

# DIRIS A60



## Contents

|                           |    |
|---------------------------|----|
| DANGER AND WARNING        | 3  |
| PRELIMINARY OPERATIONS    | 4  |
| PRESENTATION              | 5  |
| INSTALLATION              | 6  |
| PROGRAMMING               | 12 |
| OPERATION                 | 43 |
| CONNECTION TEST FUNCTION  | 48 |
| ASSISTANCE                | 52 |
| TECHNICAL CHARACTERISTICS | 53 |
| GLOSSARY OF ABBREVIATIONS | 56 |

# DANGER AND WARNING

---

This equipment must be mounted only by professionals.

The manufacturer shall not be held responsible for failure to comply with the instructions in this manual.

## Risk of electrocution, burns or explosion

- the device must be installed and serviced only by qualified personnel
- prior to any work on or in the device, isolate the voltage inputs and auxiliary power supplies and short-circuit the secondary winding of all current transformers (PTI SOCOMEC)
- always use an appropriate voltage detection device to confirm the absence of voltage
- put all mechanisms, door and covers back in place before energising the device
- always supply the device with the correct rated voltage

Failure to take these precautions could cause serious injuries.

## Risk of damaging device

### **Chek the following :**

- the voltage of the auxiliary power
- the frequency of the distribution system (50 or 60 Hz)
- the maximum voltage across the voltage-input terminals, (V1, V2, V3 and VN) 500 V AC phase-to-phase or 289 V AC phase-to-neutral
- a maximum current of 6 A on the current-input terminals (I1, I2 and I3)

# DANGER AND WARNING

---

For personnel and product safety please read the contents of these operating instructions carefully before connecting.

Check the following points as soon as you receive the package:

- the packing is in good condition,
- the product has not been damaged during transit,
- the product reference number conforms to your order,
- the packaging included a product fitted with detachable terminal strips,
- operating instructions.

# PRESENTATION

1. Key-pad with 6 dual-function keys (display or programming)
2. Backlit LCD display
3. Phase
4. Values
5. Unit
6. Activity indicator on the communication bus
7. Energy metering indication
8. Hour meter and energy display
9. Alarm relay 1
10. Alarm relay 2

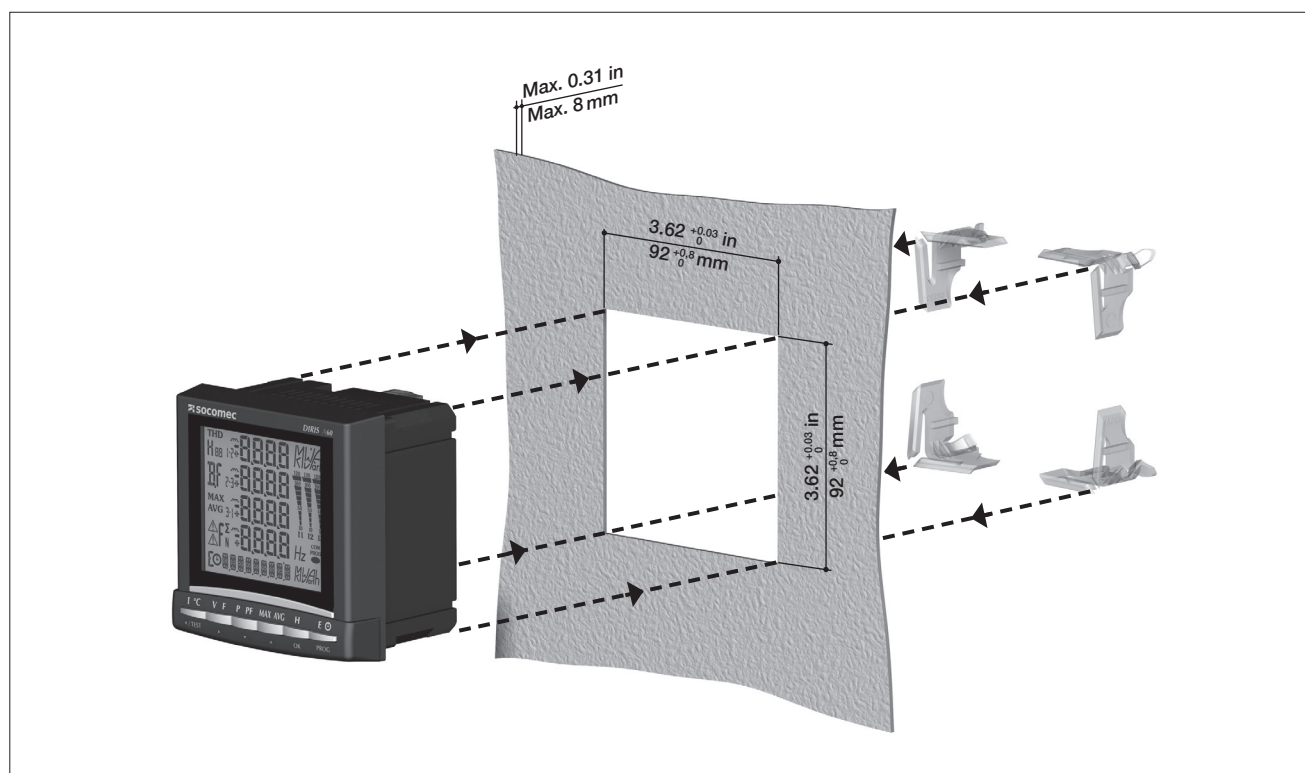
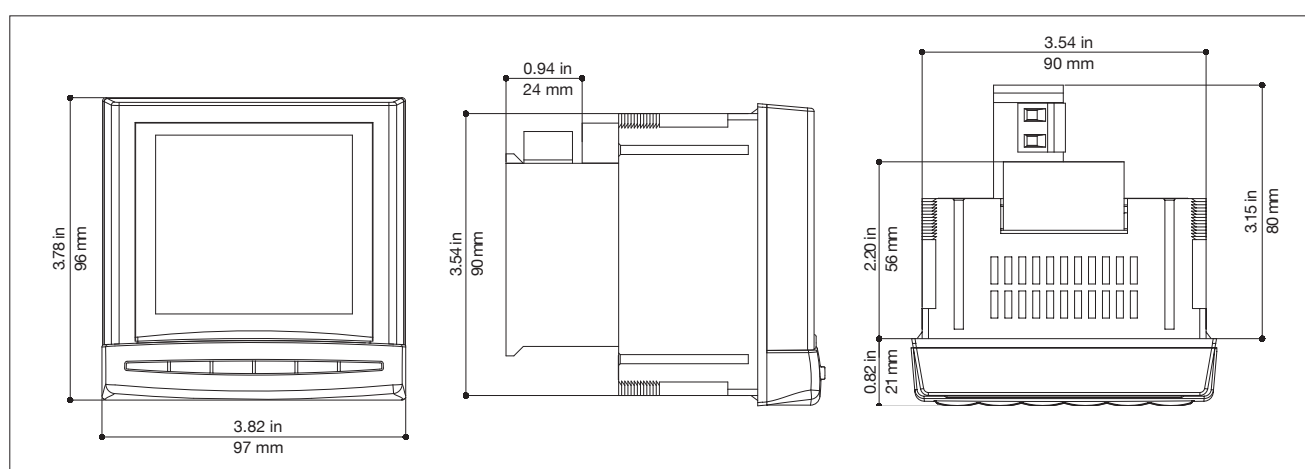


# INSTALLATION

## RECOMMENDATIONS

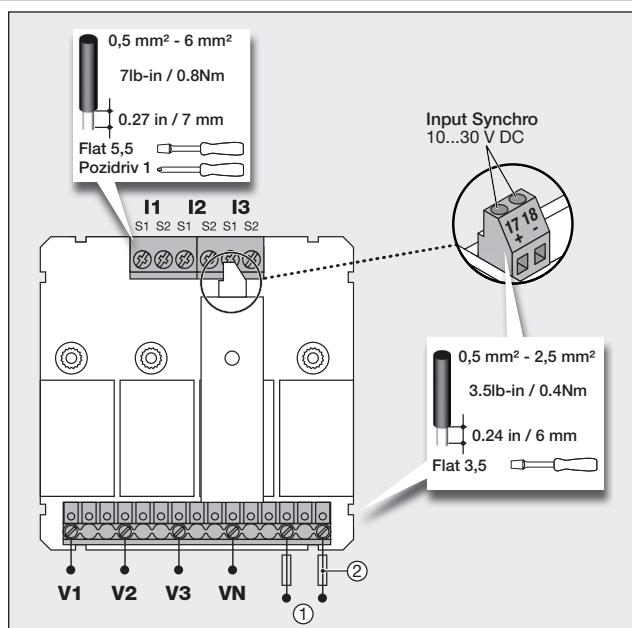
- avoid being close to systems generating electromagnetic disturbances,
- avoid vibrations involving accelerations greater than 1 G for frequencies lesser than 100 Hz.

## CUT-OUT DIAGRAM, MOUNTING



## CONNECTION

Each CT's secondary winding must be short-circuited when disconnecting the DIRIS. This can be done automatically using one of Socomec's catalogue products: the PTI. Please contact us for further information.

**DIRIS A60**

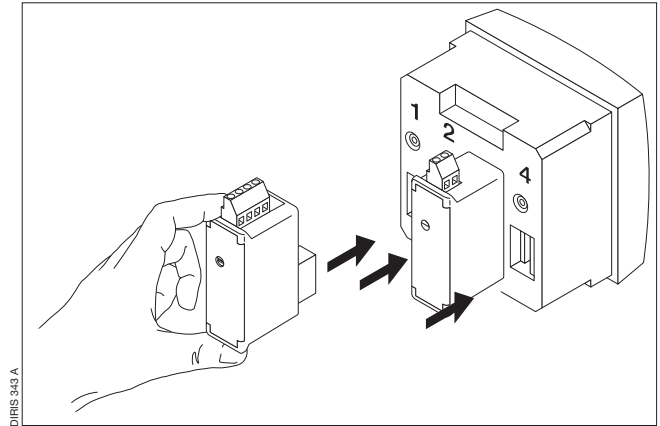
- ① **Aux.:** IEC / CE 110 ... 400 V AC  
120 ... 350 V DC  
12 ... 48 V DC
- ② **Fus.:** 0.5 A gG / BS 88 2A gG / 0.5 A class CC

# INSTALLATION

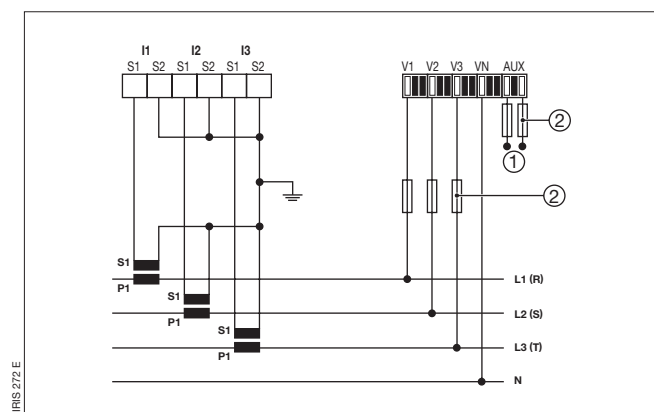
## MODULES OPTION

**DIRIS A60** can be fitted with optional modules:

- **JBUS/MODBUS communication; ref: 4825 0092:**  
RS485 JBUS/MODBUS serial port in RTU mode with a speed from 2400 to 38400 baud. (Operating instructions ref: 536 103).
- **Pulse outputs; ref: 4825 0090:**  
2 pulse outputs connected to the metering of energy in kWh, kvarh and KVAh. (Operating instructions ref: 536 045).
- **Analogue outputs; ref: 4825 0093:**  
2 analogue outputs 4/20 mA or 0/20 mA configurable for measures performed by the DIRIS A60. 2 modules can be installed, a maximum of 4 outputs. (Operating instructions ref: 536 048).
- **Inputs/Outputs; ref: 4825 0094:**  
2 outputs allocated for alarms, for voltage, current, power, power factor and THD, or remote control.  
2 inputs for the metering of pulses or controlling position. (Operating instructions ref: 536 047).
- **Ethernet; ref: 4825 0203 :**  
Link with RJ45 connector.  
Protocol MODBUS/TCP or JBUS/MODBUS RTU with TCP. WEB-server for configuration of the product, display of the main quantities and diagnosis. (Operating instructions ref.: 535 748).
- **Ethernet/gateway RS485; ref: 4825 0204:**  
Link with RJ 45 connector.  
Master gateway function MODBUS with 3 points link RS485.  
Protocol MODBUS/TCP or JBUS/MODBUS RTU with TCP. WEB-server for the configuration of the product, display of the main quantities and diagnosis. (Operating instructions ref: 535 748).
- **Temperature; ref: 4825 0206.**  
PT100 Technology:  
4 temperature indicators :
  - 1 internal
  - 3 external (PT100 input)(Operating instructions ref: 535 750).
- **Operating earth; ref: 48250087**  
(Operating instructions ref: 536 423).



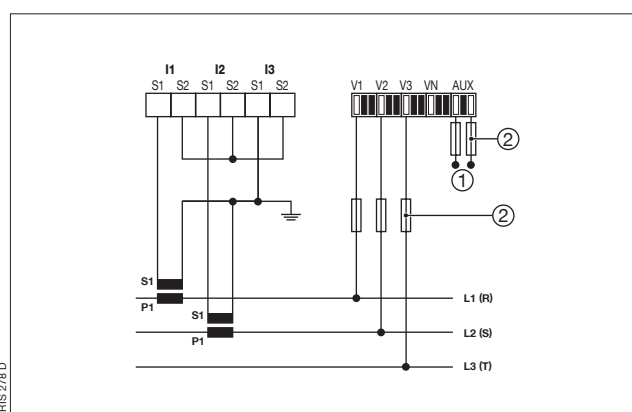
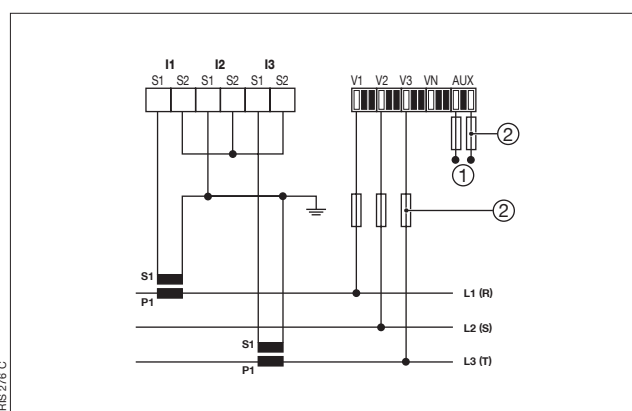
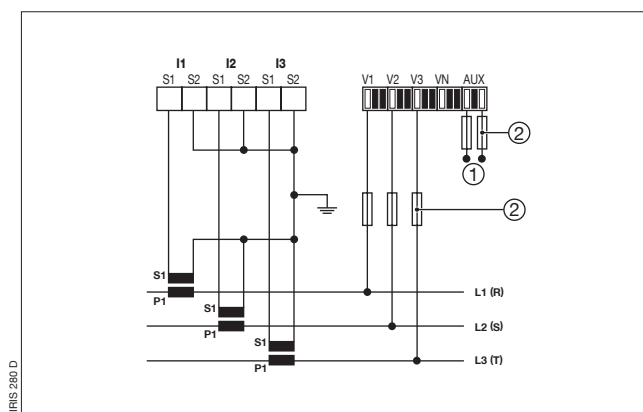
## UNBALANCED THREE-PHASE NETWORK (4NBL)



- ① **Aux.:** IEC / CE 110 ... 400 V AC  
120 ... 350 V DC
- ② **Fus.:** 0.5 A gG / BS 88 2A gG / 0.5 A class CC

## UNBALANCED THREE-PHASE NETWORK (3NBL)

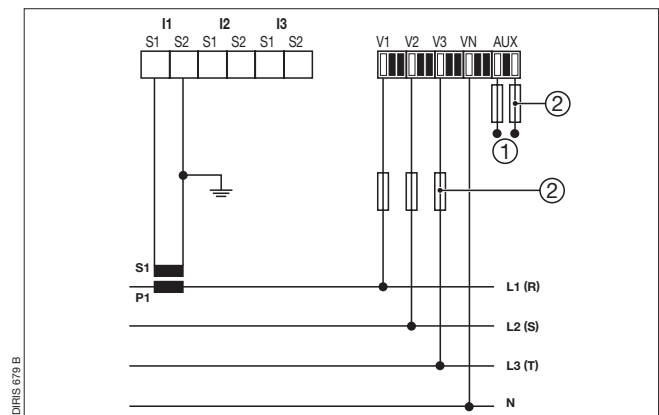
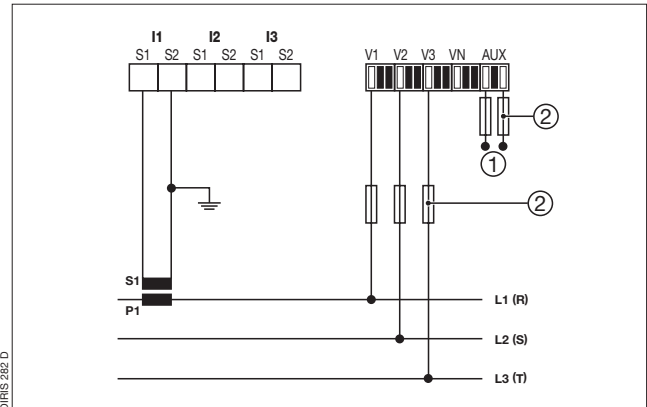
Use of 2 CTs reduces by 0.5% the accuracy of the phase, whose current is worked out by vector calculation.



- ① **Aux.:** IEC / CE 110 ... 400 V AC  
120 ... 350 V DC
- ② **Fus.:** 0.5 A gG / BS 88 2A gG / 0.5 A class CC

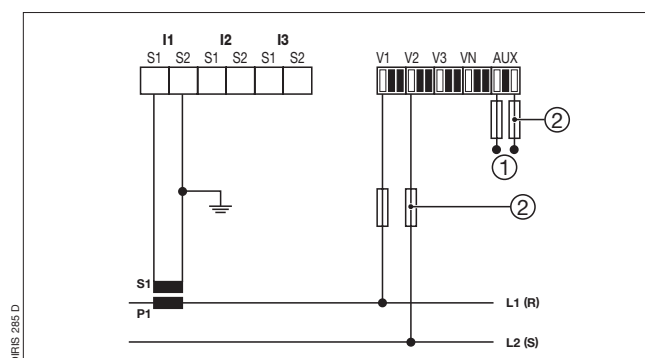
### BALANCED THREE-PHASE NETWORK (3BL/4BL)

The solution using one CT, with the 3rd phase current calculated via vectoral summation, results in an 0.5% reduction in phase accuracy.



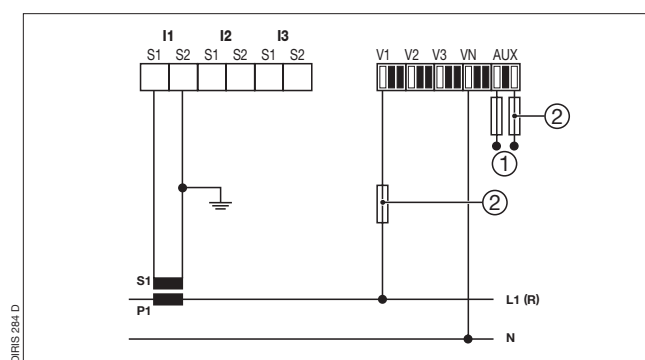
- ① **Aux.:** IEC / CE 110 ... 400 V AC  
120 ... 350 V DC
- ② **Fus.:** 0.5 A gG / BS 88 2A gG / 0.5 A class CC

## TWO-PHASE NETWORK (2BL)



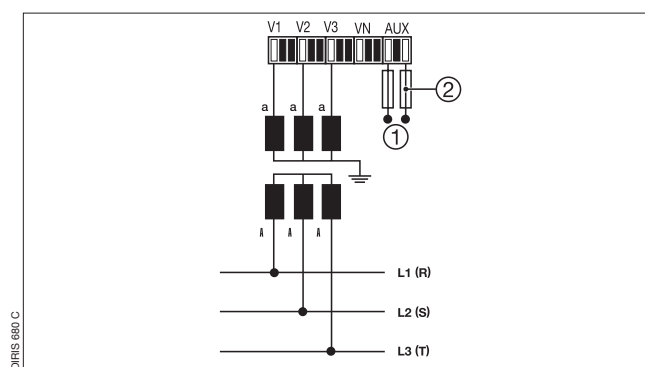
- ① **Aux.:** IEC / CE 110 ... 400 V AC  
120 ... 350 V DC
- ② **Fus.:** 0.5 A gG / BS 88 2A gG / 0.5 A class CC

## SINGLE-PHASE NETWORK (1BL)



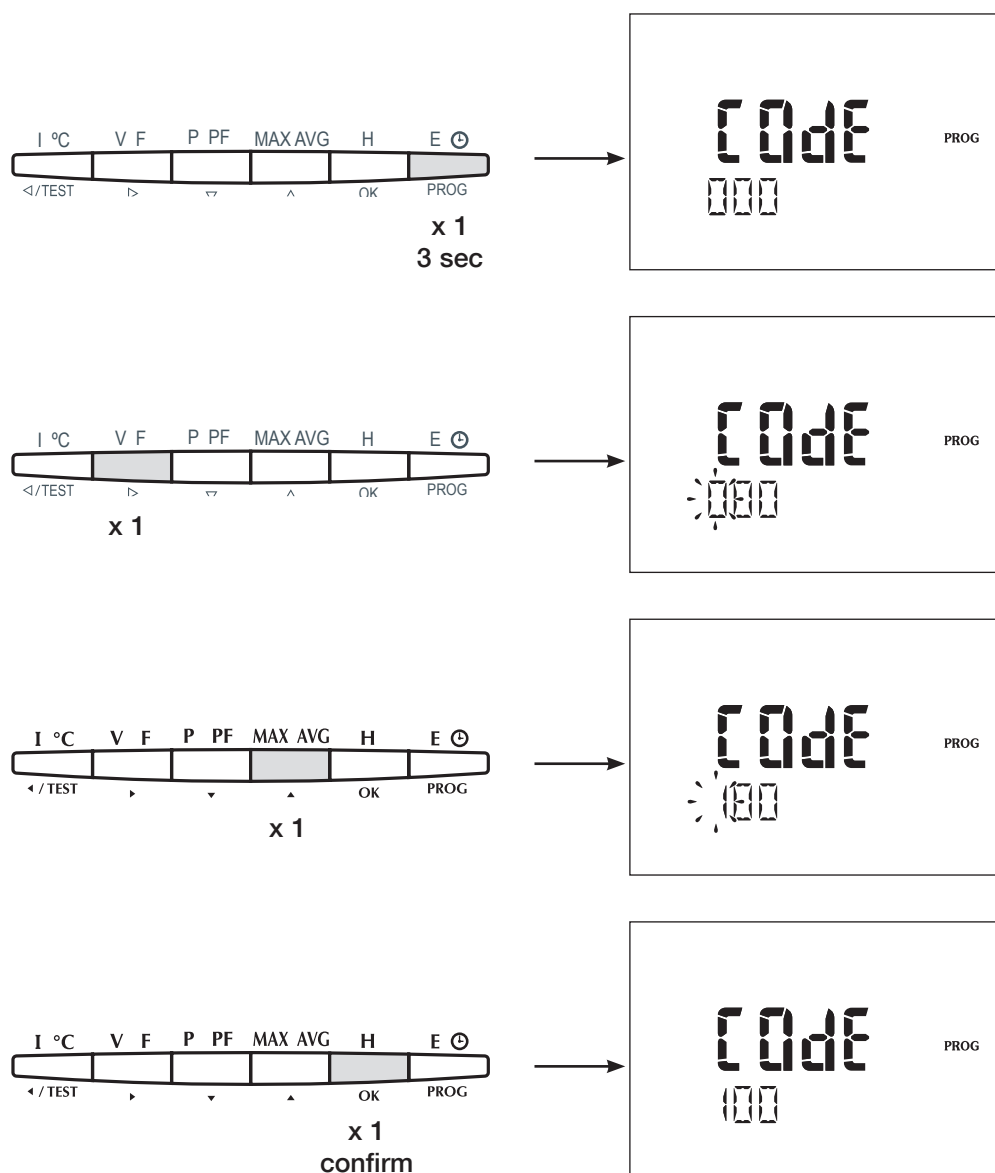
- ① **Aux.:** IEC / CE 110 ... 400 V AC  
120 ... 350 V DC
- ② **Fus.:** 0.5 A gG / BS 88 2A gG / 0.5 A class CC

## VOLTAGE TRANSFORMER

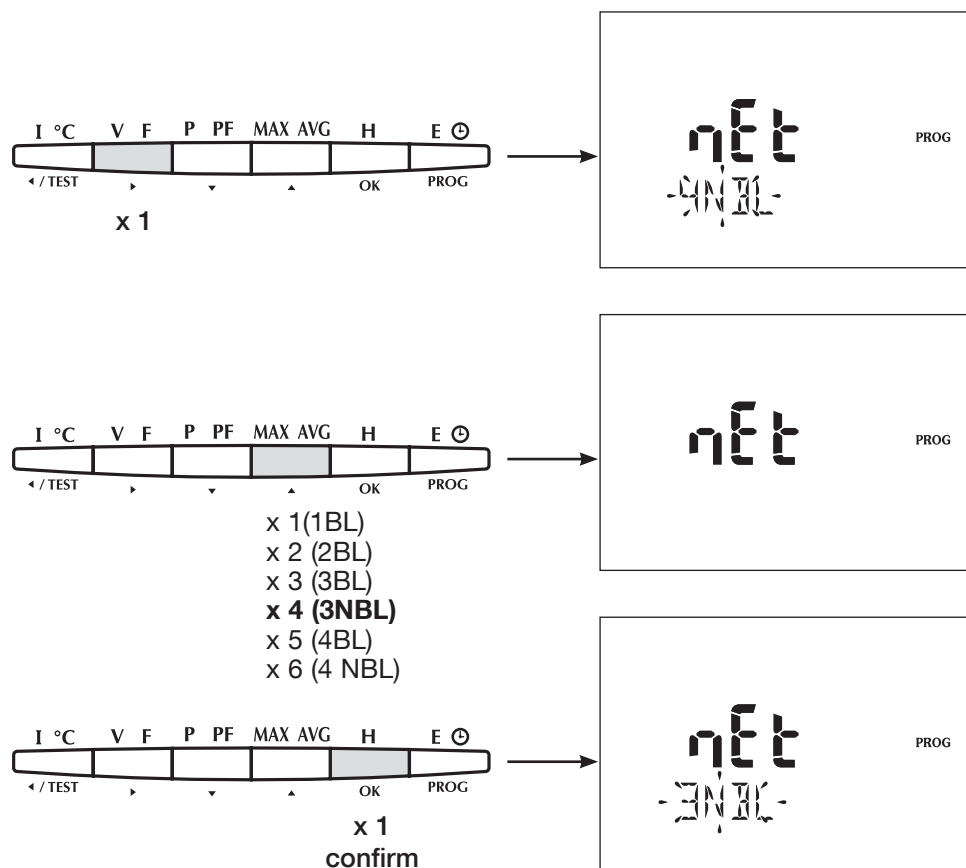


- ① **Aux.:** IEC / CE 110 ... 400 V AC  
120 ... 350 V DC
- ② **Fus.:** 0.5 A gG / BS 88 2A gG / 0.5 A class CC

### ACCESS TO PROGRAMMING MODE (COdE 100)

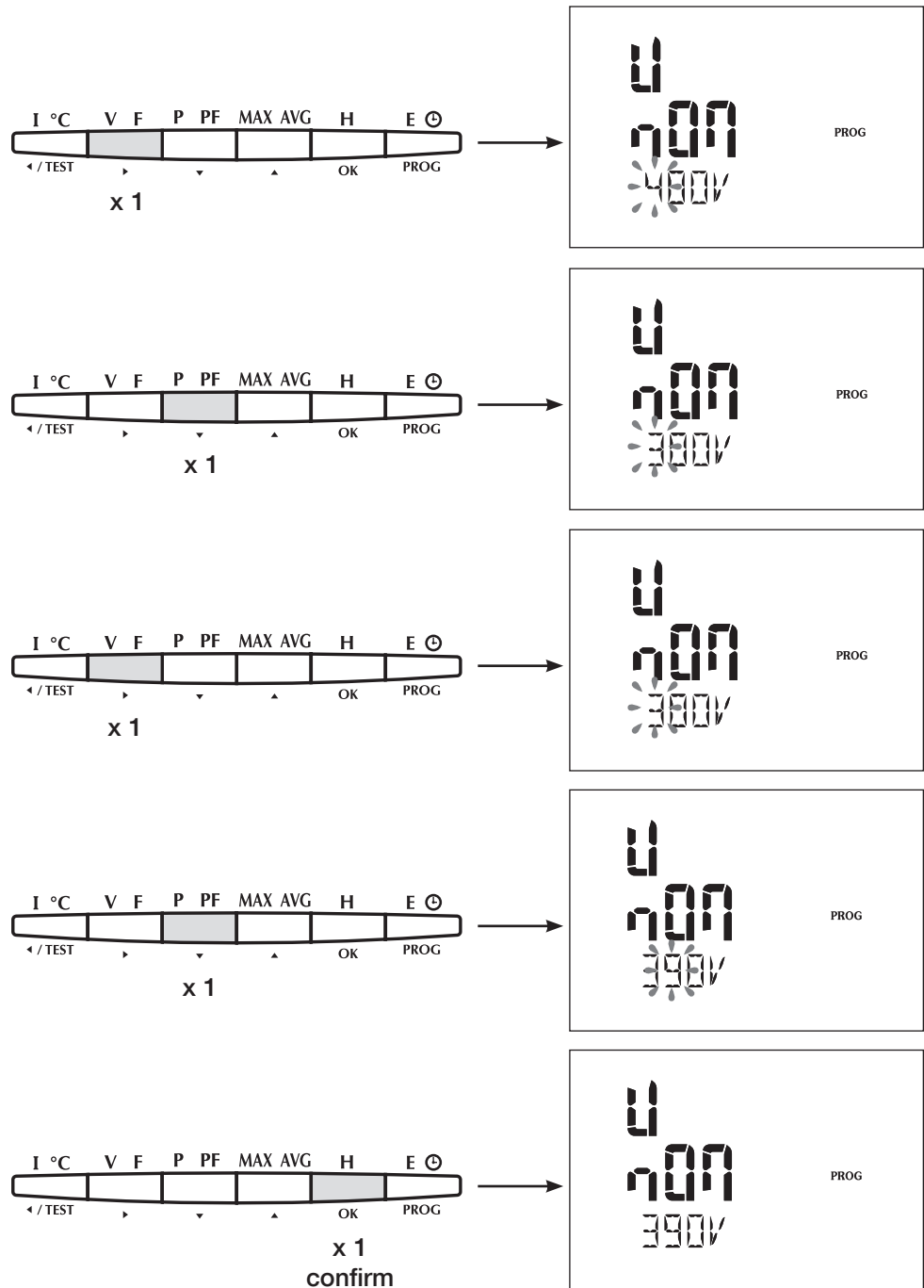


NETWORK (Example : NET = 3NBL)



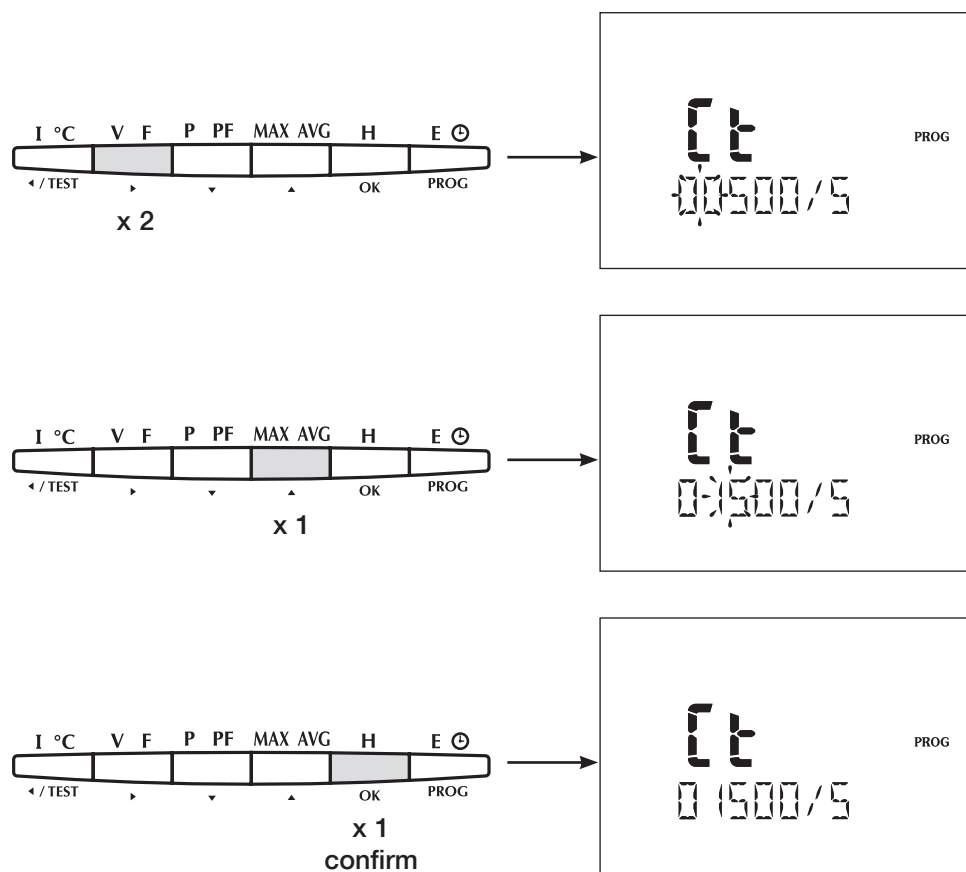
NOMINAL VOLTAGE OF THE NETWORK (phase/phase) (Example: 4NBL: U=390V)

This value is used for calculating the sliding reference voltage (Ureg) for the detection of the voltage dips and interruption, as well as voltage swell.

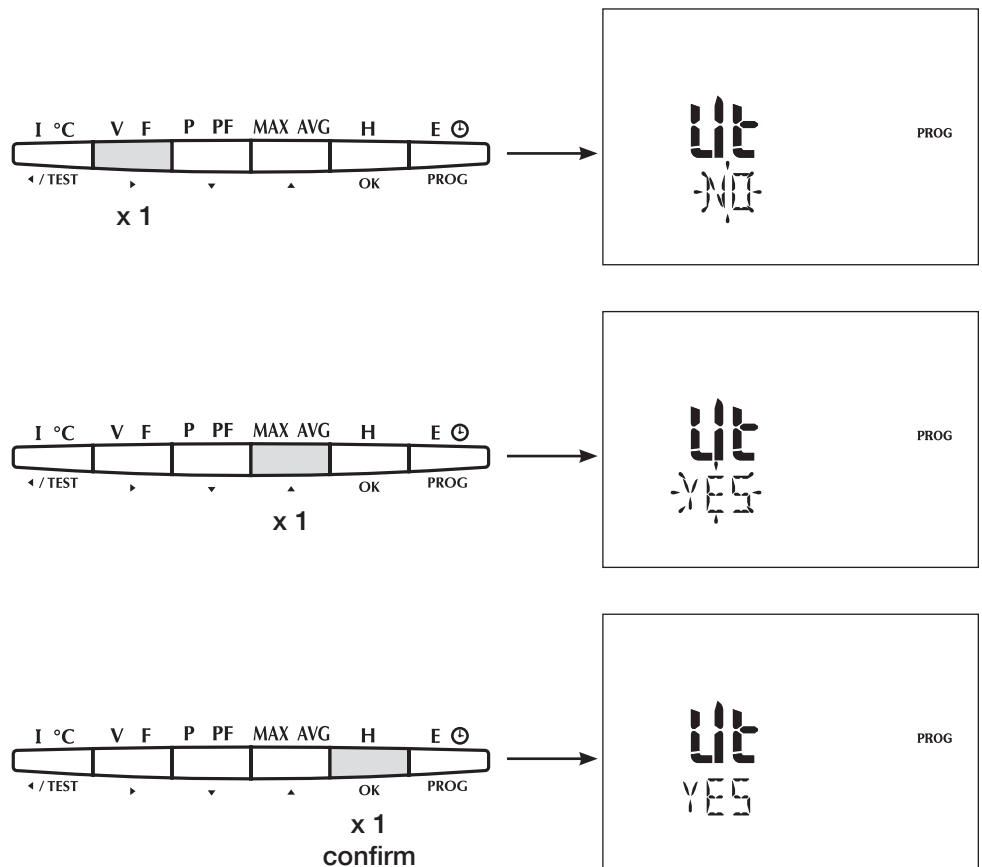


## CURRENT TRANSFORMERS (Example : CT = 1500 / 5A).

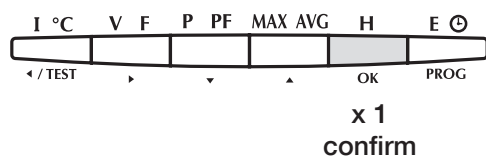
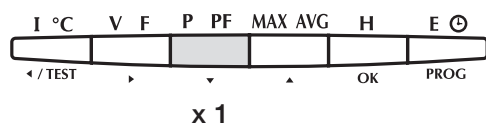
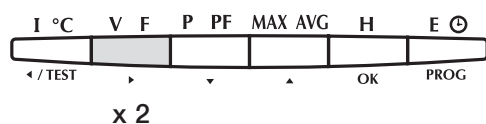
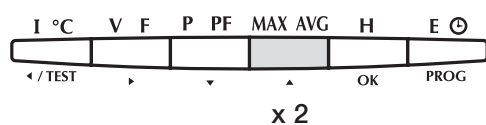
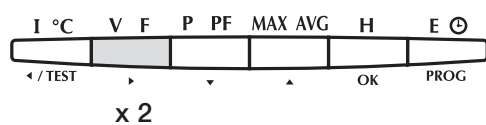
Max 10000/5 or 10000/1



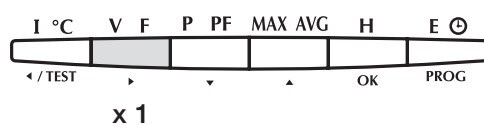
### VOLTAGE TRANSFORMER (Example : Vt = YES)



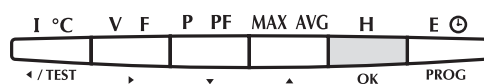
## VOLTAGE TRANSFORMER PRIMARY (Example : PR = 20 000 V)



VOLTAGE TRANSFORMER SECONDARY (Example : SE = 110 V)



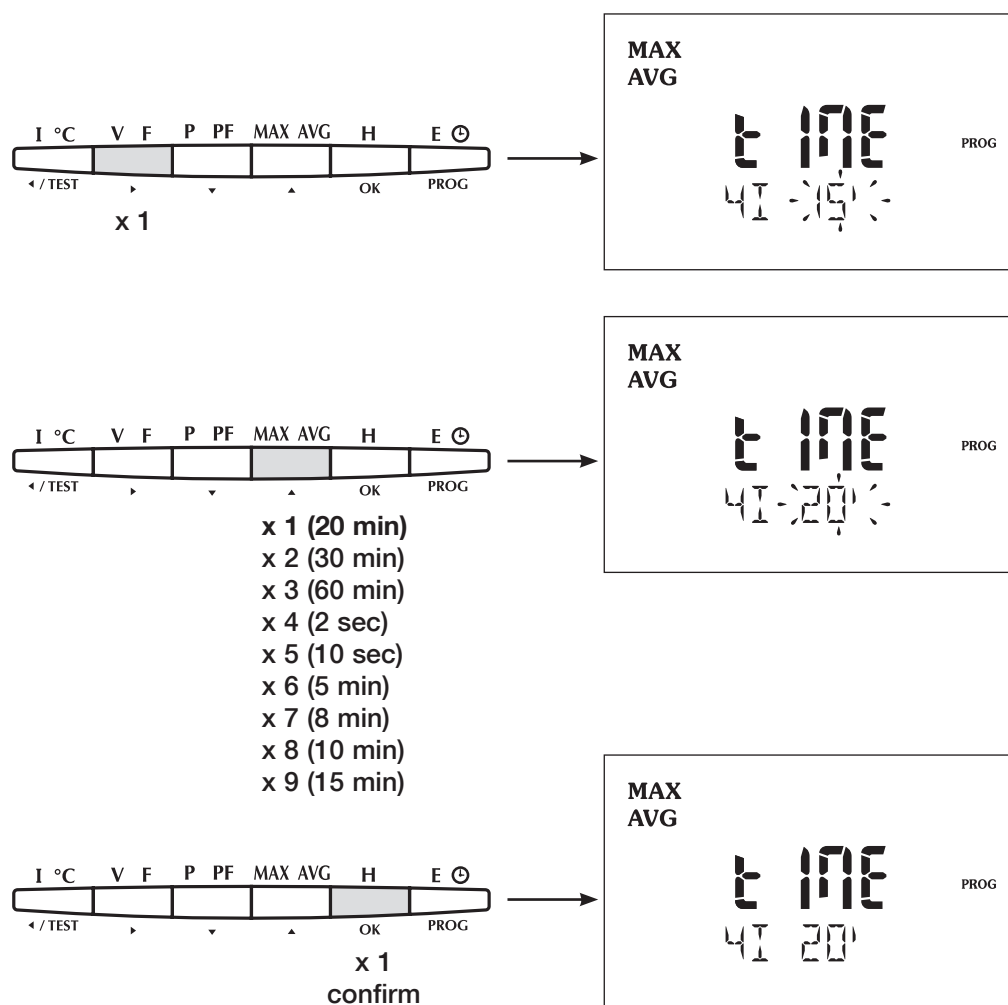
- x 1 (110)
- x 2 (115)
- x 3 (120)
- x 4 (173)
- x 5 (190)
- x 6 (60)
- x 7 (100)



x 1  
confirm

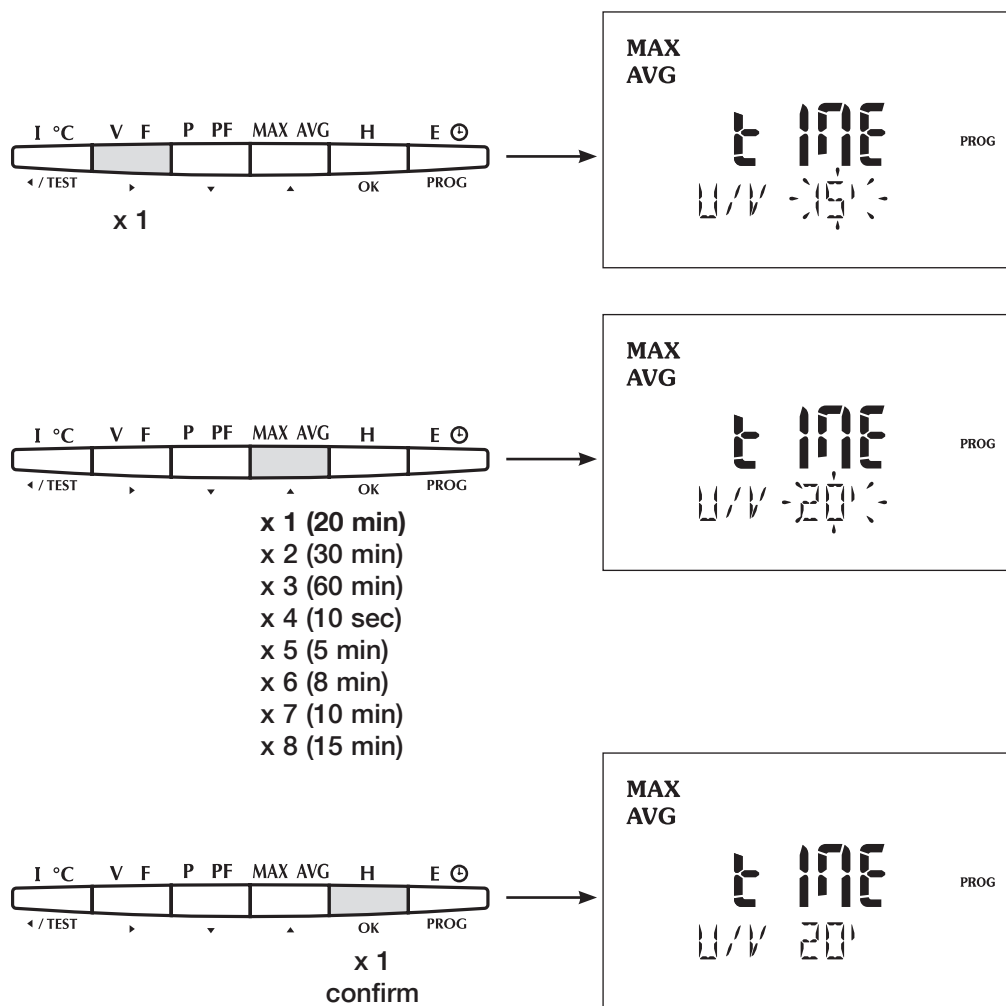


(Example : tIME 4I = 20 min)



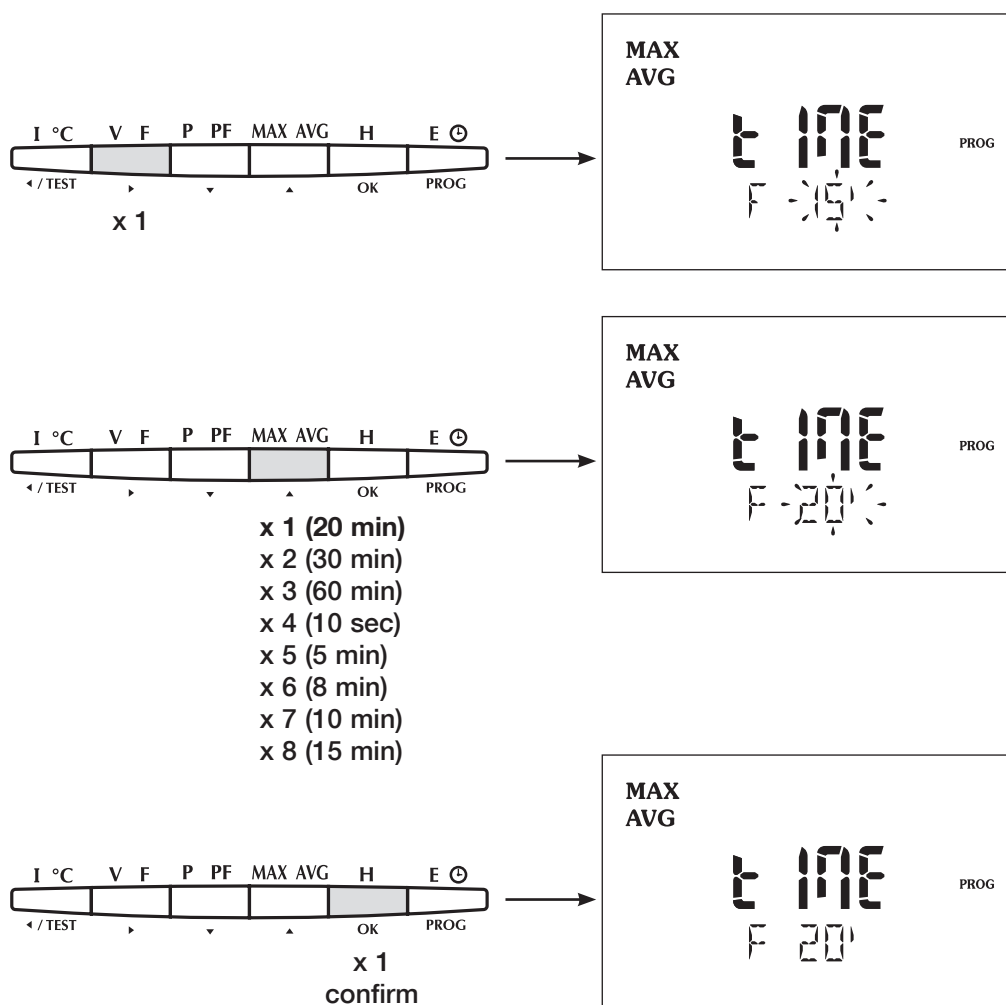
### INTEGRATION PERIOD OF AVERAGE AND MAXIMUM VOLTAGES

(Example : tIME U/V = 20 min)



# INTEGRATION PERIOD OF AVERAGE AND MAXIMUM FREQUENCIES

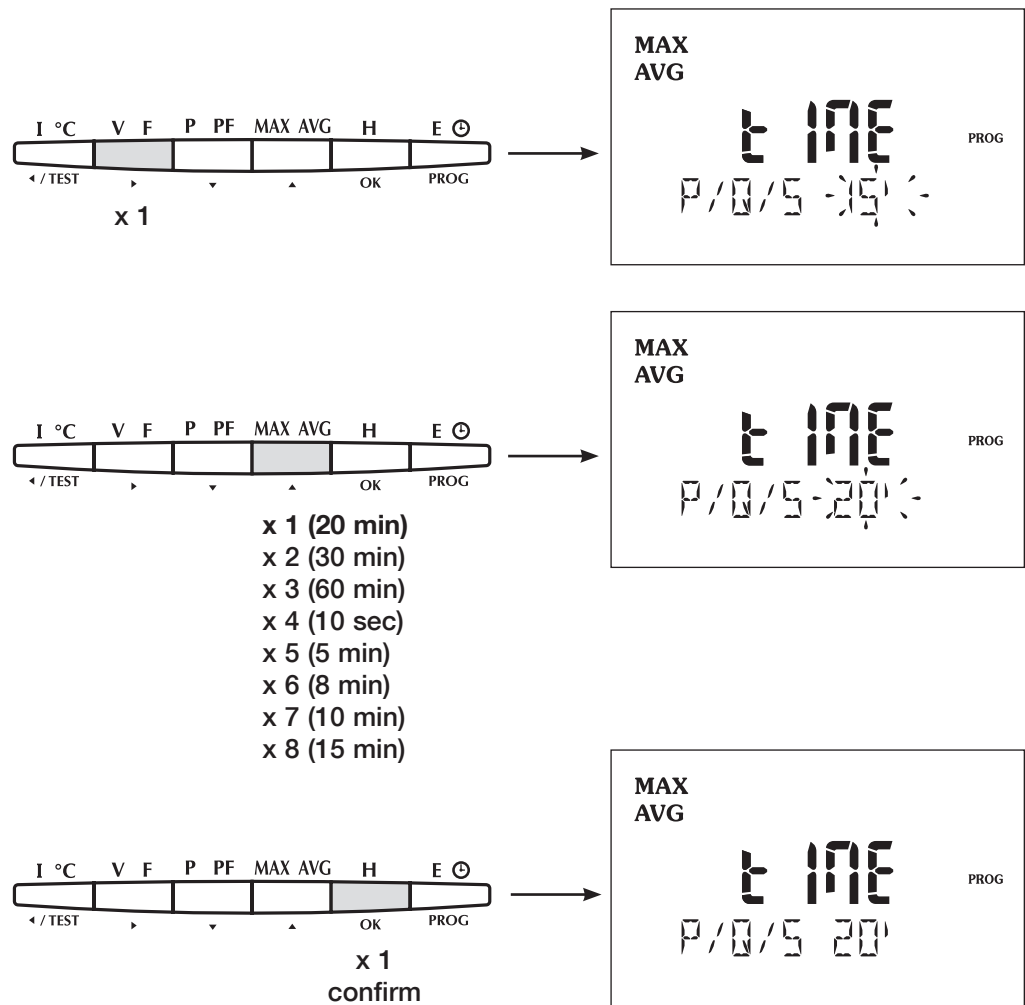
(Example : tIME F = 20 min)



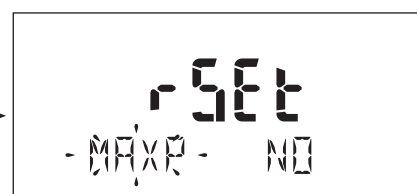
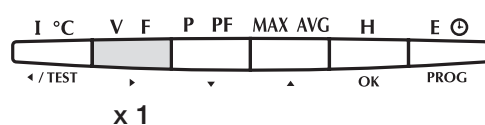
# DIRIS A60

## PROGRAMMING

INTEGRATION OF POWER (Example : tIME P/Q/S = 20 min)

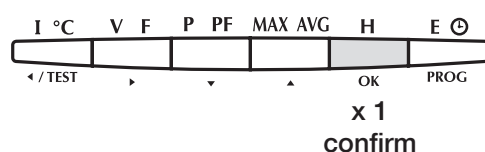
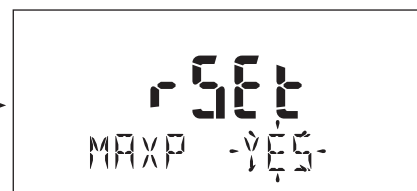
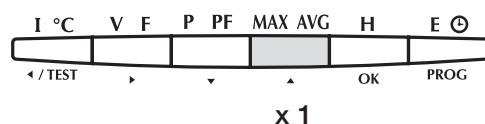
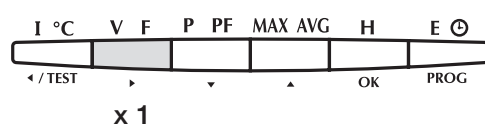


## RESET OF THE MEMORIZED VALUES (Example : rSET = Ea)

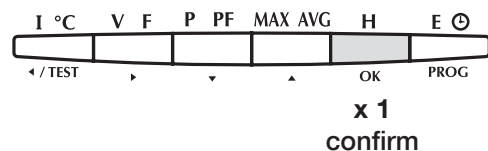
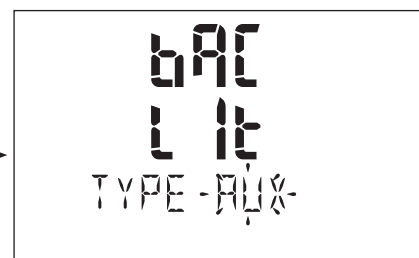
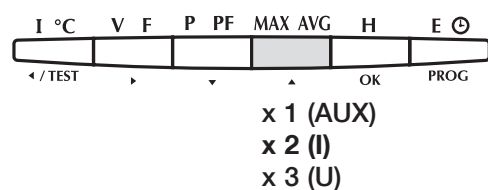
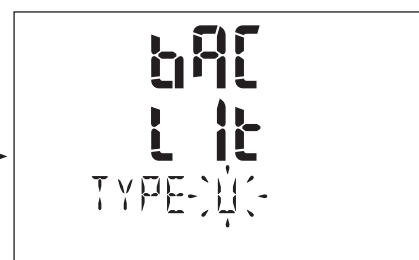
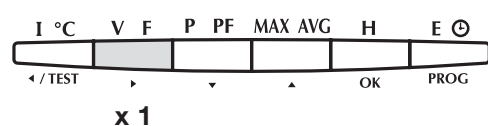


- |              |               |
|--------------|---------------|
| x 1 (MAX U)  | x 12 (ES)     |
| x 2 (MAX V)  | x 13 (EA-)    |
| x 3 (MAX F)  | x 14 (ER-)    |
| x 4 (MAX P+) | x 15 (E1)*    |
| x 5 (MAX P-) | x 16 (E2)*    |
| x 6 (MAX Q+) | x 17 (E3)*    |
| x 7 (MAX Q-) | x 18 (E4)*    |
| x 8 (MAX S)  | x 19 (E5)*    |
| x 9 (HOUR)   | x 20 (E6)*    |
| x 10 (EA+)   | x 21 (MAX 4I) |
| x 11 (ER+)   |               |

\* Indication only if I/O 4825 0094 module is present.

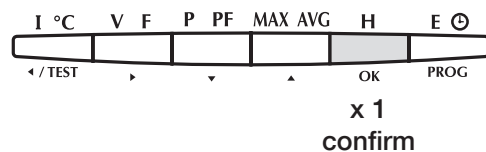
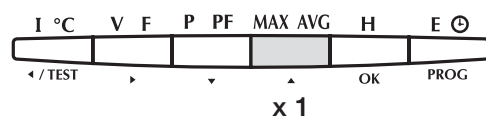
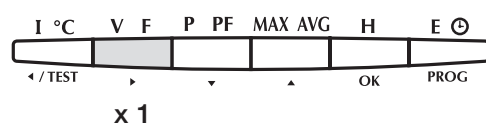
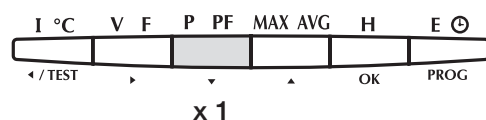
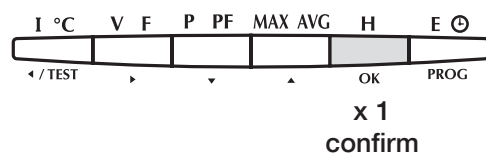
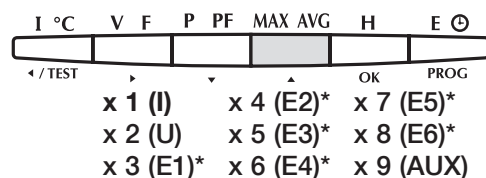
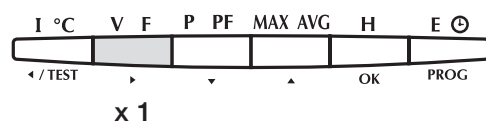


### MODE OF OPERATION OF BACKLIGHTING (Example : bACLIT = AUX)



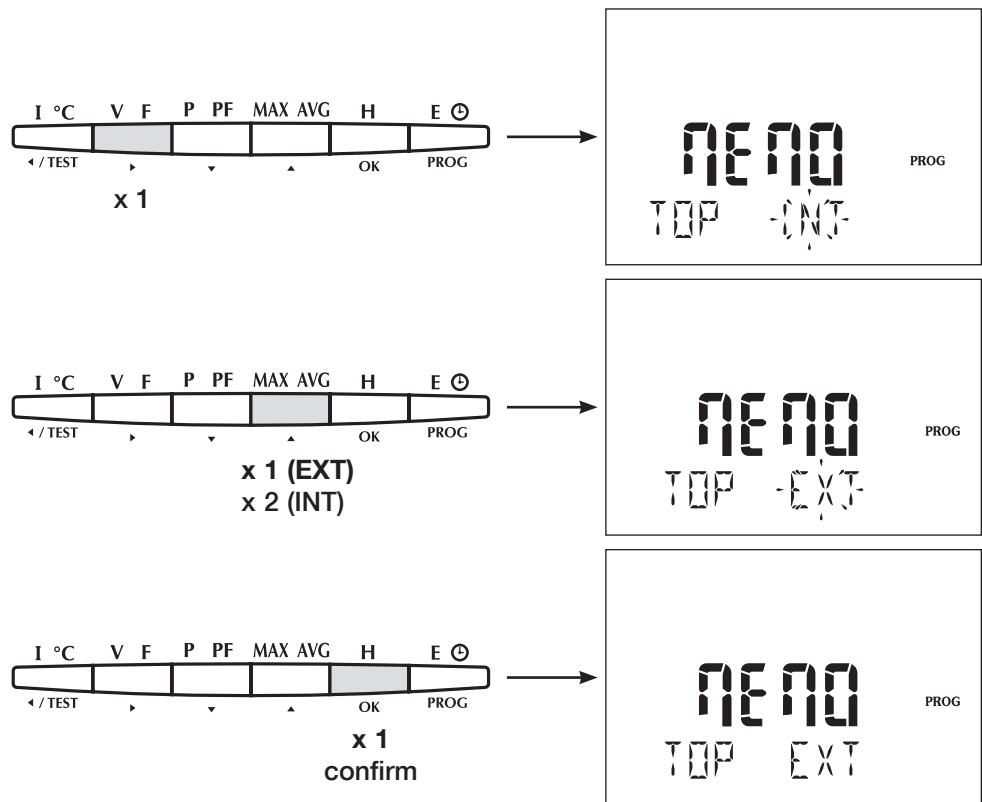
## MODE OF OPERATION OF HOUR METER

(Example : hour meter (for current) with start-up at 1000A)



\* Indication only if  
I/O 4825 0094  
module is present.

### INTERNAL OR EXTERNAL SYNCHRONIZING PULSE (Example : MEMO TOP = EXT)



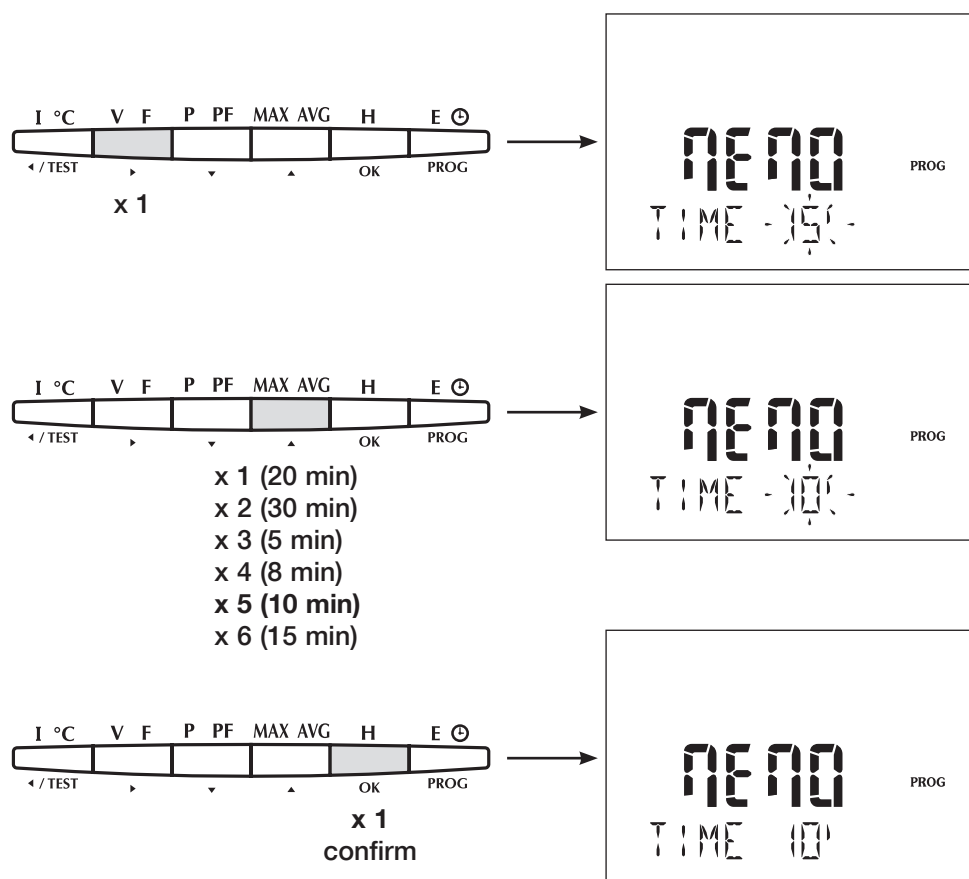
**Remark:**

This function is used for synchronizing the period of the Power load curves on:

**INTERNAL PULSE** = synchronisation en fonction de l'horloge interne du DIRIS.

**EXTERNAL PULSE** = synchronization as per the pulse received by the synchronization input of the module.

# INTEGRATION PERIOD OF THE SYNCHRONIZING PULSE (Example : MEMO TIME = 10')



### DEFINITION OF THE FUNCTIONS OF VOLTAGE DIPS AND INTERRUPTION, AS WELL AS VOLTAGE SWELL AND OVER-CURRENTS

**DIRIS A60** allows detecting events such as:

- Voltage dips
- Voltage swells
- Interruption
- Over-currents

A packet of 10 RMS  $\frac{1}{2}$  period curves (I1, I2, I3, In, V1, V2, V3, U12, U23, U31) is associated with each event detected.

At 50 Hz, a fundamental period is 20 ms, that is  $\frac{1}{2}$  a RMS period at a mean value of 10 ms

An RMS  $\frac{1}{2}$  curve period is made up of 120 points. For a signal at 50 Hz it represents a history on 1.2s (60 Hz for 1s). A configurable trigger (Pre-post mode from 0 to 100 %) allows distributing the number of points around the event (50% / 50% = 60 points before the event and 60 points after).

For voltage dips, swells and over-currents, an event starts if one of the quantities exceeds the determined threshold. It ends if all the quantities have come back to normal condition. (hysteresis).

For voltage interruption, an event starts if all the quantities exceed the determined threshold. It ends if one of the quantities has come back to normal condition.

Depending upon the length, the events are recorded in the following manner:

- Event < 1.2s (50 Hz), 1 packet of 10 curves over 1.2s.
- 1.2s < Event < 2.4s (50 Hz), 2 packets following 10 curves, i.e. 2.4s.
- Event > 2.4s (50 Hz), 1 packet of 10 curves consisting of the beginning of the event, 1 packet of 10 curves consisting of the end of the event.

Between these two, the values are not available.

#### > Logging capacity (FIFO) :

- Date and time of 60 events
- Recording of 43 curves

#### > Voltage dips and swells

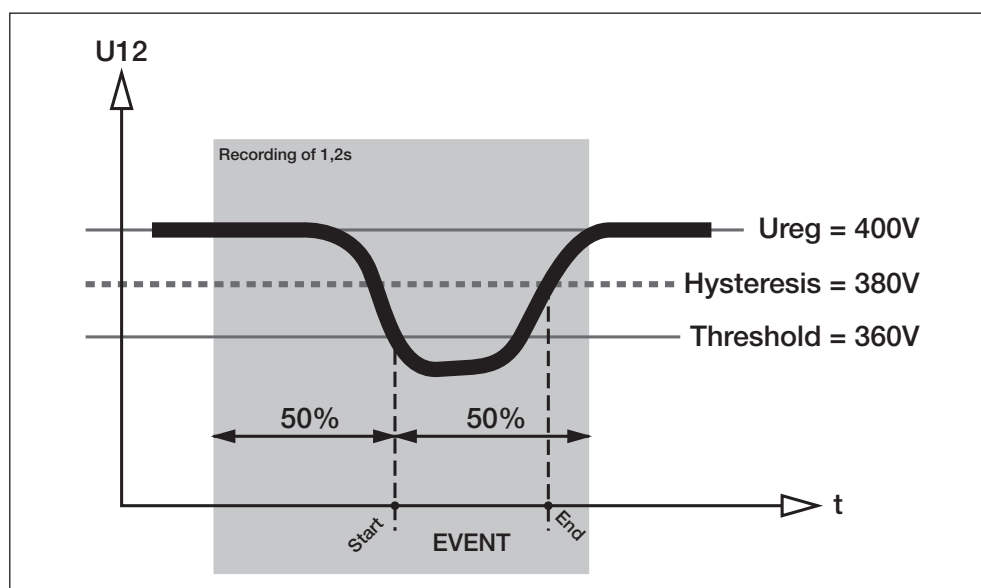
They are memorized as per IEC 61000-4-30 with a category B measurement method.

#### > Voltage interruption

It is possible to configure the outage threshold (in % of  $U_n$ ), on the other hand the measurement limit of DIRIS A60 which is 29 V AC neutral phase and 50 V AC phase/phase must be taken into account.

#### > Over-currents

The detection threshold is configured in % of the CT rating. Detection is made as in the case of voltage swell.

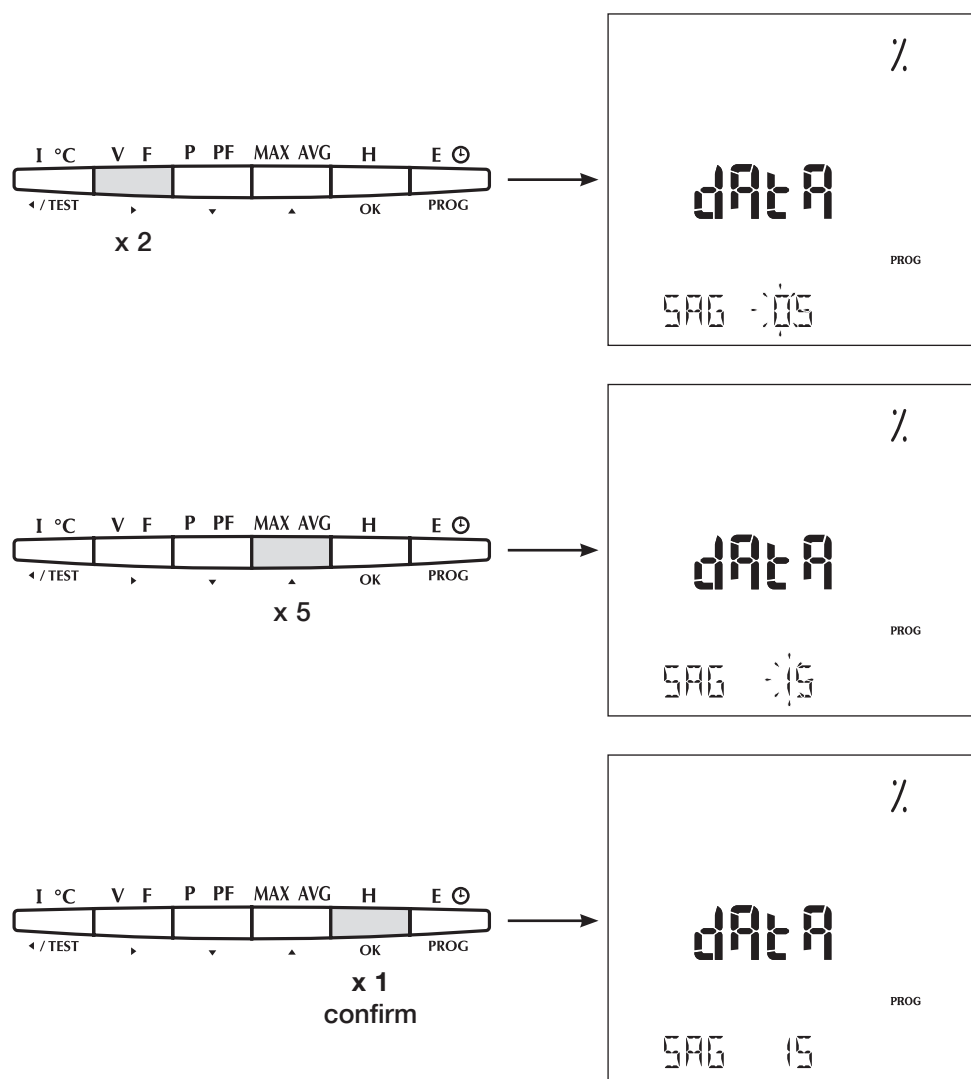


**Example :** Voltage dips with a 90 % voltage threshold and 5% hysteresis.

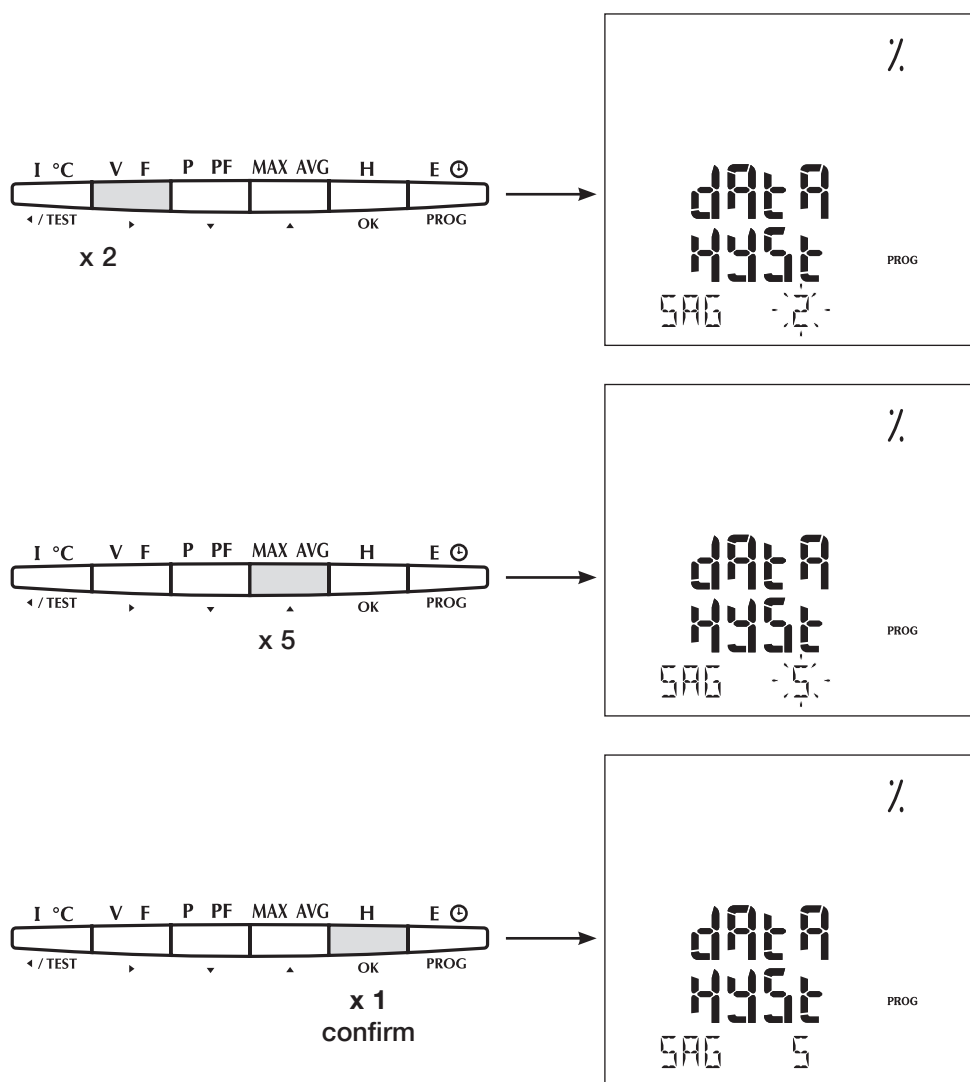
## THRESHOLD OF VOLTAGE DIPS (SAG) (Example : dAtA SAG = 90%)

% Of the residual voltage.

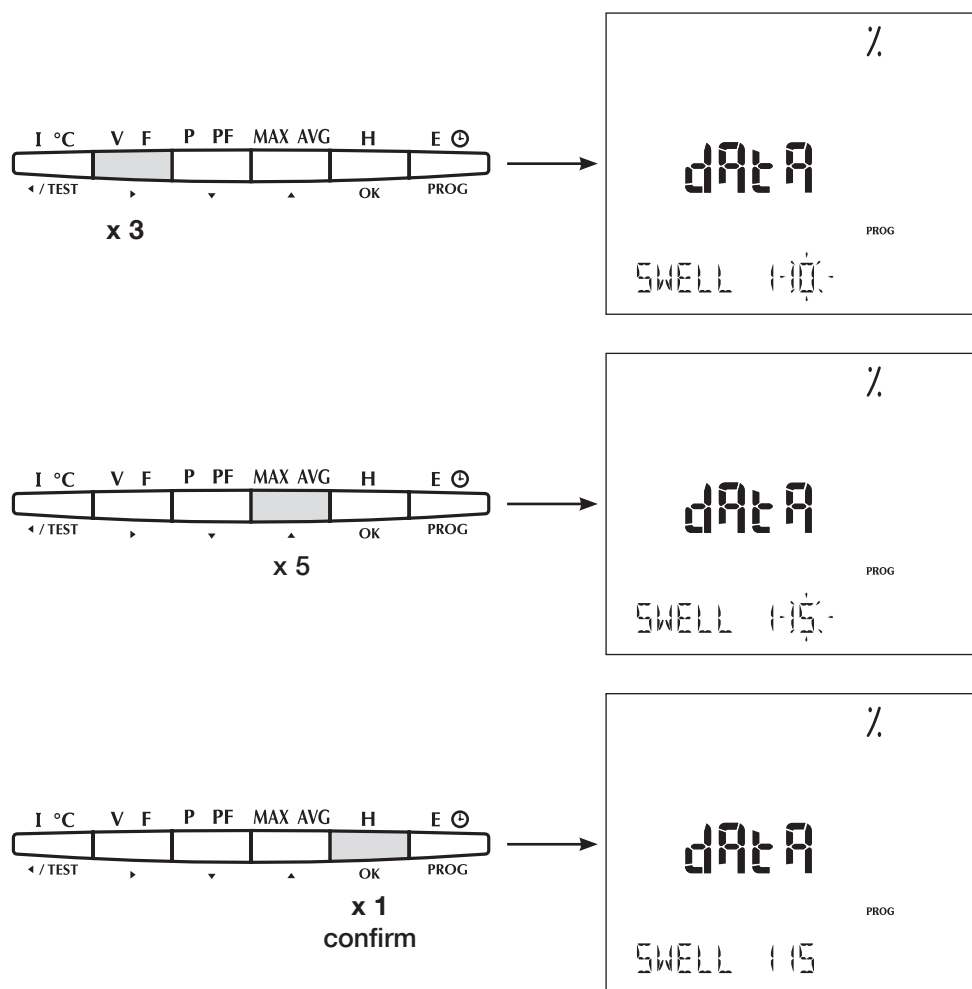
Example: 90% for 400 V, when SAG is <360 V.



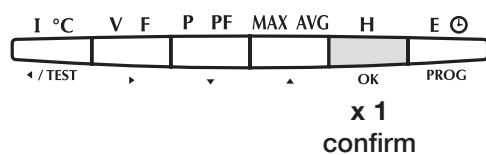
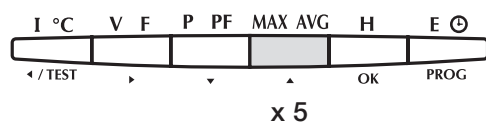
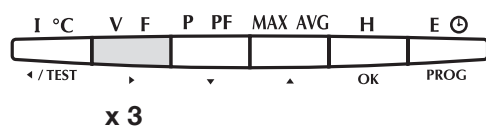
### HYSTERESIS OF THE VOLTAGE DIP (Example : dAtA HySt SAG = 5%)



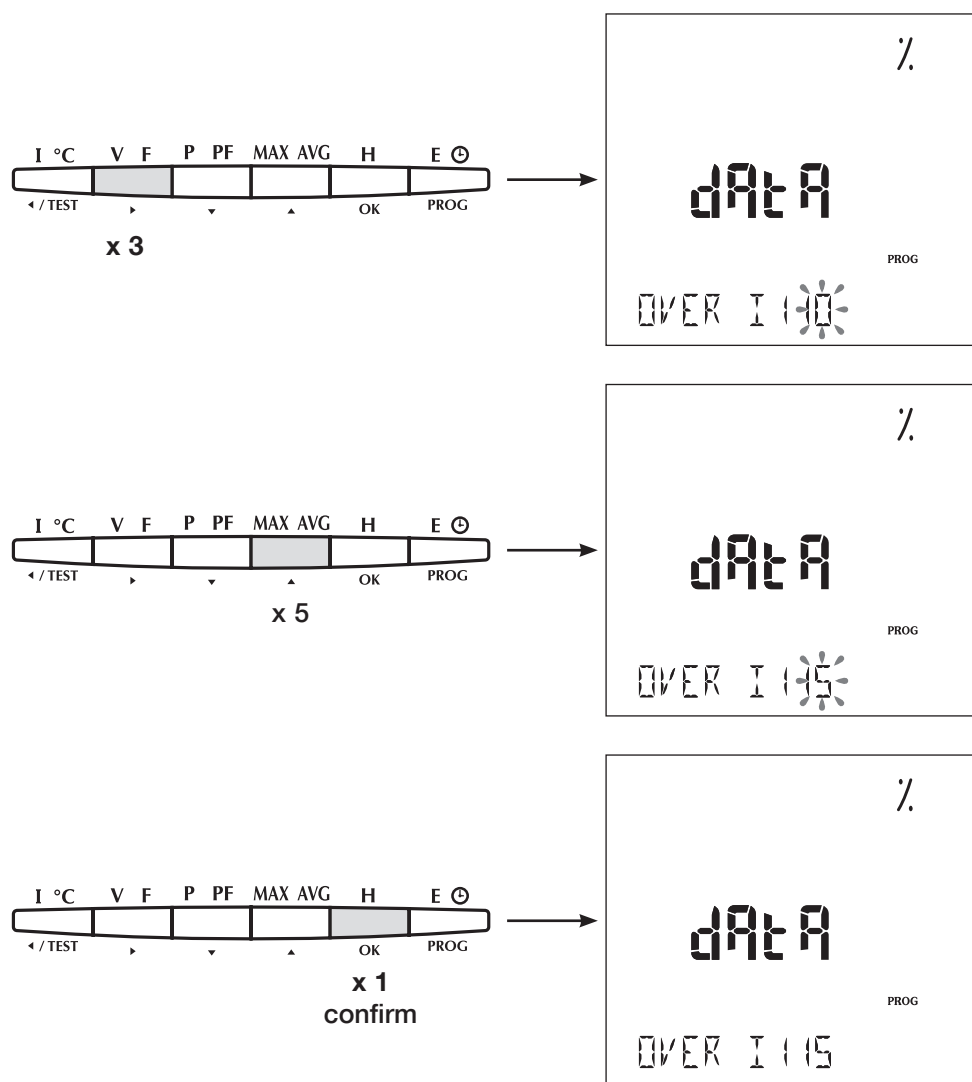
# THRESHOLD OF VOLTAGE SWELL (SWELL) (Example : dAtA SWELL = 115 %)



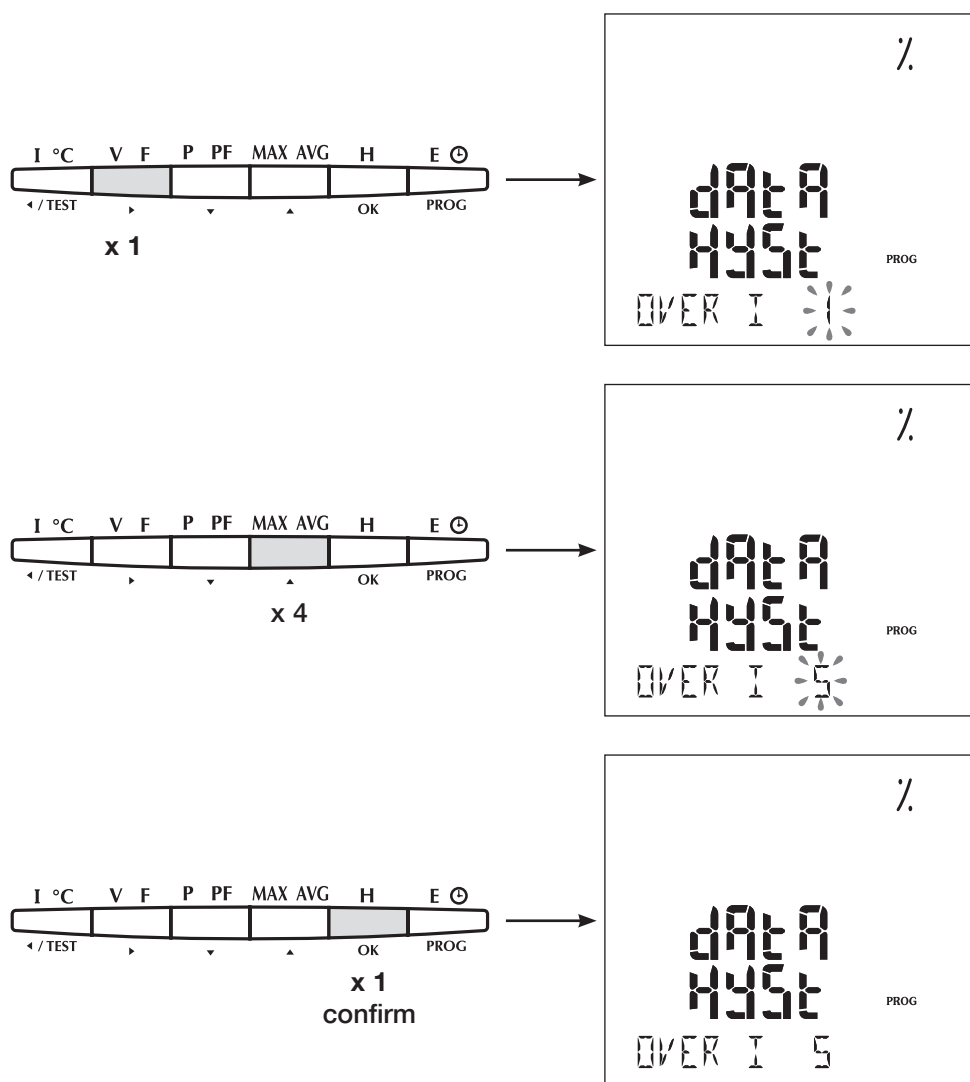
HYSTERESIS OF VOLTAGE SWELL (Example: dAtA HySt SWELL = 5%)



## THRESHOLD OF OVER-CURRENTS (Example: dAtA OVER I = 115%)

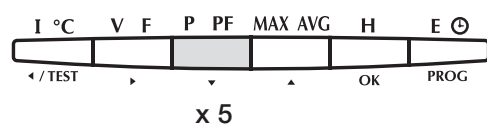
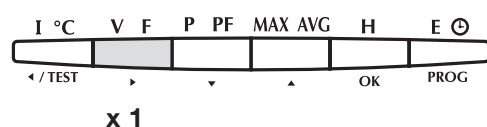
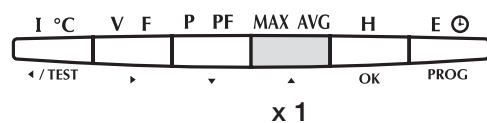
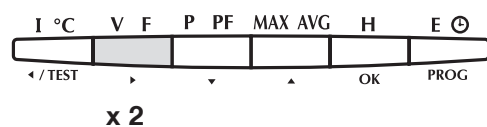


### HYSTERESIS OF OVER-CURRENTS (Example: dAtA HySt I = 5%)



# CONFIGURABLE TRIGGER FOR RMS 1/2 CURVES PERIOD

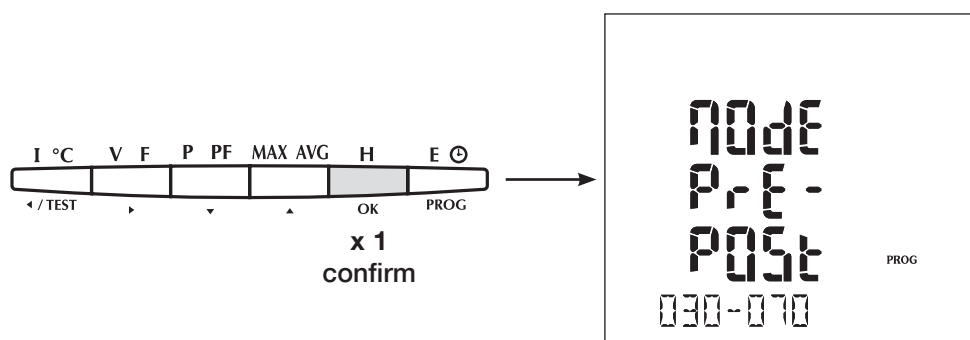
(Example: MOdE PRE-POST = 30% - 70%)



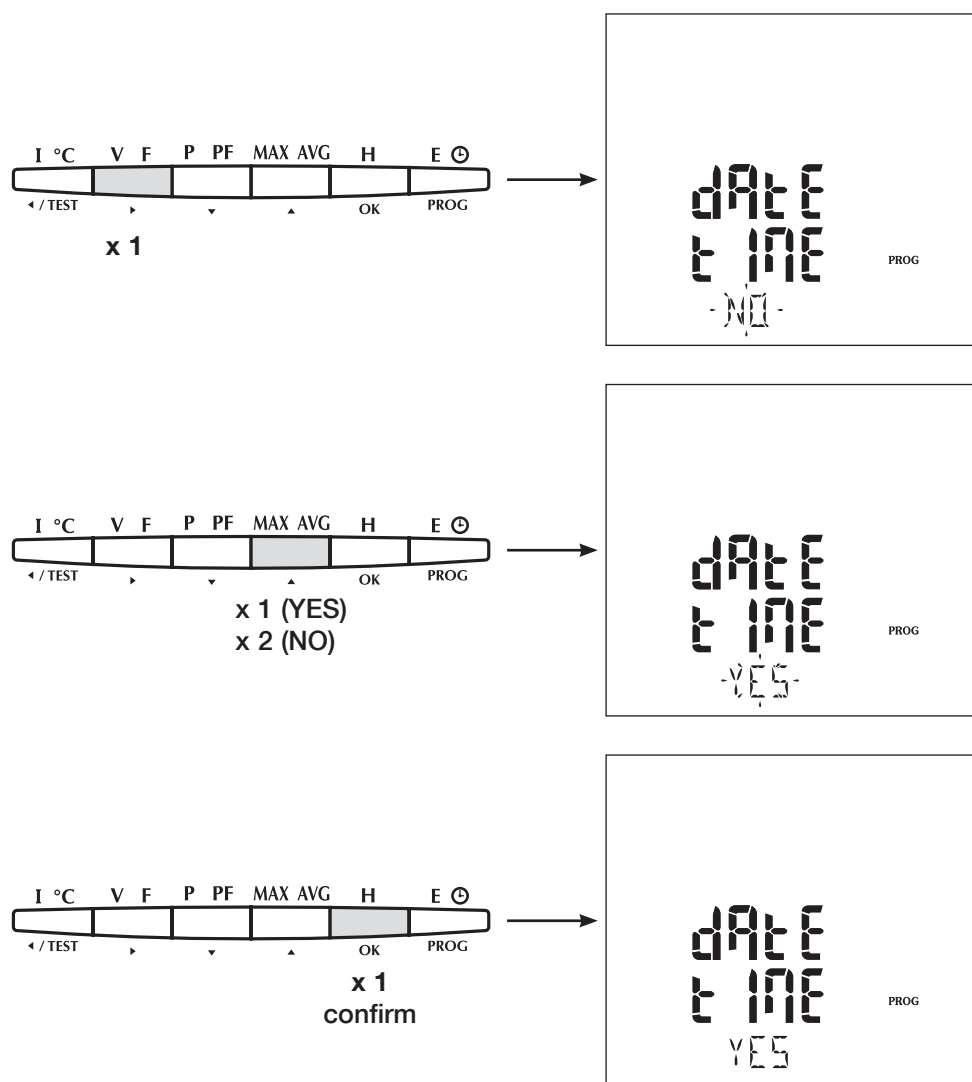
# PROGRAMMING

## TRIGGER CONFIGURABLE POUR LES COURBES RMS 1/2 PERIODE

(Example: MOdE PRE-POST = 30% - 70%)



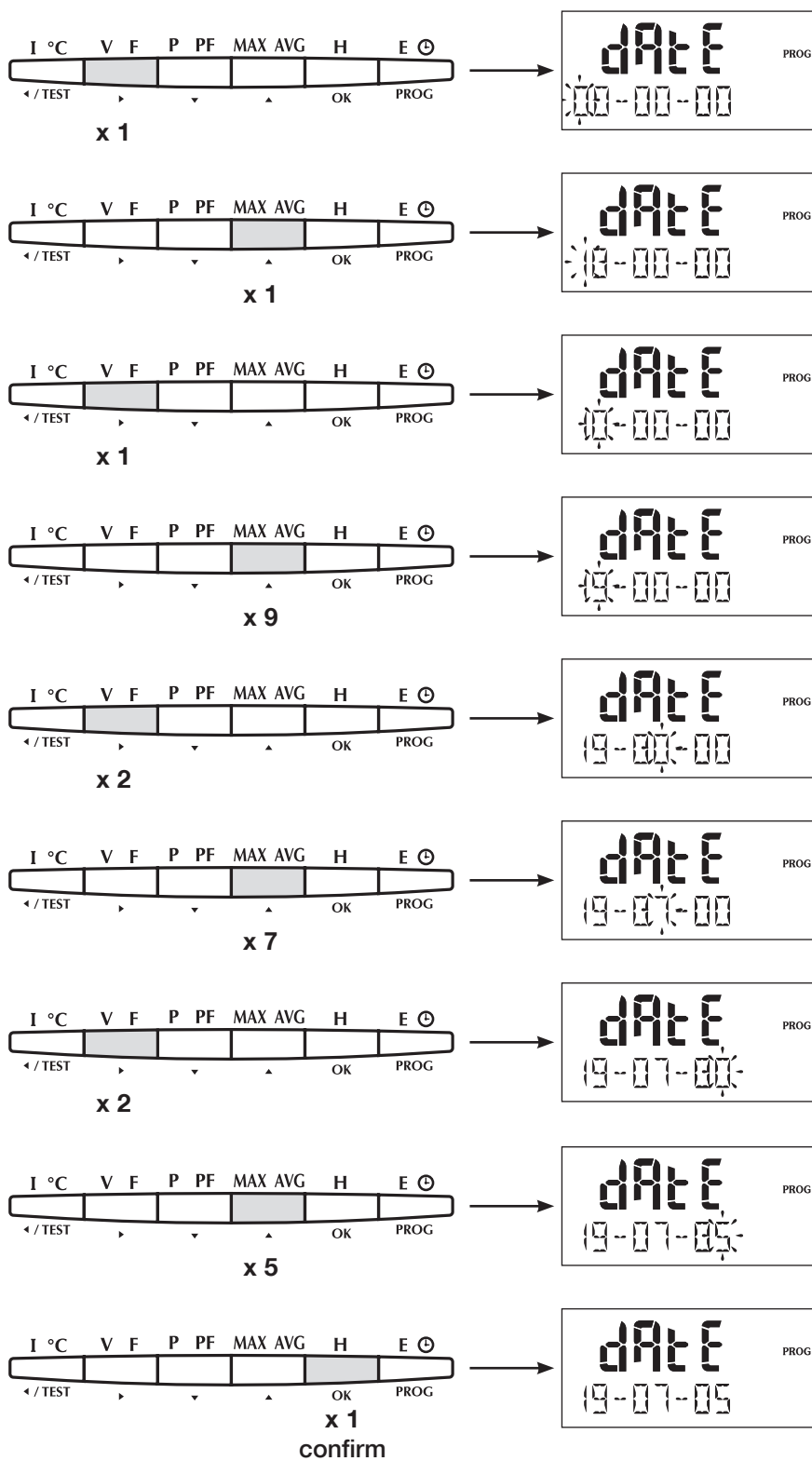
MODIFICATION OF THE DATE / TIME FUNCTION: YES / NO (By default G.M.T. time = 0) - (Example: dAtE tIME = YES))



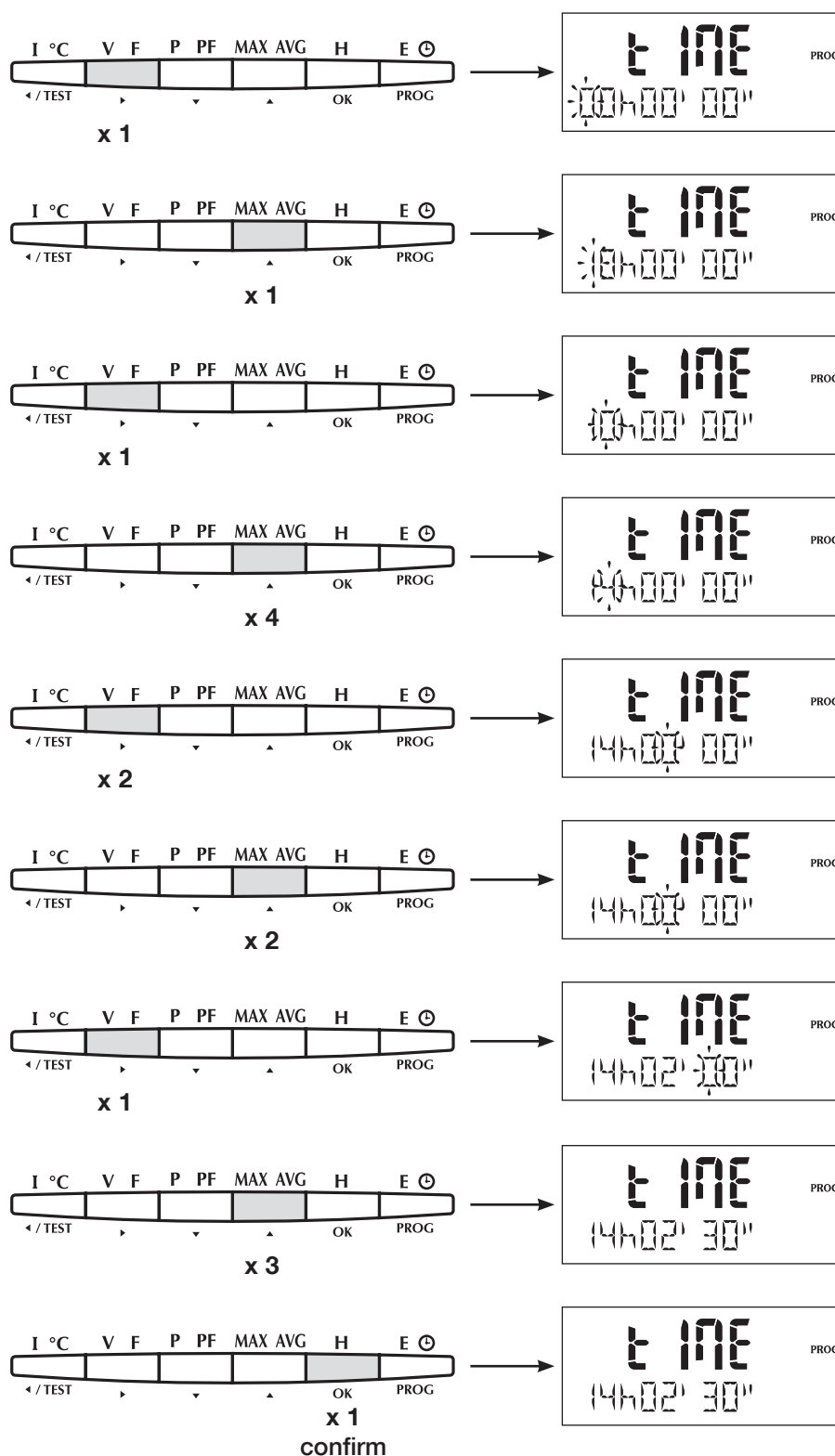
# DIRIS A60

## PROGRAMMING

DATE SETTINGS (Example: dAtE = 19-07-05)

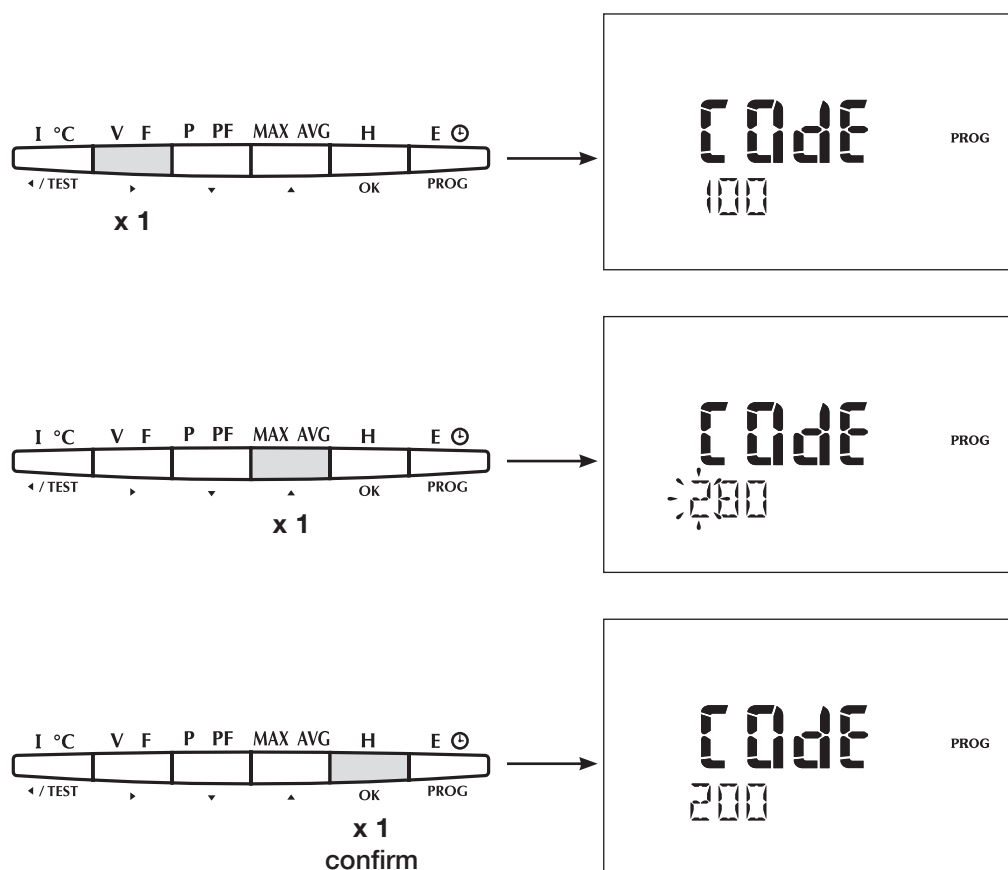


## HOUR SETTINGS (Example: tIME 14h02'30")

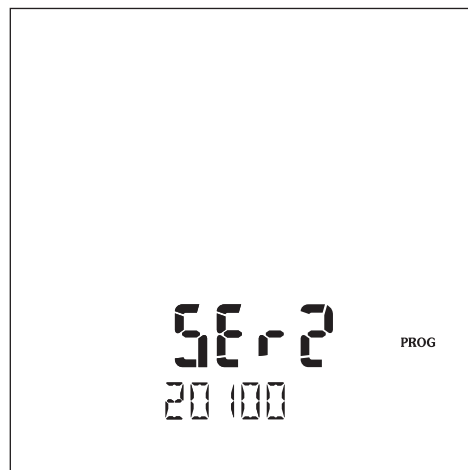
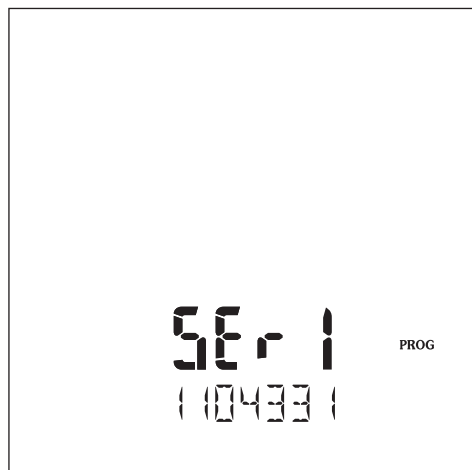


### MODIFICATION OF THE ACCESS CODE IN THE CONFIGURATION MENU

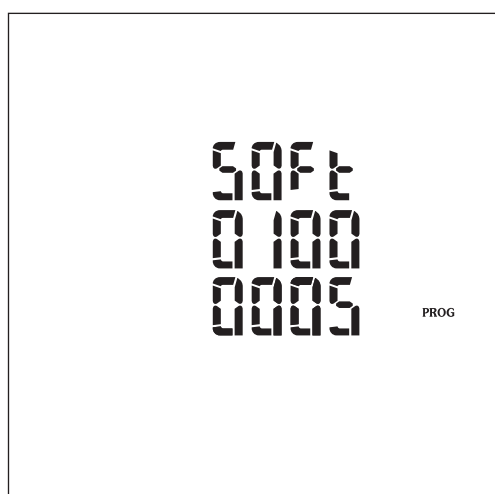
(Example: CODE = 200)



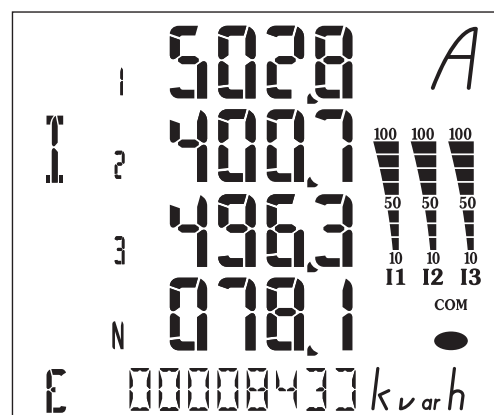
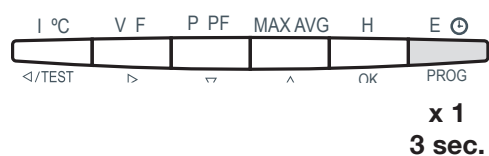
SERIAL NUMBER (Example: SEr1 = 0320100)



SOFTWARE VERSION (Example : version 100)

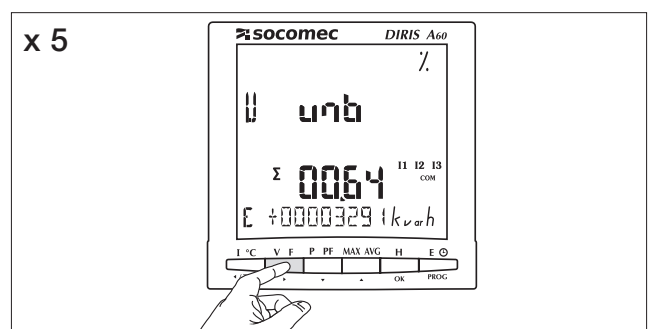
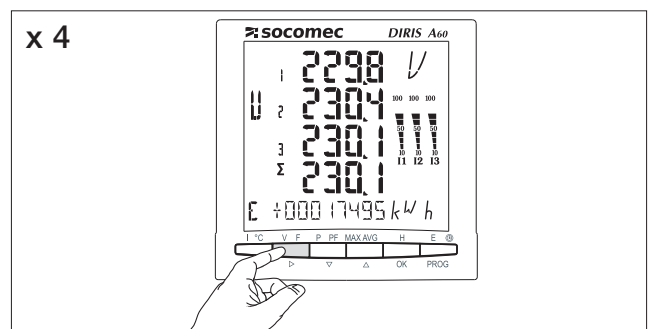
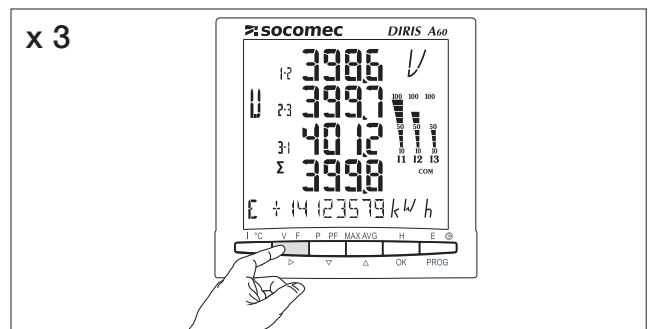
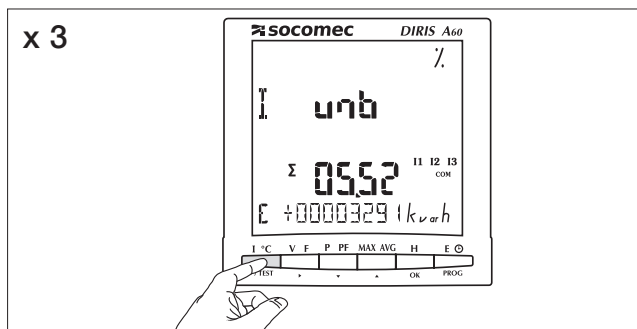
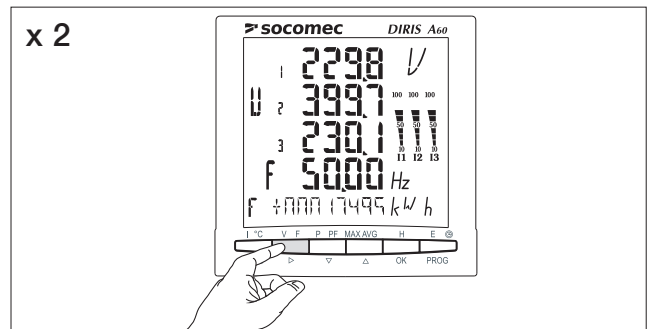
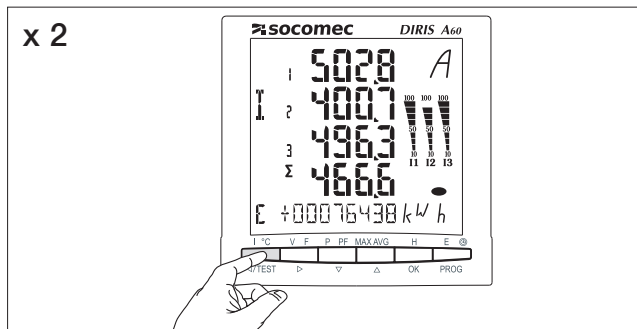
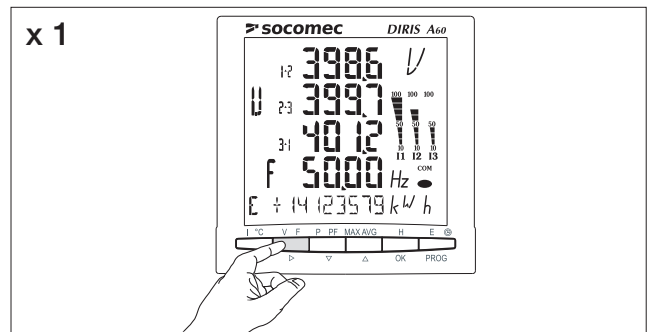
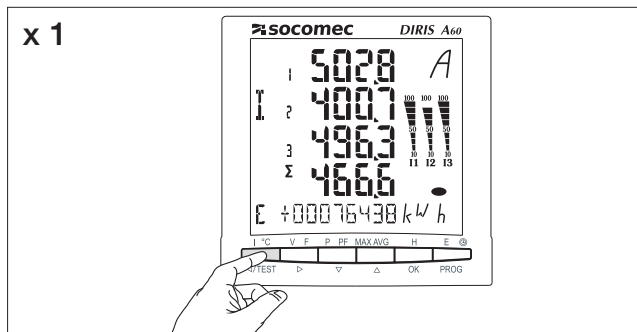


TO QUIT PROGRAMMING

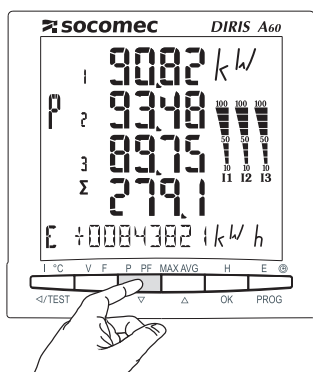


# DIRIS A60

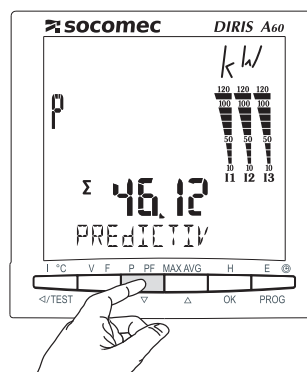
## OPERATION



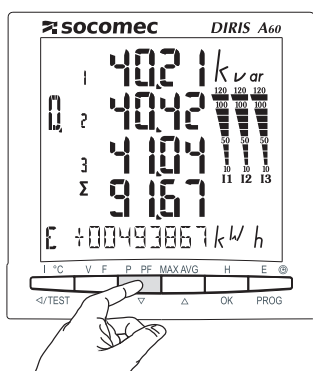
x 1



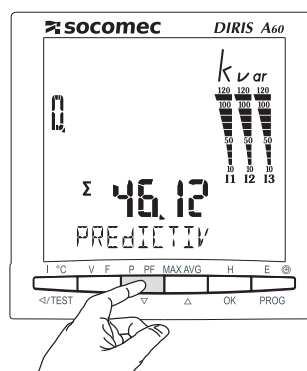
x 5



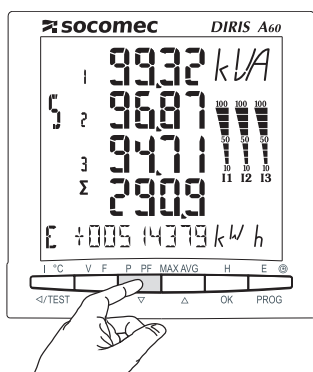
x 2



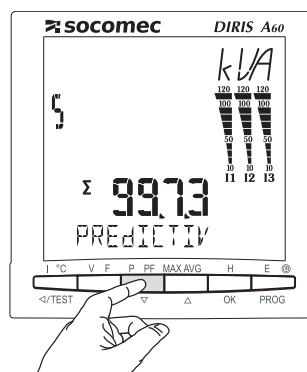
x 6



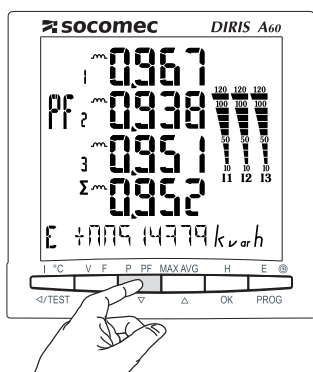
x 3



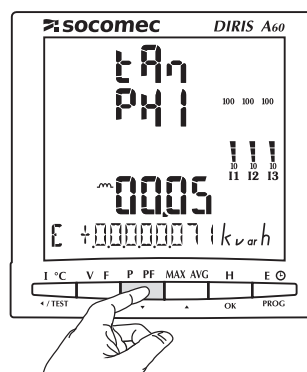
x 7



x 4



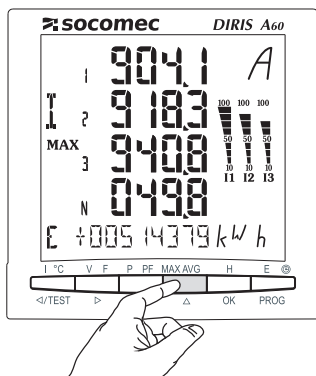
x 8



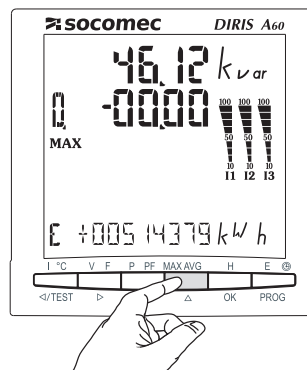
# DIRIS A60

## OPERATION

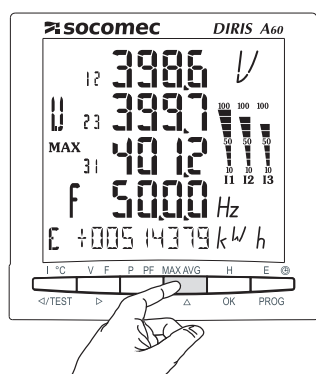
x 1



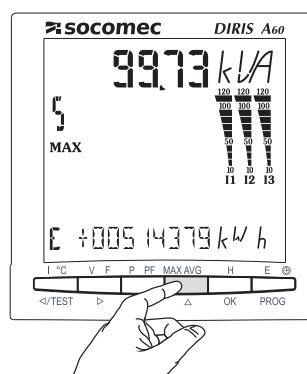
x 5



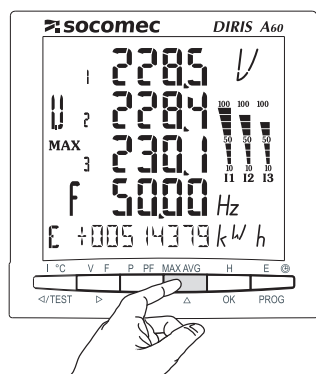
x 2



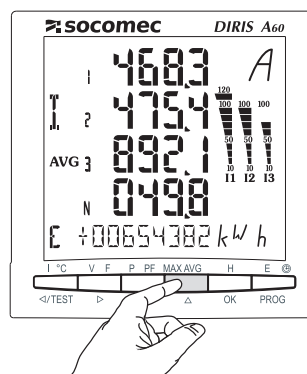
x 6



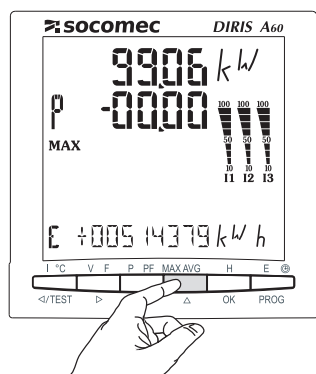
x 3



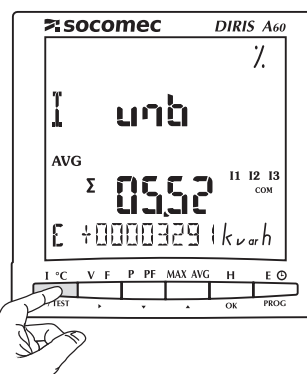
x 7



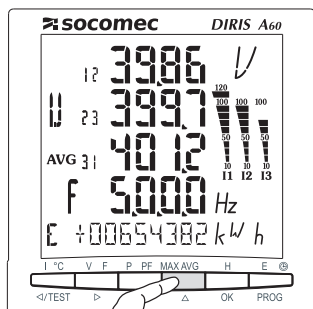
x 4



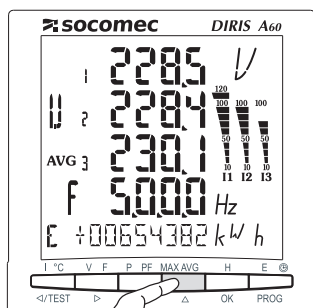
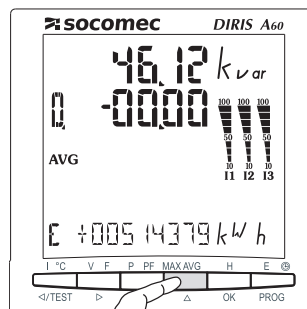
x 8



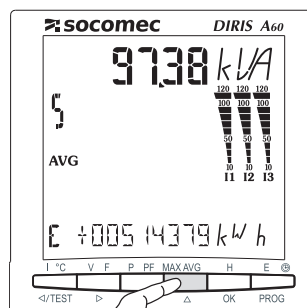
x 9



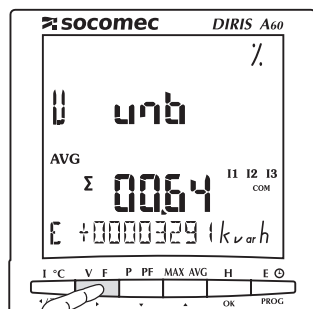
x 13



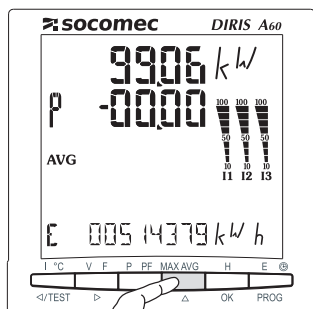
x 14



x 11



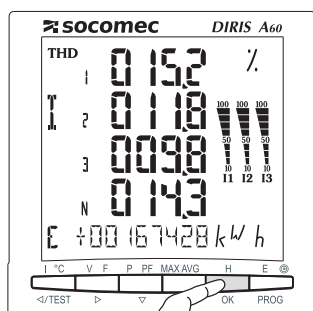
x 12



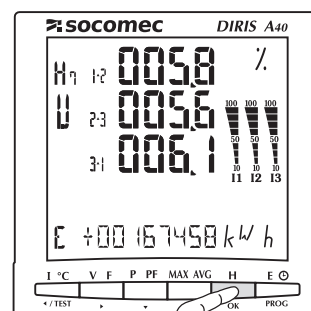
# DIRIS A60

## OPERATION

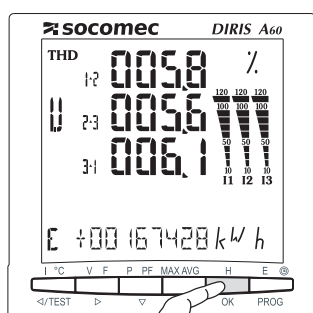
x 1



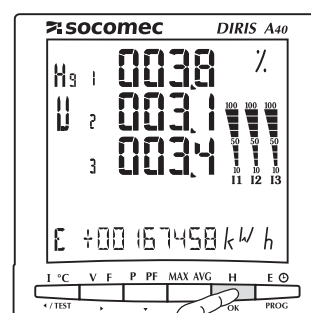
x 13



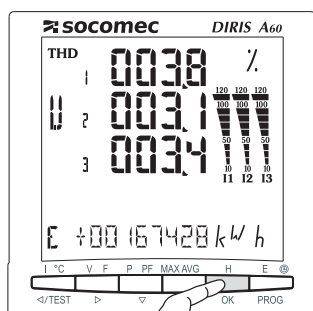
x 2



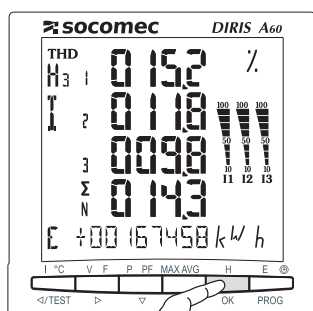
x 21



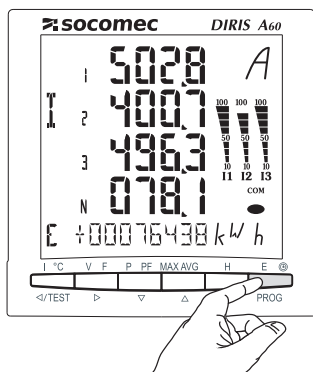
x 3



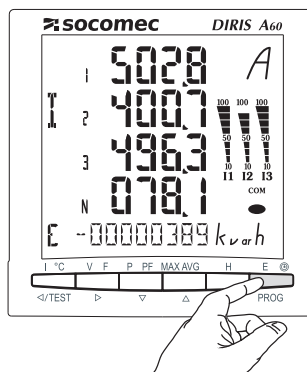
x 4



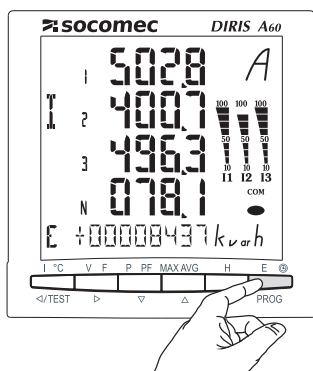
x 1



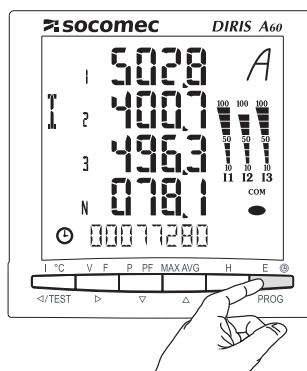
x 5



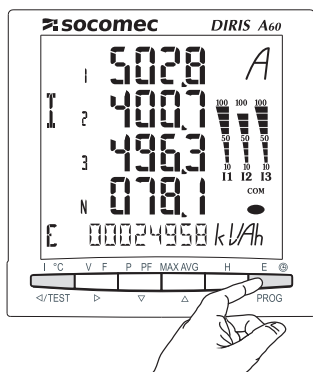
x 2



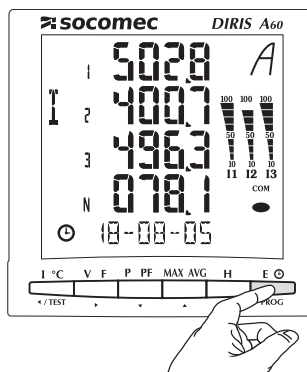
x 6



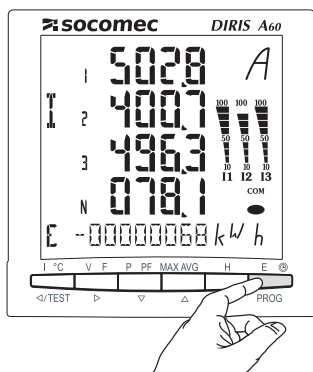
x 3



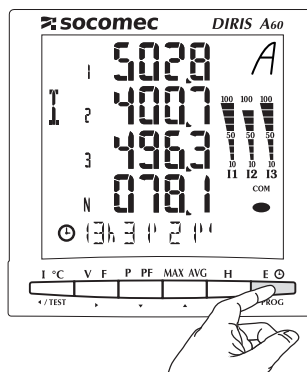
x 7



x 4



x 8



## CONNECTION TEST FUNCTION

During the test, the DIRIS must have current and voltage for each of the phases.

In addition to this, the function recognises the PF of the installation as being between  $0.6 < PF < 1$ . If the PF of the installation is not within this range, this function cannot be used.

In 4 BL/3 BL/2BL/1 BL, the connection of the CTs is controlled only.

In 4NBL and 3NBL the connection as a whole is controlled.

Do check that these are the right conditions:

Err 0 = no error

Err 1 = CT phase 1 inverted

Err 2 = CT phase 2 inverted

Err 3 = CT phase 3 inverted

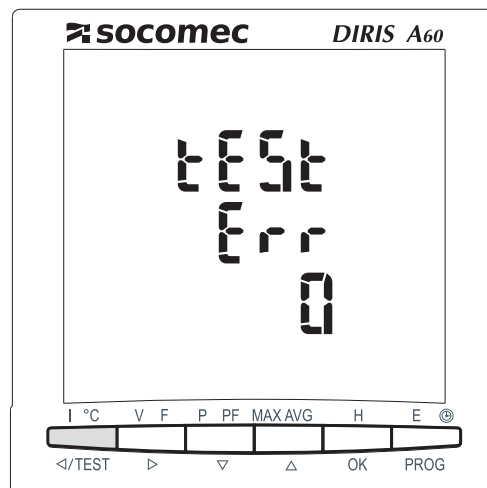
Err 4 = V1 and V2 voltages inverted

Err 5 = V2 and V3 voltages inverted

Err 6 = V3 and V1 voltages inverted

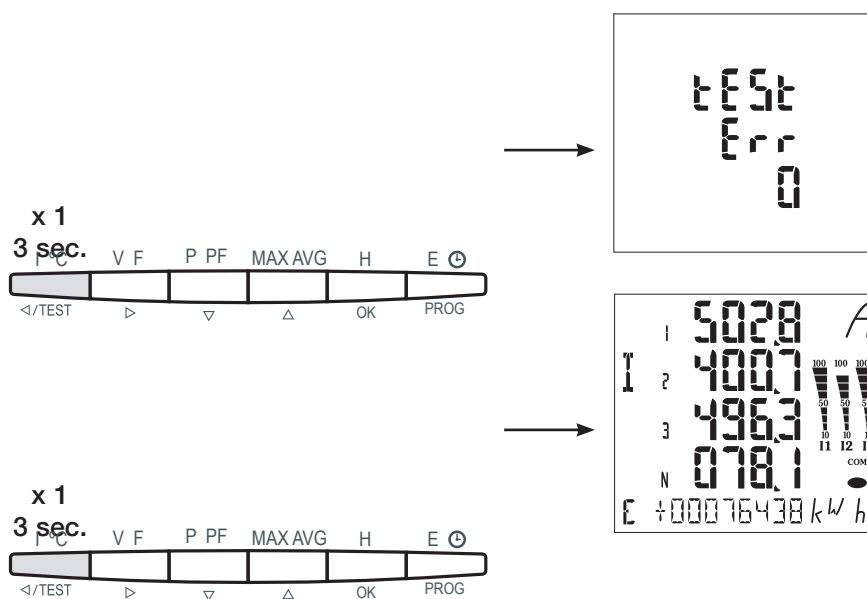
For the Err 1, Err 2 and Err 3, the modification can be performed automatically by the DIRIS or manually by correcting the current connections.

For the Err 4, Err 5 and Err 6 the modification must be performed manually by correcting the voltage connections.

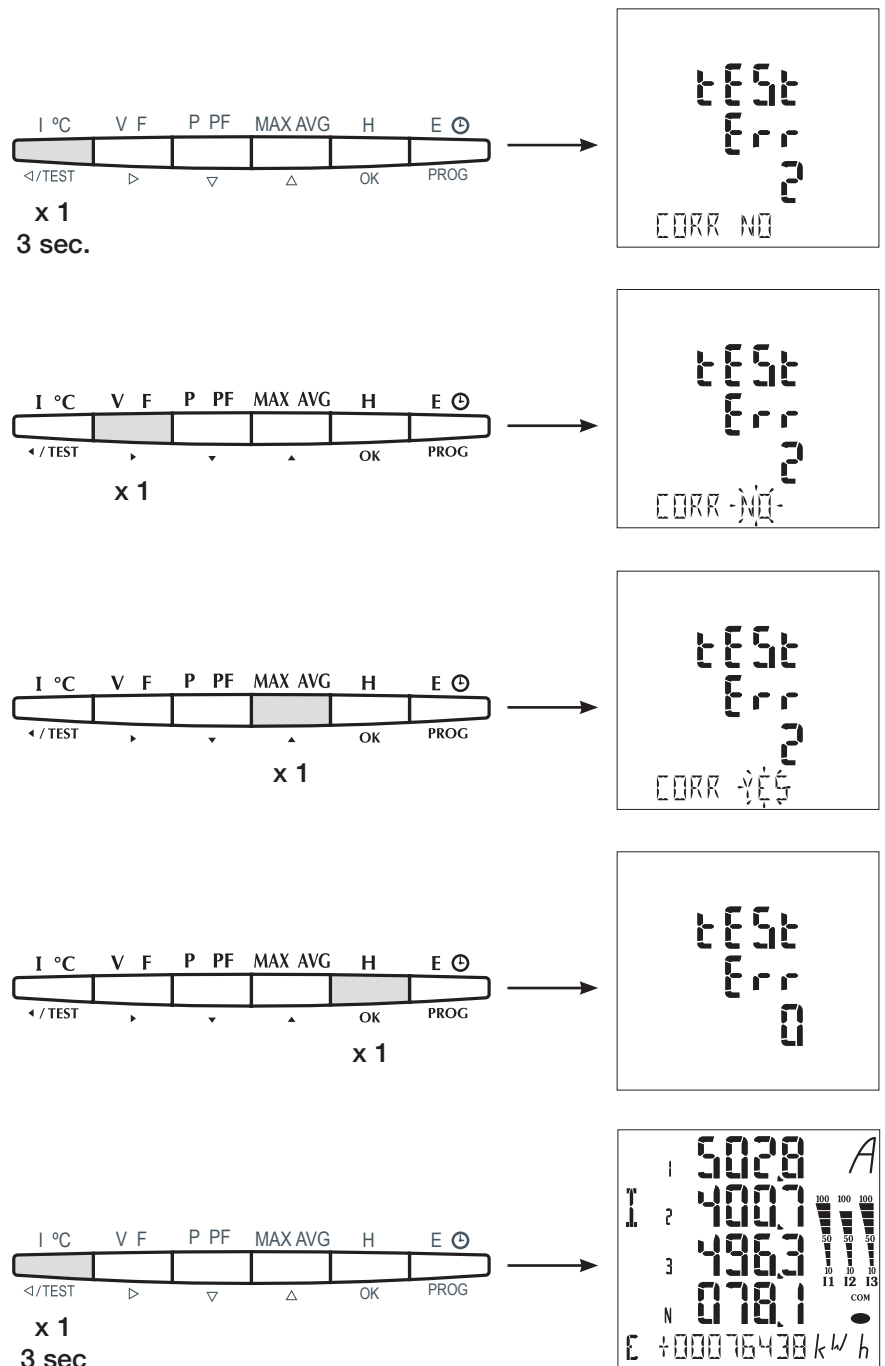


x 1  
3 sec.

Example : tEsT Err 0



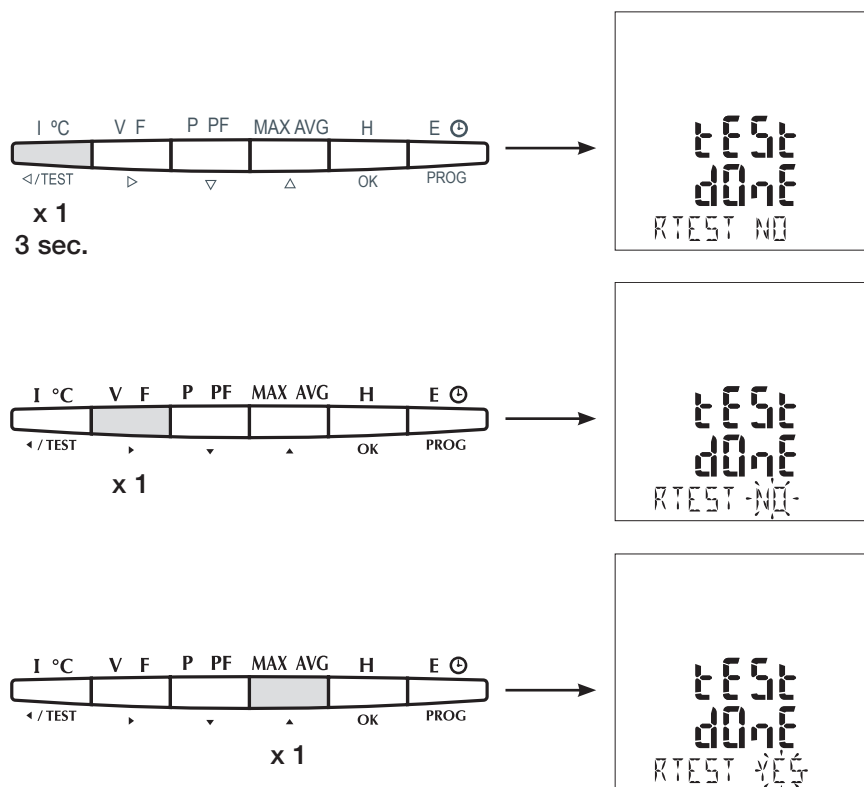
Example : tEsT Err 2



### > second test operation

This menu is displayed if the product has already been tested. You can run a full test again as explained below.

This action will delete the previous software corrections.



- 
- **Device Switched off**  
Check auxiliary supply
  - **Backlight switched off**  
Check backlight configuration in set up menu  
(p. 24)
  - **Voltage = 0**  
Verify the connections
  - **Current = 0 or incorrect**  
Verify the connections  
Verify the configuration of CT's in set up
  - **Powers, power-factor and energies false** Use the  
test connection function (p. 48)
  - **Phases missing on Display** Check the Network  
configuration  
(in set up menu) (p. 13)

**TECHNICAL CHARACTERISTICS****CASE**

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Dimensions: | 97 x 97 x 80 mm                                                                                                          |
|             | 97 x 97 x 80 mm with all optional modules (DIN 43700)                                                                    |
| Connection: | via 2.5 mm <sup>2</sup> disconnectable terminals<br>(voltage and others) and 6 mm <sup>2</sup> fixed terminals (current) |
| IP index:   | IP52 (front panel) and IP30 (case)                                                                                       |
| Weight:     | 465 gr.                                                                                                                  |

**DISPLAY**

|        |                     |
|--------|---------------------|
| Type : | Backlit LCD display |
|--------|---------------------|

**MEASUREMENTS**

Three-phase (3 or 4 wires), two-phase (2 wire) and single-phase networks

**VOLTAGE (TRMS)**

|                        |                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Direct measurement:    | from 50 to 690 V AC (phase/phase)<br>from 28 to 400 V AC (phase/neutral)                                                                 |
| Measurement via PT:    | <ul style="list-style-type: none"> <li>• Primary: up to 500 kV</li> <li>• Secondary: 60, 100, 110, 115, 120, 173 and 190 V AC</li> </ul> |
| Display and resolution | from 0 to 500.0 kV                                                                                                                       |
| Permanent overload:    | 760 V AC                                                                                                                                 |
| Update period:         | 1 second                                                                                                                                 |

**CURRENT (TRMS)**

|                           |                                                                                                           |
|---------------------------|-----------------------------------------------------------------------------------------------------------|
| Via CT with:              | <ul style="list-style-type: none"> <li>• Primary: up to 10000 A</li> <li>• Secondary: 1 or 5 A</li> </ul> |
| Minimum measuring current | 3mA with U ( Ph/N ) > 28 VAC                                                                              |
| Input consumption:        | < 0.3 VA                                                                                                  |
| Display:                  | from 0 to 11 kA (1.1 times the primary value)                                                             |
| permanent overload:       | 10 A                                                                                                      |
| intermittent overload:    | 10 In / 1 second                                                                                          |
| Update period:            | 1 second                                                                                                  |
| Maximum ratio KI x KU:    | 10 000 000                                                                                                |

**POWER**

|                |                       |
|----------------|-----------------------|
| Total:         | 0 to 8000 MW/Mvar/MVA |
| Update period: | 1 second              |

**FREQUENCY**

|                |                      |
|----------------|----------------------|
|                | from 45,0 to 65,0 Hz |
| Update period: | 1 second             |

**AUXILIARY POWER SUPPLY IEC / CE**

|                          |               |
|--------------------------|---------------|
| 110 to 400 V AC 50/60 Hz | ± 10 %        |
| 120 to 350 V DC          | ± 20 %        |
| 12 to 48 V DC            | -6 % / + 20 % |
| Consumption :            | < 10 VA       |

**PULSE INPUT**

|                          |                 |
|--------------------------|-----------------|
| Forward voltage max.     | 30 V DC         |
| Forward voltage min.     | 10 V DC         |
| Reverse voltage max.     | 30 V DC         |
| Galvanic insulation      | 3 kV            |
| Minimum pulse width      | 1s              |
| Max number of manoeuvres | 10 <sup>8</sup> |

| ACCORDING TO IEC 61557-12 Edition 2 (07/2008)                                         |                                           |                                                                                       |                                  |
|---------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------|
| PMD CHARACTERISTICS                                                                   |                                           |                                                                                       |                                  |
| Type of specification                                                                 | Examples of possible specification values |                                                                                       | Other additional characteristics |
| Supply quality evaluation function (optional)                                         | -                                         |                                                                                       | -                                |
| PMD classification                                                                    | SD                                        |                                                                                       | -                                |
| Setpoint                                                                              | K55                                       |                                                                                       | -                                |
| Humidity + Altitude                                                                   | -                                         |                                                                                       | -                                |
| Operating performance class for active power or active energy (if function available) | 0,5                                       |                                                                                       | -                                |
| CHARACTERISTICS OF THE FUNCTIONS                                                      |                                           |                                                                                       |                                  |
| Symbol of the functions                                                               | Measurement range                         | Operational performance category, in accordance with IEC 61557-12 depending on the KI | Other additional characteristics |
| P                                                                                     | 1% to 120% In                             | 0,5                                                                                   | -                                |
| Qa, Qv                                                                                | 1% to 120% In                             | 0,5                                                                                   | -                                |
| Sa, Sv                                                                                | 1% to 120% In                             | 1                                                                                     | -                                |
| Ea                                                                                    | 0 to 99999999 kW/h                        | 0,5                                                                                   | -                                |
| Era, Erv                                                                              | 0 to 99999999 kVar/h                      | 2                                                                                     | -                                |
| Eapa, Eapv                                                                            | 0 to 99999999 kW/h                        | 1                                                                                     | -                                |
| f                                                                                     | 45 to 65 Hz                               | 0,1                                                                                   | -                                |
| I                                                                                     | 5% to 120% In                             | 0,2                                                                                   | -                                |
| In, Inc                                                                               | 5% to 120% In                             | 0,2                                                                                   | Calculated                       |
| U                                                                                     | 50 to 600Vac ph/ph                        | 0,2                                                                                   | 30 to 350Vac Ph/n                |
| PFa ,PFv                                                                              | 0,5ind to 0,8cap                          | 0,5                                                                                   | -                                |
| Pst, Plt                                                                              | Unavailable function on A60               |                                                                                       |                                  |
| Udip                                                                                  | 5 to 100% Un                              | 0,5                                                                                   | -                                |
| Uswl                                                                                  | 100 to 120% Un                            | 0,5                                                                                   | -                                |
| Utr                                                                                   | Unavailable function on A60               |                                                                                       |                                  |
| Uint                                                                                  | Unavailable function on A60               |                                                                                       |                                  |
| Unba                                                                                  | Unavailable function on A60               |                                                                                       |                                  |
| Unb                                                                                   | Unavailable function on A60               |                                                                                       |                                  |
| Uh                                                                                    | Fn = 50Hz - rank 1 to 41                  | 1                                                                                     | -                                |
| THDu                                                                                  | Fn = 60Hz - rank 1 to 35                  | 1                                                                                     | -                                |
| THD-Ru                                                                                | Unavailable function on A60               |                                                                                       |                                  |
| Ih                                                                                    | Fn = 50Hz - rank 1 to 55                  | 1                                                                                     | -                                |
| THDi                                                                                  | Fn = 60Hz - rank 1 to 51                  | 1                                                                                     | -                                |
| THD_Ri                                                                                | Unavailable function on A60               |                                                                                       |                                  |
| Msv                                                                                   | Unavailable function on A60               |                                                                                       |                                  |

| CHARACTERISTICS OF THE “EVALUATION FUNCTIONS OF THE QUALITY OF SUPPLY” |                                                      |                                                                                       |                                  |
|------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------|
| Symbol of the functions                                                | Measurement range                                    | Operational performance category, in accordance with IEC 61557-12 depending on the KI | Other additional characteristics |
| f                                                                      | 45 to 65 Hz                                          | 0,1                                                                                   | -                                |
| I                                                                      | 5% to 120% I <sub>n</sub>                            | 0,2                                                                                   | -                                |
| I <sub>n</sub> , I <sub>nc</sub>                                       | 5% to 120% I <sub>n</sub>                            | 0,2                                                                                   | Calculated                       |
| U                                                                      | 50 to 600Vac ph/ph                                   | 0,2                                                                                   | 30 to 350Vac Ph/n                |
| P <sub>st</sub> , P <sub>lt</sub>                                      | Unavailable function on A60                          |                                                                                       |                                  |
| U <sub>dip</sub>                                                       | 5 to 100% U <sub>n</sub>                             | 0,5                                                                                   | -                                |
| U <sub>swl</sub>                                                       | 100 to 120% U <sub>n</sub>                           | 0,5                                                                                   | -                                |
| U <sub>int</sub>                                                       | Unavailable function on A60                          |                                                                                       |                                  |
| U <sub>nba</sub>                                                       | Unavailable function on A60                          |                                                                                       |                                  |
| U <sub>nb</sub>                                                        | Unavailable function on A60                          |                                                                                       |                                  |
| U <sub>h</sub>                                                         | Fn = 50Hz - rank 1 to 41<br>Fn = 60Hz - rank 1 to 35 | 1                                                                                     | -                                |
| I <sub>h</sub>                                                         | Fn = 50Hz - rank 1 to 55<br>Fn = 60Hz - rank 1 to 51 | 1                                                                                     | -                                |
| M <sub>sv</sub>                                                        | Unavailable function on A60                          |                                                                                       |                                  |

## CE MARKING

**DIRIS A60** COMPLIES WITH THE EUROPEAN GUIDELINES FOR:

- ELECTROMAGNETIC COMPATIBILITY NO. 2004/108/CE DATED 15 DECEMBER 2004.
- LOW VOLTAGE NO. 2006/95/CE DATED 12 DECEMBER 2006.

## CLIMATE

|                              |                                                 |
|------------------------------|-------------------------------------------------|
| OPERATING-TEMPERATURE RANGE: | IEC 60068-2-1/IEC 60068-2-2<br>-10 °C to +55 °C |
| STORAGE TEMPERATURE RANGE:   | IEC 60068-2-1/IEC 60068-2-2<br>-20 °C to +70 °C |
| HUMIDITY:                    | IEC 60068-2-30 - 95 % HR                        |
| SALINE FOG:                  | IEC 60068-2-52 - 2,5 % NaCl                     |

## MECHANICAL CHARACTERISTICS

|                                |                     |
|--------------------------------|---------------------|
| Vibration from 10 AND 100 HZ : | IEC 60068-2-6 - 2 G |
|--------------------------------|---------------------|

## INSULATION

|                        |                   |
|------------------------|-------------------|
| ELECTRIC SECURITY:     | IEC 61010-1       |
| INSTALLATION CATEGORY: | III (300VAC PH/N) |
| DEGREE OF POLLUTION:   | 2                 |

## GLOSSARY OF ABBREVIATIONS

|                                                                                     |                                                         |
|-------------------------------------------------------------------------------------|---------------------------------------------------------|
| 1BL                                                                                 | Single-phase network, 2 wires with 1 TC                 |
| 2BL                                                                                 | Two-phase network, 2 wires with 1 TC                    |
| 3BL                                                                                 | Balanced three-phase network, 3 wires with 1 TC         |
| 3NBL                                                                                | Unbalanced three-phase network, 3 wires with 2 or 3 TC  |
| 4BL                                                                                 | Balanced three-phase network, 4 wires with 1 TC         |
| 4NBL                                                                                | Unbalanced three-phase network, 4 wires with 3 or 4 TC  |
| AUX                                                                                 | Auxiliary supply                                        |
| AVG                                                                                 | Average value                                           |
| bACLIt                                                                              | LCD start-up (U or I or Aux. Condition)                 |
| Ct                                                                                  | Current transformers                                    |
| Ct In                                                                               | Neutral current transformer                             |
| dAtA                                                                                | Event storing                                           |
| dAtE                                                                                | Days / months / years                                   |
| EA-                                                                                 | Negative active power (-kWh)                            |
| EA+                                                                                 | Positive active power (+kWh)                            |
| ER-                                                                                 | Negative reactive power (-kvarh)                        |
| ER+                                                                                 | Positive reactive power (+kvarh)                        |
| ES                                                                                  | Apparent power (-kVAh)                                  |
| EXT                                                                                 | External                                                |
| HySt                                                                                | Hysteresis                                              |
| HOUr                                                                                | Hour run meter                                          |
| HOUr                                                                                | Hour meter start-up (U or I or Aux. condition)          |
| INT                                                                                 | Internal                                                |
| MAX                                                                                 | Maximum mean values                                     |
| MAX P-                                                                              | Active power maximum negative mean value                |
| MAX P+                                                                              | Active power maximum positive mean value                |
| MAX Q-                                                                              | Reactive power maximum negative mean value              |
| MAX Q+                                                                              | Reactive power maximum positive mean value              |
| MAX S                                                                               | Effective power maximum mean value                      |
| MOdE PrE-POSt                                                                       | Ratio locating the event on the record curves           |
| nEt                                                                                 | Network type                                            |
| NO                                                                                  | No                                                      |
| P+                                                                                  | Positive power consumption demand                       |
| P-                                                                                  | Active power consumption demand                         |
| PF                                                                                  | Power factor                                            |
| Q+                                                                                  | Positive reactive power consumption demand              |
| Q-                                                                                  | Negative reactive power consumption demand              |
| rSET                                                                                | Reset                                                   |
| SAG                                                                                 | Voltage dip                                             |
| SErI                                                                                | Serial number                                           |
| SOft                                                                                | Software version                                        |
| SWELL                                                                               | Overvoltage                                             |
| tAn PHI                                                                             | PHI tangent                                             |
| THD I                                                                               | Current harmonic distortion rate                        |
| THD In                                                                              | Neutral current distortion rate                         |
| THD U                                                                               | Phase-to-phase voltage distortion rate                  |
| THD V                                                                               | Phase-to-neutral voltage distortion rate                |
| tIME                                                                                | Hours / minutes / seconds                               |
| tIME                                                                                | Synchronisation period                                  |
| tIME 4I                                                                             | Integration times for mean and maximum current values   |
| tIME F                                                                              | Integration times for mean and maximum frequency values |
| tIME P/Q/S                                                                          | Integration times for mean and maximum power values     |
| tIME U                                                                              | Integration times for mean and maximum voltage values   |
| TOP                                                                                 | Synchronizing pulses                                    |
| unb                                                                                 | Unbalance                                               |
| Ut                                                                                  | Voltage transformer                                     |
| U nOM                                                                               | Nominal voltage                                         |
| Ut PR                                                                               | Voltage transformer primary                             |
| Ut SE                                                                               | Voltage transformer secondary                           |
| YES                                                                                 |                                                         |
|  | Hour run meter                                          |

[illegible]

## ***DIRIS A60***

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines across its entire width, providing a guide for handwriting or typing. The background is a clean, solid white color.

---

CORPORATE HQ CONTACT:  
SOCOMEC SAS  
1-4 RUE DE WESTHOUSE  
67235 BENFELD, FRANCE

---

[www.socomec.com](http://www.socomec.com)

Non contractual document. © 2025, Socomec SAS. All rights reserved.



536418B



 **socomec**  
Innovative Power Solutions