



# IAMS

Models No. 0002  
0022 / 0020

Drawing No. LP1109  
Version No. 104  
Revision Date 19/06





# IAMS 0002 / 0022 / 0020

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**GENERAL**

## **WARNING**

The IAMS devices are designed for connection to hazardous electric voltages.

Ignoring this warning can result in severe personal injury or mechanical damage.

To avoid the risk of electric shock and fire, the safety instructions of this manual must be observed and the guidelines followed.

The specifications must not be exceeded, and the device must only be applied as described in the following.

Prior to the commissioning of the device, this manual must be examined carefully.

Only qualified personnel (technicians) should install these devices. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



**HAZARDOUS  
VOLTAGE**

## **WARNING**

Until the devices are fixed, do not connect hazardous voltages to the devices.

The following operations should only be carried out on a disconnected devices and under ESD safe conditions:

General mounting, connection and disconnection of wires.  
Troubleshooting the device.



**Repair of the device must be done by Red Lion Controls only.**



**INSTAL-  
LATION**

## **WARNING**

To keep the safety distances, the relay contacts on the devices must not be connected to both hazardous and non-hazardous voltages at the same time.

The IAMS devices must be mounted on a DIN rail according to DIN 46277.



## **WARNING**

Do not open the front plate of the devices as this will cause damage to the connector for the display / programming module PGMMOD00. This devices contains no DIP-switches or jumpers.

## SYMBOL IDENTIFICATION



**Triangle with an exclamation mark:** Warning / demand.  
Potentially lethal situations.



**The CE mark** proves the compliance of the device with the essential requirements of the directives.



**The double insulation symbol** shows that the device is protected by double or reinforced insulation.

## SAFETY INSTRUCTIONS

### DEFINITIONS

**Hazardous voltages** have been defined as the ranges: 75 to 1500 Volt DC, and 50 to 1000 Volt AC.

**Technicians** are qualified persons educated or trained to mount, operate, and also troubleshoot technically correct and in accordance with safety regulations.

**Operators**, being familiar with the contents of this manual, adjust and operate the knobs or potentiometers during normal operation.

### RECEIPT AND UNPACKING

Unpack the device without damaging it. The packing should always follow the device until this has been permanently mounted.

Check at the receipt of the module whether the type corresponds to the one ordered.

### ENVIRONMENT

Avoid direct sunlight, dust, high temperatures, mechanical vibrations and shock, as well as rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation.

All devices fall under Installation Category II, Pollution Degree 1, and Insulation Class II.

### MOUNTING

Only technicians who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these should connect the devices. Should there be any doubt as to the correct handling of the device, please contact your local distributor or, alternatively,

**Red Lion Controls**  
**[www.redlion.net](http://www.redlion.net)**

Mounting and connection of the devices should comply with national legislation for mounting of electric materials, i.e. wire cross section, protective fuse, and location. Descriptions of input / output and supply connections are shown in the block diagram and side label.

The following apply to fixed hazardous voltages-connected devices:

The max. size of the protective fuse is 10 A and, together with a power switch, it should be easily accessible and close to the device. The power switch should be marked with a label indicating that it will switch off the voltage to the device.

### **UL INSTALLATION REQUIREMENTS**

Use 60/75°C copper conductors only

For use only in pollution degree 2 or better

Max. ambient temperature ..... 60°C

Max. wire size..... AWG 26-14

UL file number ..... E324843

### **CALIBRATION AND ADJUSTMENT**

During calibration and adjustment, the measuring and connection of external voltages must be carried out according to the specifications of this manual. The technician must use tools and instruments that are safe to use.

### **NORMAL OPERATION**

Operators are only allowed to adjust and operate devices that are safely fixed in panels, etc., thus avoiding the danger of personal injury and damage. This means there is no electrical shock hazard, and the device is easily accessible.

### **CLEANING**

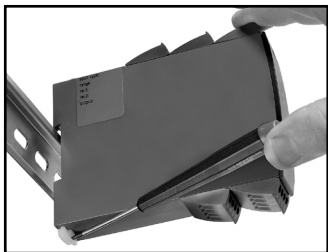
When disconnected, the device may be cleaned with a cloth moistened with distilled water.

### **LIABILITY**

To the extent that the instructions in this manual are not strictly observed, the customer cannot advance a demand against Red Lion Controls that would otherwise exist according to the concluded sales agreement.

# HOW TO DISMANTLE THE IAMS 0002 / 0022 / 0020

First, remember to demount the connectors with hazardous voltages.



**Picture 1:**

Detach the device from the DIN rail by lifting the bottom lock.

## **When front LED lights red / display shows AO.ER**

IAMS0002 and IAMS0022 are designed as SIL 2 devices with a high safety level.

Therefore, a continuous measurement of the outgoing current is carried out on a 4...20 mA and 20...4 mA output signal. If the current output signal is different from the internal calculated output value or the current output is 0 (due to e.g. an open circuit breakage), an error mode switches on the red front LED.

This function is not a default option but must be actively selected via the programming menu (S4-20 & S20-4).

The error mode can only be reset by switching off and then switching on the supply voltage to the device.

## IAMS 0002 / 0022 / 0020

- *Input for RTD, TC, Ohm, potentiometer, mA and V*
- *2-wire supply > 16 V*
- *2 adjustable alarm limits*
- *FM-approved for installation in Div. 2*
- *Output for current, voltage and 2 relays*
- *Universal AC or DC supply*

### Advanced features

- Programmable by way of detachable display front (PGMMOD 00/C1), process calibration, signal simulation, password protection, error diagnostics and selection of help text available in several languages.

### Application

- Linearised, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analogue current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control with 2 pairs of potential-free relay contacts and analogue output.
- Process control with 2 pairs of potential-free relay contacts which can be configured to suit any application.
- Process control with standard analogue output.
- Galvanic separation of analogue signals and measurement of floating signals.
- The IAMS0002 and IAMS0022 have been designed according to strict safety requirements and is thus suitable for application in SIL 2 installations.
- Trip amplifier with window function allowing the relay to change state within a high and a low setpoint on the input span.
- Relay latch function, where the relay is activated and can only be reset manually.
- Sophisticated sensor error surveillance, where one relay holds the state immediately prior to the sensor error, thus allowing the process to continue. The other relay can be set for sensor error alarm so that the defect sensor can be replaced immediately.



## Technical characteristics

- When the devices are used in combination with a programming front (PGMMOD 00/C1), all operational parameters can be modified to suit any application. As the devices are designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates normal operation and malfunction. A yellow LED is ON for each active output relay.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.
- 4-port 2.3 kVAC galvanic isolation. (IAMS0022)

## PGM DISPLAY / PROGRAMMER FRONT



### Functionality

The simple and easily understandable menu structure and the explanatory help texts guide you effortlessly and automatically through the configuration steps, thus making the product very easy to use. Functions and configuration options are described in the section "Configuration / operating the function keys".

### Application

- Communications interface for modification of operational parameters in the IAMS devices.
- Can be moved from one device to another and download the configuration of the first transmitter to subsequent transmitters.
- Fixed display for readout of process data and status.

### Technical characteristics

- LCD display with 4 lines; Line 1 (H=5.57 mm) shows input signal, line 2 (H=3.33 mm) shows units, line 3 (H=3.33 mm) shows analogue output or tag no. and line 4 shows communication and relay status.
- Programming access can be blocked by assigning a password. The password is saved in the transmitter in order to ensure a high degree of protection against unauthorised modifications to the configuration.

### Mounting / installation

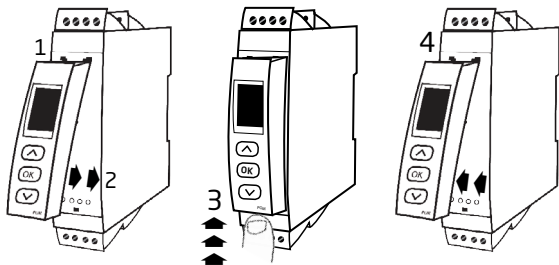
- Click PGM onto the front of the device.

## MOUNTING / DEMOUNTING THE PGMMOD

- 1: Insert the tabs of PGMMOD into the holes at the top of the device.
- 2: Swing PGMMOD into place.

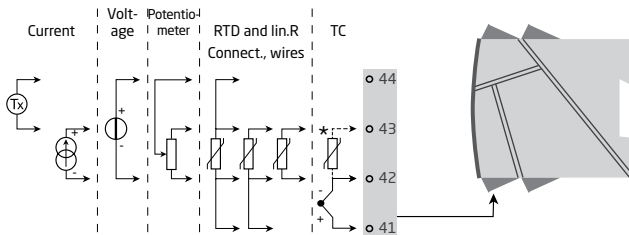
### Demounting of PGMMOD

- 3: Push the release button on the bottom of PGMMOD and swing PGMMOD up.



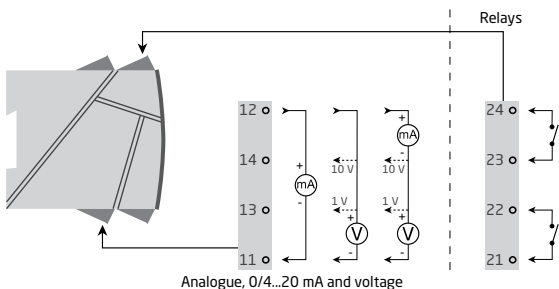
# APPLICATIONS

## Input signals:

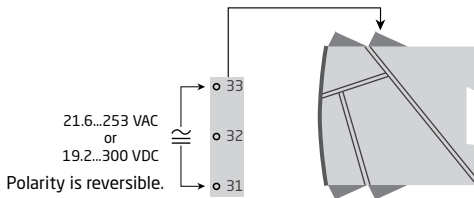


See the connection drawing on page 20.

## Output signals:



## Supply:



## Electrical specifications

### Environmental conditions

Specifications range .....	-20°C to +60°C
Calibration temperature .....	20...28°C
Relative humidity .....	< 95% RH (non-cond.)
Protection degree .....	IP20

### Mechanical specifications

Dimensions (HxBxD) .....	109 x 23.5 x 104 mm
Dimensions, with PGMMOD (HxBxD) .....	109 x 23.5 x 116 / 131 mm
Weights	
IAMS0002 .....	145 g (5.1 oz)
IAMS0020 .....	159 g (5.6 oz)
IAMS0022 .....	170 g (6.0 oz)
Max. wire size .....	1 x 2.5 mm <sup>2</sup> stranded wire
Screw terminal torque .....	0.5 Nm
Vibration .....	IEC 60068-2-6 : 2007 (IAMS0002)
	IEC 60068-2-6 (IAMS0022/IAMS0020)
2...13.2 Hz .....	±1 mm
13.2...100 Hz .....	±0.7 g

### Common specifications

Supply voltage, universal .....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. consumption .....	≤ 2.0 W
Fuse .....	400 mA SB / 250 VAC
Isolation voltage, test / operation .....	2.3 kVAC / 250 VAC
Communications interface .....	Communication enabler PGMMODC1
Signal / noise ratio .....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%):	
Temperature input .....	≤ 1 s
mA / V input .....	≤ 400 ms

Accuracy, the greater of the general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	$\leq \pm 0.1\%$ of span	$\leq \pm 0.01\%$ of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
mA	$\leq \pm 4 \mu\text{A}$	$\leq \pm 0.4 \mu\text{A} / ^\circ\text{C}$
Volt	$\leq \pm 20 \mu\text{V}$	$\leq \pm 2 \mu\text{V} / ^\circ\text{C}$
Pt100	$\leq \pm 0.2^\circ\text{C}$	$\leq \pm 0.01^\circ\text{C} / ^\circ\text{C}$
Linear resistance	$\leq \pm 0.1 \Omega$	$\leq \pm 0.01 \Omega / ^\circ\text{C}$
Potentiometer	$\leq \pm 0.1 \Omega$	$\leq \pm 0.01 \Omega / ^\circ\text{C}$
TC type: E, J, K, L, N, T, U	$\leq \pm 1^\circ\text{C}$	$\leq \pm 0.05^\circ\text{C} / ^\circ\text{C}$
TC type: R, S, W3, W5, LR	$\leq \pm 2^\circ\text{C}$	$\leq \pm 0.2^\circ\text{C} / ^\circ\text{C}$
TC type: B 85...200°C	$\leq \pm 4^\circ\text{C}$	$\leq \pm 0.4^\circ\text{C} / ^\circ\text{C}$
TC type: B 200...1820°C	$\leq \pm 2^\circ\text{C}$	$\leq \pm 0.2^\circ\text{C} / ^\circ\text{C}$

EMC immunity influence.....	< $\pm 0.5\%$ of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst .....	< $\pm 1\%$ of span

Auxiliary supplies:

2-wire supply (terminal 44...43)..... 25...16 VDC / 0...20 mA

### RTD, linear resistance and potentiometer input

Input for RTD types:

Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000  
Ni50, Ni100, Ni120, Ni1000, Cu10, Cu20, Cu50, Cu100

Input type	Min. value	Max. value	Standard
Pt10...Pt1000	-200°C	+850°C	IEC 60751
Ni50...Ni1000	-60°C	+250°C	DIN 43760
Cu10...Cu100	-200°C	+260°C	$\alpha = 0,00427$
Lin. R	0 $\Omega$	10000 $\Omega$	-
Potentiometer	10 $\Omega$	100 k $\Omega$	-

Cable resistance per wire (max.), RTD..... 50  $\Omega$

Sensor current, RTD..... Nom. 0.2 mA

Effect of sensor cable resistance

(3- / 4-wire), RTD..... < 0.002  $\Omega / \Omega$

Sensor error detection, RTD..... Yes

Short circuit detection, RTD..... < 15  $\Omega$

## TC input

Type	Min. value	Max. value	Standard
B	0°C	+1820°C	IEC 60584-1
E	-100°C	+1000°C	IEC 60584-1
J	-100°C	+1200°C	IEC 60584-1
K	-180°C	+1372°C	IEC 60584-1
L	-200°C	+900°C	DIN 43710
N	-180°C	+1300°C	IEC 60584-1
R	-50°C	+1760°C	IEC 60584-1
S	-50°C	+1760°C	IEC 60584-1
T	-200°C	+400°C	IEC 60584-1
U	-200°C	+600°C	DIN 43710
W3	0°C	+2300°C	ASTM E988-90
W5	0°C	+2300°C	ASTM E988-90
LR	-200°C	+800°C	GOST 3044-84

### Cold junction compensation (CJC)

via internal CJC sensor .....  $\pm(2.0^{\circ}\text{C} + 0.4^{\circ}\text{C} * \Delta t)$

$\Delta t$  = internal temperature - ambient temperature

Sensor error detection, all TC types..... Yes

Sensor error current:

when detecting..... Nom. 2  $\mu\text{A}$

else ..... 0  $\mu\text{A}$

### Current input

Measurement range..... 0...20 mA

Programmable measurement ranges..... 0...20 and 4...20 mA

Input resistance..... Nom. 20  $\Omega$  + PTC 50  $\Omega$

Sensor error detection:

Loop break 4...20 mA..... Yes

### Voltage input

Measurement range..... 0...12 VDC

Programmable measurement ranges..... 0...1 / 0.2...1 / 0...5 / 1...5 /

0...10 and 2...10 VDC

Input resistance..... Nom. 10 M $\Omega$



## Current output

Signal range (span) .....	0...20 mA
Programmable signal ranges.....	0...20 / 4...20 / 20...0 / 20...4 mA
Load (max.).....	20 mA / 800 $\Omega$ / 16 VDC
Load stability.....	$\leq 0.01\%$ of span / 100 $\Omega$
Sensor error detection.....	0 / 3.5 / 23 mA / none
NAMUR NE 43 Upscale / Downscale .....	23 mA / 3.5 mA
Output limitation:	
on 4...20 and 20...4 mA signals.....	3.8...20.5 mA
on 0...20 and 20...0 mA signals.....	0...20.5 mA
Current limit .....	$\leq 28$ mA

## Voltage output

Signal range.....	0...10 VDC
Programmable signal ranges.....	0...1 / 0.2...1 / 0...10 / 0...5 / 1...5 / 2...10 / 1...0 / 1...0.2 / 5...0 / 5...1 / 10...0 and 10...2 V
Load (min.).....	500 k $\Omega$

## Ex / I.S. approval

FM, applicable in.....	Class I, Div. 2, Group A, B, C, D Class I, Div. 2, Group IIC Zone 2
Max. ambient temperature for T5 .....	60°C

## Relay outputs

Relay functions.....	Setpoint, Window, Sensor error, Latch, Power and Off
Hysteresis.....	0...100%
On and Off delay.....	0...3600 s
Sensor error detection.....	Break / Make / Hold
Max. voltage .....	250 VRMS
Max. current.....	2 A / AC or 1 A / DC
Max. AC power .....	500 VA

## Observed authority requirements

	Standard
EMC 2004/108/EC .....	EN 61326-1 (IAMS0002)
EMC 2014/30/EU.....	EN 61326-1 (IAMS 0022 / 0020)
LVD 2006/95/EC.....	EN 61010-1 (IAMS0002)
LVD 2014/35/EU .....	EN 61010-1 (IAMS 0022 / 0020)
FM .....	3600, 3611, 3810 and ISA 82.02.01
UL, Standard for Safety.....	UL 508

**of span** = of the currently selected measurement range

## Visualisation in the PGM of sensor error detection and input signal outside range

Sensor error check:	
Configuration	Sensor error detection:
R1, ERR.ACT=NONE - R2, ERR.ACT=NONE, OUT.ERR=NONE.	OFF
Else:	ON

Outside range readout (IN.LO, IN.HI): If the valid range of the A/D converter or the polynomial is exceeded			
Input	Range	Readout	Limit
VOLT	0...1 V / 0.2...1 V	IN.LO	< -25 mV
		IN.HI	> 1.2 V
	0...10 V / 2...10 V	IN.LO	< -25 mV
		IN.HI	> 12 V
CURR	0...20 mA / 4...20 mA	IN.LO	< -1.05 mA
		IN.HI	> 25.05 mA
LIN.R	0...800 Ω	IN.LO	< 0 Ω
		IN.HI	> 1075 Ω
	0...10 kΩ	IN.LO	< 0 Ω
		IN.HI	< 110 kΩ
POTM	-	IN.LO	< -0.5 %
		IN.HI	> 100.5 %
TEMP	TC / RTD	IN.LO	< temperature range -2°C
		IN.HI	> temperature range +2°C

Display readout below min.- / above max. (-1999, 9999):			
Input	Range	Readout	Limit
All	All	-1999	Display readout < -1999
		9999	Display readout > 9999

### Sensor error detection limits

Sensor error detection (SE.BR, SE.SH):			
Input	Range	Readout	Limit
CURR	Loop break (4...20 mA)	SE.BR	<= 3.6 mA; > = 21 mA
POTM	All, SE.BR on all 3-wire	SE.BR	> ca. 126 kΩ
LIN.R	0...800 Ω	SE.BR	> ca. 875 Ω
	0...10 kΩ	SE.BR	> ca. 11 kΩ
TEMP	TC	SE.BR	> ca. 750 kΩ / (1.25 V)
	RTD, 2-, 3-, and 4-wire No SE.SH for Cuxx, Pt10, Pt20 and Pt50	SE.BR	> ca. 15 kΩ
		SE.SH	< ca. 15 Ω

## Error indications

Readout at hardware error		
Error search	Readout	Error cause
Test of internal CJC sensor	CJ.ER	CJC sensor defect or temperature outside range
Checksum test of the configuration in FLASH	FL.ER	Error in FLASH
Check measurement of analogue output current*	AO.ER	1) No load on the current output (only S4...20/S20...4 mA)
Communications test PGM / device	NO.CO	Connection error
Check that input signal matches input configuration	IN.ER	1) Error levels on input
Check that saved configuration in PGM matches device	TY.ER	Configuration is not IAMS 0002 / 0022 / 0020

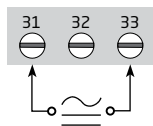
Error indications in the display flash once per second. The help text explains the error.

\* Does not apply to IAMS0020.

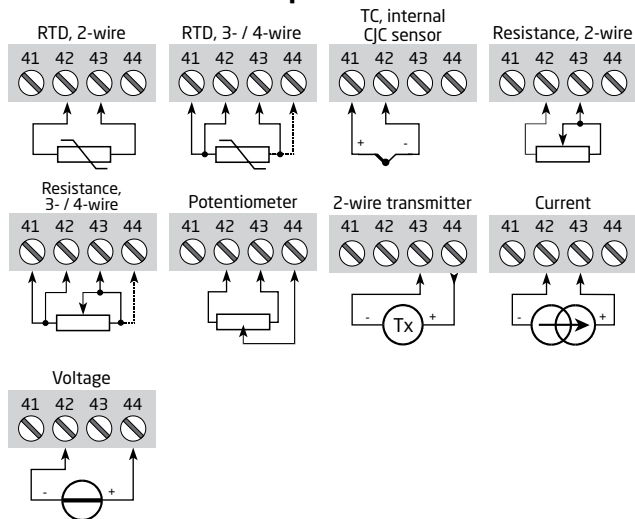
1) The error is reset by switching off and then switching on the supply voltage to the device.

# CONNECTIONS

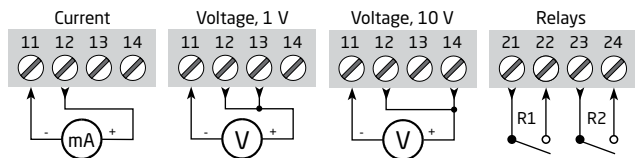
## Supply:



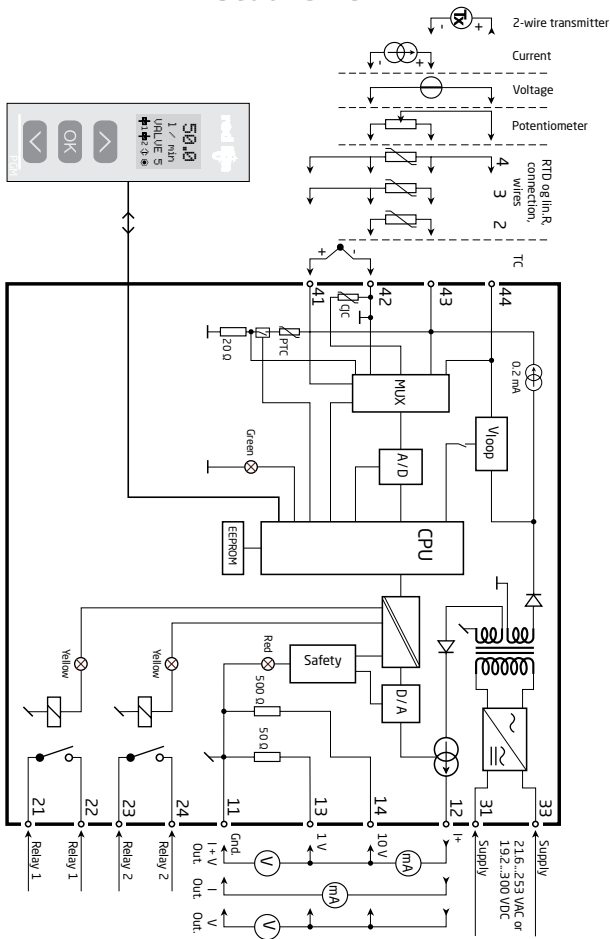
## Inputs:



## Outputs:



# BLOCK DIAGRAM



# CONFIGURATION / OPERATING THE FUNCTION KEYS

Documentation for routing diagram.

## In general:

When configuring the IAMS devices, you will be guided through all parameters and you can choose the settings which fit the application. For each menu there is a scrolling help text which is automatically shown in line 3 on the display.

Configuration is carried out by using the 3 function keys:

- ⬆ will increase the numerical value or choose the next parameter
- ⬇ will decrease the numerical value or choose the previous parameter
- OK will accept the chosen value and proceed to the next menu

When configuration is completed, the display will return to the default state 1.0. See the reference diagram on page 28.

Pressing and holding OK will return to the previous menu or return to the default state (1.0) without saving the changed values or parameters.

If no key is activated for 1 minute, the display will return to the default state (1.0) without saving the changed values or parameters.

## Further explanations:

**Fast setpoint adjustment and relay test:** These menus allow you to make a quick setpoint change and relay test when the FastSet menu is activated. This function can only be activated when the relays are set for setpoint function and are controlled by a setpoint.

Pressing ⬆ and ⬇ simultaneously will activate a relay test and change the state of the relay.

Pressing OK will save the setpoint change.

Holding down OK for more than 1 second will return the unit to the default state without saving the setpoint change.

**Password protection:** Programming access can be blocked by assigning a password. The password is saved in the transmitter in order to ensure a high degree of protection against unauthorised modifications to the configuration. Default password 2008 allows access to all configuration menus.

## Signal and sensor error info via display front PGMMOD00

Sensor error (see limits in the table) is displayed as SE.BR (sensor break) or SE.SH (sensor short). Signals outside the selected range (not sensor error, see table for limits) are displayed as IN.LO indicating low input signal or IN.HI indicating high input signal. The error indication is displayed in line 3 as text and at the same time the backlight flashes. Line 4 of the display is a status line which displays status of relay 1 and relay 2, COM (flashing bullet) indicating correct functioning of PGMMOD00 and arrow up/down which indicates tendency readout of the input signal. If the figure 1 or figure 2 flashes, the unit has detected that the setpoint has been exceeded and that the relay is in "delay" mode. When the delay time has passed and the relay makes/breaks, the relay sign either displays or disappears.

## Signal and sensor error indication without display front

Status of the unit can also be read from the red/green LED in the front of the device.

Green flashing LED 13 Hz indicates normal operation.

Green flashing LED 1 Hz indicates sensor error.

Steady green LED indicates internal error.

Steady red LED indicates fatal error.

## Relay functions

6 different settings of relay function can be selected.

**Setpoint:** The unit works as a single limit switch

**Window:** The relay has a window that is defined by a low and a high setpoint. On both sides of the window the relay has the same status.

**Error function:** The relay is activated by sensor error.

**Power:** The relay is activated as long as the power is on.

**Off:** The relay is deactivated.

**Latch:** The relay is latched. Only valid for setpoint and window function.

**Increasing/decreasing:** The relays can be set to activate at increasing or decreasing input signal.

**Delay:** An ON and an OFF delay can be set on both relays in the range 0...3600 s.

**Hysteresis:** 0.0...100.0%.

## Latch

When the setpoint is exceeded the relay outputs enter an alarm state. The latch function of the IAMS0022 and IAMS0020 will hold the relays in this state until the function is deactivated manually. The latch function can be applied when the relay function setpoint or window is selected.

The latch function can be selected separately for each relay output. If the configuration is copied from one device to another by way of the PGMMOD00, the latch function must be reconfigured.

The latch function activates and holds the relays when the input signal rises above or falls below the selected setpoints and the relay action has been selected as increasing or decreasing.

The window function is selected by choosing "window" in the menu and defining a high and a low setpoint.

It can be selected for each relay contact whether the contact is open or closed inside the window. This selection is made in the menu R1.cont and R2.cont.

The setpoint function is selected by choosing "setpoint" in the menu and entering the desired limit. The device then works as a single limit switch.

An activated relay means that the contact is closed if the contact function "normally open" is selected, and the contact is open if the contact function "normally closed" is selected.

The delay time for activation and deactivation can be set independently of each other in the menus ON.DEL and OFF DEL respectively.




If the relay function "Error" is active, the relay will latch when a sensor error occurs and will not be deactivated automatically when the sensor error is rectified.

The relay can only be deactivated by an operator and only when the normal conditions for deactivation are met. If the input signal still has a value that will activate the relay, the relay will latch again.

See the graphic depiction of the setpoint and window functions on pages 36, 37 and 38.



## Manual deactivation of the latch function



If the relay outputs are activated and thereby latched, it will be indicated in the display. The backlight flashes and the scrolling help text tells you how to deactivate the output. Manual deactivation is carried out by way of the front buttons on the PGMMOD00. Use  and  to navigate in the menu and  to validate your selection. If the password protection has been activated, the password must be entered in order to access the deactivation menu. See the menu structure on page 33.

## Advanced functions

The unit gives access to a number of advanced functions which can be reached by answering "Yes" to the point "adv.set".

**Display setup:** Here you can adjust the brightness contrast and the backlight. Setup of TAG number with 6 alphanumeric. Selection of functional readout in line 3 of the display - choose between readout of analogue output or TAG number.

**Two-point process calibration:** The unit can be process-calibrated in 2 points to fit a given input signal. A low input signal (not necessarily 0%) is applied and the actual value is entered via PGMMOD00. Then a high signal (not necessarily 100%) is applied and the actual value is entered via PGMMOD00. If you accept to use the calibration, the unit will work according to this new adjustment. If you later reject this menu point or choose another type of input signal the unit will return to factory calibration.

**Process simulation function:** If you say "yes" to the point "EN.SIM" it is possible to simulate an input signal by means of the arrow keys and thus control the output signal up or down. When you finalise the point with , the unit returns to normal mode. The point REL.SIM allows you to activate relay 1 and relay 2 by means of the arrow-keys up/down. You must exit the menu by pressing  (no time-out).

**Password:** Here you can choose a password between 0000 and 9999 in order to protect the unit against unauthorised modifications to the configuration. The unit is delivered default without password. If you have locked the device with a password by mistake, you can always open the menu by using the master password 2008.

**Language:** In the menu "lang.setup" you can choose between 7 different language versions of help texts that will appear in the menu. You can choose between UK, DE, FR, IT, ES, SE and DK.

## Auto diagnosis

The unit performs an advanced auto diagnosis of the internal circuits.

The following possible errors can be displayed in the front unit PGMMOD00.

- CJ.ER - CJC sensor defect or CJC temperature outside range
- FL.ER - Flash error
- AO.ER - No load on the current output (only for S4...20 mA/S20...4 mA)
- NO.CO - Connection error
- IN.ER - Error levels on input
- TY.ER - Configuration in PGMMOD00 does not match this product type

## Selection of units

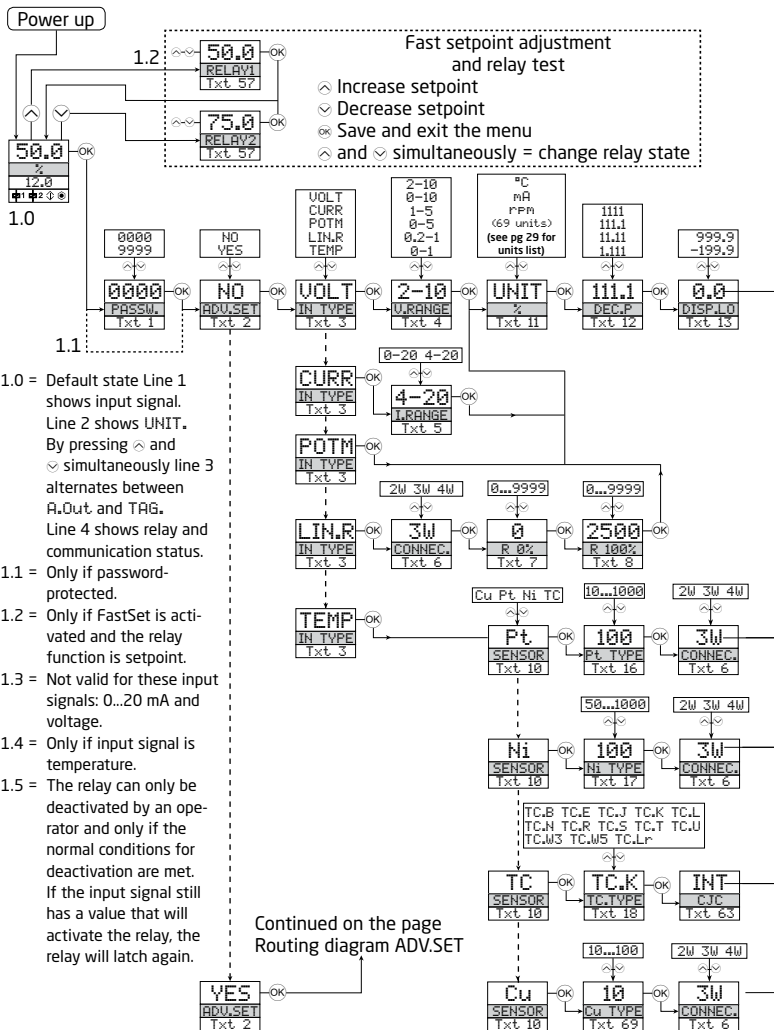
After choosing the input signal type you can choose the process units which will be displayed in text line 2 (see table). By selection of temperature input the process value is always displayed in Celsius or Fahrenheit. This is selected in the menu point after selection of temperature input.

## Safety readback

When the device is delivered with default configuration, the SIL function is disabled. The safety readback function (loop surveillance) can be selected in the menu O.RANGE, thus enabling the device to run in SIL mode. In order to enable the SIL functionality, the menu item S4...20 mA must be selected. Please note, however, that when safety readback is enabled, a sensor error will be indicated as an error on the analogue output signal.

## Memory

In the memory menu you can save the configuration of the device in the PGMMOD00, and then move the PGMMOD00 onto another device of the same type and download the configuration in the new device.

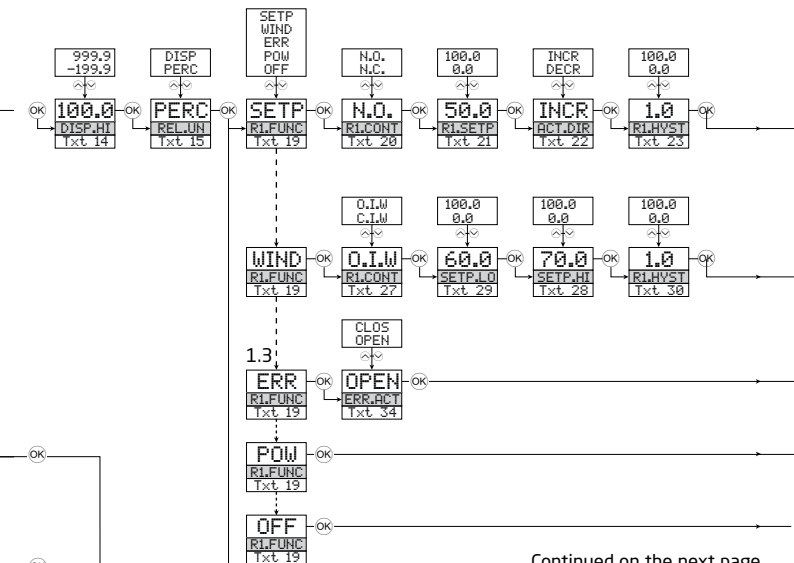


# ROUTING DIAGRAM

If no key is activated for 1 minute, the display will return to the default state 1.0 without saving configuration changes.

- ⊕ Increase value / choose next parameter
- ⊖ Decrease value / choose previous parameter
- ⊗ Accept the chosen value and proceed to the next menu

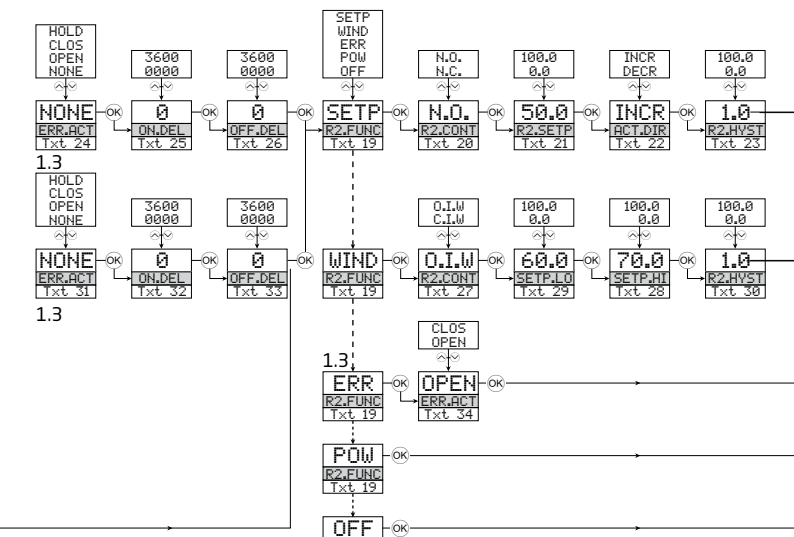
Hold ⊗ Back to previous menu / return to menu 1.0 without saving  
Availability of output parameters are model number dependent.

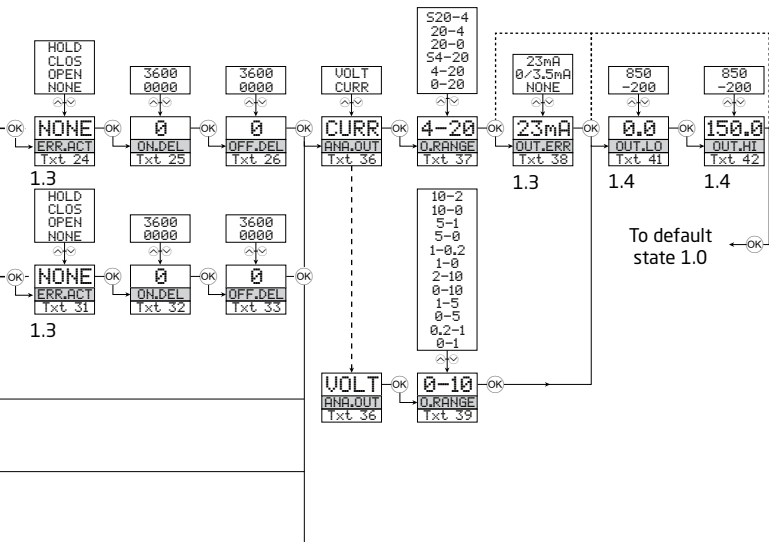


Continued on the next page

## Selectable UNITS:

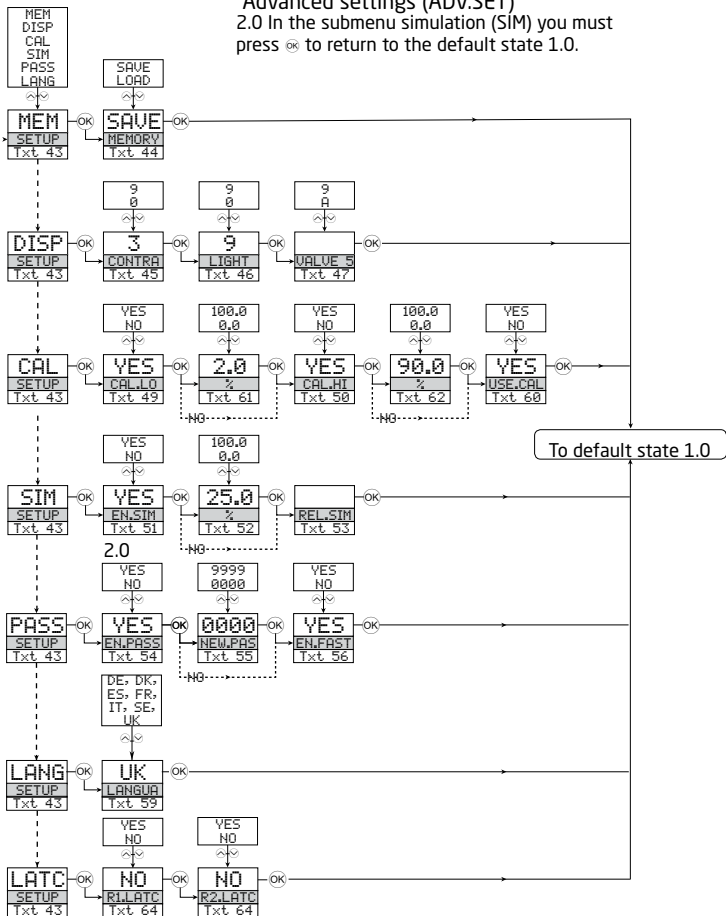
°C	hp	kw	mA	PH
°F	hPa	kWh	mbar	rPM
%	Hz	l	mils	s
A	in	l/h	min	S
bar	in/h	l/min	mm	t
cm	in/min	l/s	mm/s	t/h
ft	in/s	m	mol	uA
ft/h	ips	m/h	MPa	um
ft/min	K	m/min	mV	uS
ft/s	kA	m/s	MW	U
g	kg	m/s <sup>2</sup>	MWh	W
gal/h	kJ	m <sup>3</sup>	N	Wh
gal/min	kPa	m <sup>3</sup> /h	Ohm	yd
GW	kV	m <sup>3</sup> /min	Pa	[blank]





# ROUTING DIAGRAM

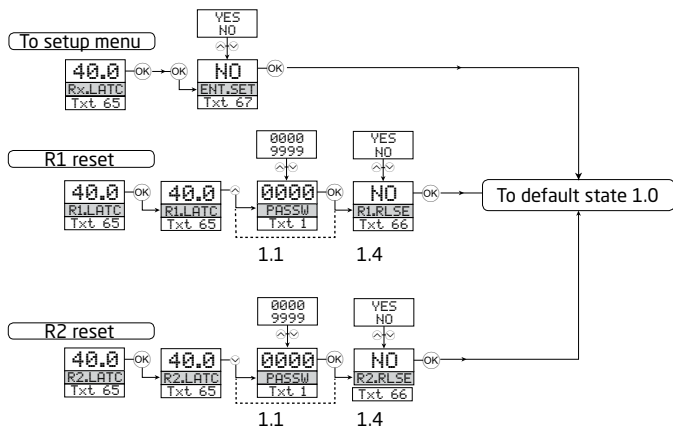
Advanced settings (ADV.SET)  
2.0 In the submenu simulation (SIM) you must  
press **OK** to return to the default state 1.0.










# ROUTING DIAGRAM

Manual deactivation of the latch function

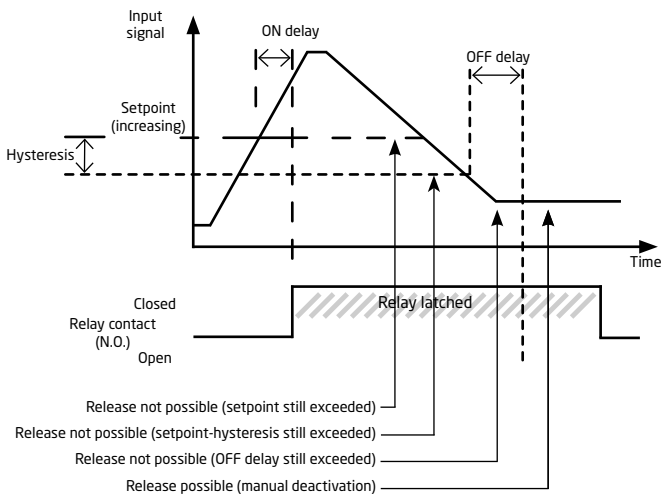


## SCROLLING HELP TEXT IN DISPLAY LINE 3

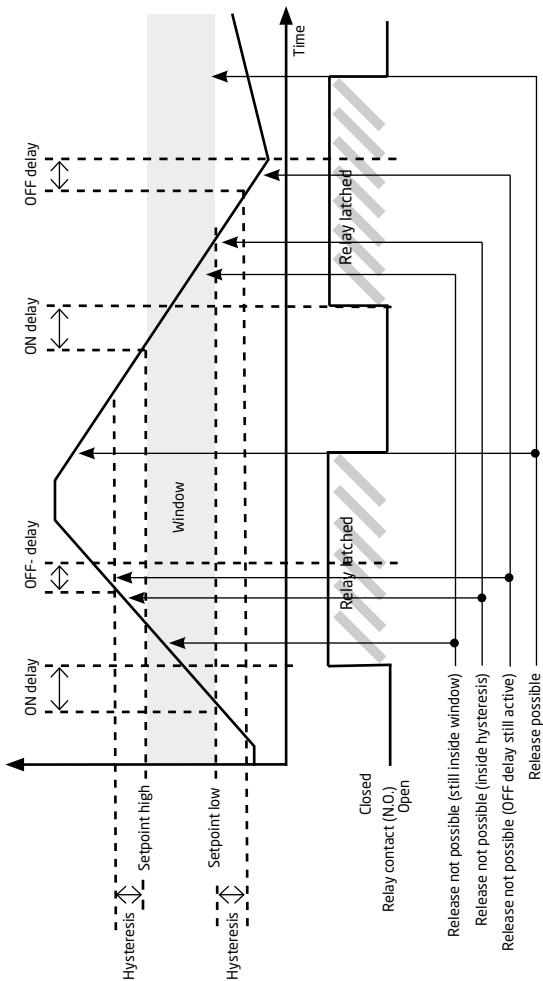
- |      |                                       |      |   |
|------|---------------------------------------|------|---|
| [01] | Set correct password                  | [19] | Select OFF function - relay is permanently off            |
| [02] | Enter advanced setup menu?            |      | Select POWER function - relay indicates power status OK   |
| [03] | Select temperature input              |      | Select ERROR function - relay indicates sensor error only |
|      | Select potentiometer input            |      | Select SETPOINT function - relay controlled by 1 setpoint |
|      | Select linear resistance input        | [20] | Select Normally Closed contact                            |
|      | Select current input                  |      | Select Normally Open contact                              |
|      | Select voltage input                  | [21] | Set relay setpoint  |
| [04] | Select 0.0-1 V input range            | [22] | Activate relay on decreasing signal                       |
|      | Select 0.2-1 V input range            |      | Activate relay on increasing signal                       |
|      | Select 0-5 V input range              | [23] | Set relay hysteresis                                      |
|      | Select 1-5 V input range              | [24] | No error action - undefined status at error               |
|      | Select 0-10 V input range             |      | Open relay contact at error                               |
|      | Select 2-10 V input range             |      | Close relay contact at error                              |
| [05] | Select 0-20 mA input range            |      | Hold relay status at error                                |
|      | Select 0-20 mA input range            | [25] | Set relay ON delay in seconds                             |
| [06] | Select 2-wire sensor connection       | [26] | Set relay OFF delay in seconds                            |
|      | Select 3-wire sensor connection       | [27] | Relay contact is Closed Inside Window                     |
|      | Select 4-wire sensor connection       |      | Relay contact is Open Inside Window                       |
| [07] | Set resistance value low              | [28] | Set relay window setpoint high                            |
| [08] | Set resistance value high             | [29] | Set relay window setpoint low                             |
| [09] | Select Celsius as temperature unit    | [30] | Set relay window hysteresis                               |
|      | Select Fahrenheit as temperature unit | [31] | No error action - undefined status at error               |
| [10] | Select TC sensor type                 |      | Open relay contact at error                               |
|      | Select Ni sensor type                 |      | Close relay contact at error                              |
|      | Select Pt sensor type                 |      | Hold relay status at error                                |
|      | Select Cu sensor type                 | [32] | Set relay ON delay in seconds                             |
| [11] | Select display unit                   | [33] | Set relay OFF delay in seconds                            |
| [12] | Select decimal point position         | [34] | Open relay contact at error                               |
| [13] | Set display range low                 |      | Close relay contact at error                              |
| [14] | Set display range high                | [36] | Select current as analogue output type                    |
| [16] | Select Pt10 as sensor type            |      | Select voltage as analogue output type                    |
|      | Select Pt20 as sensor type            | [37] | Select 0-20 mA output range                               |
|      | Select Pt50 as sensor type            |      | Select 4-20 mA output range                               |
|      | Select Pt100 as sensor type           |      | Select S4-20 mA with safety readback                      |
|      | Select Pt200 as sensor type           |      | Select 20-0 mA output range                               |
|      | Select Pt250 as sensor type           |      | Select 20-4 mA output range                               |
|      | Select Pt300 as sensor type           |      | Select S20-4 mA with safety readback                      |
|      | Select Pt400 as sensor type           | [38] | Select no error action - output undefined at error        |
|      | Select Pt500 as sensor type           |      | Select downscale at error                                 |
|      | Select Pt1000 as sensor type          |      | Select NAMUR NE43 downscale at error                      |
| [17] | Select Ni50 as sensor type            |      | Select NAMUR NE43 upscale at error                        |
|      | Select Ni100 as sensor type           | [39] | Select 0.0-1 V output range                               |
|      | Select Ni120 as sensor type           |      | Select 0.2-1 V output range                               |
|      | Select Ni1000 as sensor type          |      | Select 0-5 V output range                                 |
| [18] | Select TC-B as sensor type            |      | Select 1-5 V output range                                 |
|      | Select TC-E as sensor type            |      | Select 0-10 V output range                                |
|      | Select TC-J as sensor type            |      | Select 2-10 V output range                                |
|      | Select TC-K as sensor type            |      | Select 1-0.0 V output range                               |
|      | Select TC-L as sensor type            |      | Select 1-0.2 V output range                               |
|      | Select TC-N as sensor type            |      | Select 5-0 V output range                                 |
|      | Select TC-R as sensor type            |      | Select 5-1 V output range                                 |
|      | Select TC-S as sensor type            |      | Select 10-0 V output range                                |
|      | Select TC-T as sensor type            |      | Select 10-2 V output range                                |
|      | Select TC-U as sensor type            | [41] | Set temperature for analogue output low                   |
|      | Select TC-W3 as sensor type           | [42] | Set temperature for analogue output high                  |
|      | Select TC-W5 as sensor type           |      |   |
|      | Select TC-Lr as sensor type           |      |   |

- [43] Enter password setup  
Enter simulation mode  
  
Perform process calibration  
Enter display setup  
Perform memory operations
- [44] Load saved configuration into IAMS0002  
Save IAMS0002 configuration in PGM
- [45] Adjust LCD contrast
- [46] Adjust LCD backlight
- [47] Write a 6-character device TAG
- [48] Analogue output value is shown in display line 3  
Device TAG is shown in display line 3
- [49] Calibrate input low to process value?
- [50] Calibrate input high to process value?
- [51] Enable simulation mode?
- [52] Set the input simulation value
- [54] Enable password protection?
- [55] Set new password
- [59] Select language
- [60] Use process calibration values?
- [61] Set value for low calibration point
- [62] Set value for high calibration point
- [63] Select CJC connector (accessory)  
Select internal temperature sensor
- [64] Enable relay latch function?
- [65] Relay is latched - press  to acknowledge  
Relay 1 is latched - press  to release  
Relay 2 is latched - press  to release  
Relays are latched - press  or  to release relay 1 or relay 2
- [66] Release relay? (if conditions allow)
- [67] Enter setup menu? (latched relays may release!)
- [69] Select Cu10 as sensor type  
Select Cu20 as sensor type  
Select Cu50 as sensor type  
Select Cu100 as sensor type

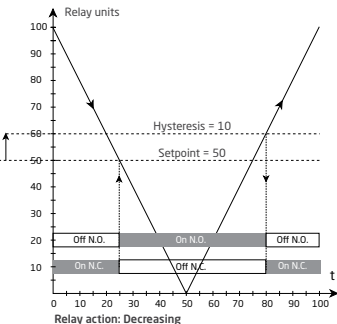
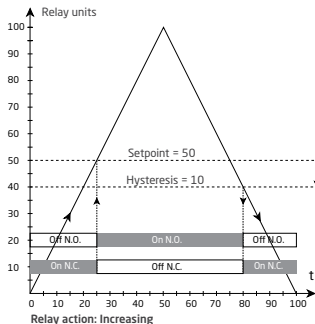
## Graphic depiction of latch function setpoint



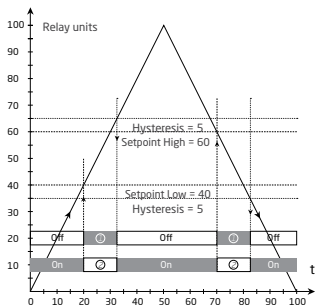
# Graphic depiction of latch function window



## Graphic depiction of relay action setpoint

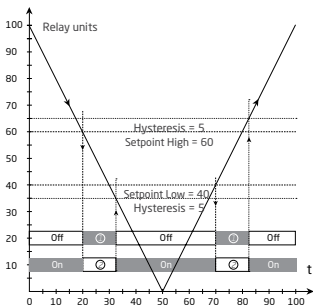


## Graphic depiction of relay action window





Relay function: Window (shown for increasing signal)

Contact: Closed inside window =   
Contact: Open inside window = 



Relay function: Window (shown for decreasing signal)

Contact: Closed inside window =   
Contact: Open inside window = 

## Ordering information

DESCRIPTION	PART NUMBER
Universal transmitter with analog output	IAMS0002
Universal transmitter with analog output / 2 relays	IAMS0022
Universal trip amplifier / 2 relays	IAMS0020
Display / programming module	PGMMOD00
Display/Comms Module - Modbus RTU protocol interface over RS-485	PGMMODC1

