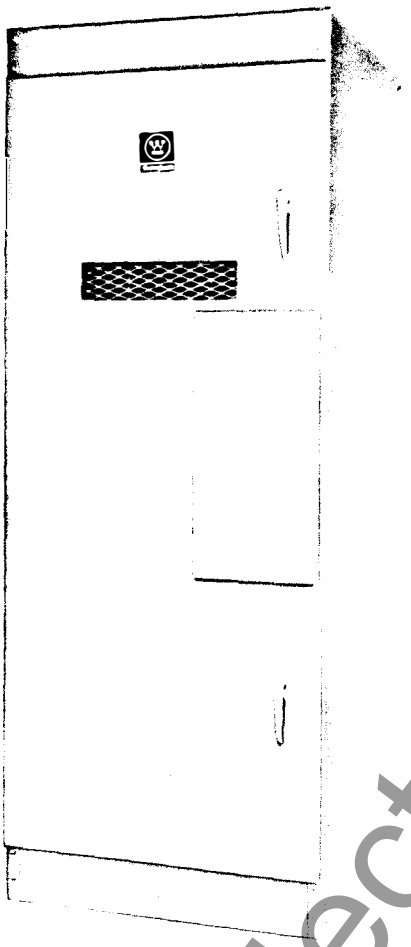
Westinghouse Electric Corporation
Distribution Equipment Division
Cincinnati, Ohio 45237

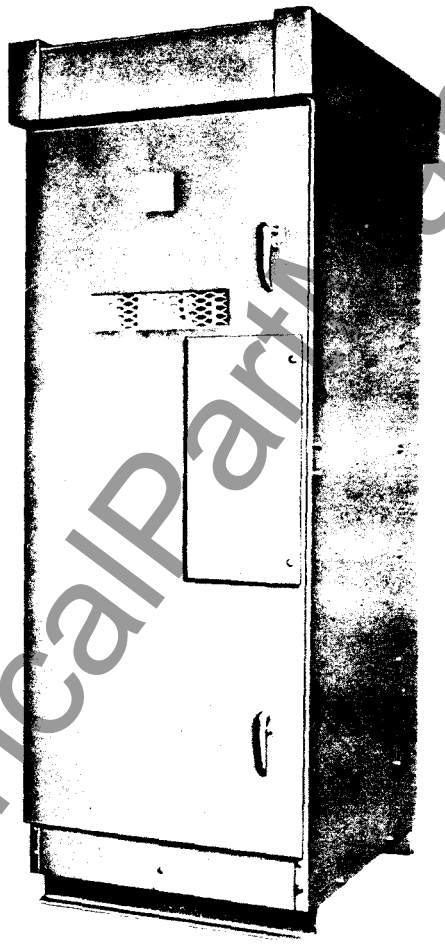
September, 1976
Supersedes Spec. Data 31-980, pages 1-2,
dated August, 1972
Mailed to: E, D, C/1935 PL, DB

5, 15, 25 and 35 Kv Units

WLI
Load Interrupter Switchgear



Indoor Single Unit



Outdoor Single Unit

Switch Ratings

Max. KV	Nom. KV	Impulse Withstand KV	Amperes Continuous	Interrupting	Momentary (Switch closed) Asym. (10 cy.)	Fault closed Asym.
5.0	4.8	60	600	600	40,000	20,000
			600	600	40,000	40,000
			1200	600	80,000	61,000
			1200	1200	80,000	61,000
15.0	13.8	95	600	600	40,000	20,000
			600	600	40,000	40,000
			1200	600	80,000	40,000
			1200	1200	80,000	40,000
			1200	600	80,000	61,000
			1200	1200	80,000	61,000
25.8	23	125 or 150	600	600	40,000	20,000
			600	600	40,000	40,000
			1200	600	40,000	40,000
			1200	600	60,000	60,000
38.0	34.5	150	600	600	40,000	20,000
			600	600	40,000	30,000
			1200	600	40,000	30,000
			1200	600	60,000	30,000

Fuse Ratings

Type Fuse	Nom. KV	Max. Amps	Interr. Rating RMS Amps (Sym.)
RBA-200	4.8	200E	19,000
RBA-400		400E	37,500
RBA-800		720E	37,500
CLE 1, 2		450X	50,000
CLE 750		750E	40,000
CLT		250C	50,000
RBA-200	7.2	200E	16,600
RBA-400		400E	29,400
RBA-800		720E	29,400
CLE-1		125E	50,000
CLE-2		200E	40,000
CLT		250C	50,000
RBA-200	14.4	200E	14,400
RBA-400		400E	29,400
RBA-800		720E	29,400
CLE-1, 2		125X	85,000
CLE 3		200X	50,000
CLT		100C	50,000
RBA-200	23.0	200E	10,500
RBA-400		300E	21,000
RBA-800		540E	21,000
RBA-200	34.5	200E	6,900
RBA-400		300E	16,800
RBA-800		540E	16,800

Application

Load interrupter switchgear provides safe, low-cost switching and circuit protection where occasional or infrequent disconnecting means is desired. The three-pole switch, with its quick-make, quick-break mechanism will interrupt full-load current and the permanently calibrated and accurate fuses assure fault protection.

This switchgear can be applied for any switching application where automatic reclosing on transient faults is not required.

Transformer primary switching
Transformer secondary switching
Service entrance switching
Switching at power centers

Type of units available:
Indoor single units and lineups
Outdoor single units and lineups
Motor operated
2 and 3 switch automatic transfer switches
Selector switches
Duplex

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Typical Specification

General Construction

Furnish and install where indicated a dead-front type, completely metal-enclosed, self-supporting structure independent of wall supports, of the required number of vertical sections bolted together to form one rigid unit incorporating switching and protective devices of the number, rating and type noted herein or shown on the drawings, with the necessary interconnections, instrumentation and control wiring. Construction shall be of the universal frame type using dieformed, welded and bolted members. To facilitate installation, maintenance, and replacement of cables the sides, top and rear shall be bolted on. All enclosing covers shall be fabricated from not less than 11 gauge steel.

Each switch cubicle shall have a single, full length, flanged front door over switch and/or fuse assembly. The flanged door shall close over a projecting door frame. The door shall be equipped with two rotary latch type handles to provide four latching members held in shear. Provision shall be made for operating the switch mechanism and storing the removable handle without opening the full length door. A rectangular, high impact type contact viewing window shall be provided in the door over the switch, and backed up by a grounded metal barrier punched with a diamond pattern to assure safety but still allow full view of the switch blades.

In fused units, fault protection shall be furnished by the fuse type indicated on the drawings. Switch and fuse assemblies shall have full length glass polyester insulating barriers between phases and between outer phases and the enclosure. Fuses shall be positively clamped in position with provision for easy removal or installation from the front.

The full length door in front of fuses shall be hinged and interlocked with the switch mechanism so that the switch must be opened before access to the fuses is possible and the door must be closed before the switch can be closed.

The door shall be hinged and interlocked with the switch mechanism so that the switch must be opened before access to the fuses is possible and the door must be closed before the switch can be closed.

Switchgear assemblies comprising several cubicles shall be group mounted with at least 11 gauge steel side sheets between adjacent sections.

Each unit shall be adequately braced to prevent distortion of the cubicle under normal operating conditions as well as during interruption of short circuit currents. Meters, instruments and/or relays shall be isolated from high voltage compartment by a grounded steel barrier.

To ensure a completely coordinated design, the metal-enclosed assembly shall be integrally designed and produced by the manufacturer of the basic switching, fusing and instrumentation components.

Small wiring, fuse blocks and terminal blocks within the switchgear shall be furnished as indicated on the drawings. All groups of control wires leaving the switchgear shall be provided with terminal blocks having suitable numbering strips.

The main bus shall consist of electro tin plated aluminum bus bar mounted on NEMA rated porcelain insulators for the voltage class and BIL specified.

The design of the busses, connections and supports shall be consistent with the mechanical stresses produced by short circuit current equivalent to the interrupting current rating of the associated switch and fuse at service voltage.

All hardware used on conductors shall have a high tensile strength and anticorrosive plating.

A ground lug shall be furnished firmly secured to the structure for a single cubicle. For multiple units, a ground bus shall be furnished to extend the entire length of the switchgear. Lugs shall be provided for copper ground cable at each end of the bus.

The structure shall be provided with adequate lifting means and shall be capable of being rolled and moved into installation position and bolted to the floor.

Adequate conduit space shall be provided to meet the N.E.C. requirements.

All terminals shall be of the solderless type suitable for copper or aluminum cable of sizes indicated on drawings.

All enclosing and supporting steel shall be thoroughly cleaned to assure proper surface for prime and finish coats. The final coat shall be a fast drying enamel and be dark gray ASA-24 for outdoor units and ASA-61 for indoor units. The finish paint shall be of a type to which field applied paint will adhere.

Outdoor units shall have a drip-proof roof sloped from front to back. All openings shall be screened to prevent the entrance of reptiles and other vermin and barriered to inhibit the entrance of snow, sand, etc. One space heater shall be provided in each cubicle. Power for the space heater shall be furnished by others.

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

Load Interrupting Switches

The load interrupter switches shall have the following ratings:

a. Impulse Withstand Voltage:_____Kv
b. Continuous Ampere Rating:_____Amps.
c. Interrupting Rating:_____Amps.
d. Fault Closing Rating:_____Amps. Asym.
e. Momentary Rating:_____Amps. Asym.

Fuses

All fused units shall be equipped with Westinghouse current limiting or expulsion fuses as indicated on drawings. Fuses shall be positively clamped in position with provision for easy removal or installation from the front.

Operating Mechanism

A quick-make, quick-break manual operating mechanism shall be supplied which utilizes a heavy duty coil spring in such a way as to provide powerful opening and closing action of the switch. The heavy duty coil spring shall be located so as to provide easy accessability.

The operating mechanism shall have the following action:

To close the switch, the mechanism cam is rotated (by means of a removable handle) through 120° motion, the spring lever reaches the over toggle position. This releases the spring which then rapidly accelerates the switch, through stored energy to the closed position. In order to open the switch, the mechanism cam is rotated in the opposite direction resulting in charging of the heavy duty spring and releasing its stored energy in a similar sequence.

Due to the action of the latch, the clearance across the open switch, from blade to jaw, is maintained during the total time the mechanism cam is being rotated. It is, therefore, impossible to tease the switch into any intermediate position. However, a defeat mechanism is provided to permit slow opening and closing of the switch for maintenance and inspection purposes.

The mechanism cam is not solidly linked to the switch blades at any time. The closing speed of the blades is, therefore, independent of the speed of rotation of the mechanism cam. When the switch is closed against a fault, the blow-out forces are not transmitted to the mechanism cam.

In order to ensure reliable operation the mechanism cam shall be in direct contact with the overtoggle cam and shall not be

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connected via cable or chain which is subject to failure.

The operating mechanism shall be designed to provide sufficient power to overcome the blow-out forces when closing the switch against a fault. When the switch is not closed against a fault, the excessive closing power of the mechanism shall be absorbed by an adjustable stop mechanism, and not transmitted to the stationary contacts or supporting insulators.

Motor Operator

The motor operator shall be of the electro-mechanical linear actuator type. The operator shall be of a proven design and be highly repetitively manufactured, and be an integral stand alone component. It shall be completely sealed and weather protected, and by itself shall be designed for rugged outdoor and industrial application. The operator shall be lubricated for normal life and no adjustments should be necessary. It shall be capable of operation in any position.

The rotary motion of the motor and gearbox shall be smoothly and quietly converted to linear motion by means of a highly efficient ball bearing screw and nut.

The operator shall be equipped with a load and current limiting clutch to allow the motor to free wheel at the end of stroke or when a preset load limit is encountered. For accuracy and a consistent slip point the clutch shall be of the ball detente type rather than friction plate.

The switch must be capable of manual operation should a loss of control power be encountered. Control power shall be 120V 60 Hz.

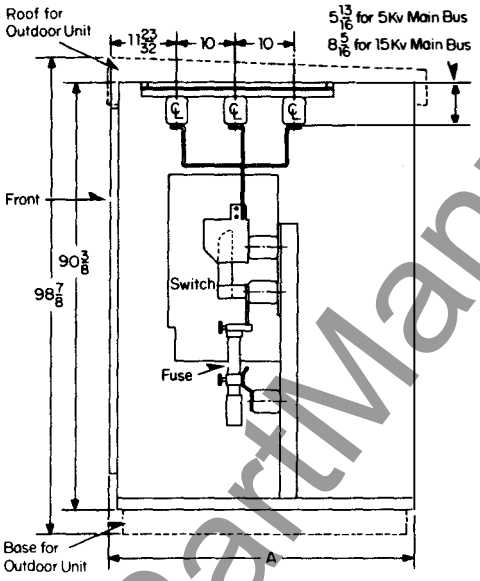
The motor shall be equipped with an automatically reset thermal overload protector, and where required a fail safe holding brake to hold the actuator in position when power is removed.

The high voltage load interrupter switchgear shall be tested at the factory in accordance with NEMA standard practices, shall conform to NEMA, NEC, IEEE, and ASA standards where applicable, and shall be Westinghouse Electric Corporation Type WLI or approved equal.

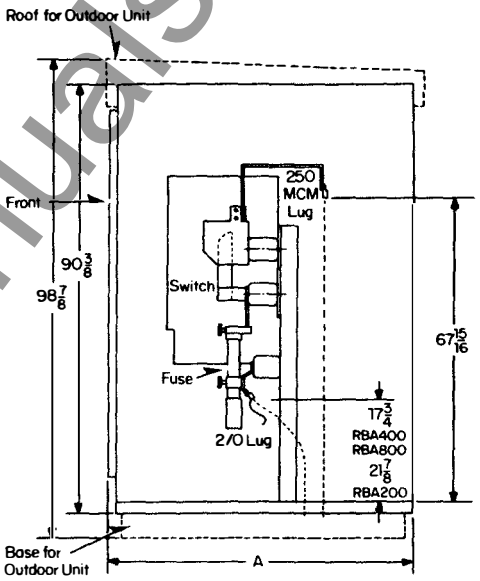
Dimensions, Inches

Dimension Certification for Construction Purposes for G. O. No._____by_____

5, 15 Kv Switches With Main Bus

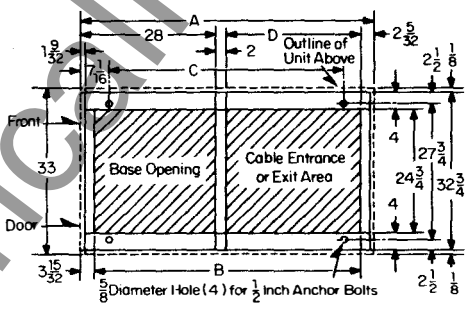


Without Main Bus



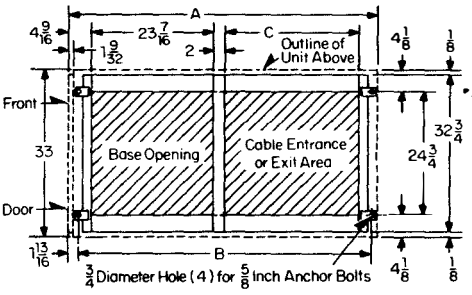
Floor Plans, Single Units

Indoor



A (Depth)	B	C	D
41	35 7/32	28	8 11/16
49 9/32	43 1/2	36 9/32	16 31/32
55 9/32	49 1/2	42 9/32	22 31/32
60	54 7/32	47	27 11/16
62	56 7/32	49	29 11/16

Outdoor



A (Depth)	B	C
41	38 1/2	7 5/16
49 9/32	46 25/32	15 27/32
55 9/32	52 25/32	21 27/32
60	57 1/2	26 5/16
62	59 1/2	28 5/16

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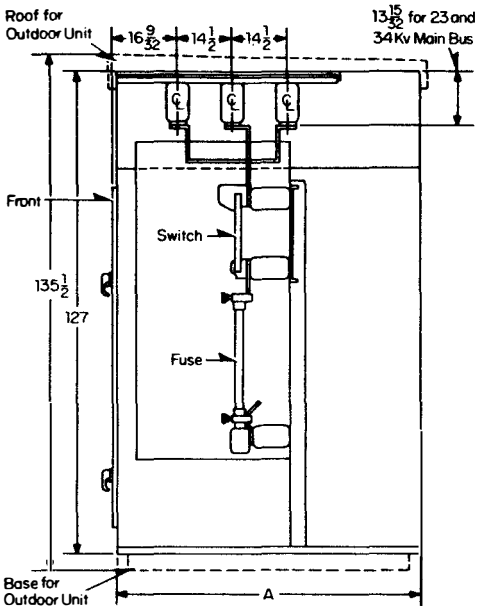
Dimensions, Inches

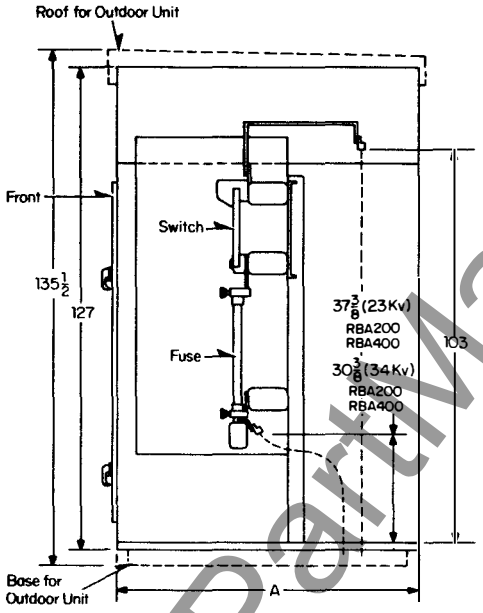
Dimension Certification for Construction Purposes for G. O. No._____by_____

25, 35 Kv Switches

With Main Bus

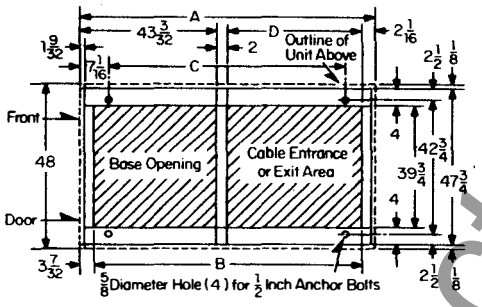


Without Main Bus



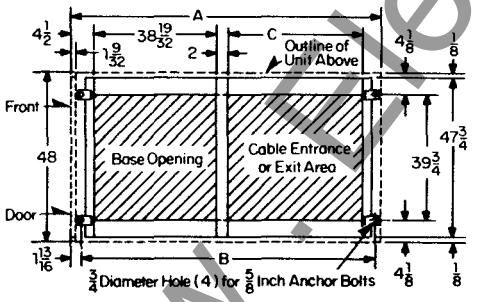
Floor Plans, Single Units

Indoor



A (Depth)	B	C	D
60	54 23/32	47	12 27/32
69	63 23/32	56	21 27/32
80	74 23/32	67	32 27/32
90	84 23/32	77	42 27/32

Outdoor



A (Depth)	B	C
60	57½	11 17/32
69	66½	20 17/32
80	77½	31 17/32
90	87½	41 17/32

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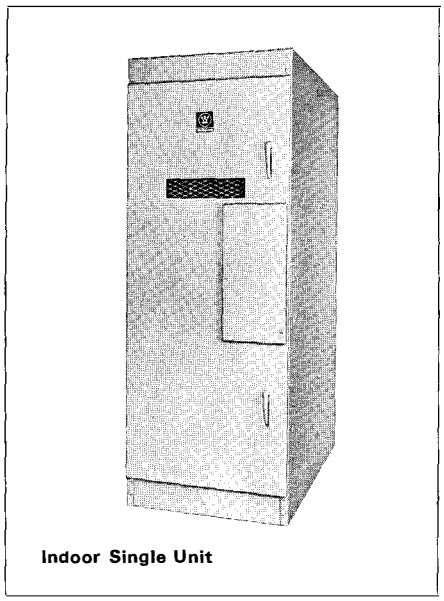
Westinghouse

WLI Load Interrupter Switchgear



Indoor Single Unit

Application

Load interrupter switchgear provides safe, low-cost switching and circuit protection where occasional or infrequent disconnecting means is desired. The three-pole switch, with its quick-make, quick-break mechanism will interrupt full-load current and the built-in fuses assure fault protection at all times.

This switchgear can be applied for a number of switching duties where manual operation is satisfactory:

- Transformer primary switching
- Transformer secondary switching
- Service entrance switching
- Switching at power centers

Type of units available:

- Indoor single and multiple units
- Outdoor single and multiple units

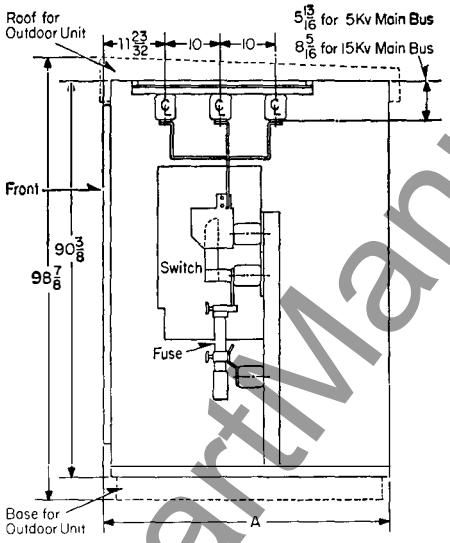
Switch Ratings

Max. Kv	Nom. Kv	Impulse Withstand Kv	Amperes Continuous	Amperes Interrupting	Fault Close ②	Momentary③ (Switch Closed)
5.0	4.8	60	600	600	20,000	40,000
			600	600	40,000	40,000
			1200	600	61,000	80,000
			1200	1200	61,000	80,000
8.25	7.2	75	600	600	20,000	40,000
			600	600	40,000	40,000
			1200	600	61,000	80,000
			1200	1200	61,000	80,000
15.0	13.8	95	600	600	20,000	40,000
			600	600	40,000	40,000
			1200	600	40,000	80,000
			1200	1200	40,000	80,000
			1200	600	61,000	80,000
			1200	1200	61,000	80,000

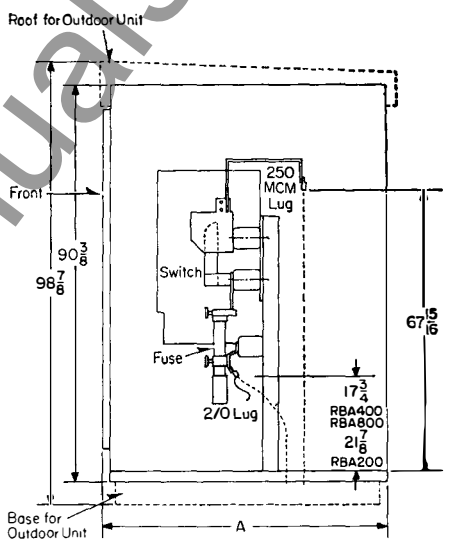
Dimensions, Inches

Dimension Certification for Construction Purposes for G. O. No. _____ by _____

With Main Bus

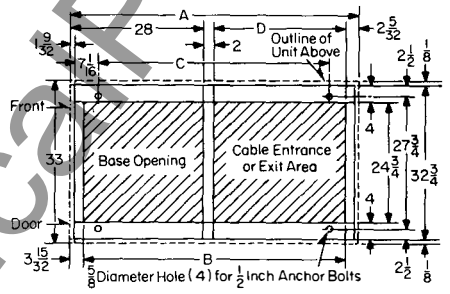


Without Main Bus



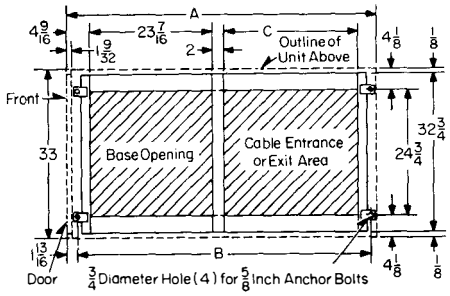
Floor Plans, Single Units

Indoor



A (Depth)	B	C	D
41	35 7/32	28	8 1/16
49 9/32	43 1/2	36 9/32	16 3/32
55 9/32	49 1/2	42 9/32	22 3/32
60	54 7/32	47	27 1/16
62	56 7/32	49	29 1/16

Outdoor



A (Depth)	B	C
41	38 1/2	7 5/16
49 9/32	46 25/32	15 27/32
55 9/32	52 25/32	21 27/32
60	57 1/2	26 5/16
62	59 1/2	28 5/16

Fuse Ratings

Type ④	Max. Kv	Max. Rating	Int. Cap. Symm. Amps (rms)⑤
RBA200	4.8	200E	19,000
RBA400		400E	37,500
RBA800		720E	37,500
CLE-1, 2		450X	50,000
CLE-750		750E	50,000
CLS-1		225	50,000
CLS-2		400	50,000
RBA200	7.2	200E	16,600
RBA400		400E	29,400
RBA800		720E	29,400
CLE-1		125E	50,000
CLE-2		200E	40,000
RBA200	13.8	200E	14,400
RBA400		400E	29,400
RBA800		720E	29,400
CLE-1		65E	85,000
CLE-2		125E	85,000
CLE-3		200X	50,000

② Maximum asymmetrical rms current the switch can be closed against, and held for 10 cycles, without incurring sufficient deterioration to the switch to materially affect continuous current carrying or load interrupting ability.

③ Maximum asymmetrical current which the switch shall be required to carry for at least one cycle.

④ RBA 200 and RBA 400 fuses equipped with discharge filter. For ratng of fuses equipped with condenser, refer to Westinghouse representative.

⑤ For interrupting ratings greater than those listed, refer to Westinghouse representative. For rating in asymmetrical amperes, multiply listed figures by 1.6.

⑥ Refer to Westinghouse.

August, 1972
Supersedes Spec. Data 31-980, pages 1-2, dated August, 1969
E, D, C/1935/PL, DB

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WLI Load Interrupter Switchgear

Typical Specification

General Construction

Furnish and install where indicated a deadfront type, completely metal-enclosed, self-supporting structure independent of wall supports, of the required number of vertical sections bolted together to form one rigid unit incorporating switching and protective devices of the number, rating and type noted herein or shown on the drawings, with the necessary interconnections, instrumentation and control wiring. Construction shall be of the universal frame type using dieformed, welded and bolted members. The sides, top, and rear shall be bolted on. All enclosing covers shall be fabricated from not less than 11 gauge steel.

Each switch cubicle shall have a single, full length, flanged front door over switch and/or fuse assembly. The flanged door shall close over a projecting door frame. The door shall be equipped with two rotary latch type handles to provide four latching members held in shear. Provision shall be made for operating the switch mechanism and storing the removable handle without opening the full length door. A rectangular, high impact type contact viewing window shall be provided in the door over the switch.

In fusible units, fault protection shall be furnished by the fuse type indicated on the drawings. 15 Kv nominal class switch and fuse assemblies shall have full length insulating barriers between phases and between outer phases and enclosure. Fuses shall be positively clamped in position with provision for easy removal or installation from the front.

The full length door in front of fuses shall be hinged and interlocked with the switch mechanism so that the switch must be opened before access to the fuses is possible and the door must be closed before the switch can be closed.

Door in front of fuses shall be hinged and interlocked with the switch mechanism so that the switch must be opened before access to the fuses is possible and the door must be closed before the switch can be closed.

Switchgear assemblies comprising several cubicles shall be group mounted with at least 11 gauge steel side sheets between adjacent sections.

Each unit shall be adequately braced to prevent distortion of the cubicle under normal operating conditions as well as during interruption of short circuit currents. Meters, instruments, and/or relays shall be isolated from high voltage compartment by a grounded steel barrier.

Small wiring, fuse blocks and terminal blocks within the switchgear shall be furnished as indicated on the drawings. All groups of control wires leaving the switchgear shall be provided with terminal blocks having suitable numbering strips.

The main bus shall consist of electro tin plated aluminum bus bar mounted on NEMA rated porcelain insulators for the voltage class and BIL specified.

The design of the busses, connections, and supports shall be consistent with the mechanical stresses produced by short circuit current equivalent to the interrupting current rating of the associated switch and fuse at service voltage. The bus shall be braced for following minimum values:

Continuous Current, Amps	Momentary Short Circuit Current Asym. Amps.
600	40,000
1200	80,000

All hardware used on conductors shall have a high tensile strength and anti-corrosive plating.

A ground lug shall be furnished firmly secured to the structure for a single cubicle. For multiple units, a ground bus shall be furnished to extend the entire length of the switchgear. Lugs shall be provided for copper ground cable at each end of the bus.

The structure shall be provided with adequate lifting means and shall be capable of being rolled and moved into installation position and bolted to the floor.

Adequate conduit space shall be provided to meet the N.E.C. requirements.

All terminals shall be of the solderless type suitable for copper or aluminum cable of sizes indicated on drawings.

All enclosing and supporting steel shall be thoroughly cleaned to assure proper surface for prime and finish coats. The final coat shall be a fast drying enamel and be dark gray ASA-24 for outdoor units and ASA-61 for indoor units. The finish paint shall be of a type to which field applied paint will adhere.

Outdoor units shall have a drip-proof roof sloped from front to back. All openings shall be screened to prevent the entrance of reptiles and other vermin and barriered to inhibit the entrance of snow, sand, etc. One space heater shall be provided in each cubicle. Power for the space heater shall be furnished by others.

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

Load Interrupting Switches

The load interrupter switches shall have the following ratings:

a. Impulse Withstand Voltage:_____Kv
b. Continuous Ampere Rating:_____Amps.
c. Interrupting Rating:_____Amps.
d. Fault Closing Rating:_____Amps. Asym.
e. Momentary Rating:_____Amps. Asym.

Fuses

All fused switches shall be equipped with fuses as indicated on drawings.

Operating Mechanism

A quick-make, quick-break manual operating mechanism shall be supplied which utilizes a heavy duty coil spring in such a way as to provide powerful opening and closing action of the switch. The heavy duty coil spring shall be located so as to provide easy accessability.

The operating mechanism shall have the following action:

To close the switch, the mechanism cam is rotated (by means of a removable handle) through 120° motion, the spring lever reaches the over toggle position. This releases the spring which then rapidly accelerates the switch, through stored energy to the closed position. In order to open the switch, the mechanism cam is rotated in the opposite direction resulting in charging of the heavy duty spring and releasing its stored energy in a similar sequence.

Due to the action of the latch, the clearance across the open switch, from blade to jaw, is maintained during the total time the mechanism cam is being rotated. It is, therefore, impossible to tease the switch into any intermediate position. However, a defeat mechanism is provided to permit slow opening and closing of the switch for maintenance and inspection purposes.

The mechanism cam is not solidly linked to the switch blades at any time. The closing speed of the blades is, therefore, independent of the speed of rotation of the mechanism cam. When the switch is closed against a fault, the blow-out forces are not transmitted to the mechanism cam.

The operating mechanism shall be designed to provide sufficient power to overcome the blow-out forces when closing the switch against a fault. When the switch is not closed against a fault, the excessive closing power of the mechanism shall be absorbed by an adjustable stop mechanism, and not transmitted to the stationary contacts or supporting insulators.

The high voltage load interrupter switchgear shall be tested at the factory in accordance with NEMA standard practices, shall conform to NEMA, NEC, IEEE, and ASA standards where applicable, and shall be Westinghouse Electric Corporation Type WLI or approved equal.

Westinghouse Electric Corporation
Distribution Equipment Division, Cincinnati, Ohio 45237
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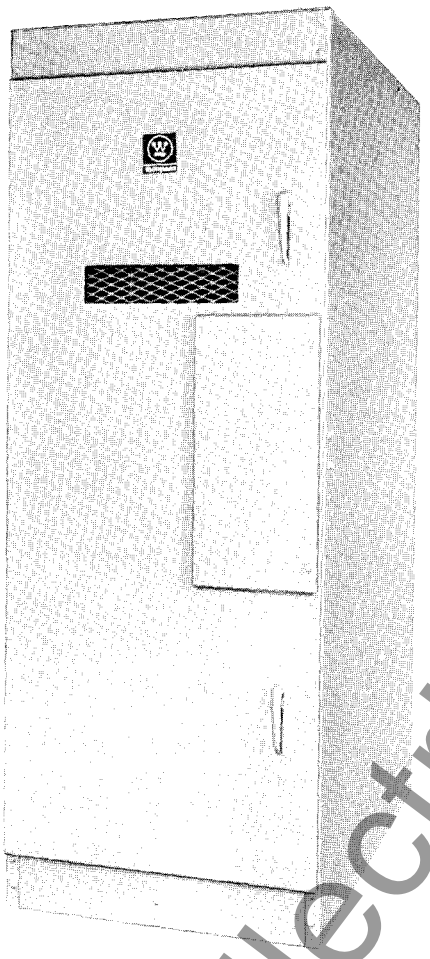
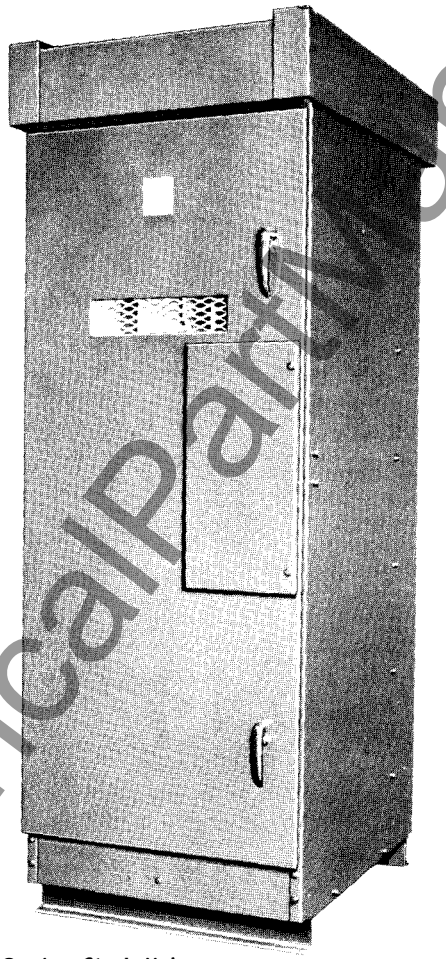
5, 15, 25 and 35 Kv Units

WLI Load Interrupter Switchgear



Indoor Single Unit



Outdoor Single Unit

Switch Ratings

Max. KV	Nom. KV	Impulse Withstand KV	Amperes Continuous	Interrupting	Momentary (Switch closed) Asym. (10 cy.)	Fault closed Asym.
5.0	4.8	60	600	600	40,000	20,000
			600	600	40,000	40,000
			1200	600	80,000	61,000
			1200	1200	80,000	61,000
15.0	13.8	95	600	600	40,000	20,000
			600	600	40,000	40,000
			1200	600	80,000	40,000
			1200	1200	80,000	40,000
			1200	600	80,000	61,000
			1200	1200	80,000	61,000
25.8	23	125 or 150	600	600	40,000	20,000
			600	600	40,000	40,000
			1200	600	40,000	40,000
			1200	600	60,000	60,000
38.0	34.5	150	600	600	40,000	20,000
			600	600	40,000	30,000
			1200	600	40,000	30,000
			1200	600	60,000	30,000

Fuse Ratings

Type Fuse	Nom. KV	Max. Amps	Interr. Rating RMS Amps (Sym.)
RBA-200	4.8	200E	19,000
RBA-400		400E	37,500
RBA-800		720E	37,500
CLE 1, 2		450X	50,000
CLE 750		750E	40,000
CLT		250C	50,000
RBA-200	7.2	200E	16,600
RBA-400		400E	29,400
RBA-800		720E	29,400
CLE-1		125E	50,000
CLE-2		200E	40,000
CLT		250C	50,000
RBA-200	14.4	200E	14,400
RBA-400		400E	29,400
RBA-800		720E	29,400
CLE-1, 2		125X	85,000
CLE 3		200X	50,000
CLT		100C	50,000
RBA-200	23.0	200E	10,500
RBA-400		300E	21,000
RBA-800		540E	21,000
RBA-200	34.5	200E	6,900
RBA-400		300E	16,800
RBA-800		540E	16,800

Application

Load interrupter switchgear provides safe, low-cost switching and circuit protection where occasional or infrequent disconnecting means is desired. The three-pole switch, with its quick-make, quick-break mechanism will interrupt full-load current and the permanently calibrated and accurate fuses assure fault protection.

This switchgear can be applied for any switching application where automatic reclosing on transient faults is not required.

- Transformer primary switching
- Transformer secondary switching
- Service entrance switching
- Switching at power centers

Type of units available:

- Indoor single units and lineups
- Outdoor single units and lineups
- Motor operated
- 2 and 3 switch automatic transfer switches
- Selector switches
- Duplex

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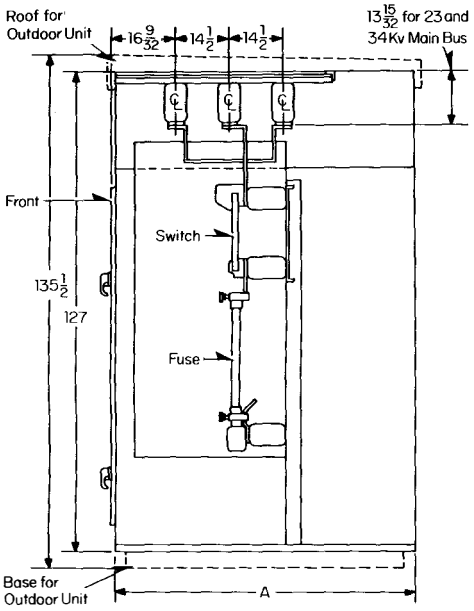
Dimensions, Inches

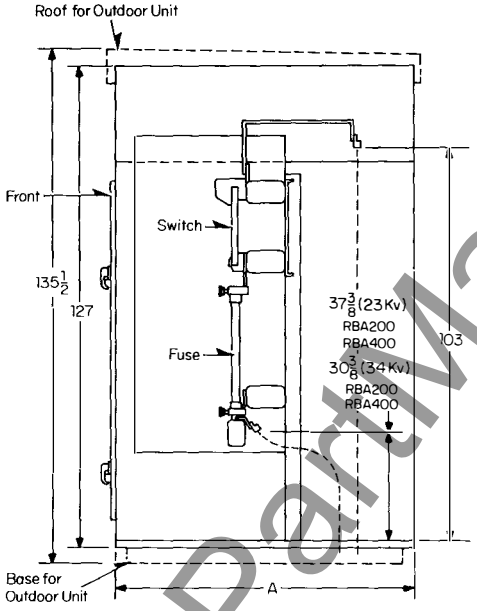
Dimension Certification for Construction Purposes for G. O. No._____by_____

25, 35 Kv Switches

With Main Bus

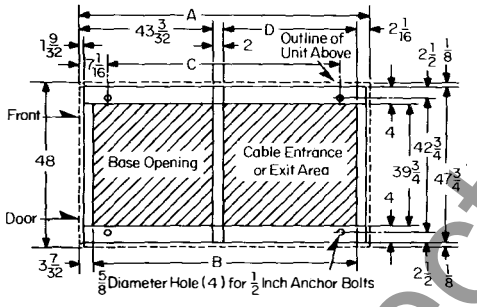


Without Main Bus



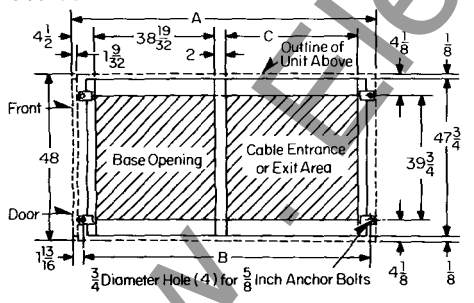
Floor Plans, Single Units

Indoor



A (Depth)	B	C	D
60	54 23/32	47	12 27/32
69	63 23/32	56	21 27/32
80	74 23/32	67	32 27/32
90	84 23/32	77	42 27/32

Outdoor



A (Depth)	B	C
60	57½	11 17/32
69	66½	20 17/32
80	77½	31 17/32
90	87½	41 17/32

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