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PLVK POWER ENGINEERS & CONSULTANTS

Office: 309, Chanakya Complex, Subhash Chowk,

Laxmi Nagar, Delhi-110092

Contact No.: +91-9971395202; +91-9818006999

Email: plvk_power@yahoo.in

Web: www.indiamart.com/plvk-powerengineers

Package Substation

With space at a premium especially in metropolitan cities like Delhi, Mumbai, etc, the compact dimensions of package substations are hugely beneficial, saving valuable floor space. The package substation is equipped to be positioned on a roof, in a car park or anywhere a suitable space can be found.

The Package Substations are tailored to suit customer requirements using products from comprehensive range of Distribution Transformers (both Oil Cooled & Dry Type), MV switchgear, and LV Equipment including Automatic Power Factor Correction Panel.

Some of the inherent benefits of Package Substations are:

i. *Available in* ***both indoor/outdoor*** *versions*
ii. ***Compact****: provides a convenient, single source packaged substation with minimum time and cost.*
iii. ***Requires smaller foundations*** *: Significant reduction in cost of civil works*
iv. ***Costly cabling eliminated****: Reduces overheads*
v. ***Ease of Installation****: Can be delivered as a single unit; easily transportable and ready to install*
vi. ***Safe*** *: Fully compartmentalized; no accidental access to live parts*
vii. ***Aesthetically superior***
viii. ***Minimal maintenance***

At the lower end of the power rating range, dry and liquid-immersed transformers are often self-cooled by natural convection and radiation heat dissipation. As power ratings increase, transformers are often cooled by such other means as forced-air cooling, force-oil cooling, water-cooling, or a combinations of these. The ***dielectric coolant*** *used in many outdoor utility and industrial service transformers is* ***transformer oil that both cools and insulates the windings.***

Oil-Cooled Transformer

Due to their various advantages over other conventional transformers these dry type transformers are extensively used for the following installations (in both environmentally sensitive and fire-risk areas).

- *Underground sub-stations*
- *High rise buildings & hotels*
- *Under-the-roof (indoor) installations*
- *Power plants -thermal, hydro, nuclear*
- *Rural electrifications*
- *Oil rigs application*
- *Metal and Mining Industry*
- *Railway electrification*
- *Metro Systems / Trains*
- *Chemical plants*
- *Steel plants/rolling mills*
- *Theatres/cinema*
- *Shopping malls*
- *Hospitals*
- *Airports*
- *Stadiums*
- *Ships*

Dry-Type Transformer

Advantages:

- *No danger of fire or explosion*
- *Easy Installation*
- *Maintenance and pollution-free solution*
- *Environmentally friendly*
- *Reduced cost of civil installation works and fire protection systems*

One of the basic functions of switchgear is protection, which is interruption of short-circuit and overload fault currents while maintaining service to unaffected circuits. Switchgear also provides isolation of circuits from power supplies. Switchgear is also used to enhance system availability by allowing more than one source to feed a load. ***Types of HV/MV switchgear that are preferred nowadays are Vacuum & Gas (SF6) Insulated switchgear.***

Basic aspects to look for in switchgear are:

- *Reliable and safe*
- *Should be able to withstand adequate number of operations – in healthy as well as unhealthy/abnormal situations*

HT Panel/Metal-Clad Switchgear (Vacuum Circuit Breaker/ SF-6 Gas Insulated Switchgear)

LT Distribution Panels/PLC Panels /Control & Relay Panels

LT Panels are designed specifically to suit customer requirements as per the type and ratings of machinery/installations being used for intended purpose.

The same may include A.M.F. (Auto Mains Failure) Panel and A.P.F.C. (Automatic Power Factor Correction) Panel of suitable ratings as per the requirement.

***We also deal in designing, fabrication, and supply of AMF (Auto Mains Failure) Panels that are installed for automatic changeover from mains to stand-by generator at the time of power failure**. Fabricated from premium quality raw material, i.e., using 14 / 16 SWG thickness, **high grade CRCA sheet steel**, these automatic AMF panels are durable, corrosion resistant, dust and vermin proof, powder coated for longer life and meticulously wired. Easy to operate and install, these synchronized AMF panels are used in areas like foundries, apartments, textiles, sugar and chemical industries, and various other industries.*

Our range of AMF panel includes automatic changeover with current limit, battery charger, power inverters, metering and all relevant indications.

A.M.F./ Automatic Change-Over Panels

Automatic Power Factor Correction (APFC) Panels

Most of the commercial and Industrial installations in the country have large electrical loads which are severely inductive in nature, such as motors, large machines, air conditioners, drivers etc. which results in a severely lagging power factor. ***This means loss and wastage of energy and heavy penalties by electricity boards.*** *In case of fixed loads this can be taken care by manual switching of capacitors.*

However in case of rapidly varying and scattered loads it becomes difficult to maintain a high power factor by manually switching on/off the capacitors in proportion to variation of load within an installation. ***This drawback is overcome by using an APFC panel (Automatic Power Factor Correction Panel)*** *which not only maintains a high power factor but also eliminates the need for constant manual intervention.*

Disadvantages of low power factor:

- *The load draws greater current for same amount of useful power*
- *Drawing higher internal current causes excessive heat to be generated, which in turn causes damage and/or shorten insulation and equipment life*
- *Greater current drawn for same amount of useful power results in requirement of increased size of power equipment like transformer, cables, switchgear, etc, thereby leading to increased costs.*
- *Penalty for Low Power Factor in electricity bills (kVAH billing) to be paid by the end user, which may be to the tune of Lacs of rupees at higher consumptions*

Advantages of APFC Panel:

- *Economical with faster payback periods.*
- *Ability to maintain a constant high power factor.*
- *Eliminates low power factor penalties levied by Electricity Board.*
- *Reduces the KVA demand charges.*
- *Improves efficiency of the system by reducing losses.*
- *Prevents leading power factor in the installation during low load conditions.*

Power Cables & Accessories

Modern power cables come in a variety of sizes, materials, and types, each particularly adapted to its uses. Modern high-voltage cables use polymers or polyethylene, including XLPE for insulation. They require special techniques for jointing and terminating.

Cables consist of three major components: ***conductors, insulation, and protective jacket.*** *The makeup of individual cables varies according to application.* ***The construction and material are determined by three main factors:***

- ***Working voltage****, determining the thickness of the insulation;*
- ***Current-carrying capacity****, determining the cross-sectional size of the conductor(s);*
- ***Environmental conditions*** *such as temperature, water, chemical or sunlight exposure, and mechanical impact, determining the form and composition of the outer cable jacket.*

We have complete range of HT/LT cables and related accessories like cable jointing and termination kits.

Materials for wiring interior electrical systems in buildings vary depending on:

- ***Intended use and amount of power demand on the circuit***
- ***Type of occupancy and size of the building***
- ***National and local regulations***
- ***Environment in which the wiring must operate.***

Wires and cables are rated by the circuit voltage, temperature rating, and environmental conditions (moisture, sunlight, oil, chemicals) in which they can be used. A wire or cable has a voltage (to neutral) rating, and a maximum conductor surface temperature rating. The amount of current a cable or wire can safely carry depends on the installation conditions.

We have complete range of electric wires and related devices and accessories viz. distribution boards, MCB's, Energy Meters, switches and sockets, Connectors, lightings, Electric Wire Conduits, Rising Mains, Junction boxes, Cable Trays, etc.

Internal Electrification (Of Large Industrial & Commercial Establishments /Residential Societies)

Servo-Controlled Voltage Stabiliser

Servo Controlled Voltage Stabilizer is highly recommended in laboratories and Industries where precision supply voltage is essential to avoid damage to voltage-sensitive equipment and instruments, *viz. CNC machines, electrical equipment, medical equipment, motors lab equipment etc. by correcting the voltage fluctuations in the incoming AC voltage and bringing and keeping in at the desired voltage levels in both single phase and three phase as per the requirement.*

The highly fluctuating A.C. Mains supply is a very common phenomenon in India and the difficulties caused by them are known too well and need not be enumerated. The absence of stable supply creates difficulties in smooth functioning of various kinds of equipment.

Unsteady voltage supply conditions may result in the total breakdown of sensitive and sophisticated equipments. ***Servo-Controlled Voltage Stabilizers*** *are highly efficient Voltage regulators that work equally well on any kind of load.*

BUS DUCTS & RISING MAINS

Bus duct is used for the effective and efficient supply of electricity in large industrial and commercial establishments. Copper or aluminum is used as conductor inside the bus duct that is insulated and enclosed completely for protection against mechanical damage and dust accumulation.

Bus Duct Systems are designed and installed by us for both Indoor and Outdoor applications.