

The H-J Family of Companies

Renewable Energy Transformer Components





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Your Supplier of Components for Renewable Energy Applications

Renewable energy



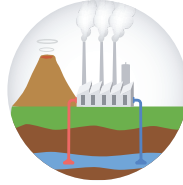
Solar



Wind



Tidal



Geothermal



Hydro



Biomass

Renewable energy applications for distributed generation is a global trend with technological challenges that are having a tremendous impact in the transformer industry. This trend will continue for padmount transformers up to 10 MVA as covered by IEEE Std. C57.12.34. The voltage levels, winding connections and types of components and protection make these transformers different from conventional padmount transformers. For example, most of them operate at 34.5 kV system voltage with delta connection, and often requiring 200 kV BIL voltage as opposed to the typical distribution level of 150 kV BIL.

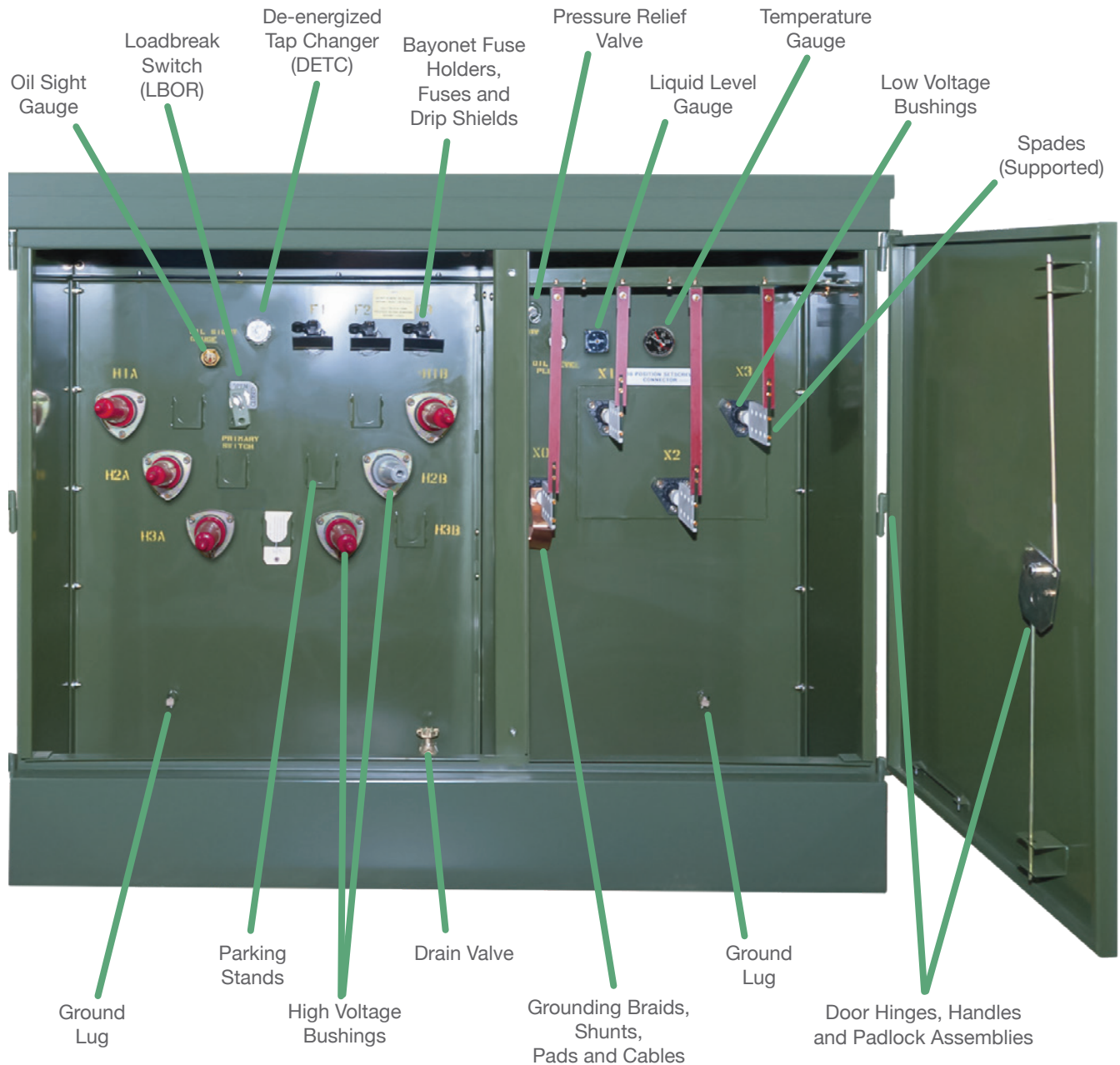
As a global supplier of transformer components, The H-J Family of Companies offers a wide variety of components for these types of distribution and substation style transformers for renewable energy applications. H-J provides complete solutions for our customers through a combined offering of our own manufactured products and services together with those from our valued partners.

Almost 50 years of experience guarantees excellent technical support as our engineers assist in design incorporation and selection of the right components for these applications.





Padmount Transformer Components



High Voltage Bushings and Cable Accessories

Our complete product line covers 15, 25 and 35 kV system voltage applications levels for the following components with interfaces based on IEEE 386:



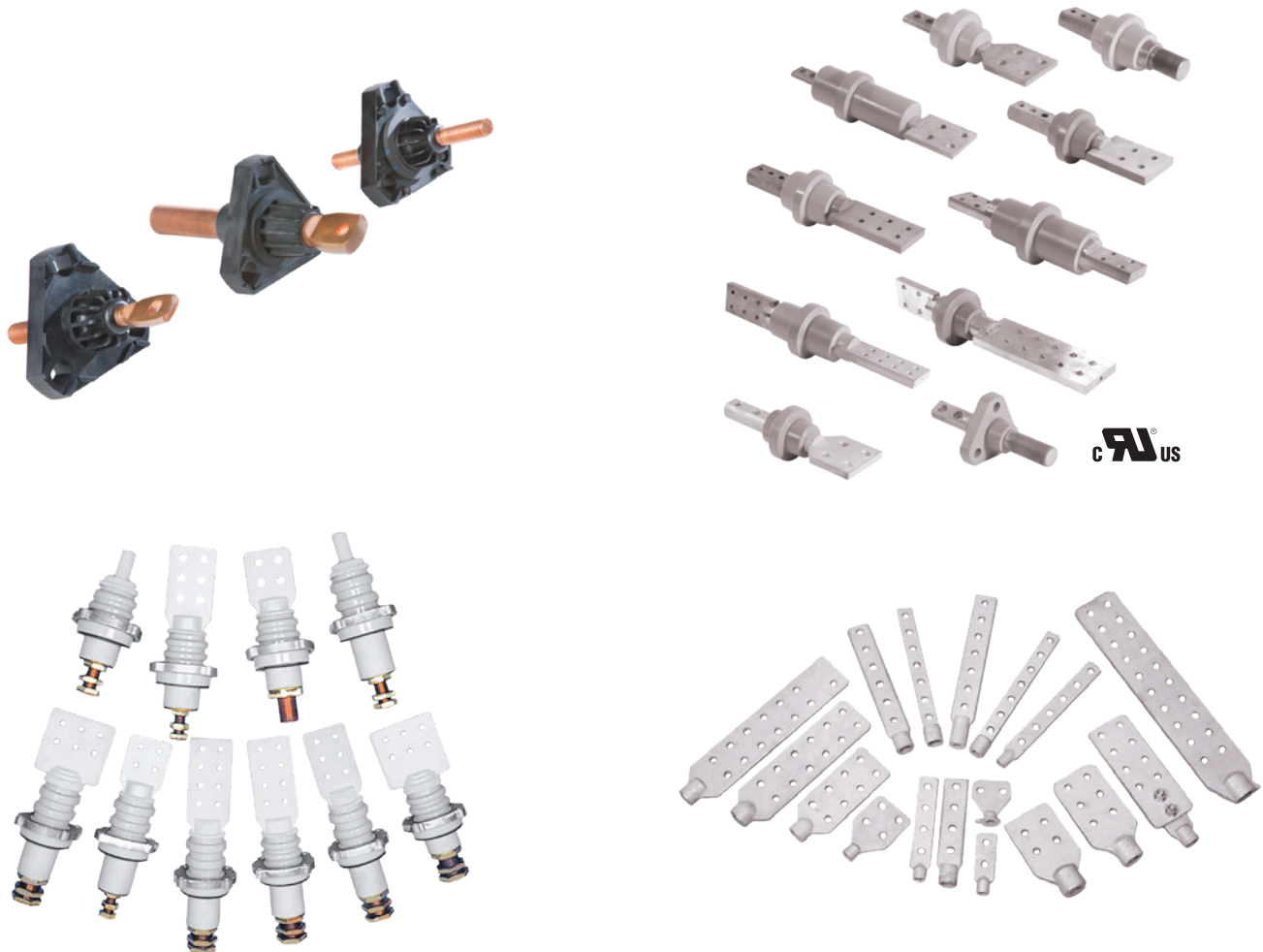
- » 200 and 600 Amp Elbows
- » 200 Amp Inserts and Feed-Thrus
- » 200 Amp Integrated Bushings
- » 600 Amp Integrated Bushings for 150 and 200 kV BIL
- » Insulated Plugs and Caps
- » Elbow Tap Plugs and Reducing Tap Plugs
- » Bushing Wells (bolted or weldable)



Low Voltage Bushings and Spade Connectors

H-J offers three types of low voltage bushings for these applications: Epoxy Insulators, Thermoplastic Insulators, and Porcelain Insulators.

- Epoxy bushings for indoor and outdoor applications, as well as UL® recognized materials, with integrated spade connectors up to 6 holes unsupported and 24+ holes supported. Bushings are available for current ratings up to 10,000 Amps.
- Thermoplastic bushings with 5/8" studs for up to 830 Amps and 1" studs for up to 1500 Amps sidewall mounted. H-J offers a wide range of screw-on spade connectors up to 6 holes unsupported and 24+ holes supported.
- Porcelain bushings (less commonly used in padmount and renewable energy transformers). This type of bushings are available in current ratings up to 6000 Amps, with a wide variety of connectors (spade or eyebolt) offered.



Fuses and Arresters

Proper fuse and protective device selection and coordination for renewable energy transformers is essential. H-J offers a full range of products, as well as engineering expertise in order to help designers select the appropriate protection for their transformer.

- Protective Link Fuses (Weak Links) from 15, 23 and 34.5 kV: to protect against overloads and secondary short circuits.
- Partial Range Current Limiting Fuses 8.3 to 38 kV Class and 50 kA interrupting capacity: to isolate a failed transformer from the circuit allowing all other in-service transformers to continue operating.
- Dead Front Elbow Arresters: gapless, metal oxide varistor (MOV) type surge arresters, designed to provide shielded, dead front arrester protection for underground systems up to 35 kV.



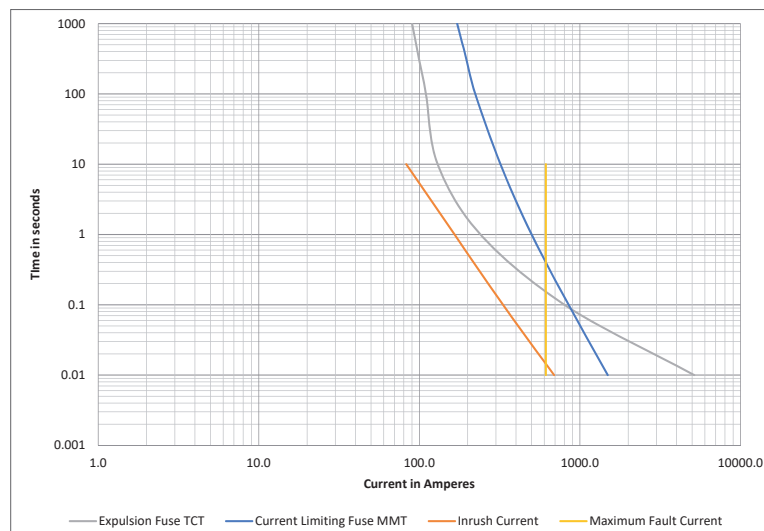
The H-J Family of Companies also offers:

- All types of Bayonet Fuses and Fuse Holders up to 23 kV and 150 kV BIL.
- Full Range Current Limiting Fuses up to 23 kV.



Fuse Coordination Support

Renewable energy transformers can be more complicated than typical padmount transformers, and can have larger ratings of 10 MVA or above. These applications require sophisticated fuse coordination programs and transformer design experience to select the correct protection. H-J offers industry-leading fuse expertise and coordination for even the most complicated of designs.





Tap Changers and Switches

- Tap changers are typically offered with 5 or 7 positions; 1 or 3 decks; 150 or 200 kV BIL; 100 or 150 Amps; hook-style, lever-type or 'pull & turn' operating handles. Other configurations, wire connectors and terminals are available upon request.



- Dual Voltage Switches

Dual voltage switches allow a transformer to be installed and connected at different locations on the distribution grid as needed with an option to easily select one of two primary voltage options. These switches typically offer 1 or 3 decks; 125 or 150 kV BIL; 50/100 or 150/300 Amps; hook-style, lever-type or 'pull & turn' operating handles. Other specifications, wire connectors and terminals are available upon request.

- Special Tap Changers for Sectionalized Windings

We offer special tap changers for sectionalized windings allowed by IEEE Std. C57.12.34 for Renewable Energy Applications. The essential need to protect and to allow taps to compensate for voltage variation in those segments arises due to their special construction. Different winding configurations have to be interconnected according to the winding voltage required.

- Loadbreak Switches

Our two position switches for single and three phase transformers are 38 kV Class, 150 kV BIL, 300 Amps continuous current.



Drain Valves

We manufacture brass and stainless steel valves from ¼" to 2", including complete assemblies with pipe plugs, oil samplers, weld-on flanges, etc. Straight and offset flanges, oversized and special application valves are available upon request.

H-J maintains a large inventory of drain valves and accessories and can provide a variety of custom manufactured valves for transformer & switchgear applications. Valves can be ordered with "custom" installed pipe plugs, nipples or both. In addition, H-J can furnish various pre-applied thread sealers and threadlockers on the valves, plugs and nipples. Among these products are Vibra-Seal 516 from Loctite Corporation, SAF-T-LOK S90 from SAF-T-LOK Chemical Corporation and others.





Gauges and Instrumentation

Our Instrument accessories line includes the following devices with and without contacts:

- Oil Temperature Gauges
- Oil Level Gauges
- Pressure Vacuum Gauges
- Resistance Temperature Detectors (RTDs)
- Flow Indicators
- Monitoring Systems



Tank Accessories

- Ground Pads and Ground Lugs

Mild or Stainless Steel Ground Pads and Bronze Ground Lugs are offered in a variety of sizes and plating options in order to meet all industry requirements.



- Hinges, Padlocks and Pentahead Bolts



Engineering and Testing Services

The H-J Family of Companies Test Lab is equipped with state-of-the-art instruments and testing devices to help in your development work. Diverse materials and finished equipment including transformers can be tested in our facility located in High Ridge, MO.



Above: The H-J Family of Companies Test Lab Facility.

Bottom Left: Inside the Faraday Cage. **Bottom Right:** Main Test Lab Control Room



The H-J Family of Companies

The offered testing services include:

- Impulse Tests up to 600 kV
- Applied Voltage Test up to 150 kV
- Faraday Cage up to 120 kV for Partial Discharge and RIV Tests
- DC Inclined-Plane Tracking and Erosion Test of Insulating Materials
- Tension, Compression, and Flexural Test of Materials
- Cantilever Tests
- Oil/Air Leak Tests
- Hydrogen Leak Test
- Thermal Cycle Tests from -70° to 180°C
- Differential Scanning Calorimetry (DSC) Testing of Polymers
- Gel Time Test
- Faro Arm Laser Scanner (Dimension Tests)
- Optical Comparator (Dimension Tests)
- Environmental Tests
 - » Non-invasive Inspection with X-ray facility
 - » UV Tests
 - » Moisture Content Tests



The H-J Quality Lab



The H-J Epoxy Lab



The H-J X-Ray Lab

Additional Components for Renewable Energy Applications

Other Components we can offer for this market, not mentioned in above items include:

- Flexible Links
- Grounding Braids
- Laminated Shunts
- Aerial Lugs
- CT Lead Blocks
- Dry Well Fuse Holders
- LV Fuses
- LV Arresters for 3-phase transformers up to 690 volts line to line (max), grounded or ungrounded connection
- Small Pressure Relief Valves (no contacts)
- Dragon Tooth[®] Connectors
- Copper and Aluminum Bars and Conductors
- Amorphous Cores

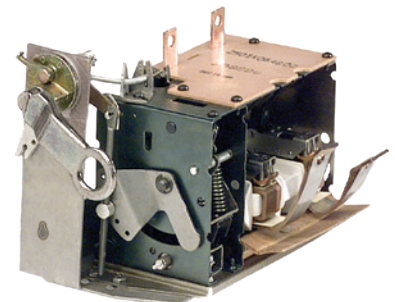
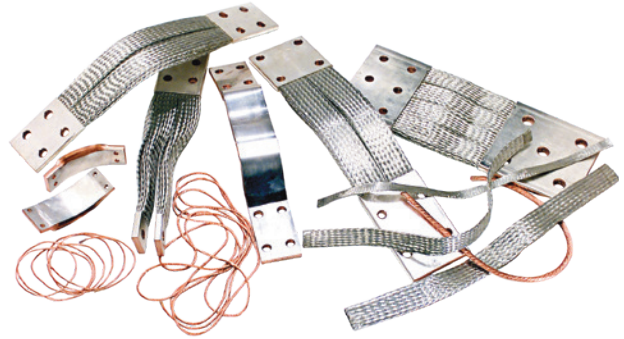
For high efficiency transformers having core losses as low as 20% of common electrical steel cores in transformers up to 6.5 MVA.

- Test Plugs

To make testing easier for transformers with 200 and 600 Amps HV Bushings with IEEE 386 male or female interfaces, The H-J Family of Companies provides reusable Test Plugs up to 200 kV BIL.

- Secondary Oil Immersed Breakers

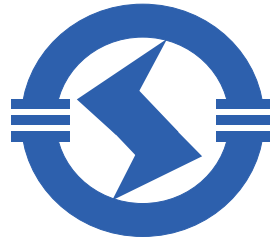
For better protection of padmount transformers, secondary oil immersed breakers offer protection against any secondary fault like short circuits and damaging overloads.





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Our Valued Partners:



SAN JIANG ELECTRIC MFG. CO., LTD.
www.sanjiang-electric.com



Trust us for your Renewable Energy Components

For more information contact us at info@h-j.com or +1-636-677-3421



