



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

EN ISO 9001:2000



Cert. No. Q 05907

EN 29001 (ISO 9001)



Lenno, Italy – Cert. No. 9/90A

Stonehouse, U.K.



Electrical Safety

This instrument complies with the requirements of CEI/IEC 61010-1:2001-2 "Safety requirements for electrical equipment for measurement, control, and laboratory use". If the instrument is used in a manner NOT specified by the Company, the protection provided by the instrument may be impaired.

Symbols

One or more of the following symbols may appear on the instrument labelling:

	Warning – Refer to the manual for instructions		Direct current supply only
	Caution – Risk of electric shock		Alternating current supply only
	Protective earth (ground) terminal		Both direct and alternating current supply
	Earth (ground) terminal		The equipment is protected through double insulation

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 Technical Publications Department.

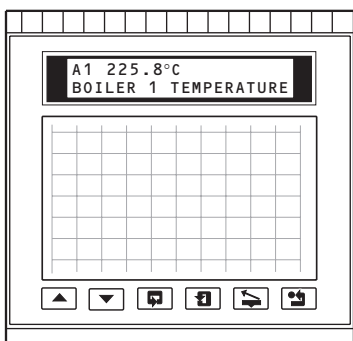
Health and Safety

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

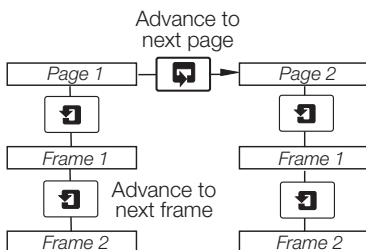
1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
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.

FRONT PANEL KEYS



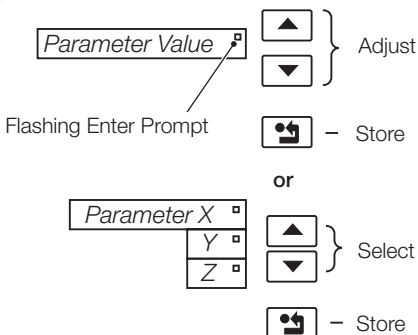
Sideways Scroll



Down Scroll



Raise and Lower



Enter



Used to confirm selections/adjustments.

Pen Lift



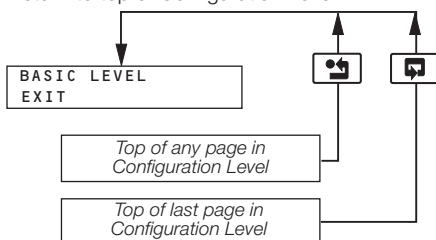
Lifts and lowers the pen on successive operations.

Short-cut Keys

Return to top of Operating Page



Return to top of Configuration Level







GETTING STARTED

The multipoint chart recorder provides accurate and reliable recording of 1, 2, 3 or 6 process signals on a 100mm wide chart. In-built text printing capabilities give clear annotation on the chart of time, date, scales and channel identifiers.

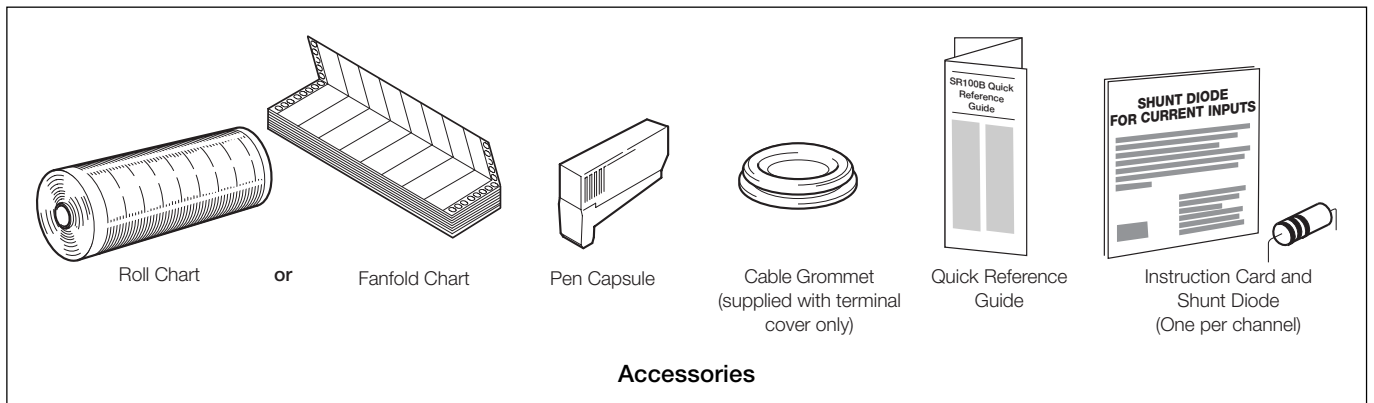
A clear view of process status is provided by the liquid crystal display (LCD) and up-to-the-minute recording can be quickly examined by means of the Easy View facility. The recorder is designed for panel mounting and provides complete dust and water protection on the front face, making it suitable for use in harsh environments.

The instrument is supplied preconfigured for the signal types and ranges specified when ordering. All configurations can be adjusted on site by means of the front panel keys.

This manual is divided into four Sections containing all the information required to install, configure and operate the multipoint chart recorder.

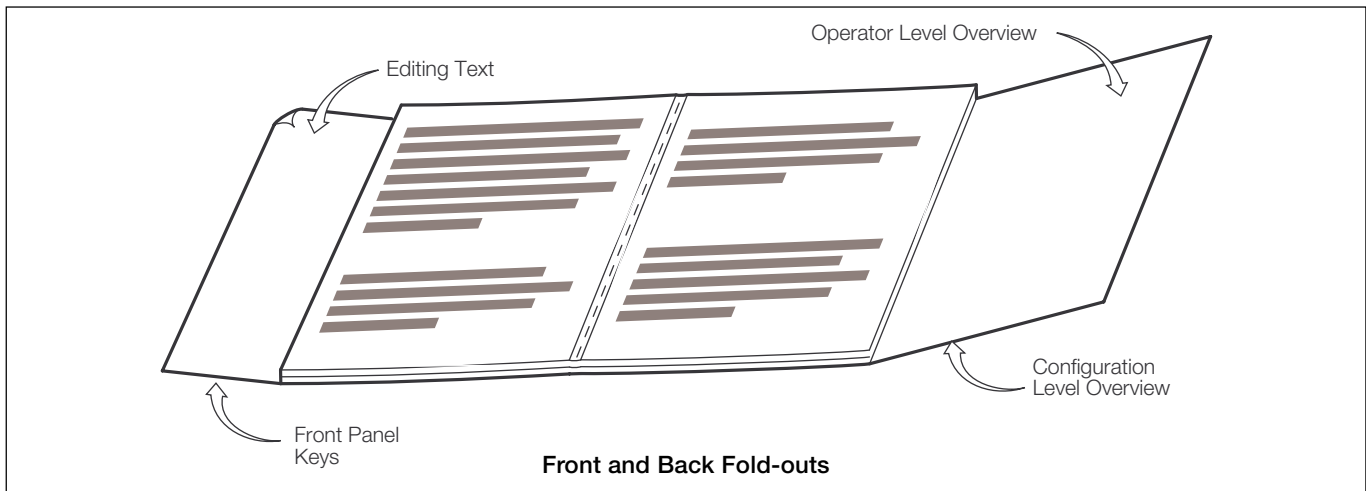
	CHARTS AND PENS <ul style="list-style-type: none">• Loading a Roll/Fanfold Chart• Fitting a Pen Capsule• Understanding the Chart Printout		CONFIGURATION <ul style="list-style-type: none">• Analog Inputs• Alarms• Chart/Pen• Output Modules• Operator Setup
	OPERATION <ul style="list-style-type: none">• Instrument Start-up• Viewing:<ul style="list-style-type: none">— Measured Values— Active Alarms• Fault Finding		INSTALLATION <ul style="list-style-type: none">• Siting• Mounting• Electrical Connections

Symbol Identification and Section Contents



CONTENTS

Section	Page	Section	Page
GETTING STARTED	1	4 INSTALLATION	31
1 CHARTS AND PENS	3	4.1 Siting	31
1.1 Loading a Roll Chart	3	4.2 Mounting	31
1.2 Loading a Fanfold Chart	6	4.3 Access to Terminals and Connections	33
1.3 Fitting a Pen Capsule	8	4.3.1 Removing the Chassis	33
1.4 Chart Printout	9	4.4 Electrical Connections	34
2 OPERATION	10	4.5 Analog Input Connections	35
2.1 Introduction	10	4.5.1 Current and Voltage	35
2.1.1 Operator Level Pages	10	4.5.2 Thermocouple	35
2.1.2 Instrument Start-up	10	4.5.3 Resistance Thermometer (RTD)	35
2.1.3 Autoscroll	10	4.5.4 Transmitter Power Supply	36
2.2 Operating Page	11	4.5.5 Relay Outputs	36
2.2.1 Easy View (roll chart only)	12	4.5.6 Selecting Analog Input Types	37
2.2.2 Operator Page Messages	12	4.6 Power Supply Connections	37
2.3 Alarm Acknowledge Page	13	4.6.1 AC Mains	37
2.4 Security Access	14	4.6.2 DC Supply	37
3 CONFIGURATION	15	5 SIMPLE FAULT FINDING	38
3.1 Introduction	15	5.1 Arc Suppression Capacitors	39
3.1.1 Accessing the Configuration Level	15	6 SPARES LIST	39
3.2 Analog Inputs	16	6.1 Consumables	39
3.2.1 Analog Input Configuration Page	16	6.2 Replacement Parts	39
3.2.2 Input Conditioning Configuration Page	19		
3.2.3 Scale Adjustment Page	20		
3.3 Alarms	22		
3.3.1 Process Alarm Configuration Page	22		
3.3.2 Alarm Acknowledge Configuration Page	23		
3.4 Chart	24		
3.4.1 Chart Control Configuration Page	24		
3.4.2 Chart Scaling Configuration Page	27		
3.4.3 Pen Position Configuration Page	28		
3.5 Output Modules	29		
3.5.1 Output Module Configuration Page – Relay Modules	29		
3.6 Operator Setup	30		
3.6.1 Security Access Configuration Page	30		
3.6.2 Real Time Clock Configuration Page	30		
3.7 Language Configuration Page	30		





1 CHARTS AND PENS

1.1 Loading a Roll Chart – Fig. 1.1

The following procedures assume that the instrument has been installed in accordance with the instructions given in Section 4.

Caution.

- Channel values and text messages are not recorded during chart reloading and cannot be printed when the chart reload is complete. All alarms and relays operate normally during chart reload.
- Do not operate the instrument without the chart cassette fitted.

To load a chart:

- Advance to the **Security Access Page** – see Fig. 1.1
- Rewind the old chart (if necessary) – see overleaf.
- Load the new chart – see Fig. 1.2
- Advance the chart onto the time line – see overleaf.

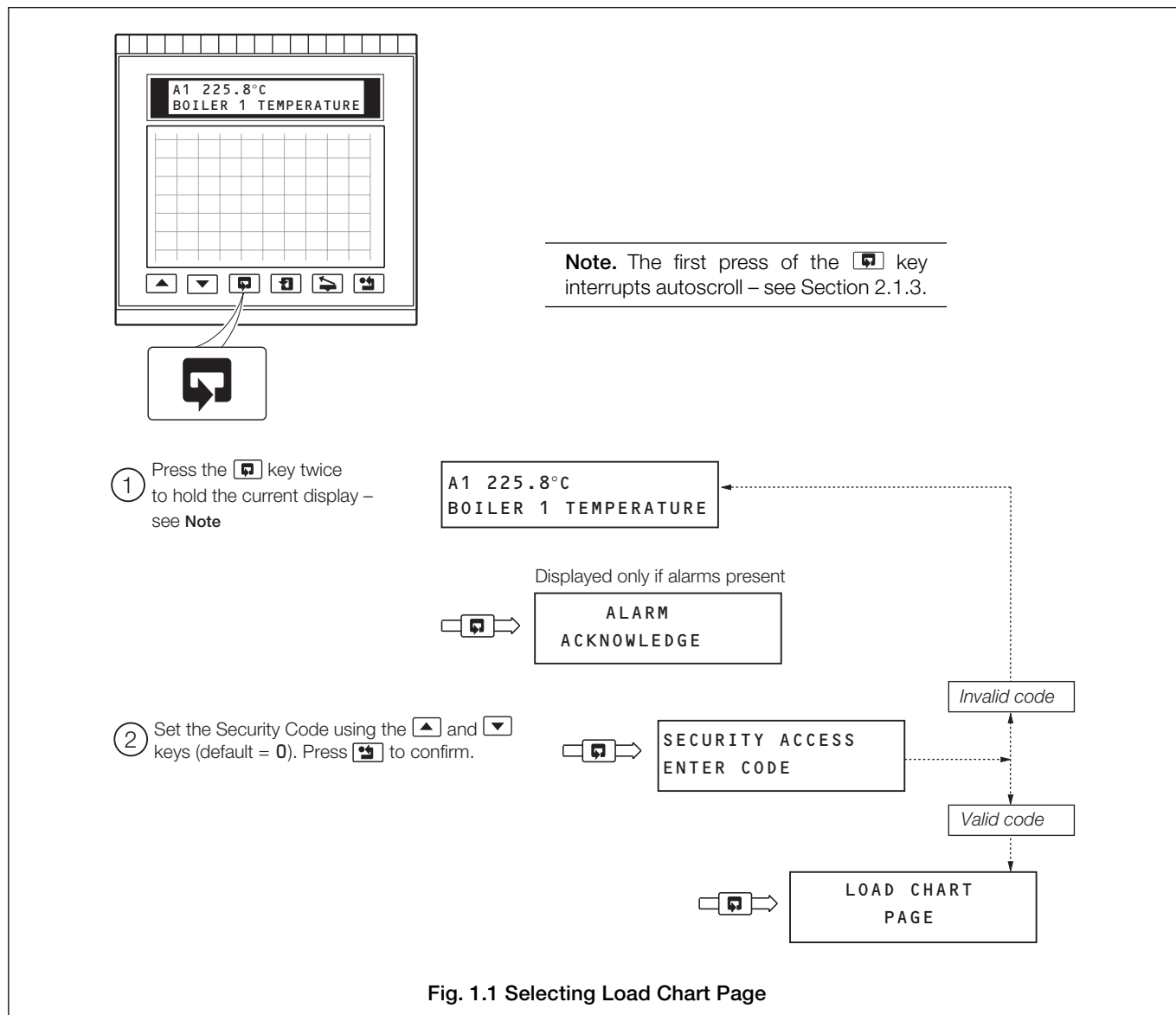


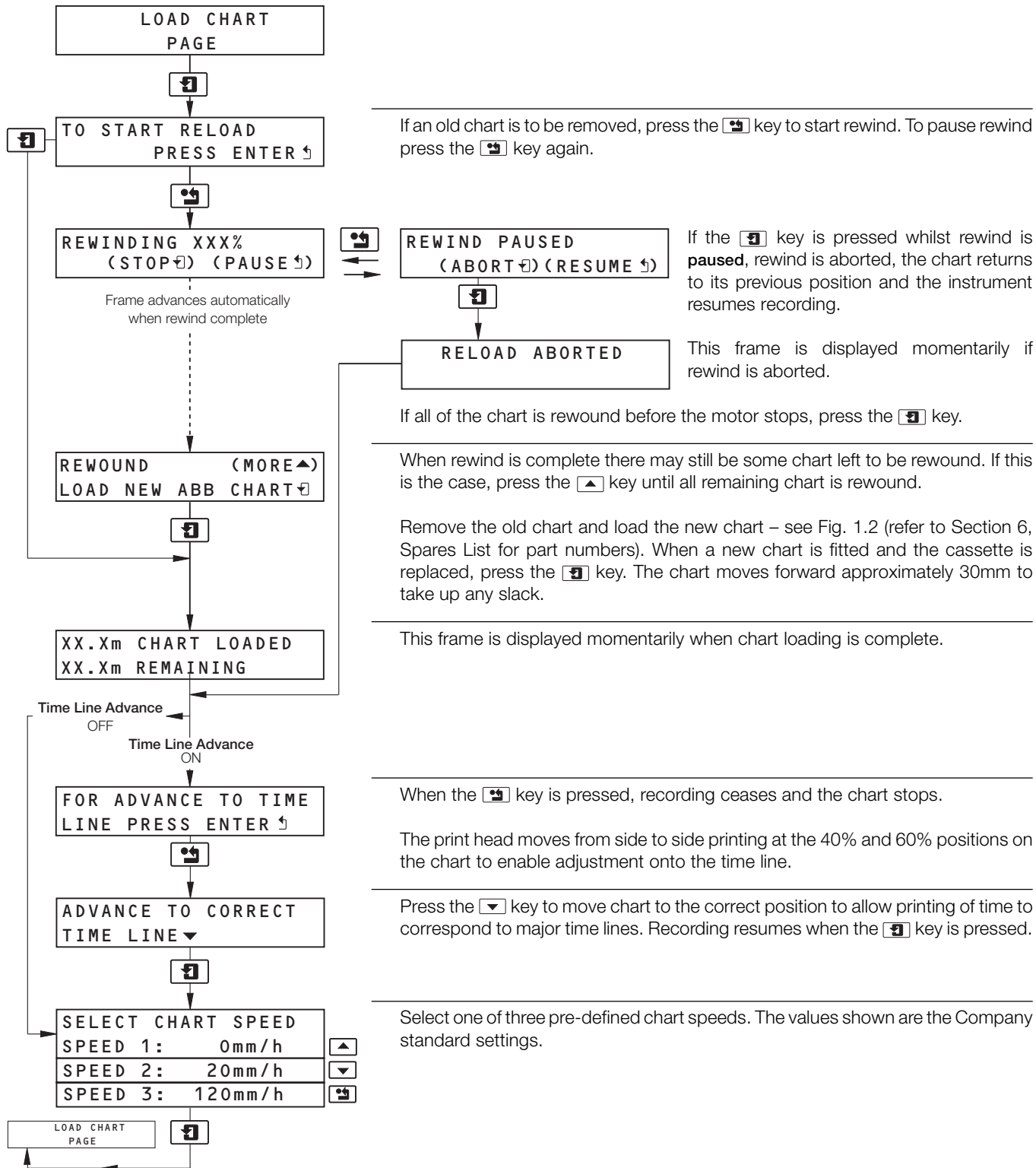
Fig. 1.1 Selecting Load Chart Page



...1.1 Loading a Roll Chart – Fig. 1.2

Select the Load Chart Page – see Fig. 1.1.

Note. If automatic chart rewind has been enabled in the **Chart Control Configuration Page** (see Section 3.4.1), when the chart remaining counter reaches 0 the chart will begin rewinding automatically and the instrument display will show the **REWINDING XXX%** frame.





...1.1 Loading a Roll Chart – Fig. 1.2

Caution. Ensure the correct chart type is set in the **Chart Control Configuration Page** – see Section 3.4.1.

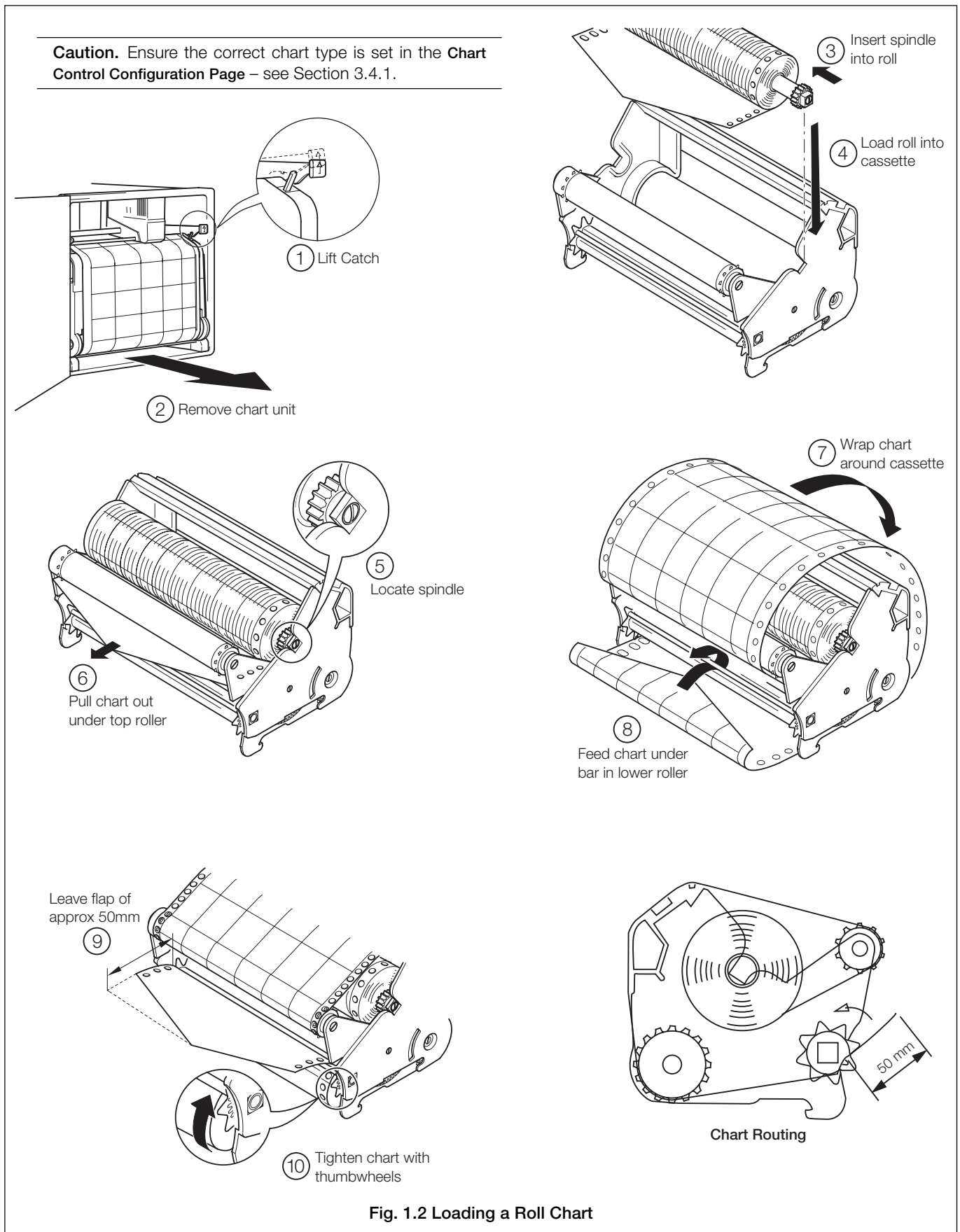
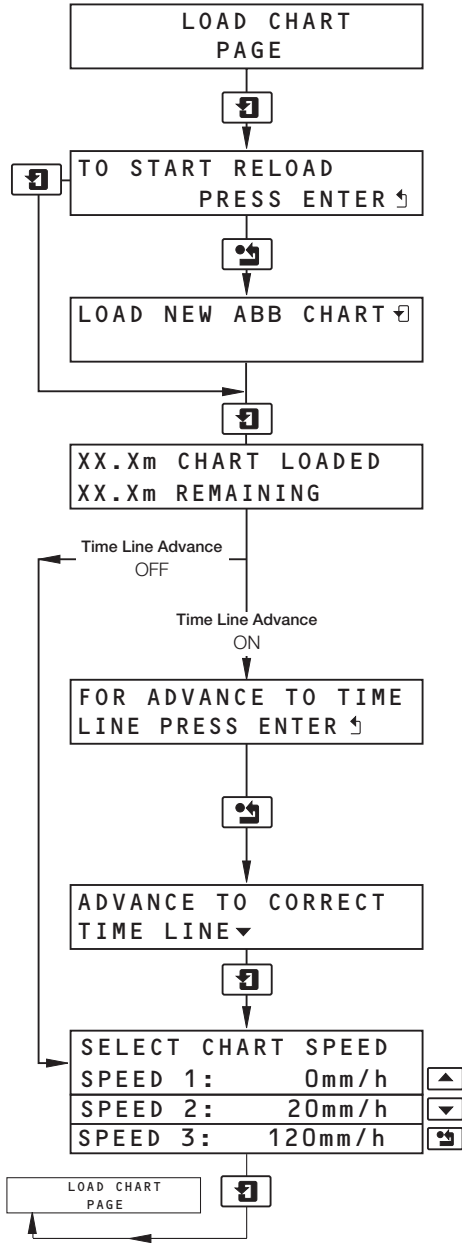


Fig. 1.2 Loading a Roll Chart



1.2 Loading a Fanfold Chart – Fig. 1.3

Select the Load Chart Page – see Fig. 1.1.



To enable chart reload procedure press the key to stop recording. Remove the old fanfold chart from the cassette.

Load new fanfold chart – see Fig. 1.3 (refer to Section 6, Spares List for part numbers). When a new chart is fitted and the cassette replaced, press the key. The chart moves forward approximately 30mm to take up any slack.

This frame is displayed momentarily when chart loading is complete.

When the key is pressed, recording ceases and the chart stops.

The print head moves from side to side printing at the 40% and 60% positions on the chart to enable adjustment onto the time line.

Press the key to move chart to the correct position to allow printing of time to correspond to major time lines. Recording resumes when the key is pressed.

Select one of three pre-defined chart speeds. The values shown are the company standard settings.



...1.2 Loading a Fanfold Chart – Fig. 1.3

Caution. Ensure the correct chart type is set in the **Chart Control Configuration Page** – see Section 3.4.1.

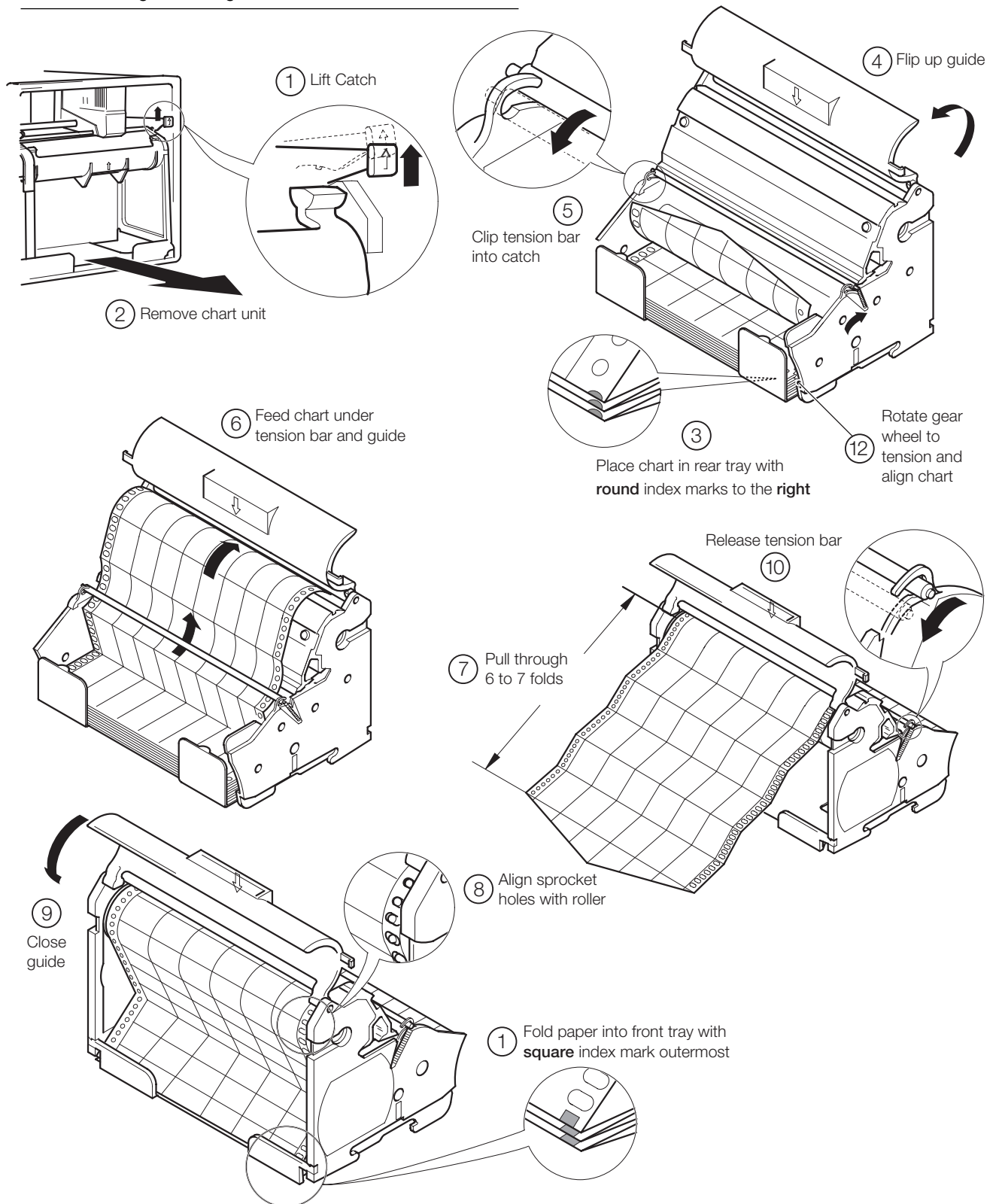


Fig. 1.3 Loading a Fanfold Chart

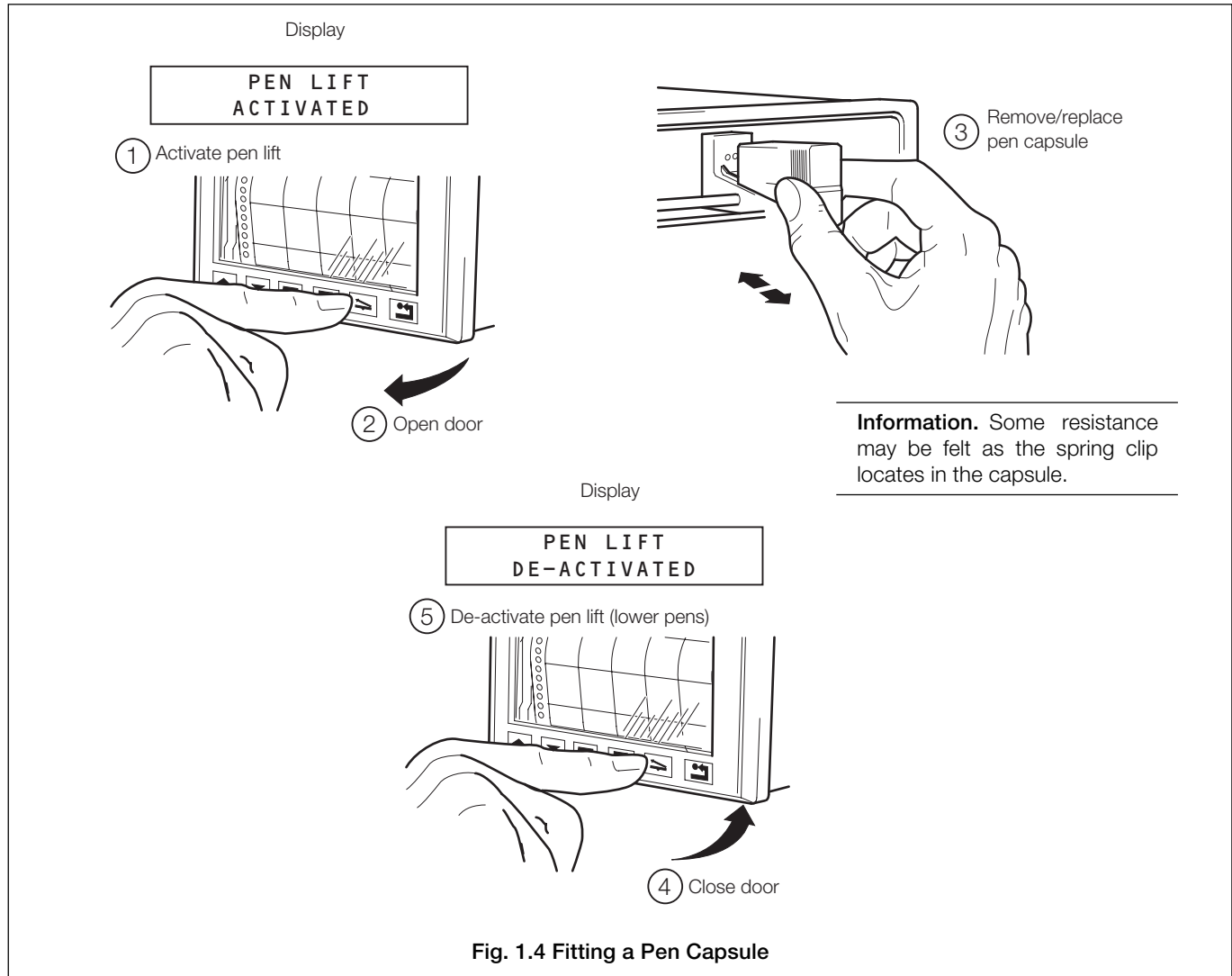


1.3 Fitting a Pen Capsule – Fig. 1.4

Ensure that the power supply is on.

Fit a new capsule as shown in Fig. 1.4. Refer to Section 6, Spares List for part numbers.

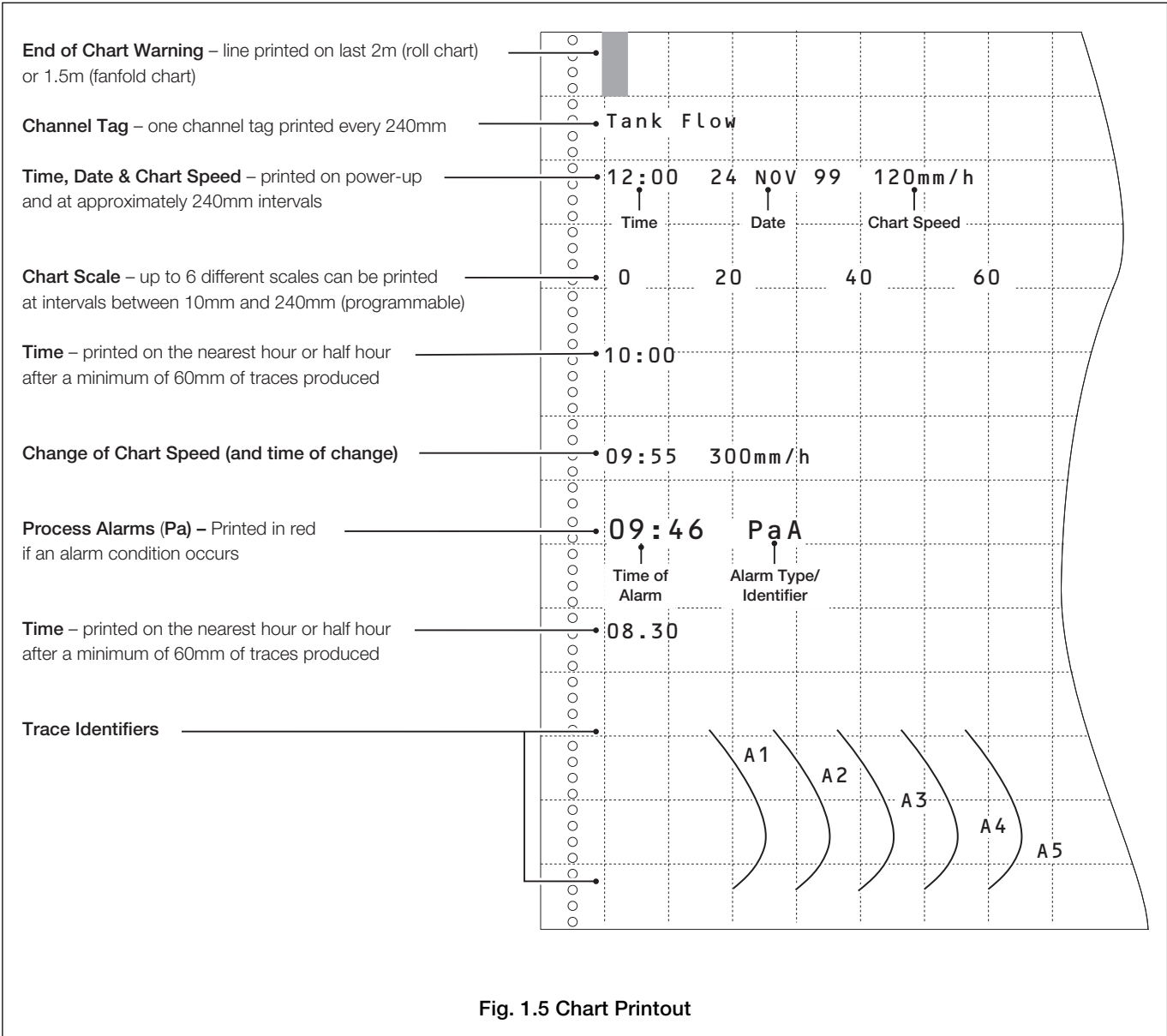
Note. After fitting a new capsule, the ink flow takes a short time to achieve full color density.





1.4 Chart Printout – Fig. 1.5

In addition to displaying up to six traces, the chart printout can contain text messages printed as events occur, such as process alarms, or at regular intervals, such as date/time and scale.





2 OPERATION

2.1 Introduction

2.1.1 Operator Level Pages – Fig. 2.1

An overview of the **Operator Level Pages** is contained on the back cover fold-out.

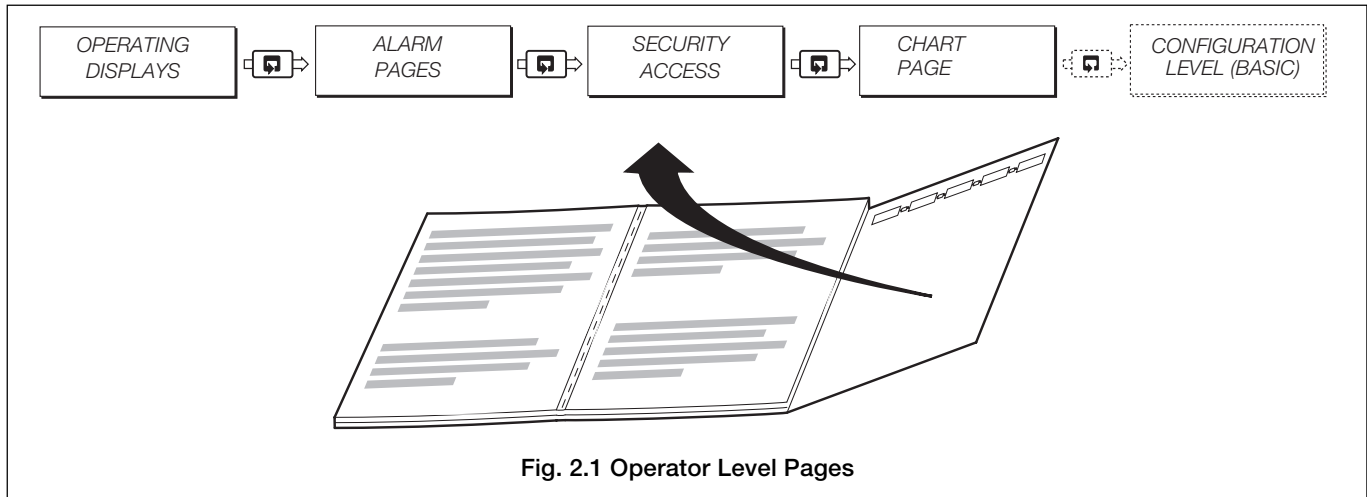


Fig. 2.1 Operator Level Pages

2.1.2 Instrument Start-up – Fig. 2.2

Caution. Ensure that all connections, especially to the earth stud, are made correctly – see Section 4.4.

Switch on the supply to the instrument, the input sensors and any power-operated control circuits.

Information.

- When powering the instrument from a DC supply, a PSU with a minimum current rating of 3A is recommended.
- Ensure that the voltage supplied is above 10V. If a lower voltage is used, the unit draws a higher current on power-up. If necessary, fit a switch in the supply line between the PSU and the instrument to ensure that the PSU is at the correct voltage before powering the unit.

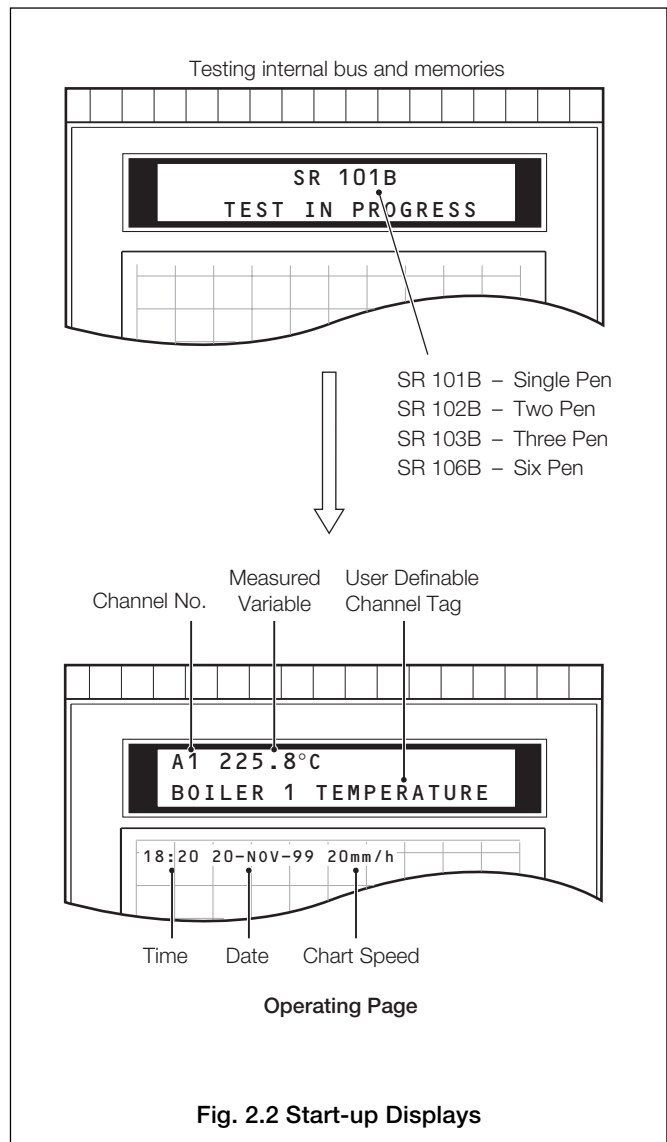


Fig. 2.2 Start-up Displays

2.1.3 Autoscroll – Fig. 2.3

In the normal day-to-day operating mode, channel information is displayed sequentially (autoscroll).

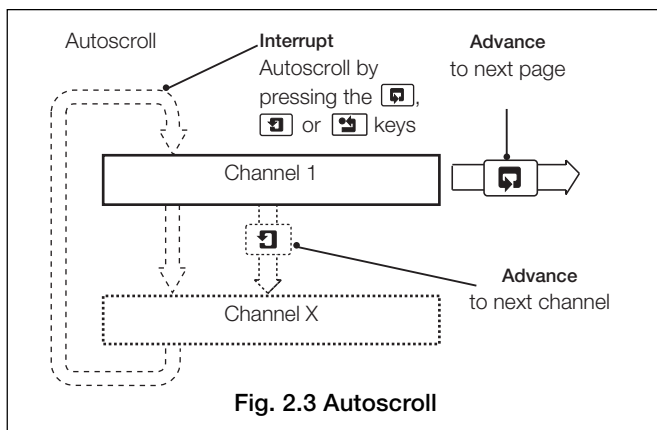


Fig. 2.3 Autoscroll

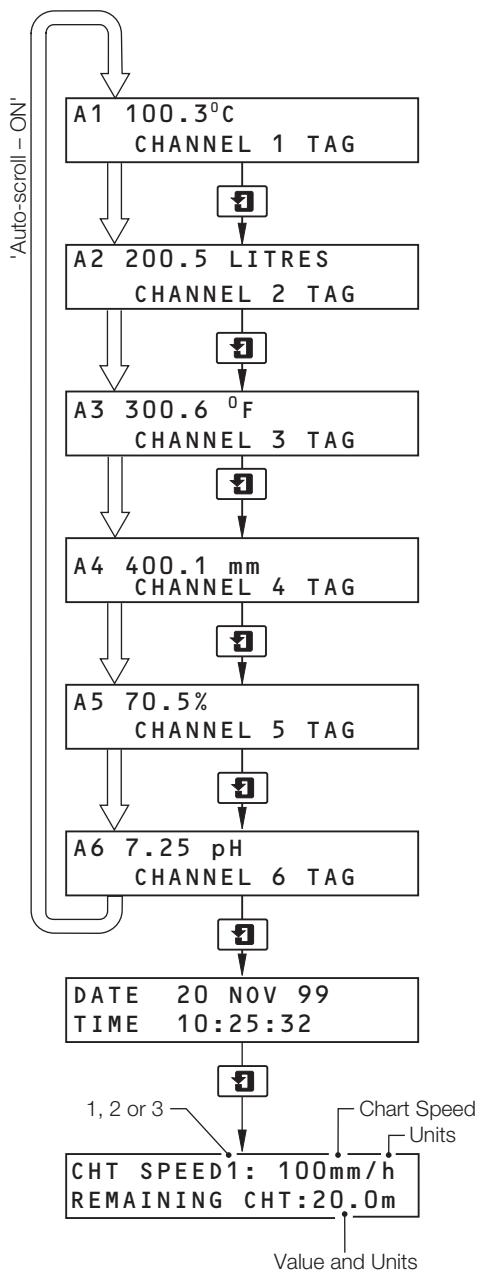


2.2 Operating Page

The **Operating Page** is the default start page.

Note.

- Autoscroll is enabled automatically on power-up. To disable/enable autoscroll press the key. Pressing the or keys at any point in the autoscroll cycle also sets autoscroll off.
- The Channel Identifiers, values and units shown in the following frames are examples only.



Input A1

- Upper Row** – Channel number, value and units
- Lower Row** – 20-character A1 channel tag

Input A2

- Upper Row** – Channel number, value and units
- Lower Row** – 20-character A2 channel tag

Input A3

- Upper Row** – Channel number, value and units
- Lower Row** – 20-character A3 channel tag

Input A4

Input A4 is not displayed on 3 pen recorders.

- Upper Row** – Channel number, value and units
- Lower Row** – 20-character A4 channel tag

Input A5

Input A5 is not displayed on 3 pen recorders.

- Upper Row** – Channel number, value and units
- Lower Row** – 20-character A5 channel tag

Input A6

Input A6 is not displayed on 3 pen recorders.

- Upper Row** – Channel number, value and units
- Lower Row** – 20-character A6 channel tag

Date/Time

The current date and time are displayed.

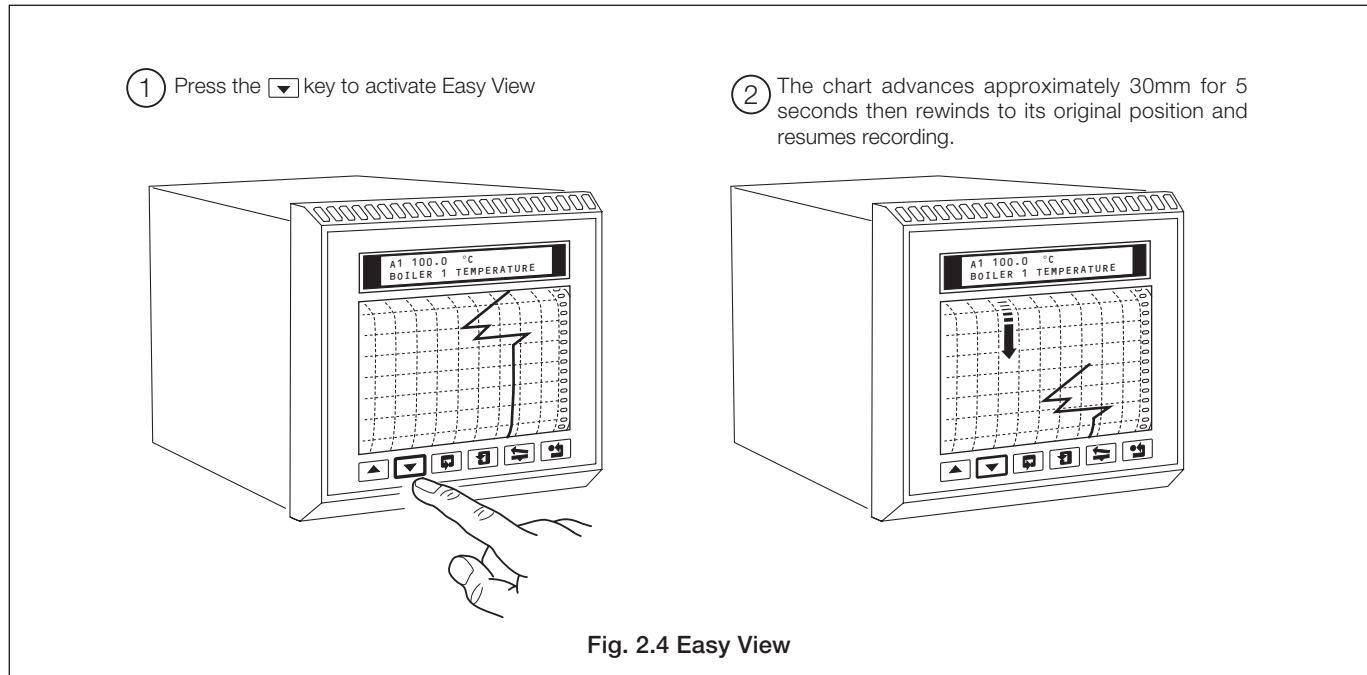
Chart Speed and Remaining Paper Length

The current chart speed and remaining paper length are displayed.



2.2.1 Easy View (roll chart only) – Fig. 2.4

Easy View allows the operator to view the most recently printed area of the chart. The chart is wound forward for a short distance and returns automatically to its original position a few seconds later. Channel values and text messages are buffered during Easy View and are printed out when recording is resumed.



2.2.2 Operator Page Messages







Message	Action	Comments
POWER FAILED	Press the  key to acknowledge message.	Alternates with top line of the display when power is restored. Displayed if the Power Failure Indication Enable frame is set to YES – see Section 3.3.2.
PAPER LOW HOURS REMAINING	Ensure a replacement chart is available	Displayed when the remaining chart paper is running low. The frequency of display of this message increases as the paper length nears its end: > 48 hours – no message < 48 hours – message flashes every 5 minutes < 12 hours – message flashes every minute
PAPER OUT	Replace the chart – see Section 1.1 (roll chart) or 1.2 (fanfold chart)	< 2 hours – PAPER OUT message flashes with normal display.
A1 200.5°C 	—	The  alarm indicator flashes to indicate an alarm condition exists. When all active alarms are acknowledged, a steady  appears. Note. The  alarm indicator is displayed only if Alarm Print is ON – see Section 3.4.1. This allows alarms to be used to control external devices as part of normal operation without indicating an alarm condition on the chart or the display.
NON-VOL ERROR CHECK CONFIGURATION	Turn instrument off and on again. Acknowledge and clear error by pressing the  key.	If error is still displayed, check configuration and correct any parameters which have been corrupted.
DISPLAY COMMS ERROR CONSULT USER GUIDE	—	Processor Board Fault – consult factory.

Table 2.1 Operator Page Messages



2.3 Alarm Acknowledge Page

This page is displayed only when alarms are active and the **Acknowledge Type** is **NORMAL** or **LATCH** – see Section 3.3.2.

There are two types of alarms:

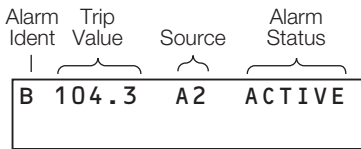
Process Alarms

Up to 12 alarms assignable to any analog input and activated by pre-defined trip levels – see Section 3.3.1.

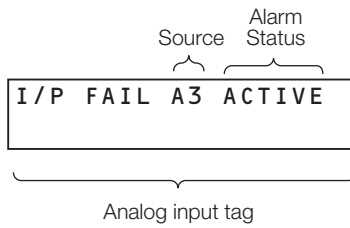
System Alarms

Up to 6 input failure alarms activated by an input being outside its pre-defined range.

General Format



General Format

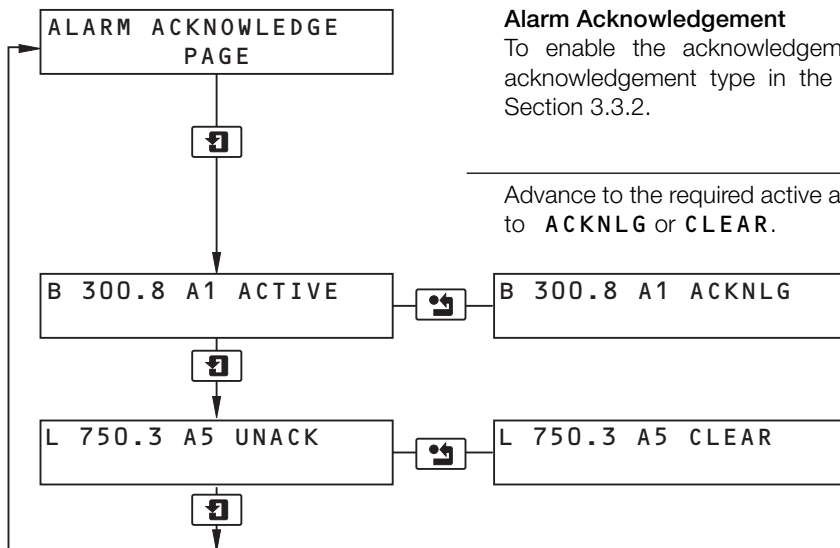


Alarm Status

The five types of alarm status are detailed in the following table.

Alarm Status	Alarm Condition	Relay Condition
Active	Active and unacknowledged	Active
Clear	Previously active, acknowledged and now inactive	Inactive
Acknowledged	Active and acknowledged	Active
Latched	Previously active but now inactive	Active
Unack	Previously active but now inactive	Inactive

Note. Alarm status **CLEAR** is displayed only if the **Alarm Acknowledge Page** is being viewed at the time the alarm becomes inactive.



Alarm Acknowledgement

To enable the acknowledgement facility, select either normal or latched acknowledgement type in the **Alarm Acknowledge Configuration Page** – see Section 3.3.2.

Advance to the required active alarm and press enter. The alarm status changes to **ACKNLG** or **CLEAR**.



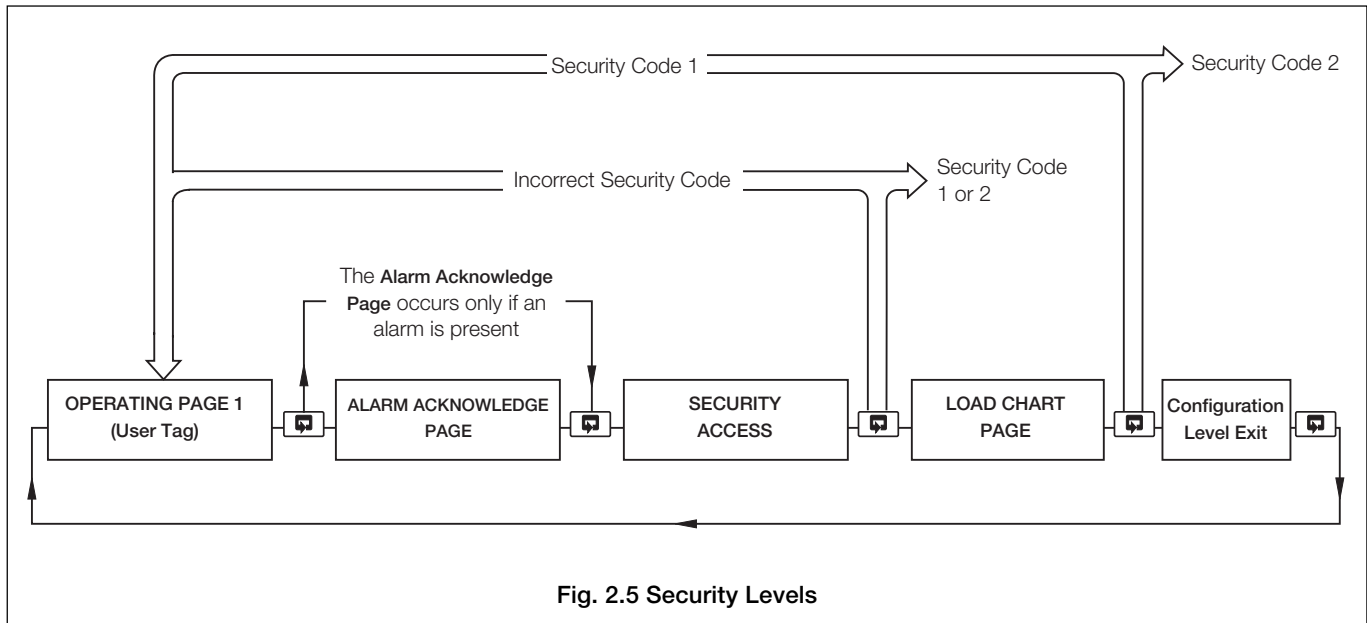
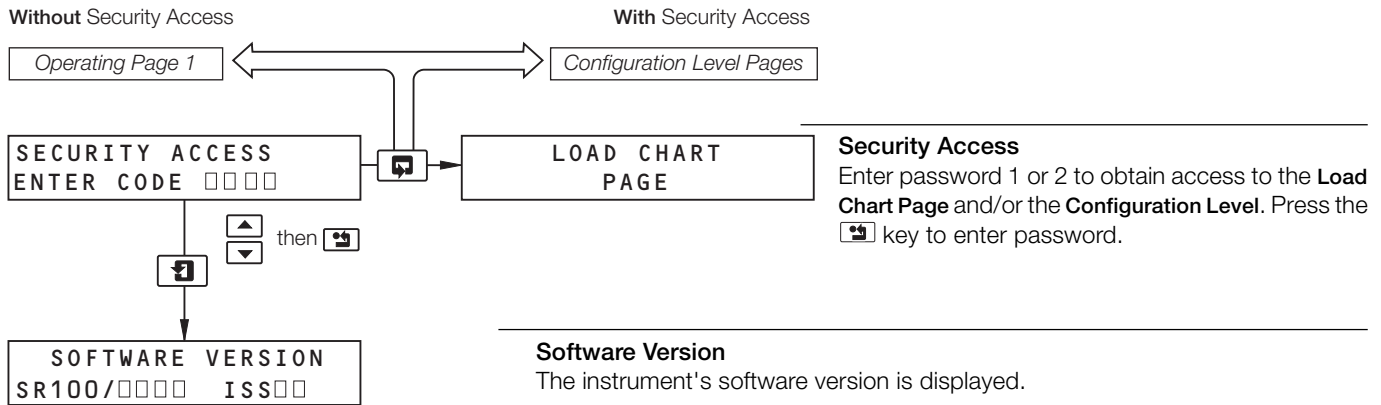
2.4 Security Access – Fig. 2.5

A security system prevents tampering with the secure parameters and has two levels of access.

Information.

- **Security Level 1** – access to **Load Chart Page**.
- **Security Level 2** – access to the **Configuration Level Pages**.

If necessary, Security Access can be disabled to allow entry to all pages by setting the passwords to 0 – see Section 3.6.1. If access to Security Level 2 is not available contact the Company for further information.



3 CONFIGURATION



3.1 Introduction – Fig. 3.1

An overview of the Configuration level is contained on the back cover fold-out (outer).

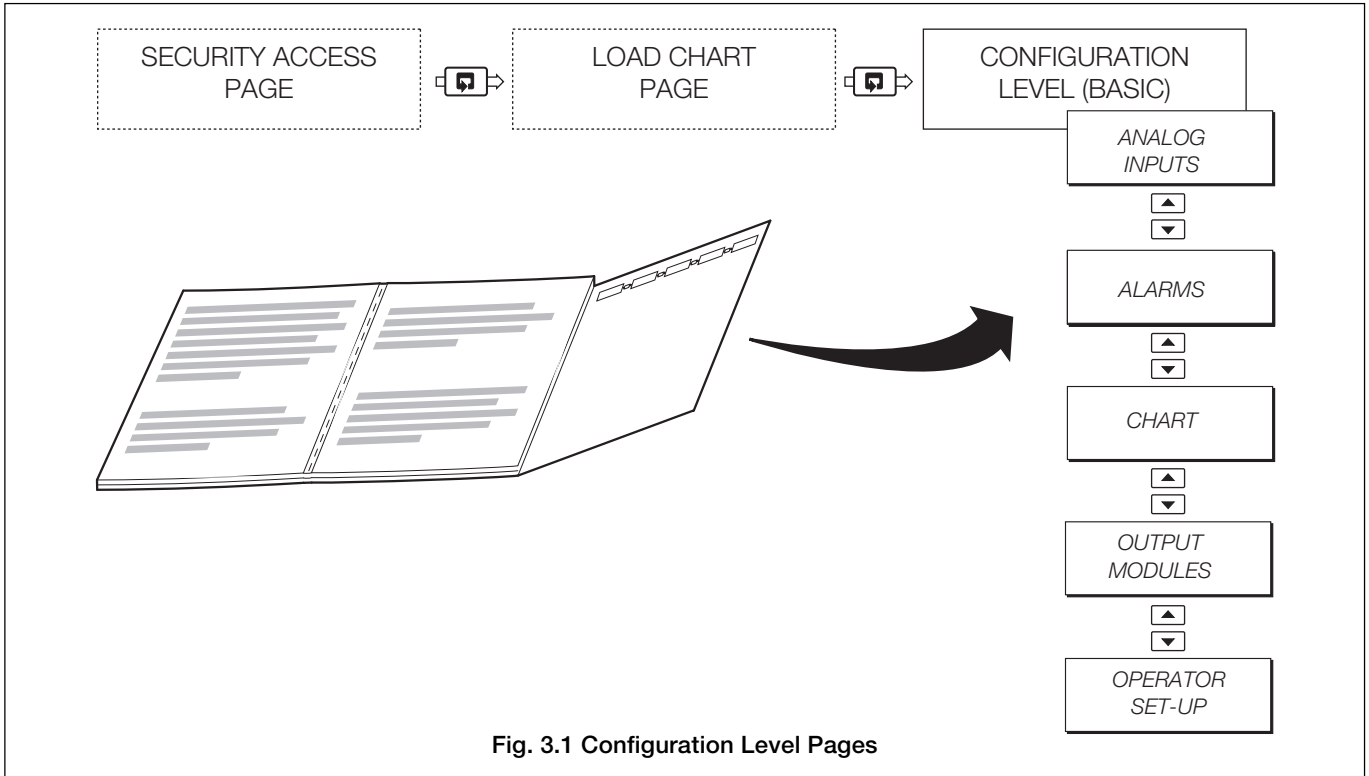


Fig. 3.1 Configuration Level Pages

3.1.1 Accessing the Configuration Level – Fig. 3.2

The Configuration level is accessed when the correct Level 2 password is entered in the Security Access Page.

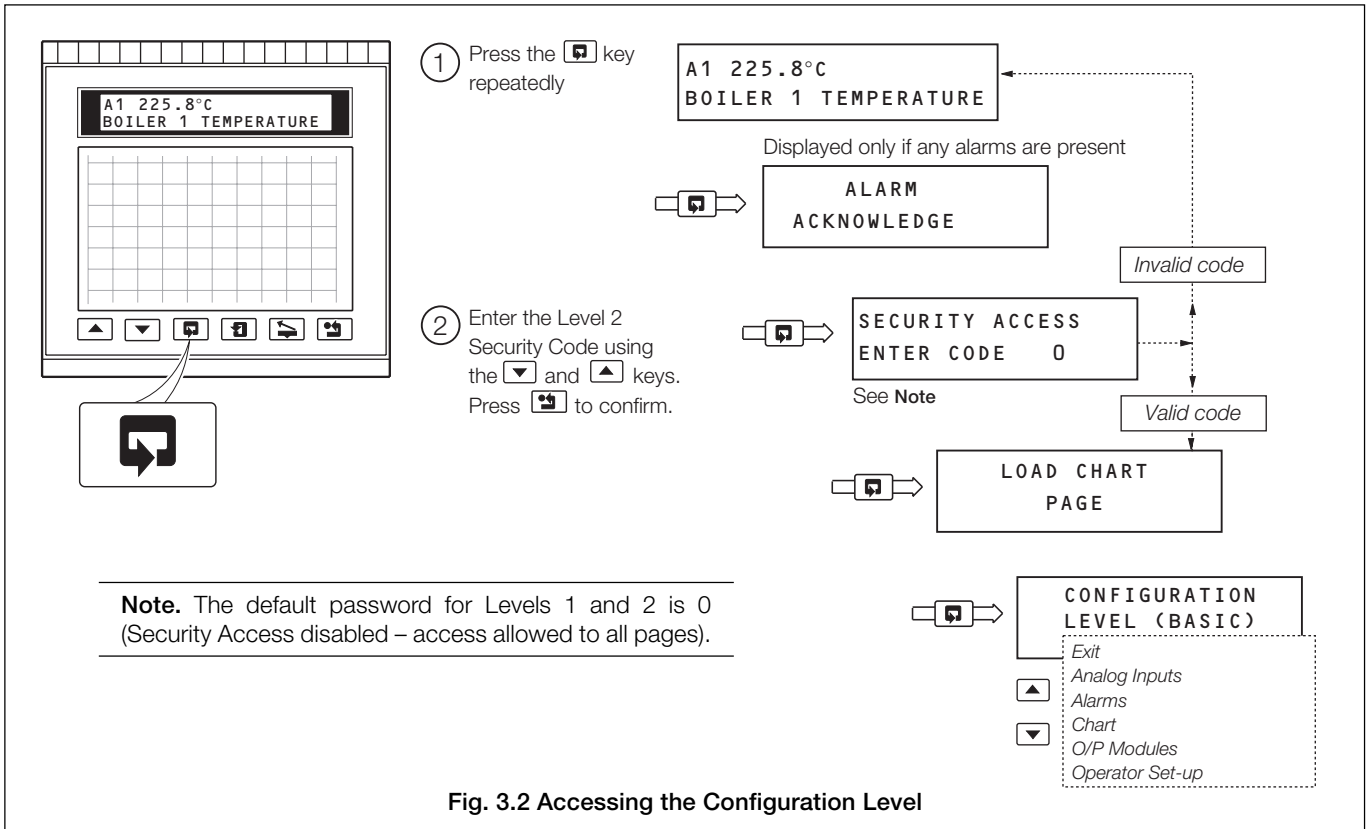


Fig. 3.2 Accessing the Configuration Level



3.2 Analog Inputs

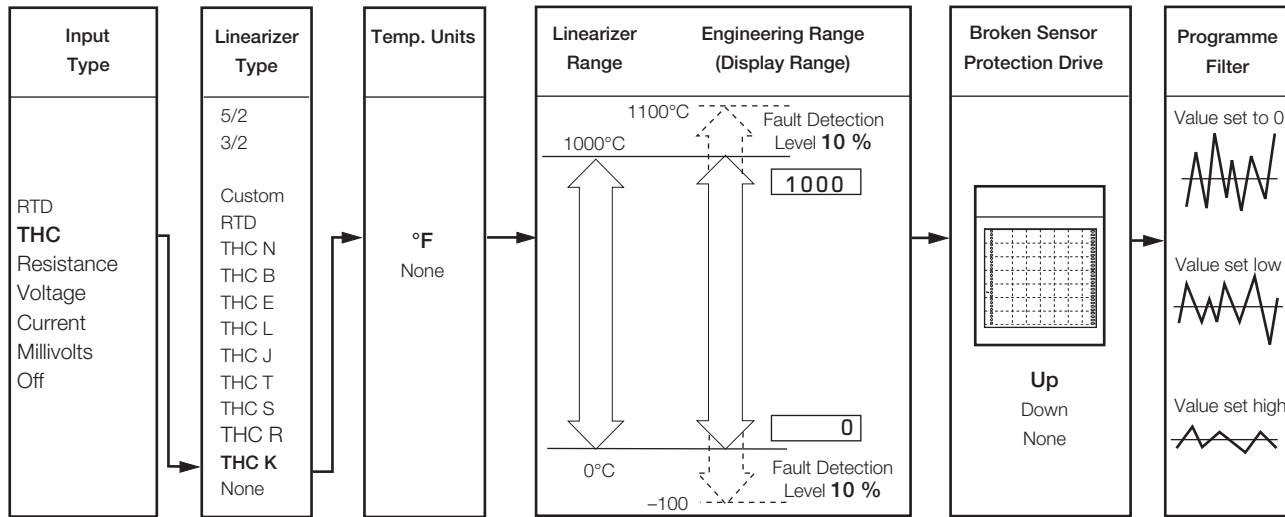
3.2.1 Analog Input Configuration Page

Information.

- Up to 6 analog inputs – on standard boards (inputs A1 to A6).
- Universal inputs – mV, mA, V, THC, RTD and resistance.
- Internal cold junction compensation.
- Linearization – of temperature sensors or any electrical input to allow use of non-linearizing transmitters.
- Programmable fault levels and actions.
- Digital filter – to reduce the effect of noise on inputs.

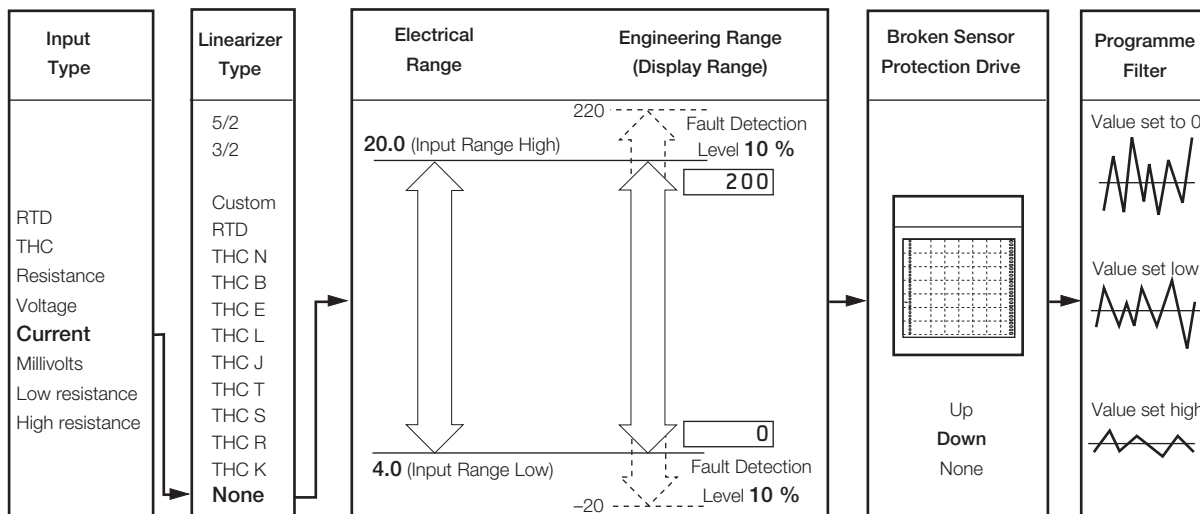
Example A – setting up:

- a Type K thermocouple
- measuring temperature in °C
- displaying a range of 0 to 1000°C (e.g. Lineariser range 0 to 1000°C)
- a fault detection level 10% above 1000°C (engineering/display range) and 10% below 0°C (engineering/display range)
- in the event of a fault being detected and/or the fault detection level being exceeded the process variable is driven upscale.



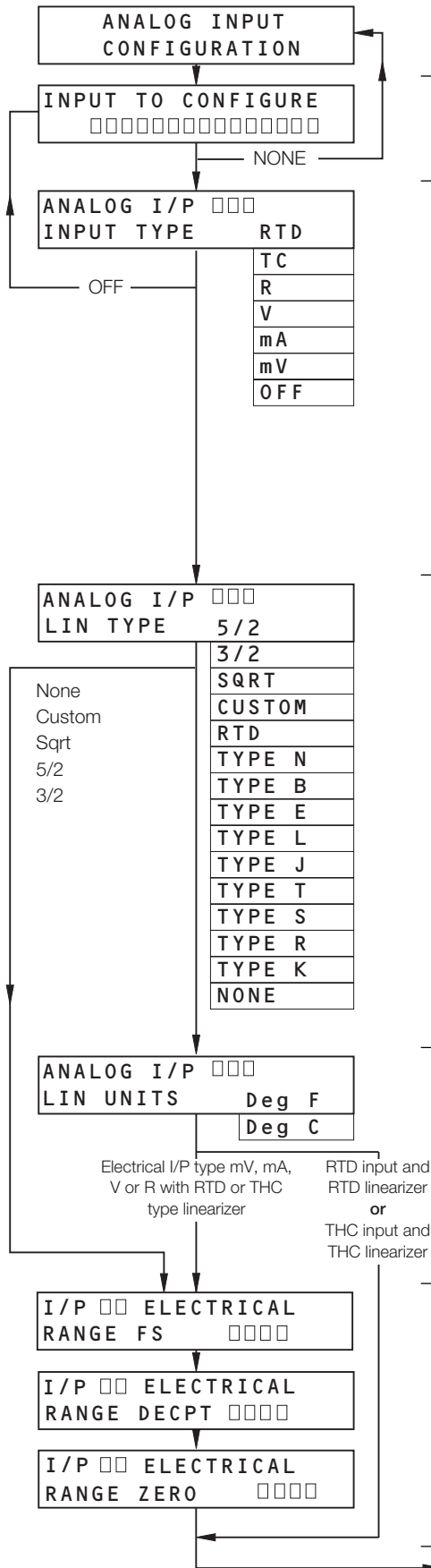
Example B – setting up:

- a current input of 4 to 20 mA
- displaying a range of 0 to 200 psi
- a fault detection level 10% above 200 psi (engineering/display range) and 10% below 0 psi (engineering/display range)
- in the event of a fault being detected and/or the fault detection level being exceeded, the process variable is driven downscale.





...3.2.1 Analog Input Configuration Page



Input to Configure

Select the analog input to configure (A1 to A6). On entry the default is **NONE**.

Input Type

Select the analog input type required:

- RTD** – Resistance Thermometer
- TC** – Thermocouple*
- R** – Resistance
- V** – Voltage
- mA** – Low current (set to at least one decimal point)
- mV** – Low voltage
- OFF** – Sets input to off (analog I/P A1 cannot be turned off)

* For thermocouple applications using an external fixed cold junction, select **mV** input type.

Note. Before selecting input types other than **TC** and **mV**, ensure links are set correctly – see Section 4.5.7.

Linearizer Type

Select the linearizer type required:

- 5/2** – $x^{5/2}$
- 3/2** – $x^{3/2}$
- SQRT** – Square root
- CUSTOM** – Not Available
- RTD** – Resistance Thermometer
- TYPE N** – Type N thermocouple
- TYPE B** – Type B thermocouple
- TYPE E** – Type E thermocouple
- TYPE L** – Type L thermocouple
- TYPE J** – Type J thermocouple
- TYPE T** – Type T thermocouple
- TYPE S** – Type S thermocouple
- TYPE R** – Type R thermocouple
- TYPE K** – Type K thermocouple
- NONE** – No Linearizer

Linearizer Units

Select the temperature units required, degrees Fahrenheit or degrees Celsius.

Input Electrical Range

Defines the electrical range (mA, mV, V or Ω) over which the input operates.

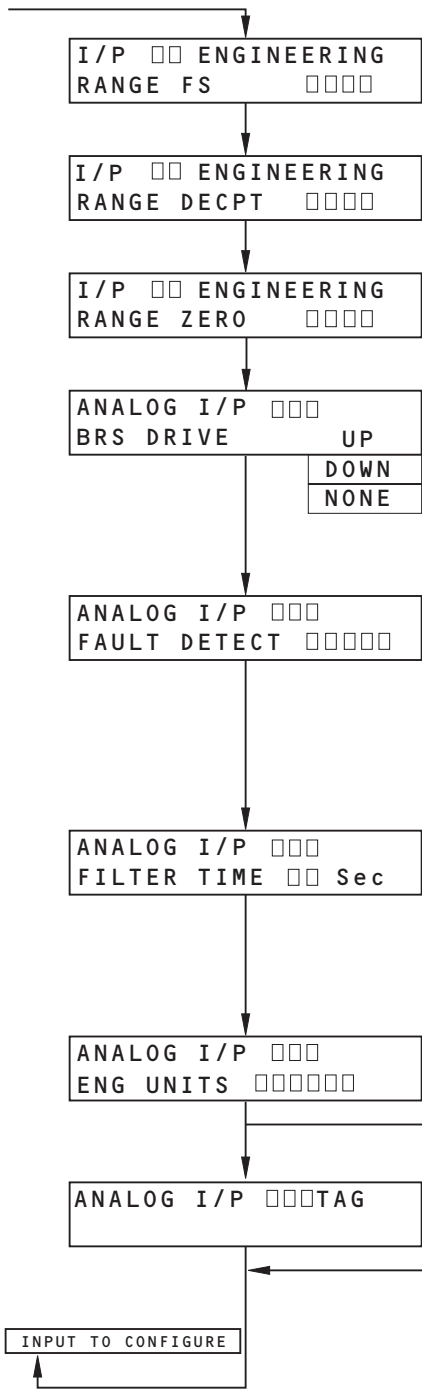
The limits are as specified in Table 3.1 on page 19.

The values and the decimal point position should be set such that the input is calculated to the maximum number of decimal places.

Continued on next page.



...3.2.1 Analog Input Configuration Page



Input Engineering Range

For inputs with RTD and thermocouple linearizers

Defines both the display range of the instrument and the operating range of the input linearizer. The limits are as specified in table 3.2, according to linearizer type.

For other input linearizer types (or NONE)

Defines the engineering range (i.e. what is displayed) over the electrical range entered previously. The limits are -999 to +9999 for both range full scale and zero.

Broken Sensor Drive

In the event of a fault being detected on the input, the analog input is driven according to the Broken Sensor Drive. Select the broken sensor drive required:

- UP** - Upscale drive
- DOWN** - Downscale drive
- NONE** - No drive

Fault Detection

A fault level percentage can be set to detect a deviation above or below the input span. Set the value required, between 0.0 and 100.0% of the display range in 0.1% increments.

Example – for a 10% setting on an input range of 100 to 200mV, a fault is detected at 90mV and 210mV.

Filter Time

This setting can be used to smooth the transition between input steps or to 'average out' a noisy input. It sets the time period (between 0 and 60 seconds in 1 second increments) in which the process variable input is sampled. The analog input is then calculated from the average of the samples taken.

Engineering Units

Input units of up to six characters can be set on the upper display – see Front Fold-out.

Analog Input Tag

An input description of up to twenty characters can be set on the upper display – see Front Fold-out.

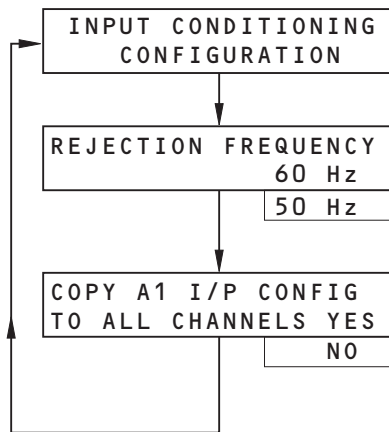
Return to **Input to Configure** frame.



3.2.2 Input Conditioning Configuration Page

Information.

- Mains filter – selectable for maximum noise rejection.
- Quick input configuration feature (copies channel A1 settings to all other inputs) – for applications where all the inputs are the same.



Rejection Frequency

Select the mains rejection frequency required; 50Hz or 60Hz.

Copy A1 Input Configuration

Allows the configuration set for channel A1 to be copied to all other analog input channels. The tag set for A1 is also copied to all the channels

Return to top of **Input Conditioning Configuration Page**.

Input Type	Min. Value	Max. Value	Min. Span
Millivolts	-2000	2000	2.5
Volts	-20	20	0.25
Milliamps	-100	100	0.25
Resistance	0	8000	10

Table 3.1 Electrical Limits

THC /RTD Type	°C			°F		
	Min.	Max.	Min. Span	Min.	Max.	Min. Span
Type B	-18	1800	710	0	3272	1278
Type E	-100	900	45	-148	1652	81
Type J	-100	900	50	-148	1652	90
Type K	-100	1300	65	-148	2372	117
Type L	-100	900	50	-148	1652	90
Type N	-200	1300	90	-328	2372	162
Type R & S	-18	1700	320	0	3092	576
Type T	-250	300	60	-418	572	108
RTD	-200	600	25	-328	1112	45

Table 3.2 Temperature Limits

Note. Performance accuracy is not guaranteed below 400°C (725°F) for types B, R and S thermocouples.

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



3.2.3 Scale Adjustment Page

Information.

- Analog inputs – do not require re-calibrating when the input or range is changed.
- Scale Adjustment Reset – removes any previously programmed offset or scale adjustment settings.
- System Offset Errors – can be removed using Offset Adjustment.
- System Scale Errors – can be removed using Span Adjustment.
- Offset/span Adjustment – can be used to perform spot calibration.

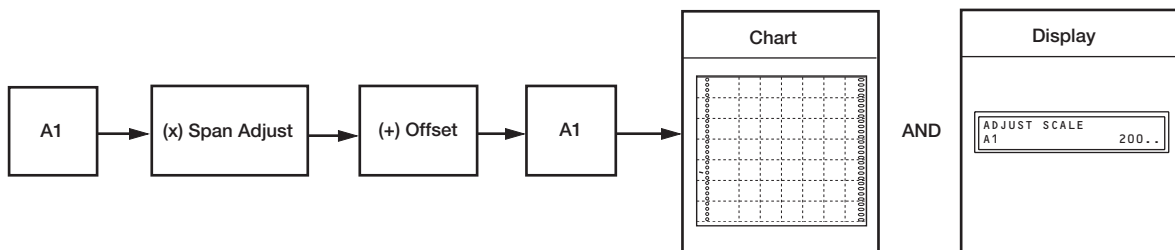
Switch off the power supply to the instrument. Connect accurate signal sources, suitable for simulation over the entire input range, in place of each analog input connection A1 to A6 (terminals TB1–1 to 18). For thermocouple inputs, connect the millivolt source using appropriate compensating cable – see Table 4.1 on page 35. For 2-lead resistance thermometers, connect the resistance box at the sensor end of the leads or the lead resistance must be added to the calibration values.

As a general rule use:

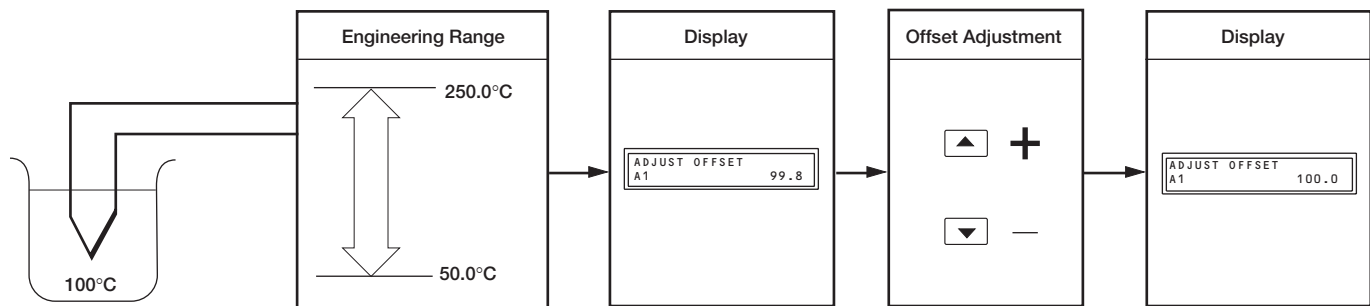
Offset adjustment for a spot calibration < 50% of engineering range span

Span adjustment for a spot calibration > 50% of engineering range span

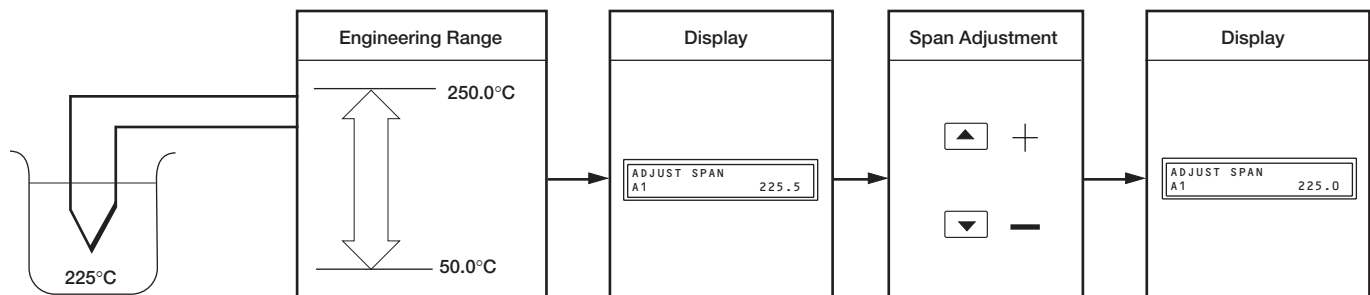
Scale Adjustment



Offset Adjustment

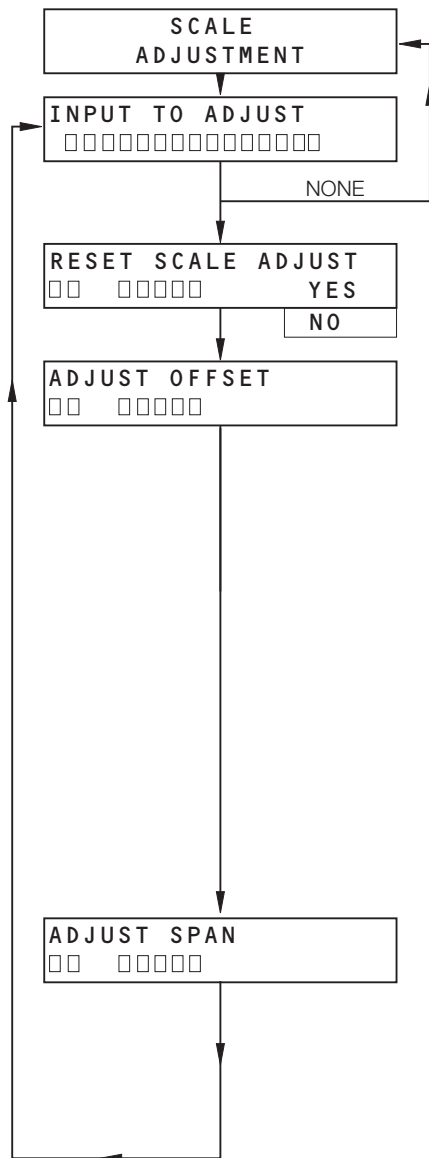


Span Adjustment





...3.2.3 Scale Adjustment Page



Input to Adjust

Select the analog input to adjust (A1 to A6). On entry the default is **NONE**.

Scale Adjustment Reset

Select **YES** to reset the analog input offset and span values to their nominal values.

Offset Adjustment

Electrical and resistance thermometer inputs:

Apply the correct input for the spot calibration required.
For RTD inputs, use resistance values obtained from standard tables.

Thermocouple inputs:

Measure the ambient temperature at the output terminals of the signal source (calibrator). From thermocouple tables obtain the millivolt equivalent of this temperature (a) and that for the spot calibration temperature (b). Subtract (a) from (b) and set the signal source to the resultant value. (The voltage is negative if the spot calibration temperature is below the measured ambient temperature).

Note. The displayed units are engineering units.

Set the value required. The decimal point is set automatically.

Example – if the display range is 50.0 to 250.0 and a spot calibration is required at 100.0 and 225, inject a signal equivalent to 100.0 and set the display to 100.0.

Span Adjustment

Proceed as for **Offset Adjustment** above and apply the correct input for the spot calibration required. The displayed units are engineering units. Set the value required. The decimal point is set automatically.

For the example above inject a signal equivalent to 225.0 and set the display to 225.0.

Return to **Input to Adjust** frame.

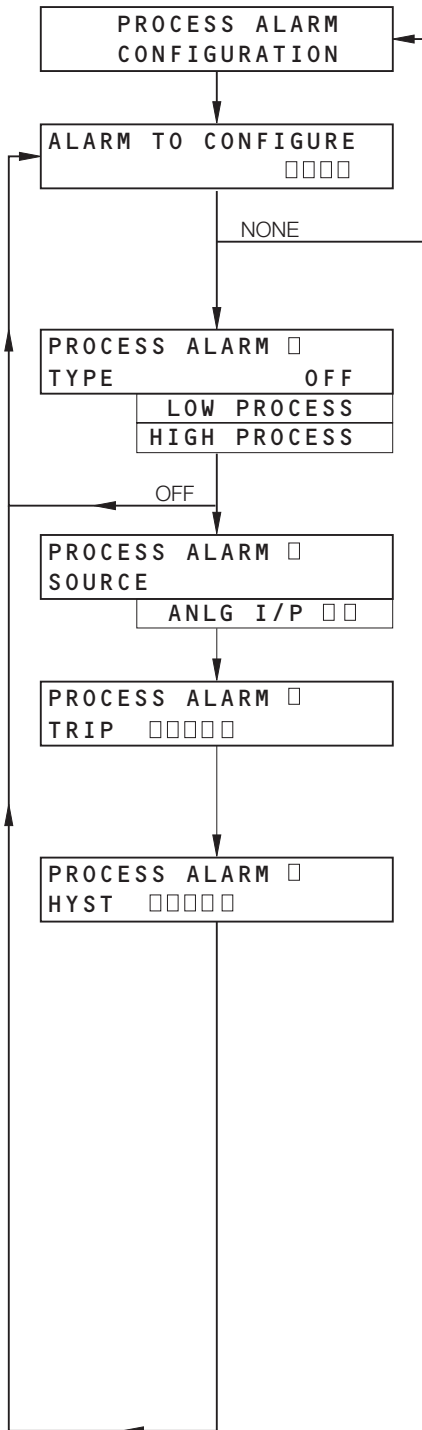


3.3 Alarms

3.3.1 Process Alarm Configuration Page

Information.

- 12 Process alarms – identified A to M (excluding I).
- Up to six alarms can be assigned to relays.
- High/low process alarms.
- Alarms assignable to any analog input.
- Adjustable hysteresis value – to prevent oscillation of alarm state.



Alarm to Configure

Select the process alarm to configure. Up to twelve alarms (A to M, excluding I) can be programmed. Each alarm can be assigned an Alarm Type, a Trip Level and a Hysteresis setting. Alarm A is the highest priority and M the lowest.

On entry the default is **NONE**.

Alarm Type

An alarm type can be assigned to the alarm identity selected above.

Select the alarm type required:

- OFF** – Sets alarm selected above to **OFF**
- LOW PROCESS** – Alarm activated when process falls below trip level
- HIGH PROCESS** – Alarm activated when process rises above trip level.

Alarm Source

An alarm source is assigned to the alarm identity selected above.

Select the alarm source required from analog inputs A1 to A6.

Trip Level

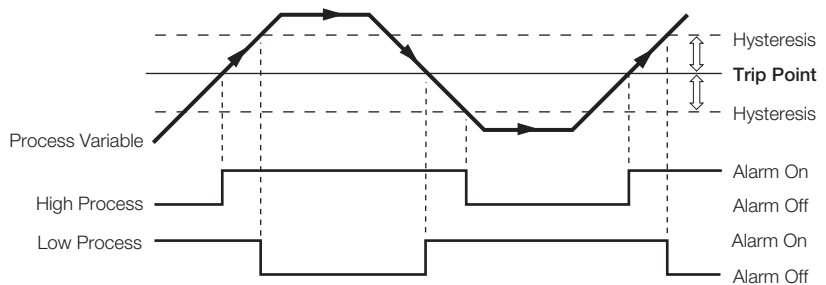
Set the trip level for the alarm selected above (the trip level set should not exceed the display range limits by more than 10%).

Trip levels are displayed in engineering units.

Hysteresis

Hysteresis is operational when the alarm is active. Set the hysteresis value required (in engineering units) between display full scale and zero.

The alarm is activated at the trip level but only turns off after the alarm variable has moved into the safe region by an amount exceeding the hysteresis value.



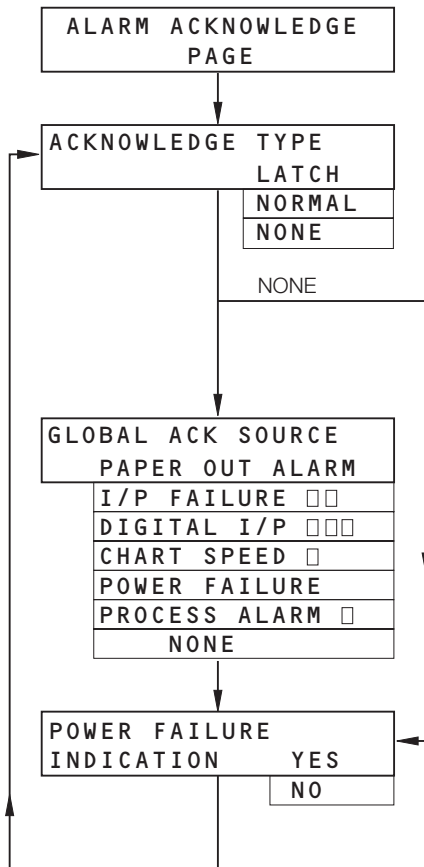
Return to **Alarm to Configure** frame.



3.3.2 Alarm Acknowledge Configuration Page

Information.

- Three operator acknowledge options.
- Global alarm acknowledgment – from internal or external digital source.
- Indication of power failure – can be enabled/disabled.



Acknowledge Type

Select the type of alarm acknowledge facility required:

- LATCH** – Alarm state remains active until acknowledged in the **Alarm Acknowledge Page** in the **Operator Level** (see Section 2.3) and the condition is removed.
- NORMAL** – Alarm state remains active until the condition is removed. Acknowledge facility available.
- NONE** – Alarm state remains active until the condition is removed. Acknowledge facility not available.

Global Acknowledge Source

Select the source required to acknowledge all alarms:

- PAPER OUT ALARM** – End of chart reached
- I/P FAILURE** – Failure of analog input (A1 to A6)
- DIGITAL I/P** – Active digital input (DA1)
- CHART SPEED** – Selection of chart speed (1 to 3)
- POWER FAILURE** – After power failure
- PROCESS ALARM** – Pre-defined process alarm (A to M, excluding I)
- NONE** – No automatic acknowledge required.

Power Failure Indication Enable

Select **YES** to enable the display of the Power Failure alarm in the **Alarm Acknowledge Page** in the **Operator Level** (see Section 2.3) and the **POWER FAILED** message in the **Operating Pages**.

Return to **Acknowledge Type** frame.

Acknowledge Type	Alarm Condition	Alarm Acknowledged	Alarm Acknowledge Page Display	***Operating Page Display
LATCH	Alarm Present	No	ACTIVE	Flashing 📢
		Yes	ACKNLG	**Steady 📢
	Alarm Cleared	No	LATCH	Flashing 📢
		Yes	*CLEAR (or none)	None
NORMAL	Alarm Present	No	ACTIVE	Flashing 📢
		Yes	ACKNLG	**Steady 📢
	Alarm Cleared	No	UN-ACK	Flashing 📢
		Yes	*CLEAR (or none)	None
NONE	Alarm Present	N/A	N / A	Flashing 📢
	Alarm Cleared	N/A	N / A	None

* An alarm status of **CLEAR** is displayed only if the **Alarm Acknowledge Page** in the **Operator Level** (see Section 2.3) is being viewed at the time the alarm becomes inactive.

** A steady 📢 appears only when ALL active alarms are acknowledged.

*** The flashing or steady 📢 appears on the Operating Page Display only if alarm print is set to **ON**.

Table 3.3 Alarm Acknowledge Facilities and Displays



3.4 Chart

3.4.1 Chart Control Configuration Page

Information.

- Set up to 3 independent chart speeds – selectable from operating level or by digital signal.
- Enable/disable printing of text (except alarms).
- **NO AUTO PRINT** facility – allows an unbroken trace at higher chart speeds (> 120mm/h), with printing of time, scales, etc. at the start and end of a batch.
- Enable/disable alarm printing.
- Text can be selected to be printed fast or slow.
- Auto pen-drop – automatically returns the pen capsule to an operating state after a 5 minute delay to ensure recording is not inadvertently left disabled.
- Easy View feature – allows quick access of latest printed information.
- Time Line Advance – allows the chart to be advanced to the required time line before commencing recording.

CHART CONTROL CONFIGURATION

CHART SPEED 1
□□□□mm/hr

CHART SPEED 1 SOURCE

PAPER OUT ALARM
I/P FAILURE □□
DIGITAL I/P □□□
CHART SPEED
POWER FAILURE
PROCESS ALARM □
NONE

CHART SPEED 2
□□□□mm/hr

CHART SPEED 2 SOURCE
□□□□□□□□□□□□□□

CHART SPEED 3
□□□□mm/hr

CHART SPEED 3 SOURCE
□□□□□□□□□□□□□□

Set Chart Speed 1

Select a chart speed between 0 and 1500mm/hr.

Chart Speed 1 Source

Select the source required to initiate a change to chart speed 1:

- PAPER OUT ALARM** – End of chart reached
- I/P FAILURE** – Failure of analog input (A1 to A6)
- DIGITAL I/P** – Active digital input (DA1)
- CHART SPEED** – Selection of chart speed (1 to 3)
- POWER FAILURE** – After power failure
- PROCESS ALARM** – Pre-defined process alarm (A to M, excluding I)
- NONE** – No automatic action

Set Chart Speed 2

Select a chart speed between 0 and 1500mm/hr.

Chart Speed 2 Source

Select a chart speed source as for chart speed 1 above.

Set Chart Speed 2

Select a chart speed between 0 and 1500mm/hr.

Chart Speed 3 Source

Select a chart speed source as for chart speed 1 above.

Continued on next page.

Information. A chart speed of 120mm/hr is required when digital input DA1 is active. At all other times set chart speed to 20mm/hr.

- Set chart speed 1 to 20mm/hr
- Set chart speed 1 source to **CHARTSPEED 2**
- Set chart speed 2 to 120mm/hr
- Set chart speed 2 source to DA1

Select chart speed 1 and start recording. When DA1 becomes active the chart speed changes to 120mm/hr. When DA1 becomes inactive the chart speed returns to 20mm/hr.



...3.4.1 Chart Control Configuration Page

TEXT PRINT	
NO AUTO PRINT	<input type="checkbox"/> ON
	<input type="checkbox"/> OFF

ALARM PRINT	<input type="checkbox"/> ON
	<input type="checkbox"/> OFF

MESSAGE PRINT SPEED	<input type="checkbox"/> FAST
	<input type="checkbox"/> SLOW

CHART CASSETTE TYPE	<input type="checkbox"/> ROLLCHART
	<input type="checkbox"/> FANFOLD

Text Print Enable

Select the text printing required:

NO AUTO PRINT – disable printing all text that is printed automatically, i.e. Time, Date, Channel Tags and Trace Identifiers

ON – enable printing of all text except alarm messages

OFF – no text printing.

Alarm Print Enable

Select **ON** to enable the printing of alarm messages.

Message Print Speed

With chart speeds ≤ 120 mm/hr the selections have the following effect:

FAST – Interrupts chart traces to print alarms.

SLOW – Prints alarms during chart traces.

Above 120mm/hr chart traces are interrupted automatically for fast printing.

Parameter to Print	Chart Speed ≤ 120 mm/h	
	Print Speed Slow	Print Speed Fast
Process Alarms	Slow	Fast
Time	Slow	Slow
Chart Speed Change	Slow	Slow
Time/Date Chart Speed (240 mm)	Slow	Slow
Scales (Scale Internal)	Slow	Slow
Scales (Digital Signal)	Slow	Slow
20 Character Channel Tag	Slow	Slow
Trace Identifiers	Slow	Slow
Scales (Test Print)	Fast	Fast

Note. The parameters in the above table are listed in order of the priority in which they are printed.

Chart Cassette Type

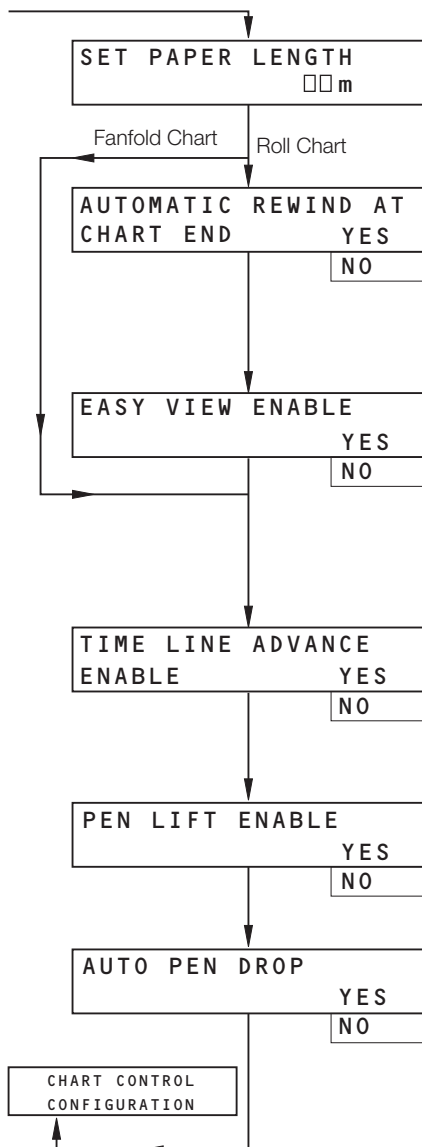
Select the type of chart cassette to be used.

Caution. Ensure the correct type of cassette is set. Damage to the instrument may occur if the type is set incorrectly.

Continued on next page.



...3.4.1 Chart Control Configuration Page



Set Paper Length

Set the required paper length in 1m increments. For roll chart, the maximum paper length is 25m. For fanfold chart, the maximum paper length is 12m.

Automatic Chart Rewind

When this feature is enabled, chart recording will stop and the chart will rewind automatically when the chart remaining value reaches zero.

Note. Automatic rewind will operate only if the instrument is in the **Operating Page** when the chart end state is set.

Easy View Enable (roll chart only)

Easy view allows the operator to view the latest printed information on the chart by winding the chart forward a small distance for a few seconds. The chart is automatically returned to the recording position where it prints any buffered data, ensuring no loss of data.

Select **YES** to enable Easy View function in the **Operating Page**.

Time Line Advance

The time line function enables the chart to be advanced to the required time line before commencing recording.

Select **YES** to display Time Line advance function in the **Load Chart Page**.

Pen Lift Enable

Select **YES** to enable the front panel Pen Raise/Lower key ().

Auto Drop Enable

Select **YES** to enable the auto drop facility. This returns the pen capsule to an operating state approximately 5 minutes after the pen lift is activated.

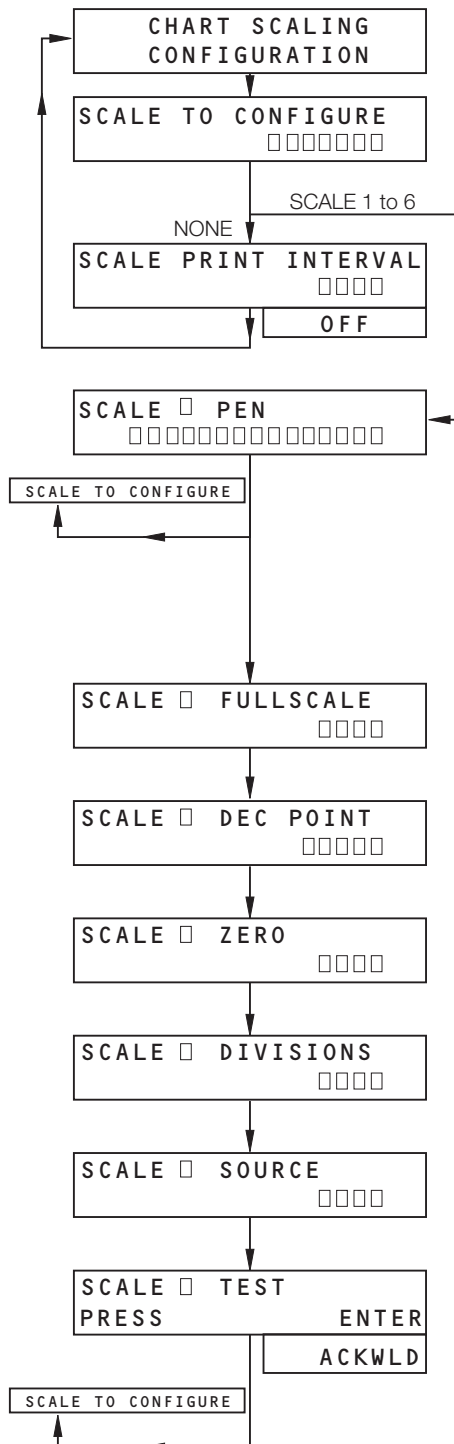
Return to top of **Chart Control Configuration Page**.



3.4.2 Chart Scaling Configuration Page

Information.

- Up to six independent scales can be printed, with selectable interval between scales.
- Programmable full scale and zero values.
- Test print facility to enable instant checking of entered scale.



Scale to Configure

Six separate scales can be programmed with full scale values, zero values, the decimal point position and the division separation of the selected chart. Select the scale to configure. On entry the default is **NONE**.

Set Print Interval

Set the interval required between scales on chart between 10mm and 240mm in 1mm intervals (this interval is the length of channel traces and not the actual chart length). If automatic scale printing is not required, select **OFF**.

Scale Pen

Select the pen color to be used to print the selected scale:

Instrument Type	Pen 1	Pen 2	Pen 3	Pen 4	Pen 5	Pen 6
Pen 1	Red	—	—	—	—	—
Two Pen	Red	Green	—	—	—	—
Three Pen	Red	Green	Blue	—	—	—
Six Pen	Magenta	Red	Black	Green	Blue	Brown

Set Full Scale

Select the full scale value for the scale, between -999 and +9999.

Set Decimal Point

Select the number of decimal places for the scale (0, 1 or 2).

Set Zero

Select the zero value for the scale, between -999 and +9999.


Set Divisions

Select the division separation of the chart for the scale (75, 70, 60, 50, 40 or 30).

Set Source

Select the digital source required to print the scale. See **Chart Speed 1 Source** parameter on page 24 for options.

Scale Test

Press the  key to initiate a scale test print. The scale is always printed in the Fast text mode.

Return to **Scale to Configure** parameter.

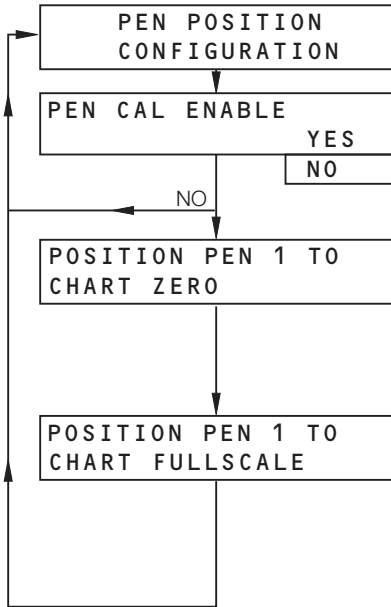
Note. Select the minimum number of digits for full scale value to ensure that the printed scale does not obscure the chart. If the sub-divisions of the scale for the major traces on the chart are not integers then set the correct number of decimal places to give the optimum accuracy.



3.4.3 Pen Position Configuration Page

Information.

- Allows accurate calibration of the pen positions on the chart.
- Can be used to remove effects of inconsistencies in the charts.



Pen Calibration Enable

Select **YES** to advance to the zero and full scale setting parameters.

Chart Zero Position

The chart advances at high speed and the pen moves to its zero position. With the door open set the chart zero position of pen 1 – Magenta/Red using the and keys. Press the key to store the pen 1 zero position.

Chart Full Scale Position

The chart continues to advance at high speed and the pen moves to its full scale setting. Set the chart full scale position of pen 1.

Press the key to store the pen 1 full scale position.

Return to **Pen Position Configuration** frame.

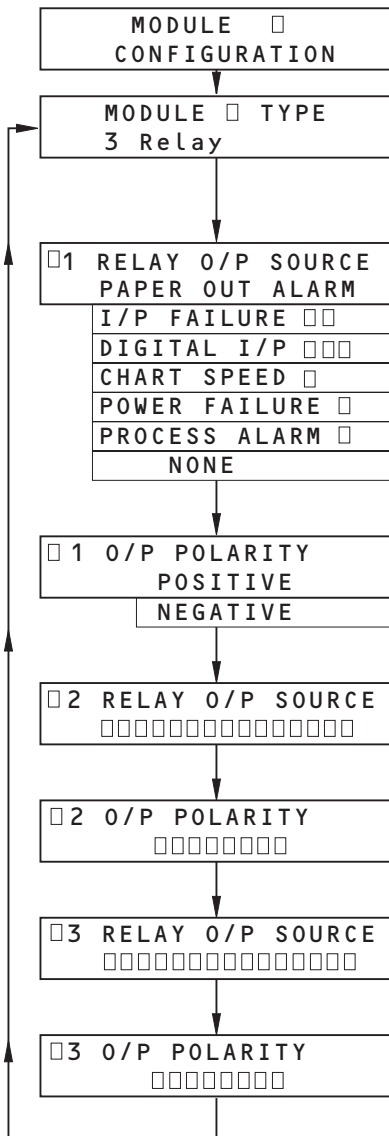
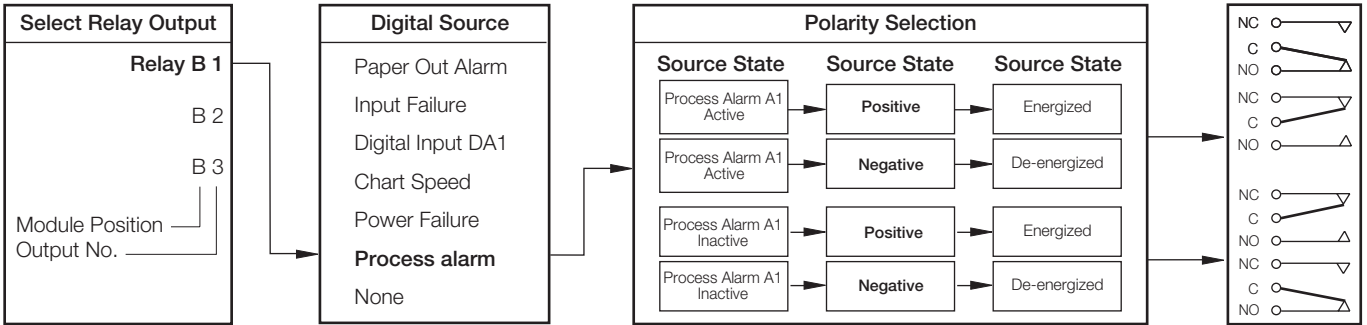


3.5 Output Modules

Information.

- Output modules can be fitted into module positions B and C.
- Automatic detection of type of modules fitted.
- Programmable sources for relay outputs.
- Programmable polarity for each relay output.

3.5.1 Output Module Configuration Page – Relay Modules



Module Type

The type of module fitted is displayed. **NOT FITTED** is displayed where the module location is not used. The Relay Output module contains three relay output circuits.

Circuit 1 Relay Output Source

- Select the source required to activate the relay output:
- PAPER OUT ALARM** – End of chart reached
 - I/P FAILURE** – Failure of analog input (A1 to A6)
 - DIGITAL I/P** – Active digital input (DA1)
 - CHART SPEED** – Selection of chart speed (1 to 3)
 - POWER FAILURE** – After power failure
 - PROCESS ALARM** – Pre-defined process alarm (A to M, excluding I)
 - NONE** – No output source required.

Circuit 1 Output Polarity

- Select the output polarity required:
- POSITIVE** – Relay energized when condition is true
 - NEGATIVE** – Relay de-energized when condition is true

Circuit 2 Relay Output Source

Select the source required to activate the relay output as for circuit 1 above.

Circuit 2 Output Polarity

Select the output polarity required as for circuit 1 above.

Circuit 3 Relay Output Source

Select the source required to activate the relay output as for circuit 1 above.

Circuit 3 Output Polarity

Select the output polarity required as for circuit 1 above.

Return to top of **Output Module Configuration Page**.

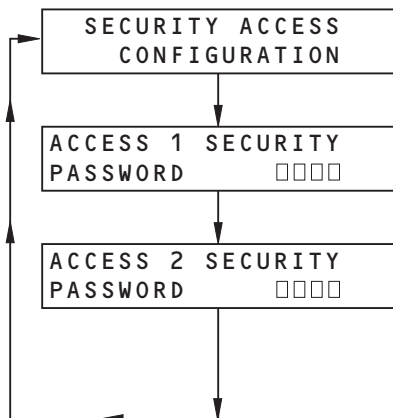


3.6 Operator Setup

3.6.1 Security Access Configuration Page

Information.

- The 2 levels of security are:
 - Level 1** – access to **Load Chart Page**
 - Level 2** – allows access to **Level 1** and the **Configuration Level**.
- This page is used to set the passwords for the security levels.



Set Access Level 1 Password

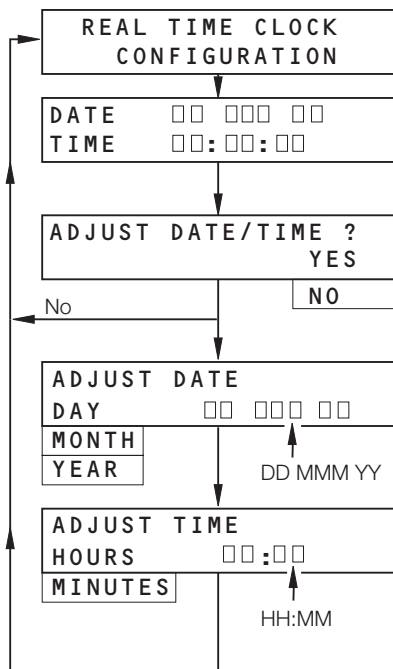
The Level 1 password allows access to the **Load Chart Page**. Set the password to any number between 0 and 1999.

Set Access Level 2 Password

The Level 2 password allows access to Level 1 and the **Configuration Level**. Set the password to any number between 0 and 1999. Security Access can be disabled by setting 0 as the password for both levels.

Return to top of **Security Access Configuration Page**.

3.6.2 Real Time Clock Configuration Page



Time and date set-up for the instrument's internal real-time clock.

Date/Time

The current date/time set on the instrument is displayed.

Adjust Date/Time

Select **YES** to advance to adjust parameters. Select **NO** to return to top of **Real Time Clock Configuration Page**.

Adjust Date

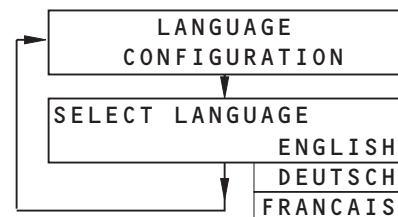
Set the day, month and year. Pressing the key stores the parameter and selects the next parameter in the **DAY**, **MONTH** and **YEAR** loop.

Adjust Time

Set the current time. Pressing the key stores the parameter and selects the next parameter in the **HOURS** and **MINUTES** loop.

Press the key to save the new date/time settings.

3.7 Language Configuration Page



Three languages are available for Operator and Programming frames: English, German and French.

Select Language

Select the language to be displayed.



4 INSTALLATION

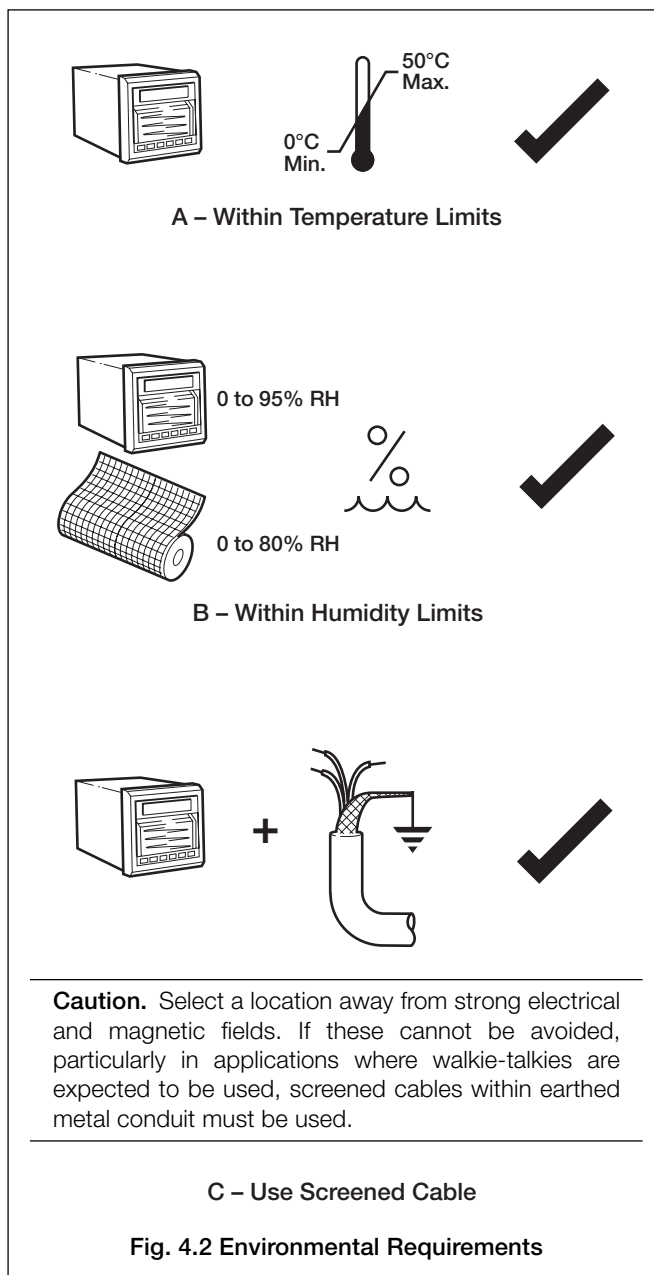
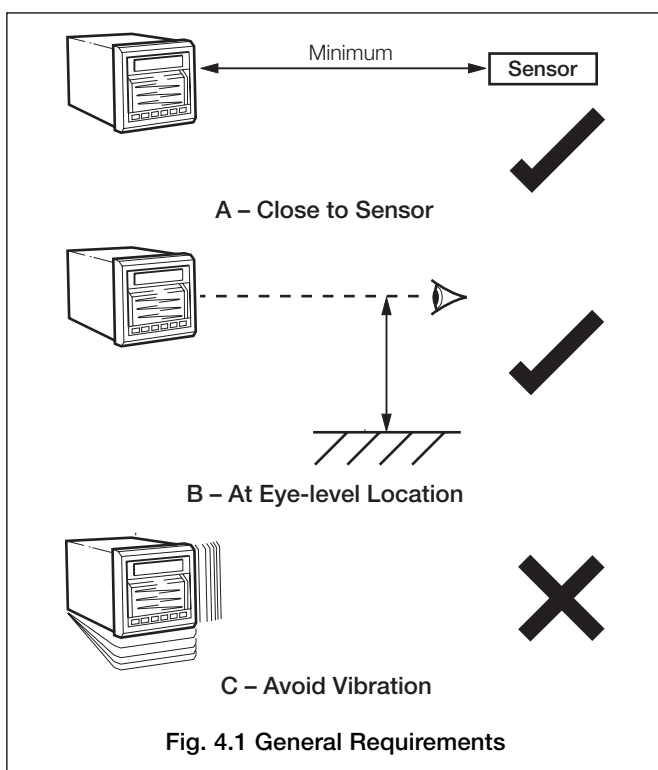
EC Directive 89/336/EEC

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.

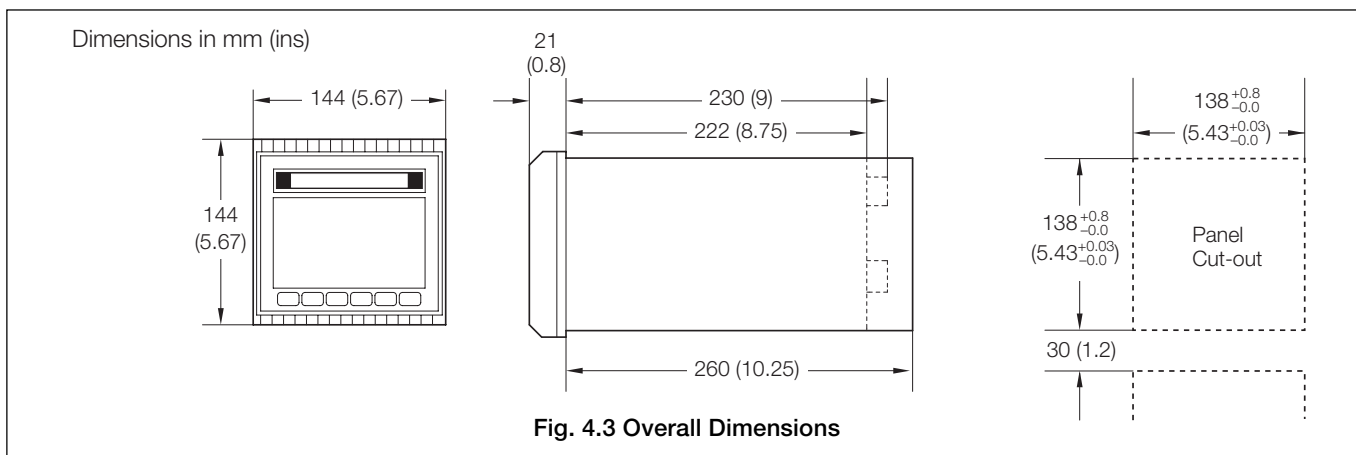
End of Life Disposal

This instrument does not contain any substance that will cause undue harm to the environment. However, the unit contains a small lithium battery. This should be removed and disposed of responsibly in accordance with local environmental regulations. The remainder of the unit can be safely considered as normal waste and disposed of accordingly.

4.1 Siting – Figs. 4.1 and 4.2



4.2 Mounting – Figs. 4.3 and 4.4





...4.2 Mounting – Figs. 4.3 and 4.4

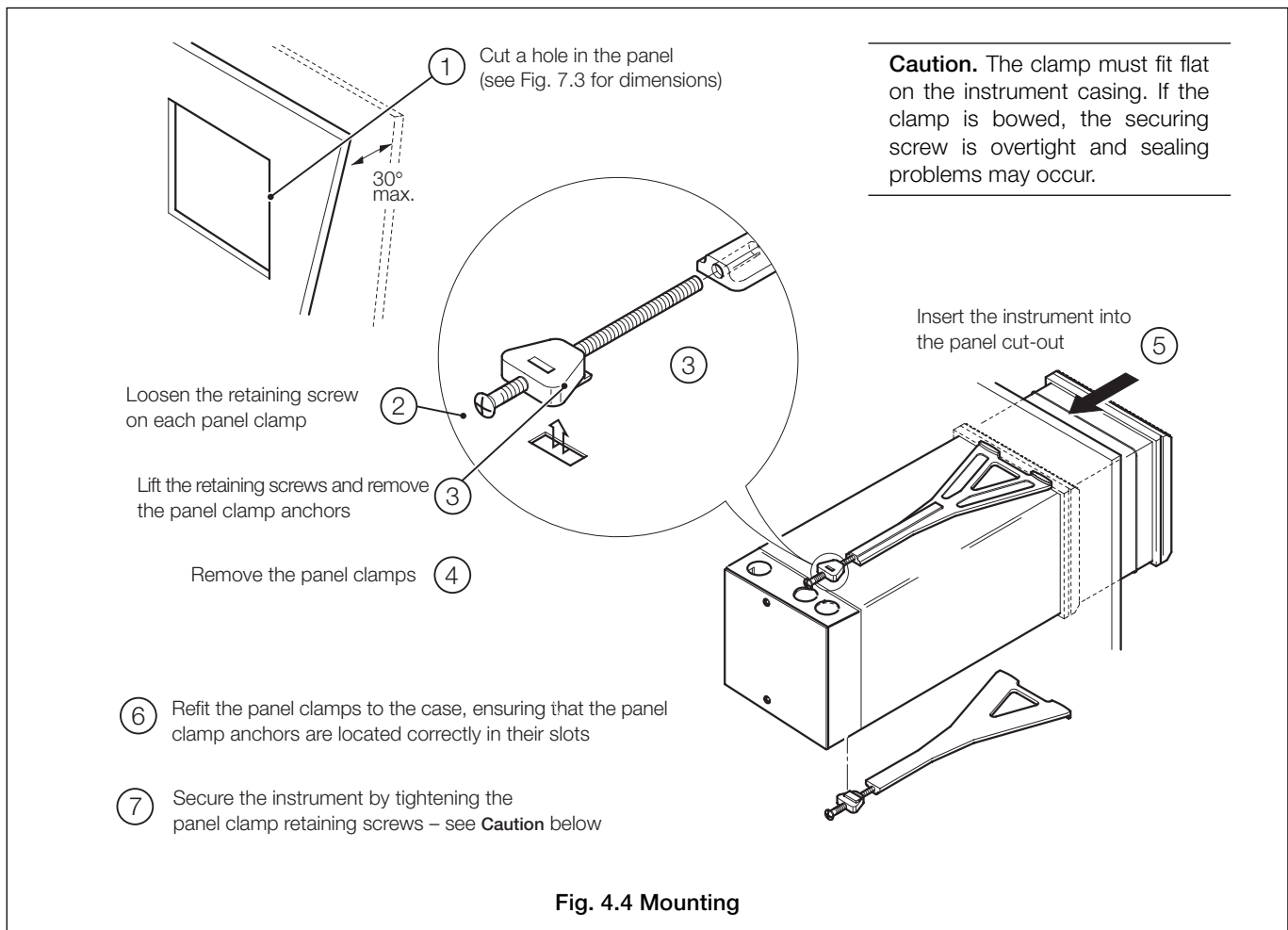
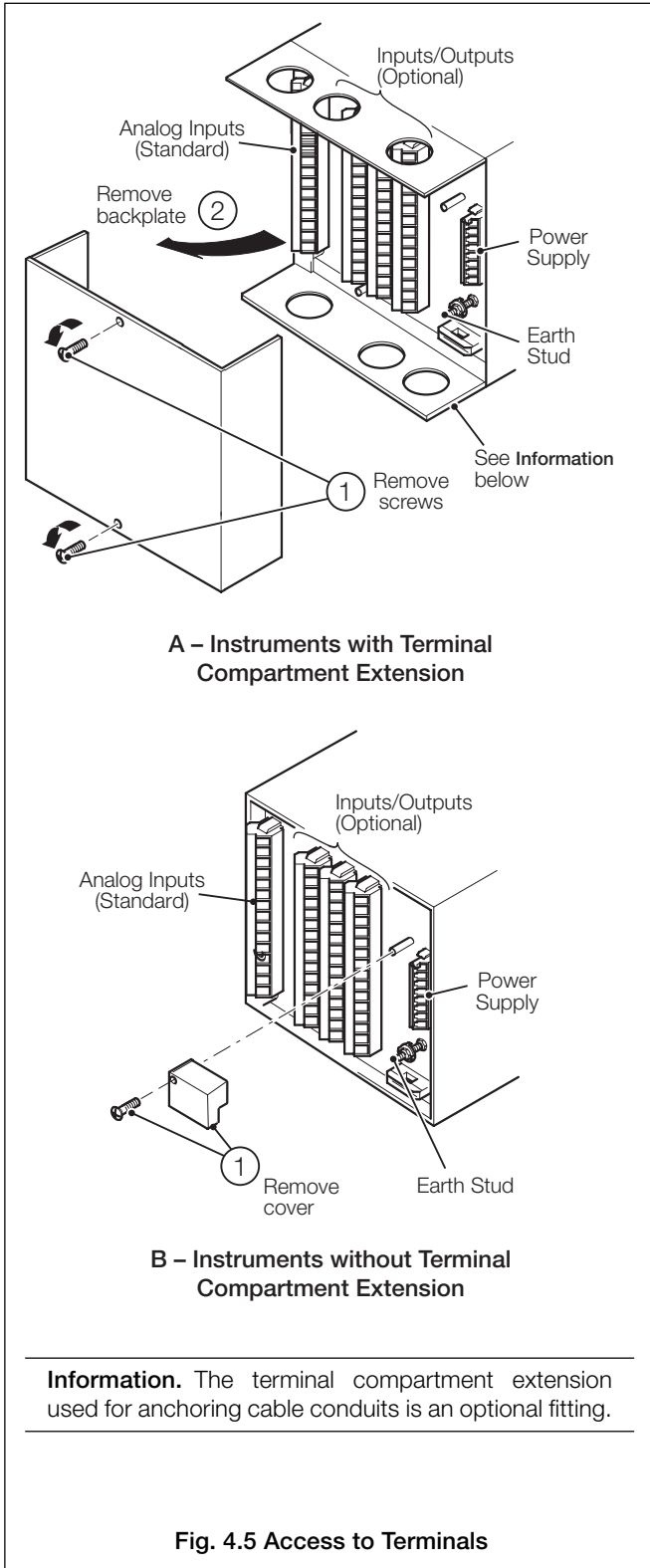


Fig. 4.4 Mounting



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

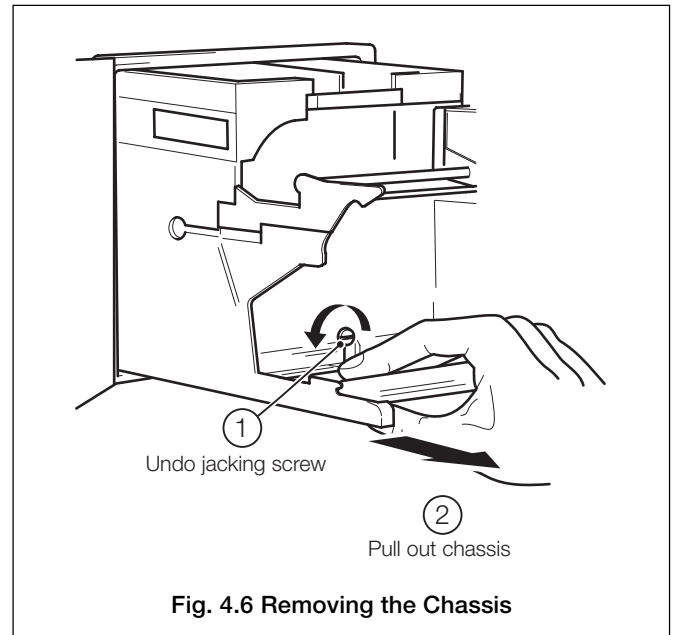
4.3 Access to Terminals and Connections – Fig. 4.5



4.3.1 Removing the Chassis – Fig. 4.6

The chassis must be removed to gain access to the electrical connections and/or analog input modules.

Open the instrument door and remove the chart unit – see Figs. 1.2 or 1.3. Remove the chassis as shown in Fig 4.6.





4.4 Electrical Connections – Fig. 4.7

The terminals accept cables up to 2.5mm² cross section.

Note.

For the combination of this apparatus with other apparatus and/or for its connection to installations, the following notes apply:

- Always route signal leads and power cables separately, preferably in earthed metal conduit.
- It is strongly recommended that screened cable is used for signal inputs and relay connections, with the screen connected to the earth stud.

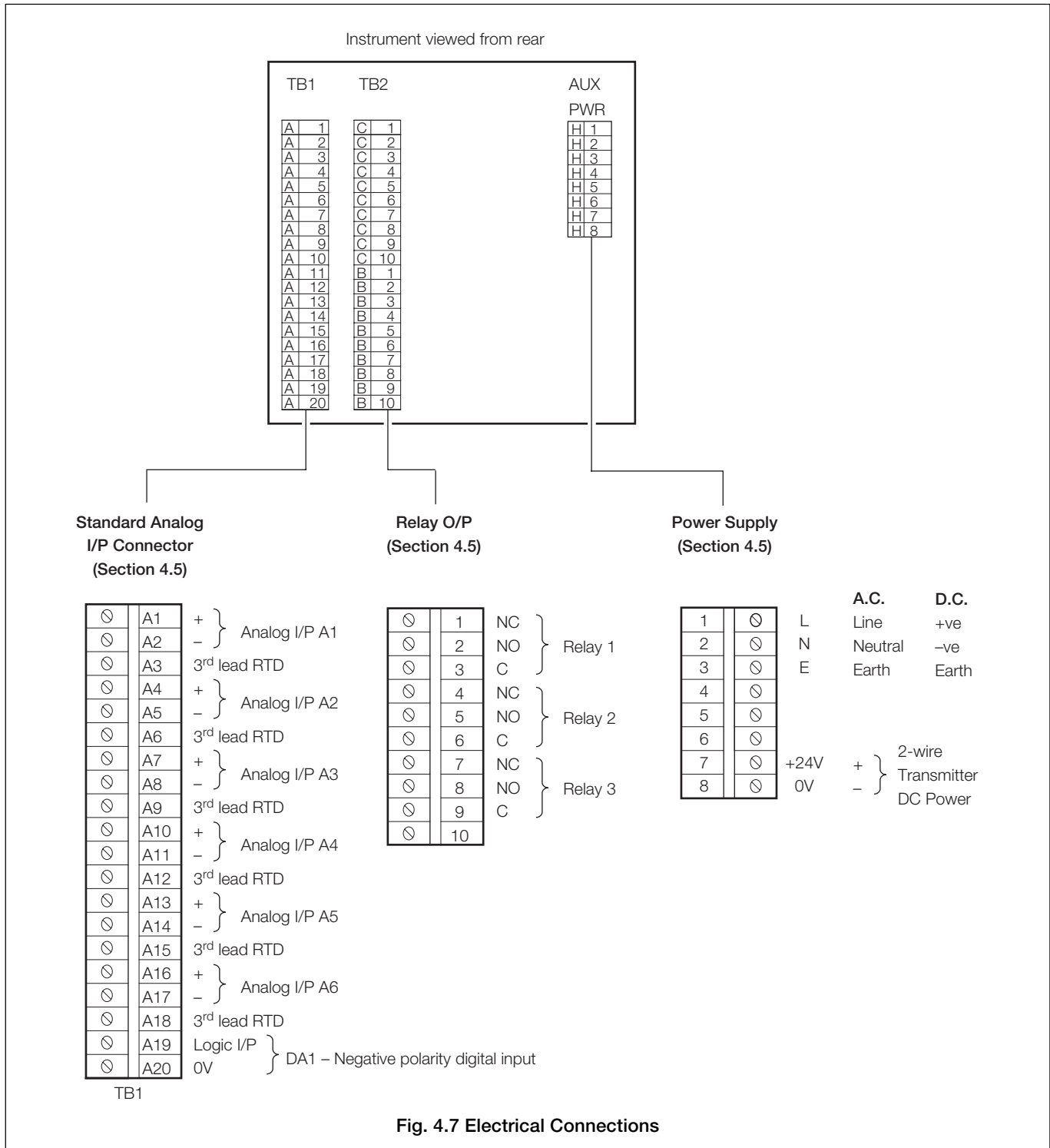


Fig. 4.7 Electrical Connections



4.5 Analog Input Connections

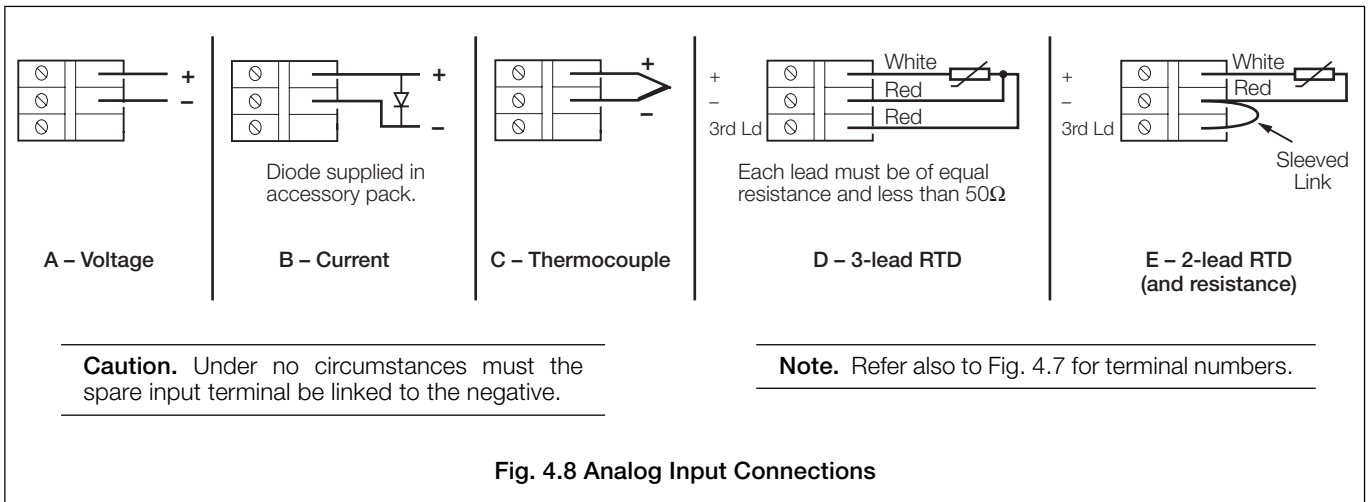


Fig. 4.8 Analog Input Connections

4.5.1 Current and Voltage – Fig. 4.8

Caution.

- To avoid damage to multi-channel instruments, high common mode voltages up to 250V r.m.s. max. must be present on all channels, or not at all.
- The maximum channel-to-channel voltage (between any two channels) must not exceed 12.5V or permanent damage to the instruments input circuitry may occur. To prevent such damage link the negative terminals on all inputs.
- For applications where the available 12.5V isolation is required, the link(s) between the relevant channel and the other channel(s) should not be fitted.

4.5.2 Thermocouple – Fig. 4.8

Use the correct compensating cable between the thermocouple and the terminals – see Table 4.1.

Automatic cold junction compensation (ACJC) is incorporated but an independent cold (reference) junction may be used.

4.5.3 Resistance Thermometer (RTD) – Fig. 4.8

If long leads are necessary it is preferable to use a 3-lead resistance thermometer.

If 2-lead resistance thermometers are used each input must be calibrated to take account of the lead resistance.

Type of Thermocouple	Compensating Cable											
	BS1843			ANSI MC 96.1			DIN 43714			BS4937 Part No.30		
	+	-	Case	+	-	Case	+	-	Case	+	-	Case
Ni-Cr/Ni-Al (K)	Brown	Blue	Red	Yellow	Red	Yellow	Red	Green	Green	Green	White	Green *
Ni-Cr/Cu-Ni (E)	—			—			—			Violet	White	Violet *
Nicrisil/Nisil (N)	Orange	Blue	Orange	Orange	Red	Orange	—			Pink	White	Pink *
Pt/Pt-Rh (R and S)	White	Blue	Green	Black	Red	Green	Red	White	White	Orange	White	Orange *
Pt-Rh/Pt-Rh (B)	—			—			—			Grey	White	Grey *
Cu/Cu-Ni (T)	White	Blue	Blue	Blue	Red	Blue	Red	Brown	Brown	Brown	White	Brown *
Fe/Con (J)	Yellow	Blue	Black	White	Red	Black	Red	Blue	Blue	Black	White	Black *
* Case Blue for intrinsically safe circuits												
Fe/Con (DIN 43710)	—			—			DIN 43710			—		
	—			—			Blue/red	Blue	Blue	—		

Table 4.1 Thermocouple Compensating Cable



4.5.4 Transmitter Power Supply – Fig. 4.9

Information. The power supply board provides a transmitter power supply capable of powering three loops.

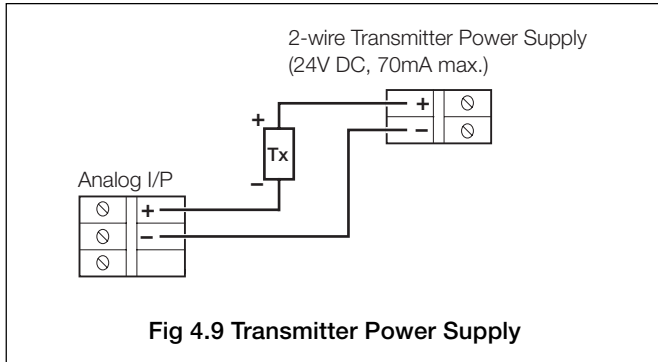


Fig 4.9 Transmitter Power Supply

4.5.5 Relay Outputs – Fig. 4.10

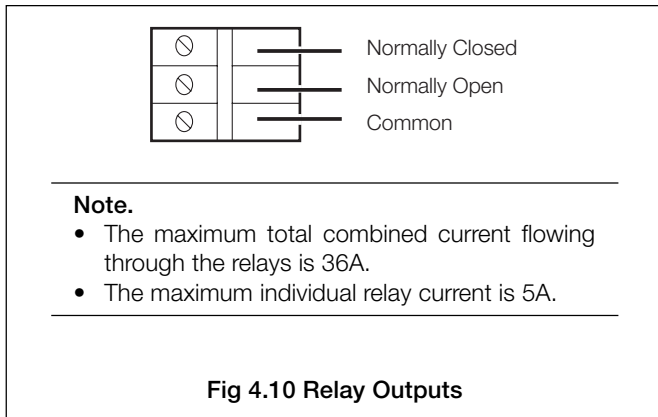


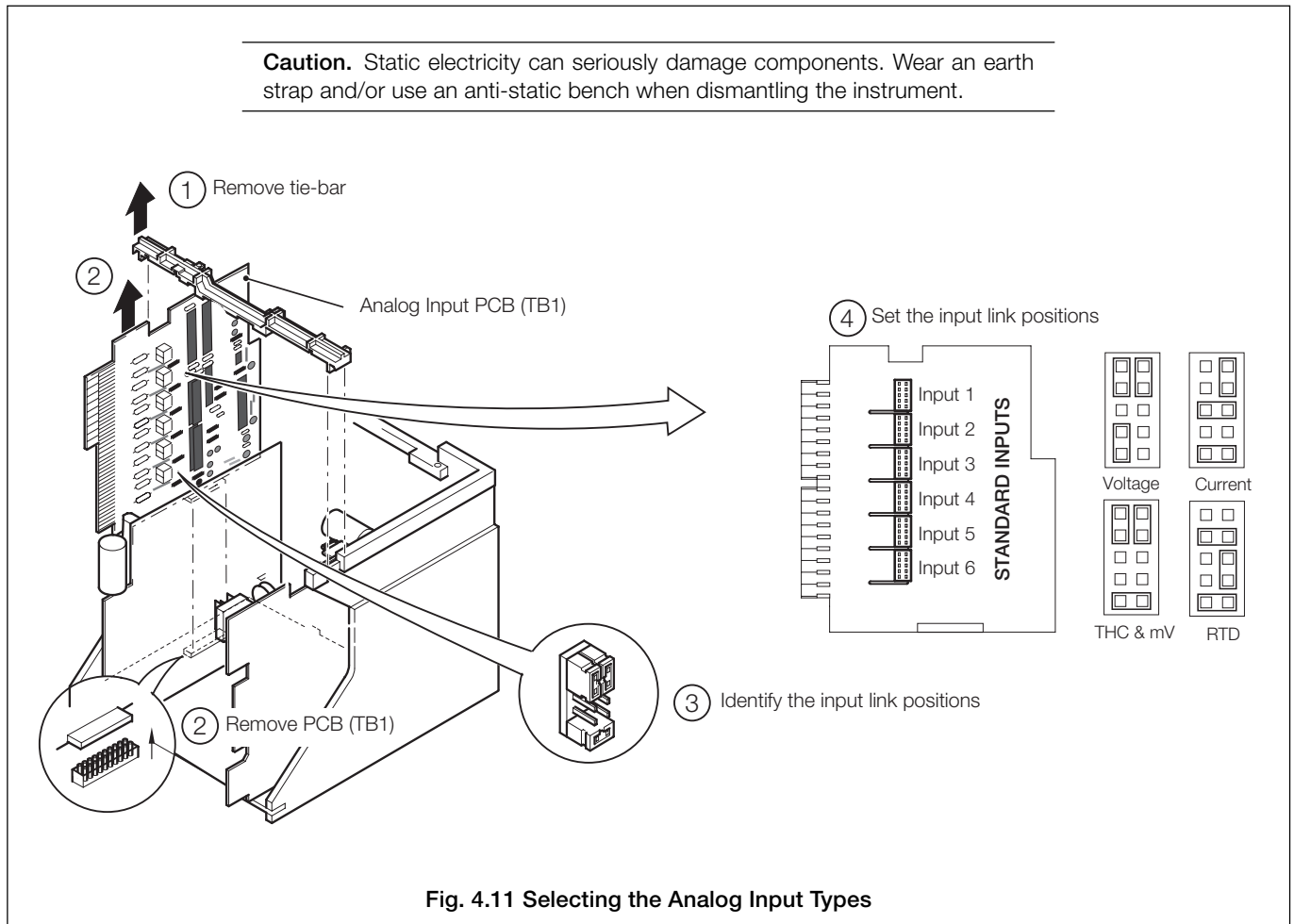
Fig 4.10 Relay Outputs



4.5.6 Selecting Analog Input Types – Fig. 4.11

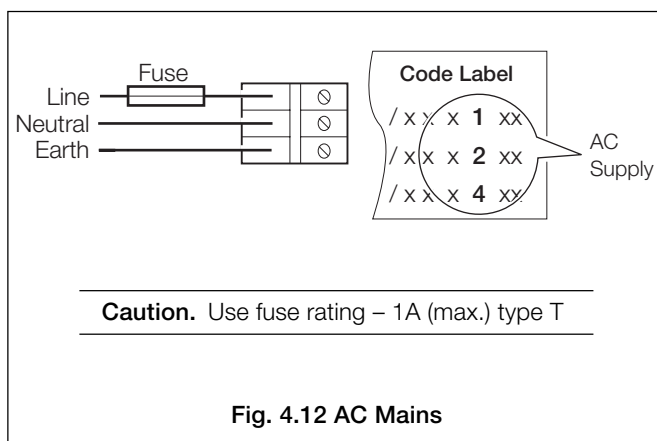
The analog inputs must be set up for the input type required.

Caution. Static electricity can seriously damage components. Wear an earth strap and/or use an anti-static bench when dismantling the instrument.

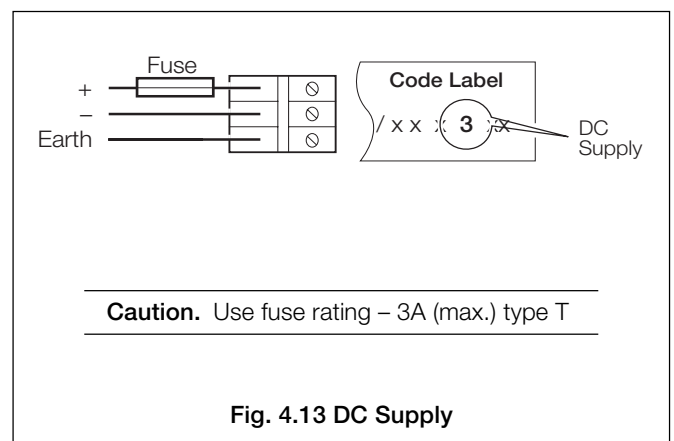


4.6 Power Supply Connections

4.6.1 AC Mains – Fig. 4.12



4.6.2 DC Supply – Fig. 4.13



5 SIMPLE FAULT FINDING

If the instrument does not appear to be working satisfactorily carry out the following checks before contacting the Customer Support Organization.

- Are all the connections made correctly?
- Is there power to the instrument?
- Is there a signal at the input terminals?
- Does an external relay fail to de-energize? If so refer to Table 5.1.

Symptom	Possible Cause	Action
Does not record (pens and chart do not move).	a) Paper remaining = 0.0m (displayed in operating pages). b) Chart speed = 0mm/hr.	a) Load a new chart – see Section 1.3 b) Select another chart speed – see Section 3.6.
Does not record (pens do not print but chart moves).	a) Cassette is not fitted correctly. b) Pen capsule is not fitted correctly. c) Pen lift is activated. d) Pen capsule has run out of ink.	a) Ensure cassette is correctly fitted – see Section 1.3. b) Remove and refit – see Section 1.4. c) Press pen lift switch to de-activate lift. d) Replace pen capsule – see Section 1.4.
Pen lift does not appear to work.	a) Recorder is completing the fast printing of a text message. b) Pen lift function is disabled in Chart Control Configuration.	a) Wait for these messages to be completed. b) Set Pen Lift Enable to YES – see Section 5.3.1.
Trace(s) have gaps in them.	a) Fast printing of text – due to high chart speed or b) Fast printing of operator messages and alarm messages.	a) Select a chart speed of 120mm/hr or slower (see Section 3.6), or turn text printing OFF (see Section 5.3.1). b) Set message print speed to SLOW – see Section 5.3.1.
Does not print date, time or trace identifiers.	Text printing is turned OFF in Chart Control Configuration.	Set Text Print to ON – see Section 5.3.1.
Does not print alarm messages.	Alarm printing is turned OFF in Chart Control Configuration.	Set Alarm Print to ON – see Section 5.3.1.
Paper cannot be re-wound to load a new roll.	Paper has come off end, due to incorrect paper length being entered.	Reload paper onto feed roller and use rewind. Ensure correct paper length is entered for new roll – see Section 5.3.1.
Does not return to correct position on chart after Cue/Review.	Cue and Review performed with cassette incorrectly fitted.	Ensure cassette is correctly fitted in place – see Section 1.3. To return to correct place remove cassette and set chart position manually.
Poor print quality.	Use of incompatible paper type.	Use the recommended Company paper for best results. See Section 9 for further information.
Instrument will not move chart during Cue/Review.	Chart has not moved sufficient distance since being loaded.	Allow time for chart recording.
'Input Failed' message.	a) Input not configured correctly. b) Input links not set correctly. c) Input out of range.	a) Check configuration of failed input – see Section 7.5. b) Check configuration of input links – see Section 7.5. c) Bring input within input range.
Input exhibits a slow response to process input.	Programmable filter set for long response time.	Reduce programmable filter response time – see Section 5.1.1.
External relay(s) holding on when de-energized.	Arc suppression capacitor leakage current preventing the external relay(s) from de-energizing.	Remove capacitor – see Section 8.1.

Table 5.1 Simple Fault Location

5.1 Arc Suppression Capacitors – Fig. 5.1

Arc suppression capacitors are fitted across the contacts of the alarm/control 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 appropriate relay module and remove it – see Fig. 5.1

Unsolder and remove the appropriate capacitors, shown in Fig. 5.1 and refit the module.

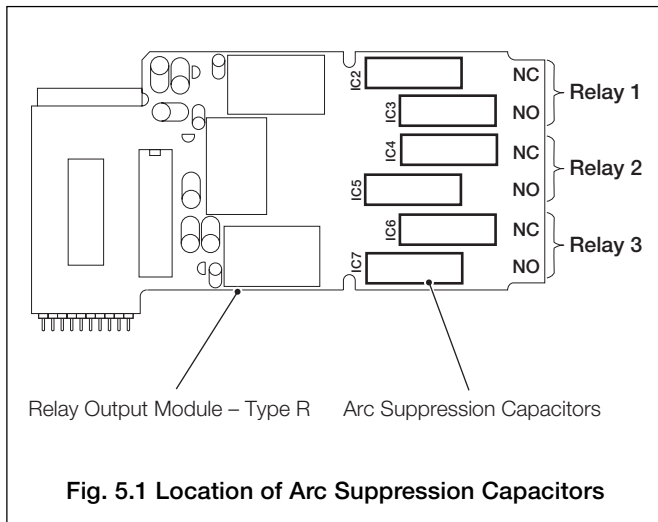


Fig. 5.1 Location of Arc Suppression Capacitors

6 SPARES LIST

6.1 Consumables

The following spares are required at regular intervals:

Item	Part No.
Roll Chart – 25m	
30 division	PR100–9000R
40 divisions	PR100–9001R
50 divisions	PR100–9002R
60 divisions	PR100–9003R
70 divisions	PR100–9004R
75 divisions	PR100–9005R
Fanfold Chart – 12m	
30 division	PR100–9000F
40 divisions	PR100–9001F
50 divisions	PR100–9002F
60 divisions	PR100–9003F
70 divisions	PR100–9004F
75 divisions	PR100–9005F
Pen capsule	
Up to three traces	PR100–0210
Up to three traces (high temperature – see Note below)	PR100–0229
Four to six traces	PR100–0211
Four to six traces (high temperature – see Note below)	PR100–0230

Note. The **high temperature cartridge** is designed for use in recorders operating at ambient temperatures consistently above 30°C.

6.2 Replacement Parts

The following spares are replacement items:

Item	Part No.
Roll chart cassette	SR100–0054
Fanfold chart cassette	SR100–0055
Analog Input module	
Standard:	
3 input pack	SR100–0517
6 input pack	SR100–0514
Relay output module	PR100–0545
Processor board	SR100–0505
Motherboard	SR100–0195
Power Supply:	
115 to 230V AC	PR100–0445
10 to 30V DC	PR100–0495

INDEX

A

Alarms	
Acknowledging	13, 23
Configuring	22
Hysteresis	22
Message Printing	25
Operator Page Messages	12
Process	13, 22
Source	22
Status	13
System	13
Trip Level	22
Type	22

Analog Inputs

Channel Tag	9, 11, 18
Conditioning	19
Configuration	16 to 18
Connections	34, 35
Copying	19
Electrical Range	17
Engineering Range	16, 18
Engineering Units	18
Fault Detection	18
Isolation	35
Linearizer Type	17
Links	37
Offset Adjustment	21
Range	17, 18
Scaling	20
Span Adjustment	21
Type	17, 37

Arc Suppression

Automatic

Chart Rewind	4, 26
Cold Junction Compensation	
(ACJC)	35
Pen-drop	26
Autoscroll	10, 11

B

Broken Sensor Drive	18
---------------------------	----

C

Chart

Configuration	24
Easy View	12, 26
Length	11, 26
Loading	4 to 6
Printout	9
Rewind	4
Set Length	26
Speed	4, 6, 9, 11, 24, 25
Time Line	4, 6, 26
Type Select	25

Configuration

Alarms. See Alarms: Configuring	
Analog Inputs	16
Chart	24
Input Conditioning	19
Relay Outputs	29
Connections	
AC Mains	37
Analog Inputs	35
DC Supply	37
Diagram	34
Relay Outputs	36
Transmitter Power Supply	36

D

Date/Time	11
Dimensions	31

E

Easy View	26
Electrical Connections	34
Electrical Range	17
End of Life Disposal	31
Engineering Range	18
Environmental Requirements	31
Error Messages	12

F

Fault Detection	18
Filter Time	18

Filters

Channel Input	16, 18
Mains	19

I

Input Electrical Range	17
Input Engineering Range	18
Inputs. See Analog Inputs	

L

Language Selection	30
Linearizer	
Type	17
Units	17
Links	37

M

Modules. See Analog Inputs and Relay	
Outputs	
Mounting	32

O

Operating Page	
Autoscroll	10, 11
Chart Loading. See Chart: Loading	
Messages	12
Operator Level. See Back Fold-out	

P

Paper Length	11, 26
Passwords	14, 15
Setting	30

Pen

Auto-drop	26
Colors	27
Fitting	8
Lift	26

Power Supply Connections. See

Connections	
Print Speed	25
Programming. See Configuration	

R

Real-time Clock	30
Relay Outputs	
Configuration	29
Connections	34, 36
Reset	
Alarms. See Alarms: Acknowledging	
Resistance Thermometer	35

S

Scales	27
Security Access. See Passwords	
Setup. See Configuration	
Siting	31
Software Version	14
Spares	39
Start-up Displays	10

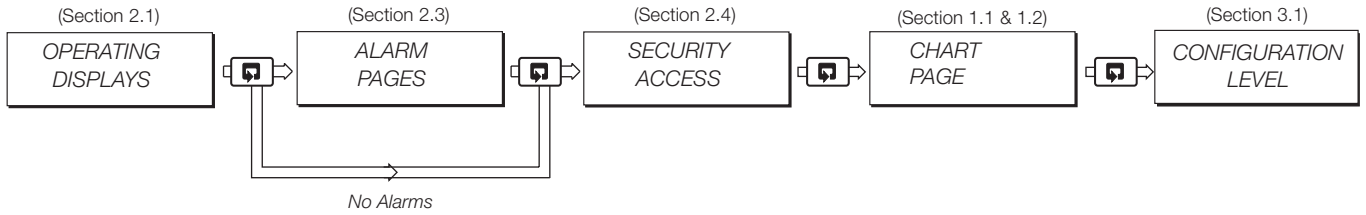
T

Temperature Units	17
Terminals	34, 35
Text Printing	25
Thermocouple	17
Compensating Cable	35
Temperature Ranges	19
Time Line Advance	4, 6, 26

V

Viewing	
Current Chart Position. See Easy View	

OPERATOR LEVEL OVERVIEW



OPERATING DISPLAYS

A1 225.8°C
BOILER 1 TEMPERATURE

- Channel reading, tag & units
- System date & time
- Chart speed
- Remaining chart

ALARM PAGES



ALARM ACKNOWLEDGE
PAGE

- Displays all active alarms
- Individual process alarm acknowledge

SECURITY ACCESS



SECURITY ACCESS

- Protected access to:
 - Chart page
 - Configuration level

CHART PAGE



LOAD CHART
PAGE

- Chart reload
- Automatic/manual rewind
- Time line advance

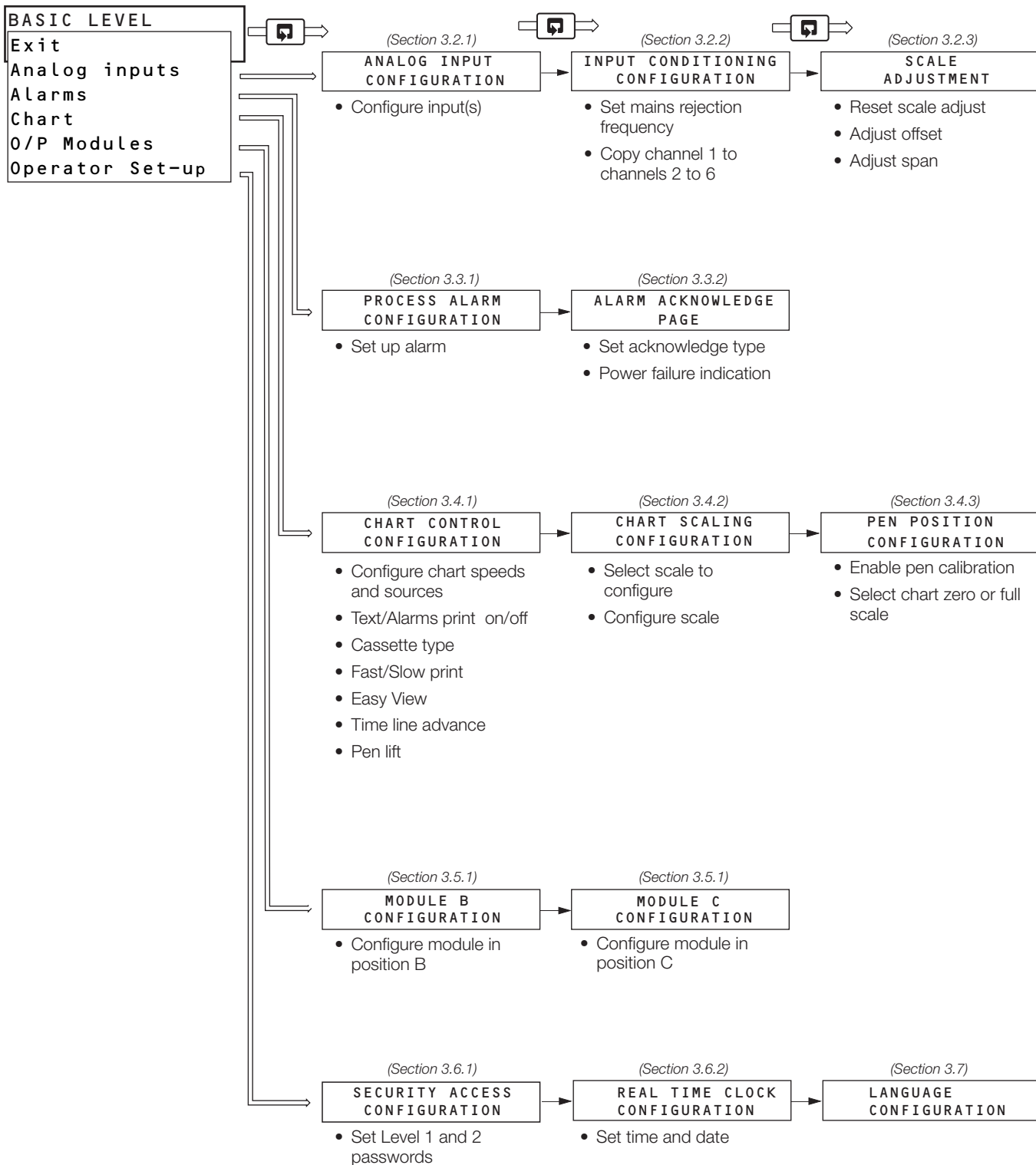
CONFIGURATION LEVEL



Configuration level
(See Overleaf)

- Analog input configuration
- Alarm configuration
- Chart control
- Output module configuration
- Operator Set-up

CONFIGURATION LEVELS OVERVIEW



PRODUCTS & CUSTOMER SUPPORT

Products

Automation Systems

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

Drives and Motors

- *AC and DC Drives, AC and DC Machines, AC Motors to 1kV*
- *Drive Systems*
- *Force Measurement*
- *Servo Drives*

Controllers & Recorders

- *Single and Multi-loop Controllers*
- *Circular Chart and Strip Chart Recorders*
- *Paperless Recorders*
- *Process Indicators*

Flexible Automation

- *Industrial Robots and Robot Systems*

Flow Measurement

- *Electromagnetic Flowmeters*
- *Mass Flow Meters*
- *Turbine Flowmeters*
- *Flow Elements*

Marine Systems & Turbochargers

- *Electrical Systems*
- *Marine Equipment*
- *Offshore Retrofit and Refurbishment*

Process Analytics

- *Process Gas Analysis*
- *Systems Integration*

Transmitters

- *Pressure*
- *Temperature*
- *Level*
- *Interface Modules*

Valves, Actuators and Positioners

- *Control Valves*
- *Actuators*
- *Positioners*

Water, Gas & Industrial Analytics Instrumentation

- *pH, Conductivity, and Dissolved Oxygen Transmitters and Sensors*
- *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 a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

United Kingdom

ABB Limited
Tel: +44 (0)1480 475321
Fax: +44 (0)1480 217948

United States of America

ABB Inc.
Tel: +1 215 674 6000
Fax: +1 215 674 7183

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 all storage, installation, operating and maintenance records relating to the alleged faulty unit.

ABB has Sales & Customer Support expertise in over 100 countries worldwide

www.abb.com

The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

Printed in UK (05.08)

© ABB 2008



ABB Limited

Howard Road, St. Neots
Cambridgeshire, PE19 8EU
UK

Tel: +44 (0)1480 475 321

Fax: +44 (0)1480 217 948

ABB Inc.

125 E. County Line Road
Warminster, PA 18974
USA

Tel: +1 215 674 6000

Fax: +1 215 674 7183