

INSTALLATION & OPERATION INSTRUCTIONS

6150/4150 Limit Controllers



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INTRODUCTION

Device data

In the space below, write the order code and other plate data shown on the label attached to the outside of the controller.

If you need technical assistance, this information must be given to Chromalox Customer Service.

Serial number	SN	
Finished product code	CODE	
Order code	TYPE	
Supply voltage	SUPPLY	
Firmware version	VERS.	

Warnings and safety

Make sure that you always have the latest version of this manual, downloadable at no cost from Chromalox's website (www.chromalox.com).

The devices described in this manual must be installed by trained personnel in conformity to current laws and regulations, following all of the instructions in this manual.

Installers and/or maintenance personnel **MUST** read this manual and scrupulously follow all of the instructions contained herein and in the attachments.

Chromalox will not be liable for any damage/harm caused to persons and/or property, or to the device itself, if all of such instructions are not followed.

This manual must always be available to people who use or work on the devices described herein.

Before using the controllers, the operator must be adequately instructed with regard to operating, emergency, diagnostics, and maintenance procedures.

If the controllers are used in applications with risk of harm to persons or damage to machines or materials, auxiliary alarm devices must be installed.

It is advisable to provide the possibility, during normal operation, of checking whether any alarms have tripped.

DO NOT touch the terminals when the device is powered.

INTRODUCTION

Typographical conventions used in this manual

Pay attention when you see these symbols in the manual.



Indicates very important information on correct product function or on safety, or an instruction that **MUST** be followed.



Indicates a suggestion that could be useful for better use of the device



Indicates risk for the safety of the installer or user due to the presence of high voltage.



Indicates a reference to other technical documents that can be downloaded from www.chromalox.com.



Indicates a point to which the reader's attention is called.

Glossary

4...20 mA	Current used as signal transmitted by certain sensors or in a specific way to control a device, such as a motorized valve.	PV	Acronym for Process Value, i.e., the value that the process variable (temperature, valve opening, etc.) has at that moment.
Alarm	Output that trips when a certain condition is reached, for example, a defined temperature	Sensor	Device that translates physical phenomena (such as change in resistance based on temperature) into electrical signals that can be acquired and processed by the indicator
Hysteresis	The phenomenon in which the value of a physical property lags behind changes in the effect causing it, as for instance when thermocouples temperature lags behind the heater temperature	Thermocouple	Sensor that transmits an electrical signal of a few millivolts. It needs specially designed extension cables
Pt100	A commonly used temperature measurement device. At 0°C its resistance is 100 ohm, normal extension cables can be used.		

Disclaimer

Although all of the information in this manual has been carefully checked, Chromalox assumes no liability regarding the presence of any errors or regarding damage to property and/or harm to individuals due to any improper use of this manual

Chromalox also reserves the right to change the contents and form of this manual, as well as the characteristics of the devices described herein, at any time and without notice.

The technical data and performance levels specified in this manual are to be considered a guide for the user in order to determine the device's suitability for a defined use, and do not constitute a guarantee.

They may be the result of test conditions at Chromalox, and the user must compare them to his/her real application requirements.

Under no circumstances will Chromalox be liable for any damage to property and/or harm to individuals due to tampering, incorrect or improper use, or use not conforming to the characteristics of the controller and to the instructions contained in this manual.

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1. GENERAL DESCRIPTION

1.1. Profile



6150



4150

Indicators 6150 and 4150 are a family of devices used to limit overheating in industrial processes.

In the event of alarm, the instrument latches the fault conditions until reset by the operator. Reset can be run by the operator from the front key (power symbol), from the digital input (optional) or serial line (optional).

As an additional feature, the instrument counts the number of times the alarm limit is exceeded and total amount of time the alarm is active.

This information can help to evaluate furnace deterioration and plan maintenance work.

The devices have the same main characteristics and the same range of functions. They differ in size (1/16, 1/4 DIN), the amount of information shown on the display, and the maximum number of digital inputs.

The displays show the process values, plus multilingual scrolling messages for diagnostics and alarms.

The 4150 model includes a segmented bar that graphically displays the temperature deviation from the alarm limit.

Configuration and unit operation is done with the front keys.

The keys have

dual-function LEDs indicating pressing of the keys. The LEDs provide feedback for pressed key and also provide guidance for permitted operations.

Initial commissioning is simplified by guided configuration text prompts that cover the commonly used base parameters accompanied by in line help messages.

With C-PWR software and PC, you can program the extended configuration, create recipes and update the firmware without having to apply power to the instrument. Thanks to the Smart Configurator function, you obtain the required configuration by answering a few simple questions. The initial parameters can always be reset, both from the keypad and from the C-PWR software.

The devices offer complete diagnostics (broken or incorrect connection of sensor), operation count, settable alarm limits (useful for scheduling preventive maintenance)

A trigger meter and alarm memory reset timer are available for alarm 1.

Maintenance of the system in which the device is installed is made easier by the ability to replace the instrument at any time simply by removing it from the faceplate.

No additional steps are needed.

1. GENERAL DESCRIPTION

1.2. Differences among models

	6140	4140
Display dimensions	35 × 30 mm	83 × 68 mm
PV display	4 digit, 7 seg., H = 17 mm	4 digit, 7 seg., H = 23 mm
SV display	5 digit, 14 seg., H = 7 mm	4 digit, 7 seg., H = 11 mm
Display F	n/a	7 digit, 14 seg., H = 9 mm
Bargraph	n/a	11 segments
Keys	4	6
Max. digital inputs	3	5
Power dissipation	5 W	10 W
Dimensions	48 × 48 mm (1/16 DIN)	96 × 96 mm (1/4 DIN)
Weight	0,16 kg	0,35 kg

n/a = not available

1.3. 6150 Controller

Main features

- Operator interface with large LCD Display, customizable, with choice of colors
- Scrolling diagnostics messages, configurable, in the selected language
- Easy, guided configuration, copy/paste parameters even with power off
- Different password levels
- Universal input configurable for thermocouples, resistance thermometers, linear inputs
- Relay, logic
- RS485 serial communication in Modbus RTU
- Removable faceplate for immediate replacement
- Sampling time 60 ms

1.3.1. Display and keys

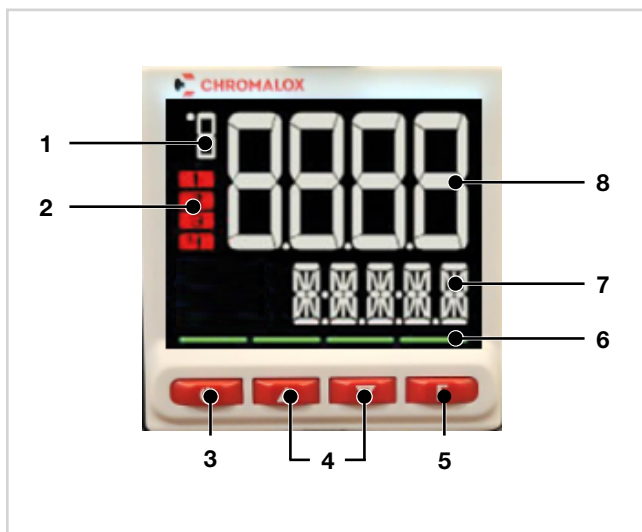


Figure 1 - Description of display and keys

1. Temperature unit of measurement
2. ALARM status
3. Alarm reset key
4. Up/down keys: raise/lower the value of the parameter displayed on the SV or PV display.
5. F key: lets you navigate among menus and parameters. Confirms the parameter value and selects the next parameter.
6. Key pressed signals.
7. SV display: Alarm 1 limit, description of parameters, diagnostic and alarm messages. It can be used to view the alarm limit and displays the associated message in the event of alarm.
8. PV display: process variable, parameter values.

1. GENERAL DESCRIPTION

1.3.2. Drilling dimensions and templates

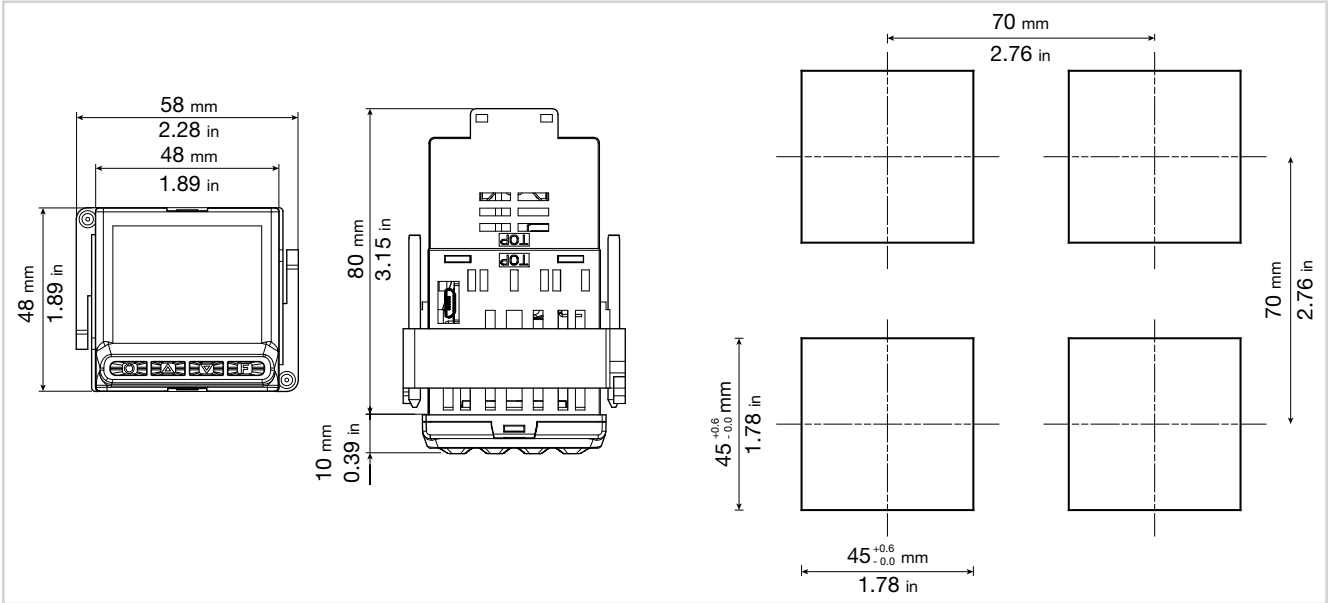


Figure 2 - 6150 drilling dimensions and templates

1.5. 4150 Controller

Main features

- Operator interface with large LCD Display, customizable, with choice of colors
- Scrolling diagnostic messages, configurable, in the selected language
- Easy, guided configuration, copy/paste parameters even with power off
- Different password levels
- Universal input configurable for thermocouples, RTDs, Current/Voltage inputs
- Relay, logic,
- RS485 serial communication in Modbus RTU
- Removable faceplate for quick replacement
- Sampling time 60 ms

1.5.1. Display and keys

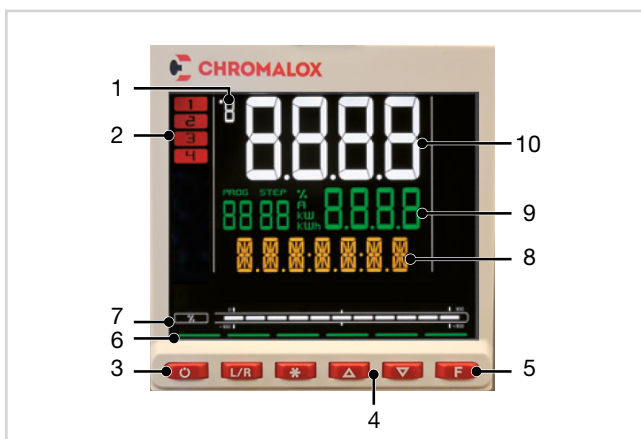


Figure 5 - Description of display and keys

1. Temperature unit of measurement
2. ALARM status
3. Alarm reset key
4. Up/down keys: raise/lower the value of the parameter displayed on the SV or PV display.
5. F key: lets you navigate among menus and parameters. Confirms the parameter value and selects the next parameter.
6. Alarm 1 limit deviation display
7. Key pressed signals.
8. Display F: parameters, diagnostic and alarm messages.
9. SV display: Alarm 1 limit, parameters being set.
10. PV display: process variable, parameter values.

1. GENERAL DESCRIPTION

1.5.2. Drilling dimensions and templates

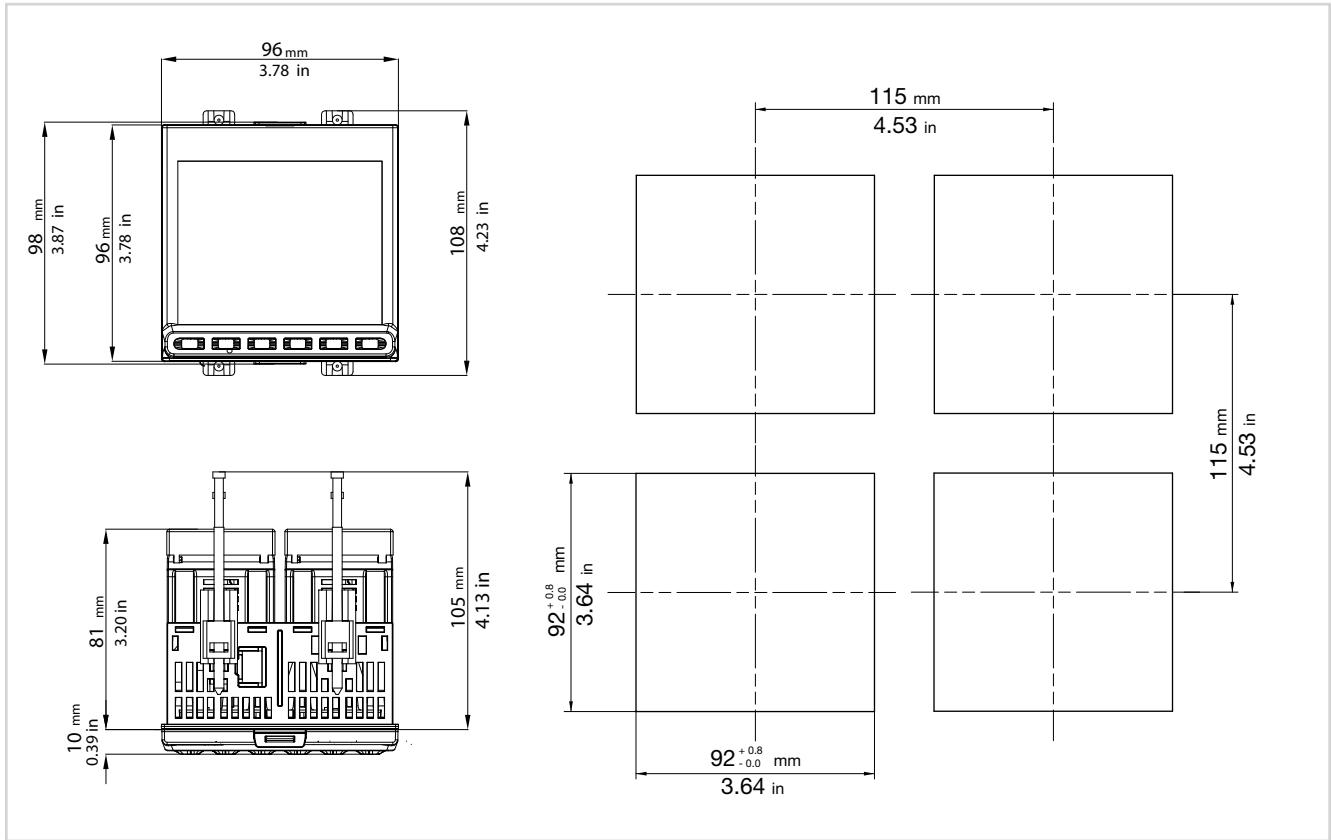


Figure 6 - 4150 drilling dimensions and templates

2. INSTALLATION



Attention! The devices described in this manual must be installed by trained personnel in conformity to current laws and regulations, following all of the instructions in this manual.

Before installing, check that the controller is in perfect condition and was not damaged in shipment. Make sure that the package contains all of the accessories listed on the accompanying document, especially the gasket and the fastening brackets.

Check that the order code matches the configuration required for the intended application (supply voltage, number and type of inputs and outputs). See Chapter 10 - Ordering code - to check the configuration corresponding to each order code.



Attention! If even one of the requirements mentioned above (trained technician in, device in perfect condition, correct configuration) is not satisfied, interrupt the installation and contact your Chromalox dealer or Chromalox Customer Service.

2.1. Mounting the controller

2.1.1. General installation rules

The controller is designed for permanent indoor installation. It must be mounted on electrical panels or on panels controlling machines or production process plants that are able to protect the exposed terminals on the rear of the controller.



Attention! DO NOT install the controller in a potentially inflammable or explosive atmosphere. It can be connected to elements that work in such atmospheres only by means of appropriate interfaces that conform to safety regulations in force in the country of installation.



Attention! the controller is used in applications with risk of harm/damage to persons/property, it MUST be connected to dedicated alarm devices. It is advisable to provide the possibility, during normal functioning of the controller and of the system or equipment that it controls, of checking whether any alarms have tripped.

The controller must be installed in a location that is not subject to sudden temperature changes or to freezing or condensation, and no corrosive gases must be present.

The controller can work in Pollution Degree 2 environments (presence of non-conductive dust, only temporarily conductive due to possible condensation). Do not allow scrap or metal particles from machining or condensation products to reach the device.

The controller is sensitive to strong electromagnetic fields. Do not position it near radio devices or other equipment that may generate electromagnetic fields, such as power contactors, relays, thyristor power units (especially phase angle), motors, solenoids, transformers, high-frequency welders, etc.

2.1.2. Drilling dimensions

For correct installation, respect the dimensions of each hole and the distance between adjacent holes shown in the figures for each model ("Figure 2 – 6150 drilling dimensions and templates" on page 9, "Figure 6 – 4150 drilling dimensions and templates" on page 12).



Attention! The support on which the operator panel is mounted must:

- be sufficiently rigid and robust to support the device without bending during use;
- be from 1 to 4 mm thick to allow the device to be fastened with the supplied bracket.

2.1.3. Protection against infiltration of dust and water

The front of the controller has an IP65 protection index, so the device can be installed without problems in rooms that are very dusty or subject to splashing water provided:

- the housing in which the device is inserted is dust-tight and watertight;
- the support on which the device is installed is perfectly smooth and without undulations on the front;
- the hole on the support scrupulously respects the specified drilling dimensions;
- the device is fully tightened to the support to ensure that the gasket inserted between the device and the panel is watertight



Attention! If not adequately protected, the controller has an IP20 protection index (rear container and terminal board).

2. INSTALLATION

2.1.4. Vibrations

The controller can support vibrations from 10 to 55 Hz, 20 m/s², in all directions (X, Y and Z).

If the device is mounted on a support that exceeds these limits, it is advisable to provide a suspension system to reduce vibrations.

2.1.5. Minimum space for ventilation

The temperature in the housing containing the controller must NEVER exceed 55°C. NEVER block the ventilation slits.



Advice. The lower the temperature in which the device works, the longer the life of its electronic components.



Attention! Forced cooling (for example, with a fan) of the rear of the controller may cause measurement errors.

2.1.6. Positioning

The controller must be positioned so that the display is not subject to direct sunlight or to very strong sources of light. If necessary, filter direct light, for example, with a reflective screen.

The controller must be tilted between 30° and 120°, as shown in the figure.

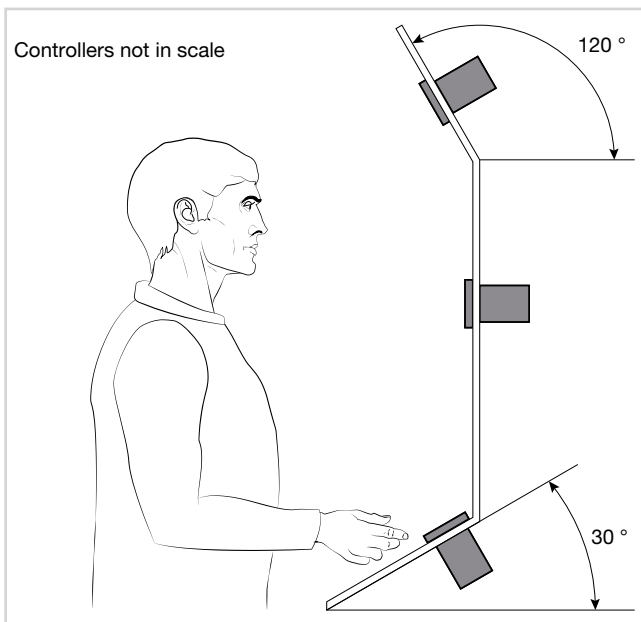


Figure 7 - Positioning the controller

2.1.7 Fastening to the panel

1. Insert the die-cut rubber gasket between the controller and the panel. The gasket (supplied) is indispensable for ensuring the declared protection index of the faceplate.
2. Insert the device into the hole previously made on the panel.
3. Place the supplied bracket(s) onto the rear of the controller.
4. Tighten the screws to fasten the device to the panel. The tightening torque must be between 0,3 and 0,4 N m.

The following figures show how to fasten the three controller models.

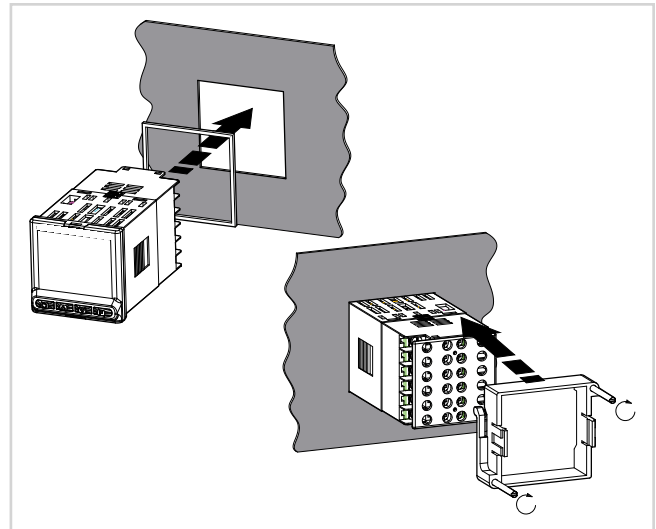


Figure 8 - Fastening the 6150

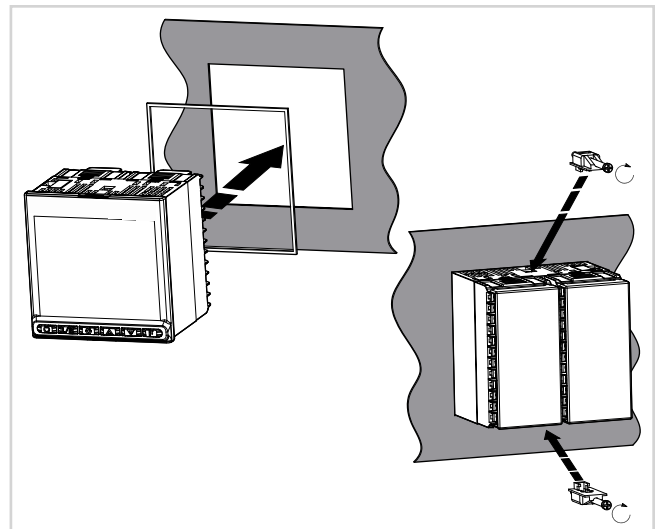


Figure 10 - Fastening the 4150

2.2. Connections



Attention! Failure to follow the instructions in this section may cause problems in electrical safety and electromagnetic compatibility, in addition to voiding the warranty.

2.2.1. General rules for connections

1. Connected external circuits must have double isolation.
2. In case of shielded cables, the shield must be grounded at a single point, possibly near the controller.
3. Input cables must be physically separated from power cables, output cables, and power connections.
4. Do not connect unused terminals.
5. Tighten the terminals without forcing. Loose terminals may cause sparks and fires.
The recommended tightening torque is 0.5 Nm.
6. When making connections, respect polarity where required.
7. Do not bend or twist the cables beyond the limits specified by the manufacturers.
8. After connecting the cables, apply the transparent cover to protect the terminals.
The terminal teeth limit and define the correct direction for applying the cover.

2.2.2. Electromagnetic compatibility (EMC)

For electromagnetic conformity, the strictest general rules have been applied, using the following test configuration:

Connection	Cable section	Length
Power supply	1 mm ² (17 AWG)	1 m (39.37")
Relay	1 mm ² (17 AWG)	3,5 m (137.79")
Serial port	0,35 mm ² (21 AWG)	3,5 m (137.79")
Thermocouple	0,8 mm ² (18 AWG)	5 m (196.85") compensated
Potentiometer, linear, "PT100" resistance thermometer	1 mm ² (17 AWG)	3 m (118.11")
Digital input/ outputs	1 mm ² (17 AWG)	3,5 m (137.79")

2.2.3. Cables

Always use cables appropriate for the voltage and current limits specified in the Technical Characteristics.




Use copper cables with 60/75°C insulation.

Use twisted and shielded cables for non-power connections.

The controller's terminal board has screw terminals (M3) that accept stripped cables and crimped terminals for a tightening torque of 0.5 N m.

Two ring or crimped fork terminals can be connected on each terminal

The following table shows the characteristics of the cables and terminals that can be used.

Cable / terminal	Cable / terminal section	Terminal size
Rigid cable	0,2...2,5 mm ² (24...14 AWG)	
Twisted	0,2...2,5 mm ² (24...14 AWG)	
 Tag terminal (to be crimped)	0,25...2,5 mm ² (23...14 AWG)	
 Fork terminal (to be crimped)		5,8 mm max (0.23")
 Ring terminal (to be crimped)		5,8 mm max (0.23")



Attention! Anchor the cables, at least in pairs, so that mechanical stresses do not discharge on the terminal connections.

2.2.4. Power supply



Attention! Before powering the controller, make sure that the supply voltage matches the one shown on the controller data plate.

Because the controller does not have a switch, a bipolar switch with fuse must be inserted upline. The switch, or isolator, must be positioned in the immediate vicinity of the device and must be easily reached by the operator.
A single switch can control multiple controllers.

The controller must be powered by a line separated from the one used for electromechanical power devices (relays, contactors, solenoids, etc).

It is advisable to install a ferrite core on the power line, as close as possible to the device, to limit the controller's susceptibility to electromagnetic noise.

If the controller's power line is heavily disturbed by the switching of thyristor power units or by motors, it is advisable to use an isolation transformer only for the controller, grounding the shield.

Use appropriate line filters in the vicinity of high-frequency generators or arc welders.

Use a voltage stabilizer if there are wide shifts in line voltage.

20...27 VAC/VDC models must be powered by a class II or low-voltage limited-energy source.

The power supply must use a line separated from the one used for electromechanical power devices, and low-voltage power cables must run along a path separated from the system or machine power cables.

2. INSTALLATION



Attention! Make sure the ground connection is efficient. Absent or inefficient grounding can make the device unstable due to excessive noise.

Specifically, check that:

- voltage between mass and ground is $< 1\text{ V}$;
- resistance is $< 6\ \Omega$.



Attention! If the controller is connected to devices that are NOT electrically isolated (such as thermocouples), ground with a specific conductor to prevent grounding directly through the machine structure.

2.2.2.2 Connecting inputs and outputs

The controller's input and output lines must be separated from the power line.

To prevent noise, the controller's input and output cables must be kept away from the power cables (high voltages or high currents).

The input and output cables and the power cables must not be placed parallel to one another.

Use shielded cables or separate cable trays.

To connect the output to an inductive load (relay, contactor, electrovalve, motor, fan, solenoid, etc.) that works in AC, mount a snubber, i.e., an RC group (resistor and condenser in series) placed parallel to the load. Installing this filter lengthens the life of the relays.

NOTE: All condensers must conform to VDE (class X2) standards and support voltage $\geq 220\text{ VAC}$.

The power of the resistor must be $\geq 2\text{ W}$.

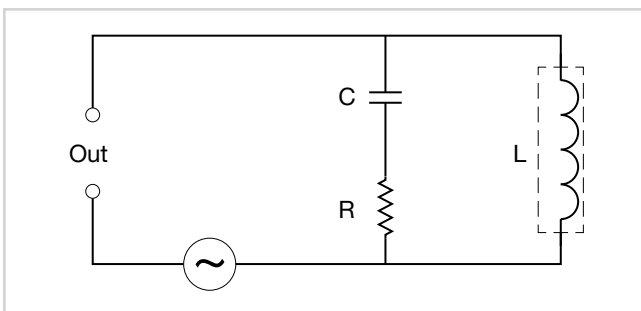


Figure 11 - Snubber connection diagram (AC)

For inductive loads that work in DC, mount a 1N4007 diode parallel to the coil.

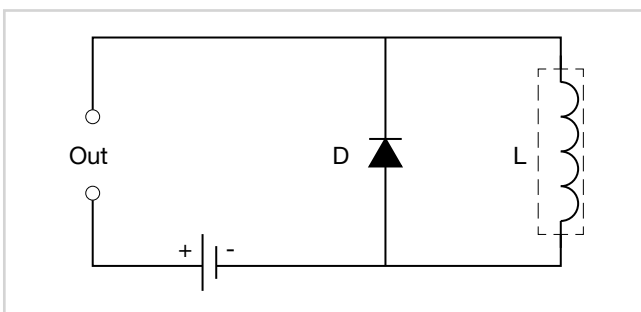
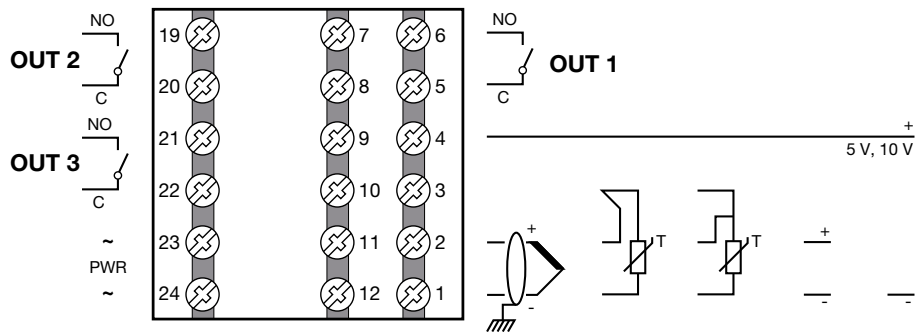


Figure 12 - Snubber connection diagram (DC)

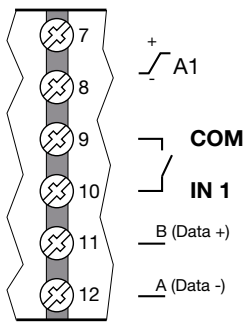
The filters must be connected as close as possible to the controller.

2.3. 6150 connection diagrams

2.3.1. General diagram



OPTIONS




LEGEND

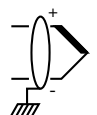
~
PWR Power supply

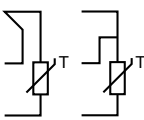
~

+
Linear input in
voltage / current

-

 dry contact digital input

 Thermocouple input

 Input
PT100
JPT100
2 / 3 wires

 Relay output

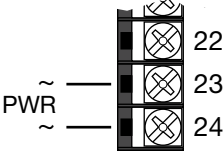
 A1 Isolated analog output

B (Data +)
A (Data -)
RS485
serial line

2. INSTALLATION

2.3.2. Power supply

Power supply:

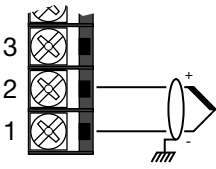


Standard: 100...240VAC/VDC \pm 10%
50/60Hz, max 5 VA

Optional: 20...27VAC/VDC \pm 10%
50/60Hz, max 5 VA

2.3.3. Inputs

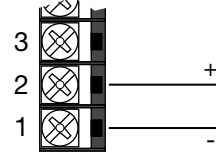
TC inputs



Available thermocouples:
J, K, R, S, T, C, D, B, E, L, L-GOST,
U, G, N, Pt20Rh-Pt4020Rh)
ITS90 or custom linearization

Respect polarity
For extensions, use a compensated
cable suitable for the type of TC used.

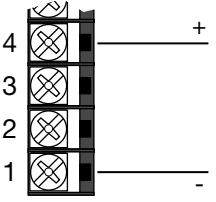
Linear input (V, I)



Linear input voltage
60 mV ($R_i > 70 \text{ k}$)
1 V ($R_i > 15 \text{ k}$)

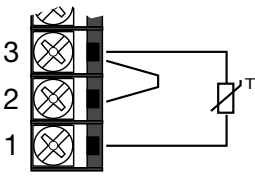
Linear input in direct current
0/4...20 mA, $R_i = 50 \sim$

Linear input (V)



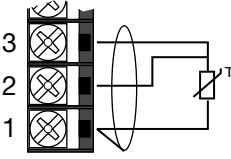
Linear input in direct voltage
5V, 10 V ($R_i > 30 \text{ k}$)

Input PT100/JPT100 - 2-wires connection



Attention:
with this type of connection the line
resistance can introduce measure-
ment error, we recommend that
you use wires of adequate.

Input PT100/JPT100 - 3-wires connection

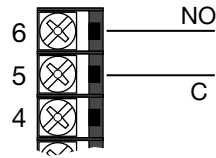


Attention:
with this type of connection the
line resistance can introduce me-
asurement error, we recommend
that you use wires of adequate
screen.
The resistance of the three wires
must be equal, the line resistance
must be less than 20 ohm.

2.3.4. Outputs

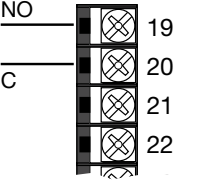
Characteristics of outputs are defined when the controller is ordered.

Output Out 1 - 5 A relay



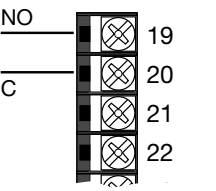
5 A Relay
250 VAC

Output Out 2 - 5 A relay



5 A Relay
250 VAC

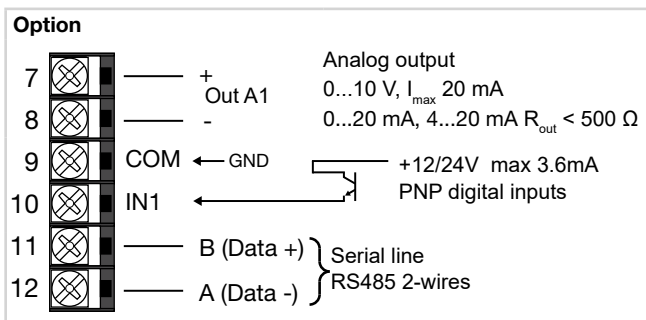
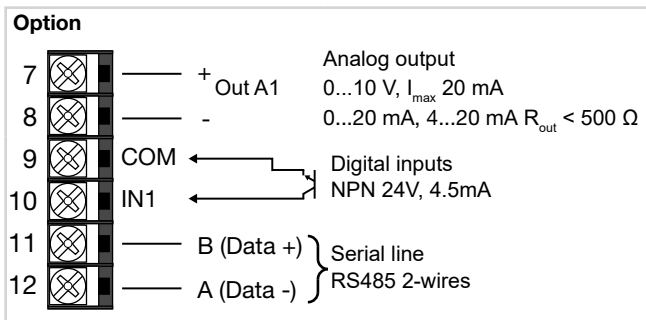
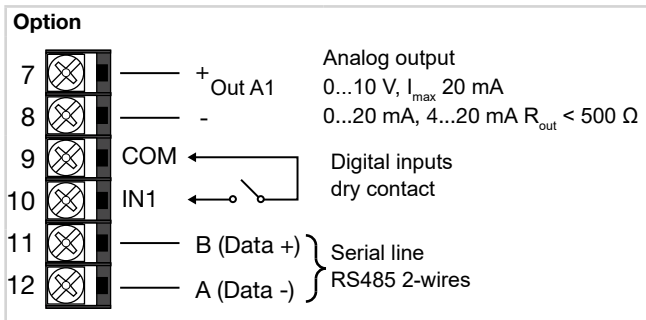
Output Out 3 - 5 A relay



5 A Relay
250 VAC

2.3.5. Options

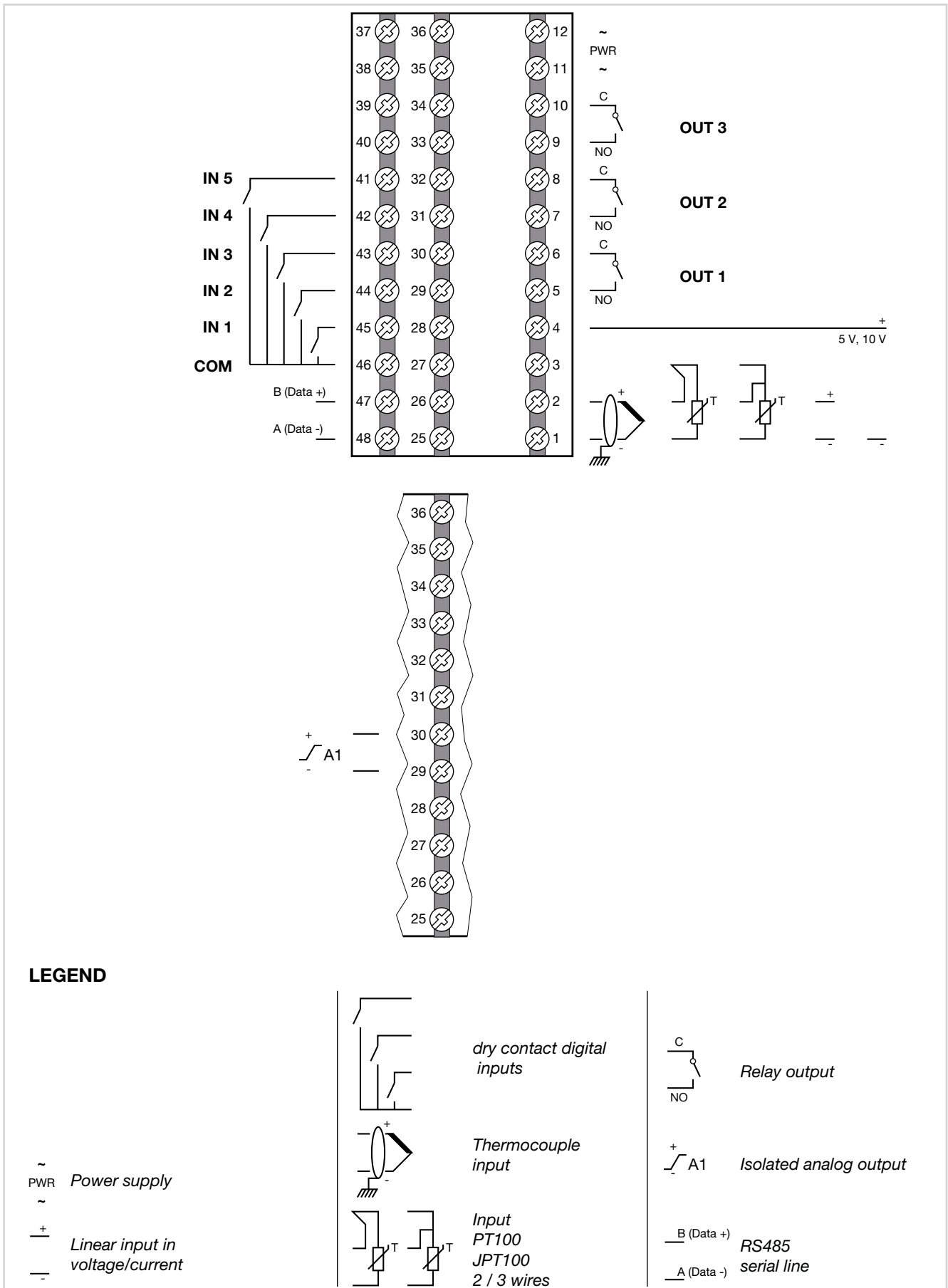
Types of optional inputs and outputs are specified when is ordered.



2. INSTALLATION

2.4. 4150 connection diagrams

2.4.1. General diagram



2.4.2. Power supply

Power supply

Standard: 100...240VAC/DC \pm 10%
50/60Hz, max 10VA

Optional: 20...27VAC/DC \pm 10%
50/60Hz, max 10VA

(*) ground connection only with option 20...27VAC/DC

Input PT100/JPT100 - 3-wires connection

Attention:
with this type of connection the line resistance can introduce measurement error, we recommend that you use wires of adequate cross-section.
The resistance of the three wires must be equal, and less than 20 ohm.

2.4.3. Inputs

TC inputs

Available thermocouples:
J, K, R, S, T, C, D,
B, E, L, U, G, N, Pt20Rh-Pt40Rh
ITS90 or custom linearization

Maintain polarity
For extensions, use a compensated cable

Linear input (V, I)

linear input voltage
60 mV ($R_i > 70 \text{ k}\Omega$)
1 V ($R_i > 15 \text{ k}\Omega$)

Linear input in direct current
0/4...20 mA, $R_i = 50\Omega$

Linear input (V)

Linear input in direct voltage
5V, 10V ($R_i > 30 \text{ k}\Omega$)

Input PT100/JPT100 - 2-wires connection

Attention:
with this type of connection the line resistance can introduce measurement error, we recommend that you use wires of adequate cross-section.
The resistance of the three wires must be equal, and less than 20 ohm.

2.4.4. Outputs

Type of outputs Out1, Out2, Out3, are specified when is ordered.

Output Out 1 - 5A relay

5A relay 250VAC / 30VDC

Output Out 2 - 5 A relay

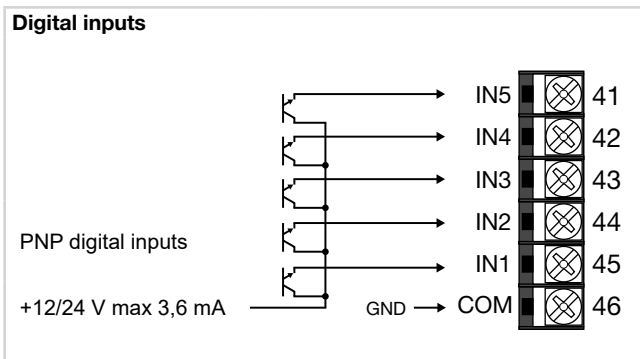
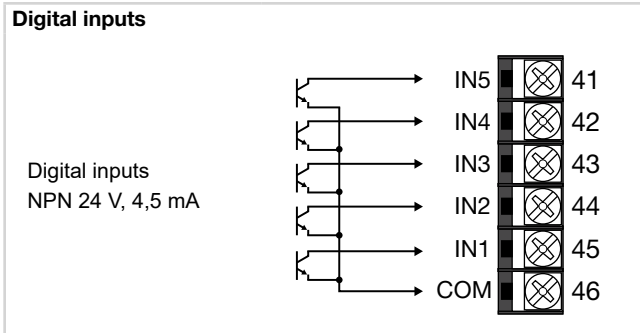
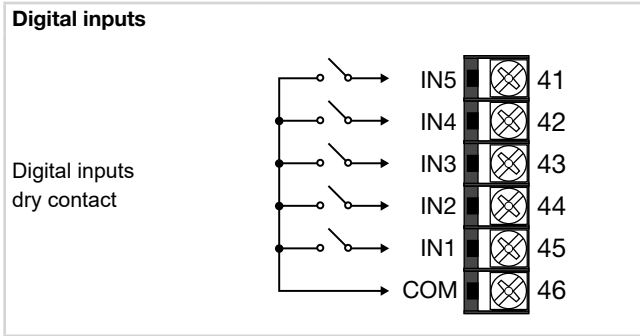
5 A relay 250 VAC / 30 VDC

Output Out 3 -5A relay

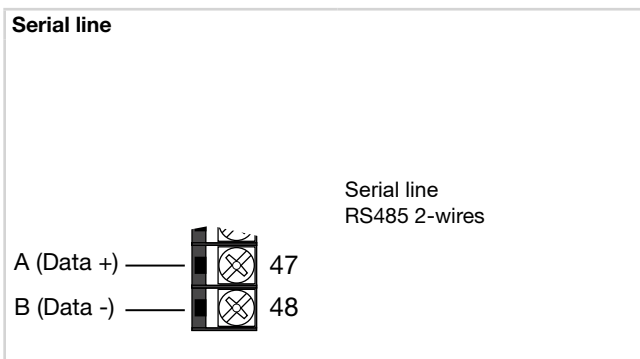
5A relay 250VAC / 30VDC

2. INSTALLATION

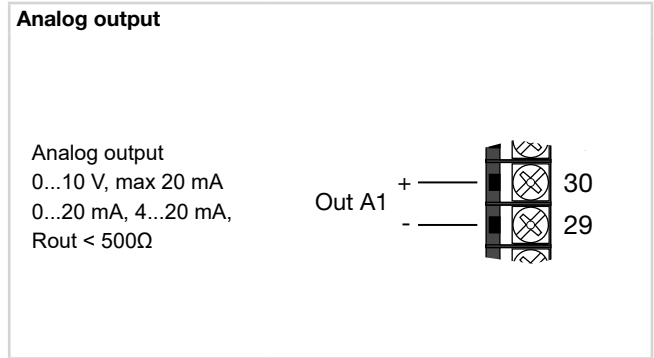
2.4.5. Digital inputs



2.4.6. Serial line



2.4.7. Analog output



2.5. RS485 serial connection diagram

Up to 31 controllers (including different models) can be connected in parallel on the RS485 line. The line must end with a resistor (120 Ω, 1/2 W).

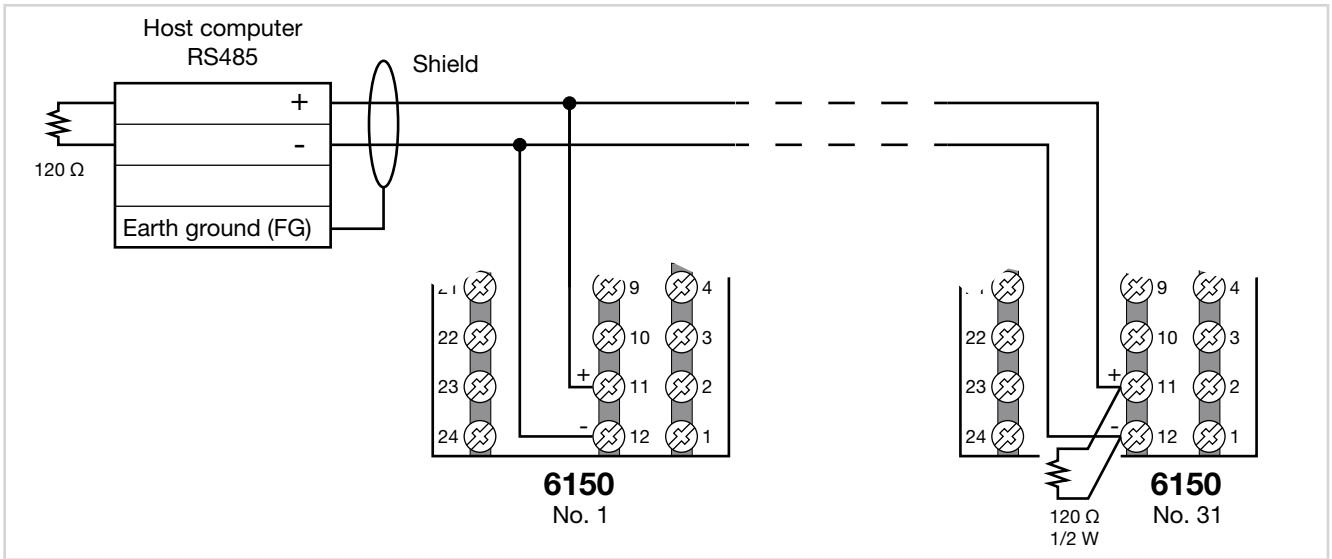


Figure 13 - RS485 connection for 6150 controller

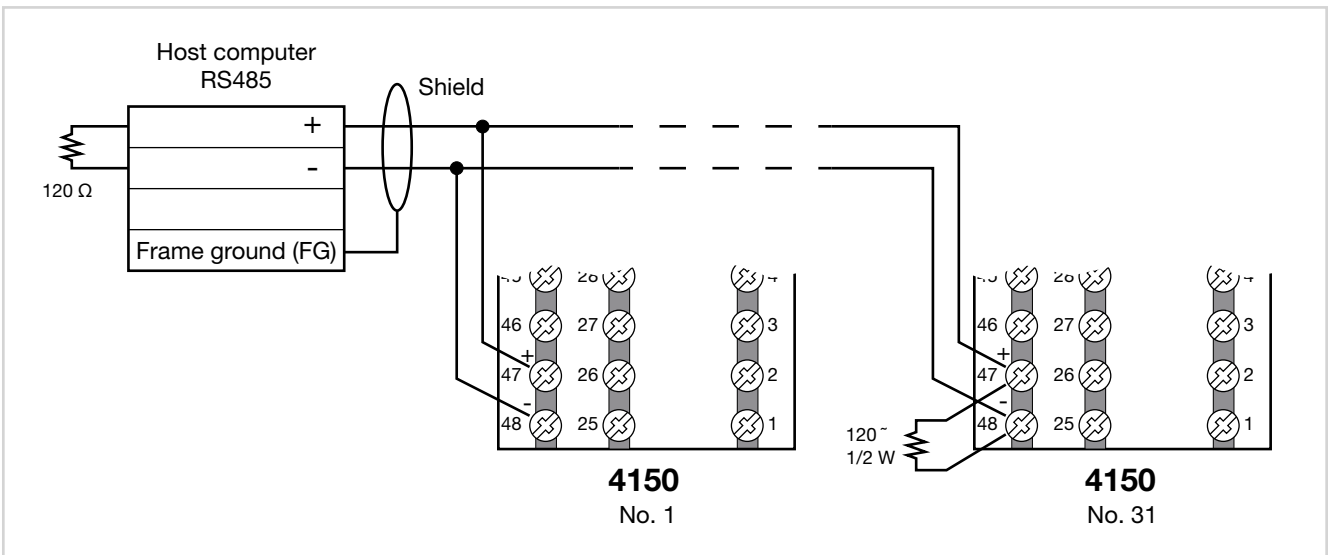


Figure 14 - RS485 connection for 4150 controllers


3. COMMISSIONING

3.1. Information on displays and use of keys


The general description of the displays and keys for each model is in paragraphs “1.3.1. Display and keys” on page 8 for the 6150, “1.4.1. “1.5.1. Display and keys” on page 12 for the 4150.


3.1.1. Navigating the menus


4 keys are used for navigating the menus and submenus and for changing parameters and confirming choices. Their function depends on the context and on how long they are pressed.


 The LEDs above the keys not only give confirmation that each key has been pressed (by flashing), but also show which keys can be used in each situation.

The navigation functions assigned to the keys are:

 At first power-on, scrolls the fast configuration menu; otherwise, the user configuration menu (Alarm limits, etc.). Each time you press the key, the value of the displayed parameter is confirmed and you go to the next menu item. Keep the key pressed for more than 2 seconds to enter the Programming/Configuration menu.

 Each time you press the key, you return to the previous menu item or to the higher menu level, as appropriate. Keep the key pressed for more than 2 seconds to return to the Main menu. Alarm RESET holding down the key for 3 seconds

 Press the key to enter a submenu or to reduce the value of the displayed parameter, as appropriate. Keep the key pressed to progressively increase the speed of reduction of the displayed parameter

 Press the key to raise the value of the displayed parameter. Keep the key pressed to progressively increase the speed of raising the displayed parameter.


3.1.2. Displays

The indicators have 2 or 3 displays, depending on the model. The Main menu shows:

- PV display: value of process variable.
- SV display: value of parameter (Alarm 1 limit).
- F Display (models 1250L only): value of control output (if parameter dS.F = OUT.PW).

On model 4150, the percentage value of the control output is also shown graphically on a bargraph.

According to the situation (programming, alarm, etc.), the indicator displays can show other information, such as the name of the parameter, description of the parameter, diagnostics messages and alarm messages.

 **Attention!** The displays show only the parameters and menus for a defined configuration.

3.1.2.1. Display characters

The displays reproduce the various characters by combining 7 or 14 segments.

The following tables show the shape of the various characters.

	!	"	#	\$	%	&	'	()
	∇	∥	∫	∫	∫	∫	/	/	/
*	+	,	-	.	/	0	1	2	3
*	+	/	.	.	/	0	1	2	3
4	5	6	7	8	9	:	;	<	=
4	5	6	7	8	9	-	/	/	:
>	?	@	A	B	C	D	E	F	G
\	∇	∇	A	B	C	D	E	F	G
H	I	J	K	L	M	N	O	P	Q
H	I	J	K	L	M	N	O	P	Q
R	S	T	U	V	W	X	Y	Z	[
R	S	T	U	V	W	X	Y	Z	[
\	\] ^	-	\	a	b	c	d	e	
\	\] ^	-	\	A	b	c	d	e	
f	g	h	i	j	k	l	m	n	o
f	g	h	i	j	k	l	m	n	o
p	q	r	s	t	u	v	w	x	y
p	q	r	s	t	u	v	w	x	y
z	|	~							
z	|	~							

Figure 15 - 14-segment font

	!	“	#	\$	%	&	‘	()
*	+	,	-	.	/	0	1	2	3
4	5	6	7	8	9	:	;	<	=
>	?	@	A	B	C	D	E	F	G
H	I	J	K	L	M	N	O	P	Q
R	S	T	U	V	W	X	Y	Z	[

Figure 16 - 7-segment font

3.1.2.2. Scrolling messages

The SV (6150) and F (4150) displays can show scrolling alphanumeric messages. These messages, up to 32 characters in length, appear:

- during configuration, describing the active parameter;
- during functioning, after the tripping of alarms, digital inputs and logic function outputs, if the relative messages were enabled

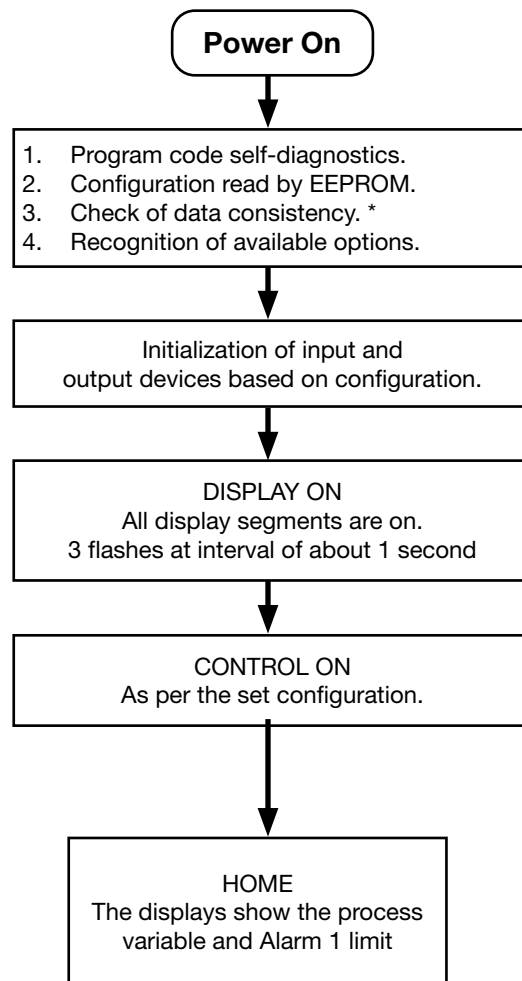
Message texts can be set via PC with C-PWR software.

There are 3 message groups, one for each of the 3 languages provided, selectable from the HMI menu with the LANG.n parameter. Each group contains up to 25 messages.

3.2. Sequence at power-on

The following diagram shows the controller sequence at power-on.

Note: the USB-TTL programming cable must be disconnected.



*) Any error is signaled by the message EEPROM CHECKSUM ERROR.

3.3. First power-on

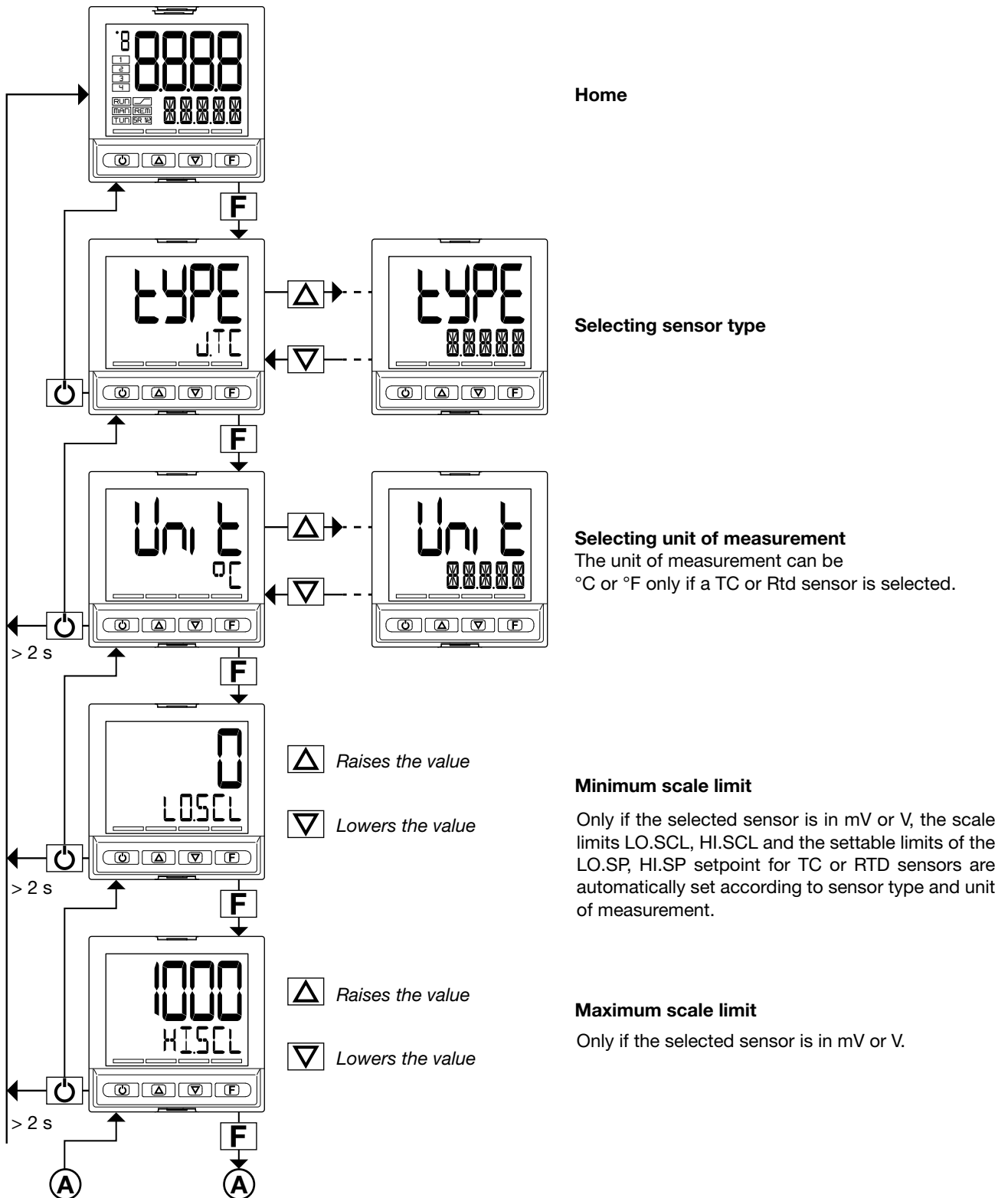
At first power-on, after the indicator has run the self-diagnostics test, press the **F** key to access the Fast Configuration Menu. The parameters shown are a subset of all the indicator parameters and let you rapidly configure the inputs and outputs.

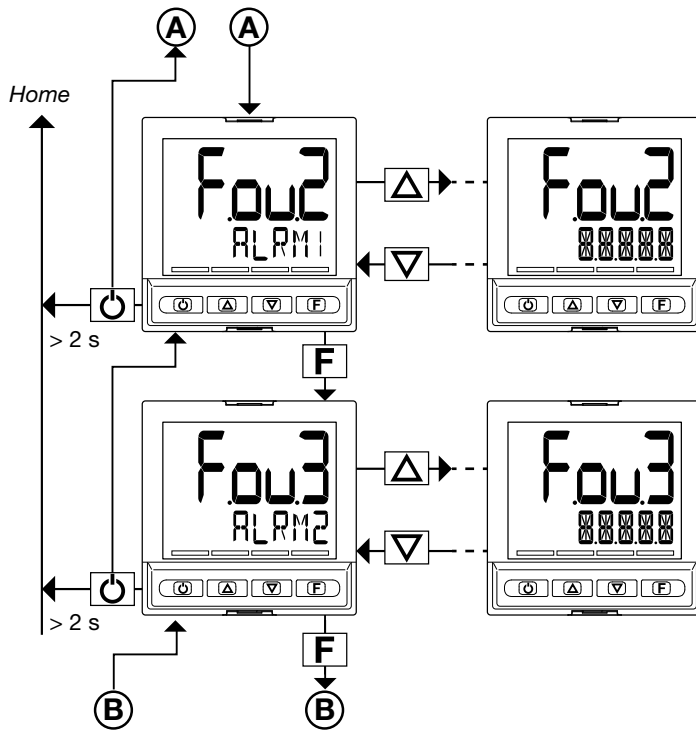
The number and type of the parameters shown depends on the indicator HW configuration and on the choices made with the parameters previously shown.

For example, minimum and maximum scale limits are shown only if you have chosen an mA or V type temperature sensor.

Fast Configuration also appears if the HMI menu is set to parameter QuiCk = On

3.3.1. Fast configuration



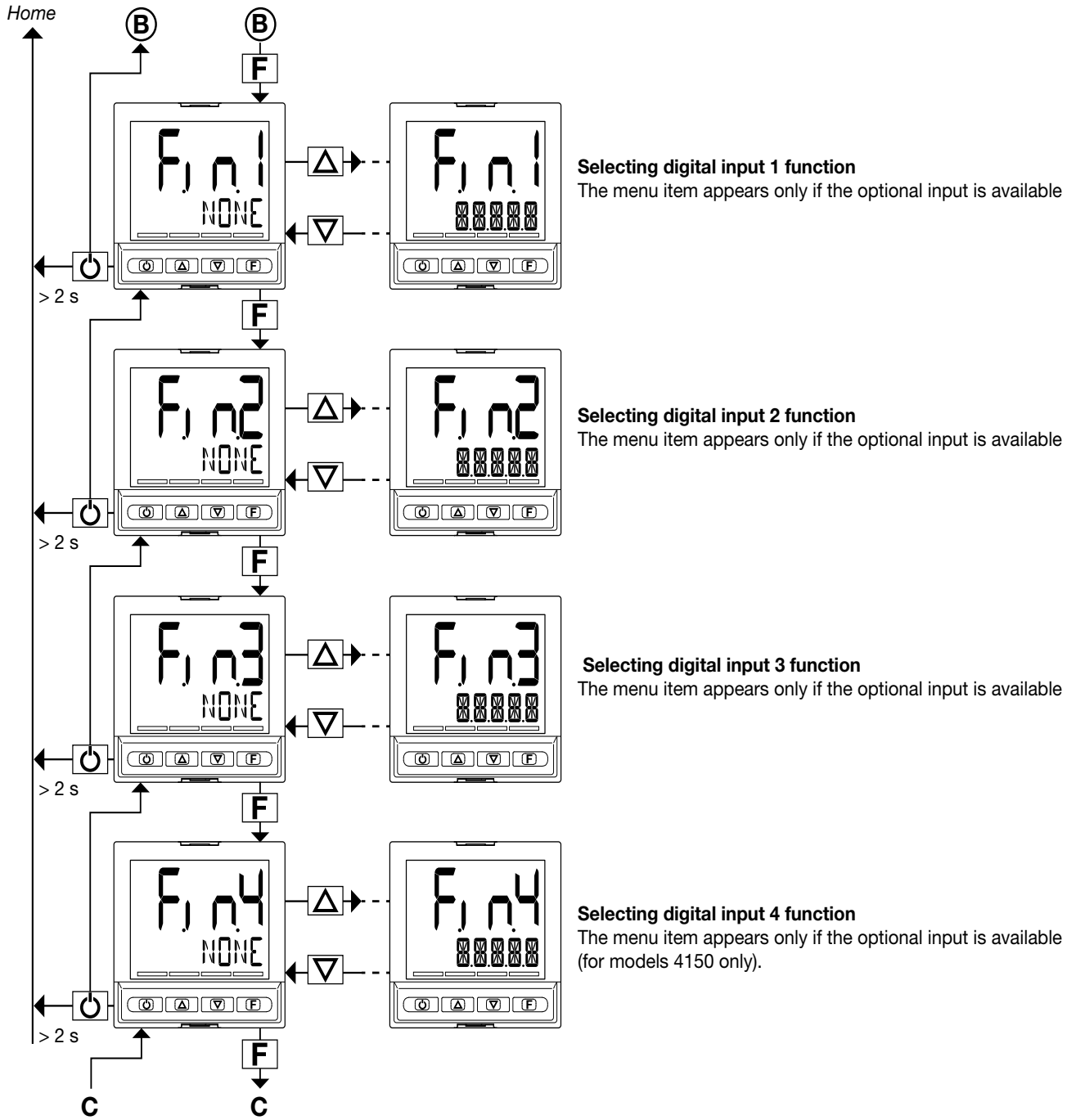


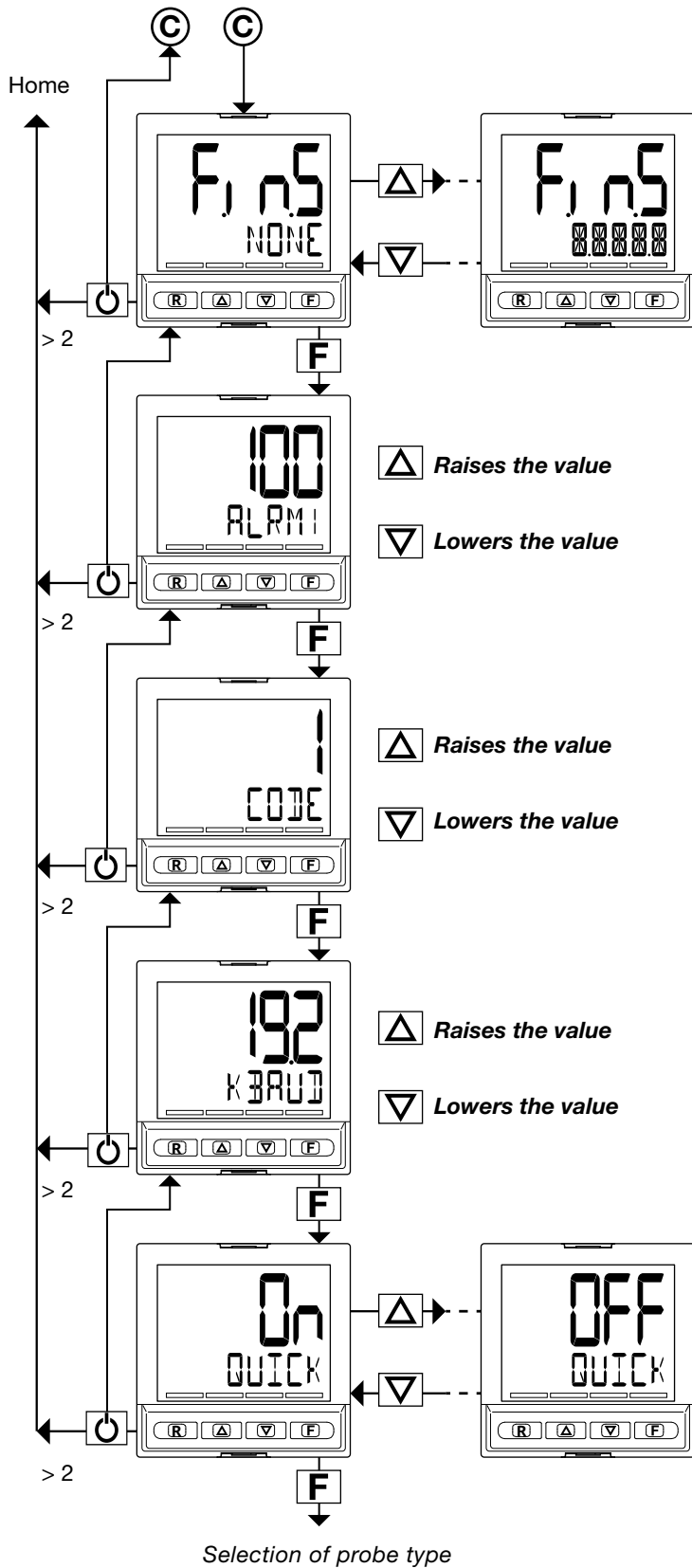
Selecting output 2 function

The proposed functions depend on output type (relay, logic).

Selecting output 3 function

The menu item appears only if the optional output is available.





Select digital input 5 function
 The menu item appears only if the optional input is available (for model 4150).

Setting Alarm 1

△ Raises the value
 ∇ Lowers the value

Setting Modbus address

The menu item appears only if the optional RS485 port is available.

△ Raises the value
 ∇ Lowers the value

Selecting baudrate

The menu item appears only if the optional RS485 port is available.

△ Raises the value
 ∇ Lowers the value

Enabling / disabling Fast Configuration

Selection of probe type

3.4. Setting up quick configuration

The quick configuration menu lets you quickly configure and start an indicator.

To do this, it uses default values for many of the parameters assigned to the functions.

With this configuration, the indicator can satisfy the majority of operating requirements.

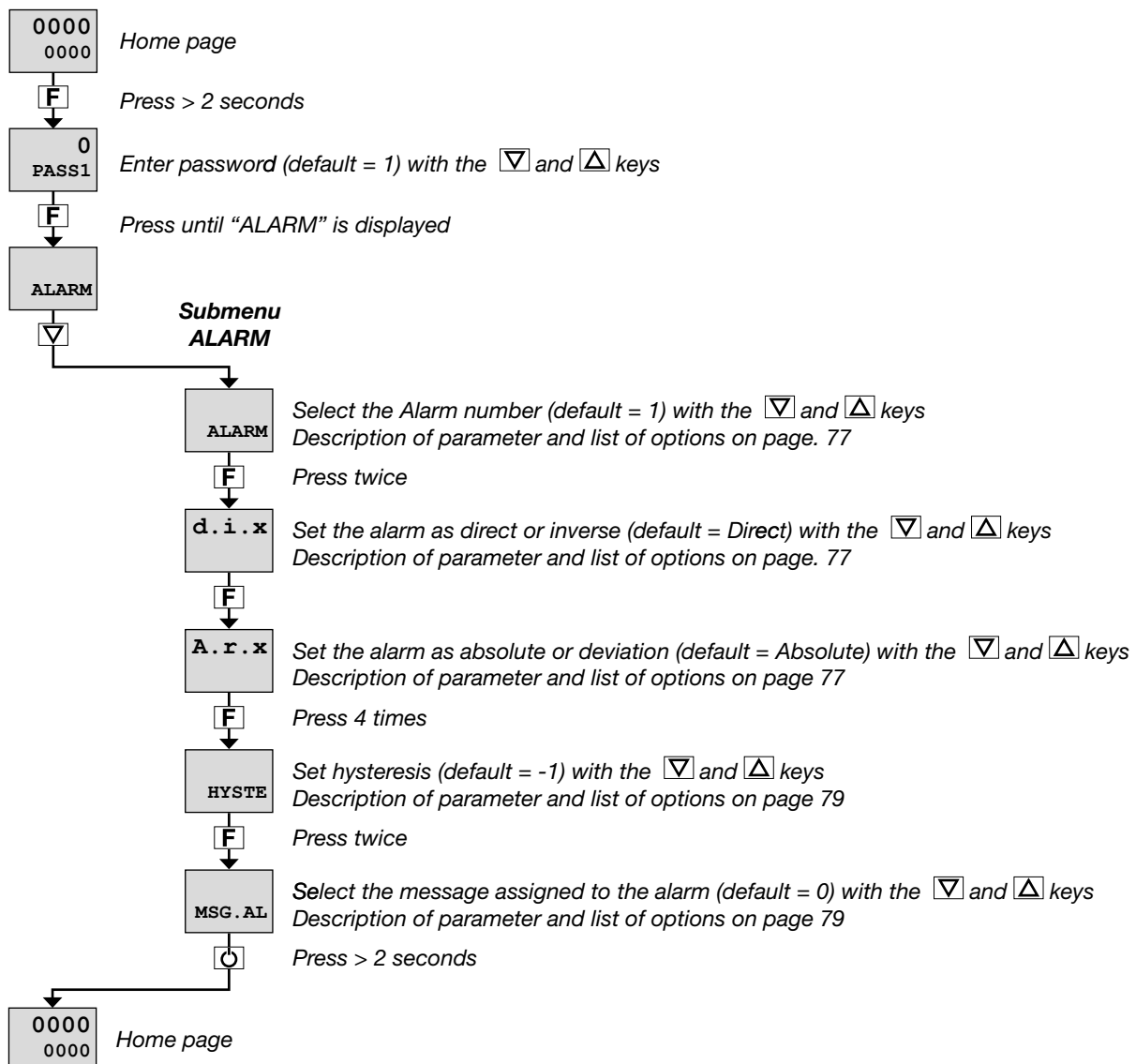
You can set up the first configuration with the main configuration menu (see paragraph “4.1. Programming/Configuration Menu” on page 32), which gives access to all of the parameters.

For purposes of example, some of the indicator’s main functions are listed below, with a list of parameters to be changed after running fast configuration to configure the indicator to specific working conditions.

For purposes of example, some of the indicator’s main functions are listed below, with a list of parameters to be changed after running fast configuration to configure the indicator to specific working conditions.

3.4.1. Setting up the Alarm

If at least one output was configured as Alarm in the fast configuration.



The ALARM submenu also lets you:

- select the method for applying hysteresis (parameter n.S.x, default = NORML);
- enable or disable the power-on alarm (parameter PWON.E, default = OFF);
- latch/not latch the active alarm state (parameter LA-TCH, default = OFF);
- set the alarm trip delay (parameter DELAY, default = 0.00);
- activate or deactivate flashing of the PV display in case of alarm (parameter BLK.AL, default = OFF).

4. CONFIGURATION

The fast configuration described in the previous chapter lets you rapidly put the indicator into operation.

To do this, the procedure configures the indicator's main parameters only, which satisfies the most common application requirements.

On the other hand, to satisfy all application requirements and to configure the indicator in detail, you have to set the parameters that are accessible only on the Programming/Configuration menu.

This type of configuration is also useful for optimizing performance.

The indicator can be configured with the buttons on its panel and from the PC with C-PWR software (see chapter "6. Programming with PC" on page 77).

4.1. Programming/Configuration Menu

4.1.1. First: know what you're doing

Correctly setting the parameters needed to configure the indicator requires thorough knowledge of the problems and techniques involved.

If you are unsure of your know-how, or are not fully aware of the consequences of incorrectly setting the parameters, we advise you not to configure the indicator with this menu.



Attention! To prevent harm to persons and damage to property, the user must check that the parameters are correctly set before commissioning the indicator.

In case of doubts, or if you need any explanations, please consult www.chromalox.com or contact Chromalox Customer Service.

4.1.2. Passwords

The configuration menu is protected by 2 passwords that allow access to two different menu sections.

The first section, accessed with password 1, groups the most operative submenus and parameters, i.e., the ones most involved in daily functioning of the controlled machine or system.

The second section, accessed with password 2, groups the submenus and parameters used to configure HW resources

The factory password settings are:

- Password 0 = 10
- Password 1 = 1
- Password 2 = 2

The passwords can be changed and even disabled if you want. See paragraphs on page 71 "4.15. PASC0 – Setting level 0 password"; "4.16. ASC1 - Setting level 1 password"; "4.17. ASC2 - Setting level 2 password".

4.1.3. Password in the User Menu

Two passwords can be entered in the User menu, respectively:

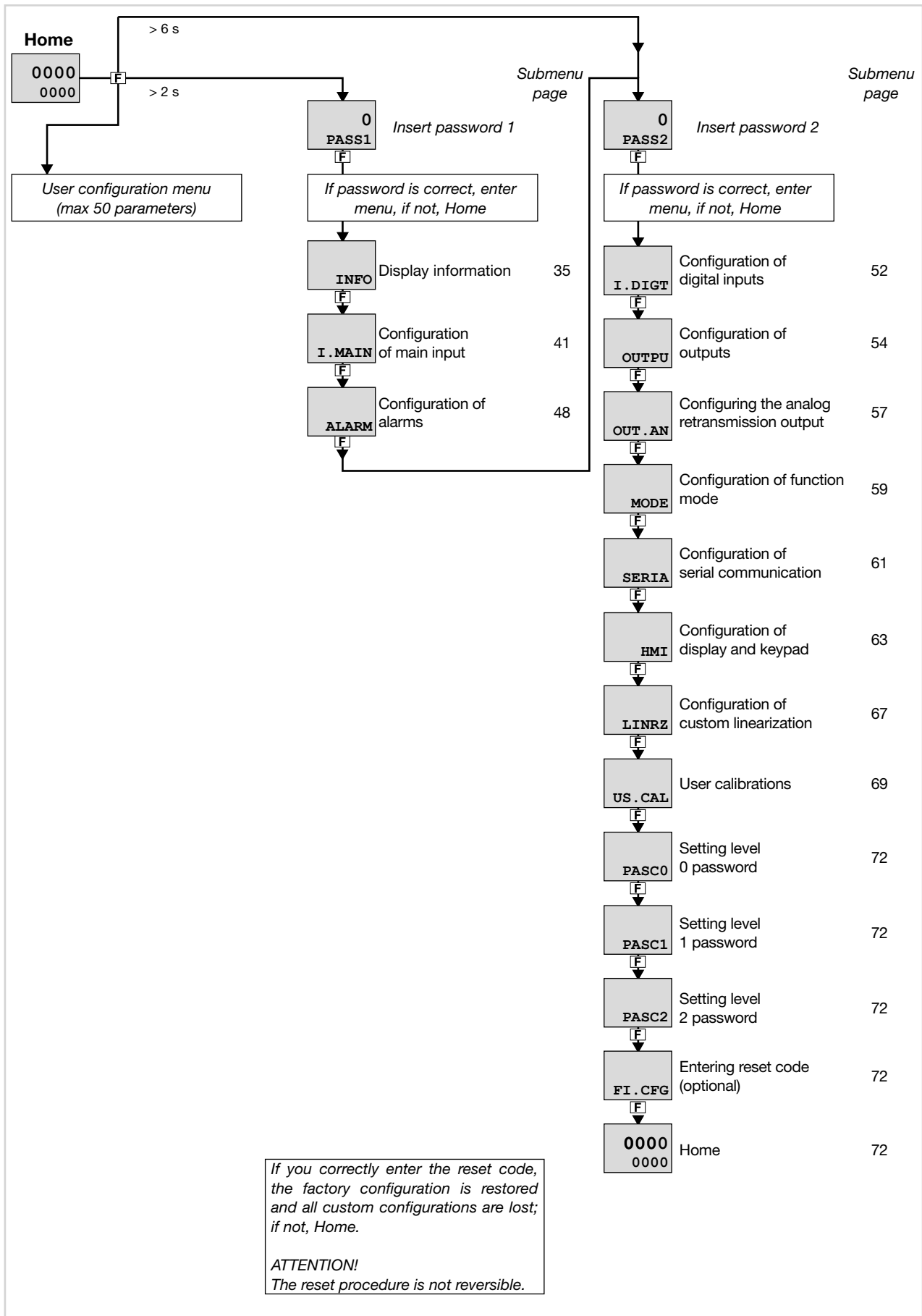
- Password 0 (default = 0)
- Password 1 (default = 1)

to inhibit navigation to parameters in positions subsequent to that assigned to the password.

Once one of the two passwords is reached:

- if the entered value matches that expected, navigation continues in the User Menu
- if the entered value does not match that expected, the Home screen will be displayed

4.2. Main menu



4. CONFIGURATION

4.3. Legend for submenus and parameters

The purposes and characteristics of submenus and parameters are described and summarized in the following tables.

4.3.1. Submenu

Acronym	Scrolling message	Password	Description
INFO	INSTRUMENT STATUS	Level 1	Gives information on indicator state and HW configuration

1. Acronym of submenu as it appears on indicator display.
2. Text of scrolling message as it appears on indicator display.
3. Password needed to access submenu items.
4. Description of functions that manage submenu

4.3.2. Parameters

Acronym	Scrolling message	Submenu	Attributes
Out1	OUTPUT TYPE	INFO	R

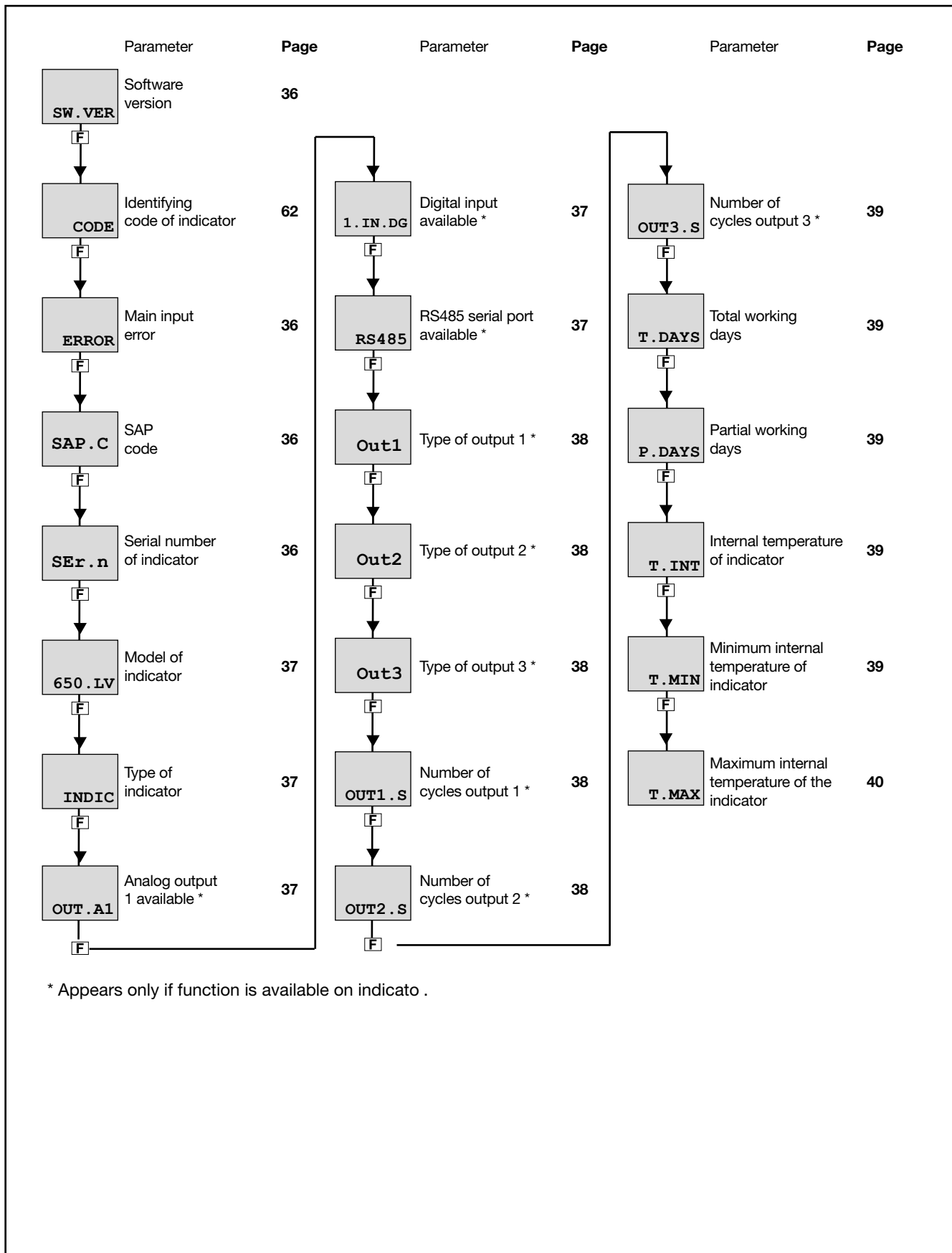
5. The parameter specifies the type of output 1
 6. **Unit of measurement:** -
 7. **Options:**

- RELAY = Relay output
- DIGIT = 24 V logic output
- CONTS = Continuous output

1. Acronym of parameter as it appears on indicator display.
2. Text of scrolling message as it appears on indicator display.
3. Submenu to which parameter belongs.
4. Attributes of parameter: R = readable, W = writable. If only R, the operator can read the parameter value but cannot change it.
5. Description of use of parameter, including any warnings or suggestions.
6. Engineering units of value managed by parameter. Engineering units can be unique or depend on other configuration choices, for example, the engineering units temperature, which can be set in degrees Centigrade or Fahrenheit. Not all parameters require the use of units of measurement.
7. Description of parameter values or information that can be read or written, as appropriate.
8. Value that the parameter can have. Value can be two types: discrete, typically numerical. For a discrete value, all possible values are listed as they appear on the indicator display. For intervals of values, the minimum and maximum parameter values are shown.
9. Any additional description of value of individual parameter.

4.4. INFO Submenu - information display

Acronym	Scrolling message	Password	Description
INFO	INSTRUMENT STATUS	Level 1	Gives information on indicator state and HW configuration.



4.4.1. SW.VER - Versione software

Acronym	Scrolling message	Password	Description
SW.VER	SOFTWARE VERSION	INFO	R
<p>The parameter shows the version (<i>major.minor</i>) of the controller software.</p> <p>Unit of measurement: -</p> <p>Options: -</p>			

4.4.2. CODE - Identifying code of controller

Acronym	Scrolling message	Password	Description
CODE	INSTRUMENT ID CODE FOR SERIAL COMM	INFO	R
<p>The parameter shows identifying code of the device for serial communication.</p> <p>Unit of measurement: -</p> <p>Options: 0...247</p>			

4.4.3. ERROR - Main input error

Acronym	Scrolling message	Password	Description
ERROR	MAIN INPUT ERROR	INFO	R
<p>The parameter shows error detected by the main input.</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> nonE = No error -Lo = Process variable (PV) is below lower scale limit -Hi = Process variable (PV) is higher than upper scale limit Err = PT100 in short circuit or input values below lower limit (for example, TC with incorrect connection) Sbr = Sensor break or input values higher than upper limit 			

4.4.4. SAP.C - SAP code

Acronym	Scrolling message	Password	Description
SAP.C	SAP ORDER CODE	INFO	R
<p>The parameter shows the product number (Fxxxxxx).</p> <p>Unit of measurement: -</p> <p>Options: -</p>			

4.4.5. SEr.n - Serial number of controller

Acronym	Scrolling message	Password	Description
SEr.n	SERIAL NUMBER	INFO	R
<p>The parameter shows the serial number of the controller (number shown on data plate). The serial number is displayed in the form <i>yy.ww nnnn</i>, where</p> <ul style="list-style-type: none"> <i>yy</i> = last two digits of year of production <i>ww</i> = week of production <i>nnnn</i> = progressive in week of production <p>Unit of measurement: -</p> <p>Options: -</p>			

4.4.6. xxxxx - Model of controller

Acronym	Scrolling message	Submenu	Attributes
xxxxx	MODEL	INFO	R
<p>The parameter shows the model of the controller. xxxxx indicates the controller model.</p> <p>Unit of measurement: -</p> <p>Options:</p> <p>615.LV = 6150 controller powered at 20...27 VAC/VDC 615.HV = 6150 controller powered at 100...240 VAC/VDC 415.LV = 4150 controller powered at 20...27 VAC/VDC 415.HV = 4150 controller powered at 100...240 VAC/VDC</p>			

4.4.7. INDIC - Type of indicator

Acronym	Scrolling message	Submenu	Attributes
INDIC	MODEL OPTION	INFO	R
<p>The parameter shows the type (xxxxx) of function.</p> <p>Unit of measurement: -</p> <p>Options: INDIC = The devices only operates as an indicator</p>			

4.4.8. OUT.A1 - Analog output 1 available

Acronym	Scrolling message	Submenu	Attributes
OUT.A1	ANALOG OUTPUT AVAILABLE	INFO	R
<p>If present, the parameter indicates that the analog output in voltage or current is installed on the indicator.</p> <p>Unit of measurement: -</p> <p>Options: -</p>			

4.4.9. x.IN.DG - Digital input available

Acronym	Scrolling message	Submenu	Attributes
x.IN.DG	DIGITAL INPUT AVAILABLE	INFO	R
<p>If present, the parameter indicates how many digital inputs are installed on the indicator.</p> <p>Unit of measurement: -</p> <p>Options:</p> <p>1.IN.DG = 1 digital input installed on the indicator (for 6150 only) 5.IN.DG = 4 digital input installed on the indicator (for 4150 only)</p>			

4.4.10. RS485 - RS485 serial port available

Acronym	Scrolling message	Submenu	Attributes
RS485	FIELD BUS AVAILABLE	INFO	R
<p>If present, the parameter indicates that an RS485 is installed on the indicator.</p> <p>Unit of measurement: -</p> <p>Options: -</p>			

4.4.11. Out1 - Type of output

Acronym	Scrolling message	Submenu	Attributes
Out1	OUTPUT TYPE	INFO	R
<p>The parameter specifies the type of output 1.</p> <p>Unit of measurement: -</p> <p>Options: RELAY = Relay output</p>			

4.4.12. Out2 - Type of output

Acronym	Scrolling message	Submenu	Attributes
Out2	OUTPUT TYPE	INFO	R
<p>If present, the parameter indicates that output 2 is available on the indicator and specifies the type.</p> <p>Unit of measurement: -</p> <p>Options: RELAY = Relay output</p>			

4.4.13. Out3 - Type of output

Acronym	Scrolling message	Submenu	Attributes
Out3	OUTPUT TYPE	INFO	R
<p>If present, the parameter indicates that output 3 is available on the indicator and specifies the type.</p> <p>Unit of measurement: -</p> <p>Options: RELAY = Relay output</p>			

4.4.14. OUT1.S - Number of cycles output 1

Acronym	Scrolling message	Submenu	Attributes
OUT1.S	NUMBER X 1000 RELAY CYCLES	INFO	R
<p>If output 1 is relay or logic, the parameter shows the number of cycles (in thousands).</p> <p>Unit of measurement: Number (× 1000)</p> <p>Options: -</p>			

4.4.15. OUT2.S - Number of cycles output 2

Acronym	Scrolling message	Submenu	Attributes
OUT2.S	NUMBER X 1000 RELAY CYCLES	INFO	R
<p>If output 2 is available on the indicator, and if it is relay or logic, the parameter shows the number of cycles (in thousands).</p> <p>Unit of measurement: Number (× 1000)</p> <p>Options: -</p>			

4.4.16. OUT3.S - Number of cycles output 3

Acronym	Scrolling message	Submenu	Attributes
OUT3.S	NUMBER X 1000 RELAY CYCLES	INFO	R
<p>If output 3 is available on the indicator, the parameter shows the number of cycles (in thousands).</p> <p>Unit of measurement: Number (× 1000)</p> <p>Options: -</p>			

4.4.17. T.DAYS - Total working days

Acronym	Scrolling message	Submenu	Attributes
T.DAYS	TOTAL DAYS OF OPERATION	INFO	R
<p>The parameter shows total number of working days of the indicator since first power-on. Each working day equals 24 hours of actual functioning.</p> <p>Unit of measurement: Day</p> <p>Options: 0...9999</p>			

4.4.18. P.DAYS - Partial working days

Acronym	Scrolling message	Submenu	Attributes
P.DAYS	PARTIAL DAYS OF OPERATION	INFO	R
<p>The parameter shows the number of working days of the indicator since the last counter reset, Each working day equals 24 hours of actual functioning.</p> <p>The counter can be reset with the Us.cal function.</p> <p>Unit of measurement: Day</p> <p>Options: 0...9999</p>			

4.4.19. T.INT - Internal temperature of indicator

Acronym	Scrolling message	Submenu	Attributes
T.INT	INTERNAL TEMPERATURE	INFO	R
<p>The parameter shows the instantaneous internal temperature of the indicator.</p> <p>Unit of measurement: °C</p> <p>Options: -</p>			

4.4.20. T.MIN - Minimum internal temperature of the indicator

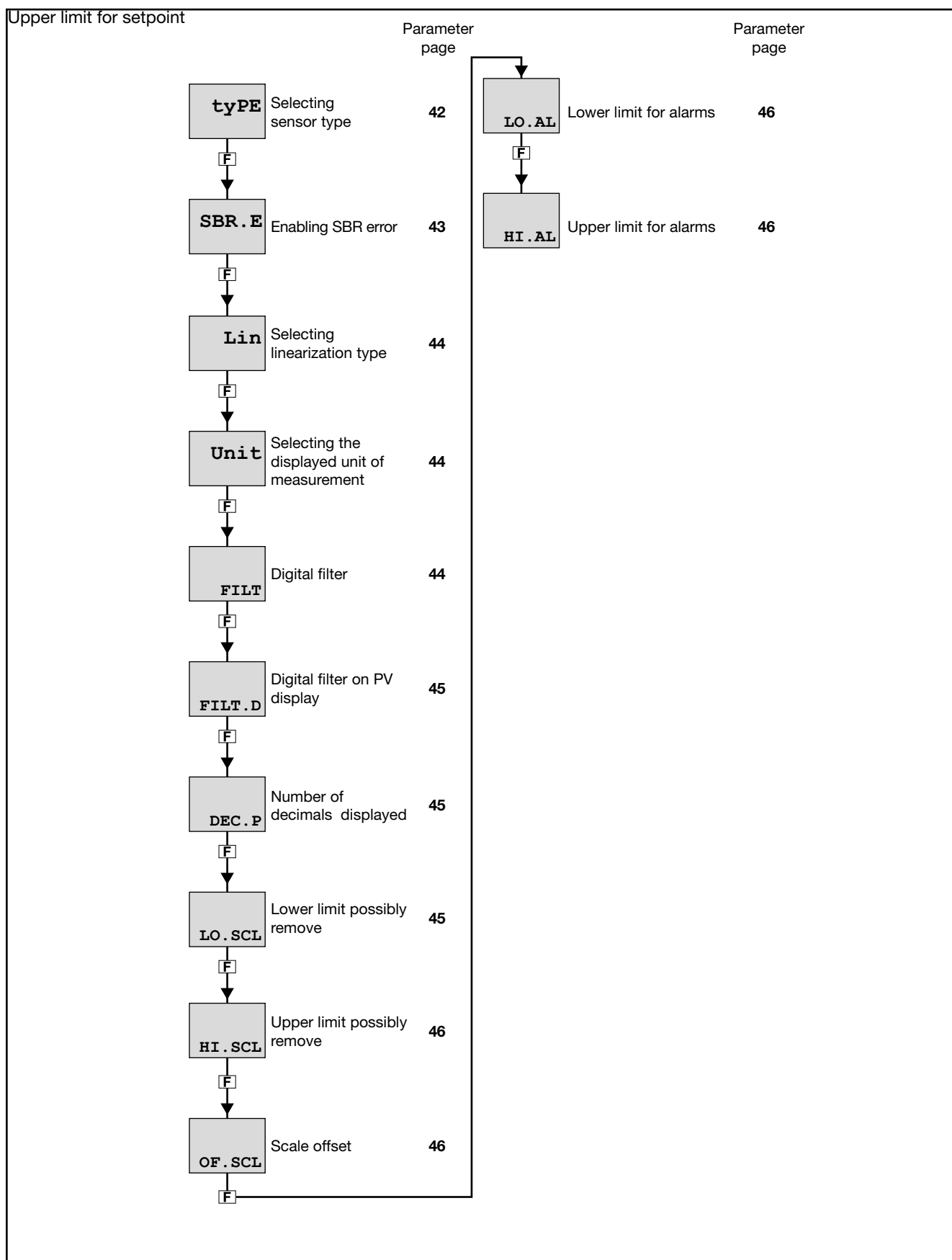
Acronym	Scrolling message	Submenu	Attributes
T.MIN	MIN INTERNAL TEMPERATURE	INFO	R
<p>The parameter shows the minimum internal temperature of the indicator.</p> <p>Unit of measurement: °C</p> <p>Options: -</p>			

4.4.21. T.MAX - Maximum internal temperature of the indicator

Acronym	Scrolling message	Submenu	Attributes
T.MAX	MAX INTERNAL TEMPERATURE	INFO	R
<p>The parameter shows the maximum internal temperature of the indicator.</p> <p>Unit of measurement: °C</p> <p>Options: -</p>			

4.5. I.MAIN Submenu - Configuration of main input

Acronym	Scrolling message	Password	Description
I.MAIN	MAIN INPUT CONFIG	Level 1	Lets you configure the indicator's main input.



4.5.1. tyPE - Selecting sensor type

Acronym	Scrolling message	Submenu	Attributes
tyPE	MAIN INPUT TYPE OF PROBE	I.MAIN	R W
<p>The parameter shows and sets the sensor type of the main input. The functions for calibrating Custom sensors are on the US.CAL menu. When a 4...20 mA input is used and the current is less than 2 mA, an Err message is generated and the relay state specified with the FAULT parameters is activated.</p> <p>The table shows the scale limits for each sensor type or input based on the set number of decimals.</p>			

Sensor type	Sensor	Unit of measurement	Scale limits for	Scale limits for	nominal accuracy limits @ 25°C	
			DEC.P = 0	DEC.P = 1	DEC.P=0	DEC.P=1
Thermocouple	J	°C	0...1000	0.0...999.9	>100°C	>300°C
	K	°C	0...1300	0.0...999.9		
	R	°C	0...1750	0.0...999.9		
	S	°C	0...1750	0.0...999.9		
	T	°C	-200...400	-199.9...400.0		
	C	°C	0...2300	0.0...999.9		>300°C
	D	°C	0...2300	0.0...999.9		>200°C
	B	°C	44...1800	n.d.		
	E	°C	-100...750	-100.0...750.0		
	L	°C	-200...900	-199.9...900.0		
	LGOST	°C	0...600	0.0...600.0		
	U	°C	-200...400	-199.9...400.0		
	G	°C	0...2300	n.d.		
	N	°C	0...1300	0.0...999.9		
Pt20Rh Pt40Rh	°C	0...1880	n.d.			
Infrared characteristic of the Tc K model see note	1	°C	10...70	10.0...70.0		
	2	°C	60...120	60.0...120.0		
	3	°C	115...165	115.0...165.0		
	4	°C	140...260	140.0...260.0		
Resistance thermometer	PT100	°C	-200...850	-199.9...850.0		
	PT100	°C	-50...250	-50.0...250.0		
	JPT100	°C	-200...600	-199.9...600.0		
Voltage /Current	0...60 mV		-1999...9999	-199.9...999.9		
	0...20 mA					
	4...20 mA					
	0...10 V					
	2...10 V					
	0...5 V					
	1...5 V					
	0...1 V					
0.2...1 V						
Custom	RTD		-1999...9999	-199.9...999.9		
	0...60 mV					
	0...20 mA					
	4...20 mA					
	0...10 V					
	2...10 V					
	0...5 V					
	1...5 V					
	0...1 V					
	0.2...1 V					

Note: the infrared temperature sensor has an output in voltage for direct connection to the input terminals of the indicator. An external thermometer is needed in order to correct the sensor error.

After identifying the work temperature range (for example, 140 – 260°C), bring the process to a temperature near the minimum scale value, and after reaching it make a note of value A1 indicated by the instrument and of value A2 indicated by the external thermometer. Bring the process to a temperature near the maximum scale value, and after reaching it make a note of value B1 indicated by the instrument and of value B2 indicated by the external thermometer. Enable 4-point linearization (see Correcting 4-point input) and enter the four requested values (A1, B1 and A2, B2)..

4. CONFIGURATION

Unit of measurement: -

Options:

- J.TC** = J thermocouple
- K.TC** = K thermocouple
- R.TC** = R thermocouple
- S.TC** = S thermocouple
- T.TC** = T thermocouple
- C.TC** = C thermocouple
- D.TC** = D thermocouple
- B.TC** = B thermocouple
- E.** = E thermocouple
- L.TC** = L thermocouple
- L.GO.TC** = L GOST thermocouple
- U.TC** = U thermocouple
- G.TC** = G thermocouple
- N.TC** = Termocoppia N **PT2.TC** = Pt20Rh / Pt40Rh thermocouple
- INFR1** = IR sensor type 1
- INFR2** = IR sensor type 2
- INFR3** = IR sensor type 3
- INFR4** = IR sensor type 4
- PT100** = Pt100 resistance thermometer
- PT.LIM** = Pt 100 limited resistance thermometer
- JTP10** = JPT100 resistance thermometer
- 60MV** = 0...60 mV sensor
- 20MA** = 0...20 mA sensor
- 4-20M** = 4...20 mA sensor
- 10V** = 0...10 V sensor
- 2-10V** = 2...10 V sensor
- 5V** = 0...5 V sensor
- 1-5V** = 1...5 V sensor
- 1V** = 0...1 V sensor
- 0.2-1V** = 0,2...1 V sensor
- C.RTD** = RTD sensor with user calibration
- C.60MV** = 0...60 mV sensor with user calibration
- C.20MA** = 0...20 mA sensor with user calibration
- C.4-20** = 4...20 mA sensor with user calibration
- C.10V** = 0...10 V sensor with user calibration
- C.2-10** = 2...10 V sensor with user calibration
- C.5V** = 0...5 V sensor with user calibration
- C.1-5V** = 1...5 V sensor with user calibration
- C.1V** = 0...1 V sensor with user calibration
- C.0.2-1** = 0,2...1 V sensor with user calibration

4.5.2. SBR.E - Enabling Sensor Break Alarm (SBR)

Acronym	Scrolling message	Submenu	Attributes
SBR.E	SBR ENABLE	INPUT	R W
<p>Enables open thermocouple probe error detection (sensor break alarm), also permitting infrared sensor management with maximum 4Kohm output impedance. The parameter only appears when a thermocouple type input is selected. The parameter will be forced ON (see options) at each Power On</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> On = Enable SBR alarm Off = Disable SBR alarm 			

4.5.3. Lin - Linearization type

Acronym	Scrolling message	Submenu	Attributes
Lin	CUSTOM LINEARIZATION	I.MAIN	R W
<p>The parameter sets linearization for the selected sensor type. The function corrects any linearity and proportionality errors in the correlation between measured value and the actual value.</p> <div style="text-align: center;"> </div> <p>This correction can be made with two different algorithms: 32-step linearization and 4-point linearization. Values are set (33 linearization for 32 steps and 4 for 4-point linearization) with the LINRZ submenu parameters.</p> <p>For an explanation of 4-point linearization, see paragraph "5.4. 4-point input correction" on page 75.</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> NONE = No linearization 32.STP = 32-step linearization 4.POIN = 4-point linearization 			

4.5.4. Unit - Displayed engineering units

Acronym	Scrolling message	Submenu	Attributes
Unit	ENGINEERING UNITS	I.MAIN	R W
<p>The parameter shows and sets the engineering units displayed for input 1. The unit appears on the Home page of the display.</p> <p>For thermocouple or RTD inputs, the °C / °F selection automatically converts the temperature value; the related scale limits and setpoint limits must be set.</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> NONE = No unit of measurement °C = Degrees Celsius °F = Degrees Fahrenheit CUST = Custom, settable with GF_eXpress 			

4.5.5. FILT - Digital filter

Acronym	Scrolling message	Submenu	Attributes
FILT	DIGITAL FILTER	I.MAIN	R W
<p>The parameter shows and sets the value of the digital filter time constant. With 0.00 no filter is applied.</p> <p>Unit of measurement: Seconds</p> <p>Options: 0.00...20.00</p>			

4.5.6. FILT.D - Digital filter on PV display

Acronym	Scrolling message	Submenu	Attributes
FILT.D	DIGITAL FILTER ON DISPLAY PV	I.MAIN	R W
<p>The parameter shows and sets the allowed tolerance between the real PV value and the value on the PV display: if the variation in real PV is within the interval displayed value - FILT.D... displayed value + FILT.D the displayed value does not change. With 0.00 no filter is applied..</p> <p>Unit of measurement: The one set with the Unit parameter</p> <p>Options: 0.0...9.9</p>			

4.5.7. DEC.P - Number of decimals displayed

Acronym	Scrolling message	Submenu	Attributes
DEC.P	DECIMAL POINT POSITION	I.MAIN	R W
<p>The parameter shows and sets the decimal point position for the process value (PV) displayed, i.e., defines its number of decimal figures. The number of decimal set may reduce the limits of the measurement scale used.</p> <p>Unit of measurement: Number</p> <p>Options: 0...3 = Number of decimals displayed 0 / 1 = Number of decimals displayed, only for TC and RTD sensors</p>			

4.5.8. LO.SCL - Lower limit of scale

Acronym	Scrolling message	Submenu	Attributes
LO.SCL	INPUT LOW LIMIT	I.MAIN	R W
<p>The parameter shows and sets the lower limit of the measurement scale used for the main input, based on input (or sensor) type, engineering units, and number of decimals selected. The upper value of LO.SCL is not limited by the value of HI.SCL</p> <p>Unit of measurement: The one set with the Unit parameter</p> <p>Options: A numerical value within the temperature range of the input or sensor</p>			
	Unit = °C DEC.P = 0	Unit = °F DEC.P = 0	
J.TC	0...1000	32...1832	JTP10
K.TC	0...1300	32...2372	60MV
R TC	0...1750	32...3182	20MA
S TC	0...1750	32...3182	4-20M
T.TC	-200...400	-328...752	10V
C.TC	0...2300	32...4172	2-10V
D.TC	0...2300	32...4172	5V
B	44...1800	111...3272	1-5V
E	-100...750	-148...1382	1V
L	-200...900	-328...1652	0.2-1V
LGOST	0...600	32...1112	C.RTD
U	-200...400	-328...752	C.60MV
G	0...2300	32...4172	C.20MA
N	0...1300	32...2372	C.4-20
PT2.TC	0...1880	32...3416	C.10V
INFR1	10...70	50...158	C.2-10
INFR2	60...120	140...248	C.5V
INFR3	115...165	239...329	C.1-5V
INFR4	140...260	284...500	C.1V
PT100	-200...850	-328...1562	C.0.2-1
PT.LIM	-50...250	-58...482	

4.5.9. HI.SCL - Upper limit of scale

Acronym	Scrolling message	Submenu	Attributes
HI.SCL	INPUT HIGH LIMIT	I.MAIN	R W
<p>The parameter shows and sets the upper limit of the measurement scale used for the main input, based on input (or sensor) type, engineering units, and number of decimals selected. The lower value of HI.SCL is limited by the value of LO.SCL.</p> <p>Unit of measurement: The one set with the Unit parameter</p> <p>Options: A value in the interval corresponding to the input or sensor type (see tables for LO.SCL parameter).</p>			

4.5.10. OF.SCL - Scale offset correction

Acronym	Scrolling message	Submenu	Attributes
OF.SCL	INPUT OFFSET	I.MAIN	R W
<p>The parameter shows and sets the offset applied to the value read in input to make it correspond to the expected value for a certain temperature. It corrects any constant read error of the sensor. This offset is applied linearly to all reads; therefore it cannot be used to correct any sensor linearity errors.</p> <p>Unit of measurement: The one set with the Unit parameter</p> <p>Options: -999...999</p>			

4.5.11. LO.AL - Lower limit for alarms

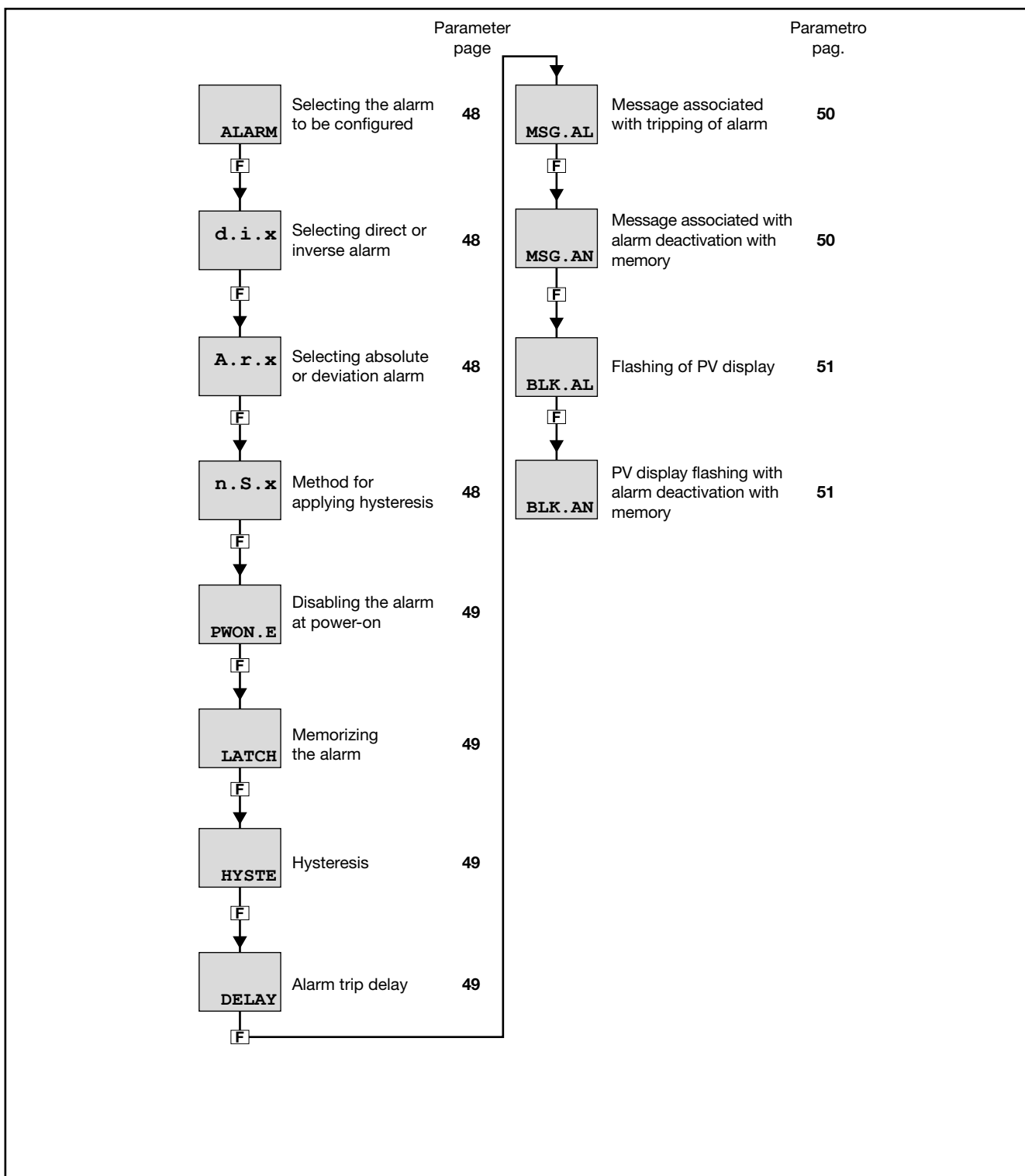
Acronym	Scrolling message	Submenu	Attributes
LO.AL	LOW LIMIT FOR ABSOLUTE ALARMS	I.MAIN	R W
<p>The parameter shows and sets, the minimum value for setting an alarm.</p> <p>Unit of measurement: The one used for the alarm limit.</p> <p>Options: -1999...9999</p>			

4.5.12. HI.AL - Upper limit for alarms

Acronym	Scrolling message	Submenu	Attributes
HI.AL	HIGH LIMIT FOR ABSOLUTE ALARMS	I.MAIN	R W
<p>The parameter shows and sets the upper limit for defining alarms, i.e., the maximum value for setting an alarm. ..</p> <p>Unit of measurement: The one used for the alarm limit.</p> <p>Options: -1999...9999</p>			

4.6. ALARM Submenu - Configuration of alarms

Acronym	Scrolling message	Password	Description
ALARM	ALARM CONFIG	Level 1	Lets you configure the generic alarms.



4.6.1. ALARM - Selecting the alarm to be configured

Acronym	Scrolling message	Submenu	Attributes
ALARM	ALARM NUMBER	ALARM	R W
<p>The parameter shows and sets the alarm to be configured, identified by its number.</p> <p>Unit of measurement: Number</p> <p>Options: 1...ALRM.N = Identifying number of alarm, where ALRM.N is the total number of alarms, setting by submenu MODE.</p>			

4.6.2. d.i.x - Selecting direct or inverse alarm

Acronym	Scrolling message	Submenu	Attributes
d.i.x	DIRECT/INVERSE DEFINITION	ALARM	R W
<p>The parameter shows and sets the behavior of alarm number “x” with respect to the alarm limit and hysteresis. Direct or inverse defines when the alarm has to trip. For a detailed explanation of this behavior, see paragraph “5.6.1. Generic alarms AL1...AL4” on page “5.3.1. Generic alarms AL2-4” on page 76.</p> <p>The parameter only appears for ALARM=2, ALARM=3 and ALARM=4.</p> <p>Only DIREC for Alarm 1</p> <p>Unit of measurement: -</p> <p>Options: DIREC = Direct alarm INVRS = Inverse Alarm</p>			

4.6.3. A.r.x - Selecting absolute or deviation alarm

Acronym	Scrolling message	Submenu	Attributes
A.r.x	ABSOLUTE/DEVIATION DEFINITION	ALARM	R W
<p>The parameter shows and defines the reference value of alarm number “x” for the alarm limit. For a detailed explanation of the difference between absolute and deviation, see paragraph “5.6.1. Generic alarms AL1...AL4” on page “5.3.1. Generic alarms AL2-4” on page 76.</p> <p>The parameter only appears for ALARM=2, ALARM=3 and ALARM=4.</p> <p>Only ABSLT for Alarm 1</p> <p>Unit of measurement: -</p> <p>Options: ABSLT = Absolute alarm RELAT = Deviation alarm</p>			

4.6.4. n.S.x - Selecting hysteresis type

Acronym	Scrolling message	Submenu	Attributes
n.S.x	NORMAL/SYMMETRIC DEFINITION	ALARM	R W
<p>The parameter shows and sets the method for applying hysteresis for alarm number “x” with respect to the alarm limit value.</p> <p>With normal, hysteresis is added to / subtracted from the alarm limit(s) based on the general alarm configuration. With symmetrical, hysteresis is added to / subtracted from the alarm limit itself. For a detailed explanation of the difference between normal and symmetrical, see paragraph “5.6.1. Generic alarms AL1...AL4” on page “5.3.1. Generic alarms AL2-4” on page 76.</p> <p>The parameter only appears for ALARM=2, ALARM=3 and ALARM=4.</p> <p>Only NORML for Alarm 1</p> <p>Unit of measurement: -</p> <p>Options: NORML = Normal alarm SYMMT = Symmetrical alarm (window)</p>			

4.6.5. PWON.E - Disabling the alarm at power-on

Acronym	Scrolling message	Submenu	Attributes
PWON.E	DISABLE AT SWITCH ON	ALARM	R W
<p>The parameter shows and sets the behavior of the alarm (being configured) when the indicator is powered on. If the parameter is "OFF," the alarm will trip when the indicator is powered on if the process variable exceeds the alarm setpoint limits. If the parameter is "On," the alarm will not trip until the alarm limit value is reached at least once after the indicator is powered on. The parameter only appears for ALARM=2, ALARM=3 and ALARM=4. Only OFF for Alarm 1</p> <p>ATTENTION! The setpoint can be reached in increment or in decrement, or it may never be reached. Therefore, with "On" the alarm might never trip even if the value of the process variable exceeds the alarm setpoint limits.</p> <p>Example – Minimum, inverse and absolute alarm When the system is off, the process variable equals room temperature (20 °C). The alarm setpoint is set at 150°C ± 10°C. The indicator powers on with the system. So with "OFF" the alarm trips as soon as the indicator is powered on because the temperature of the process variable exceeds the alarm setpoint limits. Instead, with "On" the alarm trips only after the temperature of 150°C is reached at least once for the process variable.</p> <p>Unit of measurement: -</p> <p>Options: OFF = Alarm enabled at power-on On = Alarm disabled at power-on (until setpoint is reached)</p>			

4.6.6. LATCH - Set alarm latching

Acronym	Scrolling message	Submenu	Attributes
LATCH	MEMORY DEFINITION	ALARM	R W
<p>The parameter shows and sets latching of the alarm being configured. Latching maintains the active alarm state even after the alarm conditions are eliminated. The alarm state can be removed by or reset by the digital input, serial input, or key. Only On or ONnOF settable for ALARM=1</p> <p>Unit of measurement: -</p> <p>Options: OFF = Alarm not latched (for Alarms 2...4 only) On = Alarm latched with status saved even after Power OFF OnOF = The alarm is saved with status deleted after Power OFF</p>			

4.6.7. HYTE - Hysteresis

Acronym	Scrolling message	Submenu	Attributes
HYTE	HYSTERESIS	ALARM	R W
<p>The parameter shows and sets the hysteresis applied to the alarm setpoint value for the alarm being configured. The parameter only appears for ALARM=2, ALARM=3 and ALARM=4</p> <p>Unit of measurement: Scale points</p> <p>Options: 0...999 = For absolute (A.r.x = ABSLT) and symmetrical alarm (n.S.x = SYMMT) -999...999 = For other types of alarms</p>			

4.6.8. DELAY - Alarm trip delay

Acronym	Scrolling message	Submenu	Attributes
DELAY	DELAY OF ACTIVATION	ALARM	R W
<p>The parameter shows and sets the alarm trip delay for the alarm being configured, i.e., the time that the value of the process variable has to exceed the alarm setpoint for the alarm to trip.</p> <p>This parameter prevents repeated alarms due to instantaneous and insignificant exceeding of that value or nuisance trips. If the parameter is set to "0.00" the alarm will be instantaneous, regardless of the time in which the process variable exceeds the alarm setpoint.</p> <p>For a detailed explanation of this behavior, see paragraph "5.6.1. Generic alarms AL1...AL4" on page "5.3.1. Generic alarms AL2-4" on page 76.</p> <p>The parameter only appears for ALARM=2, ALARM=3 and ALARM=4. It is always 0.00 for Alarm 1</p> <p>Unit of measurement: Minutes.seconds</p> <p>Options: 0.00...99.59</p>			

4.6.9. MSG.AL - Alarm message

Acronym	Scrolling message	Submenu	Attributes
MSG.AL	SCROLLING MESSAGE AT ALARM ACT	ALARM	R W
<p>The parameter shows and sets the number of the message associated with tripping of the alarm being configured, i.e., the scrolling message shown on the display.</p> <p>For more information on scrolling messages, see paragraph "3.1.2.2. Scrolling messages" on page 26.</p> <p>If the parameter is set to "0" no message will be displayed when the alarm trips.</p> <p>The same message number can be assigned to different alarms</p> <p>The default MSG.AL for Alarm 1 is message "5" (for LANG1 it corresponds to "HIGH ALARM1", for LANG2 it corresponds to "MAXIMUM ALARM1").</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.6.10. MSG.AN - Alarm reset message

Acronym	Scrolling message	Submenu	Attributes
MSG.AN	SCROLLING MESSAGE AT ALARM DISACT	ALARM	R W
<p>The parameter displays and sets the message number associated with alarm deactivation after an alarm condition was intercepted and left saved (for alarms with latching only).</p> <p>The parameter only appears if LATCH=On or OnOF.</p> <p>Further information on scrolling messages are found in paragraph "3.1.2.2. Scrolling messages" on page 34.</p> <p>When the parameter is set to "0", no message is displayed when the alarm is deactivated. The same message (number) can be attributed to different alarms.</p> <p>The default MSG.ACN for Alarm 1 is message "6" (for LANG1 it corresponds to "HIGH ALARM1 PRESS R", for LANG2 it corresponds to "MAXIMUM ALARM1 PRESS R").</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.6.11. BLK.AL - Flashing of PV display

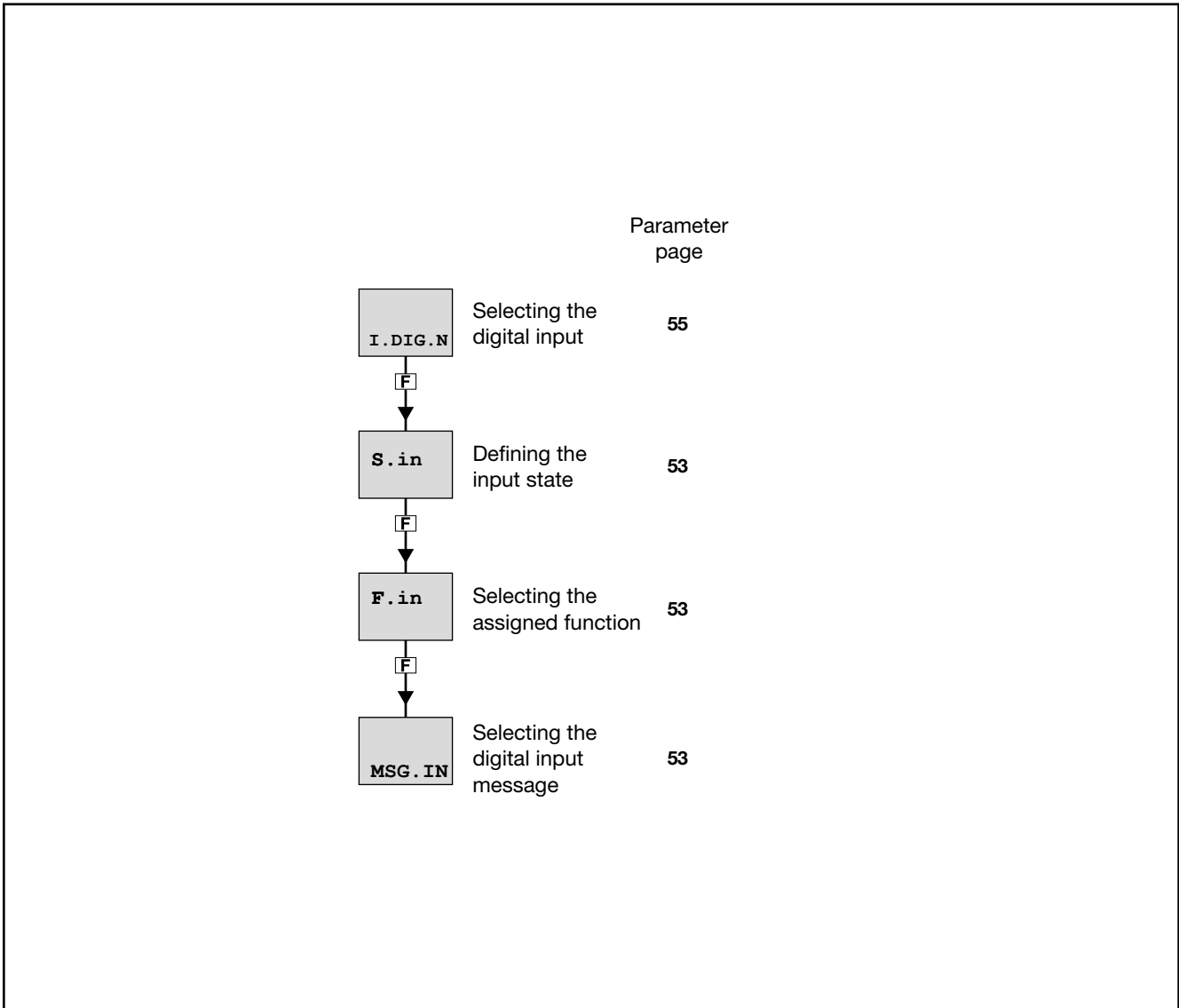
Acronym	Scrolling message	Submenu	Attributes
BLK.AL	BLINK DISPLAY PV DEF	ALARM	R W
<p>The parameter shows and sets the flashing of the PV display in case of alarm, for the alarm being configured. If the parameter is "On," the value shown on the PV display starts to flash in case of alarm. The parameter only appears for ALARM=2, ALARM=3 and ALARM=4. Only On for Alarm 1</p> <p>Unit of measurement: -</p> <p>Options: OFF = PV display does not flash in case of alarm On = The PV display flashes in the event of alarm</p>			

4.6.12. BLK.AN - PV display alarm flashing with alarm reset

Acronym	Scrolling message	Submenu	Attributes
BLK.AN	BLINK DISPLAY PV DEF AT ALARM DISACT	ALARM	R W
<p>The parameter controls the optional blinking of the PV value display with regard to latched alarms. The parameter sets PV display flashing in the case when the alarm is no longer active, but has been latched from prior triggering, but has not yet been cleared from memory. If the parameter is "On", the value displayed on the PV display flashes. The parameter only appears for ALARM=2, ALARM=3 and ALARM=4. Only OFF for Alarm 1 The parameter only appears if LATCH=On or OnOF.</p> <p>Unit of measurement: -</p> <p>Options: OFF = The PV display does not flash On = The PV display flashes</p>			

4.7. I.DIGT Submenu – Configuring digital inputs

Acronym	Scrolling message	Password	Description
I.DIGT	DIGITAL INPUT CONFIG	Level 2	Lets you configure the indicator's digital inputs. The menu is present if there are digital inputs.



4.7.1. I.DIG.N - Selecting the digital input

Acronym	Scrolling message	Submenu	Attributes
I.DIG.N	DIGITAL INPUT NUMBER	I.DI	R W
<p>The parameter shows and sets the identifying number of the digital input to be configured.</p> <p>Unit of measurement: Number</p> <p>Options: 1...5 for model 4150 with 5 digital inputs option</p>			

4.7.2. S.in.x - Defining the input state

Acronym	Scrolling message	Submenu	Attributes
S.in.x	DIGITAL INPUT STATUS	I.DI	R W
<p>The parameter shows and sets the state of the input with identifying number "x". The direct digital input is active when there is current in the digital input or the contact is closed. The inverse digital input is active when there is no current in the digital input or the contact is open. Digital inputs can be forced so that they are always on or off.</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> DIREC = Direct digital input INVRS = Inverse digital input OFF = Digital input forced off ON = Digital input forced on 			

4.7.3. F.in.x - Selecting the assigned function

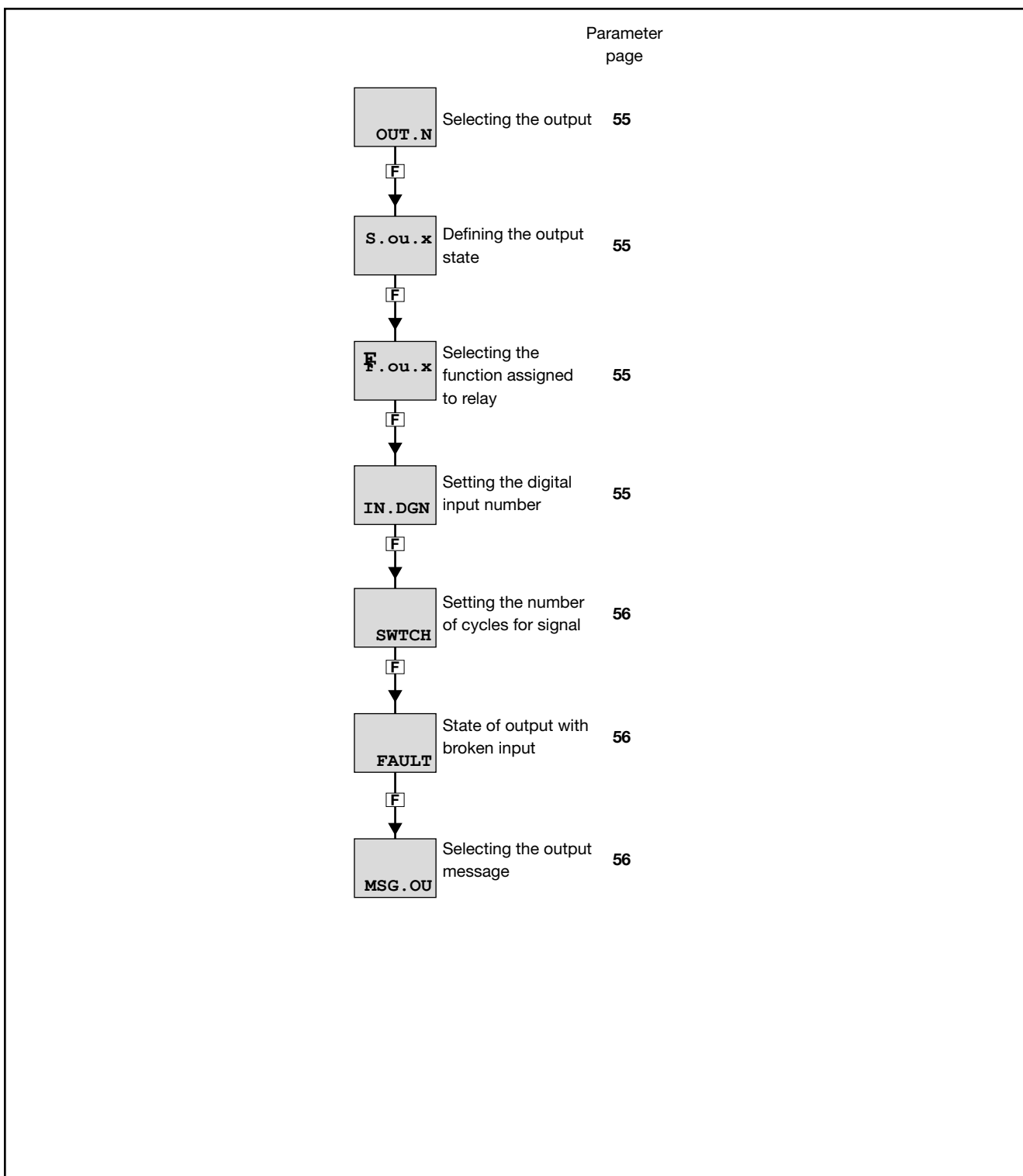
Acronym	Scrolling message	Submenu	Attributes
F.in.x	DIGITAL INPUT FUNCTION	I.DI	R W
<p>The parameter shows and sets the function assigned to the digital input with identifying number "x".</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> NONE = No assigned function AL.ACK = Reset alarm latches FKEY = Block F key PK.RES = Maximum, minimum and peak-peak reset AL.PK.A = Alarm latch + maximum, minimum peak and peak-peak reset TM.AL1 = ALARM1 timer reset CN.AL1 = ALARM1 meter reset TC.AL1 = ALARM1 timer and meter reset 			

4.7.4. MSG.IN - Selecting the digital input message

Acronym	Scrolling message	Submenu	Attributes
MSG.IN	NUMBER OF SCROLLING MESSAGE AT INPUT ACT	I.DI	R W
<p>The parameter shows and sets the number of the message assigned to activation of the digital input, i.e., the scrolling message shown on the display. For more information on scrolling messages, see paragraph "3.1.2.2. Scrolling messages" on page 26. If the parameter is set to "0" no message will be displayed when the digital input is activated. The same message number can be assigned to different inputs.</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.8. OUTPU Submenu – Configuring outputs

Acronym	Scrolling message	Password	Description
OUTPU	OUTPUT CONFIG	Level 2	Lets you configure the indicator outputs.



4.8.1. OUT.N - Selecting the output

Acronym	Scrolling message	Submenu	Attributes
OUT.N	OUTPUT NUMBER	OUTPU	R W
<p>The parameter shows and sets the identifying number of the output to be configured.</p> <p>Unit of measurement: Number</p> <p>Options: 1...3</p>			

4.8.2. S.ou.x - Defining the output state

Acronym	Scrolling message	Submenu	Attributes
S.ou.x	DIGITAL OUTPUT STATUS	OUTPU	R W
<p>The parameter shows and sets the state of the output with identifying number "x". The active direct output corresponds to the relay, output ON. The active inverse output corresponds to the relay, output OFF. The parameter only appears for OUT.N=2 and OUT.N=3. Only INVRS for OUT.1</p> <p>Unit of measurement: -</p> <p>Options: DIREC = Direct output INVRS = Inverse output</p>			

4.8.3. F.ou.x - Selecting the function assigned to relay, logic or Triac output

Acronym	Scrolling message	Submenu	Attributes
F.ou.x	OUTPUT FUNCTION	OUTPU	R W
<p>The parameter shows and sets the function assigned to the output with identifying number "x". The parameter only appears for OUT.N=2 and OUT.N=3. Only ALRM1 for OUT.1</p> <p>Unit of measurement: -</p> <p>Options: NONE = No assigned function ALRM1 = Output for Alarm 1 ALRM2 = Output for Alarm 2 ALRM3 = Output for Alarm 3 ALRM4 = Output for Alarm 4 OR.12 = Alarm 1 OR Alarm 2 OR.123 = Alarm 1 OR Alarm 2 OR Alarm 3 O.1234 = Alarm 1 OR Alarm 2 OR Alarm 3 OR Alarm 4 AND.12 = Alarm 1 AND Alarm 2 AND.123 = Alarm 1 AND Alarm 2 AND Alarm 3 AND.1234 = Alarm 1 AND Alarm 2 AND Alarm 3 AND Alarm 4 <i>if model with digital inputs:</i> IN.DIG = Repetition of a digital input</p>			

4.8.4. IN.DG.N - Setting the digital input number

Acronym	Scrolling message	Submenu	Attributes
IN.DG.N	DIGITAL INPUT NUMBER	OUTPU	R W
<p>The parameter shows and sets the number of the digital input assigned to the output. The parameter appears if the parameter F.ou.x = IN.DIG.</p> <p>Unit of measurement: Number</p> <p>Options: 1...5 Model 4150 with option 5 digital inputs</p>			

4.8.5. SWTCH - Output cycle limit alarm

Acronym	Scrolling message	Submenu	Attributes
SWTCH	NUMBER OF SWITCHING CYCLES	OUTPU	R W
<p>The parameter shows and sets the number of cycles (x1000) of the relay, exceeding which the signal is generated OUTX. SWITCH ALARM where X is the number of output 1 or 2 or 3 or 4 if the output is relay, logic or triac. The function is disabled if the parameter equals "0".</p> <p>Unit of measurement: Number</p> <p>Options: 0...9999</p>			

4.8.6. FAULT - State of output with broken input

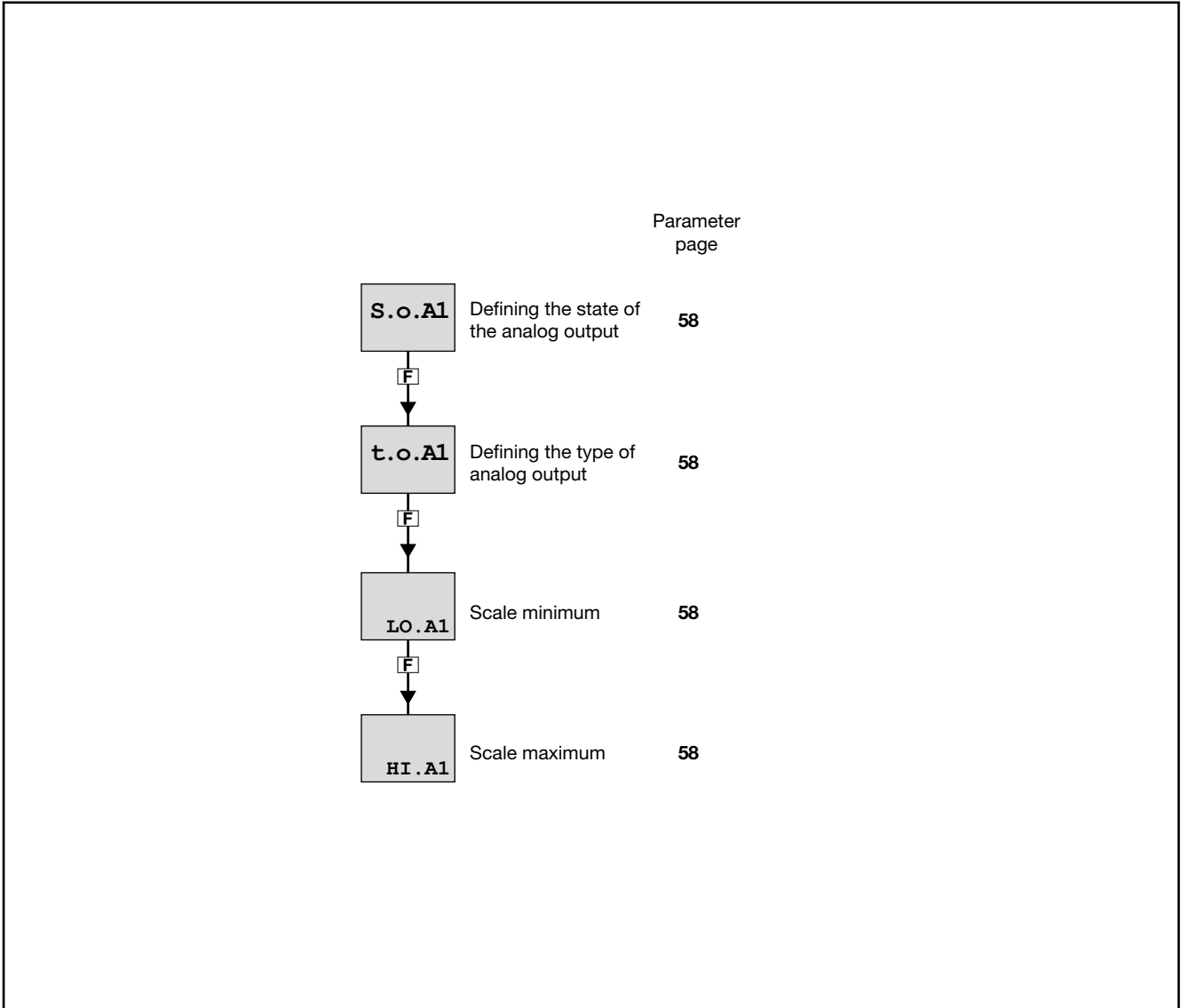
Acronym	Scrolling message	Submenu	Attributes
FAULT	FAULT OUTPUT STATE	OUTPU	R W
<p>The parameter shows and sets the state (on, off) that the output assumes in case of broken input (Err, Sbr, ...), if the output is direct or inverse.</p> <p>Unit of measurement: -</p> <p>Options: OFF = Output is off On = Output is on</p>			

4.8.7. MSG.OU - Selecting the output message

Acronym	Scrolling message	Submenu	Attributes
MSG.OU	NUMBER OF SCROLLING MESSAGE AT OUTPUT ACT	OUTPU	R W
<p>The parameter shows and sets the number of the message assigned to activation of the output, i.e., the scrolling message shown on the display. For more information on scrolling messages, see paragraph "3.1.2.2. Scrolling messages" on page 26. If the parameter is set to "0" no message will be displayed when the output is activated. The same message number can be assigned to different outputs.</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.9. OUT.AN - Submenu – Configuring the analog retransmission output

Acronym	Scrolling message	Password	Description
OUT.AN	ANALOG RETRASMISSION OUTPUT CONFIG	Level 2	Lets you configure the analog output used for retransmission of analog values. The submenu appears if the analog retransmission output is present on the indicator.



4.9.1. S.o.A1 - Defining the signal direction of the analog output

Acronym	Scrolling message	Submenu	Attributes
S.o.A1	ANALOG OUTPUT STATUS	OUT.AN	R W
<p>The parameter shows and sets the state of analog retransmission output A1. The active direct output corresponds to minimum with the minimum output value in voltage or current. The active inverse output corresponds to minimum with the maximum output value in voltage or current. The outputs can be forced so that they are always on or off.</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> DIREC = Direct output INVRS = Inverse output OFF = Forced output inactive (minimum voltage or current value) ON = Forced output active (maximum voltage or current value) 			

4.9.2. t.o.A1 - Defining the type of analog output

Acronym	Scrolling message	Submenu	Attributes
t.o.A1	ANALOG OUTPUT TYPE	OUT.AN	R W
<p>The parameter shows and sets the definition of analog output A1.</p> <p>Unit of measurement: -</p> <p>Options:</p> <ul style="list-style-type: none"> 20MA = Output 0...20 mA 4-20M = Output 4...20 mA 10V = Output 0...10 V 2-10V = Output 2...10 V C.20MA = Custom Output 0...20 mA C.4-20 = Custom Output 4...20 mA C.10V = Custom Output 0...10 V C.2-10 = Custom Output 2...10 V 			

4.9.3. LO.A1 - Scale minimum

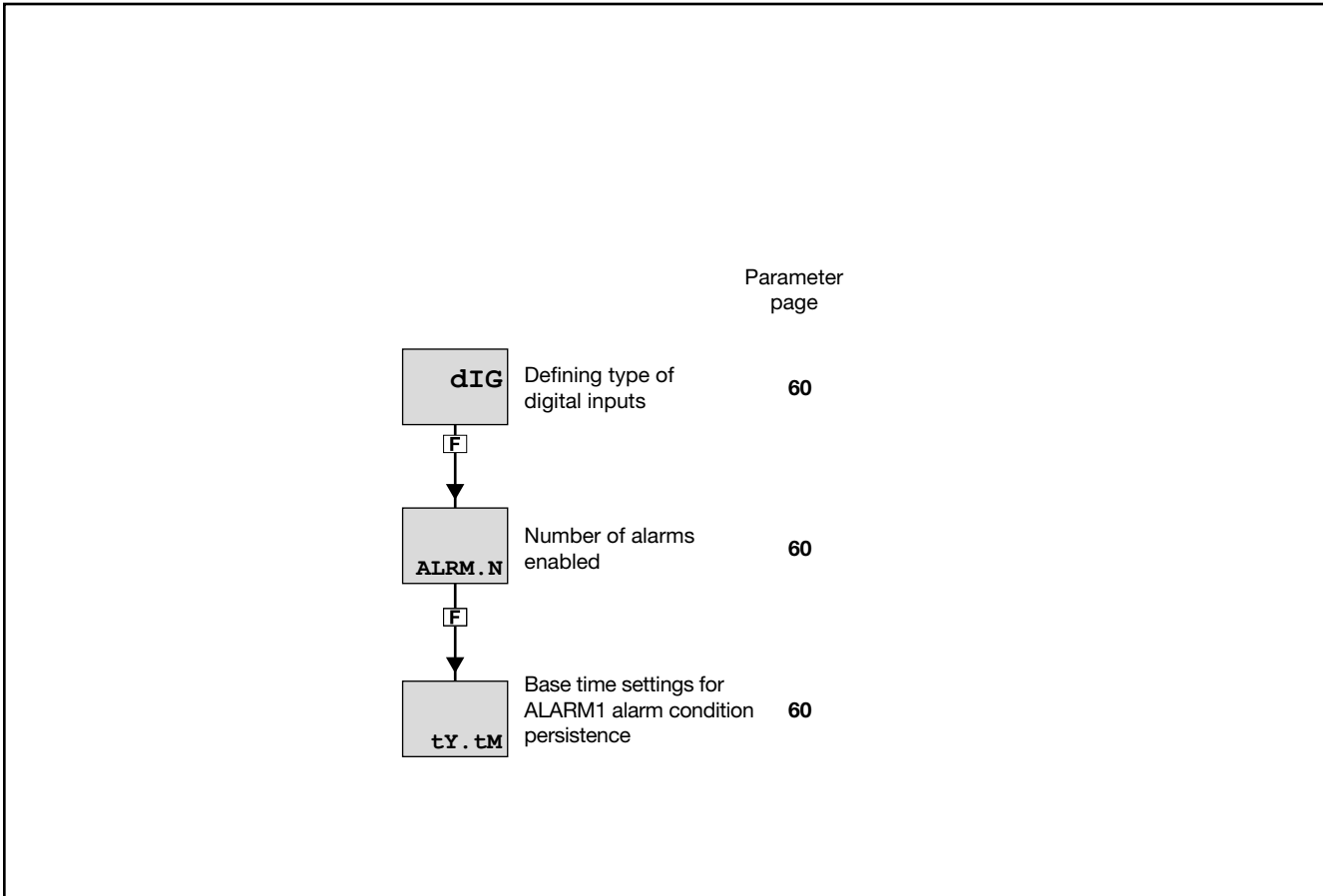
Acronym	Scrolling message	Submenu	Attributes
LO.A1	LOW LIMIT ANALOG OUTPUT	OUT.AN	R W
<p>The parameter shows and sets the scale minimum, which corresponds to minimum output value in voltage or current.</p> <p>Unit of measurement: Scale points of quantity assigned to analog output.</p> <p>Options: -1999...9999</p>			

4.9.4. HI.A1 - Scale maximum

Acronym	Scrolling message	Submenu	Attributes
HI.A1	HIGH LIMIT ANALOG OUTPUT	OUT.AN	R W
<p>The parameter shows and sets the scale maximum, which corresponds to maximum output value in voltage or current..</p> <p>Unit of measurement: Scale points of quantity assigned to analog output.</p> <p>Options: -1999...9999</p>			

4.10. MODE Submenu – Functionality configuration

Acronym	Scrolling message	Password	Description
MODE	FUNCTION MODE MANAGER	Level 2	Lets you configure the indicator's functioning mode.



4.10.1. dIG - Defining type of digital inputs

Acronym	Scrolling message	Submenu	Attributes
dIG	DIGITAL INPUT TYPE	MODE	R W
<p>The parameter shows and sets the type of digital inputs.</p> <p>Unit of measurement: -</p> <p>Options: NPN = NPN digital inputs or dry contact PNP = PNP digital inputs</p>			

4.10.2. ALRM.N - Number of alarms enabled

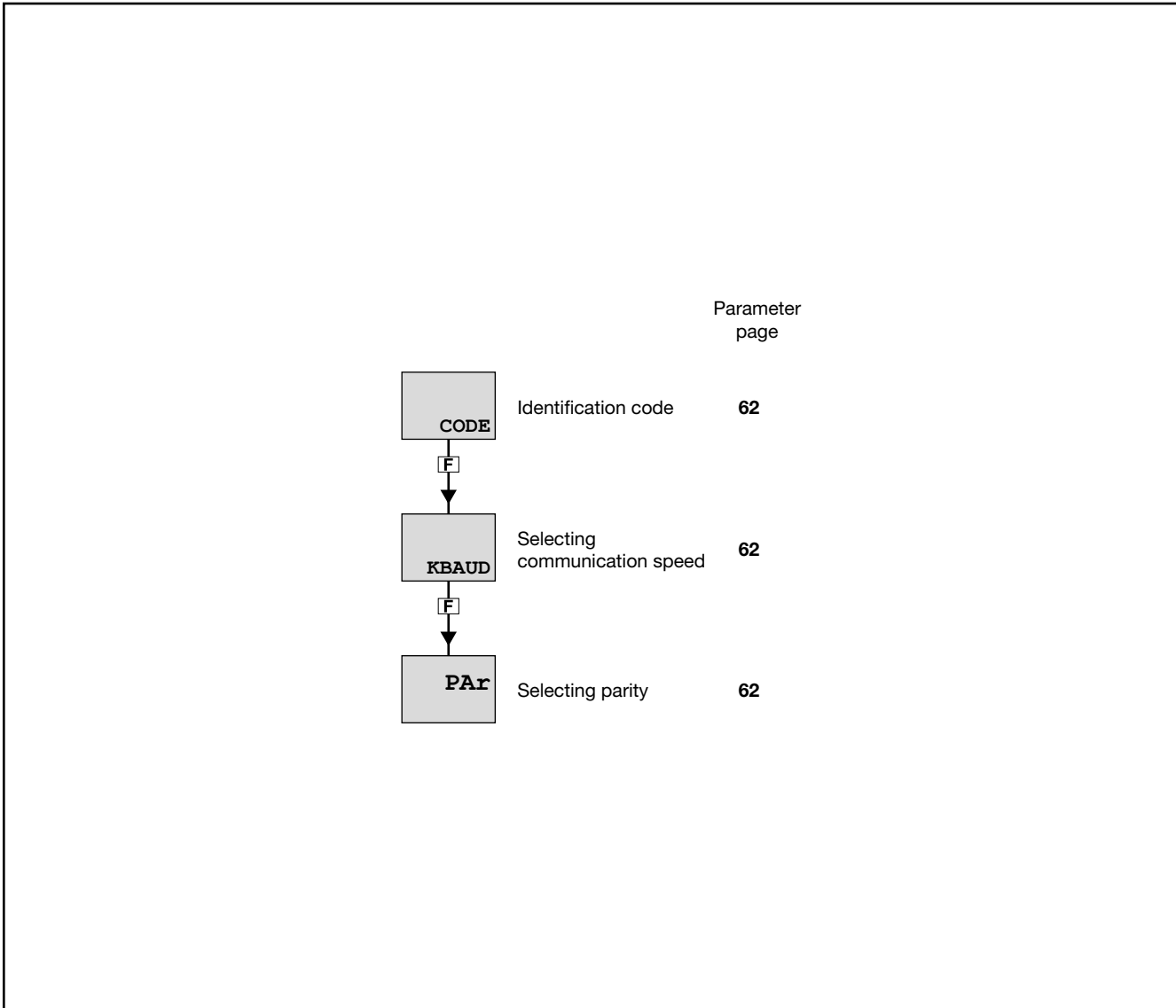
Acronym	Scrolling message	Submenu	Attributes
ALRM.N	NUM OF ENABLE ALARMS	MODE	R W
<p>The parameter shows and sets the number of alarms enabled.</p> <p>Unit of measurement: Number</p> <p>Options: 1..4</p>			

4.10.3. TY.TM - Base time settings for ALARM1 alarm condition persistence

Acronym	Scrolling message	Submenu	Attributes
tY.tM	BASE TIME DEFINITION OF ALARM1 TIMER	MODE	R W
<p>The parameter displays and sets the base times used for ALARM1 alarm condition persistence.</p> <p>Unit of measurement: -</p> <p>Options: MM.SS = Base time is calculated and displayed in minutes.seconds HH.MM = Base time is calculated and displayed in hours.minutes</p>			

4.11. SERIA Submenu – Configuring serial communication

Acronym	Scrolling message	Password	Description
SERIA	SERIAL COMMUNICATION CONFIG	Level 2	Lets you configure serial communication



4.11.1. CODE - Identification code

Acronym	Scrolling message	Submenu	Attributes
CODE	INSTRUMENT ID CODE FOR SERIAL COMM	SERIA	R W
<p>The parameter shows and sets the identifying address of the indicator in a Modbus serial network. Generally should not be set to "1"</p> <p>Unit of measurement: Number</p> <p>Options: 1...247</p>			

4.11.2. KBAUD - Selecting communication speed

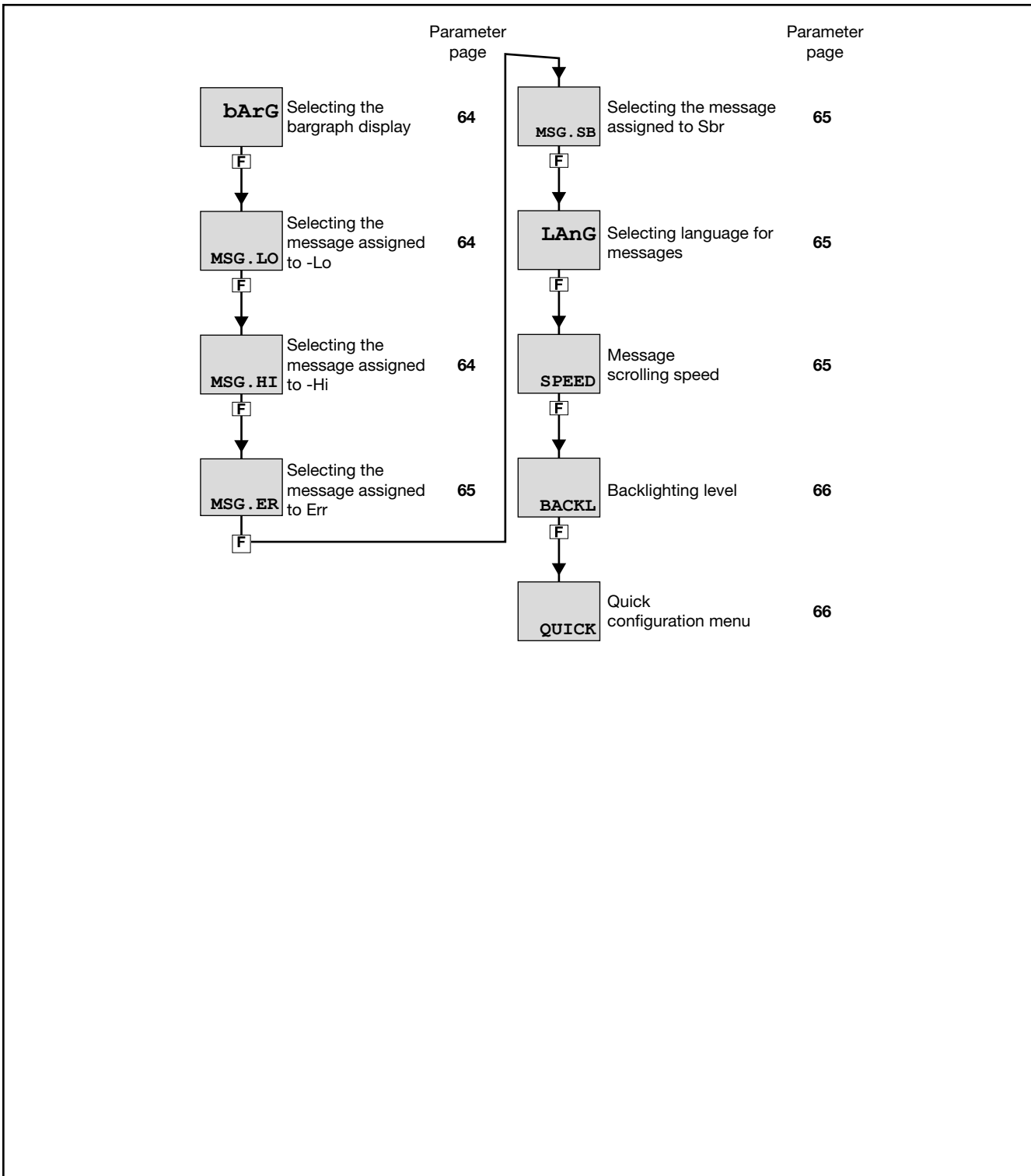
Acronym	Scrolling message	Submenu	Attributes																
KBAUD	COMMUNICATION SPEED	SERIA	R W																
<p>The parameter shows and sets the communication speed for the serial port.</p> <p>Unit of measurement: kbaud</p> <p>Options:</p> <table> <tr> <td>1.2</td> <td>= 1200 baud</td> </tr> <tr> <td>2.4</td> <td>= 2400 baud</td> </tr> <tr> <td>4.8</td> <td>= 4800 baud</td> </tr> <tr> <td>9.6</td> <td>= 9600 baud</td> </tr> <tr> <td>19.2</td> <td>= 19200 baud</td> </tr> <tr> <td>38.4</td> <td>= 38400 baud</td> </tr> <tr> <td>57.6</td> <td>= 57600 baud</td> </tr> <tr> <td>115.2</td> <td>= 115200 baud</td> </tr> </table>				1.2	= 1200 baud	2.4	= 2400 baud	4.8	= 4800 baud	9.6	= 9600 baud	19.2	= 19200 baud	38.4	= 38400 baud	57.6	= 57600 baud	115.2	= 115200 baud
1.2	= 1200 baud																		
2.4	= 2400 baud																		
4.8	= 4800 baud																		
9.6	= 9600 baud																		
19.2	= 19200 baud																		
38.4	= 38400 baud																		
57.6	= 57600 baud																		
115.2	= 115200 baud																		

4.11.3. PAr - Selecting parity

Acronym	Scrolling message	Submenu	Attributes						
PAr	PARITY	SERIA	R W						
<p>The parameter shows and sets the parity used in serial communication.</p> <p>Unit of measurement: -</p> <p>Options:</p> <table> <tr> <td>NONE</td> <td>= No parity</td> </tr> <tr> <td>ODD</td> <td>= Odd parity</td> </tr> <tr> <td>EVEN</td> <td>= Even parity</td> </tr> </table>				NONE	= No parity	ODD	= Odd parity	EVEN	= Even parity
NONE	= No parity								
ODD	= Odd parity								
EVEN	= Even parity								

4.12. HMI Submenu – Configuring the display and keypad

Acronym	Scrolling message	Password	Description
HMI	DISPLAY AND KEYBOARD	Level 2	Lets you configure the indicator's display and keys



4.12.1. bArG - Selecting the bargraph display

Acronym	Scrolling message	Submenu	Attributes
bArG	BARGRAPH FUNCTION	HMI	R W
<p>The parameter displays and sets the view associated with the bar graph. The parameter only appears if the indicator is 4150.</p> <p>Unit of measurement: -</p> <p>Options:</p> <p>NONE = No indication (bar graph off) AL1-PV = Deviation between AL1 and PV The bar graph turns on from the left when the difference is less than 10% of the maximum scale limit associated with the alarm. The bar graph will be fully on when the % difference is less than or equal to zero of the maximum scale limit associated with the alarm</p> <p>Example: With 1000 maximum alarm limit:</p> <ul style="list-style-type: none"> • the first mark on the bar graph will turn on when AL1-PV<[10% di 1000] => AL1-PV<100 • the second mark on the bar graph will turn on when AL1-PV<[9% di 1000] => AL1-PV<90 • • • the second to last mark on the bar graph will turn on when AL1-PV<[1% di 1000] => AL1-PV<10 • the last mark on the bar graph will turn on when (AL1-PV) is less than or equal to [0% di 1000] => (AL1-PV) less than or equal to 0 			

4.12.2. MSG.LO - -Lo message display

Acronym	Scrolling message	Submenu	Attributes
MSG.LO	NUM SCROLLING MSG WHEN MAIN INPUT IS LOW ERR	HMI	R W
<p>The parameter shows and sets the number of the message assigned to -Lo (process variable < minimum scale limit), i.e., the scrolling message shown on the display. For more information on scrolling messages, see paragraph “3.1.2.2. Scrolling messages” on page 26. If the parameter is set to “0” no message will be displayed for -Lo.</p> <p>As default, MSG.LO is assigned the message “1” (for LANG1 corresponds to “PROCESS VALUE UNDER LOW LIMIT”, for LANG2 corresponds to “PV AL MINIMO”).</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.12.3. MSG.HI - -Hi message display

Acronym	Scrolling message	Submenu	Attributes
MSG.HI	NUM SCROLLING MSG WHEN MAIN INPUT IS HI ERR	HMI	R W
<p>The parameter shows and sets the number of the message assigned to -Hi (process variable > maximum scale limit), i.e., the scrolling message shown on the display. For more information on scrolling messages, see paragraph “3.1.2.2. Scrolling messages” on page 26. If the parameter is set to “0” no message will be displayed for -Hi.</p> <p>As default, MSG.HI is assigned the message “2” (for LANG1 corresponds to “PROCESS VALUE OVER HIGH LIMIT”, for LANG2 corresponds to “PV SUPERIORE AL MASSIMO”).</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.12.4. MSG.ER - Err message display

Acronym	Scrolling message	Submenu	Attributes
MSG.ER	NUM SCROLLING MSG WHEN MAIN INPUT IS ERR ERR	HMI	R W
<p>The parameter shows and sets the number of the message assigned to Err (Pt100 in short circuit or input values below minimum limit), i.e., the scrolling message shown on the display. For more information on scrolling messages, see paragraph “3.1.2.2. Scrolling messages” on page 26. If the parameter is set to “0” no message will be displayed for Err.</p> <p>As default, MSG.ER is assigned the message “3” (for LANG1 corresponds to “INPUT SENSOR FAIL CONNECTION”, for LANG2 corresponds to “ERRATA CONNESSIONE SONDA”).</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.12.5. MSG.SB - Sbr message display

Acronym	Scrolling message	Submenu	Attributes
MSG.SB	NUM SCROLLING MSG WHEN MAIN INPUT IS SB ERR	HMI	R W
<p>The parameter shows and sets the number of the message assigned to Err (sensor break in short circuit or input values above maximum limit), i.e., the scrolling message shown on the display. For more information on scrolling messages, see paragraph “3.1.2.2. Scrolling messages” on page 26. If the parameter is set to “0” no message will be displayed for Sbr.</p> <p>As default, MSG.SB is assigned the message “4” (for LANG1 corresponds to “SENSOR BROKEN”, for LANG2 corresponds to “SONDA APERTA”).</p> <p>Unit of measurement: Message number</p> <p>Options: 0...25</p>			

4.12.6. LAnG - Display language

Acronym	Scrolling message	Submenu	Attributes
LAnG	MESSAGE LANGUAGE	HMI	R W
<p>The parameter shows and sets the language for the scrolling messages.</p> <p>Unit of measurement: -</p> <p>Options: LANG1 = Language 1 (English) LANG2 = Language 2 (Italian) LANG3 = Language 3</p>			

4.12.7. SPEED - Message scrolling speed

Acronym	Scrolling message	Submenu	Attributes
SPEED	SCROLLING MESSAGE SPEED	HMI	R W
<p>The parameter shows and sets the message scrolling speed. “1” corresponds to maximum scrolling speed, “10” to minimum speed. With “0” the message does not scroll and the display shows first 5 characters or the first 7 characters (on model 1250).</p> <p>Unit of measurement: -</p> <p>Options: 0...10 (default = 3)</p> <p>Note: Descriptive messages of the parameters always flow at a constant speed.</p>			

4.12.8. BACKL - Backlighting level

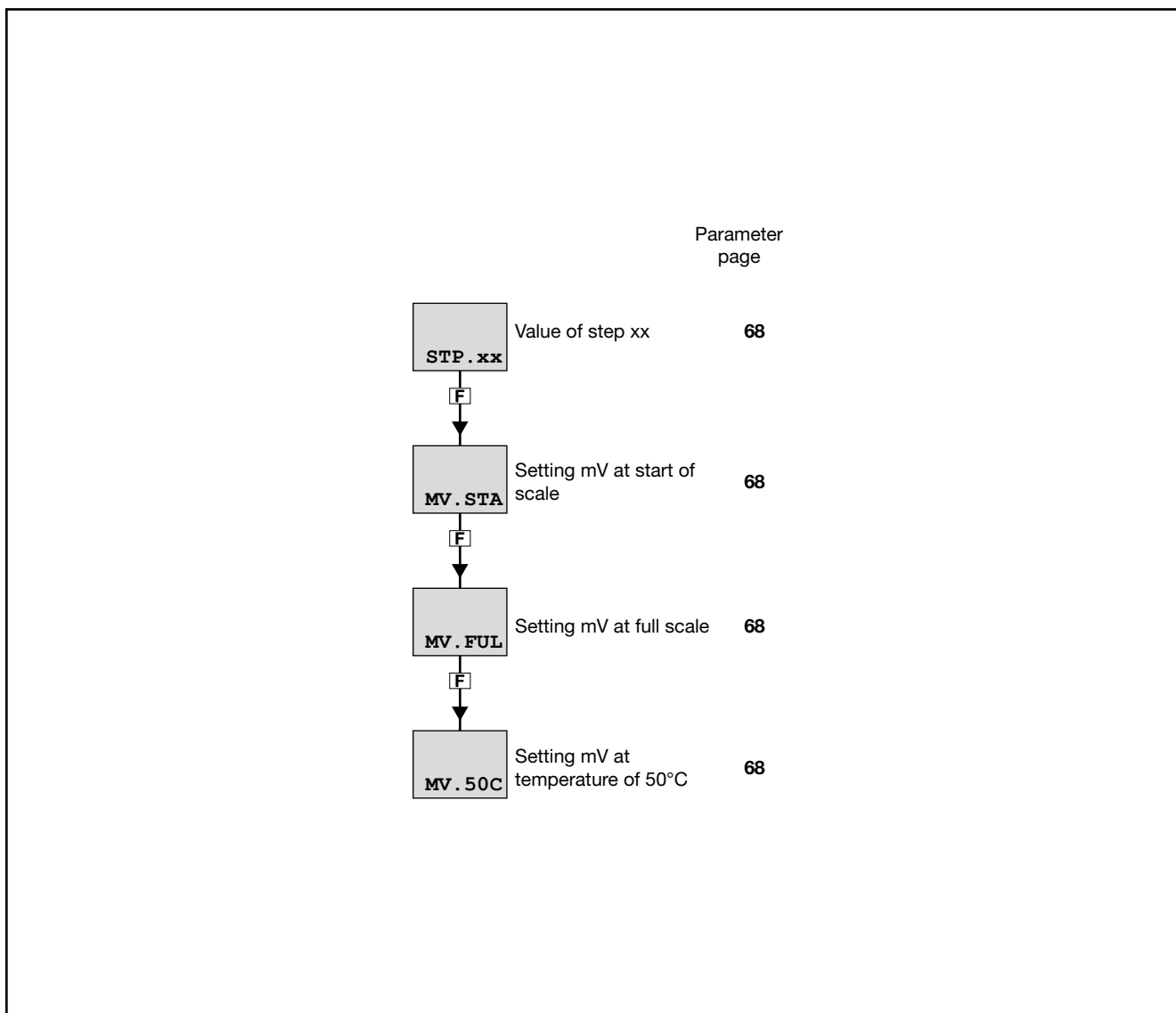
Acronym	Scrolling message	Submenu	Attributes
BACKL	BACKLIGHT LEVEL	HMI	R W
<p>The parameter shows and sets the backlight level on the display (when the indicator is on) 10 seconds after the last key has been pressed.</p> <p>With "0," the backlight does not switch off, but goes to the minimum useful level for reading the display. The backlight goes to maximum level when any key is pressed.</p> <p>Unit of measurement: -</p> <p>Options: 0...10 (default = 8)</p>			

4.12.9. QUICK - Quick configuration menu

Acronym	Scrolling message	Submenu	Attributes
QUICK	QUICK CONFIG ENABLE	HMI	R W
<p>The parameter shows and sets enabling of the quick configuration menu.</p> <p>Unit of measurement: -</p> <p>Options: OFF = Quick configuration menu is not displayed On = Quick configuration menu is displayed</p>			

4.13. LINRZ Submenu – Configuring custom linearization

Acronym	Scrolling message	Password	Description
LINRZ	CUSTOM LINEARIZATION CONFIG	Level 2	Lets you configure the parameters for custom linearization in 32 steps or 4 points. The submenu is visible only if custom linearization was enabled in the configuration of the main input or of the setpoint input. You can set only one linearization, but it can be assigned to the main input, the setpoint input, or both.



4.13.1. STP.xx - Value of step xx

Acronym	Scrolling message	Submenu	Attributes
STP.xx	CUSTOM LINEARIZATION STEP	LINRZ	R W
<p>The parameter shows and sets the value of the various steps, with xx from 0 to 32. The low scale value goes in STP.00 and the full-scale value in STP.32.</p> <p>The value of the nth step corresponds to the input: $mV \text{ start scale} + n \cdot \Delta mV$ con $\Delta mV = (mV \text{ full scale} - mV \text{ start scale})/32$.</p> <p>Unit of measurement: Scale points</p> <p>Options: -1999...9999</p>			

4.13.2. MV.STA - Setting mV at start of scale

Acronym	Scrolling message	Submenu	Attributes
MV.STA	MV START SCALE	LINRZ	R W
<p>The parameter shows and sets the value in millivolts at start of scale if the input is a thermocouple.</p> <p>Unit of measurement: mV</p> <p>Options: -19.99...99.99</p>			

4.13.3. MV.FUL - Setting mV at full scale

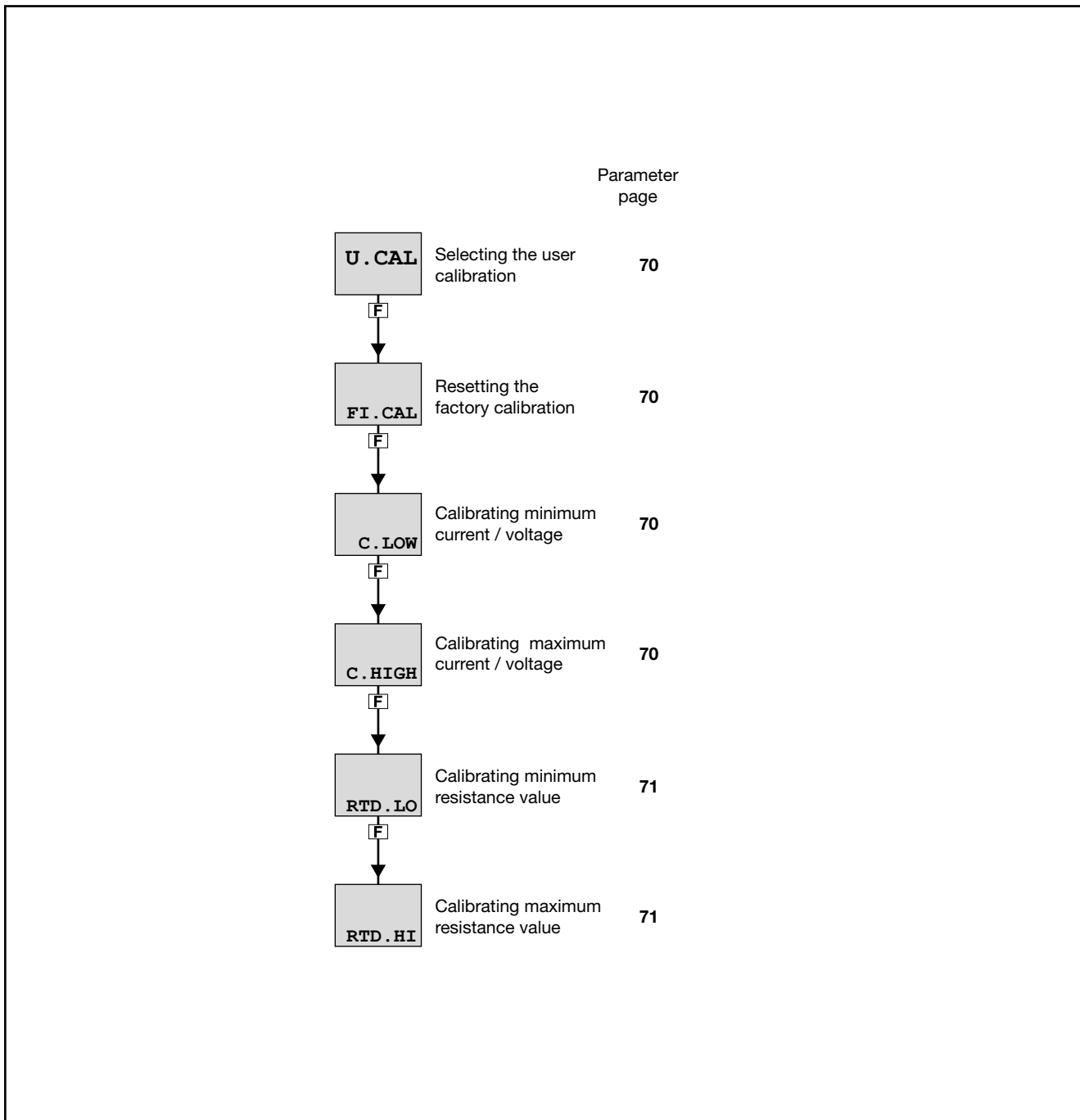
Acronym	Scrolling message	Submenu	Attributes
MV.FUL	MV FULL SCALE	LINRZ	R W
<p>The parameter shows and sets the value in millivolts at full scale if the input is a thermocouple.</p> <p>Unit of measurement: mV</p> <p>Options: MV.STA + 1...99.99</p>			

4.13.4. MV.50C - Setting mV at temperature of 50 °C

Acronym	Scrolling message	Submenu	Attributes
MV.50C	MV AT 50 °C	LINRZ	R W
<p>The parameter shows and sets the value in millivolts at 50°C if the input is a thermocouple.</p> <p>Unit of measurement: mV</p> <p>Options: -1.999...9.999</p>			

4.14. US.CAL Submenu – User calibrations

Acronym	Scrolling message	Password	Description
US.CAL	USER CALIBRATION MANAGER	Level 2	Lets the user calibrate the indicator with regard to Custom main input, HB alarm setpoints, energy reset, and partial day count.



4.14.1. U.CAL - Selecting the user calibration

Acronym	Scrolling message	Submenu	Attributes
U.CAL	USER CALIBRATION TYPE	US.CAL	R W
<p>The parameter shows and sets the parameter, input or output to which calibration will be applied.</p> <p>Unit of measurement: -</p> <p>Options:</p> <p>NONE = No calibration P.DAYS = Reset partial day count I.MAIN = Calibration of custom main input (selected with parameter tyPE on I.MAIN menu) OUT.A1 = Custom re-transmission output calibration (selected with parameter t.o.A1 in menu OUT.AN)</p>			

4.14.2. FI.CAL - Resetting the factory calibration

Acronym	Scrolling message	Submenu	Attributes
FI.CAL	FACTORY CALIBRATION	US.CAL	R W
<p>The parameter shows and sets resetting of the factory calibration. This operation can be done only for inputs and outputs, if U.CAL corresponds to I.MAIN, OUT.A1.</p> <p>Unit of measurement: -</p> <p>Options:</p> <p>NO = Keep user calibration YES = Reset factory calibration</p>			

4.14.3. C.LOW - Calibrating minimum current / voltage

Acronym	Scrolling message	Submenu	Attributes
C.LOW		US.CAL	R W
<p>The parameter appears if you are calibrating a custom I.MAIN input in current or voltage. To calibrate:</p> <ul style="list-style-type: none"> • apply the current or voltage value corresponding to minimum scale value to the selected input; • press the [F] key to acquire the calibration value. <p>Unit of measurement: -</p> <p>Options: -</p>			

4.14.4. C.HIGH - Calibrating maximum current / voltage

Acronym	Scrolling message	Submenu	Attributes
C.HIGH		US.CAL	R W
<p>The parameter appears if you are calibrating a custom I.MAIN input in current or voltage. To calibrate:</p> <ul style="list-style-type: none"> • apply the current or voltage value corresponding to maximum scale value to the selected input; • press the [F] key to acquire the calibration value. <p>Unit of measurement: -</p> <p>Options: -</p>			

4.14.5. RTD.LO - Calibrating minimum resistance value

Acronym	Scrolling message	Submenu	Attributes
RTD.LO		US.CAL	R W
<p>The parameter appears if you are calibrating a custom I.MAIN RTD input. To calibrate:</p> <ul style="list-style-type: none"> • apply a resistance corresponding to minimum scale value to the main input (for example, 18.52 Ω for Pt100 ; • press the [F] key to acquire the calibration value. <p>Unit of measurement: -</p> <p>Options: -</p>			

4.14.6. RTD.HI - Calibrating maximum resistance value

Acronym	Scrolling message	Submenu	Attributes
RTD.HI		US.CAL	R W
<p>The parameter appears if you are calibrating a custom I.MAIN RTD input. To calibrate:</p> <ul style="list-style-type: none"> • apply a resistance corresponding to maximum scale value to the main input (for example, 390.48 Ω for Pt100); • press the [F] key to acquire the calibration value. <p>Unit of measurement: -</p> <p>Options: -</p>			

4.14.7. C.LO - Setting analog output minimum

Acronym	Scrolling message	Submenu	Attributes
C.LO		US.CAL	R W
<p>The parameter shows and sets the minimum analog output value. You can change the displayed value with the [Δ] and [▽] keys. To check the real voltage/current value on the output during calibration, measure it with a voltmeter/ammeter.</p> <p>Unit of measurement: Converter points</p> <p>Options: 0...65535</p>			

4.14.8. C.HIG - Setting analog output maximum

Acronym	Scrolling message	Submenu	Attributes
C.HIG		US.CAL	R W
<p>The parameter shows and sets the maximum analog output value. You can change the displayed value with the [Δ] and [▽] keys. To check the real voltage/current value on the output during calibration, measure it with a voltmeter/ammeter.</p> <p>Unit of measurement: Converter points</p> <p>Options: 0...65535</p>			

4.15. PASC0 – Setting level 0 password

Acronym	Scrolling message	Submenu	Attributes
PASC0	SET PASS0	Level 2	R W
<p>The parameter is used to set the password to access User Menu parameters. Default code = 10</p> <p>Unit of measurement: Number</p> <p>Options: 0...9999</p>			

4.16. PASC1 - Setting level 1 password

Acronym	Scrolling message	Submenu	Attributes
PASC1	SET PASS1	Level 2	R W
<p>The parameter lets you set the password for accessing level 1 configuration submenus. Default code = 1</p> <p>Unit of measurement: Number</p> <p>Options: 0...9999</p>			

4.17. PASC2 - Setting level 2 passwor.

Acronym	Scrolling message	Submenu	Attributes
PASC2	SET PASS2	Livello 2	R W
<p>The parameter lets you set the password for accessing level 2 configuration submenus. Default code = 2</p> <p>Unit of measurement: Number</p> <p>Options: 0...9999</p>			

4.18. FI.CFG - Entering the reset codĀ

Acronym	Scrolling message	Submenu	Attributes
FI.CFG	ENTER DEFAULT CONFIGURATION PASS	Livello 2	R W
<p>The parameter lets you set the code for resetting the indicator to factory configuration, which will delete all changes made. Default code: 99.</p> <p>ATTENTION! After you have set code 99, when you press the F key the indicator runs the Power-on procedure, as described in paragraph “3.2. Power-on sequence” on page 26.”</p> <p>Unit of measurement: Number</p> <p>Options: 0...9999</p>			

5. EXAMPLES AND APPLICATION NOTES

5.1. Control application

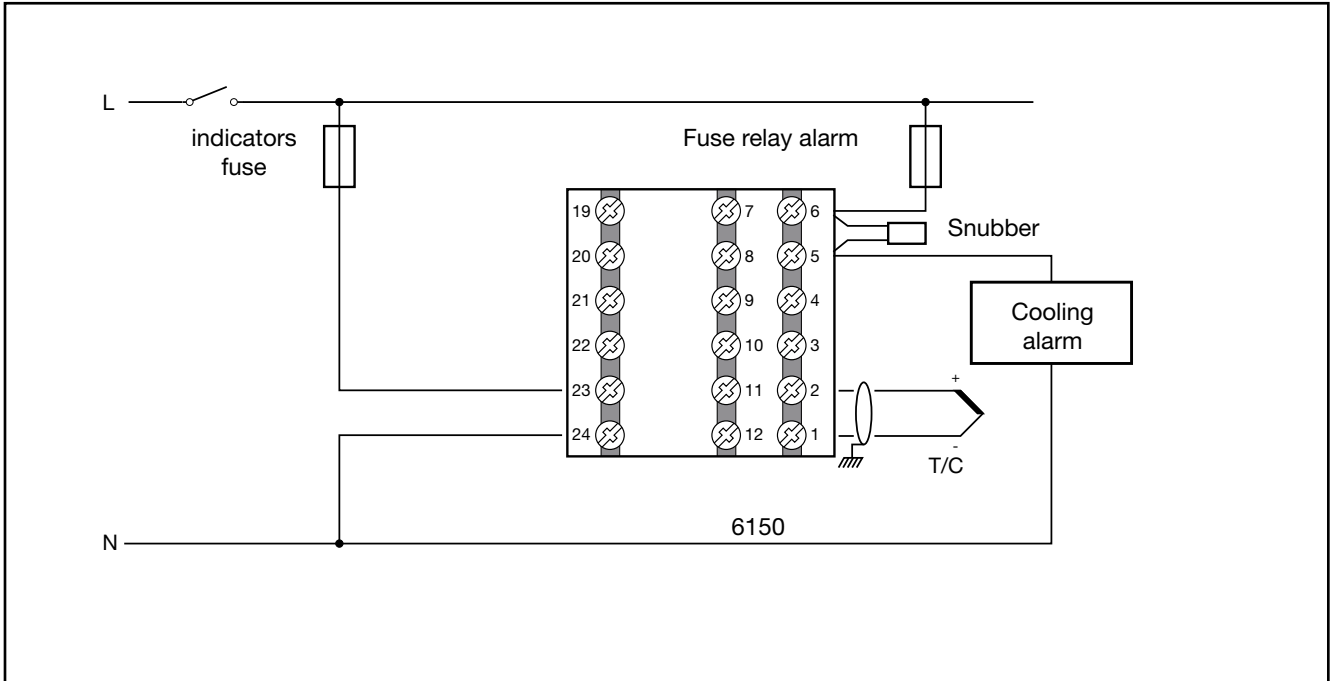
A TC measures temperature. Each branch of the circuit is protected by a fuse and the alarm relay is protected with a snubber circuit. Keep in mind one switch can control multiple indicators.

The diagram below shows the various connections.

With Quick Configuration you set:

- sensor type (TC);
- engineering units of temperature (°C);
- the temperature value that trips the alarm (ALRM1).

5.1.1. Connection diagram



5. EXAMPLES AND APPLICATION NOTES

5.2. 4-point input correction

The 4-point input correction lets you correct the reading of the main input and/or of the remote setpoint input by setting four values: A1, B1, A2 and B2.

To enable the function, set parameter Lin to 4.POIN (I.MAIN menu).

The limitations are:

- B1 must always be larger than A1;
- B1-A1 must be 25% larger than the full scale of the selected sensor.

The setting is limited to the preset scale LO.SCL... HI.SCL on the I.MAIN menu. The offset function (parameter OF.SCL, I.MAIN menu) remains active.

By using this function for linear scales (60 mV, 1 V, 5 V, 10 V, 20 mA) you can invert the scale.

The four values are set on the LINRZ menu as follows:

- A1 = STP.00
- B1 = STP.01
- A2 = STP.02
- B2 = STP.03

Example

Select Pt100 input with Lin = 4.POIN to obtain an RTD sensor with 4-point input correction.

Input Pt100 with:

- Lin = 4.POIN (Pt100 natural scale -200...850),
- DEC.P = 0
- LO.SCL = 0
- HI.SCL = 400

The reference points on the real curve (input) are:

- A1 = STP.00 = 50,
- B1 = STP.01 = 350,

B1-A1 = 300, which is larger by 212,5 (25% of 850).

The corresponding points on the corrected curve (indication) are:

- A2 = STP.02 = 120,
- B2 = STP.03 = 220.

With the corrected curve an input value of 200 is displayed as 170.

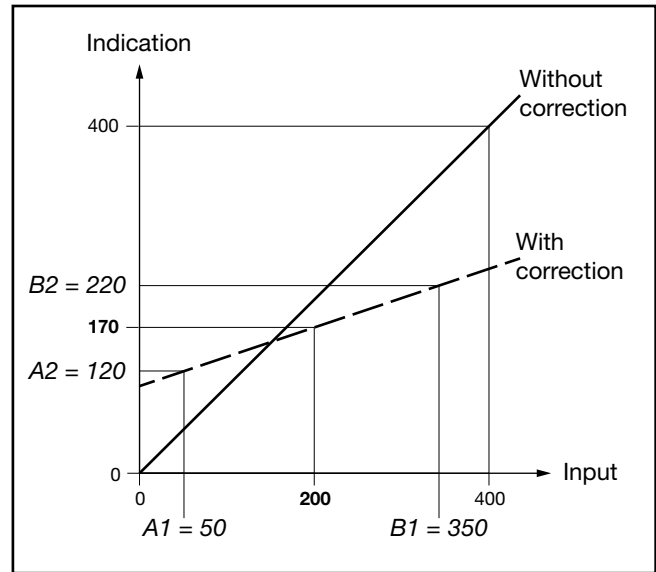
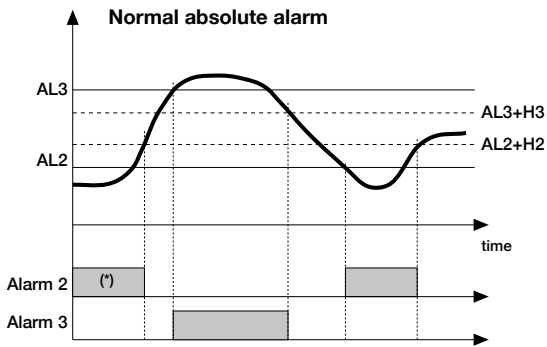


Figure 17 - Diagram of 4-point input correction, for the example (Pt100 input)

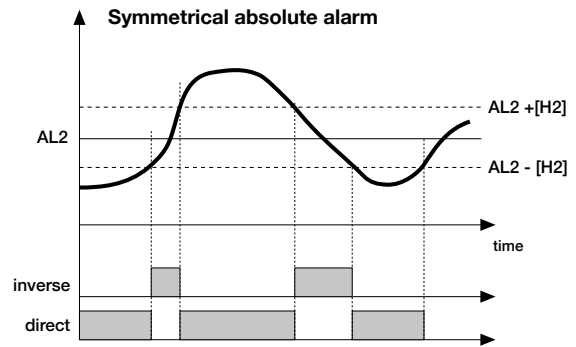
5.3. Alarms

5.3.1. Generic alarms AL2-4

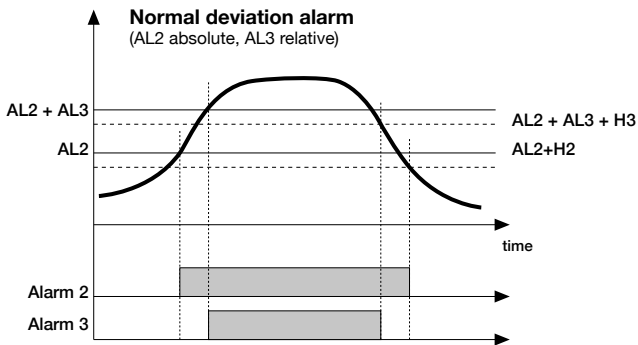
Note: AL1 is latched and only used for high limit control. Reset is required



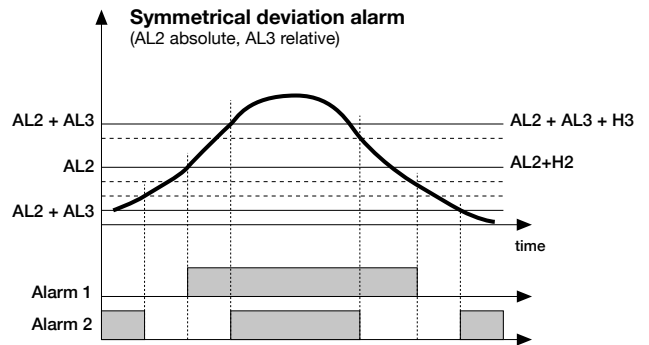
For AL2 inverse absolute alarm (min.) with positive H2, A2 t = 1
 (*) = OFF if disabling on power-on exists
 For AL3 direct absolute alarm (max) with negative H3, A3 t = 0



For AL2 inverse absolute, symmetrical alarm with hysteresis H2, A2 t = 5
 For AL2 direct absolute, symmetrical alarm with hysteresis H2, A2 t = 4



For AL2 direct absolute alarm (max) with negative H2, A2 t = 0
 For AL3 direct relative alarm (max) with negative H3, A3 t = 2



For AL2 direct absolute alarm (max) with negative H2, A2 t = 0
 For AL3 symmetrical deviation alarm H3, A3 t = 6

6. PROGRAMMING WITH PC

6.1. Indicator-PC connection

The indicator has a port to connect the device to a PC. The following photos show where the port is located on the different models.

The connection requires a special accessory cable (code F060800), which acts as a USB-serial interface/converter and communicates as a Virtual COM Port with a USB port on the computer.



Attention! To use this interface you have to install the VCP driver, downloadable from:
www.chromalox.com

When the indicator is connected to the PC you can configure it without applying power.

The instrument configuration memory is powered by the USB connection.

Connecting the indicator to the primary power supply while the USB cable is still connected DOES NOT activate normal Power-on. You must first disconnect the indicator from the PC and then apply primary power.

Note: Leaving the USB connected to the PC while the indicator is booting up will cause the unit to fail to boot. The cable must be disconnected when powering on the unit.

6.2. Programming Tool

6.2.1. C-PWR

The C-PWR software lets you:

- read and write the configuration of the indicator (set of parameters);
- save recipes on the PC (recipe archive);
- set the user configuration menu sequence and parameters;
- set message strings (3 selectable languages);
- transfer firmware updates.

6.2.1.1. System requirements

	Minimum	Recommended
Operating system	Windows XP SP2 or Windows Vista or Windows 7 (32 bit)	Windows 7 (64 bit)
Processor	Intel Pentium 1 GHz	Intel Core i5 2,5 Ghz or higher
RAM	2 GB	4 GB or higher
Free space on Hard Disk	2 GB	4 GB or higher
Resolution	XGA (1024 x 768 pixel)	SXGA (1280 x 1024 pixel) or higher
Browser	Microsoft Internet Explorer 8.0	Microsoft Internet Explorer 9.0 or higher
Serial port	RS232	RS232
DVD reader	Yes	Yes
USB port	1 USB 2.0	1 USB 2.0

7. OPERATOR GUIDE

7.1. Displays and keys

The display and keys for each model are described in paragraphs “1.3.1. Display and keys 6150” on page 8, and “1.5.1. Display and keys 4150” on page 12.

7.1.1. Navigating the menus

Keys are used for navigating menus and submenus, changing parameters, and confirming choices. Their function depends on the context and on how long they are pressed.



The LEDs above the keys not only give confirmation that each key has been pressed (by flashing), but also show which keys can be used in each situation.

The following navigation functions are assigned to the keys:



Scroll User Configuration menu (Setpoint, Alarm setpoints, Control output, etc.).

Each time the key is pressed, it confirms the value of the displayed parameter and goes to the next item on the menu.

Keep the key pressed for more than 2 seconds to enter the Programming/Configuration Menu.



Each time the key is pressed, you go back to the previous menu item or to the higher menu level, according to the context.

Keep the key pressed for more than 2 seconds to return to the Home page.



Press the key to enter a submenu or to lower the displayed parameter value, according to the context.



Press the key to raise the value of the displayed parameter.

When the process variable is displayed, if held down for at least 3 seconds in standard configuration the Power Button mutes alarms.

7.2. Power-on

The indicator runs a self-diagnostics test immediately after power-on.

During the test all segments of the display flash and a checksum is run.

The hardware resources present are also acquired.

If the self-diagnostics test detects no errors, the indicator enters normal functioning state (display shows Home page).

If any system errors are detected, the indicator displays the related information.

If the error is caused by a damaged program, update the firmware.

If the error is caused by incorrect configuration, reconfigure the indicator with PC and C-PWR software.

Errors are saved in a register and can be displayed with the Error function on the INFO menu.

7.3. Operation as indicator

The device's normal operating mode is indicator-only.

The display shows the following information:

- PV displays the process variable value;
- SV displays alarm 1 limit value
- by pressing the **F** key the PV display shows, in sequence the significant values that condition indicator function: alarm setpoints, etc., which can be changed if necessary (parameters in the user menu).

Keep the **F** key pressed for more than 2 seconds to enter the Programming/Configuration menu.

7.4. Errors during operation

If errors occur during normal operation, the display shows:

- the identifying code of the error on the PV display;

If provided during configuration of the indicator, a specific scrolling message appears on the SV display (model 6150) or on the F display (model 4150).

The most common error messages are:

- Lo** Process variable is below minimum scale limit (parameter LO.SCL on I.MAIN).
- Hi** Process variable is above maximum scale limit (parameter HI.SCL on I.MAIN).
- Err** PT100 in short circuit or input values below minimum limits (for example, thermocouple with incorrect connection) or 4...20 mA transmitter broken or not powered.
- Sbr** Sensor broken or input values above maximum limit.

7.5. Configuration (User menu)

Every operator has a freely accessible menu (no password required) on which he can configure indicator parameters.

The User Configuration menu can be customized with the C-PWR software, grouping up to 50 parameters from those available for indicators configuration (see chapter “4. Configuration” on page 32).

Among the parameters available are PASS0 and PASS1; you can add password entry to the user menu. In the example (p. 81) a password entry is used to allow alarms settings to be changed.

The indicator leaves the factory with a preconfigured user configuration menu (shown below for models 6150-x-xxx-00000-x-xxx, and 4150-x-xxx-00000-x-xxx). This menu can subsequently be modified. The related parameters are shown for models with options; the complete list of parameters is shown on the C-PWR user menu page.

Press the **[F]** key to access the User Configuration menu. C-PWR can be used to set the time delay before returning the menu to Home when no user activity is detected.

Example Menu user parameter PASS 1

	Description/ Scrolling message	Unit of measurement	Valid values	Note
ALRM1	Alarm 1 limit ALARM SETPOINT	scale points	LO.AL...HI.AL	Read-only value
ALRM2	Alarm 2 limit ALARM SETPOINT	scale points	LO.AL...HI.AL -999...999	Read-only value If absolute alarm. If deviation alarm.
ALRM3	Alarm 3 limit ALARM SETPOINT	scale points	LO.AL...HI.AL -999...999	Read-only value If absolute alarm. If deviation alarm.
ALRM4	Alarm 4 limit ALARM SETPOINT	scale points	LO.AL...HI.AL -999...999	Read-only value If absolute alarm. If deviation alarm.
PV . LOW	Process variable minimum peak value PROCESS VALUE MINIMUM PEAK	scale points	LO.SCL...HI.SCL	Read-only value Reset by holding down Δ + ∇ for a time > 2 seconds (**) or digital input function
PV . HIG	Process variable maximum peak value PROCESS VALUE MAXIMUM PEAK	scale points	LO.SCL...HI.SCL	Read-only value Reset by holding down Δ + ∇ for a time > 2 seconds (**) or digital input function
PV . PPK	Process variable maximum peak value PROCESS VALUE PEAK-PEAK	scale points	LO.SCL...HI.SCL	Read-only value Reset by holding down Δ + ∇ for a time > 2 seconds (**) or digital input functio
TM . AL1	ALARM1 alarm condition persistence (*) TIME OF ALARM1 OVER THRESHOLD	mm.ss or hh.mm (see parameter tY.tM)	00.00...99.59	Read-only value
CN . AL1	ALRM1 alarm event count (*) COUNTER OF ALARM1 OVER THRESHOLD	-	0...9999	Read-only value
PASS0	Insert password 0			
0				
	<i>If the password is correct you are in the menu, otherwise Home</i>			

7. OPERATOR GUIDE

Display / setting of alarm thresholds are subject to setting
PASS 1

	Description/ Scrolling message	Unit of measurement	Valid values	Notes
ALRM1	Alarm 1 limit ALARM SETPOINT	scale points	LO.AL...HI.AL	
ALRM2	Alarm 2 limit ALARM SETPOINT	scale points	LO.AL...HI.AL -999...999	If absolute alarm. If deviation alarm.
ALRM3	Alarm 3 limit ALARM SETPOINT	scale points	LO.AL...HI.AL -999...999	If absolute alarm. If deviation alarm.
ALRM4	Alarm 4 limit ALARM SETPOINT	scale points	LO.AL...HI.AL -999...999	If absolute alarm. If deviation alarm.
TM.AL1	ALARM1 alarm condition persistence (*) TIME OF ALARM1 OVER THRESHOLD	mm.ss or hh.mm (see parameter tY:tM)	00.00...99.59	Read-only value Reset by holding down + for a time > 2 seconds (**) or digital input functio
CN.AL1	ALARM1 alarm event count (*) COUNTER OF ALARM1 OVER THRESHOLD	-	0...9999	Read-only value Reset by holding down + for a time > 2 seconds (**) or digital input functio
Home page				

(*) the value is saved when the instrument is turned off

(**) Key reset can be inhibited using the Read-only option in the user menu definition from C-PWR

8. MAINTENANCE



Attention! The indicator must only be repaired by technicians trained and authorized by Chromalox. Any attempt by unauthorized personnel to repair or change the hardware characteristics of the indicator will void the warranty.

8.1. Replacing the indicator

The instrument (display + electronic circuits) can be replaced without having to remove the entire indicator from the panel and disconnect its wiring.

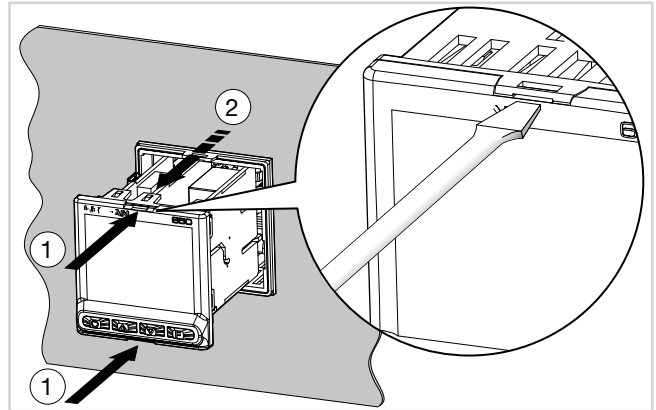
First remove power to the indicator and to any devices connected to it.

Then release the top and bottom of the faceplate and remove the instrument (see figure).

Insert the new instrument and restore power.



Attention! Replace the entire indicator if the blade contacts inside the instrument or the protective case show evidence of burns or are not in perfect condition.



8.2. Replacing the gasket

The gasket may lose resiliency over time and due to environmental conditions.

To maintain IP65 faceplate protection, replace the gasket (between faceplate and case and between case and panel) at regular intervals.

To replace the gasket between the case and the panel you have to disassemble the indicator from the panel and then reassemble it; to replace the gasket between the faceplate and the case, follow the instructions for replacing the indicator).

8.3. Cleaning

To clean the faceplate and the case, use only a soft cloth dampened with water or alcohol. DO NOT use hydrocarbon solvents (trichloroethylene, gasoline, etc.).

Do not use compressed air to remove dust from the electronic cards. If necessary, use a clean brush with soft bristles.

You can also clean the inside of the indicator if necessary. To do this, first remove power to the indicator and to any devices connected to it. Then slide out the indicator as explained in paragraph "8.1. Replacing the indicator" to access and clean the inside of the case.

8.4. Disposal



The indicators must be disposed of in conformity to current laws and regulations. If not correctly disposed of, some of the components used in the devices may harm the environment.

9. TECHNICAL DATA

OPERATOR INTERFACE		6150	4150
DISPLAY	Type	LCD black background	
	Screen area (L x H)	35x30 mm (1.38" x 1.18")	83x68 mm 3,26" x 2.68")
	Lighting	Backlit with LEDs, life > 40.000 hours @ 25 °C * with brightness level BACKL=0.	
	PV Display	Number of digits: 4 to 7 segments, with decimal point	
		Digit height: 17 mm	Digit height: 23 mm
		Color: white or "custom"	
	SV Display	Number of digits: 5 to 14 segments, with decimal point Digit height: 7.5 mm (0.29") Color: green or "custom"	Number of digits: 4 to 7 segments, with decimal point Digit height: 11 mm Color: green or "custom"
	F Display		Number of digits: 7 to 14 segments, with decimal point Digit height: 9 mm Color: ambra or "custom"
	Engineering units	Selectable, °C, °F or custom ¹ Color: same as PV display	
Alarms state signals	Number: 4 (1, 2, 3, 4) Color: red		
Bargraph indicator, configurable		Type: graphic bargraph, 11 segments Deviation between AL1 and PV	
KEYPAD		Keys number: 4, silicone Type: mechanical	Keys number: 6, silicone Type: mechanical

1) Programming is done with the C-PWR configuration program.

INPUTS		6150	4150
MAIN INPUT	Sensor type	TC, RTD (PT100, JPT100), infrared sensor (only for 1250L), DC linear sensor	
	Accuracy	TC inputs: Calibration accuracy: < +/- (0.25% of reading value in °C +0.1°C) Linearization accuracy: 0.1% of reading value Cold junction accuracy: < +/- 1.5°C a 25°C room temperature) Cold junction compensation: > 30:1 rejection to the change of the room RTD input: Calibration accuracy: < +/- (0.15% of reading value in °C +0.4°C) Temperature drift: < +/- (0.005% of reading value in °C +0.015°C)/°C from 25°C room temperature Linearization accuracy: 0.1% of reading value Linear inputs: Calibration accuracy:< 0.1% full scale Temperature drift: < +/- 0.005% full scale /°C at 25°C room temperature	
	Sampling time	60 ms / 120 ms, selectable	
	Digital filter	0.0...20.0 s	
	Temperature unit of measurement	Degrees C / F, selectable from keypad	
	Signal interval	Type: linear Scale: -1999...9999, settable decimal point	
	TC (thermocouple) input	Thermocouple: J, K, R, S, T, C, D, B, E, L, L GOST, U, G, N, Pt20Rh-Pt40Rh Linearization: ITS90 or custom	
RTD (resistance thermometer) input	Resistance thermometer: PT100, JPT100 Input impedance (Ri): ≥ 30 kΩ Linearization: DIN 43760 or custom Max. line resistance: 20 Ω		
DC linear input	0...60 mV input impedance (Ri): > 70 kΩ 0...1 V input impedance (Ri): > 15 kΩ 0...5 V / 0...10 V input impedance (Ri): > 30 kΩ 0/4...20 mA input impedance (Ri): 50 Ω Linearization: linear or custom		
DIGITAL INPUTS	Type	voltage dry contact, or NPN 24 V - 4.5 mA, or PNP 12/24 V - max 3.6 mA (for detail see electrical connections)	
	Isolation	500 V	
	Number	1 max	5 max

OUTPUTS		6150	4150
	Relay (R)	Number: 4 max Type of relay contact: NO Max. current: 5 A, 250 VAC Minimum load: 5 V, 10 mA Life cycle: > 100,000 operations Double isolation	Number: 4 max Type of relay contact: NO Max. current: 5 A, 250 VAC / 30 VDC, cosφ = 1
	Analog retransmission (A1)	Number: 1 max 0...10 V, max 20 mA, R _{out} : > 500 Ω 0...20 mA, 4...20 mA, R _{out} : < 500 Ω Resolution: 12 bit Isolated from main input	
ALARMS	Number of alarm functions	4 max, assignable to an output	
	Possible configurations	Maximum, minimum, symmetric, absolute/relative, exclusion at firing, memory, reset from keypad and/or contact,	

9. TECHNICAL

CONTROL FUNCTIONS		6150	4150
DIAGNOSTIC		Short circuit or open circuit	
RETENTIVE MEMORY	Type	EEPROM	
	Max. number of writes	1,000.000	
SERIAL INTERFACE			
		Type: RS485 Baudrate: 1200, 2400, 4800, 9600, 19.200, 38.400, 57.600, 115.200 bit/s Protocoll: MODBUS RTU Isolated from main input	

1) Programming is done with the C-PWR configuration program.

GENERAL DATA		6150	4150
POWER SUPPLY	Operating voltage	100...240 VAC/VDC $\pm 10\%$, 50/60 Hz (on request 20...27 VAC/VDC $\pm 10\%$)	
	Power dissipation	5 W max	10 W max
	Protections	Overvoltage 300 V / 35 V	
	Connection	Screw terminals and crimp connector, max. wire section 1 mm ²	
CONNECTIONS	Serial configuration port (for USB connection)	Connector: microUSB	
	Inputs and outputs	Screw terminals and crimp connector, max. wire section 2,5 mm ²	
AMBIENT CONDITIONS	Use	Indoor	
	Altitude	2000 m max	
	Operating temperature	-10 ... +55 °C (as per IEC 68-2-14)	
	Storage temperature	-20 ... +70 °C (as per IEC 68-2-14)	
	Relative humidity	20...85% RH non-condensing (as per IEC 68-2-3)	
PROTECTION LEVEL		IP 65 on front panel (as per IEC 68-2-3)	
ASSEMBLY	Positioning	On panel, removable faceplate	
	Installation regulations	Installation category: II; Pollution degree: 2 Isolation: double	
DIMENSIONS		48 × 48 mm (1/16 DIN) (1.89" x 1.89"), Depth: 80 mm (3.15")	96 × 96 mm (1/4 DIN) (3.78" x 3.78") Depth: 80 mm (3.15")
WEIGHT		0.16 kg (35 lb)	0.34 kg (0,74 lb)
CE STANDARDS	EMC (electromagnetic compatibility)	Conforms to directive 2014/30/EU with reference to standard EN 61326-1 emission in industrial environment class A emission in residential environment class B	
	Safety LVD	conforms to directive 2014/35/EU with reference to standard EN61010-1	

10. ORDER METHODS

10.1. Model list

6150 (1/16 DIN) Standard Offering Order Table													
Power Supply Voltage	Model	Inputs			Outputs						Logic functions	Total Number of Outputs	
		Digital	CT	Remote Setpoint	Relay	Triac	SSR Driver	Analog I	Analog Retrains	RS485			
20-27V	6150-R-RR0-00000-0-G				3								3 outputs
100-240V	6150-R-RR0-00000-1-G				3								
20-27V	6150-R-RR0-01011-0-G	1			3				1	•			4 outputs
100-240V	6150-R-RR0-01011-1-G	1			3				1	•			

4150 (1/4 DIN) Standard Offering Order Table													
Power Supply Voltage	Model	Inputs			Outputs						Logic functions	Total Number of Outputs	
		Digital	CT	Remote Setpoint	Relay	Triac	SSR Driver	Analog I	Analog Retrains	RS485			
20-27V	4150-R-RR0-00000-0-G				3								3 outputs
100-240V	4150-R-RR0-00000-1-G				3								
20-27V	4150-R-RR0-01051-0-G	5			3				1	•			4 outputs
100-240V	4150-R-RR0-01051-1-G	5			3				1	•			

Bold Model Codes are Stocked

If a custom model is required please contact your local Chromalox representative, minimum of 5 pieces

11. ACCESSORIES

Code	Description
0149-50200	Cable for programming with PC, USB-TTL 3 V with USB – microUSB connectors, length 1.8 m
0149-50201	Gasket for 6150
0149-50202	Gasket for 4150
0149-50203	Fastening Clip for 6150
0149-50204	Fastening Clip for 4150

FM	FM approvals project NO: 0003054712
UL	Conformity C/UL/US File no. E216851
CE	EMC (electromagnetic compatibility): conforms to directive 2014/30/EU with reference to standard EN 61326-1 emission in industrial environment class A emission in residential environment class B Safety LVD: conforms to directive 2014/35/EU with reference to standard EN61010-1

Limited Warranty:

Please refer to the Chromalox limited warranty applicable to this product at
<http://www.chromalox.com/customer-service/policies/termsofsale.aspx>.

Chromalox, Inc.
103 Gamma Drive
Pittsburgh, PA 15238
(412) 967-3800
www.chromalox.com