



Hammond Power  
Solutions Inc.

## Typical Specification

### 1.2kV Class Iron Core Reactor

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## 1 **GENERAL**

### 1.1 SCOPE

- A This section defines three phase iron core line reactor as indicated.

### 1.2 NON LINEAR LOADS DEFINITIONS

- A Non-Linear loads are defined as per UL 1561, CSA C22.2 No. 47 & further explained in IEEE 519 Harmonic Spectrum for Switching Power supply & IEEE C57.110 and IEEE 1100.

### 1.3 RELATED DOCUMENTS

- A Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

### 1.4 REFERENCES

- A NEMA ST-20 Dry-Type Transformer for General Applications  
B IEEE C57.110 Recommended Practice for establishing transformer capability when feeding non-sinusoidal load currents.  
C UL 508, CSA C9 & C22.2 No. 47.  
D IEC 61558-1, IEC 61558-2-20

### 1.5 TESTING & QUALITY CONTROL

- A Production tests: each unit according to applicable sections of:
- UL 508
  - IEC 61558-1, IEC 61558-2-20
- B Perform a Type Test for each model design and submit report
- C Standard production tests to include:
- DC resistance
  - Hi POT
  - Inductance
  - Losses

### 1.6 SUBMITALS

- A Submit shop drawing and product data for approval and final documentation in the quantities listed according to the Conditions of the contract. Customer name, customer location and customer order number shall identify all transmittals.
- B Product Data including, Current Amps, Temperature Rise, detailed enclosure dimensions, system voltage, inductance, unit weight, warranty., insulation class

### 1.7 STORAGE AND HANDLING

- A Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from potential damage from weather and construction operations. Store so condensation will not form on or in the reactor housing and if necessary, apply temporary heat where required to obtain suitable service conditions.
- B Handle line reactors using proper equipment for lifting and handling; use when necessary lifting eye and/or brackets provided for that purpose.

### 1.8 WARRANTY

- A The reactor shall carry a 10 year limited warranty.  
(For details, refer to the manufacturers published warranty)

## 2 **PRODUCTS**

## 2.1 GENERAL CONSTRUCTION:

Three phase reactors shall be open style. All three phase reactors shall be constructed with three coils and a single core. Terminals may be terminal blocks or copper pads. Terminals shall be marked with A1, B1, C1, A2, B2, and C2. B Reactor winding shall be suitable for 150% RMS overload for 60 seconds OR 200% for 2 min once per hour 300% for 30 sec once per hour.

- C Reactors shall be designed, constructed and rated in accordance with UL, CSA and NEMA standards. If shipping to Europe, reactor will also have to be manufactured in accordance to CE standards and carry a CE mark.

## 2.2 VOLTAGE AND IMPEDANCE REQUIREMENTS:

- A Fundamentals Maximum Voltage : [600VAC] for UL and CSA, CE up to [690VAC]  
B Impedance Rating: [3% - 5%]  
C System Frequency: [50 Hertz][60 Hertz]

## 2.3 BASIC REQUIREMENTS:

- A Impedance at 60Hz: +15% to -10%  
B Nameplate Rating: Shall include Catalog #, Nominal Motor Amps, 3Ph, 60 Hz, 600V, Temp Rise, as required by standards  
C Inductance:  
i Nominal inductance +15% & -10% @ rated current  
ii 95% of nominal inductance @ 110% rated current  
iii 80% of nominal inductance @ 150% rated current  
iv 50% of nominal inductance @ 200% rated current  
D Temperature Rise:  
i 130°C (70°C rise) up to 40 Amps (50°C ambient),  
ii 180°C or 220°C (115°C rise) above 40 Amps (50°C ambient)  
E Altitude (de-rating): Comply with NEMA ST20 - 2014  
F Audible: maximum 65dB at 2 meters  
G Dielectric: 4000 volts RMS (2200 volts peak repetitive)  
H Coil conductors: continuous copper windings, with terminations brazed, welded or bolted.  
I Impregnation: vacuum pressure impregnated polyester resin.  
J Sound Level: 65dB  
K Enclosure: (When specified) Ventilated, [Type 1] [Type 3R] [other].  
L Enclosure Finish: ANSI 61 Grey suitable for UL50 outdoor applications [orange][other].  
M Line Reactors shall terminate copper terminal pads or terminal blocks: Contractors shall provide all necessary lugs not already provided with line reactors.  
N UL listed, CSA approved, [CE Mark].  
O Built to NEMA ST-20 and in accordance with all applicable UL, CSA and ANSI/IEEE standards.

## OPTIONS:

- Single Phase: De-rated using only two coils for single phase 208/240 VAC application from 0.5 to 10.0 HP and 0.25 to 0.5 HP for 120 VAC
- Enclosures: [Type 3R] [Type 4] [Type 4X] [Type 12] [other]
- Over-Temperature switches 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]

- Strip Heaters
- Marine Duty (meet ABS requirements) As an option-with special inspection

#### 2.4 ACCEPTABLE PRODUCT AND MANUFACTURER:

- A Hammond Power Solutions Inc. (Canada: 1-888-798-8882 / U.S.: 1-866-705-4684).
- B Substitutions are permitted, subject to meeting all requirements of this specification and also having written approval by engineering 10 days prior to bid closing.

### 3 **EXECUTION**

#### 3.1 INSTALLATION

- A The installing contractor shall install the line reactors per manufacturer's recommended installation practices as found in the installation, operation, and maintenance manual and comply with all applicable codes.
- B Make sure that the line reactor is level.
- C Check for damage and loose connections.
- D Mount line reactor to comply with all applicable codes.
- E Install optional vibration isolation pads between line reactor enclosure and the mounting surface.
- F Coordinate all work in this section with all work of other sections.