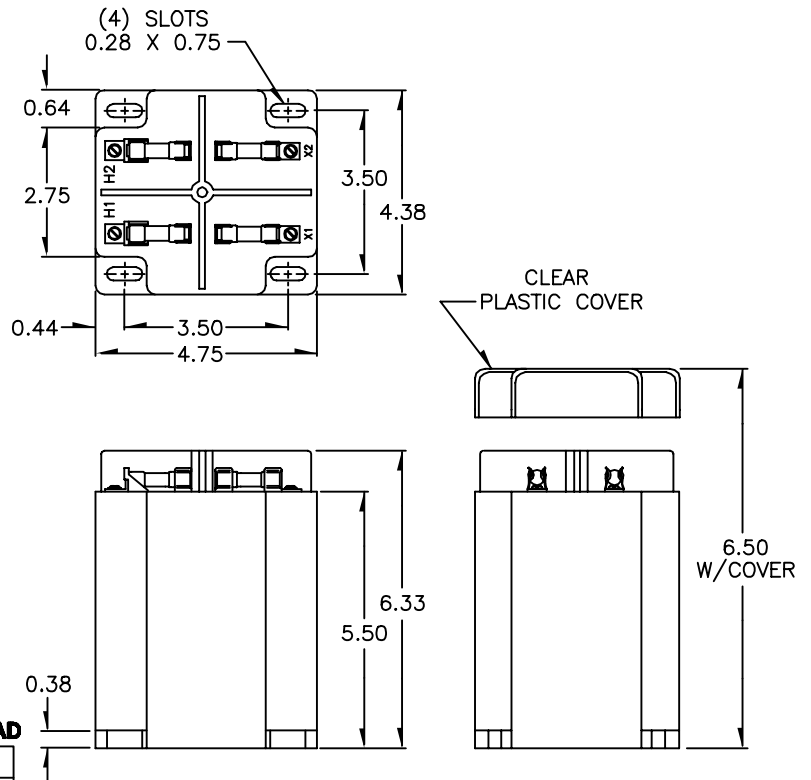
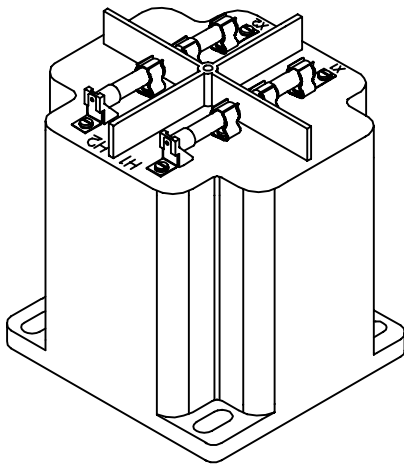
THERMAL RATING:
300 VA at 30°C. amb.,
200 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

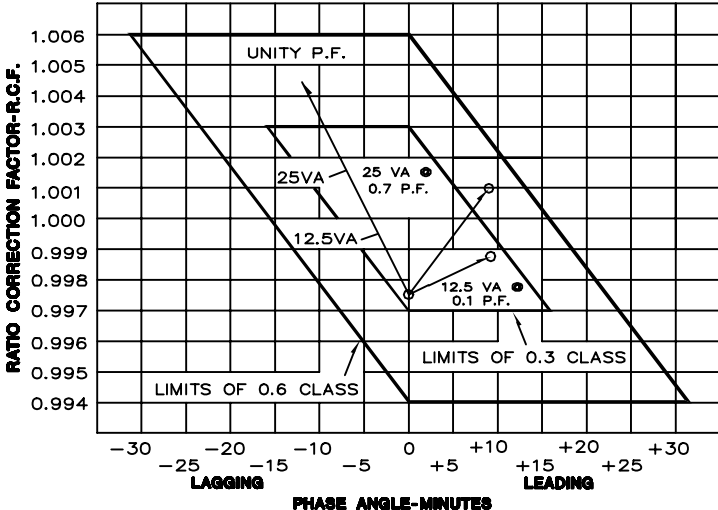


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- The primary and secondary terminals are #8 brass screws with flat washer and a lockwasher.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- It is desirable to use a 3.0 amp BBS type or equal fuse in the secondary to protect the transformer.
- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Models designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- This page contains a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- Transformer has a plastic terminal cover.
- Approximate weight: 12.5 lbs.



VOLTAGE TRANSFORMER CIRCLE DIAGRAM
THIS GRAPH IS DRAWN FOR A 60Hz 0.6 P.F. SYSTEM LOAD



CATALOG NUMBERS			VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
NOT FUSED	PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES			
475-069	475-069F	475-069FF	69.3:120	0.58:1	10.0
475-120	475-120F	475-120FF	120:120	1:1	6.0
475-208	475-208F	475-208FF	208:120	1.73:1	4.0
475-240	475-240F	475-240FF	240:120	2:1	4.0
475-277	475-277F	475-277FF	277:120	2.31:1	4.0
475-288	475-288F	475-288FF	288:120	2.4:1	3.0
475-300	475-300F	475-300FF	300:120	2.5:1	3.0
475-346	475-346F	475-346FF	346:120	2.88:1	3.0
*475-480	*475-480F	*475-480FF	*480:120	4:1	2.0
*475-600	*475-600F	*475-600FF	*600:120	5:1	1.5

VOLTAGE TRANSFORMER

Model 456

FREQUENCY:
60 Hz

STANDARD SECONDARY VOLTAGE:
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
0.3 W, X, M and 0.6Y
Those marked ** are
0.6 W, X, M and Y
THERMAL RATING:
500 VA at 30°C. amb.,
300 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

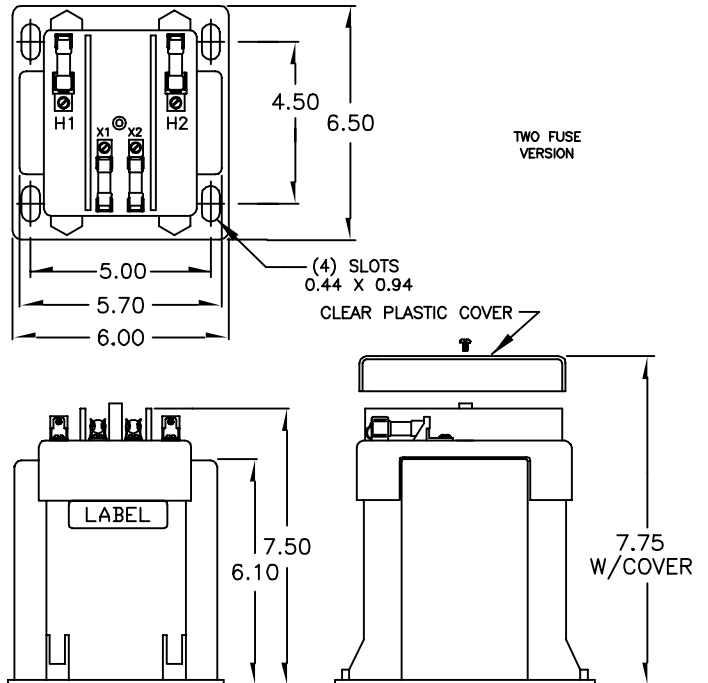
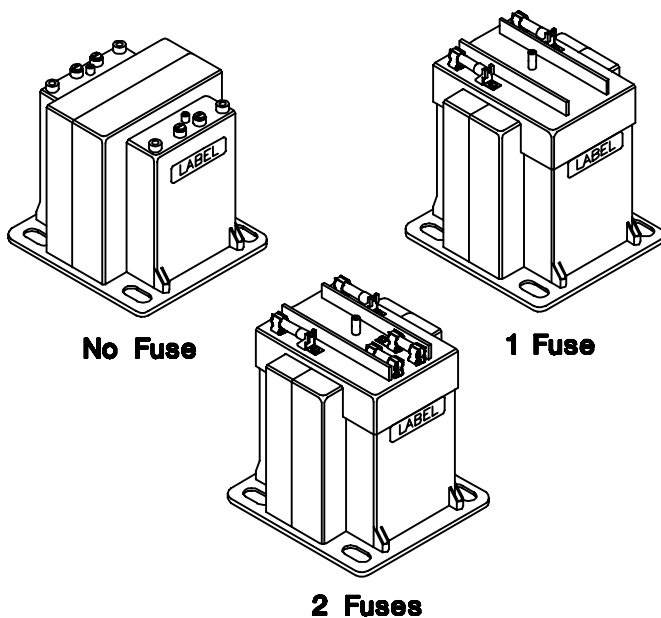


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

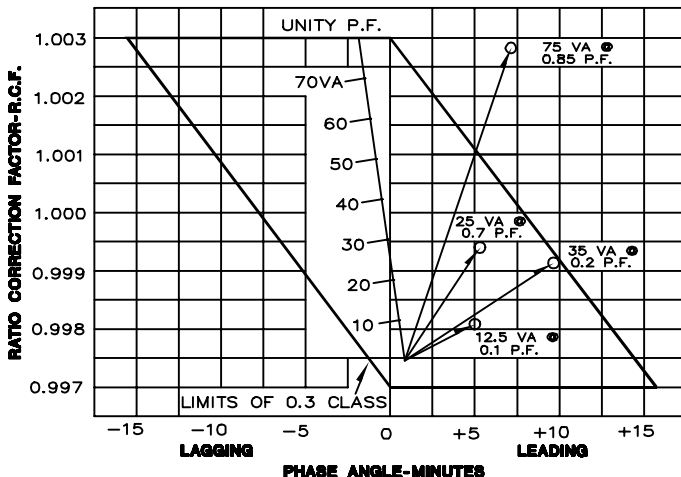
- The primary and secondary terminals are No. 10-32 screws into 3/8" deep brass inserts and fitted with one lockwasher and flatwasher and are contained in a sealable terminal cover.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- It is desirable to use a 5.0 amp BBS type or equal fuse in the secondary to protect the transformer.

- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Models designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- Fuse blocks containing type KTK-R (class CC) fuses can be fitted.
- When primary fuses are requested, the ratings will be as given in the table below.

- This page contains a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- When only one fuse is used, it must be connected into the line side (H1) terminal wiring. This will prevent the presence of voltage at the H1 terminal for a ruptured fuse in the neutral (H2) terminal wiring for line-to-neutral connected transformers.
- Approximate weight: 18.5 lbs.



VOLTAGE TRANSFORMER CIRCLE DIAGRAM
THIS GRAPH IS DRAWN FOR A 60Hz 0.6 P.F. SYSTEM LOAD



CATALOG NUMBERS			VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
NOT FUSED	PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES			
**456-069	456-069F	456-069FF	69.3:120	0.58:1	12.0
**456-120	456-120F	456-120FF	120:120	1:1	10.0
456-208	456-208F	456-208FF	208:120	1.73:1	6.0
456-240	456-240F	456-240FF	240:120	2:1	6.0
456-277	456-277F	456-277FF	277:120	2.31:1	6.0
456-288	456-288F	456-288FF	288:120	2.4:1	5.0
456-300	456-300F	456-300FF	300:120	2.5:1	4.0
456-346	456-346F	456-346FF	346:120	2.88:1	4.0
*456-480	*456-480F	*456-480FF	480:120	4:1	3.0
*456-600	*456-600F	*456-600FF	600:120	5:1	2.0

Retro Fit Fuse Kit Order No. 0222 PL 7019

VOLTAGE TRANSFORMER

Model 450

FREQUENCY:

60 Hz

STANDARD SECONDARY VOLTAGE:

120 Volts

INSULATION LEVEL:

600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:

0.3 W, X,M & Y, 1.2Z
@0.3 W, 0.6 X, M & Y

THERMAL RATING:

750 VA at 30°C. amb.,
500 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

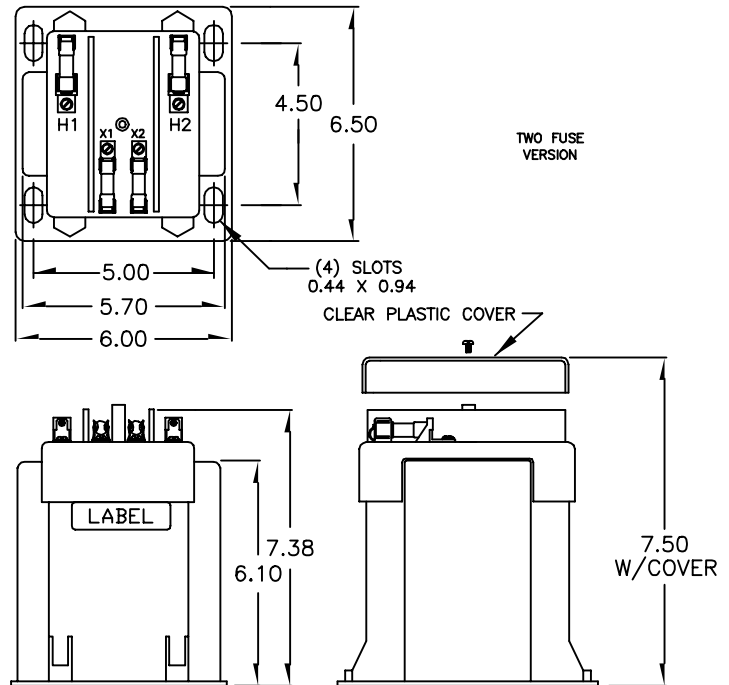
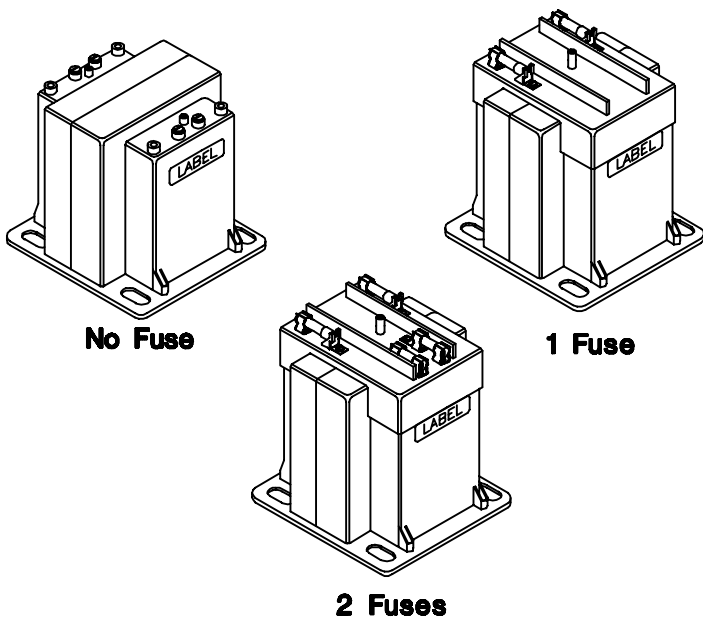


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

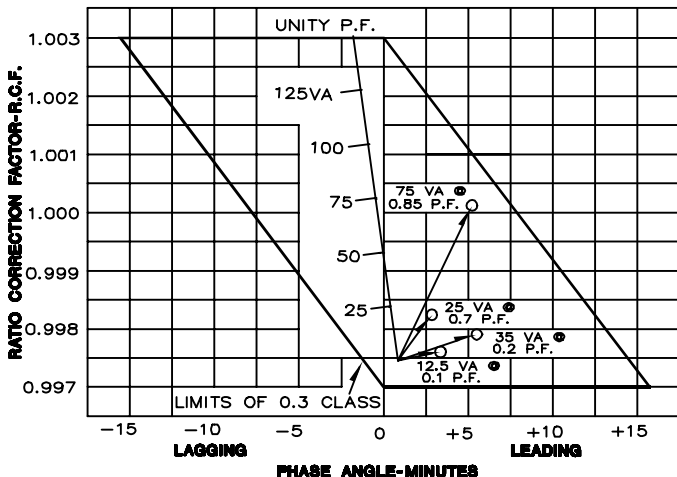
- The primary and secondary terminals are No. 10-32 screws into 3/8" deep brass inserts and fitted with one lockwasher and flatwasher and are contained in a sealable terminal cover.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- It is desirable to use an 8.0 amp BBS type or equal fuse in the secondary to protect the transformer.

- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Model designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- Fuse blocks containing type KTK-R (class CC) fuses can be fitted.
- When primary fuses are requested, the ratings will be as given in the table below.

- This page contains a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- When only one fuse is used, it must be connected into the line side (H1) terminal wiring. This will prevent the presence of voltage at the H1 terminal for a ruptured fuse in the neutral (H2) terminal wiring for line-to-neutral connected transformers.
- Approximate weight: 25 lbs.



VOLTAGE TRANSFORMER CIRCLE DIAGRAM
THIS GRAPH IS DRAWN FOR A 60Hz 0.6 P.F. SYSTEM LOAD



CATALOG NUMBERS			VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
NOT FUSED	PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES			
@450-069	450-069F	450-069FF	69.3:120	0.58:1	15.0
@450-120	450-120F	450-120FF	120:120	1:1	10.0
450-208	450-208F	450-208FF	208:120	1.73:1	8.0
450-240	450-240F	450-240FF	240:120	2:1	8.0
450-277	450-277F	450-277FF	277:120	2.31:1	8.0
450-288	450-288F	450-288FF	288:120	2.4:1	6.0
450-300	450-300F	450-300FF	300:120	2.5:1	6.0
450-346	450-346F	450-346FF	346:120	2.88:1	5.0
*450-480	*450-480F	*450-480FF	480:120	4:1	4.0
*450-600	*450-600F	*450-600FF	600:120	5:1	3.0

Retro Fit Fuse Kit Order No. 0222 PL 7019

3 PHASE VOLTAGE TRANSFORMER

Model 2VT469

FREQUENCY:

60 Hz

STANDARD SECONDARY VOLTAGE:

120 Volts

INSULATION LEVEL:

600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:

± 1% at all burdens up to 5 VA at 1.0 and 0.95 P.F.

THERMAL RATING:

40 VA at 30°C. amb.,
27 VA at 55°C. amb.

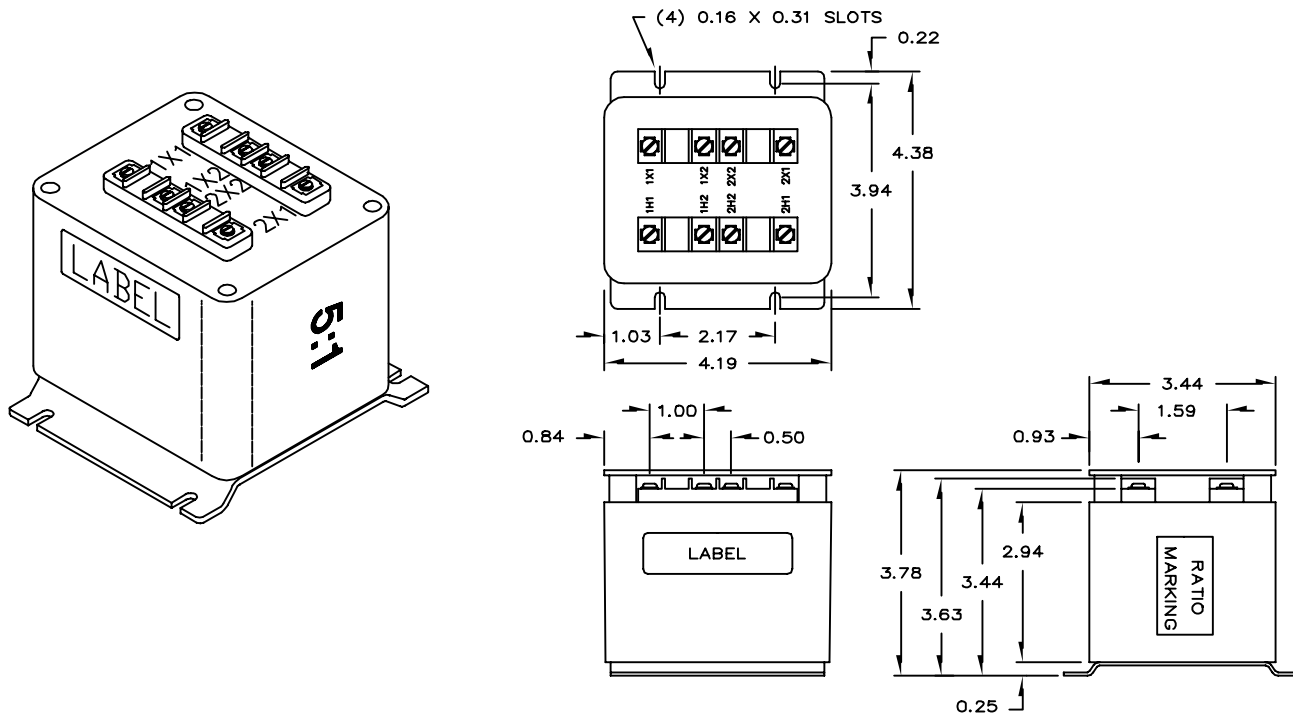
REGULATORY AGENCY APPROVALS



Manufactured to meet the requirements of ANSI/IEEE C57.13.
Classified by U.L. in accordance with IEC 44-2

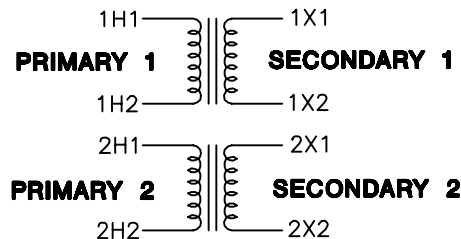
See page 14 & 15 for 3 phase 4 wire connected version.

- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line-to-line. They may also be operated line-to-ground or line-to-neutral at reduced voltage, (58% of rated volts).
- Terminals are No. 6-32 screws with one lockwasher and one flatwasher.
- It is desirable to use a 0.40 amp fuse in the secondary to protect the transformer.
- With two exceptions these transformers are ANSI C57.13 group 1. Those marked * are group 2.
- Models designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- Model 469 is an assembly of two transformers in one case with all terminals accessible, for open delta connection.
- Each transformer has a clear plastic terminal cover.
- Approximate weight: 4.5 lbs.



CATALOG NUMBER	VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
469-069	69.3:120	0.58:1	1.5
469-120	120:120	1:1	1.0
469-208	208:120	1.73:1	0.5
469-240	240:120	2:1	0.5
469-277	277:120	2.31:1	0.5
469-288	288:120	2.4:1	0.4
469-300	300:120	2.5:1	0.4
469-346	346:120	2.88:1	0.4
*469-480	*480:120	4:1	0.25
*469-600	*600:120	5:1	0.25

469 CONNECTION DIAGRAM



3 PHASE VOLTAGE TRANSFORMER

Model 3VT471

FREQUENCY:
60 Hz

**STANDARD
SECONDARY VOLTAGE:**
120 Volts line-to-line

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS: (Per Phase)
±1% @ 5 VA

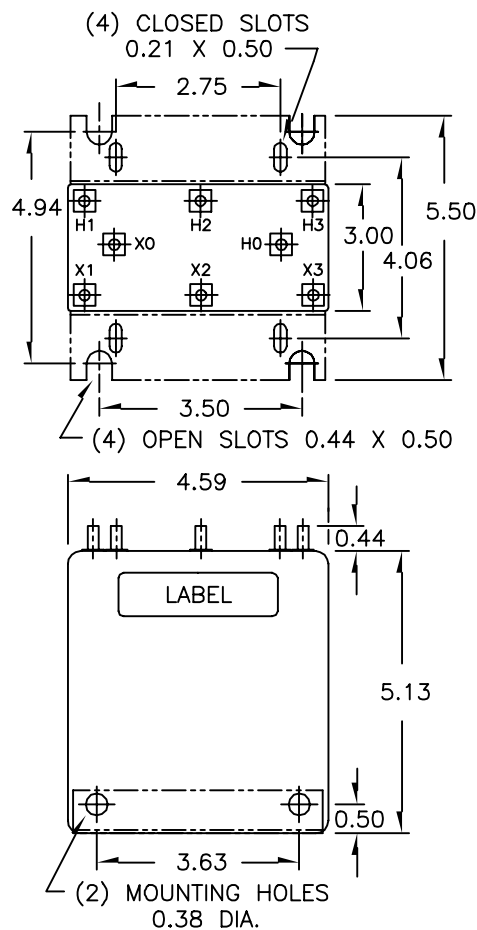
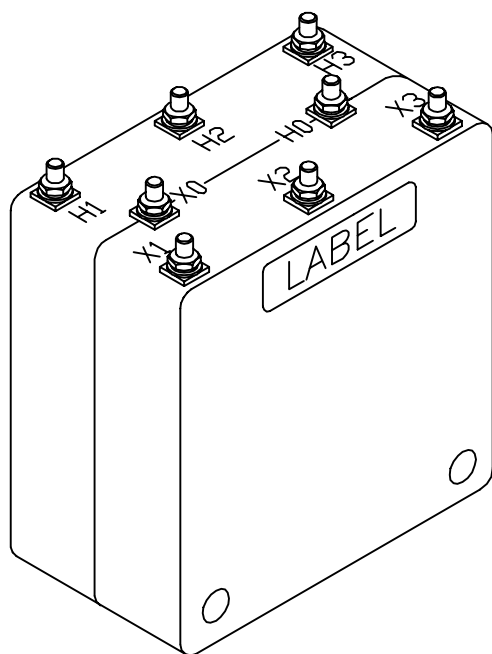
THERMAL RATING: (Per Phase)
40 VA at 30°C. amb.,
27 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

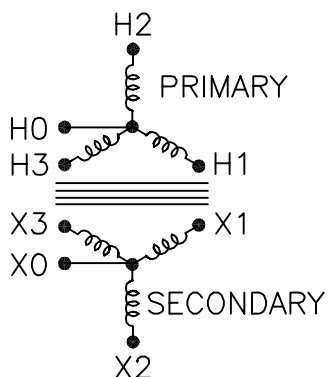


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- 3VT471 terminals are brass studs No. 8-32 with one lockwasher, flatwasher and regular nut.
- The core and coil assembly is encased in a thermoplastic shell, and filled with resin.
- Only ground XO/HO terminals if source is 3 phase, 4 wire effectively grounded.
- These transformers are designed for application to Y connected systems.
- Approximate weight: 8 lbs.



Order Mounting Bracket
Kit No. 0221B00541



CATALOG NUMBER	PRIMARY VOLTS LINE/LINE	SECONDARY VOLTS		TURNS RATIO	REC. PRIMARY FUSE RATING	SECONDARY FUSE RATING
		LINE/LINE	LINE/NEUTRAL			
3VT471-120-120	120Y	120	69.3	1:1	1.5	0.8
3VT471-120-208	120Y	208	120	1:1.73	1.5	0.4
3VT471-208-120	208Y	120	69.3	1.73:1	1.0	0.8
3VT471-208-208	208Y	208	120	1:1	1.0	0.4
3VT471-480-120	480Y	120	69.3	4:1	0.5	0.8
3VT471-480-208	480Y	208	120	2.31:1	0.5	0.4
3VT471-600-120	600Y	120	69.3	5:1	0.4	0.8
3VT471-600-208	600Y	208	120	2.88:1	0.4	0.4

3 PHASE VOLTAGE TRANSFORMER

Model 3VT472

FREQUENCY:
60 Hz

**STANDARD
SECONDARY VOLTAGE:**
120 Volts line-to-line

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS: (Per Phase)
±1% @ 5 VA

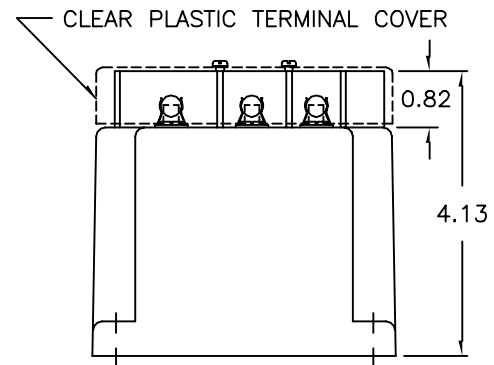
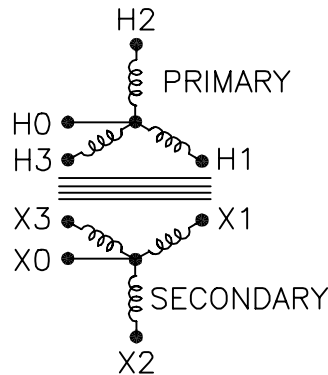
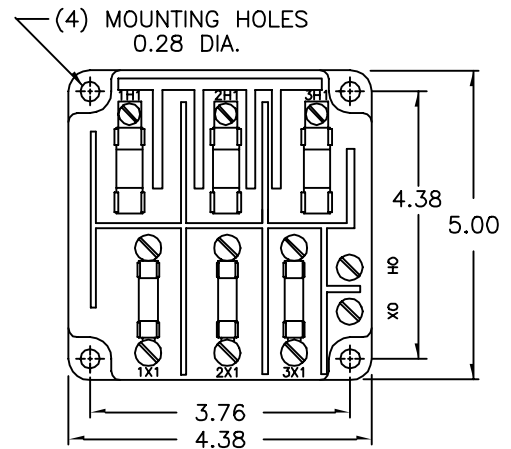
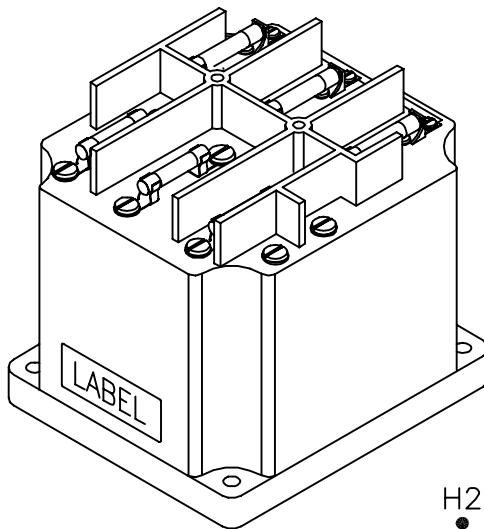
THERMAL RATING: (Per Phase)
40 VA at 30°C. amb.,
27 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS



Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- 3VT472 terminals are brass screws No. 8-32 with one lockwasher and flatwasher.
- The core and coil assembly is encased in a thermoplastic shell, and filled with resin.
- Only ground X0/HO terminals if source is 3 phase, 4 wire effectively grounded.
- These transformers are designed for application to Y connected systems.
- 3VT472 available with primary and/or secondary fuses.
- Primary fuses are type CC rejection style. Secondary fuses are type BBS.
- Approximate weight: 8 lbs.



CATALOG NUMBERS		PRIMARY VOLTS LINE/LINE	SECONDARY VOLTS		TURNS RATIO	REC. PRIMARY FUSE RATING	SECONDARY FUSE RATING
PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES		LINE/LINE	LINE/NEUTRAL			
3VT472-120-120F	3VT472-120-120FF	120Y	120	69.3	1:1	1.5	0.8
3VT472-120-208F	3VT472-120-208FF	120Y	208	120	1:1.73	1.5	0.4
3VT472-208-120F	3VT472-208-120FF	208Y	120	69.3	1.73:1	1.0	0.8
3VT472-208-208F	3VT472-208-208FF	208Y	208	120	1:1	1.0	0.4
3VT472-480-120F	3VT472-480-120FF	480Y	120	69.3	4:1	0.5	0.8
3VT472-480-208F	3VT472-480-208FF	480Y	208	120	2.31:1	0.5	0.4
3VT472-600-120F	3VT472-600-120FF	600Y	120	69.3	5:1	0.4	0.8
3VT472-600-208F	3VT472-600-208FF	600Y	208	120	2.88:1	0.4	0.4

3 PHASE VOLTAGE TRANSFORMER

Model 3VT468

FREQUENCY:
60 Hz

**STANDARD
SECONDARY VOLTAGE:**
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS:
± 0.6% @ 7.5 VA.

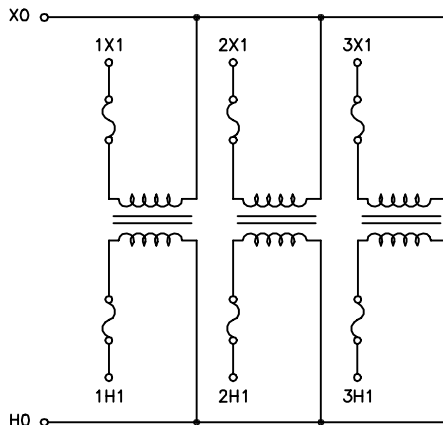
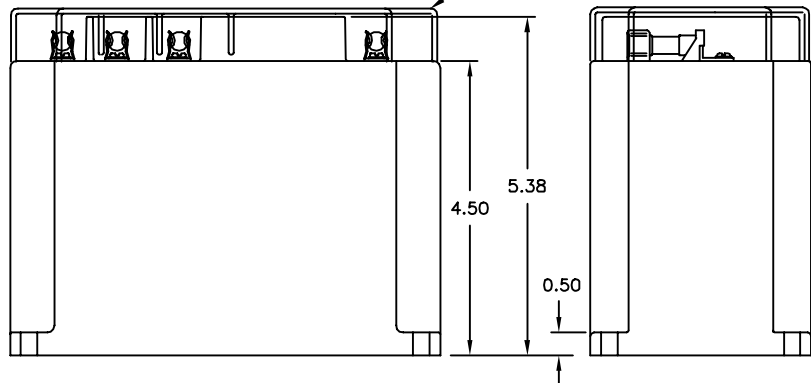
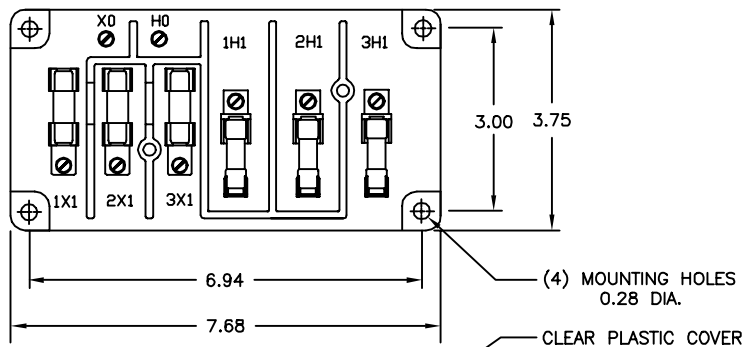
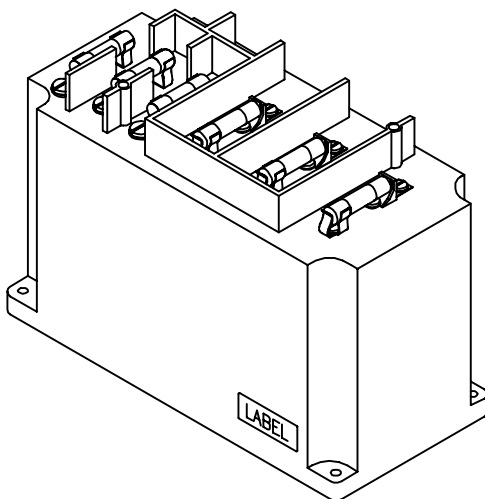
THERMAL RATING: (Per Phase)
75 VA at 30°C. amb.,
50 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS



Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- Terminals are brass screws No. 8-32 with one lockwasher and flatwasher.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for application to Y connected systems.
- Only ground XO/HO terminals if source is 3 phase, 4 wire effectively grounded.
- Primary fuses are class CC rejection type.
- It is desirable to use a 0.80 amp BBS type or equal fuse in the secondary to protect the transformer.
- Models designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- Supplied with a plastic terminal cover.
- Approximate weight: 8.00 lbs.



CONNECTION DIAGRAM

CATALOG NUMBERS			LINE/NEUTRAL VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
NOT FUSED	PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES			
3VT468-069	3VT468-069F	3VT468-069FF	69.3:120	0.58:1	3.0
3VT468-120	3VT468-120F	3VT468-120FF	120:120	1:1	2.0
3VT468-208	3VT468-208F	3VT468-208FF	208:120	1.73:1	1.0
3VT468-240	3VT468-240F	3VT468-240FF	240:120	2:1	1.0
3VT468-277	3VT468-277F	3VT468-277FF	277:120	2.31:1	1.0
3VT468-288	3VT468-288F	3VT468-288FF	288:120	2.4:1	0.75
3VT468-300	3VT468-300F	3VT468-300FF	300:120	2.5:1	0.75
3VT468-346	3VT468-346F	3VT468-346FF	346:120	2.88:1	0.75

3 PHASE VOLTAGE TRANSFORMER

Model 2VT460

FREQUENCY:
50/60 Hz

**STANDARD
SECONDARY VOLTAGE:**
120 Volts

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS: (Per Phase)
0.6 W, 1.2 X at 60 Hz.

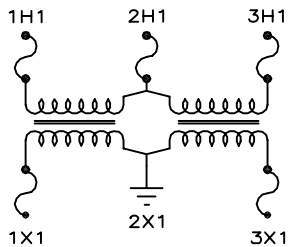
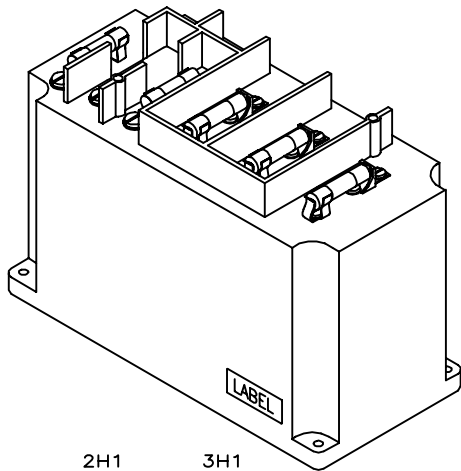
THERMAL RATING: (Per Phase)
150 VA at 30°C. amb.,
100 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

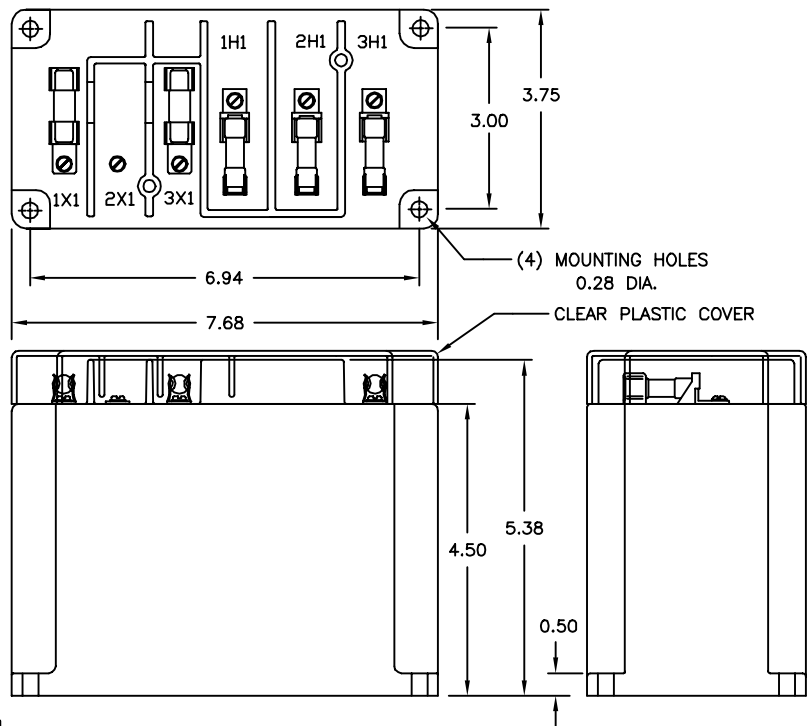


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

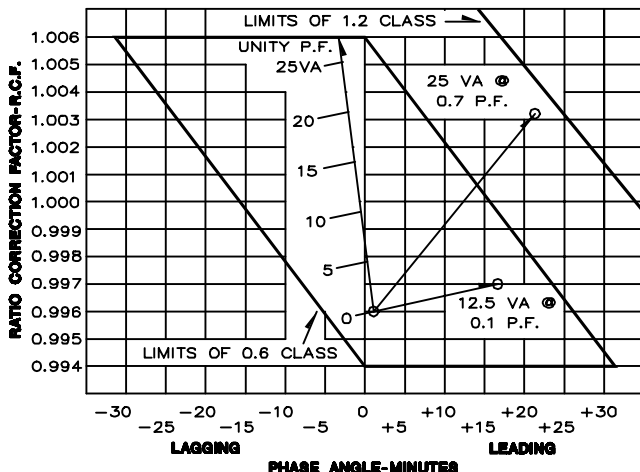
- Terminals are brass screws No. 8-32 with one lockwasher and flatwasher.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for open delta connection.
- Primary fuses are class CC rejection type.
- It is desirable to use a 1.6 amp BBS type or equal fuse in the secondary to protect the transformer.
- Models designed specifically for 50Hz operation are available with reduced performance consult factory for details.
- This page contains a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- Approximate weight: 15.5 lbs.



CONNECTION DIAGRAM



VOLTAGE TRANSFORMER CIRCLE DIAGRAM
THIS GRAPH IS DRAWN FOR A 60Hz 0.6 P.F. SYSTEM LOAD



CATALOG NUMBERS		VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES			
2VT460-069F	2VT460-069FF	69.3:120	0.58:1	5.0
2VT460-120F	2VT460-120FF	120:120	1:1	4.0
2VT460-208F	2VT460-208FF	208:120	1.73:1	2.0
2VT460-240F	2VT460-240FF	240:120	2:1	2.0
2VT460-288F	2VT460-288FF	288:120	2.4:1	1.5
2VT460-300F	2VT460-300FF	300:120	2.5:1	1.5
*2VT460-480F	*2VT460-480FF	*480:120	4:1	1.0
*2VT460-600F	*2VT460-600FF	*600:120	5:1	0.75

3 PHASE VOLTAGE TRANSFORMER

Model 3VTN460

For line to neutral connection

FREQUENCY:

60 Hz

STANDARD SECONDARY VOLTAGE:

120 Volts Line-to-neutral.

INSULATION LEVEL:

600 Volt, 10 kV BIL full wave.

ACCURACY CLASS: (Per Phase)

0.6 W, 1.2 X AT 60 Hz.

THERMAL RATING: (Per Phase)

150 VA at 30°C. amb.,

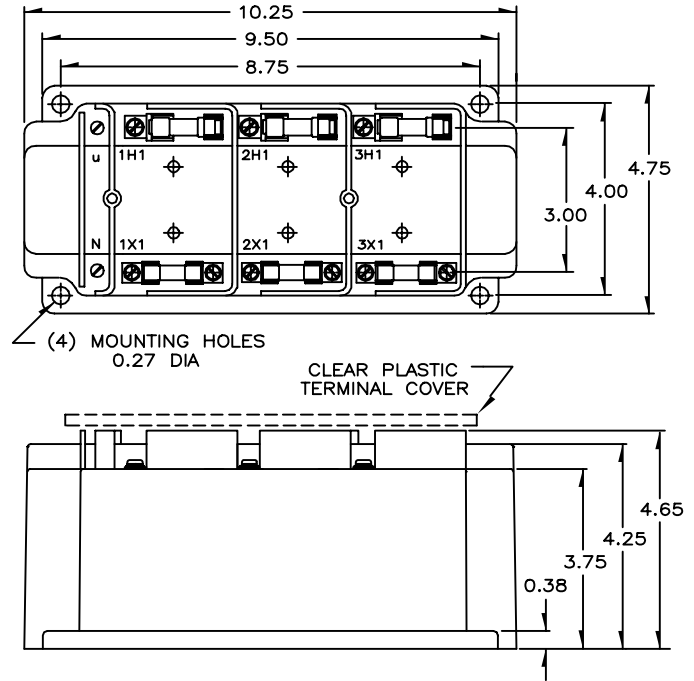
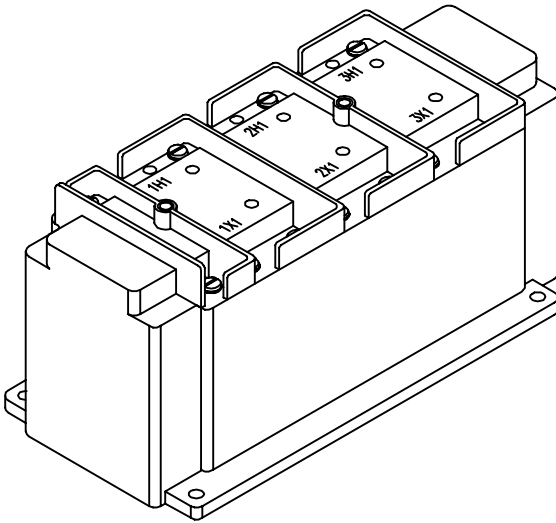
100 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

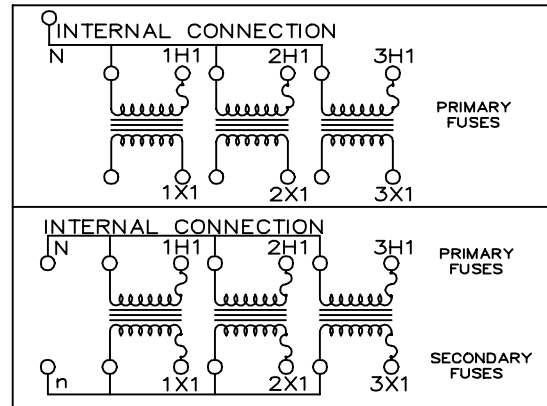


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- The model 3VTN460 is an assembly of three transformers in one case.
- The primary and secondary terminals are No. 8-32 screws into 1/2" deep brass inserts and fitted with one lockwasher and flatwasher.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line to neutral.
- Spacing between live parts per U.L. 1558.
- Primary fuses are current limiting, 200kA interrupting capacity, incorporating a rejection feature, typically (class CC) KTK-R type.
- It is desirable to use a 1.6 amp BBS type or equal fuse in the secondary to protect the transformer.
- The transformer has a clear plastic terminal cover.
- Only ground N/n terminals if source is 3 phase, 4 wire effectively grounded.
- See page 8 of this section for a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- Approximate weight: 24 lbs.



CATALOG NUMBER		LINE TO NEUTRAL VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
PRIMARY FUSES ONLY	PRIMARY AND SECONDARY FUSES			
3VTN460-069F*	3VTN460-069FF*	69.3:120	0.58:1	5.0
3VTN460-120F*	3VTN460-120FF*	120:120	1:1	4.0
3VTN460-240F*	3VTN460-240FF*	240:120	2:1	2.0
3VTN460-277F*	3VTN460-277FF*	277:120	2.31:1	2.0
3VTN460-300F*	3VTN460-300FF*	300:120	2.5:1	1.5
3VTN460-346F*	3VTN460-346FF*	346:120	2.88:1	1.5



CONNECTION DIAGRAMS

* FUSE ORDERING
INSERT F AFTER PRIMARY VOLTAGE RATING FOR PRIMARY FUSES,
INSERT FF AFTER PRIMARY VOLTAGE RATING FOR PRIMARY AND
SECONDARY FUSES.

3 PHASE VOLTAGE TRANSFORMER

Model 3VTL460
For line to line connection

FREQUENCY:
60 Hz

**STANDARD
SECONDARY VOLTAGE:**
120 Volts Line-to-Line.

INSULATION LEVEL:
600 Volt, 10 kV BIL full wave.

ACCURACY CLASS: (Per Phase)
0.6 W, 1.2 X AT 60 Hz.

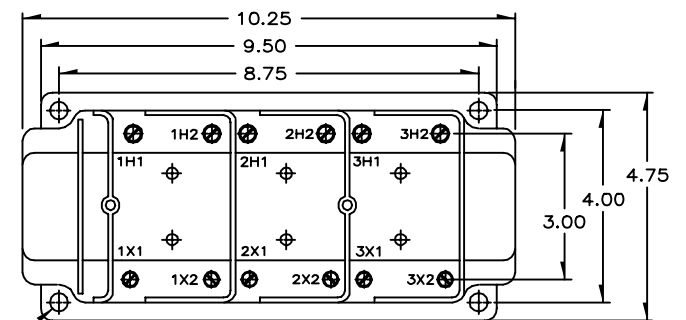
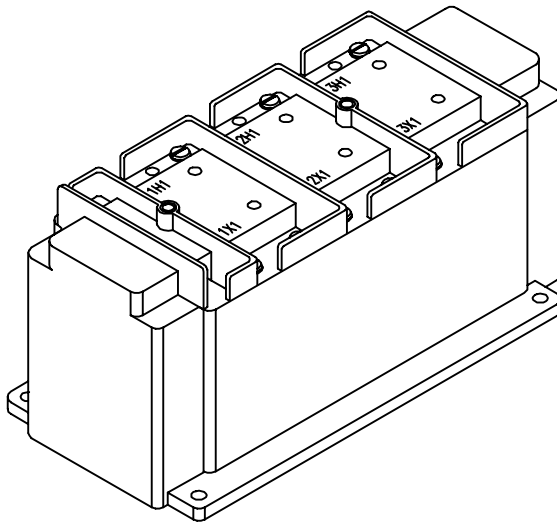
THERMAL RATING: (Per Phase)
150 VA at 30°C. amb.,
100 VA at 55°C. amb.

REGULATORY AGENCY APPROVALS

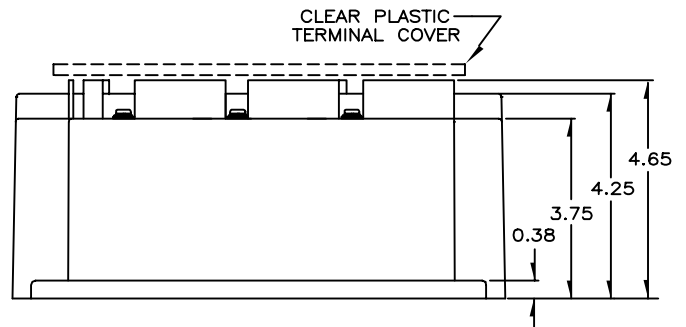


Manufactured to meet the requirements of ANSI C57.13.
Classified by U.L. in accordance with IEC 44-2

- The model 3VTL460 is an assembly of three transformers in one case.
- The primary and secondary terminals are No. 8-32 screws into 1/2" deep brass inserts and fitted with one lockwasher and flatwasher.
- The core and coil assembly is encased in a thermoplastic shell and filled with resin.
- These transformers are designed for operation line to line. All terminals are accessible.
- Spacing between live parts per U.L. 1558.
- The transformer has a clear plastic terminal cover.
- See page 8 of this section for a circle diagram for the estimation of the errors for other than rated burdens. See page 20 in this section for a description of its use.
- Approximate weight: 24 lbs.

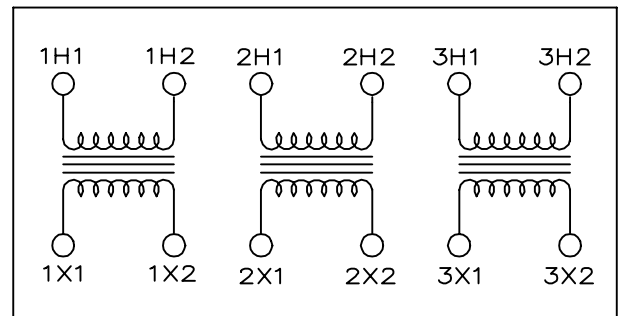


(4) MOUNTING HOLES
0.27 DIA



CLEAR PLASTIC
TERMINAL COVER

CATALOG NUMBERS	LINE TO LINE VOLTAGE RATING	TURNS RATIO	REC. PRIMARY FUSE RATING
3VTL460-120	120:120	1:1	4.0
3VTL460-208	208:120	1.73:1	2.0
3VTL460-240	240:120	2:1	2.0
3VTL460-288	288:120	2.4:1	1.5
3VTL460-480	480:120	4:1	1.0
3VTL460-600	600:120	5:1	0.75



CONNECTION DIAGRAM

CIRCLE DIAGRAM METHOD FOR THE ESTIMATION OF VOLTAGE TRANSFORMER ACCURACY CLASSES.

The accuracy of a voltage transformer is a function of the algebraic and vectorial summation of the no load (or excitation) losses and the burden voltage drop. The elements of these losses at rated voltage can be conveniently estimated by means of a circle diagram, drawn with axes expressed in 0.001 unit steps vertically to represent Ratio Correction Factor and 3.44 minutes of arc horizontally to represent Phase Angle. To use the diagram for a specific voltage transformer, it is necessary to ascertain the elements of RCF and phase angle for no load and with one burden of known volt-ampere rating and power factor. When these elements are plotted on the diagram with a line joining them, the errors for any other burden VA and power factor can be estimated, within the scale of the diagram, by scaling volt-amperes from the distance between the two loci and the power factor in angular measurement difference. It is more convenient to construct a unity power factor line, drawn from the no load error locus, at an angle equal to the power factor angle of the known burden. All the other power factor angles can be constructed from this line. The example below indicates the construction of the diagram and lists the burdens used in the Instrument Transformer Standard, ANSI C57.13

