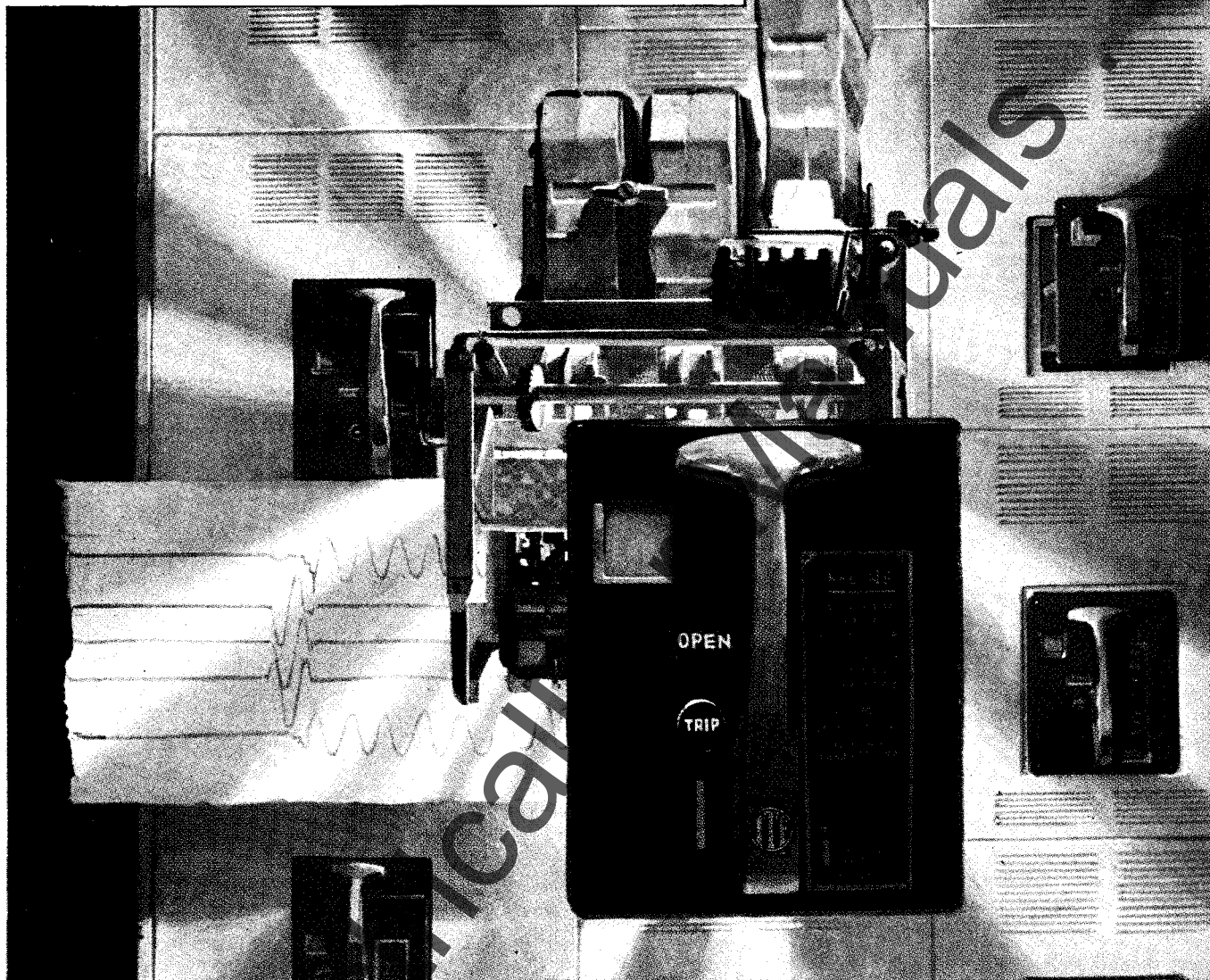


BULLETIN No. 1604-A



IFE *K Line*

LOW VOLTAGE POWER CIRCUIT BREAKERS

15 THROUGH 1600 AMPERES CONTINUOUS

15,000 THROUGH 75,000 AMPERES INTERRUPTING

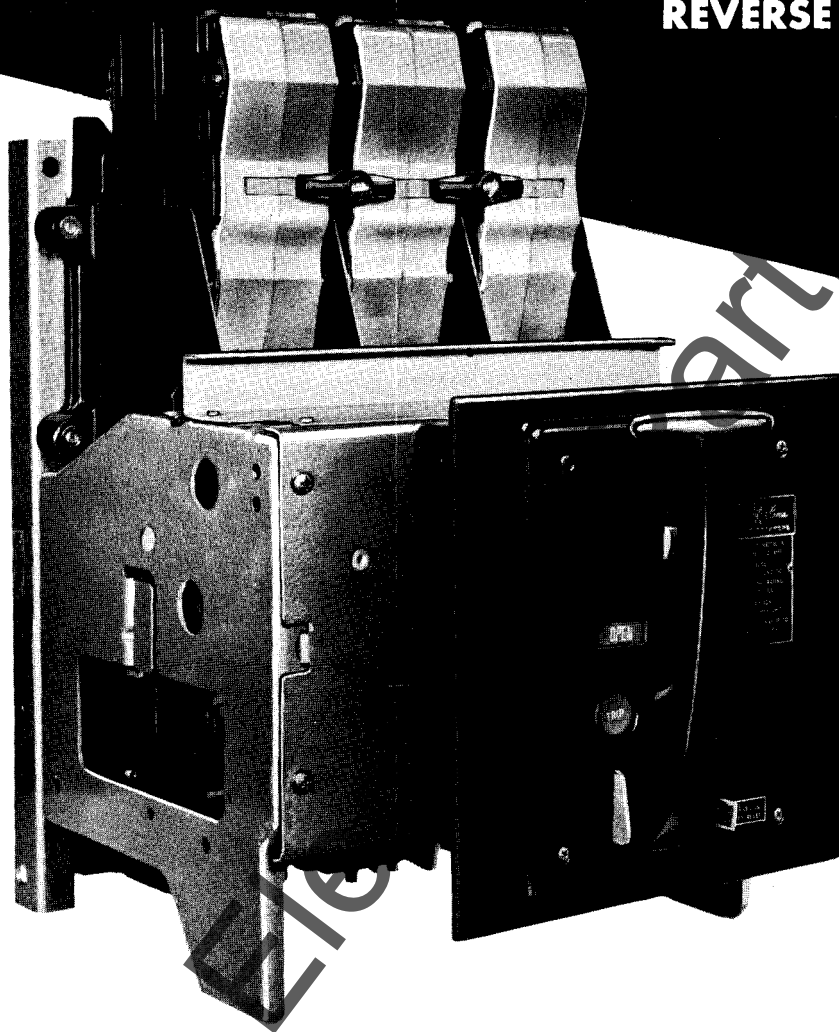
600V AC; 250V DC

K

**QUICK MAKE OPERATION
EXPANDED OVERCURRENT TRIP
CALIBRATION**

REVERSE FLOW ARC EXTINCTION

**CONVERTIBLE
MANUAL TO
ELECTRICAL**



*Type K-600 manually charged,
stored energy "quick-make" cir-
cuit breaker.*

K-225

**15-225 Amp. Continuous
Class 15000 I.C.**

K-600

**30-600 Amp. Continuous
Class 25000 I.C.**

K-1600

**150-1600 Amp. Continuous
Class 50000 I.C.**

DEAD FRONT

STURDY BOX CONSTRUCTION

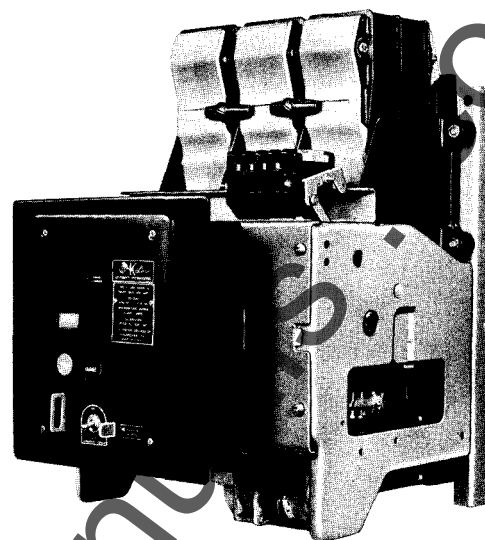
REDUCED IN SIZE AND WEIGHT

FREE STANDING

PULL DOWN HANDLE ON MANUAL MODELS

LOW CLOSING CURRENT ON ELECTRICAL MODELS

5 CYCLE CLOSING



Type K-600 motor charged, stored energy "quick-make" circuit breaker. All controls and indicators are on the escutcheon such as close and trip buttons, on-off power switch, position, spring charge and automatic trip indicators.

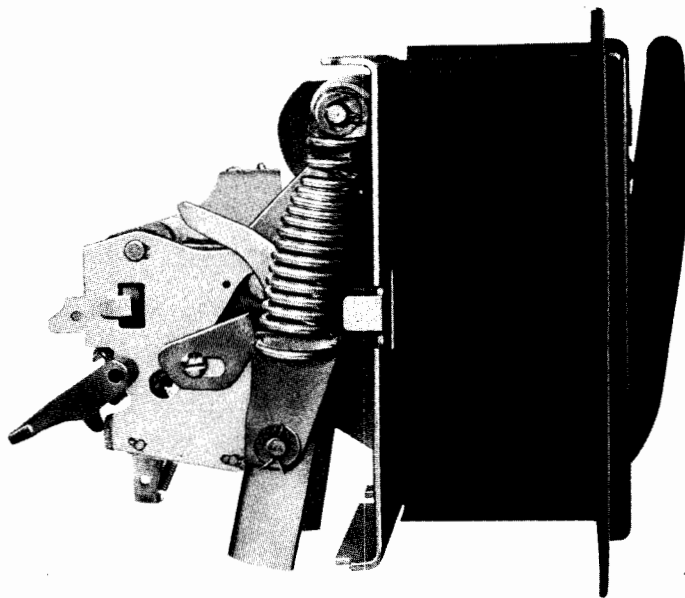
The following table shows the various interrupting ratings and the associated minimum trip coil ratings assigned to K Line Circuit Breakers in standard applications at standard service voltages.

K Line Circuit Breaker Ratings As a Function of Application and Voltage	Type K-225 15-225 Amp. Continuous Class 15000 I.C.			Type K-600 30-600 Amp. Continuous Class 25000 I.C.			Type K-1600 150-1600 Amp. Continuous Class 50000 I.C.		
Maximum Voltage At Which Following Ratings are Applicable	600 V. A-C	480 V. A-C	240 V. A-C	600 V. A-C	480 V. A-C	240 V. A-C	600 V. A-C	480 V. A-C	240 V. A-C
A. Fully Rated Breakers									
1. Maximum Available Fault Current									
Average 3 ϕ Rms Asymmetrical.....	15000	25000	30000	25000	35000	50000	50000	60000	75000
Average 3 ϕ Rms Symmetrical.....	14000	22000	25000	22000	30000	42000	42000	50000	65000
2. Minimum Applicable Trip Coil Rating.....	15	15	30	30	90	150	150	250	500
B. Breakers in 2nd Step Cascade									
1. Maximum Available Fault Current									
Average 3 ϕ Rms Asymmetrical.....	30000	50000	60000	50000	70000	100000	100000	100000	120000
Average 3 ϕ Rms Symmetrical.....	25000	42000	50000	42000	60000	85000	85000	85000	100000
2. Minimum Applicable Trip Coil Rating.....	15	15	30	30	90	150	150	250	500
C. Selective Breakers									
1. Maximum Available Fault Current									
Average 3 ϕ Rms Asymmetrical.....	15000	15000	15000	25000	25000	25000	50000	50000	50000
Average 3 ϕ Rms Symmetrical.....	14000	14000	14000	22000	22000	22000	42000	42000	42000
2. Minimum Applicable Trip Coil Ratings									
a. Maximum Short Time Delay Band.....	100	100	100	175	175	175	350	350	350
b. Intermediate Short Time Delay Band...	125	125	125	200	200	200	400	400	400
c. Minimum Short Time Delay Band.....	150	150	150	250	250	250	500	500	500

Note: The ratings listed in Section A under 600 V. A-C are applicable for D-C voltages up to 250 volts.

QUICK MAKE S

MANUAL

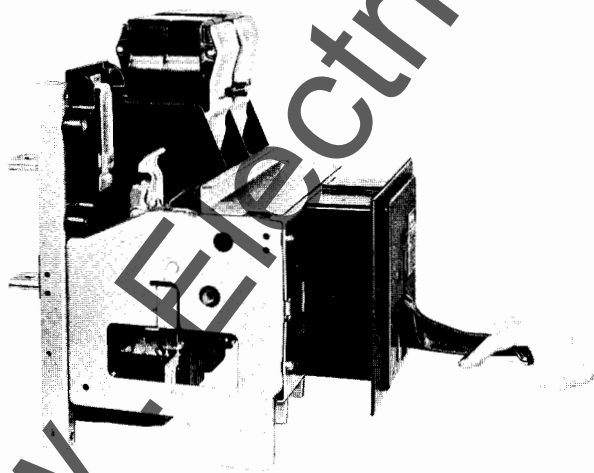


Type K-600 Manually Charged Operating Mechanism. Side view shows powerful closing springs and the cams which transfer the spring energy to the contacts. Simply removed from breaker structure by removal of only four screws.

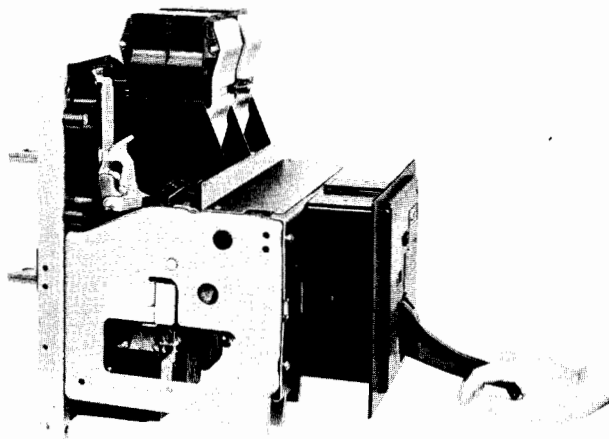
The manually charged stored energy (quick-make) closing mechanism offers several advantages to the users of manual circuit breakers. Of primary importance is the added safety for operating personnel. This "quick-make" mechanism also provides longer contact and breaker life and increases the scope of application for manual circuit breakers.

K Line Circuit Breakers cannot be teased into the closed position. A pair of powerful springs actually close the contacts. The operator simply supplies energy to the device by pulling the semi-flush closing handle downward through approximately 90 degrees. The initial 80 degrees of handle motion fully charges the closing springs and the remaining motion releases the spring energy to drive the contacts into the closed position by a smooth cam action. The fully charged springs develop sufficient energy to close and latch the breaker safely under any conditions within the breaker rating. For this reason, K Line manual circuit breakers which are equipped with short time delay, may be safely applied in selective systems where the available fault current does not exceed the breaker short time rating. K Line manual circuit breakers which are equipped with instantaneous trip elements may be safely applied up to their full interrupting rating.

A manual "trip" button is located on the breaker escutcheon where it is easily accessible. The button is flush mounted to minimize the possibility of accidental tripping. Provision is made to lock breaker in open position with as many as 3 padlocks. The mechanism is also equipped with an Automatic Trip Indicator (Hand Reset) which provides a visual indication of automatic trip operations.



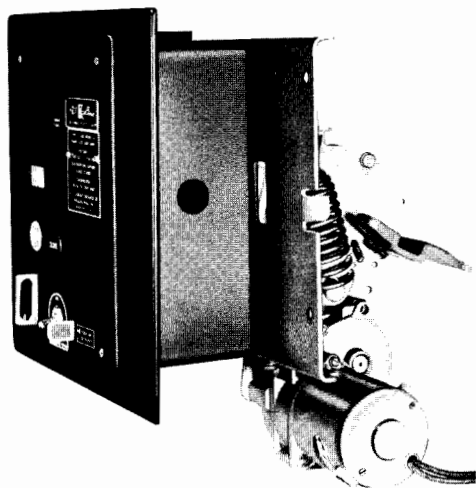
Springs fully charged after handle has been moved downward through approximately 80 degrees. Note contacts remain in open position.



Continuation of handle motion through 90 degrees releases spring energy instantly to close contacts.

T O R E D E N E R G Y

ELECTRICAL

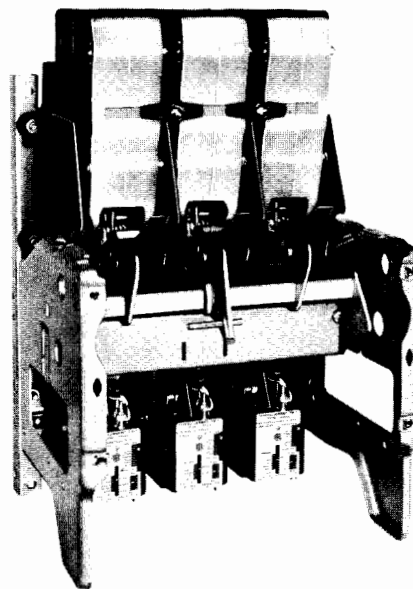


Type K-600 Motor Charged Operating Mechanism. The fractional horsepower motor with enclosed speed reduction gears provides the closing energy.

The motor charged stored energy closing mechanism should be applied when remote control or local electrical control of a K Line Circuit Breaker is required. The stored energy principle insures positive close and latch operation under maximum fault conditions with greatly reduced control voltage. The normal control power required by this closing mechanism is only a small fraction of the control power requirement of a comparable solenoid closing mechanism.

A fractional horsepower electric motor with enclosed speed reduction gears provides mechanical closing energy. The high torque low speed output of this unit easily charges a set of powerful closing springs. The closing springs are retained in a fully charged condition by a relay operated latch until the spring energy is required for a closing operation. A closing operation may be initiated after the breaker is charged by energizing or manually operating the latch release relay. This operation releases the charged closing springs to drive the contacts into closed and latched position by a smooth cam action.

The standard control scheme automatically charges the mechanism immediately after a trip operation. An emergency charging handle is provided for manually charging when a control power is not available. The breaker may be electrically closed by either the "close" button on the breaker escutcheon or a remote contact which energizes this latch release relay. An "emergency close" lever is provided on the control relay as a means of closing when control power is not available. The breaker may be tripped by a mechanical "Trip" button on the breaker escutcheon or by either a shunt trip controlled from a remote point or undervoltage trip.



Type K-600 Circuit Breaker with operating mechanism removed. This basic structure permits simple conversion from manual to electrical operation by the removal of four screws and the addition of control wiring. No linkage connections are required.

The image shows three GE Type 100A circuit breakers, each with its internal components exposed. The breakers are mounted on a dark, textured panel. Each breaker has a white label with the following text: "OVERCURRENT TRIP TYPE 100A", "MAX. OVERCURRENT TRIP, AMP. 100 (1000)", and a table of settings. The table has two columns: "TRIP" and "TRIP TIME". The "TRIP" column has settings for 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000. The "TRIP TIME" column has settings for 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 10.0. The breakers are labeled "100A", "200A", and "300A" respectively.

Type K-600 Lower Base Molding Assembly. Three OD-3 General Purpose Overcurrent Trip Devices are mounted on one impact resistant molding. Three single pole moldings are employed on the Type K-1600. Pick-up and time delay adjustment screws may be seen at the bottom of each device.

The OD-3 General Purpose Device provides the standard combination of long time delay and instantaneous trip characteristics with the additional advantages of improved adjustment and "expanded range" calibration. The OD-4 Selective Trip Device provides long time delay and short time delay trip characteristics. Applications which require instantaneous tripping only or other special tripping characteristics should be referred to the factory for additional information.

OD-3 General Purpose Dual Magnetic Overcurrent Trip Calibration

The OD-3 is a fully adjustable dual magnetic trip device. It employs a single armature connected to an oil displacement dashpot by a collapsible instantaneous calibration linkage to provide both long time delay and instantaneous trip characteristics. This device offers independent adjustment of the long time delay pick up, the instantaneous pick up, and the amount of time delay.

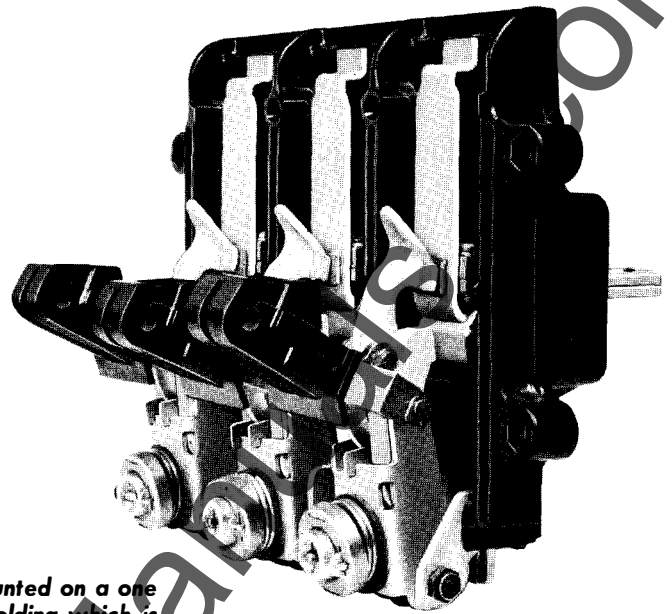
Expanded range calibration has been incorporated to provide a greater number of usable calibrated long time trip settings. Conventional trip devices provide only two calibrated pick up settings (80% and 100%) which may be used continuously without excessive overheating. Table II shows the increased number of OD-3 calibrated long time trip settings within the continuous current rating of each trip coil. This feature permits a user to select an OD-3 with a trip coil rating which provides adequate protection for present power requirements and also permits an increase in capacity by means of a simple adjustment.

A wide range of adjustment makes the OD-3 ideal for protection of motors and equipment which require close protection.

Product Code	Minimum Order Quantity	Minimum Order Value	Minimum Order Weight	Minimum Order Volume
K-225	20	20	20	20
K-225 and K-400	40	40	40	40
K-225 and K-600	60	60	60	60
K-225 and K-600	125	100	100	100
K-225 and K-600	225	150	150	150
K-225 and K-600	400	250	250	250
K-225 and K-600	600	500	500	500
K-225 and K-600	800	500	500	500
K-225 and K-600	1600	1000	1000	1000
K-225 and K-600	1600	1000	1000	1000

ARC QUENCHER AND CONTACT STRUCTURE

The new K Line arc quenchers employ a unique design which provides improved arc extinction in a minimum amount of space. A unique system of baffles and deflectors confine the interruption to the arc quencher and control the discharge of gaseous arc products after they have cooled and de-ionized. The resulting interruption is very fast and efficient. Since there is no external display at even the highest short circuit currents, K Line breakers require very little overhead clearance. The arc quenchers are easily removable from the front of the breaker for inspection of the contacts without removing the breaker from its cubicle.



The "braidless" contact structure is mounted on a one piece impact resistant upper base molding which is readily removable from the front of the circuit breaker.

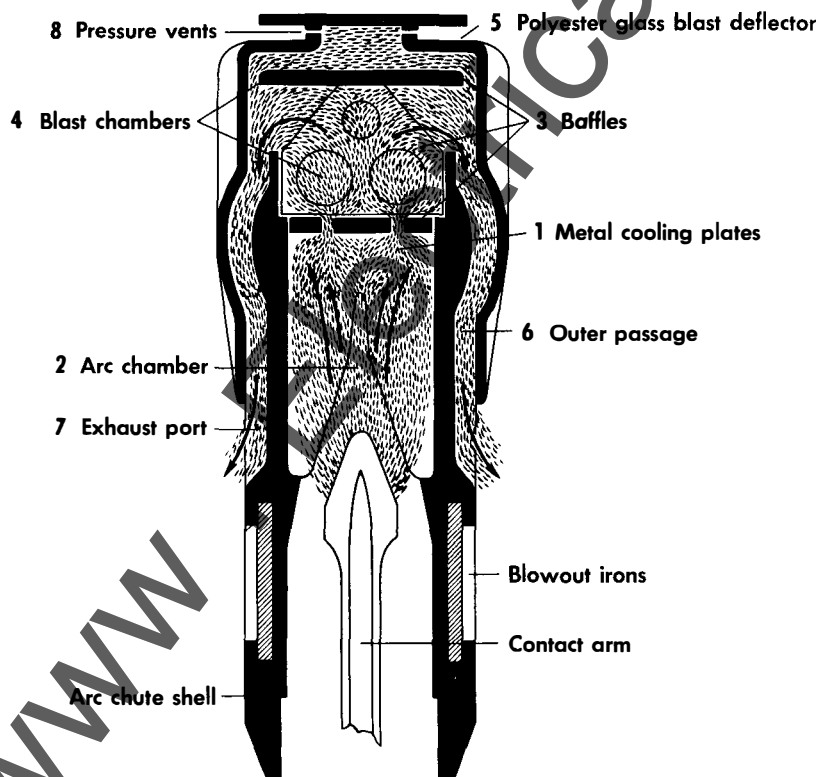
REVERSE FLOW ARC EXTINCTION

NEW, FAST-ACTING REVERSE FLOW ARC QUENCHER

A major breakthrough in the art of arc extinction

As it is being stretched and dissipated by the metal cooling plates **1**, the white-hot core of the arc continues to generate a terrific blast of ionized gas which must be cooled and purged from the arc chamber **2** to prevent reignition. This stream of arc products escapes through a labyrinth of baffles **3** and blast chambers **4** directly above the cooling plates until it strikes the polyester glass blast deflector **5** at the top of the arc quencher. Here it is actually spun around and directed downward through the twisting outer passages **6**, finally to emerge, completely deionized, through the exhaust ports **7**. The small pressure vents **8** cushion the initial explosive pressure of the arc blast. As the arc collapses, cool, clean air flows in to purge the arc chamber, and the remaining arc products filter harmlessly out the exhaust ports. Interruption is very fast, and with no external display, even at the highest short circuit currents.

With the new I-T-E reverse flow arc quenchers, you may be assured of unequalled interrupting performance with a high margin of safety.





NEW!
EXCLUSIVE!

- QUICK MAKE
- EXPANDED TRIP
- REVERSE FLOW
ARC EXTINCTION
- CONVERTIBLE

FOR FURTHER INFORMATION OR ASSISTANCE ON ANY ELECTRICAL
PROBLEMS . . . CONSULT YOUR NEAREST I-T-E SALES OFFICE

OFFICES IN PRINCIPAL CITIES



I-T-E CIRCUIT BREAKER COMPANY
19th AND HAMILTON STREETS, PHILADELPHIA 30, PENNSYLVANIA