

# Air circuit breakers DMX<sup>3</sup> 6300

5000 and 6300 A



0 289 51 + 0 288 02

Dimensions **see e-catalogue**  
 Electrical characteristics **see e-catalogue**

Automatic air circuit breakers must be equipped with electronic protection unit, imperatively ordered together for factory assembly  
 Please ask for DMX<sup>3</sup> order form

Pack	Cat.Nos		Fixed version
			Supplied with - 4 auxiliary contacts: NO/NC - rear terminals for horizontal connection with bars - door sealing <b>DMX<sup>3</sup> - L 6300</b> Breaking capacity Icu 100 kA (415 V~) In(A) 5000 6300
	Frame 6300		
	3P	4P	
1	0 289 50	0 289 60	
1	0 289 51	0 289 61	
			<b>Draw-out version</b> Supplied with: - 4 auxiliary contacts: NO/NC - draw-out base and kit - flat rear terminals for connection with bars - door sealing <b>DMX<sup>3</sup> - L 6300</b> Breaking capacity Icu 100 kA (415 V~) In(A) 5000 6300
	Frame 6300		
	3P	4P	
1	0 289 52	0 289 62	
1	0 289 53	0 289 63	

Dimensions of DMX<sup>3</sup> range,  
**see e-catalogue**



# Electronic protection units for DMX<sup>3</sup> 2500, 4000 and 6300



0 288 02



0 288 03

Settings and curves **see e-catalogue**

DMX<sup>3</sup> circuit breakers must be equipped with electronic protection units (to be ordered together for factory assembly) enabling very precise adjustments of the protection conditions, while maintaining total discrimination with downstream devices  
 All protection units are equipped with batteries for powering in case of mains fault or when the breaker is open or not connected

Pack	Cat.Nos	MP4 protection units with LCD screen
1	0 288 00	Integrated LCD screen for displaying electrical values, settings and log Adjustment via selector switches <b>LI protection unit</b> Adjustment of: li, Ir, tr 
1	0 288 01	<b>LSI protection unit</b> Adjustment of: I <sub>sd</sub> , t <sub>sd</sub> , Ir, tr and li 
1	0 288 02	<b>LSIg protection unit</b> Adjustment of: I <sub>sd</sub> , t <sub>sd</sub> , Ir, tr, li, Ig and tg 
		<b>MP6 touch screen protection units</b> Measure and display instantaneous, maximum and average values of different electrical values and protection conditions Fault signalling and log <b>LSI protection unit</b> Adjustment of: I <sub>sd</sub> , t <sub>sd</sub> , Ir, tr and li <b>LSIg protection unit</b> Adjustment of: I <sub>sd</sub> , t <sub>sd</sub> , Ir, tr, li, I <sub>g</sub> and t <sub>g</sub>
1	0 288 05 <sup>1</sup>	<b>Accessories for electronic protection units</b> Communication option for DMX <sup>3</sup> electronic protection units
1	0 288 06	24 V DC external auxiliary power supply
1	0 288 10 <sup>1</sup>	External neutral for DMX <sup>3</sup> 6300
1	0 288 11 <sup>1</sup>	External neutral for DMX <sup>3</sup> 2500 and 4000
1	0 288 12 <sup>1</sup>	Module programmable output

<sup>1</sup>: Optional accessories, to be ordered when ordering electronic protection unit and DMX<sup>3</sup> air circuit breakers for factory assembly

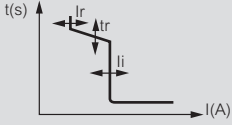
# DMX<sup>3</sup>

## electronic protection units

### Settings of the electronic protection units

#### MP4 LI

I<sub>r</sub>, I<sub>l</sub>, t<sub>r</sub> adjustment on front panel



#### • Long time delay protection against overloads

I<sub>r</sub> from 0.4 to 1 x I<sub>n</sub> (6 + 6 steps) on two selectors (0.4 ÷ 0.9, by steps of 0.1 and 0.0 ÷ 0.1, by steps of 0.02)

#### • Long delay protection operation time

t<sub>r</sub> - at 6 x I<sub>r</sub> (4 + 4 steps)  
t<sub>r</sub> = 5-10-20-30 s (MEM ON) 30-20-10-5 s (MEM OFF)

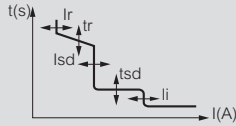
#### • Instantaneous protection against very high short circuits

I<sub>l</sub> from 2 to 15 x I<sub>n</sub> or I<sub>cw</sub> (9 steps) I<sub>l</sub> = 2-3-4-5-6-8-10-12-15 x I<sub>n</sub> or I<sub>cw</sub>

#### • Neutral protection: IN = I-II-III-IV x I<sub>r</sub> (0-50-100-100 %)

#### MP4 LSI

I<sub>r</sub>, t<sub>r</sub>, I<sub>sd</sub>, t<sub>sd</sub>, I<sub>l</sub> adjustment on front panel



#### • Long time delay protection against overloads

I<sub>r</sub> from 0.4 to 1 x I<sub>n</sub> (6 + 6 steps) on two selectors (0.4 ÷ 0.9, by steps of 0.1 and 0.0 ÷ 0.1, by steps of 0.02)

#### • Long delay protection operation time

t<sub>r</sub> - at 6 x I<sub>r</sub> (4 + 4 steps) t<sub>r</sub> = 5-10-20-30 s (MEM ON) 30-20-10-5 s (MEM OFF)

#### • Short time delay protection against short circuits

I<sub>sd</sub> from 1.5 to 10 x I<sub>r</sub> (9 steps) I<sub>sd</sub> = 1.5-2-2.5-3-4-5-6-8-10 x I<sub>r</sub>

#### • Short time delay protection operation time

t<sub>sd</sub> from 0 to 0.3 s (4 + 4 steps) t<sub>sd</sub> = 0-0.1-0.2-0.3 s (t=cost), 0.3-0.2-0.1-0.01 s (I<sup>2</sup>t=cost)

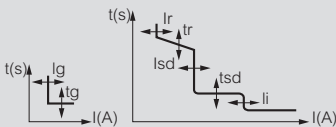
#### • Instantaneous protection against very high short circuits

I<sub>l</sub> from 2 to 15 x I<sub>n</sub> or I<sub>cw</sub> (9 steps) I<sub>l</sub>=off-2-3-4-6-8-10-12-15 x I<sub>n</sub> or I<sub>cw</sub>

#### • Neutral protection: IN = I-II-III-IV x I<sub>r</sub> (0-50-100-100 %)

#### MP4 LSig

I<sub>r</sub>, t<sub>r</sub>, I<sub>l</sub>, I<sub>g</sub>, t<sub>g</sub>, I<sub>sd</sub>, t<sub>sd</sub>, adjustment on front panel



#### • Long time delay protection against overloads

I<sub>r</sub> from 0.4 to 1 x I<sub>n</sub> (6 + 6 steps) on two selectors (0.4 ÷ 0.9, by steps of 0.1 and 0.0 ÷ 0.1, by steps of 0.02)

#### • Long delay protection operation time

t<sub>r</sub> - at 6 x I<sub>r</sub> (4 + 4 steps) t<sub>r</sub> = 5-10-20-30 s (MEM ON) 30-20-10-5 s (MEM OFF)

#### • Short time delay protection against short circuits

I<sub>sd</sub> from 1.5 to 10 x I<sub>r</sub> (9 steps) I<sub>sd</sub> = 1.5-2-2.5-3-4-5-6-8-10 x I<sub>r</sub>

#### • Short time delay protection operation time

t<sub>sd</sub> from 0 to 0.3 s (4 + 4 steps) t<sub>sd</sub> = 0-0.1-0.2-0.3 s (t=constant), 0.3-0.2-0.1-0.01 s (I<sup>2</sup>t=constant)

#### • Instantaneous protection against very high short circuits

I<sub>l</sub> from 2 to 15 x I<sub>n</sub> or I<sub>cw</sub> (9 steps) I<sub>l</sub> = 2-3-4-6-8-10-12-15 x I<sub>n</sub> or I<sub>cw</sub>

#### • Earth fault current

I<sub>g</sub> from 0.2 to 1 x I<sub>n</sub> (9 steps) I<sub>g</sub> = 0.2-0.3-0.5-0.6-0.7-0.8-1 x I<sub>n</sub> : OFF t<sub>g</sub> from 0.1 + 1 s (4 steps) t<sub>g</sub> = 0.1-0.2-0.5-1 s (both t = k and I<sup>2</sup>t = k)

#### • Neutral protection: IN = I-II-III-IV x I<sub>r</sub> (0-50-100-100 %)

### Selectivity in three-phase network 400 V<sub>~</sub>

#### DMX<sup>3</sup>/DPX

Downstream	Upstream	DMX <sup>3</sup> 2500					DMX <sup>3</sup> 4000	DMX <sup>3</sup> 6300
		800 A	1000 A	1250 A	1600 A	2000 & 2500 A	3200 & 4000 A	5000 & 6300 A
DPX <sup>3</sup> 160 <sup>(1)</sup>		T	T	T	T	T	T	T
DPX <sup>3</sup> 250 <sup>(1)</sup>		T	T	T	T	T	T	T
DPX <sup>3</sup> 630 <sup>(1)</sup> TM and elec.		T	T	T	T	T	T	T
DPX <sup>3</sup> 1600 <sup>(1)</sup> thermal magnetic	630 A	T	T	T	T	T	T	T
	800 A		T	T	T	T	T	T
	1000 A			T	T	T	T	T
	1250 A				T	T	T	T
DPX <sup>3</sup> 1600 <sup>(1)</sup> electronic	630 A			T	T	T	T	T
	800 A			T	T	T	T	T
	1000 A				T	T	T	T
	1250 A				T	T	T	T
1600 A					T	T	T	

1: All breaking capacity

T: total selectivity, up to downstream circuit breaker breaking capacity according to IEC 60947-2

#### DMX<sup>3</sup>/DMX<sup>3</sup>

Downstream	Upstream	DMX <sup>3</sup>									
		800 A	1000 A	1250 A	1600 A	2000 A	2500 A	3200 A	4000 A	5000 A	6300 A
DMX <sup>3</sup>	800 A		T	T	T	T	T	T	T	T	T
	1000 A			T	T	T	T	T	T	T	T
	1250 A				T	T	T	T	T	T	T
	1600 A					T	T	T	T	T	T
	2000 A						T	T	T	T	T
	2500 A							T	T	T	T
	3200 A								T	T	T
4000 A									T	T	
5000 A										T	
6300 A											

T: total selectivity, up to downstream circuit breaker breaking capacity according to IEC 60947-2 I<sub>cu</sub> of downstream circuit breaker ≤ I<sub>cu</sub> of upstream circuit breaker Selectivity values are intended with protection unit properly adjusted

#### DMX<sup>3</sup>/DX<sup>3</sup>

	DMX <sup>3</sup> 2500						DMX <sup>3</sup> 4000		DMX <sup>3</sup> 6300		
	630 A	800 A	1000 A	1250 A	1600 A	2000 A	2500 A	3200 A	4000 A	5000 A	6300 A
DX <sup>3</sup> 6000 - 10 kA	T	T	T	T	T	T	T	T	T	T	T
DX <sup>3</sup> 10000 - 16 kA	T	T	T	T	T	T	T	T	T	T	T
DX <sup>3</sup> 25 kA	T	T	T	T	T	T	T	T	T	T	T
DX <sup>3</sup> 36 kA	T	T	T	T	T	T	T	T	T	T	T
DX <sup>3</sup> 50 kA	T	T	T	T	T	T	T	T	T	T	T

T: total selectivity, up to downstream circuit breaker breaking capacity according to IEC 60947-2



For the settings of MP6 protection units, Please, consult us

# Protection unit MP4 - DMX3

Item **288 00** - Item **288 01**

Item **288 02** - Item **288 08**



# Contents

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<b>1. Identification and factory setting</b> .....	40
<b>2. Insertion /substitution battery</b> .....	41
<b>3. Setting levels protection</b> .....	41
<b>4. Signaling of protection unit state</b> .....	44
<b>5. Test button</b> .....	45
<b>6. Visualisation and use of menus</b> .....	46
<b>7. Default page</b> .....	47
<b>8. Setting of currents visualisation</b> .....	50
<b>9. Visualisation rules for temperature</b> ...	50
<b>10. Visualisation rules for battery charge</b> ...	50
<b>11. Menu pages</b> .....	51
<b>12. Accessories</b> .....	52
<b>13. Menu navigation</b> .....	53
<b>14. Menu structure</b> .....	65
<b>15. Technical annexes</b> .....	67
15.1. Curves .....	67
15.2. Tripping time .....	72

**FW Version Display 2.6.X**

# Protection unit DMX<sup>3</sup>

## 1. Identification and factory setting

### 288 00

#### Factory setting

$l_i = l_{cw}$ ;  
 $I_r = (0.9 + 0.1) \times I_n$ ;  
 $t_r = 30s$  (MEM=OFF);  
 $I_{sd} = 10 I_r = \text{fix}$   
 $T_{sd} = 1s = \text{fix}$   
 $N = 50\%$

### 288 01

#### Factory setting

$l_i = l_{cw}$ ;  
 $I_{sd} = 10 \times I_r$ ;  
 $t_{sd} = 1s$  ( $t = \text{const}$ );  
 $I_r = (0.9 + 0.1) \times I_n$ ;  
 $t_r = 30s$  (MEM=OFF);  
 $N = 50\%$

### 288 08

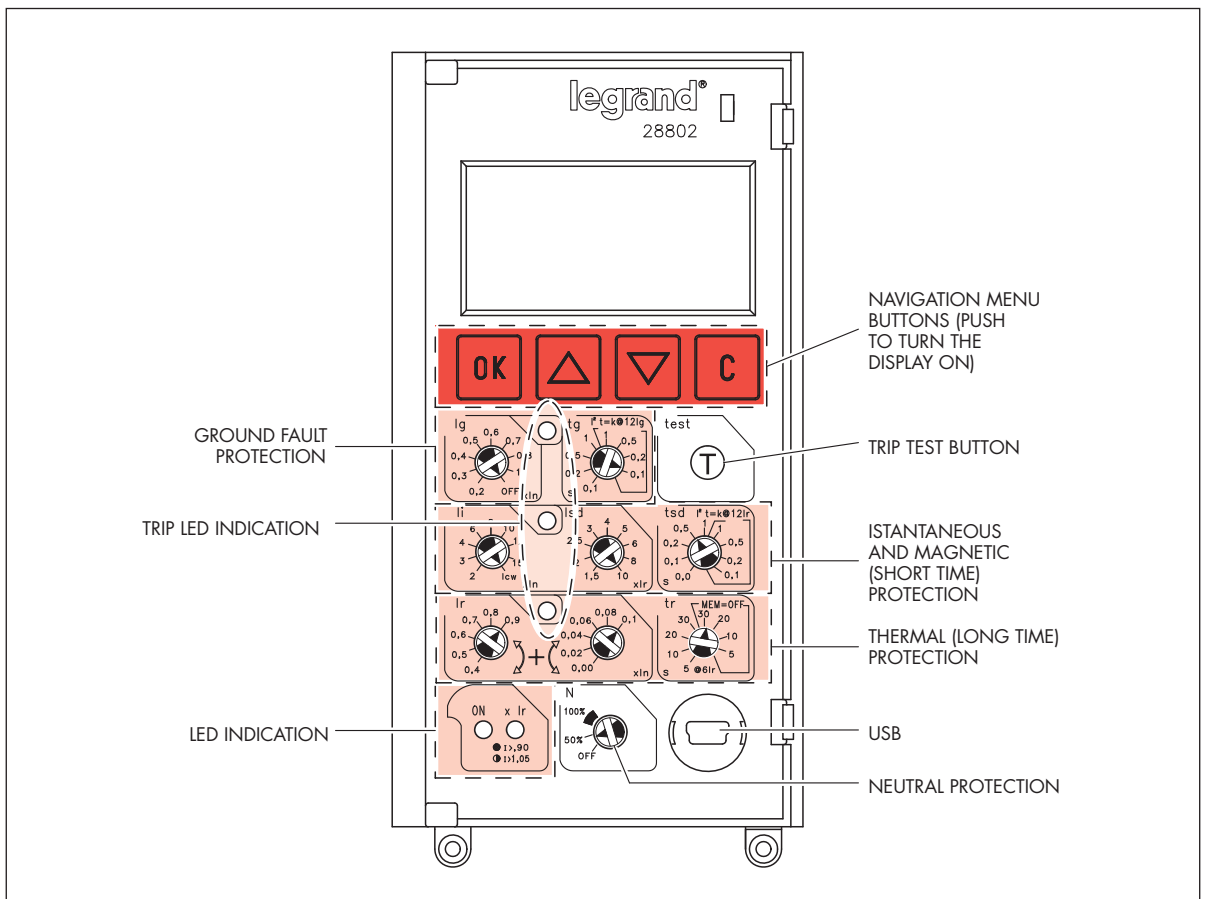
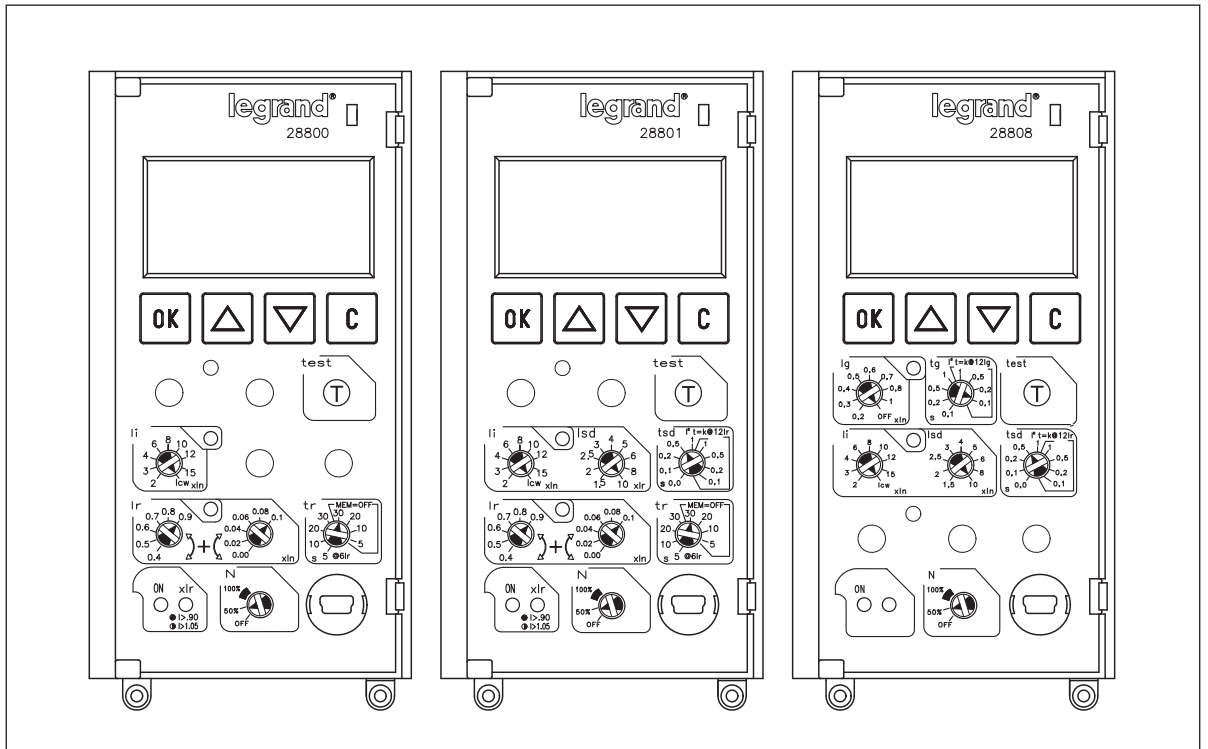
#### Factory setting

$I_g = \text{OFF}$ ,  $t_g = 0.1$ ,  
 $l_i = l_{cw}$ ;  
 $I_{sd} = 10 \times I_r$ ;  
 $t_{sd} = 1s$  ( $t = \text{const}$ );  
 $N = 50\%$

### 288 02

#### Factory setting

$I_g = \text{OFF}$ ,  $t_g = 0.1$ ,  
 $l_i = l_{cw}$ ;  $I_{sd} = 10 \times I_r$ ;  
 $t_{sd} = 1s$  ( $t = \text{const}$ );  
 $I_r = (0.9 + 0.1) \times I_n$ ;  
 $t_r = 30s$  (MEM=OFF);  
 $N = 50\%$

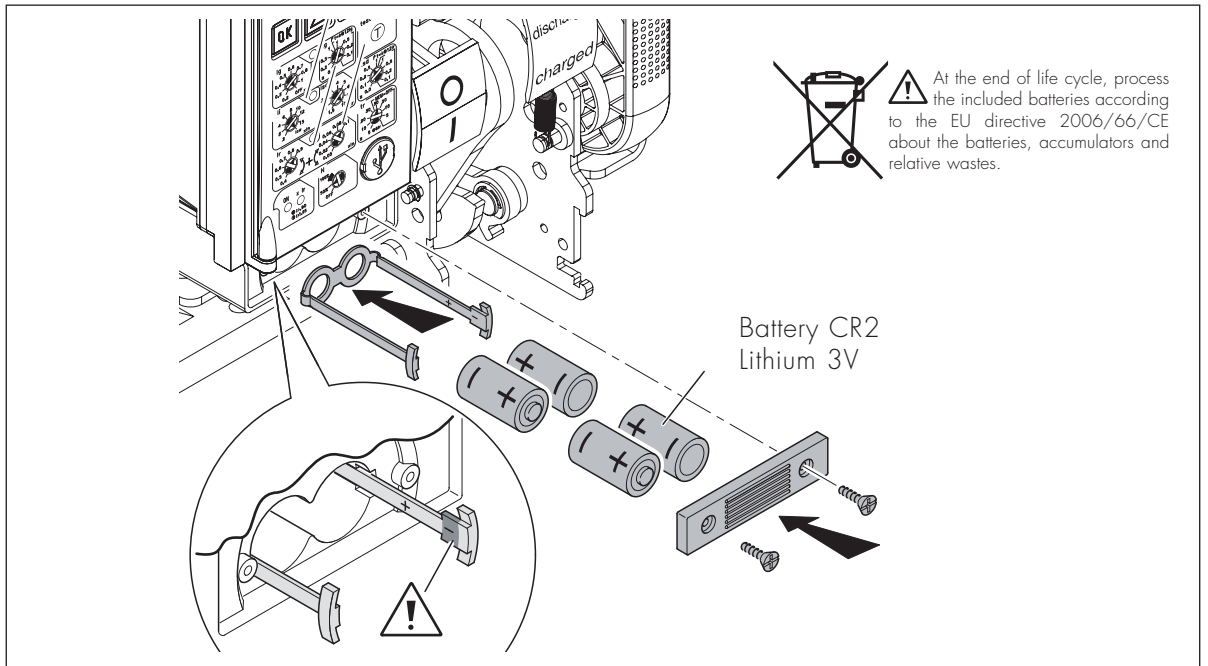


"MEM OFF" =  
 thermal memory off

# Protection unit DMX<sup>3</sup>

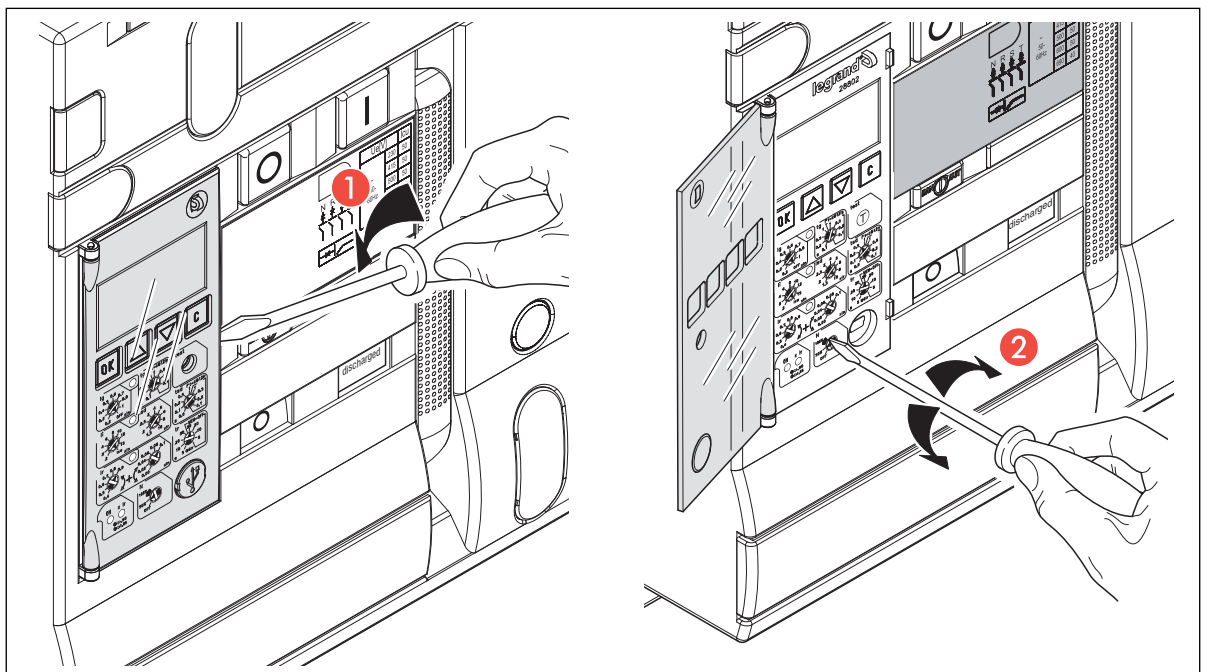
## 2. Insertion/substitution battery

Remove frontal cover of the breaker. like shown on picture. Batteries are delivered outside the breaker. Insert the 4 batteries on the lower part of the protection unit keeping polarity and mounting order



## 3. Setting levels protection

Setting of levels protection is possible with rotary switches. Execute setting with a plate screwdriver.

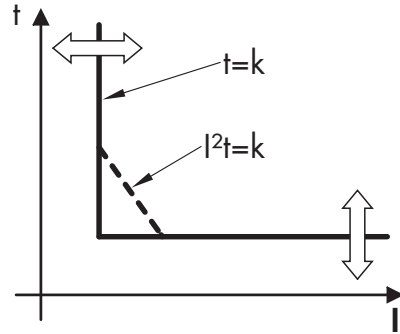
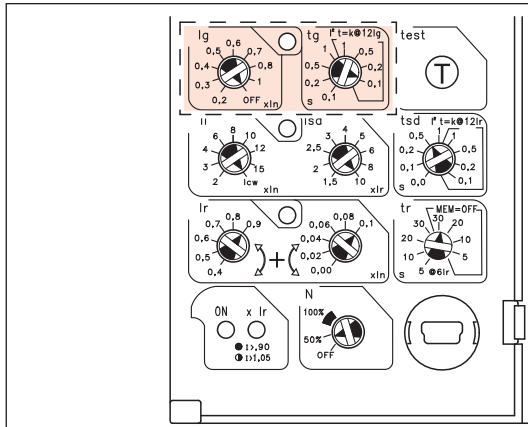


# Protection unit DMX<sup>3</sup>

## Ground fault protection (only for item 288 02 and 288 08)

Setting of current (9 steps)  $I_g = 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 - 1 \times I_n$  - OFF

Setting of time delay (@12xI<sub>g</sub>) (4+4 steps)  
 $t_g = 0.1 - 0.2 - 0.5 - 1 \text{ s}$  ( $t = \text{const}$ )  
 $t_g = 1 - 0.5 - 0.2 - 0.1 \text{ s}$  ( $I^2 t = \text{const}$ )



## Overload protection (Long Time Setting) (not for item 288 08)

Setting of current (@12xI<sub>g</sub> 2x6 steps)  
 $I_r = 0.4 \div 1 \times I_n$   
 With 2 switches (0.4 ÷ 0.9, steps of 0.1, 0.0 ÷ 0.1, steps of 0.02)

Example:  
 $I_r = 0.4 + 0.06 = 0.46 I_n$

Setting of time delay (@6I<sub>r</sub>) (4+4 steps)  
 $t_r = 5 - 10 - 20 - 30 \text{ s}$  (MEM ON)  
 $t_r = 30 - 20 - 10 - 5 \text{ s}$  (MEM OFF)

"MEM OFF" = thermal memory off  
 "MEM ON" = thermal memory on

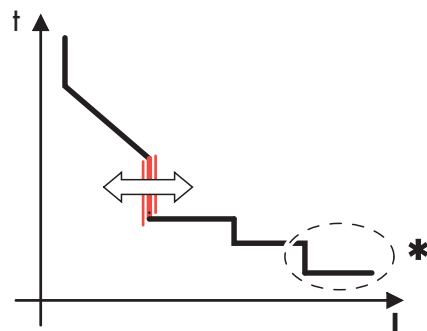
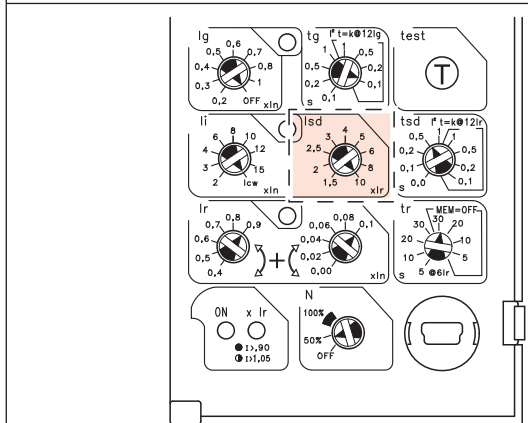
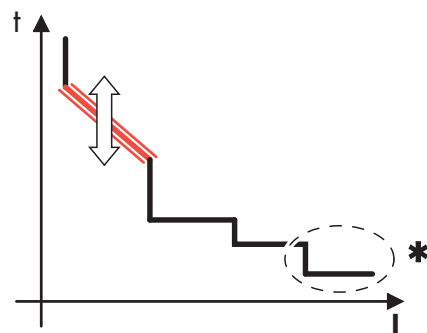
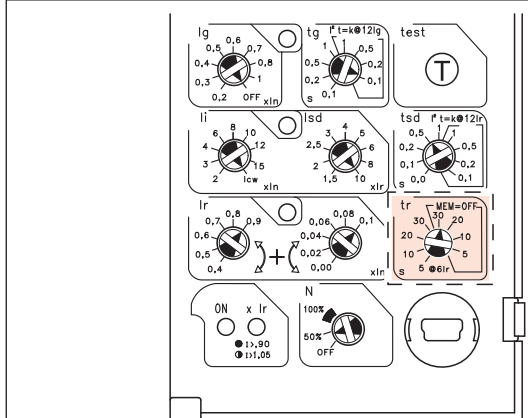
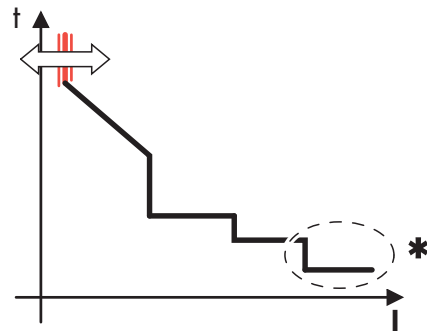
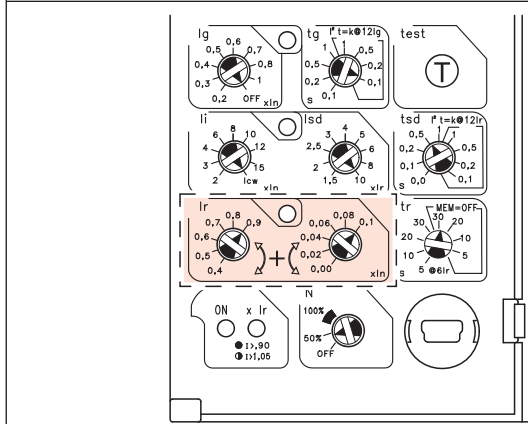
## Short circuit protection

Setting of current (9 steps)  
 $I_{sd} = 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 8 - 10 \times I_n$   
 (For item 288 08)  
 $I_{sd} = 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 8 - 10 \times I_n$



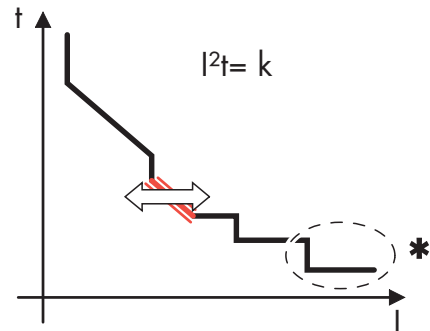
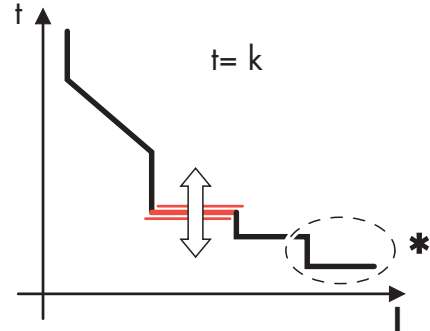
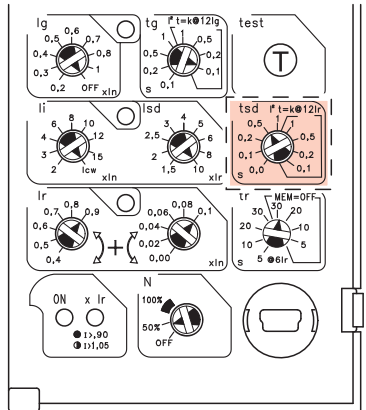
If  $I_i < I_{sd}$ , then instantaneous setting prevails against the magnetic one.

\* Last intervention threshold not adjustable =  $I_f = I_{cw}$



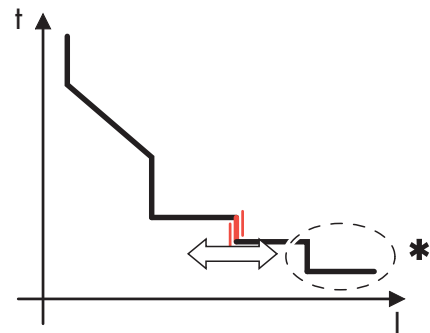
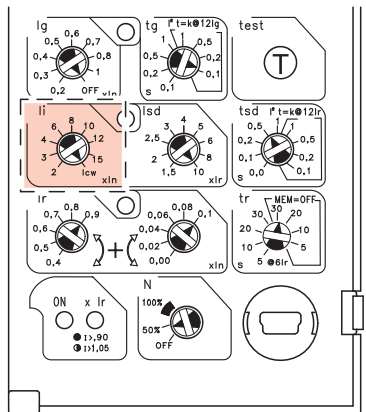
# Protection unit DMX<sup>3</sup>

Setting of time delay  
(5+4 steps)  
Tsd=0-0.1-0.2-  
0.5-1 s (t=const)  
Tsd=1-0.5-0.2-  
0.1 s (I<sup>2</sup>t=const)



## Instantaneous short circuit protection

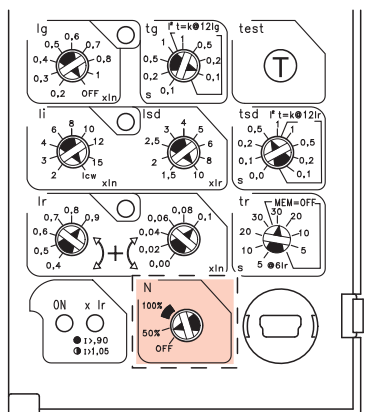
Setting of current  
(9 steps)  
Ii=2-3-4-6-8  
10-12-15x In-lcw



## Neutral protection

Setting of current  
(3 steps)  
N=OFF-50%-100%

**Protection against over temperature**  
(not adjustable)  
t > 95°C



### Neutral protection

Position	Protection
OFF	No protected
50%	Protected at 50% Ir-Istd-Ii
100%	Protected as Ir-Istd-Ii

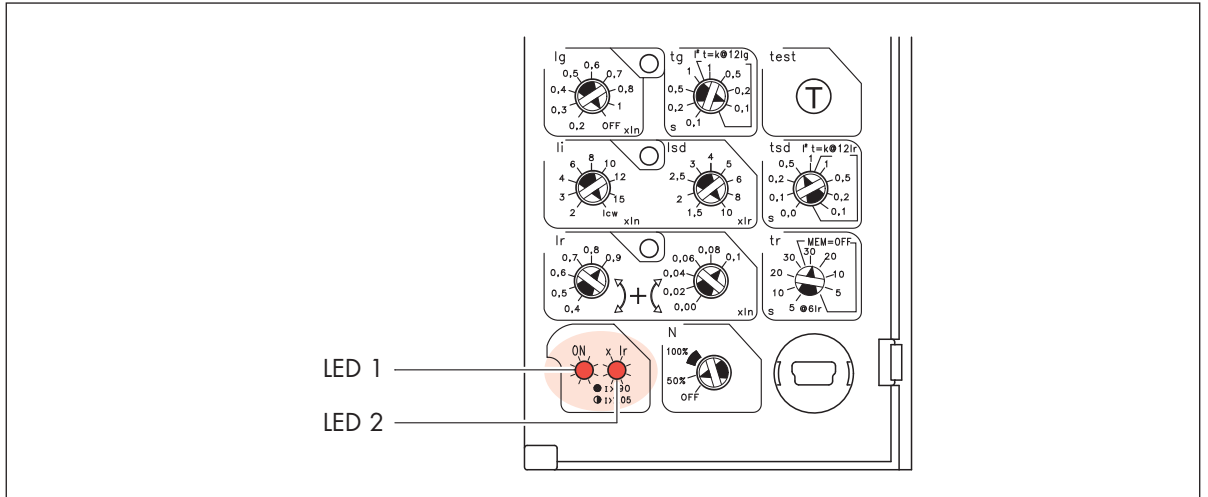
\* Last intervention threshold not adjustable = If = Icw



# Protection unit DMX<sup>3</sup>

## 4. Signaling of protection unit state

LED 1 and LED 2



The state of the protection unit is signaled through LED 1 and 2, according to the next table:

Protection	Led 1	Led 2
Inactive	Switched off	Switched off
Active ( $I \geq 100A$ or supplied)	Green	Fix Switched off
Active: (overload pre alarm ( $I > 0,9I_r$ ))	Green Fix	Red Fix
Active: (overload alarm $I > 1,05I_r$ )	Green Fix	Red Flashing
Active: over temperature alarm ( $T > 75^\circ C$ )	Green Flashing	Red Flashing

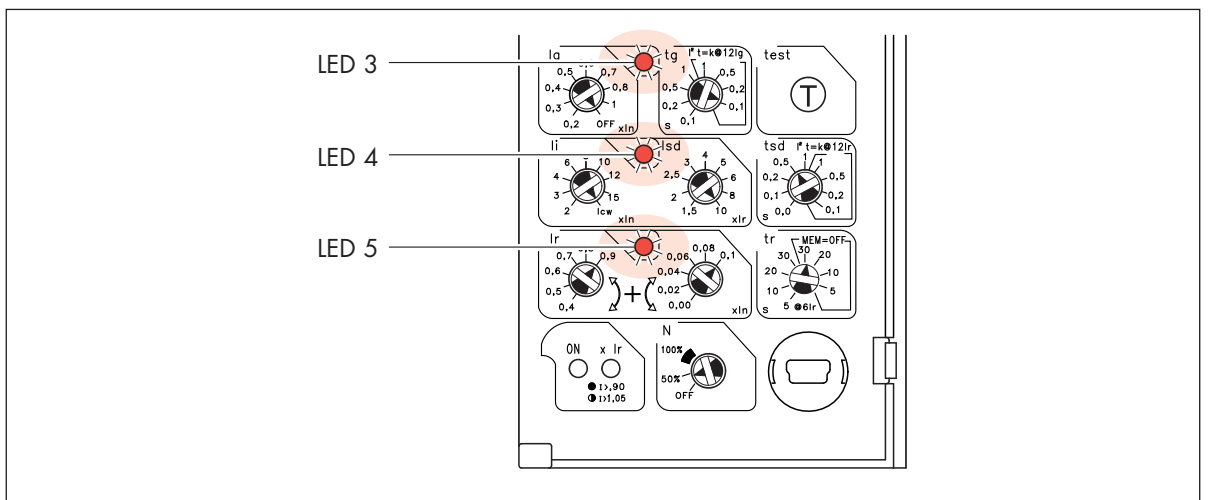
### Signaling:

An alarm is more important than a prealarm. The overload is more important than over temperature

LED 3:  
Failure by earth  
fault (only for  
item 288 02  
and 288 08)

LED 4:  
Failure by short  
circuit/instantaneous  
short circuit

LED 5:  
Failure by overload/  
overtemperature  
(not for item 288 08)



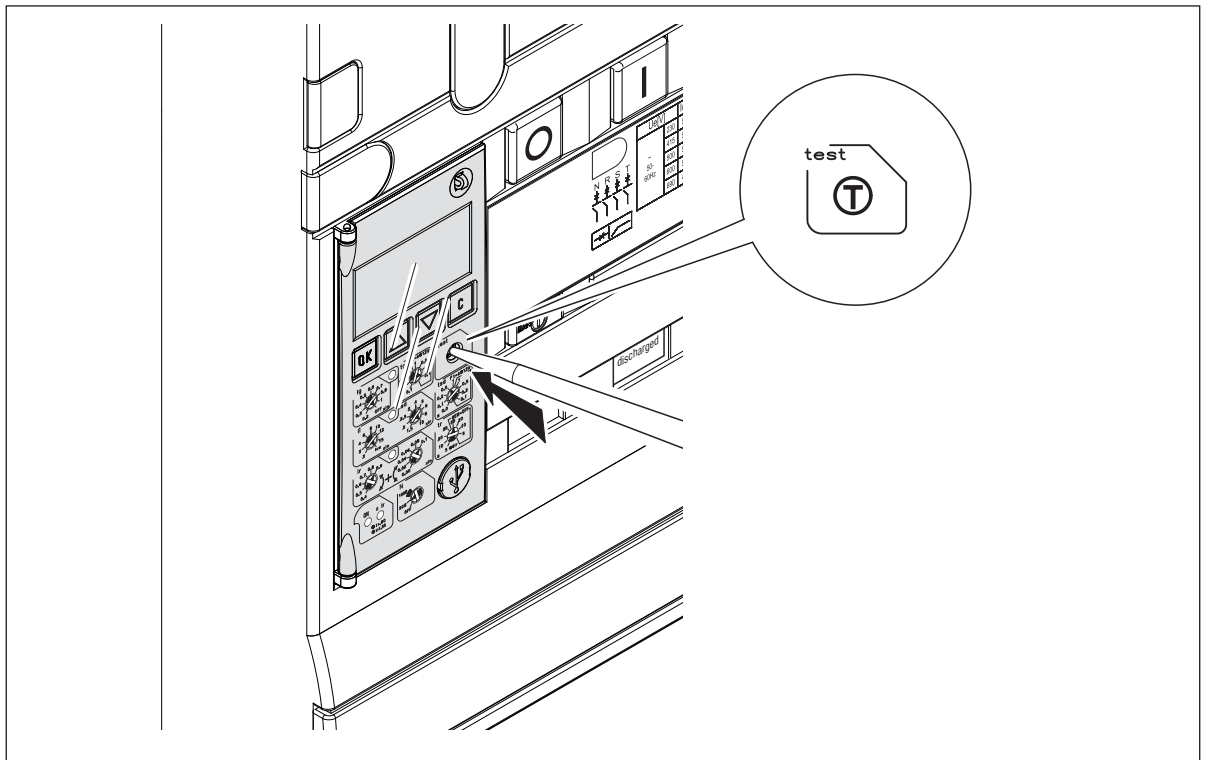
# Protection unit DMX<sup>3</sup>

## 5. Test button

On the right side of the protection unit, below the navigation buttons, there's the TEST button. This command allows to verify the correct functioning of breaker and protection unit. Pushing the TEST button for a time higher than 2 seconds makes the breaker trip and allows to verify correct working of the protection device.

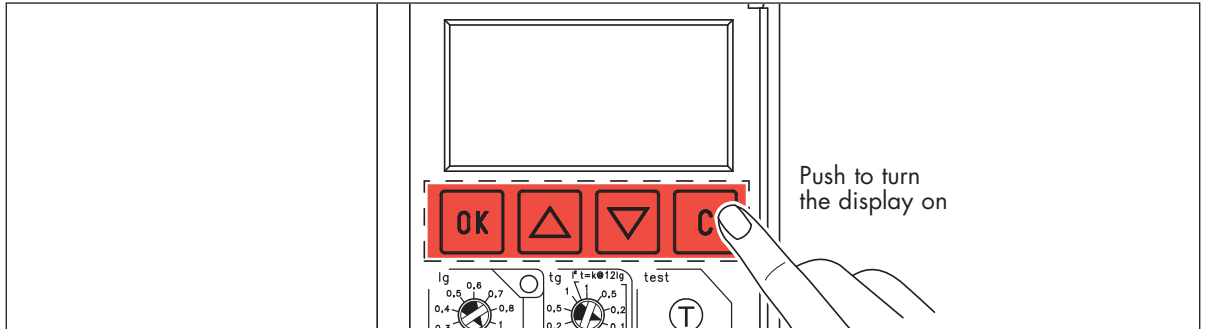
The tripping sequence is:

1. Push for at least 2 seconds the "T" button
2. All LEDs light on for 1 second (ON LED on orange the others on red)
3. The breaker trips and each LEDs switch off. The ON LED move from orange to green.



# Protection unit DMX<sup>3</sup>

## 6. Visualisation and use of menus



It's possible to explore the menu using the OK, ▲, ▼, buttons.

It's possible to visualize 2 type of pages:

- **Default pages:** Show the state of the breaker in all the allowed uses (closed-normal, closed-alarm, tripped, open). It's shown every time that protection unit is turn on and it's automatically refreshed if, after a determinated time (fixed T1=10 seconds), there's no activity on the 4 navigation buttons. From this page it's possible to reach the Menu Page only by pushing OK button.
- **Menu pages:** these are the pages active when using the menu.

The exit from submenus pages that allow a parameter setting (Example: setting of brightness) is possible in three ways:

**(1) Push OK button:**

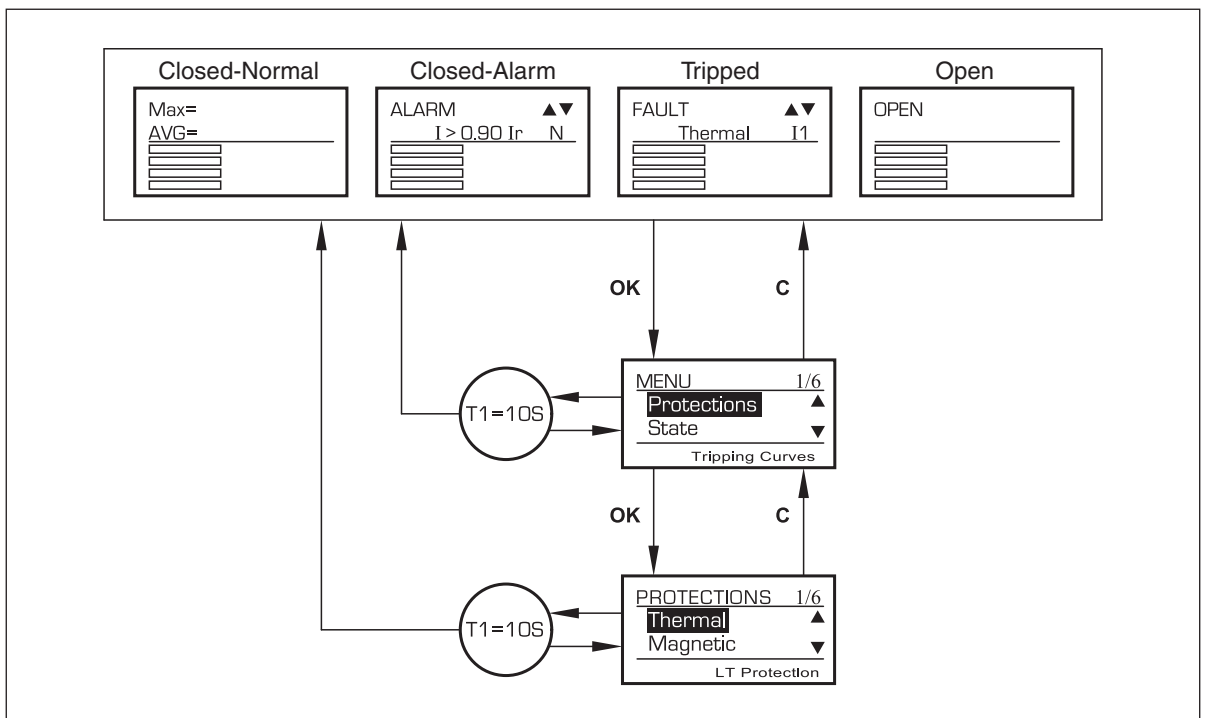
back to upper level **with** storage of the new parameter.

**(2) Push C button:**

back to upper level **without** storage of the new parameter.

**(3) After time T1**

back to main page **without** storage of the new parameter.



# Protection unit DMX<sup>3</sup>

## 7. Default page

Like shown on the bottom, display have an "Upper part", of two lines, and a "Lower part", of four lines.


Four type depending on breaker status.

**1. BREAKER CLOSED - NORMAL:** (no pre alarm or alarm signal). On upper side are shown maximum average currents.

**Example:** maximum value 1000A on 1 phase, average value 700A.

M	a	x	=	1	0	0	0	A					I	1						
A	v	g	=		7	0	0	A												

From this position (closed breaker and no alarms) it's possible to enter the main page by pushing **OK** button. MAX represents the maximum value among the currents (phase shown on side, I1, I2, I3 or N; this last one only if Neutral is present); AVG instead shows the average value obtained by:

$$AVG = \frac{\sum I_i}{n}$$

Where "n" is the number of phase detected by the breaker, so:

4 if Neutral is present (four poles or three poles with external neutral)

3 if Neutral is absent (3 poles without external neutral)

Phases I1, I2, and I3 are always considered in the sum; Neutral only if is present.

# Protection unit DMX<sup>3</sup>

**2. BREAKER CLOSED - ALARM:** (protection unit in alarm position) Upper side of the display become like shown:

A	L	A	R	M								▲	▼	
	(	d	e	s	c	r	i	p	t	i	o	n	)	

From this position (closed breaker and protection unit in alarm position) it's possible to enter the main page pushing one time the **OK** button.

**Description:** possible cases (I1 and I3 are an example of indications).

	I	>	0	.	90		I	r				I	1
	I	>	1	.	05		I	r				I	3
	T	>	75	°	C								

Indication on alarm type is shown on the second line; if there are several alarms, these can be visualized scrolling with ▲▼. If more than one phase is on alarm position (**Example:** I1 and I3 > 1.05 Ir) two different descriptions are shown on different lines.

**3. BREAKER TRIPPED:** Upper side of the display is like shown:

F	A	U	L	T								▲	▼	
	(	d	e	s	c	r	i	p	t	i	o	n	)	

Indication on failure type is shown in the second line; if there are several events at the same time, these can be visualized scrolling with ▲▼. If more than one phase is on failure position (**Example:** Thermal I1 and Thermal I3) two different descriptions are shown on different lines. From this page is possible to reach the main page pushing one time the **OK** button.

**Description:** possible cases (I1, I2 and I3 are an example of indications).

	T	h	e	r	m	a	l						I	1
	M	a	g	n	e	t	i	c					I	2
	I	s	t	a	n	t	a	n	e	o	u	s	I	3
	O	v	e	r	t	e	m	p	.					
	3	°	E	l	e	m	e	n	t					
	T	e	s	t										

# Protection unit DMX<sup>3</sup>

**4. BREAKER OPEN:** Upper side of the display is like shown:

O	P	E	N											

From this page is possible to reach the main page pushing one time the **OK** button.

In the lower side and for all the 4 types of main or default page, are shown the currents of each phase, if present, the earth fault/leakage current, temperature detected by the protection unit and the residual charge on the auxiliary batteries. If information to show are more than 4 two pages will be **automatically** shown alternatively every 5 seconds. It's also possible to manual switch pushing everyone of the buttons **▲**, **▼** and **C**. (Example: four poles breaker with earth fault protection → phase currents + I<sub>g</sub>).

Page 1:

						1	1	0	0	A		1	1	0	%	I	1	
								6	0	0	A			6	0	%	I	2
								5	0	0	A			5	0	%	I	3
								7	0	0	A			7	0	%		N

Page 2:

										0	A				0	%	I	G
										8	3	°	C		8	7	%	
						1	1	.	5	V				9	7	%		

# Protection unit DMX<sup>3</sup>

## 8. Setting of currents visualisation

1. Each current can be shown in 3 way: an histogram, a value and a percentage; all calculated with the same accuracy rule:

VALUE has no more than 6 spaces. If  $VALUE \leq 9999$  is shown on 4 digits plus the symbol "A", using so 5 spaces. If instead  $9999 < VALUE < 99999$  digits are only 3 with a decimal digit divided by a dot and followed by "k" and "A" symbols (so 6 spaces) and are obtained reducing VALUE to the nearest lower decimal (Example: 12550 A become 12500 and is shown as 12.5kA). If is  $VALUE \geq 99999$  digits are still 3, but are hundred, decine and unit, obtained once more reducing to the nearest lower unit and followed by the symbols "k" and "A" (so 5 spaces). (Example: 245650 A become 246000 and is shown like 246kA).

If PERCENTAGE > 999% is shown the symbol > > > %.

2. Histograms of currents can shown values among 0 and  $1,2 * I$  threshold [A], where I threshold is the threshold current for thermal protection ( $I_r$ ); if detected current is higher than maximum value, the histogram is shown complete (so equivalent to a threshold of 120%).

					18 A				1 %	11
					56.5 A				56 %	12
					1000 A				100 %	13
					11 kA				> > > %	N

## 9. Visualisation rules for temperature

3. Temperature is shown in 3 way: an histogram, a value and a percentage; all calculated with the same accuracy rule. VALUE has no more than 5 spaces, 3 digits (only integer values) and the symbol "°C". If PERCENTAGE > 999% is shown the symbol > > > %.

4. Temperature histogram shows values among 0 and 95 [°C]; if detected temperature is higher than maximum value histogram is shown complete (so equivalent to 95°C).

## 10. Visualisation rules for battery charge

5. Residual charge on battery is shown in 3 way: an histogram, a value and a percentage; all calculated with the same accuracy rule. VALUE has no more than 5 spaces, 3 digits (decine, unit and 1 decimal digit separated by a dot) and the symbol "V".

6. Histogram of residual charge on battery shows values among 0 and 12 [V]; if detected battery is higher than maximum value histogram is shown complete (so equivalent to 12V). Additionally, for **absolute values** of voltage  $\leq$  Val. Min. Batt. (settable parameter, see Main page – System options), is shown an empty histogram and the message "Change battery" instead of the percentage value.

										change battery
--	--	--	--	--	--	--	--	--	--	----------------

# Protection unit DMX<sup>3</sup>

## 11. Menu pages

Level 1 {	P	R	O	T	E	C	T	I	O	N	S			4	/	6									
Level 2 {		s	h	o	r	t		c	i	r	c	u	i	t		▲									
		N	e	u	t	r	a	l								▼									
Level 3 {												n	e	u	t	r	a	l	s	e	t	t	i	n	g

### VISUALISATION:

Display has 3 levels, the central one is for exploring, the two others to show information:

- **Level 1: INFORMATION** - Menu name active.
- **Level 2: DESCRIPTION** (two lines) - possible pages on active menu; sequential number (N/M) is referred to the selected page (name on black background and white letters) and it's also present on the upper left part of the **level 1**. Using ▲ and ▼ buttons is possible to select other pages of the same level updating sequential number and information on level 3 (see below). Pushing **OK** is possible to activate the menu responding to the selected page; DESCRIPTION move to level 1 and are shown the pages available for the new menu, and a description of selected page (default first page); **C** button move up to previous level.
- **Level 3: INFORMATION** - description of content inside selected page.

Scrolling down to the last level available on the menu and pushing the "**OK**" button, it's possible to see on the screen the same structure explained previously unless that the **level 3** is no more shown.

T	I	M	E												1	/	1
	T	r		=	5		s	e	c								
									@	6		I	r				

### SETTING:

If page allow to set a parameter (**Example:** setting of contrast/brightness, setting of Modbus addresses, etc.) is possible to change the value using ▲ and ▼ buttons. New setting will be operative only if confirmed pushing the **OK** button.

M	I	N	.	V	A	L	.	B	A	T	T	.					
	9	.	5	V													



# Protection unit DMX<sup>3</sup>

## 12. Accessories

**288 10 - 288 11** (factory assembled)

**External current transformer for earth fault and neutral protection (not disconnected).**

It's possible to use it with 3poles breakers and is installed on the neutral in the following cases:

- neutral protection (not disconnected; with version 288 00 ou 288 01 and 288 03)
- earth fault protection (with version 288 02 and 288 04)

The device 288 10 can works with nominal currents up to 4000A (is not available on DMX<sup>3</sup> automatic breakers «Frame I with Icu=42kA»), while the device 288 11 can works only on automatic breakers DMX<sup>3</sup> Frame III up to 6300A.

**288 06**

**External power supply module.**

The accessory allows an uninterrupted supply of electronic protection unit, even if the circuit breaker is switched off/tripped.

The accessory allows to power one protection unit MP6 or 4 protection unit MP4.

**288 12**

**Module adjustable contacts**

This module is an accessory used to manage other external devices for signal/control.

Must be related to the protection unit, which allow its adjustment, and must be connected to the terminals on the upper part of the breaker.

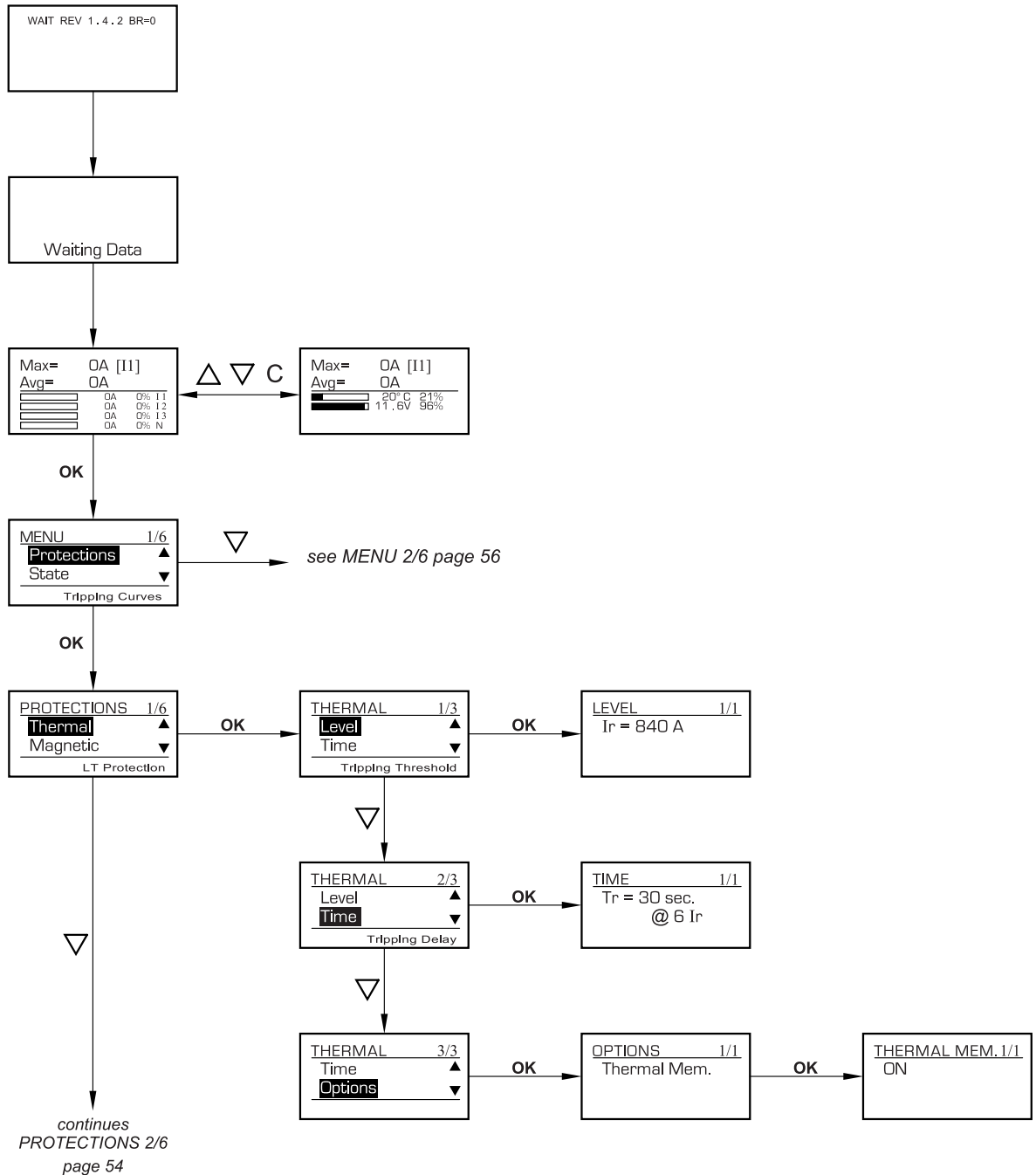
**288 05** (factory assembled)

**Communication option**

Factory assembled this option allows to connect the breaker to a MODBUS RS485. supervision system.

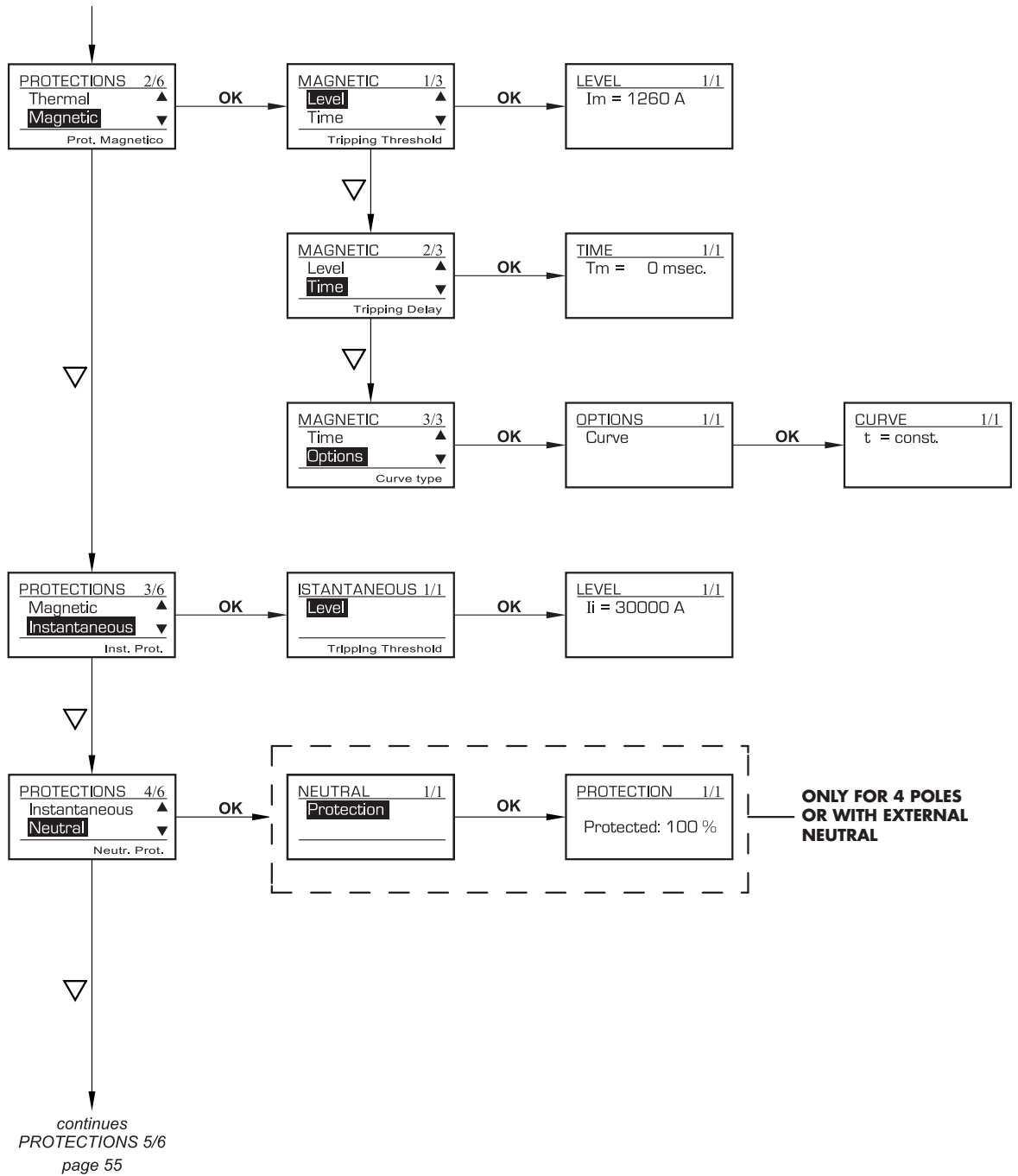
# Protection unit DMX<sup>3</sup>

## 13. Menu navigation



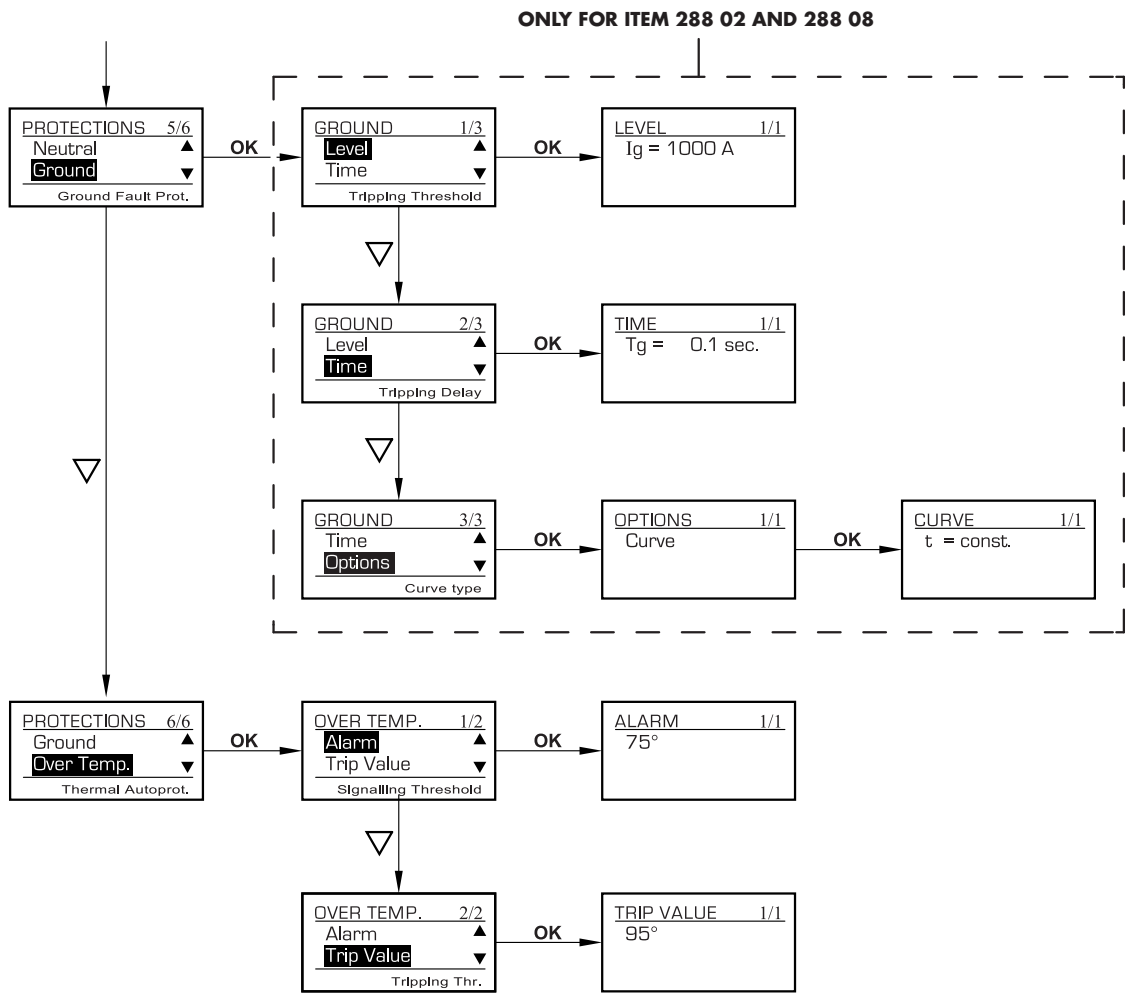
To come back to the upper level of menu push C - To scroll up push "△"

# Protection unit DMX<sup>3</sup>



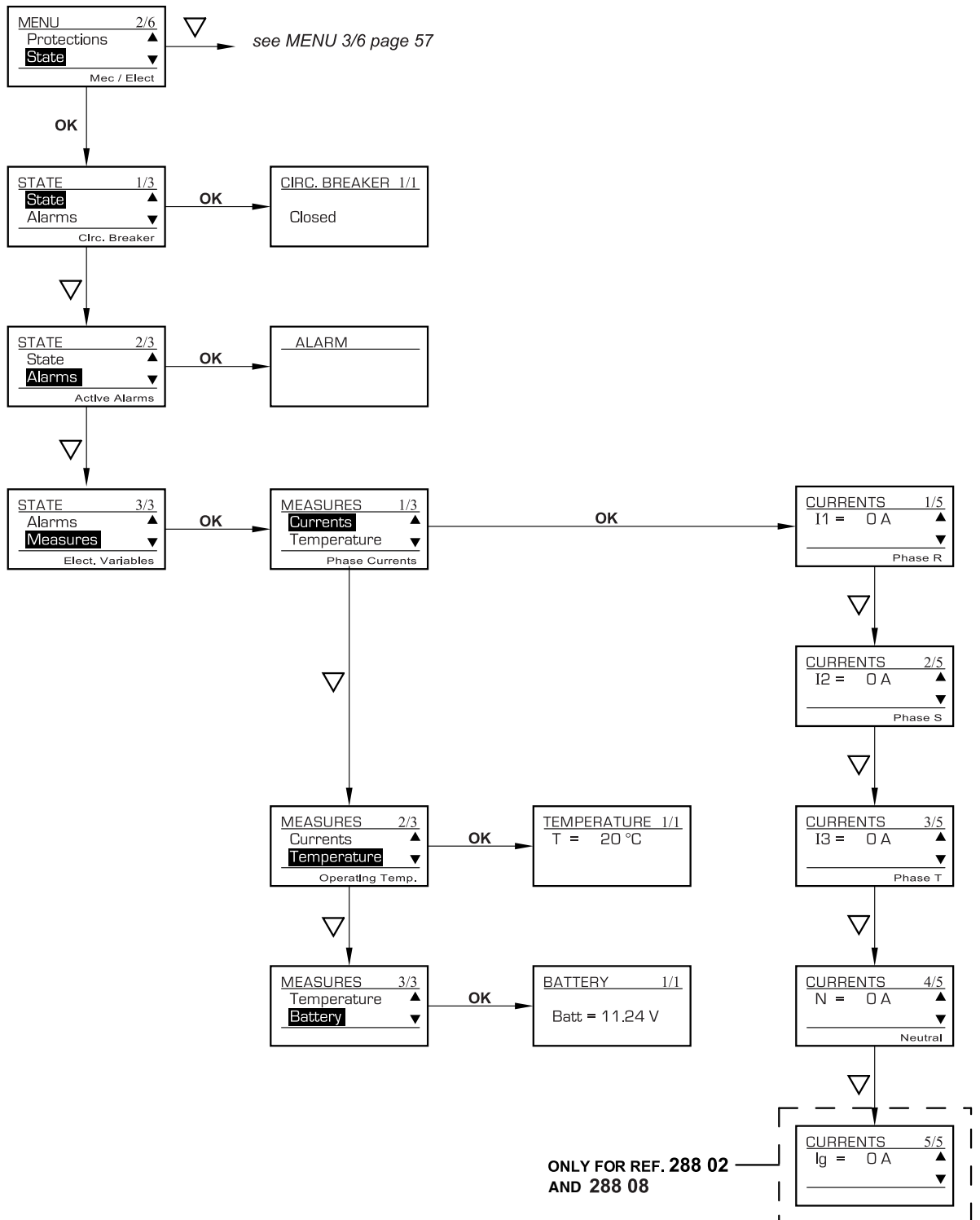
To come back to the upper level of menu push C - To scroll up push "△"

# Protection unit DMX<sup>3</sup>



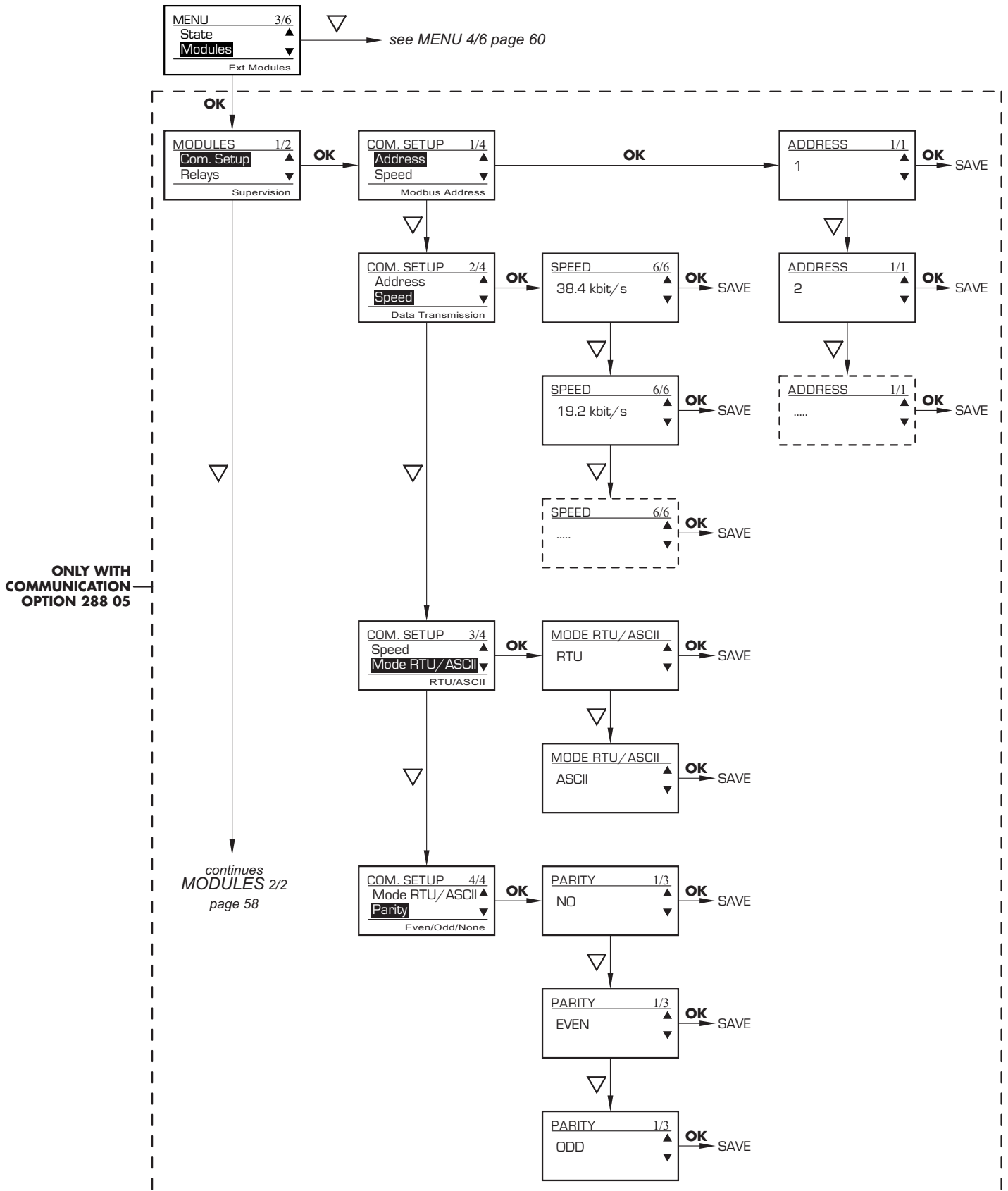
To come back to the upper level of menu push **C** - To scroll up push "△"

# Protection unit DMX<sup>3</sup>



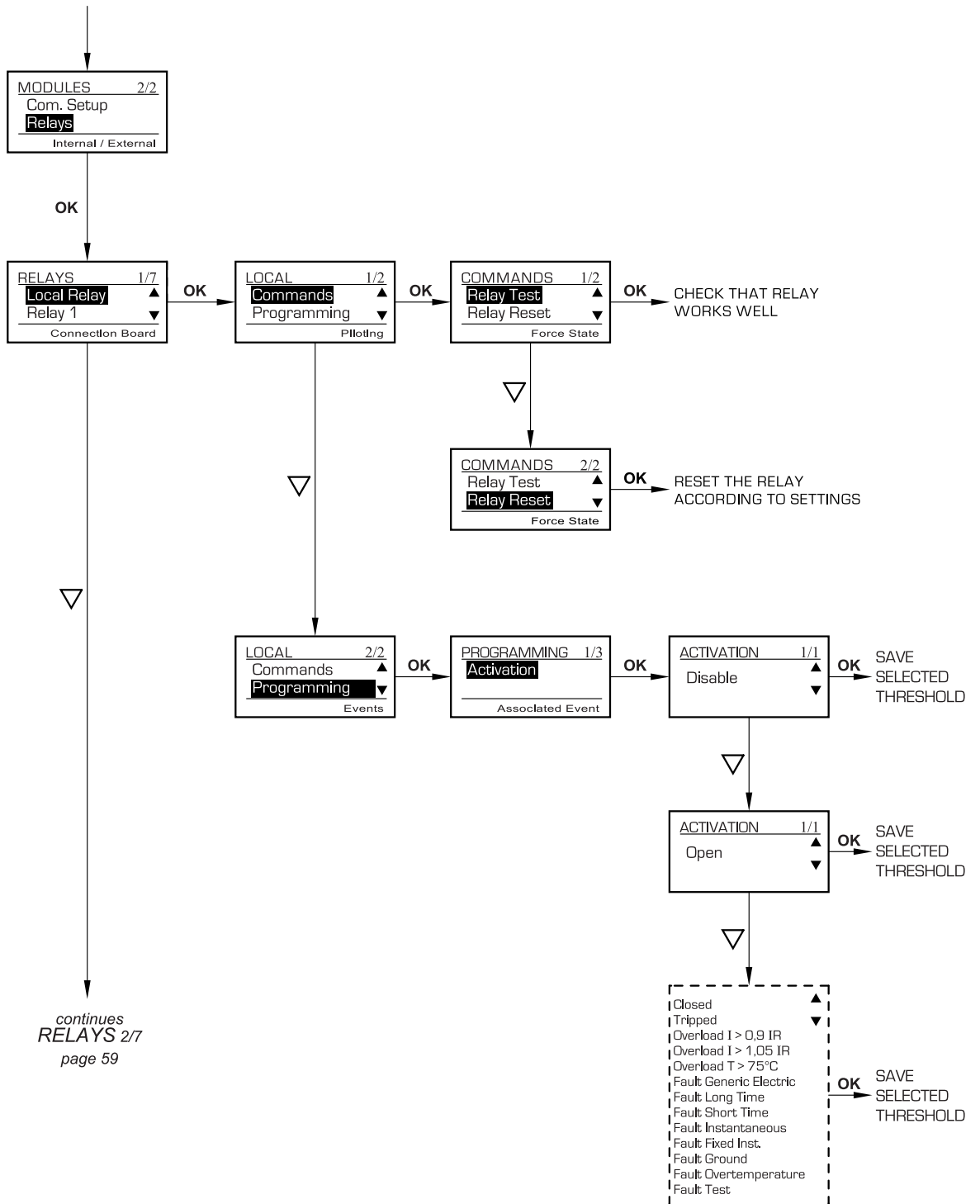
To come back to the upper level of menu push C - To scroll up push "△"

# Protection unit DMX<sup>3</sup>



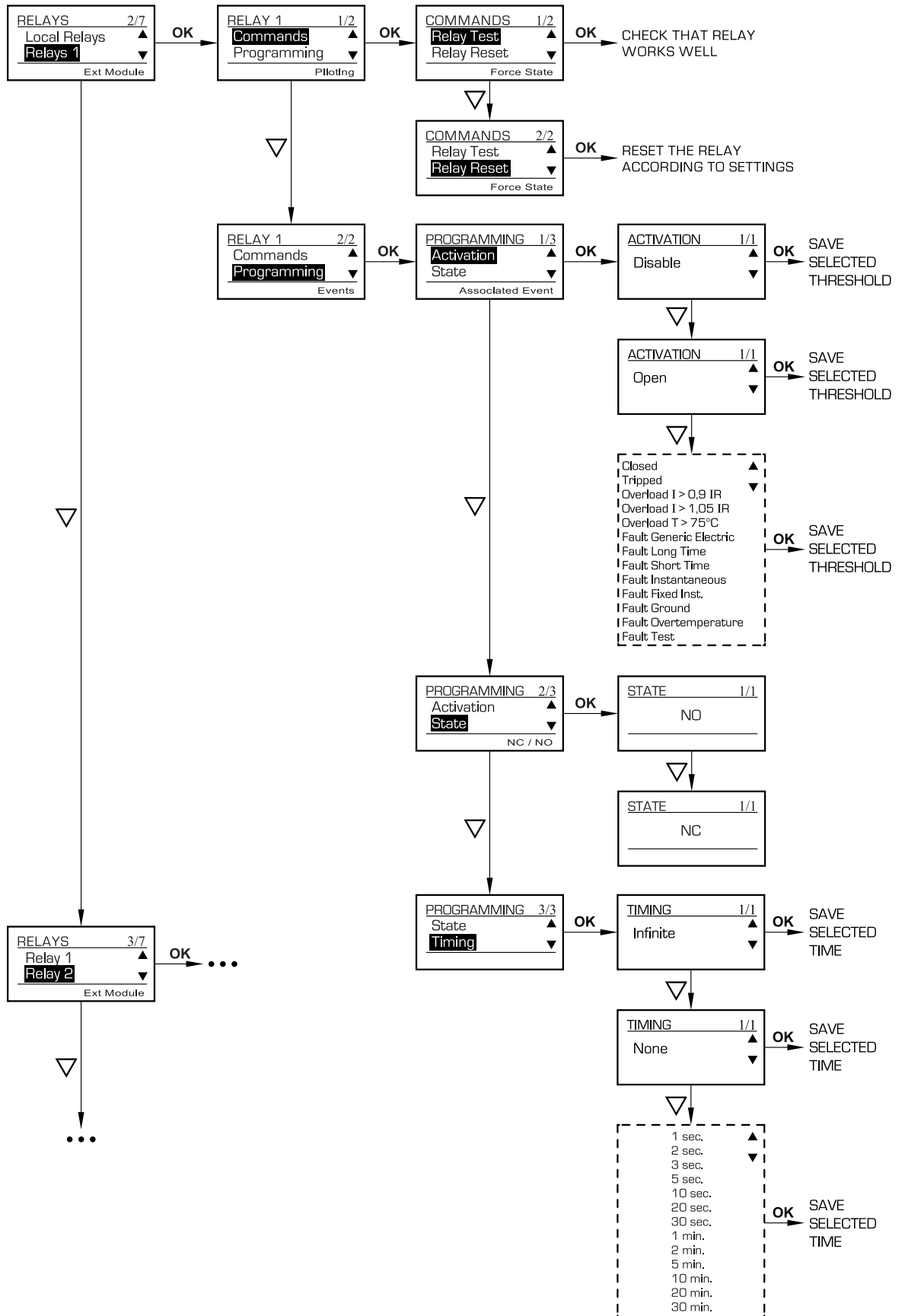
To come back to the upper level of menu push C - To scroll up push "△"

# Protection unit DMX<sup>3</sup>



To come back to the upper level of menu push C - To scroll up push "△"

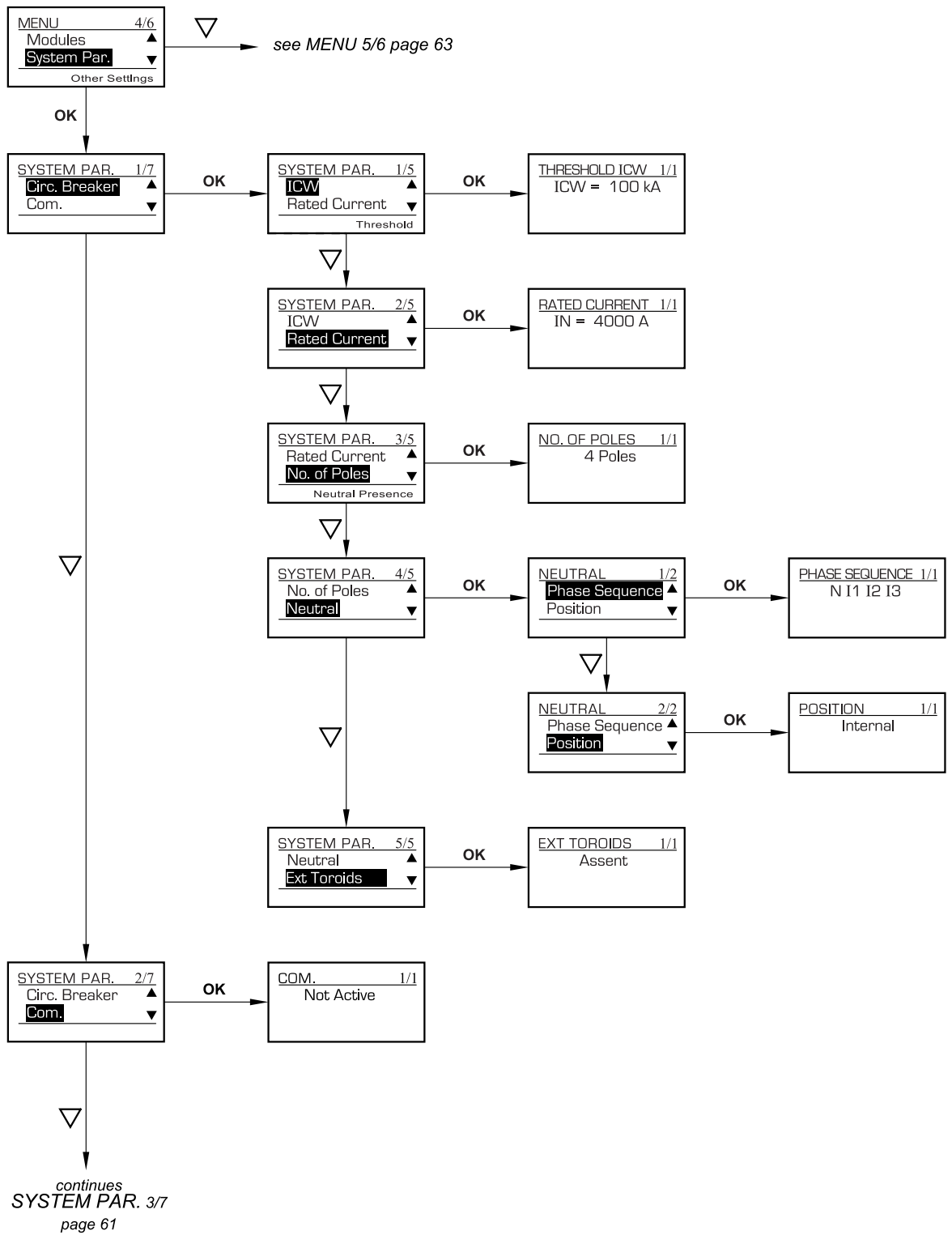
# Protection unit DMX3



To come back to the upper level of menu  
push C - To scroll up push "△"

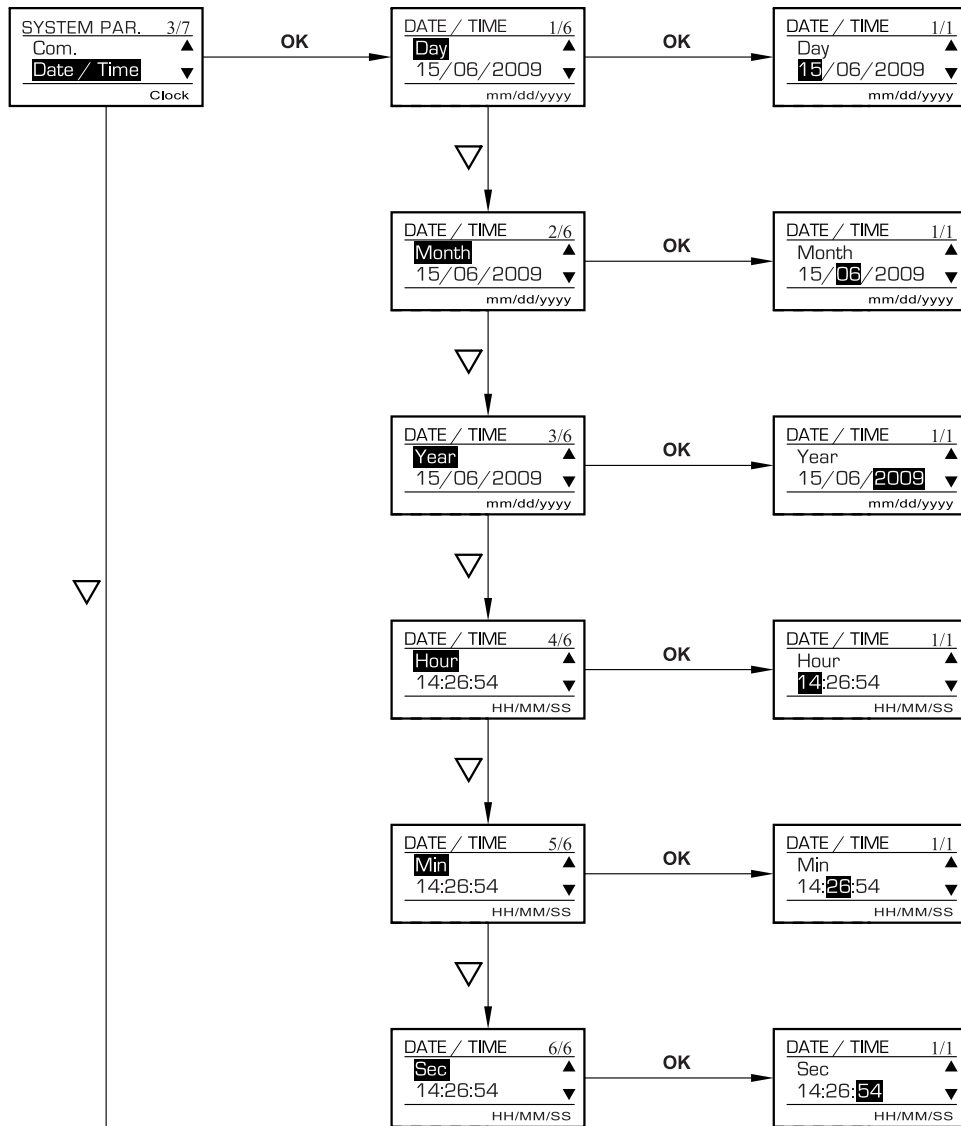


# Protection unit DMX<sup>3</sup>



To come back to the upper level of menu push **C** - To scroll up push "△"

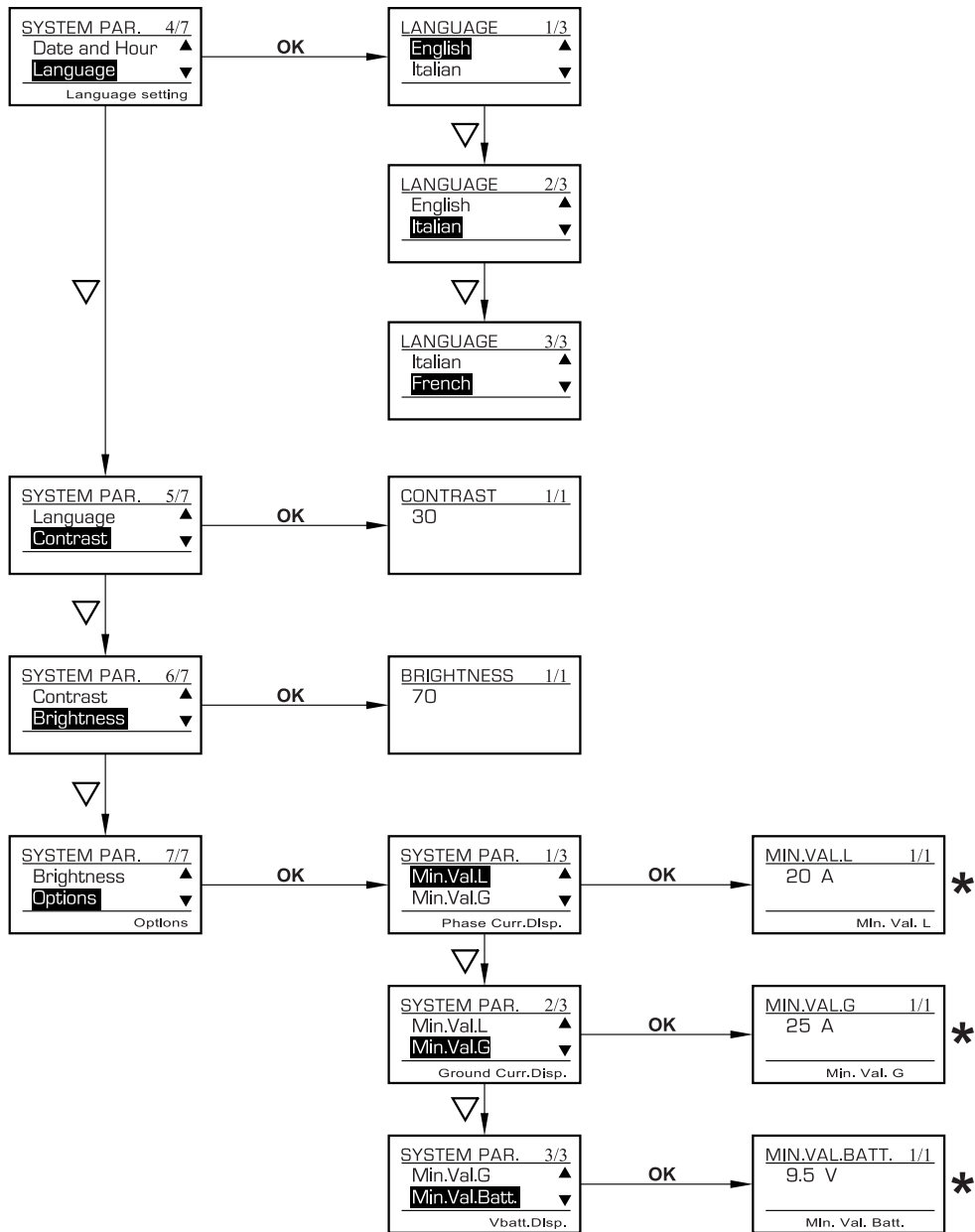
# Protection unit DMX<sup>3</sup>



continues  
SYSTEM PAR. 4/7  
page 62

To come back to the upper level of menu push C - To scroll up push "△"

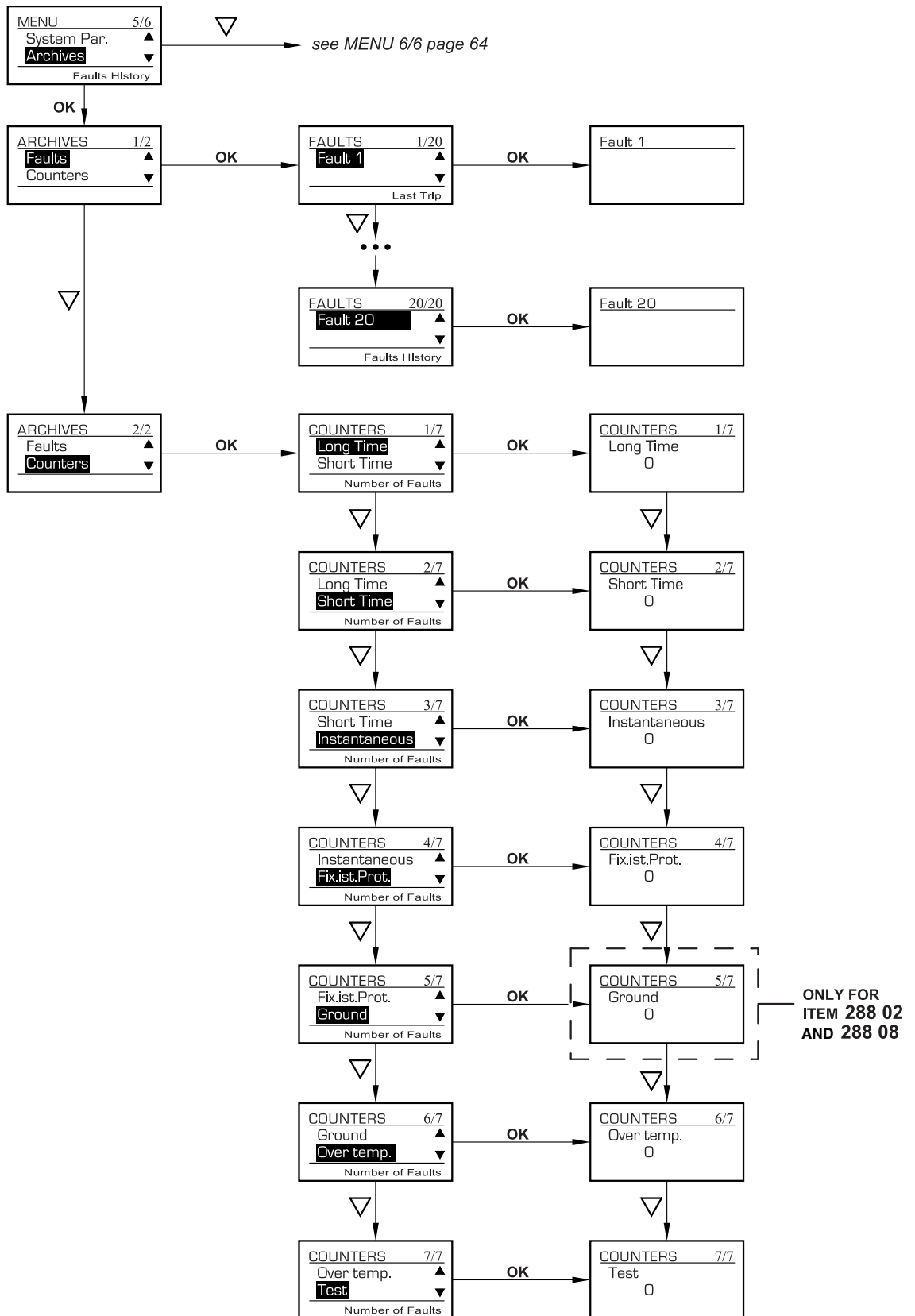
# Protection unit DMX<sup>3</sup>



\* MINIMUM VALUE SHOWN ON DISPLAY

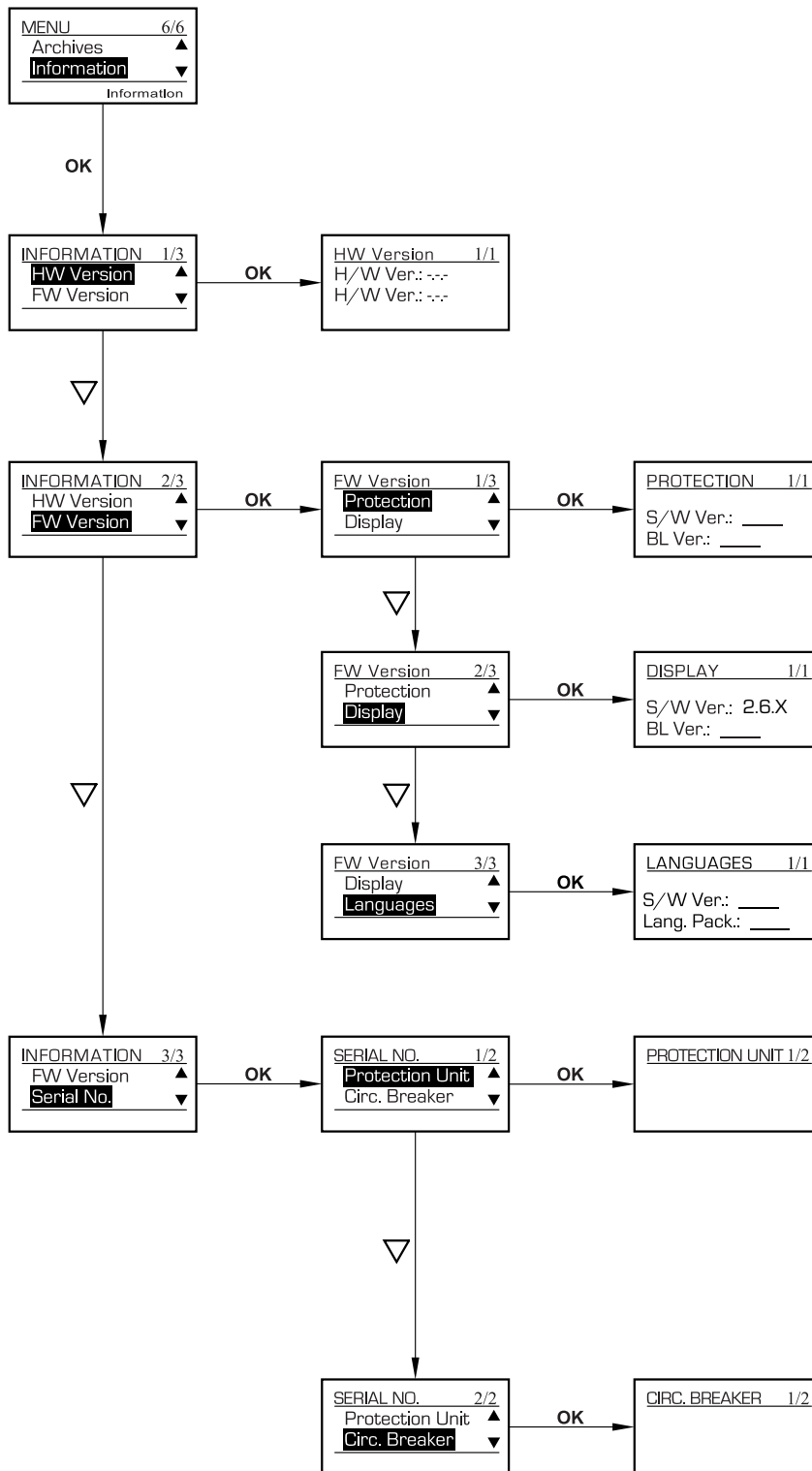
To come back to the upper level of menu push C - To scroll up push "△"

# Protection unit DMX<sup>3</sup>



To come back to the upper level of menu push C - To scroll up push "△"

# Protection unit DMX<sup>3</sup>



To come back to the upper level of menu push C - To scroll up push "△"

# Protection unit DMX<sup>3</sup>

## 14. Menu structure

Level 1 Menu	Level 2 Menu	Level 3 Menu	Level 4 Menu	
Protection	Long Time	Level		
		Time		
		Options	Thermal memory (ON/OFF)	
	Short Time	Level		
		Time		
		Options	Curve	
	Instantaneous	Level		
	Neutral	Protection		
	Ground	Level		
		Time		
		Options	Curve	
	Overtemperature	Alarm	75°C	
		Trip value	95°C	
	State	State	e.g. closed	
Alarms				
Measures		current	I1	
			I2	
			I3	
			N	
			Ig	
Temperature				
Battery				
Modules	Com. Setup	Address	1,2....	
		Speed		
		Mode RTU-ASCII	RTU	
			ASCII	
		Parity	No	
			Even	
	Odd			
	Relays *	local relay	Commands (test; reset)	
			Programming	
		relay 1	Commands (test; reset)	
			Programming	
....				
relay 6	Commands (test; reset)			
	Programming			

\* Local relay:  
terminal block W  
on breaker  
Relay1..Relay6:  
external program-  
mable module  
288 12 (optional  
accessory)

# Protection unit DMX<sup>3</sup>

Level 1 Menu	Level 2 Menu	Level 3 Menu	Level 4 Menu
System Parameter	circuit breaker	lcw	
		rated current	
		n° of poles	
		Neutral	phase sequence
			position (ext/int/absent)
	external toroids	(present/absent)	
	COM	(Active/NoActive)	
	date/time		
	Language		
	Contrast		
	Brightness		
	Options	val min L	
		Val Min G	
Val Min Batt			
Archives	Faults	history of last 20 trips	
	Counters	Long Time	
		Short Time	
		Instantaneous	
		Fix Instantaneous	
		Ground	
		Overtemperature	
		Test	
Information	FW version *	Protection	S/W version
			BL version ***
	FW version *	Display	S/W version
			BL version
	FW version *	Languages	version S/W
			lang. pack
	HW version **	H/W version	
		H/W version	
	Serial Number	Protection Unit	
Circuit Breaker			

\* FW: software  
 \*\* HW: hardware  
 \*\*\* BL: boot loader

# Protection unit DMX<sup>3</sup>

## 15. Technical annexes

### 15.1 Curves

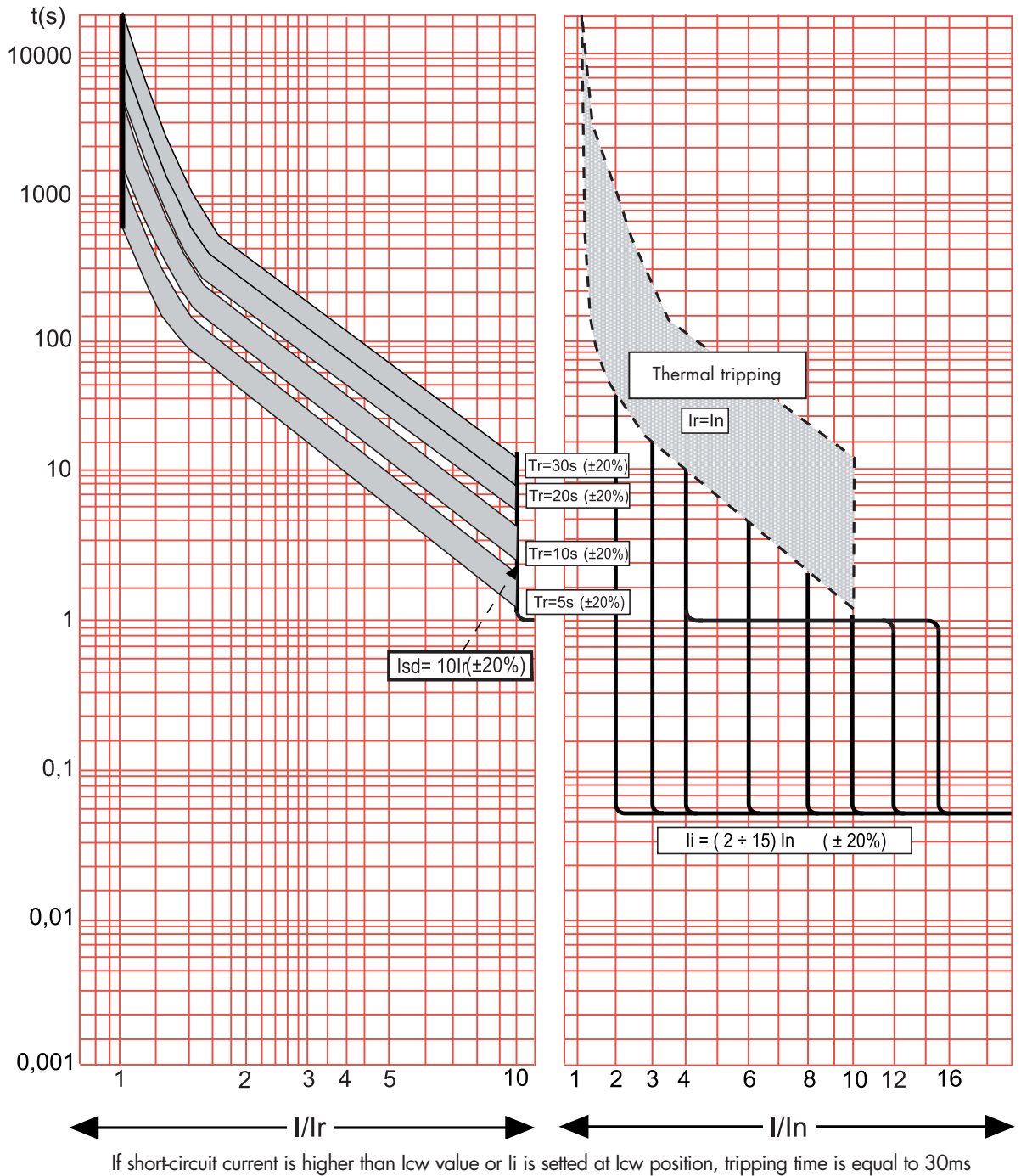
Time-current tripping characteristic - item 288 00

$I_r$  = Long time setting current

$T_r$  = Long time delay

$I_{sd}$  = Short time setting current

$I_i$  = Instantaneous intervention setting current

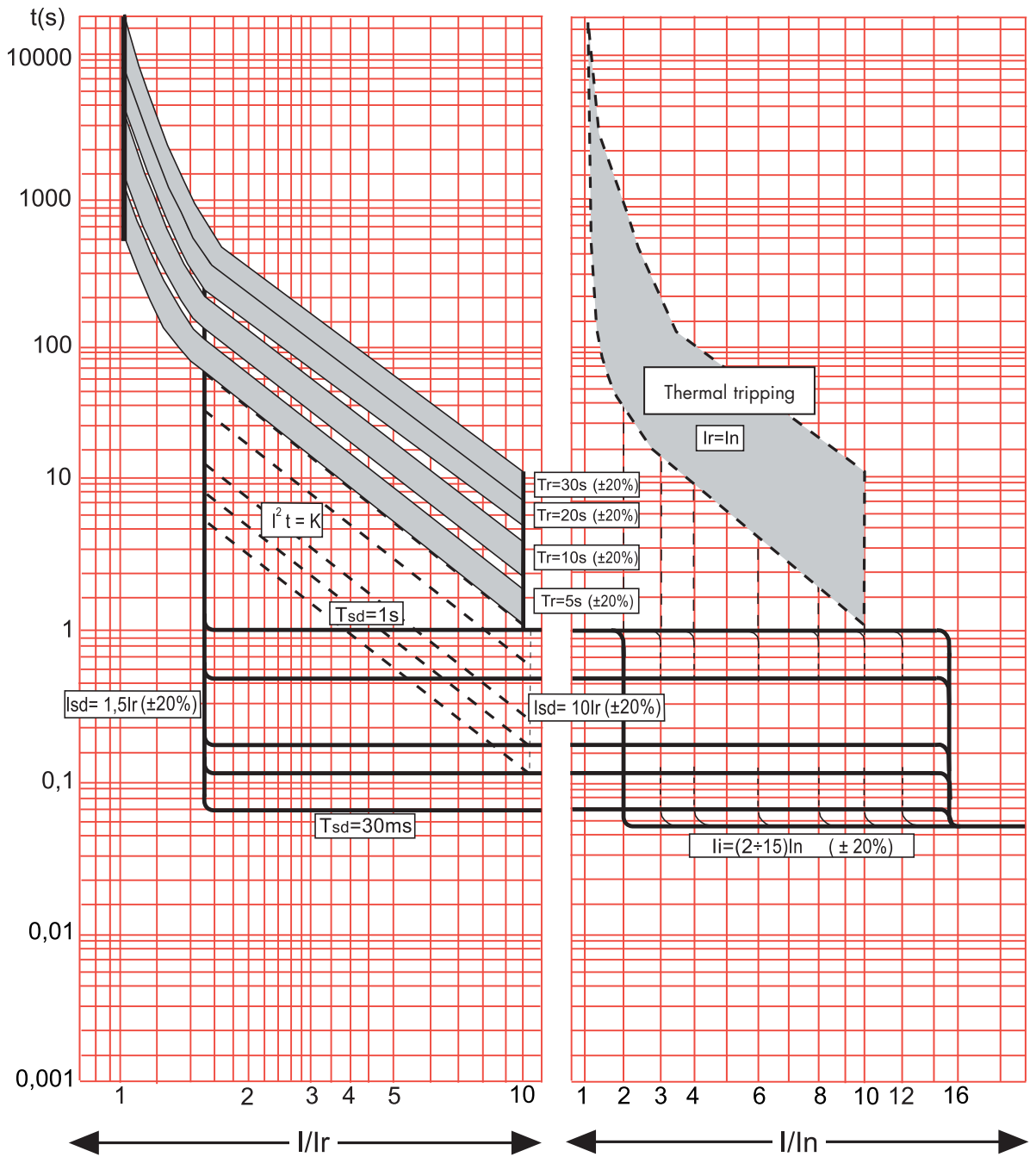




# Protection unit DMX<sup>3</sup>

Time-current tripping characteristic - item 288 01 and 288 02

$I_r$  = Long time setting current  
 $T_r$  = Long time delay  
 $I_{sd}$  = Short time setting current  
 $T_{sd}$  = Short time delay  
 $I_i$  = Instantaneous intervention setting current

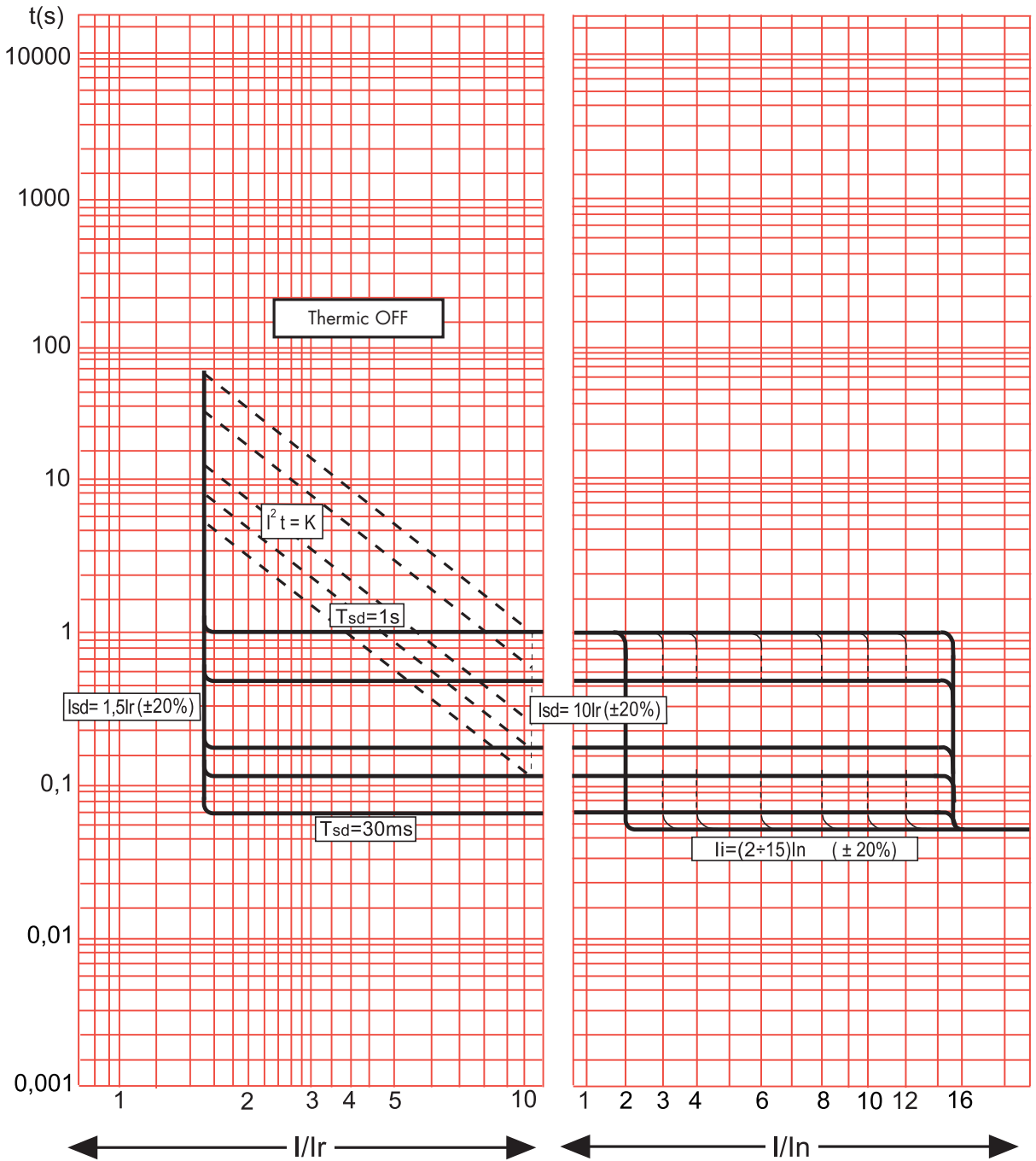


If short-circuit current is higher than low value or  $I_i$  is setted at low position, tripping time is equal to 30ms

# Protection unit DMX<sup>3</sup>

Time-current tripping characteristic - item 288 08

$I_{sd}$  = Short time setting current  
 $T_{sd}$  = Short time delay  
 $I_i$  = Instantaneous intervention setting current

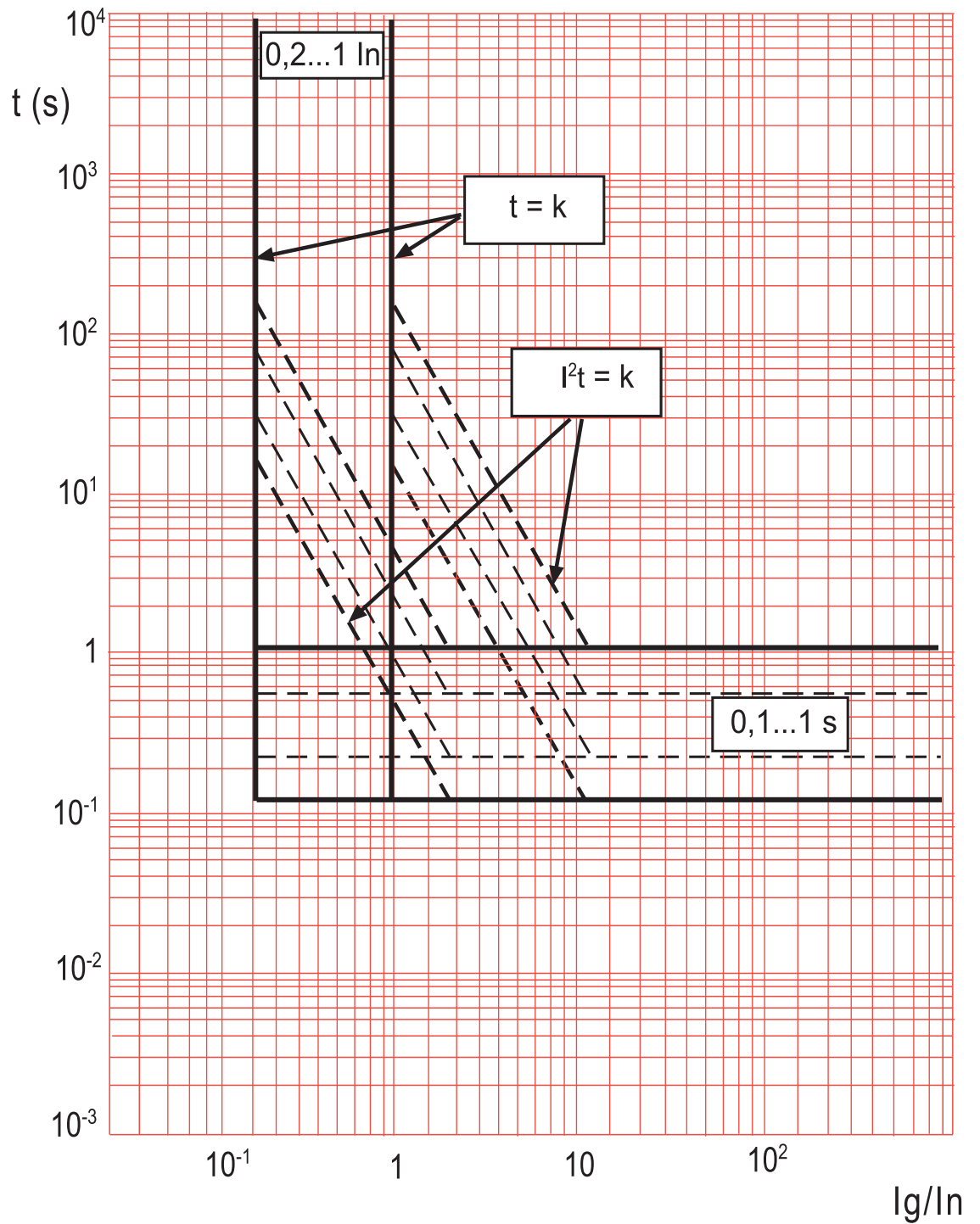


$I_{cc}$  = estimated short circuit symmetrical current (RMS value)

$I^2t$  = pass-through specific energy

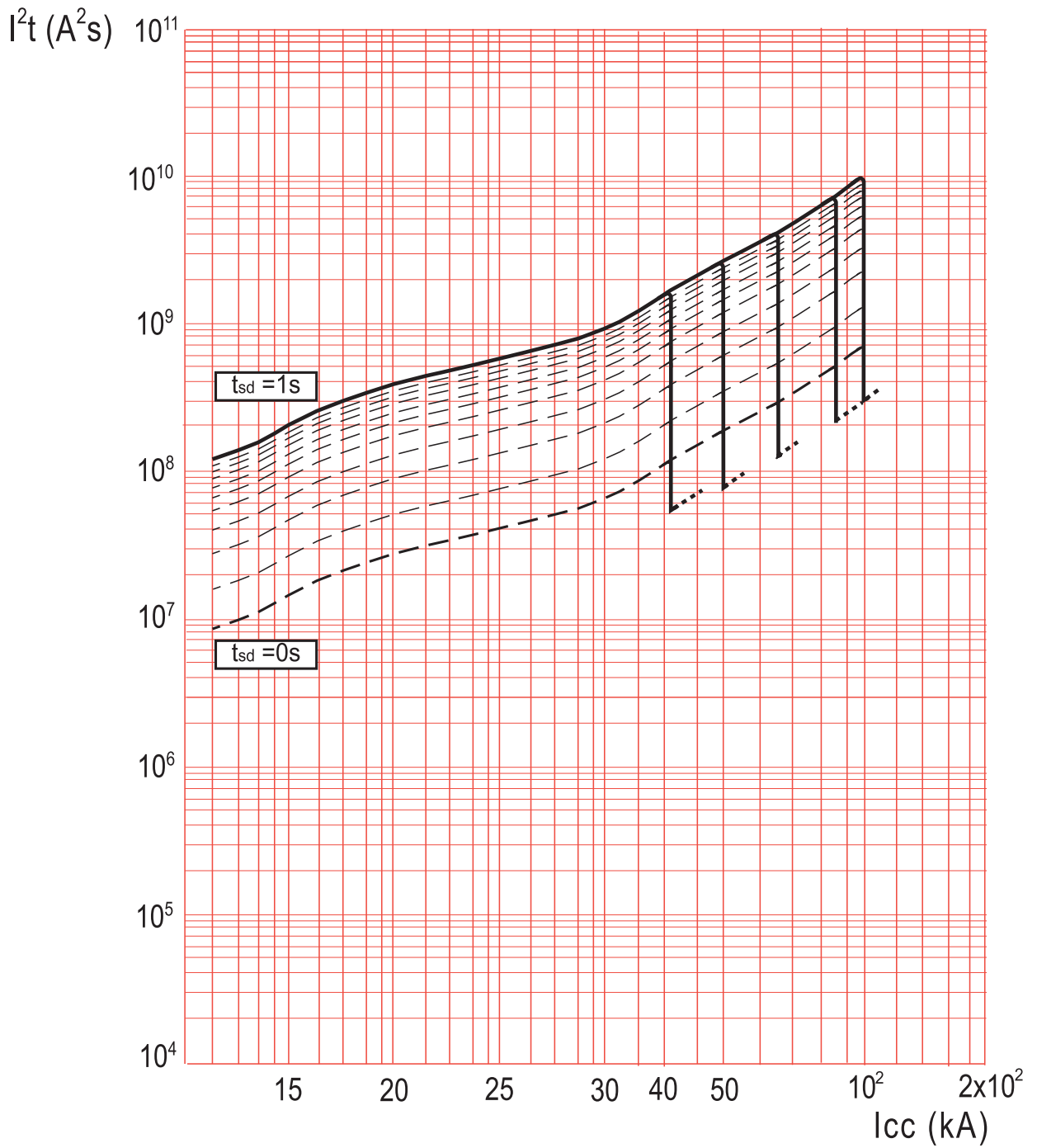
# Protection unit DMX<sup>3</sup>

Ground fault tripping characteristic



# Protection unit DMX<sup>3</sup>

Pass-through  
specific energy  
characteristic



$I_{cc}$  = estimated short circuit symmetrical current (RMS value)

$I^2t$  = pass-through specific energy

# Protection unit DMX<sup>3</sup>

## 15.2 Tripping time

Time delay	No tripping time	Tripping time
<b>Tsd</b>	<b>(ms)</b>	<b>(ms)</b>
0	30	70
100	70	120
200	150	205
500	450	515
1000	930	1000

	No tripping time	Tripping time
	<b>(ms)</b>	<b>(ms)</b>
<b>li</b>	30	55

	Tripping time
	<b>(ms)</b>
<b>lcw</b>	30