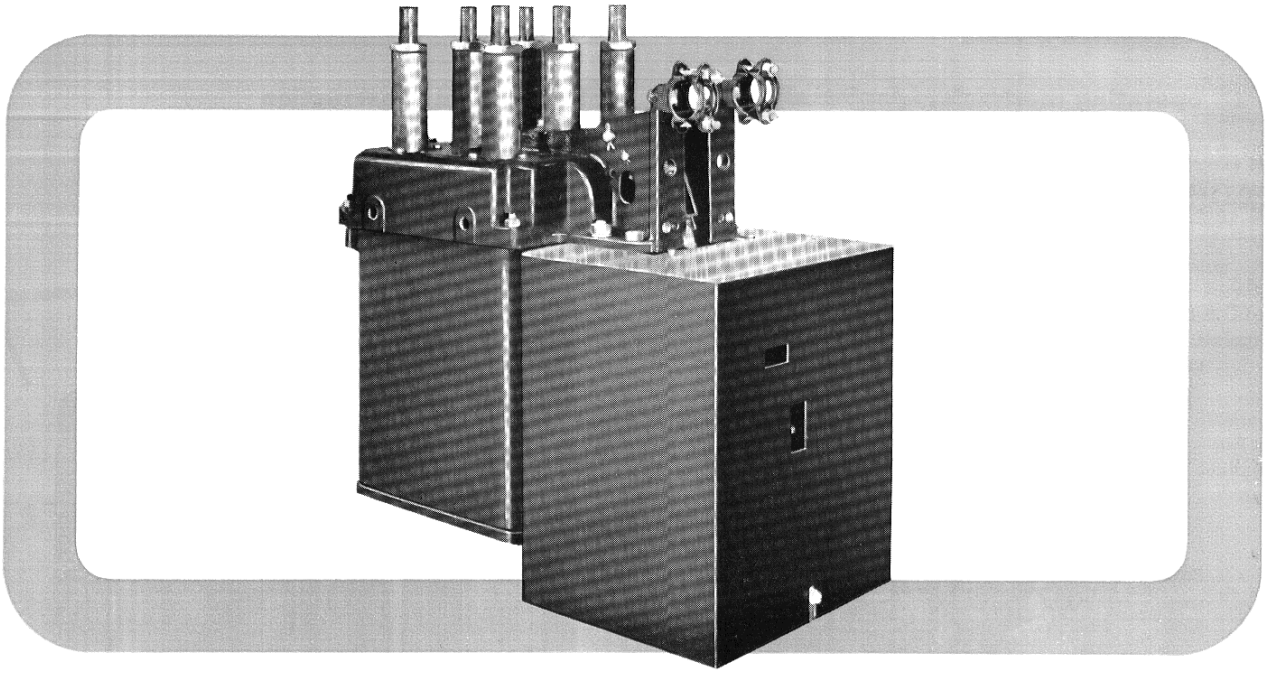
indoor oil breakers types F-122 and F-124-A

3 pole • panel, wall or frame mounted



ratings

F-122

600 amperes at 4160 volts
25 mva interrupting rating
8 cycle interrupting time

F-124-A

600 amperes at 7200 volts
1200 amperes at 4160 volts
50 mva interrupting rating
8 cycle interrupting time

application

Types F-122 and 124-A indoor oil circuit breakers are designed for a variety of industrial and central station applications.

Operating mechanisms of the manual or solenoid types are used. The manual mechanism, commonly called the coverplate, has provision for mounting the closing handle, tripping latch and trip coils. Addition of other accessories permits remote control operation.

Electric operation is obtained by adding a d-c solenoid mechanism to the unit. When a-c power only is available, a Rectox® closing unit is supplied.

Mounting for manually operated breakers can be arranged for pipe, panel or panel frame for direct control; for remote control, pipe, wall or through the wall. Electrically operated breakers can be mounted on wall, pipe or steel frame.

advantages

De-ion® interrupter arc control: Reduces fault clearance time, contact burning and oil deterioration with resultant lower maintenance.

single tank construction: Rectangular shape and enclosed operating levers permit mounting in small space.

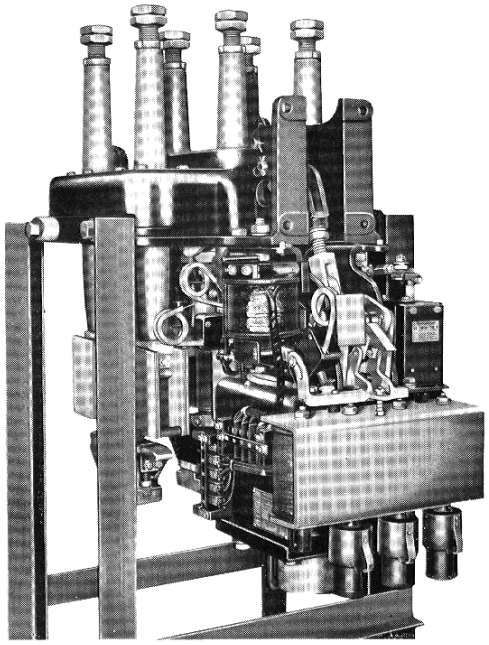
trip-free mechanisms: Operating mechanisms are mechanically trip-free at any point of the closing stroke.

condenser bushings: Wound Micarta type provides high dielectric and mechanical strength.

December, 1962
supersedes descriptive bulletin 33-150, dated April, 1959 and descriptive bulletin 33-151, dated April, 1959
mailed to: E/1139/DB; D/811/DB; C/330/DB

design features

1 operating mechanisms



solenoid operating mechanism: The 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 under-voltage 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.

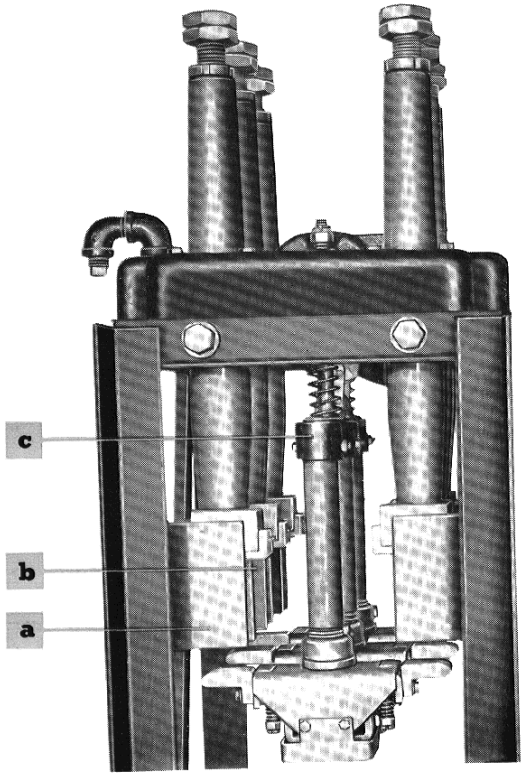
The solenoid mechanism mounts directly on the breaker unit or the breaker unit and the solenoid can be mounted on opposite sides of a wall.

manual operation: Provided through a coverplate arranged for panel or pipe frame mounting. Overload tripping is obtained by transformer trip coils of 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.

solenoid mechanism closing and tripping currents

type	rated kv	60-cycle amperes	125-volt d-c		250-volt d-c	
			close	trip	close	trip
F-122	4.16	600	42	4	22	4
F-124-A	7.2	600	57	4	29	4
	4.16	1200	57	4	29	4

2 internal construction



a De-ion arc control

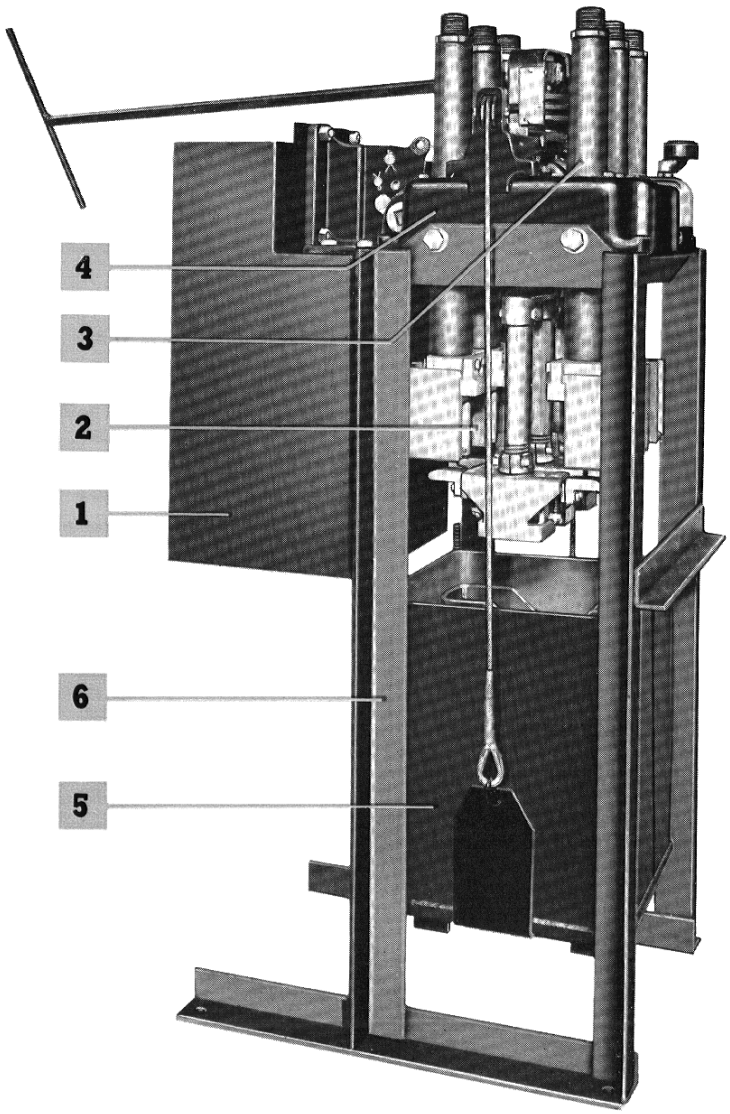
De-ion arc interrupters effectively control the arc during circuit interruption. As the contacts part, the arc is magnetically pulled away from the contacts, lengthened, and forced into a wall of cool oil. This produces a de-ionizing action that quickly extinguishes the arc.

b 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.

c 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.



3 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.

4 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.

5 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.

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

style numbers

type F-122
accessories and attachments

description	style number
coverplates, bell cranks, mounting brackets	
coverplate, single-throw, 2-coil*	1040 931
coverplate, single-throw, 3-coil*	1040 932
coverplate, double-throw, 3-coil*	1040 933
motor-starting coverplate, double-throw, 3-coil—left-hand side non-automatic, right-hand side automatic	1040 934
bell cranks (set)†	1043 455
panel-frame mounting brackets for single-throw breaker‡	478 301
pipe mounting bracket for single-throw breaker—2 coils	300 796
pipe mounting bracket for single-throw breaker—3 coils	751 559
pipe mounting brackets for breaker unit (2 required per breaker) remote control	296 764
pipe supporting frame for breaker with 2-coil coverplate①	296 799
pipe supporting frame for breaker with 3-coil coverplate▲	296 800
accessories and attachments for manually operated breakers	
5-ampere transformer-trip coil (instantaneous) complete	1081 469
5-ampere transformer-trip coil (inverse-time-limit) complete	296 773
mechanical sequence interlock	333 061
mechanical interlock for 2-handle coverplate	333 059
mechanical interlock for two single-handle coverplates, on 13½-inch centers	333 060
auxiliary switch, 2-pole D.T.	296 797
bell alarm switch	296 798
capacitor time delay device	
capacitor time delay device, 110 to 550 volts	1799 092
undervoltage release (hand retrieve)¶§	1019 273
undervoltage release (automatic retrieve)¶	1019 274
instantaneous undervoltage release attachment for 110, 220, 440, 550 volts a-c	
hand retrieve	1251 594
automatic retrieve	1251 595
resistors for use with instantaneous undervoltage release attachment※.	

* Coverplates have space for, but do not include, coils as specified. Add overload coils as required.

† Remote control is obtained by adding these bell cranks to a panel mounting breaker. One set required.

‡ Panel frame mounting may be obtained by adding these brackets to a panel mounting breaker.

① Add pipe mounting bracket style no. 300 796.

▲ Add pipe mounting bracket style no. 751 559.

¶ One of either for use with time delay device, style no. 1799 092.

※ Standard undervoltage attachments equipped with 12-volt d c coil (in the d-c side of a Rectox rectifier). Variations in control voltage are secured by connecting to the proper terminals of a small auto-transformer.

§ Can be used with motor starting combinations or with any of the standard single-throw or double-throw coverplates. When used with a single-throw, 3-coil coverplate, a special reset pin style no. 379 973 is required.

type F-124-A
breaker units, parts, and accessories

description	style number
breaker unit only	
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
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-122
shunt trip and electric lockout attachments

type	volts	style number
shunt trip attachment complete		
direct-current	12	1081 470
	24	1081 471
	48	1081 474
	125	1081 473
	250	1081 475
alternating-current, 25-cycle	110	1081 474
	220	1081 475
	440–550	1081 476
alternating-current, 60-cycle	110	1081 471
	220	1081 474
	440–550	1081 475
capacitor trip device	. . .	1799 090
shunt trip attachment	. . .	1043 278
electric lockout attachment complete for remote control breakers		
alternating-current, 25-cycle	110	333 055
	220	333 056
	440	333 057
	550	333 058
alternating-current, 60-cycle	110	333 054
	220	333 055
	440	333 056
	550	333 056

ratings

type	voltage ratings			insulation level		current ratings in amperes			interrupting ratings			
	rated kv *	maximum design kv *	min. kv. for rated int. mva	withstand test: low frequency rms-kv	withstand test: impulse crest kv†	continuous 60 cycles ‡	short time ¶: momentary	short time ¶: four-second	3-phase rated mva	amperes at rated voltage §	maximum amperes	time in cycles ※
F-122	4.16	4.76	2.3	19	60	600	10000	6300	25	3500	6300	8
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:

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

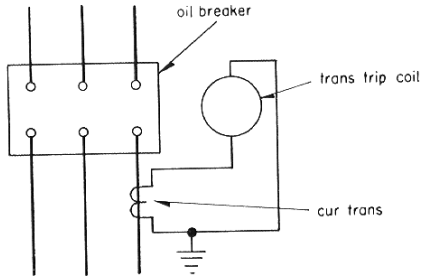
For calculated values use the nearest 100-ampere step.

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.

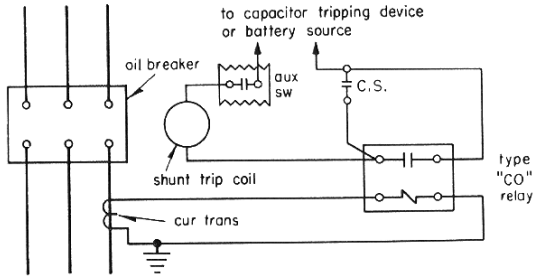
※ Time measured at 60 cycles per second.

circuit breaker tripping

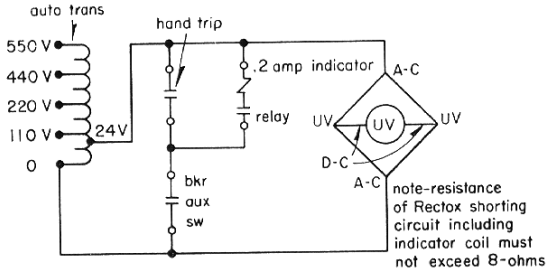
transformer trip coil instantaneous or with I.T.L. attachment



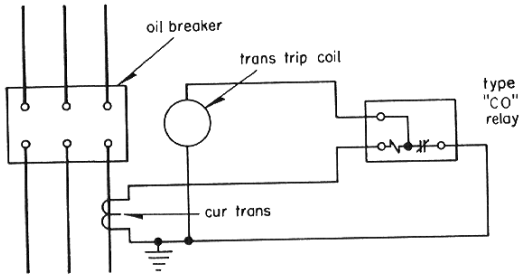
d-c shunt trip coil with capacitor trip device or battery



instantaneous undervoltage release attachment



transformer trip coil with circuit opening type CO relay

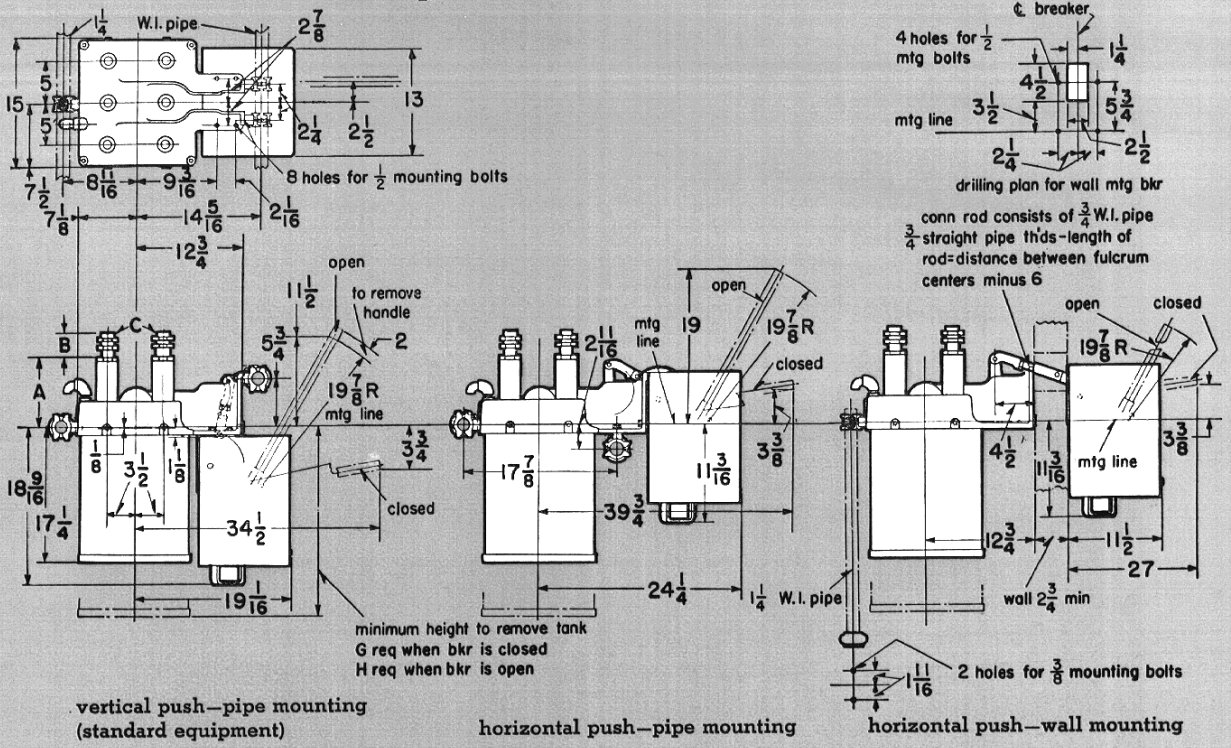


tripping method	breaker tripping device
battery	d-c shunt trip coil
a-c supply with capacitor trip device	d-c shunt trip coil
separate a-c supply	a-c shunt trip coil
line current	transformer trip coils* 2 for 3-phase ungrounded 3 for 3-phase grounded neutral

* Transformer trip may be instantaneous or time delay with I.T.L. attachments or relays. For accurate time delay trip, use circuit opening type CO relay with transformer trip coil. D-c tripping with battery or capacitor trip device is preferable.

dimensions in inches • approximate, not for construction purposes

F-122 and F-124-A solenoid operated type

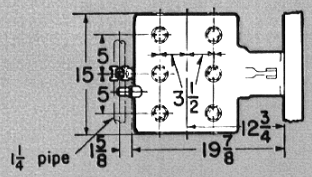


vertical push—pipe mounting (standard equipment)

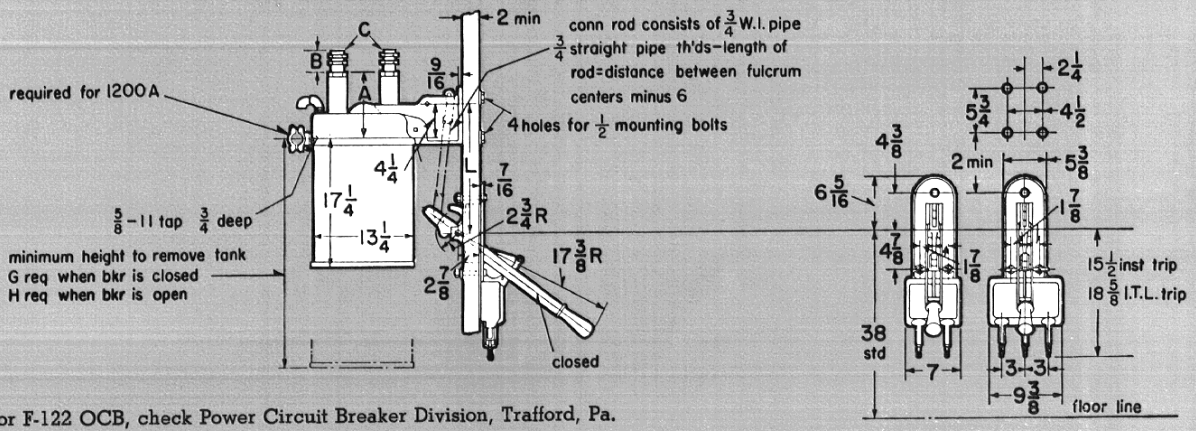
horizontal push—pipe mounting

horizontal push—wall mounting

F-124-A manually operated—panel mounted▲



type	rated kv	60-cycle amps	dimensions A	B	C	G	H
F-122	4.16	600	7⅝	1⅞	1-14	26⅛	29⅞
F-124-A	7.2	600	9⅞	1⅞	1-14	29	33¼
F-124-A	4.16	1200	8⅜	3	1½-12	29½	33¾

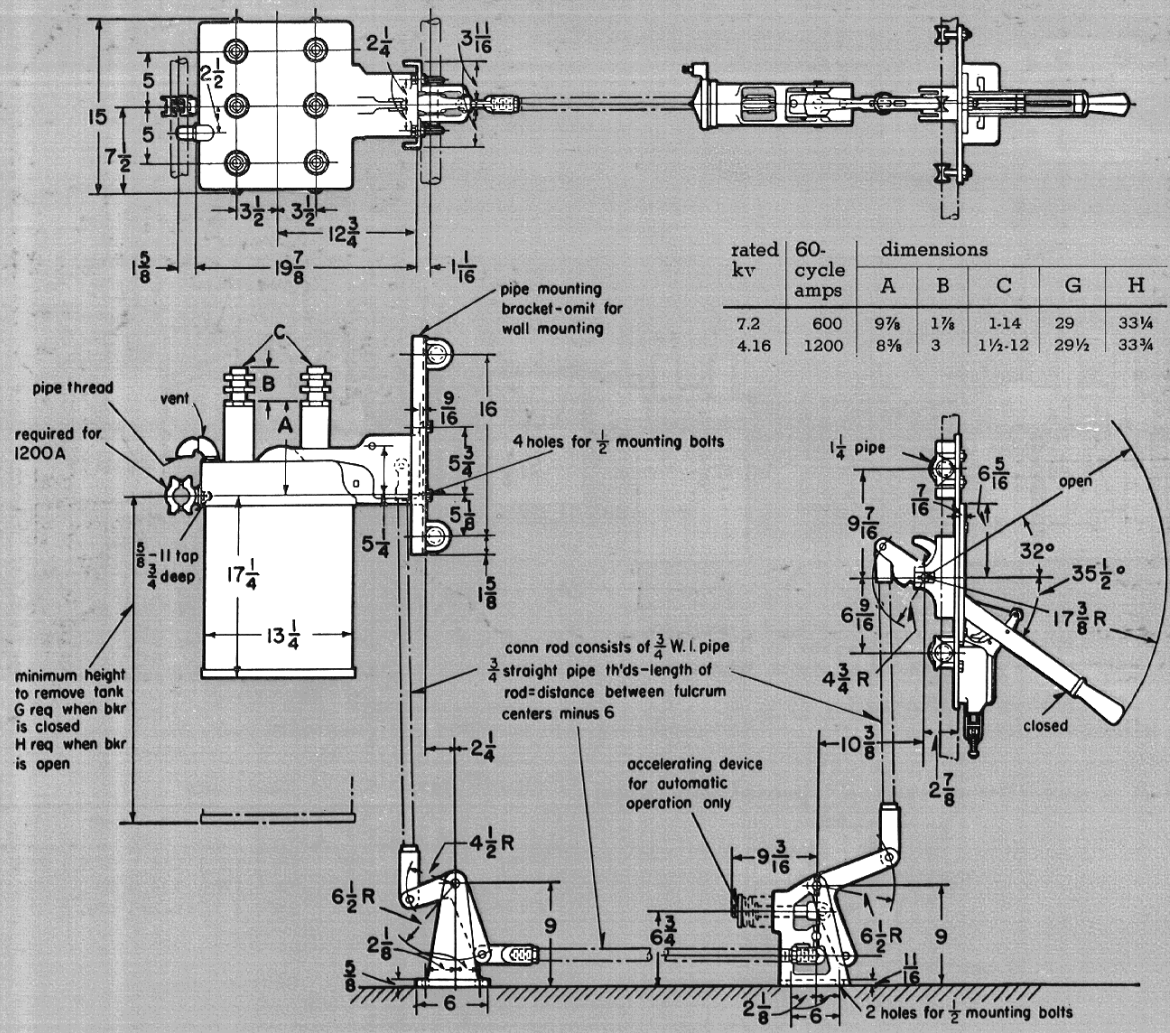


▲ for F-122 OCB, check Power Circuit Breaker Division, Trafford, Pa.

dimensions

in inches • approximate, not for construction purposes

manually operated—remote control▲



rated kv	60-cycle amps	dimensions A	B	C	G	H
7.2	600	9⅞	1⅞	1-14	29	33¼
4.16	1200	8⅜	3	1½-12	29½	33¾

▲ for F-122 OCB, check Power Circuit Breaker Division, Trafford, Pa.

further information:

prices: price list 33-120

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