# Earth Leakage Relays




## Operating Instruction

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**DIN 35mm**

## Salient features

- **Leakage current monitoring in 1Ø and 3Ø systems**
- **RMS value measurement (AC)**
- **CBCT detection**
- **User selectable power ON delay, Trip delay and Recovery delay**
- **Adjustable hysteresis**
- **Two separate relays with NO or NC operation selectable**
- **Test and Reset via Front / Remote**

## Ordering information

| Product code | Supply voltage | Certification |
|---|---|---|
| **900ELR-2-230V-CE** | 230V AC ±( 15%) | CE |
| **900ELR-2-110V-CE** | 110V AC ±( 15%) | CE |

All safety related modifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.
If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment. If there is physical damage to the unit then do not use it.
Read complete instructions prior to installation and operation of the unit.

### Warning guidelines

1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement
2. Wiring shall be done strictly according to the terminal layout with shortest connections. Confirm that all connections are correct

### Caution

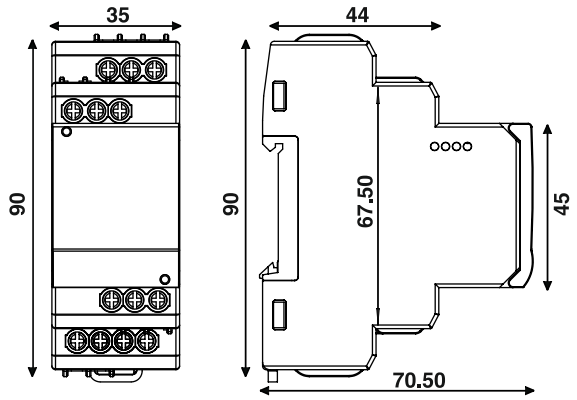
- To ensure the safe operation of unit, check the wiring and connections

**Note for connection**

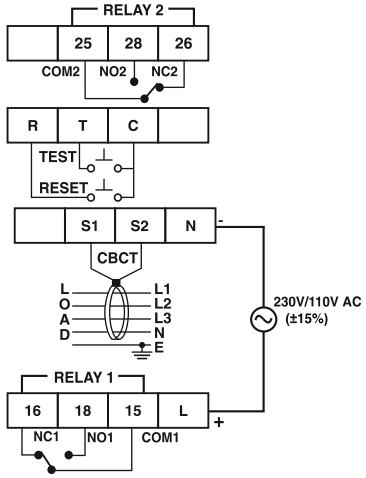
- For single phase applications, only the live and neutral needs to be passed through the CBCT
- The earth must not pass through the CBCT
- The distance between relay and CBCT should be kept as short as possible
- Use screen, shielded cable or twisted pair cable between the unit and CBCT for long distance (greater than 1m)

| Technical specifications | |
|---|---|
| Display | 3 Digits, Liquid crystal display with backlight |
| Display current range | 4mA - 30A |
| Network connection | 1Ø-2 wire, 3Ø-3 wire, 3Ø-4 wire |
| Auxiliary supply | 230V AC (±15%) (for: 900ELR-2-230V-CE)<br>110V AC (±15%) (for: 900ELR-2-110V-CE) |
| Frequency range | 50/60 Hz |
| VA rating | 3VA max |
| Trip settings | Leakage current range: 10mA - 30A |
| Instantaneous trip for current | ON/OFF (5 times of set current) |
| Time setting | Power ON delay: 0.5 - 99.9sec<br>Trip time delay: 0 - 99.9sec (NA for 33mA RNG)<br>Recovery time: 0 - 99.9sec<br>Response time:<br>< <30ms (if trip current > 5 x set value & Instantaneous trip is ON)<br>< <50ms (if trip current = 1 x set value) |
| Hysteresis | 5 to 40% {for eg., If set HYS is 10% & SV is 100mA;<br>unit will allow untrip at 90mA} |
| Resolution | 0.1mA, 1mA, 0.01A, 0.1A (depends on trip setting) |
| CBCT detection | Yes, when CBCT absent or short |
| Accuracy | Current: ±5% of setting<br>Time parameters: ±5% of setting ±100ms |
| Output specifications | No. of relay contacts: Relay 1: 1C/O (SPDT)<br>Relay 2: 1C/O (SPDT) |
| Relay rating | 5A @250V AC (NO)<br>3A @250V AC (NC) |
| LED indication | LED1 (Red): Relay 1<br>LED2 (Red): Relay 2 |
| Environmental specifications | - Indoor use<br>- Altitude of up to 2000 meters<br>- Pollution degree II<br>- Impulse withstand voltage (Uimp): 4kV |
| Degree of protection | IP20: Terminals<br>IP30: Housing<br>IP50: Faceplate |
| Temperature | Operating: 0 °C to 50 °C<br>Storage: -20 °C to 70 °C |
| Humidity | Up to 95% RH, non-condensing |
| Mechanical specifications | No. of push buttons: 3<br>Size: 35mm width<br>Mounting: 35mm din rail mount<br>Wire size (max): 4 sq.mm<br>Screw tightening torque: 0.5 N-M |
| Weight | 217gms |
| CE certification | IEC60947-2 |

## Dimensions (All dimensions in mm)



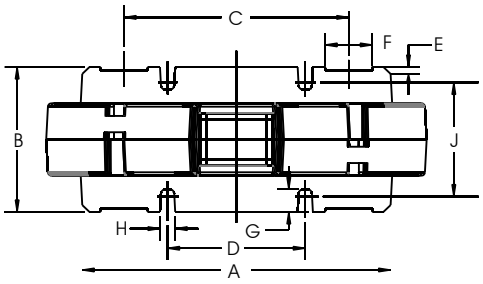

## Terminal connections



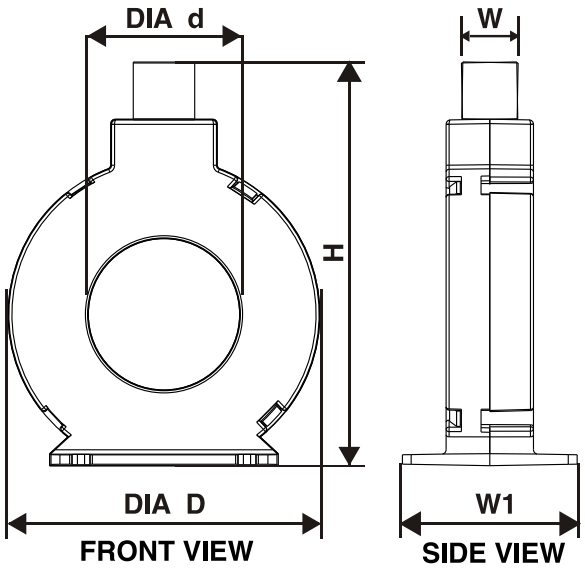

| LED indication chart | | |
|---|---|---|
| **Conditions** | **'R1' LED** | **'R2' LED** |
| No fault | OFF | OFF |
| Trip (if RLY2 programmed for RLY1) | ON | ON |
| Pre-Alarm (if RLY2 programmed for PRE) | OFF | ON |
| CBCT error | Blinking | Blinking |

## Core balanced current transformer

TOP VIEW



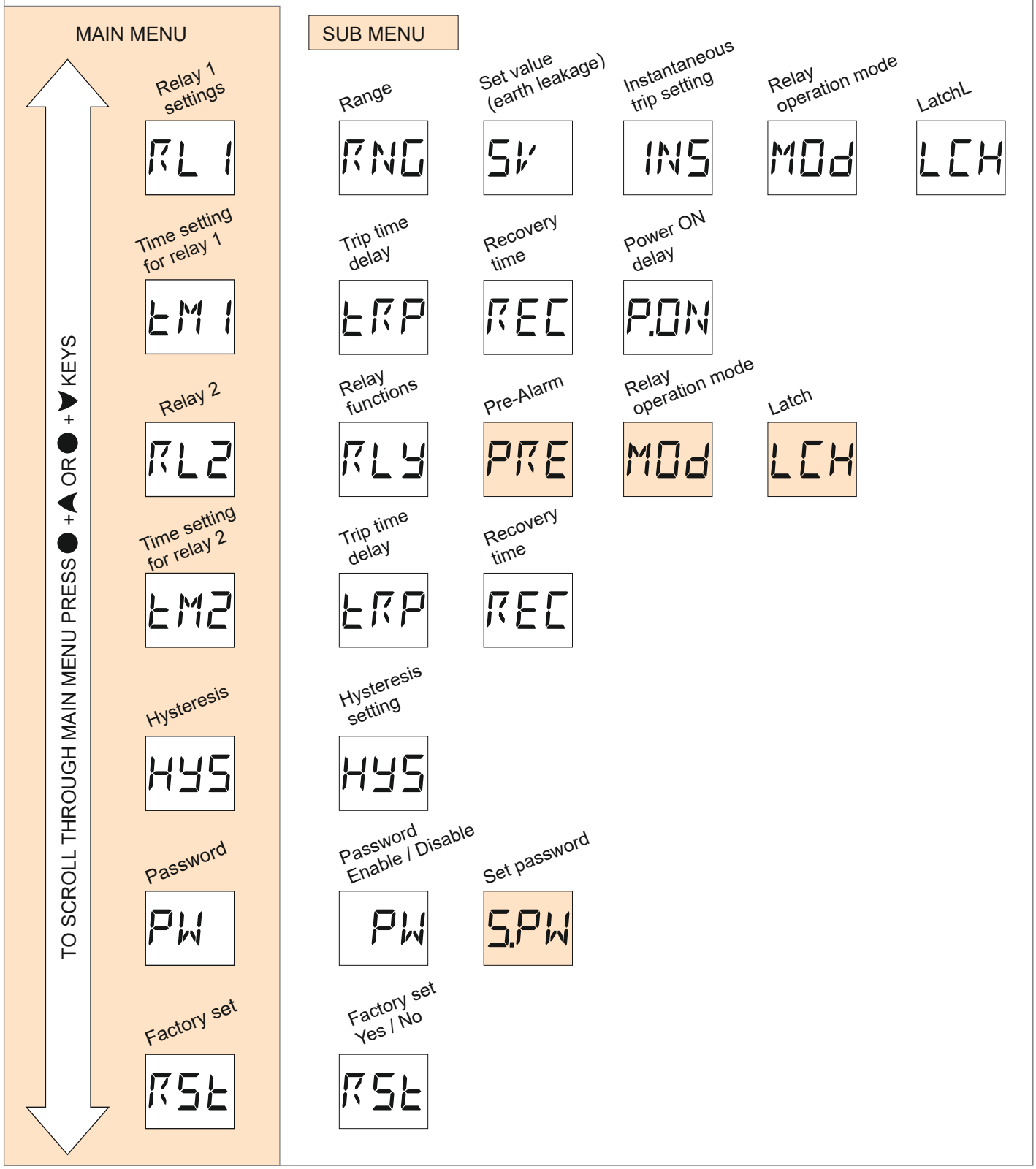

| CBCT TYPE | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J |
| CBCT 35 | 51.7 | 40 | NA | 38 | 1 | 13 | 6.25 | 4 | 31.5 |
| CBCT 70 | 85.1 | 40 | 62 | 38 | 1 | 13 | 6.25 | 4 | 31.5 |
| CBCT 120 | 120.1 | 40 | 70 | 38 | 1 | 13 | 6.25 | 4 | 31.5 |
| CBCT 210 | 199.15 | 55 | NA | 120 | NA | NA | 11 | 6.6 | 39.6 |
| CBCT 310 | 299 | 65 | NA | 200 | NA | NA | 16 | 6.6 | 39.6 |
| Tolerence | **Linear tolerence:** ±0.1mm | | | | | | | | |




| CBCT TYPE | Dimensions (mm) | | | | |
|---|---|---|---|---|---|
| | D | d | H | W | W1 |
| **35-1** | 71.30 | 35 | 97 | 15 | 40 |
| **70-1** | 107.50 | 70 | 133 | 15.50 | 40 |
| **120-1** | 158 | 120 | 184.50 | 15.50 | 40 |
| **210-1** | 268 | 210 | 270 | 25 | 55 |
| **310-1** | 377 | 310 | 379 | 25.50 | 65 |
| **STD. TOL.** | **Linear tolerence:** ±0.1mm | | | | |

**CT type ZPC (zero phase current)**

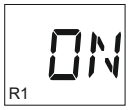
Press ▲ + ▼ for 3sec. to enter or exit configuration menu.

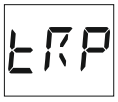
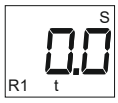
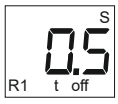
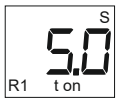


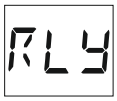
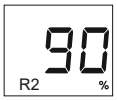
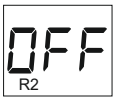

**Note 1:** Appearance of shaded menus depends on selection of parent parameter

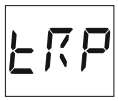
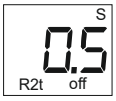
**Note 2:** The product will display over range (OVR), if applied leakage current is greater than twice the set current value (SV) or if exceeds the maximum set current value (SV), whichever is less

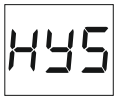
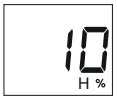
## SUB MENU

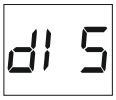
| Relay 1 (Rl1) settings | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | Trip current range |  | 33.0mA / 550mA / 5.50A / 30.0A | Depending upon this selection, the set trip value will be prompted. If this setting is changed the default trip value is loaded. |
|  | Set trip value for earth leakage |  | SV can be programmed between 10.0mA to 30A irrespective of the selected range. Default SV for different ranges are: 33.0mA: 30.0mA 550mA: 100mA 5.50A: 1.00A 30.0A: 10.0A | If SV exceeds max limit of specified range then next range will automatically be made applicable. for eg. If SV is set 40mA, range will get changed from 33mA to 550mA automatically. |
|  | Instantaneous trip selection |  | OFF / ON (5 times of set current) | If INS = ON and leakage current ≥5 times the set value, the relay trips instantaneously irrespective of trip time delay |
|  | Relay operation mode |  | ON / OFF (In ON mode, contact will be in changed over state in normal condition ) | In Healthy condition, ON : NO OFF: NC |
|  | Latch |  | ON / OFF | If Latch is ON, user has to reset the unit manually when fault is removed |

| Time setting for relay 1 (TM1) | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | Trip time delay |  | 0.0 - 99.9 Sec. | (Not applicable for 33mA range) |
|  | Recovery time delay |  | 0.0 - 99.9 Sec. | |
|  | Power ON delay |  | 0.5 - 99.9 Sec. | Applicable for Relay 1 & Relay 2 |

| Relay 2 (RL2) | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | Relay 2 functions |  | RL1 / PRE | If RL1 is selected, all the settings done for RL1 will be automatically set for RL2 & no other parameter of RL2 will be prompted. |
|  | Pre-Alarm |  | 60 to 100% for 33.0mA range & 50 to 100% for all other ranges | Will be prompted only when RL2 = PRE |
|  | Relay operation mode |  | ON / OFF | In healthy condition, ON : NO OFF: NC |
|  | Latch |  | ON / OFF | If Latch is ON, user has to reset the unit manually when fault is removed |

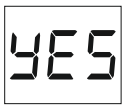
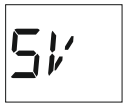
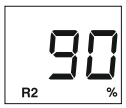
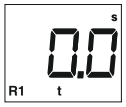
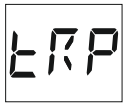
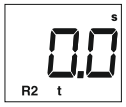
| Time setting for relay 2 (TM2) | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | Trip time delay |  | 0.0 - 99.9 Sec. | (Not applicable for 33mA range) |
|  | Recovery time delay |  | 0.0 - 99.9 Sec. | |

| Hysteresis (HYS) | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | Hysteresis |  | 5 to 40% | |

| **Password (PW)** | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | Password |  | ENB / DIS | Enable / Disable password protection option |
|  | Set password |  | 0-999 | Will be prompted only when password option is enabled |
|  | Main menu password | | **NOTE:** PW option will be asked when the user enter the config. menu if PW option is enabled in the config menu and the user has to enter the password which he has set in the S.PW (set password) option. | |

| **Factory set (RST)** | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | Reset (factory set) |  | YES / NO | |

**Press ▲ key for 3 sec. to enter or exit Trip Value Setting menu :**

| Press ▲ or ▼ to scroll through main menu | | Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value | | |
|---|---|---|---|---|
| **Display (for 1sec)** | **Description** | **Default** | **Range** | **Condition** |
|  | LOCK |  | YES / NO | This option will prompted first when the user enters the trip setting menu. User has to set NO after which he can access the trip setting menu. |
|  | Set trip value for earth leakage |  | SV can be programmed between 10.0mA to 30A irrespective of the selected range. Default SV for different ranges are : 33.0mA: 30.0mA 550mA: 100mA 5.50A : 1.00A 30.0A : 10.0A | If SV exceeds max limit of specified range then next range will automatically be made applicable. For eg.If SV is set 40mA, range will get changed from 33mA to 550mA automatically. |
|  | Pre-Alarm |  | 60 to 100% for 33.0mA range & 50 to 100% for all other ranges | Applicable only if RLY2 is programmed as PRE-Alarm |
|  | Trip time delay for earth leakage |  | 0.0 - 99.9 Sec. | (Not applicable for 33mA range) |
|  | Trip time delay for Pre Alarm. |  | 0.0 - 99.9 Sec. | Applicable only if RLY2 is programmed as PRE (Not applicable for 33mA range) |
|  | LOCK |  | YES / NO, (In this option if YES is selected by the user, then whenever the user enters the trip value setting, initially LOCK option will be prompted. The user will have to set NO after which he can access the trip setting menu. If the user wants to disable LOCK option, he can set NO when LOCK option is prompted after TRP option.) | |

# TEST & RESET FUNCTION

● LED ON ○ LED OFF

| Key | Description | Display (for 1sec.) | LED's | Condition |
|---|---|---|---|---|
| For TEST | Press TST key for >2 Sec. |  | ○ R1 ○ R2 | Applicable only when unit is in healthy condition |
| Test passed | |  | ● R1 ● R2 | If test is passed, OK will be displayed till reset button is pressed |
| Test failed | |  | ○ R1 ○ R2 | ---- |
| RST | Press RST key for >2 Sec. | Actual value | ○ R1 ○ R2 | If current is in mA then "mA" will be ON. |

| | |
|---|---|
| **CBCT Detection** | If CBCT error is there, display will show CT.E and all LED's will be blinking |
| **TRIP Indication** | Trip Indication on press of ▲ key: Trip value will be displayed till the key is pressed |
| **RESET** | Press ● key for 3sec. to reset manually |

**Master password: 753**

# WARRANTY / LIMITATIONS OF LIABILITY

Selec warrants the products to be free from defects in the materials and workmanship for a period of one year (or other period specified, if any) from the date of sale by Selec.

The warranty does not apply to defects resulting from any action of the buyer, including but not limited to improper handling, operating the product outside the specification limits or unauthorized disassembling / altering of the product. The warranty shall be VOID if the product shows evidence of having been tampered or being damaged due to usage in corrosive environment; or current, heat, moisture or vibration; improper specification; wrong usage in an application; misuse or other operating conditions outside of Selec's control.

Selec shall not be responsible for special, indirect or consequential damages, loss of profits or commercial loss in any way connected with the products, whether such claim is based on contract, warranty, negligence or strict liability.

In no event shall the responsibility of Selec for any act exceed the individual price of the product on which liability is asserted.

In no event shall Selec be responsible for warranty or other claims regarding the products unless Selec's analysis confirms that the products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification or repair.

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