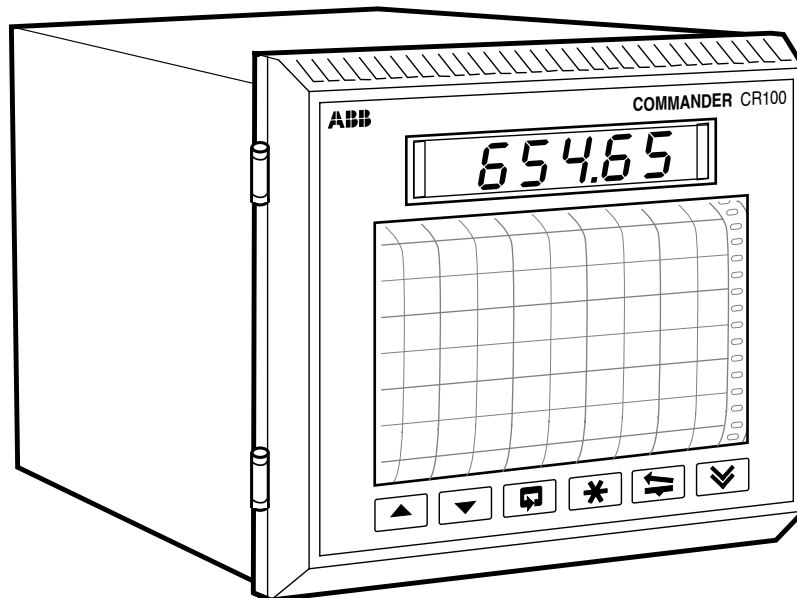


COMMANDER CR100
Multipoint Chart Recorder

User Guide



ABB



ABB

The Company

We are an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology.

The NAMAS Calibration Laboratory (No. 0255) is just one of ten flow calibration plants operated by the Company, and is indicative of our dedication to quality and accuracy.

BS EN ISO 9001



Cert. No. Q5907

EN 29001 (ISO 9001)



Lenno, Italy – Cert. No. 9/90A



Stonehouse, U.K.

Use of Instructions



Warning.

An instruction that draws attention to the risk of injury or death.



Note.

Clarification of an instruction or additional information.



Caution.

An instruction that draws attention to the risk of damage to the product, process or surroundings.



Information.

Further reference for more detailed information or technical details.

Although **Warning** hazards are related to personal injury, and **Caution** hazards are associated with equipment or property damage, it must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death. Therefore, comply fully with all **Warning** and **Caution** notices.

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of the Marketing Communications Department.

Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.




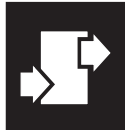



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GETTING STARTED

This manual is divided into 5 sections which contain all the information needed to install, configure, commission and operate the Recorder. Each section is identified clearly by a symbol as shown below.

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 FRONT PANEL, PENS AND CHARTS <ul style="list-style-type: none"> • Function Keys • LED Alarms and Indicators • Error Messages • Charts and Pens 	3 3 5 6 7
 OPERATOR MODE <ul style="list-style-type: none"> • Operator Menus for <ul style="list-style-type: none"> — Auto Scroll Mode — Manual Scroll Mode 	11 11 12
 SET UP MODE <ul style="list-style-type: none"> • Alarm Trip Points • Chart Speed • Offset Adjustment • Pen Calibration 	13 14 15 16 16
 CONFIGURATION MODE <ul style="list-style-type: none"> • LEVEL 3 <ul style="list-style-type: none"> — Input 1 Configuration — Alarm Setting — Hardware Configuration — Input 2 Configuration • LEVEL 4 <ul style="list-style-type: none"> — Ranges and Passwords 	17 18 20 22 23 24
 INSTALLATION <ul style="list-style-type: none"> • Siting • Mounting • Electrical Connections 	27 27 28 29

Symbol Identification and Section Contents

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i Information.

Pages 31 and 32 of this manual show all the frames in the programming levels. Space is provided on the page for writing the programmed setting or selection for each frame.

1.1 Introduction – Fig. 1.1

The Instrument front panel display, function keys and LED indicators are shown in Fig. 1.1.

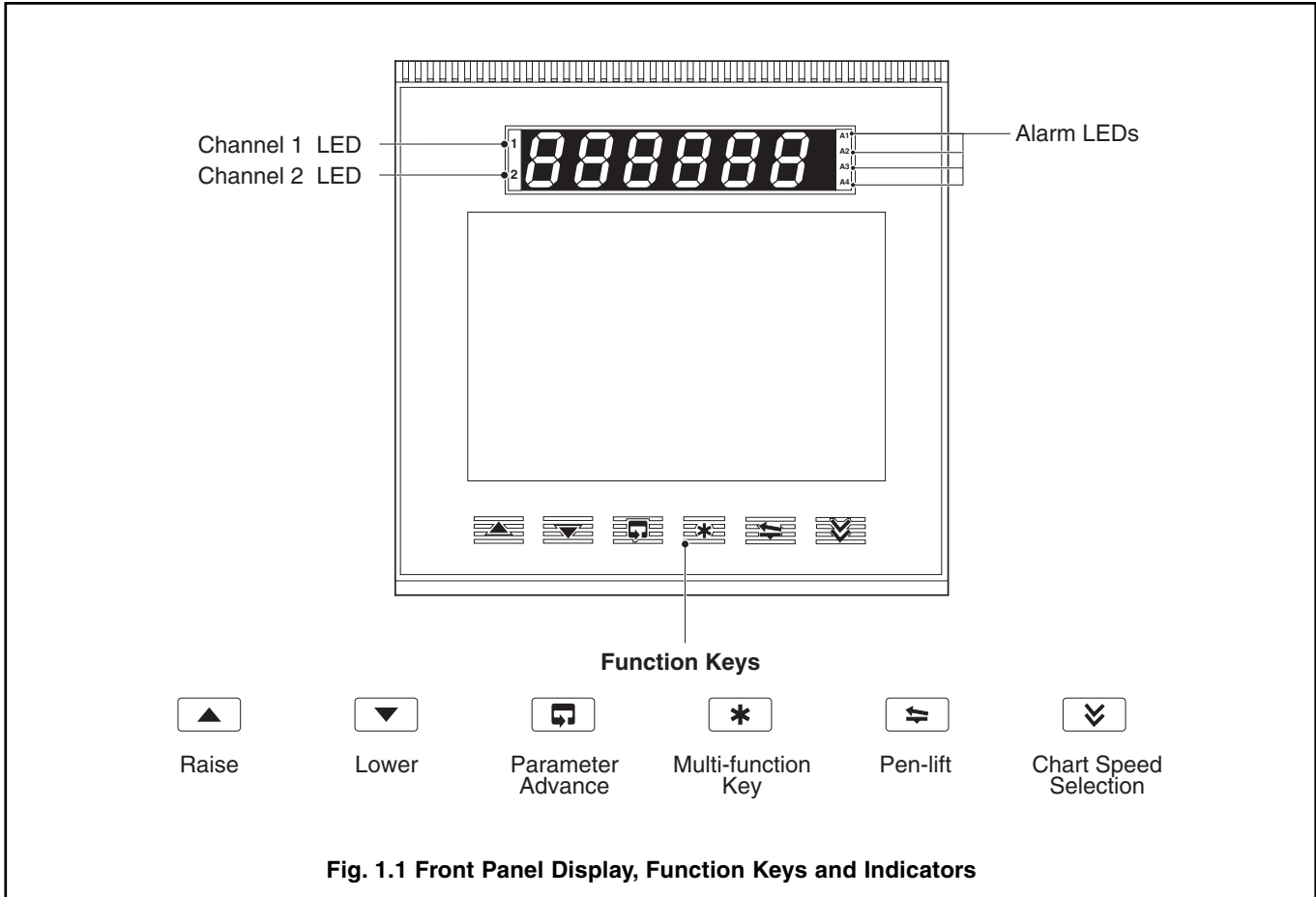
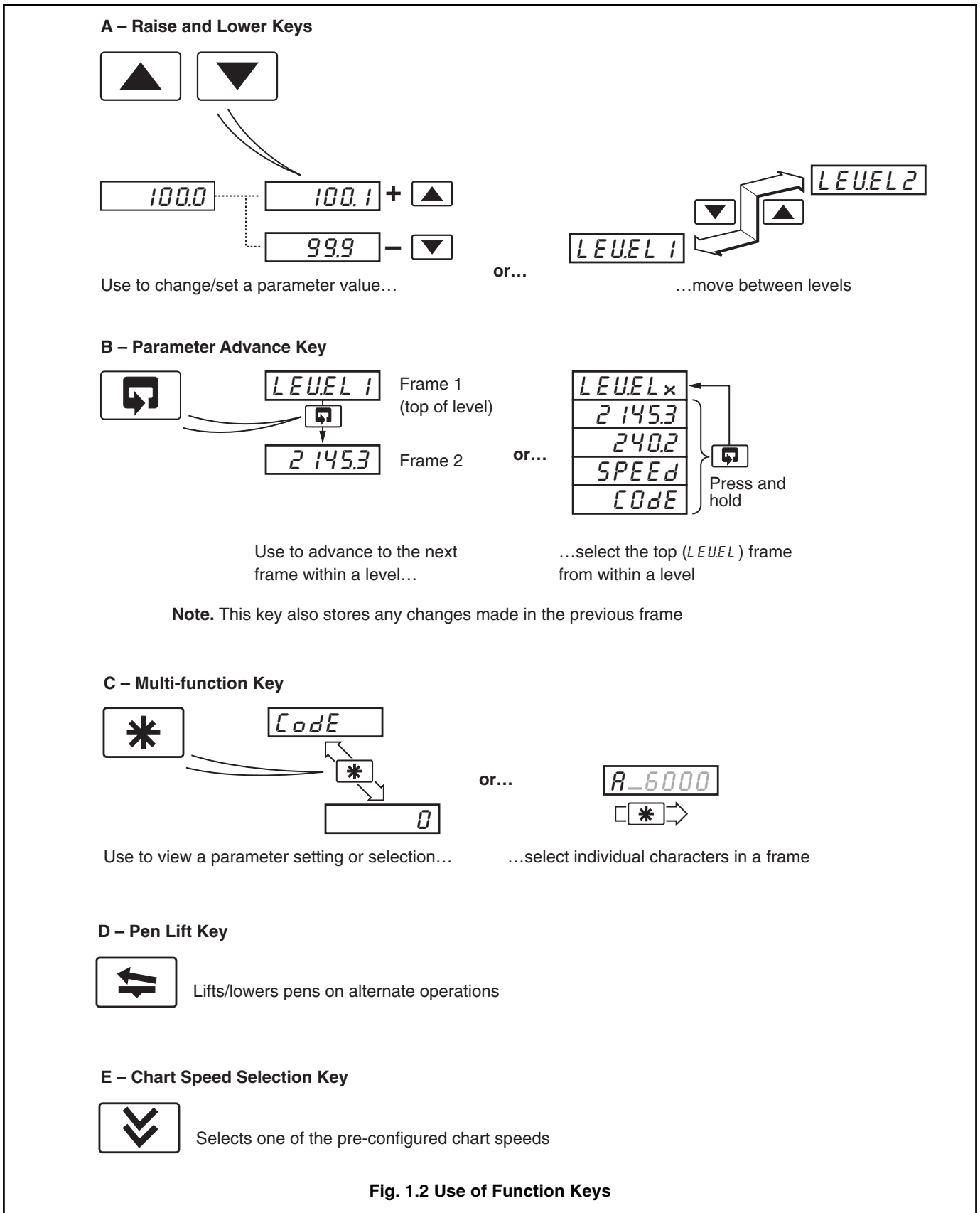
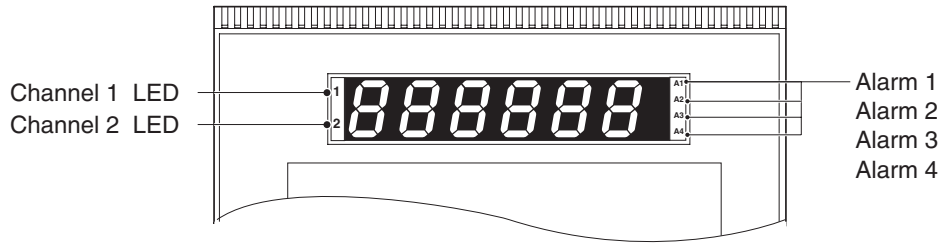


Fig. 1.1 Front Panel Display, Function Keys and Indicators

1.2 Use of Function Keys – Fig. 1.2



1.3 LED Alarms and Indicators – Fig. 1.3



LED Status

All Alarm LEDs (and one or both channel identification LEDs in 2-pen instruments) flashing

- Recorder is in the configuration mode – see section 4

Alarm LEDs A1, A2, A3 and A4





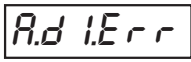
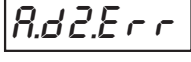
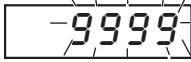
- Flashing – the associated alarm is active (off when inactive)
- Lit constantly – the associated alarm is an active latch alarm which has been acknowledged

Channel Identification LED's 1 or 2

- Indicates to which channel the display information is applicable (channel identification LED's are applicable only to 2-pen instruments)

Fig. 1.3 LED Alarms and Indicators


1.4 Error Messages

Display	Error/Action	To Clear Display
	Calibration Error Turn main power off and on again (if the error persists contact the Service Organization).	Press the  key.
	Configuration Error The configuration and/or setup data for the instrument is corrupted. Turn main power off and on again (if the error persists check the configuration/setup settings).	Press the  key.
	A to D Converter Fault The analog to digital converter is not communicating correctly for input 1.	Turn power off and on again. If the error persists contact the Service Organization.
 *	A to D Converter Fault The analog to digital converter is not communicating correctly for input 2.	Turn power off and on again. If the error persists contact the Service Organization.
	Process Variable Over/Under Range	Restore valid input.


* 2-pen recorder only.

1.5 Fitting Charts & Pens

1.5.1 Removing/Refitting a Chart Unit – Fig. 1.4

Operate the  key to lift the pen(s). Referring to Fig. 1.4:



① Open the door.

 **Note.** Items ② and ③ must be carried out simultaneously.

② Press the chart latch and...

③ Using the chart grip, swing the chart unit outwards and upwards through 90°.

④ Pull to remove the chart unit from the chassis.

 **Note.** Before refitting the chart unit check that the pen(s) are raised. If not, press the  key.

⑤ To refit the chart unit, hold it with the front horizontal and locate the fulcrum pins in the slots in the chassis side plates.

⑥ Swing down the chart unit.

⑦ Press on the bottom of the unit until it latches into place.

Close the door. Press the  key to lower the pen(s).

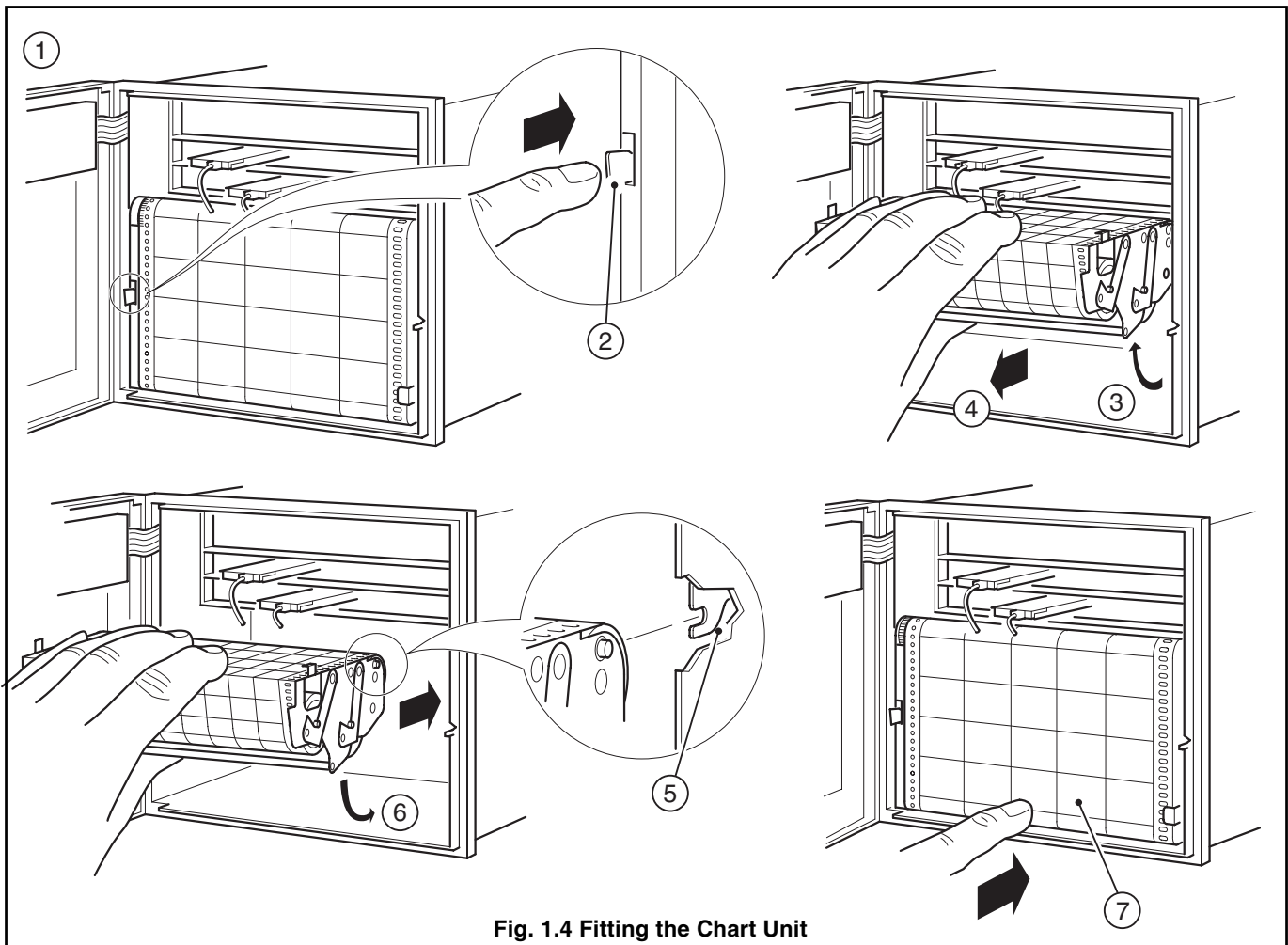


Fig. 1.4 Fitting the Chart Unit

...1.5 Fitting Charts & Pens

1.5.2 Fitting a Fanfold Chart – Fig. 1.5

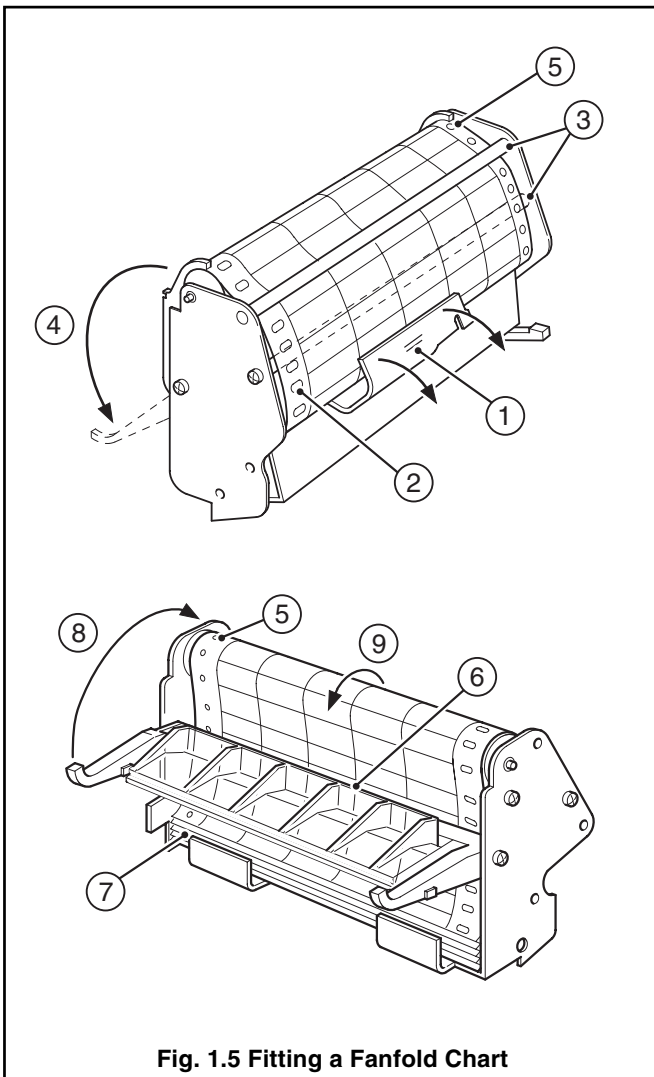


Fig. 1.5 Fitting a Fanfold Chart

Remove the chart unit and the used chart from the tray – see Section 1.5.1. Referring to Fig. 1.5:

- ① With the spring flap held open, place the new chart in the feed tray and close the flap.
- ② Ensure that as the paper is withdrawn the perforated slots are to the left and the printed side outwards.
- ③ Feed the paper over the first tie rod and under the second.
- ④ Hinge back the window moulding.
- ⑤ Feed the paper over the top roller, ensuring that the holes engage correctly with the drive pegs.
- ⑥ Pass the end of the paper behind the window moulding.
- ⑦ Feed the paper into the tray, arranging the folds so that the brown dots are visible on the external folded edges at the front of the tray.
- ⑧ Close the window moulding.
- ⑨ Advance the chart to the correct time line.

If the instrument is already operating, refit the chart unit. If the instrument is being set up for the first time, fit the pen cartridge – see Section 1.5.4.

...1.5 Fitting Charts & Pens

1.5.3 Fitting a Roll Chart – Fig. 1.6

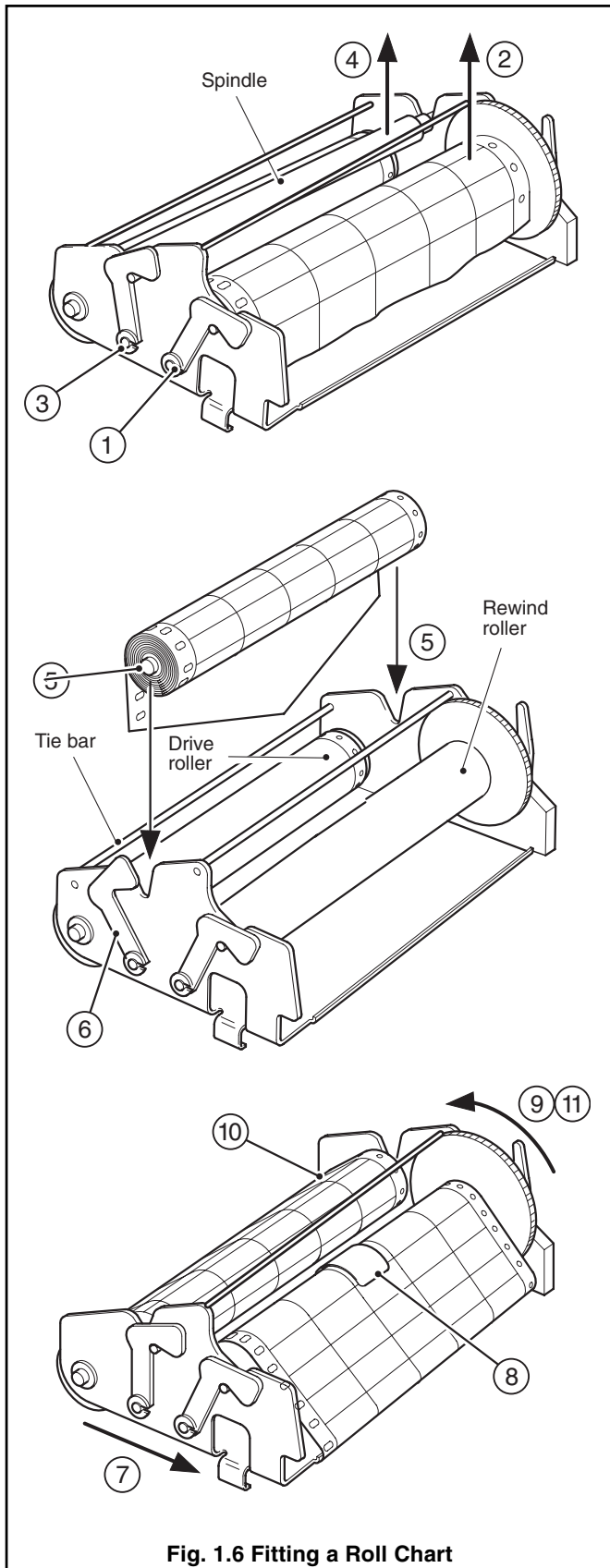


Fig. 1.6 Fitting a Roll Chart


Remove the chart unit – see Section 1.5.1.
Referring to Fig. 1.6:

- ① To remove a used chart, lay the chart unit face downwards and release the rewind roller latches on each side.
- ✳ **Note.** During item ② retain the spring clip which will be found inside the roll.
- ② Remove the rewind roller and discard the used roll. Refit the roller and secure the latches.
- ③ To fit a new chart, release the feed spindle latches on each side.
- ④ Lift the spindle away.
- ⑤ Insert the spindle into the new chart roll and refit the spindle to the chart unit.
- ⑥ Secure the latches at each end.
- ⑦ Draw off about 200mm (8 in.) of paper from the chart. Pass the paper over the tie bar and round the drive roller.
- ⑧ Feed the tapered end of the chart onto the rewind roller, wind on two turns and secure with the spring clip retained at ②.
- ⑨ Take up the slack by rotating the thumbwheel.
- ⑩ Ensure that the holes along the edge of the paper are correctly engaged with the pegs on the drive roller assembly.
- ⑪ Advance the chart to the correct time line using the thumbwheel.

If the instrument is already operating, refit the chart unit. If the instrument is being set up for the first time, fit the pen cartridge – see Section 1.5.4.

...1.5 Fitting Charts & Pens

1.5.4 Fitting a Pen Cartridge – Fig. 1.7


Ensure that the instrument is switched on and operate the  key to raise the pens. Referring to Fig. 1.7:

- ① Pull the used pen(s) (if fitted) gently from the assemblies and discard.
- ② Remove the air vent cover(s) from the new pen(s).
- ③ Carefully twist and pull the cap(s) from the fibre tip(s).
- ④ Push each new pen into the appropriate clip assembly.

No. 1 (red) pen in the bottom position.

No. 2 (green) pen in the top position.

Pull gently on each pen to ensure that it is engaged in the clip.

Press the  key to lower the pens. Close the door.

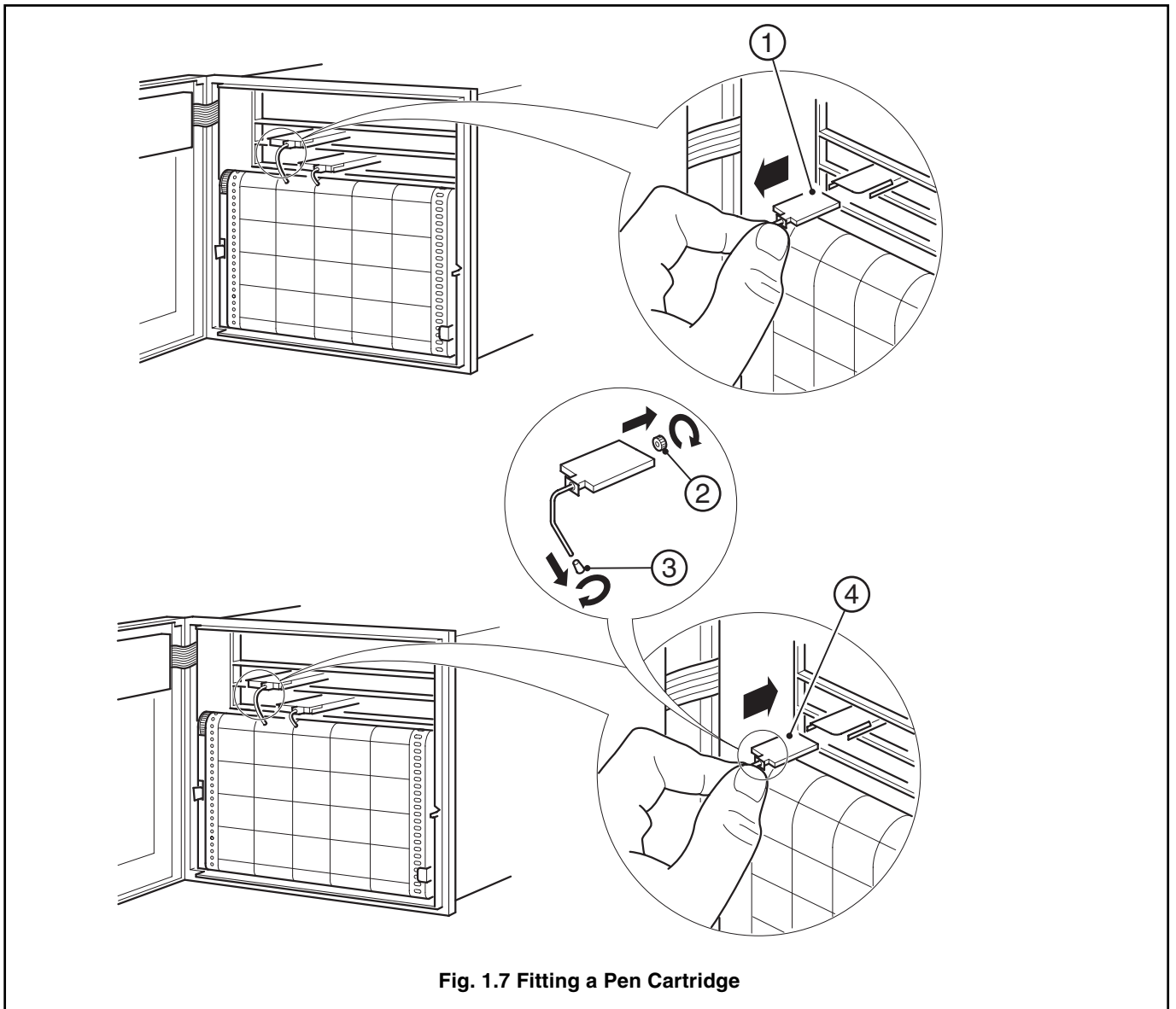


Fig. 1.7 Fitting a Pen Cartridge



2 OPERATOR MODE

2.1 Introduction

Operator Mode (Level 1) is the normal day-to-day mode of the Recorder.

Frames displayed in Level 1 are determined by the functions which are selected during configuration of the instrument – see Section 4.

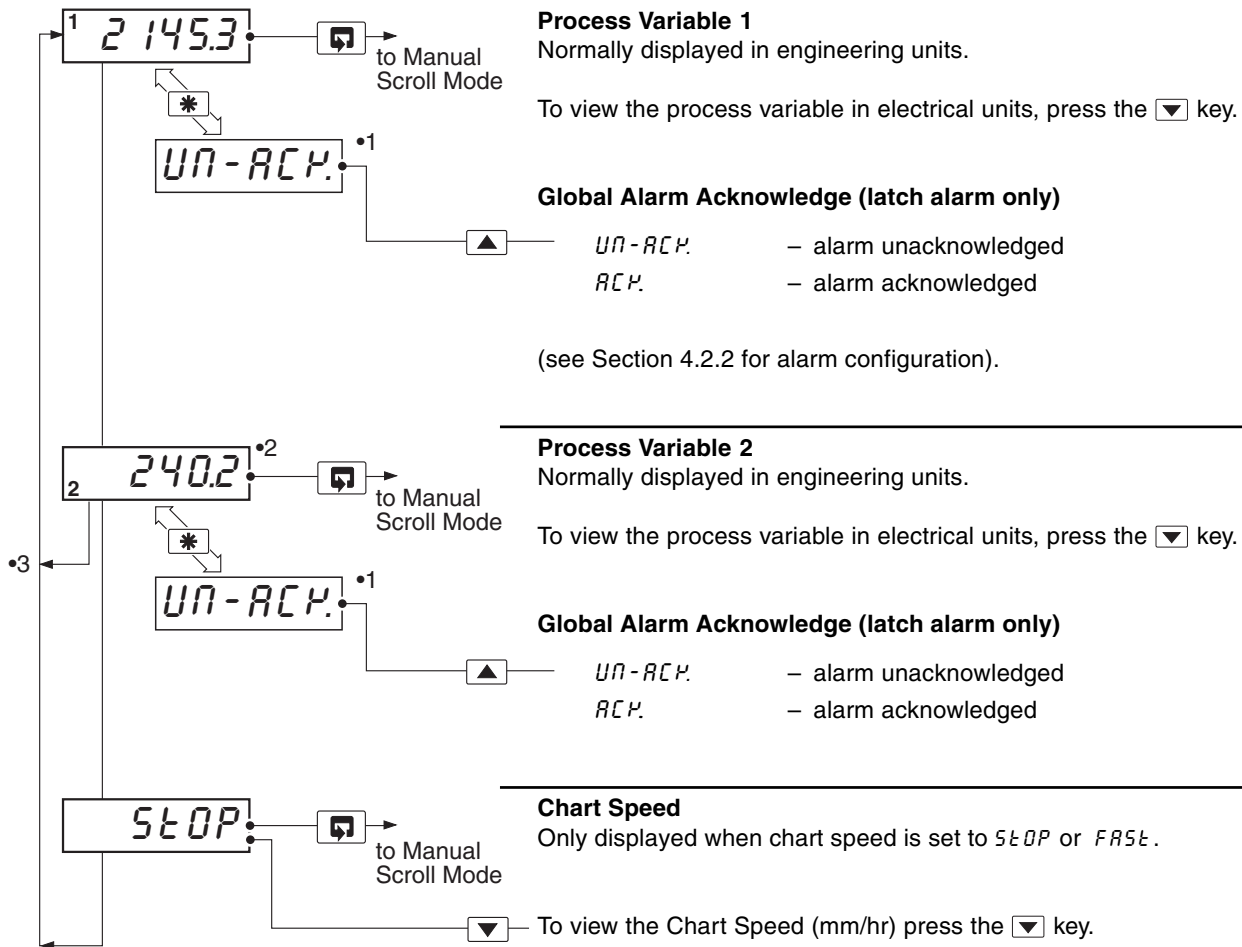


Note. Only the operating frames relevant to the configured functions are displayed in Operator Mode.

The two indicator functions are:

- **Auto Scroll Mode** – This page
- **Manual Scroll Mode** – Page 11

2.2 Operating Page (Level 1) – Auto Scroll Mode



- 1 Displayed only if there is an active latch alarm.
- 2 Not displayed in single-pen instruments.
- 3 Auto Scroll loop if the chart speed is set to 'Normal'.



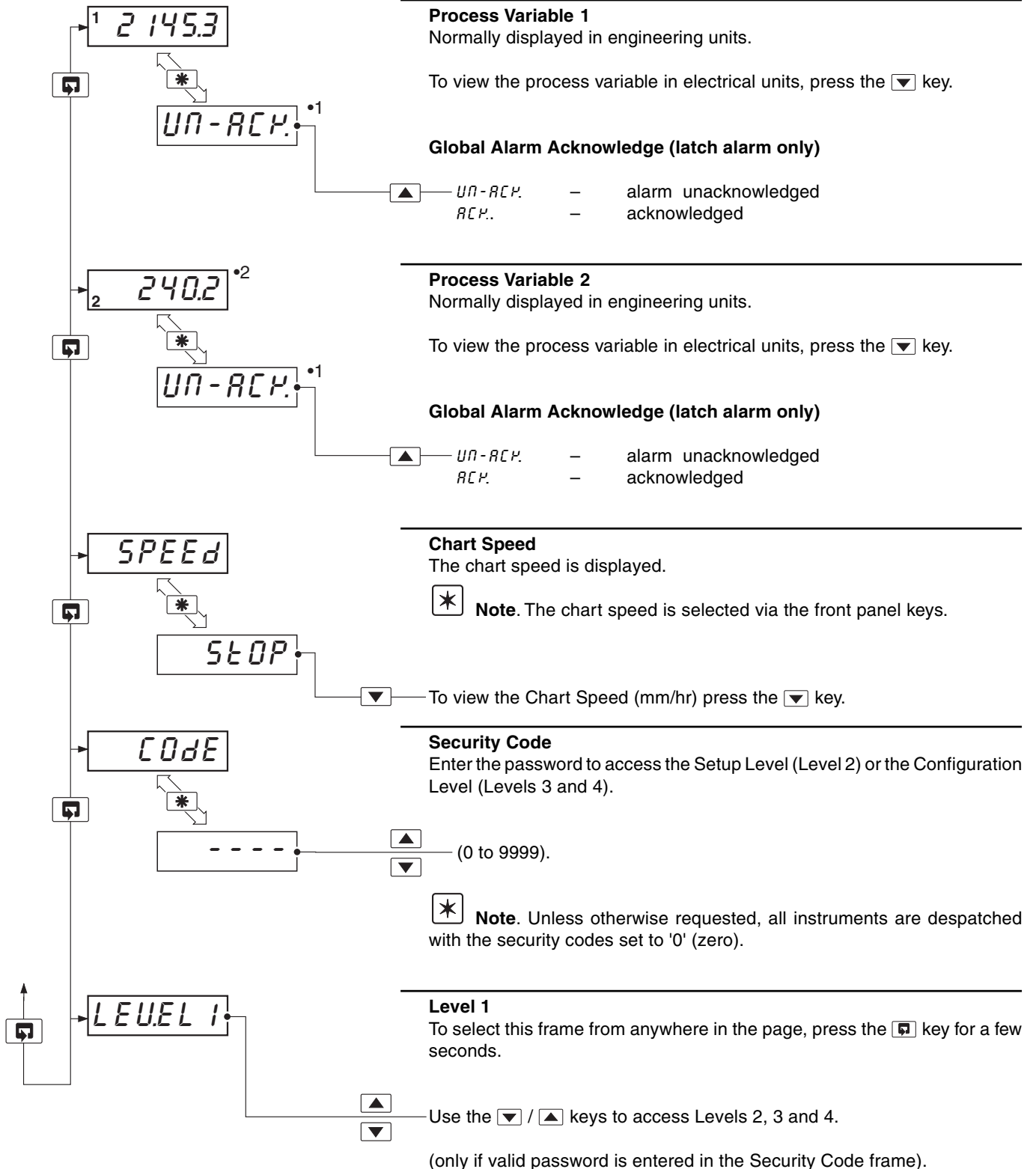
Notes.

- To exit Auto Scroll Mode from any frame in the Auto Scroll loop, press the key. The display remains in this frame until the key is pressed again.
- Instrument starts up in Auto Scroll Mode at Power-on or when the key is pressed at LEVEL 1.
- Press the key anywhere in the page to select pre-configured chart speed.
- Single-pen instruments default to Auto Scroll Mode when the chart speed is set to STOP or FAST.





2.3 Operating Page (Level 1) – Manual Scroll Mode



•1 Only displayed if there is an active latch alarm.
•2 Not displayed in single-pen instruments.



3 SET UP MODE

3.1 Introduction

To access the Set Up Level (Level 2) the correct password must be entered in the security code frame in Level 1 – see Fig. 3.1

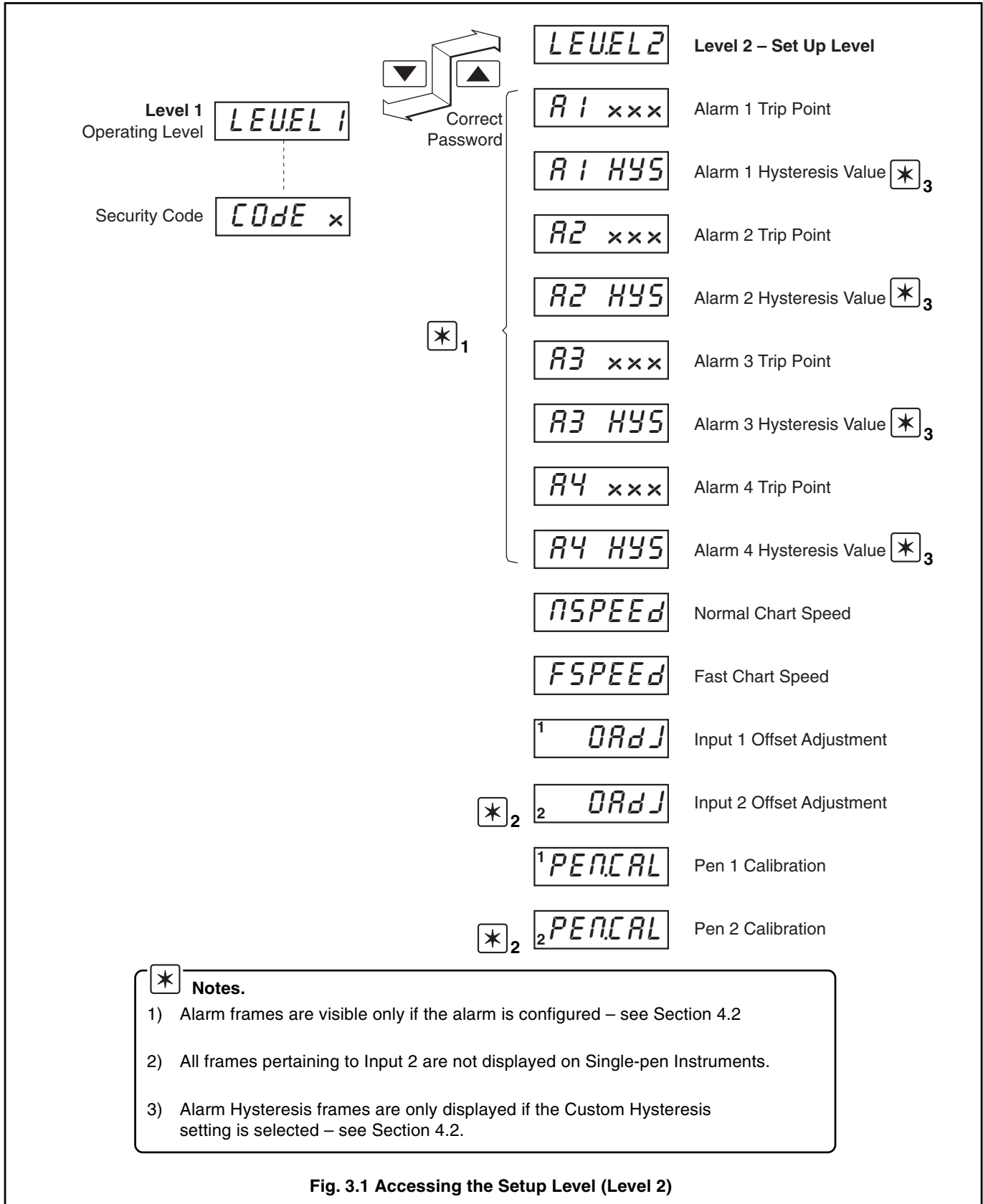
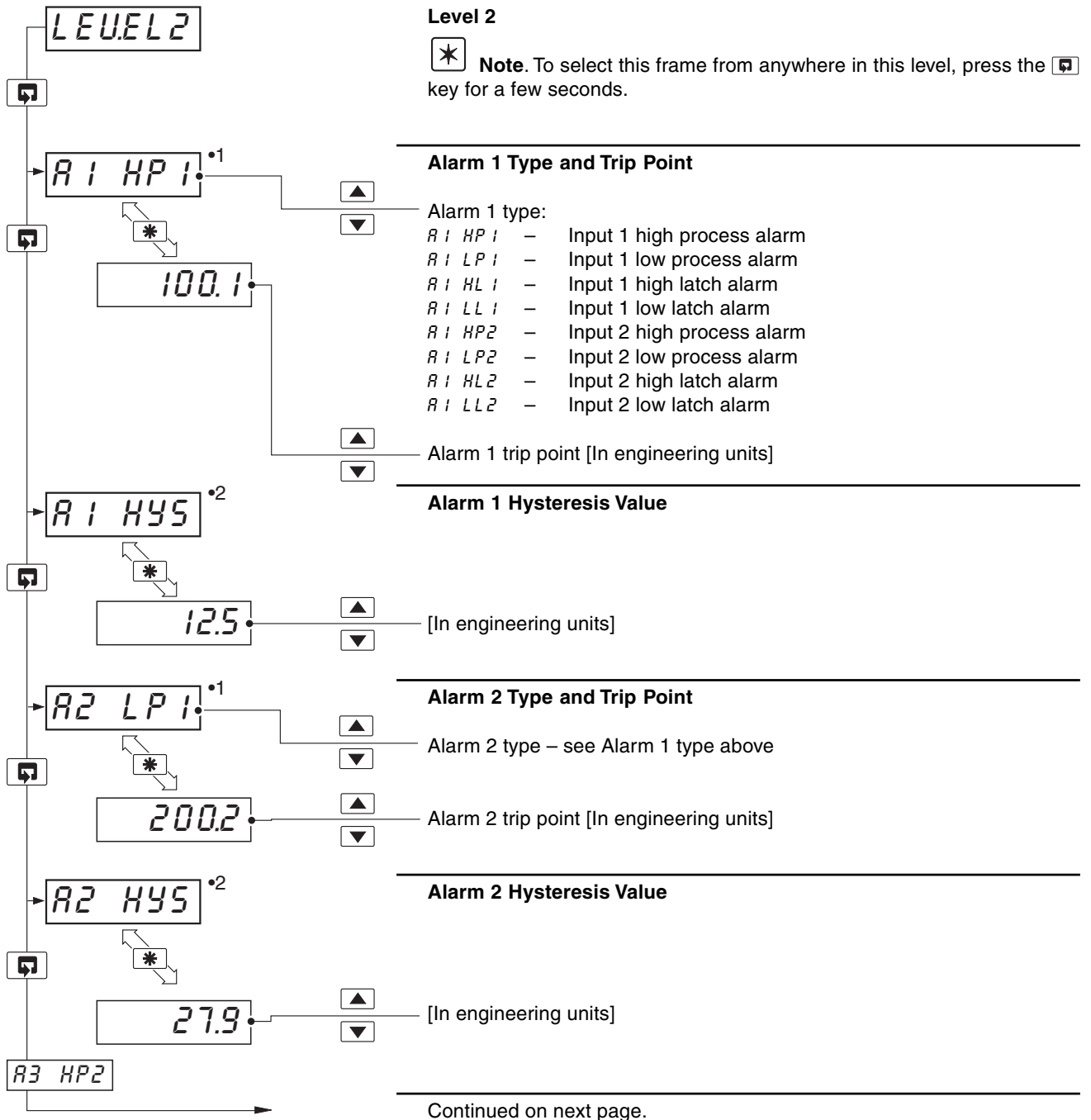


Fig. 3.1 Accessing the Setup Level (Level 2)





3.2 Set Up Level (Level 2)

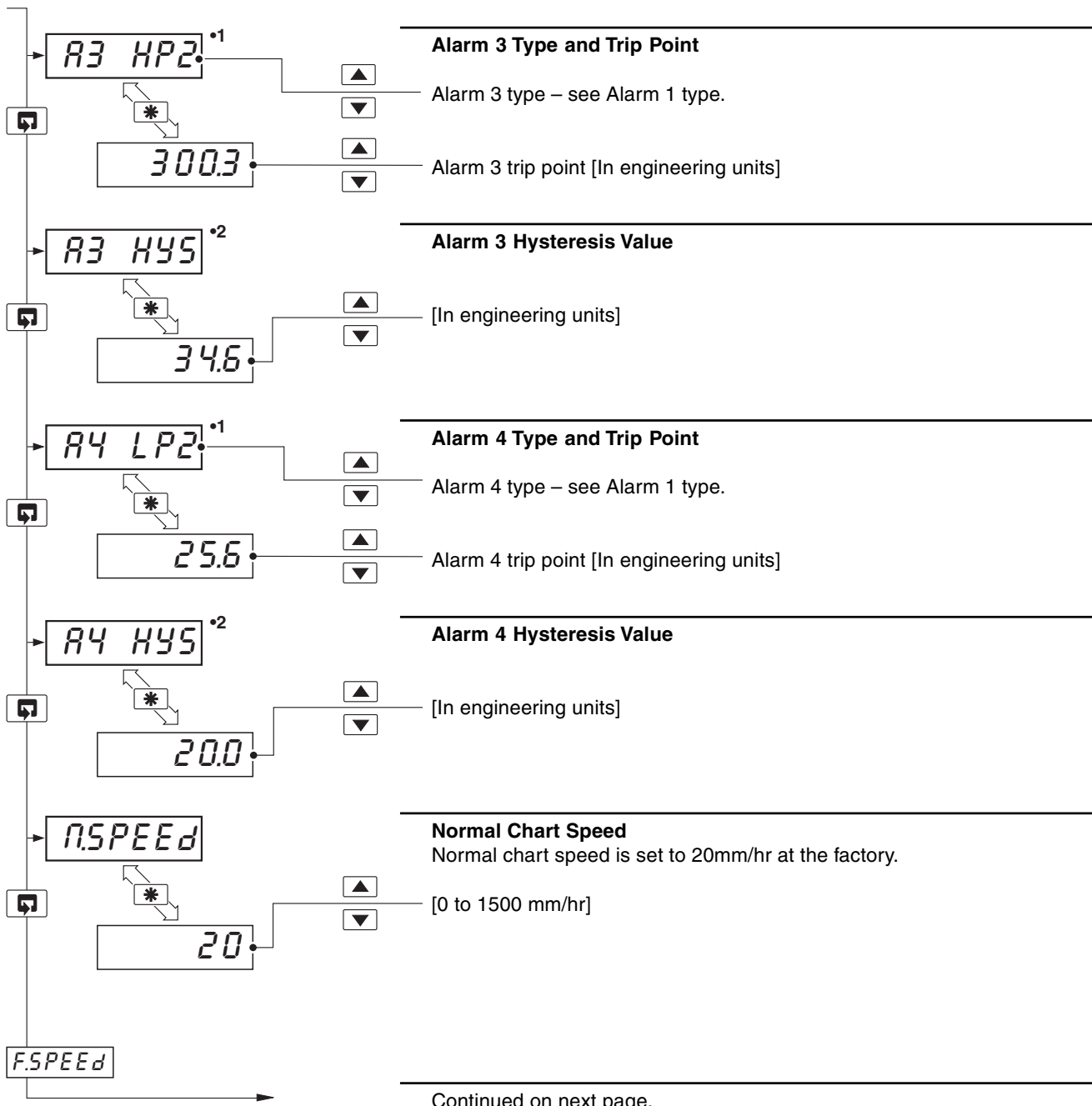


•1 Not displayed if the alarm is disabled ('None' is selected) – see Section 4.2.2
 •2 Displayed only if custom alarm hysteresis is selected – see Section 4.2.3



...3 SET UP MODE

...3.2 Set Up Level (Level 2)

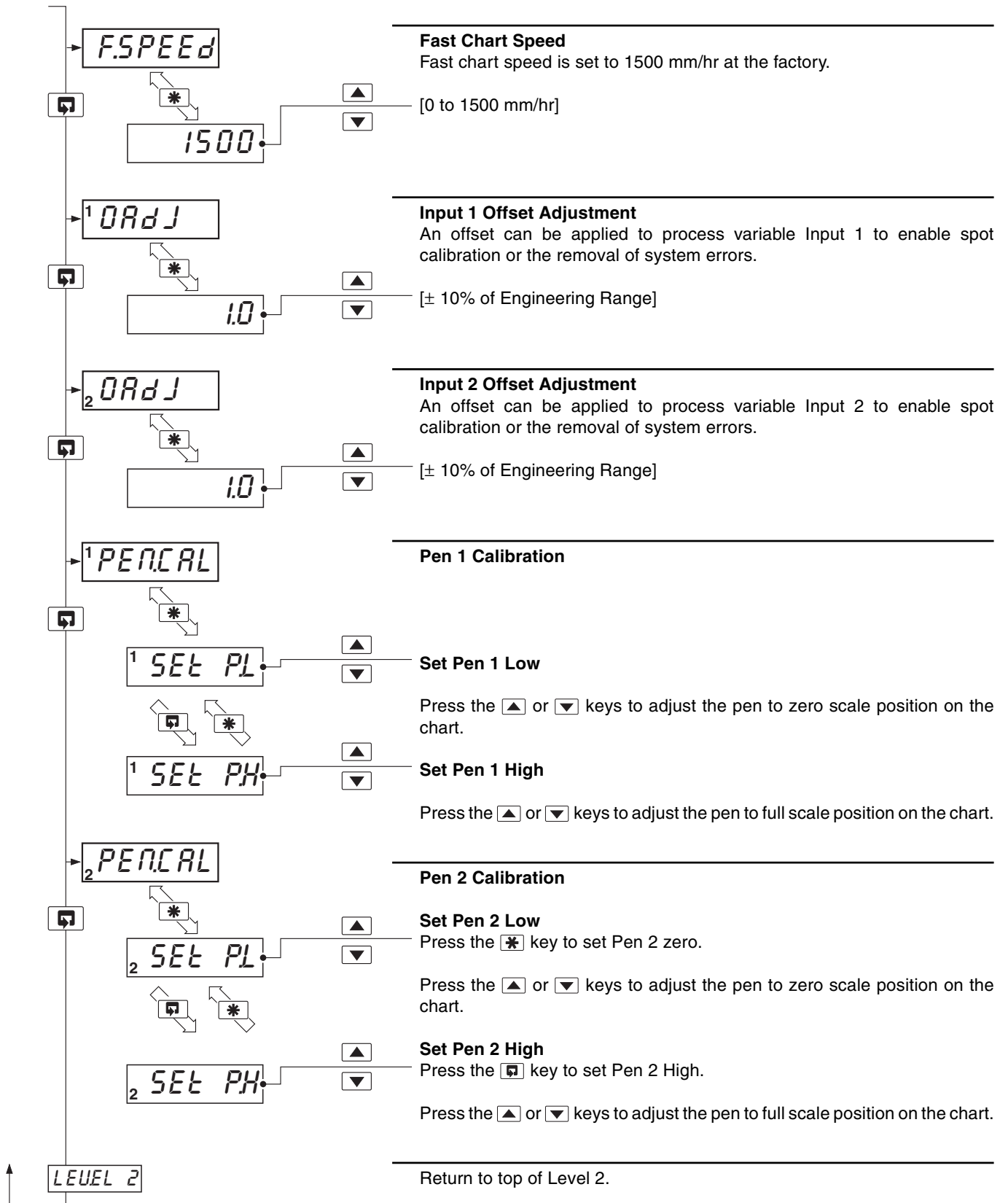


- 1 Not displayed if the alarm is disabled ('None' is selected) – see Section 4.2.2
- 2 Displayed only if custom alarm hysteresis is selected – see Section 4.2.3





...3.2 Set Up Level (Level 2)





4 CONFIGURATION MODE

4.1 Introduction

The Configuration Mode comprises two levels (3 and 4) as shown in Fig. 4.1.



Note.

When in the configuration level:

- All Alarm l.e.d.s (and one or both Channel Identification l.e.d.s on 2-pen instruments) flash.
- All relays are turned OFF.
- The analog output reverts to 'Retransmission Low' (4mA) output level.

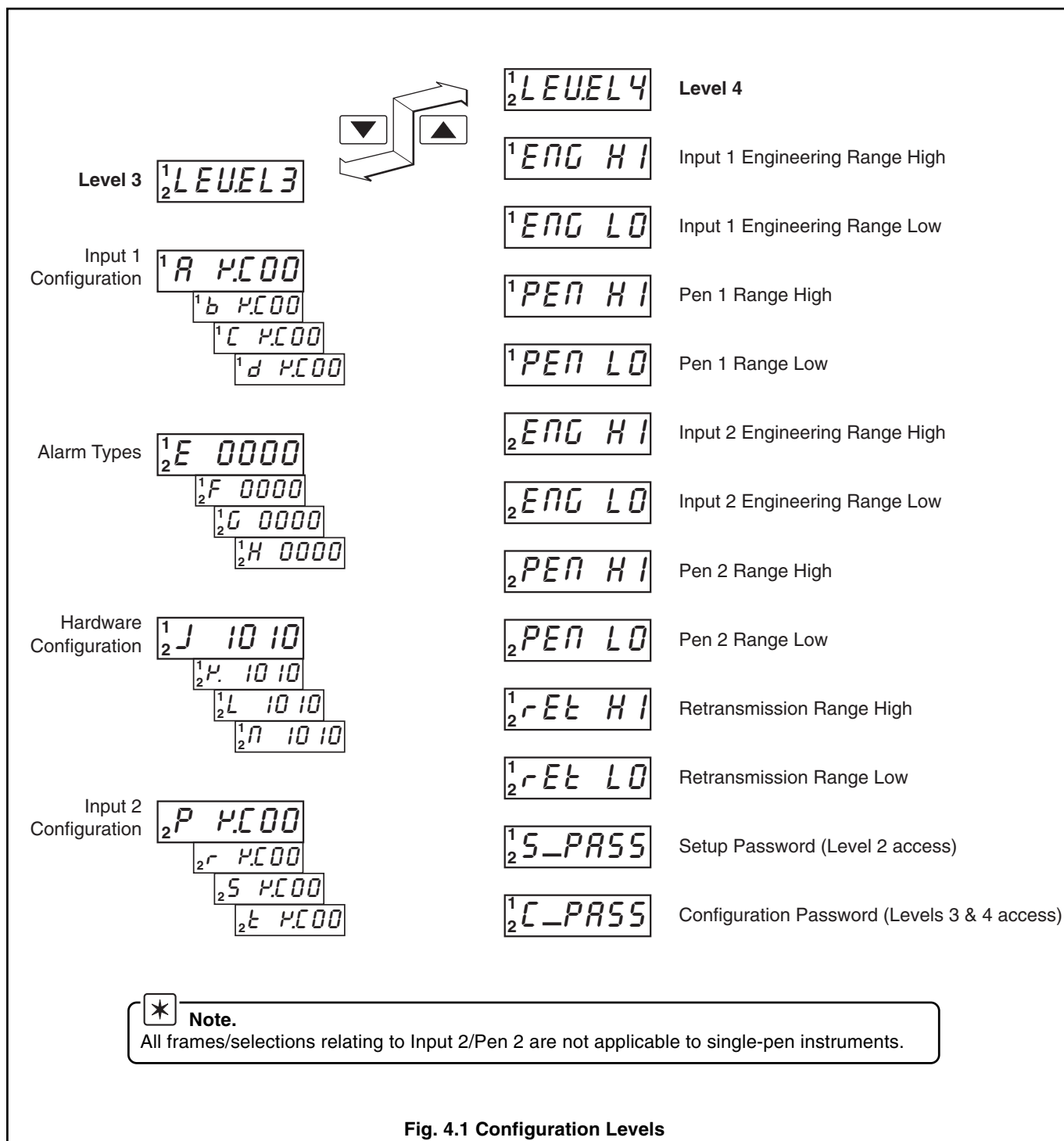


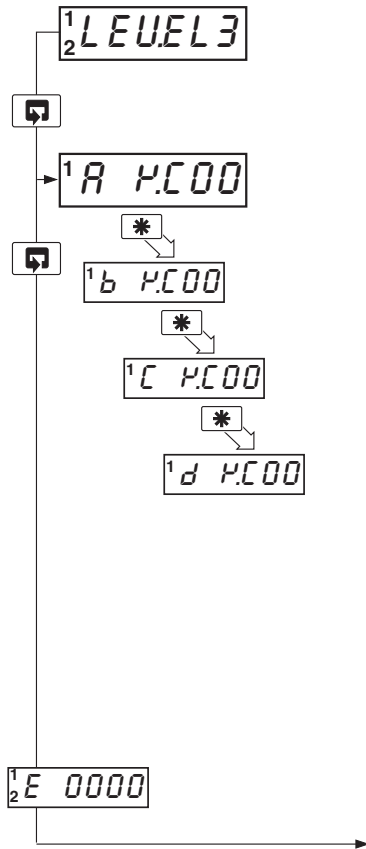
Fig. 4.1 Configuration Levels





4.2 Input, Hardware & Alarms Configuration (Level 3)

4.2.1 Input 1 Configuration



Level 3

Note. To select to this frame from anywhere in this level, press the for a few seconds.

'ABCD' Settings

The first character (*A*, *b*, *C* or *d*) identifies the parameter to be changed. The current setting is indicated by a flashing letter. Parameter options are shown in Fig. 4.2

- A* = Input type and range configuration
- b* = Temperature units
- C* = Number of decimal points
- d* = Analog input filter

Notes.

- 1) When changing to a temperature input type (codes b to P), the full operating range of the thermocouple or RTD (see Table 4.1) is entered in Level 4 Engineering Range High/Low and Pen Range High/Low – see Section 4.3. For voltage or current input types (codes 1 to 7) the values remain unchanged.
- 2) In the event of a fault being detected on the input, the 'Broken Sensor Drive' action is dependent on the input type:
 - Thermocouple and RTD – Upscale
 - mA, mV and Volt – Downscale
- 3) For custom settings contact the local distributor.

Continued on page 19

Thermocouple	Range °C	Range °F	Accuracy (% of reading)
B	-18 to 1800	0 to 3270	0.25% or ±2°C (above 200°C)
E	-100 to 900	-140 to 1650	0.25% or ±0.5°C
J	-100 to 900	-140 to 1650	0.25% or ±0.5°C
K	-100 to 1300	-140 to 2350	0.25% or ±0.5°C
N	-200 to 1300	-325 to 2350	0.25% or ±0.5°C
R	-18 to 1700	0 to 3000	0.25% or ±1°C (above 300°C)
S	-18 to 1700	0 to 3000	0.25% or ±1°C (above 200°C)
T	-250 to 300	-400 to 550	0.25% or ±0.5°C

RTD	Maximum Range °C	Maximum Range °F	Accuracy of Reading
Pt100	-200 to 600	-325 to 1100	0.25% or ±0.5°C

Linear Inputs	Range	Accuracy of Reading
Milliamps	0 to 20	0.25% or ±2µA
Milliamps	4 to 20	0.25% or ±2µA
Volts	0 to 5	0.25% or ±2mV
Volts	1 to 5	0.25% or ±2mV
Millivolts	0 to 50	0.25% or ±20µV

Square Root Inputs	Range	Accuracy of Reading
Milliamps	4 to 20	0.25% ±2µA

Note.

Performance accuracy is not guaranteed below 400°C (752°F) for types B, R and S thermocouples.
 RTD, 3-wire platinum, 100Ω per DIN 43760 standard (IEC751) with range of 0 to 400Ω.

Min. span below zero: Type T 70°C (126°F)
 Type N 105°C (189°F)
 THC standards DIN 43710 IEC 584
 RTD standards DIN 43760 IEC 751

Table 4.1 Analog Input ranges





...4 CONFIGURATION MODE

A 4.C00

A – Input Type and Range Configuration (Input 1)

Display		Display	
<i>b</i>	THC Type B	<i>1</i>	0 to 20 mA
<i>E</i>	THC Type E	<i>2</i>	4 to 20 mA
<i>J</i>	THC Type J	<i>3</i>	0 to 5 V
<i>K</i>	THC Type K	<i>4</i>	1 to 5 V
<i>n</i>	THC Type N	<i>5</i>	0 to 50 mV
<i>r</i>	THC Type R	<i>7</i>	4 to 20 mA (square root linearizer)
<i>S</i>	THC Type S	<i>U</i>	Custom Configuration
<i>t</i>	THC Type T		
<i>P</i>	PT100 RTD		

b 4.C00

b – Temperature Units

Display	Temperature Units
<i>C</i>	Degrees C*
<i>F</i>	Degrees F*
<i>0</i>	No temperature units

* Temperature inputs only

C 4.C00

C – Process Variable Display Decimal Places

Display	
<i>0</i>	xxxxx
<i>1</i>	xxxx . x
<i>2</i>	xxx . xx
<i>3</i>	xx . xxx
<i>4</i>	x . xxxx

d 4.C00

d – Analog Input Filter

Display	
<i>0</i>	0 seconds
<i>1</i>	1 second
<i>2</i>	2 seconds
<i>5</i>	5 seconds
<i>10</i>	10 seconds
<i>20</i>	20 seconds
<i>40</i>	40 seconds
<i>60</i>	60 seconds

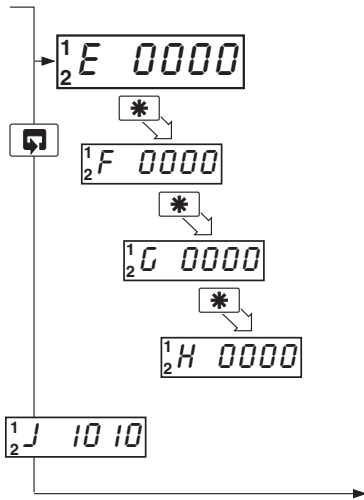
Fig. 4.2 Input 1 Configuration





4.2.2 Alarms Configuration

Note. Relays assigned to alarms are de-energized in the alarm state.



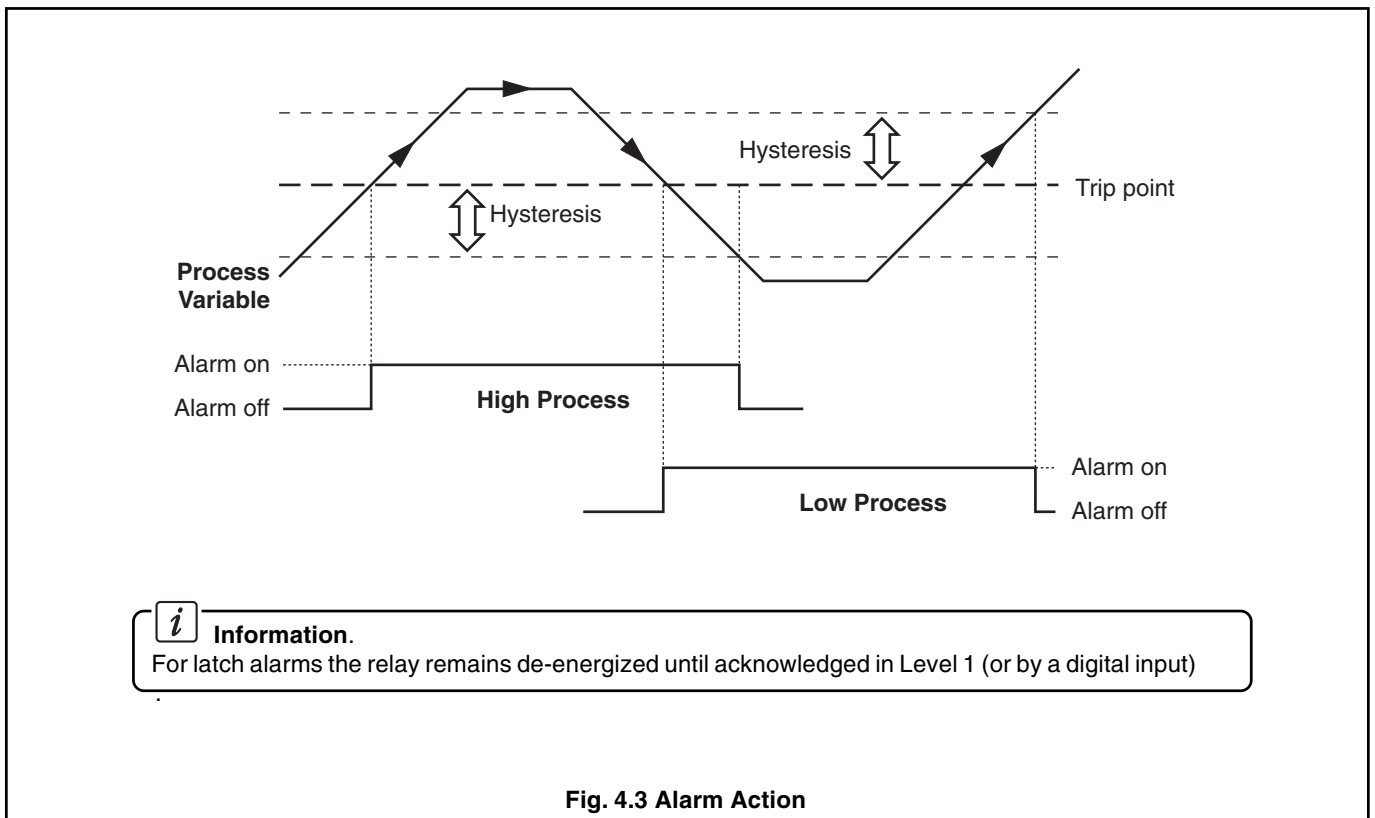
'EFGH' Settings

The first character (*E*, *F*, *G* or *H*) identifies the parameter to be changed. The current setting is indicated by a flashing letter. Parameter options are shown in Fig. 4.4.

- E* = Alarm 1 type
- F* = Alarm 2 type
- G* = Alarm 3 type
- H* = Alarm 4 type

Note. For custom settings contact your local Service Organization.

Continued on page 20.



i Information. For latch alarms the relay remains de-energized until acknowledged in Level 1 (or by a digital input)

Fig. 4.3 Alarm Action



...4 CONFIGURATION MODE

¹₂ E 0000 E – Alarm 1 Type

Display	
0	None
1	Input 1 High Process
2	Input 1 Low Process
3	Input 1 High Latch
4	Input 1 Low Latch
5	Input 2 High Process
6	Input 2 Low Process
7	Input 2 High Latch
8	Input 2 Low Latch

¹₂ F 0000 F – Alarm 2 Type

Display	
0	None
1	Input 1 High Process
2	Input 1 Low Process
3	Input 1 High Latch
4	Input 1 Low Latch
5	Input 2 High Process
6	Input 2 Low Process
7	Input 2 High Latch
8	Input 2 Low Latch

¹₂ G 0000 G – Alarm 3 Type

Display	
0	None
1	Input 1 High Process
2	Input 1 Low Process
3	Input 1 High Latch
4	Input 1 Low Latch
5	Input 2 High Process
6	Input 2 Low Process
7	Input 2 High Latch
8	Input 2 Low Latch

¹₂ H 0000 H – Alarm 4 Type

Display	
0	None
1	Input 1 High Process
2	Input 1 Low Process
3	Input 1 High Latch
4	Input 1 Low Latch
5	Input 2 High Process
6	Input 2 Low Process
7	Input 2 High Latch
8	Input 2 Low Latch

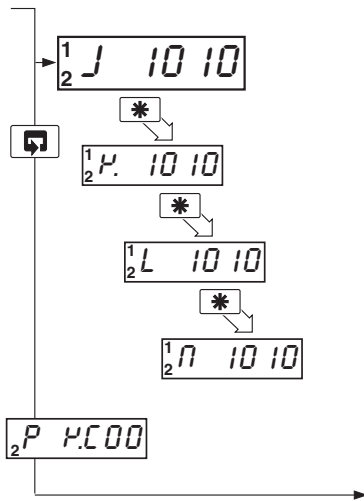


Note. Alarm types relating to Input 2 are not applicable for single-pen instruments.

Fig. 4.4 Alarm Type Settings



4.2.3 Hardware Configuration



'JKLN' Settings

The first character (*J*, *P*, *L* or *n*) identifies the parameter to be changed. The current setting is indicated by a flashing letter. Parameter options are shown in Fig. 4.5.

- J* = Hardware configuration
- P* = Digital input functions
- L* = Relay sources configuration
- n* = Alarm hysteresis

Note. For custom settings contact the local distributor.

Continued on next page.

1 J 10 10

J – Hardware Configuration

Freq.		Analog Retrans Source
50Hz	60Hz	
<i>i</i>	<i>A</i>	Input 1
<i>2</i>	<i>b</i>	Input 2
U		Custom

1 P 10 10

K – Digital Input Functions

Display	Alarm Ack Source	Chart Fast Source	Chart Stop Source
0	None	None	None
<i>1</i>	Dig 1	None	None
<i>2</i>	None	Dig 1	None
<i>3</i>	None	None	Dig 1
<i>4</i>	Dig 1	Dig 2	None
<i>5</i>	None	Dig 1	Dig 2
<i>6</i>	Dig 1	None	Dig 2

1 L 10 10

L – Relay Sources Configuration

Display	Relay 1 Source	Relay 2 Source
<i>1</i>	Alarm 1	Alarms 2, 3 OR 4
<i>2</i>	Alarms 1 OR 2	Alarms 3 OR 4
<i>3</i>	Alarms 1 OR 3	Alarms 2 OR 4
<i>4</i>	Alarms 1, 2 OR 3	Alarms 4

1 n 10 10

n – Alarm Hysteresis

Display	Hysteresis
0	None
<i>1</i>	0.1 %
<i>2</i>	0.2 %
<i>3</i>	0.5 %
<i>4</i>	1.0 %
<i>5</i>	2.0 %
<i>6</i>	5.0 %
U	Custom

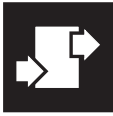
As percentage of engineering range

In engineering units

Note. Alarm relays are logical 'OR' configured

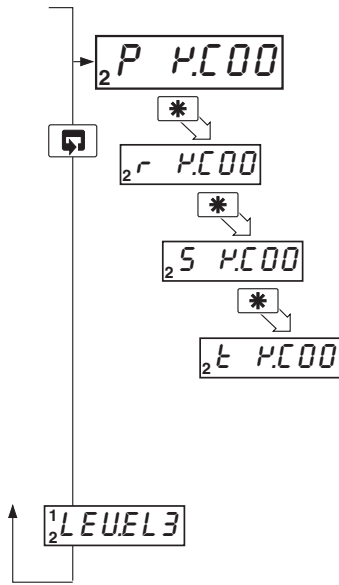
Fig. 4.5 Hardware Configuration





...4 CONFIGURATION MODE

4.2.4 Input 2 Configuration



'PRST' Settings

The first character (*P*, *r*, *S* or *t*) identifies the parameter to be changed and the current setting is indicated by a flashing letter. Parameter options are shown in Fig. 4.6.

P = Input type and range configuration

Note. Input 2 can only be configured as a thermocouple type if input 1 is also configured as a thermocouple.

r = Temperature units

S = Number of decimal points

t = Analog input filter

Note. For custom settings contact the local distributor.

Return to top of Level 3.

P – Input Type and Range Configuration (input 2)

Display		Display	
<i>b</i>	THC Type B	<i>1</i>	0 to 20 mA
<i>E</i>	THC Type E	<i>2</i>	4 to 20 mA
<i>J</i>	THC Type J	<i>3</i>	0 to 5 V
<i>K</i>	THC Type K	<i>4</i>	1 to 5 V
<i>N</i>	THC Type N	<i>5</i>	0 to 50 mV
<i>r</i>	THC Type R	<i>7</i>	4 to 20 mA (square root lineariser)
<i>S</i>	THC Type S	<i>U</i>	Custom Configuration
<i>t</i>	THC Type T		
<i>P</i>	PT100 RTD		

r – Temperature Units

Display	Temperature Units
<i>C</i>	Degrees C*
<i>F</i>	Degrees F*
<i>0</i>	No temperature units

* Temperature inputs only

S – Process Variable Display Decimal Places

Display	
<i>0</i>	xxxxx
<i>1</i>	xxxx . x
<i>2</i>	xxx . xx
<i>3</i>	xx . xxx
<i>4</i>	x . xxxx

t – Analog Input Filter

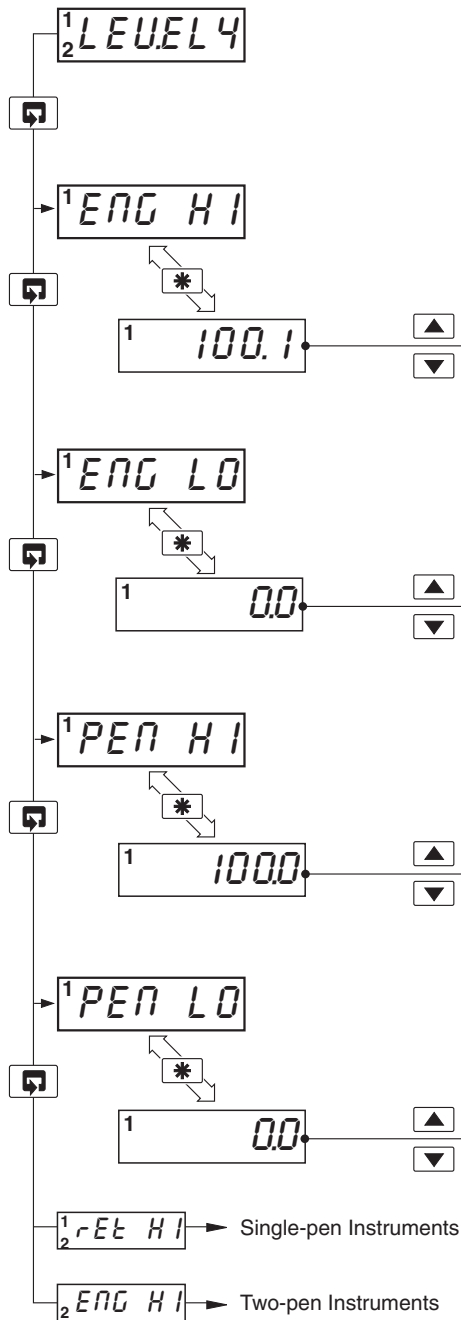
Display	
<i>0</i>	0 seconds
<i>1</i>	1 second
<i>2</i>	2 seconds
<i>5</i>	5 seconds
<i>R</i>	10 seconds
<i>b</i>	20 seconds
<i>C</i>	40 seconds
<i>d</i>	60 seconds

Fig. 4.6 Input 2 Configuration





4.3 Ranges and Passwords (Level 4)



Level 4

Note. To select this frame from anywhere in this level, press the key for a few seconds.

Engineering (Display) Range

Input 1 High

[-9999 to 99999]

Input 1 Low

[-9999 to 99999]

Pen 1 Range High

Note. The pen range can be set to a value greater or less than the engineering range, to suit the chart range markings.

[-9999 to 99999]

Pen 1 Range Low

[-9999 to 99999]

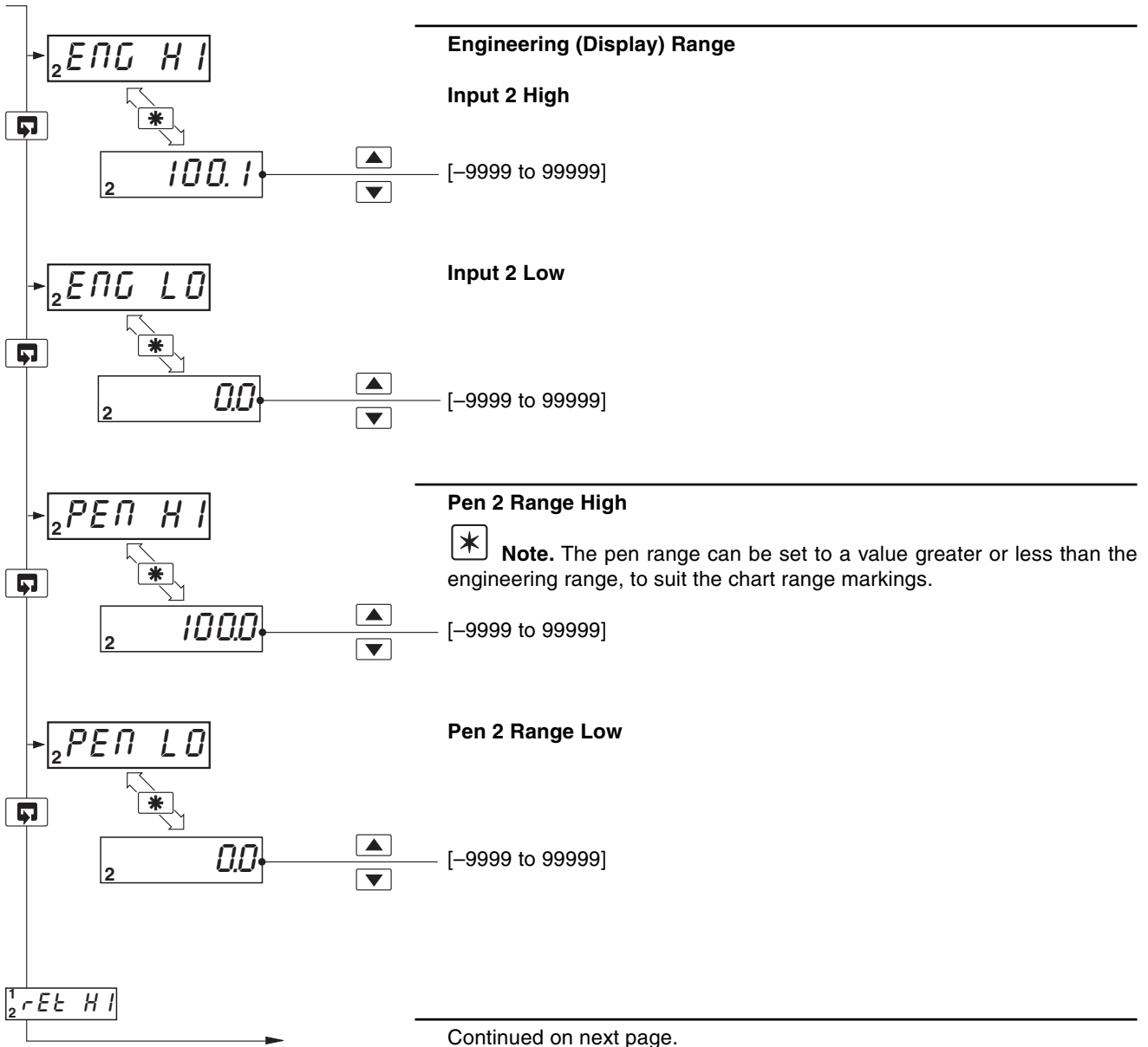
Continued on pages 24 and 25.



...4 CONFIGURATION MODE

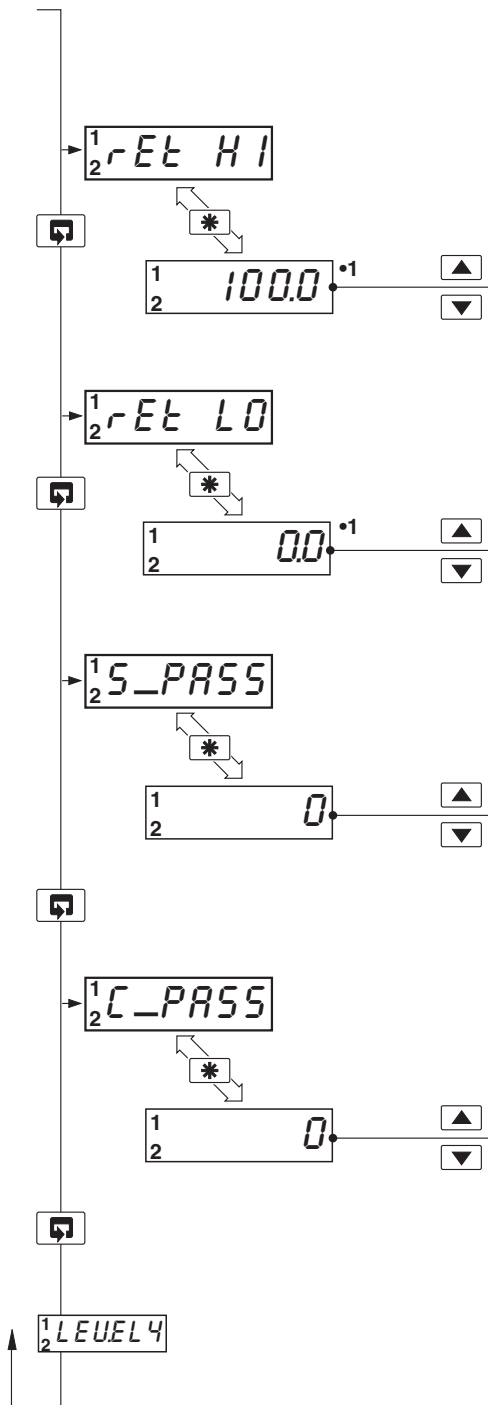
...4.3 Ranges and Passwords (Level 4)

* **Note.** Settings relating to Input 2 are not applicable for single-pen instruments.





...4.3 Ranges and Passwords (Level 4)



Retransmission Range

The retransmission range defines the engineering range to be retransmitted – see Section 4.2 Code J for source selection.

High (20mA output)

1 2 100.0 *1 ▲ ▼ [-9999 to 99999 (in engineering units)]

Low (4mA output)

1 2 0.0 *1 ▲ ▼ [-9999 to 99999 (in engineering units)]

Set Up Level Password

Set the password to enable access to the Setup Level (level 2).

1 2 0 ▲ ▼ [0 to 9999]

* **Note.** Unless otherwise requested, all instruments are despatched with passwords set to '0' (zero).

Configuration Level Password

Set the password to enable access to the Configuration Level (levels 3 and 4).

1 2 0 ▲ ▼ [0 to 9999]

* **Note.** Unless otherwise requested, all instruments are despatched with passwords set to '0' (zero).

Return to top of page.

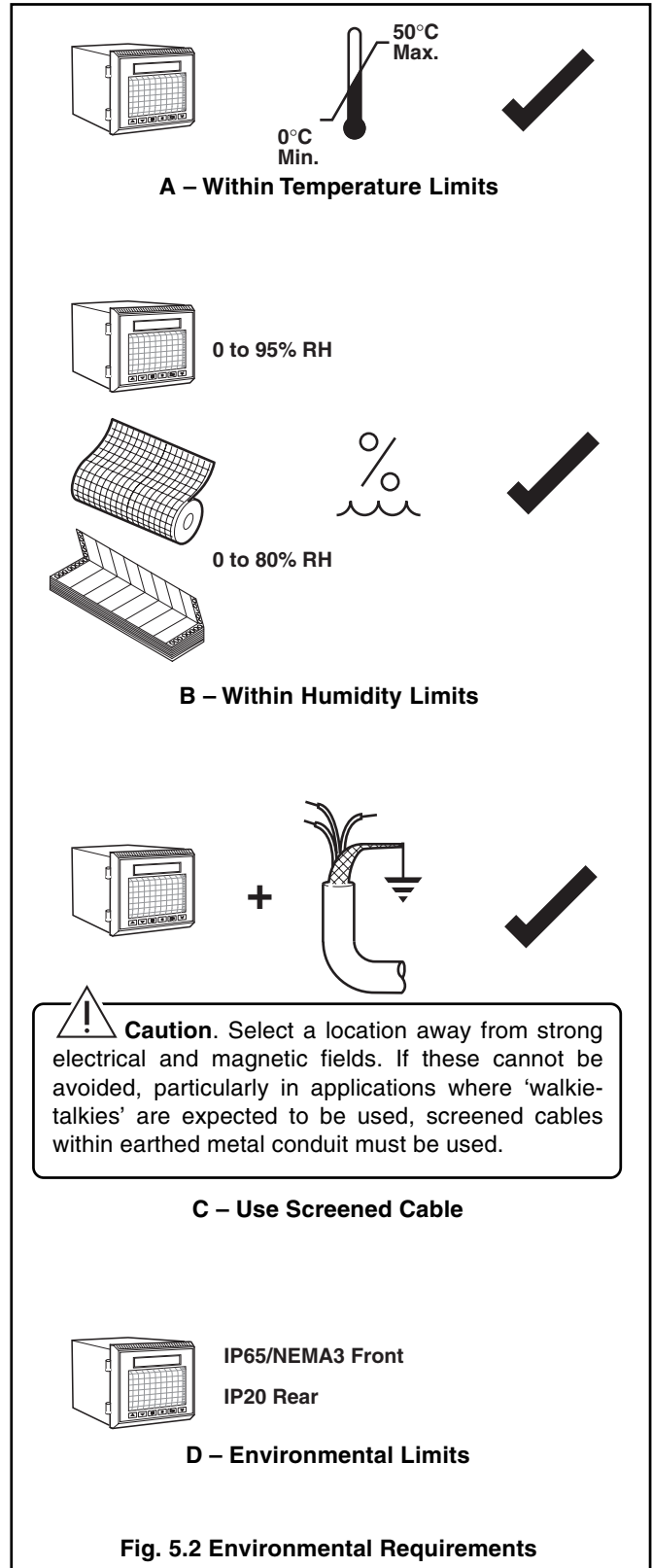
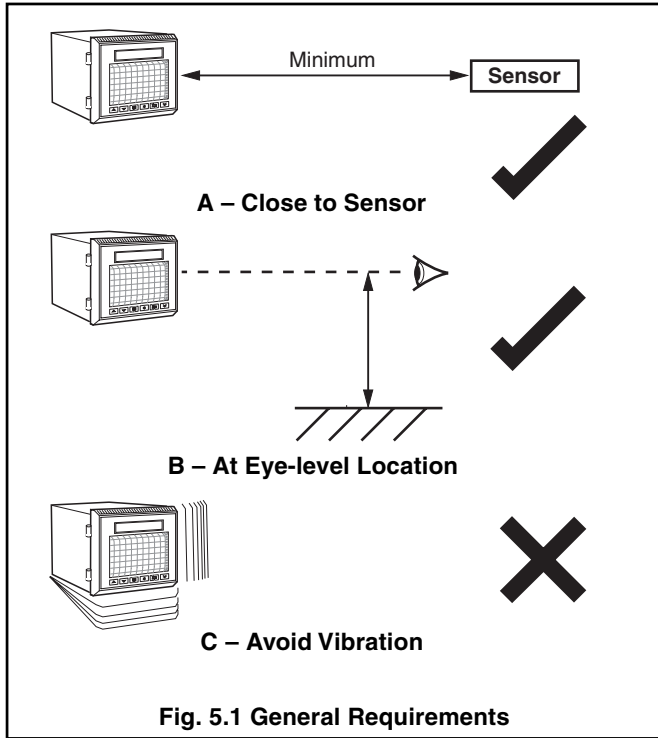


5 INSTALLATION

EC Directive 89/336/EEC

In order to meet the requirements of the EC Directive 89/336/EEC for EMC regulations, this product must not be used in a non-industrial environment.

5.1 Siting – Figs. 5.1 and 5.2



Caution. Select a location away from strong electrical and magnetic fields. If these cannot be avoided, particularly in applications where 'walkie-talkies' are expected to be used, screened cables within earthed metal conduit must be used.

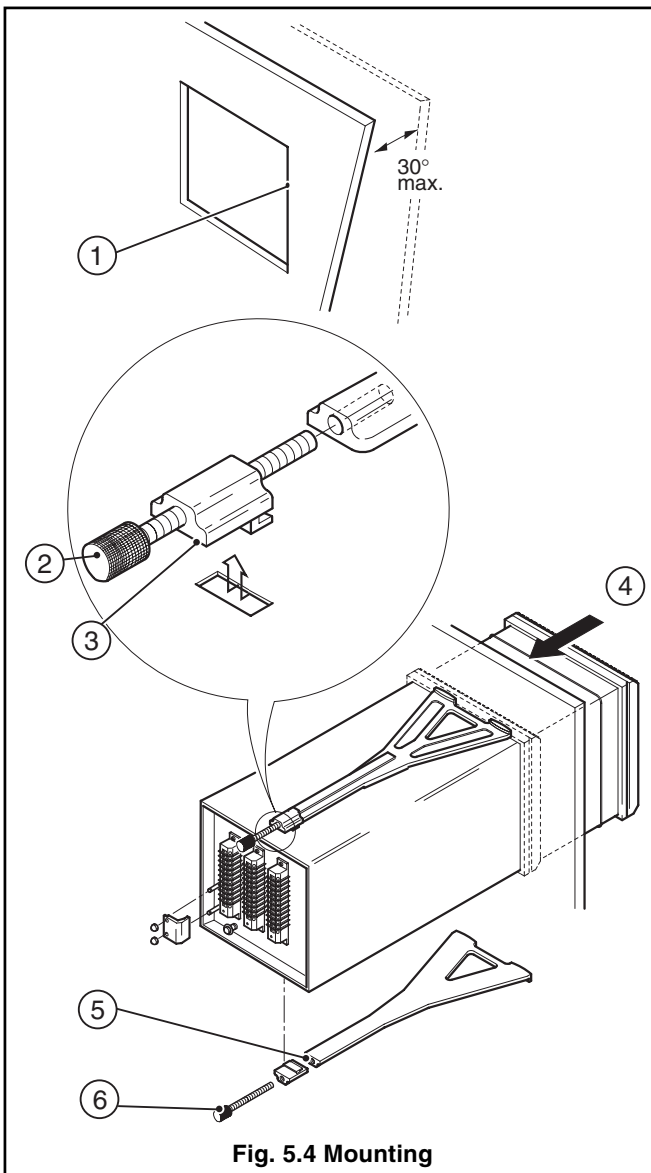
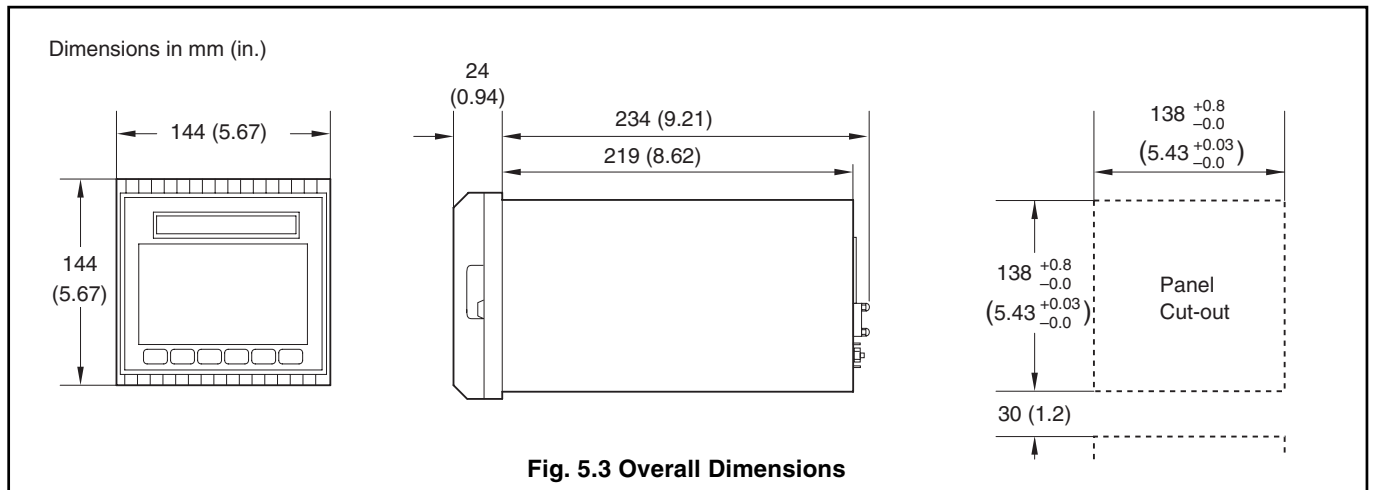




5.2 Mounting – Figs. 5.3 and 5.4



Information. A minimum mounting panel thickness of 3mm is recommended.



- ① Cut a hole in the panel (see Fig. 5.3 for dimensions).
- ② Loosen the retaining screw on each panel clamp.
- ③ Lift the retaining screws and remove the panel clamp anchors. Remove the panel clamps.
- ④ Insert the instrument into the panel cut-out.
- ⑤ Refit the panel clamps to the case, ensuring that the panel clamp anchors are located correctly in their slots.
- ⑥ Secure the instrument by tightening the panel clamp retaining screws.



Caution. The clamp must fit flat against the instrument case. If the clamp is bowed, the securing screw is too tight and sealing problems may occur.



5.3 Electrical Connections – Fig. 5.6 (opposite)



Warning. Before making any connections, ensure that the power supply, any powered control circuits and high common mode voltages are switched off.



Note. If it is not possible to avoid strong electrical and magnetic fields, screened cables within earthed metal conduit must be used.

5.4 Relays, Arc Suppression and Output

5.4.1 Relay Contact Ratings

Relay contacts are rated at:

115/230V AC at 5A (non-inductive)

250V DC 25W max.

5.4.2 Arc Suppression Capacitors – Fig 5.5

Arc suppression components are fitted across both relays. If these contacts are used to operate external relays, the capacitor leakage current may be sufficient to prevent the external relay from de-energizing. If so, switch off the power supply and external alarm circuits. Identify the relay module and remove it. Cut the links to the suppression circuit and refit the module.

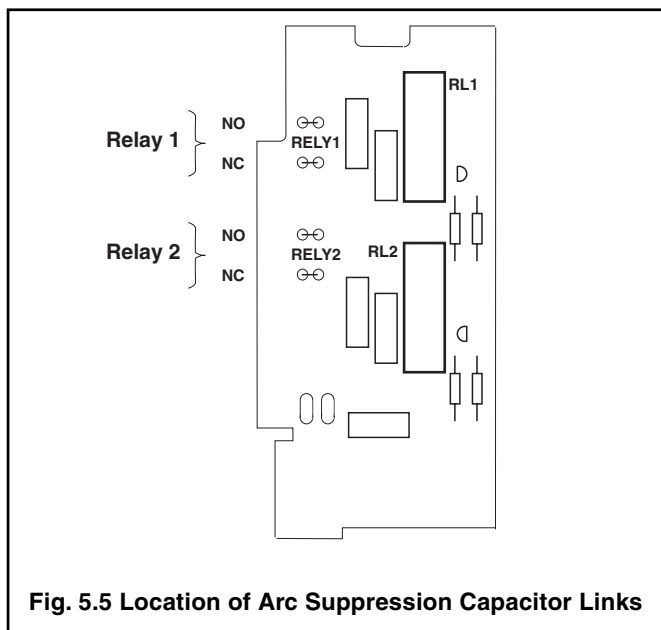


Fig. 5.5 Location of Arc Suppression Capacitor Links

5.4.3 Retransmission Analog Output

Max. load 15V (750Ω at 20mA)

Isolation 500V from I/Ps

5.5 Spares and Consumables

Roll Charts

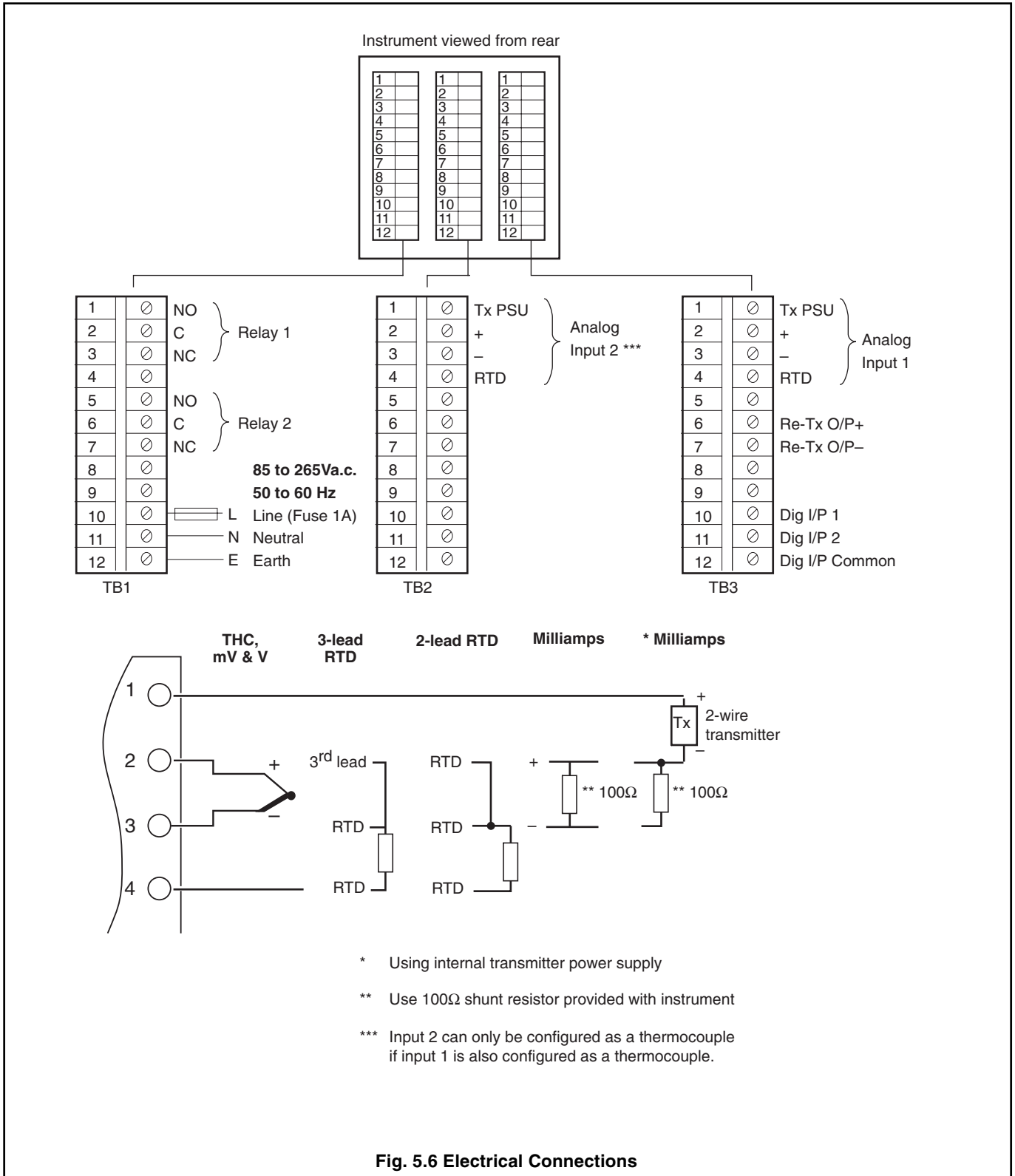
Range	International	North America
-50/+50	P100L/7477G	KPC100-1110
-50/+100	P100L/7484G	-
0/10	P100L/7402G	KPC100-1023
0/14	P100L/17463G	KPC100-1047
0/20	P100L/7404G	KPC100-1080
0/50	P100L/7401G	KPC100-1032
0/60	P100L/7469G	KPC100-1118
0/70	P100L/17400G	-
0/75	P100L/17487G	-
0/80	P100L/7432G	-
0/100*	P100L/7400G	KPC100-1037
0/150	P100L/7414G	KPC100-1039
0/200	P100L/7420G	KPC100-1040
0/300	P100L/7415G	KPC100-1042
0/500	P100L/7465G	KPC100-1043
0/800	P100L/17446G	KPC100-1045
0/1000	P100L/7476G	KPC100-1072
0/1200	P100L/7461G	KPC100-1074
0/1400	P100L/17484G	-
0/1600	P100L/17488G	-
800/1600	P100L/17490G	-

Fanfold Charts

Range	International	North America
-50/+50	P100L/7477X	KPC100-8042
-50/+100	P100L/7484X	-
0/10	P100L/7402X	KPC100-8010
0/14	P100L/17463X	KPC100-8032
0/20	P100L/7404X	KPC100-8008
0/50	P100L/7401X	-
0/60	P100L/7469X	-
0/70	P100L/17400K	-
0/75	P100L/17487X	-
0/80	P100L/7432X	-
0/100*	P100L/7400X	KPC100-8034
0/150	P100L/7414X	KPC100-8050
0/200	P100L/7420X	KPC100-8051
0/300	P100L/7415X	KPC100-8053
0/500	-	KPC100-8058
0/800	P100L/17446X	KPC100-8064
0/1000	P100L/7476X	KPC100-8037
0/1200	P100L/7461X	KPC100-8039
0/1400	P100L/17484X	-
800/1600	P100L/17490X	-

* Supplied as standard







...5 INSTALLATION

...5.5 Spares and Consumables

Miscellaneous

Description	Part Number
Roll chart unit	CR100/0021
Fan fold chart unit	CR100/0022
Motor module plate - 1 pen	CR100/0003/1
Motor module plate - 2 pen	CR100/0003/2
Pen carriage sub-assembly	P100M/0079
Pen carriage spindle	P100M/0156
Chart drive motor assembly	P100M/0072
Solenoid sub-assembly	CR100/0004
Panel clamp pack	CR100/0020
Terminal blanking plate	CR100/0026
Motor module assembly	CR100/0001
Drive belt	B9394
Terminal block 12 way	CR100/0009
Door assembly with display	CR100/0016
Spare door sub-assembly	CR100/0018
Case assembly - 1 pen	CR100/0015/1
Case assembly - 2 pen	CR100/0015/2
Ribbon cable assembly	CR100/0013
Display PCB cover	CR100/0012
Display cover repair pack	CR100/0025
Panel gasket	PR100/0186
Door gasket (white)	SR100/0107
Label for mains cover	CR100/0007
'Danger Live Terminal' cover	CR100/0008
Front overlay	CR100/0011
Instruction manual	IM/CR100

PCB Assemblies

Power relay board	CR100/1801
Display board	CR100/1804
I/O board service pack - 1 pen	CR100/1100/1
I/O board service pack - 2 pen	CR100/1100/2
Main board service pack - 1 pen	CR100/1101/1
Main board service pack - 2 pen	CR100/1101/2

Pens (pack of 3)

Red	P100L/1095
Green	P100M/0056





CUSTOMER SETUP LOG

LEVEL 1		LEVEL 2	
Code x		A1 xxx	-----
		A1 HYS	-----
		A2 xxx	-----
		A2 HYS	-----
		A3 xxx	-----
		A3 HYS	-----
		A4 xxx	-----
		A4 HYS	-----
		N.SPEED	-----
		F.SPEED	-----
		¹ DRdJ	-----
		² DRdJ	-----

Instrument Serial Number : _____

Product Code : CR10 / _____





CUSTOMER CONFIGURATION LOG

		¹ LEVEL4 ₂ LEVEL4	-----
¹ LEVEL3 ₂ LEVEL3		¹ ENG HI ₂ ENG HI	-----
¹ ENG LO ₂ ENG LO		¹ ENG LO ₂ ENG LO	-----
¹ A PCOD A_B_C_D_		¹ PEN HI ₂ PEN HI	-----
¹ PEN LO ₂ PEN LO		¹ PEN LO ₂ PEN LO	-----
¹ E 0000 E_F_G_H_		² ENG HI ₂ ENG HI	-----
² ENG LO ₂ ENG LO		² ENG LO ₂ ENG LO	-----
¹ J 1010 J_K_L_N_		² PEN HI ₂ PEN HI	-----
² PEN LO ₂ PEN LO		² PEN LO ₂ PEN LO	-----
² P PCOD P_r_s_t_		¹ rEt HI ₂ rEt HI	-----
		² rEt LO ₂ rEt LO	-----
		¹ S_PASS ₂ S_PASS	-----
		² C_PASS ₂ C_PASS	-----

Instrument Serial Number : _____
 Product Code : CR10_/_____



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Products

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- *for the following industries:*
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 - Food & Beverage
 - Manufacturing
 - Metals and Minerals
 - Oil, Gas & Petrochemical
 - Pulp and Paper

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- *Force Measurement*
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- *Paperless Recorders*
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- *Level*
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- *Positioners*

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- *ammonia, nitrate, phosphate, silica, sodium, chloride, fluoride, dissolved oxygen and hydrazine analyzers.*
- *Zirconia oxygen analyzers, katharometers, hydrogen purity and purge-gas monitors, thermal conductivity.*

Customer Support

We provide a comprehensive after sales service via our Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

United Kingdom



Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification. Periodic checks must be made on the equipment's condition.

In the event of a failure under warranty, the following documentation must be provided as substantiation:

1. A listing evidencing process operation and alarm logs at time of failure.
2. Copies of operating and maintenance records relating to the alleged faulty unit.



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