



WAUKESHA

ELECTRIC SYSTEMS

Waukesha PDS[®] Modular Substations

WHY PDS?

Simply because of the unique and innovative PDS concept—a concept that helps you solve any or all of these six basic problems:

IS LIMITED SPACE A PROBLEM?

PDS, with its modular, self-contained design, requires only a **small fraction** of the land area of conventional substations. Often, just a single pad, with “drop-in” installation, is all that is required.

IS EASE OF RELOCATION A PROBLEM?

For the reasons just mentioned, PDS is as easy to relocate as it is to install initially. This gives you ready flexibility for adapting to changing load conditions.

IS AESTHETICS A PROBLEM?

You can't beat a PDS for good looks. Compact, low-profile design, plus the options of underground cable connections and tamper-resistance, make it a welcome neighbor and a “much easier sell” for utilities.

IS POWER QUALITY A PROBLEM?

In today's computerized world many customers cannot tolerate even infrequent momentary interruptions. Waukesha Electric Systems can help solve that problem—and often reduce the customer's power costs in the bargain.

IS A SHORTAGE OF MANPOWER A PROBLEM?

PDS can save a lot of in-the-field man hours with its fast and easy installation. PDS substations are factory pre-assembled, factory pre-tested, and may be shipped as a **complete** unit. Everything fits together and works together, the first time. This is a PDS **exclusive**.

IS FAST DELIVERY A CONSIDERATION?

More often than not, a modular-design PDS can save **months** of waiting time. And Waukesha's flexibility in meeting individual customer needs is also a big advantage.



FEATURES

The Waukesha PDS modular substation is equipped with the following standard equipment, and available with optional tamper resistant construction:

DC POWER SUPPLY

A 48 volt dc battery system is standard in the Waukesha PDS modular substation, 125 v dc systems are available.

STATION SERVICE TRANSFORMER

A fused fixed-mounted single phase 120/240 volt 3 wire station service transformer is included as a standard feature.

POTENTIAL TRANSFORMERS

Three single phase, fused potential transformers may be included, and installed in the low voltage switchgear or air terminal chambers, as appropriate.

SURGE ARRESTERS

Metal oxide surge arresters are included for protection of the incoming and outgoing underground cables.

CONTROL CONNECTIONS

All connections between removable equipment, circuit switchers, live tank circuit breakers, etc., are designed to minimize the assembly and test time necessary at installation of the Waukesha PDS modular substation.

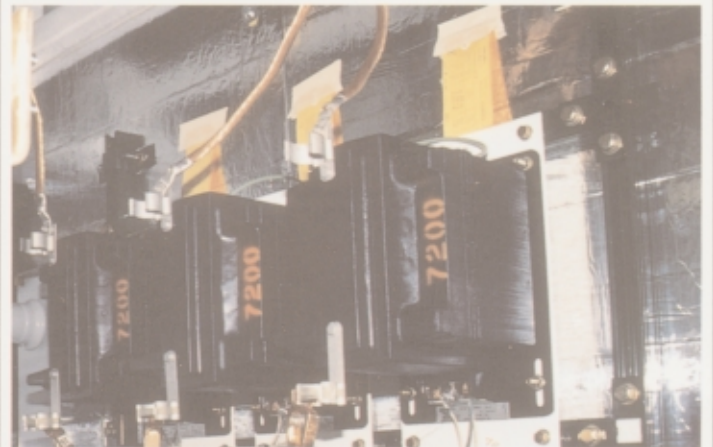
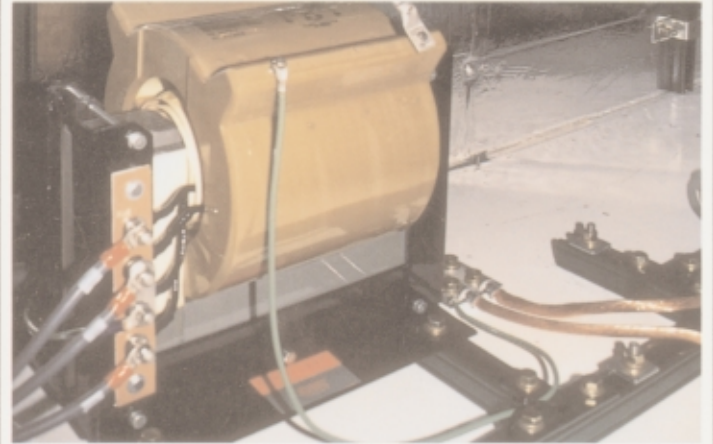
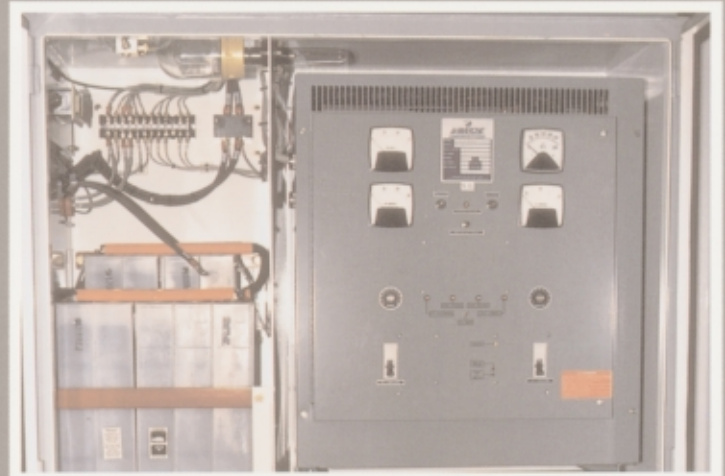
OPTIONAL LOW PROFILE

Pocket bushings and circuit switchers with horizontal interrupters can be provided where low profile installations are necessary.

OPTIONAL TAMPER RESISTANCE

Tamper resistance adds the following features to the PDS modular substation:

- Penta head hardware for all exterior doors, with padlocking provisions.
- Special radiator features, i.e. welded drain plugs, special tamper resistant valves and mounting flanges.
- Tamper resistant manhole cover design.
- Enclosed transformer gauges, valves, pressure relief device, tap changer operating mechanisms, etc.



RELAYS AND CONTROLS

The Waukesha PDS modular substation is supplied complete with a full complement of relays and controls.

Standard Protective functions include:

Device 87, transformer differential relay protection

Device 86, lockout relays

Device 50/51, instantaneous and time overcurrent relays

Device 50N/51N, instantaneous and time overcurrent neutral relay

Device 79, reclosing relay

Substation monitoring includes:

Critical transformer winding temperature

Critical transformer top oil temperature

Critical transformer oil levels

Transformer sudden pressure relay

Transformer pressure relief device operation

Dc supply undervoltage

SWITCHGEAR ASSEMBLIES

The relays and controls are semi-flush mounted on the front doors of the circuit breaker compartments, with clearance to allow storage of the circuit breaker in the disconnected position with the door closed for designs with draw-out breakers.

RELAY PANELS

For fixed-mounted breaker assemblies, the relays are supplied in front access enclosures. The relays are semi-flush mounted on hinged panels.

OPTIONS

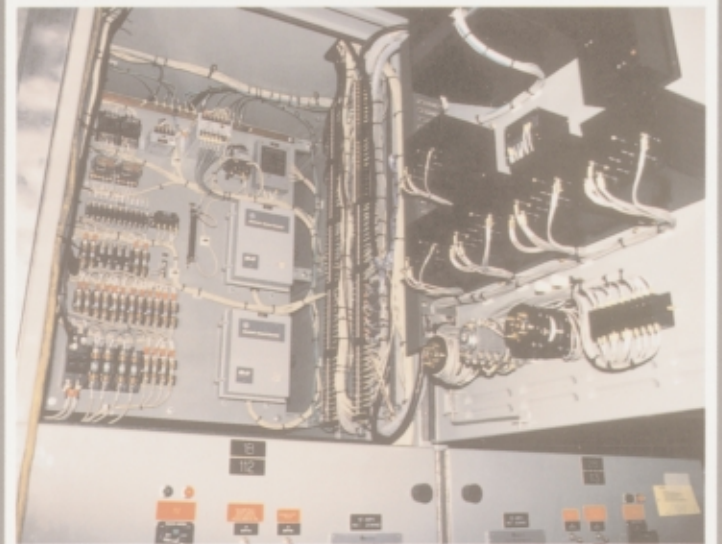
All alarm and SCADA points brought to a central location for customer interface.

Space for RTUs.

Provisions for radio communication equipment.

Metering per customer specifications.

Transducers for customer metering.



PROOF OF PERFORMANCE IN OVER 100 INSTALLATIONS. FOR EXAMPLE:

INNOVATION

A major east coast utility desired to incorporate many of the features of a pad mounted transformer in a complete stand-alone substation. A team effort between utility and Waukesha Electric Systems personnel resulted in the design of a Waukesha PDS modular substation to fulfill this requirement. Results: To date this utility has installed 14 more similar units.

RAPID GROWTH

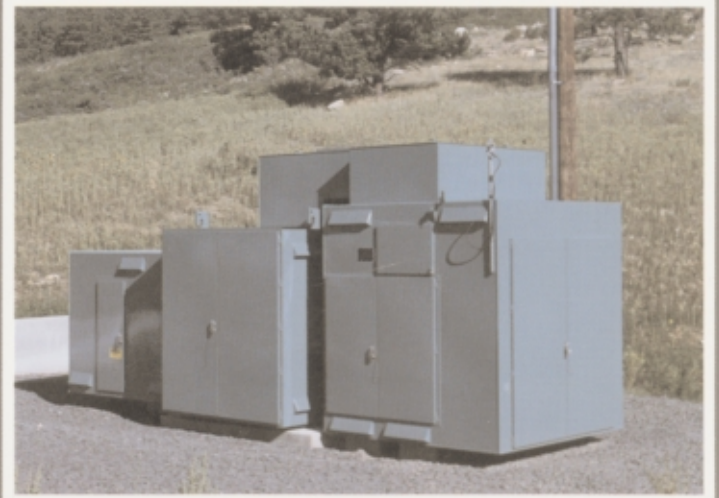
To serve an unexpected rapidly developing load, a northeast utility installed a "drop-in" PDS modular substation on a temporary foundation (railroad ties), thus buying time so that the permanent substation design and installation process could proceed.

POWER QUALITY

To improve reliability and quality of its power supply, a major southwestern utility installed a PDS modular substation to convert the customer from a 15 kV distribution service to an independent supply at 69 kV. This greatly reduced the chance of power outages while also providing 100% clean power... critical for this customer where computer interruptions could result in a substantial restart cost.

AESTHETICS

To preserve the natural beauty of this rural setting, a western utility installed a Waukesha PDS modular substation with tamper resistant features and coordinated paint color to blend the substation into the environment. The local public authorities approved the proposed installation without hesitation.



ISO 9001
Certified

400 S. Prairie Avenue • Waukesha, WI 53186-5940
1-800-835-2732