

*Enerpact*TM Merlin Gerin

Catalogue

04

Air Circuit Breaker
Energy at your control



a brand of
Schneider
Electric



Merlin Gerin



NH 800



NH 1600



NH 3200

Enerpact™ Merlin Gerin

Technology meets reliability

Constant innovation and an unwillingness to compromise has positioned Schneider Electric as the world leader in its field.

Enerpact™, the latest in air circuit breakers from  **Merlin Gerin** symbolizes the best of Schneider Electric.

A product of cutting-edge R&D from the Merlin Gerin team, *Enerpact™* is designed to excel in Indian conditions.

It's passed the most stringent quality tests, and also goes well past the most exacting Merlin Gerin worldwide standards. But that isn't the only reason that sets *Enerpact™* apart from ordinary air circuit breakers.

Besides the Merlin Gerin hallmark of international quality, *Enerpact™* comes with a host of benefits: It offers greater safety and reliability, no matter what the conditions. It gives precise, 100% fail-safe protection for your expensive unit. It is upgradable, should your needs change in the future.

And above all else, it is user-friendly, once you fit it, you'll forget it's even there.

Enerpact™ comes with various auxiliaries and accessories, to suit every kind of application.

In short, *Enerpact™* offers dependability, safety and ease-of-use, just the right combination of qualities for a world-class air circuit breaker!

Enerpact™. Technology you can trust!

Schneider Electric, moving from strength to strength.

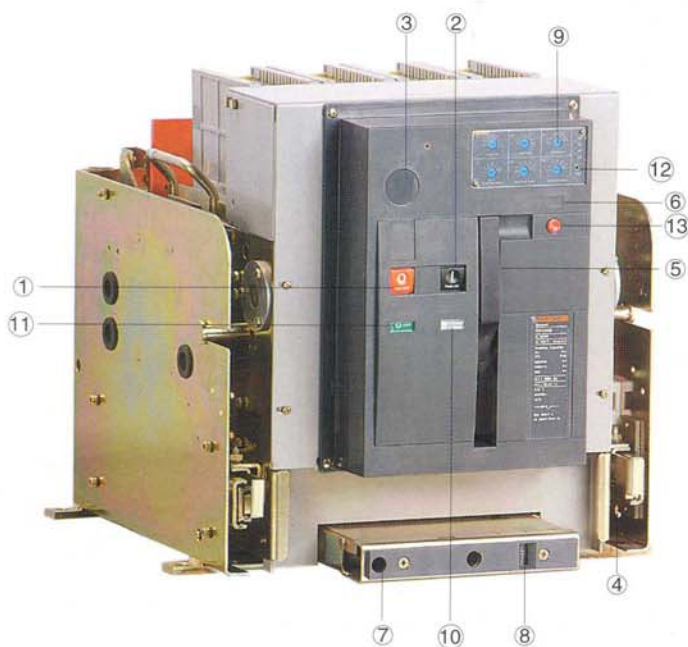
Enerpact™ circuit breakers are used to protect and control low-voltage distribution systems. They may be installed in main LV switchboards (incoming units, main and secondary outgoing). Enerpact™ has a complete range offering a large selection of performance levels :

- Ratings from 800 to 3200 A
- Breaking capacity from 50 to 80 KA rms
- Operational voltages 660 V AC

Many versions

- Frame 1-800-1250 Amp
- Frame 2-1600-2000 Amp
- Frame 3-2500A-3200 Amp
- 3 and 4 poles
- Fixed and draw out versions
- Wide range of control units offering multiple functions

Circuit breakers designed for all applications. Enerpact™ circuit breakers comply with all major Indian/international standards and meet T2 tropicalisation criteria.



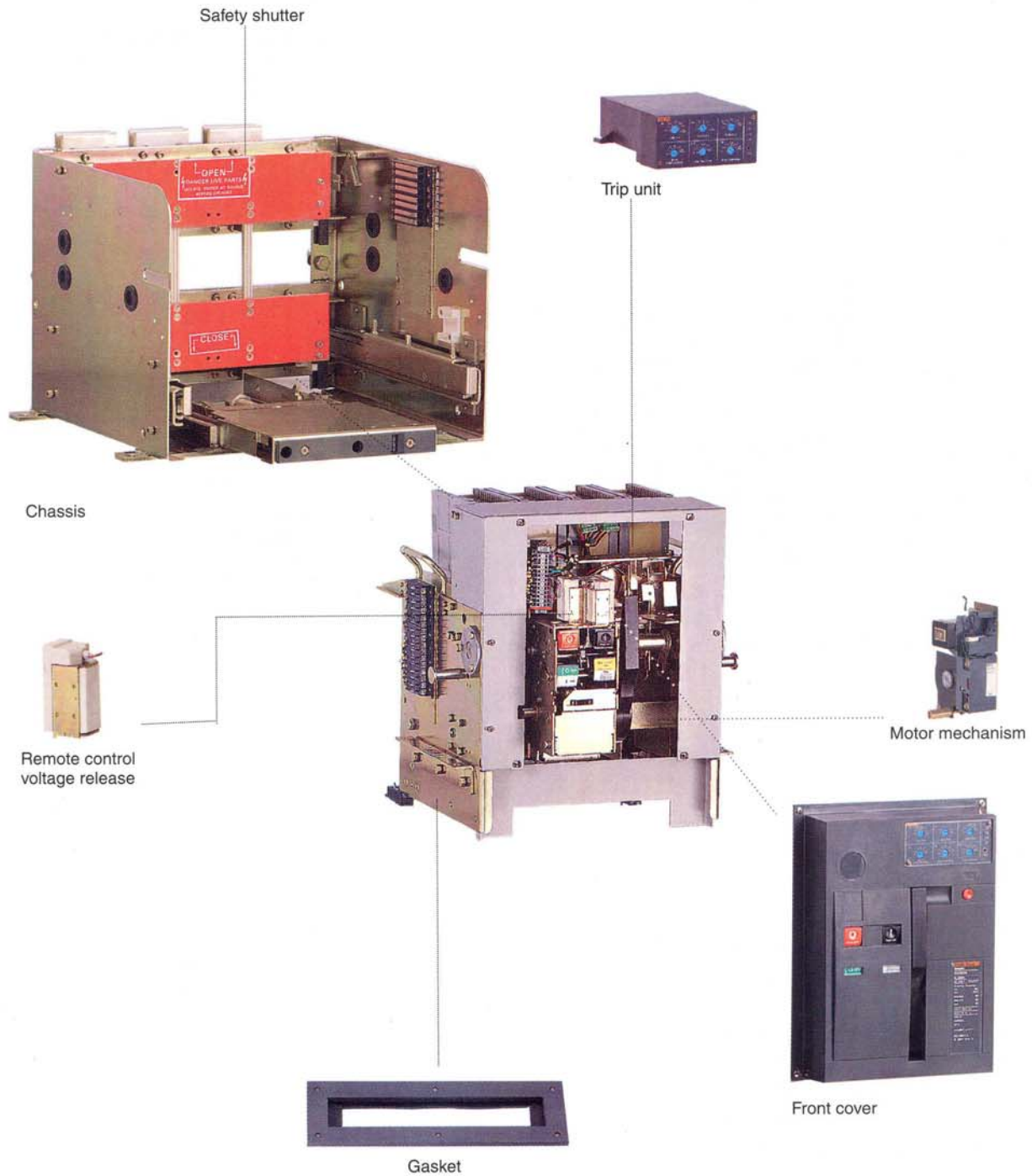
Front face

1. Opening push-button (O).
2. Closing push-button (I).
3. Keylock for castle lock position.
4. Door interlock.
5. Stored-energy-mechanism charging handle.
6. Operations counter position.
7. Racking handle storage.
8. Functional position indicator "connected", "test" and "disconnected".
9. Trip unit position.
10. Stored-energy-mechanism status indicator
• "Charged"
• "Discharged"
11. Main-contact position indicator
• "OFF" (O)
• "ON" (I)
12. Fault trip indication for overload short circuit fault and earth fault.
13. Manual reset button.

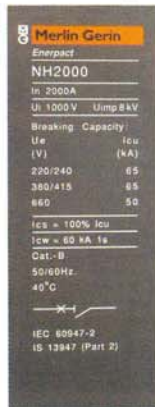


Reduced dimensions

- AC circuit breakers
- Three frame size from 800 to 3200 A
- Common height and depth from 800 to 3200 A



Conformity with standards



Standardised characteristics indicated on the rating plate :

- Ui : rated insulation voltage
- Ue : rated operational voltage
- Icu : ultimate breaking capacity, for various values of the rated operational voltage Ue
- Ics : service breaking capacity
- Icw : short-time withstand current
- : suitable for isolation

*Enerpact*TM circuit breakers comply with all the major international/Indian standards :

- International standards :
 - IEC 60947-1 general rules
 - IEC 60947-2 circuit breakers
- Indian standards :
 - IS 13947(part 1) general rules
 - IS 13947(part 2) circuit breakers

IEC 60947-2

This standard replaces IEC 157-1, applicable since 1973 and is an upgradation of IEC 947-89.

The circuit breaker selection criteria are unchanged, but the new standard provides the user with a better guarantee concerning quality and performance.

Circuit breakers are subjected to tests that are more representative of real operating conditions.

IEC 60947-2 also clarifies the notion of breaking capacity

- Icu : the ultimate breaking capacity, which must be greater than or equal to the 3-phase short-circuit current at the point of installation of the circuit breaker, a value unlikely to be reached under real conditions.
- Ics : the service breaking capacity, generally expressed as a percentage of the ultimate breaking capacity (25, 50, 75 or 100% of Icu). It corresponds to a short-circuit current that is more likely to be reached under real conditions. The circuit breaker must continue to operate normally after having interrupted a current equal to Ics several times.
- Icw : short-time withstand current for circuit breakers belonging to category B (category B refers to circuit breakers with time discrimination and category A to those without time discrimination). Furthermore, IEC 60947-2 takes into account recent technological advances.
- Suitability for isolation recognised for circuit breakers having passed special electrical and mechanical tests.
- Industrial earth-fault circuit breakers covered by an appendix.
- Definition of tests designed to ensure coordination between two circuit breakers.

Tropicalisation

As standard, *Enerpact*TM circuit breakers comply to standard level 2 conditions (95% relative humidity at 45°C or 80% at 55°C, hot and humid climate conditions). They also comply with the following standards :

- IEC 68-2-30 damp heat
- IEC 68-2-2 dry heat
- IEC 68-2-11 salt spray
- IEC 68-2-1 low temperatures during storage

Pollution degree

*Enerpact*TM circuit breakers are certified for operation in pollution degree III

Environments as defined by

IEC standard 60947 (industrial environments)



Maximum dependability

All *Enerpact*[™] circuit breakers are also disconnectors (suitable for isolation) as specified by IEC 60947-2. They bear the corresponding symbol on the front cover.

This characteristic considerably increases the dependability of the circuit breaker. The conditions specified by IEC 60947-2 for this function are:

- Positive contact indication
- Impulse withstand 8 kV at sea level
- Very low leakage current, checked on New circuit breakers and on circuit breakers subjected to tests representative of the end of service life.

Moreover, *Enerpact*[™] circuit breakers have a central racking with telescopic rail with clear position indication on cradle.

Installation

Enerpact[™] circuit breakers may be installed on horizontal metal surfaces or on rails. They are secured by four points accessible at the bottom of the chassis (draw out versions) or on either side of the circuit breaker (fixed versions).

A single door cut-out is required for the entire range for fixed version and two cut outs on door for draw out version and provides access to *Enerpact*[™] controls. Testing of static trip unit can be done at site through a portable test kit.

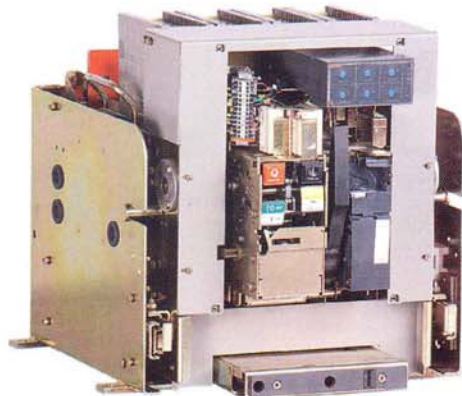
Degree of protection

(as defined by IEC 529)



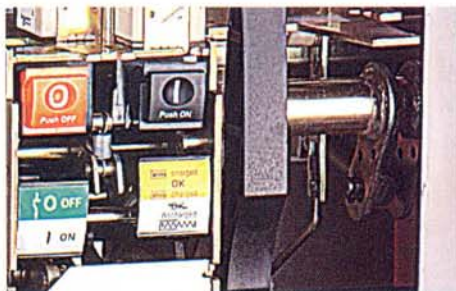
Circuit breaker installed in a cabinet with access to controls through a door cut-out.

IP 40-5



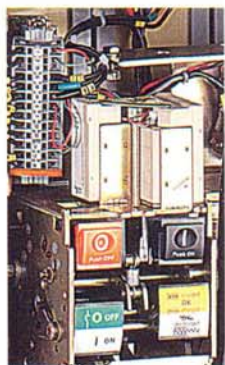
Safety and reliability

- Mechanical anti-pumping with indication on the mechanism.
- Safety shutter provided as standard for draw out circuit breaker.
- No live parts are accessible from front.
- Electromagnetic compatibility for static releases.
- Positive contact indication.
- Auxiliary devices can be fitted on site without adjustment.
- Fewer parts than conventional range.
- A trip interlock ensures that the circuit breaker is open during connection and disconnection.
- Connection to top or bottom terminals.
- Fully tropicalised as per standard.
- Sealable release cover avoids possibilities of tampering at site.



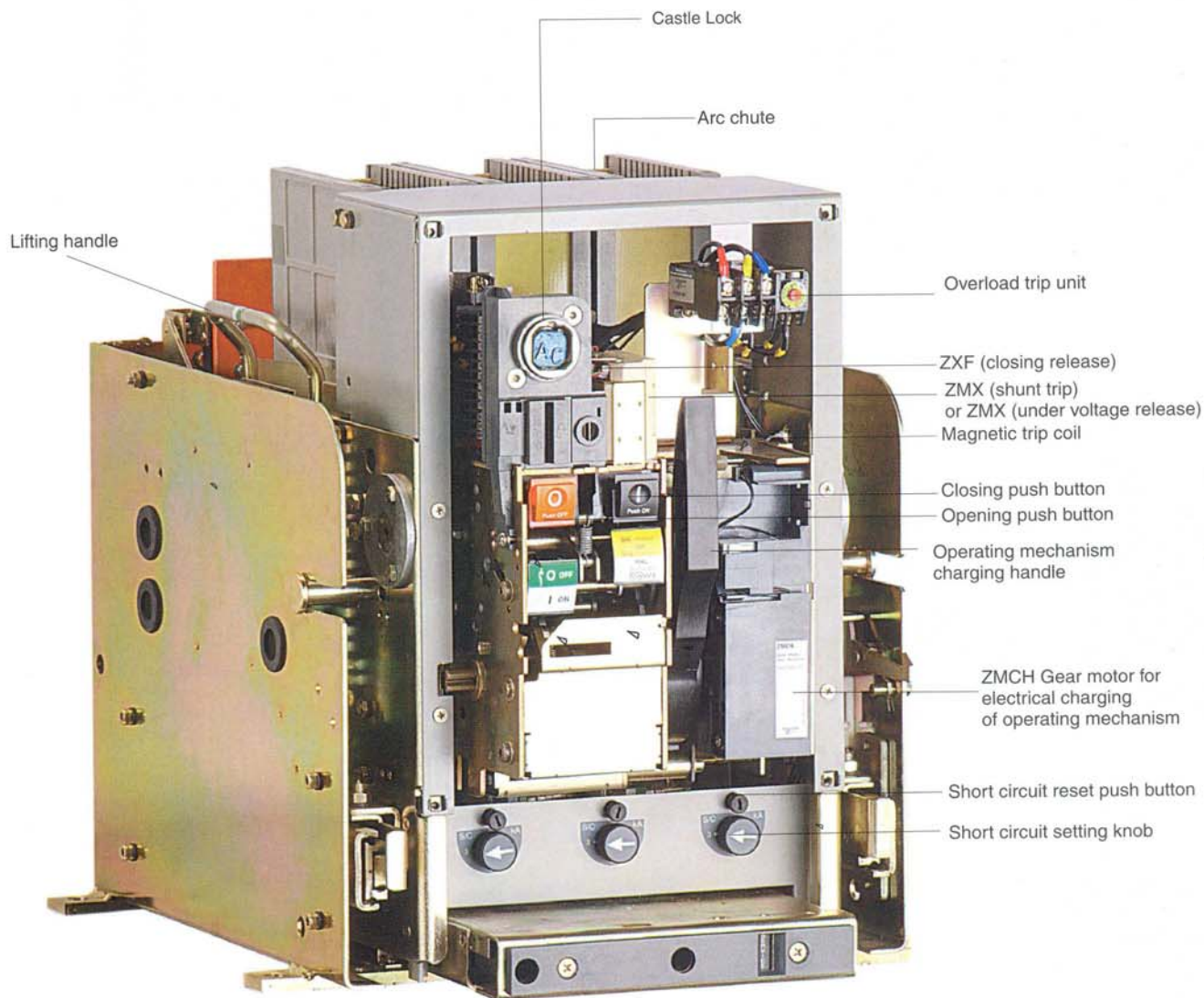
Stored energy operating mechanism

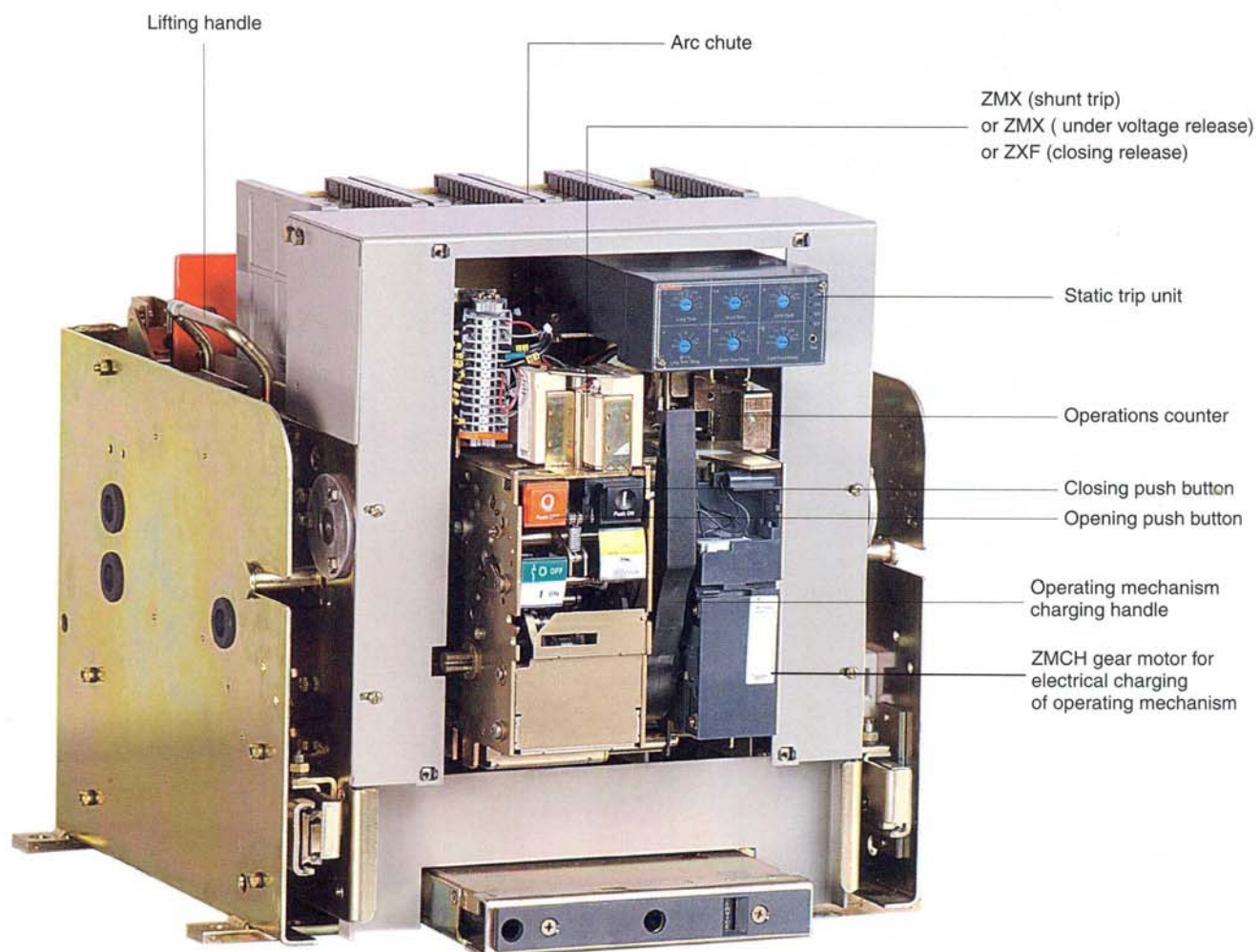
Enerpact™ circuit breakers come with stored energy mechanism for instantaneous opening and closing. The mechanism is charged either manually or electrically. Closing and opening operations can be initiated either from the local push buttons on the circuit breaker front face, or by remote control.



Common auxiliaries from 800 A to 3200 A

- Accessible from the front without adjustment.
- Secured by a single screw.
- Adjustment-free can be fitted at site.
- Continuous rated shunt and closing release.
- New under voltage release with time delay.
- Fast acting motor mechanism
 - Less than 4 Sec. Charging time.







Circuit breaker

Ratings

- Frame 1: 800 - 1250 Amp.
- Frame 2: 1600A - 2000 Amp.
- Frame 3: 2500 - 3200 Amp.
- 3 and 4 Pole.
- Fixed/Draw out versions.
- Manual/Electrical versions.



Protection unit

- Thermal magnetic trip unit.
- Static trip unit for overload, short circuit and earth fault protection with time delay with separate indication for individual fault.
- All static trip units are EMC compatible.

Benefits

- Reliable stored energy mechanism.
- Single bolt fixing of motor mechanism help convert manual ACB into electrical one at site.
- Continuous rated shunt and under voltage release fitted by single screw at site.
- Mechanical anti-pumping with indication on the mechanism.
- Offers positive isolation in all versions of ACB's.
- Mechanical cycle of 12500 operations and electrical cycle of 6500 operations.
- Automatic tripping before breaker removal or insertion of breaker.
- Direct acting short circuit protection in case of TMD ACB.
- Cradle mismatch protection.
- All static trip unit are Electromagnetic compatible.



NH 800A



NH 1600A

Type

Number of Poles

Electrical Characteristics as per IEC 60947-2 & IS 13947 (part 2)

Rated Current (A)	In
Rated Insulation Voltage (V)	Ui
Impulse Withstand Voltage (kV)	Uimp
Rated Operational Voltage (V)	
Ultimate Breaking Capacity (kA rms)	Icu AC 50/60 Hz

Service Breaking Capacity (% Icu)	Ics
Short Time Withstand Capacity (kA peak)	Icw AC 50/60 Hz
Making Capacity (kA peak)	Icm AC 50/60 Hz

Electrodynamic Withstand (kA peak)
Utilisation Category
Break Time
Closing Time
Endurance (CO) Cycles

Protection Unit

Sensor Rating
Thermal Magnetic
Static Release (STU)

Installation and Connection

Fixed Version
Drawout Version

Indication and Measurement

Breaker Position (Sliding Contacts)
Fault Indication Auxiliary Switch (Short Circuit for T-M)

Control Auxiliaries

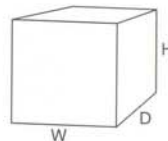
Auxiliary Releases (Closing, Tripping, Undervoltage)
Time Delay for Undervoltage Release (ZMNR), Magnetic Short Circuit (ZRS)
Motorised Mechanism (ZMCH)
Mechanical Counter

Installation and Connection Accessories

Safety Shutters
Chassis Position Lock
Door Interlock
Castell Key Interlock
Gasket for Escutcheon

Dimensions and Weights (Drawout Version)

Overall Dimensions W x H x D (mm)

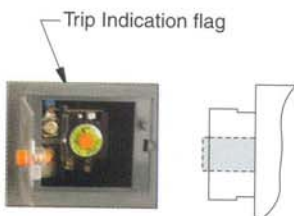
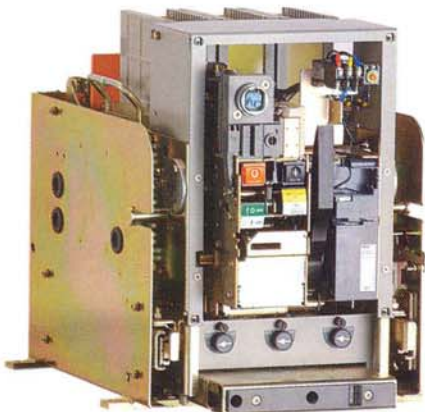


Weight (kg.)

•Available

		Frame 1			Frame 2	
		3/4	3/4	3/4	3/4	3/4
40°C		800	1000	1250	1600	2000
		1000	1000	1000	1000	1000
		8	8	8	8	8
AC 50/60 Hz		660	660	660	660	660
220/240V		50	50	50	65	65
380/415V		50	50	50	65	65
660V		50	50	50	50	50
		100%	100%	100%	100%	100%
1.0 sec.		50	50	50	60	60
220/240V		105	105	105	143	143
380/415V		105	105	105	143	143
660V		105	105	105	105	105
		105	105	105	143	143
		B	B	B	B	B
ms		<40	<40	<40	<40	<40
ms		60	60	60	60	60
mechanical		12500	12500	12500	12500	12500
electrical 415V AC		6500	6500	6500	6500	6500
		400, 630, 800	800, 1000	800, 1000, 1250	1600	1600, 2000
		.	.	.	.	.
		.	.	.	.	.
Type of connection		H	H	H	H	H
Type of connection		F, H, V	F, H, V	F, H, V	H, V	V
		.	.	.	.	.
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3 Pole	F Type	370x480x561	370x480x561	370x480x561		
	H Type	370x480x571	370x480x571	370x480x571		
	V Type	370x480x586	370x480x586	370x480x586	460x480x586	460x480x586
4 Pole	F Type	460x480x561	460x480x561	460x480x561		
	H Type	460x480x571	460x480x571	460x480x571		
	V Type	460x480x586	460x480x586	460x480x586	610x480x586	610x480x586
3 Pole/4 Pole		83/96	85/99	87/102	115/140	115/140

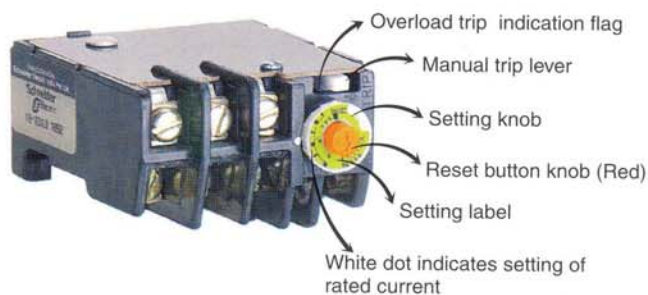
Thermal magnetic protection



Thermal protection

Thermal overload trip

Overload protection is provided through CT operated continuous variable bimetallic overload unit.
By adjusting the setting of overload unit, current settings can be varied from 50% to 100% of I_n for the entire range.



Setting knob

By changing position of setting knob on the trip unit scale, required secondary current value is set.
Since the scale is fairly linear, intermediate values can be easily set.
For instance on NH800 ($I_n=800A$) the scale of 2.5A to 5A can be set for current value as mentioned on thermal rating label. This label is provided on the hinged cover.

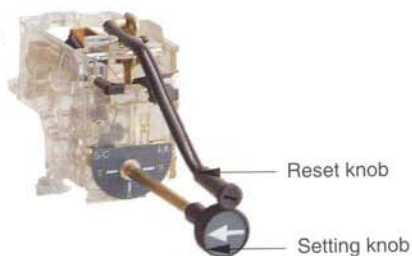
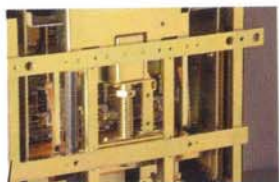
Reset knob

Manual reset

Factory setting of reset knob is manual (hand). In this mode, if overload occurs flag will appear indicating trip unit has tripped. Wait for couple of minutes for bimetal to cool and press the red knob to reset.

Auto reset

Overload trip unit can be put in auto reset mode by pressing and rotating the red reset knob anti-clockwise. When trip unit responds to overload, it will reset automatically after bimetal cools.



Thermo-Magnetic protection

▪ Short circuit protection

Short circuit protection is provided through an armature type direct acting magnetic release. During short circuit fault the armature is instantaneously attracted, in turn, tripping the ACB through detaching of trip shaft.

▪ Magnetic short circuit trip (instantaneous)

This is an armature type trip unit, having stored energy in an elongated spring. Under prevailing normal current condition, the charged spring is held in position. The moment short circuit current flows higher than adjustment, magnetic field induced operates the actuator, which releases the spring energy to open the circuit breaker instantaneously. After the tripping in built reset lock prevents further closing of circuit breaker to re-close the circuit breaker press the resetting knobs. The opening time varies from 36ms to 40ms.

The instantaneous short circuit setting are available in the following ranges.

Sr. No.	Frame	Short Circuit Current (kA)
1	NH800 ~ NH1250	3.0~9.0 (Standard)
2		5.0~15.0 (Optional)
3	NH1600 ~ NH 3200	5.0~15.0 (Standard)
4		15.0~25.0 (Optional)



▪ Magnetic short circuit trip (Time delayed)

This trip unit is generally used to achieve discrimination between upstream & downstream breakers. The trip unit consists of an additional armature as an over ride pickup. On occurrence of a short circuit, the instantaneous attraction of the first armature actuates a micro switch which is connected to a solid state relay (ZRS Relay) having time delay selectivity of 40 msec. to 460 msec. Depending on the delay setting relay provides a signal to tripping mechanism through either ZMX (shunt trip) or ZMN (under voltage trip) to open the ACB.

When fault level exceeds 18kA or 30kA, thermal and dynamic stresses generated are quite high. Hence, the built-in additional armature (for over ride pickup) opens the circuit breaker instantaneously.

▪ Fault indications

Mechanical

ACBs are fitted with mechanical trip indications for overload as well as individual phase wise trip indication for short circuit.

Electrical

Change over contact of overload trip unit (provided as a standard). On request, short circuit trip indication without time delay can be provided through micro switches fitted on individual magnetic short circuit trip units.

A. With override pick-up set at 18 kA	
NH800~NH1250	3.0~9.0 kA
	5.0~15.0 kA
B. With override pick-up set at 30 kA	
NH1600~NH3200	15.0~25.0 kA

Static protection



Description

Introduction

NH 800-3200A circuit breakers are equipped with solid state protection relay type STU. The control unit is designed with latest state of the art technology to protect power circuits and connected load.

In addition to giving tremendous flexibility of choosing as many as six long time delay characteristics, it eliminates the need for a reliable control supply voltages giving a phenomenal boost to safe application.

Salient features

- Conforms to the requirement of EMC as per IEC 60947-2.
- Common control for all 3 phases.
- Highly flexible close overload protection with choice.
- No requirement of auxiliary supply voltage, for protective circuit.
- Separate fault indications along with ON indication.
- Test terminal on front facia, to check the health of STU.
- Test kit for testing the control unit.

STUs are available in following versions viz.



- **STU 20** - (3ph, 3 wire) suitable for overload and short circuit protection (with four switches & three indications).



- **STU 33** - (3ph, 3 wire) suitable for Overload, short circuit & earth fault protection (with six switches & four indications).



- **STU 34** - (3ph, 4 wire) suitable for Overload, short circuit & earth fault protection (with six switches & four indications).

Functions

It is possible to use the same STU for different breaker ratings (i.e 400,630.... 2500 & 3200A).

For STU 33, earth fault protection requires Interposing CT (ICT). This ICT shall be located in the panel as per customers convenience.

For STU 34, Earth fault protection requires Interposing CT (ICT) along with Neutral CT (NCT) in the neutral bus bar system. NCT should be connected to ICT. This ICT shall be located in the panel as per customers convenience.

Description

Identification



Long time protection

This function protects cables (phase and neutral) against overload.

Long time (I_r)

The rated current (I_r) can be adjusted from 40% to 100% of nominal current (I_n), in steps of 10%.

(I_n is CT tap value, i.e. for a 800A ACB with CT rating of 800A, $I_n=800A$)

Long time delay (t_r)

This switch selects anyone of the 6 long time delay characteristics. Switch positions indicate timings @ 6 times I_r i.e 4 to 25 Sec. Corresponding to long time delay curves I1-I6 (refer graph 1).



Short time protection

This function provides protection to the distribution system against short circuit.

Short time (I_{sd})

With the help of this switch, level of short circuit pickup can be set as a multiple of the rated current (I_r). Switch positions are 2, 3, 4, 5, 6, 8 & 10.

Short time delay (t_{sd})

With the help of this switch, when S/C current crosses the set level, STU will give a trip signal after the preset time delay in seconds (refer graph II). Switch positions are Inst., 0.2, 0.4, 0.6, 0.8 & 1.0 Sec.



Earth fault protection

Earth fault (I_g)

With the help of this switch E/F levels can be selected. Switch position indicates percentage of nominal current from 10% to 60%. Switch positions are 0.1, 0.2, 0.3, 0.4, 0.5 & 0.6 (Refer graph III).

Earth fault delay (t_g)

When E/F current crosses the level. STU will give a trip signal after the preset time delay in seconds (refer graph no.III). Switch positions are Inst. 0.2, 0.4, 0.6, 0.8 & 1.0 Sec.



Indications

ON starts glowing at 7% I_n .

O/L, S/C, E/F On occurrence of fault, respective LED would glow.

Test terminal

Use Mini test kit (ZTK1) for checking long time and short time one point trip test.

Fault indicating potential free contact- available on request



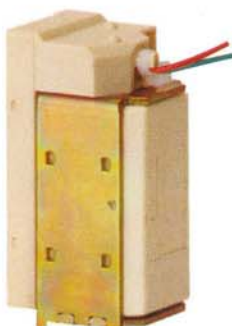
Gear motor (ZMCH)

- Optional equipment, one ZMCH gear motor per circuit breaker.
- The gear motor automatically charges and recharges the spring mechanism.
- Standard version:
 - 24/30V DC
 - 48/60V DC
 - 100/125V DC
 - 200/250V DC
 - 100/130V AC
 - 200/240V AC
 - 277V AC
 - 380/415V AC
 - 400/440 V AC
 - 480 V AC
- Charging time:
 - 4 seconds maximum
- Consumption:
 - 180 VA AC
 - 180 W DC
- Inrush current:
 - 2 to 3 In for 0.1 second
- Operating rate
 - Maximum 3 cycles /minute



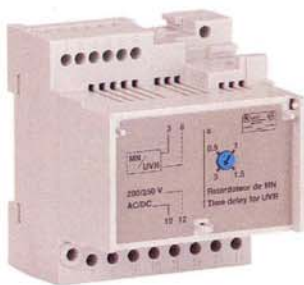
Opening releases ZMX/1 and ZMX/2, closing release ZXF

- ZMX1 is mandatory equipment for the thermal magnetic breaker and ZMX2 additional (optional) 1 no.
- Optional equipment, ZMX1 or ZMX2 release per breaker for static breaker.
- The function of (ZMX or ZXF) is determined by where the coil is installed.
- The ZXF release instantaneously closes the circuit breaker when energised, if the device is "ready to close".
- If ZMX2 is offered, ZMN as an option is invalid.
- The supply can be maintained.
- Standard version:
 - 12V AC 50/60 Hz /DC
 - 24/30V AC 50/60 Hz /DC
 - 48/60 V AC 50/60 Hz /DC
 - 100/130 V AC 50/60 Hz /DC
 - 200/250 V AC 50/60 Hz /DC
 - 277V AC 50/60 Hz /DC
 - 380/480 V AC 50/60 Hz /DC
 - 500/550V AC 50/60 Hz /DC
- Operating thresholds:
 - ZXF: 0.85 to 1.1 Ue
 - ZMX: 0.7 to 1.1 Ue
- Consumption
 - Pick-up: 200 VA or W (80 ms)
 - Hold: 4.5 VA



Instantaneous under voltage release (ZMN)

- Optional equipment, 1 ZMN per circuit breaker.
- ZMN release instantaneously opens the circuit breaker when its supply voltage drops.
- Standard version:
 - 24/30V AC 50/60 Hz /DC
 - 48/60V AC 50/60 Hz /DC
 - 100/130V AC 50/60 Hz /DC
 - 200/250V AC 50/60 Hz /DC
 - 380/480V AC 50/60 Hz /DC
 - 500/550V AC 50/60 Hz /DC
- Device response time:
 - 90 ms $\pm$ 5 %
- Operating threshold:
 - Opening: 0.35 to 0.7 Un
 - Closing :0.85 Un
- Consumption:
 - Pick-up: 200VA (80 ms)
 - Hold: 4.5 VA



Delay unit for ZMN release ZMNR

- Optional equipment, 1 ZMN with delay unit per circuit breaker.
- The unit delays operation of the ZMN release to eliminate circuit breaker nuisance tripping during short voltage dips.
- The unit is wired in series with ZMN and must be installed outside the circuit breaker.
- Standard version:
 - 48/60 V AC 50/60 Hz / DC
 - 100/130 V AC 50/60 Hz / DC
 - 200/250 V AC 50/60 Hz / DC
 - 380/480 V AC 50/60 Hz / DC
- Device response time: 0.5, 1, 1.5, 3 seconds
- Operating threshold:
 - opening: 0.35 to 0.7 U_e
 - closing: 0.85 U_e
- Consumption:
 - Pick-up: 200 VA (80 ms)
 - Hold: 4.5 VA



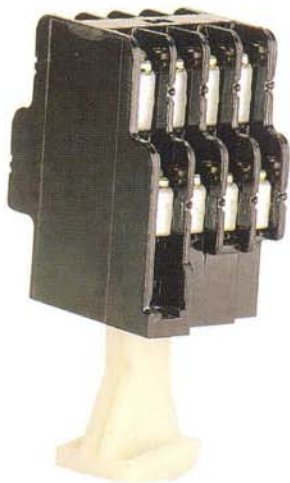
Earth fault relay (for thermo magnetic) ZEFR

- Optional equipment, 1 ZEFR per circuit breaker.
- Base mounting and door mounting arrangement both are available.
- This unit provides earth fault protection, sensitivity ranging from 10% to 40% of I_n.
- The unit should be connected in series with the overload trip unit and must be installed outside the circuit breaker. For wiring refer page no. 28 & 29
- Standard version :
 - 415V 50/60 Hz AC 3 phase;3 wire system
 - 220V 50/60 Hz AC 3 phase;4 wire system
 - 415V 50/60 Hz AC 3 phase;4 wire system



Delay unit for short circuit trip unit (for thermo-magnetic) ZRS

- Optional equipment, 1 ZRS relay per circuit breaker.
- Base mounting and door mounting arrangement both are available.
- ZRS relay is used to achieve discrimination between incomer & feeder.
- The unit is wired in series with the micro switches of magnetic short circuit trip unit and must be installed outside the circuit breaker. For wiring page no 29.
- Standard version:
 - 40 msec.(fixed)
 - 415V 50/60 Hz AC
 - 240V 50/60 Hz AC
 - 40-460 msec (adjustable)
 - 110V AC 50/60 Hz AC
 - 220V AC 50/60 Hz AC
 - 415V AC 50/60 Hz AC
 - 24V DC
 - 30V DC
 - 48V DC
 - 60V DC
 - 110V DC
 - 220V DC



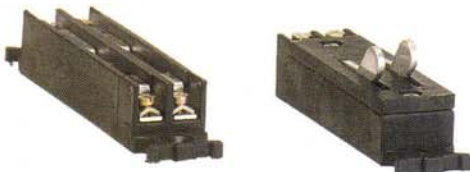
Electrical:

Auxiliary contacts

- Mandatory equipment.
- 4 NO+4NC potential free auxiliary contacts available per circuit breaker.
- For fixed version, auxiliary contacts are wired to terminal block. Customer wiring has to be tapped from terminal block.
- For draw out version, auxiliary contacts are wired to sliding contacts. Customer wiring has to be tapped from sliding contacts.

- Standard version:
4NO+4NC

- Rating:
240 V AC 15 :15 Amp
415 V AC 15: 4 Amp
- Making capacity:
AC 15- 40 Amp
- Breaking capacity:
AC15-40 Amp



Sliding contacts (Z214)

- Available in drawout circuit breakers only. Maximum 38 ways per circuit breaker.
- Fixed and moving sliding contacts gets connected in test and service condition.
- Sliding contact (16 ways) are available as standard for customer use. Additional 22 ways will be provided based on the requirements.
- Moving sliding contacts are wired at the factory and fixed sliding contacts to be wired by the customer.
- Standard version:
16 ways

- Rating:
240 V AC:10 Amp
415 V AC: 6 Amp



Mini test Kit: (ZTK1)

- Portable test kit (optional) available on the request.
- Used for checking long time and short time one point trip test.
- Standard rating 220 V 50/60 Hz AC.



Mechanical:

Castle lock (Z244C)

- Optional equipment, 1 locking kit per circuit breaker.
- The kit inhibits local or remote closing of the circuit breaker.
- Standard version:
 - Castle lock & key with letter A
 - Castle lock & key with letter B
 - Castle lock & key with letter C
 - Castle lock & key with letter - B
 - Castle lock & key with letter C -
 - Castle lock & key with letter AB
 - Castle lock & key with letter CB
 - Castle lock & key with letter CD
 - Castle lock & key with letter - D

Padlocks (Z244P)

Device locking in the OFF position using padlock.

- Optional equipment, 1 locking kit per circuit breaker.
- The kit inhibits local or remote closing of the circuit breaker.
- Up to 3 padlocks may be used for locking.

Transparent cover for push button locking using padlock, lead seal or screws (ZTCPB)

- Optional equipment, 1 locking kit per circuit breaker.
- The Transparent cover blocks access (together or separately) to open and close the circuit breaker.
- Locking requires a padlock, a lead seal or two screws.

Operation counter (Z602)

- Optional equipment, 1 kit per circuit breaker.
- The operation counter sums the number of operating cycles of the circuit breaker.

Circuit breaker locking in "service", "test" and "isolated" position (Z236).

- Optional equipment, 1 locking kit per circuit breaker.
- Mounted on the chassis and accessible with door closed, this system locks the device in "service", "test", "isolated" position.

Shutter locking (ZSHL)

- Standard equipment.
- Locking is possible with the shutter in closed condition.
- Locking requires a padlock.



Mechanical

Switchboard door lock for fixed version (Z245F)

- Optional equipment, 1 locking kit per circuit breaker.
- The kit inhibits switchboard door opening when circuit breaker is ON.
- Defeating facility is available. By defeating, switchboard door can be opened when circuit breaker is in "ON" position.



Switchboard door lock for draw out version (Z245D)

- Optional equipment, 1 locking kit per circuit breaker.
- The kit inhibits switchboard door opening when circuit breaker is in "service" or "test" position.
- Defeating facility is available. By defeating switchboard door can be opened when circuit breaker is in "service" or "test" position.



Door gasket for fixed version.

- Standard equipment, 1 per circuit breaker.
- The gasket increases the degree of protection to IP 40.



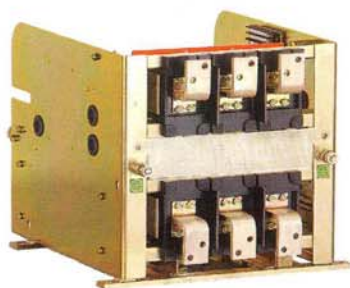
Door gasket for draw out version.

- Standard equipment, 1 per circuit breaker.
- The gasket increases the degree of protection to IP 40.

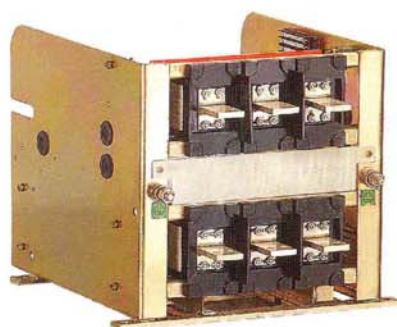




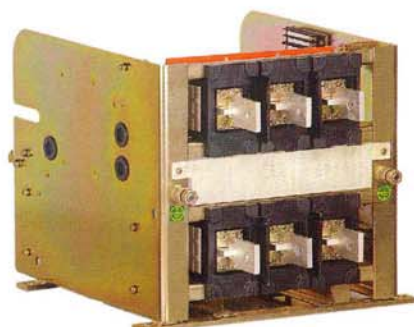
Fixed version
Horizontal type (H)
Available as STANDARD for NH 800-3200 ACBs



Draw out version
Front type (F)
Available as STANDARD for NH1800-1250 ACB's



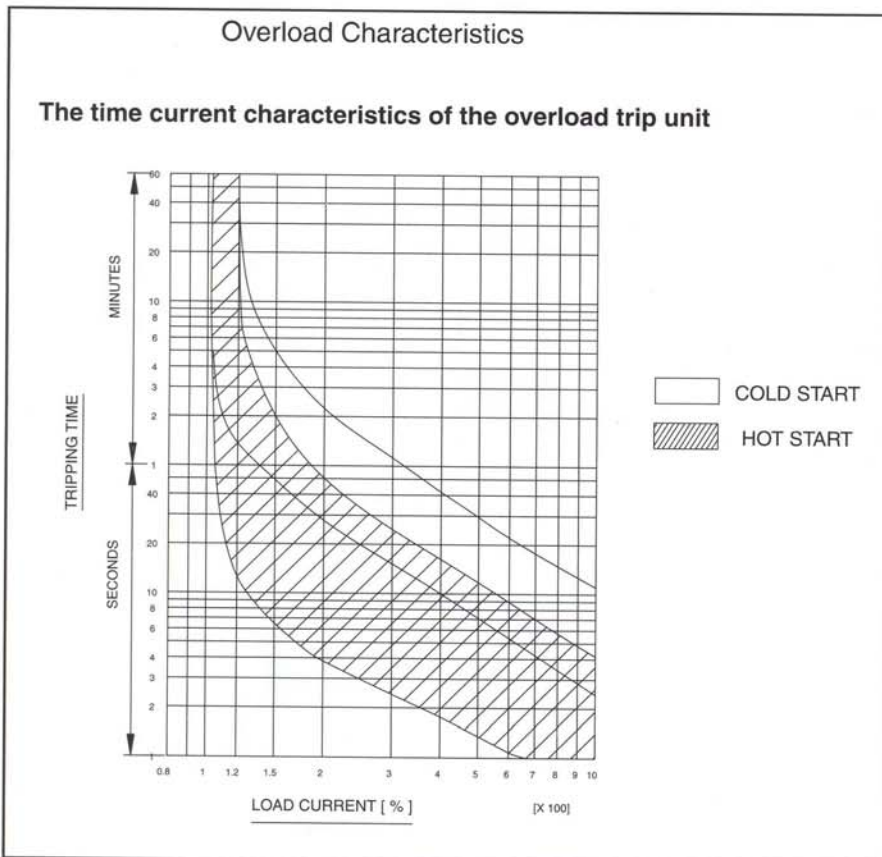
Horizontal type (H)
Available as OPTIONAL for NH-800-1250 ACBs



Vertical type (V)
Available as STANDARD for NH16---3200 ACB's
Available as OPTIONAL for NH 800-1250 ACB's

OVER CURRENT TRIP CHARACTERISTICS

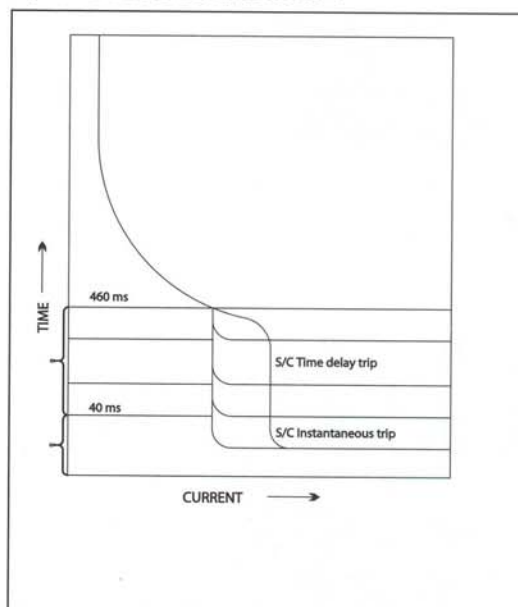
Thermal magnetic



S/C characteristics :

If the ACB is provided with time delayed short circuit trip, it will trip after the set time delay has elapsed.

Magnetic release will take over at the short circuit setting, tripping the ACB instantaneously.

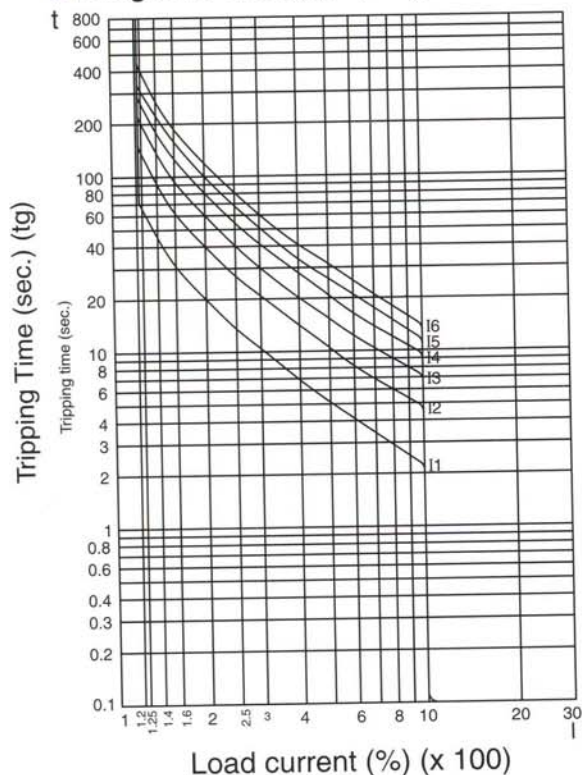


OVER CURRENT TRIP CHARACTERISTICS

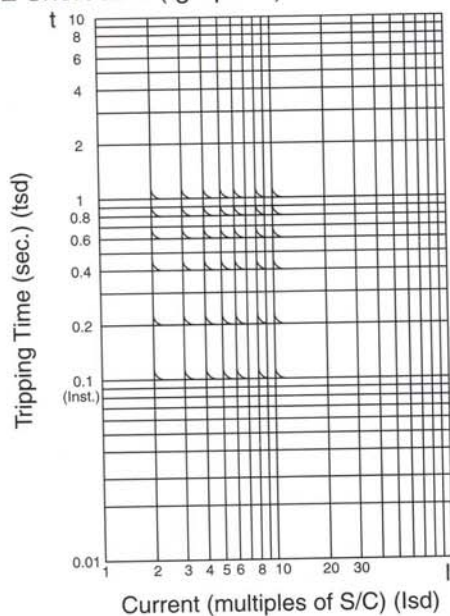
Static protection I

Tolerance on tripping time is $\pm 15\%$

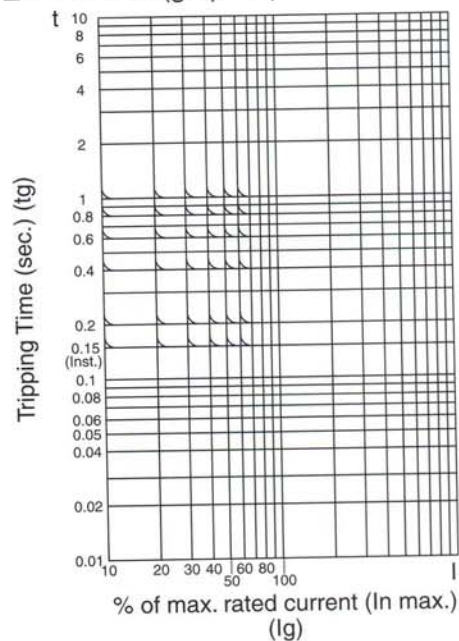
■ Long time delay (graph I)



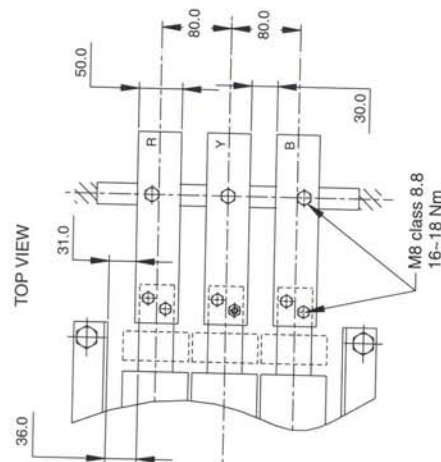
■ Short time (graph II)



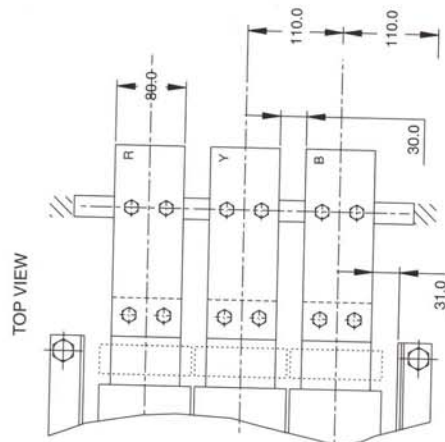
■ Earth fault (graph III)



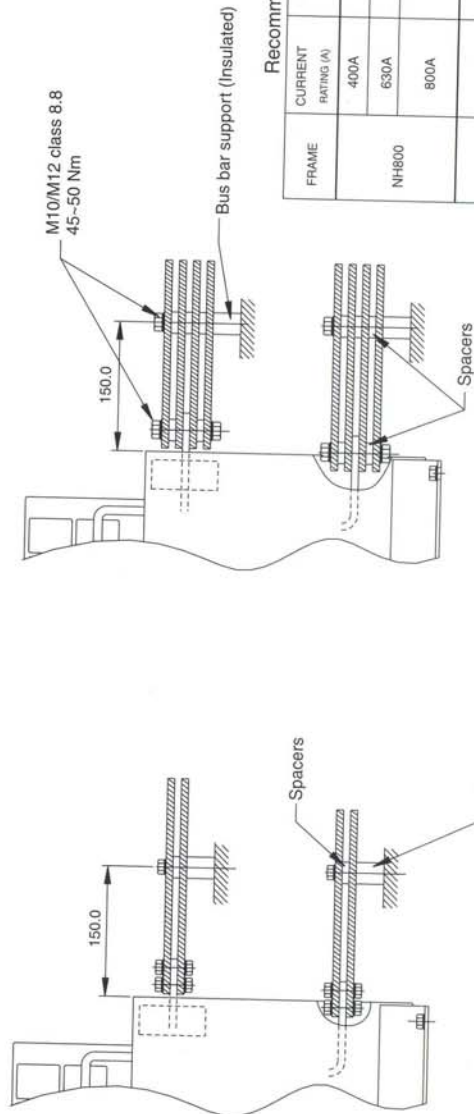
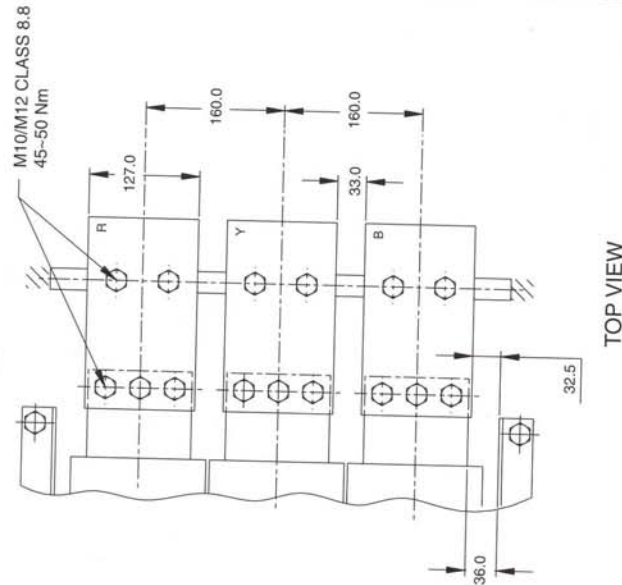
NH 800-1250



NH1600-2000



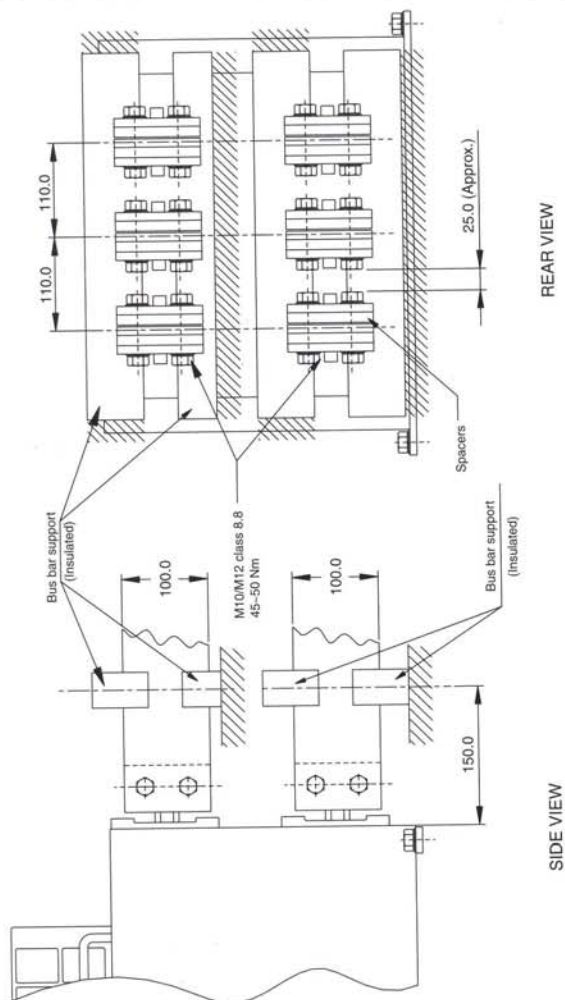
NH2500-3200



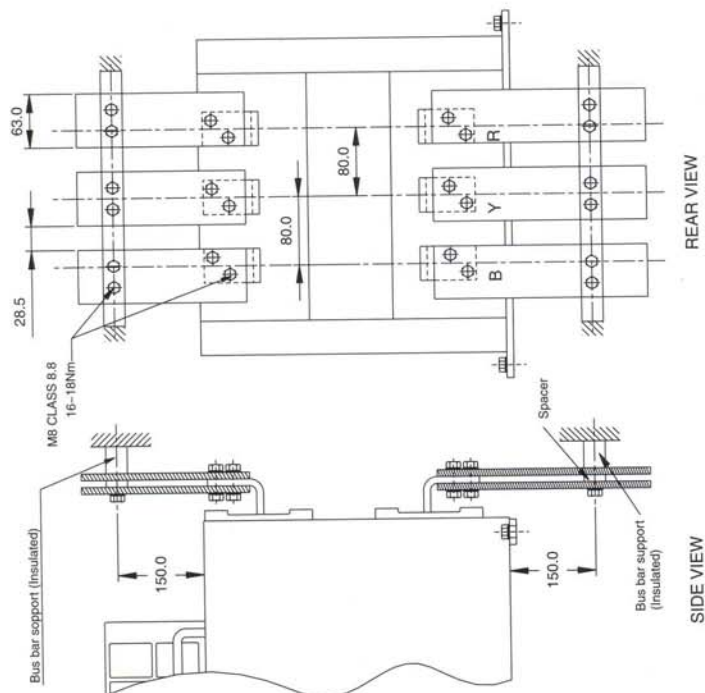
Recommended sizes of Aluminium bus bar (Fixed ACBs)

FRAME	CURRENT RATING (A)	BUS BAR SIZE (mm)	QTY/PH. (nos.)	FRAME	CURRENT RATING (A)	BUS BAR SIZE (mm)	QTY/PH. (nos.)
NH800	400A	32 X 8	2	NH1600	1600A	76 X 6	4
	630A	40 X 8	2			80 X 6	4
	800A	50 X 6 or 50 X 8	3	NH2000	2000A	76 X 10 or 80 X 10	4
NH1250	1000A	50 X 10 or 40 X 10	2	NH2500	2500A	127 X 6 or 100 X 10	6
	1250A	50 X 10	3	NH3200	3200A	127 X 6	4
		50 X 15	2			127 X 12	8

NH 1600-2000



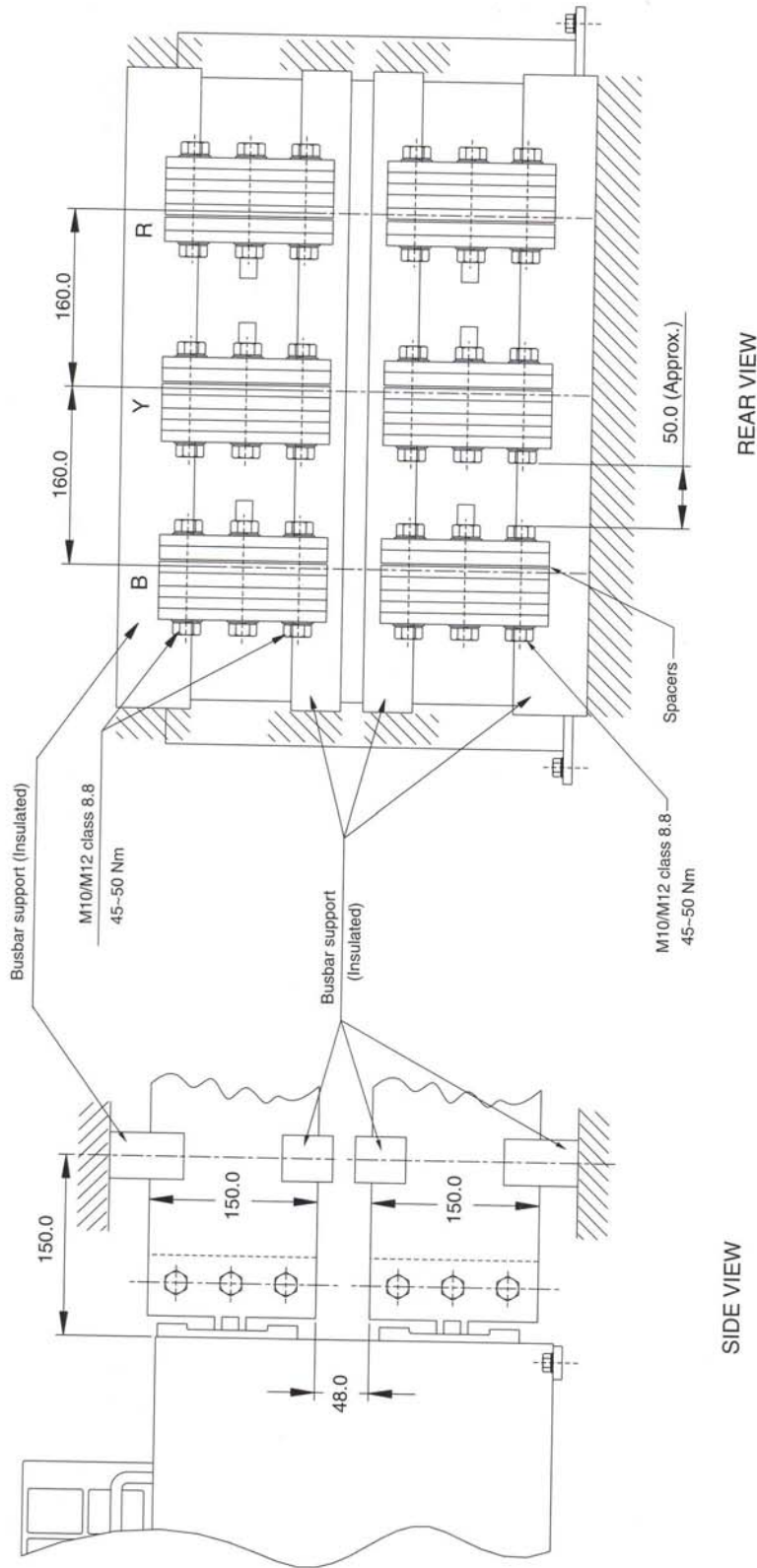
NH 800-1250



Recommended sizes of Aluminium bus bar (Draw out ACBs)

FRAME	CURRENT RATING (A)	BUS BAR SIZE (mm)	QTY./PH. (no.)	FRAME	CURRENT RATING (A)	BUS BAR SIZE (mm)	QTY./PH. (no.)
NH800	400A	32 X 8	2	NH1250	1000A	50 X 10 OR 40 X 10	2
	630A	40 X 8	2		1250A	50 X 10 OR 63 X 12	3
	800A	50 X 6 OR 50 X 8	3				2
NH1600	1600A	76 X 6 OR 80 X 6	4	NH2000	2000A	76 X 10 OR 80 X 10	4

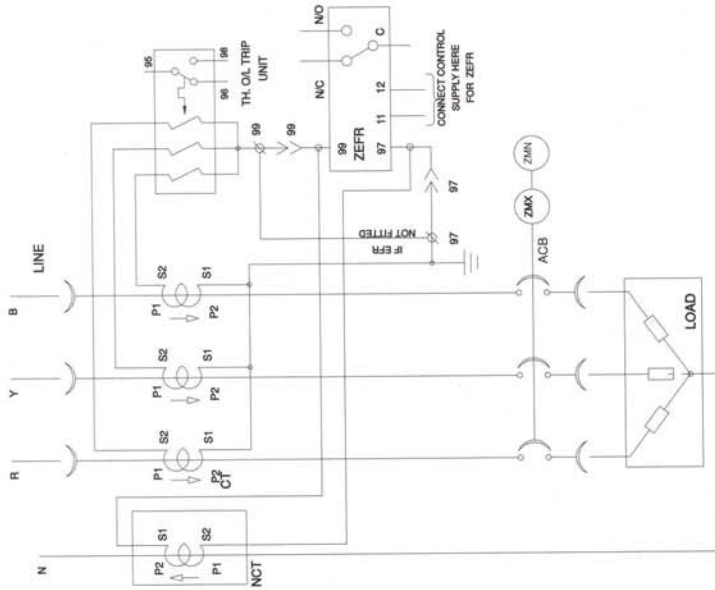
NH 2500-3200



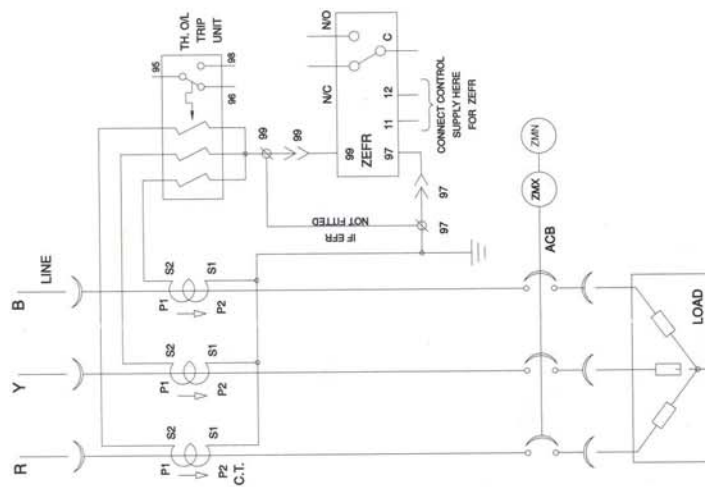
Recommended sizes of
Aluminium busbar (draw out ACBs)

FRAME	CURRENT RATING (A)	BUS BAR SIZE (mm)	QTY./PH. (no.)
NH2500	2500A	150 X 6	5
		OR 100 X 10	4
NH3200	3200A	150 X 6	7
		OR 150 X 10	4

3 PH; 4 WIRE SYSTEM



3 PH; 3 WIRE SYSTEM



CAUTION : Polarity of CTs (P1, P2, S1, S2) to be maintained as shown to avoid nuisance tripping of ACB.

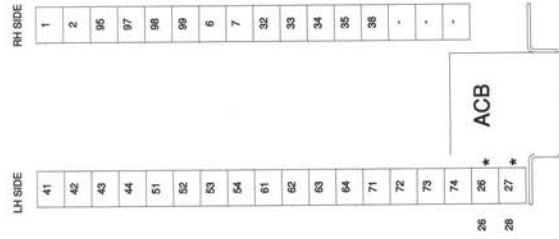
NOTES :-

- 1) All wiring shown assuming breaker is %OFF%u, spring %DISCHARGED%u.
- 2) For ZMX, ZMN, ZXF & ZMCH control wiring, refer page no. 29.
- 3) Connect supply for ZMX across 1 and 2 terminal block / sliding contact.
- 4) Connect supply for ZMN across 6 and 7 terminal block / sliding contact.
- 5) Connect supply for ZMX across 32 and 33 terminal block / sliding contact.
- 6) Connect supply for ZXF across 34 and 35 terminal block / sliding contact.
- 7) * Marked terminal block / sliding contact are OPTIONAL (as per customers requirement).
- 8) EFR (OPTIONAL) is supplied loose, to be wired as shown.
- 9) In case "LINE" is fed from bottom terminal, ensure NCT polarity is reversed.

Legend :-

Sliding contact	ACB internal wiring
Terminal block	Wiring to be done by customer

SLIDING CONTACT ARRANGEMENT FOR D/O TYPE ACBs



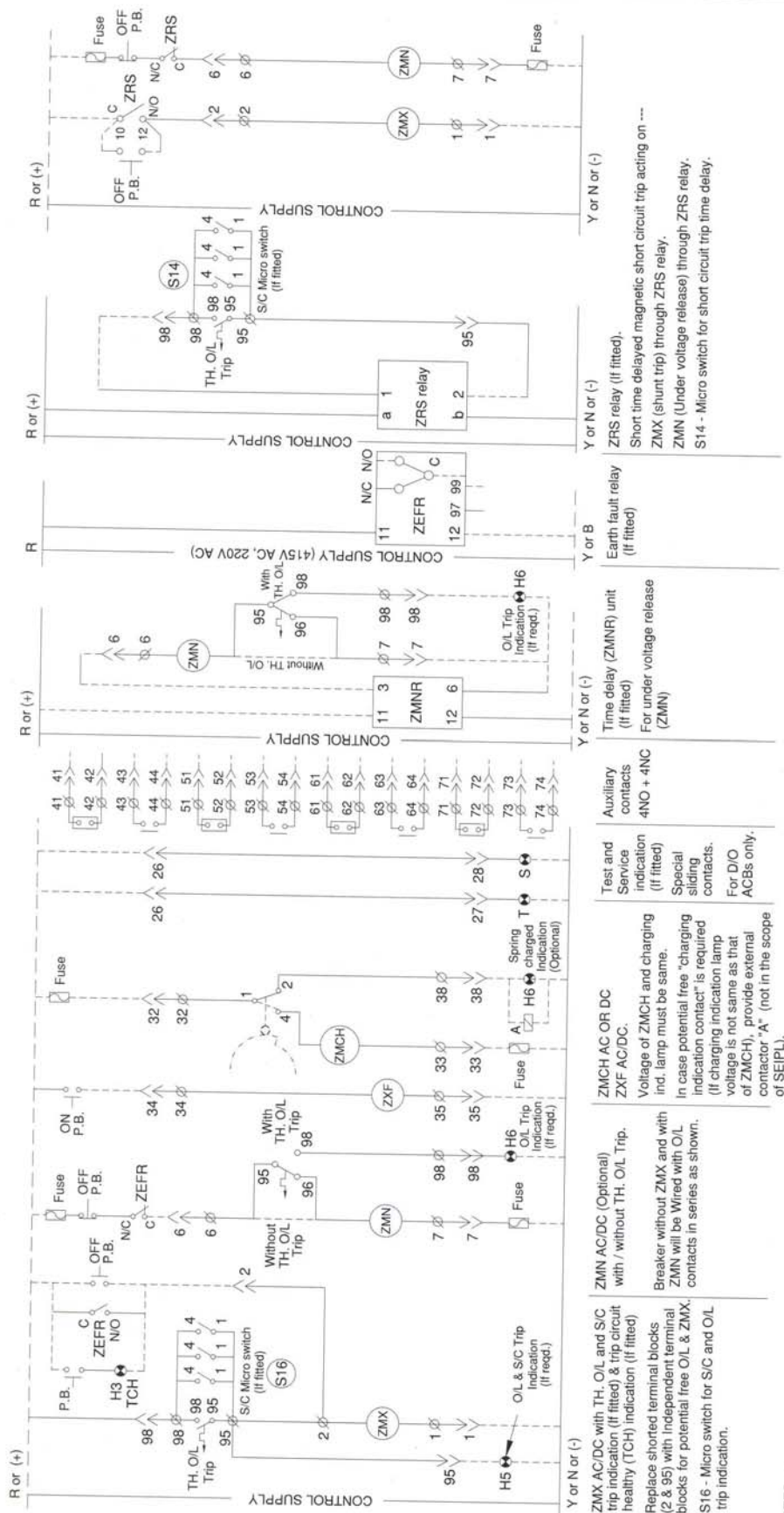
TERMINAL BLOCK CONTACT ARRANGEMENT

FOR D/O TYPE ACBs

1	2	35	37	38	6	7	32	33	34	35	38
---	---	----	----	----	---	---	----	----	----	----	----

41	42	43	44	51	52	53	54	61	62	63	64	71	72	73	74
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

For ACB with ZMX, ZMN, ZXF, ZMCH, ZEFR, ZRS, ZMNR, 4NO+4NC & O/L, S/C trip indication, Test/Service indication



NOTES :-

- 1) All wiring shown assuming breaker is OFF, spring DISCHARGED.
- 2) Optional accessories ZEFR, ZRS, ZMNR are supplied loose and to be mounted inside the panel, to be wired as shown

LEGEND:-

- Sliding contacts
Terminal block
ACB internal wiring
Wiring to be done by customer
N/O contact
N/C contact

SLIDING CONTACT ARRANGEMENT FOR D/O TYPE ACBs



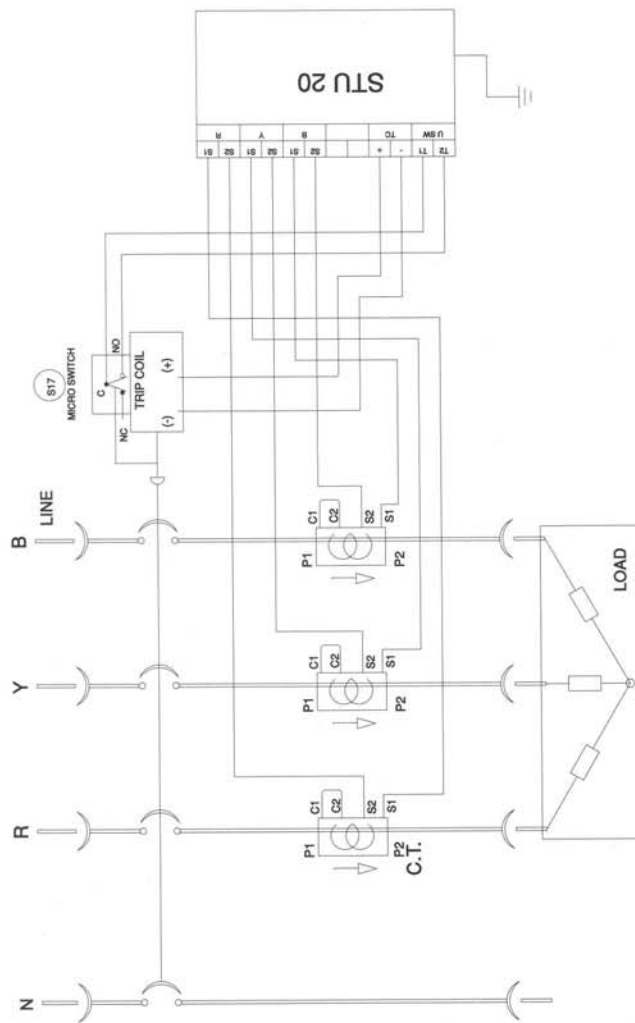
TERMINAL BLOCK CONTACT ARRANGEMENT

FOR D/O TYPE ACBs

1	2	35	37	38	6	7	32	33	34	35	36
---	---	----	----	----	---	---	----	----	----	----	----

41	42	43	44	51	52	53	54	61	62	63	64	71	72	73	74
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

For ACB with STU 20 (3Ø, 3W)



CAUTION : Polarity of CTs (P1, P2, S1, S2) to be maintained as shown to avoid nuisance tripping of ACB.

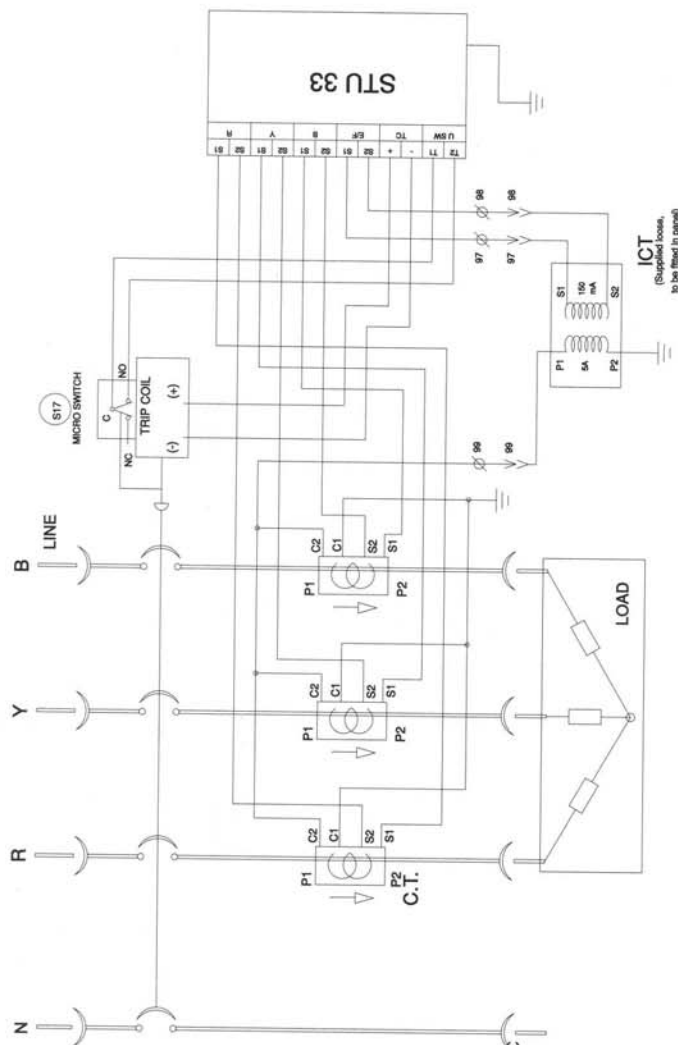
NOTES :-

- 1) All wiring shown assuming breaker is %uOFF%u, spring %uDISCHARGED%u.
- 2) For ZMX, ZMN, ZXF & ZMCH control wiring, refer page no. 44.
- 3) Connect supply for ZMN across 1 and 2 terminal block / sliding contact.
- 4) Connect supply for ZMX across 6 and 7 terminal block / sliding contact.
- 5) Connect supply for ZMCH across 32 and 33 terminal block / sliding contact.
- 6) Connect supply for ZXF across 34 and 35 terminal block / sliding contact.
- 7) * Marked terminal block / sliding contact are OPTIONAL (as per customers requirement).

Legend :-

- Sliding contact
- ACB internal wiring
- Terminal block
- Wiring to be done by customer

For ACB with STU 33 (3Ø, 3W)



CAUTION : Polarity of CTs (P1, P2, S1, S2) to be mentioned as shown to avoid nuisance tripping of ACB.

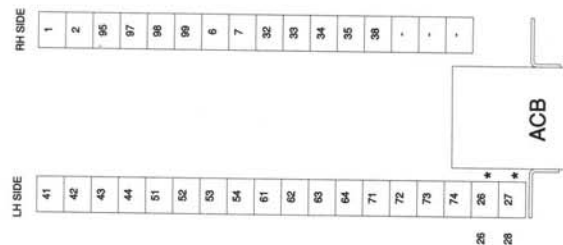
NOTES :-

- 1) All wiring shown assuming breaker is %uOFF%u, spring %uDISCHARGED%u.
- 2) For ZMX, ZMN, ZXF & ZMCH control wiring, refer page no. 29.
- 3) Connect supply for ZMX across 1 and 2 terminal block / sliding contact.
- 4) Connect supply for ZMN across 6 and 7 terminal block / sliding contact.
- 5) Connect supply for ZMCH across 32 and 33 terminal block / sliding contact.
- 6) Connect supply for ZXF across 34 and 35 terminal block / sliding contact.
- 7) * Marked terminal block / sliding contact are OPTIONAL (as per customers requirement).

Legend :-

	Sliding contact		ACB internal wiring
	Terminal block		Wiring to be done by customer

SLIDING CONTACT ARRANGEMENT FOR D/O TYPE ACBs



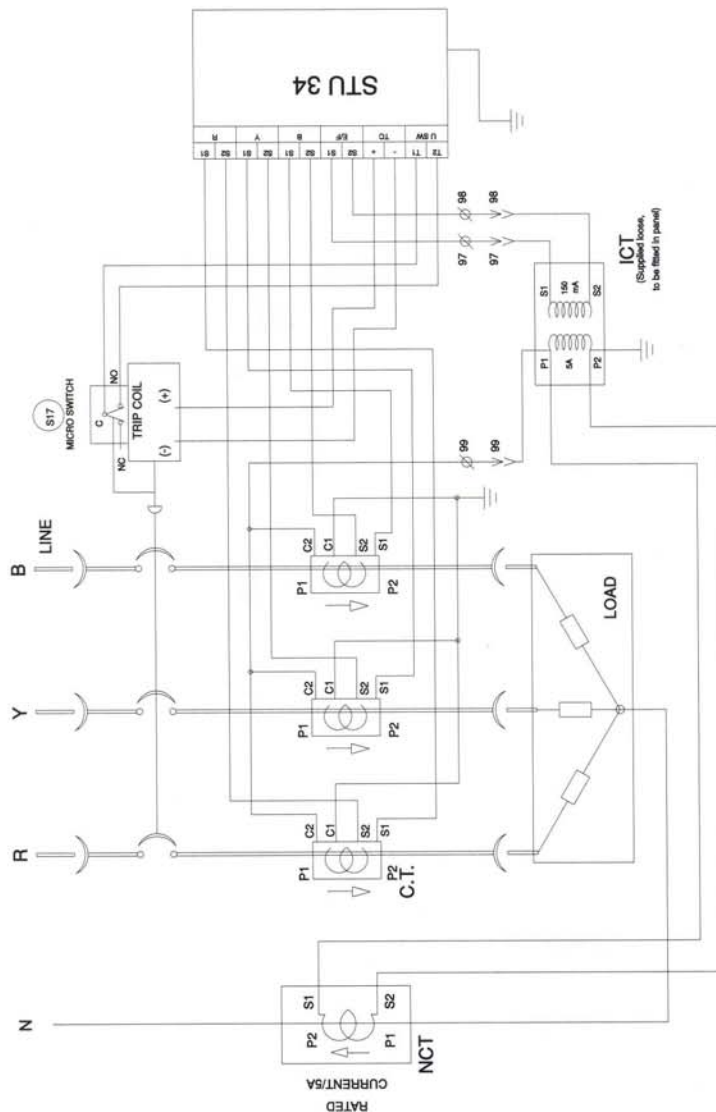
TERMINAL BLOCK CONTACT ARRANGEMENT

FOR D/O TYPE ACBs

1	2	95	97	98	99	6	7	32	33	34	35	36
---	---	----	----	----	----	---	---	----	----	----	----	----

41	42	43	44	51	52	53	54	61	62	63	64	71	72	73	74
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

For ACB with STU 34 (3Ø, 4W)



CAUTION : Polarity of CTs (P1, P2, S1, S2) to be mentioned as shown to avoid nuisance tripping of ACB.

- NOTES :-**
- 1) All wiring shown in breaker %uOFF%u, spring %uDISCHARGED%u.
 - 2) for ZMX, ZMN, ZXF & ZMCH control wiring, refer page no. 29.
 - 3) Connect ZMN supply between terminal block / sliding contact 6 and 7.
 - 4) Connect ZMX supply between terminal block / sliding contact 1 and 2
 - 5) Connect ZMCH Supply between terminal block / sliding contact 32 and 33
 - 6) Connect ZXF supply between terminal block / sliding contact 34 and 35
 - 7) * Marked terminal block / sliding contact are OPTIONAL (as per customers requirement).

Legend :-

- Sliding contact
- Terminal block
- ACB Internal wiring
- Wiring to be done by customer

SLIDING CONTACT ARRANGEMENT
FOR D/O TYPE ACBs

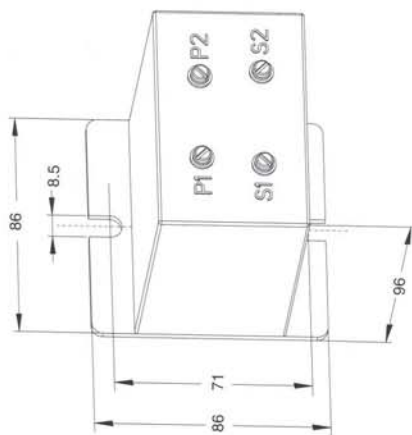


TERMINAL BLOCK CONTACT ARRANGEMENT
FOR D/O TYPE ACBs

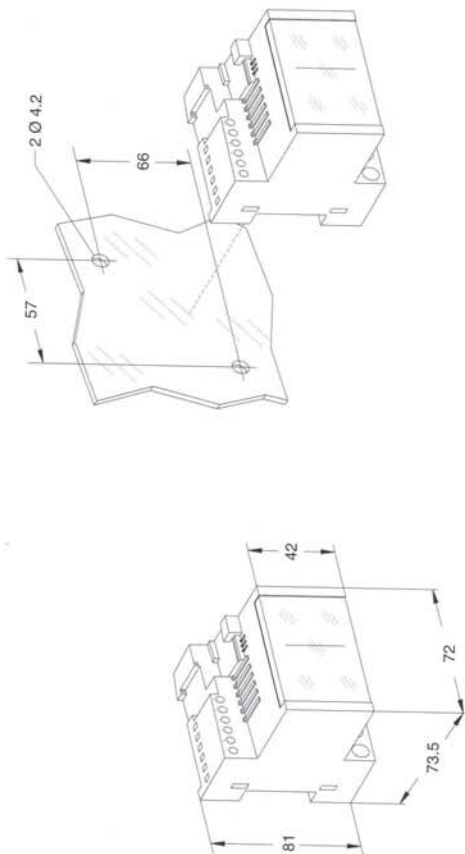
1	2	95	97	98	99	6	7	32	33	34	35	38
---	---	----	----	----	----	---	---	----	----	----	----	----

41	42	43	44	51	52	53	54	61	62	63	64	71	72	73	74
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

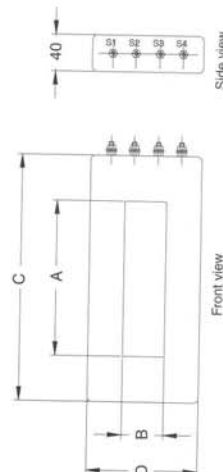
Interposing current transformer for STU 34



Delay unit for ZMN (ZMNR)

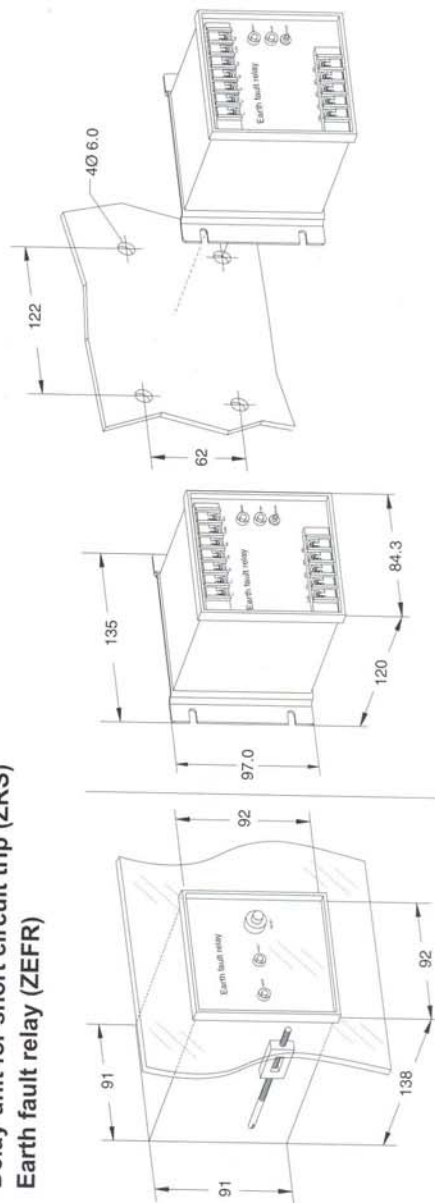


Neutral current transformer for 3ph; 4wire system



Rating	Dimension (mm)			
	A	B	C	D
400-630-800/5A	110	10	190	90
800-1000-1250/5A	110	30	190	110
1250-1600-2000/5A	210	45	310	120

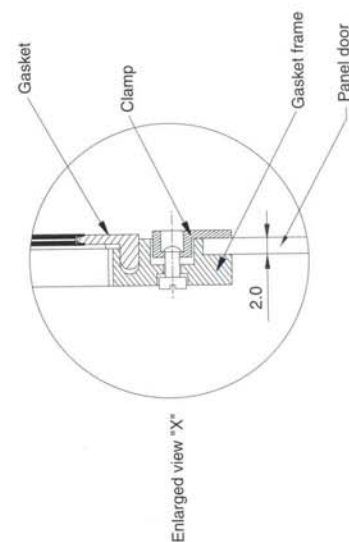
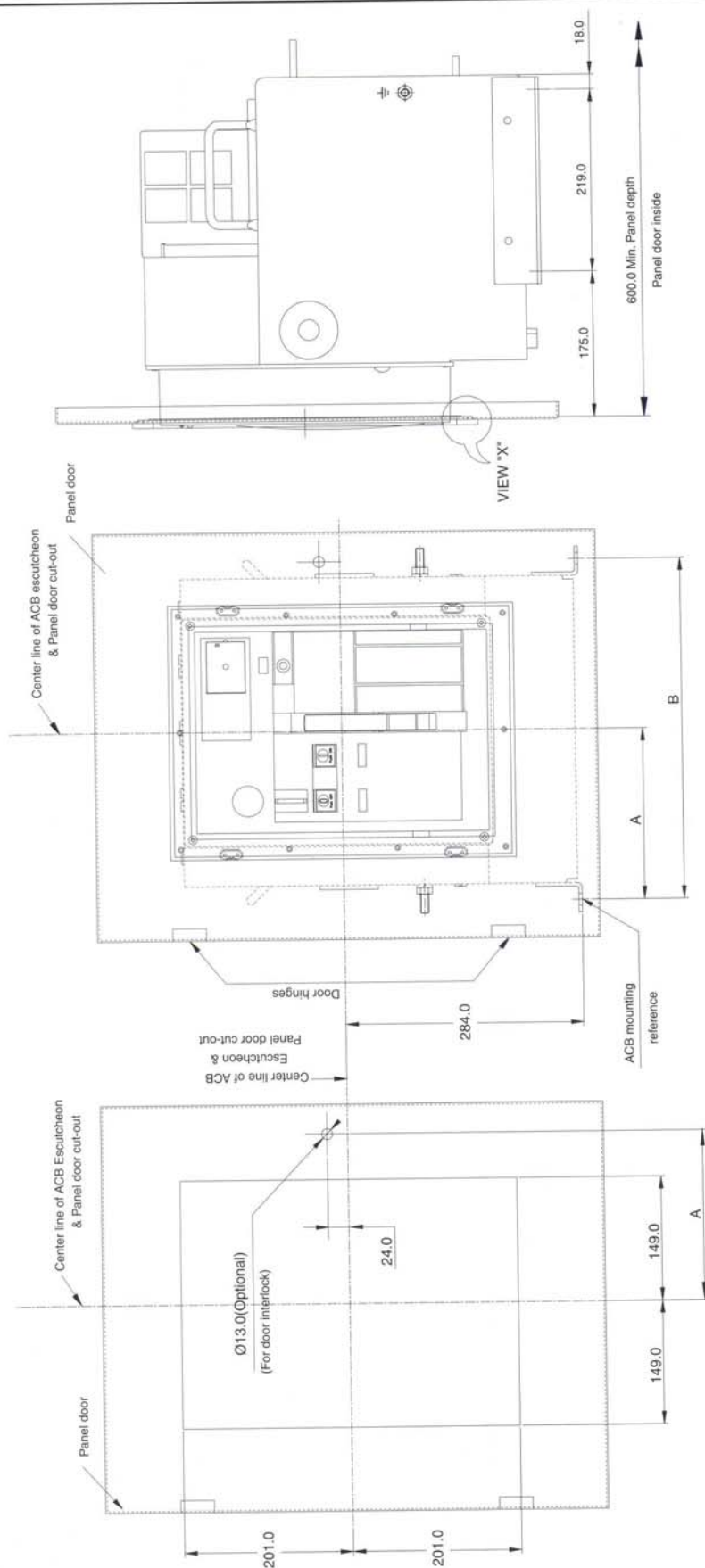
Delay unit for short circuit trip (ZRS)
Earth fault relay (ZEFR)



Door mounting

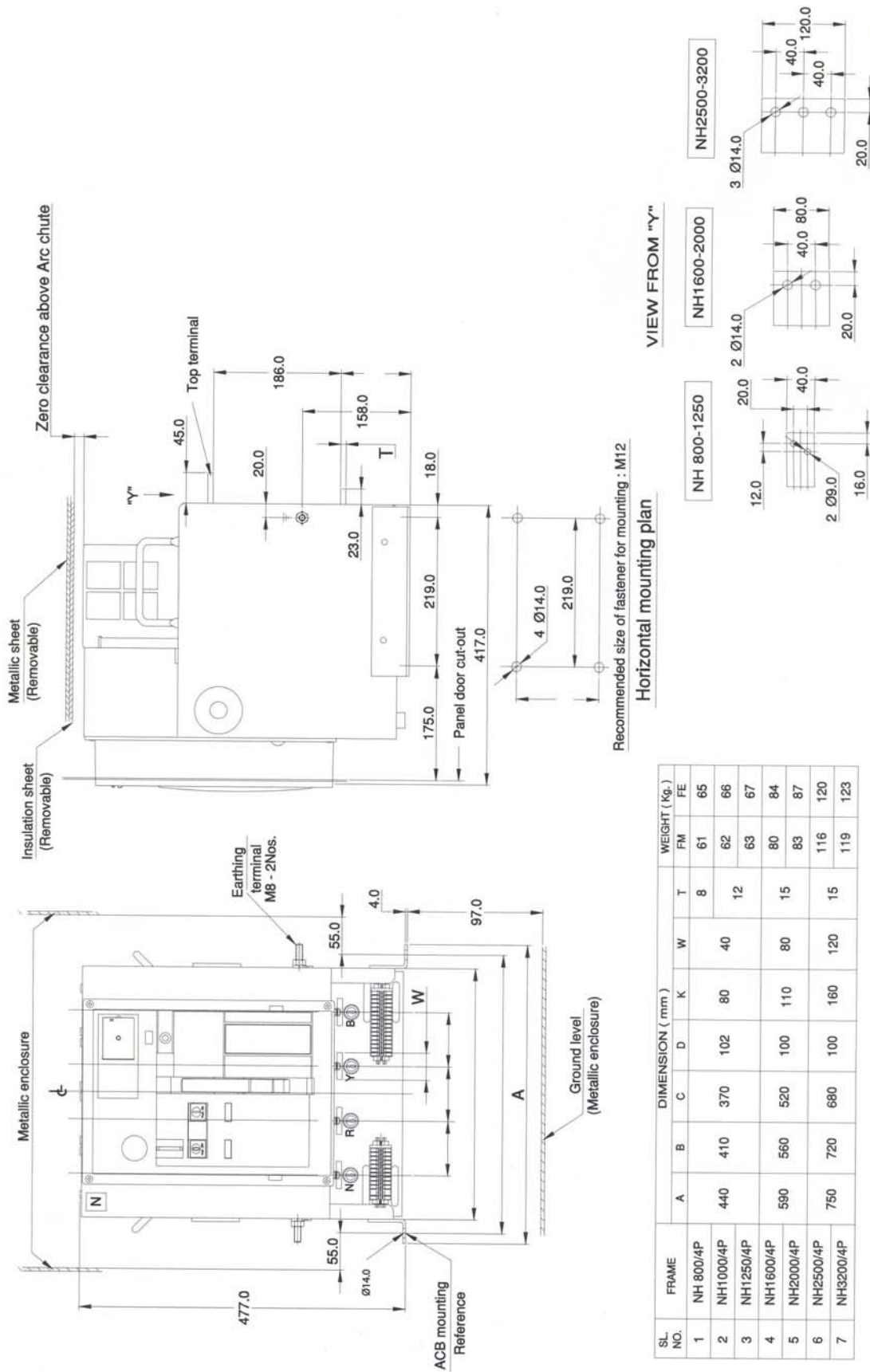
Base mounting

Panel door cut-out for NH800-3200/3P & 4P, fixed ACBs.



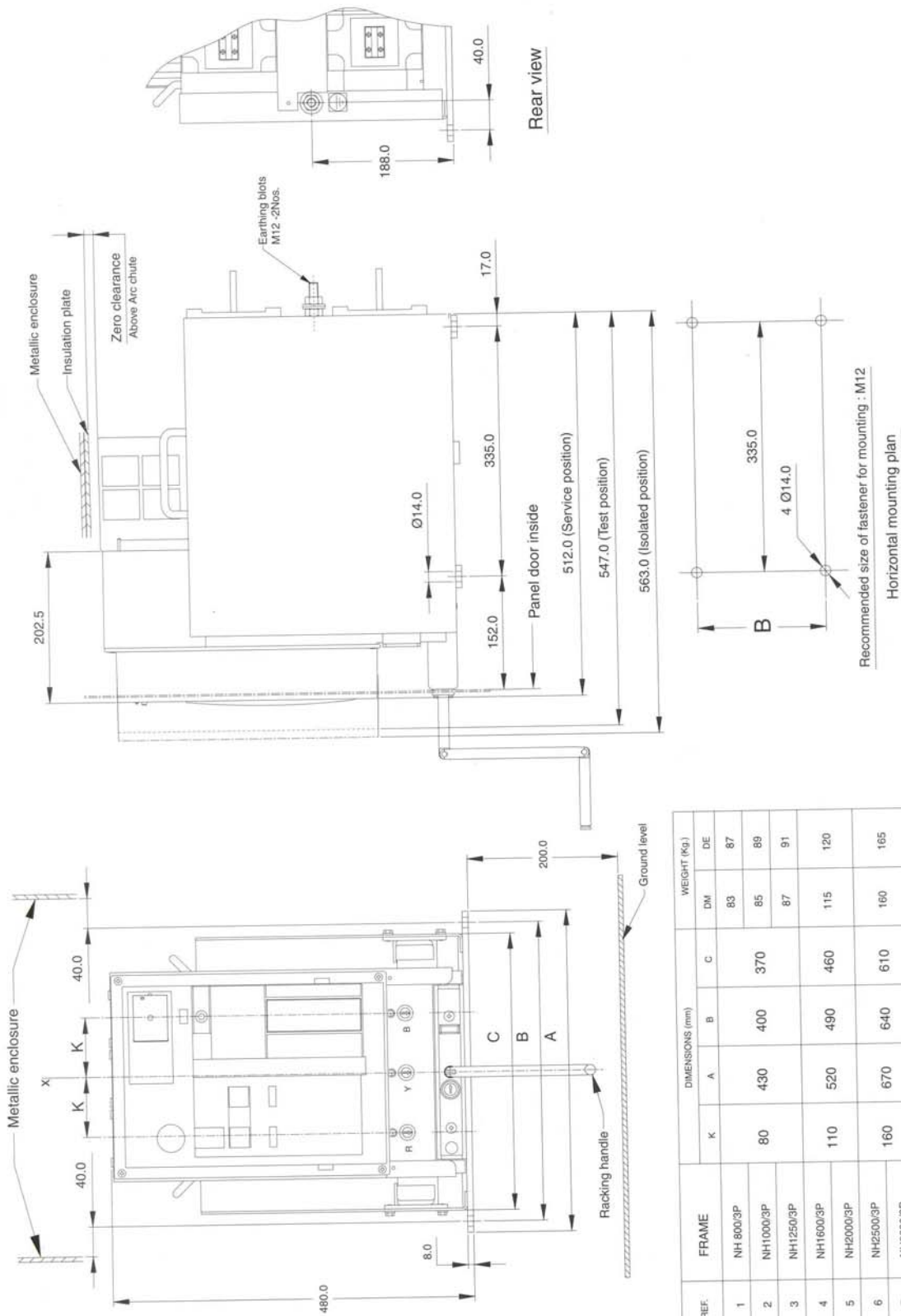
REF.	FRAME	DIMENSIONS (mm)	
		A	B
1	NH 800-1250/3P	160.0	320.0
2	NH 800-1250/4P	205.0	410.0
	NH1600-2000/3P		
3	NH1600-2000/4P	280.0	560.0
	NH2500-3200/3P		
4	NH2500-3200/4P	360.0	720.0

Overall dimensions, mounting plan, safety clearances & terminal arrangement 4P fixed ACBs.



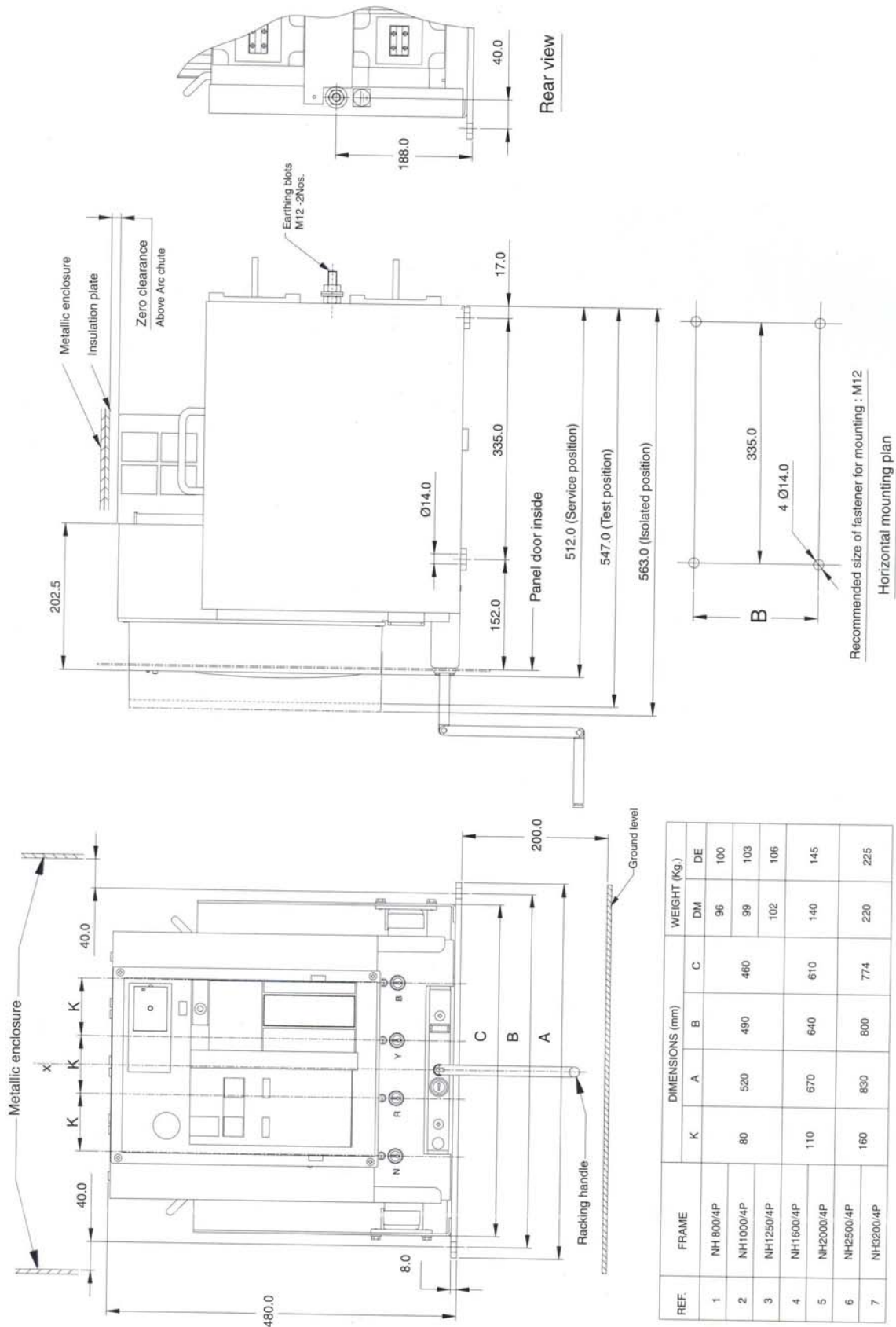
SL. NO.	FRAME	DIMENSION (mm)							WEIGHT (Kg.)		
		A	B	C	D	K	W	T	FM	FE	
1	NH 800/4P	440	410	370	102	80	40	8	61	65	
2	NH1000/4P								62	66	
3	NH1250/4P							12	63	67	
4	NH1600/4P	590	560	520	100	110	80	15	80	84	
5	NH2000/4P								83	87	
6	NH2500/4P	750	720	680	100	160	120	15	116	120	
7	NH3200/4P								119	123	

Overall dimensions, mounting plan & safety clearances for 3P draw out ACBs.

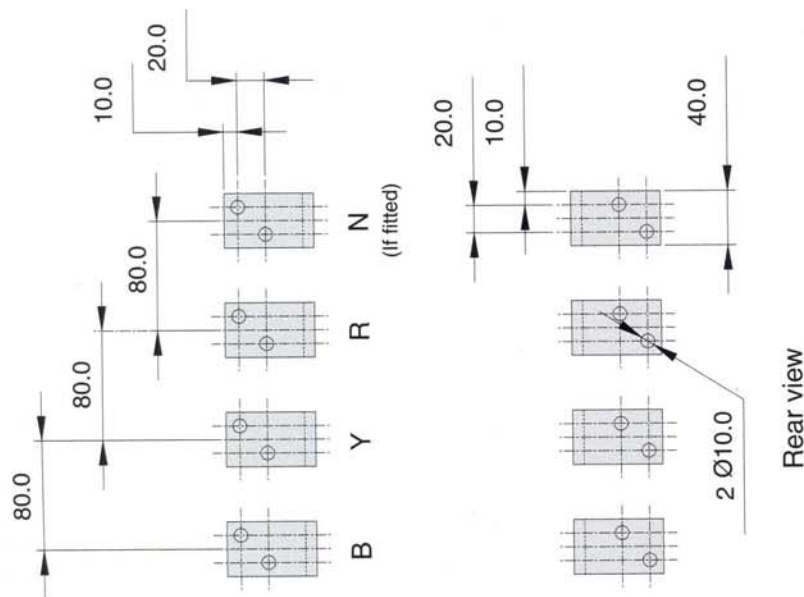


REF.	FRAME	DIMENSIONS (mm)			WEIGHT (Kg.)	
		K	A	B	C	DE
1	NH 800/3P					87
2	NH1000/3P	80	430	400	370	89
3	NH1250/3P					91
4	NH1600/3P	110	520	490	460	120
5	NH2000/3P					
6	NH2500/3P	160	670	640	610	165
7	NH3200/3P					

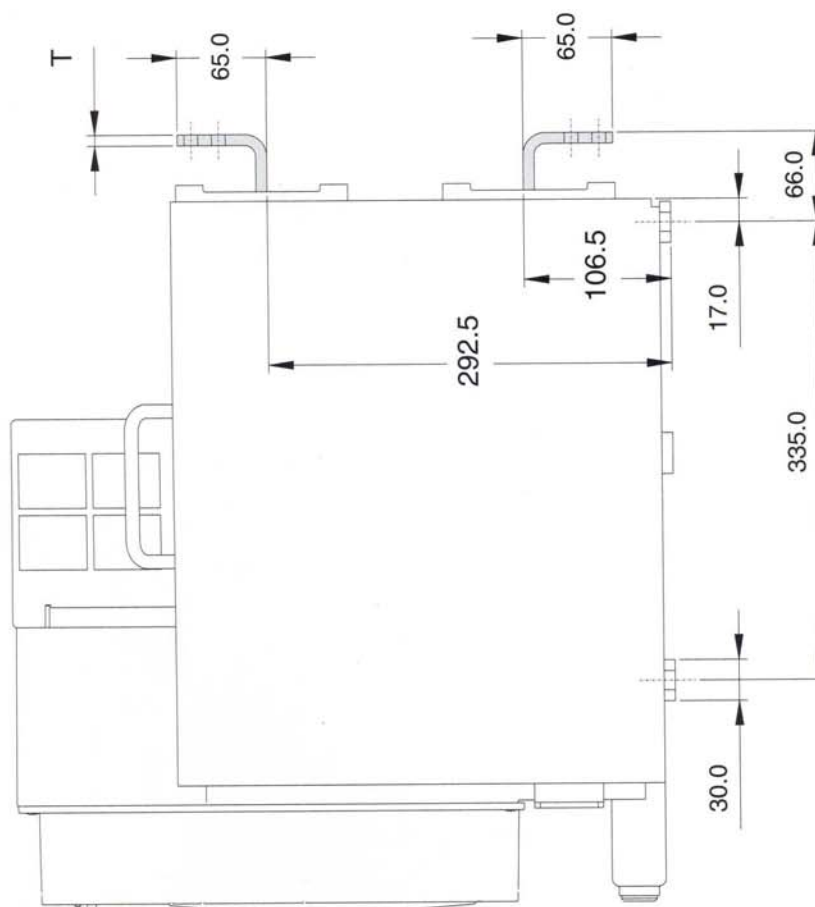
Overall dimensions, mounting plan & safety clearances for 4P draw out ACBs.



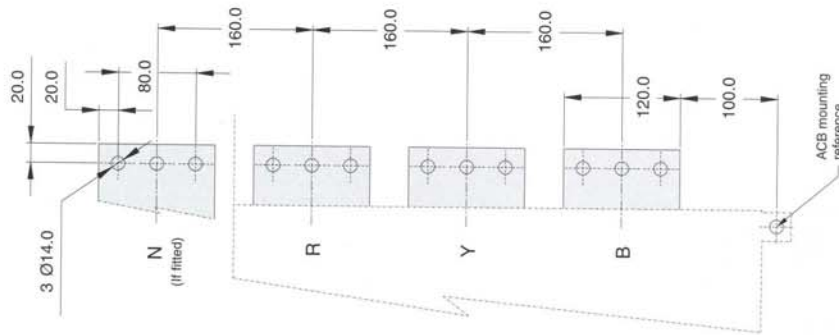
Terminal arrangement (F type) NH 800-1250/3P & 4P draw out ACBs.



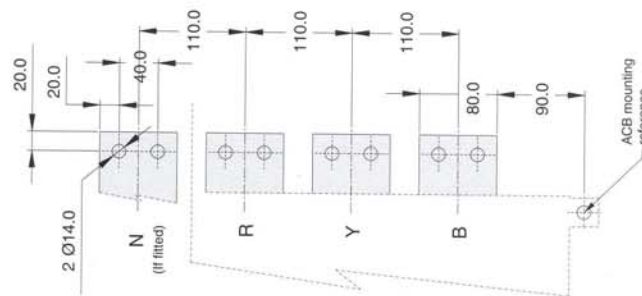
REF.	FRAME	DIM.N.T
1	NH 800	8.0
2	NH1000	12.0
3	NH1250	12.0



Terminal arrangement (H type) NH 800-3200/3 & 4P, draw out ACBs.

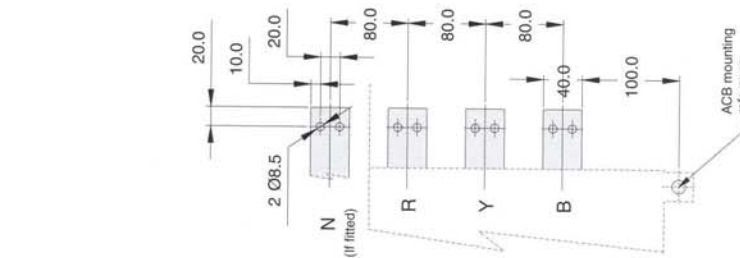


NH2500-3200

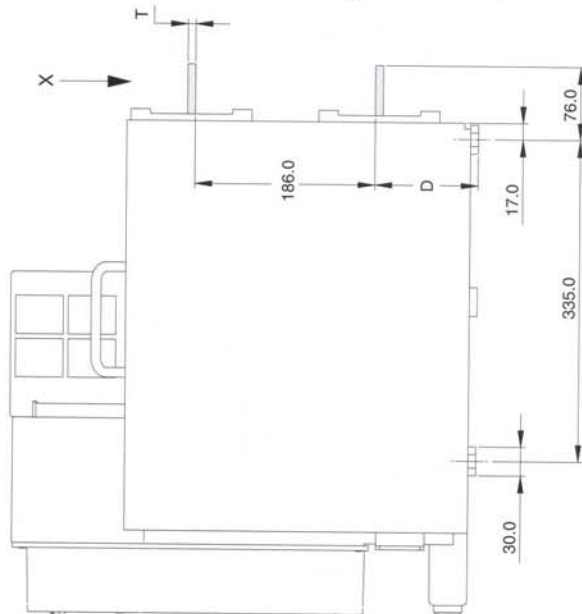


NH1600-2000

View from (X)

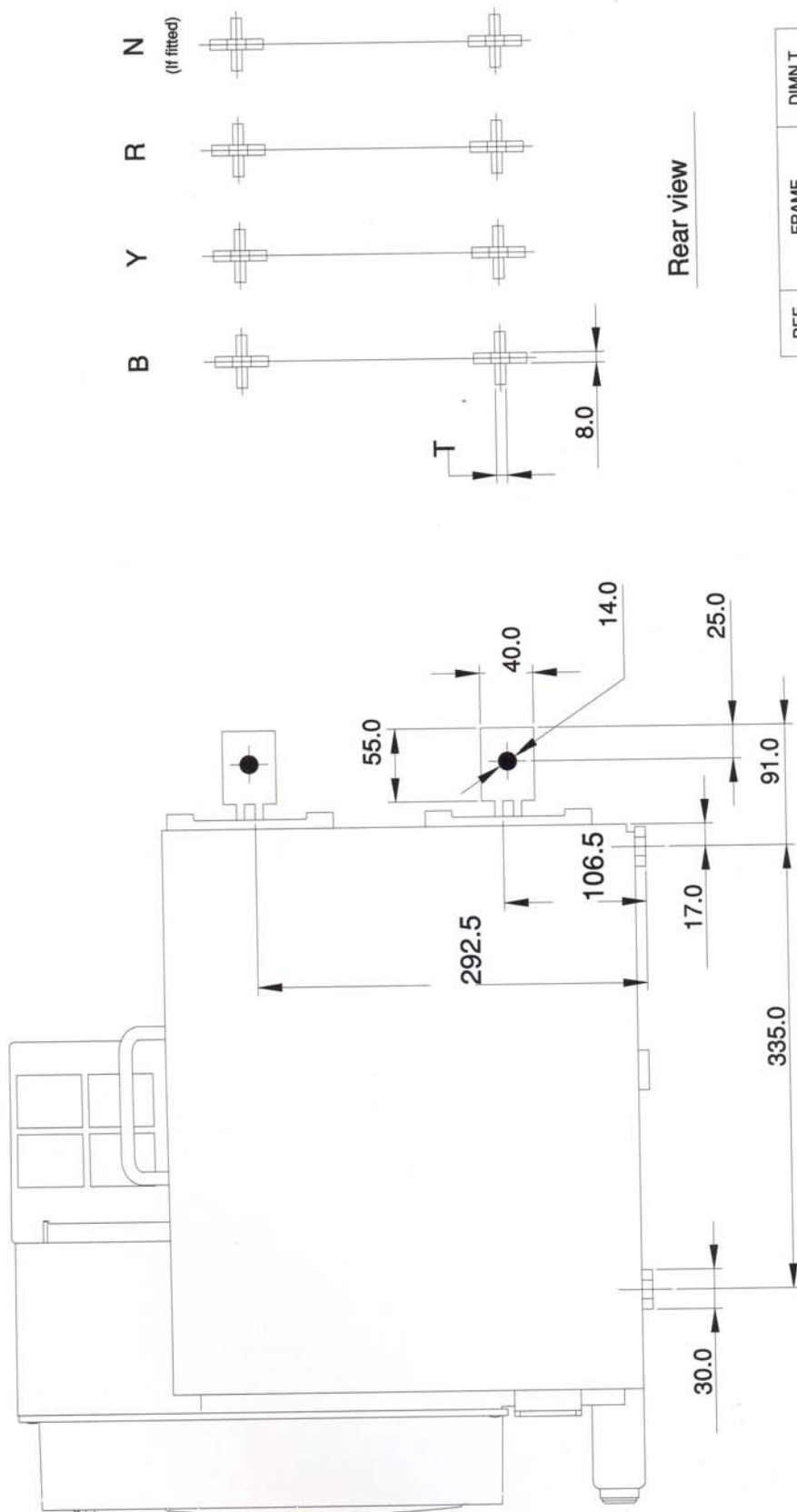


NH 800-1250



REF.	FRAME	DIMENSION (mm)	
		D	T
1	NH 800	106.5	8
2	NH1000-1250		12
3	NH1600-2000	104.5	15
4	NH2500-3200		

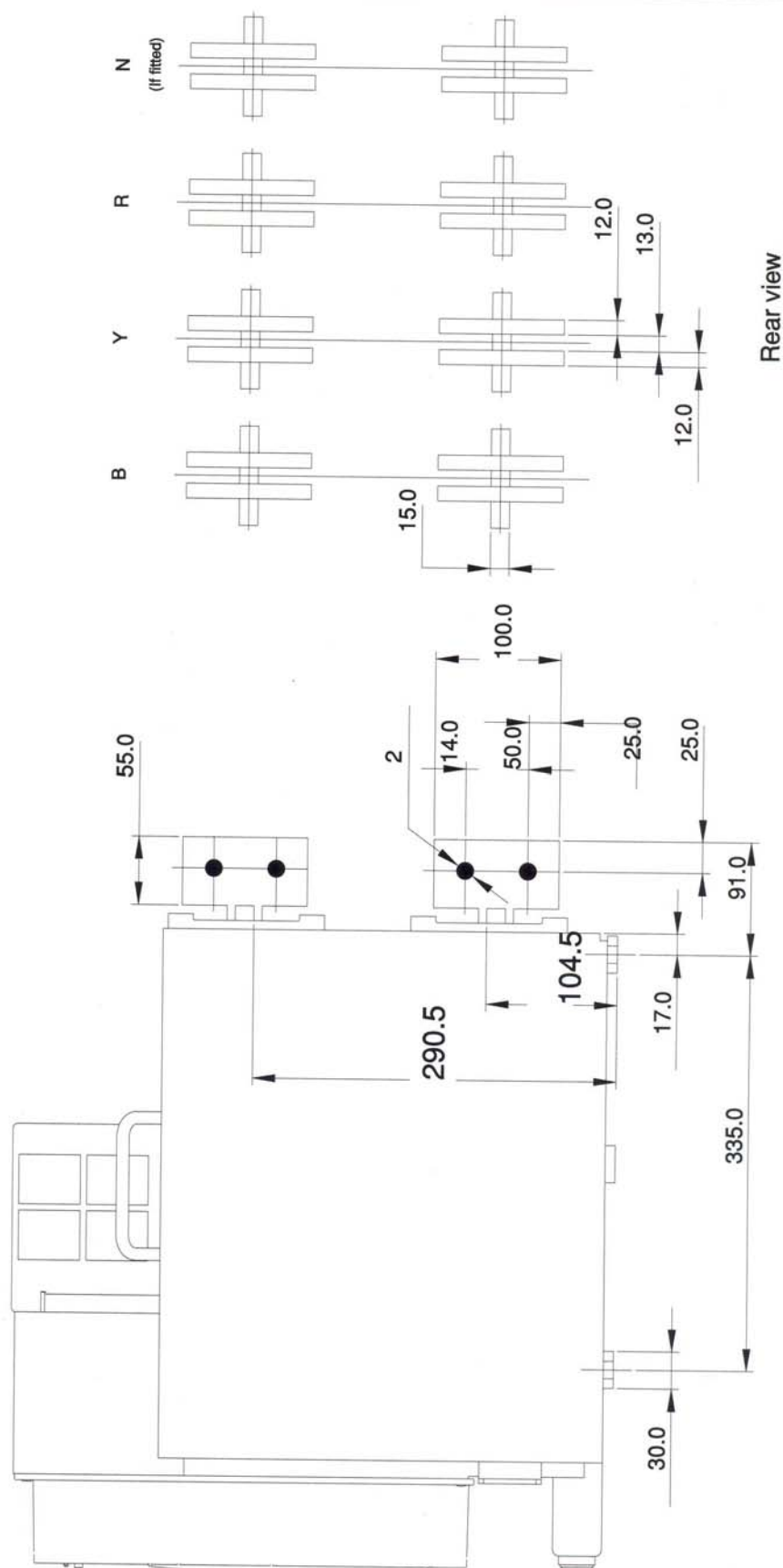
Terminal arrangement (V type) NH 800-1250/3P & 4P draw out ACBs.



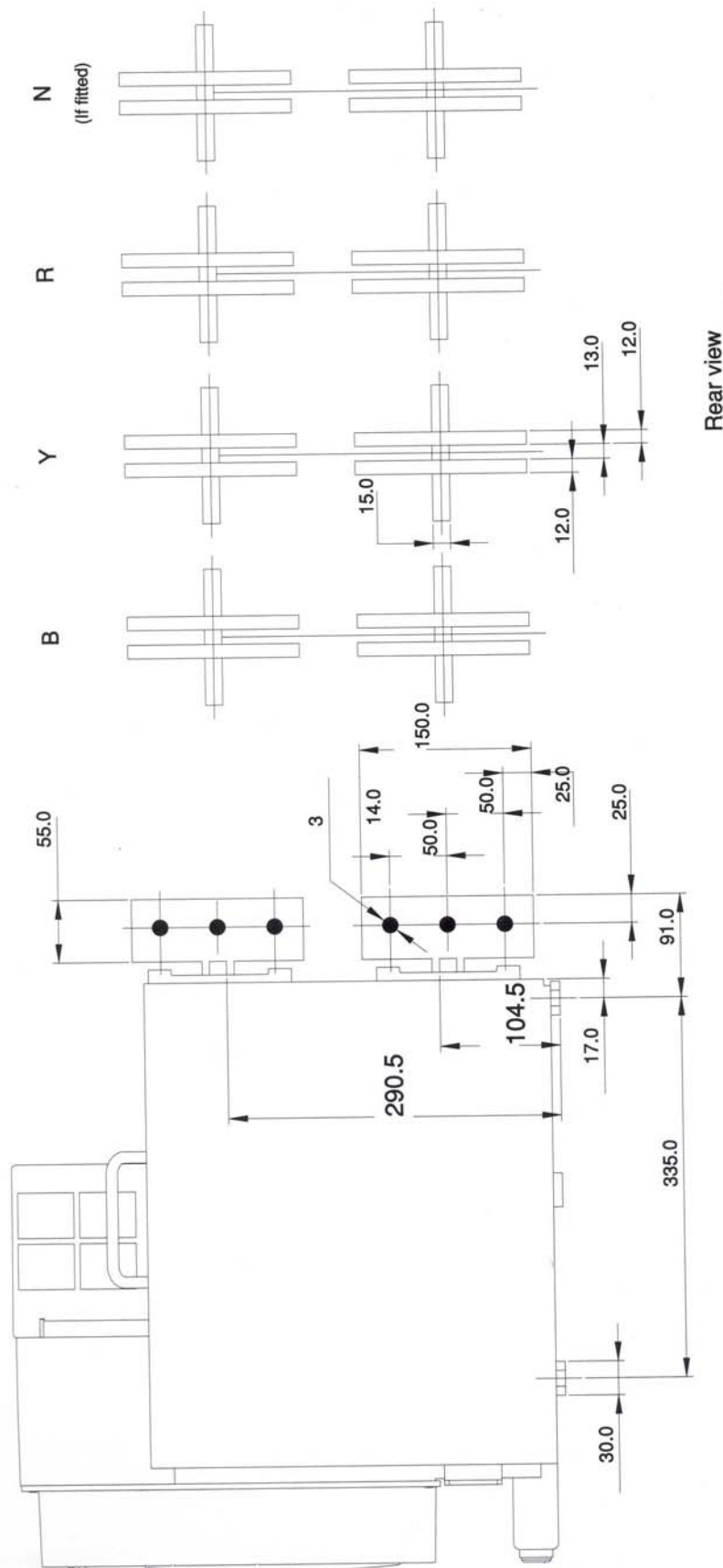
Rear view

REF.	FRAME	DIMN.T
1	NH 800	8.0
2	NH1000	12.0
3	NH1250	

Terminal arrangement (V type) NH1600-2000/3P & 4P draw out ACBs.



Terminal arrangement (V type) NH2500-3200/3P & 4P draw out ACBs.



ORDER FORM

SAMPLE ACB ORDER FORM

1. CIRCUIT BREAKER

- 1.1 Quantity :
1.2 Frame :
1.3 Number of poles :
1.4 Sensor rating : A
1.5 Version : Fixed type ☐ Type H
: Draw out type ☐ Type F (Available as std. for NH800-1250)
☐ Type H (Available as optional for NH800-1250)
☐ Type V (Available as std. for NH1600-3200)
(Available as optional for NH800-1250)
1.6 Charging mechanism : ☐ Manual
☐ Electrical Motor (ZMCH) V AC/DC
Closing coil (ZXF) V AC/DC

2. PROTECTION

- 2.1 ISOLATOR ☐
2.2 THERMAL MAGNETIC ☐
Short circuit protection : ☐ Instantaneous ☐ Electrical trip indication
☐ Time delayed with ZRS relay ☐ 40 ms (fixed) V AC/DC
☐ 40-460 ms (adj.) V AC/DC
Earth fault protection : ☐ 3Ph 3Wire 415 V
☐ 3Ph 4Wire ☐ 415 V AC ☐ 240 V AC
2.3 STATIC RELEASE : ☐ STU20 (O/L & S/C)
☐ STU33 (O/L, S/C & E/F 3ph 3 wire) ☐ Microswitch for STU for
☐ STU34 (O/L, S/C & E/F 3ph 4 wire) Common fault indication

3. ELECTRICAL AUXILIARIES

- 3.1 Shunt release (1st position) (ZMX1) V AC/DC (Mandatory for thermal magnetic ACB)
3.2 Shunt release (2nd position) (ZMX2) V AC/DC (Optional)
3.3 Under voltage release (ZMN) ☐ Instantaneous V AC/DC
☐ Time delayed with ZMNR V AC/DC
(delay time settable at 0.5, 1, 1.5 & 3 secs.)
3.4 Contact block for Test, Service, Isolated position indication
3.5 Closing coil for manual ACB (ZXF) V AC/DC

4. MECHANICAL ACCESSORIES

- 4.1 Door Interlock ☐ 4.2 Operational counter
4.3 Castle Lock with key ☐ Define key letter (A, B, C, -B, C-, AB, CB, CD, -D)
4.4 Padlock ☐
4.5 Padlock & Castle lock combination ☐ Define key letter (A, B, C, -B, C-, AB, CB, CD, -D)
4.6 Transparent cover for push button locking ☐
4.7 Chassis position locking device ☐ 4.8 Safety shutter lock ☐

Shunt release is provided as standard for thermal magnetic ACB

Separate order form to be filled up for ACBs with different configurations.

All ACB orders have to be accompanied by filled-in order form for registration. To be filled up with Schneider Electric Sales Engineer.

Schneider Electric India Pvt. Ltd. (A 100% subsidiary of Schneider Electric Industries SAS)

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