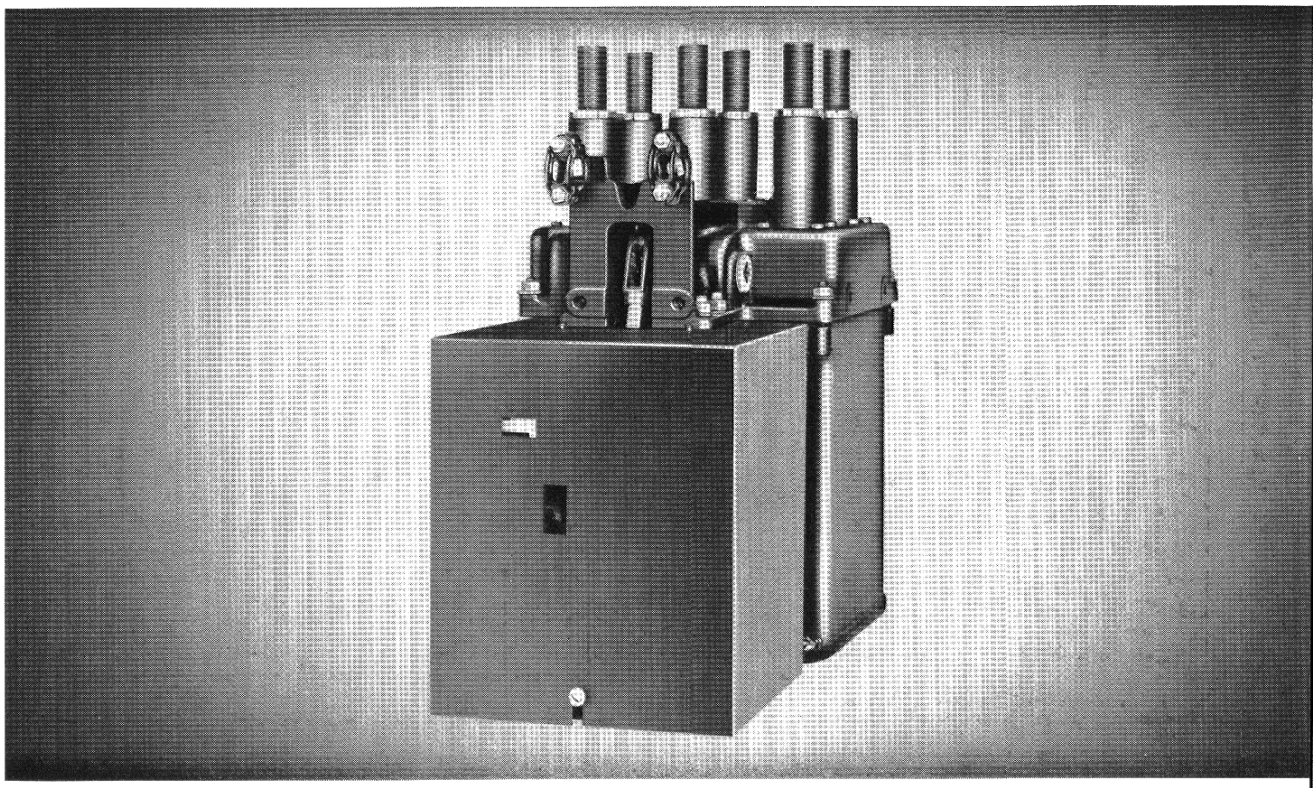
POWER CIRCUIT BREAKERS
OIL—TYPE F-124-A
INDOOR • PANEL, WALL, OR FRAME MOUNTED • 3-POLE

DESCRIPTIVE BULLETIN
33-151

600 AMPERES 7200 VOLTS • 1200 AMPERES 4160 VOLTS • 50 MVA • 8-CYCLE INTERRUPTING TIME



INDOOR OIL CIRCUIT BREAKERS—TYPE F-124-A are designed for a variety of industrial and central station applications. Standard ratings include:

600 Amperes at 7200 Volts

1200 Amperes at 4160 Volts

INTERRUPTING RATING—50 mva

INTERRUPTING TIME—8 cycles

Comparable to larger capacity breakers in sturdiness, performance, and appearance, these breakers are compact units with all operating elements mounted within the top casting and single rectangular tank.

OPERATING MECHANISMS of the manual or electric solenoid types are available. The manual mechanism commonly known as the coverplate is arranged for panel mounting. It contains the closing handle, tripping latch and trip coils. Addition of bell cranks, accelerating device and connecting pipes permits remote control operation. Electric operation is obtained from a d-c solenoid mechanism attached to the breaker unit. When only a-c power is available a Rectox® closing unit is added.

MOUNTING—Manually operated breakers may be arranged for pipe, panel or panel-frame mounting, direct control, or structural steel frame mounting, remote control. Electrically-operated breakers may be arranged for wall, pipe, or structural steel mounting, remote control.

WESTINGHOUSE SPECIAL FEATURES

1. **DE-ION® INTERRUPTER ARC CONTROL** reduces fault clearance time, contact burning, and oil deterioration, with resultant lower maintenance.

2. **SINGLE TANK CONSTRUCTION**—The single rectangular tank and the dome-shaped top provide a compact, dust-proof unit containing all the operating elements.

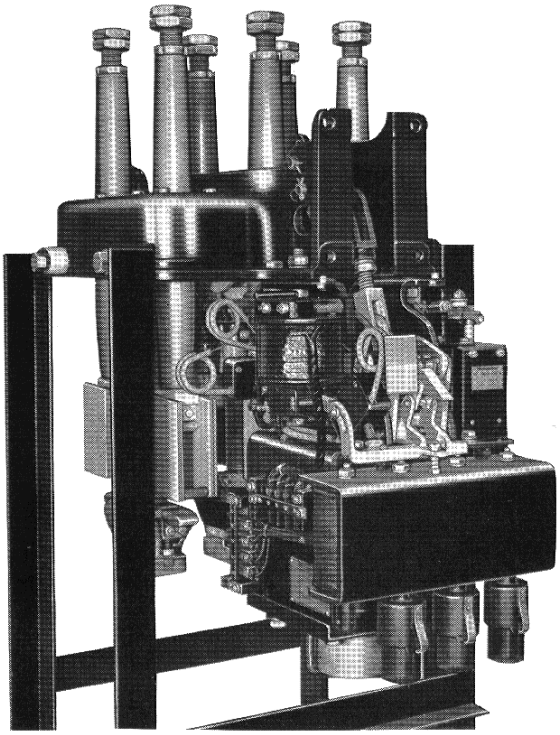
3. **TRIP-FREE MECHANISMS**—All of the operating mechanisms are mechanically trip-free at any point of the closing stroke.

4. **CONDENSER BUSHINGS,** made up of alternate layers of metal foil and Micarta® insulation, provide uniform voltage stress, light weight, and high mechanical strength.

Supersedes Descriptive Bulletin 33-226 dated February, 1951
E/275, 276/DB; D64-5C; C26-5Y

EFFECTIVE APRIL, 1959

OPERATING MECHANISMS • CONSTRUCTION FEATURES



Solenoid-operated breaker with mechanism cover removed.

OPERATING MECHANISMS

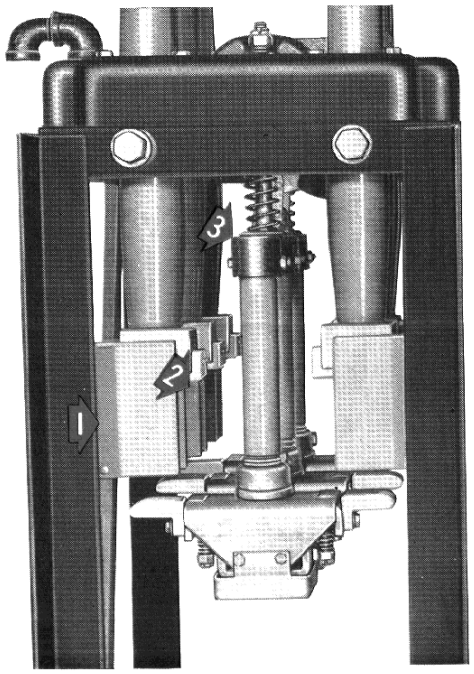
SOLENOID OPERATING MECHANISM—The Type SAF-2 solenoid mechanism provides efficient remote control operation. This mechanism is mechanically trip free and the control relays included provide electrically trip-free operation.

The standard mechanism includes d-c closing and shunt trip coils, a six contact auxiliary switch and control relay. An undervoltage trip or capacitor trip device can be added. A Rectox® closing unit is added when only a-c control is available. The shunt trip device can be replaced by a four coil trip attachment which permits the use of three transformer trip coils in addition to the shunt trip coil.

The solenoid mechanism mounts directly on the breaker unit or the breaker unit and the solenoid can be mounted on opposite sides of a wall.

Solenoid Mechanism Closing and Tripping Currents

RATED KV	60-CYCLE AMPERES	125-VOLT D-C		250-VOLT D-C	
		CLOSE	TRIP	CLOSE	TRIP
7.2	600	57	4	29	4
4.16	1200	57	4	29	4



1200-ampere breaker with tank removed to show internal construction.

INTERNAL CONSTRUCTION

1 DE-ION ARC CONTROL

De-ion arc interrupters effectively control the arc during circuit interruption. As the contacts part, the arc is magnetically pulled away from the contacts, lengthened, and forced into a wall of cool oil. This produces a de-ionizing action that quickly extinguishes the arc.

2 CONTACTS

All contacts are of butt-type construction with adequate cross-section to insure high conductivity and long life. The contacts are resiliently mounted on heavy compression springs. The main stationary contacts are silver plated and the moving elements have silver inserts to insure long life and reduce maintenance.

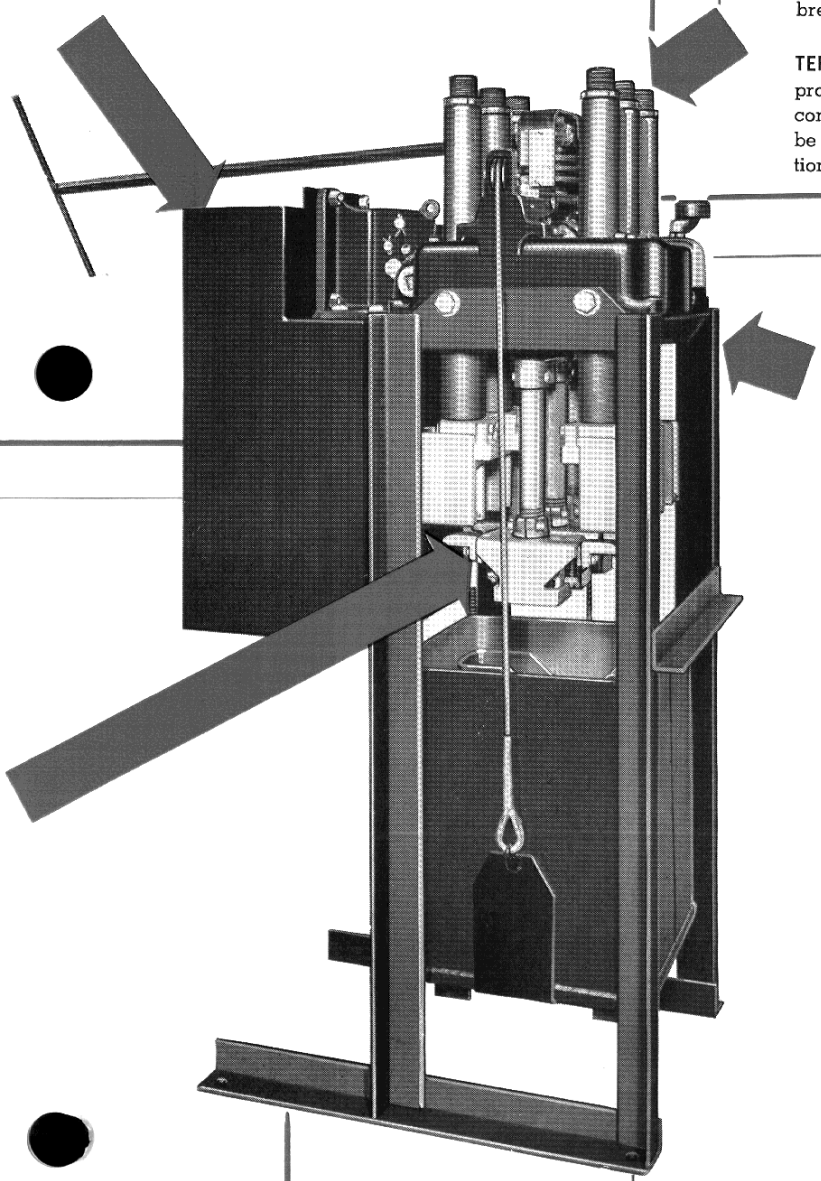
3 LIFT RODS AND GUIDES

The moving contacts are attached to lift rods of selected and treated wood with ample mechanical and electrical strength for efficient operation. Two cross bar guides extend downward from the breaker top to align the contacts properly. These guides also serve as seats for the accelerating springs and are integral parts of the hydraulic bumpers which absorb the shock of opening and prevent rebound of the moving contacts.

TYPE F-124-A INDOOR OIL CIRCUIT BREAKERS

OPERATING MECHANISMS—Cont'd

MANUAL OPERATION is provided through a Type BCA coverplate arranged for panel or pipe frame mounting. Overload tripping is obtained by transformer trip coils on either instantaneous or time delay types. Addition of bell cranks permits remote control operation. Connecting pipes are provided by the purchaser. This mechanism is of mechanically trip free design. Standard accessories as listed are available.



TERMINAL BUSHINGS

CONDENSER TYPE BUSHINGS consist of alternate layers of metal foil and insulating Micarta wound concentrically over the conducting core. Because the operating voltage is divided equally across several layers of the insulating material, the stress is uniformly distributed. Protection against moisture is insured by several coats of varnish, each thoroughly dried before application of the next. The construction of the bushing provides high inherent mechanical strength.

A brass sleeve, accurately machined on the inside diameter, is secured to the bushing by the tightly pressed fit and a shellac bond. The sleeve is brazed to the bushing mounting flange which provides the surface for fastening the bushing to the breaker top casting.

TERMINAL CONNECTORS—A pair of sturdy contact nuts is provided on all studs. Either tube-type terminals for cable connection or clamp-type for cable or bus bar connection can be furnished when size and number of conductors with direction of run is given.

EXTERNAL CONSTRUCTION

TOP CASTING—The rectangular top casting serves as a base for mounting all the breaker operating elements. It provides the mounting support for the breaker unit and the solenoid operating mechanism. The bushings are clamped against the machined surface on the inside of the top, insuring rigidity and causing any internal pressure to produce an upward force which tends to close the joint more tightly.

By enclosing the main operating levers inside the top, the main operating parts are removed entirely from the live contact terminals, increasing the electrical clearance to ground outside the breaker. This arrangement also gives the breaker a neat, trim appearance, free from outside moving parts, and easily cleaned. Corrosion-resisting pins and bearings are used throughout.

TANK—A single rectangular tank, fabricated from heavy sheet steel and welded to withstand short-circuit pressures, provides a compact enclosure. An insulating tank liner provides additional insulation. Flax packing provides an oil tight joint with the main top casting. A removable windlass tank lifter is available for raising and lowering the tank.

MOUNTING—The breaker unit can be mounted on self-supporting structural steel frame, pipe structure, or any flat vertical surface.

TYPE F-124-A INDOOR OIL CIRCUIT BREAKERS

TYPE	VOLTAGE RATINGS			INSULATION LEVEL		CURRENT RATINGS IN AMPERES			INTERRUPTING RATINGS			
				WITHSTAND TEST			SHORT TIME¶					
	RATED KV *	MAXIMUM DESIGN KV *	MIN. KV. FOR RATED INT. MVA	LOW FREQUENCY RMS-KV	IMPULSE CREST KV†	CONTINUOUS 60 CYCLES‡	MOMENTARY	FOUR-SECOND	3-PHASE RATED MVA	AMPERES AT RATED VOLTAGE §	MAXIMUM AMPERES	TIME IN CYCLES #
F-124-A	7.2	8.25	2.3	26	75	600	20000	12500	50	4000	12500	8
F-124-A	4.16	4.76	2.3	19	60	1200	20000	12500	50	7000	12500	8

* Voltage Ratings based on recommendations of EEI-NEMA Joint Committee on Preferred Voltage Ratings for A-C Systems and Equipment.

† 1.5 x 40 MS Positive or Negative. All impulse values are phase-to-phase and phase-to-ground and across the open contacts.

‡ The 25-cycle continuous current rating for 600 amperes, 60-cycle, is 700 amperes; for 1200 amperes, 60-cycle, it is 1400 amperes.

¶ For the definitions of short time current ratings, see American Standard for Alternating Current Power Circuit Breakers.

§ To obtain the rated interrupting current of a breaker at an operating voltage other than the rated voltage of the circuit breaker, the following formula should be used:

Amperes at operating voltage $= \text{amperes at rated voltage} \times \frac{\text{rated voltage}}{\text{operating voltage}}$

For calculated values use the nearest 100-ampere step.

If the value so calculated exceeds that of the rated maximum interrupting current, then the latter rating must be used as the interrupting rating of the breaker.

Time measured at 60 cycles per second.

STYLE NUMBERS—BREAKER UNITS, PARTS, AND ACCESSORIES

DESCRIPTION	STYLE NUMBER
BREAKER UNIT ONLY	
Add Coverplate or Solenoid Mechanism for Mounting or Operation Desired‡	
4.16 kv, 1200 amps	940 020
7.2 kv, 600 amps	940 017
COVERPLATES*	
Direct mounting, 2 coils, 5 amps instantaneous	1767 266
Direct mounting, 3 coils, 5 amps instantaneous	1767 267
Direct mounting, 2 coils, 5 amps I.T.L.	1767 268
Direct mounting, 3 coils, 5 amps I.T.L.	1767 269
Remote mounting, 2 coils, 5 amps instantaneous	1767 270
Remote mounting, 3 coils, 5 amps instantaneous	1767 271
Remote mounting, 2 coils, 5 amps I.T.L.	1767 272
Remote mounting, 3 coils, 5 amps I.T.L.	1767 273
MOUNTING DETAILS	
Switchboard direct	1767 261
Pipe direct	1767 262
Panel frame (use direct coverplate)	1767 263
∅Remote (wall or panel mounting)	1767 264

DESCRIPTION	STYLE NUMBER
ACCESSORIES AND ATTACHMENTS FOR MANUALLY OPERATED BREAKERS	
Instantaneous undervoltage release (110 to 550 volts)	1251 592
Undervoltage release for capacitor time delay	1196 223
Capacitor time delay device for above	1799 092
Hand reset attachment for undervoltage release	591 799
Shunt trip attachment†	1589 232
Capacitor trip device #	1799 090
Auxiliary switch, 2-pole double throw for remote control breaker, without lockout only	519 423
Electric lockout attachment △	1227 186
Tank lifter	1019 254

‡ The complete manually-operated breaker is obtained by ordering the breaker unit, coverplate, and mounting details from the appropriate tables. Additional accessories are available as listed. For solenoid-operated breakers specify breaker rating, desired mounting arrangement, and closing and trip voltages, plus any special features. Specify terminal requirements if other than contact nuts.

* Includes 5 amp instantaneous or inverse time limit transformer trip attachments as indicated.

† Mounts in space normally taken by instantaneous or I.T.L. attachment. Specify voltage and frequency of coil.

See Descriptive Bulletin 33-353 for complete information on this device. Use with proper shunt trip coil.

△ Specify voltage and frequency of coil.

∅ For pipe mounting, add the following:

Pipe brackets for breaker (2)	949 039
Pipe brackets for coverplate	591 485

TYPE F-124-A INDOOR OIL CIRCUIT BREAKERS

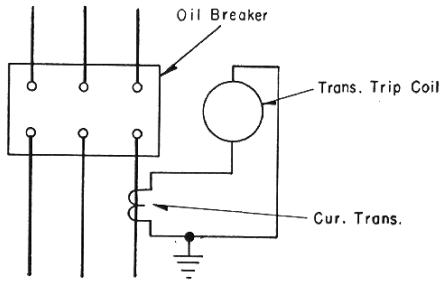
WEIGHTS AND OIL REQUIREMENTS

60-CYCLE AMPERES	RATED KV	GALLONS OF OIL†	WEIGHTS WITH OIL*		
			PANEL FRAME AND SWITCHBOARD MOUNTING	REMOTE CONTROL	SOLENOID OPERATED
600	7.2	10	305	345	575
1200	4.16	10	315	355	565

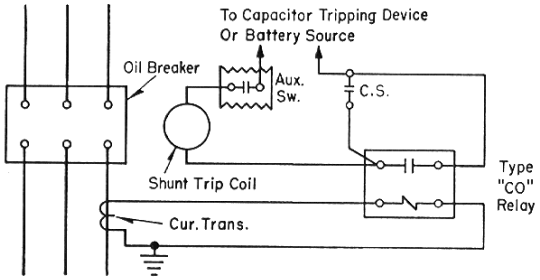
* Including operating mechanism

† Shipping weight, approximately 9 pounds per gallon.

CIRCUIT BREAKER TRIPPING



Transformer trip coil instantaneous or with I.T.L. attachment.

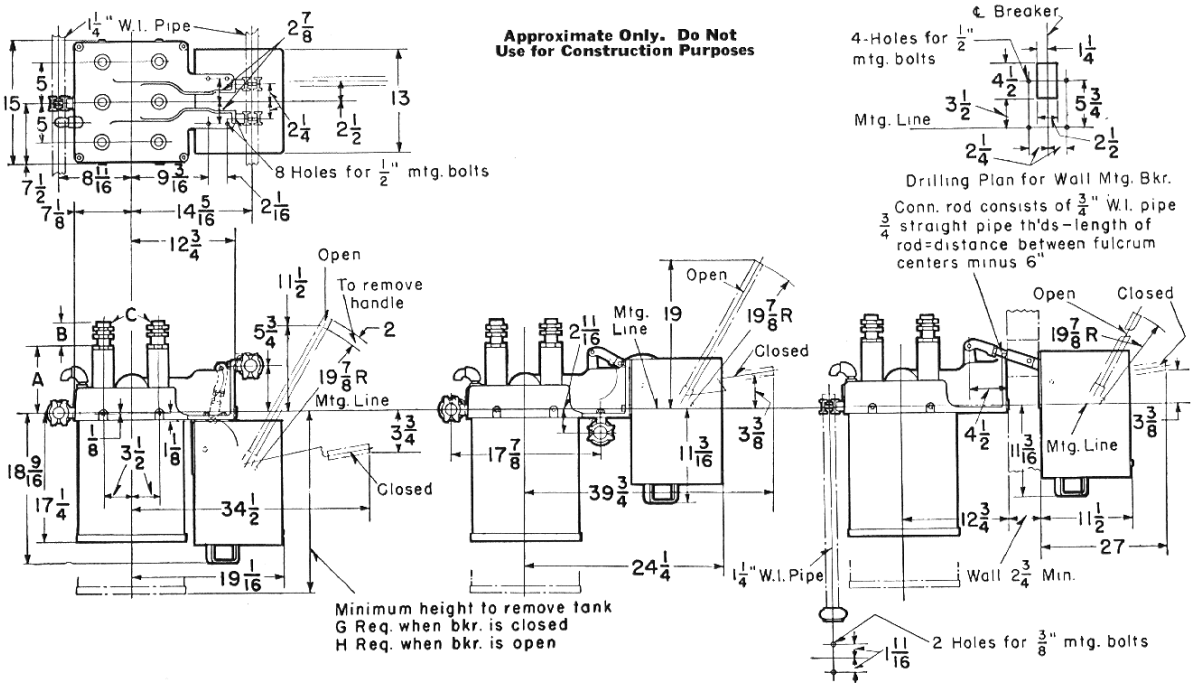


D-c shunt trip coil with capacitor trip device or battery.

D.B. 33-151

OUTLINE DIMENSIONS—TYPE F-124-A

OUTLINE DIMENSIONS IN INCHES—SOLENOID OPERATED



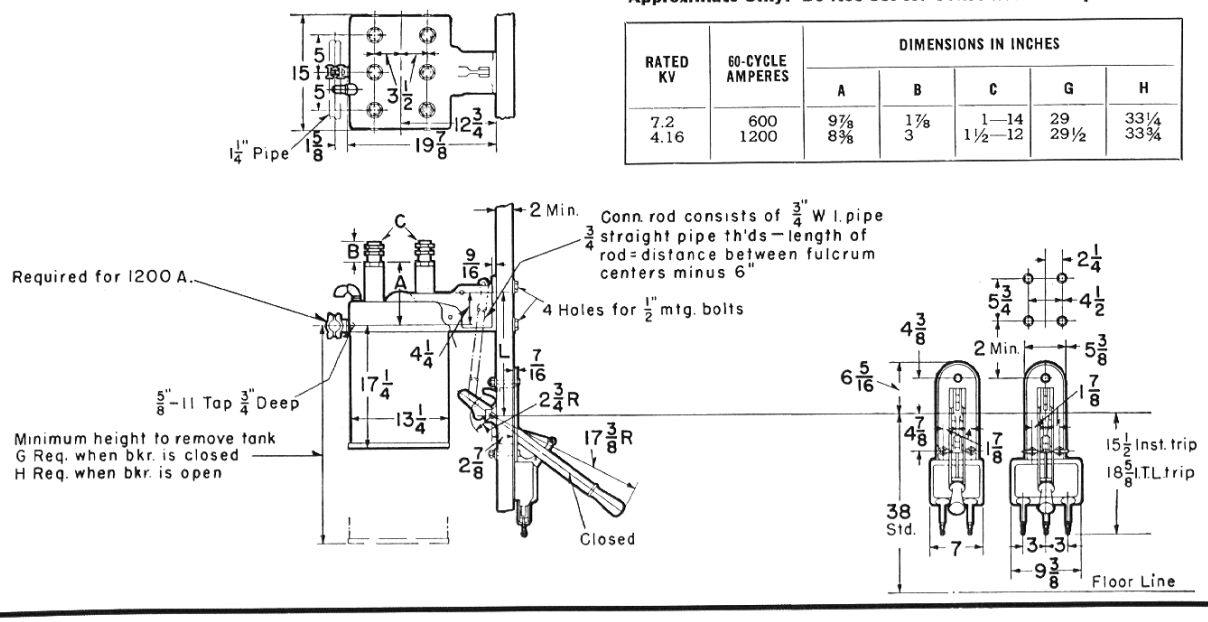
Vertical push, pipe mounting (standard equipment).

Horizontal push, pipe mounting.

Horizontal push, wall mounting.

RATED KV	60-CYCLE AMPERES	DIMENSIONS IN INCHES				
		A	B	C	G	H
7.2 4.16	600 1200	9⅞ 8⅜	1⅞ 3	1—14 1½—12	29 29½	33¼ 33¾

OUTLINE DIMENSIONS IN INCHES—MANUALLY OPERATED, PANEL MOUNTED

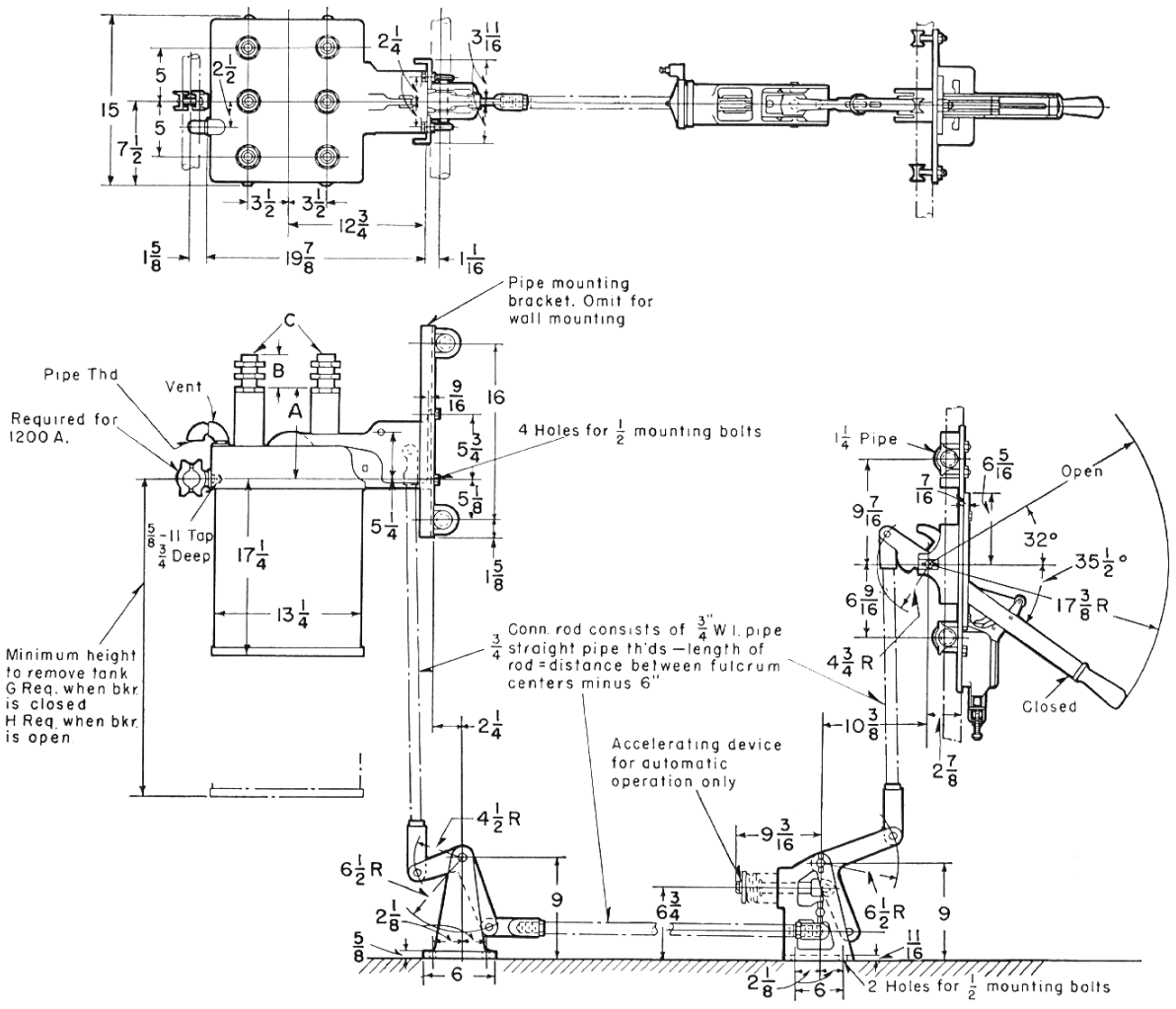


RATED KV	60-CYCLE AMPERES	DIMENSIONS IN INCHES				
		A	B	C	G	H
7.2 4.16	600 1200	9⅞ 8⅜	1⅞ 3	1—14 1½—12	29 29½	33¼ 33¾

INDOOR OIL CIRCUIT BREAKERS

OUTLINE DIMENSIONS IN INCHES—MANUALLY OPERATED, REMOTE CONTROL—

Approximate Only. Do Not Use for Construction Purposes.

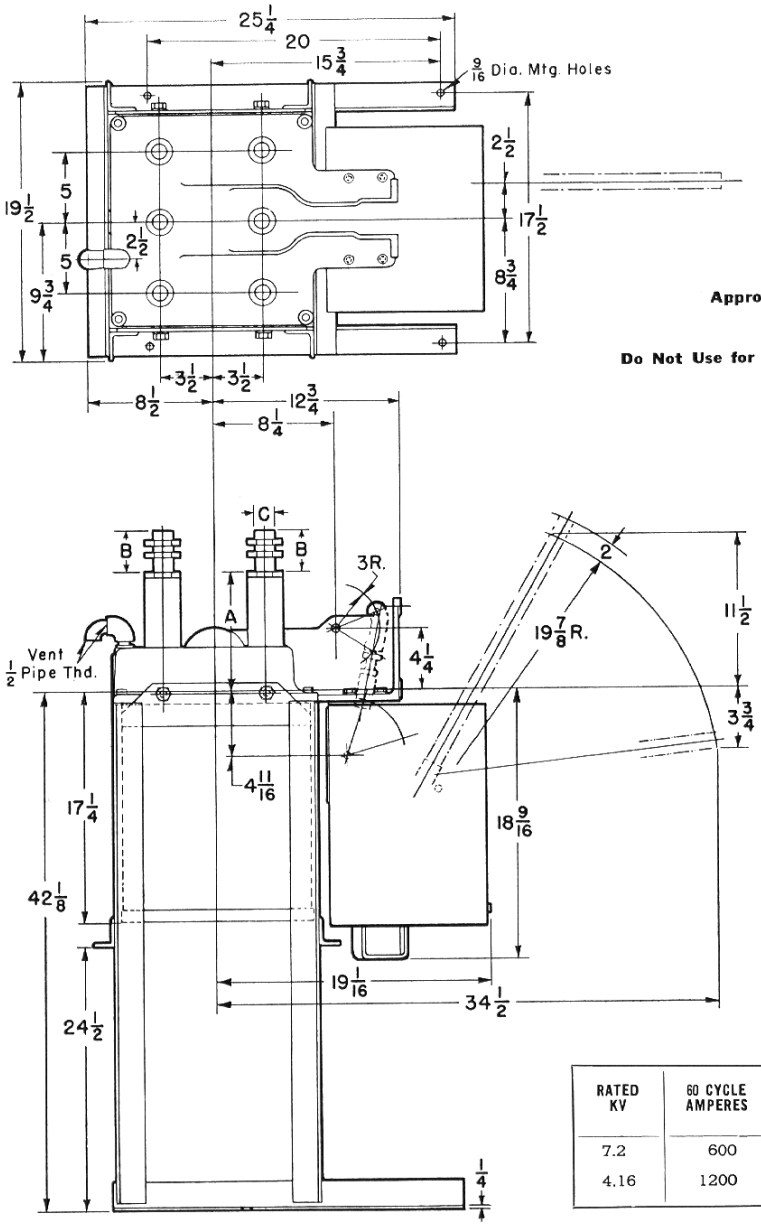


RATED KV	60-CYCLE AMPERES	DIMENSIONS IN INCHES				
		A	B	C	G	H
7.2	600	9⅞	1⅞	1 —14	29	33¼
4.16	1200	8⅜	3	1½—12	29⅓	33¾

OUTLINE DIMENSIONS

TYPE F-124-A INDOOR OIL CIRCUIT BREAKERS

OUTLINE DIMENSIONS IN INCHES—SOLENOID OPERATED, FRAME MOUNTED



Approximate Only.

Do Not Use for Construction Purposes.

RATED KV	60 CYCLE AMPERES	DIMENSIONS IN INCHES		
		A	B	C
7.2	600	9⅞	1⅞	1-14
4.16	1200	8⅜	3	1½-12

LITERATURE REFERENCE

PRICES—See Price List 33-120.

CONDENSER BUSHINGS—See Price List 33-320 and Descriptive Bulletin 33-354.

WESTINGHOUSE ELECTRIC CORPORATION

POWER CIRCUIT BREAKER DEPT. • EAST PITTSBURGH DIVISION • EAST PITTSBURGH, PA.

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