Electro-Mechanical Relays

* High Speed Trip Lock out Relays (CLR-A)
* Remote Reset Relays (with both CAR-A / CLR-A)
* Auxiliary Relays (CAR-A)

Introduction :

The Auxiliary relay CAR-A and CLR-A series are voltage operated single element electro-mechanical, hinged armature type relay, mainly used in protection, control and alarm circuits.

These relays are provided with option of hand reset, self reset and remote reset.The flag of both CAR-A and CLR-A are hand operated and remote reset relays areauto reset.

Application :

The Auxiliary relays are used in various application such as: -

- Switching functions in protection and control circuits
- High speed tripping functions requiring a number of simultaneous switching operation.
- Control with interlocks and inter tripping

Features & Characteristics :

- Suitable for tripping, signaling in protection and control system
- Consistent repeated accuracy
- High resistance to shock and vibration
- Flexible & user friendly contacts arrangement as per customer selection from ordering information
- Self as well as Hand reset contacts
- Hand reset flag indication
- High speed operation
- Elegant & Ergonomics design
- Durable & Reliable operations
- Silver alloy contacts

Health & Safety

⚠ Before carrying out any work on the equipment the user should be familiar with the contents of this safety section and the ratings on the equipments rating label.

When electrical equipment is in operation, dangerous voltages will be present in certain parts of the equipment. Failure to observe warning notices, incorrect use or improper use may endanger personnel and equipment and cause personal injury or physical damage.

Proper and safe operation of the equipment depends on appropriate shipping and handling, proper storage, installation and commissioning and on careful operation, maintenance and servicing. For this reason only qualified personnel may work on or operate the equipment.

Installing Servicing & Commissioning

⚠ Equipment connections

Personnel undertaking installation, commissioning or servicing work for this equipment should be aware of the correct working procedures to ensure safety.

The equipment documentation should be consulted before installing, commissioning or servicing the equipment.

Terminals exposed during installation, commissioning and maintenance may present a hazardous voltage unless the equipment is electrically isolated.

Design :

The design of electro-mechanical relays is hinged armature type.

It has been ensured to have consistent electrical & magnetic qualities while designing the Armature, Yoke and the core materials.

The coil is wound with wires of high thermal rating to with stand the problems of over heating due to continuous operation. It is also ensured that the coil though rated for the very short time will tolerate the high burden to ensure the faster operation.The relay contacts will ensure the supply is cut off at a very short time.

The contacts have been designed with silver alloy to have superior contact rating with minimum wear and tear. It is also ensured in the design and construction the contact pressure is maximum to ensure superior contact rating. The contact spring is designed with superior phosphor-bronze spring quality material to have the flexible movements.

In case of high speed trip relays one break contact is connected in series with the relay elements as a cut-off contact. This reduces the burden and saves the power from the battery. The flag is always hand reset. The relay with self reset contacts may be provided without flag also.

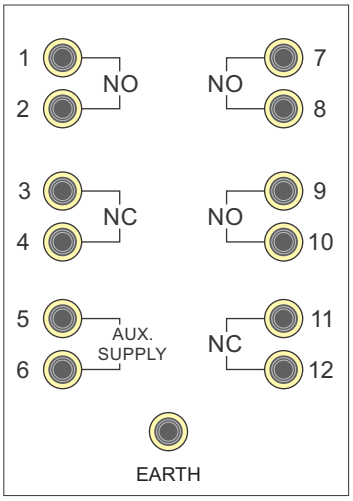
Connection Diagram :

Connection diagram of supplied relay will be as per ordered relay and a sticker of connection diagram is pasted on the top side of the supplied relay itself.

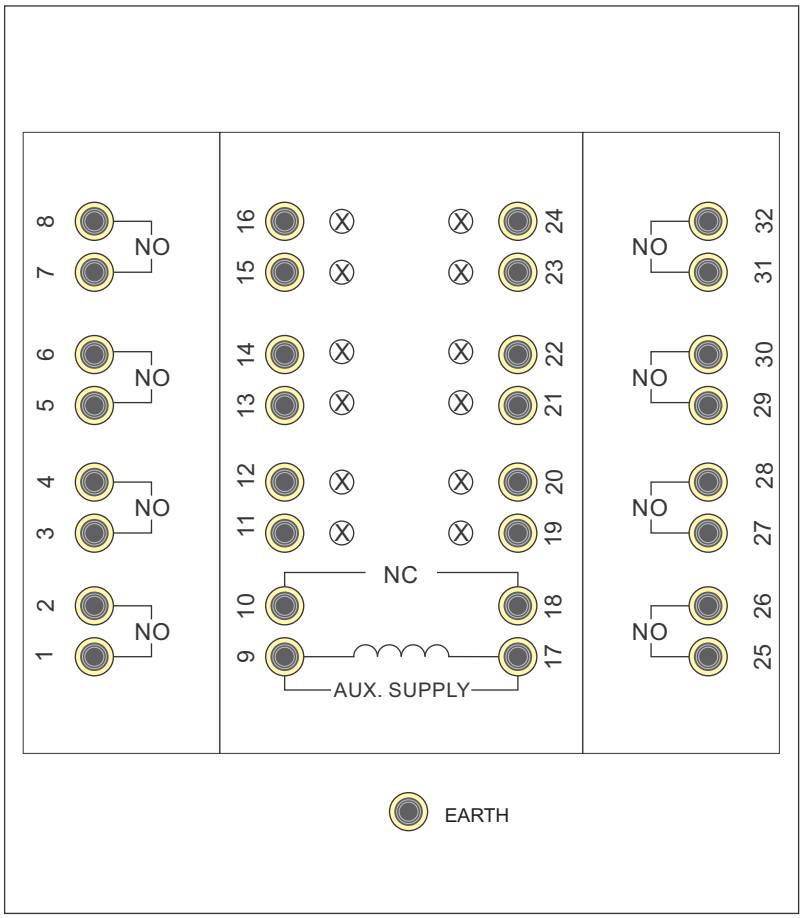
RISK OF ELECTRIC SHOCK

TERMINAL ARRANGEMENT VIEWED FROM REAR

(e.g. 1 : 3 NO + 2 NC)



(e.g. 1 : 8 NO + 1 NC)



⊗ NOT CONNECTED

Technical Specifications :

Type	:	CLR-A / CAR-A
Design	:	Flush mounting plastic case
Duty	:	Continuous operation
Rated Voltage	:	DC : 24V, 30V, 48V, 110V, 220V AC : 24V, 63.5V, 110V, 230V
Operating Voltage Range *	:	35% to 120% of Rated voltage
Pickup Voltage	:	35 to 70% of Rated voltage * Operating Voltage Range starts from Actual Pickup voltage observed.
Burden	:	Depends upon series / type of relay, operating voltage, number of contacts and number of elements. For example the burden of CAR-A relay with 24V DC and 3 NO / 2 NC contacts in single element is < 10 Watts. Also another example of CLR-A relay with 24V DC and 3 NO / 2 NC contacts in single element is < 60 Watts. Refer burden table separately for burden of individual relays.
Operating Time	:	CLR-A : < 10 milli Sec at rated voltage
	:	CAR-A : < 20 milli Sec at rated voltage
Flag	:	Hand / Electrical reset mechanical flag
Insulation	:	2KV RMS, 50Hz for 1 min/2.5KV for 1 sec between all terminals & case as per IS:3231 and 1 KV RMS, 50Hz for 1 min across open contacts.
Contact configuration	:	As per product ordering code
Connection Cables	:	PVC insulated cable cross section area ≤ 4 sq. mm

Environmental requirements and ranges

- Operating Temperature	:	-10 deg to +55 deg Celsius
- Storage Temperature	:	-25 deg to +70 deg Celsius
- Humidity,	:	Max. 95% RH non condensing
- Atmospheric pressure	:	86 - 106 kPa
IP rating	:	Front : IP 54, Back : IP 42
Pollution degree	:	PD2
Insulation class	:	Class I
Mounting position	:	Flush mount
Protective earthing	:	Protective earthing terminal is separately provided in the terminal block
Ventilation requirements	:	Natural air ventilation

Contact Rating (Switching Capacity) :

	AC	DC
Make & carry continuously	1250 VA AC within limits of 660V & 5A	1250 Watts DC within limits of 660V & 5A
Make & carry for 3 sec	7500 VA AC within limits of 660V & 30A	7500 Watts DC within limits of 660V & 30A
Break	1250 VA AC within limits of 250V & 5A	100 Watts (resistive) 50Watts (inductive) (L/Ratio=0.04) within limits of 250V & 5A

Installation :

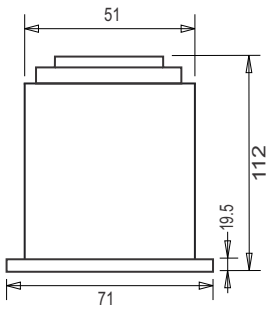
The electro mechanical relays are flush mounted and are installed in the panel cut out as per the cut out size shown in outline dimensions.

Outline Dimensional Details :

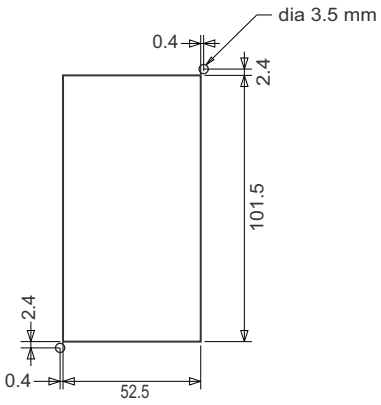
All the dim are in mm (Gen. Tol : +1 mm)

Single Element (Small Size Enclosure) Relay

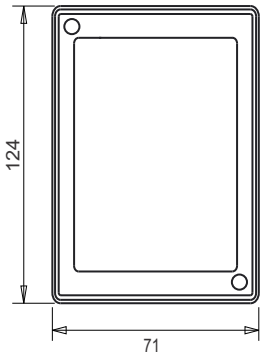
Top View



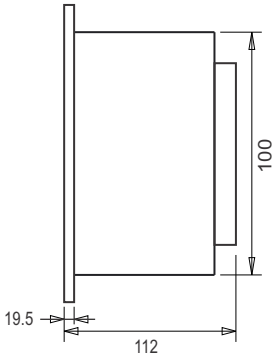
Panel cut out dimensions



Front View

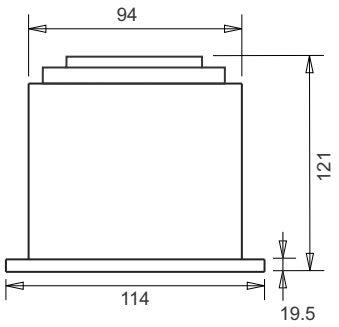


Side View

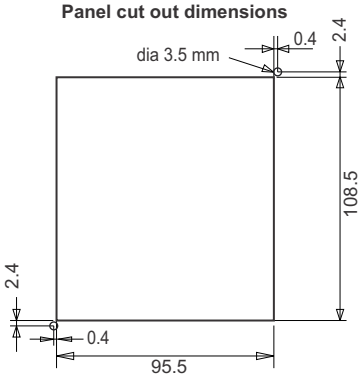


Single Element (Medium Size Enclosure) Relay

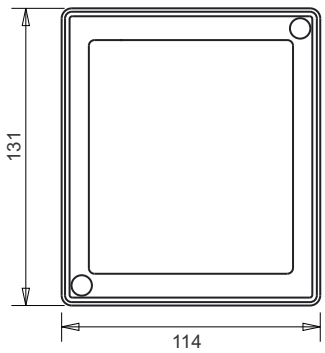
Top View



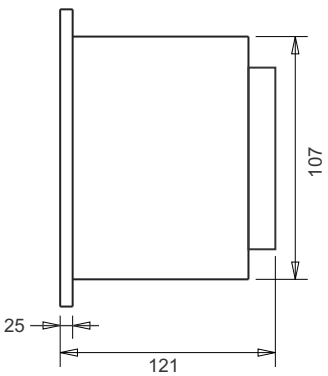
Panel cut out dimensions



Front View

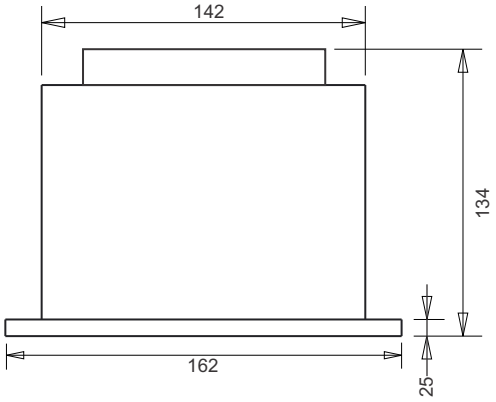


Side View

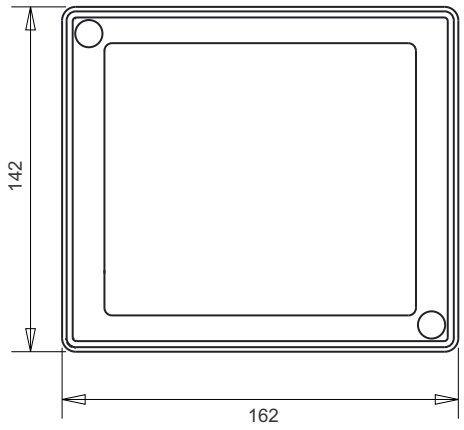


Three Element / Remote Reset (Large Size Enclosure) Relay

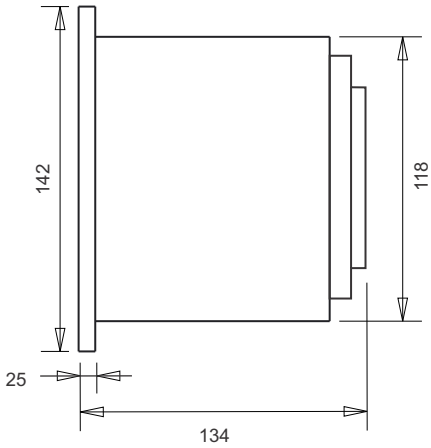
Top View



Front View

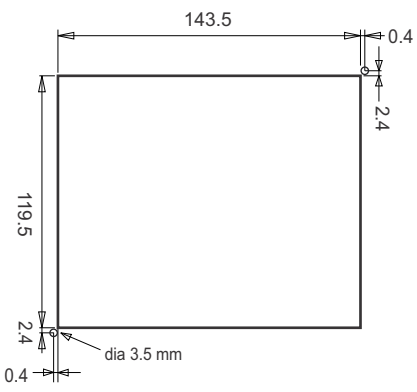


Side View



Panel cut out dimensions

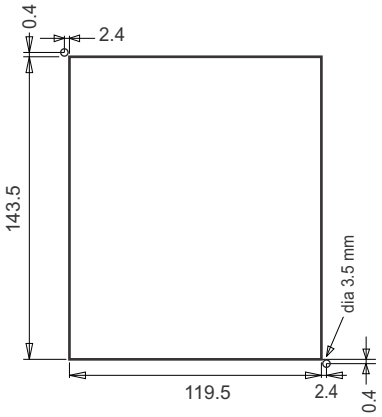
For Manual Reset Relays : In 2 or 3 elements, (keeping the 143.5 mm length in **Horizontal** direction).



For Large Enclosure (Horizontal mounting)

Panel cut out dimensions

For Manual Reset Relays : In 1 element and for **Electrical Reset Relays**, (keeping the 143.5 mm length in **Vertical** direction).



For Large Enclosure (Vertical mounting)

Ordering Information :

Model No. : XXX-A - X - XXXXXX - X - XXOYC - X - X - XX - XX

MODEL
CLR-A
CAR-A

RESET
S : Self Reset
H : Hand Reset
E : Electrical (Remote) Reset

Aux Power Supply DC Rating	
024VDC	: 24Volts DC
030VDC	: 30Volts DC
048VDC	: 48Volts DC
110VDC	: 110Volts DC
220VDC	: 220Volts DC
Aux Power Supply AC Rating	
63.5VAC	: 63.5Volts AC
110VAC	: 110Volts AC
230VAC	: 230Volts AC

ELEMENTS
1 : Single Element
2 : Two Elements
3 : Three Elements

CONTACTS
XXOYC

FLAG
N : Normal
R : Reverse

ENCLOSURE TYPE
S : Small size enclosure
M : Medium size enclosure
L : Large size enclosure

TERMINAL SHROUD
NS: Terminals not shrouded
TS : Terminals shrouded

TRIP COIL SUPERVISION
WS : Trip relay with supervision terminal
WO : Relay without supervision terminal

XXX-A - X - XXXXXX - X - XXOYC - X - X - XX - XX

EXAMPLE 1 : CAR-A - H - 110VDC - 1 - 03O2C - N - S - TS - WS

Relay CAR-A type, Hand reset, 110V DC, Single element, Contacts 3 NO / 2 NC & Normal flag in small enclosure with shrouded and supervision terminal

EXAMPLE 2 : CAR-A - S - 110VDC - 3 - 06O6C - N - L - NS - WO

Relay CAR-A type, Self reset, 110V DC, Three element, Contacts 6 NO / 6 NC & Normal flag in large enclosure with terminal not shrouded and without supervision terminal

Maximum number of contact pairs possible in various types of relay in our enclosures:

Relay Type	Small size enclosure (one element)	Medium size enclosure (one element)	Large size enclosure (one element)	Large size enclosure (two elements)	Large size enclosure (three elements)
CAR relays	7 pairs	8 pairs	10 pairs	12 pairs	12 pairs
CLR relays	7 pairs	7 pairs	9 pairs	10 pairs	12 pairs
Electrical reset relays	N.A	N.A	8 pairs	N.A	N.A
CLR hand reset relays with coil supervision terminals	6 pairs	7 pairs	9 pairs	10 pairs	9 pairs
Electrical reset relays with coil supervision terminals	N.A	N.A	8 pairs	N.A	N.A

Explanation of multiplication of elements contacts in more than one element per relay:

If it is required to use three elements & each element has say 2NO & 2NC contacts, then the total contacts required in the relay will be 3 x 2NO & 2NC = 6NO & 6NC.

Thus the code for such a three element relay will be for example CAR-A-H-024VDC-3-6O6C-N-L

Similarly the code for such a two element relay will be for example CAR-A-H-024VDC-2-4O4C-N-L

Similarly the code for such a one element relay will be for example CAR-A-H-024VDC-1-2O2C-N-S

NOTE : 1) All CLR-A-E models are available in large enclosure only.

2) Ordering code CLR-A-E-024VDC-1-3O2C-N-L-TS-WS is available in large enclosure only

NOTE

The content in this document are not binding and is for general information.
C&S reserves the right to change the design, content or specification contained in this document without prior notice.

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Revision History

S.No.	Rev.No.	Description	Date
01	01	Change in introduction & features & characteristics, include application heading	26.11.17
02	02	Panel cut out details of all 3 types of model	29.11.17
03	03	Include one more conn. diagram for 3 NO + 2 NC on page 2	12.06.18
04	04	Change in ordering information	17.08.18
05	05	Include page for the explanation of the Aux relay enclsoures	16.04.19
06	06	Add Features, burden details in Technical specification & change in ordering info	08.08.19
07	07	Change in flag heading of tech specification on page 3, Max no. of contact pairs on page 5	09.12.19
08	08	Change in Technical specs of the catalog	09.09.20
09	09	Three element Panel cut out view added / changed in the catalog	29.12.20
10	10	Single element Panel enclosure total depth dim changed on page 3 from 111 to 112 mm	29.05.21
11	11	Change in Max no. of contact pair for CAR relay from 6 to 5	20.08.21
12	12	Include Manual/Operating Instruction on page 4	23.10.21
13	12	Include Safety Instruction on page 1	23.10.21
14	13	Panel cut out description for three element on page 5 changed	27.01.22
15	14	Burden describing words delete & change, Panel cut out dimensions 1 or 2 change to 2 or 3, Small enclosure number of contact increase to 7 and put bracket in elements, Adding NS and TS for not shrouded and shrouded relay respectively.	03.03.22
16	15	change in ordering information and its details	21.03.22
17	16	Add text ``e.g.1 : 8 NO + 1 NC`` in Terminal arrangement viewed from rear of page 2	22.04.22
18	16	Change in Technical specification burden op. time on page 3 & max no. of contacts on page 7	22.04.22
19	17	Removed word vertical from **Technical specifications**---> **Mounting position**	16.05.22
20	18	Change in operating range of Technical Data on page3	18.10.22
21	19	On 1st page catalog heading Auxiliary Relays change to Electro-Mechanical Relays	30.03.23
22	20	Included **Pickup voltage** line in Technical specification	28.01.25
23	21	On Page 3 of Tech specification, Change in Pickup voltage from 35 to 50% of rated voltage to 35 to 70% of rated voltage On Page 3 of Tech specification, Included line "* Operating Voltage Range starts from Actual Pickup voltage observed".	19.03.25