

## ELECTRO-MECHANICAL RELAYS

- LEIOS SERIES**
- LOCK OUT RELAY
  - CONTACT MULTIPLIER
  - DRAW-OUT / NON DRAW-OUT
  - ELECTRICAL / HAND / SELF RESET



LEIOS-22



LEIOS-10



LEIOS-6

**PMD Division**

We touch your **electricity** everyday!

**Introduction :**

The LEIOS series relays are voltage operated electro-mechanical, hinged armature type relays, mainly used in protection, control and alarm circuits. These relays are provided with option of hand reset and remote reset.

**Design :**

The design of LEIOS series 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 withstand the problems of over heating due to continuous operation. It is also ensured that the coil of high speed trip will tolerate the high burden to ensure the faster operation though rated for the 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 that the contact pressure is maximum to ensure superior contact rating. The contact spring is designed with 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 disconnects the burden and saves the power from the battery.

**Features & Characteristics :**

- Electro-mechanical design in fully draw-out / non draw-out enclosure.
- Suitable for tripping, signaling in protection and control system.
- High resistance to shock and vibration.
- Flexible and user friendly contacts arrangement as per customer selection from ordering information.
- Remote as well as Hand reset flag indication.
- High Speed operation.
- Silver Alloy contacts.
- Durable & Reliable operations.
- Elegant & Ergonomics design.
- Minimum 4 to 22 pairs of contacts.
- DIN dimensions.
- High speed trip lock out relays.
- Electrically remote reset relays.
- Contact multiplier.

**Technical Specifications :**

Type : LEIOS Series Electro-Mechanical relays.  
 Design : Flush mounting Poly carbonate plastic enclosure, Draw-out or Non Draw-out.  
 Duty : Continuous operation.  
 Rated Voltage (Un) : DC : 24V, 30V, 110V, 220V, 250V  
 AC : 24V, 30V, 48V, 110V, 220V, 230V, 250V  
 Operating Voltage Range \* : (1) Trip 40% to 120% Un Electrical Reset : 60% to 120% Un  
 OR  
 (2) Trip 80% to 120% Un Electrical Reset : 60% to 120% Un  
 Pickup Voltage : (1) Trip = 40% to 60% Un Electrical Reset : 60% to 80% Un  
 OR  
 (2) Trip = 80% to 85% Un Electrical Reset : 60% to 80% Un  
 \* Operating Voltage Range starts from Actual Pickup voltage observed.

|                |                     |                    |                      |
|----------------|---------------------|--------------------|----------------------|
| Trip Timings : | <b>Relay Type</b>   | <b>Pickup time</b> | <b>Drop-out time</b> |
|                | Aux Relay           | <20 ms             | 4 to 12ms            |
|                | Latching Relay      | <10ms              | 4 to 12ms            |
|                | Aux Relay Fast Trip | <4ms               | 4 to 12ms            |

|        |   |       |                               |
|--------|---|-------|-------------------------------|
| Burden | For LEIOS-6 DC Changeover                         | <10W  |                               |
|        | For LEIOS-6 with Flag                             | <90W  |                               |
|        | For LEIOS-6 without Flag                          | <480W |                               |
|        | For LEIOS-10 with Flag-Lockout Relay              | <120W | Reset coil <190W (at 220V DC) |
|        | For LEIOS-10 without Flag Selection/CT switching) | <120W | Reset coil <190W (at 220V DC) |
|        | For LEIOS-22                                      | <275W | Reset coil <575W (at 220V DC) |

Contact Reset : Self Reset / Hand Reset / Electrical Remote Reset.  
 Flag Reset : Hand Reset / Electrical Remote Reset.  
 Insulation : 2 kV AC for 1 min between all terminals & earth.  
 and 1 kV AC for 1 min across open contacts.  
 Operating Temperature : -10 deg to +55 deg Celsius

**Contact Rating :**

Conforming to IEC 60255-1 edition 2.0, 2022-12

Contact rating is selectable by the user. The available ratings are as under :-

Carry continuously (no making or Breaking \*\*)

: AC : 5 Amp, 10 Amp, 20 Amp

: DC : 5 Amp, 10 Amp, 20 Amp

\*\* For Making and Breaking IEC 60255-1 edition 2.0, 2022-12 is followed.

**Weights :**

General Tolerance : ± 10% of the weight

| Description  | LEIOS-6 | LEIOS-10 | LEIOS-22 |
|--------------|---------|----------|----------|
| Draw-out     | 475 gm  | 950 gm   | 1530 gm  |
| Non Draw-out | 525 gm  | 890 gm   | 1530 gm  |

**Cable Size & Lugs :**

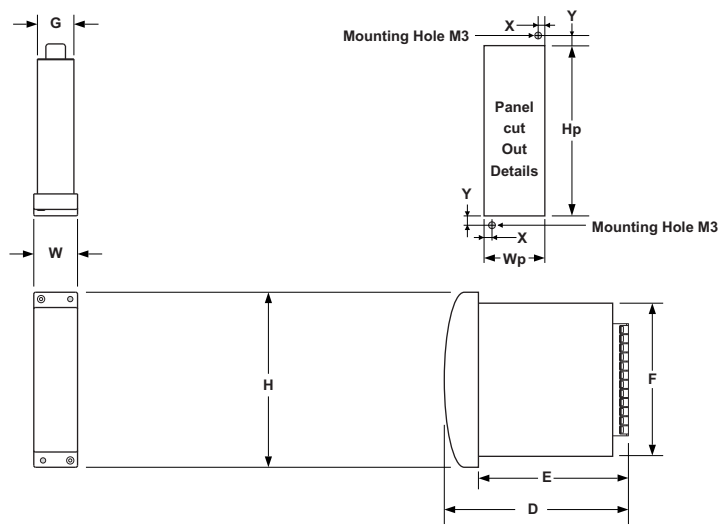
| Cable Size |                    |                                |
|------------|--------------------|--------------------------------|
| 1)         | 1 mm               | Max. 2 cables per terminal     |
| 2)         | 1.5 mm             | Max. 2 cables per terminal     |
| 3)         | 2.5 mm             | Max. 2 cables per terminal     |
| Lugs       |                    |                                |
| 1)         | U Type             | Max. Tong width (Outer) : 7 mm |
| 2)         | Circular Type      | Max. O.D : 8 mm                |
| 3)         | Straight or L Type | Max. width = 8 mm              |

Note : All the dim are in mm, Gen. Tol. : ± 1.0 mm

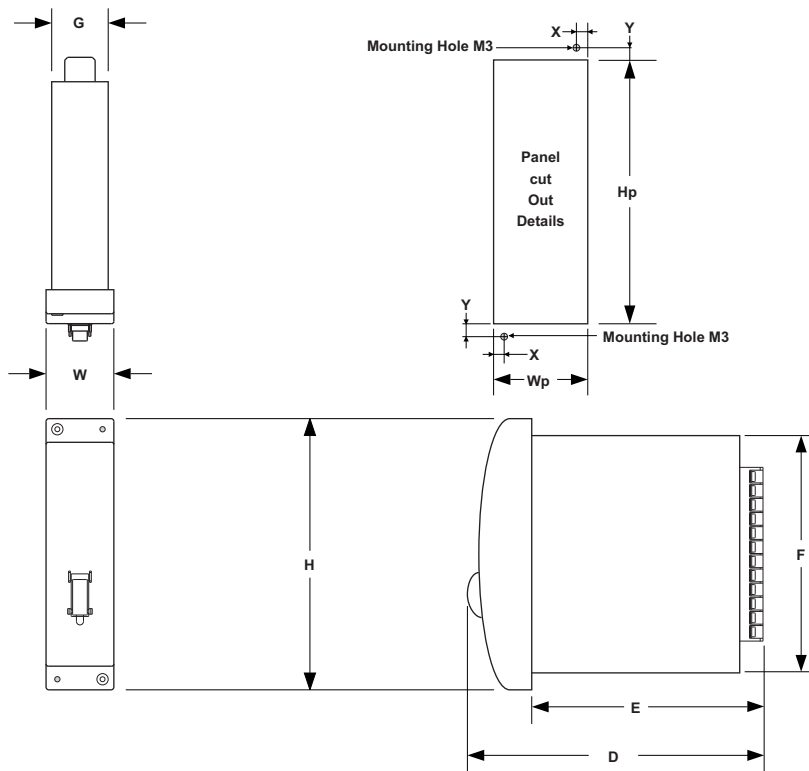
Outline Dimensional Details :

| Model    | Type         | Front Cover |        | Total Length | Enclosure body inside the panel |        |       | Panel Cut out (Hp x Wp) | Mounting Holes |      |
|----------|--------------|-------------|--------|--------------|---------------------------------|--------|-------|-------------------------|----------------|------|
|          |              | Width       | Height |              | Depth                           | Height | Width |                         | X              | Y    |
|          |              | (W)         | (H)    | (E)          | (F)                             | (G)    |       |                         |                |      |
| LEIOS-6  | Draw-out     | 48          | 95     | 201.6        | 170.2                           | 78.7   | 40.0  | 81.5x43                 | 5.50           | 1.62 |
| LEIOS-10 | Draw-out     | 48          | 192    | 213.7        | 171.7                           | 168.0  | 40.0  | 169.5x43                | 5.50           | 3.75 |
| LEIOS-22 | Draw-out     | 72          | 192    | 238.0        | 196.0                           | 168.0  | 64.0  | 169.5x67                | 9.50           | 3.75 |
| LEIOS-6  | Non Draw-out | 48          | 95     | 201.6        | 170.2                           | 78.7   | 40.0  | 81.5x43                 | 5.50           | 1.62 |
| LEIOS-10 | Non draw-out | 48          | 192    | 209.0        | 167.0                           | 168.0  | 40.0  | 169.5x43                | 5.50           | 3.75 |
| LEIOS-22 | Non draw-out | 72          | 192    | 231.6        | 189.6                           | 168.0  | 64.0  | 169.5x67                | 9.50           | 3.75 |

LEIOS-6



LEIOS-10 & LEIOS-22



**Type Tests :**

Conforming to the Standards IEC 60255, IEC 60068, IEC 60259, IEC 60297, IEC 61000, IS:9844, IS:9839

| Sr. No. | Description of Test                                |
|---------|--|
| 1       | Dimensions of structure and visual inspection      |
| 2       | Cold Temperature Test (Operating)                  |
| 3       | Cold Temperature Test (Storage)                    |
| 4       | Dry Temperature Heat (Operating)                   |
| 5       | Dry Temperature Test (Storage)                     |
| 6       | Change of temperature Test                         |
| 7       | Static Damp Heat Test (Steady State)               |
| 8       | Cyclic Temperature Test Humidity                   |
| 9       | Vibration Response Test & Vibration Endurance Test |
| 10      | Shock Response Test & Shock Endurance Test         |
| 11      | Bump Test  |
| 12      | Seismic test                                       |
| 13      | Salt spray test                                    |
| 14      | High frequency disturbance test                    |
| 15      | Electrical Fast Transient Disturbance Test         |
| 16      | Electro-static Discharge Immunity Test             |
| 17      | Surge Immunity Test                                |
| 18      | Impulse voltage withstand test                     |
| 19      | AC ripple on DC supply                             |
| 20      | Power frequency magnetic field                     |
| 21      | Damped oscillatory magnetic field value            |
| 22      | Impulse magnetic field immunity test               |
| 23      | Thermal withstand continuous                       |
| 24      | Maximum allowable temperature                      |
| 25      | Degree of Protection Test (IP-54) on Relay Front   |
| 26      | Maximum altitude of operation                      |
| 27      | Installation category (overvoltage category)       |
| 28      | Pollution degree                                   |
| 29      | Safety Test as per IEC 60255-27                    |
| 30      | Safety Test as per IEC 61010-1                     |
| 31      | Pick-up Value Test                                 |
| 32      | Drop-out Value Test                                |
| 33      | Temperature Rise Test                              |
| 34      | Mechanical Durability Test                         |
| 35      | Contact Performance Test                           |
| 36      | Rated Burden Test                                  |
| 37      | Dielectric Test                                    |

**Applicable Contact Configurations :** User selectable from following combination : -

**LEIOS-6**

(Aux Relay with Flag)

| <u>NO</u> | + | <u>NC</u> |
|-----------|---|-----------|
| 3         | + | 1         |
| 2         | + | 2         |
| 1         | + | 3         |

Table-1a

(Aux Relay without Flag)

| <u>NO</u> | + | <u>NC</u> |
|-----------|---|-----------|
| 6         | + | 0         |
| 4         | + | 2         |
| 3         | + | 3         |
| 2         | + | 4         |

Table-1b

(DC Change over)

|      |
|------|
| 4 CO |
|------|

Table-1c

**LEIOS-10**

| <u>NO</u> | + | <u>NC</u> |
|-----------|---|-----------|
| 9         | + | 1         |
| 8         | + | 2         |
| 7         | + | 3         |
| 6         | + | 4         |
| 5         | + | 5         |
| 4         | + | 6         |
| 3         | + | 7         |
| 2         | + | 8         |
| 1         | + | 9         |

Table-2

**LEIOS-22**

| <u>NO</u> | + | <u>NC</u> |
|-----------|---|-----------|
| 3         | + | 19        |
| 7         | + | 15        |
| 11        | + | 11        |
| 15        | + | 7         |
| 19        | + | 3         |

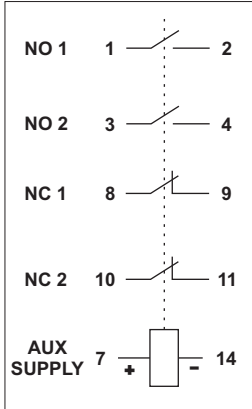
Table-3

Note : For supervision terminal, one NC contact pair will reduce in every type of relay. e.g. 7NO/3NC will become 7NO/2NC, if supervision terminal is required. however if same no. of contacts are desired then one common terminal can be provided for 2 no. contacts.

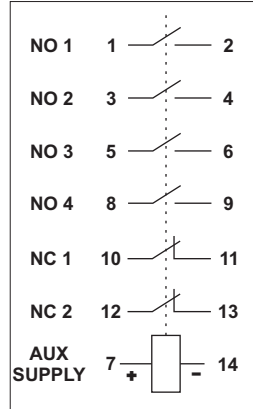
Terminal Arrangement viewed from Rear

e.g. LEIOS-6

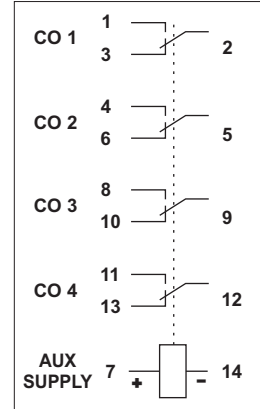
(Aux Relay with Flag)  
(2NO / 2NC)



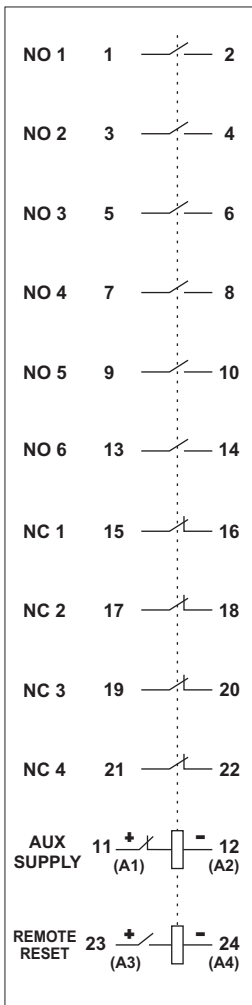
(Aux Relay without Flag)  
(4NO / 2NC)



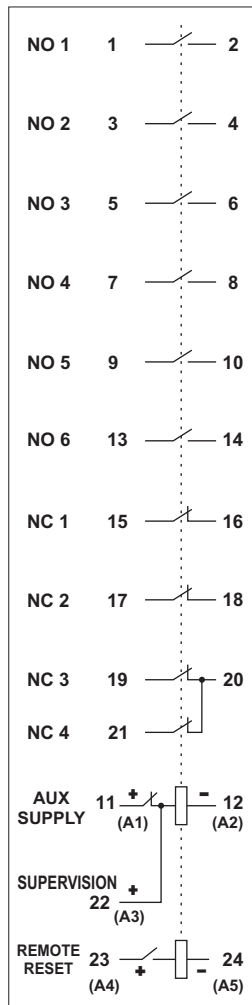
DC Changeover  
(4CO)



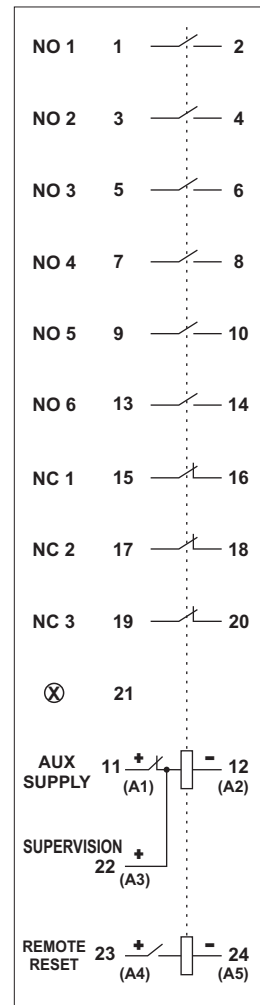
e.g. for LEIOS-10, 6NO / 4NC  
without Supervision Terminal



e.g. for LEIOS-10, 6NO / 4NC  
with Supervision Terminal

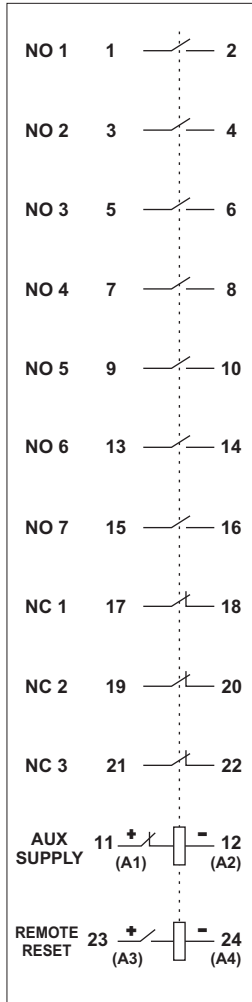


e.g. for LEIOS-10, 6NO / 3NC  
with Supervision Terminal

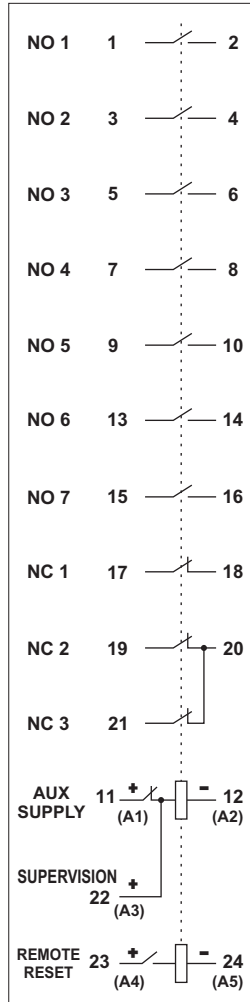


Terminal Arrangement viewed from Rear

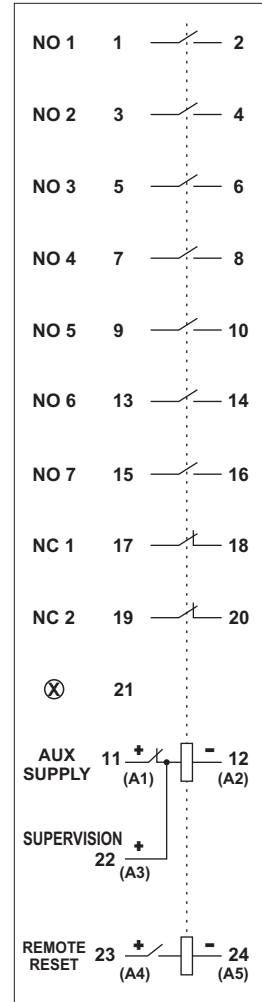
e.g. for LEIOS-10, 7NO / 3NC  
without Supervision Terminal



e.g. for LEIOS-10, 7NO / 3NC  
with Supervision Terminal

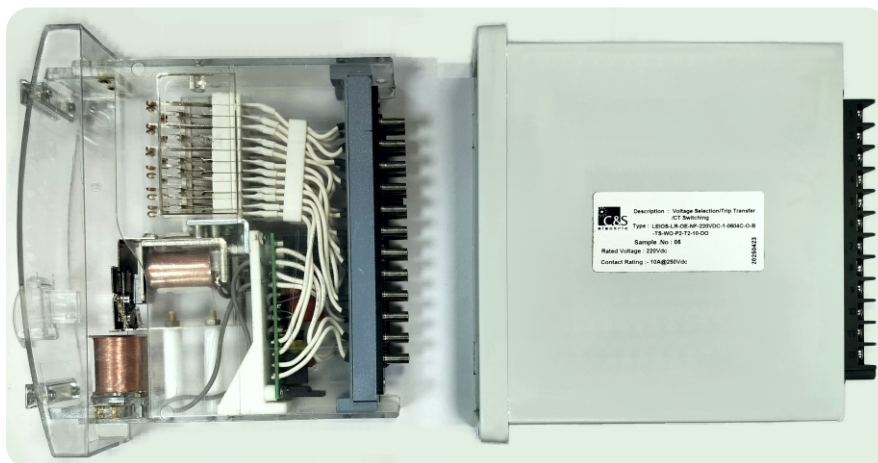


e.g. for LEIOS-10, 7NO / 2NC  
with Supervision Terminal



Draw-out Relays :  
Internal Assembly View

LEIOS-10 :

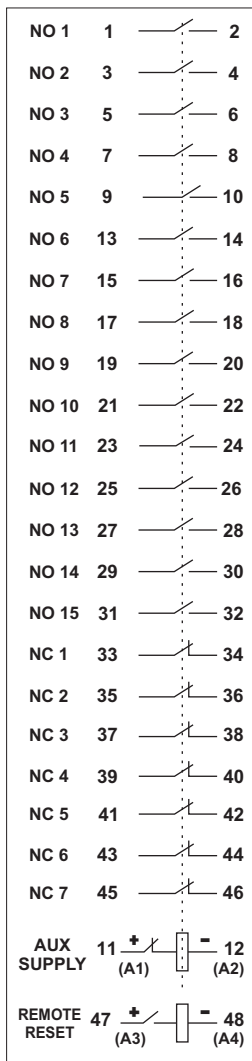


Front Cover with Internal Assembly

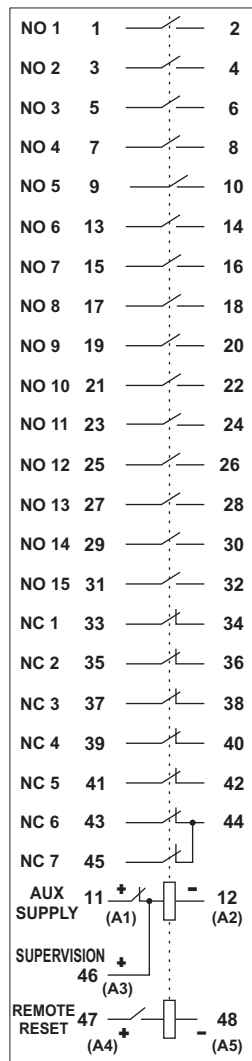
Relay Enclosure

Terminal Arrangement viewed from Rear

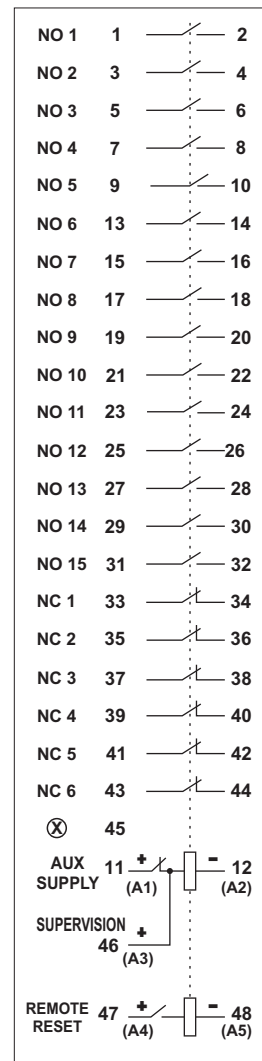
e.g. for LEIOS-22, 15NO / 7NC  
without Supervision Terminal



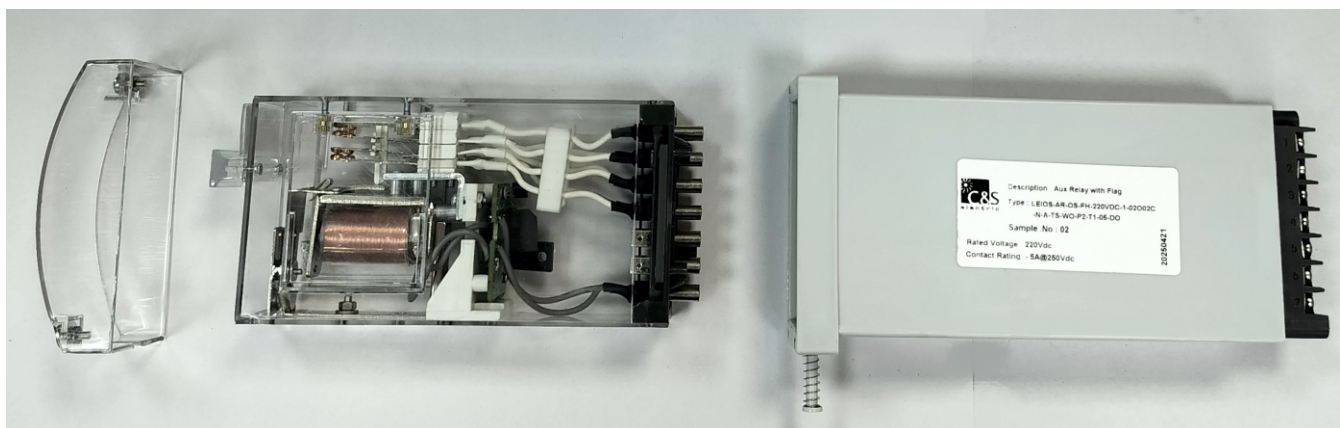
e.g. for LEIOS-22, 15NO / 7NC  
with Supervision Terminal



e.g. for LEIOS-22, 15NO / 6NC  
with Supervision Terminal



Draw-out Relays :  
 Internal Assembly View  
 LEIOS-6 :

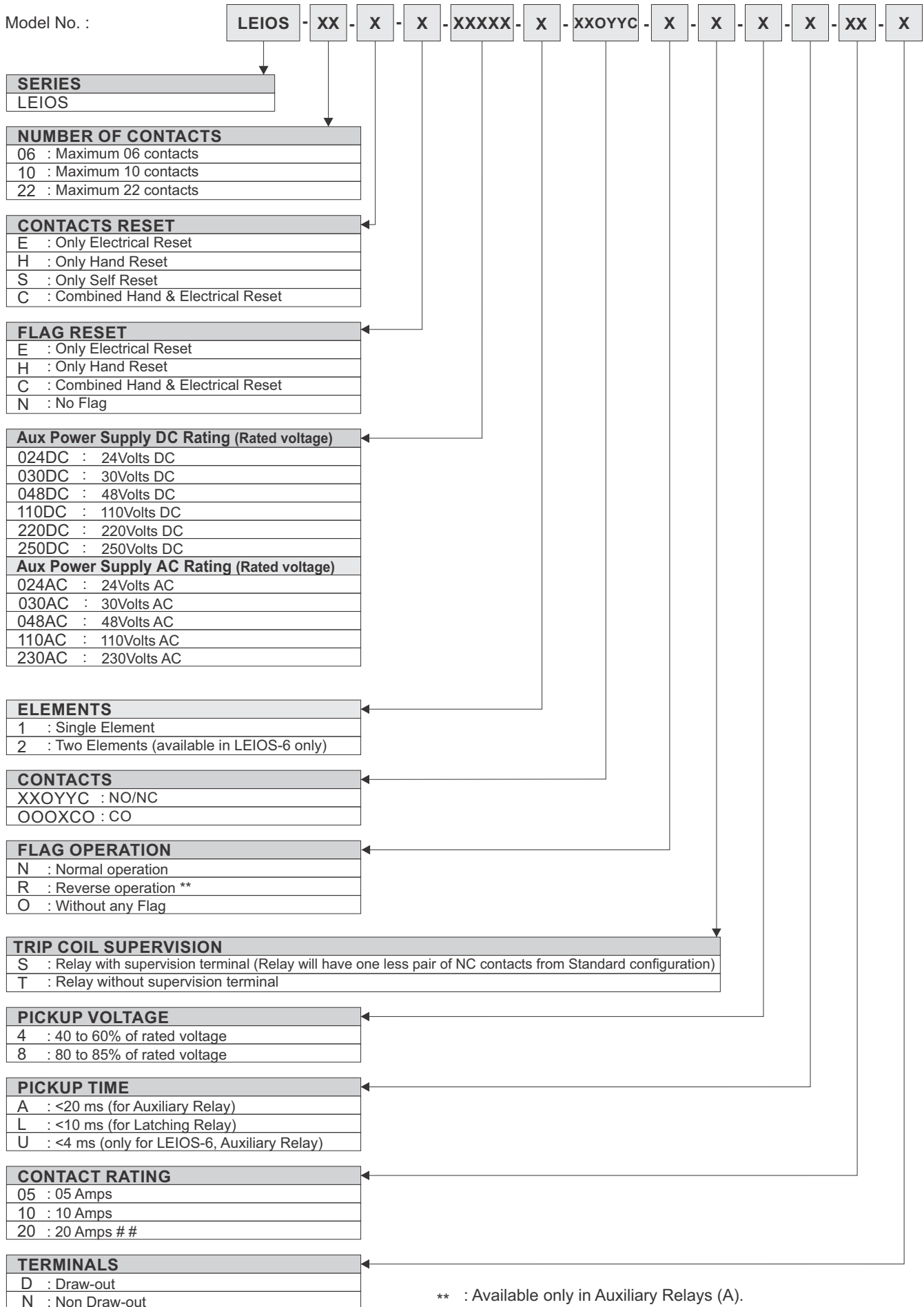


Front Cover

Internal Assembly

Relay Enclosure

**Ordering Information :** NOTE : Refer 1a, 1b, 1c, Table 2 and Table 3 on Page 6 for possible arrangement of contacts.



\*\* : Available only in Auxiliary Relays (A).

# # : Available only in change over(C) relays.

**Ordering Code Examples:**

XXXXX - XX - X - X - XXXXX - X - XXOYYC - X - X - X - XX - XX - X

**EXAMPLE 1 : LEIOS-10 contacts :**

**LEIOS - 10 - C - C - 220DC - 1 - 06O04C - N - S - 8 - L - 10 - D**

LEIOS-10, Contacts are Hand & Electrical Reset, Flag is Hand & Electrical Reset, Aux supply 220VDC, Single element,

Contacts configuration 6NO+4NC, Normal flag operation, with supervision terminal, Pickup voltage of 80 to 85% of rated voltage,

less than 10ms of pickup time, Contact rating of 10 Amps & Draw-out type terminals.

**EXAMPLE 2 : LEIOS-6 Aux Relay with Flag**

**LEIOS - 06 - S - H - 220DC - 1 - 02O02C - N - T - 8 - A - 05 - D**

LEIOS-06 series, Contacts are only Self Reset, Flag is Hand Reset, Aux supply 220VDC, Single element, Contacts configuration 2NO+2NC,

Normal flag operation, without supervision terminal, Pickup voltage of 80 to 85% of rated voltage, less than 20ms of pickup time, Contact rating of 05 Amps and Draw-out type terminals.

**EXAMPLE 3 : LEIOS-6 Aux Relay without Flag**

**LEIOS - 06 - S - N - 220DC - 1 - 04O02C - O - T - 8 - U - 05 - D**

LEIOS-06 series, Contacts are only Self Reset, No Flag, Aux supply 220VDC, Single element, Contacts configuration 4NO+2NC, Without any flag

without supervision terminal, Pickup voltage of 80 to 85% of rated voltage, less than 4ms of pickup time, Contact rating of 05 Amps & Draw-out type terminals.

**EXAMPLE 4 : LEIOS-6 DC Change over Relay**

**LEIOS - 06 - S - N - 220DC - 1 - 00O4CO - O - T - 8 - A - 20 - D**

LEIOS-06 series, Contacts are only Self Reset, No Flag, Aux supply 220VDC, Single element, Contacts 4 change over, without any flag

without supervision terminal, Pickup voltage of 80 to 85% of rated voltage, less than 20ms of pickup time, Contact rating of 20 Amps & Draw-out type terminals.

**EXAMPLE 5 : LEIOS-10 Contacts :**

**LEIOS - 10 - E - N - 220DC - 1 - 06O04C - O - T - 8 - L - 10 - D**

LEIOS-10 series, Contacts are only Electrical Reset, No Flag, Aux supply 220VDC, Single element, Contacts configuration 6NO+4NC, without any flag,

without supervision terminal, Pickup voltage of 80 to 85% of rated voltage, less than 10ms of pickup time, Contact rating of 10 Amps & Draw-out type terminals.

**NOTE:**

- 1) In Hand reset relay, the contacts are hand reset and the flag is also hand reset mechanically.
- 2) In Self reset relay, the contacts are self reset but the flag is mechanically hand reset.
- 3) In Electrical reset relay, the contacts are electrically reset and the flag is also electrically reset from a remote location.

