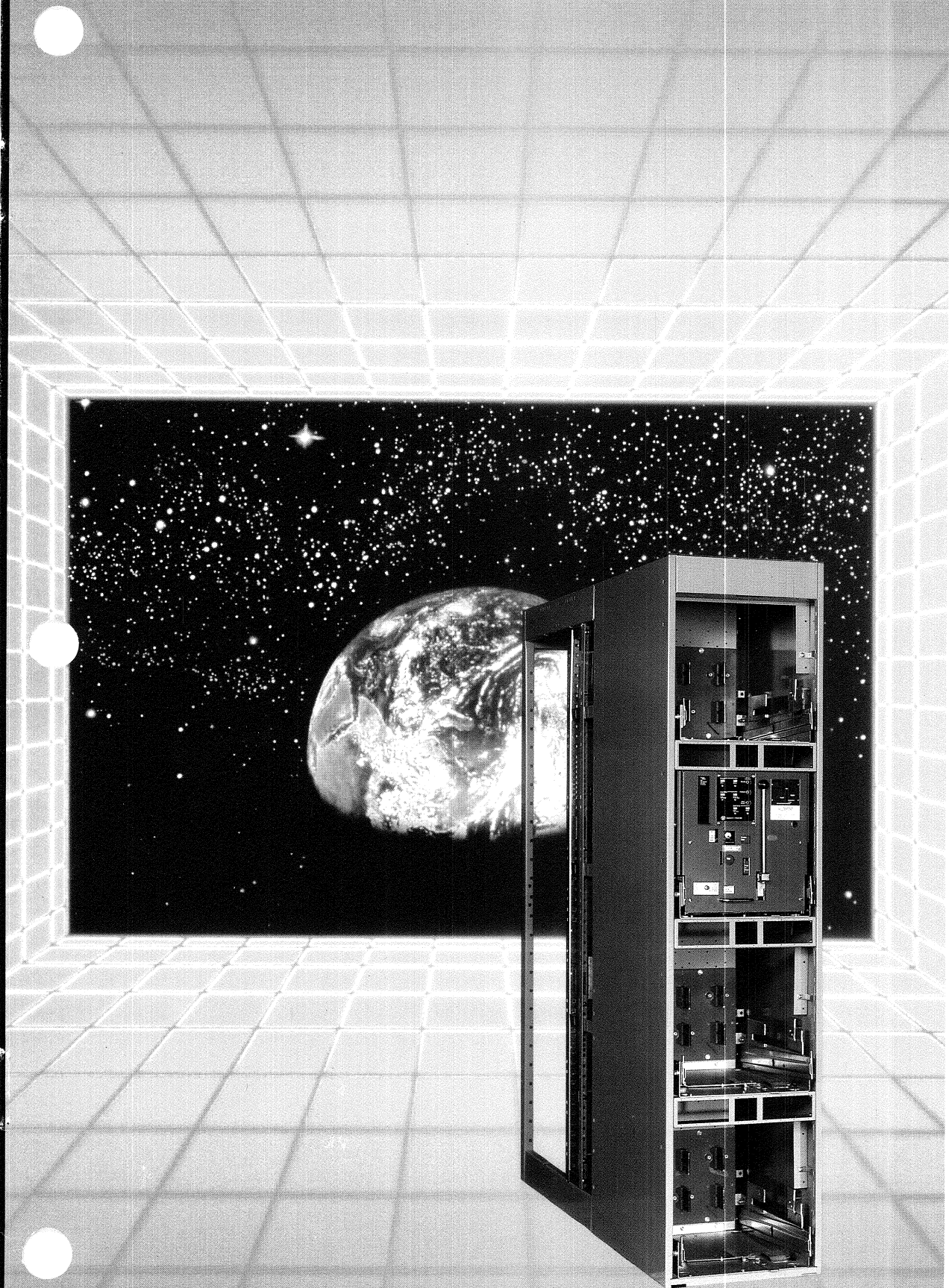
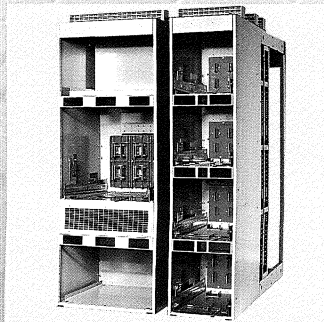
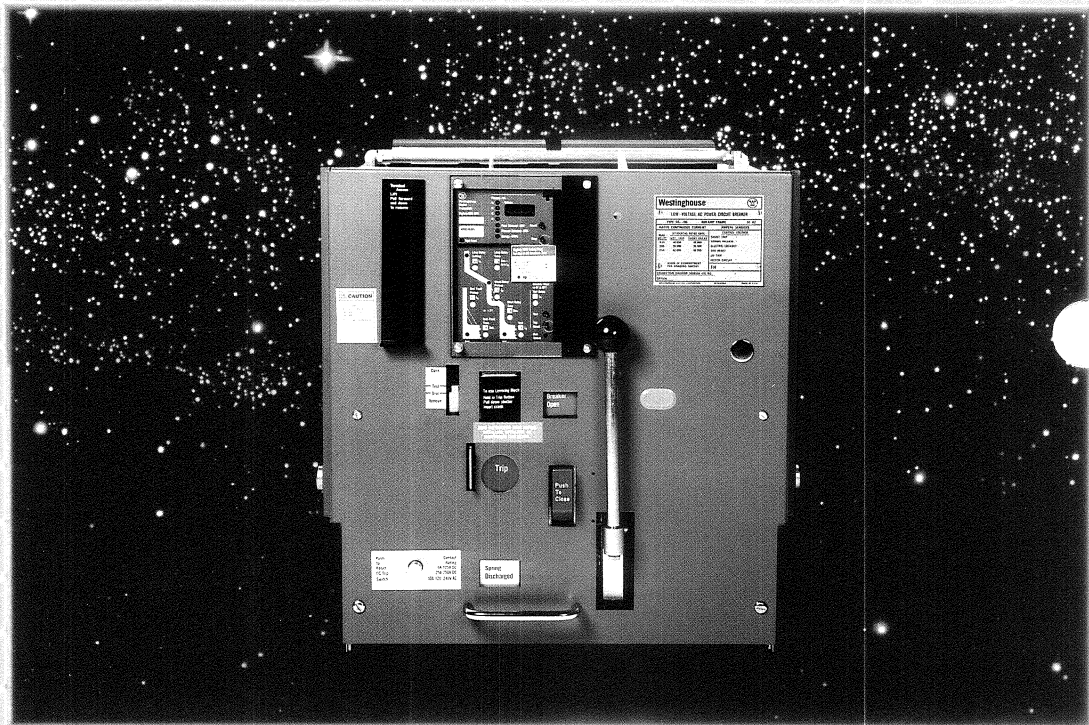


WESTINGHOUSE • DS POWER MODULES



Enhance the OEM Value Added Approach To Low Voltage Switchgear Construction

WESTINGHOUSE • VALUE ADDED DESIGNS



DS Power Modules, featuring Type DS Circuit Breakers, enhance the Westinghouse commitment to OEM customers and the value added approach to low voltage switchgear construction.



ANOTHER VALUE ADDED DESIGN

DS Power Modules enhance the Westinghouse value added approach to low voltage switchgear construction for original equipment manufacturers. Continuing with its commitment of **No More Than Wanted, No Less Than Needed**, Westinghouse makes available its fourth different low voltage structure offering for OEM customers.

The approach depends upon an OEM's design requirements. A selection can be made from the new Power

Module or the previously available One High Cell, Substructure and, for maximum value added, Erector Set Parts.

By using any one of these four structural approaches, OEM customers take advantage of all the industry leading DS Switchgear design features. At the same time, they are able to showcase their own uniqueness and contribute the desired amount of value.

PROVEN DESIGN AND WORLDWIDE ACCEPTANCE

DS Power Modules are standardized low voltage structures. They are tailored specifically for the needs of original equipment manufacturers involved in the design, application and manufacture of power distribution equipment up to 600 volts. The Power Module, featuring Type DS Air Circuit Breakers, offers a proven switchgear design, known for its reliability and worldwide acceptance.

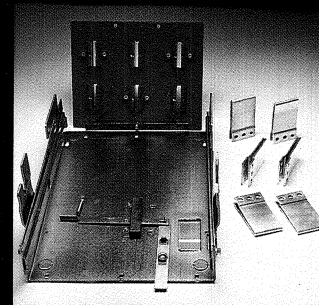
The field proven slot and tab structural design assures critical breaker and cell alignments, even under less than ideal installation conditions. Precise alignments and ruggedness go hand-in-hand with the DS Switchgear Design.

All breaker and structure insulation is Westinghouse glass polyester, which provides better mechanical, thermal and electrical properties than phenolics.

Circuit protection is provided by the DS circuit breaker equipped with either the Amptector trip unit or the Digitrip RMS micro-processor based trip unit. An OEM's entire system can be further enhanced with a variety of other Westinghouse micro-processor based devices, providing monitoring, energy management and communications capabilities.

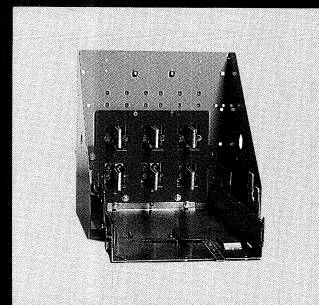
DS ERECTOR SET PARTS

Three basic items permit an OEM to display individual uniqueness with maximum value added.



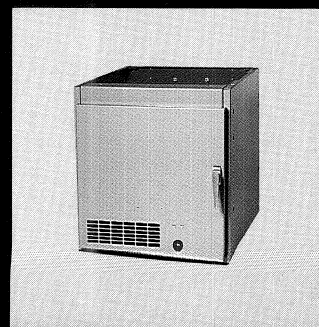
DS SUBSTRUCTURE

A substructure is a basic assembled supporting structure with a smaller degree of value added.

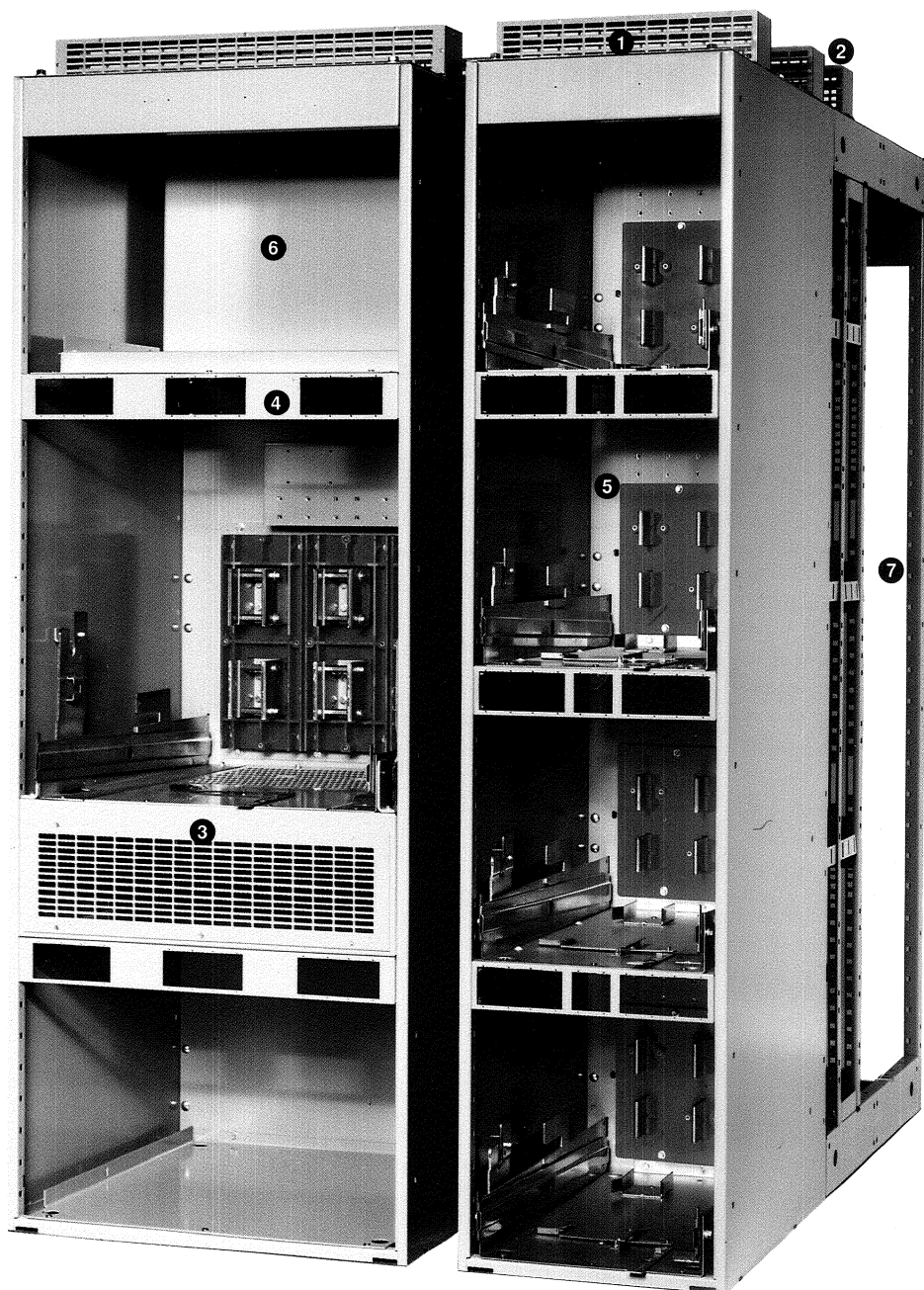


DS ONE HIGH CELL

The one high assembled box facilitates stacking with the amount of value added further reduced.



WESTINGHOUSE • DS POWER MODULES



The DS Power Module on the left accommodates a 4000A. DS circuit breaker and auxiliary space, while the DS Power Module on the right accommodates a variety of DS circuit breakers from 800A. through 2000A.

- ❶ Breaker compartment roof ventilator
- ❷ Rear compartment roof ventilators
- ❸ Ventilation panel
- ❹ Fixed meter panel with cutouts
- ❺ Equipped breaker compartment
- ❻ Blank auxiliary space
- ❼ Rear bus and cable compartments



VERTICAL STRUCTURES

All vertical structures are 92 inches high (not including 4 inch roof ventilators), and either 12 inches wide (transition section), 21 inches wide (breaker and auxiliary compartments through 2000 amperes), 30 inches wide (generator main structure) or 34 inches wide (4000 ampere breaker compartment). Structure depths will range from 58.875 to 76.875 inches, depending upon circuit breaker combinations and OEM requirements.

Vertical structures feature:

- Complete and free standing design to reduce labor
- Up to four breaker compartments in same vertical structure
- Breaker and auxiliary compartment mixing
- Separate full height and depth auxiliary units
- Superior insulation system with glass polyester
- Precise slot and tab design insuring critical alignments
- Rugged welded construction
- Electrodeposition paint process for uniform thickness and 100 percent coverage
- Rear accessible main bus and cable compartments
- Front breaker and auxiliary sections barriered from bus compartment for safety
- Optional rear compartment barriers for additional safety
- Integral ventilation chimneys and roof ventilators
- Fixed meter panels with cutouts
- Wiring troughs for simplified wiring
- Lifting angles for ease of structure placement
- Pre-punched holes for accessory mounting

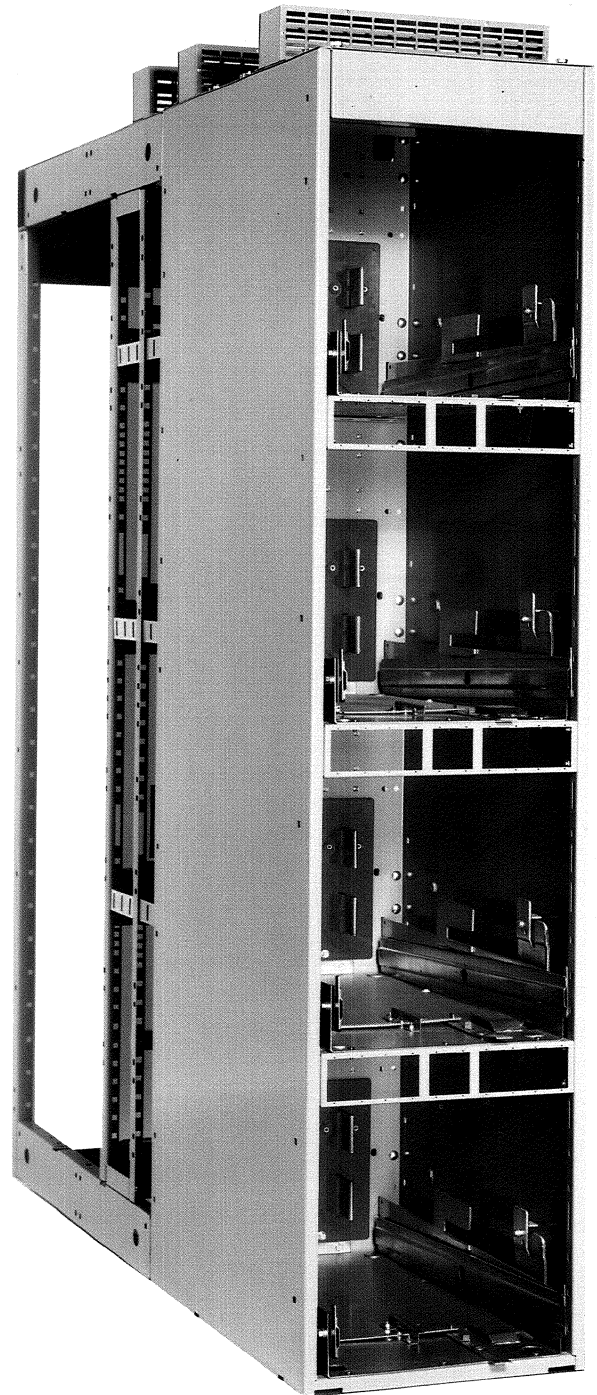
Free Standing Vertical Structure

OEMs Add

- Doors
- LV control wiring
- Horizontal bus
- Rear sheets
- Back side sheets

OEMs Save

- Labor
- Testing
- Time
- Space
- People



WESTINGHOUSE • DS POWER MODULES

CIRCUIT BREAKER COMPARTMENTS

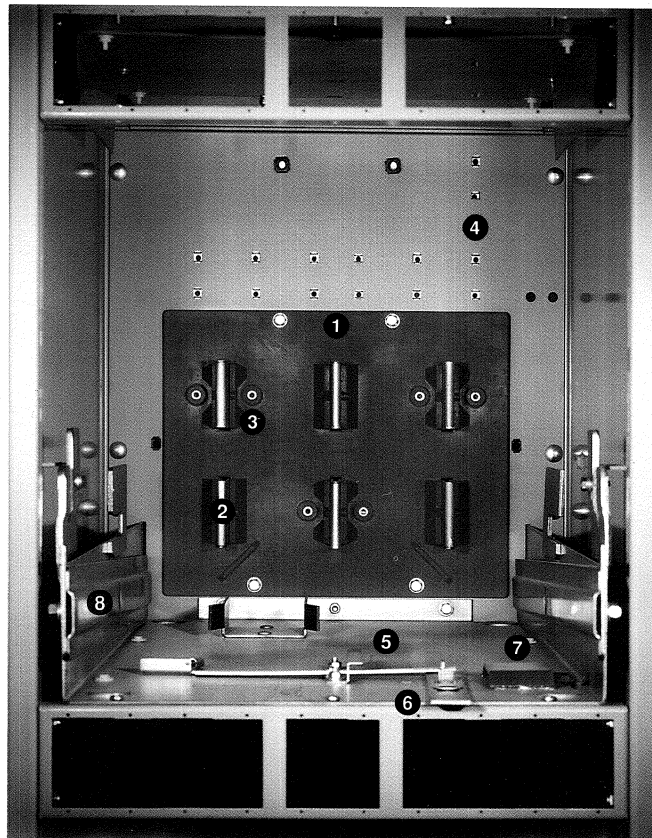
Circuit breaker compartments are complete with safety features and interlocks already incorporated. An OEM needs only to mount auxiliary wiring devices and do internal secondary wiring.

In addition, circuit breaker compartments offer:

- Unique double front steel barrier for personnel safety
- Line and load stationary primary contacts
- Glass polyester primary contact mounting plate
- Breaker mounting pan with push-to-trip mechanism, ground contact and safety interlocks
- Current transformer mounting provisions
- Four position drawout (connect, test, disconnect and withdrawn)
- Closed door breaker storage in disconnect position
- Breaker inspection/maintenance on captive extension rails
- Accommodates non-fused or fused breakers

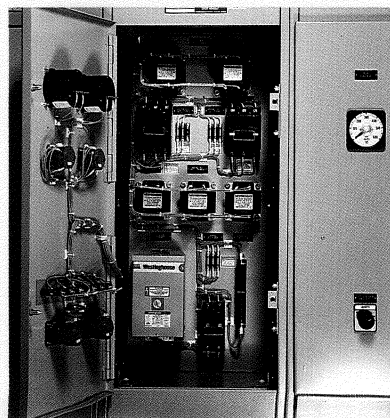
AUXILIARY AND BLANK COMPARTMENTS

Auxiliary and/or blank compartments can be combined in the same vertical structure with circuit breaker compartments for OEM mounting of metering, instrumentation and control equipment. The three size choices available are based on height, 1/4 the height of a vertical structure (equivalent in size to a standard breaker compartment), 1/2 high (two breaker compartment equivalent) and 3/4 high. If more space is required, separate full height auxiliary structures are also available.



DS Circuit Breaker Compartment

- | | |
|--|-----------------------------------|
| ① Contact mounting plate | ⑤ Breaker mounting pan |
| ② Stationary main contacts | ⑥ Push-to-trip mechanism |
| ③ Pre-tapped current transformer mounting provisions | ⑦ Ground contact |
| ④ Pre-punched accessory mounting holes | ⑧ Captive drawout extension rails |



A 1/2 high auxiliary compartment is shown with a variety of devices already installed and wired.



BUS AND CABLE COMPARTMENTS

The accessible rear bus and cable compartments provide more space for easier connections, maintenance and inspection.

Bus bracing is available for 75,000 amperes rms (standard) or 100,000 and 200,000 amperes rms (optional). Bus sizing for the DS Assembly Design is based on NEMA standard temperature rise criteria of 65°C over 40°C ambient (outside the enclosure). This bus system design meets industry standards for phase-to-phase clearance without utilizing insulated bus.

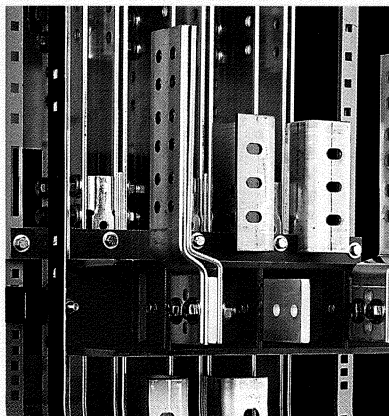
Bus and cable compartments also provide:

- Sleeved load bus runbacks with glass polyester supports
- Full length ground bus with solderless terminals
- Wiring channels for convenient secondary wire routing

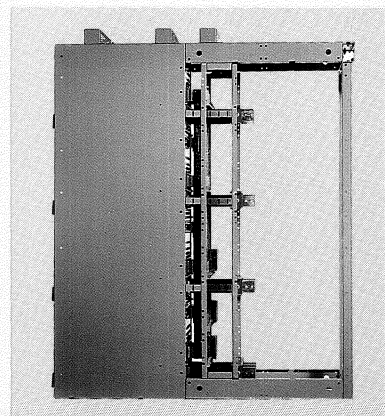


Rear view of a completed DS switchgear assembly

- | | |
|--------------------------|---------------------------------------|
| ① Bus tap plate | ⑤ Optional steel safety barrier |
| ② Horizontal main bus | ⑥ Rear mounted terminal blocks |
| ③ Vertical riser bus | ⑦ Glass polyester bus runback support |
| ④ Full length ground bus | ⑧ Glass polyester bus riser tie bar |



A rear view closeup clearly shows the horizontal main bus tap plate locations, riser bus and glass polyester runback supports.



Sleeve insulated load bus runbacks are evident in this side view of a typical DS Power Module. The glass polyester supports can be seen where the runbacks enter the cable compartment.

WESTINGHOUSE • OPTIONAL ITEMS

CUSTOMIZING AN ASSEMBLY

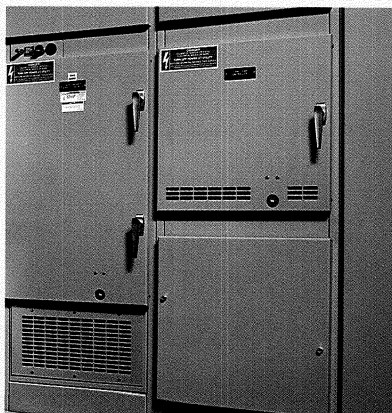
A wide variety of accessory items are available for OEMs to customize their low voltage assembly. Some of the accessories are designed to be integral parts of the assembly itself. When selected, these items will be installed at the factory. Other accessories complement the assembly, and, when selected, are shipped as separate items for OEM installation.

Factory Installed Accessories:

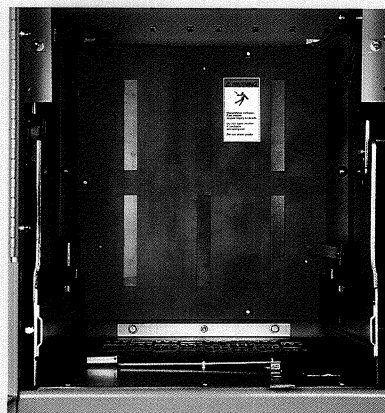
- Front door
- Blank cover
- End cover
- Rear cover
- Side barriers
- Bus cable barrier



- 1 End Covers are full height, front to rear steel covers that bolt to the right and/or left ends of an assembly structure.
- 2 Rear Covers are split into two horizontal sections to facilitate handling. Both pieces are bolt-on, made of steel and cover the full height of a vertical section.
- 3 Front to Rear Side Barriers separate vertical sections, and are complete with glass polyester insulation and main bus windows.
- 4 Bus Cable Barriers are grounded steel safety barriers between bus and cable compartments.



Front doors, available for all size breaker and fuse truck compartments, are supplied complete with necessary ventilation openings, quick opening latches and push-to-trip flaps. Blank covers are of a bolt-on design.



As the breaker is withdrawn from the cell, the glass polyester shutter system automatically covers stationary primary contacts, providing for an additional degree of personnel safety.



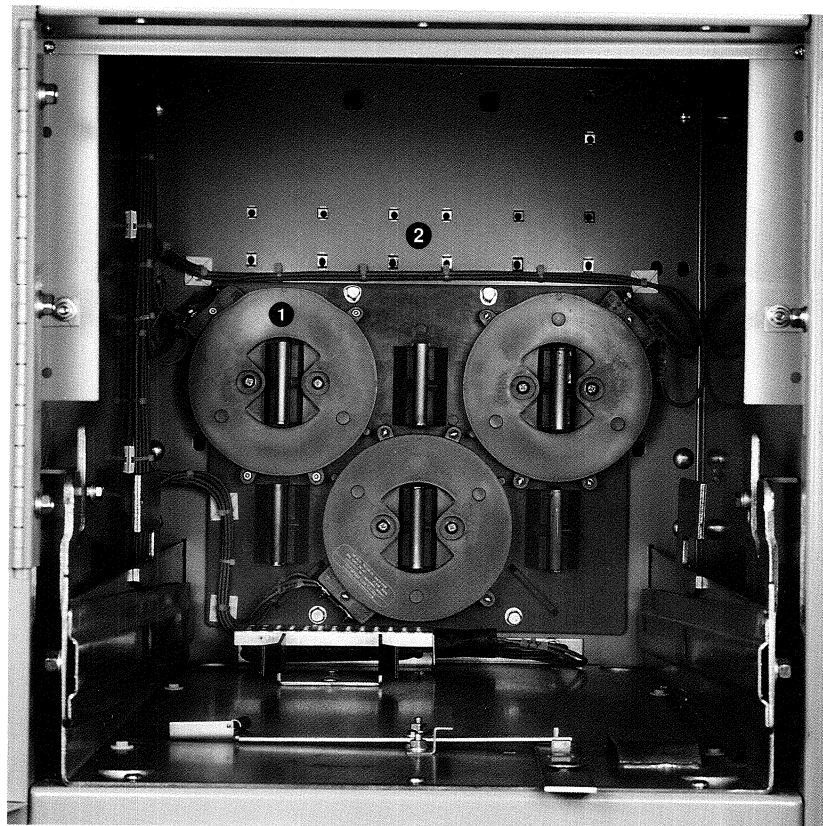
OEM Installed Accessories:

- Mechanical interlock
- Kirk Key interlock
- Shutter system
- Traveling lifter
- Lifting bar
- Handling carriage
- Instrument current transformers
- Secondary contact block

Mechanical Interlock - The mechanical interlock prevents two breakers, located one above another, from being closed at the same time.

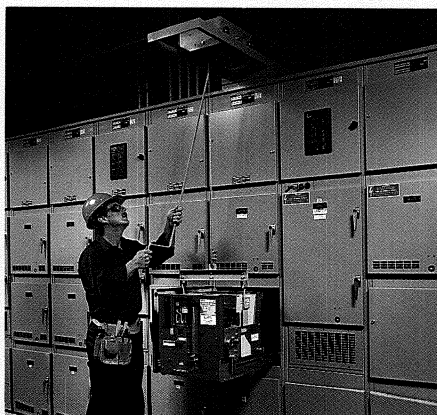
Kirk Key Interlock - Two different interlock designs are available. One prevents the breaker from being levered into either the test or connected positions. The other prevents the breaker from closing. Westinghouse provides only the interlock provisions.

For more detailed information and other available accessories, refer to the DS OEM Handbook under the section entitled "Miscellaneous Options."



1 Three front accessible current transformers can be mounted in each breaker compartment. Ratios from 100/5 to 6000/5 are available, depending upon the frame size.

2 A double row of pre-drilled holes, just above the glass polyester contact plate, is provided for mounting secondary contact blocks. Each compartment accommodates up to four (8 contact) blocks.



A convenient traveling circuit breaker lifter is rail mounted on top of the assembly for easily removing or installing circuit breakers. The lifting bar attaches to the breaker and can be used with any lifting device.



A handling carriage is a portable breaker lifting device and transport truck. It makes the movement of a circuit breaker from one location to another a simple task.

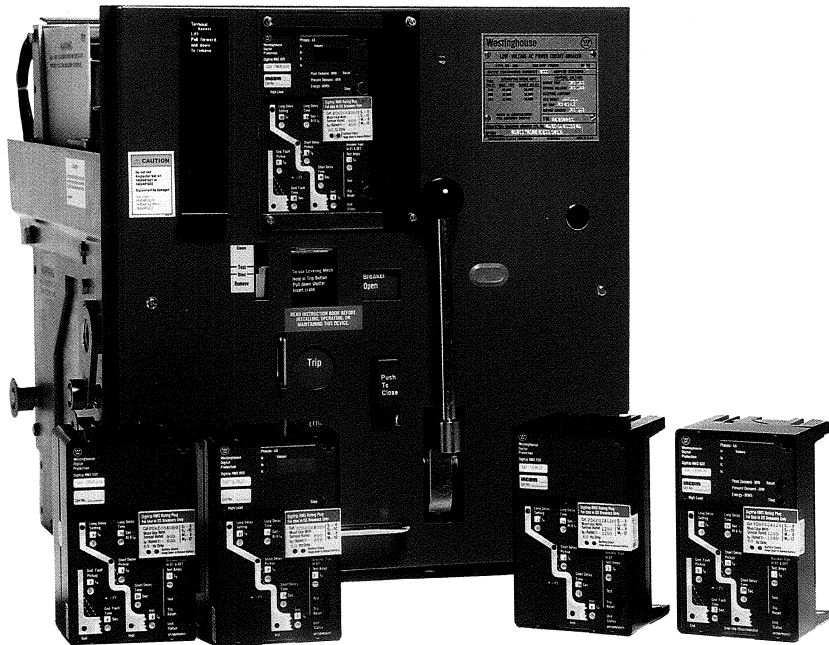
WESTINGHOUSE • DS CIRCUIT BREAKERS

THE CIRCUIT BREAKER OF CHOICE

Westinghouse DS and DSL low voltage power circuit breakers, recognized worldwide as the circuit breaker of choice, were designed for safe, reliable service in metal enclosed switchgear applied at system voltages up to 600 Vac. They are available with either of two distinct trip unit families, Amprector or Digitrip RMS. Digitrip RMS is a second generation micro-processor-based trip unit with true rms sensing capabilities.

Five continuous current frame sizes, 800 through 4000 amperes, are covered by just three physically different breaker frame sizes.

DSL circuit breakers are coordinated combinations of standard DS circuit breakers and integrally mounted series connected current limiters. The primary purpose of the current limiters is to extend the interrupting rating of the DS circuit breaker up to 200,000 amperes. Integrally mounted limiters are used with 800 and 1600 ampere frame DSL circuit breakers, while 3200 and 4000 ampere frames use limiters mounted in separate drawout trucks.



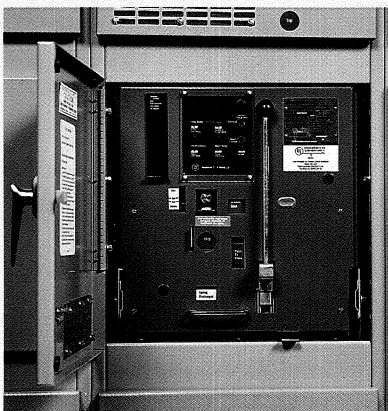
DS circuit breakers are supplied with either the Amprector trip unit (analog device) or the Digitrip RMS trip unit (digital device).

Amprector Offers

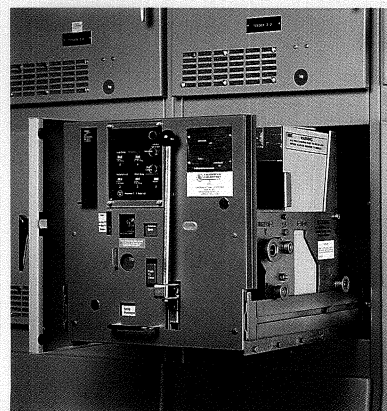
- Independent and continuously adjustable overcurrent tripping functions
- Trip mode indicators
- Test kit testing

Digitrip RMS Offers

- True RMS sensing
- Protection
- Information
- Integral testing
- Remote communications
- Energy monitoring



The unique combination of the closed outer metal door in conjunction with the metal breaker faceplate forms a double front safety barrier for operating personnel.



Captive drawout extension rails provide for the simple inspection and maintenance of DS circuit breakers.



The four position drawout DS circuit breaker is available with either a manually or electrically operated two-step stored energy mechanism. Positive control of the closing

instant is assured by the stored energy mechanism.

Controls and indicators are functionally grouped on the front of the

breaker. Easy access to the stored energy mechanism and control devices is gained by removing the breaker faceplate.

Standard Ratings ① of Type DS Low Voltage Air Circuit Breakers

Breaker Type DS		206	206H	416	416H	420	632	840
Continuous Current Amperes		800	800	1600	1600	2000	3200	4000
Temperature Rise, °C. Max		85	85	85	85	85	85	85
600 V 60 Hz Fully Rated Breaker	(Amps Sym)	30,000	42,000	42,000	50,000	50,000	65,000	85,000
600 V 60 Hz Selective Breaker	(Amps Sym)	30,000	42,000	42,000	50,000	50,000	65,000	85,000
480V 60 Hz Fully Rated Breaker	(Amps Sym)	30,000	42,000	50,000	65,000	65,000	65,000	85,000
480V 60 Hz Selective Breaker	(Amps Sym)	30,000	42,000	50,000	65,000	65,000	65,000	85,000
240V 60 Hz Fully Rated Breaker	(Amps Sym)	42,000	50,000	65,000	65,000	65,000	85,000	130,000
240V 60 Hz Selective Breaker	(Amps Sym)	30,000	42,000	50,000	65,000	65,000	65,000	85,000

① All type DSL breakers, with current limiters, can provide up to a maximum of 200,000 Symmetrical amperes of protection

QUALITY AND DEPENDABILITY

The quality and dependability of the DS circuit breaker design have been consistently proven for more than 25 years, with the largest installed base worldwide. To insure the continuation of this high degree of quality and reliability, a series of Westinghouse Quality Assurance Programs are ongoing.

Ongoing Programs:

- Quality Assurance Certificate supplied with each circuit breaker
- Life Test Program performed monthly
- Mini-Life Test Program performed daily

STANDARDS AND TESTING

The DS Switchgear Assembly is built and tested in accordance with the latest standards of IEEE, NEMA, ANSI and UL. More specifically, the DS assembly is designed in accordance with ANSI Standard C37.20.1, C37.51 and UL Standard 1558. In addition, the assembly structure itself is seismically certified.

Since the new DS Power Module is an integral part of the complete DS Switchgear Assembly, many of the benefits of the comprehensive

Westinghouse design and testing programs are extended to OEM customers.

Of particular interest and benefit are:

- DS Circuit Breakers with UL Labels
- DS Power Modules built to meet UBC4 Seismic Requirements (An optional seismic kit must be added to a DS Power Module by the OEM.)

- DS Power Modules with a UR1558 Classification (Although it takes an entire low voltage assembly to comply with UL1558 and is the OEM's responsibility, the DS Power Module is recognized by UL as being an acceptable component of an assembly that meets UL1558.)

WESTINGHOUSE • DIGITRIP RMS TRIP UNITS

USER FRIENDLY AND EASIER TO OPERATE

The family of U.L. listed Digitrip RMS Trip Units provides increased circuit protection with true RMS sensing. Digitrip RMS affords opportunities to improve systems control, monitoring, and testing while also providing for future energy monitoring and remote communications requirements.

Digitrip RMS family comprises four models: 500, 600, 700, and 800. Digitrip RMS 500 is the basic model. The 600, 700, and 800 units build upon the 500, and each other, to provide increased function levels with the flexibility to meet specific distribution requirements. Along with circuit protection, all Digitrip RMS models include information and testing functions.

Remote communications and energy monitoring functions are provided by Digitrip RMS 800 and RMS 700.

As many as five phase and two ground time-current adjustments, providing increased levels of protection, are available on each Digitrip RMS Unit to help meet specific application requirements.

All Digitrip RMS Trip Units are capable of zone selective interlocking for coordinating time delays with downstream devices so the circuit breaker closest to a fault trips instantly.

Interchangeable rating plugs establish the continuous ampere rating of the circuit breaker.

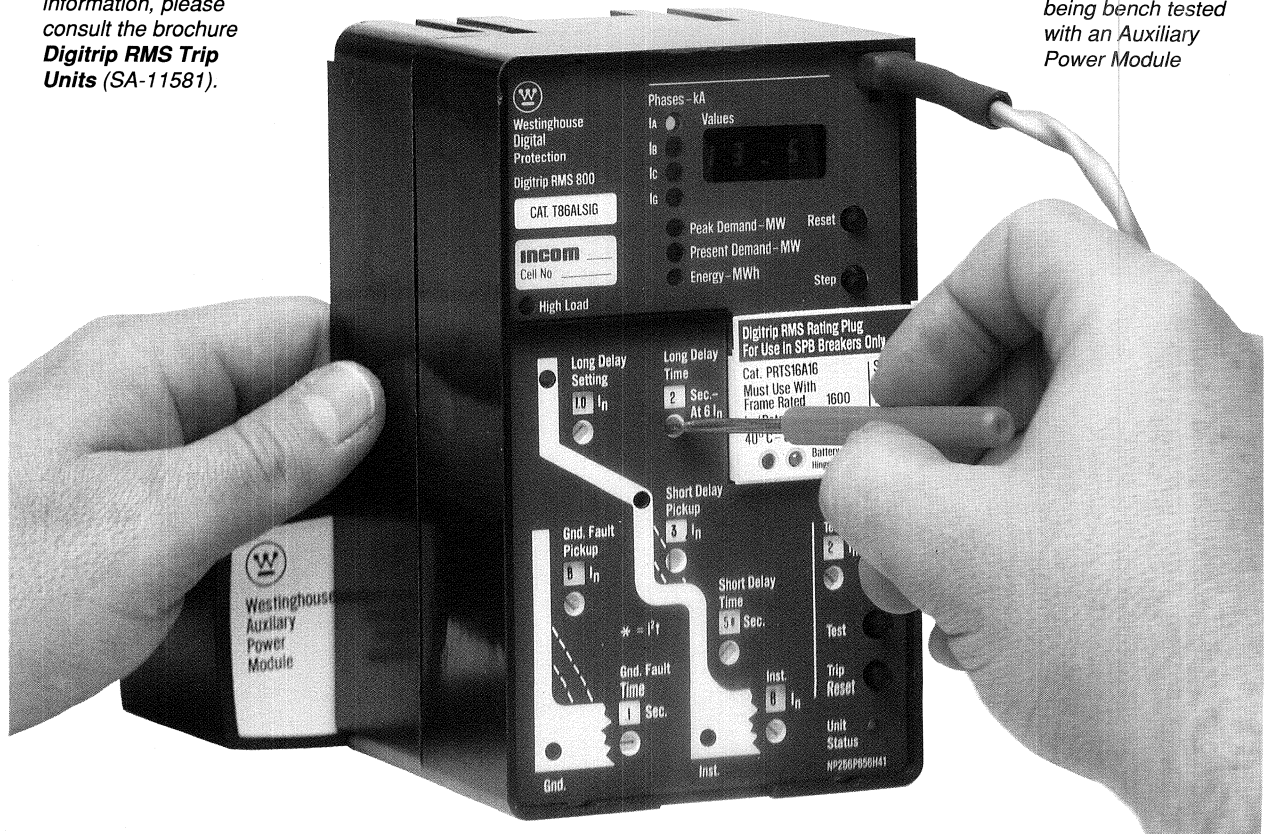
Testing features are unique to Digitrip RMS Trip Units because a fault condition can be quickly and easily simulated to show if all functions are operating properly. Any protection function can be tested. The integral test panel includes a test selector switch, and test and trip unit reset pushbuttons.

Bench testing can be conducted with the Auxiliary Power Module accessory.

Digitrip RMS Trip Units are completely self-contained and, when the circuit breaker is closed, no external power is required to operate their protection systems. They operate from current signal levels and the control power is derived from the current sensors integrally mounted in the circuit breaker.

For additional Digitrip RMS Trip Unit information, please consult the brochure Digitrip RMS Trip Units (SA-11581).

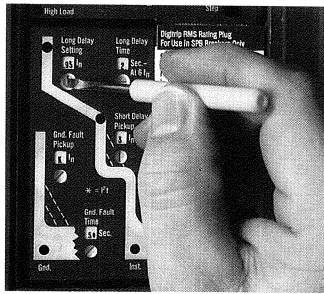
The Digitrip RMS 800 Unit is shown being bench tested with an Auxiliary Power Module





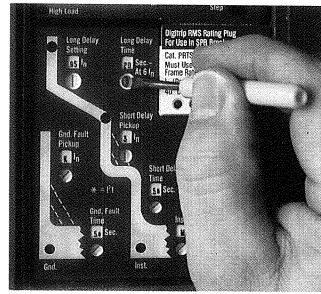
CURVE SHAPING MADE EASY

Digitrip RMS Trip Units give the circuit breakers greater selective coordination potential. Curve shaping adjustments are permitted over an extremely wide range with a greater degree of accuracy than possible with conventional circuit breakers equipped with conventional electronic trip units. The number of curve shaping adjustments used is determined by individual distribution system requirements, but there are actually thousands of possible curves; and Digitrip RMS Trip Units show time-current curves on the faceplate.



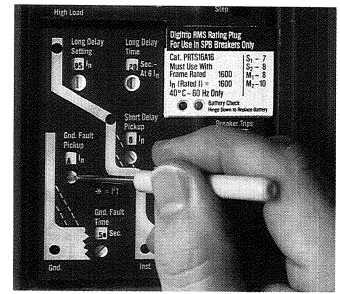
Long Delay Adjustment

Available settings range from 0.5 to 1.0 I_n . Each setting is expressed as a multiple of the maximum ampere rating (I_n) of the installed rating plug.



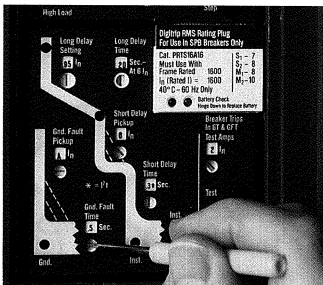
Long Delay Time Adjustment

Available settings range from 2 to 24 seconds, represent total clearing times at a current value equal to six times the ampere rating of the installed rating plug.



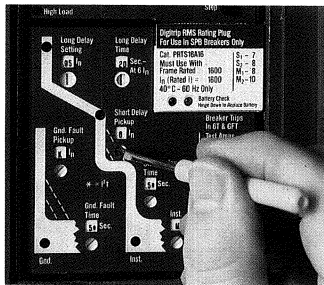
Ground Fault Current Pickup Adjustment

Available settings are given in alphabetical notations from A to H. Specific setting values are a function of the rating plug. Pickup settings range from 0.25 to 1.0 times the ampere rating of the installed rating plug up to a maximum pickup value of 1200 amperes.



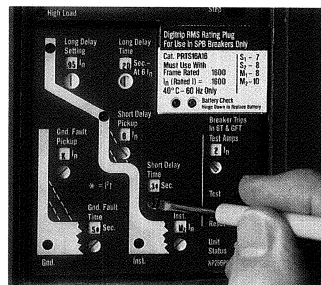
Ground Fault Time Delay Adjustment

Two different curve configurations are possible: flat or I^2t response. Five flat and three I^2t response time delay settings are provided.



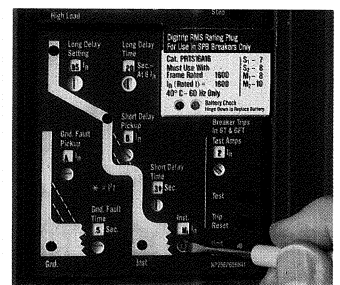
Short Delay Pickup Adjustment

Available settings range from 2 to 6 I_n with two variable settings of S1 and S2.



Short Delay Time Adjustment

Two different curve configurations are possible: flat or I^2t response. Five flat and three I^2t response time delay settings are provided.



Instantaneous Pickup Adjustment

Available settings range from 2 to 6 I_n with two variable settings of M1 and M2.

Available Basic Functions	RMS 500	RMS 600	RMS 700	RMS 800
Protection				
Long Time/Instantaneous	●	●	●	●
Long Time/Short Time	●	●	●	●
Long Time/Short Time/Instantaneous	●	●	●	●
Long Time/Instantaneous/Ground	●	●	●	●
Long Time/Short Time/Ground	●	●	●	●
Long Time/Short Time/Instantaneous/Ground	●	●	●	●
Information				
LED Trip Indications	●	●	●	●
Long Time Fault	●	●	●	●
Shout Time Fault	●	●	●	●
Instantaneous Fault	●	●	●	●
Ground Fault	●	●	●	●
Unit Status	●	●	●	●
Battery Check	●	●	●	●
Testing				
Simulated Testing Of All Six Protection Functions	●	●	●	●

Optional Functions	RMS 500	RMS 600	RMS 700	RMS 800
System Parameters and Troubleshooting				
Four-Digit Alpha-Numeric Display With:				
Eleven Trip And Trouble Readouts		●		●
Ammeter Instrumentation		●		●
Individual Phase Current Readouts		●		●
Ground Current Readout		●		●
Trip Current Readout		●		●
High Load Indication		●		●
Remote Communications				
Direct To Remote PC			●	●
Via AEM For Local Monitoring			●	●
Via AEM For Local Monitoring Then Into PC Remote			●	●
Mode of Trip Signals (Hard Wired)		●	●	●
High Load Alarm Signal (Hard Wired)		●	●	●
Energy Monitoring			●	●
Energy Monitoring				
Four-Digit Readout Display With:				
Piak Dmand (With Reset Pushbutton)				●
Present Demand				●
Energy Consumption				●



Westinghouse Electric
Corporation

Distribution and Control
Business Unit

Five Parkway Center
Pittsburgh, PA 15220

This brochure is published solely for information purposes and should not be considered all inclusive. If further information is required, you should consult Westinghouse Electric Corporation.

Sale of product shown in this literature is subject to terms and conditions outlined in appropriate Westinghouse Electric Corporation selling policies or other contractual agreement between the parties. This literature is not intended to and does not enlarge or add to any such contract. The sole source governing the rights and remedies of any purchaser of this equipment is the contract between the purchaser and Westinghouse.

NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OR WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE, ARE MADE REGARDING THE INFORMATION, RECOMMENDATIONS AND DESCRIPTIONS CONTAINED HEREIN. In no event will Westinghouse be responsible to the purchaser or user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations and descriptions contained herein.

*Refer to the DS Power Module
Order Entry and Pricing Form
(Form 33-822) for detailed information
concerning available configurations,
layout, pricing and ordering.*