Non-Linear Load Transformers

Acme's Non-Linear Load and Harmonic Mitigating Transformers protect equipment on the line and prevent damage caused by harmonic currents.

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Many of today's electronic devices are non-linear loads generating high levels of harmonic currents that are then fed back onto your distribution system. This waveform distortion results in overheating of motors and transformers, increased neutral currents and malfunction/damage to other equipment on the line.

Typical non-linear loads include desktop computers, AC variable speed drives, HID lighting, electronic ballasts, inverters and welders. Of these non-linear loads, the major source of harmonic currents is the switch mode power supply found in desktop computers, data processors and other office equipment.

The following guide will help you select the proper transformer when the K-factor is unknown.*

K-Factor/Type of Load	
K1	Resistance heating, Incandescent lighting, Motors, Transformers, control/distribution
K4	Welders, Induction heaters, HID lighting, Fluorescent lighting, Solid state controls
K-13	Telecommunications equipment, Branch Circuits in classrooms and health care facilities
K-20	Main frame computers, Variable speed drives, Branch circuits with exclusive loads of Data Processing equipment, Desktop computers

***** These ratings are to be used as a guide only. They may vary from one load equipment manufacturer to another. A Spectrum Analysis is the best source.

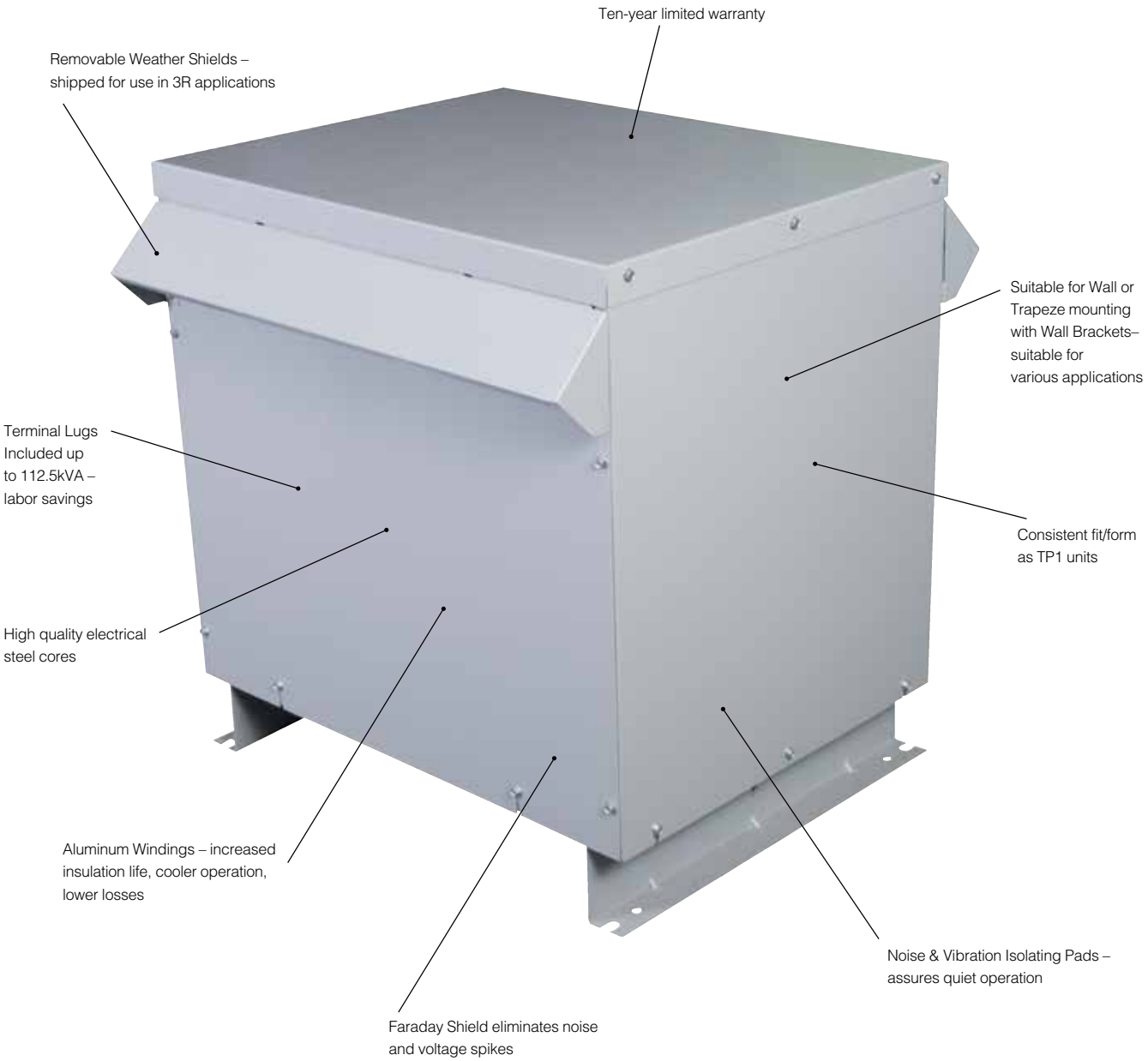
NON-LINEAR LOAD TRANSFORMERS

Acme non-linear load isolation transformers use special winding techniques to minimize eddy current losses generated by harmonic currents. A double-sized neutral conductor handles the excessive neutral current found in non-linear load applications.

The amount of harmonics produced by a given load is represented by the term "K" factor. The larger the "K" factor, the more harmonics are present. Linear loads have a "K" factor of 1; switch mode power supplies typically have a "K" factor as high as 20.

Features

- Available in K-factors of 4, 13 and 20. Consult factory for other K-factors.
- 3R Compliant
- All new units ship with weather shields already installed Flexibility. When a weather shield is not needed, it can easily be removed Terminal Lugs.
- Primary and secondary terminals come standard with lugs (up to 112.5kVA) for quicker, easier connections.
- 150°C and 115°C temperature rise units. 80°C temperature rise consult factory.
- 10-year limited warranty.
- UL Listed and CSA Certified.
- Available in 480V and 208V primary, 15 through 225 kVA.
- Primary taps: (2) 2½% ANFC, (4) 2½% BNFC.
- Aluminum windings



Double-sized neutral conductor handles excessive neutral currents

K FACTOR 13, 150°C RISE
208 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height ② (Inches)(Cm.)	Width ② (Inches)(Cm.)	Depth ② (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15	T3015K0064BK13S	25.50 (64.8)	24.90 (62.0)	19.37 (49.2)	320 (145.1)	F①	61	E
30	T3030K0064BK13S	25.50 (64.8)	24.90 (62.0)	19.37 (49.2)	366 (166.0)	F①	61	E
45	T3045K0064BK13S	29.40 (74.7)	28.15 (71.5)	22.37 (56.8)	522 (236.8)	F①	61	E
75	T3075K0064BK13S	35.40 (89.9)	31.90 (81.0)	26.87 (68.2)	667 (302.6)	F	61	E
112	T3112K0064BK13S	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	1200 (544.0)	F	61	E
150	T3150K0064BK13S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1700 (771.0)	F	61	E
225	T3225K0064BK13S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2165 (982.0)	F	61	G

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes

For Additional Low Temperature Rise 115° and 80° Degree Units and Copper Wound Units, Consult Factory

K FACTOR 20, 150°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height ② (Inches)(Cm.)	Width ② (Inches)(Cm.)	Depth ② (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15.0	T3015K0013BK20S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F ①	22	E
30.0	T3030K0013BK20S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	420 (191.0)	F ①	22	E
45.0	T3045K0013BK20S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	575 (261.0)	F	22	E
75.0	T3075K0013BK20S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	620 (281.0)	F	22	E
112.5	T3112K0013BK20S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1200 (544.0)	F	22	E
150.0	T3150K0013BK20S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1700 (771.0)	F	22	E
225.0	T3225K0013BK20S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2165 (982.0)	F	22	G

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes

K FACTOR 13, 150°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height ② (Inches)(Cm.)	Width ② (Inches)(Cm.)	Depth ② (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15.0	T3015K0013BK13S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F①	22	E
30.0	T3030K0013BK13S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	360 (163.0)	F①	22	E
45.0	T3045K0013BK13S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	440 (200.0)	F①	22	E
75.0	T3075K0013BK13S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	600 (272.0)	F	22	E
112.5	T3112K0013BK13S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	870 (395.0)	F	22	E
150.0	T3150K0013BK13S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1500 (680.0)	F	22	E
225.0	T3225K0013BK13S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	22	E

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes

K FACTOR 4, 150°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height ② (Inches)(Cm.)	Width ② (Inches)(Cm.)	Depth ② (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15.0	T3015K0013BK4S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F①	22	E
30.0	T3030K0013BK4S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	345 (157.0)	F①	22	E
45.0	T3045K0013BK4S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	430 (195.0)	F①	22	E
75.0	T3075K0013BK4S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	560 (254.0)	F	22	E
112.5	T3112K0013BK4S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	875 (397.0)	F	22	E
150.0	T3150K0013BK4S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1550 (703.0)	F	22	E
225.0	T3225K0013BK4S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1600 (725.8)	F	22	E

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes

K FACTOR 13, 115°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height ② (Inches)(Cm.)	Width ② (Inches)(Cm.)	Depth ② (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15	T3015K0013BK13SF	29.90 (75.9)	28.20 (71.6)	22.40 (56.9)	400 (181.0)	F①	22	E
30	T3030K0013BK13SF	35.90 (91.2)	31.90 (81.0)	26.90 (68.3)	575 (261.0)	F	22	E
45	T3045K0013BK13SF	35.90 (91.2)	31.90 (81.0)	26.90 (68.3)	750 (340.0)	F	22	E
75	T3075K0013BK13SF	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	1120 (508.0)	F	22	E
112	T3112K0013BK13SF	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	1200 (544.0)	F	22	E
150	T3150K0013BK13SF	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1700 (771.0)	F	22	E
225	T3225K0013BK13SF	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2165 (982.0)	F	22	G

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes

HARMONIC MITIGATING TRANSFORMERS

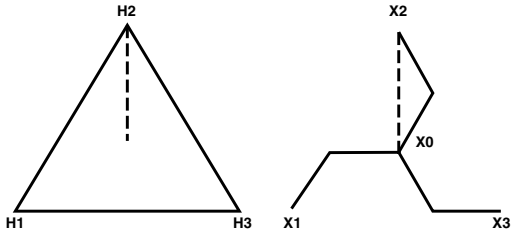
Acme Electric introduces a line of harmonic mitigating transformers that combine the technologies shown in our non-linear load (K-Factor) transformers. Where conventional K-Factor transformers "deal" with harmonics, containing them within the transformer and preventing them from going further upstream; harmonic mitigating transformers eliminate harmonics by pitting them against themselves. This technology not only results in "cleaner power" but also provides the most energy efficient means to deal with harmonic problems.

How do they work?

They consist of a Delta primary and a Zig-Zag secondary. The Zig-Zag secondary causes a phase shift in the triplen harmonics, which results in a canceling effect. This prevents the triplen harmonic losses from being coupled back into the primary and results in cooler operation and increased energy efficiency.

Diagram Showing Delta Primary and Zig-Zag Secondary

(Zero degree angular displacement)



The Acme Advantages

- Acme utilizes special winding techniques and "foil" conductors in both its K-Factor and Harmonic Mitigating transformers to minimize the heating effects of harmonic currents
- The use of foil conductor increases the dielectric strength of the insulation because one layer is only one turn. Foil also eliminates the effects of axial forces, which can result in failure of wire wound transformers.

Features

- Unlike K-rated transformers, Harmonic Mitigating transformers actually treat the triplen harmonics in the secondary winding
- Reduce supply voltage flat topping caused by non-linear loads
- Improve overall power factor of supply system
- Suitable for K-Factor loads
- Improved energy efficiency
- Copper conductor construction

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Weather Shield	Wiring Diagrams	Design Figures
30.0	CMT533124S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	535 (242.7)	F ①	WSA2	81	E
45.0	CMT533134S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	WSA2	81	E
75.0	CMT533144S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	760 (344.7)	F ①	WSA3	81	E
112.5	CMT533154S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1180 (535.2)	F	WSA4	81	E
150.0	CMT533164S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1340 (607.8)	F	WSA4	81	E
225.0	CMT533174S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1970 (893.6)	F	WSA4	81	E

① Wall mounting brackets are available for these sizes

NOTES

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