

Dräger REGARD 3900

One to Sixteen channel controller



Installation, operation and maintenance guide

Issue 2 – July 2006

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FOR YOUR SAFETY

Follow the instructions

Follow the instructions for installation, operation and maintenance.

Maintenance

The equipment must be inspected and serviced regularly by trained personnel. Keep a record of inspections and servicing.

Repairs of this apparatus should only be carried out by competent personnel.

We recommend that either a training course or service contract is obtained from Draeger and that all repairs are carried out by them.

Refer to EN 50073 and/or local regulations.

Refer to the operating manual of the transmitter for information on operation and maintenance of the transmitter.

Not for use in areas where explosion hazards are possible

This equipment is not approved or certified for installation in potentially explosive atmospheres.

Liability for proper function or damage

Liability for proper function of the equipment is irrevocably transferred to the owner or operator to the extent that the equipment is serviced or repaired by personnel not employed or authorised by Draeger, or if the equipment is used in a manner not conforming to its intended use.

Draeger Safety UK Limited can not be held responsible for any damage caused by non-compliance with the above recommendations. The warranty and liability provisions of the terms and conditions of sale and delivery of Draeger Safety UK Limited are likewise not modified by the recommendations given above.

Draeger Safety UK Ltd

Special conditions for safe use

according to EC-type examination certificate **TRL 06 ATEX 21099 X**

1. Only remote sensor transmitters with valid and appropriate ATEX certification for safety and measurement performance shall be connected to this control equipment. These connections may be via ATEX certified safety interface barriers.
2. Any cable used for interconnection of remote sensor transmitters should be selected to ensure that its resistance does not have any adverse effects on the operation of the mid range control unit.

Requirements for flammable gas detection according to EN 61779

If Regard 3900 is used for flammable gas detection to protect against risk of explosion, at least one gas alarm relay should be set latching. (See EN 61779-1:2000 *Electrical apparatus for the detection and measurement of flammable gases — General requirements and test methods*, section 3.2.3.1)

INTENDED USE

- For stationary, continuous monitoring of flammable or toxic gases and vapours, oxygen deficiency or enrichment
- Display of measured gas value
- Indication of alarms and control of countermeasures

The controller is designed for use in a control room environment. The atmosphere should be free of contaminants and pollutants, which are known to be harmful to electronic equipment.

The REGARD 3900 is suitable for use in residential, commercial and industrial environments.

The controller is not designed or certified for use in areas where combustible or explosive gases, vapours or dust mixtures are likely to occur.

CE mark

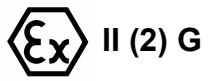
Regard 3900 meets the requirements of the following directives:

- “EMC directive” 89/336/EEC
- “Low-voltage directive” 73/23/EEC
- ATEX directive 94/9/EC

Use of a power supply not supplied or installed by Dräger may require re-assessment of the controller’s compliance with the EMC and/or low-voltage directive(s).

ATEX marking

The controller carries the following ATEX marking:



**THIS MARKING DOES NOT MEAN THAT THE UNIT IS “EXPLOSION PROOF”.
Regard 3900 cannot be used in areas subject to explosion hazards (“hazardous areas”) without suitable protection.**

DESCRIPTION

General

The REGARD 3900 is a standalone, self-contained gas detection system comprising of an enclosure complete with a display board, and up to four individual input/output modules. The combination of input/output modules is flexible¹ and is matched to the application or solution. All input/output modules are connected together via a ribbon cable to make up the complete system solution.

The input modules are based on a four channel design with common relays; three relays per input module for Fault 1, Alarm 1 and Alarm 2. Relay outputs are volt free single pole (SPDT). Each input module requires a 24vdc supply which is either derived from the internal AC/DC power supply or is fed from an external DC supply.

The output modules comprise of simple relay modules, each having seven configurable relays plus one non-configurable system fault relay. All relays are volt free single pole (SPDT). Each relay module is powered via the internal ribbon cable.

For system configuration and servicing no tools are required. The complete system is configured and serviced using the REGARD 3900 Config software; a Windows based PC software program. A RS232 CAN interface cable is required to connect the REGARD 3900 to the configuration PC.

Main display board

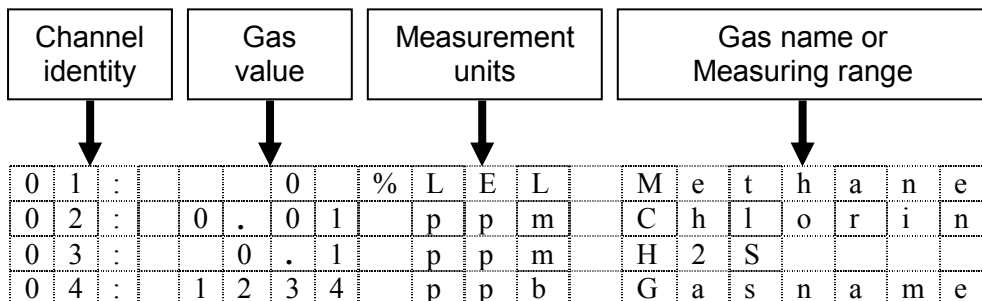
LCD display

The main display board is located within the enclosure lid. The display board offers the following information to the user:

- Channel identity
- Gas value
- Measurement units
- Gas name
- Measuring range (when HOLD is pressed for > 1 sec.)

The display format is explained as follows

- Normal display shows gas value, unit and gas name



If there are more than four channels installed, the display will scroll to display all channels sequentially. To freeze the display press HOLD for less than 1 sec. Pressing HOLD again, will revert back to a scrolling display

¹ No greater than two relay modules – a maximum of four I/O modules in any one system.

Note 1 – Very low gas values of $\pm 2\%$ of measuring range will be displayed as zero.

- If the transmitter signal exceeds 20mA the display for that channel shows:

0 2 : O v e r - r a n g e

The Over-range indication remains on the display even after the transmitter signal falls below 20mA. Press Acknowledge to reset the display.

- If the transmitter signal is less than 3.7mA, but not a stable 3.4mA Maintenance signal from the transmitter the display shows:

0 2 : U n d e r - r a n g e

- To display the measuring range of each channel, press the HOLD button for > 1s. The gas name is replaced by the measuring range (FSD).

Example, range 0-1000:

0 2 : 1 2 3 4 p p m (1 0 0 0)

- When the signal from a transmitter is fixed at 3.4mA's to represent 'Maintenance of the transmitter' the display shows:

0 2 : M a i n t e n a n c e

- Resolution and decimal places depends on the selected range

Range	Resolution	Dec. places	Range	Resolution	Dec. places
0 – 1	0.01	2	0 – 25	0.1	1
0 – 2	0.01	2	0 – 30	0.1	1
0 – 3	0.01	2	0 – 50	0.1	1
0 – 4	0.01	2	0 – 75	0.1	1
0 – 5	0.01	2	0 – 100	1	0
0 – 6	0.01	2	0 – 200	1	0
0 – 7	0.01	2	0 – 250	1	0
0 – 8	0.01	2	0 – 300	1	0
0 – 9	0.01	2	0 – 500	1	0
0 – 10	0.1	1	0 – 1000	5	0
0 – 11	0.1	1	0 – 2000	5	0
0 – 12	0.1	1	0 – 3000	10	0
0 – 15	0.1	1	0 – 5000	10	0
0 – 20	0.1	1	0 – 9999	25	0

LEDs

Alarm 1, Alarm 2, Fault, Active

LED	When LED is...	It means...
Alarm 2	Flashing	A2 alarm tripped
	Steady	A2 alarm acknowledged but gas present
	Off	No alarm condition
Alarm 1	Flashing	A1 alarm tripped
	Steady	A1 alarm acknowledged but gas present
	Off	No alarm condition
Fault	Flashing	Fault alarm tripped
	Steady	Fault alarm acknowledged but fault present
	Off	Channel healthy
Active	Steady	Channel active
	Blinking	Alarms inhibited
	Off	Channel inactive

Note 2 - There is no LED or other indicator for Alarm 3 or Fault 2.

Power AC

The AC power LED is used in conjunction with an external battery support system. This LED indicates AC power failure to the charging circuitry of the external battery support system (see page 16).

Power DC

The DC power LED is illuminated when there is a 24V DC supply to the modules.

Inhibit

The Inhibit LED is illuminated when the Inhibit switch on the display board is in position 1, indicating that relays are held in their current state.

Pushbuttons

Acknowledge

The Acknowledge push button allows all alarm statuses to be acknowledged. Depending upon the alarm condition LEDs will either extinguish or change to permanent, relays will reset or remain active and the local, internal buzzer will silence.

Hold

Action	Effect
Press for < 1sec	Engage/disengage “scroll lock”: Engaged: only channels currently on display shown Disengaged: all channels displayed sequentially (Only applies when more than four channels displayed.)
Press and hold for > 1sec	Shows measuring range

Internal controls and indicators

Sounder (buzzer)

A sounder on the display board gives a local audible notification of Alarm 1, Alarm 2 or Fault 1 alarm. **The sounder does not operate for Alarm 3 or Fault 2.**

Contrast control

Use the contrast control to adjust the display’s contrast or viewing angle. This may be necessary if the controller is installed in a very cold or very warm environment.

Inhibit switch

Inhibits alarm relays during configuration and/or calibration.

Position	Effect
0	All relays operate normally
1	All common, single and voted alarm relays, F1 and F2 relays are frozen in their current state. Relay(s) whose function is “Alarms inhibited” energise. Inhibit LED lights. Active LEDs flash and internal sounder operates briefly every 30s.

Red LEDs

Two red LEDs on the right-hand side of the display board flicker during normal operation.

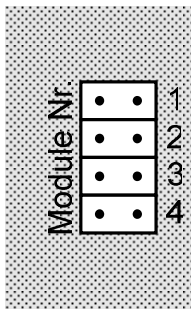
4-20mA input module

General description

The 4-20mA input module has four inputs for 2- or 3-wire 4-20mA transmitters. For three-wire transmitters, the module works only with transmitters having a 4-20mA source output. The module can supply up to 400mA to a three-wire transmitter. A fuse protects the output against short circuit. Each input module requires a 24vdc supply. This supply is derived from the internal AC/DC power supply using the 24vdc cables provided. Additional input modules are wired to adjacent input modules using the 24vdc cables provided.

The input module has three volt-free relays (SPDT): A1 gas alarm, A2 gas alarm and Fault. Relays can be set latching or non-latching. Relays are not acknowledgeable. A red LED next to each relay illuminates when the relay is energised.

Each input module must have a different module number. Set the first physical module as number 1, the next as number 2, and so on.



A module's number determines the channels on that module:

Module No.	Channels
1	1 – 4
2	5 – 8
3	9 – 12
4	13 – 16

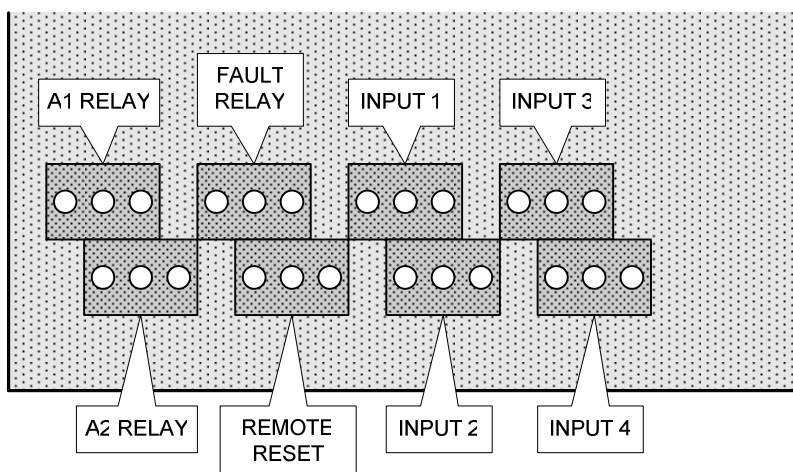
If you only have one input module, set it to number 1.

All modules must be numbered in sequence – if not, then difficulties will occur when trying to configure the system

Red LEDs

Two red LEDs on the right-hand side of each module flicker during normal operation.

4-20mA module terminals



Remote reset

There are remote reset terminals on each input module. Momentarily closing the remote reset switch will silence the internal sounder, return acknowledgeable relays on the input module(s) and relay module(s) to their non-alarm state, and reset non-acknowledgeable relays whose alarm condition has

cleared. LEDs showing the alarm condition will be reset or become permanently illuminated until the gas condition disappears.

Only one module needs a connection: the remote-reset signal is distributed to the other modules via the ribbon cable.

Relay module

General description

The relay module has eight volt-free single-pole (SPDT) relays that can be used to control alarms, ventilators, electrical equipment, etc. The first relay of each relay module has a fixed configuration. The remaining seven relays are fully configurable.

A maximum of two relay modules can be installed in the REGARD 3900 if there is enough room. A single relay module will work with up to 12 input channels or two relay modules will work with up to 8 input channels.

The red LED next to each relay lights when that relay is energised.

Relay functions

Relay 1 on each relay module is permanently set to:

- Common fault (F1)
- Normally-energised
- Not acknowledgeable

The function of relay 1 cannot be changed. This relay will de-energise if the ribbon cable is disconnected from the module, or if there is a hardware fault on the relay module.

The other seven relays can be set to the following functions

Function	Changes state (energises or de-energises*) when:
Common A1	A1 trips on any channel
Common A2	A2 trips on any channel
Common A3	A3 trips on any channel
Common fault (F1)	F1 trips on any channel
Common F2	F2 trips on any channel
Common A1, A2 or A3	A1 or A2 or A3 trips on any channel
Voted A1	A1 trips on a specified number of channels in a group
Voted A2	A2 trips on a specified number of channels in a group
Voted A3	A3 trips on a specified number of channels in a group
Voted fault (F1)	F1 trips on a specified number of channels in a group
Voted F2	F2 trips on a specified number of channels in a group
Single A1	A1 trips on one specified channel
Single A2	A2 trips on one specified channel
Single A3	A3 trips on one specified channel

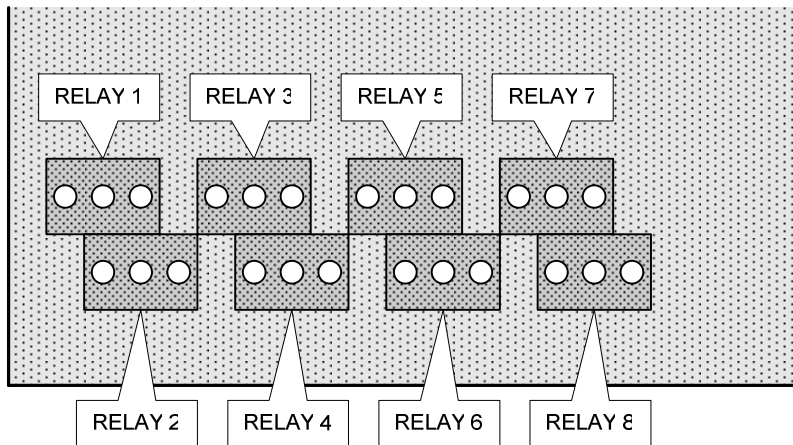
Single fault F1	F1 trips on one specified channel
Single F2	F2 trips on one specified channel
“Alarms inhibited”	Inhibit switch on the display board is in moved to position “1”

* Depending on the whether the relay is set as ‘energise-on-alarm’ or ‘normally energised’.

Common, voted and single relays do not change state if the Inhibit switch is in position “1”

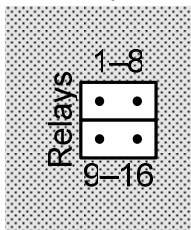
Setting	Behaviour
Latching	Ack or rr required to return relay to non-alarm state
Non-latching	Relay automatically returns to non-alarm state
Acknowledgeable	relay can be returned to non-alarm state even while alarm is tripped
Not acknowledgeable	Relay cannot be returned to non-alarm state until alarm has cleared

Field terminals



Relay numbers

A link on the relay module sets the relay numbers



When you have two relay modules the 16 relays are numbered as follows:

Link	Relay on module..... number in system
1-8	RL1 1
	RL2 2
	RL3 3
	RL4 4
	RL5 5
	RL6 6
	RL7 7
	RL8 8
9-16	RL1 9
	RL2 10
	RL3 11
	RL4 12
	RL5 13
	RL6 14
	RL7 15
	RL8 16

Red LEDs

Two red LEDs on the right-hand side of each module flicker during normal operation.

INSTALLATION

Installation environment

When selecting the installation place, consider the following;

- Locate the REGARD 3900 where the display and indicators are easily seen, and controls are accessible
- The REGARD 3900 is not “explosion proof” and may not be installed in a hazardous area without additional Ex-protection
- Avoid locations where excessive vibration is possible
- Avoid locations where aggressive or corrosive gases, contaminants or pollutants harmful to electronic equipment are present

The controller is not “explosion proof” and must not be installed in a hazardous area without additional Ex-protection.

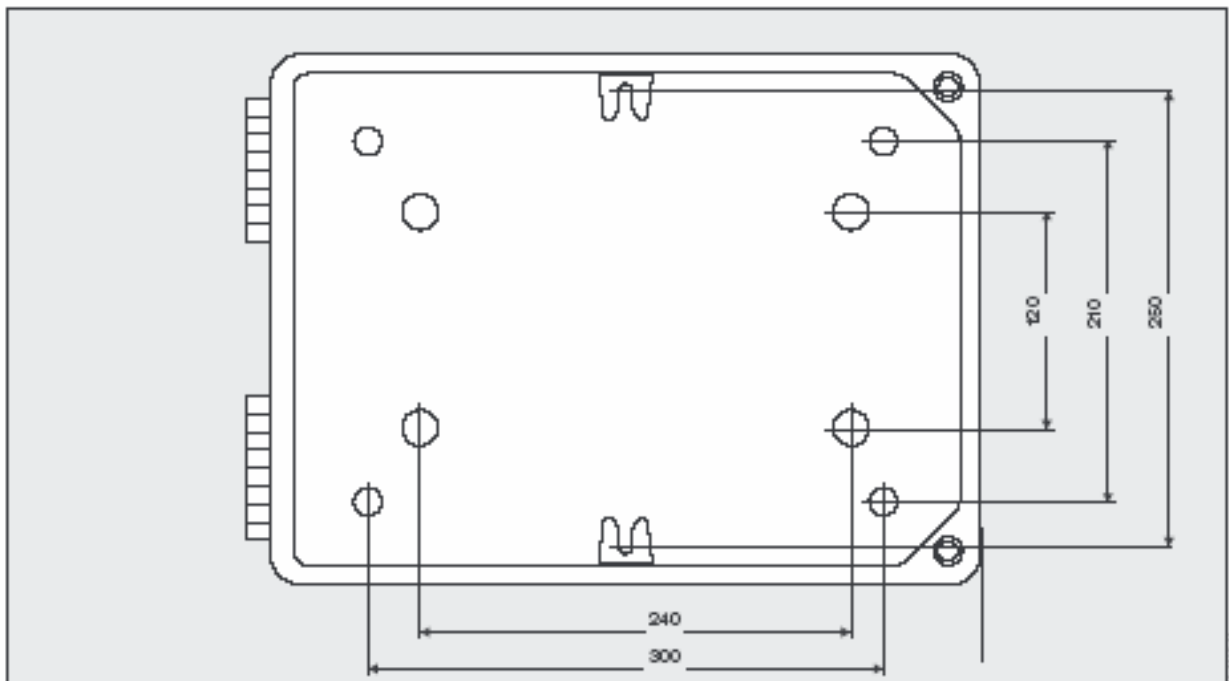
Use a 5mm Allen key (hexagonal tool) to open the enclosure.

Mounting

The preferred method of mounting the REGARD 3900 is to use the mounting brackets provided. The use of non-intrusive mounting brackets maintains the enclosures IP65 rating.

Using the internal mounting holes reduces the ingress protection of the enclosure.

Mounting points dimensions (not to scale):



Note – 3 Maintain electrical clearance between conductive mounting screws and hazardous-live connections.

Cable entries

Preformed cable entries are supplied along the top and bottom face of the enclosure. Wherever possible use the cable entries adjacent to the terminals of the I/O modules.

Use a 20mm hole saw to open the cable entries. Do not attempt to “knock out” the cable entries, this will damage the enclosure. Take care when drilling the cable entries to avoid damaging modules already installed in the enclosure.

Cable screen earthing plate

An earthing plate is available to terminate cable screens to earth. Connect the plate to a low-impedance earth using large cross-section braided cable.

Note – 4 The gland earth plate is not required for Regard 3900 to meet EMC Directive.

Power supply

The REGARD 3900 can be operated from an AC supply when using a 24V DC power supply inside the enclosure, or from an independent external 24V DC supply.

AC supply

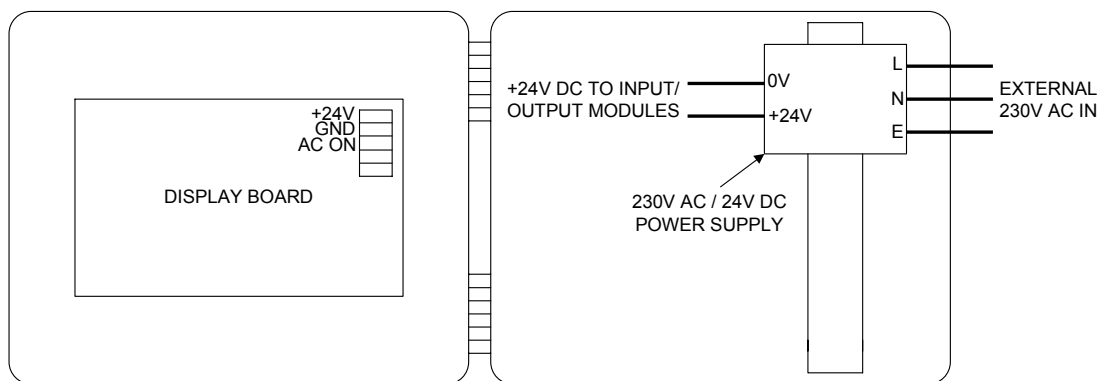
Operation from AC requires a 24V DC power supply inside the enclosure.

- If you use a power supply not supplied by Draeger, use one that meets EMC and LVD requirements.

If the AC supply to the controller is from an AC socket, the maximum allowed length of cable between the socket and the controller is 3m.

AC connection to the internal power supply

The AC power supply is wired as per the drawing below.



DC connection between input modules

Each input module requires a 24Vdc connection. This is done by following the four simple steps as described below (see picture below).

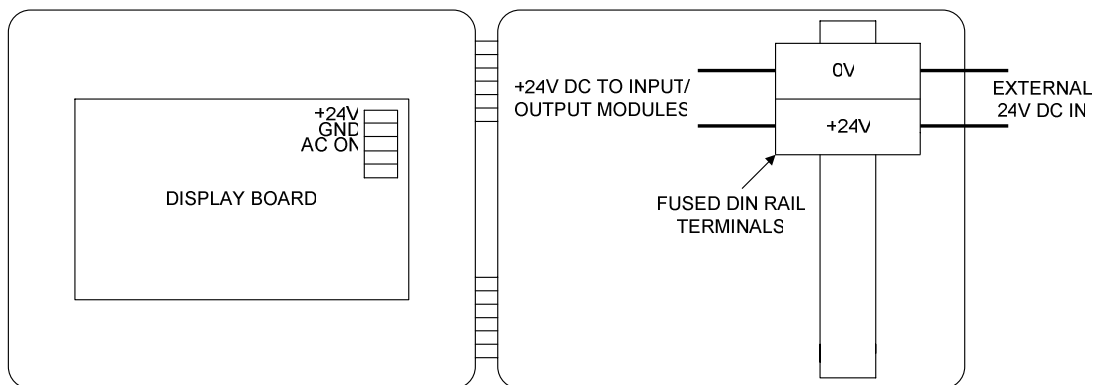
- Connect the 24V DC output of the power supply to one 4-20mA input module using the long leads provided.
- If fitted, connect the second 4-20 module's DC terminals to the first module's DC terminals.
- If fitted, connect the third 4-20 module's DC terminals to the second module's DC terminals.
- If fitted, connect the fourth 4-20 module's DC terminals to the third module's DC terminals.

The display board and relay modules do not need a DC supply connection.



External DC supply

To power the controller from external 24V DC, use a regulated, noise-free 24V DC supply. If the DC input is likely to be subject to high levels of conducted RF noise, use a filter to remove the noise. If there is a requirement to use HART diagnostics for the field transmitters the power supply used must conform to the requirements of HART (refer to the transmitters Operating Manual).

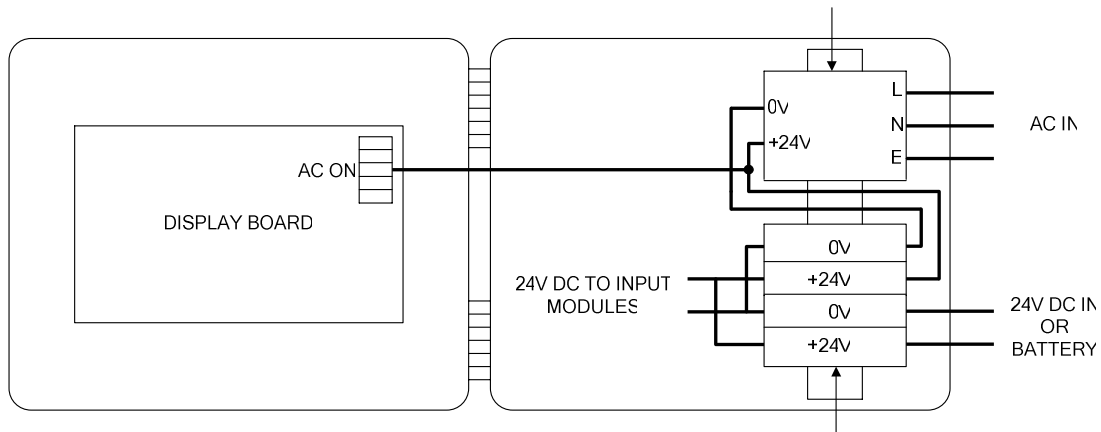


AC and DC supply or battery backup

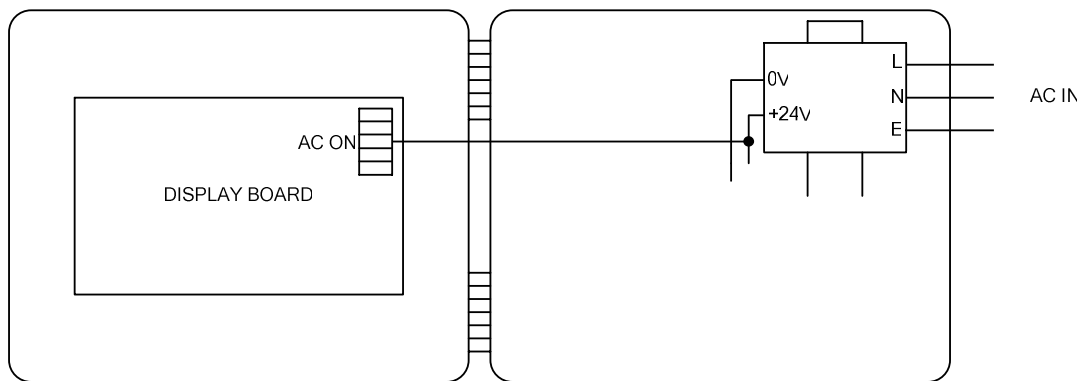
By fitting extra terminals inside the enclosure, the controller can be powered from an AC supply and an external standby 24V DC supply or 24V battery.

Diodes and/or relays may be necessary to switch from the primary DC supply to the backup DC supply or battery.

Example:



Optional: when the controller is supplied with both AC and DC, connect the output of the primary 24V supply to the **AC ON** input on the display board. The **Power AC LED** on the display will illuminate when the AC is on. A diode terminal will be required to guard against reverse current flow which will falsely indicate a healthy AC supply to the primary power supply.



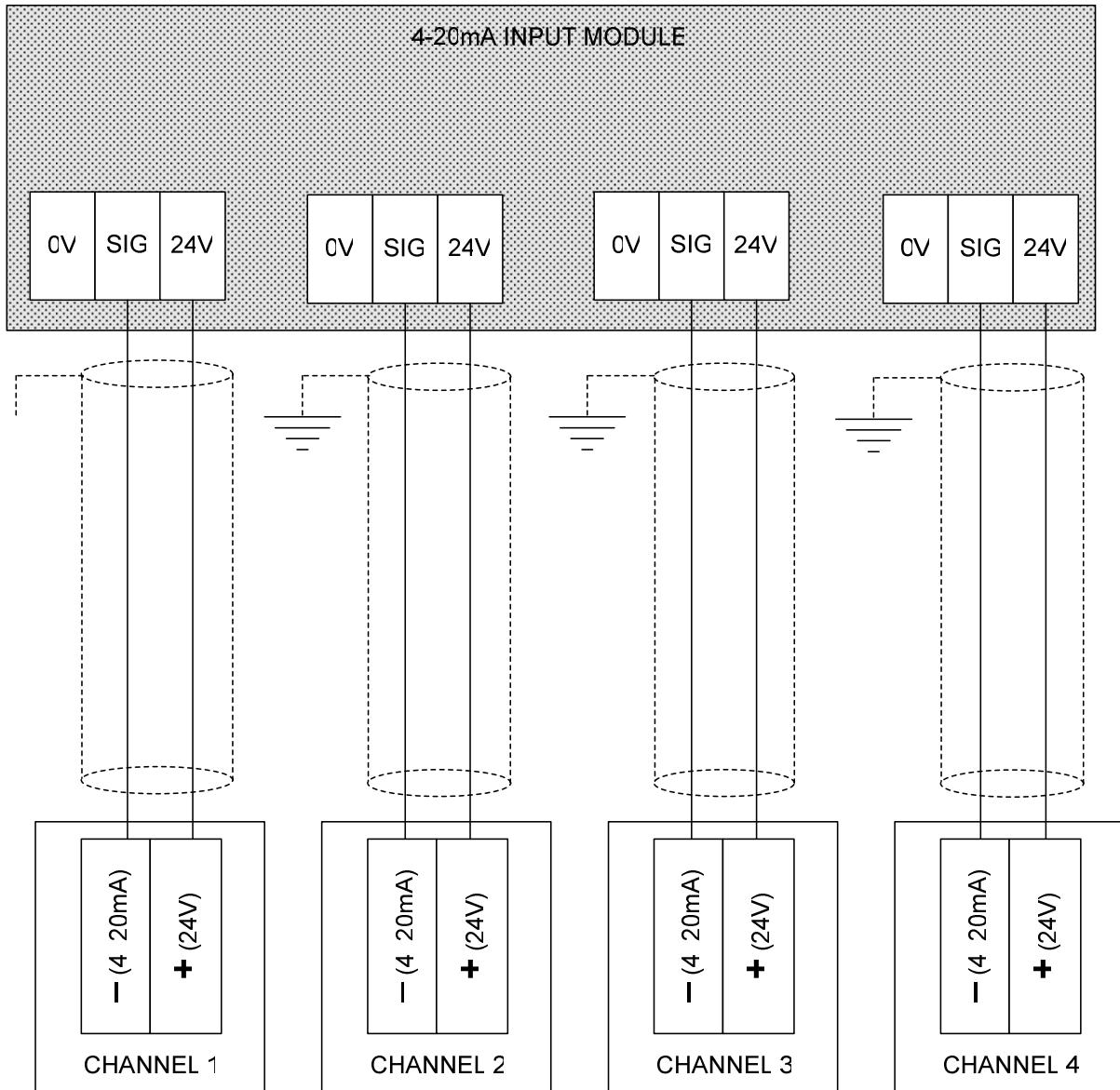
Ribbon cable

- Connect the ribbon cable to all modules and the display board.

Connecting transmitters

Two-wire 4-20mA transmitters

Use screened cable if required by the transmitter.



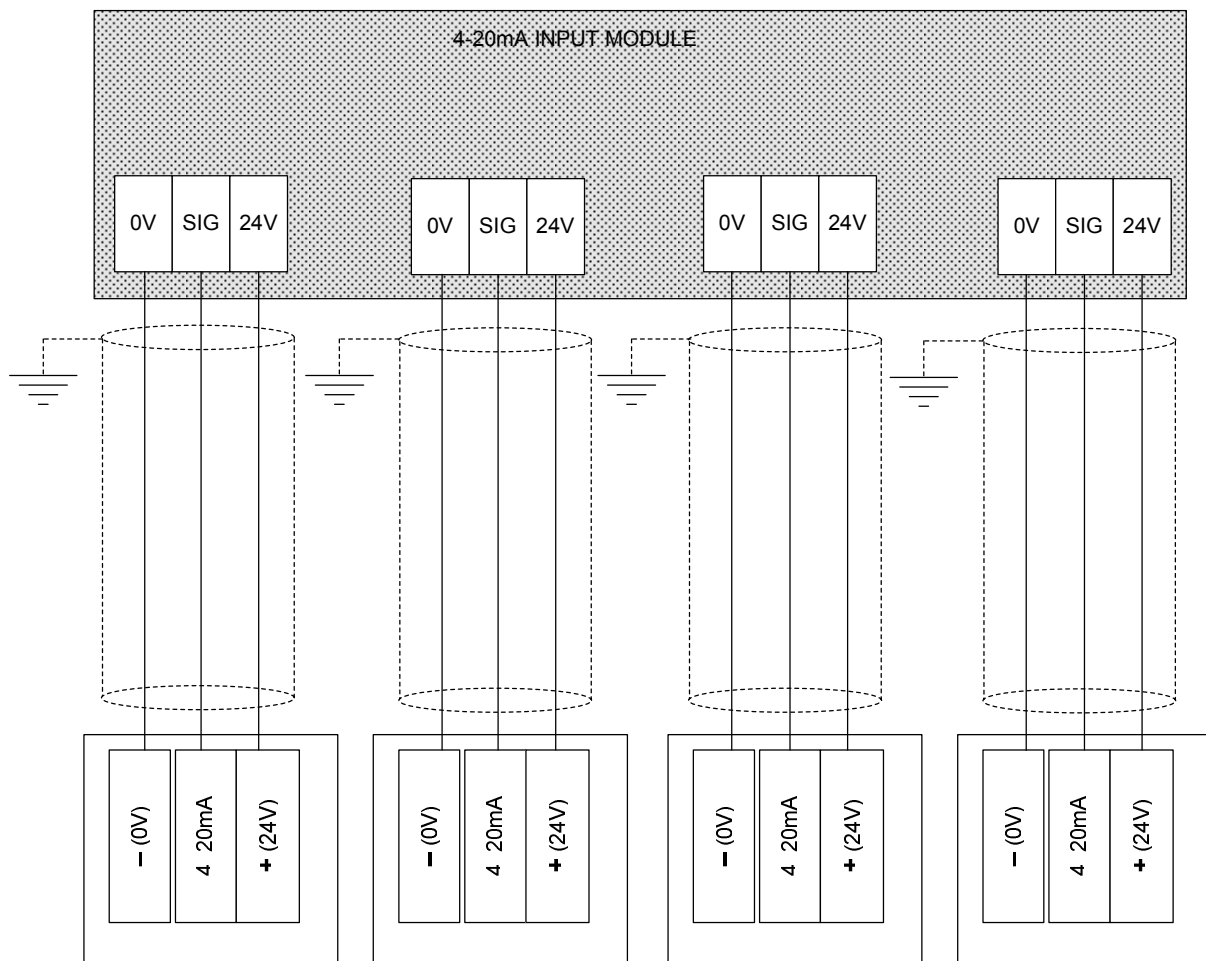
Three-wire 4-20mA transmitter

Regard 3900 will work with any three-wire 4-20mA transmitter with a 4-20mA source output (maximum supply current 400mA).

Regard 3900 will not work three-wire transmitters that have a 4-20mA **sink** output. If necessary, use a sink-to-source converter.

If the transmitter requires more than 400mA operating current, connect the transmitter's supply terminal directly to the power supply.

Use screened cable if required by the transmitter.



Short-circuit fault indication for three-wire transmitters

To ensure that a short circuit between the 4-20mA output and 0V at the transmitter causes a fault indication at the controller, the cable resistance must not exceed the value given by the following formula:

$$R_{\text{cable}} = \frac{250 \times I_{\text{fault}}}{I_{\text{transmitter}}}$$

where:

- R_{cable} is the resistance per core from controller to the transmitter (in ohms);
- I_{fault} is the fault trip level (in mA);
- $I_{\text{transmitter}}$ is the transmitter operating current (in mA).

This formula assumes that the three cores of the connecting cable each have the same resistance.

Example

Transmitter operating current: 100mA

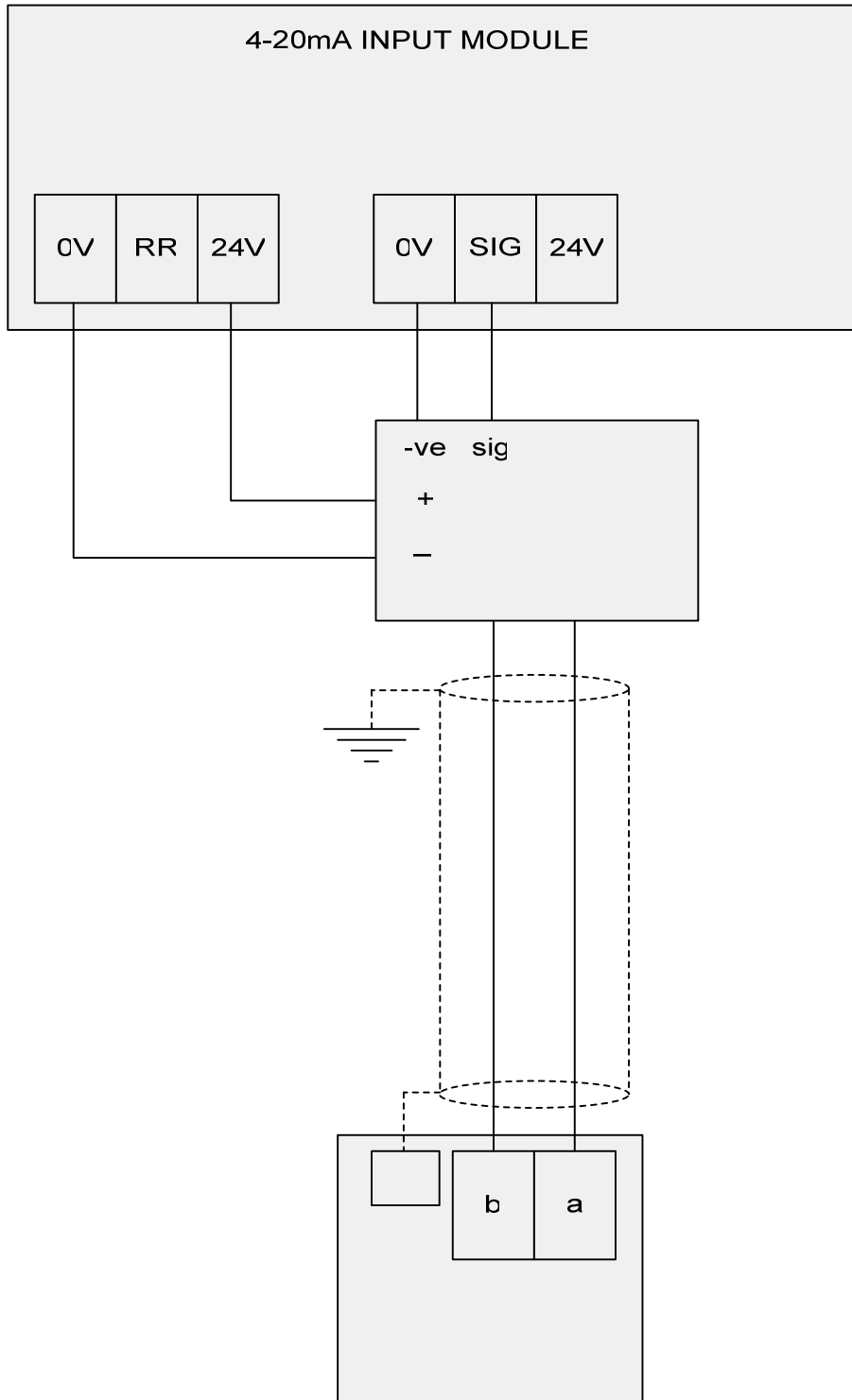
Fault trip level: 3.2mA

$$\text{Maximum cable resistance} = \frac{250 \times 3.2}{100} = 8 \text{ ohms per core}$$

Two-wire 4-20mA transmitter with safety barrier

The following diagram shows the general arrangement. Refer to specific instructions for safety barrier and transmitter for connections between transmitter and barrier, and for instruction for earthing of barrier, where necessary.

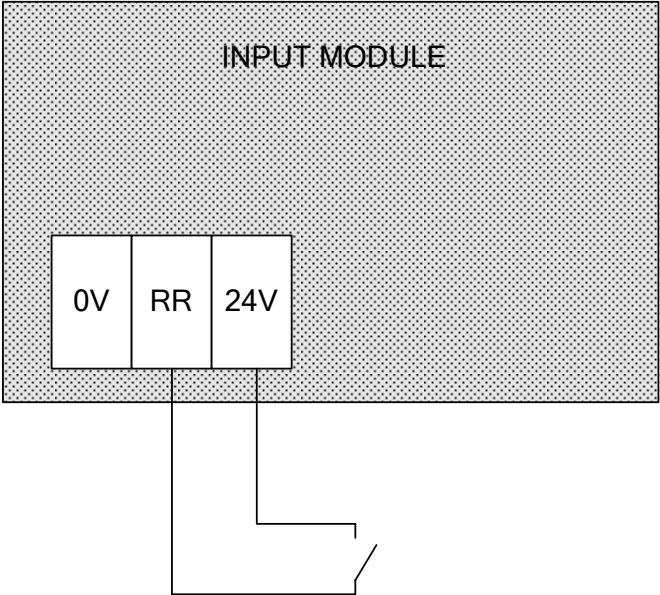
Use screened cable if required by the transmitter



Remote reset

If remote reset is required, connect a normally-open switch across the terminals. Close the contacts momentarily to acknowledge or reset alarms.

It is sufficient to connect the remote reset switch to one input module only. When the connection is closed, all acknowledgeable relays in the system will be reset.

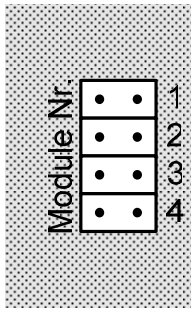


CONFIGURATION AND CALIBRATION

Set input module number

If you have more than one input module you must set the module number of each module using the hardware links on the modules. Fit a jumper on the link marked with the number.

Each module must have a different module number. Set the first physical module as number 1, the next as number 2, and so on.



A module's number determines the channels on that module:

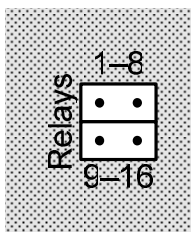
Module No.	Channels
1	1 – 4
2	5 – 8
3	9 – 12
4	13 – 16

If you only have one input module, set it to number 1.

It is easier to configure a system if the modules are numbered without gaps, and in sequence: eg, 1–2–3, not 1–2–4.

Set relay numbers

Set the relay numbers link on each relay module.



- If you have one relay module fit the link on position '1-8'
- If you have two relay modules fit a link on position '1-8' on the first module, and '9-16' on the second module.

When you have two relay modules the relays are numbered 1 to 16:

Link	Relay on module..... number in system
1-8	RL1 1
	RL2 2
	RL3 3
	RL4 4
	RL5 5
	RL6 6
	RL7 7
	RL8 8
9-16	RL1 9
	RL2 10
	RL3 11
	RL4 12
	RL5 13
	RL6 14
	RL7 15
	RL8 16

Display board

The display board needs no configuration.

Inhibit alarms

The inhibit LED on the front panel will light and the ‘Active’ LEDs on the front panel will flash briefly every 30s. The internal sounder will beep every 30s.

If you have configured a relay as “alarm inhibit” it will change state when the Inhibit switch is in position “1”.

Return the switch to position “0” after you complete configuration/calibration.

Inhibit alarms during configuration

To prevent alarms occurring during configuration or calibration, set the Inhibit switch on the display board to position "1".

You can configure the system with the Inhibit switch in position "0". If you inactivate a channel with the Inhibit switch in position “0” the fault alarm will trip.

Configuration

Once the REGARD 3900 is mechanically assembled its configuration needs to be set. Refer to the REGARD 3900 Config guidance document. The parameters which require setting are

Input module

Gas name, Gas units, Gas Range, A1 trip level, A2 Trip level, A3 Trip level (if used), Alarm levels rising/falling, Alarm levels latching/non-latching, Fault 1 Trip level and Fault 2 Trip level (if used).

Output module

Common alarms, Single alarms with channel identity, Voting alarms with voting logic, Alarms inhibited, No Function alarm relay, Energise on alarm or normally energised, Latching or non latching and Acknowledgeable or Not Acknowledgeable.

Calibrating 4-20mA inputs

(Also refer to the transmitter's operating manual for calibration instructions.)

Zero calibration

Before calibrating the signal loop between the REGARD 3900 and transmitter, it is mandatory to perform a calibration of the transmitter to ensure that the output signal of the transmitter is 4 mA for a zero gas reading.

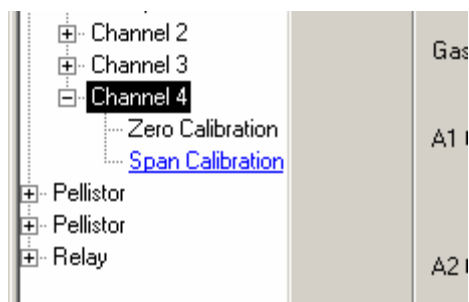
The display of the REGARD 3900 will indicate zero for a transmitter signal of $4\text{mA} \pm 0.3\text{mA}$. If necessary, calibrate the transmitter to give 4.0mA at zero gas.

Span calibration

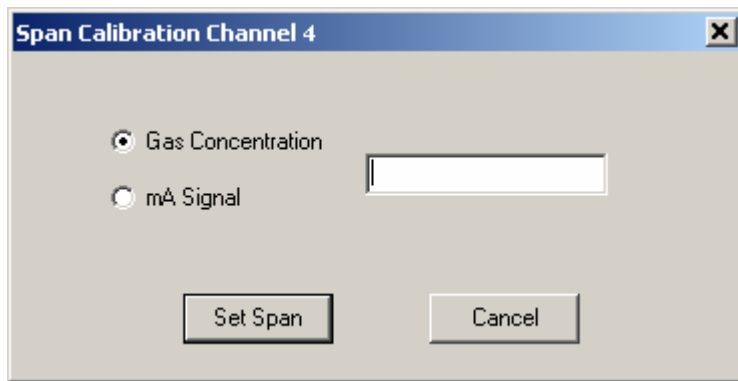
Span calibration can be performed either by applying calibration gas to the transmitter/sensor, or by controlling the output of the transmitter directly (eg, by means of the transmitter's front panel controls) to simulate a gas signal.

If applying calibration gas to the transmitter:

- Apply calibration gas with concentration at least 40% of measuring range to the transmitter
- Allow the reading on the REGARD 3900 display to settle
- Click "Span calibration" for the channel you are calibrating



- Type in the concentration of the calibration gas and click "Set span"



- When the calibration confirmation message appears, verify that the REGARD 3900 display reading corresponds to the gas concentration
- Remove the calibration gas.

If controlling the transmitter output:

- Set the output of the transmitter to a value between 10mA and 20mA.
- Click "Span calibration"
- Select "mA signal", type in the transmitter's signal in mA and click "Set span"
- When the confirmation message appears, verify that the REGARD 3900 display reading corresponds to the gas level that the transmitter signal would represent.

You do not need to click 'Send Channel' after calibrating zero or span.

MAINTENANCE

Check the controller for operation regularly.

The transmitters may require periodic recalibration. Refer to the instruction manual for the transmitters for guidance.

Observe EN 50073 and respective national regulations.

LED and display test

To test the LEDs and LCD display, press and hold the Acknowledge and Hold buttons at the same time.

Fault finding

Fault	Cause	Remedy
Controller non-operational	No DC supply to controller	Check controller has electrical supply connected. Check third party electrical supply. Check and replace power supply if necessary. Check internal power distribution wiring.
Display blank	No DC supply to display board	Check ribbon cable is connected to display board and all modules. Check internal power distribution wiring. Replace display board.
Display shows NO INPUTS		Check ribbon cable is connected to display board and all modules.
LED test fails		Replace display board.
Power AC and/or Power DC LEDs not illuminated, but LCD display on.		Check controller has the required supply connected. Replace display board.
Display shows Under-range		Check transmitter connections. Check and measure loop current. Check transmitter calibration.
Display shows Over-range		Short-circuit field cables Note: Over-range indication is latching. Press Acknowledge to clear Over-range indication. If Over-range does not clear, check transmitter
Fault LED lit for a single channel.		Check transmitter connections. Check and measure loop current. Check transmitter calibration. Replace transmitter.

		Replace input module.
Fault LED lit for a group of four channels.		Check transmitter connections. Check system ribbon cable. Replace input module.
Input module fitted, but no LEDs lit or data on LCD for the module.		Check system ribbon cable. Check internal power distribution wiring. Check display board. Replace input module. Replace display board.
Controller display different value to sensor display.		Check sensor calibration. Check channel calibration.
Unable to transfer configuration to or from controller.		Check RS 232 interface cable connections. Check controller is on and has power connected.
Calibration failure.		Check transmitter connections and calibration. Check transmitter and input module type. Check modules have correct configuration.
Water ingress.		Check sealing ring is in place. Check cable entry glands. Check product label is firmly affixed.
Fault alarm trips when channel made inactive		Set Inhibit switch to position "1", then return it to position "0"

Other information

Polytron warning signal

The Polytron transmitter warning signal - 3mA for 1s every 10s - will trip the fault relay on 4-20 module if trip level is set above 2.9mA. If fault relay is non-latching the relay will change state momentarily every 10s, in time with warning signal. Because the duration of the warning signal's 3mA level is short, it may not trip the fault alarm every time.

Polytron 3/5mA 1Hz maintenance signal

The 3-5mA 1Hz maintenance (calibration) signal on older Polytron transmitters will trip the fault alarm if the fault trip level is set higher than 2.9mA. If the fault relay is non-latching then the fault relay will toggle.

SPECIFICATIONS

System

Dimensions	415mm × 305mm × 150mm	
Weight	Approx. 5kg	
Enclosure material	ABS – VO	
Colour	Grey	
Mounting	External (M6), Internal	
Ingress protection	IP65 (with external mounting brackets)	
Cable entries	M20 (preformed)	
Cable cross-section	2.5mm ² (minimum 0.5mm ²)	
AC input voltage	Depends on power supply. Typical: 230V ± 10%; 110V ± 10%	
AC current consumption	Typical	Maximum
• 2A PSU / 4 channels	< 0.5A	0.5A
• 5A PSU / 8 channels	0.5A	1A
• 10A PSU / 12/16 channels	1A	2A
DC input voltage	24Vdc ± 2Vdc	
DC current consumption @ 24V	4-20 module:	60 mA excluding transmitters
	Relay module:	200mA
	Display:	170mA
	RS-232 interface:	50mA
Visual outputs	Alarm, Inhibit, Power, Active and Fault LEDs Four line, 20 character LC-display with backlight	
Storage temperature	-10 °C to 60 °C	
Operating temperature	0 °C to 55 °C	
Storage humidity	0 to 100%, non condensing	
Operating humidity	0 to 100%, non condensing	
Warm-up time	< 40 seconds	
Response time	< 3 seconds	
Accuracy	1%	
Module fixings	M3	

Relays (all modules)

Contact material	Silver alloy
Nominal switching capacity	5A 250VAC; 5A 30V DC
Max. switching power	1,250VA, 150W

Max. switching voltage	250VAC, 100V DC
Max. switching current	5A
Min. switching voltage	10V
Min. switching current	100mA

4-20mA module

Transmitter input	2 or 3 wire 4-20mA (3 wire source transmitters only)
Transmitter supply	24V DC (nominal), max. 400mA
Remote reset	2 wire normally open switch input
Relays	A1, A2 & Fault Volt-free, single-pole changeover (SPDT)

Relay module

Relays	<p>Eight single-pole changeover</p> <p>Relay 1: common fault, normally-energised, latching, not acknowledgeable</p> <p>Relays 2 to 7 can be set as:</p> <ul style="list-style-type: none"> • common A1, common A2, common A3, common fault, common F2, common A1, A2 or A3, voted A1, voted A2, voted A3, voted fault, voted F2, single A1, single A2, single A3, single fault, single F2 or “alarms inhibited”; • energise-on-alarm or normally-energised; • latching or non-latching; • acknowledgeable or not acknowledgeable.
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Configuration program

IBM-compatible PC

- Windows 2000 or XP
- 128MB RAM
- Display resolution 800 x 600 minimum
- Mouse or other pointing device
- Serial port

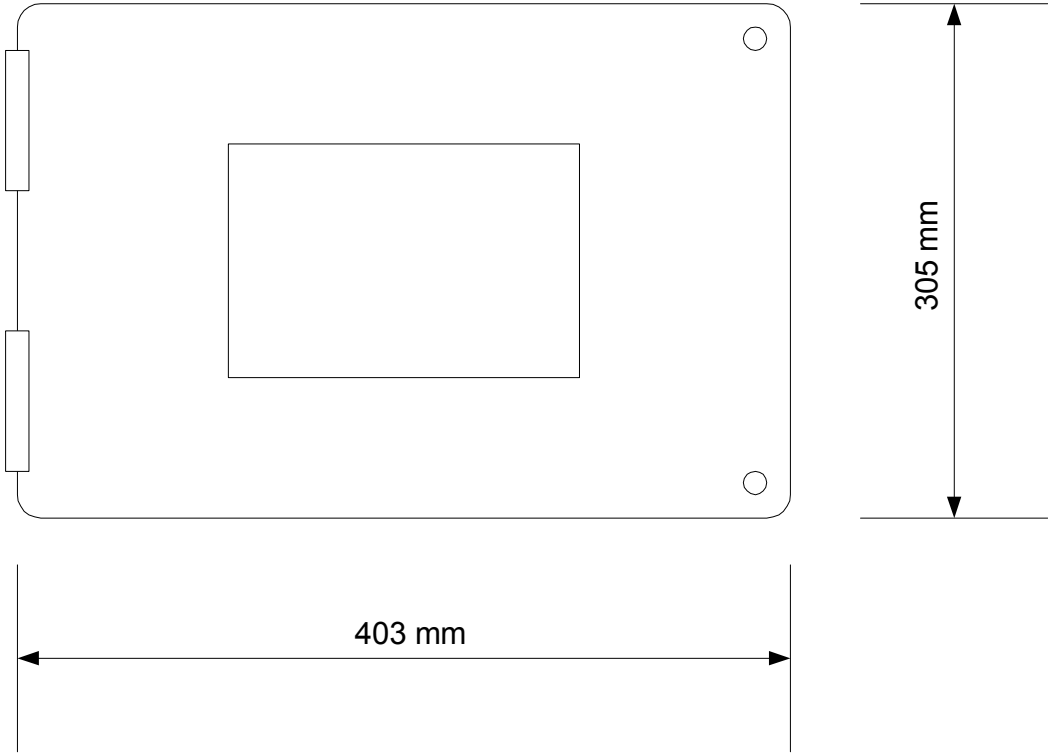
Part numbers

Description	Part number
Regard 3900 basic unit	4208780
Display board	4208781
4-20mA input module	4208782
Relay module	4208784
Installation, operating and maintenance manual (English)	4208800 en
Installation, operating and maintenance manual (German)	4208801
Installation, operating and maintenance manual (French)	4208802
Installation, operating and maintenance manual (Spanish)	4208803
Accessories	
RS-232 interface	4208785
Configuration program	4208804
Enclosure	4208760
Marshalling enclosure	4208751
Spare parts	
Inter-module ribbon cable	4208750
Power cable (long – PSU to module)	4208792
Power cable (short – module to module)	4208791

Regard 3800 modules, boards and accessories will not work on Regard 3900 and vice versa. Regard 3800 and Regard 3900 modules and boards are not interchangeable.

Enclosure dimensions

The dimensions given below are for the standard enclosure. It is recommended that a 50mm space is left around the total enclosure when installed. Available space to the left of the enclosure may be required to accommodate the opening profile of the enclosure.



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