32h8e EPower Remote Panel – Installation and Operating Instructions

Model number 32h8e is a horizontal 1/8 DIN indicator and alarm unit that performs the dual function of remote display for EPower and independent 'policeman'. The latter is intended to disconnect power should an over temperature (or other excess process condition) occur.

32h8e communicates with EPower using Modbus protocol via the 3-wire EIA485 RJ45 connector located on the underside of the EPower driver.

The remote panel is normally ordered as an option with EPower units. It is a fixed hardware build consisting of a relay output in OP1 and an analogue output on OP3. There is no user communications since this is used to communicate with EPower and the supply is high voltage only (100 – 230Vac). The unit is configured using a 'Quick Start' code on initial start up.
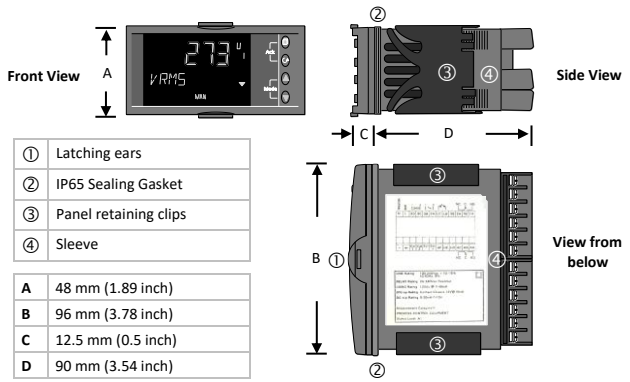
This installation sheet provides step by step instructions to help you to install, wire, configure and use the remote panel.

32h8e is based on indicator series 3200i and has the same and additional features as this instrument. For features not covered in these instructions, please refer to 3200i User Guide Part No HA029006.

This guide and other related handbooks such as EPower User Guide (part No HA179769) can be downloaded from https://www.eurotherm.com/en/.

Unpacking and Dimensions

Contents of Package
1x Indicator mounted in sleeve
2 x Panel retaining clips
1 x IP65 sealing gasket mounted on the sleeve
1 x Component packet containing:
• A snubber for the alarm relay output (see 'General Notes about Relays and Inductive Loads').
• 2.49 Ω resistor for current inputs (see 'Sensor Measuring Input').
5 metre cable RJ45 to spade terminals

Front View

①	Latching ears
②	IP65 Sealing Gasket
③	Panel retaining clips
④	Sleeve

A	48 mm (1.89 inch)
B	96 mm (3.78 inch)
C	12.5 mm (0.5 inch)
D	90 mm (3.54 inch)

Side View

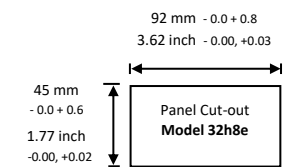**View from below**

HA029782/7   05/25

HA029782ENG/7

Installation

This remote indicator is intended for permanent installation, for indoor use only, and enclosed in an electrical panel

Select a location which is subject to minimum vibrations, the ambient temperature is within 0 and 55°C (32 - 131°F) and humidity 5 to 95% RH non condensing.

The unit can be mounted on a panel up to 15mm thick

To ensure IP65 front sealing against dust and water, mount on a non-textured surface.

92 mm - 0.0 + 0.8
3.62 inch - 0.00, +0.03

45 mm - 0.0 + 0.6
1.77 inch -0.00, +0.02

Panel Cut-out
Model 32h8e

1. Cut out the panel to the size shown.
2. Fit the IP65 sealing gasket behind the front bezel of the unit
3. Insert the unit in its sleeve through the cut-out.
4. Spring the panel retaining clips into place. Secure the unit in position by holding it level and pushing both retaining clips forward.
5. Peel off the protective cover from the display

Recommended Minimum Spacing

If more than one unit is mounted in the same panel they should be spaced to allow sufficient air flow between them.

10 mm (0.4 inch)

38 mm (1.5 inch)

(Not to scale)
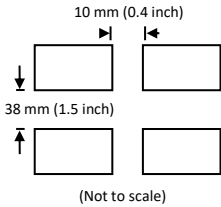
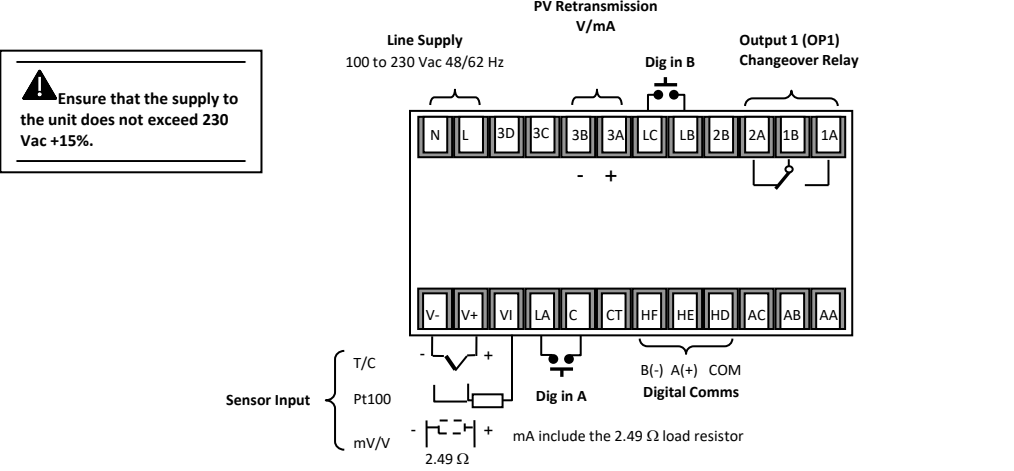### To Remove the Remote Indicator from its Sleeve

Ease the latching ears ① outwards and pull the unit forward.

When plugging back in ensure that the latching ears click into place to maintain the IP65 sealing

Wiring

Wire Sizes

The screw terminals accept wire sizes from 0.5 to 1.5 mm (16 to 22AWG). Hinged covers prevent hands or metal making accidental contact with live wires. The rear terminal screws should be tightened to 0.4Nm (3.5lb in).

Terminal Layout 32h8e

⚠️ **Ensure that the supply to the unit does not exceed 230 Vac +15%.**

Output 3 (OP3) PV Retransmission V/mA

Line Supply 100 to 230 Vac 48/62 Hz

Dig in B

Output 1 (OP1) Changeover Relay

| N | L | 3D | 3C | 3B | 3A | LC | LB | 2B | 2A | 1B | 1A |

| V- | V+ | VI | LA | C | CT | HF | HE | HD | AC | AB | AA |

Sensor Input
- T/C
- Pt100
- mV/V

Dig in A

B(-) A(+) COM
Digital Comms

mA include the 2.49 Ω load resistor
2.49 Ω

Sensor (Measuring) Input

- Do not run input wires with power cables
- When shielded cable is used, it should be grounded at one point only
- Any external components (such as zener barriers) connected between sensor and input terminals may cause errors in measurement due to excessive and/or un-balanced line resistance, or leakage currents.
- Sensor input not isolated from the logic outputs & digital inputs

Thermocouple
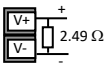- Use the correct compensating cable preferably shielded.

V+ +
V- -

RTD
V- Lead compensation
V+ and VI PRT

VI
V+
V-

- The resistance of the three wires must be the same. The line resistance may cause errors if it exceeds 22 Ω.

Linear mA or mV
- For mA input only connect the 2.49Ω resistor supplied between the V+ and V- terminals as shown

V+ +
V- -
2.49 Ω

Voltage
- With this adaptor fitted sensor break alarm does not operate.
- For a 0-10 Vdc input an external input adapter is required (not supplied). Part number: SUB21/IV10.

±⊗
100 kΩ
0-10 V
806 Ω
V+
V-
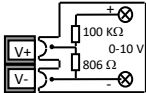
Digital Communications

Digital communications uses Modbus protocol - **EIA485 (3-wire)** and is used to communicate with EPower using the RJ45 socket on the underside of the EPower controller.

HD	Common
HE	Rx A(+)
HF	Tx B(-)

- EIA485 (3-wire)
- Isolated 240 Vac.

32h8e Terminal		RJ45 Pin Number
HD	Common	3
HE	Rx A(+)	2
HF	Tx B(-)	1

Remote Panel Power Supply

⚠️ **Ensure that you have the correct supply for your instrument**
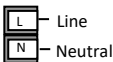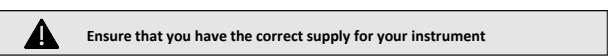
1. Check order code of the remote panel supplied
2. Use copper conductors only.
3. The power supply input is not fuse protected. This should be provided externally.

Safety requirements for permanently connected equipment state:
- A switch or circuit breaker shall be included in the building installation
- It shall be in close proximity to the equipment and within easy reach of the operator
- It shall be marked as the disconnecting device for the equipment.

Note: a single switch or circuit breaker can drive more than one instrument.

L — Line
N — Neutral

- High voltage supply: 100 to 230 Vac, +/-15%, 48/62 Hz
- Recommended external fuse ratings are as follows: Fuse type: T rated 2 A 250 V.

Outputs

The unit is supplied as standard with a changeover relay on output 1 and analogue (voltage or current) on output 3.

Output 1 Relay (Form C changeover)

- Isolated output 240 Vac CATII
- Contact rating: 2A 264 Vac resistive
- Output functions: Alarm

OP1
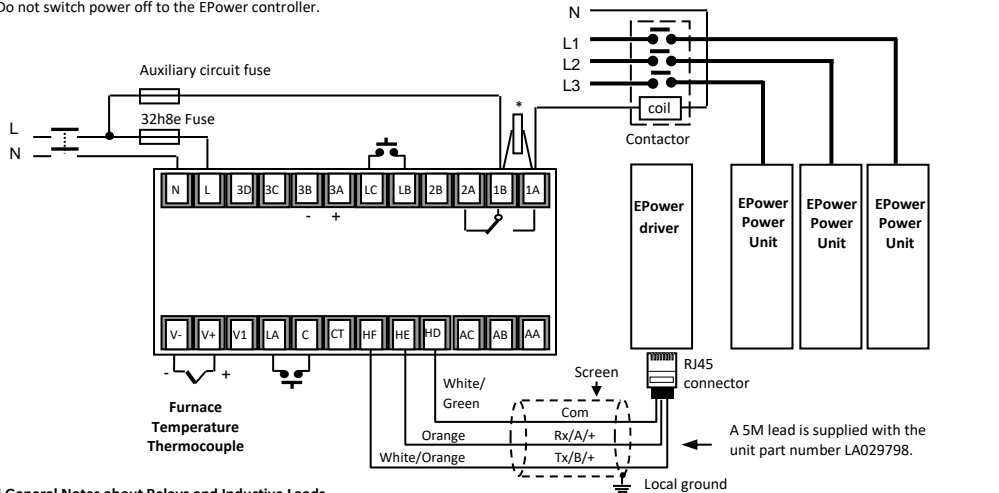1A
1B
2A
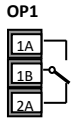
Output 3 Analogue (V or mA)

- Isolated output 240 Vac CATII
- Used for analogue retransmission of PV
- Configurable: 0-20 mA, 4-20 mA, 0-5 V, 0-10 V, 1-5 V, 2-10 V.
- Max load resistance: 500 Ω
- Calibration accuracy: +(<0.25% of reading + <50 µA)

OP3
3A +
3B -

Example Wiring Diagram

This diagram is not intended to show load connections, load fusing, isolator, or other components associated with high power connections.

It shows communications connections and the over temperature contactor connections.

Do not switch power off to the EPower controller.

Auxiliary circuit fuse

32h8e Fuse

N
L1
L2
L3

coil

Contactor

EPower driver

EPower Power Unit

EPower Power Unit

EPower Power Unit

Furnace Temperature Thermocouple

White/Green
Orange
White/Orange

Screen

Com
Rx/A/+
Tx/B/+

RJ45 connector

A 5M lead is supplied with the unit part number LA029798.

Local ground

* General Notes about Relays and Inductive Loads

When switching inductive loads such as contactors or solenoid valves, wire the 22 nF/100 Ω 'snubber' supplied across normally open relay terminals. This will prolong contact life and reduce interference.

⚠️ **WARNING** Snubbers pass 0.6 mA at 110 V and 1.2 mA at 230 Vac, which may be sufficient to hold on high impedance loads. Do not use in these installations.

Safety and EMC Information

This instrument is intended for industrial temperature and process control applications within the requirements of the European Directives on Safety and EMC.

The information contained in this manual is subject to change without notice. While every effort has been made to ensure the accuracy of the information, your supplier shall not be held liable for errors contained herein.

⚠️ **The safety and EMC protection can be seriously impaired if the unit is not used in the manner specified. The installer must ensure the safety and EMC of the installation.**

Safety. This instrument complies with the European Low Voltage Directive 2006/95/EC, by the application of the safety standard EN 61010.

Unpacking and storage. If on receipt, the packaging or unit is damaged, do not install but contact your supplier. If being stored before use, protect from humidity and dust in an ambient temperature range of -10 °C to +70 °C.

Electrostatic discharge precautions. Always observe all electrostatic precautions before handling the unit.

Service and repair. This instrument has no user serviceable parts. Contact your supplier for repair.

Cleaning. Isopropyl alcohol may be used to clean labels. Do not use water or water based products. A mild soap solution may be used to clean other exterior surfaces.

Electromagnetic compatibility. This instrument conforms with the essential protection requirements of the EMC Directive 2004/108/EC, by the application of a Technical Construction File. It satisfies the general requirements of the industrial environment defined in EN 61326.

Caution: Charged capacitors. Before removing an instrument from its sleeve, disconnect the supply and wait at least two minutes to allow capacitors to discharge. Avoid touching the exposed electronics of an instrument when withdrawing it from its sleeve.

Safety Symbols. Symbols used on the instrument have the following meaning:

⚠️ Caution, refer to accompanying documents)   ▢ Equipment protected throughout by DOUBLE INSULATION

Installation Category and Pollution Degree. This unit has been designed to conform to BSEN61010 installation category II and pollution degree 2, defined as follows:

- **Installation Category II (CAT II).** The rated impulse voltage for equipment on nominal 230V supply is 2500V.
- **Pollution Degree 2.** Normally only non conductive pollution occurs. However, a temporary conductivity caused by condensation must be expected.

Personnel. Installation must only be carried out by suitably qualified personnel

Enclosure of Live Parts. To prevent hands or metal tools touching parts that may be electrically live, the Remote Panel must be installed in an enclosure.

Safety and EMC Information (continued)

Caution: Live sensors. The remote panel is designed to operate if the temperature sensor is connected directly to an electrical heating element. However, you must ensure that service personnel do not touch connections to these inputs while they are live. With a live sensor, all cables, connectors and switches for connecting the sensor must be mains rated for use in 230Vac +15%: CATII.

Wiring. It is important to connect the unit in accordance with the data in this sheet. Wiring must comply with all local wiring regulations, i.e. UK, the latest IEE wiring regulations, (BS7671), and USA, NEC Class 1 wiring methods.

⚠️ **Do not connect AC supply to low voltage sensor input or low level inputs and outputs.**

Voltage rating. The maximum continuous voltage applied between any of the following terminals must not exceed 230Vac +15%:

- relay output to logic, dc or sensor connections;
- any connection to ground.

The Remote Panel must not be wired to a three phase supply with an unearthed star connection. Under fault conditions such a supply could rise above 264Vac with respect to ground and the product would not be safe.

Conductive pollution. Electrically conductive pollution i.e. carbon dust, MUST be excluded from the enclosure in which the Remote Panel is installed. To secure a suitable atmosphere in conditions of conductive pollution, fit an air filter to the air intake of the enclosure. Where condensation is likely, include a thermostatically controlled heater in the enclosure.

Grounding of the temperature sensor shield. In some installations it is common practice to replace the temperature sensor while the Remote Panel is still powered up. Under these conditions, as additional protection against electric shock, we recommend that the shield of the temperature sensor is grounded. Do not rely on grounding through the framework of the machine.

Over Temperature Protection. To prevent overheating of the process under fault conditions, a separate over-temperature protection unit should be fitted which will isolate the heating circuit. This must have an independent temperature sensor. The 32h8e is intended for this function.

Note: Alarm relays within the unit will not give protection under all failure conditions.

Installation Requirements for EMC. To comply with European EMC directive certain installation precautions are necessary:

- General guidance. Refer to EMC Installation Guide, Part no. HA025464.
- Relay outputs. It may be necessary to fit a suitable filter to suppress conducted emissions. Filter requirements depend on the type of load.
- Table top installation. If using a standard power socket, compliance with commercial and light industrial emissions standard is usually required. To comply with conducted emissions standard, a suitable mains filter must be installed.

⚠️ **WARNING: This product can expose you to chemicals including lead and lead compounds which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to:** https://www.P65Warnings.ca.gov.

Level 3 and Configuration Level

Level 3 makes all operating parameters available (if not read only). It is typically used when commissioning the indicator. Examples are Input filter time constant, alarm latching, alarm delay, etc.

Configuration Level will enable the fundamental characteristics of the indicator to be changed. This includes parameters in the Quick Configuration code plus others.

Operation at both levels is explained in the 3200i Engineering Handbook Part No. HA029006 which can be downloaded from https://www.eurotherm.com/en/.

The sections on this page describe features which are additional to or differ from those available in the standard 3200i series indicators.

### To Select Access Level 3

From any display press and hold 🗐 for more than 5 seconds. Lev 3 will be displayed followed by c o d e . Press ▲ or ▼ enter the passcode – 3 by default for a new instrument.

To Select Configuration Level

When Lev 3 is displayed and before c o d e is displayed, press ▲ or ▼ to 'goto' Conf. Press ▲ or ▼ enter the passcode – 4 by default for a new instrument. The mnemonic Conf will appear in the display

To Return to Lower Levels

Press and hold 🗐 until g o t o appears. Press ▲ or ▼ to select the required operating level. It is not necessary to enter a passcode when going from a higher level to a lower one.
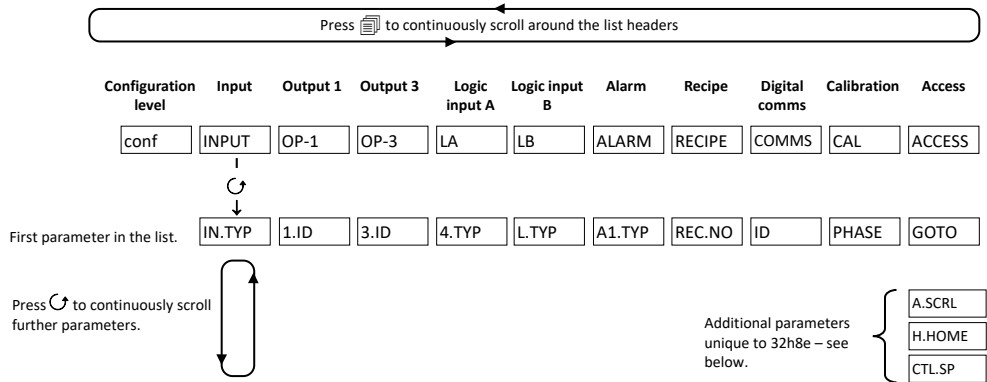
Note: EPower summary parameters are not available in Level 3 or Configuration Level.

Navigation in Levels 3 and Configuration

The structure is the same in both levels but in Configuration level more parameters are available.

Parameters are listed under headings associated with a particular function. The function heading is chosen by repeatedly pressing 🗐. Parameters associated with the function are selected by repeatedly pressing ↻.

The list of parameters under each heading is the same as the 3200i series and these are listed in the manual HA029006 downloadable from https://www.eurotherm.com/en/. The exception to this are three additional parameters in the Access List. These are described below.

Press 🗐 to continuously scroll around the list headers

	Configuration level	Input	Output 1	Output 3	Logic input A	Logic input B	Alarm	Recipe	Digital comms	Calibration	Access
	conf	INPUT	OP-1	OP-3	LA	LB	ALARM	RECIPE	COMMS	CAL	ACCESS
First parameter in the list.	IN.TYP	1.ID	3.ID	4.TYP	L.TYP	A1.TYP	REC.NO	ID	PHASE	GOTO

Press ↻ to continuously scroll further parameters.

Additional parameters unique to 32h8e – see below.

- A.SCRL
- H.HOME
- CTL.SP

PV Retransmission

An EPower unit will generally be part of a wider system, and as such EPower parameters may be communicated to a Fieldbus Network Master i.e. SCADA package, PLC or DCS system. The 32h8e is an independent policeman, and, therefore, the process PV may also be communicated to the Fieldbus network master.

To this end, the 32h8e PV is periodically (every 0.5 second) written to the EPower's Instrument.Config.RemotePV parameter, which can be transmitted to the master device.

It should be noted that PV retransmission is also provided as an analogue (V or mA) signal using the analogue output OP3. This may be used as a back-up to the digitally communicated parameter in the event of a failure of the communications link

HOME Page Timeout

The 32h8e will inherit a HOME Page timeout from the 32h8i, this forces the display to go back to the HOME page after a period of keyboard inactivity.

However, in the 32h8e, if the current focus is on an EPower parameter then the HOME Page timeout will not be imposed.

This will allow the user to display a specific EPower Network parameter indefinitely (auto-scrolling must be disabled).

Digital Alarm Outputs

In the 32h8e up to 4 source parameters can be logically OR'ed together to give a digital output state see Engineering Handbook Part No. HA029006. The list of source parameters has the following addition to 1.SRC.A, 1.SRC.B, 1.SRC.C AND 1.SRC.D:-

Ep.aL	All EPower alarms

Note the ALL.A (All Alarms parameter) also includes the above EPower alarms as well as indicator alarms.

## Features Which Differ from Standard 3200i Indicators

32h8e does not include Strain Gauge, 24Vac/dc Supply, User Digital Communications.
The following features are unique to 32h8e.

To Turn On Auto-scrolling (A.SCRL)

In Configuration level, press 🗐 to scroll to ACCES list. Press ↻ until A . S C R L (long message AUTO SCROLLING) is displayed. Press ▲ or ▼ to select 5, 10, 30 or OFF. This sets the duration between scrolls in seconds.

To Hide the HOME Display (H.HOME)

In the ACCES list press ↻ until h . h o m e (long message HIDE HOMEPAGE) is displayed. Press ▲ or ▼ to select y e s .

Control and Setpoint Display (CTL.SP)

Press ▲ or ▼ to select y e s or N o . See also 'Setpoint Editing' section.

If set to YES the EPower control parameters (Current, Voltage, or Power) can be viewed, in Operator level, simultaneously with it's associated Setpoint. When displaying an EPower control parameter the bottom line of the display is used to display the working setpoint.

When set to No the bottom line of the display is used to display the parameter name and parameter description (as per other indicator displays).

EPower SetProv Configurations

If EPower is configured via Quick Start and the functionality of the Analogue Input has been set to Setpoint then, in a multiple network configuration, the Quick Start will wire SetProv.1 to all of the networks associated Control.Main.SP, allowing each Control Block to share the same local or remote setpoint. This is shown in the diagrams below which are taken from iTools configuration package.

Multiple Single Phase Configuration

2x2 Leg Configuration
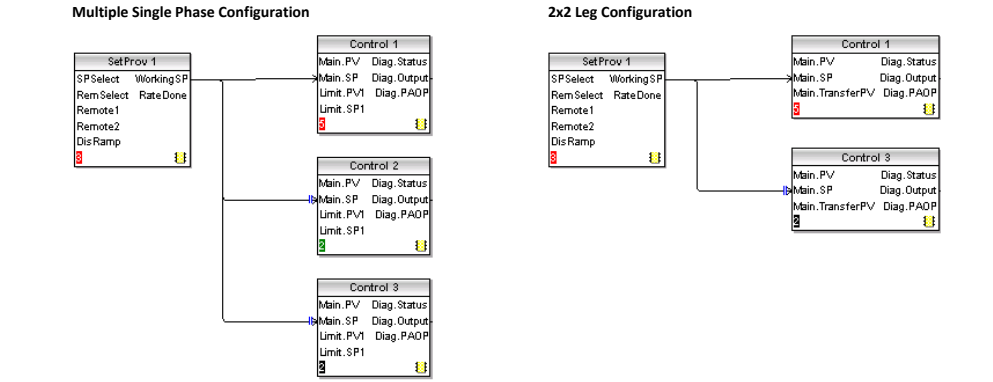
If EPower is configured via QuickStart and the functionality of the Analogue Input is not set to Setpoint then the Quick Start does not enable any of the SetProv function blocks, allowing each Control Block setpoint to be set locally.

If EPower is configured via the Graphical Wiring Editor (using iTools configuration package) then it is possible to enable all of the SetProv function blocks, allowing each Control Block to have individual setpoints either local or remote.

This flexibility has an impact on the 32h8e with regard to the availability of the Setpoint parameters and when the REM/MAN beacons should be lit.

It should be noted that it is assumed that if the user requires another source for the Control.Setpoint i.e. a user value then the user will wire the user value to one of the SetProv's remote setpoints and NOT directly to the Control's setpoint.

Setpoint Availability

Multiple Single Phase Configuration

With SetProv.1 supplying all control blocks then only the setpoint for network 1 is available on 32h8e.

With no SetProv.1 function blocks enabled then the setpoints for network 1, network 2 and network 3 are available on 32h8e.

With each network being wired from its own SetProv then the setpoints for network 1, network 2 and network 3 are available on 32h8e.

2x2 Leg Configuration

With SetProv.1 supplying both control blocks then only the setpoint for network 1 is available on 32h8e.

With no SetProv.1 function blocks enabled then the setpoints for network 1 and network 2 are available on 32h8e.

With each network being wired from its own SetProv then the setpoints for network 1 and network 2 are available on 32h8e.

Note: These diagrams show wiring within the EPower unit.

REM / MAN Beacons

The REM / MAN beacons are dependent upon which Network the currently displayed value is associated with. However, they are also dependent upon which, if any, SetProv function blocks are enabled as described below:

When displaying a Network 1 parameter

If no SetProv blocks are enabled then the MAN beacon is always lit else REM / MAN depends upon SPselect of SetProv.1

When displaying a Network 2 parameter

- If no SetProv blocks are enabled then the MAN beacon is always lit
- If 2x2Leg configuration and SetProv.1 and SetProv.3 are enabled then REM / MAN depends upon SPselect of SetProv.3
- If 2x2Leg configuration and SetProv.1 is enabled but SetProv.3 is not then REM / MAN depends upon SPselect of SetProv.1
- If single phase configuration and SetProv.1 and SetProv.2 are enabled then REM / MAN depends upon SPselect of SetProv.2
- If single phase configuration and SetProv.1 is enabled but SetProv.2 is not then REM / MAN depends upon SPselect of SetProv.1

When displaying a Network 3 parameter

- If no SetProv blocks are enabled then the MAN beacon is always lit
- If SetProv.1 and SetProv.3 are enabled then REM / MAN depends upon SPselect of SetProv.3
- If SetProv.1 is enabled but SetProv.3 is not then REM / MAN depends upon SPselect of SetProv.1
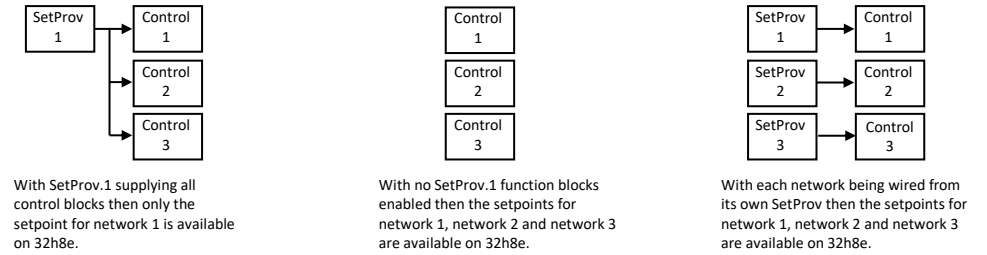
When displaying a Network 4 parameter

- If no SetProv blocks are enabled then the MAN beacon is always lit
- If SetProv.1 and SetProv.4 are enabled then REM / MAN depends upon SPselect of SetProv.4
- If SetProv.1 is enabled but SetProv.4 is not then REM / MAN depends upon SPselect of SetProv.1

Switch On

A brief start up sequence consists of all segments of the display being illuminated followed by the firmware version number and the instrument type.

Initial Configuration

If it has not previously been configured (e.g. a new instrument) it will start up showing the 'Quick Configuration' codes.

This consists of two 'SETS' of five characters `set 1` `*****` `set 2` `*****`. The upper section of the display shows the set selected, the lower section shows the five digits which make up the set.

⚠ Incorrect configuration can result in damage to the process and/or personal injury. Instrument configuration must be carried out by a competent person authorised to do so. It is the responsibility of the person commissioning the Remote Panel to ensure the configuration is correct

Adjust characters as follows:.

1. Press any button. The first character will change to a flashing '-'.
2. Press ▲ or ▼ to change the flashing character to the required code shown in the quick code tables – next section. Note: An ✕ indicates that the option is not fitted.
3. Press ↻ to scroll to the next character or ▤ to return to the first character. When all five characters have been configured the display will go to Range High and Range Low then to Set 2.

When the last digit has been entered press ↻ again, the display will show `No EXIT`

Press ▲ or ▼ to `YES EXIT` The unit will then automatically start in operator level 1.

SET 1

`K C 1 C`

Input Type		Display units		Decimal point		PV Colour Top part of display only		HOME display	
Thermocouple		C	°C	0	nnnnn	G	Green	N	PV only
B	Type B	F	°F	1	nnnn.n	R	Red	A	First Alarm SP only
J	Type J	K	K	2	nnn.nn	C	Colour change on Alarm. Green to red	1	PV + Alarm SP R/W
K	Type K	X	None	3	nn.nnn	X	Not applicable	2	PV + Alarm SP R/O
L	Type L	P	%	4	n.nnnn			I *	Current
N	Type N	0	Pa					V *	Voltage
R	Type R	1	mPa	E	%RH			P *	Power
S	Type S	2	Kpa	G	%O2			E *	Energy
T	Type T	3	Bar	H	%CO2				
C	Custom C	4	mBar	J	%CP				
RTD		5	PSI	K	V				
P	Pt100	6	Kg/cm²	L	Amp				
Linear		7	mmWG	R	mA				
M	0-80mV	8	inWG	T	mV				
2	0-20mA	9	mmHG	U	Ohm				
4	4-20mA	A	Torr	W	ppm				
0	0-10Vdc	B	L-H	Y	RPM				
1	1-5Vdc	D	L-m	Z	m-s				
3	2-10Vdc								
6	0-5Vdc								

* When I, V. P or E has been configured the selected parameter for Network 1 will be displayed following a power cycle, exit from configuration level or timeout on an indicator page.

Pressing ▤ will select the next networks V, I or P parameter (rms or average depending upon the network configuration).

Set 1 is followed with R N G . H I	Set this for the maximum display range required
Then R N G . LO	Set this for the minimum display range required

Set 2 follows these parameters	See next panel

SET 2

`H 1 X W`

OP1		OP3		OP4 (Not applicable)	Digital input A		Digital input B	
X	Unconfigured	X	Unconfigured		X	Unconfigured	X	Unconfigured
	Relay Output		Analogue Output		W	Alarm acknowledge	W	Alarm acknowledge
Alarm 1		**PV Retransmission** [3]			K	Keylock	K	Keylock
H	High alarm	1	4-20 mA		U	Remote up button	U	Remote up button
L	Low alarm	2	0-20 mA		D	Remote down button	D	Remote down button
R	Rate-of change - Rising	3	0-5 Vdc		V	Recipe 2/1 select	V	Recipe 2/1 select
N	New alarm flag	4	1-5 Vdc		J	Alarm Inhibit	J	Alarm Inhibit
O	Sensor break	5	0-10 Vdc		M	Peak Reset	M	Peak Reset
P	Power fail	6	2-10 Vdc		Y	Freeze PV	Y	Freeze PV
With sensor Break [1]								
7	High alarm							
8	Low alarm							
9	Rate-of change							
With power Fail [2]								
A	High alarm							
B	Low alarm							
C	Rate-of change							
With sensor Break and power fail [2]								
E	High alarm							
F	Low alarm							
G	Rate-of change							

Notes:-

Alarm should be set to High alarm for process alarm.

Alarm outputs are set to inverted when exiting from Quick Code. This means the alarm relay de-energises in alarm.

(1) The output relay operates when either a High alarm or Sensor Break alarm occurs.

(2)When power is restored after being removed an alarm message POWER FAIL is scrolled across the display. The relay remains relaxed in its alarm state. The relay will be re-set and the alarm message cancelled when the alarm is acknowledged.

(3)PV re-transmission is the PV of the indicator (normally process temperature).

The final press of will show `No EXIT`. Press ▲ or ▼ to `YES EXIT` The unit will then automatically start in operator level 1.

Subsequent Starts

The unit will briefly show the quick codes during start up, then proceed to **Operator Level 1**.

You will see a display similar to those shown - called the **HOME** display.

If N, A, 1 or 2 is chosen in SET 1 of the Quick Configuration Codes the HOME display will show process (e.g. furnace) related parameters.

If I, V, P or E is chosen then the HOME display will show EPower parameters. The HOME display shown here appears if V is chosen in the Quick Configuration.

`728 °C` ← Process Value (e.g. Furnace Temperature)

`273 U` `VRMS` ← Process Value (e.g. Voltage)
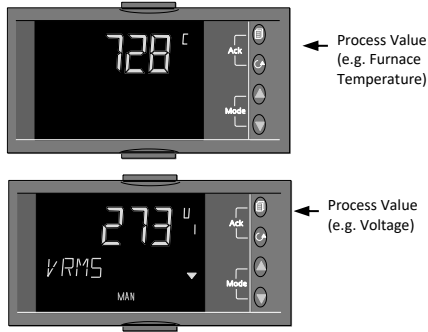
☺ Deeper access levels are available under the protection of passcodes – see following sections. If the Quick Codes do NOT appear during start up, this means that the unit has been re-configured in Configuration access level. The Quick Codes may then not be valid and are therefore not shown.

☺ The HOME display can be hidden in Configuration level – see back page ('To Hide the HOME Display').

☺ The colour of the upper display can be set in the Quick Codes to be green or red or red on alarm
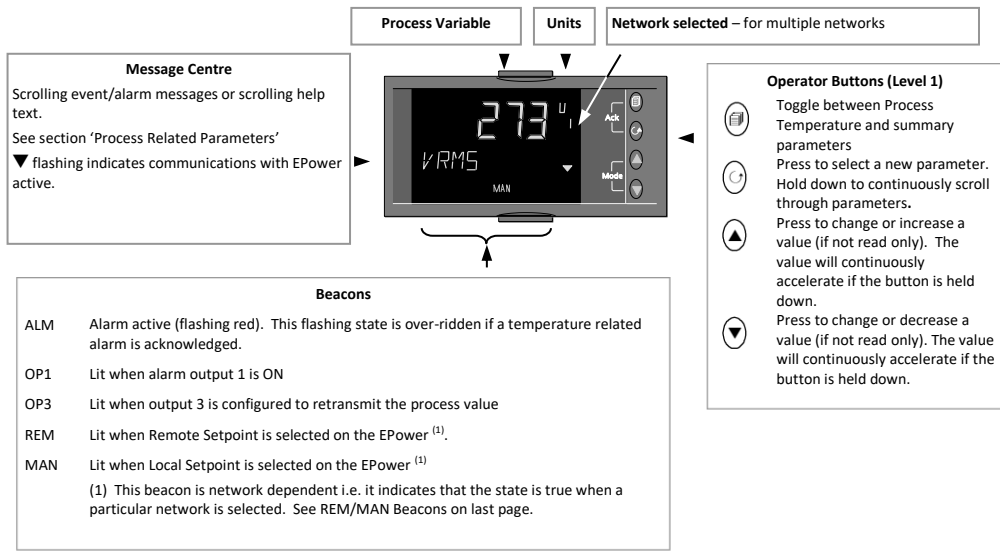
To Re-Enter Quick Code Mode

If you need to re-enter the 'Quick Configuration' mode this can always be done by powering down the unit.

Then hold ▤ button down and power the unit up again. Keep the button pressed until you are requested to enter a passcode.

Enter a passcode using the ▲ or ▼ buttons. In a new unit the passcode defaults to 4. If an incorrect passcode is entered you must repeat the whole procedure

Front panel layout

From the HOME display shown in the previous section, press ▤ to show a summary of EPower parameters.

| Process Variable | Units | Network selected – for multiple networks |

Message Centre

Scrolling event/alarm messages or scrolling help text.

See section 'Process Related Parameters'

▼ flashing indicates communications with EPower active.

`273 U` `VRMS`

Operator Buttons (Level 1)

- (▤) Toggle between Process Temperature and summary parameters
- (↻) Press to select a new parameter. Hold down to continuously scroll through parameters.
- (▲) Press to change or increase a value (if not read only). The value will continuously accelerate if the button is held down.
- (▼) Press to change or decrease a value (if not read only). The value will continuously accelerate if the button is held down.

Beacons

ALM	Alarm active (flashing red). This flashing state is over-ridden if a temperature related alarm is acknowledged.
OP1	Lit when alarm output 1 is ON
OP3	Lit when output 3 is configured to retransmit the process value
REM	Lit when Remote Setpoint is selected on the EPower [1].
MAN	Lit when Local Setpoint is selected on the EPower [1]

(1) This beacon is network dependent i.e. it indicates that the state is true when a particular network is selected. See REM/MAN Beacons on last page.

Navigation Operator Level 1 (1 to 4 Single Phase Networks)

Press ▤ to manually select between different list headings. These are:

- Process related parameters, for example furnace temperature, alarm settings, etc.
- Network related parameters (EPower Summary Parameters) for example, voltage, current power, etc. A separate list is shown for each connected network (1 to 4). The network selected (if more than 1) is shown by the number 1 to 4 to the right of the parameter value.

From the chosen heading press ↻ to step through the list of parameters shown in the message centre. The value of the chosen parameter is shown in the upper display.

When the 'Process' heading is chosen a scrolling description of the parameter mnemonic always appears once, 5 seconds after the parameter is first selected.
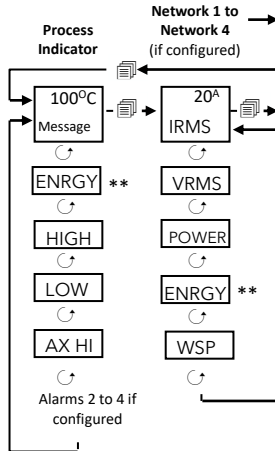
If a Network heading is chosen the scrolling message appears only if there are no alarms or events present.

Note: The first parameter shown in this list may be Current, Voltage, Power or Energy depending on how it was configured using the Quick Start Code. The example diagram shows Current.

Lists of all possible parameters are shown in following sections.

Energy parameters within the Process Indicator list refer to the Global Energy Counter in the EPower instrument.

** Energy parameters are only available if the Energy Counter feature is enabled in the connected EPower instrument.

Process Indicator → **Network 1 to Network 4** (if configured)

Process Indicator		Network 1 to Network 4
100°C Message	▤	20A IRMS
ENRGY **		VRMS
HIGH		POWER
LOW		ENRGY **
AX HI		WSP

Alarms 2 to 4 if configured

Working Setpoint

This is displayed in a network list as wsp, (depending upon configuration). It is the working setpoint currently being used by the EPower unit and may be the Local Setpoint or the Remote Setpoint derived from an analogue input or via digital communications.

Navigation Operator Level 1 and Level 2 (3 Phase Networks)

This includes 3 and 4 wire star, open delta, closed delta, 1 x 2-leg and 2 x 2-leg load configurations.

For these types of system it is necessary to also show the individual RMS values for Current and Voltage not just the average values.

The diagram shows a 2 x 2-leg configuration which comprises two networks.

For 1 x 2 leg or 3-phase configuration Network 2 is not applicable.

Press ▤ to select between list headings.

Press ↻ to scroll around the list of parameters.

Press ▲ or ▼ to raise or lower the value of the selected parameter shown in the upper part of the display.

The parameter shown in the HOME display of Network 1 or 2 is configured by the last character in SET 1 of the Quick Codes. In the example here it is configured as I (for Current).

Setpoint is edited for 3 phase networks in the same way as single phase networks as described under 'Setpoint Editing'.

Operating Level 2 parameters are described in a later section of this guide.

* Alarms are only shown if configured.

The examples shown are:

Alarm 1 High

Alarm 2 Low

Alarm 3 & 4 Rate of Change (rising or falling)

Process Indication	Operating Level	Network 1	Operating Level	Network 2	Operating Level
100°C Message		50 A1 I.AVG		55 A2 I.AVG	
ENRGY **	1	V.AVG	1	V.AVG	1
E.RST **	2	POWER	1	POWER	1
PRST	2	ENRGY **	1	ENRGY **	1
HIGH	1	WSP	1	WSP	1
LOW	1	SP.SEL	1	SP.SEL	1
A1.HI	1*	E.RST **	2	E.RST **	2
A2.LO	1*	IRMS1	1	IRMS1	1
A3.ROC	1*	IRMS2	1	IRMS2	1
A4.ROC	1*	IRMS3	1	IRMS3	1
ADDR	2	VRMS1	1	VRMS1	1
HOME	2	VRMS2	1	VRMS2	1
ID	2	VRMS3	1	VRMS3	1
REC.NO	2				
STORE	2				
UNITS	2				

** Energy parameters are only available if the Energy Counter feature is enabled in the connected EPower instrument.

Setpoint Editing

Firmware versions from V1.20 onwards include a choice of how setpoint editing is presented. This is chosen in Configuration Level using the parameter CTL.SP, CONTROL AND SETPOINT DISPLAY.

When Current, Voltage, Power or Energy is displayed, the setpoint is viewed/changed as shown below:

These examples are shown for network 2.

CTL.SP = No This presentation is the only one available up to and including version V1.10.

Step	Value	Description
	30 A2 IRMS	Network Display
From any display press ▲ or ▼	20% 2 WSP	The value of the the working setpoint is displayed.
Press ▲ or ▼ again	20% 2 SP	The value of the local setpoint is displayed.
Press ▲ or ▼ again to raise or lower the setpoint.	50 % SP	
	40 A2 IRMS %	Once the edit is confirmed, or no edit has taken place, the display reverts to the parameter originally being viewed.

CTL.SP = yes

Step	Value	Description
	30 A2 WSP	Network Display
From any display press ▲ or ▼	20% 2 WSP	The value of the working setpoint is displayed.
Press ▲ or ▼ again	20% 2 SP	The value of the local setpoint is displayed.
Press ▲ or ▼ again to raise or lower the setpoint.	50% SP	
	40 A2 WSP 50%	Once the edit is confirmed, or no edit has taken place, the display reverts to the parameter originally being viewed.

Auto Scrolling

Auto scrolling is active if it has been configured in Configuration level – see last page ('To Turn On Auto-scrolling'). It allows the power related parameters (see previous page) to be continuously selected in turn. If EPower has one single phase, one 2leg network or a 3phase network then auto scrolling will be performed horizontally as if the 'Scroll' key had been pressed as seen in the diagram below:

If EPower has multiple Networks then auto scrolling will be performed vertically changing the Network but keeping the focus on the parameter type as seen in the diagram below:
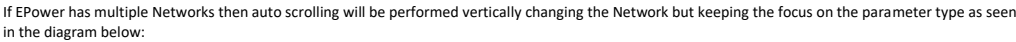
Note:- if the next parameter in the scroll (in either auto-scrolling method) is not available, the scroll will continue to the next + 1 parameter.

The duration between scrolls can be configured as OFF, 5, 10, 30 seconds. See 'To Turn On Auto-scrolling'.

Individual RMS values in a 3Phase Configuration

These RMS values are available in Network 1 (3 Phase and 2 Leg) and Network 2 (2x2Leg) in Level 1 and Level 2 and will be part of the normal navigation as shown below:

It should be noted that these RMS parameters are NOT included in the auto-scrolling.

Alarm Indication

Up to four alarms can be configured (in configuration level). Each alarm may configured as High, Low, Rising or Falling Rate of Change.

If any alarm occurs, the red ALM beacon will flash, any output attached to the alarm will operate and a scrolling text message will describe the source of the alarm, for example **A L A R M 1 H I G H , M I S S M A I N S** , etc.

If the display is configured for red on alarm (Quick Code C) the PV will also flash when an alarm occurs.

Alarm acknowledgement

Press 🖥 and ↻ (Ack) together.

A global acknowledge of EPower alarms takes place when either the indicator HOME page is selected or when on the EPower HOME page (Network 1 Irms or Iavg) AND the indicator HOME page is hidden.

The action of this button depends on the source of alarm, as follows:-

EPower Alarm

The alarm indication in the EPower controller only is acknowledged – it is still indicated in 32h8e.

Temperature (Process) Alarm

The alarm beacon and flashing display become steady. Any output attached to the alarm remains active.

EPower Plus Temperature (Process) Alarm

The alarm beacon and flashing display become steady. Any output attached to the alarm remains active.

However, if the temperature alarm disappears and the EPower alarm is still active then the 32h8e display resumes flashing.

By default alarms are configured as non-latching, de-energised in alarm. The alarm indication in 32h8e is only reset if the alarm condition disappears. If you require latched alarms, please refer to the Engineering Handbook HA029006.

Sensor Break Indication

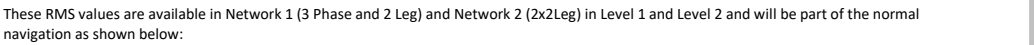An alarm condition (S.br) is indicated if the sensor or the wiring between sensor and indicator becomes open circuit or over range.

For a PRT input, sensor break is indicated if any one of the three wires is broken.

For mA input sensor break will not be detected due to the load resistor connected across the input terminals.

For Volts input sensor break may not be detected due to the potential divider network connected across the input terminals.

EPower Event/Alarm Messages
For further information on EPower alarms see EPower User Guide HA179769.

These messages are generated in EPower and are available in the Remote Panel as a fixed set of scrolling messages as follows:

Message	Description
MISS MAINS	Supply power is missing to the relevant power module.
THYR SC	A thyristor short circuit leads to current flowing even when not firing.
OPEN THYR	No current flows even when the thyristor(s) should be firing.
FUSE BLOWN	High speed thyristor fuse failed on one or more phases.
OVER TEMP	Thyristor heat sink temperature exceeds limits and firing is inhibited. The heat sink must cool below a set hysteresis limit before firing can re-commence.
VOLT DIPS	This detects a reduction in supply voltage. The threshold is set in EPower by the user.
FREQ FAULT	Supply frequency out of limits (47 to 63 Hz). Firing stops until the frequency is within acceptable limits.
PB 24V	The 24V supply rail in the power module has failed. Firing stops and does not re-start until the fault is rectified.
TLF	Load open circuit or not connected to one or more power controllers.
CHOP OFF	This alarm is triggered when the load current meets or exceeds the threshold for more than 5 seconds. Firing stops. Firing will not re-start until the alarm is acknowledged or will restart after 100 ms depending on how it is configured in EPower. The threshold is set in EPower between 100% and 150% of the nominal load current.
PLF	This alarm detects a static increase in load impedance over a mains cycle in phase angle firing mode and over the burst period for burst and logic firing. The sensitivity of the measurement can be set in EPower up to six parallel load elements are open circuit (all elements must have the same characteristics and impedance values).
PLU	Partial load unbalance applies only to three phase systems and occurs when the difference between maximum and minimum current of the three phase system exceeds the threshold as a percentage of the nominal current supplied by the power module. The alarm can be detected between 5 and 50%.
VOLT FAULT	One or more phases not present or out of limits set in EPower.
PRE TEMP	This alarm acts as a warning that unexpectedly high operational temperatures have been reached. The warning becomes active before unit operation stops.
PMOD WDOG	The relevant power module PIC microprocessor has performed a watchdog reset.
PMOD COM ERR	Power module communications error
PMOD T OUT	Power module communications timeout
CLOSED LP	The control loop cannot achieve setpoint despite the loop demanding 100% or 0% power. This is normally due to an external constraint in the load.
OUT FAULT	Same as Output short circuit alarm in EPower. Indicates a short circuit is detected in the output circuit. Firing is stopped.

Operator Level 2

Level 2 provides access to additional parameters. It is protected by a security code (2 by default).

To Enter Level 2

1. From any display press and hold 🖥.
2. After a few seconds the display will show: **LEu1 GOTO**
3. Release 🖥 (If no button is pressed for 45 seconds the display returns to the HOME display)
4. Press ▲ or ▼ to choose Lev 2 (Level 2)
4. After 2 seconds the display will show: **LEu2 GOTO 0 CODE**
5. Press ▲ or ▼ to enter the pass code. Default = '2'

If an incorrect code is entered the indicator reverts to Level 1

To Return to Level 1

1. Press and hold 🖥 **2 CODE**
2. Press ▲ or ▼ to select LEv 1

The indicator will return to the Level 1 HOME display. Note: A pass code is not required when going from a higher level to a lower level.

Level 2 Parameters

In the HOME display, press ↻ to step through the list of parameters, as in Level 1. The mnemonic of the parameter is shown in the message centre and after five seconds a scrolling text description of the parameter appears. Hold ↻ down to continuously scroll.

The value of the parameter is shown in the upper display. Press ▲ or ▼ to adjust the value. If the value is read only ----- will be displayed.

If no key is pressed for 30 seconds the indicator returns to the HOME display.

Backscroll is achieved when you are in this list by repeatedly pressing ▲ while holding down ↻.

To return to the HOME display at any time press 🖥.

The table below shows a list of parameters available in the Process List in Level 2.

Errors

There are several additional errors that are indicated. These are:

Communication Errors:

Modbus master transactions between EPower and the 32h8e fail / timed out.

Configuration Error:

The number of power modules is 0, not able to show Current, Voltage or Power values.

EPower Errors

At least one Fatal Error, Config Error or Standby Error has been reported by the EPower instrument.

These errors are indicated by the way of a blinking message on the top display when on the HOME page or on an EPower Page.

The messages for the above errors respectively are: **Com.Er   EP.CnF   EP.Er**

Recipes

It is possible to store operating values in up to five different recipes by taking a snapshot of the current settings and storing these in a recipe number. Examples, of typical operating parameters may be alarm setpoint values. A particular recipe number may then be recalled for a particular process.

To Store Values in a Recipe

1. In the list of parameters, press ↻ to select store
2. Select a recipe number from 1 to 5 in which to store the current settings. The indicator will show done when the values are stored. All previous values which may have been stored in this recipe are overwritten.

To Load a Recipe

1. In the list of parameters, press ↻ to select rec.no
2. Select a recipe number from 1 to 5 in which the required settings have been stored. The values will automatically loaded from the recipe. If no values have been stored in that recipe faiL will be indicated.

Level 2 Parameter List – Process Parameters.

Mnemonic	Scrolling Display and description
PRST	**PEAK RESET.** Select On to reset the HIGH and LOW peak values. The display automatically returns to OFF
HIGH	**PEAK HIGH.** This is the highest reading that the indicator has recorded since switch on or since it was reset. Read only
LOW	**PEAK LOW.** This is the lowest reading that the indicator has recorded since switch on or since it was reset. Read only
A X ----	**ALARM X SETPOINT.** Alarm threshold, alterable in Level 2. X = alarm 1, 2, 3 or 4 ---- = the type of alarm configured. For example High (Hi), Low (Lo), Rate of change (ROC).
ADDR	ADDRESS Digital communications address for the instrument. 1 to 254
HOME	HOME DISPLAY. This configures the parameter which will be displayed in the HOME display in normal operation. PV = Process variable; aLm = Alarm setpoint; pv.aL = PV + Alarm SP; p.a.ro = PV + Alarm SP read only Ep.1 = Current; Ep.v = Voltage; Ep.p = Power
ID	CUSTOMER ID Customised instrument identification number	0 to 9999
REC.NO	CURRENT RECIPE NUMBER. The recipe currently in use. See also section 'Recipes'. None = No recipe; 1 – 5 = 1 to 5 selected; FaiL = Recipe not saved
STORE	RECIPE TO SAVE. See also section 'Recipes'. none = Do not save a recipe; 1 – 5 = 1 to 5; done = Recipe saved
UNITS	DISPLAY UNITS are shown in the top right hand corner of the display in normal operation. Units available are:

°C	° C	°F	° F	°k	Kelvin		
none	No units displayed	Perc	Percentage	pa	Pascals	mpa	Mpascals
kpa	Kpascals	bar	Bar	mbar	milli Bar	psi	PSI
kgcm	kg/sq cm	mmwg	mm water gauge	inwg	Inches water gauge	mmhg	mm mercury
torr	Torr	L-H	Litres per hour	L-m	Litres per minute	p.rh	%Relative humidity
p.O 2	% O2	p.CO2	% CO2	P.CP	% carbon potential	VoLt	Volts
Amp	Amps	ma	milli amps	mV	milli volts	Ohm	Ohms
ppm	Parts per million	rpm	Revs per minute	m-s	milli seconds	SEC	Seconds
min	Minutes	hrs	Hours	PH	Ph	P.PH	% Ph
mPH	Miles per hour	mG	milli grams	GrAm	Grams	kG	Kilo grams

Level 2 Parameter List – Network Parameters

Mnemonic	Scrolling Text *. Description
IRMS	**CURRENT RMS.** Either Irms or IrmsAverage load current depending upon network type. Units - Amps
VRMS	**VOLTS RMS.** Either Vrms or VrmsAverage load voltage depending upon network type. Units - Volts
POWER	**TRUE POWER.** Either P or PBurst depending upon firing mode of the network. Units – Watts or KW.
ENRGY	**ENERGY.** User Energy Total available only if Energy Counter is enabled in EPower, value is displayed in Energy Units which are dynamic and can be: WH, 10 WH, 100 WH, KWH, 10 KWH, 100 KWH, MWH, 10 MWH, 100 MWH, GWH.
WSP	**SETPOINT.** Current setpoint being used by EPower. See panel above.
SP	This is the setpoint for the network in use. It can be edited via the remote panel with the value either directly setting the Control.Setpoint if EPower's SetProv function block is not enabled, or setting the Local setpoint of the SetProv function block if it is enabled and its SPSelect parameter is set to Local. Units - % or Engineering units. If the range is more than 99999 the setpoint is displayed as nnn.n K (K = Kilo). For example, 100,000 = 100.0K and 1,000,000 = 1000.0K.
SP.SEL	**SP SELECT.** Available only in level 2 (see also section 'Operator Level 2') and if the associated SetProv function block in EPower is enabled, allowing the user to select between local (LSP) and remote setpoint (rsp).
E.RST	**ENERGY RESET.** Available only in level 2 and Energy Counter is enabled in Epower. User Energy Total can be reset.
IRMS1,IRMS2,IRMS3	**CURRENT RMS 1 (2** or **3).** RMS load current phases 1 to 3.
VRMS1,VRMS2,VRMS3	**VOLTAGE RMS 1 (2** or **3).** RMS load voltage phases 1 to 3.
I.AVG	**I AVERAGE.** Average current
V.AVG	**V AVERAGE.** Average voltage

* The scrolling help message for the currently displayed parameter is only shown if no event/alarm messages are active.

If EPower has multiple Networks then the network number (1 - 4) will be displayed on the right hand side under the parameter units. This is to ensure that the user can see which network the currently displayed parameter relates to, even when a message (event, alarm or help text) is being displayed.