PART 1 –GENERAL

1.1 A four output Harmonic Mitigating Transformer (HMT) designed to eliminate the harmful effects of all the low frequency, odd order harmonic currents from the 3rd through 21st:

.1 3rd, 9th, & 15th harmonics and other zero sequence currents shall be treated within the secondary windings through cancellation of the zero sequence fluxes. Simply trapping these currents in the delta primary winding is NOT acceptable.

.2 There shall be four outputs per phase, with the appropriate phase-shifts between them to achieve cancellation of the 5th, 7th, 11th, 13th, 17th & 19th harmonic fluxes within the secondary windings.

.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 Input kVA rating: [75][112.5][150][225][300][other] kVA

.2 Rating of each output as percent of input rating: 33% [other]

.3 Primary Voltage: [208][480][600][other] Volts

.4 Secondary Voltage: [120/208][277/480][347/600][other] Volts

.5 System Frequency: 60 [50][other] Hertz

PART 2 - PRODUCT

2.1 Key Requirements:

.1 Four 3-phase outputs with relative phase-shifts to cancel 5th, 7th, 11th, 13th, 17th & 19th harmonic fluxes within the secondary windings

.2 Positive & negative sequence impedance at 60Hz:
2.8% to 3.5% (75 kVA), 3.2% to 4.5% (112.5 to 300 kVA)

.3 Zero sequence impedance/reactance at 60Hz: Less than 0.95% and 0.3% respectively

.4 Load compatibility: K factor up to 20, Crest factor up to 4.5

.5 Secondary neutral connection rated at 200% of the rated secondary phase current

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 [115°C] [other]

.5 Full load Efficiency at 170°C: > 97%

.6 Taps: 2 x ± 2.5% (2FCAN, 2FCBN) for 75 kVA and larger, 1 x ± 5% for 208V primary

.7 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

.8 Enclosure: ventilated, sprinkler-proof NEMA-2 [NEMA-3R][totally enclosed][other].

.9 Finish: Grey [other]

.10 Anti-vibration pads shall be used between the core and the enclosure

.11 Single electrostatic shield: 60dB attenuation (Isolation transformers only)

.12 UL listed and CSA approved

.13 Built to NEMA ST-20 and in accordance with all applicable UL, CSA and ANSI/IEEE standards

.14 Warranty: 10 year pro-rated, with standard limited liability clauses

2.3 Options:

.1 Electrostatic shielding: single [double]

.2 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]

.3 EnergyStar Compliant models which meet NEMA TP-1 energy efficiency standards

2.4 Acceptable Product & Manufacturer:

HARMONY-4™ Harmonic Mitigating Transformer, by MIRUS International Inc.

PART 3 – EXECUTION

3.1 Installation

.1 The installing contractor shall install the Harmonic Mitigating Transformer per the manufacturer's recommended installation practices as found in the installation, operation, and maintenance manual and comply with all applicable codes.

3.2 Acceptance

.1 Manufacturer's representative shall visit site, verify installation, and submit to owner a letter stating equipment and installation meets intent of specification and manufacturer's warranties and guarantees are in effect.