



Electrical Safety

This equipment complies with the requirements of CEI/IEC 61010-1:2001-2 "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use". If the equipment is used in a manner NOT specified by the Company, the protection provided by the equipment may be impaired.

Symbols

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

	Warning – Refer to the manual for instructions
	Caution – Risk of electric shock
	Protective earth (ground) terminal
	Earth (ground) terminal

	Direct current supply only
	Alternating current supply only
	Both direct and alternating current supply
	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.

GETTING STARTED

This manual is divided into 5 sections which contain all the information needed to install, configure, commission and operate the COMMANDER V250. Each section is identified clearly by a symbol as shown below.



Displays and Function Keys

- Displays and function keys
- LED Indication
- Error Messages



Operator Mode (Level 1)

- Operator menus for:
 - Standard controller
 - Remote Set Point controller
 - Profile controller
 - Multiple Fixed Set Points controller



Set Up Mode (Levels 2, 3 and 4)

- Level 2 – Tuning
- Level 3 – Set Points
- Level 4 – Profile



Configuration Mode (Levels 5 and 6)

- Level 5 – Basic hardware and control functions
- Level 6 – Ranges and passwords



Installation

- Siting
- Mounting
- Electrical connections

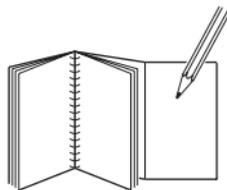
Symbol Identification and Section Contents

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Note.

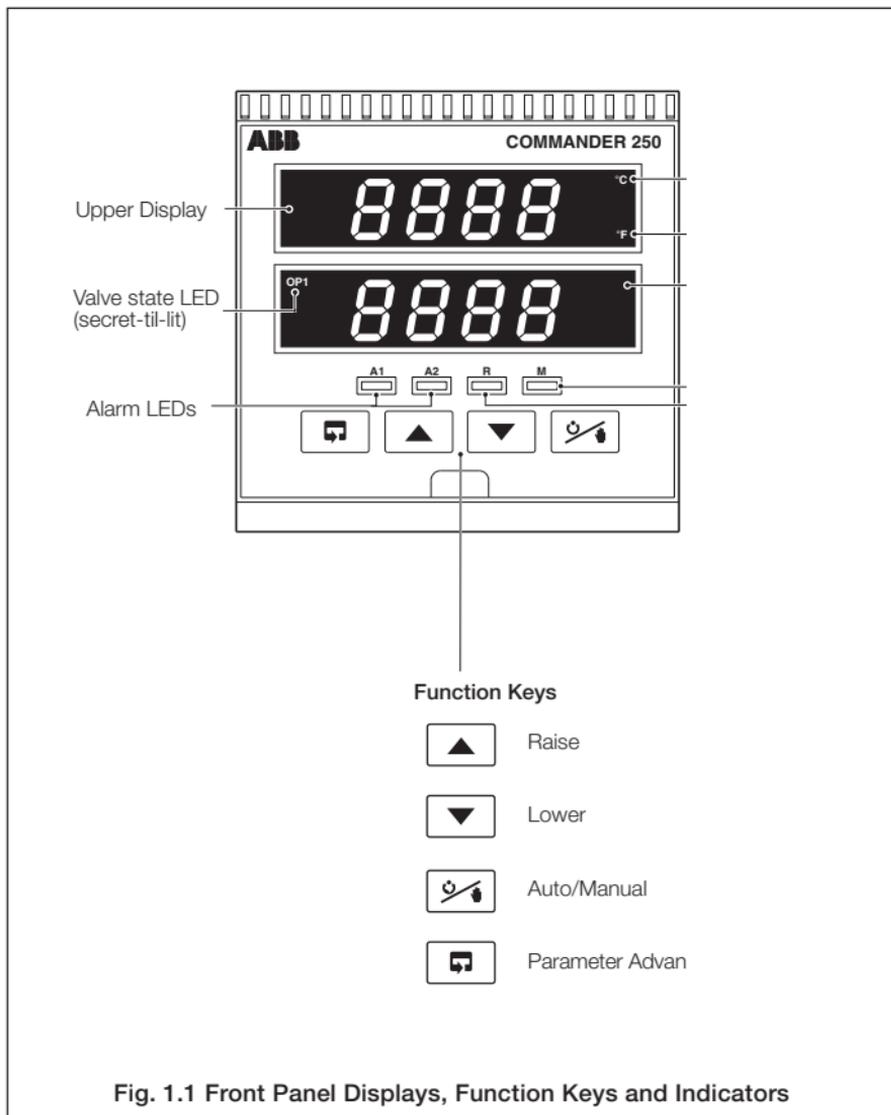
The fold-out page inside on the back cover of this manual shows all the frames in the programming levels. Space is provided on the page for writing the programmed setting or selection for each frame.



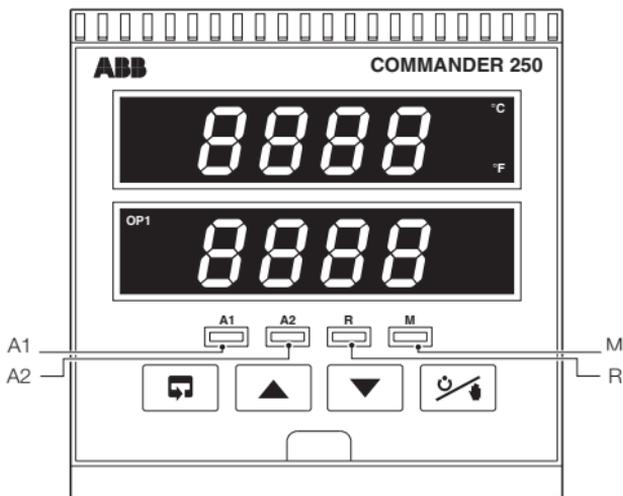
1 DISPLAYS AND FUNCTION KEYS

1.1 Introduction – Fig. 1.1

The COMMANDER V250 front panel displays, function keys and LED indicators are shown in Fig. 1.1.



1.2 LED Alarms and Indicators – Figs. 1.2 and 1.3

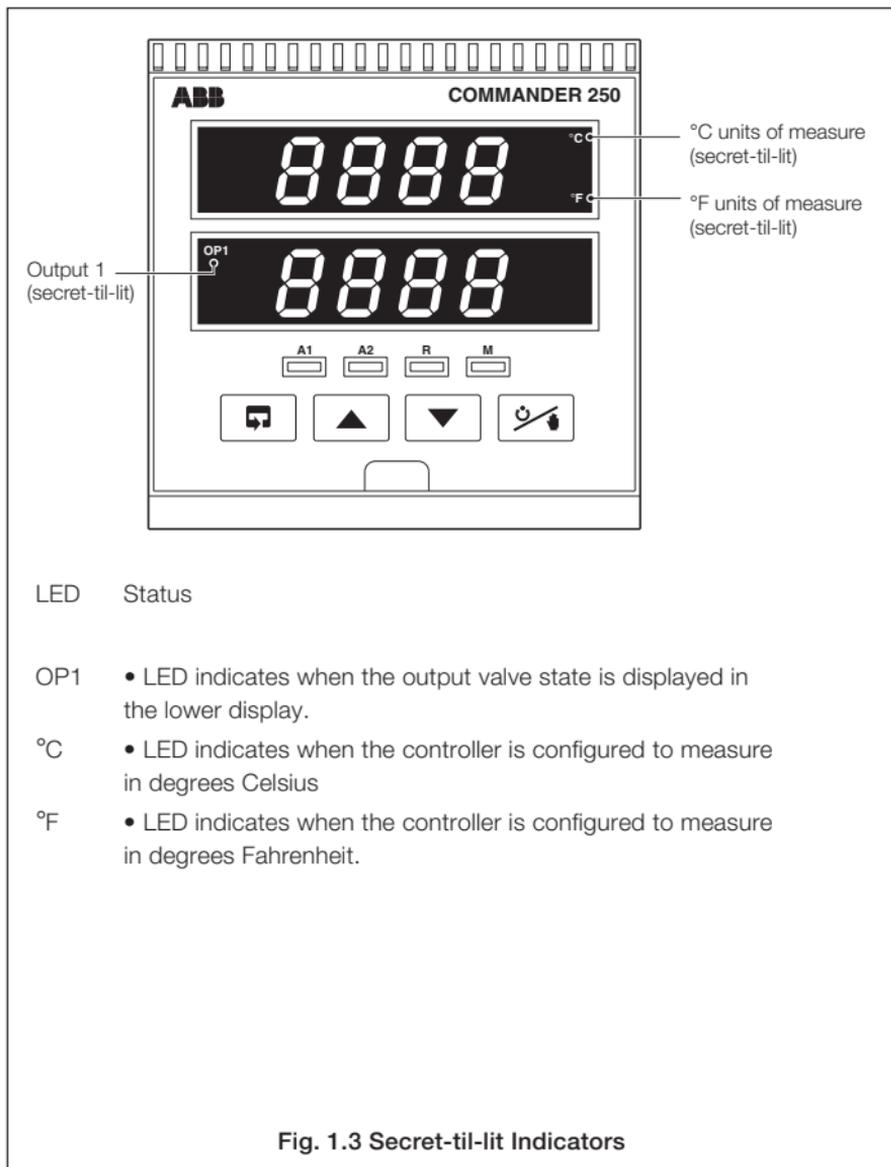


LED Status

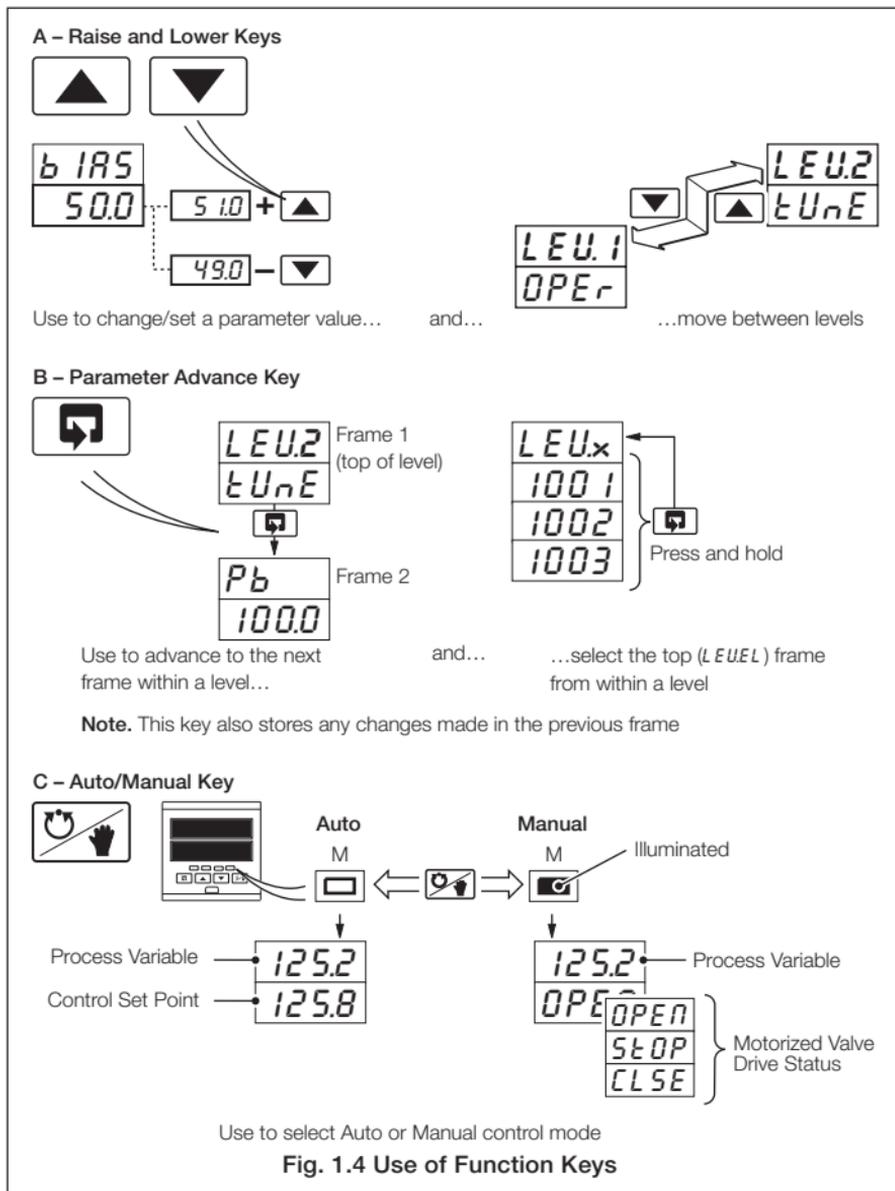
- All
- All LEDs flashing – controller is in the configuration mode.
- A1
- Flashes when Alarm 1 is active (off when inactive).
- A2
- Flashes when Alarm 2 is active (off when inactive).
- R
- On when the controller is operating on the remote set point value.
 - Off when the controller is operating using the local set point value or one of the four fixed set points (in multiple set point mode).
 - Flashes when a Ramp/Soak profile is running.
- M
- On when the controller is operating in Manual control mode.
 - Off when the controller is operating in Auto control mode.

Fig. 1.2 LED Alarms and Indicators

...1.2 LED Alarms and Indicators – Figs. 1.2 and 1.3



1.3 Use of Function Keys – Fig. 1.4



1.4 Error Messages

Display	Error/Action	To Clear Display
	<p>Calibration error</p> <p>Turn mains power off and on again (if the error persists contact the Service Organization).</p>	Press the key
	<p>Configuration error</p> <p>The configuration and/or setup data for the instrument is corrupted. Turn mains power off and on again (if the error persists, check configuration/setup settings).</p>	Press the key
	<p>A to D Converter Fault</p> <p>The analog to digital converter is not communicating correctly.</p>	Turn mains power off and on again. If the error persists, Contact the Service Organization
	<p>Process Variable Over/Under Range</p>	Restore valid input
	<p>Remote Set Point Over/Under Range</p> <p>The remote set point value is over or under range. Flashing stops automatically when the remote set point input comes back into range.</p>	Select the local set point (<i>rSP.n</i>) in the Operating Page or the Set Points Level
	<p>Option error</p> <p>Communications to the option board have failed.</p>	Contact the Service Organization



2 OPERATOR MODE

2.1 Introduction

Operator Mode (Level 1) is the normal day-to-day mode of the COMMANDER V250.

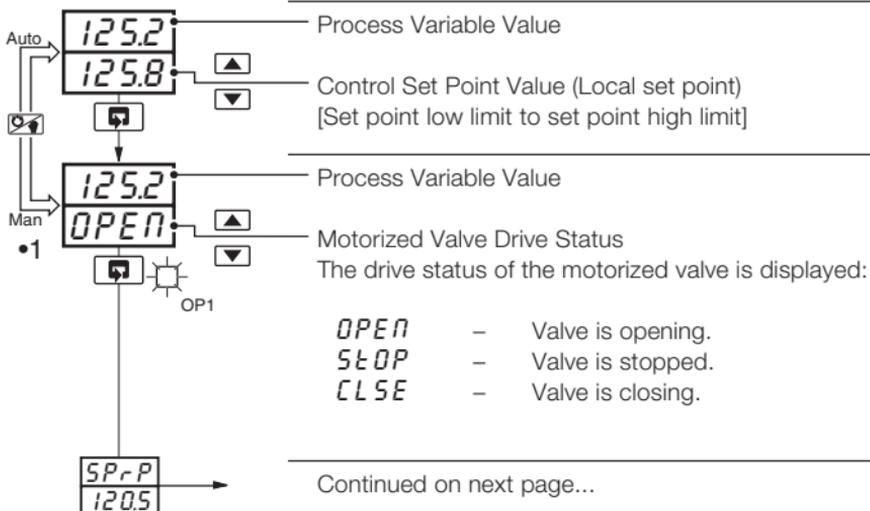
Frames displayed in level 1 are determined by the control strategy which is selected during configuration of the instrument – see Section 4.

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

The four control strategies are:

- Standard controller – page 8
- Remote Set Point controller – page 10
- Profile controller – page 12
- Multiple Fixed Set Points controller – page 14

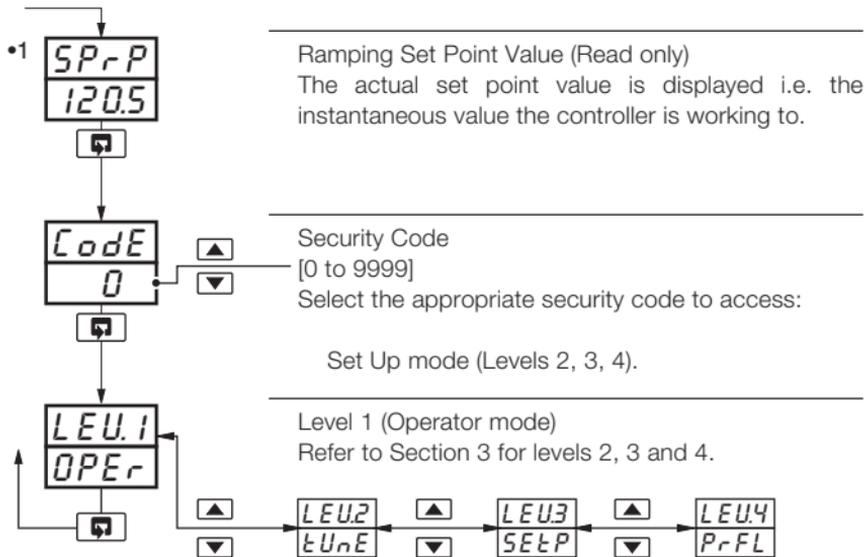
2.2 Standard Controller



- 1 The valve drive status is adjustable in Manual mode only.



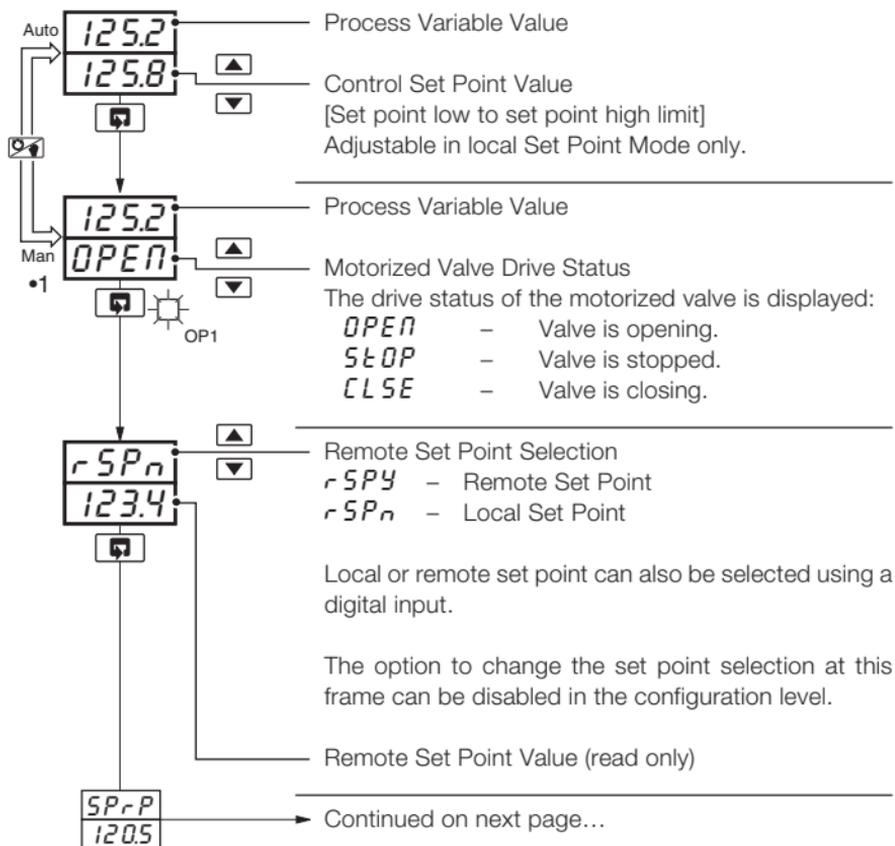
...2.2 Standard Controller



- 1 Not displayed if the ramping set point facility is turned off – refer to Section 3.3.



2.3 Remote Set Point Controller



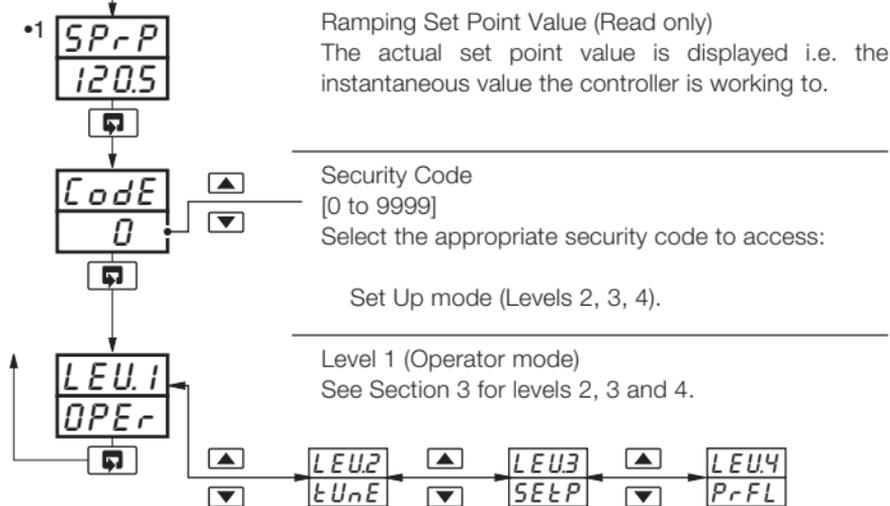
Note.

If the remote set point input fails while selected, the controller automatically selects the local set point value. The upper display changes to *rSPF* and the lower display flashes. When the fault condition is removed the remote set point is re-selected automatically. To clear the error condition while the remote set point input is still outside its allowed range, select the local set point by pressing the \square key (*rSP.n* is displayed).

- 1 The valve drive status is adjustable in Manual mode only.



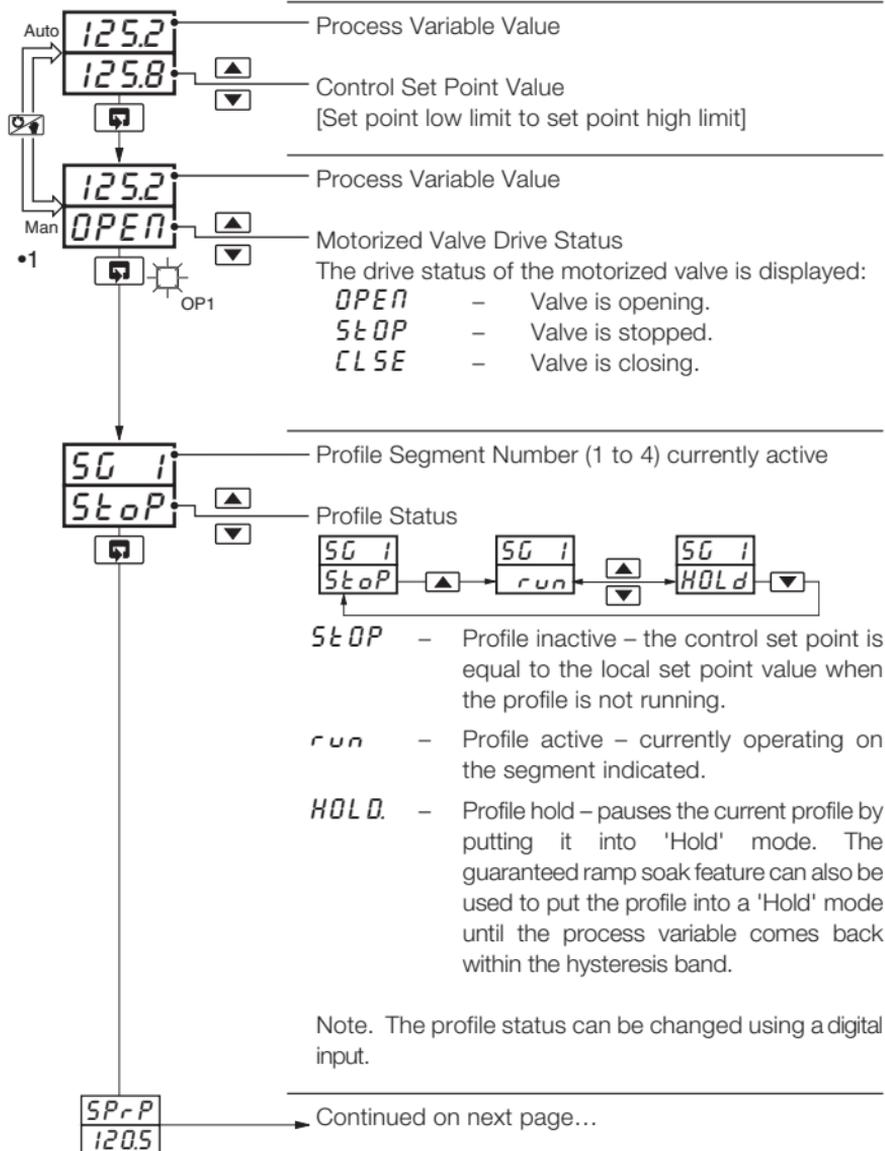
...2.3 Remote Set Point Controller



- 1 Not displayed if the ramping set point facility is turned off – refer to Section 3.4.



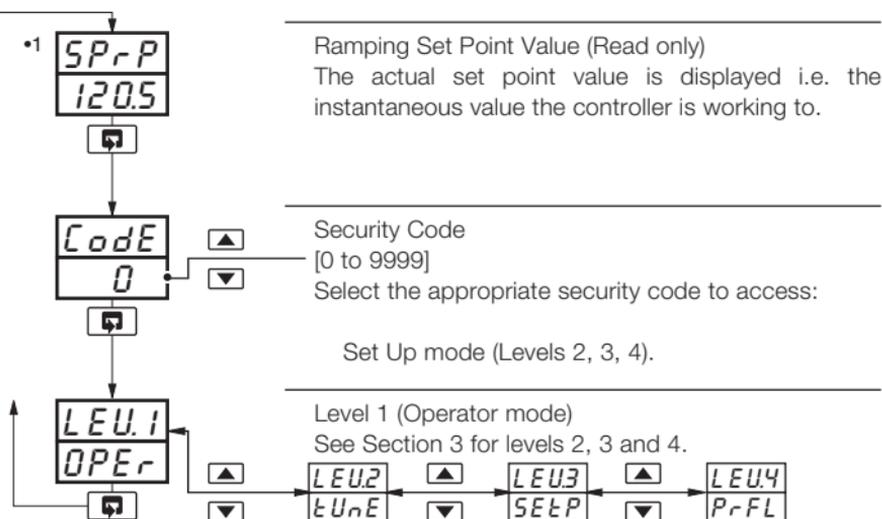
2.4 Profile Controller



•1 The valve drive status is adjustable in Manual mode only.



...2.4 Profile Controller

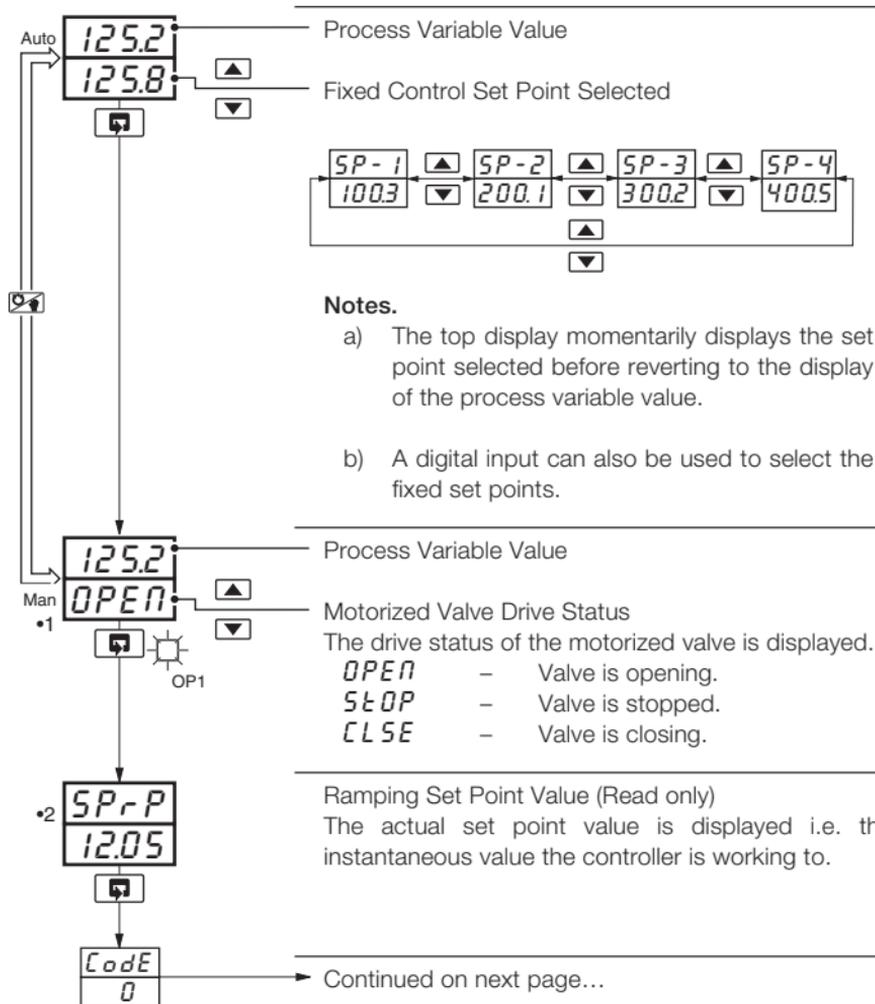


- 1 Not displayed if the ramping set point facility is turned off – refer to Section 3.4.



2.5 Multiple Fixed Set Points Controller

If the Multiple Fixed Set Points Controller type is selected during configuration, four fixed control set points can be set – see Section 4.4.



Notes.

- The top display momentarily displays the set point selected before reverting to the display of the process variable value.
- A digital input can also be used to select the fixed set points.

Process Variable Value

Motorized Valve Drive Status

The drive status of the motorized valve is displayed.

- | | | |
|--------------|---|-------------------|
| <i>OPEN</i> | – | Valve is opening. |
| <i>STOP</i> | – | Valve is stopped. |
| <i>CLOSE</i> | – | Valve is closing. |

Ramping Set Point Value (Read only)

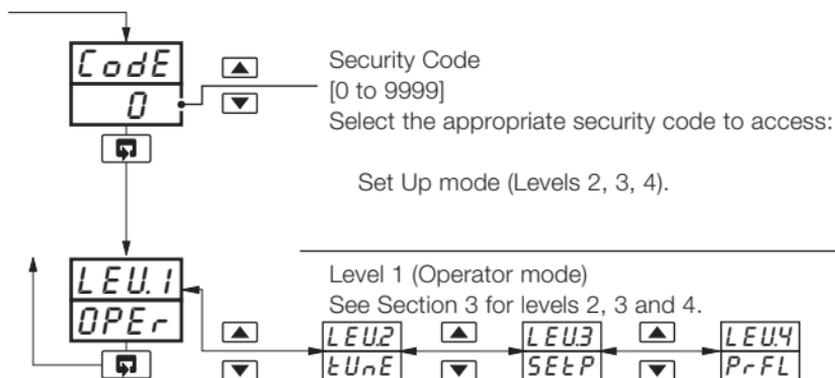
The actual set point value is displayed i.e. the instantaneous value the controller is working to.

Continued on next page...

- 1 The valve drive status is adjustable in Manual mode only.
- 2 Not displayed if the ramping set point facility is turned off – refer to Section 3.4.



...2.5 Multiple Fixed Set Points Controller

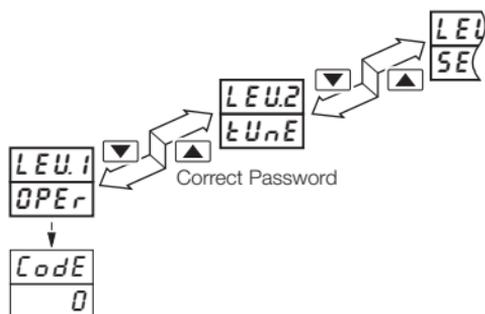




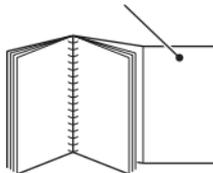
3 SET UP MODE

3.1 Introduction

To access the Set Up Mode (Levels 2, 3 and 4) the correct password must be entered in the security code frame (the default password code is 0). Refer to the fold-out sheet at the back of this manual for the contents of these levels.



Refer to the fold-out sheet
for the contents of each level

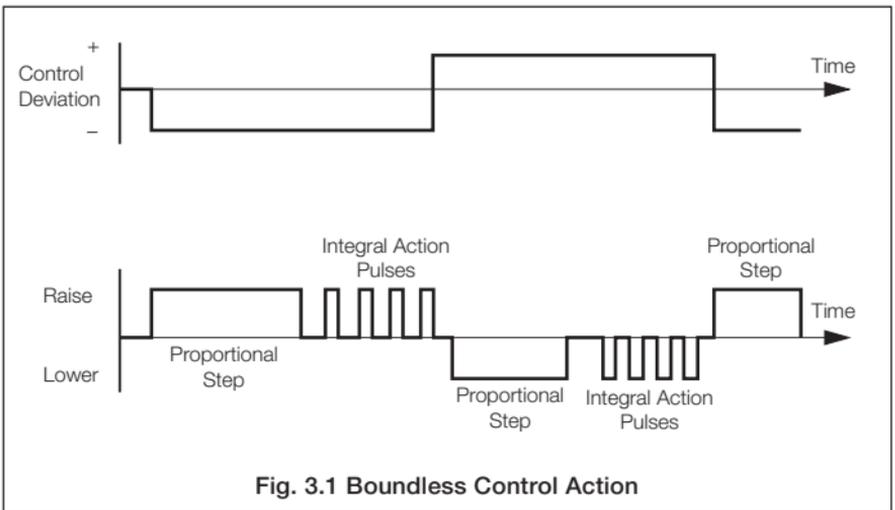




3.2 Motorized Valve Control – Fig. 3.1

The COMMANDER V250 is a 'boundless' process controller which provides an output that is effectively the time derivative of the required regulator position, i.e. the controller signals the regulator, not where to go to (position derivative), but in which direction to travel and how far to move, by a series of integral action pulses. Thus, the controller does not need to know the absolute regulator position and is unaffected when regulator reaches the upper or lower limit, as determined by the regulator's limit switches (giving rise to the term 'boundless').

When a deviation from set point is introduced, the regulator is driven for a length of time equivalent to the proportional step. The regulator is then driven by integral action pulses until the deviation is within the deadband setting.





3.2.1 Calculation for Control Pulses, Steps and Deviation (Boundless Control only)

The following calculations, carried out by the instrument, are shown for guidance when setting deadband/travel time values. They can be used to check the suitability of boundless control for a particular application

Minimum 'ON' time of integral action pulses (for a fixed control deviation).

$$= \frac{\text{Travel Time} \times \text{Deadband \%}}{\% \text{ Proportional Band}} \quad (\text{in seconds})$$

Minimum (approximate) time between integral action pulses (for a fixed control deviation)

$$= \frac{\text{Integral Action Time} \times \text{Deadband \%}}{2 \times \% \text{ Control Deviation}} \quad (\text{in seconds})$$

Duration of the proportional step

$$= 2 \times \left[\frac{\% \text{ Control Deviation}}{\% \text{ Proportional Band}} \right] \times \text{Travel Time in Seconds}$$

$$\% \text{ Control Deviation} = \frac{\text{Set Point} - \text{Process Variable}}{\text{Eng Hi} - \text{Eng Lo}} \times 100$$

$$\% \text{ Deadband} = \frac{\text{Deadband}}{\text{Eng Hi} - \text{Eng Lo}} \times 100$$



3.3 Tuning (Level 2)

Level 2 – Tuning Level



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

LEU2
tUNE



Pb
1000



Proportional Band

Enter the proportional band value.
[0.1% to 999.9%]

Intr
30



Integral Action Time

[1 to 7200 seconds or OFF (OFF=0)]

dr IU
1.0



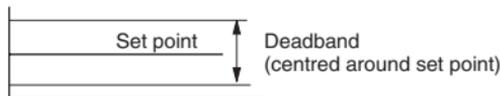
Derivative Action Time

[0.1 to 999.9 seconds or OFF (OFF=0)].

dbnd
0.0



Motorized Valve Deadband



1 to 9999 [in engineering units].

r.tr U
1000

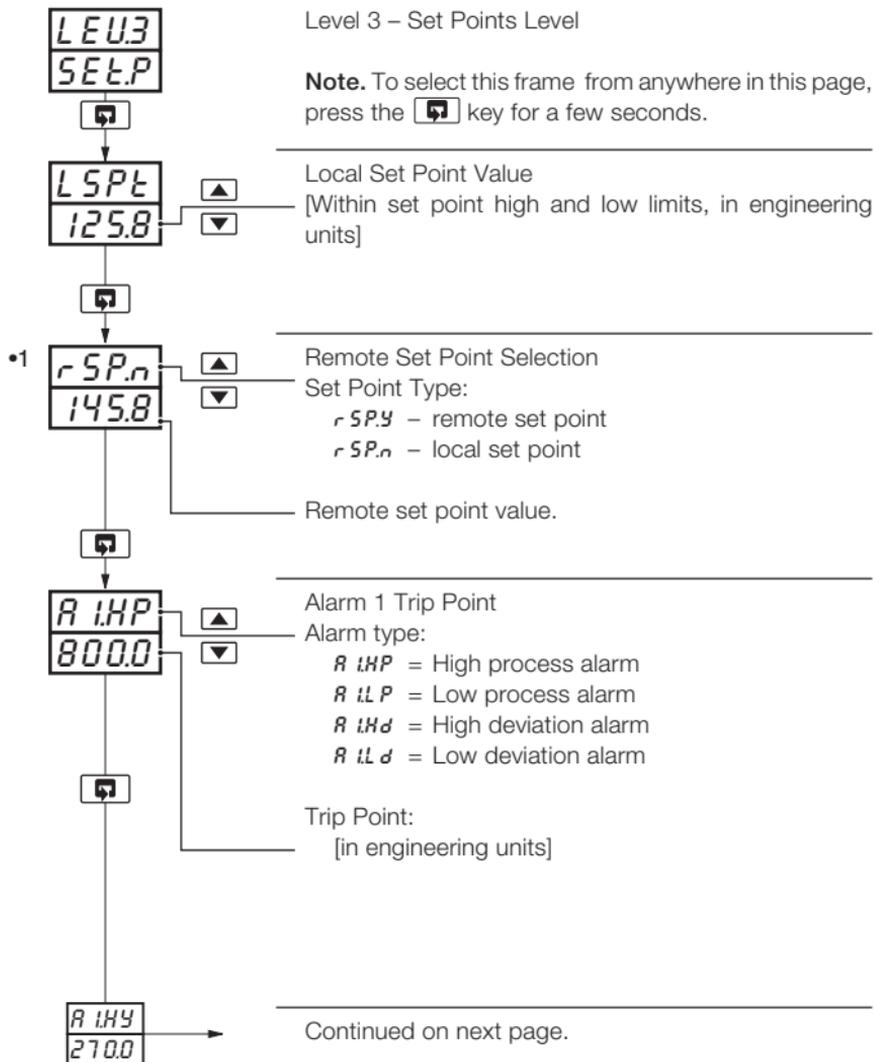


Regulator Travel Time

Time taken for the regulator to travel from the fully open to the fully closed position.

[10 to 5000 seconds.]

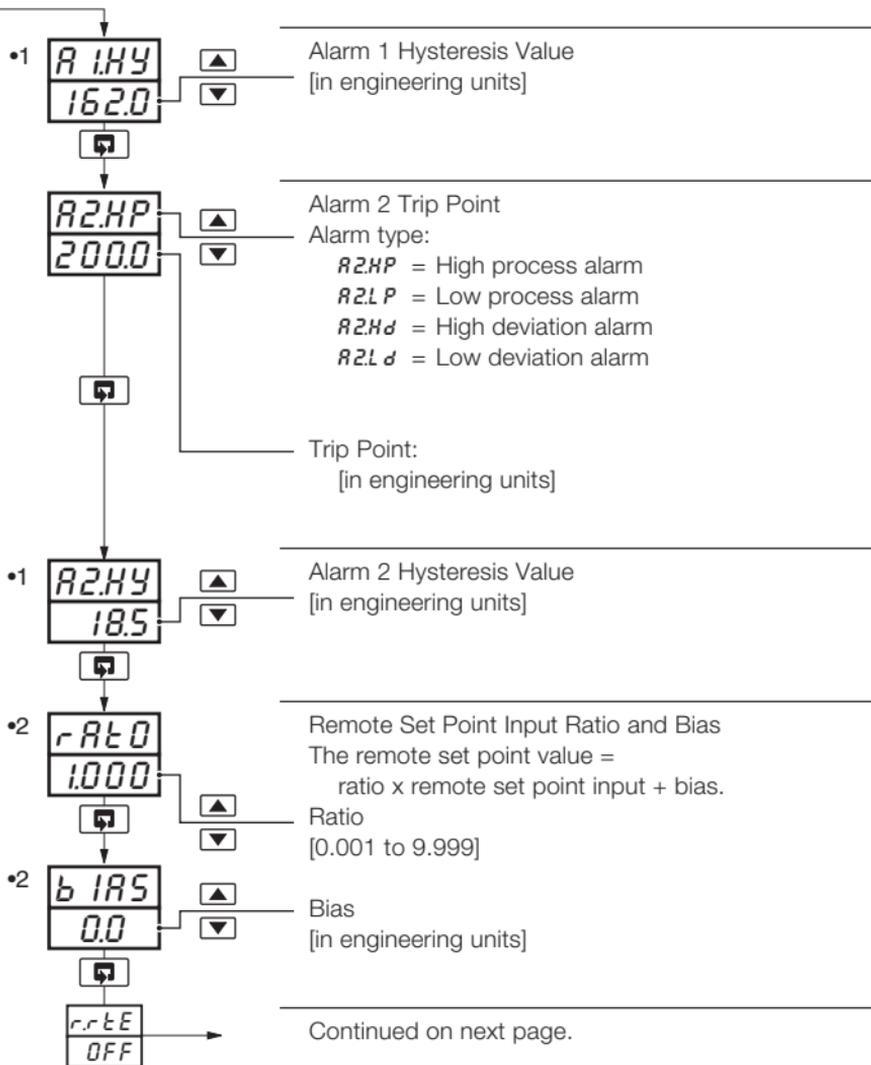
3.4 Set Points (Level 3)



•1 Only displayed if the remote set point option is selected.

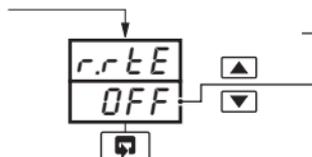


...3.4 Set Points (Level 3)



- 1 Only displayed if custom alarm hysteresis is selected – see section 4.3.2, not displayed if Loop Break Alarm type selected.
- 2 Only displayed if the remote set point option is selected.

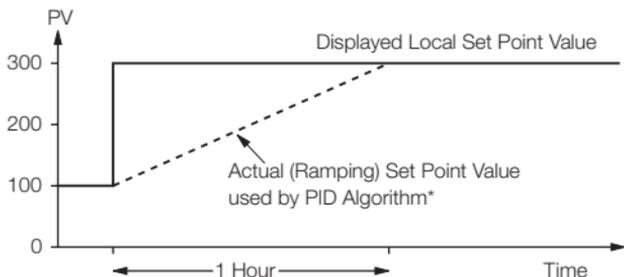
...3.4 Set Points (Level 3)



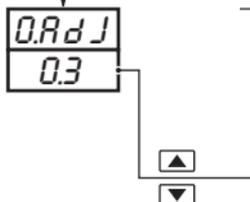
Ramp Rate (for ramping set point facility)
[1 to 9999 engineering units per hour, or OFF]

The ramping set point facility can be used to prevent a large disturbance to the control output when the set point value is changed. This only applies to the local and multiple fixed set points.

Note. For remote set points, the ramp rate is applicable only when switching from remote to local mode, not local to remote.



* e.g. Ramp Rate = 200 Increments/Hour



Offset Adjustment

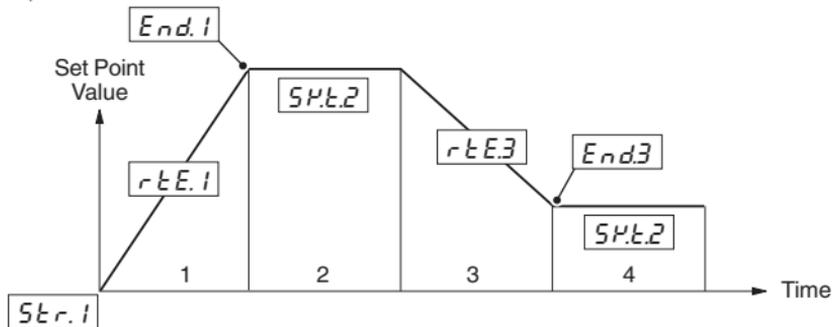
An offset can be applied to the process variable input to enable spot calibration or the removal of system errors.

[$\pm 10\%$ of engineering range in engineering units]



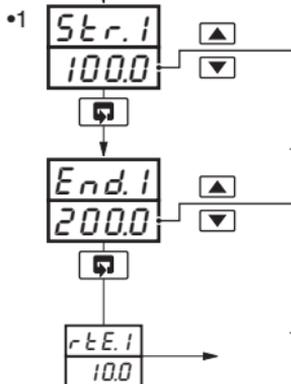
3.5 Profile (Level 4)

A four segment ramp/soak profile facility is provided. This level can only be accessed if the profile option is selected in the configuration level. The four segments are fixed as ramps or soaks as follows:



Level 4 – Profile Level

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



Start value for 1st Segment (ramp).
[Within display range (in engineering units)]

Enter the start value required.

End Value for 1st Segment (ramp).
[Within display range (in engineering units)]

Enter the end value required.

Continued on next page.

- 1 With the self-seeking set point facility enabled, the first ramp starts at the current process variable value instead of the start value for the 1st segment.

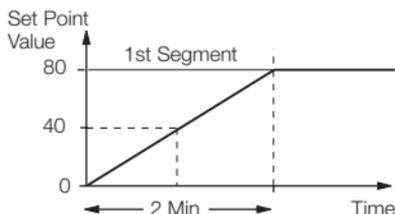
...3.5 Profile (Level 4)

*1
r t E.1
40.00

Ramp Rate for 1st Segment.
[Engineering units*]

Enter the ramp rate required.

* The time option Eng Units/hr or Eng Units/min is set in the configuration level – see section 4.3.2.



Example. Required Ramp Rate 40°C/min
Ramp Rate set to 40, Time Option set to 'Min' – see section 4.3.2

SPL.2
60.00

Soak Time for 2nd Segment.
[0 to 999.9 minutes or hours]*

End.3
100.0

End Value for 3rd Segment (ramp).
[Within display range (in engineering units)]

r t E.3
20.00

Ramp Rate for 3rd Segment.
[Engineering units/hour or /minute]*

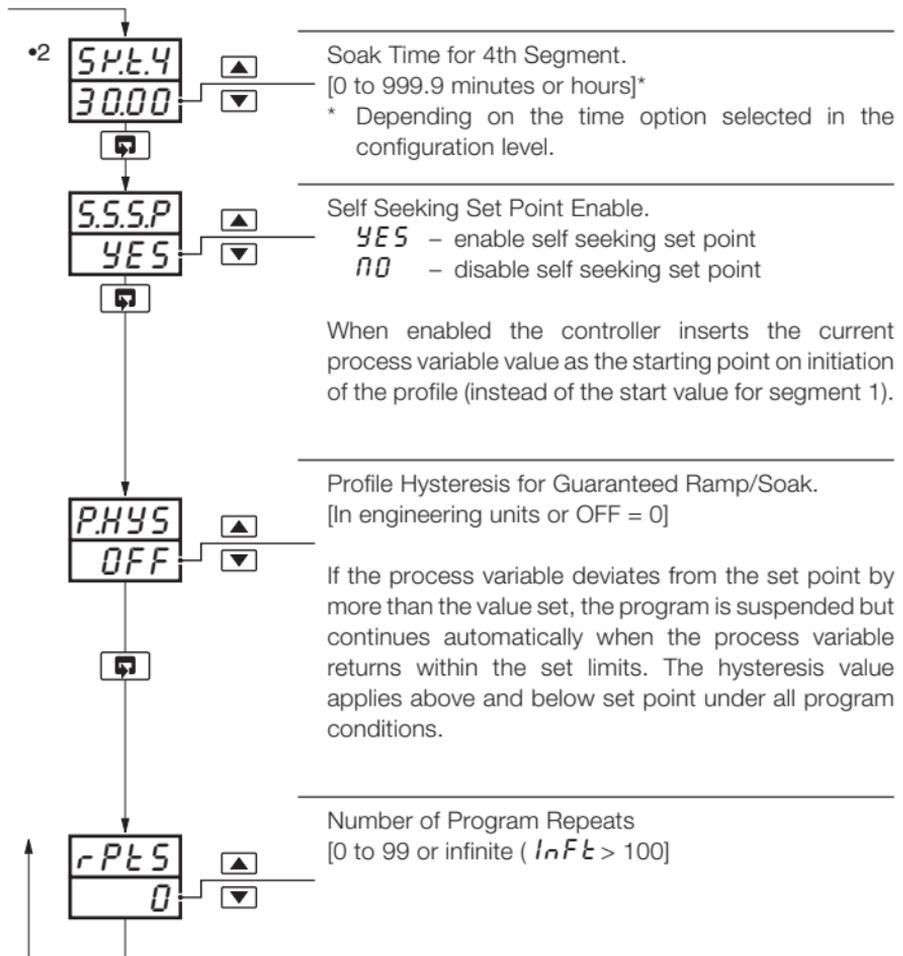
* Depending on the time option selected in the configuration level.

SPL.4
30.00

Continued on next page.

- *1 The engineering value is shown with an extra decimal place (up to a maximum of 3) for greater accuracy in setting the ramp rate.

...3.5 Profile (Level 4)



- 2 The engineering value is shown with an extra decimal place (up to a maximum of 3) for greater accuracy in setting the ramp rate.



4 CONFIGURATION MODE

4.1 Introduction

The Configuration Mode comprises two levels (5 and 6) as shown in Fig. 4.2.

Level 5 is divided into four frames. For most simple applications it is only necessary to set up the parameters in the first frame.

Note.

When in the configuration level:

- All the l.e.d. indicators flash.
- All relays and logic outputs are turned off.
- The analog output reverts to 0% (4mA) output level.

4.2 Accessing the Configuration Mode – Fig. 4.1

To access the Configuration Mode set the security switch to the 'Configure' position (levels 1 to 4 cannot be accessed from this setting). When the configuration parameters are programmed, reset the security switch to the 'Normal' position. The Operating page is displayed automatically .

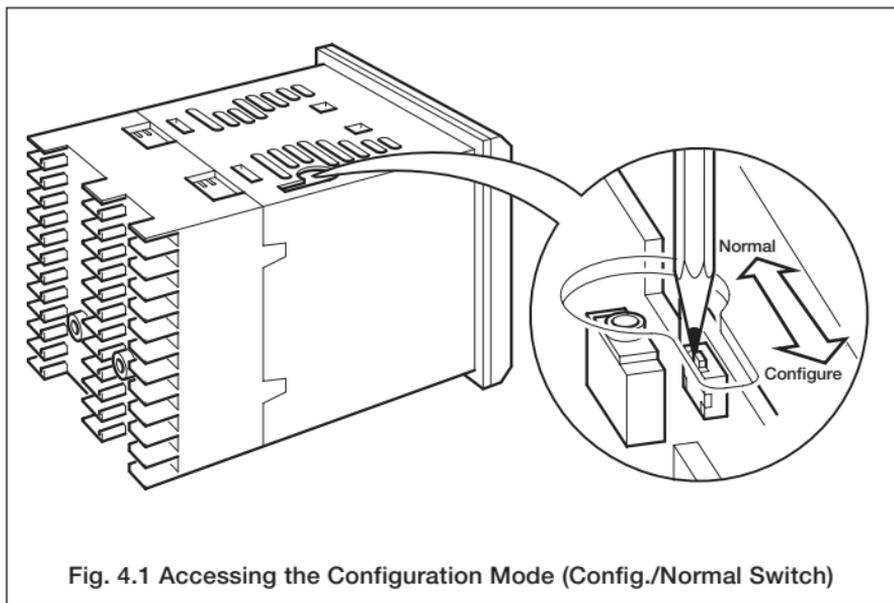


Fig. 4.1 Accessing the Configuration Mode (Config./Normal Switch)

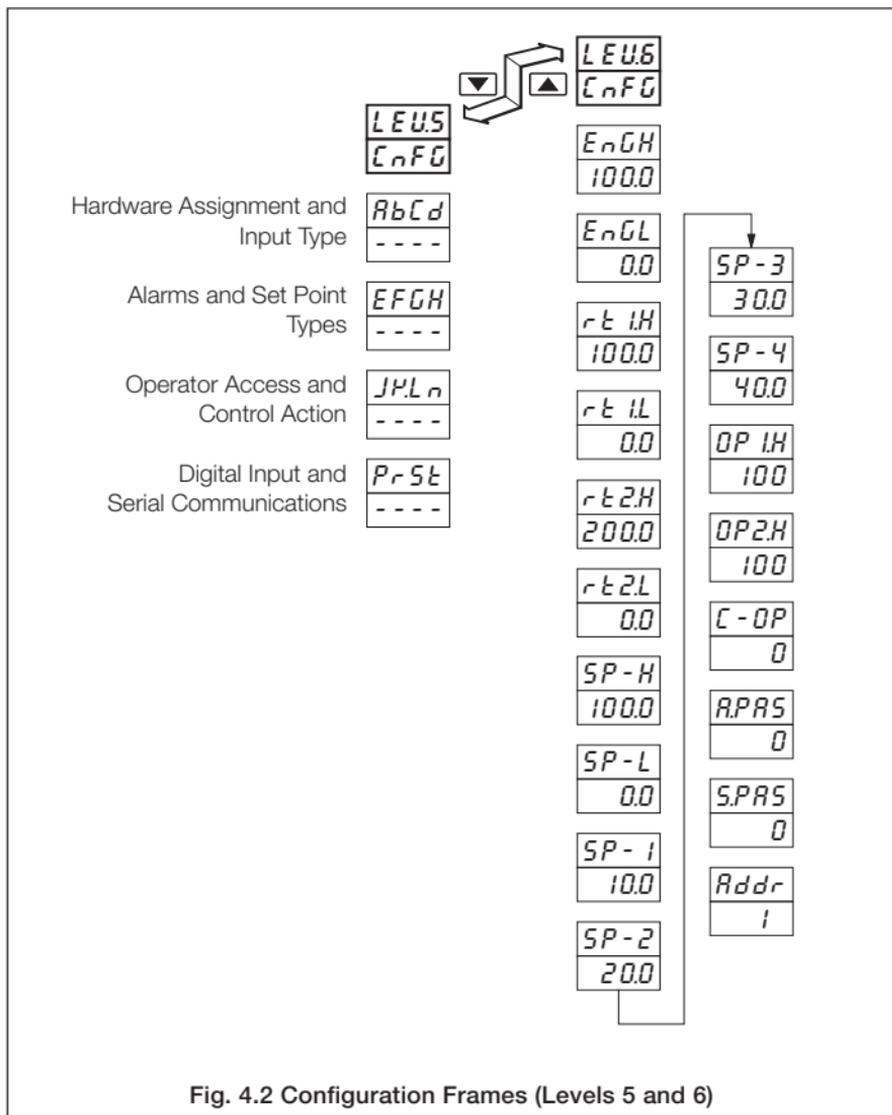


Fig. 4.2 Configuration Frames (Levels 5 and 6)



4.3 Basic Hardware and Configuration (Level 5)

4.3.1 Hardware Assignment and Input Type – Fig. 4.3

LEU5
CnFG



RbCd
6400



EFGH

Level 5 –Configuration



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

'ABCD' Settings

RbCd
6400



RbCd
6400



RbCd
6400

The parameter to be changed is indicated by the letter which is flashing. Parameter options are shown in Fig. 4.3.

- R* = Hardware configuration
- b* = Input type and range
- C* = Temperature units
- d* = Process variable display decimal places

Notes.

Note 1. When the input type (parameter b) is changed, the range is set automatically to the maximum permissible for the input type selected.

Note 2. For custom settings contact the local distributor.

Continued on page 30.



AbCd
6400

A – Hardware Configuration

Frequency		Rly 1	Rly 2	Rly 3*	Logic O/P	An. O/P 1	An. O/P 2*	Control Type
50Hz	60Hz	Open Valve	Close Valve	Alarm 1	Alarm 2	PV Rtx	SP Rtx	Boundless
<i>6</i>	<i>F</i>							
<i>U</i>		Custom	Custom	Custom	Custom	Custom	Custom	Custom

* Only available if option board is fitted

AbCd
6400

B – Input Type and Range Configuration

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>6</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		

AbCd
6400

C – Temperature Units

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

AbCd
6400

D – Process Variable Display
Decimal Places

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

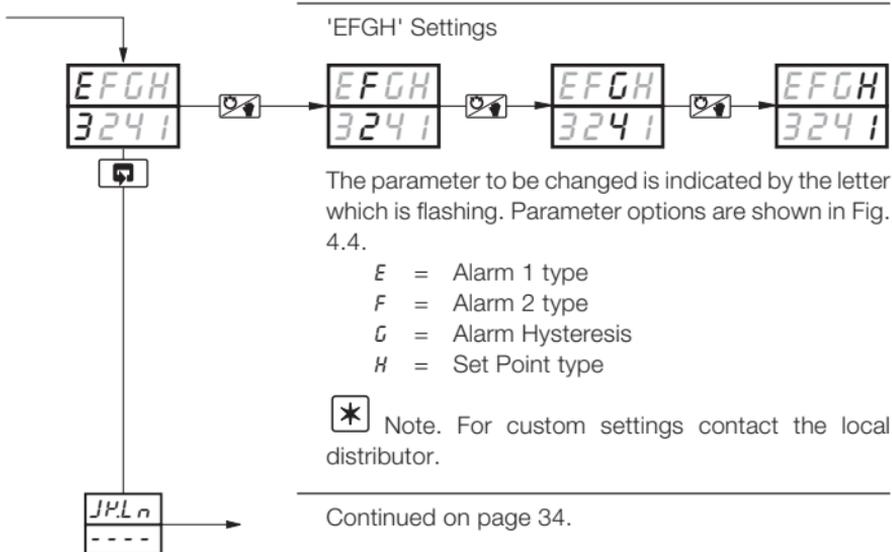
* Temperature inputs only

Fig. 4.3 Hardware Assignment and Input Type



4.3.2 Alarms and Set Point Types – Fig. 4.4

Note. All relays are **de-energised** in the alarm state.





E – Alarm 1 Type*

EFGH
3241

Display	
0	None
1	High Process
2	Low Process
3	High Deviation
4	Low Deviation

F – Alarm 2 Type*

EFGH
3241

Display	
0	None
1	High Process
2	Low Process
3	High Deviation
4	Low Deviation

* Refer to Figs. 4.5 and 4.6 for alarm action

G – Alarm Hysteresis

EFGH
3241

Display	
0	None
1	0.1%
2	0.2%
3	0.5%
4	1.0%
5	2.0%
6	5.0%
U	Custom

Value in % of
engineering
range

Value in engineering units

Note 1. When custom alarm hysteresis is selected, the alarm hysteresis values are set individually in the **set up level** – see section 3.3

*₁

H – Set Point Type

EFGH
3241

Display	
0	Local Set Point Only
1	Local + Remote Set Point (no Remote Set Point Tracking)**
2	Local + Remote Set Point (with Remote Set Point Tracking)**
3	Multiple Fixed Set Points
4	Ramp/Soak (Time Units in Minutes)
5	Ramp/Soak (Time Units in Hours)

*₂

**Only available if option board is fitted. Remote set point input is 4 to 20 mA

Note 2. With remote set point tracking enabled the local set point tracks the remote set point when in the remote set point mode.

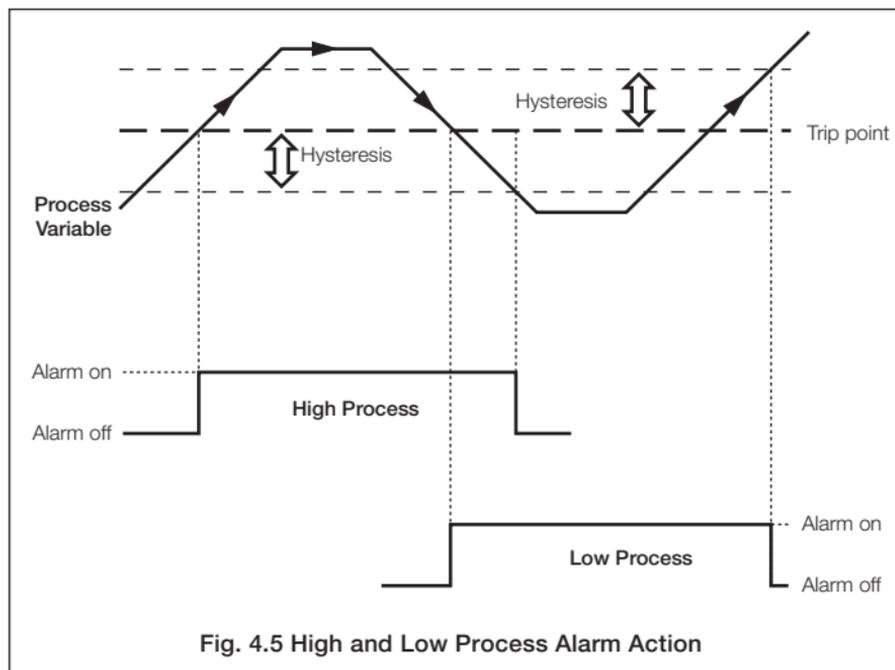
Fig. 4.4 Alarms and Set Point Types

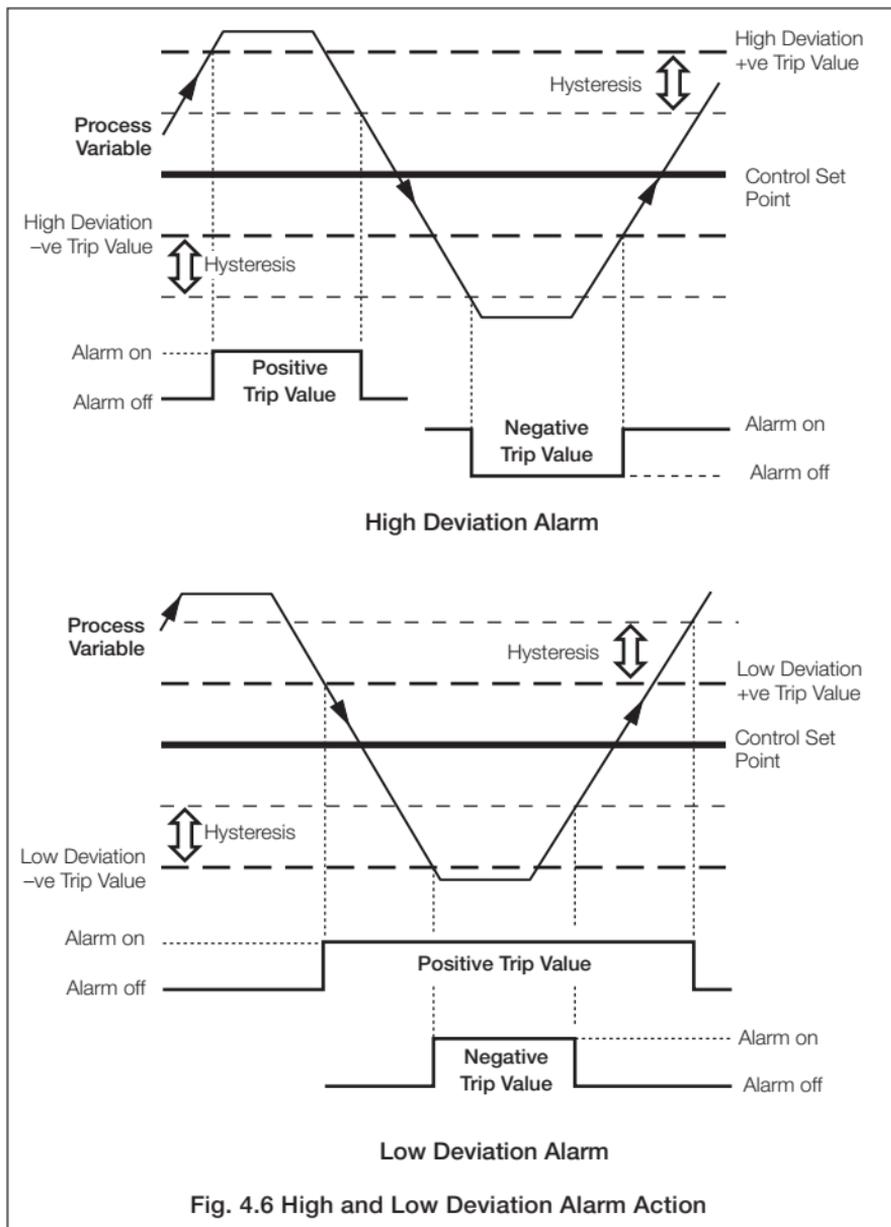


...4.3.2 Alarms and Set Point Types – Fig. 4.4

Note. All relays are **de-energised** in the alarm state.

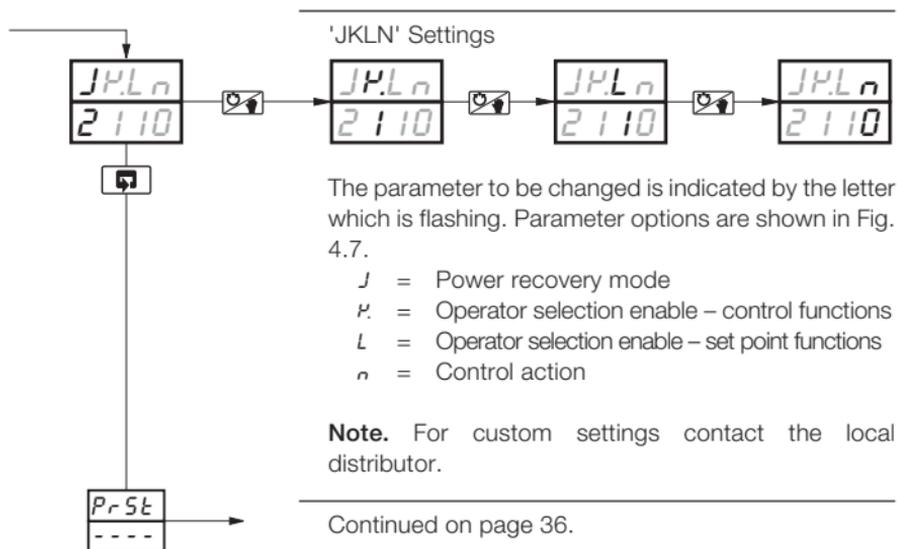
Process and Deviation Alarms (High/Low) – Figs 4.5 and 4.6







4.3.3 Operator Access and Control Action – Fig. 4.7





JPLn
2110

J – Power Recovery Mode

Display	Mode
0	Last Mode
1	Manual with last valve position
2	Manual with valve fully closed
3	Manual with valve fully open
4	Auto
U	Custom

JPLn
2110

K – Operator Selection Enable,
Control Functions

Display	Auto/Manual
0	Enable Auto/Manual
1	Disable Auto/Manual

JPLn
2110

L – Operator Selection Enable,
Set Point Functions

Display	Local Set Point Adjustment and Local/Remote Set Point Selection
0	Enable Both Functions
1	Disable Set Point Adjust, Enable Local/Remote Selection
2	Enable Set Point Adjust, Disable Local Remote Function
3	Disable Both Functions

JPLn
2110

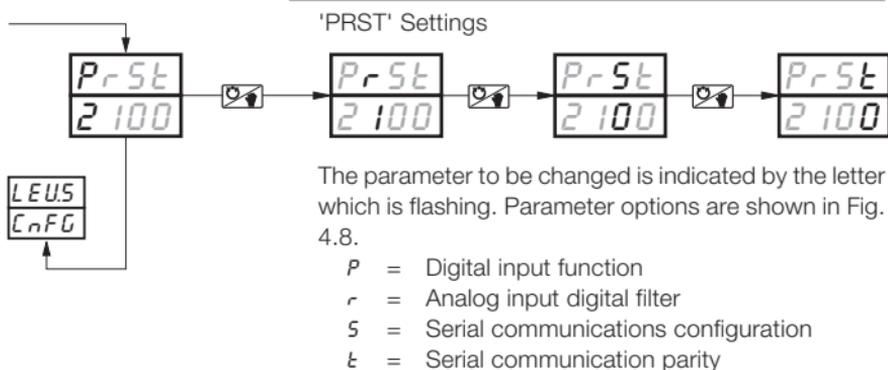
N – Control Action

Display	Action
0	Reverse
1	Direct

Fig. 4.7 Operator Access and Control Action



4.3.4 Digital Input and Serial Communications – Fig. 4.8



Note. For custom settings contact the local distributor.

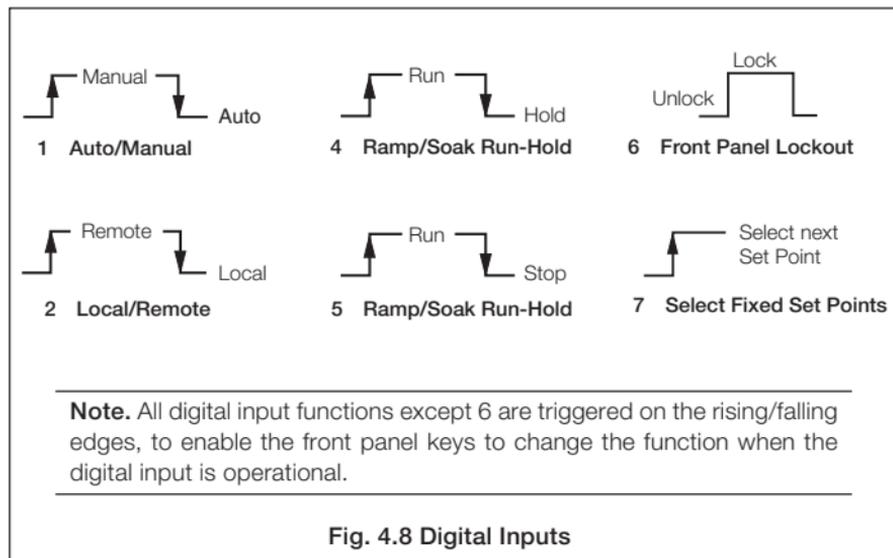


Fig. 4.8 Digital Inputs



P r St
2 100

P – Digital Input Functions

Display	Function
0	None
1	Auto/Manual
2	Local/Remote
4	Ramp/Soak Run-Hold
5	Ramp/Soak Run-Stop
6	Front Panel Lockout
7	Select Fixed Set Points

P r St
2 100

R – Analog Input Digital Filter

Display	
0	0 seconds
1	1 second
2	2 seconds
5	5 seconds
R	10 seconds
B	20 seconds
C	40 seconds
D	60 seconds

Input filter averages the process variable input values over the time set

P r St
2 100

S – Serial Communication Configuration

Display	Baud Rate, 2/4 Wire
0	Off
1	2400, 2 Wire
2	2400, 4 Wire
3	9600, 2 Wire
4	9600, 4 Wire

P r St
2 100

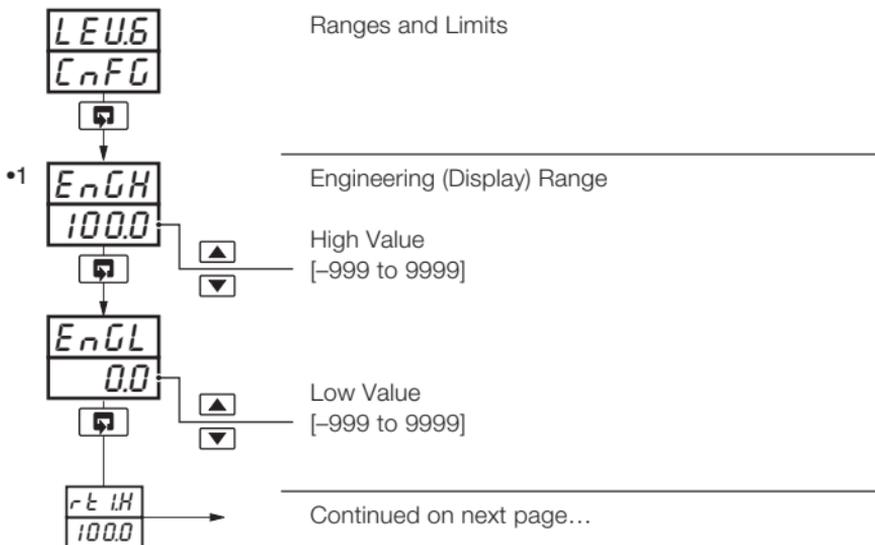
T – Serial Communications Parity

Display	
0	None
1	Odd
2	Even

Fig. 4.9 Digital Input and Serial Communications



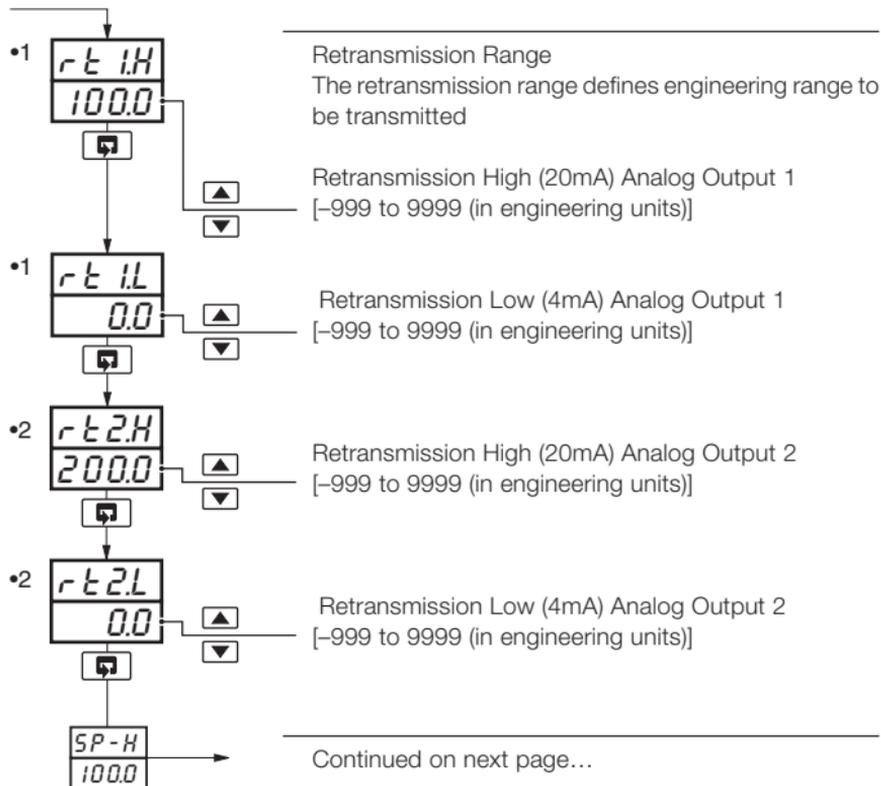
4.4 Ranges and Passwords (Level 6)



- 1 The engineering range high and low values are automatically set to the maximum allowed value when thermocouple or RTD is selected in the configuration level – see Section 4.3.1.



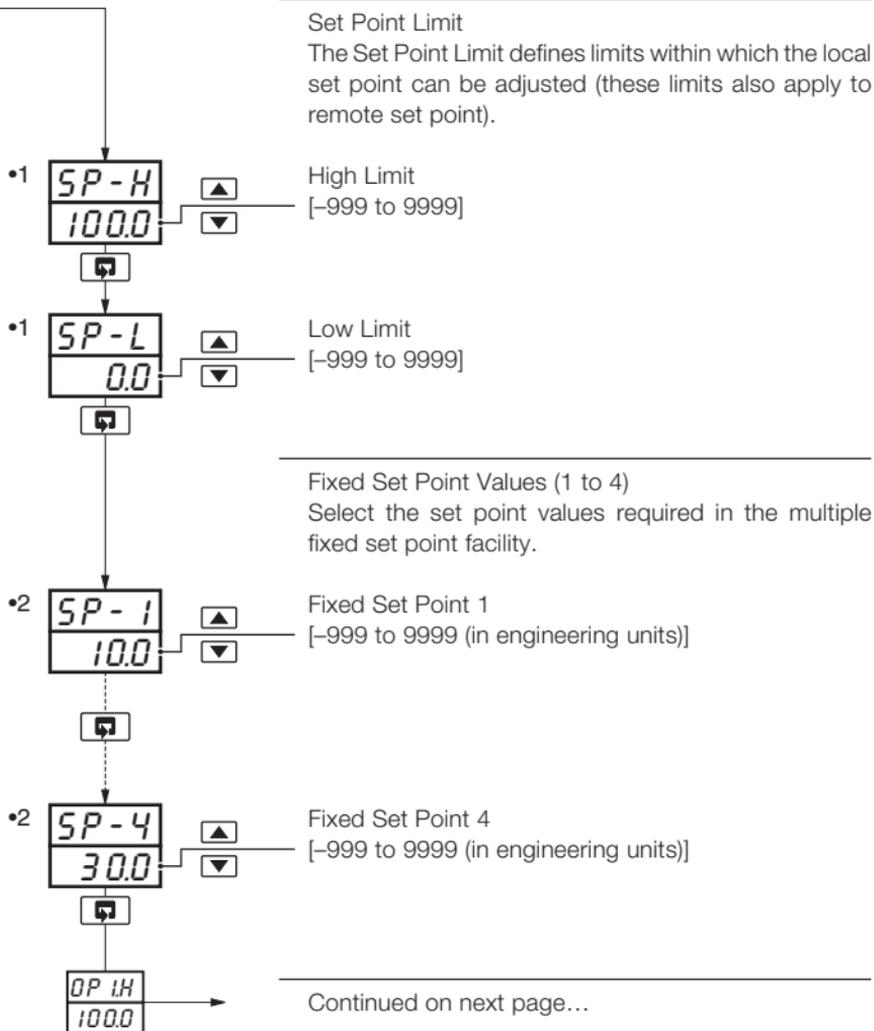
...4.4 Ranges and Passwords (Level 6)



- 1 Only displayed if the analog output is configured to retransmit the process variable or control set point value.
- 2 Only displayed if the retransmission option board is fitted.



...4.4 Ranges and Passwords (Level 6)



- 1 This limit applies to the local and remote set point values.
- 2 Only displayed if the multiple fixed set point facility is selected.



...4.4 Ranges and Passwords (Level 6)

C-OP
OPEN



Configured Output

This output value is used when:

- manual control is selected using a digital input, or
- the process variable input fails.

- OPEN* – Opens the valve fully.
- CLSE* – Closes the valve fully.
- LASE* – Leaves the valve at its current position.

S.PAS
0



Setup Password

[0 to 9999 (default 0)]

This password enables access to the setup levels (levels 2, 3, and 4) and to the auto tune facility.

Addr
1



Modbus Address

[1 to 99]

This frame allows the Modbus address to be set.



5 INSTALLATION

5.1 Siting – Figs. 5.1 and 5.2

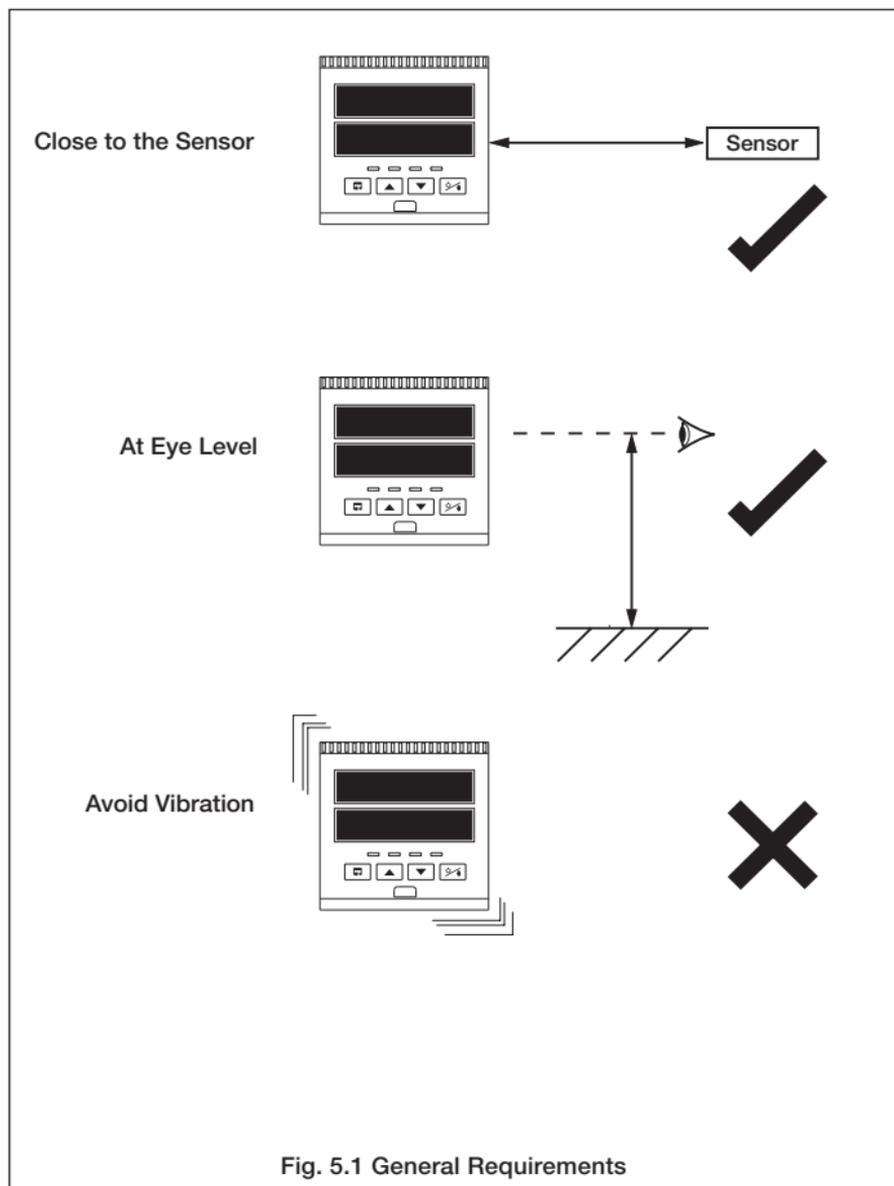
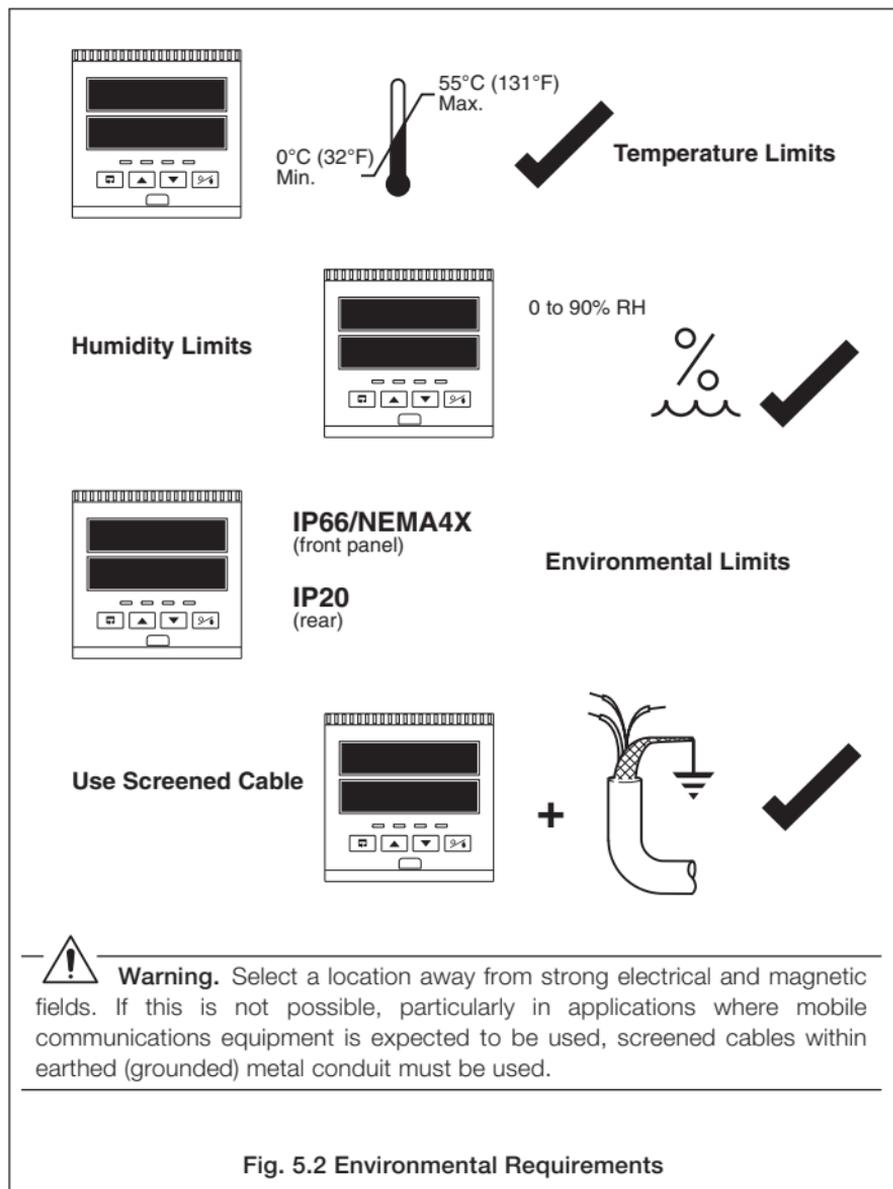


Fig. 5.1 General Requirements



...5.1 Siting – Figs. 5.1 and 5.2

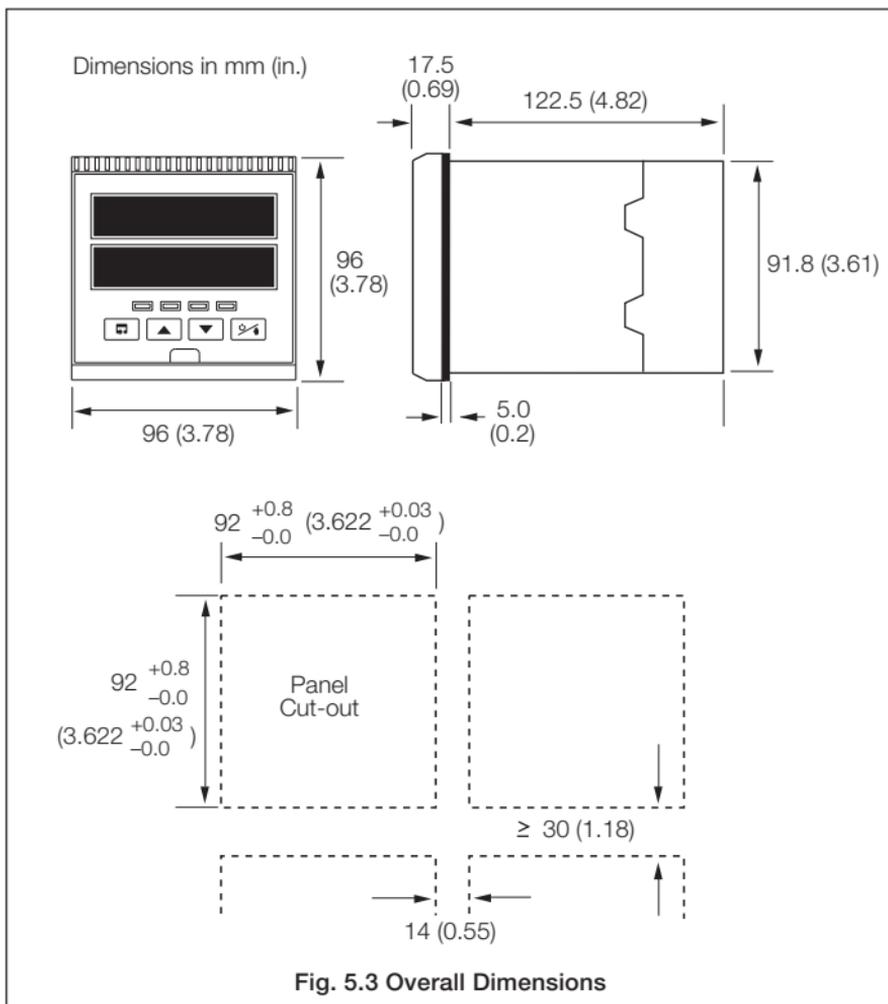




5.2 Mounting – Figs. 5.3 and 5.4

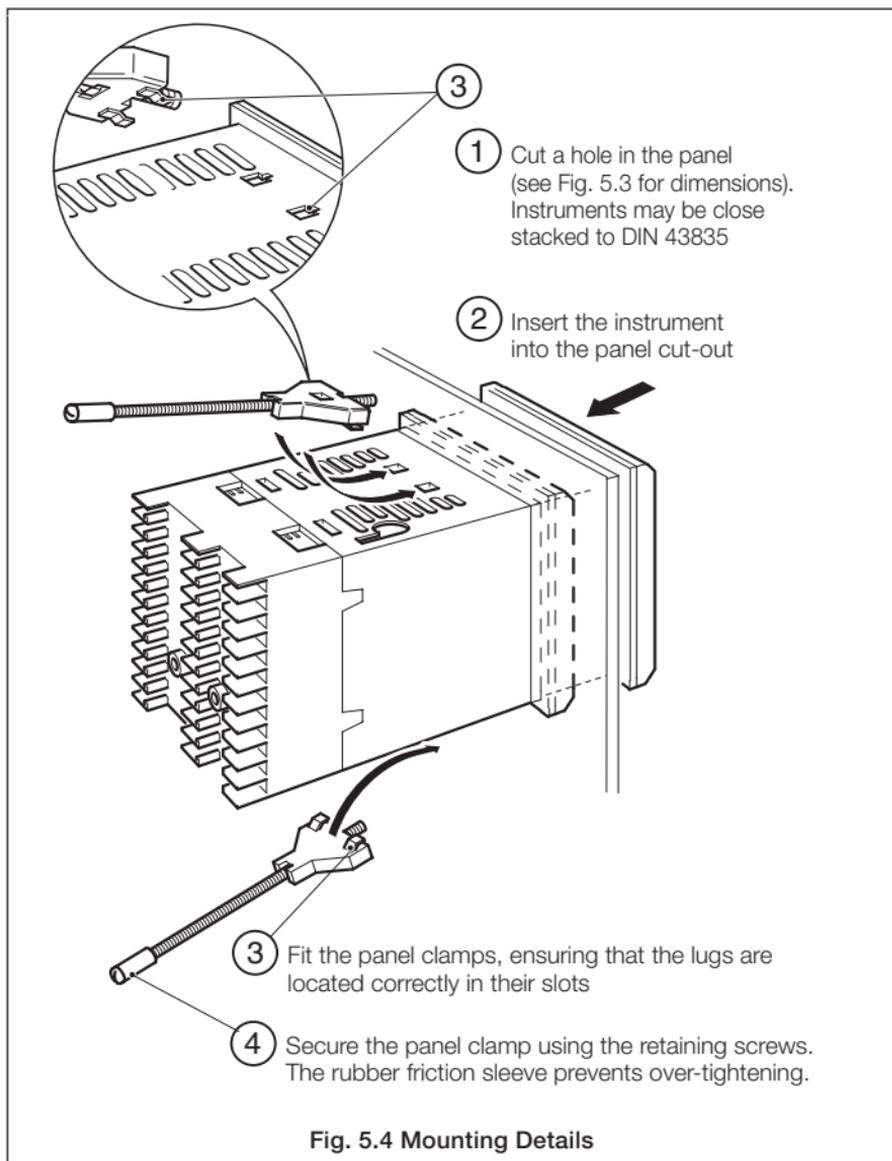
The instrument is designed for panel mounting (see Fig. 5.4). Overall dimensions are shown in Fig. 5.3.

Note. For NEMA4X protection, a minimum panel thickness of 2.5mm is recommended.





...5.2 Mounting – Figs. 5.3 and 5.4





...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.

End of Life Disposal

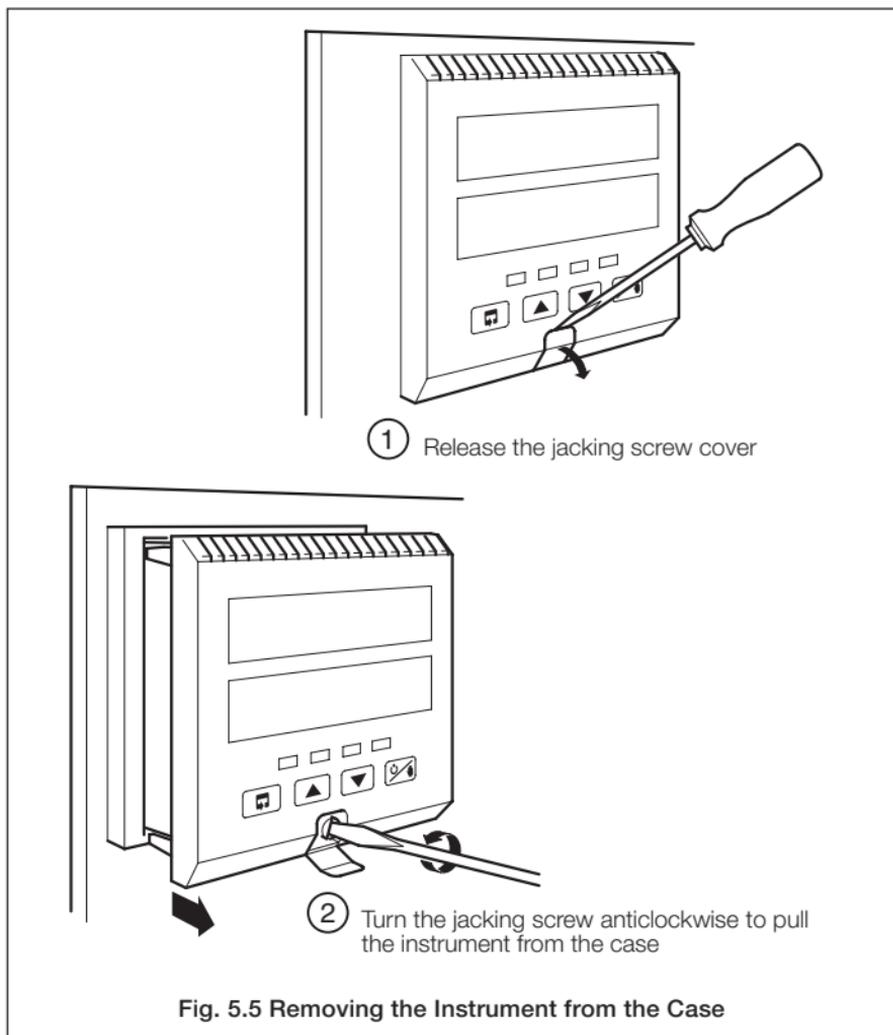
This instrument does not contain any substance that will cause undue harm to the environment. It can therefore be safely considered as normal waste and disposed of accordingly.

Cleaning

Clean the front panel only, using warm water and a mild detergent.



5.3 Removing the Instrument from the Case – Fig. 5.5





5.4 Electrical Connections – Fig. 5.6



Warning.

- The instrument is not fitted with a switch therefore a disconnecting device such as a switch or circuit breaker conforming to local safety standards must be fitted to the final installation. It must be mounted in close proximity to the instrument within easy reach of the operator and must be marked clearly as the disconnection device for the instrument
 - Remove all power from supply, relay and any powered control circuits and high common mode voltages before accessing or making any connections.
 - Use cable appropriate for the load currents. The terminals accept cables up to 14AWG (2.5mm²).
 - The instrument conforms to Mains Power Input Insulation Category 2, Pollution Degree 2 (EN601010–1).
 - All connections to secondary circuits must have basic insulation.
 - After installation, there must be no access to live parts, e.g. terminals
 - Terminals for external circuits are for use only with equipment with no accessible live parts.
 - If the instrument is used in a manner not specified by the Company, the protection provided by the equipment may be impaired.
 - All equipment connected to the instrument's terminals must comply with local safety standards (IEC 60950, EN601010–1).
-

Note.

- Always route signal leads and power cables separately, preferably in earthed (grounded) metal conduit.
 - It is strongly recommended that screened cable is used for signal inputs and relay connections.
-



This equipment is protected through double insulation (Class II).



5.5 Relays, Arc Suppression, Outputs and Input

5.5.1 Relay Contact Ratings

Relay contacts are rated at:

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

250V DC 25W max.

A suitable fuse must be fitted.

5.5.2 Arc Suppression

Arc suppression components are fitted to relays 2 and 3 only. If relay 1 is required to switch inductive loads, the arc suppression components supplied must be fitted.

5.5.3 Logic Output

18V DC at 20mA.

Min load 900 Ω .

Isolated from inputs (not isolated from analog O/P 1),
dielectric strength – 500V d.c. for 1 minute.

5.5.4 Control or Retransmission Analog Outputs

Max. load 15V (750 Ω at 20mA).

Analog O/P 1 – Isolated from inputs (not isolated from logic O/P),
dielectric strength – 500V d.c. for 1 minute.

Analog O/P 2 – Non-isolated.

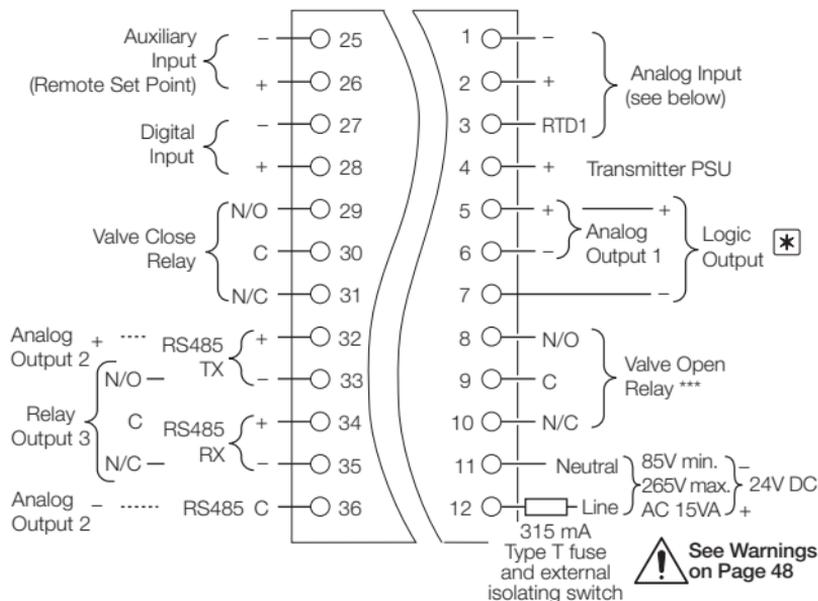
5.5.5 Digital Input

Type – Volt-free

Minimum pulse – 250ms



...5 INSTALLATION



Note. Analog output 1 and the logic output use a common positive terminal, capable of driving both outputs simultaneously.

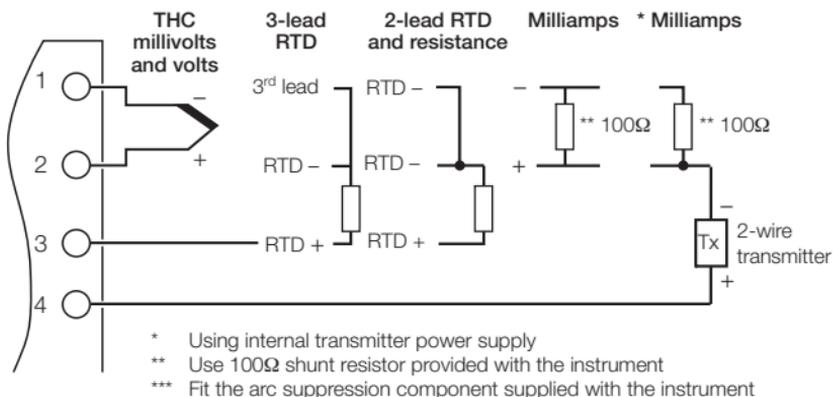


Fig. 5.6 Electrical Connections

SPECIFICATION

Summary

P, PID single loop, valve position controller
Fully user configurable
NEMA4X/IP66
PC Configuration

Operation

Display

High-intensity 7-segment, 2 x 4-digit LED display
Display range -999 to +9999
Display resolution ± 1 digit
Display height 14mm (0.56 in.)

Configuration

User-defined via front panel or via PC configurator

Control Functions

Control types

P+I or P+I+D Boundless

Valve travel time

10 to 5000s

Adjustable deadband (engineering units)

-999 to +9999

Control terms

P	=	0.1 to 999.9%
I	=	1 to 7200s
D	=	0.1 to 999.9s

Set points strategies

Local
Remote
4 selectable, fixed value
Ramping Set Point

...SPECIFICATION

...Control Functions

Profile controller

Number	4 Ramp/Soak segments
Features	Guaranteed Ramp/Soak, Self-seeking Set point, Program Repeat
Controls	Run, Hold and Stop from Front Panel Switches Run/Hold or Run/Stop from digital input

Alarms

Number	Two user-defined
Type	High/Low process High/Low deviation

Standard Build

Relay output

Two relays with arc suppression components included as standard (SPDT) –
5A @ 115/230V AC

Logic output

18V DC at 20mA
Min. load 400 Ω

PV retransmission

Analog, configurable in the range of 4 to 20mA
Max. load 15V (750 Ω at 20mA)
Accuracy \leq 0.25% of span

Analog Inputs

Number

One standard process variable
One optional remote set point input

Input sampling rate

250ms per channel

...Analog Inputs**Type**

Universally configurable

Channel 1	Thermocouple (THC)
	Resistance Thermometer (RTD)
	Millivolt
	Current
	DC voltage
Channel 2	4 to 20mA

Input impedance

mA	100 Ω
mV, V	>10M Ω

Linearizer functions

Programmable for standard inputs:

√, THC types B, E, J, K, N, R, S, T or Pt100

Broken sensor protection

Upscale drive on THC and RTD

Downscale drive on milliamps and voltage

Cold junction compensation

Automatic CJC incorporated as standard

Stability <0.05°C/°C change in ambient temperature

Input protection

Common mode isolation	>120dB at 50/60Hz with 300 Ω imbalance
Series mode rejection	>60dB 50/60Hz

Transmitter power supply

24V, 30mA max. powers one 2-wire transmitter

...SPECIFICATION

Optional I/O specification

Relay output

SPDT 5A @ 115/230V AC

Digital input

Type Volt-free

Minimum pulse 250ms

Modbus serial communications

Connections RS422/485, 2- or 4-wire

Speed 2.4k or 9.6k baud rate

Protocol Modbus RTU slave

Remote Set Point Input

4 to 20 mA DC, 100 Ω nominal input impedance

Preset to process variable engineering units

Physical

Size

96 wide x 96 high x 122.5mm deep

(3.78 in. wide x 3.78 in. high x 4.82 in. deep)

Weight

520g (1.1 lb) approx.

Electrical

Voltage

85 to 265V AC (50/60Hz)

24V DC

Power consumption

<6VA

Power interruption protection

<60ms/<3 cycles, no effect

>60ms/>3 cycles, instrument returns to operation after a controlled reset

Environmental**Operating limits**

0 to 55°C (32 to 131°F)

5 to 95% RH non-condensing

Temperature stability

<0.02% of reading or 2 μ V/°C (1 μ V/°F)

Front face

IP66 (NEMA4X), case rear IP20

EMC**Emissions and Immunity**

Meets requirements of IEC 61326 for an Industrial Environment

Design and manufacturing standards

Designed to meet CSA requirements

CE Mark

Electrical safety

EN61010

SS/V250 Issue 4

Customer Support

We provide a comprehensive after sales service via our Worldwide Service Organization. Contact one of the following offices for details of 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

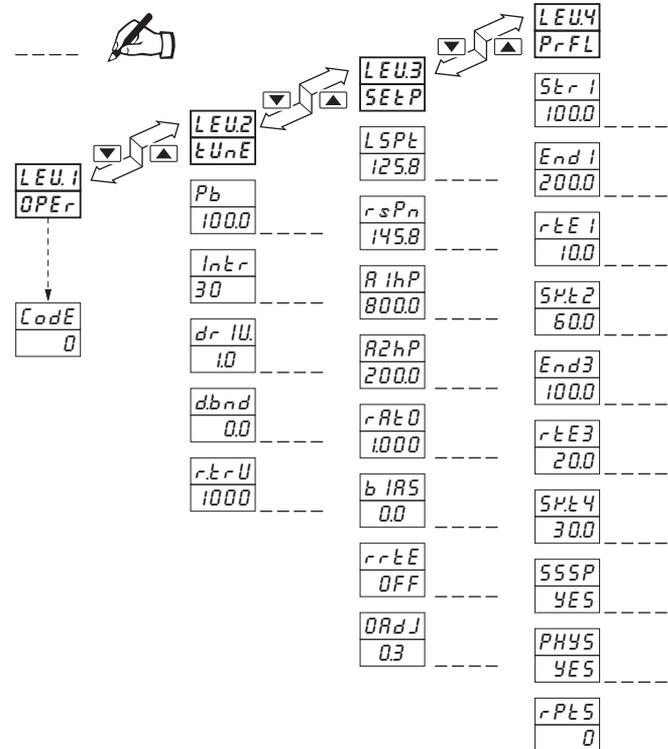
Client Warranty

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 operating and maintenance records relating to the alleged faulty unit.

CUSTOMER SETUP LOG



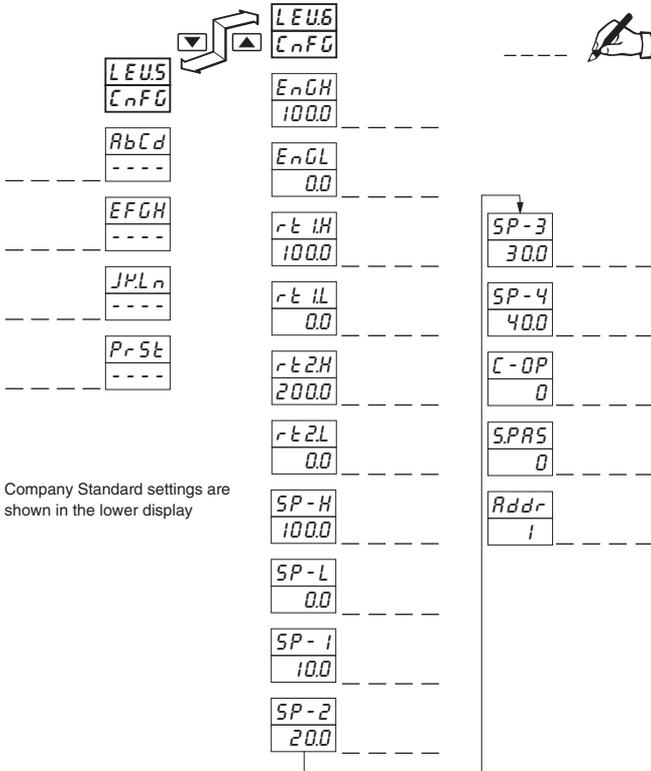
Company Standard settings are shown in the lower display

Instrument Serial Number: _____

Product Code: V 250 / _____ / _____



CUSTOMER CONFIGURATION LOG



Company Standard settings are shown in the lower display

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

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

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