

PART 1 – GENERAL**1.1 3-phase, 3-wire phase shifting autotransformers designed to produce cancellation of the characteristic harmonics of 6 pulse and 12 pulse, 3-phase rectifier loads, such as variable frequency drives.**

- .1 The device shall have the appropriate input/output phase-shift to produce upstream cancellation of the targeted harmonic currents with those generated by similar, unshifted loads.
 - For 5-7 Eliminator™: 180° at the 5th, 7th, 17th, & 19th harmonic
 - For 11-13 Eliminator™: 180° at the 11th & 13th harmonic
 - For 5-13 Eliminator™: 120° at the 5th, 7th, 11th & 13th harmonic
- .2 Harmonic mitigation shall be by electromagnetic means only. No capacitors or electronics shall be used.
- .3 Evidence of relevant application experience must be available upon request.

1.2 Voltage and kVA Requirements:

- .1 Voltage: [208][480][600][other] Volts, 3-phase, 3-wire
- .2 kVA rating:
[7.5][11][14][15][20][27][30][34][40][45][51][63][75][93][112.5][118][145][150][175][220][225][275][300][330][440][500][550][660][750][other] kVA
- .3 System Frequency: 60 [50][other] Hertz
- .4 Appropriate input/output phase-shift to cancel targeted harmonics upstream:
[5th & 7th] [11th & 13th] [5th, 7th, 11th & 13th]

PART 2 - PRODUCT**2.1 Key Requirements:**

- .1 3-phase, 3-wire, NO NEUTRAL
- .2 Positive & negative sequence impedance at 60Hz: 0.95 to 1.25%
- .3 Load compatibility: K factor up to 20, Crest factor up to 4.5

2.2 Basic Requirements:

- .1 Three-phase, common core construction. Convection air cooled.
- .2 Copper Windings
- .3 Insulation Class: 220°C system
- .4 Temperature rise: 130°C [80°C][115°C][other]
- .5 Full load Efficiency at 170°C: 98% minimum
- .6 Sound level at 5 ft:
max. 45dB up to 45 kVA, 50 dB from 75 to 150 kVA and 55 dB from 150 to 300 kVA
- .7 Enclosure: ventilated, sprinkler-proof NEMA-1 [totally enclosed][other].
- .8 Finish: Grey [other]
- .9 Anti-vibration pads shall be used between the core and the enclosure
- .10 UL listed and CSA approved
- .11 Built to NEMA ST-20 and in accordance with all applicable UL, CSA and ANSI/IEEE standards
- .12 Warranty: 10 year pro-rated, with standard limited liability clauses

2.3 Options:

- .1 Over-temperature alarm - wired to internal terminal strip
- .2 Contact (one per set point): normally closed [normally open]
- .3 Over-Temperature switch wired to internal terminal strip. Temperatures specified for use with class 220°C insulation systems. Standard configuration is N.C. opening on high temperature. Optional configuration is N.O. closing on high temperature. Installation options: [one switch: 170°C or 200°C on center coil][two switches: 170°C and 200°C on center coil][six switches: one 170°C and one 200°C on each of the 3 coils]

2.4 Acceptable Product & Manufacturer:

5-7, 11-13 or 5-13 Eliminator™, by MIRUS International Inc.

PART 3 - EXECUTION**3.1 Installation**

- .1 The harmonic mitigation equipment shall be handled, stored and installed in accordance with the manufacturer's recommended installation practices as found in the installation, operation, and maintenance manual. Installation shall comply with all applicable codes.

3.2 Acceptance

- .1 Harmonic compliance shall be verified with onsite field measurements of both the voltage and current harmonic distortion at the input terminals of the harmonic mitigating equipment with and without the equipment operating. A recording type Fluke 41 or equivalent harmonics analyzer displaying individual and total harmonic currents and voltages must be utilized.