

## 4. CONNECTIONS

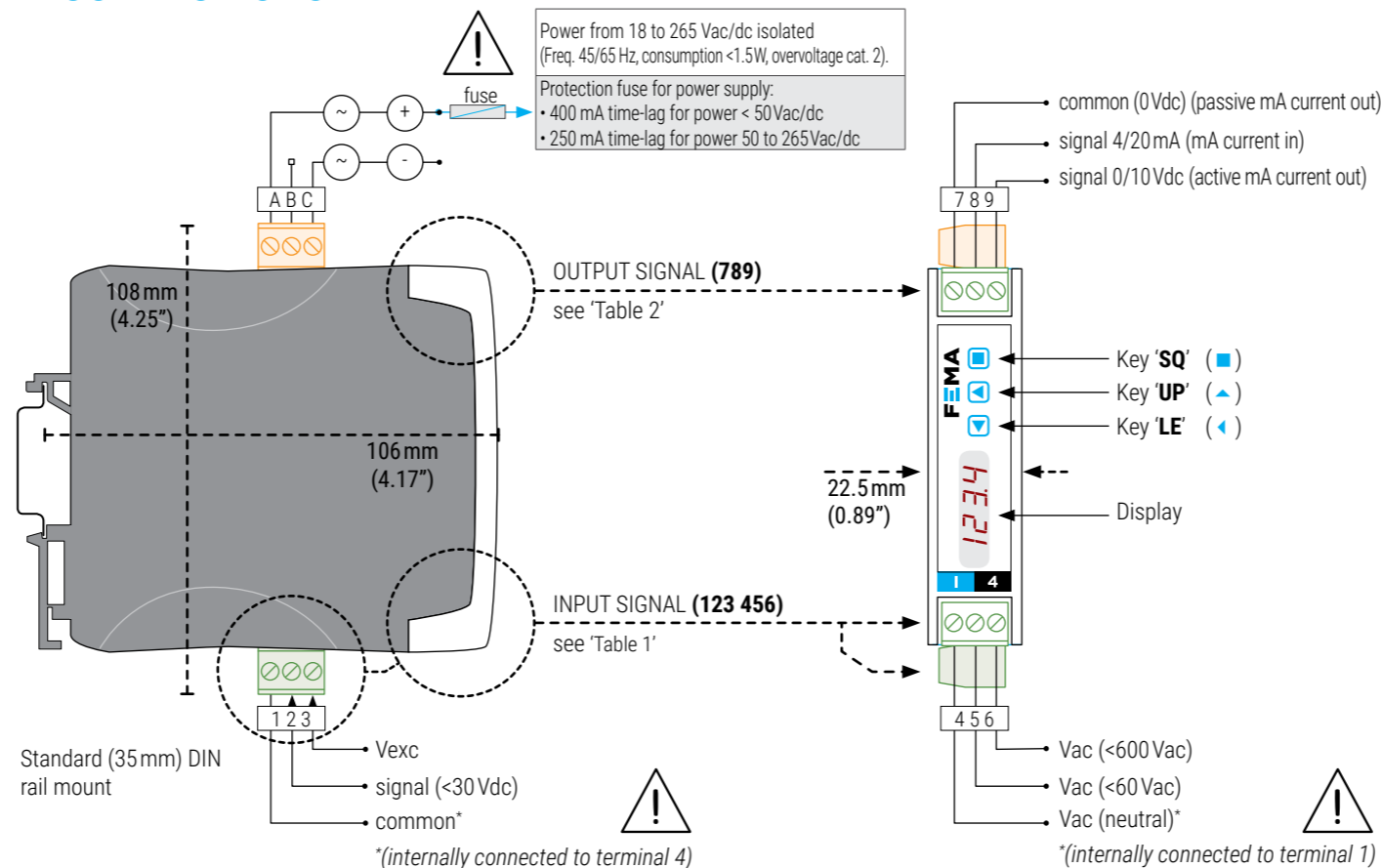


Table 1 | INPUT signal connections

INPUT signal	Input terminal					
	1	2	3	4	5	6
Vac (<600 Vac)				~Vac		~Vac
Vac (<60 Vac)				~Vac	~Vac	
Npn (2 wires)	common	signal				
Pnp (2 wires)		signal	Vexc			
Npn, Pnp (3 wires)	common	signal	Vexc			
Pick-up	common	signal				
Namur		signal	Vexc			
Mechanical contact	common	signal				
Reed contact	common	signal				
Others	common	signal	Vexc			

Table 2 | OUTPUT signal connections

OUTPUT signal	Output terminal			Connections
	7	8	9	
4/20 mA active output		mA- (in)	mA+ (out)	
4/20 mA passive output* (*external loop power needed)	mA+ (out)	mA- (in)		
0/10 Vdc	common		+Vdc	

## 5. HOW TO ORDER

Reference	Description
I4F	Signal converter

## 6. PREDEFINED CONFIGURATION CODES

Table 3 | Predefined configuration codes

Input signal range	Output 4/20 mA codes	Output 0/10 Vdc codes
0/1 Hz	010	110
0/2 Hz	011	111
0/4 Hz	012	112
0/6 Hz	013	113
0/8 Hz	014	114
0/10 Hz	015	115
0/20 Hz	016	116
0/40 Hz	017	117
0/60 Hz	018	118
0/80 Hz	019	119
0/100 Hz	020	120
0/200 Hz	021	121
0/400 Hz	022	122
0/600 Hz	023	123
0/800 Hz	024	124

Table 3 | Predefined configuration codes

Input signal range	Output 4/20 mA codes	Output 0/10 Vdc codes
0/1 KHz	025	125
0/2 KHz	026	126
0/4 KHz	027	127
0/6 KHz	028	128
0/8 KHz	029	129
0/10 KHz	030	130
0/20 KHz	031	131
0/40 KHz	032	132
0/60 KHz	033	133
0/80 KHz	034	134
0/100 KHz	035	135
0/1 MHz	036	136
Reserved	037 to 099	137 to 199
(End of list)	'---	
(Custom selection)	'uSEr'	

### Notes

• Code 'uSEr' indicates that a user custom configuration is active, and it does not match any of the listed codes. The code 'uSEr' is non-selectable, for information only.

• Code '---' identifies the end of the list, it follows code '199' and the list continues with code '010'. Select '---' to exit the list without applying changes.

## 7. ERROR CODES

Table 4 | Error codes

<b>Er.01'</b>	Password error. The password code entered is not correct.
<b>Er.04'</b>	Output hardware overrange. The output signal should be higher than the maximum output signal that can be generated.
<b>Er.05'</b>	Output hardware underrange. The output signal should be lower than the minimum output signal that can be generated.
<b>Er.08'</b>	Scaled input slope not valid. The value for 'Input signal high' must be higher than 'Input signal low'. Enter a different value to validate the parameter.
<b>Er.09'</b>	Scaled output slope not valid. The values for 'Output signal low' and 'Output signal high' can not be the same. Enter a different value to validate the parameter.
<b>Er.10'</b>	Scaled process display slope not valid. The values for 'Process low' and 'Process high' can not be the same. Enter a different value to validate the parameter.

Error codes are shown flashing on display. Error codes are not visible inside the 'configuration menu' or inside the 'force' menu. The error code remains active on display until the problem that caused the error is solved. In case of multiple error codes, solve the first problem to see the next active error code.

Messages below are not 'errors' and do not affect the output signal, do not trigger the 'On error' (On.Er) function

Table 5 | Messages

<b>d.ovr'</b>	Display overrange. The display value should be higher than the maximum value that can be displayed.
<b>d.udr'</b>	Display underrange. The display value should be lower than the minimum value that can be displayed.
<b>-nA-</b>	Function not available. For the actual configuration, the function is not available.

## 1. INSTALLATION AND START-UP

1. Install the instrument at the DIN rail
2. Connect the power supply (see section 4)
  - see section 8 for an explanation on 'normal mode' of operation
3. Access the 'configuration menu' (see section 8) and at the 'function code' parameter (see section 9) introduce one of the 'predefined configuration codes' (see section 6)
4. At the 'predefined sensors' menu (see section 9), select one of the listed sensors
5. If a custom configuration is needed, download the user's manual for a full explanation on how to customize input and output signal ranges, and the sensor parameters (see section 3)

- customize the input signal range and the output signal range
- customize the sensor parameters

6. Connect the output signal (see section 4)
  - to validate remote devices (PLC, SCADA, HMI, ...), access the 'force' menu (press and maintain the 'UP' (▲) key for 1 second) and use the 'force' functions to manually set the output to different values

7. Connect the input signal (see section 4)
  - for a list of display errors see section 7
8. Other functions you may consider to configure:
  - the 'Messages' function, to access information on the input and output values
  - the 'SOS' mode, to set the output fixed to a value (if input signal is missing)
  - the 'Label', to define a name for the instrument
  - the 'Password' function, to block access to the 'configuration menu'

Access the user's manual (see section 3) for detailed explanations. Do not forget to read the 'installation precautions' section at the user's manual.

## 2. MATERIAL INCLUDED

The instrument is provided with the following elements :

- 1 x instrument I4F
- 4 x plug-in screw terminals, connected to the instrument
- 1 x Quick installation guide

## 3. ADDITIONAL DOCUMENTATION

User's manual	<a href="http://www.fema.es/docs/5799_I4F_manual_en.pdf">www.fema.es/docs/5799_I4F_manual_en.pdf</a>
Datasheet	<a href="http://www.fema.es/docs/5801_I4F_datasheet_en.pdf">www.fema.es/docs/5801_I4F_datasheet_en.pdf</a>
Quick installation guide	<a href="http://www.fema.es/docs/5803_I4F_installation_en.pdf">www.fema.es/docs/5803_I4F_installation_en.pdf</a>
Declarations of conformity	<a href="http://www.fema.es/docs/5642_CE-Declaration_I4_en.pdf">www.fema.es/docs/5642_CE-Declaration_I4_en.pdf</a> <a href="http://www.fema.es/docs/5648_UKCA-Declaration_I4_en.pdf">www.fema.es/docs/5648_UKCA-Declaration_I4_en.pdf</a>
Warranty	<a href="http://www.fema.es/docs/4153_Warranty1_en.pdf">www.fema.es/docs/4153_Warranty1_en.pdf</a>
Web	<a href="http://www.fema.es/Series_I4">www.fema.es/Series_I4</a>



Scan the QR code to directly access the user's manual of this instrument.

### 8. HOW TO OPERATE

**AT POWER-UP** When the power supply is connected:

- the 'display' shows the firmware code 'b4.xx'.
- the 'display' shows the configured 'units', 'input range' and 'sensor' (for example: 'kHz', '20' and 'nPn').
- the instrument is now in 'normal mode' of operation and the 'display' shows the 'information' configured at the 'DISP' parameter.

**FROM 'NORMAL MODE' OF OPERATION**

- key 'SQ' (■) gives access to the 'configuration menu' (see section 9).
- key 'UP' (▲) gives access to the 'force' menu (see section 1).
- key 'LE' (◀) activates the 'messages' function.

**'ECO' FUNCTION ('DISPLAY' POWERED OFF)**

The 'Eco' function (enabled by default) powers off the display under the following conditions:

- the instrument is in 'normal mode' of operation.
- there is no interaction from the operator for 60 seconds.

**HOW TO ENTER THE 'CONFIGURATION MENU'**

With the instrument in 'normal mode' of operation, press the 'SQ' (■) key and maintain for 1 second. The horizontal leds light from bottom to top. When the upper led lights, the instrument enters into the 'configuration menu'.

The first menu entry displayed is 'Function code' (codeE). You can introduce one of the 'predefined configuration codes' (see section 6) for a fast configuration, or download the user's manual (see section 3) for a full explanation on the functions available.

If the 'SQ' (■) key is released before entering into the 'configuration menu', the horizontal leds light downwards from top to bottom, and the instrument returns to 'normal mode' of operation.

**HOW TO OPERATE INSIDE THE 'CONFIGURATION MENU'**

Inside the 'configuration menu', use the front keypad to move through menu entries, parameters, and select configuration values:

- Key 'SQ' (■)** functions as the 'ENTER' key. It selects the menu entry currently displayed. At numerical value entries, it validates the number displayed.
- Key 'UP' (▲)** moves vertically through the different menu entries. At numerical value entries, it modifies the selected digit by increasing its value to 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. The most significant digit has additional values '-1' and '-1'.
- Key 'LE' (◀)** functions as the 'ESCAPE' key. It leaves the selected menu entry, and eventually, will leave the 'configuration menu'. When leaving the 'configuration menu', the changed parameters are activated. At numerical value entries, the 'LE' (◀) key allows to select the active digit. To modify a numeric value press the 'UP' (▲) key to increase the value '+1'. Press the 'SQ' (■) key to validate the value.

**'ROLLBACK' FUNCTION**

If there is no interaction from the operator for 60 seconds, the instrument exits the 'configuration menu' discarding changes, and returns to 'normal mode' of operation.

**WHEN EXITING THE 'CONFIGURATION MENU'**

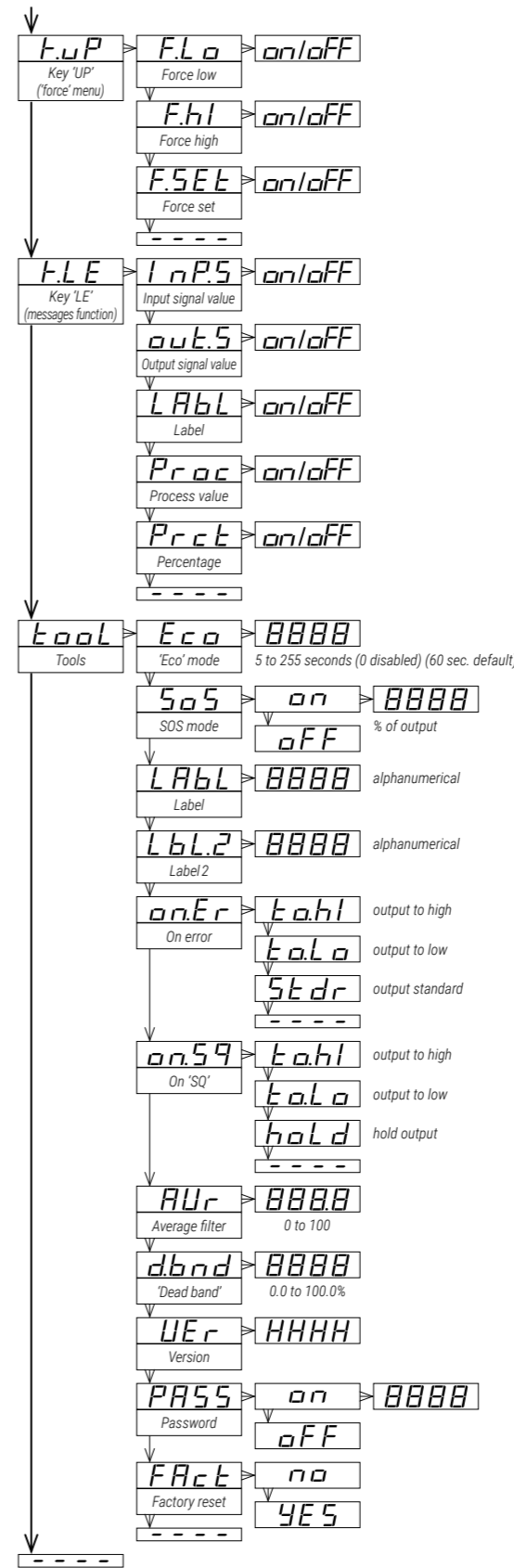
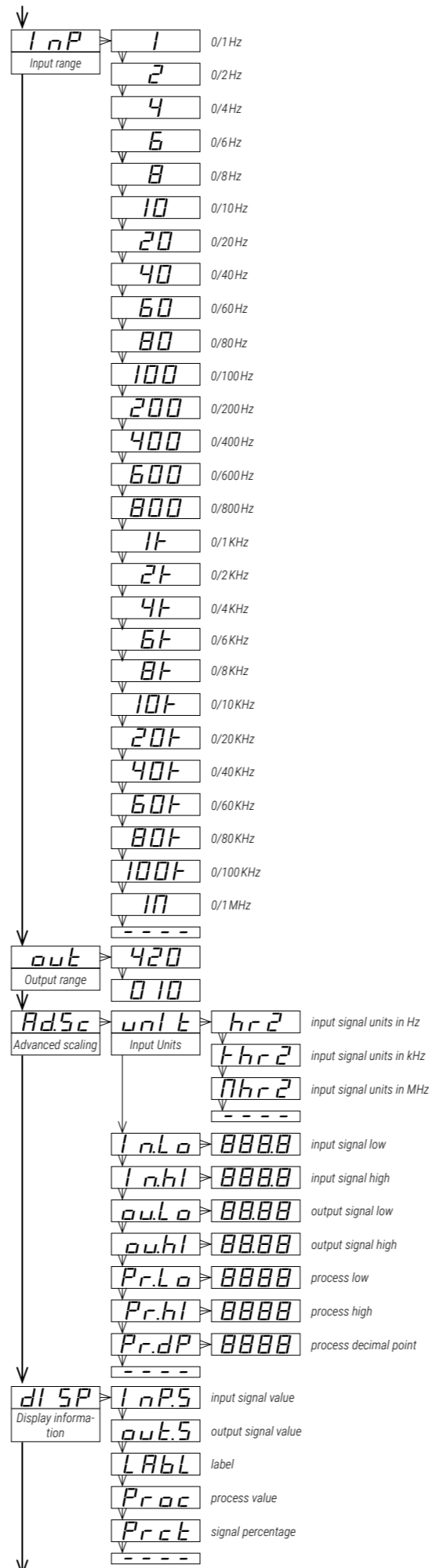
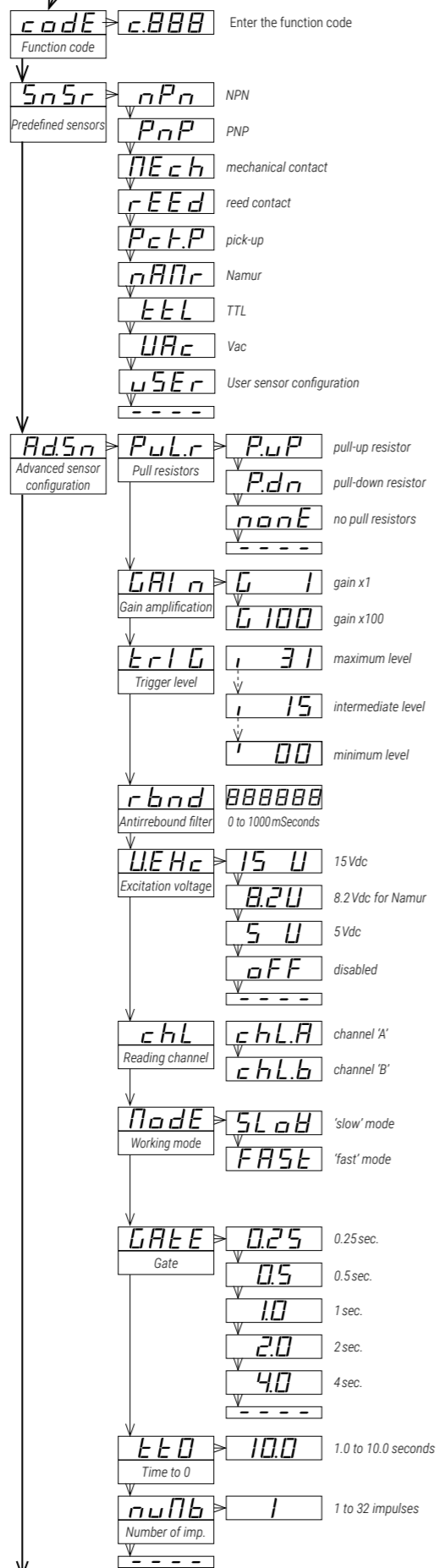
When exiting the 'configuration menu' without changes (either by 'rollback' activation or because there are no changes in the configuration), the horizontal leds light down from top to bottom, and the instrument returns to 'normal mode' of operation.

When exiting the 'configuration menu' with changes, the display leds light a round shape while the new configuration is stored. When the round shape is finished, a start-up is applied. After start-up, the new configuration is active and the instrument is in 'normal mode' of operation.

- When inside the 'configuration menu', the output signal remains overranged at maximum signal. Other configurations available at the 'On 'SQ'' parameter
- When the operator exits the 'configuration menu', the output signal is underranged to minimum value for <5 seconds, while the instrument restarts.

### 9. CONFIGURATION MENU

Press 'SQ' (■) for 1 second to access the 'configuration menu'.



Risk of electrical shock. Instrument terminals can be connected to dangerous voltage.

Instrument protected with double isolation. No earth connection required.

Instrument conforms to CE and UKCA rules and regulations.

### 10. FACTORY CONFIGURATION

Function code (codeE)	025	(c.025)
Predefined sensors (SnSr)	nPn	(nPn)
advanced sensor configuration (Ad.Sn)		
Pull resistors (PuLr)		pull-up (PuP)
Gain amplification (GAI n)	x1	(G 1)
Trigger level (tRIG)	25	
Antirrebound filter (r bnd)	0	[milliseconds]
Excitation voltage (UEhc)	15Vdc	(15 V)
Reading channel (chL)	'B'	
Calculation mode (ModE)	Fast	(FAST)
Gate (GATE)	0.5	[seconds]
Time to 0 (tEO)	1.0	[seconds]
Number of impulses (nuNb)	1	
Input range (InP)	0/1KHz	(1K)
Output range (out)	4/20mA	(420)
Advanced scaling (Ad.Sc)		
Units (untS)	khertz	(khrZ)
Input signal low (In.Lo)	0.0	[kHz]
Input signal high (In.hI)	1.0	[kHz]
Output signal low (ou.Lo)	4.00	[mA]
Output signal high (ou.hI)	20.00	[mA]
Process low (Pr.Lo)	0	
Process high (Pr.hI)	1000	
Process decimal point (Pr.dP)	xxxx	
Display information (dISP)		
Key 'UP' ('force' menu) (K.uP)		
Force low (F.Lo)	on	
Force high (F.hI)	on	
Force set (FSEt)	on	
Key 'LE' ('messages' function) (K.LE)		
Input signal value (InP.S)	off	
Output signal value (out.S)	on	
Label (LABL)	off	
Process value (Proc)	off	
Percentage (Prct)	off	
Tools (tooL)		
'Eco' mode (Eco)	60	[seconds]
SOS mode (SoS)	off	
Label (LABL)	LABL	
Label2 (LbL.2)	---	(disabled)
On error (on.Er)	to.hI	(output to maximum value)
On 'SQ' (on.Sq)	to.hI	(output to maximum value)
Average filter (AVr)	0	(disabled)
Dead band (d.bnd)	0.0	(disabled)
Password (PASS)	off	(disabled)

**RESET TO DEFAULT FACTORY PARAMETERS**

To return to default factory parameters, enter into 'configuration menu', go to 'Tools' (tooL) / 'Factory reset' (FAct) and select 'yes'

- the leds light a round shape while the new configuration is applied
- the start up message appears ('SEnSor nPn 1.000 kHz')
- the actual signal input value is displayed
- the instrument is in 'normal mode' of operation

### 11. REGULATIONS

This instrument conforms to the actual CE regulations. For a copy of the 'CE declaration of conformity' see section 3. Applicable regulations are :

**Security regulations EN-61010-1** ('Fixed' equipment, 'Permanently connected'. 'Double' isolation. Overvoltage category 2).

**Electromagnetic compatibility regulations EN-61326-1**

This instrument does not provide a general mains switch and will start operation as soon as power is connected. The instrument does not provide protection fuse, and the fuse must be added during installation. Instrument designed to be DIN rail mounted, inside a cabinet, protected from direct impacts.

According to directive 2012/19/EU, electronic equipment must be recycled in a selective and controlled way at the end of its useful life.

Standard warranty of 3 years according to actual european legislation. Free of cost warranty extension of 5 years, available at (see section 3).