Westinghouse Electric Corporation
Distribution Equipment Division
St. Louis, Mo. 63141

December, 1974
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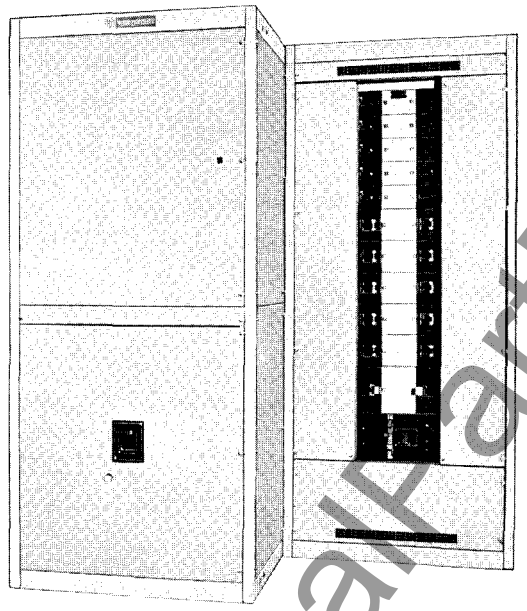
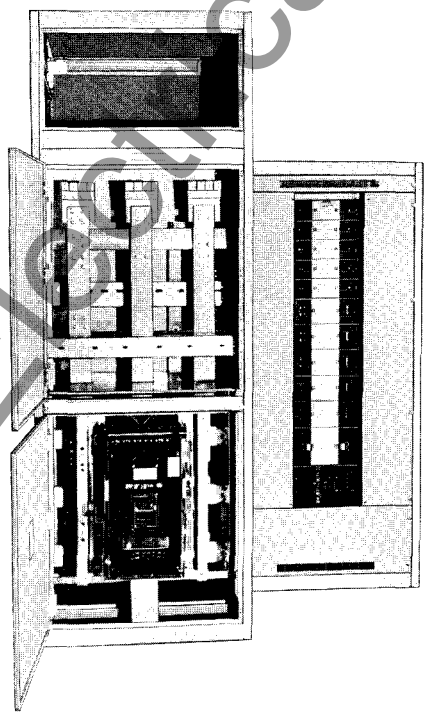
Low Voltage Distribution Switchboards and Power Assemblies



Front View



Access View

Type WF Switchboards
Meet NEMA Standard PB-2, 1972

Construction Details
3000 Ampere Main Bus Maximum
All front accessible – Main sections front and/or side accessible.

Branch devices panel mounted

Sections flush at rear

Designed especially for mounting against a wall, but self supporting.

©Main Devices, Individually Mounted
Molded case breaker, 225-3000 Amps, fixed

SELTRONIC™ breaker: 800-3000 Amps fixed

MARK 75® circuit breaker, 225-1200 Amps, fixed

TRI-PAC® circuit breaker, 225-1600 Amps, fixed

DS power circuit breaker, fixed or drawout, 600-3000 Amps

SCB-II circuit breaker, 600-3000 Amps, fixed, drawout, or fixed/front removable

Bolted pressure contact switch, 800-3000 Amps

FDP fusible switch, 800-1200 Amps, fixed

Branch Devices, Panel Mounted
Molded case breaker, 15-1200 Amps

SELTRONIC™ breaker: 800-1200 Amps

MARK 75 circuit breaker, 15-1200 Amps

TRI-PAC circuit breaker, 15-800 Amps

FDP fusible switch, 30-1200 Amps

Combination motor starter unit, full voltage, non-reversing or reversing;

Mac B circuit breaker type, Size 0-4

Mac F fusible switch type, Size 0-4

© Changed since previous issue.

Type WRP Switchboards
Meet NEMA Standard PB-2, 1972

Construction Details
Rear (and front) accessible – main sections also side accessible

Branch devices panel mounted

Sections flush at front and rear

Designed especially to be mounted with code clearance to a wall.

©Main Devices, Individually Mounted
Molded case breaker, 225-3000 Amps, fixed

SELTRONIC™ breaker: 800-3000 Amps, fixed

MARK 75® circuit breaker, 225-1200 Amps, fixed

TRI-PAC® circuit breaker, 225-1600 Amps, fixed

DS power circuit breaker, 600-4000 Amps, fixed or drawout

DBE entrance protector, fusible, 800-4000 Amps, fixed

SCB-II circuit breaker, 600-3000 Amps, fixed, drawout or fixed/front removable

FDP fusible switch, 800-1200 Amps, fixed

Bolted pressure contact switch, fusible, 800-4000 Amps

Branch Devices, Panel Mounted
Molded case breaker, 15-1200 Amps

SELTRONIC™ breaker: 800-1200 Amps

MARK 75 circuit breaker, 15-1200 Amps

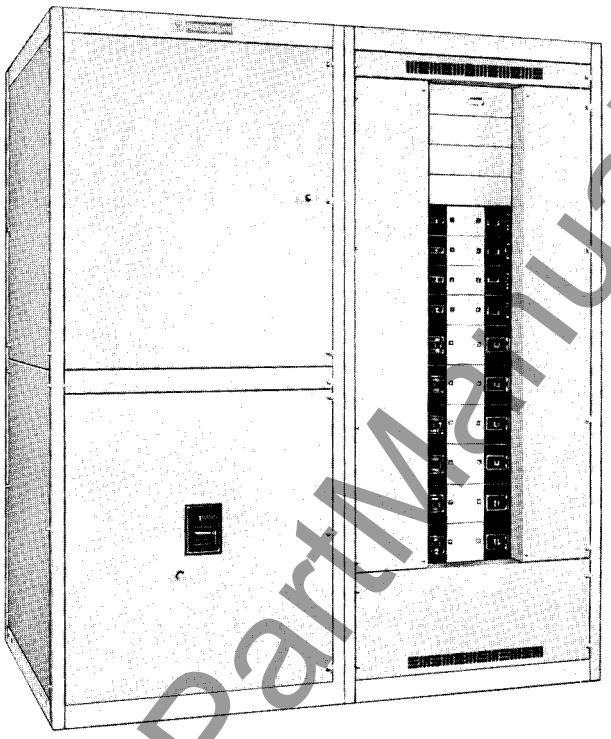
TRI-PAC circuit breaker, 15-800 Amps

FDP fusible switch, 30-1200 Amps

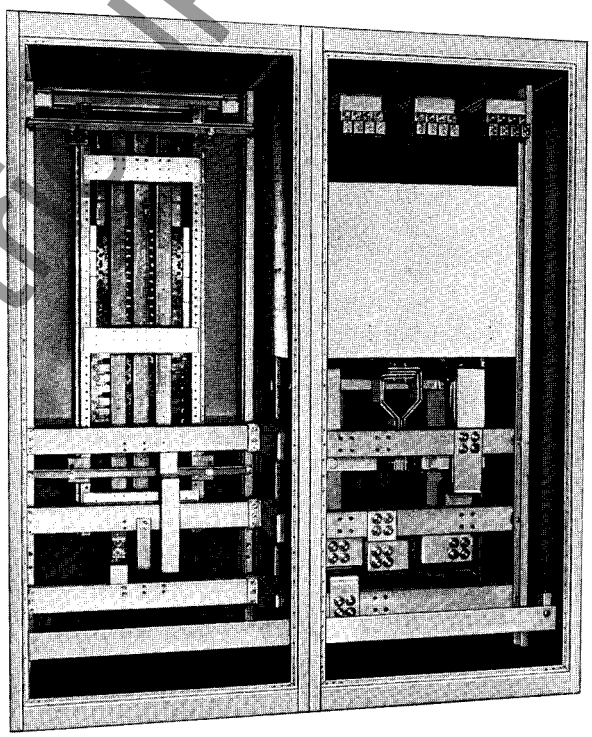
Combination motor starter unit, full voltage, non-reversing or reversing:

Mac B circuit breaker type, sizes 0-4

Mac F fusible switch type, sizes 0-4



Front View



Rear View

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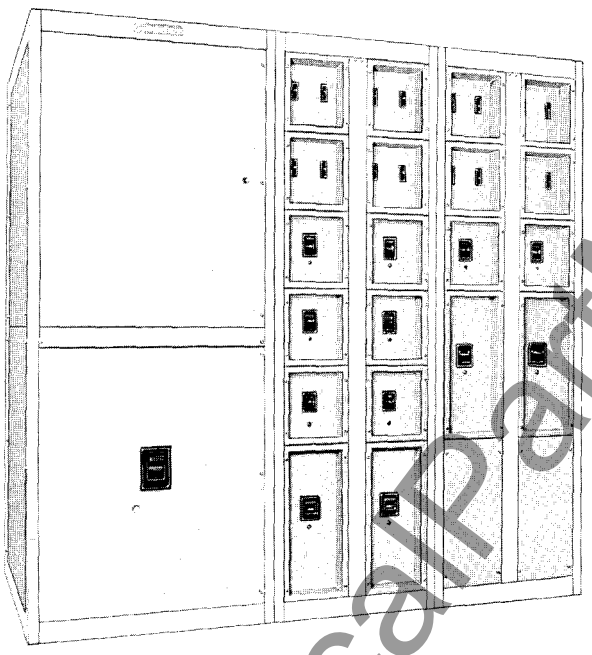
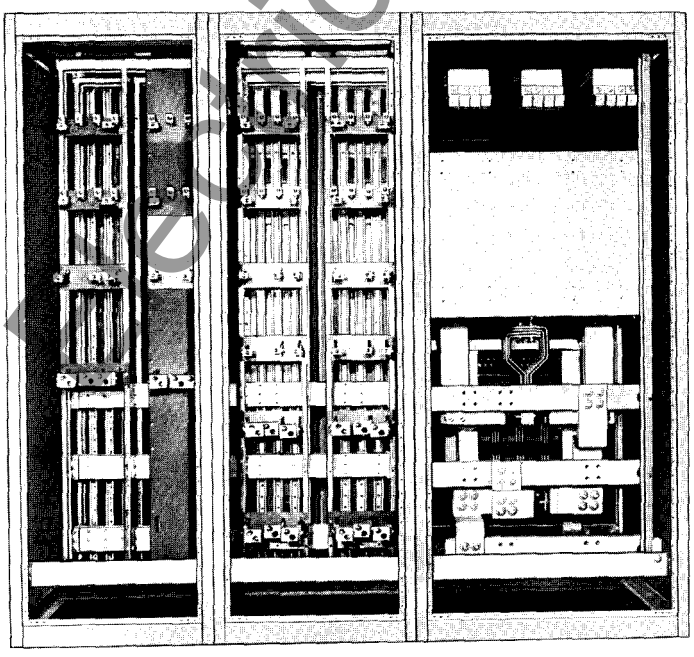


Front View



Rear View

Type WRI Switchboards
Meet NEMA Standard PB-2, 1972

Construction Details
Rear (and front) accessible – main section also side accessible

Branch devices individually mounted

Sections flush front and rear

Designed especially to be mounted with code clearance to a wall.

©Main Devices, Individually Mounted
Molded case breaker, 225-3000 Amps, fixed

SELTRONIC™ breaker: 800-3000 Amps fixed

MARK 75® circuit breaker, 225-1200 Amps, fixed

TRI-PAC® circuit breaker, 225-1600 Amps, fixed

DS power circuit breaker, 600-4000 Amps, fixed or drawout

DBE entrance protector, fusible, 800-4000 Amps, fixed

SCB-II circuit breakers, 600-3000 Amps, fixed, drawout, or fixed/front removable

FDP fusible switch, 400-1200 Amps, fixed

Bolted pressure contact switch, fusible, 800-4000 Amps, fixed

Branch Devices, Individually Mounted
Molded case circuit breaker 100-3000 Amps, fixed

SELTRONIC™ breaker: 800-3000 Amps, fixed

MARK 75® circuit breaker, 100-1200 Amps, fixed

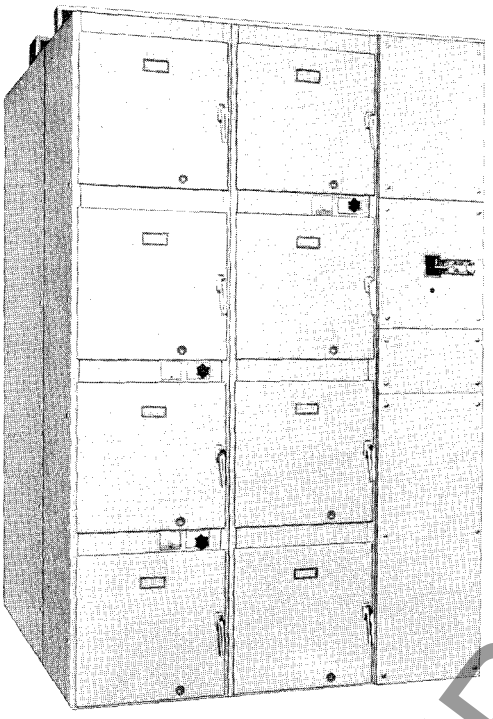
TRI-PAC® circuit breaker, 100-1600 Amps, fixed

SCB-II circuit breakers, 600-3000 Amps, fixed, drawout, or fixed/front removable

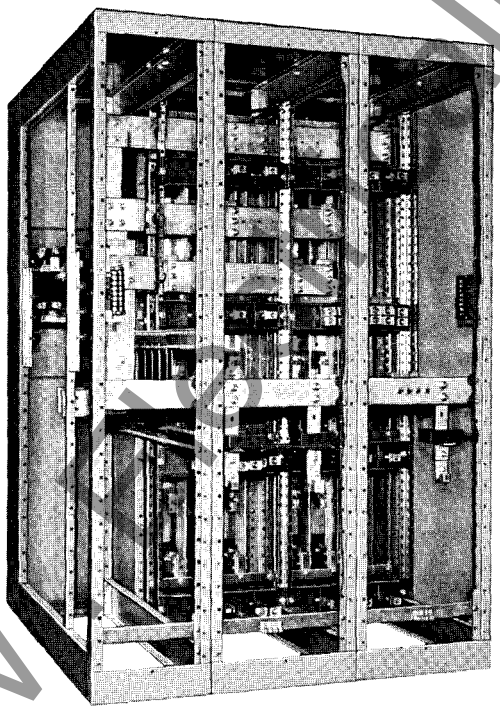
FDP fusible switch, 100-1200 Amps, fixed

Bolted pressure contact switch, fusible, 800-4000 Amps, fixed

© Changed since previous issue.



Front View



Rear View

Type WPA Power Assemblies

Meet NEMA Standard SG-5, 1971

Construction Details, Indoor and Outdoor
Rear and front accessible

Low voltage metal enclosed switchgear

Designed especially to mount other than against a wall, and to contain power circuit breakers only, in modular arrangement

Fully compartmentized

Main Devices, Individual Cell Mounted, Drawout Only
Type DS power circuit breaker with adjustable solid state trip devices and stored energy, manual or electrical operating mechanism, 600-4000 Amps

Type DSL fusible power circuit breaker with adjustable solid state trip devices and stored energy, manual or electrical operating mechanism, 600-4000 Amps

Branch Devices, Individual Cell Mounted, Drawout Only
Type DS power circuit breaker with adjustable solid state trip devices and stored energy, manual or electrical operating mechanism, 600-4000 Amps

Type DSL fusible power circuit breaker with adjustable solid state trip devices and stored energy, manual or electrical operating mechanism, 600-4000 Amps

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Low Voltage Distribution Switchboards and Power Assemblies

Application Considerations and Definitions

POW-R-LINE™ Design

Pow-R-Line designates a modern family of distribution switchboards, Types WF, WRP and WRI (see pages 1, 2, 3) which replaces conventional type switchboards. The enclosures have a distinctive appearance as compared to the conventional design, as frame parts and covers are formed in a different manner and a two-tone gray finish is applied. All Pow-R-Line types have main horizontal bus arrangements that put the three phases in the same vertical plane,

Pow-R-Line Type WRI is a compartmentized design having advanced safety features and uses the modular concept for individually mounted molded case breakers and other devices in the distribution sections. Service sections utilize a complete range of main devices.

Pow-R-Line Types WF and WRP are distinguished from their conventional counterparts chiefly in the design and appearance of the enclosure.

Pricing for Pow-R-Line switchboards is found in Price List 31-520.

Front/Rear Line-up of Switchboard Sections

Type **WF Switchboards** will always line up in the rear. This enables them to be placed flat against a wall. If the main section is deeper than others, due to physical size of the main device, the necessary off-set in line up will occur in the front, and the main section will be accessible from the side as well as from the front. A Type WF Switchboard may be furnished with both front and rear line up as a special modification.

Type **WRP Switchboards** (panel mounted branches) are furnished with both front and rear line up.

Type **WRI Switchboards** (individually mounted branches) and all **Power Assemblies**② (Type WPA) line up front and rear.

Standard Switchboard Height

Types WF, WRP, WRI, WPA:
Standard switchboard height is 90 inches nominally. Special 78 inch (nominal) switchboards are available at additional price.

Panel Mounting

Panel mounted circuit protective devices are an assembly of units mounted on a panelboard type base (panelboard construction). Units may be molded case AB De-ion® breakers, FDP switches or Mac-B/Mac-F motor starter units. Panel mounted assemblies are for installation in Type WF and Type WRP Switchboards. Circuit protective devices are accessible from the front.

A main molded case breaker or main FDP switch, within the sizes listed for panelboard design, can be included in the panel mounted assembly.

On panel mounted circuit breaker construction, the panel front for each vertical section is recessed (without door) so that the breaker handles are readily accessible but do not extend beyond the face of the switchboard. Full length panel door covering exposed handles can be furnished as a modification.

For panel mounted FDP construction, the panel front is semi-flush with the face of the switch units. Individual doors with external operating handles are furnished as standard over each switch unit. Full length panel door covering all switch units is not available.

Individually Mounted Devices

Individually mounted circuit protective devices are those which are each separately mounted with rear connected line and load terminals. Operating handles project through a cutout in a removable or hinged cover. Devices are rear accessible for connection and are front accessible for installation, adjustment and inspection.

Individually mounted circuit protective devices are supplied in Type WRI switchboards. Where Mac-B/Mac-F motor starter units, CDP or FDP units are required, they will be built into a panel mounted vertical section and incorporated in the Type WRI switchboard line-up.

Space Only for Future Devices

a. Panel mounted construction
Where space only for future circuit protective devices is required, the proper space and a blank filler plate will be supplied. Connections and mounting hardware are not included. List price additions for space only appear in the price list for all devices on which this is available.

b. Individually mounted construction
Space only for individually mounted branch devices is not available. However, provisions for mounting future device are available.

Provision for Future Devices

Where provisions for future circuit protective devices are required, space for the device, corresponding vertical bus, device connectors and the necessary mounting hardware will be supplied. Connectors and hardware for panel mounted devices are normally packaged in individual kits and are shipped with the equipment. For individually mounted devices, these parts are generally included as a part of the switchboard assembly. List price additions for this feature are listed in Price List 31-520 for all devices on which this is available.

Bus Bar System

Standard bus in switchboards is tin-plated aluminum. Copper is available at additional price. Silver-plating is also available at additional price.

Main bus and sub-main busses meet U.L. standards for temperature rise of 65°C on all Pow-R-Line Type WF, WRP and WRI switchboards. Type WPA Power Assemblies meet NEMA standards for temperature rise of 65°C.

To properly select and size overcurrent devices for use in a switchboard, this allowable tempreature rise must be taken into account as to its effect on the tripping characteristics of the devices in question.

Accordingly, Article 220-4(a) of the NEC requires over current devices to be rated not less than 125% of the continuous load they are protecting. To comply with this, an 80% derating factor must be used with all overcurrent devices such as molded case breakers unless they are tested and

② If one or all feeder breakers are power types such as DS, DSL, DBE, in addition to mains and ties, the switchboard is a Power Assembly.

approved for application at 100% of their rating.

Standard bus and connectors on all switchboards are braced to withstand short circuit stresses up to 50,000 RMS amperes.

Maximum main bus ampacities and extra bus bracing are listed below for each type of switchboard.

Type WF
Main bus ampacity through 3000 amperes max. Main bus bracing for 50,000 RMS amperes is standard. Extra bracing to 100,000 RMS amperes is available in Pow-R-Line design.

Type WRP and WRI
Main bus ampacities through 4000 amperes max, including vertical sub-main busses in panel mounted circuit device panels.

Main bus bracing for 50,000 RMS amperes is standard. Main bus bracing above 50,000 RMS up to 200,000 RMS amperes is available as a modification.

Type WPA
Main bus ampacity is 4000 amperes max. Main bus bracing for 50,000 RMS amperes is standard; main bus bracing above 50,000 RMS up to 200,000 RMS amperes is available as a modification.

Provision for Bus Duct Entrance and Exit
Bus duct connections to switchboard sections include cutout and drilling in the top of the switchboard with riser connections from the switchboard device or bus, up to the point where the bus duct enters the switchboard. No connections are furnished external to the switchboard.

In all transactions involving Bus Duct attached to switchboards, it is essential that information regarding orientation of the "top" of the Bus Duct with respect to front of the switchboard be supplied to the coordinating Division or plant.

On Type WF, WRP and WRI switchboards, solid bus bar is used to connect the bus duct to the individually mounted main device, main or sub-main switchboard bus, or vertical main bus of panel mounted circuit protective device panels. **Bus ducts fed by panel mounted branch devices are cable connected.**

Aluminum riser connections are standard. Copper is available as a modification.

Generally, bus duct connections are brought into the incoming service section, however, there are numerous instances where this provision is required in distribution sections. Preferred layout arrangements are shown on page 28.

Transitions
Connection transitions are required for connecting switchboards to the secondary of power center transformers (dry or liquid) motor control centers, and for other special switchboard configurations such as "L" or "U" shaped switchboard arrangements. In some applications, an extra structure complete with connections is required; in others, where switchboard depth and space permit, only the connection conductors are required.

Aluminum conductors are standard. Copper is available as a modification.

Auxiliary Blank Sections
These are normally mounted adjacent to service sections or distribution sections and used where incoming service or feeder conductors require additional space or facilities not included in the standard switchboard, such as:

1. Mounted adjacent to a top connected service section and used as a cable pull section where service conductors are brought in underground. Auxiliary sections are the same depth as the service section, and are wide enough to accommodate the incoming cables.

2. Mounted adjacent to a service section and used as a bus transition compartment for running riser bus from the loadside of the service section up to top outgoing bus duct connection when distribution sections are not required. Auxiliary sections are the same depth as service sections.

In addition to the above applications, auxiliary sections may be mounted adjacent to a distribution section and used as section for lighting panel or other device which may be cable connected to branch circuit device in distribution section. Dimensions are compatible with arrangements required.

Switchboards Used for Service Equipment
Service equipment is the electrical equipment that constitutes the main control and means of power cutoff for the electric service (normally Power Company supply) brought into the building.

Where switchboards are to be used as service equipment, certain N.E.C. requirements apply that necessitate modifications not normally supplied in switchboards.

Following is a summary of the requirements which are pertinent to the pricing and ordering of a switchboard for service equipment:

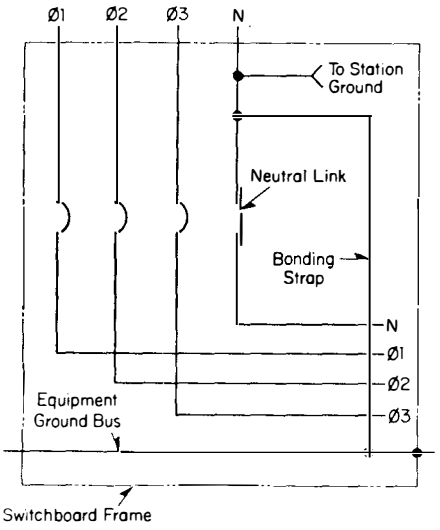
a. A switchboard with main lugs only (no main disconnect) must be designed so that all circuits in the switchboard can be disconnected from the supply source by the operation of no more than six operating handles (breaker or switch).

   Switchboard equipped with main disconnect devices are not subject to the above six disconnect limitation, as the entire board can be de-energized with the main disconnect device.

b. For testing purposes, means are also required to disconnect the switchboard neutral bus from the grounded service neutral conductor (1 phase 3 wire, 3 phase 4 wire systems). To comply with this requirement, a removable link (solid bar) is provided in the switchboard neutral bus. This link is generally located near the point where the main feeders enter the switchboard or in the area of the main disconnect device where one is provided.

   To further comply with N.E.C. requirements, a separate bonding strap is connected from the neutral bus to the switchboard frame. This bonding strap is located on the line side of the removable neutral link maintaining a service ground to the switchboard frame, when the test link is removed. See Figure 1.

Figure 1



Where switchboards are to be used for service equipment, it should be clearly indicated in requests for quotations, and noted on the General Order.

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Low Voltage Distribution Switchboards and Power Assemblies

Application Considerations and Definitions, *Continued*

Underwriters' Laboratories, Inc. Requirements and Labelling

The basic requirements for obtaining an Underwriters' Laboratories, Inc. label on a switchboard, is that all the component devices (breakers, switches, etc.,) in the switchboard assembly must be Underwriter listed. In addition, the switchboard must comply with all applicable provisions of UL-891.

Today's modern electrical systems require that switchboards offer a wide selection of electrical devices, many of which do not fall within the scope of Underwriters' listed devices. Therefore, the conditions under which a switchboard may be labeled are limited.

Listed below are several important guidelines for consideration when an Underwriters' Laboratories label is specified:

1. Underwriters' nameplates, where applicable, are supplied for each vertical structure rather than one common nameplate for the complete switchboard lineup. Where all of the component devices in the switchboard are Underwriter listed and all applicable provisions of UL-891 are met, each of the vertical structures which make up the switchboard may be labeled.

2. Individual vertical structures of a switchboard may be labeled where they comply with Underwriters' requirements, although other vertical structures in the same switchboard lineup may not meet the UL standards.

Where switchboards are required to display the Underwriters' label, the factory must be contacted during the negotiation stage. Orders entered having this requirement must carry a separate notation on the General Order.

3. All Pow-R-Line Switchboards are U.L. labeled if all mounted devices are U.L. listed.

② This design uses conventional switchboard construction in lieu of Pow-R-Line. Refer to Westinghouse.

Plug-in Breakers, Type WRI Switchboards

Standard construction includes fixed mounted breakers. Plug-in branch or feeder circuits up thru 400 amp maximum are available as a modification only in Type WRI switchboards having individually mounted molded case branches.

The plug-in feature is available in EB, EHB, F, HF, JA, KA, HKA, LA, LAB and HLA frames to 400 amp maximum. Layout dimensions and front panel arrangements are the same as for fixed, individually mounted units of conventional design.②

Mac-B/Mac-F Motor Starters

a. Starter Units

Mac-B/Mac-F motor starters are available only in panel mounted construction in Type WF or Type WRP. These combination starter units contain type A/200 starters with either MCP (motor circuit protectors), molded case breakers or FDP fusible disconnects. A single hinged door is provided over each starter and disconnect unit combination. Each disconnecting device is interlocked with the door permitting the opening of the door when the device is in the OFF position only. A defeater latch is incorporated in the door to permit inspection by authorized personnel while the device is in the ON position. Disconnect handles can be padlocked in the OFF position. Starter doors are also arranged for padlocking. The combination starter unit is internally wired for main connections. An operating coil rated at line voltage will be furnished as standard. For coils other than line voltage and frequency, specify coil voltage and frequency. Full length panel door covering all starter units is not available.

b. Types of Wiring

Type A wiring does not include terminal blocks. Terminals are provided on the starter component devices for load and control connections. Combination line starters are factory wired and assembled in the unit enclosure in the most efficient arrangement. Auxiliary devices can be supplied but no wiring external to the unit will be furnished. All feeder circuit breakers or fusible disconnect units are in this classification. Type A wiring is standard.

Type B wiring essentially duplicates Type A except that all control wires terminate at blocks near the side of each unit. Load terminals are conveniently located near the vertical wire gutter and adjacent to the control terminal block. No wiring external to the unit will be furnished.

Type C wiring utilizes Type B units. In addition, factory wiring of all control wiring is extended from the unit terminal block to a master terminal block. The same method is followed for all load wiring through size 3 starters. Master terminal blocks can be located at the top or bottom of each vertical switchboard section.

Automatic Throw-Over Equipment

For continuity of service, automatic throw-over equipment between two (2) incoming services may be required. This equipment transfers the load upon failure of the normal (or preferred) source to the standby (or emergency) source. Upon restoration of the normal source, the load is automatically transferred back to it. To accomplish this, electrically-operated main protective devices (and bus tie device, if required) must be employed. Additional relays also are required to detect source voltage failure and to transfer control power when required. A manual selector switch is usually provided to select the mode of operation – automatic or manual transfer.

Device Selection Data

Circuit protective devices such as circuit breakers should be applied according to their voltage, continuous currents and interrupting current ratings. To accurately calculate available fault current at a point in a given system, as the basis for selecting adequate protective devices, requires a knowledge of the impedance of all circuit elements such as cables, busses, generators, transformers and connected motor feedback. However, approximate values of maximum fault current available at the input terminals of a switchboard may be estimated by referring to a table of precalculated data. The table below ignores the impedance of conductors connecting the switchboard to its power source and is based only on the electrical parameters shown.

Table A: Symmetrical Fault Currents of Typical System Sources and System Loads

Transformer Rating 3 Phase Kva and Impedance Percent	Maximum Short Circuit Kva Available from Primary System	208 Volts, 3 Phase				240 Volts, 3 Phase				480 Volts, 3 Phase				600 Volts, 3 Phase			
		Rated Load Continuous Current, Amps.	Short-Circuit Current RMS Symmetrical Amps.			Rated Load Continuous Current, Amps.	Short-Circuit Current RMS Symmetrical Amps.			Rated Load Continuous Current, Amps.	Short-Circuit Current RMS Symmetrical Amps.			Rated Load Continuous Current, Amps.	Short-Circuit Current RMS Symmetrical Amps.		
			Transformer Alone	50% Motor Load ②	Combined		Transformer Alone	100% Motor Load ②	Combined		Transformer Alone	100% Motor Load ②	Combined		Transformer Alone	100% Motor Load ②	Combined
300	50000	834	14900	1700	16600	722	12900	2900	15800	361	6400	1400	7800	289	5200	1200	6400
5%	100000		15700		17400		13600		16500		6800		8200		5500		6700
	150000		16000		17700		13900		16800		6900		8300		5600		6800
	250000		16300		18000		14100		17000		7000		8400		5600		6800
	500000		16500		18200		14300		17200		7100		8500		5700		6900
	Unlimited		16700		18400		14400		17300		7200		8600		5800		7000
500	50000	1388	21300	2800	25900	1203	20000	4800	24800	601	10000	2400	12400	481	8000	1900	9900
5%	100000		25200		28000		21900		26700		10900		13300		8700		10600
	150000		26000		28800		22500		27300		11300		13700		9000		10900
	250000		26700		29500		23100		27900		11600		14000		9300		11200
	500000		27200		30000		23600		28400		11800		14200		9400		11300
	Unlimited		27800		30600		24100		28900		12000		14400		9600		11500
750	50000	2080	28700	4200	32900	1804	24900	7200	32100	902	12400	3600	16000	722	10000	2900	12900
5.75%	100000		32000		36200		27800		35000		13900		17500		11100		14000
	150000		33300		37500		28900		36100		14400		18000		11600		14500
	250000		34400		38600		29800		37000		14900		18500		11900		14800
	500000		35200		39400		30600		37800		15300		18900		12200		15100
	Unlimited		36200		40400		31400		38600		15700		19300		12600		15500
1000	50000	2780	35900	5600	41500	2406	31000	9600	40600	1203	15500	4800	20300	962	12400	3900	16300
5.75%	100000		41200		46800		35600		45200		17800		22600		14300		18200
	150000		43300		48900		37500		47100		18700		23500		15000		18900
	250000		45200		50800		39100		48700		19600		24400		15600		19500
	500000		46700		52300		40400		50000		20200		25000		16200		20100
	Unlimited		48300		53900		41800		51400		20900		25700		16700		20600
1500	50000					3609	41200	14400	55600	1804	20600	7200	27800	1444	16500	5800	22300
5.75%	100000						49800		64200		24900		32100		20000		25800
	150000						53500		57900		26700		33900		21400		27200
	250000						56800		71200		28400		35600		22700		28500
	500000						59600		74000		29800		37000		23900		29700
	Unlimited						62800		77200		31400		38600		25100		30900
2000	50000									2406	24700	9600	34300	1924	19700	7800	27500
5.75%	100000										31000		40600		24800		32600
	150000										34000		43600		27200		35000
	250000										36700		46300		29400		37200
	500000										39100		48700		31300		39100
	Unlimited										41800		51400		33500		41300
2500	50000									3008	28000	12000	40000	2405	22400	9600	32000
5.75%	100000										36500		48500		29200		38800
	150000										40500		52500		32400		42000
	250000										44600		56600		35600		45200
	500000										48100		60100		38500		48100
	Unlimited										52300		64300		41800		51400

② The motor's short circuit current contributions are computed on the basis of motor characteristics that will give four times normal current. For 208 volts, 50% motor load is assumed while for other voltages 100% motor load is assumed. For other percentages, the motor short circuit current will be in direct proportion.

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Low Voltage Distribution Switchboards and Power Assemblies

Device Selection Data

Continued

Power Circuit Breakers

Formerly, circuit breaker interrupting ratings were based on the total asymmetrical RMS current value of the first half cycle. Since this value defies simple calculation, the IEEE and NEMA recognize a factor of 1.25 to convert the easily calculated symmetrical value to the asymmetrical. The 1.25 factor is based on a system X/R ratio of 11.72.

NEMA standards for power circuit breakers have now been changed to symmetrical interrupting ratings even though the breakers are actually tested under asymmetrical conditions with the test circuit X/R ratio being not less than 6.6 which corresponds to an asymmetry factor of 1.17 (15% power factor). This is a good approximation of the majority of low voltage systems.

Auxiliary Features

Type DS Breakers
Short Time Delay, Selective static trip
Ground Fault Static Trip
Undervoltage Release, Instantaneous
Undervoltage Release, Time delay
Shunt Trip, Manually operated breakers
Auxiliary switch (4 pole module)
Bell alarm switch, electric or hand reset
Electric close release, manually operated breakers
Overcurrent alarm, no trip
Key interlock
Portable test kit for static trip

Type DB Breakers (Obsolete)
Short Time Delay, Selective trip
Undervoltage Release, Instantaneous
Undervoltage Release, Time delay
Shunt Trip, Manually operated breakers
Auxiliary switch (4 pole module)
Dc reverse current
Bell alarm switch, electric or hand reset
Key interlock
Ground fault trip

Ⓒ Changed since previous issue.
② Long delay time setting adjustable from 4 to 36 seconds at 600% rating.
③ Short delay time setting adjustable from .18 to .5 seconds (11 to 30 HZ).
④ Ground current trip time setting adjustable from .22 to .5 seconds (13 to 30 HZ).
⑤ Do not use long delay pick-up settings which allow continuous current flow in excess of breaker frame rating (ie., 600A, 1600A, 2000A, 3200A, 4000A).

Table B: Type DS Power Circuit Breakers Standard Ratings With Instantaneous or Short Delay Solid State Trip Device⑥

Breaker Type	Trip Range, Amps	Available Current Sensor Ratings	Interrupting Ratings, RMS Amperes					
			Symmetrical, Ac Volts			Asymmetrical, Ac Volts		
			240	480	600	240	480	600
With Instantaneous Trip Device								
DS-206	50-600	100, 150, 200, 300, 400, 600	42000	30000	22000	50000	35000	25000
DS-416	50-1600	100, 150, 200, 300, 400, 600, 800, 1200, 1600	65000	50000	42000	75000	60000	50000
DS-420	1000-2000	2000	65000	50000	42000	75000	60000	50000
DS-632	1200-3200	2400, 3200	85000	65000	65000	100000	75000	75000
ⒸDS-840	2000-4000	4000	130000	85000	85000	150000	100000	100000
With Short Delay Trip Device								
DS-206	50-600	100, 150, 200, 300, 400, 600	30000	30000	22000	35000	35000	25000
DS-416	50-1600	100, 150, 200, 300, 400, 600, 800, 1200, 1600	50000	50000	42000	60000	60000	50000
DS-420	1000-2000	2000	50000	50000	42000	60000	60000	50000
DS-632	1200-3200	2400, 3200	65000	65000	65000	75000	75000	75000
ⒸDS-840	2000-4000	4000	85000	85000	85000	100000	100000	100000

Table B1: Adjustable Solid State Trip Ranges⑥

Current Sensor Rating, Amperes	Long Time Delay Pick-up Range, Amperes②⑤		Instantaneous Pick-up Range, Amperes		Short Time Delay Pick-up Range, Amperes③		Ground Current Trip, Amperes④
	Min.	Max	Min.	Max.	Min.	Max.	Min.
100	50	125	400	1200	400	1000	20
150	75	187	600	1800	600	1500	30
200	100	250	800	2400	800	2000	40
300	150	375	1200	3600	1200	3000	60
400	200	500	1600	4800	1600	4000	80
600	300	750	2400	7200	2400	6000	120
800	400	1000	3200	9600	3200	8000	160
1200	600	1500	4800	14400	4800	12000	240
1600	800	2000	6400	19200	6400	16000	320
2000	1000	2500	8000	24000	8000	20000	400
2400	1200	3000	9600	28800	9600	24000	480
3200	1600	4000	12800	38400	12800	32000	640
Ⓒ4000	2000	5000	16000	48000	16000	40000	800

Table B2: Type DB Power Circuit Breakers(Obsolete) – Standard Ratings With Instantaneous or Short Time Dual Magnetic Trip Device⑥

Breaker Type	Ampere Rating	Interrupting Ratings, RMS Amperes						
		Symmetrical, Ac Volts			Asymmetrical, Ac Volts			250 Volt Dc
		240	480	600	240	480	600	
With Instantaneous Dual Magnetic Trip Device								
DB-15	30-225	25000	22000	14000	30000	25000	15000	15000
DB-25	150-600	42000	30000	22000	50000	35000	25000	25000
DB-50	600-1600	65000	50000	42000	75000	60000	50000	50000
DB-75	2000-3000	85000	65000	65000	100000	75000	75000	75000
DB-100	4000	130000	85000	85000	150000	100000	100000	100000
With Short-Time Dual Magnetic Trip Device								
DB-15	30-225	14000	14000	14000	15000	15000	15000	.....
DB-25	150-600	22000	22000	22000	25000	25000	25000	.....
DB-50	600-1600	42000	42000	42000	50000	50000	50000	.....
DB-75	2000-3000	65000	65000	65000	75000	75000	75000	.....
DB-100	4000	85000	85000	85000	100000	100000	100000	.....

⑥ All adjustable magnetic or solid state breaker trip devices on these circuit breakers are factory set and shipped at the minimum settings. Any exception to this practice is to be negotiated.

Molded Case Circuit Breakers

NEMA Standards for molded case breakers have been changed to recommend application of breakers on the basis of symmetrical ratings, even though actual tests are conducted under asymmetrical conditions with the test circuit power factor not more than 20% for interrupting ratings above 20,000 amps, not more than 30% for ratings of 10,001 to 20,000 amps, and not more than 50% for ratings of 10,000 amps or less. Where circuit power factors are known to be appreciably different from those above, it may be necessary to apply breakers on the basis of asymmetrical ratings. For this reason both values are shown in the table.

Note: For application of molded case breakers on 3 phase, 3 wire Delta systems having one phase grounded, refer to Westinghouse.

Auxiliary Features and Modifications

See Price List 29-120 or Descriptive Bulletin 29-150.

SELTRONIC™ Breakers

SELTRONIC breakers have a solid state trip unit which utilizes a series of adjustable and non-adjustable rating plugs to establish the continuous current rating of the breaker. Adjustable plugs permit adjustment of continuous current within preset limits. With non-adjustable plugs, maximum continuous current is limited to the rating of the plug.

SELTRONIC breakers are available as follows: Type MC, 400-800 amps; Type NC, 600-1200 amps; and Type PC, 1000-3000 amps. Rating plugs are available as follows:

Type MC Breaker (400-800 Amps)
Non-Adj.: 400, 500, 600, 700, 800 Amps
Adjustable: 500, 600, 700, 800 Amps (adjustable from 70-100%)

Type NC Breaker (600-1200 Amps)
Non-Adj.: 600, 700, 800, 900, 1000, 1200 Amps
Adjustable: 800, 900, 1000, 1200 Amps (Adjustable 70-100% except 800 Amp which is adjustable 75-100%)

Type PC 2000 Breaker (1000-2000 Amps)
Non-Adj.: 1000, 1200, 1400, 1600, 1800, 2000 Amps
Adjustable: 1600, 1800, 2000 Amps (adjustable 70-100%)

Type PC 2500 Breaker (1400-2500 Amps)
Non-Adj.: 1400, 1600, 1800, 2000, 2500 Amps
Adjustable: 1800, 2000, 2500 Amps (Adjustable 70-100%)

Type PC 3000 (1600-3000 Amps)
Non-Adj.: 1600, 1800, 2000, 2500, 3000 Amps
Adjustable: 2500, 3000 Amps (Adjustable 70-100%)

Table C: Molded Case Circuit Breakers, Standard Interrupting Ratings

Breaker Type	Trip Type	Available Ampere Ratings	Interrupting Rating② Symmetrical Ac 240 V	Symmetrical Ac 480 V	Symmetrical Ac 600 V	Asymmetrical Ac 240 V	Asymmetrical Ac 480 V	Asymmetrical Ac 600 V	Dc 250 V⑨
Conventional Breakers									
EB	NIT	15- 100	10000⑪	.....	.....	10000	.....	.....	5000⑥
EHB	NIT	15- 100	18000③	14000	.....	20000	15000	.....	10000⑦⑧
FB	NIT	15- 150	18000	14000	14000	20000	15000	15000	10000⑦
JA	NIT	70- 225	25000	22000	22000	30000	25000	25000	10000
KA	IT	70- 225	25000	22000	22000	30000	25000	25000	10000
CA	NIT	125- 225	10000	.....	.....	10000	.....	.....	.....
LBB	NIT	125- 400	42000	30000	22000	50000	35000	25000	10000
LB	IT	70- 400	42000	30000	22000	50000	35000	25000	10000
LAB	NIT	125- 400	42000	30000	22000	50000	35000	25000	10000
DA	NIT	250- 400	22000	.....	.....	25000	.....	.....	10000
LA	IT	70- 600④	42000	30000	22000	50000	35000	25000	10000
MA	IT	125- 800	42000	30000	22000	50000	35000	25000	10000⑩⑩
NB	IT	900-1200	42000	30000	22000	50000	35000	25000	10000⑩
PB	IT	600-3000	125000	100000	100000	150000	115000	115000	75000⑩⑪
MARK 75® Breakers									
HFB	NIT	15- 150⑪	65000⑤	25000	18000	75000	30000	20000	10000⑦
HKA	IT	70- 225	65000	35000	25000	75000	40000	30000	10000
HLB	IT	125- 400	65000	35000	25000	75000	40000	30000	10000
HLA	IT	125- 600	65000	35000	25000	75000	40000	30000	10000
HMA	IT	125- 800	65000	35000	25000	75000	40000	30000	10000⑩⑩
HNB	IT	900-1200	65000	35000	25000	75000	40000	30000	10000⑩
TRI-PAC® Breakers									
FB	IT	15- 100	200000	200000	200000	200000	200000	200000	.....
LA	IT	70- 400	200000	200000	200000	200000	200000	200000	.....
NB	IT	300- 800	100000	100000	100000	100000	100000	100000	.....
PB	IT	600-1600	200000	200000	200000	200000	200000	200000	.....

©Table C1: SELTRONIC™⑮ Breakers, Standard Interrupting Ratings

Breaker Type	Trip Type	Available Ampere	Interrupting Rating Symmetrical Ac 240V	Symmetrical Ac 480V	Symmetrical Ac 600V	Asymmetrical Ac 240V	Asymmetrical Ac 480V	Asymmetrical Ac 600V	Mag. Trip Adj. Range in % of O/L Setting
Standard SELTRONIC Breakers									
MC	IT	400- 800	42000	30000	22000	50000	35000	25000	500-1000%
NC	IT	600-1200	42000	30000	22000	50000	35000	25000	400-800%
PC2000	IT	1000-2000	125000	100000	100000	150000	115000	115000	300-600%
PC2500	IT	1400-2500	125000	100000	100000	150000	115000	115000	250-500%
PC3000	IT	1600-3000	125000	100000	100000	150000	115000	115000	200-400%
Mark 75® SELTRONIC Breakers									
HMC	IT	400-1000	65000	35000	25000	75000	40000	30000	500-1000%
HNC	IT	600-1200	65000	35000	25000	75000	40000	30000	400-800%

② Basis: Underwriters' Laboratories, Inc. Test Procedures.
③ 14,000 amperes, 1-pole, 277 volt Ac.
④ 70-100 ampere ratings have reduced interrupting capacities. See Application Data 29-160.
⑤ 65,000 amperes, 1-pole, 277 volt Ac, 15-30 amperes; 25,000 amperes, 1 pole, 277 volts Ac, 40-100 amperes.
⑥ Single pole rating at 125 volt Dc and 2-pole at 125/250 volt Dc.
⑦ Dc ratings apply to substantially non-inductive circuits.
⑧ Single pole rating at 125 volt Dc and 2-pole 70, 90, 100 amoere breakers are rated 125/250 volt Dc.
⑨ Dc ratings not applicable to 3-pole breakers.
⑩ 250 volts Dc rating applies only to magnetic only breakers.
⑪ 1 pole rating is at 120 volts Ac.
⑫ Basis: NEMA Test Procedures.
⑬ 90-150 amp ratings based on NEMA Test Procedures.
⑭ Dc rating applies up to 600 amps max.
⑮ Breakers with magnetic only rating plugs are not U.L. Listed.

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Low Voltage Distribution Switchboards and Power Assemblies

Device Selection Data, *Cont.*

SCB-II Systems Circuit Breakers

SCB-II breakers are designed specifically to provide the maximum in service continuity as well as maximum protection for circuit elements of a low voltage distribution system. The system served may be a selective tripping system in which only the breaker nearest the fault will open to isolate the faulted circuit, leaving the rest of the system energized; or it may be a fully rated, non-selective system in which all breakers in the system, mains or ties and branches, have interrupting capabilities equal to or exceeding the maximum fault currents available at their points of application. For selective tripping systems, breakers with short time delay must be applied.

SCB-II breakers have tripping characteristics which can be adjusted to accomplish system coordination. In addition, they utilize reliable solid state components built into the breaker frame to detect overcurrents and initiate breaker trips.

In addition to normal overcurrent and short circuit current protection, SCB-II breakers provide integral adjustable ground fault protection circuitry with sensitivities and time delays as shown in the tabulated data.

Auxiliary Features See Price List 29-820.

Table D: SCB-II Circuit Breakers with Instantaneous Trip, Short Delay Trip and Ground Fault Trip Solid State Devices⑩

Breaker Type	Trip Range Amperes	Available Current Sensor Ratings	Interrupting Ratings, RMS Amperes					
			Symmetrical, Ac Volts			Asymmetrical, Ac Volts		
			240	480	600	240	480	600
With Instantaneous Solid State Trip Device								
SPCB-600	125-600	250, 400, 600	42000	30000	22000	50000	35000	25000
SPCB-1200	125-1200	250, 400, 600, 800, 1000, 1200	42000	30000	22000	50000	35000	25000
SPCB-2000	300-2000	600, 800, 1000, 1200, 1600, 2000	125000	100000	100000	150000	115000	115000
SPCB-2500	1250-2500	2500	125000	100000	100000	150000	115000	115000
SPCB-3000	1500-3000	3000	125000	100000	100000	150000	115000	115000
With Short Delay Solid State Trip and Instantaneous Override								
SPCB-600	125-600	250, 400, 600	42000	30000	22000	50000	35000	25000
SPCB-1200	125-1200	250, 400, 600, 800, 1000, 1200	42000	30000	22000	50000	35000	25000
SPCB-2000	300-2000	600, 800, 1000, 1200, 1600, 2000	125000	100000	100000	150000	115000	115000
SPCB-2500	1250-2500	2500	125000	100000	100000	150000	115000	115000
SPCB-3000	1500-3000	3000	125000	100000	100000	150000	115000	115000

Table D-1: Adjustable Solid State Trip Ranges⑩

Current Monitor Rating, Amperes	Long Time Delay Pick-up Range, Amperes②⑤		Instantaneous Pick-up Range, Amperes⑨		Short Time Delay Pick-up Range, Amperes③⑨		Ground Fault Pick-up Range Amperes④	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
250	125	300	250	3000	250	1750	50	250
400	200	480	400	4800	400	2800	80	400
600	300	720	600	7200	600	4200	120	600
800	400	960	800	9600	800	5600	160	800
1000	500	1200	1000	12000	1000	7000	200	1000
1200	600	1440	1200	14400	1200	8400	240	1200
1600	800	1920	1600	19200	1600	11200	320	1600
2000	1000	2400	2000	24000	2000	14000	400	2000
2500	1250	3000	2500	30000	2500	17500	500	2500
3000	1500	3600	3000	36000	3000	21000	600	3000

Fusible Equipment

When a pressure contact switch or other fusible device is used either as a main or branch device, it is usually used with current limiting fuses. In such cases where the let-through current of the fuse exceeds 50,000 amperes, the switchboard must be specified and designed with extra bus bracing to withstand the added short circuit stress.

When an FDP fusible switch is used either as a main or a branch device and the fault current would exceed 50,000 amperes, current limiting fuses should be used and appropriate fuse clips specified.

Table E: Fusible Devices, Standard Ratings

Device Type	Available Current Rating, Amperes	Volts	Max. Short Circuit Capability of Device and Current Limiting Fuse Combination at Device Rated Volts RMS Symmetrical Amperes⑧
DBE Entrance Protector	800-1200 1600 2000 3000 4000	240 and 480	200,000 (w/class "L" C. L. Fuse)
DBL-25⑥ DBL-50⑥ Obsolete DBL-75⑥ DBL-100⑥	40-600 200-1600 3000 4000	240 and 480	200,000 (w/special C. L. Fuse⑦)
DSL-206⑥ DSL-416⑥ DSL-632⑥ DSL-840⑥	40-600 200-1600 1200-3200 2000-4000	240 and 480	200,000 (w/special C. L. Fuse⑦)
Pressure Contact Fusible Switch	800-1200 1600, 2000 2500, 3000 4000	240 and 480	200,000 (w/Class "L" C. L. Fuse)
FDP Quick Make-Quick Break Fusible Switch	30-1200	240 and 600	.....

Ⓒ Changed or added since previous issue.
② Long delay time setting adjustable from 2 to 20 seconds at 600% of rating.
③ Short delay time setting adjustable from 2 to 10 HZ.
④ Ground current trip time setting adjustable from 0.1 to 0.5 seconds (6 to 30 HZ).
⑤ Do not use long delay pick-up settings which allow continuous current flow in excess of breaker frame rating (i.e., 600A, 1200A, 2000A, 2500A and 3000A).
⑥ Not Underwriters' Laboratories, Inc. listed.
⑦ Fuses are integral with circuit breaker on DSL206, DSL416. Fuses are in separate assembly on DSL632, DSL840.
⑧ Ratings based on manufacturers' published fuse ratings only.
⑨ Breakers without adjustable instantaneous trip, but having short time delay for use in selective systems are fitted at the factory with a fixed overriding instantaneous trip device which allows all short time rated breakers to be applied on systems having short circuit current up to the maximum interrupting rating of the breaker frame This instantaneous override is fixed at 14 times monitor rating for 600, 2500 and 3000 amp units and at 21 times monitor rating for 1200 and 2000 amp units. Fault currents in excess of these values will cause the breaker to trip instantaneously.
⑩ Adjustable solid state trip devices are set to minimums at factory. Any variation of this policy must be negotiated.

Motor Starter Applications

Circuit breaker and fusible switch continuous current ratings to meet given motor load requirements may be determined and proper frame size selected if the full load current of the motor is known.

In using Table F to select the proper breaker, switch or fuse for a given horsepower motor, please note that the values shown are based on the following criteria:

1. Ratings are for full voltage starting or reactor or resistor reduced voltage starting (code letters F to V or without code letters).

2. Full load currents are from NEC tables and are for motors running at usual speeds and with usual torque characteristics.

3. Circuit breaker and fuse ratings are based on full voltage or reduced voltage starting (resistor or reactor).

4. The 3 phase induction motors are of squirrel-cage type.

5. Ambient temperature is not above 40°C (104°F), outside the enclosure.

6. Motor starting, stopping or reversing is infrequent.

7. Motor accelerating time is 10 seconds or less.

8. Locked rotor current does not exceed 6 times full load current.

9. The temperature inside the breaker enclosure is 50°C (122°F).

Variations from these criteria will require the selection of a higher or lower rated full load protective device than that shown.

©Table F: Motor Application – Breaker or Switch and Fuse

Horse-Power	Approx. Full Load Amps	NEMA Size	N.E.C. Fuse, Amps	Time Delay Fuse That Can be Used, Amps	Recommended W Fusible Switch With N.E.C. Fuses	Recommended W Fusible Switch With Time Delay Fuses	Recommended W Circuit Breakers or MCP Amps. Type
200 Volts							
1	4.1	0	15	8	30	30	7MCP
1½	6	0	20	12	30	30	15MCP
2	7.8	0	25	15	30	30	15MCP
3	11	0	35	20	60	30	15MCP
5	17.4	1	60	35	60	60	30MCP
7½	25.3	1	80	45	100	60	30MCP
10	32	2	100	60	100	60	60MCP
15	48	3	150	90	200	100	100MCP
20	62	3	200	110	200	200	100MCP
25	78	3	250	150	...	200	100MCP
30	92	4	300	175	...	200	150MCP
40	119	4	400	225	...	...	150MCP
50	149	..	450	300	...	...	.....
60	177	..	600	350	...	...	300LA
75	220	..	800	400	...	...	350LA
100	285	..	1000	500	...	...	500LA
125	358	..	1200	...	...	...	600LA
150	414	..	1600	...	...	...	700MA
200	552	..	2000	...	...	...	800MA
230 Volts							
1	3.6	0	15	8	30	30	7MCP
1½	5.2	0	20	10	30	30	15MCP
2	6.8	0	25	12	30	30	15MCP
3	9.6	0	30	20	30	30	15MCP
5	15.2	1	50	30	60	30	30MCP
7½	22	1	70	40	100	60	30MCP
10	28	2	90	50	100	60	50MCP
15	42	2	150	80	200	100	100MCP
20	54	3	175	100	200	100	100MCP
25	68	3	225	125	...	200	100MCP
30	80	3	250	150	...	200	100MCP
40	104	4	350	200	...	200	150MCP
50	130	4	400	250	...	...	150MCP
60	154	..	500	300	...	...	250LA
75	192	..	600	350	...	...	300LA
100	248	..	800	450	...	...	400LA
125	312	..	1000	600	...	...	500LA
150	360	..	1200	...	...	...	600LA
200	480	..	1600	...	...	...	700MA
460 Volts							
1	1.8	0	15	4	30	30	3MCP
1½	2.6	0	15	5	30	30	7MCP
2	3.4	0	15	8	30	30	7MCP
3	4.8	0	15	10	30	30	15MCP
5	7.6	0	25	15	30	30	15MCP
7½	11	1	35	20	60	30	15MCP
10	14	1	45	25	60	30	15MCP
15	21	2	70	40	100	60	30MCP
20	27	2	90	50	100	60	50MCP
25	34	2	125	60	200	60	50MCP
30	40	3	125	70	200	100	50MCP
40	52	3	175	100	...	100	100MCP
50	65	3	200	125	...	200	100MCP
60	77	4	250	150	...	200	100MCP
75	96	4	300	175	...	200	150MCP
100	124	4	400	225	...	...	150MCP
124	156	..	500	300	...	...	250LA
150	180	..	600	350	...	...	300LA
200	240	..	800	450	...	...	350LA

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Low Voltage Distribution Switchboards and Power Assemblies

Device Selection Data,
Continued

Overload Heater Selector Guide for Mac B and Mac F Motor Starters

1. Heater rating is 125% of minimum full load motor current. The range has been selected such that the current to produce ultimate tripping is 105% to 125% of full load motor current at 40°C ambient.

2. Each heater is identified by a code marking stamped on one terminal. The heater application table indicates the range of full load motor current to which a given heater may be applied. Heaters should be applied based on motor nameplate rating.

3. When motor and starter are in the same ambient, the data listed in the table provide 40°C rated motors or those with a service factor of 1.15 to 1.25 with 115% to 125% protection. For 50°C or 55°C rated motors or those with a 1.00 service factor or where a maximum of 115% protection is desired, select one size smaller heater than indicated.

4. When non-compensated overload relays are used and motor and starter ambients differ, select heaters from table using adjusted motor current as follows: Decrease rated motor current 1% for each °C motor ambient exceeds starter ambient; increase rated motor current 1% for each °C starter ambient exceeds motor ambient.

5. For ambient compensated overload relays select heaters according to the table and selection data above, regardless of the ambient. The trip rating of a heater at 40°C ambient is 125% of the minimum full load current.

6. Protect the heater and starter against short circuits by providing branch circuit protection per National Electric Code, and as shown in Table F. In no case should the fuse rating exceed 4 times the motor full load current.

Table G: Heater Table

	Cat. No.	Motor Full Load Current, Amps. 3 Pole Relays	
		Ambient Compensated	Non-Compensated
For Size 0	H03	.25 – .27	.24 – .25
	H04	.28 – .31	.26 – .28
	H05	.32 – .34	.29 – .31
	H06	.35 – .38	.32 – .35
	H07	.39 – .42	.36 – .39
	H08	.43 – .46	.40 – .43
	H09	.47 – .50	.44 – .47
	H10	.51 – .55	.48 – .51
	H11	.56 – .62	.52 – .57
	H12	.63 – .68	.58 – .63
	H13	.69 – .75	.64 – .70
	H14	.76 – .83	.71 – .77
	H15	.84 – .91	.78 – .85
	H16	.92 – 1.00	.86 – .93
	H17	1.01 – 1.11	.94 – 1.03
	H18	1.12 – 1.22	1.04 – 1.13
	H19	1.23 – 1.34	1.14 – 1.25
	H20	1.35 – 1.47	1.26 – 1.37
	H21	1.48 – 1.62	1.38 – 1.51
	H22	1.63 – 1.78	1.52 – 1.65
	H23	1.79 – 1.95	1.66 – 1.81
	H24	1.96 – 2.15	1.82 – 1.99
	H25	2.16 – 2.35	2.00 – 2.19
For Size 1	H26	2.36 – 2.58	2.20 – 2.39
	H27	2.59 – 2.83	2.40 – 2.63
	H28	2.84 – 3.11	2.64 – 2.89
	H29	3.12 – 3.42	2.90 – 3.17
	H30	3.43 – 3.73	3.18 – 3.47
	H31	3.74 – 4.07	3.48 – 3.79
	H32	4.08 – 4.39	3.80 – 4.11
	H33	4.40 – 4.87	4.12 – 4.55
	H34	4.88 – 5.3	4.56 – 5.0
	H35	5.4 – 5.9	5.1 – 5.5
	H36	6.0 – 6.4	5.6 – 5.9
	H37	6.5 – 7.1	6.0 – 6.6
	H38	7.2 – 7.8	6.7 – 7.2
For Size 2	H39	7.9 – 8.5	7.3 – 7.9
	H40	8.6 – 9.4	8.0 – 8.7
	H41	9.5 – 10.3	8.8 – 9.5
	H42	10.4 – 11.3	9.6 – 10.5
	H43	11.4 – 12.4	10.6 – 11.5
	H44	12.5 – 13.5	11.6 – 12.6
	H45	13.6 – 14.9	12.7 – 13.8
	H46	15.0 – 16.3	13.9 – 15.1
	H47	16.4 – 18.0	15.2 – 16.7
	H48	18.1 – 19.8	16.8 – 18.3
	H49	19.9 – 21.7	18.4 – 20.2
	H50	21.8 – 23.9	20.3 – 22.2
	H51	24.0 – 26.2	22.3 – 24.3
	H52	26.3 – 28.7	24.4 – 26.6
	H53	28.8 – 31.4	26.7 – 29.1
	H54	31.5 – 34.5	29.2 – 32.0
	H55	34.6 – 37.9	32.1 – 35.2
	H56	38.0 – 41.5	35.3 – 38.5
	H57	41.6 – 45.0	38.6 – 42.3

	Cat. No.	Motor Full Load Current, Amps. 3 Pole Relays	
		Ambient Compensated	Non-Compensated
For Size 3	H72	19.0 – 20.8	17.5 – 19.1
	H73	20.9 – 22.9	19.2 – 21.1
	H74	23.0 – 25.2	21.2 – 23.2
	H75	25.3 – 27.8	23.3 – 25.6
	H76	27.9 – 30.6	25.6 – 28.1
	H77	30.7 – 33.5	28.2 – 30.8
	H78	33.6 – 37.5	30.9 – 34.5
	H79	37.6 – 41.5	34.6 – 38.2
For Size 4	H80	41.6 – 46.3	38.3 – 42.6
	H81	46.4 – 50	42.7 – 46
	H82	51 – 55	47 – 51
	H83	56 – 61	52 – 56
	H84	62 – 66	57 – 61
	H85	67 – 73	62 – 67
	H86	74 – 79	68 – 73
	H87	80 – 87	74 – 80
	H88	.. – ..	81 – 87
	H88	.. – 95	.. – ..
	H89	95 – 105	88 – 95
	H90	106 – 116	96 – 105
	H91	117 – 128	106 – 116
	H92	... – ...	117 – 127

Application Data

Terminations

Wire and cable terminals supplied on switchboard mounted devices for making up incoming or outgoing cable connections are of the mechanical screw clamp pressure type. All standard terminals are suitable for use with either aluminum or copper cable except as noted in the table. Panel mounted devices utilize the terminal provided as standard for and furnished with that device.

©Table H: Standard Switchboard and Power Assembly Terminals Molded Case Breakers③

Device Type	Ampere Rating	Wiring Range	
		Individually Mounted	Panel Mounted
EB④	15-100	.....	#14-1/0
EHB, FB, HFB, FB TRI PAC	15-100	#14-1/0	#14-1/0
FB, HFB	125-150	#6-3/0	#6-3/0
CA④	125-175	.....	#1-4/0
	200-225	.....	2/0-300 MCM
©JA, KA, HKA, JB, KB	70-225 (KB-250A)	#6-350 MCM	#4-350 MCM
DA④	250-350	#2-600 MCM	250 MCM-500 MCM
	400	#2-600 MCM	(2) #3/0-250 MCM
LB, LBB, HLB	125-225	#6-350 MCM	#4-350 MCM
	250-400	#2-600 MCM	(2) 3/0-250 MCM
LA, LAB, HLA, LA TRI PAC	125-225	#6-350 MCM	#4-350 MCM
	250-400	#2-600 MCM	(1) #4-250 MCM (1) 3/0-600 MCM
LA, HLA	500-600	(2) #2-600 MCM	(2) 250 MCM-500 MCM
©MA, HMA, MC, HMC	125-600	(2) #2-600 MCM	(2) #1-500 MCM
	700-800	(3) #2-600 MCM	(3) 3/0-400 MCM
©NB, HNB, NC, HNC, NB TRI PAC	900-1000	(3) #2-600 MCM	(3) 3/0-400 MCM
	1100-1200	(4) #2-600 MCM	(4) 4/0-500 MCM
©PC, PB, PB TRI PAC	900-1600	(4) #2-600 MCM	.....
	2000	(5) #2-600 MCM	.....
	2500, 3000	As Specified	.....

FDP Switches③

Ampere Rating	Wire Range	
	Individually Mounted	Panel Mounted
240 and 600 Volts Ac		
30 (Compact)④	.....	#14-#8②
30	#14-#1/0	#14-1/0
60	#14-#1/0	#14-1/0
100	#14-#1/0	#14-1/0
200	#4-300 MCM	#4-300 MCM
400	#2-600 MCM	#4-600 MCM
600	(2) #2-600 MCM	(2) #4-600 MCM
800	(3) #2-600 MCM	(3) #4-600 MCM, or (2) 500-1000 MCM
1200	(4) #2-600 MCM	(4) #4-600 MCM, or (3) 500-1000 MCM

©Power Circuit Breakers

Breaker Type	Ampere Rating	Wire Range Individually Mounted
DB 15	15-100	#14-1/0
	225	#6-350
DB 25	400	#4/0-500
DB-25 DSL-206, DS 206	600	(2) #2-600
DB 50	800	(3) #2-600
DSL-416, DS 416	1200-1600	(4) #2-600
DS 420, DB 75	2000	(5) #2-600
©DS 632, DSL 632	3200	As Specified
©DB 100, DS 840, DSL 840	All	As Specified

SCB-II System Circuit Breakers

Breaker Type	Ampere Rating	Wire Range Individually Mounted
SPCB-600	400	#4/0-500 MCM
	600	(2) #2-600 MCM
SPCB-1200	900-1000	(3) #2-600 MCM
	1100-1200	(4) #2-600 MCM
SPCB-2000	1600	(4) #2-600 MCM
	2000	(5) #2-600 MCM
SPCB-2500	2500	As Specified
SPCB-3000	3000	As Specified

Motor Starter Units

Type Unit	NEMA Size	Wire Range ②
Mac B, F	Size 0	#14-#8
Mac B, F	Size 1	#14-#8
Mac B, F	Size 2	#10-#4
Mac B, F	Size 3	#8-#2/0
Mac B, F	Size 4	#6-#4/0

Bolted Pressure Switches

Switch Type	Ampere Rating	Wire Range Individually Mounted
Fusible Pressure Switches	800	(3) #2-600
	1200	(4) #2-600
	1600	(4) #2-600
	2000	(5) #2-600
	Above 2000	As Specified

© Changed since previous issue.
② Listed with Underwriters' Laboratories, Inc. to accept copper cable only.
③ For other terminals available on some ratings of molded case circuit breakers and FDP fusible switches that are suitable for use on copper cable only or on aluminum cable only, refer to Price List 29-120 or Price List 29-620.
④ 240 volts only.

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May, 1978
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Mailed to: E, D/1929, 1946/DB

Low Voltage Distribution Switchboards and Power Assemblies

POW-R-LINE™ Switchboard Layout Dimensions

Type WF Utility Type Service Sections Complete with Utility C.T. Compartment

Hot Sequence (CT's on Line Side of Main)

Bottom Entrance

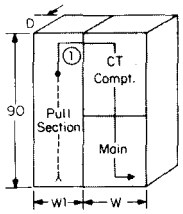


Figure 1

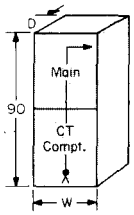


Figure 2 ⑤
2000A Maximum

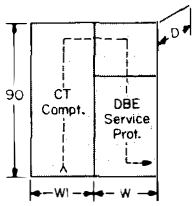


Figure 3 ⑥
(2000, 3000 and 4000 Amp Only)

Top Entrance

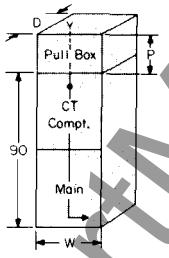


Figure 4

Cold Sequence (CT's on Load Side of Main)

Bottom Entrance

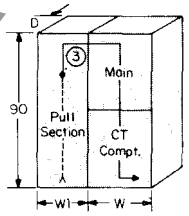


Figure 5

Top Entrance

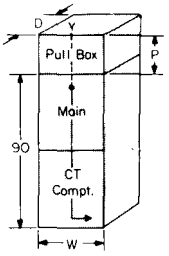
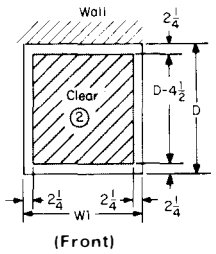


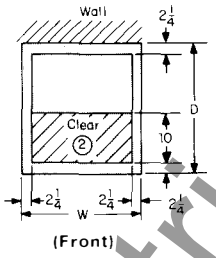
Figure 6

Pull Section (Floor Plan)



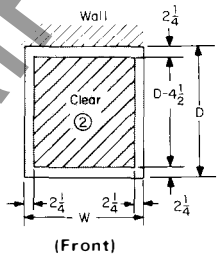
(Front)

Floor Plan (Figure 2 Only)



(Front)

Pull Box (Top Plan)



(Front)

① Rigid bus extension into pull section is required above 2000 amp.
② Clear area assumes no floor channels used under front or rear frame members.
③ Rigid bus extension into pull section is required for 1200 amp and above.
④ Mounted in bottom only.
⑤ For inverted fusible bolted pressure switch requiring no pull section for bottom entrance, see Fig. 2. Units mounts in top position only.
⑥ Bottom entrance only.
⑦ Required for Fig. 6 arrangement only.
⑧ Refer to Westinghouse for dimension.

Dimensions for Figures 1-6

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. D	Pull Sect. When Used W1	Pull Box P
Fixed Mounted Devices					
SPB Breakers					
SPB-250/800	800	38	30	14	...
SPB-1600	1600	38	30	28	15⑦
SPB-2000	2000	38	30	28	15⑦
SPB-2500	2500	38	30	28	24
SPB-3000	3000	38	30	28	24
SPB-4000	4000	⑧	⑧	⑧	⑧
SCB-II Breakers					
SPCB-600	600	38	20	14	...
SPCB-1200	1200	38	24	14	15⑦
SPCB-2000	2000	38	30	28	15⑦
SPCB-2500	2500	38	30	28	24
SPCB-3000	3000	38	30	28	24
SELTRONIC™ Breakers					
LC, HLC	600	38	20	14	...
MC(G), HMC(G)	800	38	20	14	...
NC(G), HNC(G)	1200	38	24	14	15⑦
PC, PCC	1600	38	30	28	15⑦
PC, PCC	2000	38	30	28	15⑦
PC, PCC	2500	38	30	28	24
PC, PCC	3000	38	30	28	24
TRI-PAC® Breakers					
LA-P	400	38	20	14	...
NB-P	800	38	24	14	...
PB-P	1600	38	30	28	15⑦

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. D	Pull Sect. When Used W1	Pull Box P
Fixed Mounted Devices					
QA Bolted Pressure Switches					
BPS-800	800	38	30	14	...
BPS-1200	1200	38	30	14	15⑦
BPS-1600	1600	38	30	28	15⑦
BPS-2000	2000	38	30	28	15⑦
BPS-2500	2500	42	36	28	24
BPS-3000④	3000	54	30	28	24
BPS-4000④	4000	54	36	28	24
FDP Fusible Switches					
FDP-400	400	38	24	14	...
FDP-600	600	38	24	14	...
FDP-800	800	38	24	14	...
FDP-1200	1200	38	24	14	15⑦
CBC Bolted Pressure Switches					
BPS-800	800	38	36	14	...
BPS-1200	1200	38	36	14	15⑦
BPS-1600	1600	38	36	28	15⑦
BPS-2000	2000	38	36	28	15⑦
BPS-2500	2500	42	36	28	24
BPS-3000④	3000	54	36	28	24
BPS-4000④	4000	54	36	28	24
Power Circuit Breakers④					
DS-416	1600	38	36	28	...
DS-420	2000	38	36	28	...
DS-632	3200	38	36	28	24
DS-840	4000	48	42	28	24

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. D	Pull Sect. When Used W1	Pull Box P
Fixed Mounted Devices					
Service Protectors④					
DBE-1200	1200	38	36	14	...
DBE-1600	1600	38	36	28	...
DBE-2000	2000	38	36	38	⑥
DBE-3000	3000	38	36	38	⑥
DBE-4000	4000	38	36	38	⑥
Drawout Mounted Devices					
SPB Breakers④					
SPB-250/800	800	38	42	14	...
SPB-1600	1600	38	48	28	15⑦
SPB-2000	2000	38	48	28	15⑦
SPB-2500	2500	38	48	28	24
SPB-3000	3000	38	48	28	24
SPB-4000	4000	⑧	⑧	⑧	⑧
SCB-II Breakers					
SPCB-600	600	38	36	14	...
SPCB-1200	1200	38	36	14	15⑦
SPCB-2000	2000	38	36	28	15⑦
SPCB-2500	2500	38	36	28	24
SPCB-3000	3000	38	36	28	24
Power Circuit Breakers④					
DS-416	1600	38	48	28	...
DS-420	2000	38	48	28	...
DS-632	3200	38	48	28	24
DS-840	4000	50	54	28	24

POW-R-LINE™ Switchboard Layout Dimensions, *Continued*

Type WF Non-Utility Type Service Sections No Utility C.T. Compartment Required

With Customer Instrument Compartment

Bottom Entrance

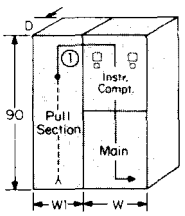


Figure 1

Top Entrance

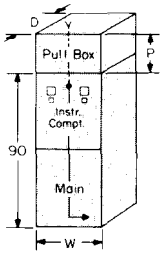


Figure 2

No Instrument or Metering Compartment

Bottom Entrance

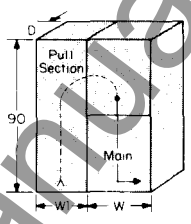


Figure 3

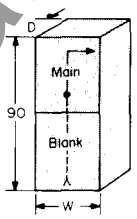


Figure 4 ③

Top Entrance

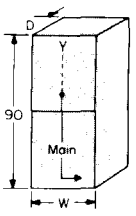
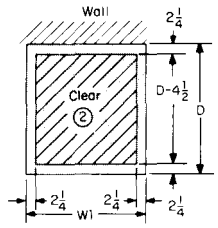
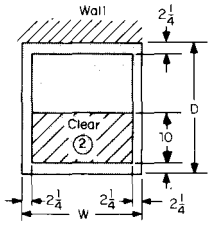


Figure 5

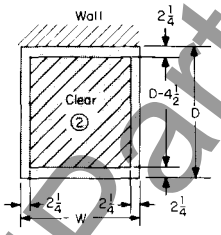
Pull Section
(Floor Plan)



Floor Plan
(Figure 4 Only)



Pull Box
(Top Plan)



① Rigid bus extension into pull section is required above 2000 amp.
② Clear area assumes no floor channels used under front or rear frame members.
③ For inverted fusible bolted pressure switch requiring no pull section for bottom entrance, see Fig. 4. Units mount in top position only.
④ Refer to Westinghouse for dimensions.
⑤ Mounted in bottom only.

Dimensions for Figures 1-5

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. D	Pull Sect. When Used W1	Pull Box When Used P
Fixed Mounted Devices					
SPB Breakers					
SPB-250/800	800	30	30	14	...
SPB-1600	1600	34	30	28	...
SPB-2000	2000	38	30	28	...
SPB-2500	2500	38	30	28	24
SPB-3000	3000	38	30	28	24
SPB-4000	4000	④	④	④	④
SCB-II Breakers					
SPCB-600	600	30	20	14	...
SPCB-1200	1200	34	24	14	...
SPCB-2000	2000	34	30	28	...
SPCB-2500	2500	38	30	28	24
SPCB-3000	3000	38	30	28	24
SELTRONIC™ Breakers					
LC, HLC	600	30	20	14	...
MC(G), HMC(G)	800	30	20	14	...
NC(G), HNC(G)	1200	34	24	14	...
PC, PCC	1600	34	30	28	...
PC, PCC	2000	34	30	28	...
PC, PCC	2500	38	30	28	24
PC, PCC	3000	38	30	28	24
TRI-PAC® Breakers					
LA-P	400	30	20	14	...
NB-P	800	30	24	14	...
PB-P	1600	34	30	28	...

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. D	Pull Sect. When Used W1	Pull Box When Used P
Fixed Mounted Devices					
OA Bolted Pressure Switches					
BPS-800	800	34	30	14	...
BPS-1200	1200	38	30	14	...
BPS-1600	1600	38	30	28	...
BPS-2000	2000	38	30	28	...
BPS-2500	2500	42	36	28	24
BPS-3000⑤	3000	54	30	28	24
BPS-4000⑤	4000	54	36	28	24
FDP Fusible Switches					
FDP-400	400	38	24	14	...
FDP-600	600	38	24	14	...
FDP-800	800	38	24	14	...
FDP-1200	1200	38	24	14	...
CBC Bolted Pressure Switches					
BPS-800	800	38	36	14	...
BPS-1200	1200	38	36	14	...
BPS-1600	1600	38	36	28	...
BPS-2000	2000	38	36	28	...
BPS-2500	2500	42	36	28	24
BPS-3000⑤	3000	54	36	28	24
BPS-4000⑤	4000	54	36	28	24
Power Circuit Breakers⑤					
DS-416	1600	34	36	28	...
DS-420	2000	34	36	28	...
DS-632	3200	38	36	28	24
DS-840	4000	48	42	28	24

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. D	Pull Sect. When Used W1	Pull Box When Used P
Drawout Mounted Devices					
SPB Breakers⑤					
SPB-250/800	800	30	42	14	...
SPB-1600	1600	34	48	28	...
SPB-2000	2000	38	48	28	...
SPB-2500	2500	38	48	28	24
SPB-3000	3000	38	48	28	24
SPB-4000	4000	④	④	④	④
SCB-II Breakers					
SPCB-600	600	30	36	14	...
SPCB-1200	1200	34	36	14	...
SPCB-2000	2000	34	36	28	...
SPCB-2500	2500	38	36	28	24
SPCB-3000	3000	38	36	28	24
Power Circuit Breakers⑤					
DS-416	1600	38	48	28	...
DS-420	2000	38	48	28	...
DS-632	3200	38	48	28	24
DS-840	4000	50	54	28	24

May, 1978
New Information
Mailed to: E, D/1929, 1946/DB

Low Voltage Distribution Switchboards and Power Assemblies

POW-R-LINE™ Switchboard Layout Dimensions, *Continued*

Type WRP and WRI Utility Type Service Sections Complete with Utility C.T. Compartment

Hot Sequence (CT's on Line Side of Main)

Bottom Entrance

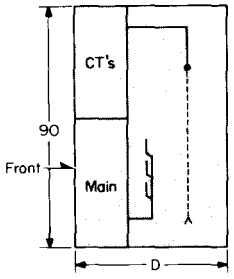


Figure 1 (Side View)

Top Entrance

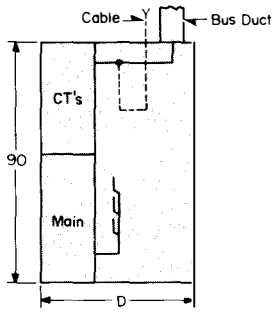


Figure 2 (Side View)

Cold Sequence (CT's on Load Side of Main)

Bottom Entrance

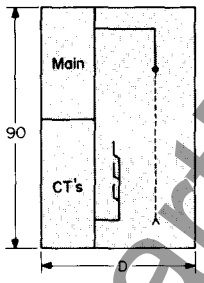


Figure 3 (Side View)

Top Entrance

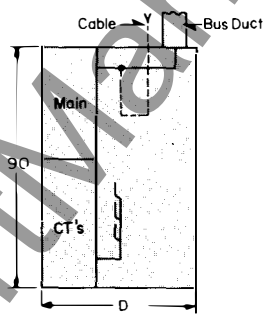


Figure 4 (Side View)

Top or Bottom Entrance

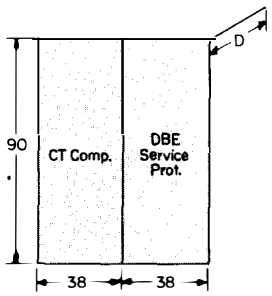
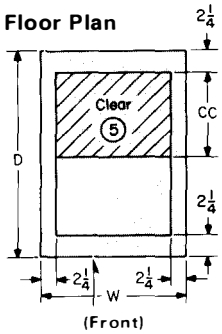


Figure 5 (Front View)

Floor Plan



① These units require two sections when utility metering transformer provisions are required (see Figure 5)
② "D" dimension is as shown unless adjoining distribution sections are deeper; then "D" will be equal to depth of distribution sections.
③ Refer to Westinghouse for dimensions.
④ Mounted in bottom position only.
⑤ Clear area assumes no floor channels used under front or rear frame members.

Dimensions for Figures 1-5

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. ② D	Cable Space Depth CC
Fixed Mounted Devices				
SPB Breakers				
SPB-250/800	800	38	36	6
SPB-1600	1600	38	36	6
SPB-2000	2000	38	42	12
SPB-2500	2500	38	42	12
SPB-3000	3000	38	42	12
SPB-4000	4000	③	③	③
SCB-II Breakers				
SPCB-600	600	38	24	4
SPCB-1200	1200	38	30	6
SPCB-2000	2000	38	36	6
SPCB-2500	2500	38	42	12
SPCB-3000	3000	38	42	12
SELTRONIC™ Breakers				
LC, HLC	600	38	24	4
MC(G), HMC(G)	800	38	24	4
NC(G), HNG(G)	1200	38	30	6
PC(G), PCC(G)	1600	38	36	6
PC(G), PCC(G)	2000	38	36	6
PC(G), PCC(G)	2500	38	42	12
PC(G), PCC(G)	3000	38	42	12
TRI-PAC® Breakers				
LA-P	400	38	30	4
NB-P	800	38	30	6
PB-P	1600	38	36	6

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. ② D	Cable Space Depth CC
Fixed Mounted Devices				
QA Bolted Pressure Switches				
BPS-800	800	38	36	6
BPS-1200	1200	38	36	6
BPS-1600	1600	38	36	6
BPS-2000	2000	38	36	6
BPS-2500	2500	42	48	12
BPS-3000④	3000	54	42	12
BPS-4000④	4000	54	48	12
CBC Bolted Pressure Switches				
BPS-800	800	38	42	6
BPS-1200	1200	38	42	6
BPS-1600	1600	38	42	6
BPS-2000	2000	38	42	6
BPS-2500	2500	42	48	12
BPS-3000④	3000	54	48	12
BPS-4000④	4000	54	48	12
FDP Fusible Switches				
FDP-400	400	38	30	6
FDP-600	600	38	30	6
FDP-800	800	38	30	6
FDP-1200	1200	38	30	6
Power Circuit Breakers④				
DS-416	1600	38	42	6
DS-420	2000	38	42	6
DS-632	3200	38	48	12
DS-840	4000	48	54	12

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. ② D	Cable Space Depth CC
Fixed Mounted Devices				
Service Protectors①				
DBE	1600	38	42	6
DBE	2000	38	42	6
DBE	4000	38	54	12
Drawout Mounted Devices				
SPB Breakers④				
SPB-250/800	800	38	48	6
SPB-1600	1600	38	54	6
SPB-2000	2000	38	60	12
SPB-2500	2500	38	60	12
SPB-3000	3000	38	60	12
SPB-4000	4000	③	③	③
SCB-II Breakers				
SPCB-600	600	38	42	6
SPCB-1200	1200	38	42	6
SPCB-2000	2000	38	42	6
SPCB-2500	2500	38	48	12
SPCB-3000	3000	38	48	12
Power Circuit Breakers④				
DS-416	1600	38	54	6
DS-420	2000	38	54	6
DS-632	3200	38	60	12
DS-840	4000	50	66	12

POW-R-LINE® Switchboard Layout Dimensions, *Continued*

Type WRP and WRI Non-Utility Service Sections No Utility C.T., Compartment Required

With Customer Instrument Compartment

Bottom Entrance

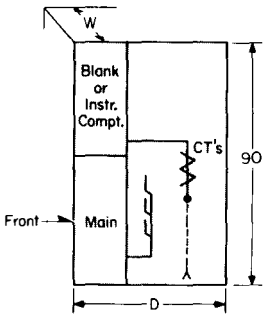


Figure 1 (Side View)

Top Entrance

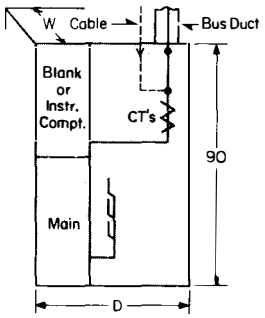
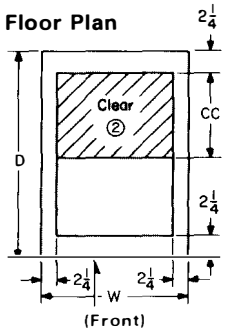


Figure 2 (Side View)

Floor Plan



① "D" dimension is as shown unless adjoining distribution sections are deeper; then "D" will be equal to depth of distribution sections.
② Clear area assumes no floor channels used under front or rear frame members.
③ Mounted in bottom position only.
④ Refer to Westinghouse for dimensions.

Dimensions for Figures 1 and 2

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. ① D	Cable Space Depth CC
Fixed Mounted Devices				
SPB Breakers				
SPB-250/800	800	30	36	6
SPB-1600	1600	34	36	6
SPB-2000	2000	38	42	12
SPB-2500	2500	38	42	12
SPB-3000	3000	38	42	12
SPB-4000	4000	④	④	④
SCB-II Breakers				
SPCB-600	600	30	24	4
SPCB-1200	1200	34	30	6
SPCB-2000	2000	34	36	6
SPCB-2500	2500	38	42	12
SPCB-3000	3000	38	42	12
SELTRONIC™ Breakers				
LC, HLC	600	30	24	4
MC(G), HMC(G)	800	30	24	4
NC(G), HNC(G)	1200	34	30	6
PC(G), PCC(G)	1600	34	36	6
PC(G), PCC(G)	2000	34	36	6
PC(G), PCC(G)	2500	38	42	12
PC(G), PCC(G)	3000	38	42	12
TRI-PAC® Breakers				
LA-P	400	30	30	4
NB-P	800	30	30	6
PB-P	1600	34	36	6

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. ① D	Cable Space Depth CC
Fixed Mounted Devices				
QA Bolted Pressure Switches				
BPS-800	800	34	36	6
BPS-1200	1200	38	36	6
BPS-1600	1600	38	36	6
BPS-2000	2000	38	36	6
BPS-2500	2500	42	48	12
BPS-3000③	3000	54	42	12
BPS-4000③	4000	54	48	12
CBC Bolted Pressure Switches				
BPS-800	800	38	42	6
BPS-1200	1200	38	42	6
BPS-1600	1600	38	42	6
BPS-2000	2000	38	42	6
BPS-2500	2500	42	48	12
BPS-3000③	3000	54	48	12
BPS-4000③	4000	54	48	12
FDP Fusible Switches				
FDP-400	400	38	30	6
FDP-600	600	38	30	6
FDP-800	800	38	30	6
FDP-1200	1200	38	30	6
Power Circuit Breakers③				
DS-416	1600	34	42	6
DS-420	2000	34	42	6
DS-632	3200	38	48	12
DS-840	4000	48	54	12

Main Device	Max. Amp. Rating	Width Dim. W	Depth Dim. ① D	Cable Space Depth CC
Drawout Mounted Devices				
SPB Breakers③				
SPB-250/800	800	30	48	6
SPB-1600	1600	34	54	6
SPB-2000	2000	38	60	12
SPB-2500	2500	38	60	12
SPB-3000	3000	38	60	12
SPB-4000	4000	④	④	④
SCB-II Breakers				
SPCB-600	600	30	42	6
SPCB-1200	1200	34	42	6
SPCB-2000	2000	34	42	6
SPCB-2500	2500	38	48	12
SPCB-3000	3000	38	48	12
Power Circuit Breakers③				
DS-416	1600	38	54	6
DS-420	2000	38	54	6
DS-632	3200	38	60	12
DS-840	4000	50	66	12

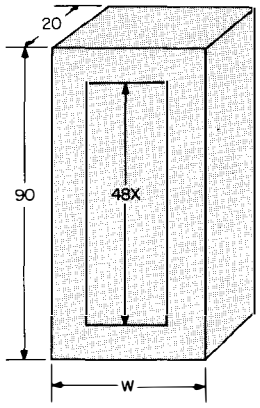
May, 1978
Supersedes Application Data 31-526
pages 17-18, dated September, 1975
Mailed to: E, D/1929, 1946/DB

Low Voltage Distribution Switchboards and Power Assemblies

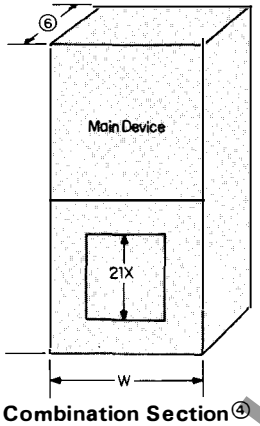
POW-R-LINE™ Switchboard Layout Dimensions, *Continued*

Distribution Sections, Panel Mounted Devices

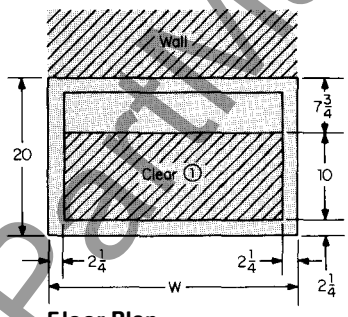
Type WF ③



Full Height Feeder or Branch Section

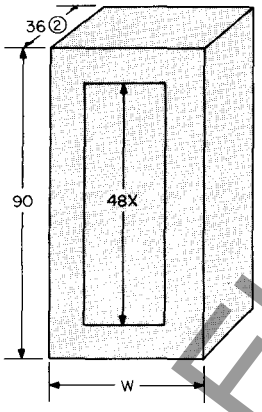


Combination Section ④

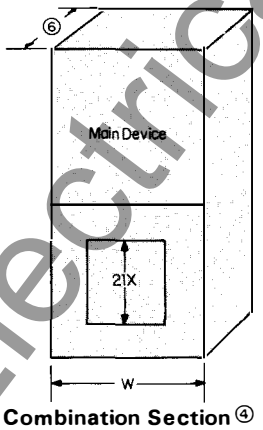


Floor Plan

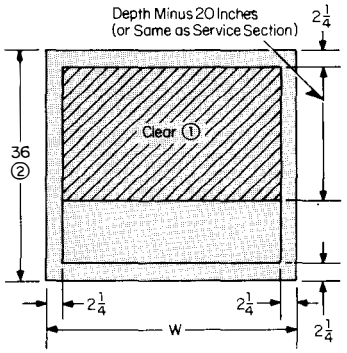
Type WRP



Full Height Feeder or Branch Section



Combination Section ④

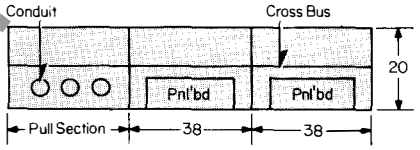


Floor Plan

① Clear area assumes no floor channels used under bottom frame.
② Depth is 36 in. minimum. Must be equal to depth of service section if used.
③ For single sections, main lugs only, maximum terminal size is #4-600 MCM per phase and neutral (1600 Amp rating) with copper cable.
④ For single sections only with main device in top compartment.
⑤ 18X when main device requires Ground Fault System.
⑥ Service section tables on pages 15-16.2 determine depth of these sections.

Multi-Section Lineup Without Main Device

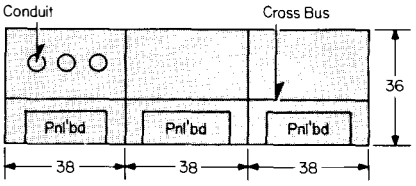
Type WF



800-2000 Amps: Cable enters pull section top or bottom. Cross bus extends into pull section for termination. Width as required for conduit. Bus duct into top only.

2500-4000 Amps: Bus duct only into top only. See page 28 for preferred bus duct flange positioning. 48X is available in all distribution sections.

Type WRP



800-2000 Amps: Cable enters rear of any distribution section, top or bottom. Bus duct into top only.

2500-4000 Amps: Bus duct only into top only of any section. See page 28 for preferred bus duct flange positioning. 48X is available in all distribution sections.

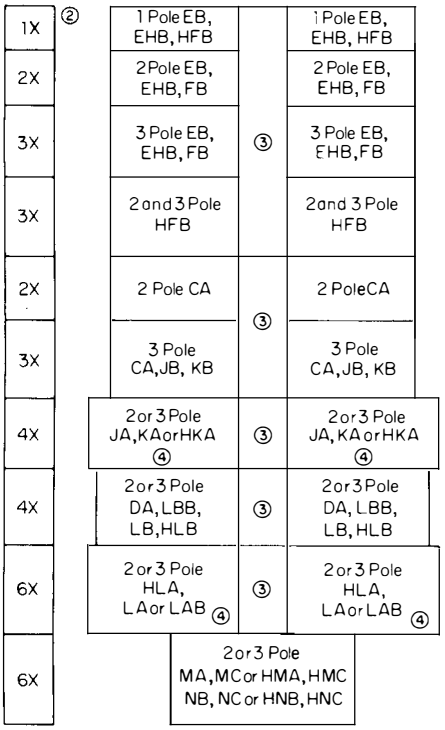
Width of Sections (W) When Panel Mounted Devices are Used

Panel Type	Largest Breaker or Switch Mounted in Panel Chassis	Dim W, Inches
CPD	EB thru MC	38
	NC, NB TRI-PAC	42
	LA TRI-PAC	48
FDP	All units, 30-1200 amp except horizontally mounted 800 or 1200 amp	38
	800 or 1200 amp horizontally mounted unit	42
Mac B Mac F	Any NEMA Size, 0-4	38

POW-R-LINE™ Switchboard Dimensional Information

Types WF and WRP – Distribution Sections, Panel Mounted Devices Only
Front Accessible – Type WRP Also Rear Accessible
Layout Guides for Panel Mounted Devices, X Heights (1X=1⅜ in.)

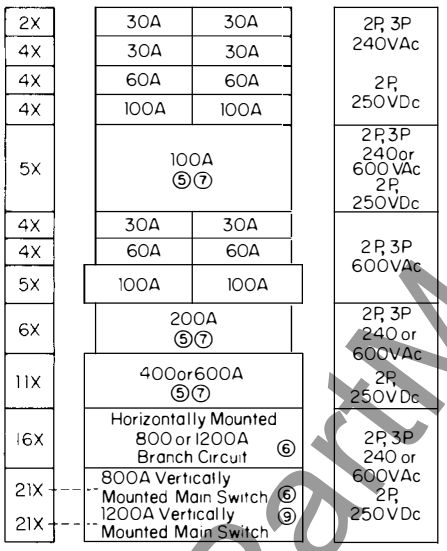
CDP Panel Layout Guide



② When only one EB, EHB or HFB single pole breaker is required in conjunction with other frame size breakers the single pole breaker space required changes from 1X to 2X.

③ Breakers of the same frame size regardless of number of poles may be mounted opposite each other. In addition, JA may be mounted opposite KA breakers. LA may be mounted opposite LAB breakers and JA and KA may be mounted opposite DA breakers.

FDP Panel Layout Guide⑧



④ KA, KB, HKA, HKB, LA, LB, HLA and HLB (interchangeable trip) breakers may not be used as main breakers.

⑤ May be used as main switches.

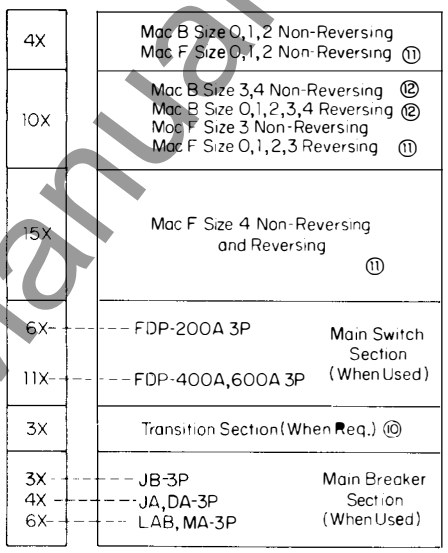
⑥ Available with provision for NEMA class "L" fuses only.

⑦ Fuse clips in these units may be provided which will reject standard NEC fuses, but which will accept Chase-Shawmut type 4 current limiting fuses. Such units will not have Underwriters' labels.

⑧ For FDP Switches 30 through 600 ampere with provision for "J" Type Fuses – use 600 volt dimensions for both 240 and 600 volts.

⑨ 800 and 1200 ampere vertical main switches may be mounted at bottom or top.

Mac Starter Units Layout Guide⑬



⑩ Mac B starter units may be mixed on same chassis with AB breakers by allowing a 3X space between starter units and breakers. No transition space is required between Mac F and FDP units.

⑪ All starters unit doors are provided with 4 knockouts for control pushbuttons and indicating lights.

⑫ 10X size 4 units are for motors with 10 second starting time maximum. If longer starting time, use 15X size enclosure.

⑬ For starter types not shown, refer to Westinghouse

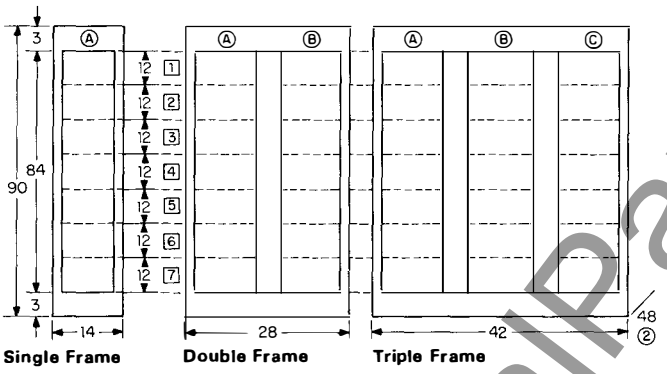
December, 1974
Supersedes Application Data 31-526,
pages 19-20, dated March, 1973.
Mailed to: E, D/1929, 1946/DB

Low Voltage Distribution Switchboards and Power Assemblies

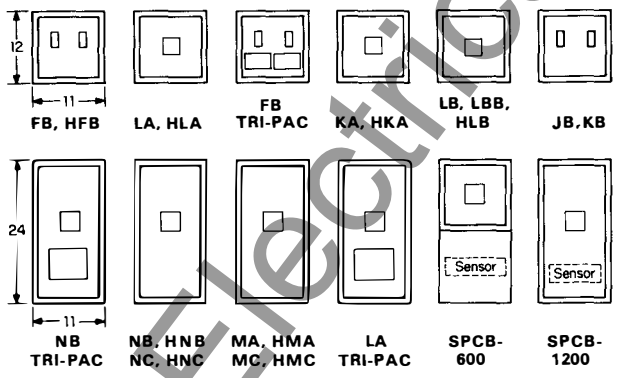
POW-R-LINE™ Switchboard Dimensional Information

ⓒType WRI, Distribution Sections, Individually Mounted Devices

Layout Dimensions
Vertical Sections With Standard, Pre-Punched Vertical Bus in Each 14 Inch Width – For Use With Fixed Mounted Molded Case Breaker Modules Thru 1200 Amps.

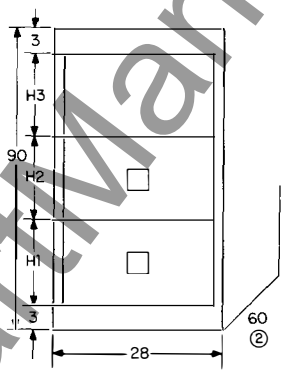


Molded Case Breakers Up to 1200 Amperes As Standard Bolt-in Modules For Mounting in Single, Double or Triple Frame Sections Shown Above



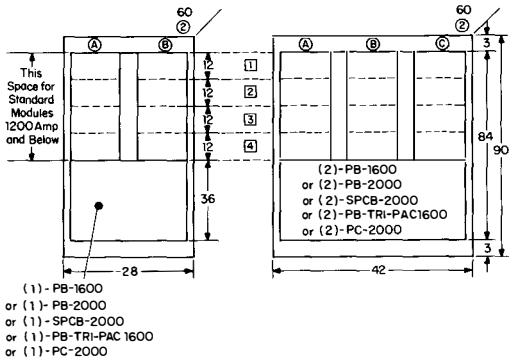
② Depth dimension is as shown except if service section is deeper; then depth is increased to match that of the service section.

SCB-II Circuit Breakers and Molded Case Breakers Above 1200 Amperes, Fixed Mounted

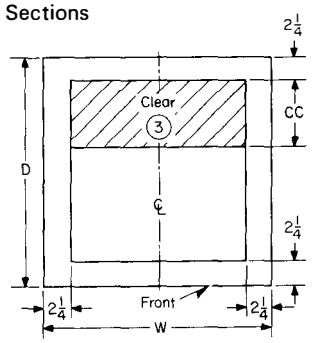


Breaker Type	Max. Amps.	Cell Height H1	H2	H3
PB	1600	28	28	Space Only
PB	2000	28	28	
PB	2500	28	Space Only	
SPCB-2000	2000	28	28	
SPCB-2500	2500	28	Space Only	
PB TRI-PAC	1600	28	28	

SCB-II Circuit Breakers, Molded Case Breakers Above 1200 Amperes, Mixed With Modular Units 1200 Amperes and Below, Fixed Mounted



Standard Floor Plan for Pow-R-Line Type WRI Distribution Sections



Dimensions D	CC
48	13
54	19
60	25
66	31
72	37

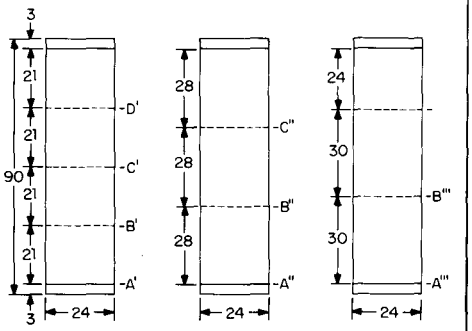
Floor Plan

③ Clear area assumes no floor channels used under front or rear frame members.

POW-R-LINE® Switchboard Dimensional Information

Type WRI Distribution Sections – Individually Mounted Devices

Molded Case PC SELTRONIC™ and Systems Power Circuit Breakers, Draw-out Mounted



Group 1: LA, SPCB-600
Group 2: MA, NB, SPCB-1200
Group 3: PB-2000, SPCB-2000, FFR-2000, PC-2000

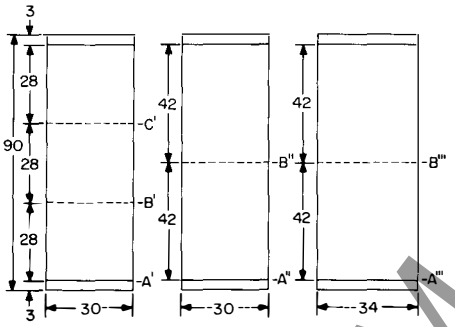
Units from Groups 1, 2 and 3 may be intermixed in a single 90 in. high section, with the following restrictions:

1. Units must always be located with the bottoms of their compartments corresponding to the dotted locator lines shown above for their respective sizes, that is:
   Group 1 Device Bottoms at A', B', C' or D'
   Group 2 Device Bottoms at A'', B'' or C'' Only
   Group 3 Device at A''' or B''' Only

2. The 84 in. total vertical space cannot be exceeded.

3. Blank spaces resulting from inter-mixing are unusable.

Bolted Pressure Contact Switches, Fixed Mounted



Group 1: 800Amp Pringle Type QA
Group 2: 1200Amp QA-CBC, 1600Amp QA-CBC, 2000 Amp QA-CBC
Group 3: 2500AmpQA-CBC

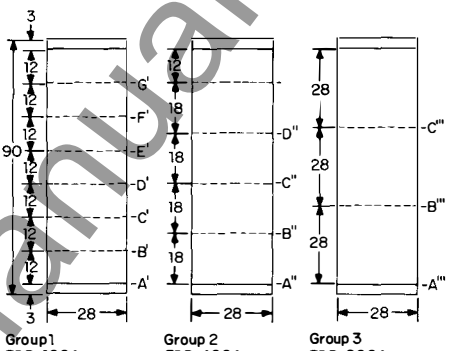
Units from Groups 1, 2 and 3 may be intermixed in the same 90 in. high vertical sections with the following limitations:

1. Units must always be located with the bottom of their compartments corresponding to the dotted locator lines shown above for their respective sizes, that is:
   Group 1 Device bottoms at A', B' or C'
   Group 2 Device Bottoms at A'' or B''
   Group 3 Device Bottoms at A''' or B'''

2. The 84 in. vertical mounting space cannot be exceeded.

3. Blank spaces resulting from intermixing are unusable.

FDP Fusible Switches, Fixed Mounted



Group 1: FDP-100Amp, FDP-200Amp
Group 2: FDP-400Amp, FDP-600Amp
Group 3: FDP-800Amp, FDP-1200Amp

Units from Groups 1, 2 and 3 may be intermixed in the same 90 in. high vertical section with the following limitations:

1. Units must always be located with the bottoms of their compartments corresponding to the dotted locator lines shown above for their respective sizes, that is:
   Group 1 Device Bottoms at A', B', **C'**, D', E', F' and G'
   Group 2 Device Bottoms at A'', B'', C'', or D''
   Group 3 Device Bottoms at A''', B''' or C'''

2. The 84 in. total vertical space cannot be exceeded.

3. Blank spaces resulting from intermixing are unusable.

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Low Voltage Distribution Switchboards and Power Assemblies

Conventional Construction Switchboard Dimensional Information

Type WF – All Front Accessible, Meet NEMA PB-2, 1972 Standards
Incoming or Service Sections – One Main (or tie) Device Only, Individually Mounted, Front Accessible
Metering C. T. Compartment and Cable Arrangements

Hot Sequence

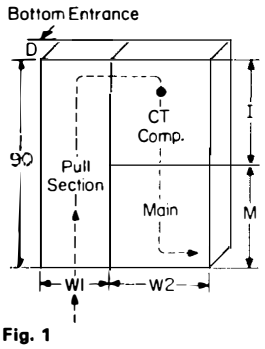


Fig. 1

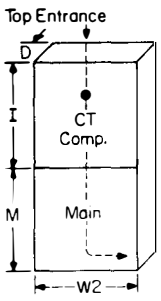


Fig. 2

Cold Sequence

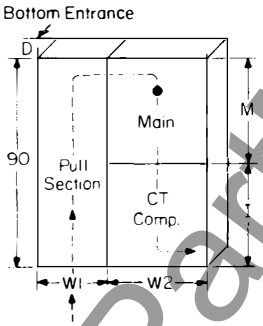


Fig. 3

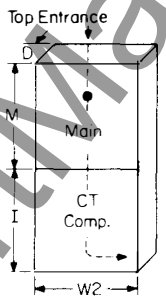
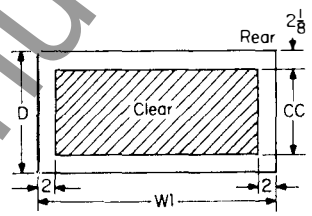


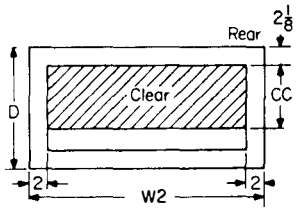
Fig. 4



Floor Plan, Pull Section

Pull Section

Dim. D	Dim. CC
15	9¾
24	18¾
30	24¾



Top Plan, Main Section

Layout Dimensions

Main Device	Max. Ampere Rating	Dimension in Inches W1	W2	D	I	M	CC Fig. 2, 4
Fixed Devices							
Power Circuit Breakers							
DBE	800-1600	②	38	30	45	45	24
DBE	2000	②	38	30	30	60	24
System Circuit Breakers							
SCB-600	600	②	38	15	45	45	9
SCB-1200	1200	②	38	15	45	45	9
SCB-2000	2000	②	38	24	45	45	18
Molded Case Breakers							
LA, HLA	600	②	38	15	45	45	9
MA, HMA	800	②	38	15	45	45	9
NB, HNB	1200	②	38	15	45	45	9
PB	2000	②	38	15	45	45	9
Auto. Transf. Sw.③	100-1200	②	38	15	45	45	9
TRI-PAC Circuit Breakers							
LA	400	②	38	15	45	45	9
NB	800	②	38	15	45	45	9
PB	1600	②	38	15	45	45	9
Bolted Pressure Contact Switches							
BPS	800-2000	②	38	15	45	45	9
Quick-Make, Quick-Break Fusible Switches							
FDP	800, 1200	②	38	15	45	45	9
Combination Sections – Main Plus Distribution – Single Section Only							
Bolt Pr. Sw. w/CDP or FDP	800-2000	②	38	15	45	45	9
Mold Case Brkr. w/CDP or FDP	2000	②	38	15	45	45	9
CDP or FDP 6 Circ. only	2000	②	38	15	45	45	9
Drawout Devices							
System Circuit Breaker							
SCB-600	600	②	38	24	45	45	18
SCB-1200	1200	②	38	24	45	45	18
SCB-2000	2000	②	38	30	45	45	24

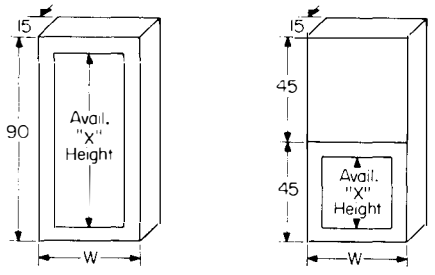
② 20" and 24" are standard options.
③ All transfer switch arrangements are for cable connection only.

Conventional Construction Switchboard Dimensional Information

Type WF – All Front Accessible, Meet NEMA PB-2, 1972 Standards

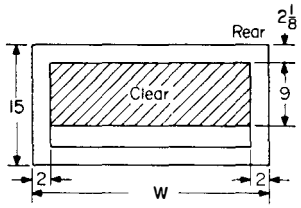
Distribution Sections

Panel Mounted Devices Only, Front Accessible



Full Height Panel **Half Height Panel**

For W Dim. and Max. available "X" Heights in above drawings, refer to adjacent tables.



Floor Plan

Layout Dimensions

Width of Sections Containing Panel Mounted Devices

Panel Type	Largest Breaker or Switch	Width, Inches
CDP	KA	30
	LAB thru MA	38
	NB, NB TRI-PAC	42
	LA TRI-PAC	48
FDP	Single unit thru 200A, except twin 100A, 600V	30
	400A thru 1200A including twin 100A, 600V, except 800A or 1200A horizontal Mounted unit	38
	800A or 1200A horizontal Mounted unit	42
Mac B Mac F	All NEMA sizes 0-4	34

Maximum "X" Height Available in Panels

Distribution Section is Fed by:	Available "X" Height	
	Full Height Panel	Half Height Panel
Through bus from adjacent section rated 2000 amp and below	48X⑭	14X
Cable into top or bottom of single Main Lug Only section		
A. Without Neutral, 400 thru 1600 amp	48X	22X
B. With Neutral		
400 Amp	45X	19X
600 Amp	44X	18X
800 Amp	42X	16X
1200 Amp	40X	14X
1600 Amp⑮	40X	14X

⑭ 2000 amp Distribution Section fed from main section: 47X max.

⑮ Max. incoming lug size: 4-600 MCM per phase and neutral, copper only. For cable entrance above 1600 amps, use Type WRP.

Layout Guides for Panel Mounted Devices, X Heights (1X = 1⅜ in.)

CDP Panel Layout Guide

1X ②	1 Pole EB, EHB, HFB		1 Pole EB, EHB, HFB
2X	2 Pole EB, EHB, FB		2 Pole EB, EHB, FB
3X	3 Pole EB, HB, FB	③	3 Pole EB, EHB, FB
3X	2 and 3 Pole HFB		2 and 3 Pole HFB
2X	2 Pole CA	③	2 Pole CA
3X	3 Pole CA, JB, KB		3 Pole CA, JB, KB
4X	2 or 3 Pole JA, KA or HKA ④	③	2 or 3 Pole JA, KA or HKA ④
4X	2 or 3 Pole DA, LBB, LB, HLB	③	2 or 3 Pole DA, LBB, LB, HLB
6X	2 or 3 Pole HLA, LA or LAB ④	③	2 or 3 Pole HLA, LA or LAB ④
6X	2 or 3 Pole MA, MC or HMA, HMC NB, NC or HNB, HNC		

② When only one EB, EHB or HFB single pole breaker is required in conjunction with other frame size breakers the single pole breaker space required changes from 1X to 2X.

③ Breakers of the same frame size regardless of number of poles may be mounted opposite each other. In addition, JA may be mounted opposite KA breakers. LA may be mounted opposite LAB breakers and JA and KA may be mounted opposite DA breakers.

④ KA, HKA, LA, and HLA (interchangeable trip) breakers may not be used as main breakers.

FDP Panel Layout Guide⑦

2X	30A	30A	2P, 3P 240VAc
4X	30A	30A	
4X	60A	60A	2P, 250VDc
4X	100A	100A	
5X	100A ⑥		2P, 3P 240 or 600 VAc 2P, 250VDc
4X	30A	30A	2P, 3P 600VAc
4X	60A	60A	
5X	100A	100A	
6X	200A ⑥		2P, 3P 240 or 600VAc 2P, 250VDc
11X	400 or 600A ⑥		
16X	Horizontally Mounted 800 or 1200A Branch Circuit ⑤		2P, 3P 240 or 600VAc 2P, 250VDc
21X	800A Vertically Mounted Main Switch ⑤		
21X	1200A Vertically Mounted Main Switch ⑧		

⑤ Available with provision for NEMA class "L" fuses only.

⑥ Fuse clips in these units may be provided which will reject standard NEC fuses, but which will accept Chase-Shawmut type 4 current limiting fuses. Such units will not have Underwriters' labels.

⑦ For FDP Switches 30 through 600 ampere with provision for "J" Type Fuses – use 600 volt dimensions for both 240 and 600 volts.

Mac Starter Units Layout Guide⑬

4X (6X) ⑩	Mac B Size 0, 1, 2 Non-Reversing Mac F Size 0, 1, 2 Non-Reversing ⑪	
10X	Mac B Size 3, 4 Non-Reversing ⑫ Mac B Size 0, 1, 2, 3, 4 Reversing ⑫ Mac F Size 3 Non-Reversing Mac F Size 0, 1, 2, 3 Reversing ⑪	
15X	Mac F Size 4 Non-Reversing and Reversing ⑪	
6X	FDP-200A 3P	Main Switch Section (When Used)
11X	FDP-400A, 600A 3P	
3X	Transition Section (When Req.) ⑨	
4X	JA, DA-3P	Main Breaker Section (When Used)
6X	LAB, MA-3P	

⑧ 800 and 1200 ampere vertical main switches may be mounted at bottom or top.

⑨ Mac B starter units may be mixed on same chassis with AB breakers by allowing a 3X space between starter units and breakers. No transition space is required between Mac F and FDP units.

⑩ 4X units can be furnished in 6X enclosures, if specified on order.

⑪ All starters unit doors are provided with 4 knockouts for control pushbuttons and indicating lights.

⑫ 10X size 4 units are for motors with 10 second starting time maximum. If longer starting time, use 15X size enclosure.

⑬ For starter types not shown, refer to Westinghouse.

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Low Voltage Distribution Switchboards and Power Assemblies

Conventional Construction Switchboard Dimensional Information

Type WRP – Rear Accessible, Meet NEMA PB-2, 1972 Standards

Incoming or Service Sections, One Main (or tie) Device Only

Individually Mounted, Rear Accessible, Used With Panel Mounted Distribution Sections Only

Layout Dimensions

When Used With Rear Accessible *Panel Mounted* Distribution Sections

Main Device	Max. Ampere Rating	Dimension in Inches W1	W2	D	I	M	CC Fig. 2, 4
Fixed Main Devices Rated 2000 Amps and Below							
Power Circuit Breakers							
DBE	800-1600	②	38	30	45	45	24
DBE	2000	②	38	30	30	60	24
System Circuit Breakers							
©SPCB-600	600	②	38	15	45	45	9
©SPCB-1200	1200	②	38	15	45	45	9
©SPCB-2000	2000	②	38	24	45	45	18
Molded Case Circuit Breakers							
LA, HLA	600	②	38	15	45	45	9
MA, HMA	800	②	38	15	45	45	9
NB, HNB	1200	②	38	15	45	45	9
PB	2000	②	38	15	45	45	9
Auto. Trans. Sw.③	100-1200	②	38	15	45	45	9
TRI-PAC Circuit Breakers							
LA	400	②	38	15	45	45	9
NB	800	②	38	15	45	45	9
PB	1600	②	38	15	45	45	9
Bolted Pressure Contact Switches							
BPS	800-2000	②	38	15	45	45	9
Quick-Make, Quick-Break Fusible Switches							
FDP	800, 1200	②	38	15	45	45	9
Combination Sections – Main Plus Distribution – Single Section Only							
Bolt Pr. Sw. w/CDP or FDP	800-2000	②	38	15	45	45	9
Mold. Case Brkr. w/CDP or FDP	2000	②	38	15	45	45	9
CDP or FDP 6 Circ. Only	2000	②	38	15	45	45	9
Drawout Main Devices Rated 2000 Amps and Below							
System Circuit Breakers							
©SPCB-600	600	②	38	24	45	45	9
©SPCB-1200	1200	②	38	24	45	45	9
©SPCB-2000	2000	②	38	30	45	45	15

© Changed since previous issue.
② Auxiliary or pull section widths; 20, 24, 26, 30, 38 inches. Depth to match incoming main devices section.
③ These transfer switch arrangements are front accessible and cable connected only.

Metering CT Compartment and Incoming Cable Arrangements, 2000 Amps. and Below

Hot Sequence

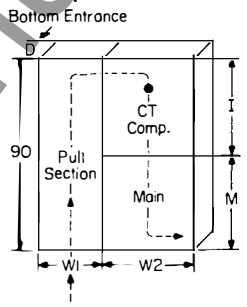


Fig. 1

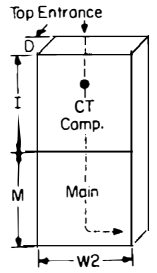
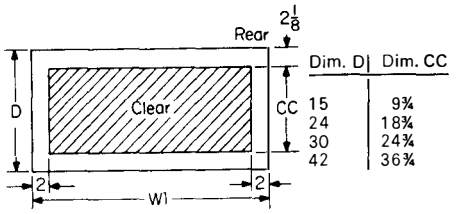


Fig. 2



Floor Plan, Pull Section

Cold Sequence

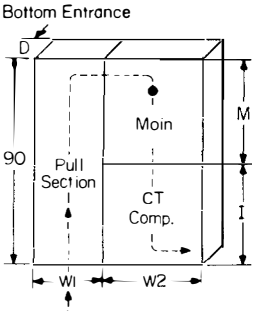


Fig. 3

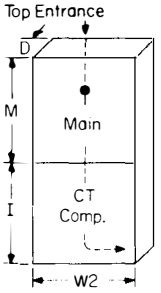
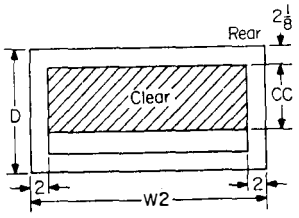


Fig. 4



Top Plan, Main Section

Conventional Construction Switchboards Dimensional Information

Type WRP – Rear Accessible, Meet NEMA PB-2, 1972 Standards

Incoming or Service Sections, One Main (or tie) Device Only

Individually Mounted, Rear Accessible, Used With Panel Mounted Distribution Sections Only

Layout Dimensions

When Used With Rear Accessible Panel Mounted Distribution Sections

Main Device	Max. Ampere Rating	Dimensions in Inches W1	W2	D	I	M	CC③ Fig. 6
Fixed Main Devices Rated Above 2000 Amps							
Power Circuit Breakers							
DBE	3000-4000	. .	38	54	30	60	20
System Circuit Breaker							
SCB-2500	2500	. .	38	42	45	45	20
Molded Case Breakers							
PB-2500	2500	. .	38	36	45	45	20
PB-3000	3000	. .	. .	. .	. .	. .	②
Auto. Transf. Sw.	2000	. .	38	42	45	45	20
Bolted Pressure Switches							
BPS	2500	. .	38	42	45	45	20
BPS	3000-4000	. .	44	42	45	45	20
Combination Sections – Applied as Single Sections Only							
CDP/FDP 6 Circ. Only	2500-4000	. .	38	36	45	45	20
Bolt. Pres. Sw. w/CDP or FDP	2500	. .	38	36	45	45	20
Bolt. Pres. Sw. w/CDP or FDP	3000-4000	. .	44	42	45	45	20
PB-2500 w/CDP or FDP	2500	. .	38	36	45	45	20
Drawout Main Devices Rated Above 2000 Amps							
							CC Fig. 5
System Circuit Breaker							
SPCB-2500	2500	38	26	60	45	45	20
ⓒSPCB-3000	3000	38	26	60	45	45	20

ⓒ Changed since previous issue.
② For Dimensions, refer to Westinghouse.
③ Conduit space either top or bottom.

Metering CT Compartment and Incoming Cable Arrangements, above 2000 Amps

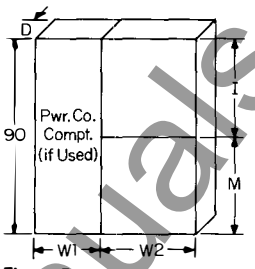


Figure 5

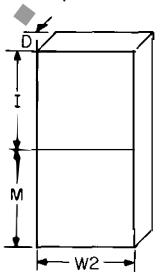
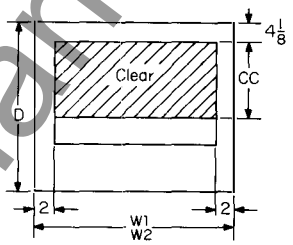


Figure 6



Floor Plan (Incoming Section above 2000A)

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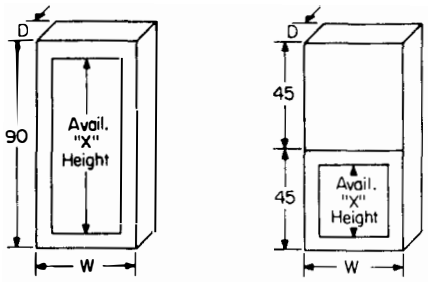
Low Voltage Distribution Switchboards and Power Assemblies

Conventional Construction Switchboard Dimensional Information

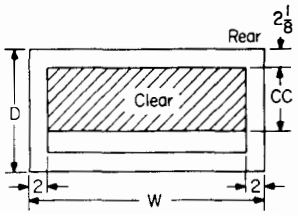
Type WRP – Rear Accessible, Meet NEMA PB-2, 1972 Standards

Distribution Sections
Panel Mounted Devices Only, Rear (and Front) Accessible



Full Height Panel **Half Height Panel**

For W Dim. and Max. available X Heights in above drawings, refer to adjacent tables.



Floor Plan

Dimensions

Main Bus Rated 2000 Amps and Below
D =15 Inches
CC =9 Inches
W =See table at right
Max. "X" Ht. =See table at right

Main Bus Rated 2500 to 4000 Amps
D =Same depth as Incoming or Service Section, or 36 In. (Min.) if no Service Section used.
CC =Same as for Incoming or Service Section
W =See width table above.
Max. "X" Ht. =Same as table above, except Full Height Panel "X" Height =55X and Half Panel "X" Height=26X for main bus connected Distribution Sections. No reduction of "X" Height for sections with neutral.

Layout Dimensions

Width of Sections Containing Panel Mounted Devices

Panel Type	Largest Breaker or Switch	Width, Inches
CDP	KA	30
	LAB thru MA	38
	NB, NB TRI-PAC	42
	LA TRI-PAC	48
FDP	Single unit thru 200A, except twin 100A, 600V	30
	400A thru 1200A including twin 100A, 600V, except 800A or 1200A horizontal mounted unit	38
	800A or 1200A horizontal mounted unit	42
Mac B, Mac F	All NEMA sizes 0-4	34

Maximum "X" Height Available in Panels

Distribution Section is Fed By:	Available "X" Height: Full Height Panel	Available "X" Height: Half Height Panel
Through bus from adjacent section rated 2000 amp and below	48X②	14X
Cable into top or bottom of single Main Lug Only section:		
A. Without neutral, 400 thru 600 amps	48X	22X
B. With Neutral		
400 amp	45X	19X
600 amp	44X	18X
800 amp	42X	16X
1200 amp	40X	14X
1600 amp③	40X	14X

② 2000 amp Distribution Section fed from main section: 47X max.
③ Max. incoming Lug size: 4-600 MCM per phase and neutral, copper only. For cable or bus duct entrance to single sections above 1600 amps, and lineups without main section, depth is 36 In. (Min.) and connections are made to standard horizontal bus.

Power Assembly Dimensional Information

Type WPA – Meet NEMA SG-5 Standards

Incoming Service Sections with Compartment and Mounting Provisions for Power Co. CT's and One (1) Type DS Power Circuit Breaker Main Device, Drawout Mounted

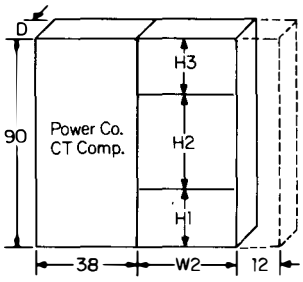


Figure 1

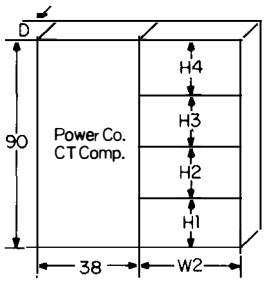
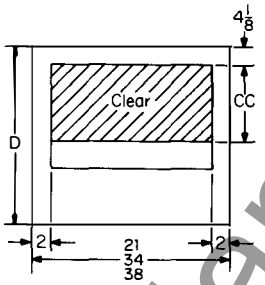


Figure 2



Floor Plan

Note:
When a DS-840 Section is Adjacent to a Section Containing Smaller Frame Sizes, a 12 Inch Bus Transition Section is Required between The Two Sections. All Sections are Then 72 Inches Deep.

Layout Dimensions, Inches (Figures 1 and 2)

Breaker	Max. Amperes	Fig. No.	W2	D	H1 Dim.	H1 Device	H2 Dim.	H2 Device	H3 Dim.	H3 Device	H4 Dim.	H4 Device	CC (Min.) Power Co. Section	CC (Min.) Main Section
Drawout Devices														
©DS-206	600	2	21	60	22½	Blank	22½	Main	22½	Main	22½	Blank or Instr.	15	10
DS-416	1600	2	21	60	22½	Blank	22½	Main	22½	Main	22½	Blank or Instr.	15	10
DS-420	2000	2	21	60	22½	Blank	22½	Main	22½	Main	22½	Blank or Instr.	15	10
DS-632	3200	1	21	60	22½	Blank	45	Main	22½	Blank or Instr.	..	.....	15	10
©DS-840	4000	1	34	72	22½	Blank	45	Main	22½	Blank or Instr.	..	.....	..	14

Incoming Line and Distribution Sections Instrumentation and/or Metering for Customer Purposes Only, No Power Co. CT's Involved

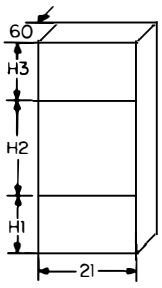


Figure 3

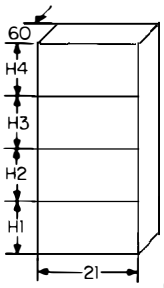


Figure 4

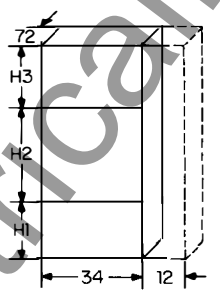
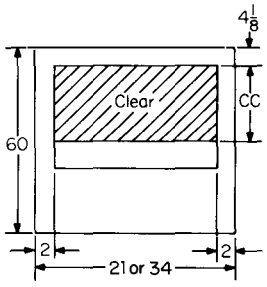


Figure 5



Floor Plan

Note:
When a DS-840 Section is Adjacent to a Section Containing Smaller Frame Sizes, a 12 Inch Bus Transition Section is Required between The Two Sections. All Sections are Then 72 Inches Deep.

Layout Dimensions, Inches (Figures 3, 4 and 5)

Breaker	Max. Amperes	Fig. No.	H1 Dim.	H1 Device	H2③ Dim.	H2③ Device	H3③ Dim.	H3③ Device	H4 Dim.	H4 Device	CC (Min.)
Drawout Devices											
DS-206	600	4	22½	Breaker	22½	Breaker	22½	Breaker②	22½	Breaker	10
DS-416	1600	4	22½	Breaker	22½	Breaker	22½	Breaker②	22½	Breaker	10
DS-420	2000	4	22½	Breaker	22½	Breaker	22½	Breaker②	22½	Breaker	10
DS-632	3200	3	22½	④	45	Breaker③	22½	⑤	..	.....	10
©DS-840	4000	5	22½	Blank	45	Main, Tie or Feeder	22½	Blank or Instr.	..	.....	14

Note: All the above breaker types may be intermixed with each other or with spaces in a vertical section, adhering to compartment heights shown and footnotes ② thru ⑤.

© Changed since previous issue.
② Tie breaker, if used, must be located in H3 space.
③ Type DS-206, 416 and 420, when used as main breakers, must be located in space H2 or H3.
④ DS-206, 416 and 420 feeder breakers may be mounted in the H1 space.
⑤ DS-206, 416 and 420 feeder breakers or instrumentation may be mounted in this H3 space.

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Low Voltage Distribution Switchboards and Power Assemblies

Power Assembly Dimensional Information

Type WPA – Meet NEMA SG-5 Standards

Incoming Service Sections with Compartment and Mounting Provisions for Power Co. CT's and One (1) Type DSL Power Circuit Breaker Main Device, Drawout Mounted

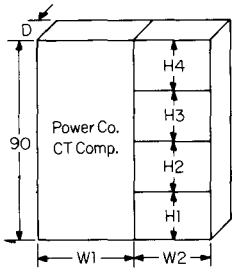


Figure 1

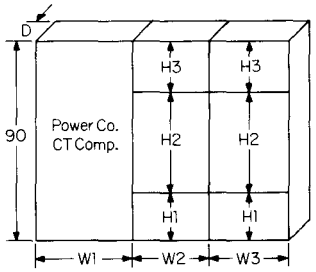


Figure 2

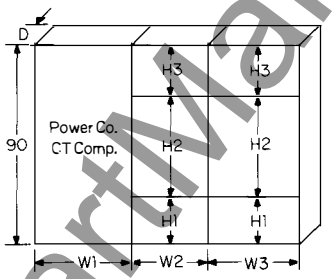
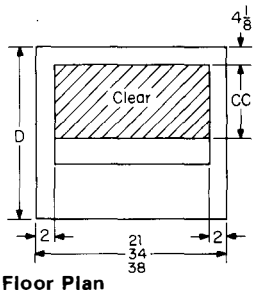


Figure 3



Floor Plan

Layout Dimensions, Inches (Figures 1, 2 and 3)

Breaker	Max. Amperes	Fig. No.	W1	W2	W3	D	H1 Dim.	H1 Device	H2 Dim.	H2 Device	H3 Dim.	H3 Device	H4 Dim.	H4 Device	CC Min. Bottom W1	CC Min. Bottom W2	CC Min. Bottom W3
Drawout Devices																	
DSL-206	600	1	38	21	..	66②	22½	Blank	22½	Main	22½④	Main	22½	Blank or Instr.	63	8	..
DSL-416	1600	1	38	21	..	66②	22½	Blank	22½	Main	22½④	Main	22½	Blank or Instr.	63	8	..
DSL-632	3200	2	38	21	21	72	22½	Blank	45	Main or Fuse Truck	22½	Blank or Instr.	...	.....	63	14	14
DSL-840	4000	3	38	34	34	72	22½	Blank	45	Main or Fuse Truck	22½	Blank or Instr.	...	.....	63	14	14

Incoming Line and Distribution Sections Instrumentation and/or Metering for Customer Purposes Only, No Power Co. CT's Involved

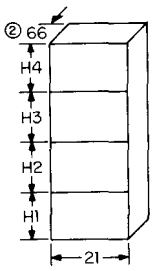


Figure 4

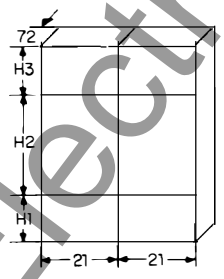


Figure 5

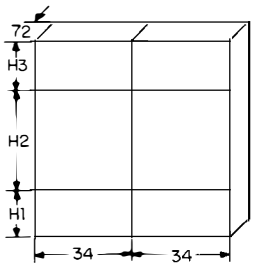


Figure 6

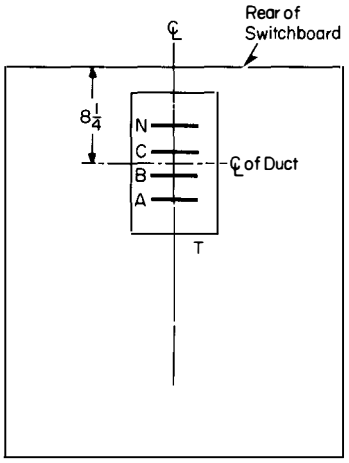
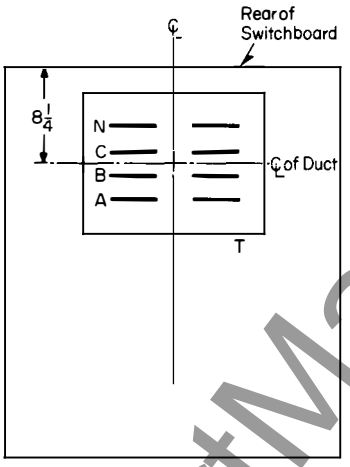
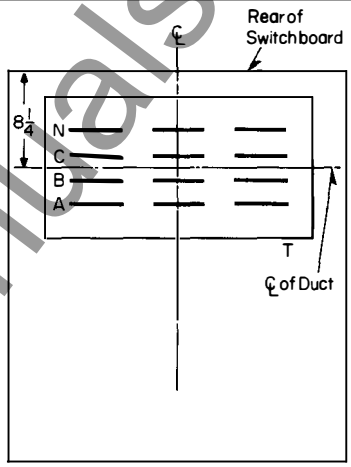
Layout Dimensions, Inches (Figures 4, 5 and 6)

Breaker	Max. Amperes	Fig. No.	H1 Dim.	H1 Device	H2 Dim.	H2 Device	H3 Dim.	H3 Device	H4 Dim.	H4 Device	CC (Min.) Bot.
Drawout Devices											
DSL-206	600	4	22½	Dist. Brkr.	22½	Main or Dist. Brkr.	22½④	Main or Dist. Brkr.	22½	Dist. Brkr. or Instr.	8
DSL-406	1600	4	22½	Dist. Brkr.	22½	Main or Dist. Brkr.	22½④	Main or Dist. Brkr.	22½	Dist. Brkr. or Instr.	8
DSL-632	3200	5	22½	③	45	Main or Fuse Truck	22½	Blank or Instr.	...	.....	14
DSL-840	4000	6	22½	Blank	45	Main or Fuse Truck	22½	Blank or Instr.	...	.....	14

Note: All the above breaker types may be intermixed with each other or with spaces in a section, adhering to compartment heights shown and footnotes ②, ③ and ④.

② This dimension is 72 In. if DSL-632 or DSL-840 is in assembly lineup.
③ DSL-206 or DSL-416 feeder may be mounted in H1 space below main DSL-632 but not below fuse truck.
④ Tie breaker, if used, must be located in H3 space.

Bus Duct Entrance into Switchboard Top, Standard Locations④

Depth of Structure (Inches)	Pow-R-Way Bus Duct into Pow-R-Line Switchboards③④		
	1 Bar/Phase	2 Bar/Phase	3 Bar/Phase
15② 20② 30 36 42 48 54 60 66 72	 Top View	 Top View	 Top View

C Changed since previous issue.
② Bus Duct connection not available for 15 or 20 inch deep sections without the addition of a top mounted pullbox unless top section is blank.
③ For bus duct entrance to Type WPA Power Assembly with DS Breakers, refer to Westinghouse.
④ Long dimension of duct cannot exceed width of switchboard section.

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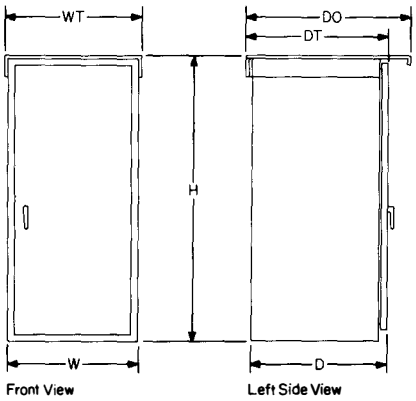
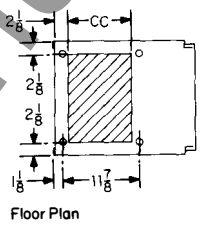
Low Voltage Distribution Switchboards and Power Assemblies

Outdoor Enclosures② Dimensions, Inches *Not to be used for construction purposes unless approved.*

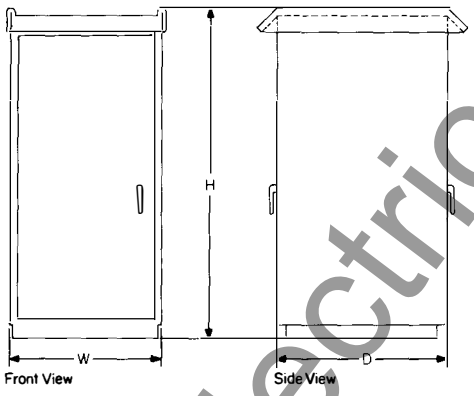
Type WF, Non Walk-in Front Accessible



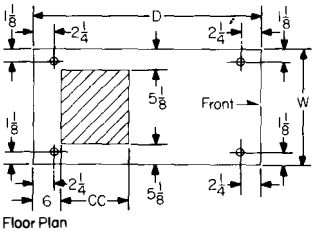
Dimensions, Inches	
W	Std. Indoor Width, +¼ In.
D	28
DT	28½
DO	32⅝
H	90⅝
WT	Std. Indoor Width, +½ In.
CC	Same as Indoor Section



Type WRP or WRI, Non Walk-in Front and Rear Accessible

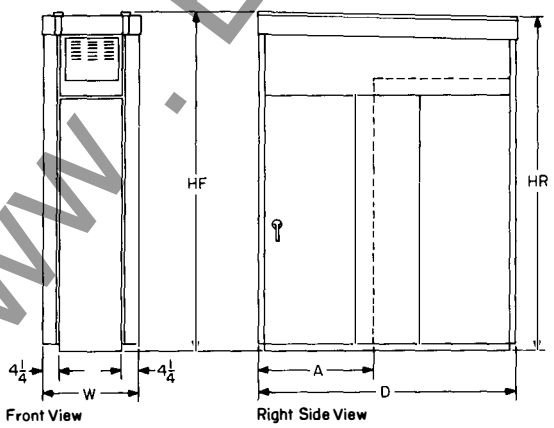


Dimensions, Inches	
H	101⅝
W	Width of Inner Struct., +4½ In.
D	Depth of Inner Struct., +8 In.
CC	Same as for Inner Structure

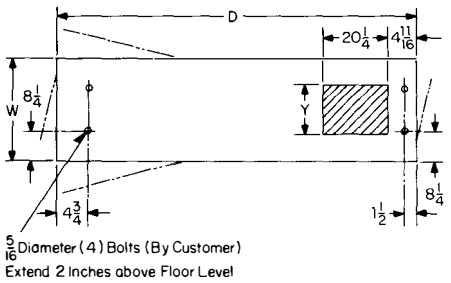


Type WPA, Walk-in Front Aisle Type, Front, Rear and End Accessible

To house DS breaker type Power Assemblies only.



Dimensions, Inches				
HF	124			
HR	121			
D	117			
W	Same as Indoor Section, including 8½ in. (total) per line-up.			
	DS206 416 420 632	DS840	DSL206 416 632	DSL840
A	46½	38½	38½	38½
Y	17½	30½	17½	30½



② Internal assemblies used with these outdoor housings must utilize conventional enclosures in lieu of Pow-R-Line.

Typical Specifications

General Construction

Furnish and install where indicated a dead front type, completely metal enclosed, self-supporting structure independent of wall supports. It shall consist of the required number of vertical sections bolted together to form one rigid switchboard 90⅜" high incorporating switching and protective devices of the number, ratings and type noted herein or shown on the drawings with all necessary interconnections, instrumentation and control wiring. Switchboard construction shall be of the universal frame type using die-formed members bolted and braced through the exclusive use of self-tapping bolts which willl not loosen during shipment. The sides, top and rear shall be covered with removable screw-on plates having formed edges all around. Front plates shall be sectionalized and removable. All front plates shall be fabricated from code gauge steel and shall have formed edges all around. Ventilation openings shall be provided where required. All covers shall be secured by self-tapping screws.

The bus shall be tin plated aluminum of sufficient size to limit the temperature rise to 65°C based on U.L. tests, and adequately braced and supported to withstand mechanical forces exerted during short circuit conditions when directly connected to a power source having the indicated available short circuit current. All connections shall be tightly bolted.

Small wiring, necessary fuse blocks and terminal blocks within the switchboard shall be furnished when required. All groups of control wires leaving the switchboard shall be provided with terminal blocks with suitable numbering strips. All hardware used on conductors shall have a high tensile strength and an anti-corrosive zinc plating.

A ground bus and lug shall be furnished firmly secured to each vertical section structure and shall extend the entire length of the switchboard.

Switchboard shall be provided with adequate lifting means and shall be capable of being rolled or moved into installation position and bolted directly to the floor without the use of floor sills.

A-B-C type bus arrangement, left-to-right, top-to-bottom, and front-to-rear, as viewed from the front, shall be used throughout.

Record drawings shall be furnished providing the following information: switchboard voltage/current rating; overall outline dimensions including available conduit space; switching and protective device ampere ratings; and one line diagram.

Adequate conduit space shall be provided to meet NEC requirements.

Each switching and protective device shall be provided with visible means of ON-OFF identification. All terminals shall be of the anti-turn solderless type suitable for Cu or Al cable of sizes indicated.

All exterior and interior steel surfaces of the switchboard shall be properly cleaned and finished with two-toned gray baked enamel over a rust-inhibiting phosphatized coating. Two-toned gray shall be ANSI 61 and ANSI 49.

Westinghouse Type WF

Switchboard shall be of construction equal to Westinghouse Type WF in which:

All sections of the switchboard shall be 20 inches deep except service sections containing large ampacity main circuit breakers or pressure contact type main fusible switches which may be deeper. All sections of the switchboard shall align so that the back of the complete structure may be placed flush against a wall.

Construction shall allow maintenance of incoming line terminations, main device connections and all main bus bolted connections to be performed without rear access.

The feeder or branch devices shall be removable from the front and shall be panel mounted with the necessary device line and load connections front accessible.

The main horizontal bus bars shall be mounted on glass polyester insulators with all three phases arranged in the same vertical plane. The main bus shall have a maximum ampacity of (600) (800) (1200) (1600) (2000) (2500) (3000) amperes and shall be braced for short circuits up to (50,000) (75,000) (100,000) RMS amperes. Main bus splices shall be supplied between adjacent distribution sections.

Vertical sections shall be completely factory assembled, wired and tested before delivery and shall bear U.L. labels where qualified. Design shall meet NEC and NEMA standards as well as OSHA requirements. Individual vertical sections shall be designed for bolting together at installation site.

Westinghouse Type WRP—
Panel Mounted Devices

Switchboard shall be of construction equal to Westinghouse Type WRP with panel mounted distribution devices in which:

All vertical sections shall have whatever depth is necessary to accommodate safe mounting and connecting of the equipment. All vertical sections shall align front and rear.

All internal devices except the main disconnect, shall be removable from the front and shall be panel mounted with the necessary line and load connections front accessible. The main device and its connections shall be rear accessible.

Main horizontal bus bars shall be mounted on glass polyester insulators with all three phases arranged in the same vertical plane. The main bus shall have a maximum ampacity of (1200) (1600) (2000) (2500) (3000) (4000) amperes and shall be braced for short circuits up to (50,000) (75,000) (100,000) (150,000) (200,000) RMS amperes. Main bus splices shall be supplied between adjacent distribution sections.

Switchboards shall be completely factory assembled, wired and tested before delivery and shall bear U.L. labels, where qualified. Designs shall meet NEC and NEMA standards as well as OSHA requirements.

Westinghouse Type WRI—
Individually Mounted Devices

Switchboard shall be of construction equal to Westinghouse Type WRI with individually mounted distribution devices in which:

Sections shall have whatever depth is necessary to accommodate safe mounting and connecting of the equipment. All vertical sections shall align front and rear.

All internal devices, main and feeders, shall be rear accessible and shall be individually mounted.

Main horizontal bus bars shall be mounted on glass polyester insulators with all three phases arranged in the same vertical plane. The main bus shall have a maximum ampacity of (1200) (1600) (2000) (2500) (3000) (4000) amperes and shall be braced for short circuits up to (50,000) (75,000) 1000,000) (150,000) (200,000) amperes. Main bus splices shall be supplied between adjacent distribution sections.

Distribution sections shall be compartmentized so as to include full height vertical barriers of glass polyester material between the front device compartment. Between the main bus compartment and the rear cable compartment, a full height glass polyester barrier shall be available as a standard modification.

Each 3 phase vertical section bus shall consist of tin plated aluminum bars, "J" shaped in cross-section, and pre-punched for the attachment of bolt-in molded case breaker modules. In order to accommodate the maximum number of molded case modules, it shall be possible to incorporate up to a maximum of three sets of section bus in a single steel vertical structure.

Insulated rigid conductors shall extend from load sides of individually mounted breaker modules into the rear compartment where outgoing cable connections may be made

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Low Voltage Distribution Switchboards and Power Assemblies

Typical Specifications,
Continued

without reaching into or near the main bus compartment.

Switchboard shall be completely factory assembled, wired and tested before delivery, and shall bear U.L. labels, where qualified. Designs shall meet NEC and NEMA standards, as well as OSHA requirements.

Westinghouse Type WPA—
Power Circuit Breaker Main and Feeder Devices

Switchboard shall be equal to Westinghouse type WPA power assembly in which circuit breakers conforming to all requirements of NEMA SG-3 are housed in metal enclosed switchboard structures as fixed or drawout standardized modular elements.

Vertical structures shall be segregated into three distinct compartments, front to back; a front breaker compartment having cell-like construction to house the vertically stacked breaker modules, an intermediate bus compartment to contain line side connections and complete bus bar assembly, and a rear cable compartment containing load side termination provisions for outgoing feeder connections. Isolation of (front and intermediate) (all three) compartments shall be furnished. The switchboard shall be front and rear accessible.

Bus bars shall be tin plated aluminum and all connections securely bolted to ensure high integrity joints with low maintenace. Temperature rise shall not exceed 65°C on switchboard bus bars in conformity with NEMA standards. Glass polyester shall be used for all bus supports and bus bracing of (50,000), (100,000), (150,000), (200,000) RMS amperes shall be supplied. Horizontal bus bars shall be arranged with all phases in a single plane parallel to the switchboard front.

Power circuit breakers for use in individual cells of the front compartment shall be type DS with integral adjustable solid state overcurrent (3 phase and ground) trip devices requiring no external control power for operation.

A formed steel safety dead front hinged cover shall be provided over each drawout circuit breaker compartment which can be completely closed and latched with the breaker in any of its 3 positions: "connected," "test," and "fully withdrawn."

Individual circuit breaker compartments for drawout breakers shall be equipped with cell interlocks to prevent the racking out of a breaker from its "connected" position while its contacts are closed.

The power assembly shall be completely assembled, wired, adjusted and tested at the factory prior to shipment and shall conform to NEMA standard SG-5, NEC and OHSA requirements.

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