

PART 1 – GENERAL

- 1.1 A dual output phase shifting autotransformer designed to produce cancellation of the characteristic harmonics of 6 pulse, 3-phase rectifier loads, such as variable frequency drives. A quasi 12 pulse scheme is produced when two similarly sized 6 pulse rectifier loads are fed from the same unit. A quasi 24 pulse scheme can be achieved when multiple units are used to service several loads.**
- .1 There shall be two outputs per phase, with a phase-shift between them of 180° at the 5th, 7th, 17th, & 19th harmonics to achieve cancellation of these currents on the output side.
 - .2 There shall be two separate sets of input terminals to produce upstream cancellation of 11th & 13th harmonics when multiple 3-phase rectifier loads require more than one Drive 12/24™. When serviced from the same utility supply, alternating units connected to one set of input terminals with units connected to the other set of input terminals will produce a quasi 24 pulse scheme - treatment of 5th, 7th, 11th, 13th, 17th and 19th harmonics.
 - .3 Harmonic mitigation shall be by electromagnetic means only. No capacitors or electronics shall be used.
 - .4 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 Input kVA rating: [7.5][11][14][20][27][30][34][40][45][51][63][75][93][112.5][118][145][150][175][220][225][275][300][330][400][440][500][550][600][660][other] kVA
 - .3 Rating of each output as percent of input rating: 60% [100%][other]
 - .4 System Frequency: 60 [50][other] Hertz

PART 2 - PRODUCT

- 2.1 Key Requirements:**
- .1 Two 3-phase outputs with relative phase-shift to cancel 5th, 7th, 17th & 19th harmonic currents
 - .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, (transformers up to 34 kVA have 200°C insulation class)
 - .4 Temperature rise: 130°C [80°C][115°C][other]
 - .5 Full load Efficiency at 170°C: 97% 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 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:**
Drive 12/24™, 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.