SECTION 16272
SUBMERSIBLE TRANSFORMERS

PART 1   GENERAL

1.1 DESCRIPTION:

Submersible Transformers and Insulating Oil for installation in underground distribution system.

1.3 INCORPORATED DOCUMENTS:

A. Section 16010, Electrical General Provisions, applies to this Section.

B. NEMA TR-1 and ANSI C57.12.00, C57.12.10, and C57.12.24 requirements for liquid immersed and underground transformers.

1.4 SUBMITTALS:

A. Shop drawings required: drawings and descriptions containing information of weight, dimensions, sound level, impedance, voltage regulation and efficiency. Manufacturer’s literature describing the product.

B. Test report as described below for transformer furnished.

PART 2   PRODUCTS

2.1 GENERAL DESCRIPTION:

Oil-filled submersible type with top mounted primary and secondary connections as manufactured by Van Tran, Asea Brown Boveri (ABB), Square D, and Carte International.

2.2 ELECTRICAL CHARACTERISTICS:

A. Self cooled rating (KVA): [225] [300] [500] [750], 3 Phase, 60 Hz.

B. Insulating Liquid: Mineral Oil, ASTM D-3487.

C. Primary Voltage: [12,470] [4,160] Delta.

D. Secondary Voltage: [208Y/120] [480Y/277] Volts.

E. Impedance: 4.50% minimum.
F. Taps: Two 2.5% Full capacity above and below normal; externally operable, pad-lockable, no-load tap changer.

G. Temperature Rise: 65 ºC.

2.3 HIGH VOLTAGE TERMINATION AND EQUIPMENT:

A. Transformer shall be configured for radial feed and be furnished with three (3) externally clamped bushing wells and parking stands.

B. Provide one (1) oil immersed OFF-ON, LBOR switch with eye for hot stick operation on the primary. Interlock the switch to prevent removal of the fuses with the switch in the “on” position.

C. Provide primary protection by current limiting fuses in loadbreak drywells. Fuses shall be Combined Technologies X-LIMITER or equal.

Or

D. Provide Primary protection by internal under-oil partial range current limiting fuses in series with externally operable Bayonet expulsion fuses. Provide three spare of all fuses.

2.4 LOW VOLTAGE TERMINATION AND EQUIPMENT:

Low Voltage connections shall be by blade type spade terminals with NEMA standard hole spacing.

2.5 CONSTRUCTION:

A. The transformer shall be of sealed tank construction of sufficient strength to withstand a pressure of 7 psi without permanent distortion. Provide a bolted and gasketed hand-hole for inspection and internal maintenance.

B. Coils shall be wound with copper conduction

C. Connections and accessories shall be on the top of the transformer.

D. Lifting lugs and provisions for jacking, rolling, and skidding shall be included.

E. The following accessories shall be included:

   1) Pressure Relief Valve
   2) Pressure/Vacuum gauge with bleeder connection.
   3) Dial type thermometer.
   4) Liquid level gauge.
5) One inch drain valve with sampling device.
6) Upper filter press connection.
7) ½-inch liquid level plug.
8) Ground Pad.

F. Exterior finish shall be epoxy enamel over a properly prepared and primed surface. Provide additional corrosion resistant undercoating on bottom and mounting surfaces. Exterior color shall be black.

2.6 FACTORY TEST:

A. Factory tests shall be performed on each transformer in accordance with ANSI C57.12.90 and certified test reports submitted to the Owner Prior to Installation of transformer.

B. Report shall include the following test results:

1) Winding to winding and winding to ground resistance measurement.
2) Ratio tests on rated voltage connection and all tap connections.
3) Polarity and phase relation tests on the rated voltage connection.
4) No load loss.
5) Exciting current.
6) Impedance and load loss at full load.
7) Applied potential test.
8) Induced potential test
9) Impulse test
10) Pressure Leak Test.

PART 3 EXECUTION

Not Used.

END OF SECTION