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SECUNDERBAD

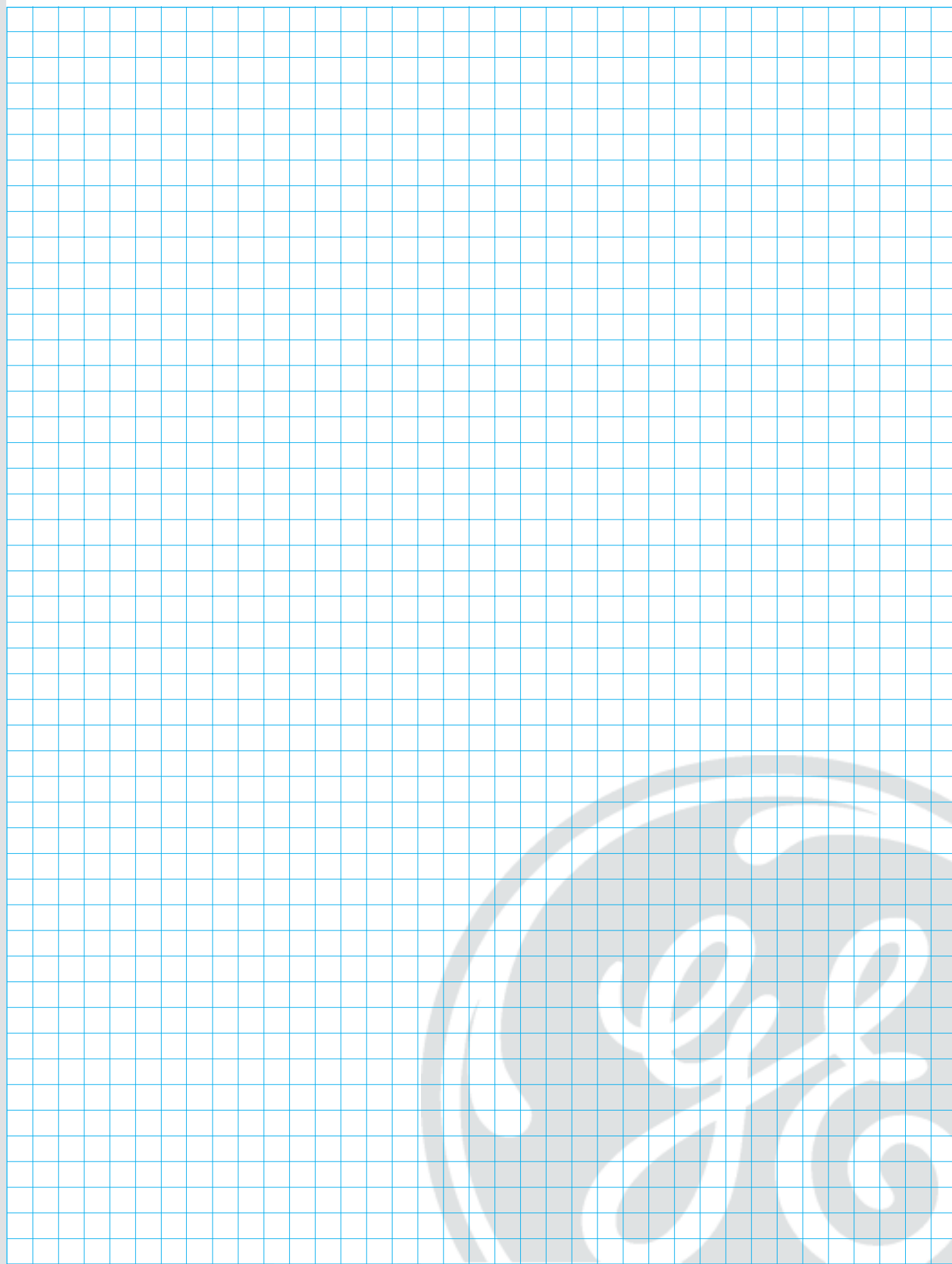
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M - PACT Air Circuit Breaker





Technical Data

- All M-pact circuit breakers comply with IS:13947-2 (1993).
- Line load interchangeability.
- All tests are carried out within the cassette thus guaranteeing the certification remains valid when the circuit breaker in its cassette is mounted within an enclosure.

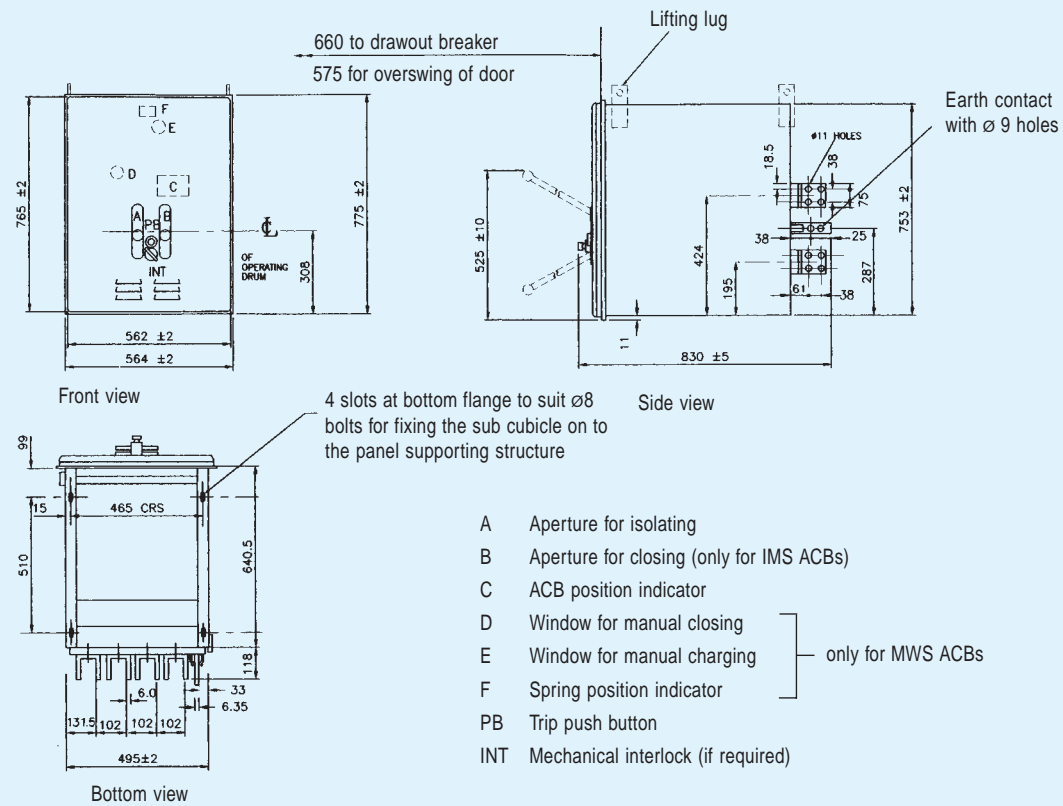
		M 610	M 16	M 20	M 25	M 3032	M 40
1. Rated voltage	Volts	415	415	415	415	415	415
2. Thermal rating	Amps	1000	1600	2000	2500	3200	4000
3. Rated insulation voltage	Volts	660	660	660	660	660	660
4. Making capacity	kA peak	105	105	105	105	105	105
5. Ultimate rated breaking (Icu)	kA rms	50	50	50	50	50	50
6. Rated service breaking Capacity (Ics) at 415V	kA rms	50	50	50	50	50	50
7. Rated short time withstand capacity for 1 sec (Icw) at 415V	kA rms	50	50	50	50	50	50
8. Utilisation category		B	B	B	B	B	B
9. Pollution degree		3	3	3	3	3	3
10.No. of poles		3/4	3/4	3/4	3/4	3	3



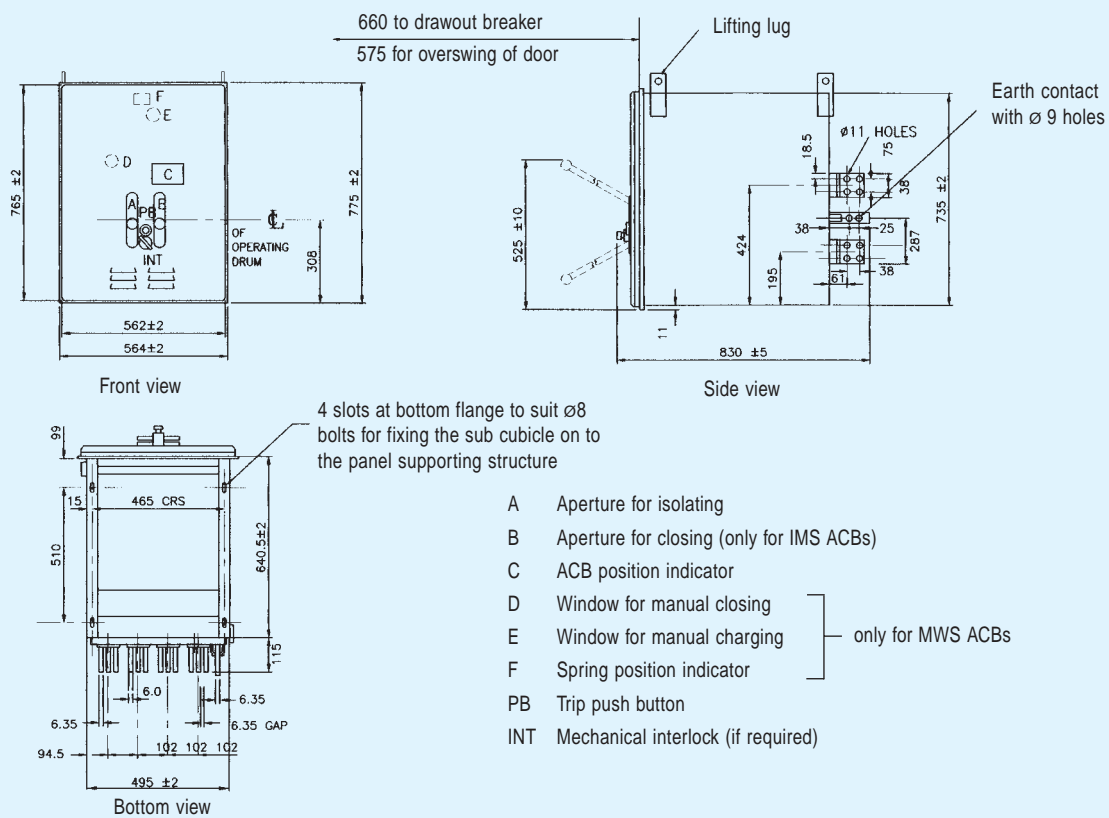
M-PACT Air Circuit Breaker

Type M610, M16 & M20 - 4 Pole

Dimensional Drawings in mm



Type M25 - 4 Pole



M-PACT Air Circuit Breaker

M-PACT A C B

M-Pact cassette type air circuit breaker alone offer certified test evidence, conforming that the standard unit will retain its tested integrity when fitted in custom-built switchboard or motor control centres. This is endorsed by leading consulting engineers, specifying authorities and discerning switchboard and motor control gear manufacturers.

The unique cassette type enclosure on withdrawable circuit breakers, guarantees the operating environment. The user, therefore, can be certain that the independently certified test evidence remains entirely valid when the circuit breaker is in the switch board.

This is not the case with circuit breakers supplied in an 'open type' cradle of chassis arrangement which inevitably have been tested in conditions of 'free air' and not the final working enclosure.

Features

Salient Features

- Air Circuit Breakers are supplied in cassettes. This cassette assures 100% guarantee for short circuit performance, since the proving tests have been conducted on Air Circuit Breakers in "cassettes".
- Three basic frame sizes cover ratings from 630A to 4000A.
- ACBs are suitable for either Manual (IMS) or Motor operation (MWS).
- Each circuit breaker is provided with distinct SERVICE / TEST / ISOLATED positions.
- Tested as per IS13947-2 (1993).
- Line load interchangeability.
- Static trip releases provided on the ACBs have highly flexible trip characteristics for perfect co-ordination.
- ACBs are provided with inherent safety interlocks / features such as safety shutters and door interlocks.
- Robust and tripfree mechanism.
- Compliance with Indian and International standards.
- Approved by major specifying authorities.
- Tested by CPRI / other independent test authorities.

Safety Features

- Cassette door can be opened only by means of tools to prevent unauthorised opening.
- Access flap locking prevents unauthorised operation.
- Independent Manual Spring closing mechanism permits safe closing on to high fault currents.
- **Safety Shutters**
 - Automatic shrouding of main contacts by a safety shutter thus preventing inadvertent contact with isolating contacts when breaker is withdrawn from the cassette.
 - Manual padlocking of safety shutters can be provided optionally.
- The cassette and the breaker are provided with the following built-in interlocks:
 - The breaker cannot be closed in any intermediate position other than the three distinct positions, SERVICE / TEST / ISOLATED.
 - When the breaker is closed, the hinged door of the cassette can not be opened.





M-PACT Air Circuit Breaker

Safety Features

- While withdrawing the moving portion from the cassette, a stop on the guide rails prevents accidental falling down of the circuit breaker.
- A circuit breaker of one thermal rating cannot be put into the cassette of another air circuit breaker of different thermal rating.
- Optional safety interlock (DOI) can be provided such that the door of the cassette cannot be opened till the breaker is racked into the ISOLATED position. While racking in, the breaker cannot be moved from ISOLATED to the TEST position unless the door is closed. It will be possible, however, for a competent operator to defeat the interlock and put the breaker in the TEST position with the door open. But the door of the breaker cannot be closed unless the breaker is brought back to the ISOLATED position.
- The moving portion of the breaker is provided within a heavy duty plug-in type earth contact which makes before and breaks after the main isolating contacts during the insertion into and withdrawal from the service position of the breaker. This earth contact remains connected from the service to the isolated position of the breaker.
- PVC arc baffles are provided above the arc chutes to let out ionized gases and thus preventing phase to earth short circuit.
- Optional fault lock-out/Antipumping Device can be provided so that the breaker cannot be reclosed after tripping on fault. The breaker can be closed only after manual reset is done, and that too after opening the cassette door.

Construction

The circuit breaker is supplied fully enclosed in cassettes, designed for ease of construction of switchboard. The cassette can be easily handled and mounted and is not liable to distortion and misalignment.

The formed and welded steel construction is given corrosive resistant treatment following fabrication work. The cassette and doors are finished with stoved enamel paint.

The breaker has three distinct position, SERVICE/TEST/ISOLATED/ MAINTENANCE, within the cubicle, and this is achieved by a racking cam and slide rails operated from the front of the equipment. Isolated conditions simplifies inspection, and from this position the circuit breaker can be completely withdrawn from the housing.

The breaker can be withdrawn to TEST and ISOLATED positions with the cassette door closed. In isolated position, ACB inspection & routine maintenance can be carried out.

The fixed contacts are fitted with copper terminals allowing multiple bolt fixing.

Electrical closing is possible by using MWS (Motor Wound Stored charge spring closing) mechanism. A mechanical indicator charged / free is provided to indicate the state of the charging spring.

'ON / OFF' mechanical indicators are available.

Two access flaps on doors are provided in IMS Air circuit breaker for:

- 'ON/OFF' operation.
- Racking operation (for withdrawing). These flaps can be independently locked.

Operating Mechanism

IMS - Independent Manual Spring Closing

This mechanism is standard for all M-pact breakers. Operation is by insertion of an operating handle into the operating sector provided and depressing. This continuous action will charge and release the closing springs in one movement closing the breaker at the correct speed independent of the operator. A direct mechanical coupling gives indication of ACB 'ON' or 'OFF'.

MWS - Motor Wound Stored Charge Spring Closing

The motorised mechanism charges a closing spring upon circuit connection. The spring charge may be electrically or manually released effecting closure of the circuit breaker. The closing spring is automatically recharged ready for the next closing command. An operator can also manually charge the closing spring.

The spring condition 'charged' or 'free' is shown through an indicator.

Standard Operating Voltage for Motor

Voltage	Power Consumption of Motor	RPM
220V/240V AC/DC	235W	2800

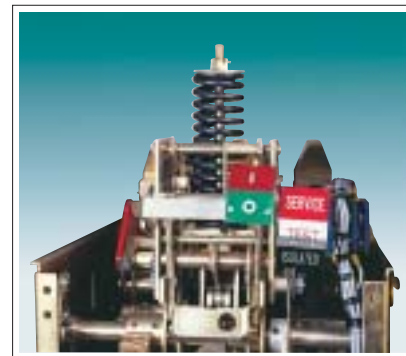
ACB Position Indicators

The draw-out mechanism has three breaker body positions and the breaker can be locked in any of these positions. Visual indicators provided show these three positions viz. SERVICE, TEST & ISOLATED.

Other indicators

Visual indicator showing the operation position viz. 'ON/OFF' and spring charging (for MWS only) 'CHARGED/FREE' are provided.

IMS closing mechanism



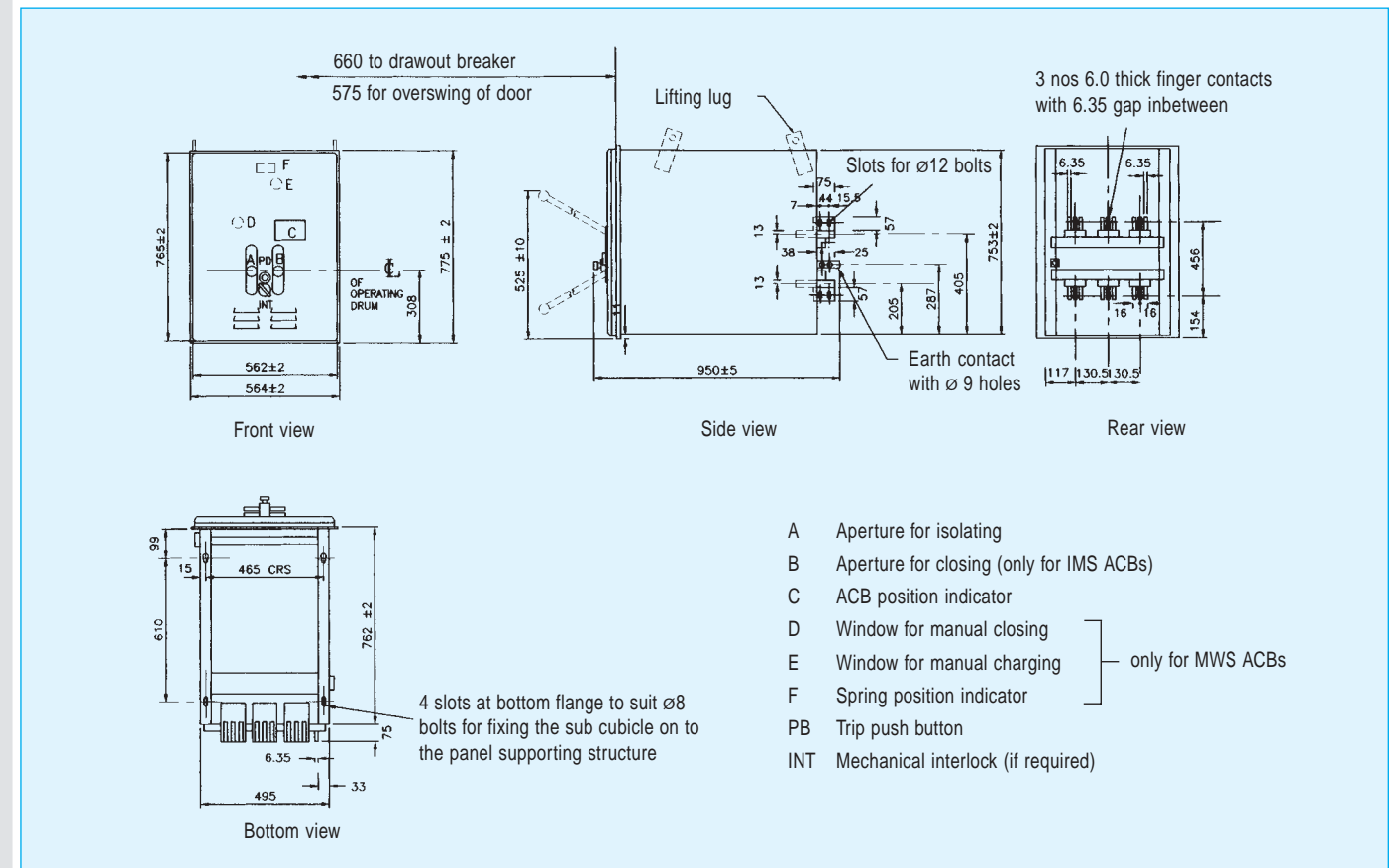
MWS closing mechanism



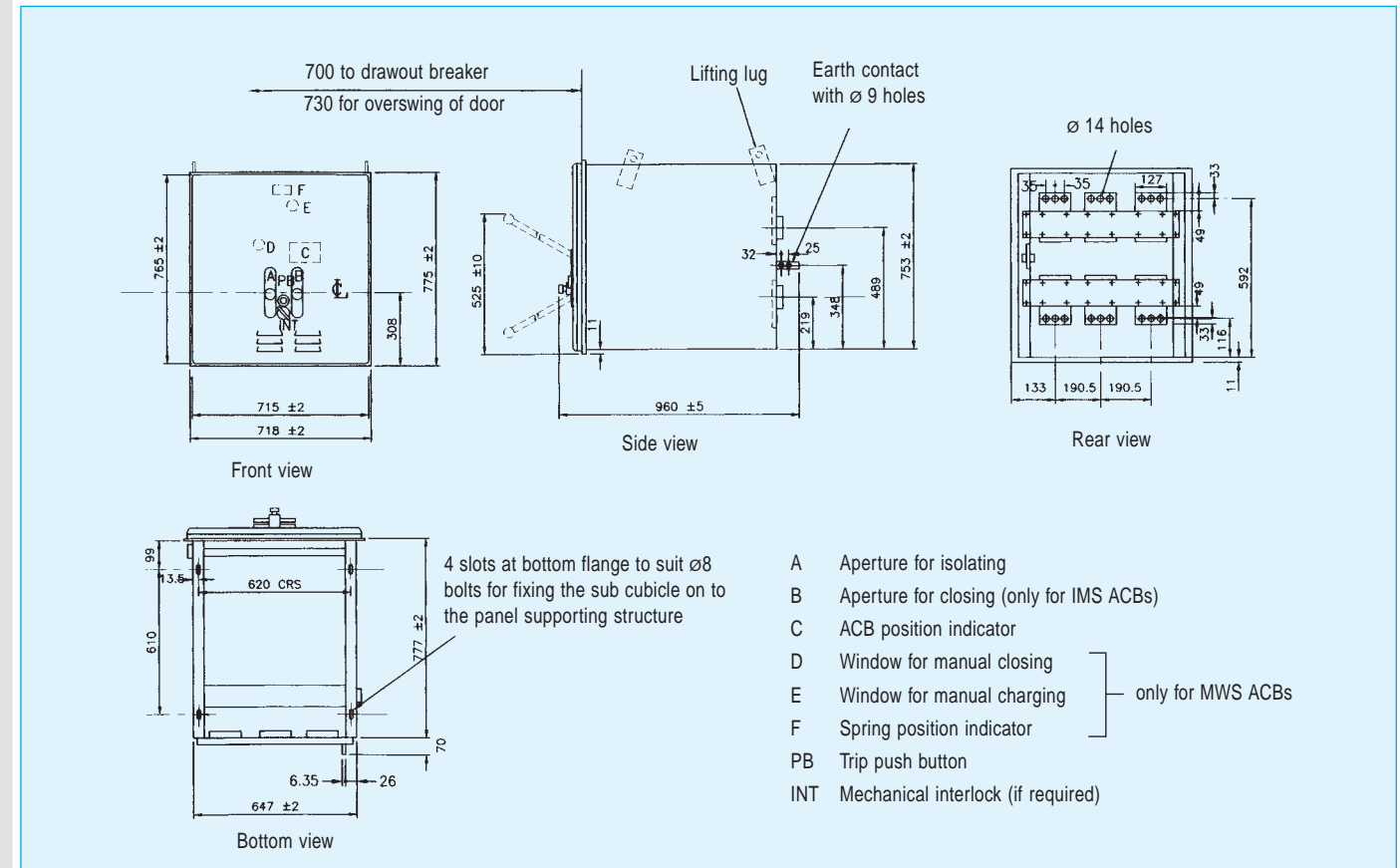
M-PACT Air Circuit Breaker

Type M2025 & M3032 - 3 Pole

Dimensional Drawings in mm



Type M40 & M3037 - 3 Pole





M-PACT Air Circuit Breaker

Earthfault:

Switch Io sets the rated current (Io) for earthfault pick-up, from 20% (0.2) to 70 % (0.7) of the nominal earthfault current (In). Earthfault characteristic has a definite time delay of 0.2 sec + the time delay setting of (t>>).

Accuracy:

Inverse square time delay over current characteristics has a non-trip value of 1.05 and a positive trip value of 1.30 times the current setting. The overall tolerance for all settings is ± 15 %.

Nominal Current: (For Release)

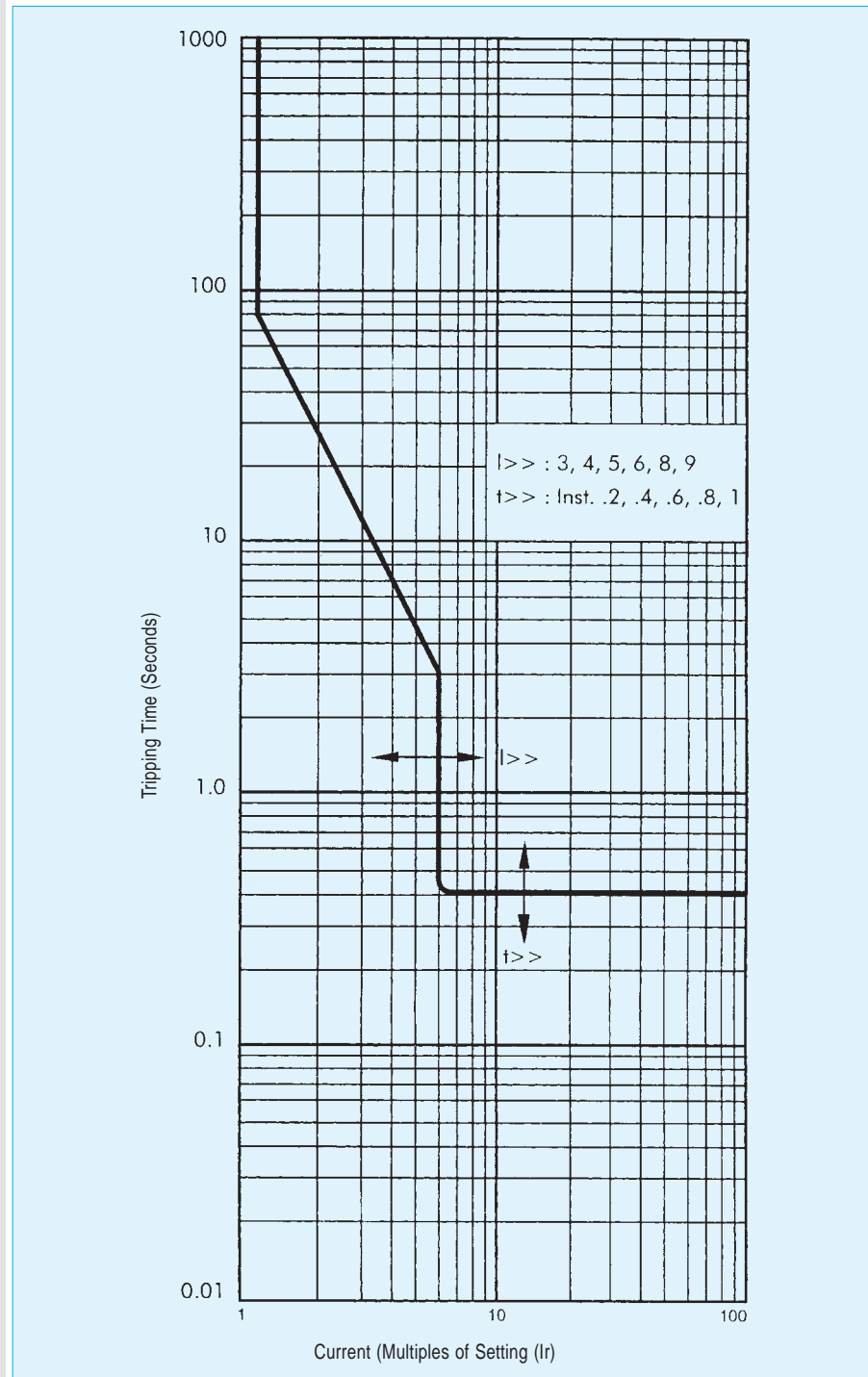
5A for both over current and earth-fault elements.

LMZ 2: OVERLOAD, SHORT CIRCUIT & EARTHFAULT PROTECTION (The setting details)

• Rated current setting (Ir)	: 0.5, 0.6, 0.7, 0.8, 0.9 and 1.0 time nominal current (In)
• Overload delay time	: 3 sec at 6 times the set current (Ir) as shown in the characteristic curve
• Short time delay pick-up current (I>>)	: 3,4,5,6,8 and 9 times the rated current (Ir)
• Short time delay (t>>)	: Instantaneous, 0.2, 0.4, 0.6, 0.8 and 1.0 sec.
• Earthfault current pickup setting (Io)	: 0.2, 0.3, 0.4, 0.5, 0.6 and 0.7 times earthfault nominal current (In)
• Earthfault delay	: 0.2 sec + Short time delay(t>>) setting

Test plug: Test plug is provided for testing the release for both earthfault as well as over current protection.

Time Current characteristics (IDMT) of LMZ 2



M-PACT Air Circuit Breaker



CTZM71 - release

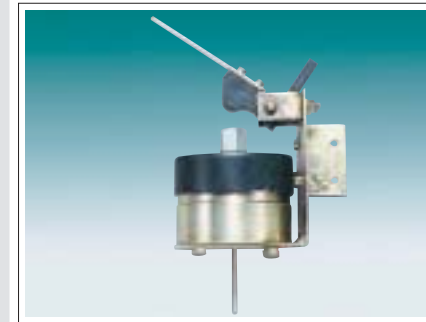
A versatile static trip release Type CTZM integrally mounted is available for overcurrent and earthfault protection. This static trip is used in conjunction with 'PERA' a sensitive tripping device. 'PERA' is a magnetic latched stored energy trip release. This device is intended for use in CTZM static trip device. A micro switch can be fitted for trip/reset indication for O/L, E/F & S.C fault separately.

This release has the following adjustments as shown in the characteristic curves.

• Overcurrent pick-up	- 0.5, 0.6, 0.7, 0.8, 0.9, 1.00 times current rating.
• Inverse tripping time at	- 4, 8, 12, 16, 20, 24 seconds at 6 times current setting.
• Short-time delay pick-up	- 2, 3, 4, 5, 6, 8 times current setting.
• Short-time delay	- Instantaneous, 0.2, 0.4, 0.6, 0.8, 1.0 seconds.
• Earthfault pick-up	- 0.1, 0.2, 0.3, 0.4, 0.5, 0.6 times current rating.
• Earthfault delay	- Instantaneous 0.1, 0.4, 0.9 seconds.

The characteristics can be arranged to arrive at full discrimination with:

- Relays with inverse and very inverse characteristics.
- Fuses with extreme inverse characteristics.
- Moulded case circuit breakers.
- Circuit breakers with high tolerance thermal and instantaneous combinations giving high "kneepoint" characteristics.



The 'Static' trip release has the following features:

- Self powered release
- High accuracy, reliability & repeatability
- Maximum flexibility of characteristics
- Total integration and protection of circuit breaker
- Close overload protection
- Characteristics unaffected by temperature variation
- Close pick-up/drop-off ratio
- Earthfault protection
- Simple control selection
- No moving parts
- Independent from auxiliary supplies
- Compliance with Indian and International standards.
- Free from maintenance
- Three phases adjusted simultaneously with one control