Three-phase, pad-mounted transformers, for use on underground power distribution systems, meet modern design requirements for flexibility, and provide a visually pleasing installation. Construction allows installation in locations accessible to the general public without the need for protective fencing or vaults. These units are ideally suited for apartment buildings, schools, hospitals, shopping centers, commercial buildings, and industrial sites. Standard liquid-filled sizes range from 75-5,000 kVA with primary ratings from 2,400 V to 46,000 V. These designs meet all applicable industry standards of ANSI, NEMA, CSA, and IEEE.

PART 1 PRODUCT

1.01 SUPPLIER
A. Square D Company [no equal] [or approved equal]

1.02 PAD-MOUNTED TRANSFORMERS, LIQUID-FILLED
A. The transformer(s) shall be compartment type, self-cooled, for mounting on a pad and shall comply with the latest applicable standards.
B. The average temperature rise of the windings, measured by the resistance method, shall be [55° C] [65° C] when the transformer is operated at rated kVA output. The transformer shall be capable of being operated at rated load in a 30° C average, 40° C maximum ambient, as defined by IEEE C57.12.00 without loss of service life expectancy.
C. Coolant and insulating fluid shall be [inhibited mineral oil.] [less flammable seed-oil based fluid].
D. The high and low voltage compartments shall be located side by side, separated by a steel barrier. When facing the transformer, the low voltage compartments shall be on the right. Terminal compartments shall be full height, air-filled, with individual doors. The high voltage door fastenings shall not be accessible until the low voltage door has been opened.
E. The following accessories shall be provided as standard on all transformers:
   1. Nameplate in low voltage compartment.
   2. 1” upper filter press and filling plug
   3. 1” Drain valve with sampling device.
   4. Lightning arrester mounting provisions. (live front units only).
   5. Tap changer, for de-energized operation only, which is externally operable and padlockable.
   6. The front of both compartments shall be removable to allow the transformer to be rolled or skidded into position over conduit stubs. ANSI tank grounding provisions shall be furnished in both compartments.
   7. Dial type thermometer.
   8. Magnetic liquid-level gauge.
   9. Pressure vacuum gauge.
   10. Pressure relief valve.
   11. Pentahead bolts for compartment doors.
F. The transformer(s) shall be rated [ ] kVA self cooled (ONAN). Primary voltage _______ [delta] [wye]. Secondary voltage _______ [delta] [wye], [3-wire] [4-wire], 60 Hz with two 2-1/2% full capacity above normal and two 2-1/2% below normal taps. Impedance shall be [ %] [manufacturer's standard impedance], ±7-1/2%. Basic impulse level of the primary winding shall be [kV] [as specified in IEEE C57.12.00 for comparable kV class].
G. The transformer shall be of sealed-tank construction of sufficient strength to withstand a pressure of 7 psi without permanent distortion. The cover shall be welded and the handhole fastenings tamper-resistant. The transformer shall remain effectively sealed for a top oil temperature range of -5° C to 105° C. When required, cooling panels will be provided on the back and sides of the tank. Lifting eyes and jacking provisions will be provided.
H. Coils shall be wound with [copper] [aluminum] conductors.
I. All cores to be constructed of high grade, grain-oriented, non-aging silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Magnetic flux is to be kept well below the saturation point.
J. The high voltage terminations and equipment shall be [live front] [dead].
K. Live front bushings shall be porcelain with [clamp-type connector] [blade terminals incorporating a 2-hole drilling pattern]. Bushings shall be externally clamped and front removable.
L. HV dead front bushings shall 200 Amp, either universal wells or one-piece integrated for use with separable connectors. Bushings shall be externally clamped and front removable.
M. HV dead front bushings shall 600 Amp, one-piece integrated, with removable stud, for use with separable connectors. Bushings shall be externally clamped and front removable.
N. The low voltage bushings (<600V) shall be molded polymer, and provided with blade-type spade terminals with NEMA standard hole spacing arranged for vertical take-off. The low voltage neutral shall be an insulated bushing, grounded to the tank by a removable ground strap.
O. Provide a load break, gang operated, liquid immersed switch rated at [200 A] [300 A] [600 A] that is externally operable from the high voltage compartment through the use of a distribution hot-stick. Switch to be [2-position "OFF-ON" type for use on a radial feed-system] [3-position for use on an alternate feed system with feed-from-the-left, feed-from-the-right, or off] [4-position "sectionalizing" type for use on an extended radial or loop-feed system with feed-from-the-left, feed-from-the-right, isolated-from-either-side, or through-feed to both sides] [2-position switches to be used as "sectionalizing" switches on extended radial or loop-feed systems with feed-from-the-left, feed-from-the-right, isolated-from-either-side, or through-feed-to-both-sides].
P. Select one of the following options for fusible protection:
   1. Provide internal liquid immersed cartridge fuses sized at [amperes] [approximately three times the full-load primary current].
   2. Provide bayonet type liquid immersed fuses that are externally replaceable with a hot-stick without opening the transformer tank.
   3. Provide bayonet type liquid immersed fuses in series with liquid immersed current-limiting fuses. Bayonet type fuses are to be externally replaceable with a hot-stick without opening the transformer tank.
   4. Provide dry-well canister mounted current limiting fuses that are externally replaceable with a distribution hot-stick without opening the transformer tank.
   5. Provide McGraw-Edison type NX Arc Strangler(r) fuses or switchblades in series with NX fuses mounted for cold-sequence connection of incoming radial feed line.
Q. Surge Protection - Provide three _______ kV distribution class lightning arresters for surge protection. Arresters are to be mounted in the high voltage compartment.
R. Additional Accessories
   1. Automatic pressure relief device (self-sealing with indicator).
   2. Mounting provisions for low voltage current transformers and potential transformers.
   3. Busway opening into the low voltage compartment to accommodate Square D I-LINE(r) Busway.
   5. Sudden pressure relay.
   6. Key interlock to primary or secondary compartment door.
   7. KWH meter socket with hinge cover externally mounted on the side of the low voltage compartment.
   8. Bushing well inserts
   10. MOVE elbow arresters.
S. Transformer shall be UL [c/UL] [non-UL] listed.
T. Transformer shall be FM labeled [non-FM].
U. Testing - Tests shall be conducted in accordance with the provisions of IEEE C57.12.90 and shall include, as a minimum, the following tests:
   1. Ratio
   2. Polarity
   3. Phase Rotation
   4. No-Load Loss
   5. Excitation Current
   6. Impedance Voltage
   7. Load Loss
   8. Applied Potential
   9. Induced Potential
   10. QC Impulse Test