EH-HMI

Hitachi Operator Panels

Installation Guide

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EH-HMI
Hitachi Operator Panel
Installation Guide
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The contents of this manual have been checked for correctness and conformance to the described equipment. Nevertheless, it is not possible to guarantee the absence of possible discrepancies. The contents of the manual are checked on a regular basis and any necessary corrections are introduced in succeeding versions.

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CONTENTS

INTRODUCTION

This Installation Guide describes the main features of the EH-HMI operator panels. The Guide refers to the following models:

EH-TD10	Text display with 4x20 characters, LCD display
EH-OP05	Operator panel with 4x20 characters, LCD graphic display
EH-OP10	Operator panel with 8x40 characters, LCD graphic display
EH-OP20	Operator panel with 16x40 characters, LCD graphic display
EH-OP30	Operator panel with 16x40 characters, color graphic display
EH-TP10	Touch panel with 320x240 pixel and LCD graphic display
EH-TP20	Touch panel with 320x240 pixel and color graphic display
EH-TP25	Touch panel with TFT VGA color graphic display
EH-TP30	Touch panel with monochrome VGA graphic display
EH-TP40	Touch panel with VGA color graphic display
EH-TP50	Touch panel with TFT VGA color graphic display
EH-TP60	Touch panel with TFT SVGA color graphic display

The products have been designed for installation in an industrial environment in compliance with the regulations:

Emitted interference	EN 50081-2, 1993
Noise Immunity	EN 50082-2, 1994

In compliance with the above regulations the products are CE marked.

Product Identification

The product may be identified through a plate attached to the rear cover. You will have to know the type of unit you are using for correct usage of the information contained in the guide.
An example of this plate is shown in the figure below:

EH-OP10	product model name
09/99	month/year of production
08034 46132	serial number
H/W V.	hardware version of the product
S/W V.	software version of the product

TECHNICAL SPECIFICATIONS

Power supply voltage	DC 18 - 30 V
Power consumption	(1)
Back-up battery [(1)]	3 V Lithium, not rechargeable, life about 1 year, user replaceable, model: Duracell DL2430
Fuse	Overcurrent protection device (except the models EH-OP20, EH-OP30, that are equipped with a 2 A T user replaceable)

Environmental conditions

Operating temperature	0 ÷ +50 °C	IEC 68-2-14
Storage temperature	-20 ÷ +70 °C	IEC 68-2-14
Operating and storage humidity	5 ÷ 95 % RH non-condensing	IEC 68-2-3
Vibrations	10 ÷ 57 Hz, 0,075 mm peak 57 ÷ 500 Hz, 1 g	IEC 68-2-6
Shock	50 g, 11 ms, 3 pulses per axis	IEC 68-2-27
Protection class	IP65 front panel [(2)]	IEC 529
Keyboard reliability	> 3 million operations	
Touch screen technology	Resistive	
Touch screen reliability	> 1 million operations	

Electromagnetic Compatibility (EMC)

Emitted interference	Class A	EN 55011
Immunity to radiated radiofrequency electromagnetic field	80 MHz ÷ 1 GHz, 10 V/m 900 MHz, 10V/m	ENV 50140 ENV 50204
Immunity to conducted disturbances inducted by radiofrequency field	0.15 ÷ 80 MHz, 10 V	ENV 50141
Fast transient	2 KV power supply 1 KV signal lines	EN 61000-4-4
Electrostatic discharge	8 KV in air	EN 61000-4-2

PC/Printer Port[1]	RS-232 connector D-sub 15 pin female 300 - 38400 baud
PLC Port	RS-232, RS-422, RS-485, C.L. 20 mA (active), connector D-15 pin male 300 - 38400[1] baud
AUX Port	connector D-9 pin female (functionality can be configured with an optional communication module)
User memory	(1)
Recipe memory [1]	16 KB / 32 KB RAM with back-up battery
Hardware clock [1]	Clock/Calendar with back-up battery
Alarms [1]	256/1024
Historical event list [1]	last 256/1024 events with back-up battery
Programming software	EH-VIEW

Notes:
(1)   Feature depends on the panel model; see Table 1 below.
(2)   All the installation instructions described in the chapter 'Installation Environment' must be followed in detail.

Model	EH-TD10	EH-OP05	EH-OP10
Display	4x20 LCD	4x20 LCD	8x40 LCD
Colors	Mono	Mono	Mono
Graphics		120x32	240x64
Display dimensions (mm)		70x21	127x34
Diagonal (inches)	-	-	-
Character height (mm)	5	-	-
User memory	512KB	512KB	512KB
(applications + protocol)	(448+64)KB	(448+64)KB	(448+64)KB
User memory expansion	-	up to 1024KB	up to 1024KB
Function keys	4	12	23
System keys	7	23	24
Touch screen	-	-	-
User LED's	4	12	24
System LED's	4	4	4
PC/Printer Port	-	YES	YES
PLC Port	YES	YES	YES
AUX Port	YES	YES	YES
Programming speed	9600	9600-38400	9600-38400
Battery	-	YES	YES
Recipe memory	-	16KB	16KB
Alarms	256	1024	1024
Event list	-	256	256
Hardware clock	-	YES	YES
Downloadable characters	8	256	256
Screen saver	-	-	-
Buzzer	-	-	-
Max power consumption on 24VDC (mA)	250	300	400
Dimensions WxHxD (mm)	149x109x65	141x176x74	220x176x76
Max panel thickness (mm)	5	5	5
Weight (Kg)	0.9	1.1	1.2

Table 1 - EH-HMI Technical Data

Model	EH-OP20	EH-OP30	EH-TP10
Display	¼ VGA LCD	¼ VGA STN	¼ VGA LCD
Colors	Mono	16	Mono
Graphics	320x240	320x240	320x240
Display dimensions (mm)			
Diagonal (inches)	5.6″	5.6″	5.6″
Character height (mm)	-	-	-
User memory (applications + protocol)	8MB	8MB	8MB
User memory expansion	-	-	-
Function keys	33	33	-
System keys	24	24	-
Touch screen	-	-	YES
User LED's	24	24	-
System LED's	4	4	4
PC/Printer Port	YES	YES	YES
PLC Port	YES	YES	YES
AUX Port	YES	YES	YES
Programming speed	9600-38400	9600-38400	9600-38400
Battery	YES	YES	YES
Recipe memory	32KB	32KB	32KB
Alarms	1024	1024	1024
Event list	256	256	1024
Hardware clock	YES	YES	YES
Downloadable characters	256	256	256
Screen saver	YES	YES	YES
Buzzer	-	-	-
Max power consumption on 24VDC (mA)	600	600	600
Dimensions WxHxD (mm)	275x220x79	275x220x79	187x147x88
Max panel thickness (mm)	5	5	5
Weight (Kg)	1.9	1.9	1.4

Table 1 - EH-HMI Technical Data

EH-TP20	EH-TP25	EH-TP30	EH-TP40	EH-TP50	EH-TP60
¼ VGA STN	VGA TFT	VGA LCD	VGA STN	VGA TFT	SVGA TFT
16	256	Mono	16	256	256
320x240	640x480	640x480	640x480	640x480	800x600
5.6″	8.4″	9.6″	10.4″	10.4″	12.1″
-	-	-	-	-	-
8MB	8MB	8MB	8MB	8MB	8MB
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
YES	YES	YES	YES	YES	YES
-	-	-	-	-	-
4	4	4	4	4	4
YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES
9600-38400	9600-38400	9600-38400	9600-38400	9600-38400	9600-38400
YES	YES	YES	YES	YES	YES
32KB	32KB	32KB	32KB	32KB	32KB
1024	1024	1024	1024	1024	1024
1024	1024	1024	1024	1024	1024
YES	YES	YES	YES	YES	YES
256	256	256	256	256	256
YES	YES	YES	YES	YES	YES
-	-	-	-	-	-
600	900	700	700	900	1100
187x147x88	262x197x88	287x232x88	287x232x88	287x232x88	337x267x88
5	5	5	5	5	5
1.4	2.0	2.5	2.5	2.5	3.0

Table 1 - EH-HMI Technical Data

INSTALLATION

EH-HMI panels are designed to be mounted on the front of some type of enclosure. The bezel height, bezel width and the cut-out dimensions for each panel type are given in the following pages.

Note: Remove the red BATTERY PROTECTION strip before installation

Physical Dimensions

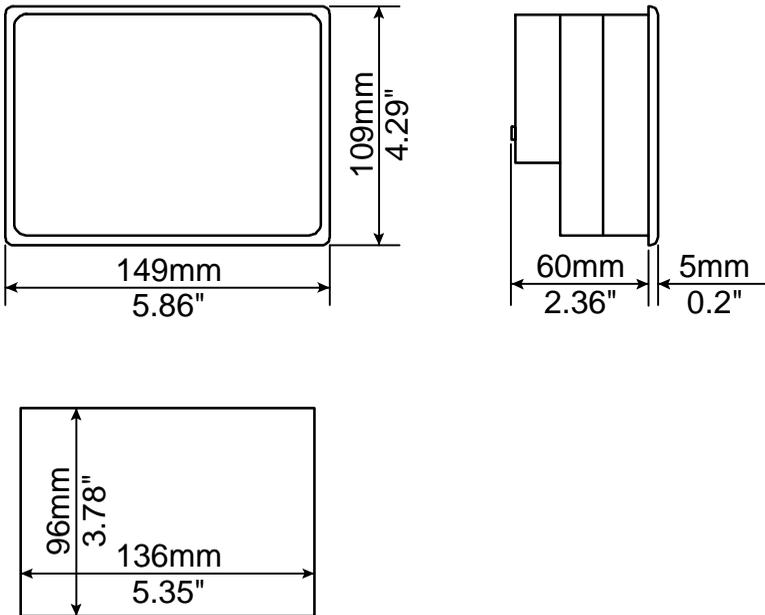All measurements are given in mm, with tolerance ±0.5.
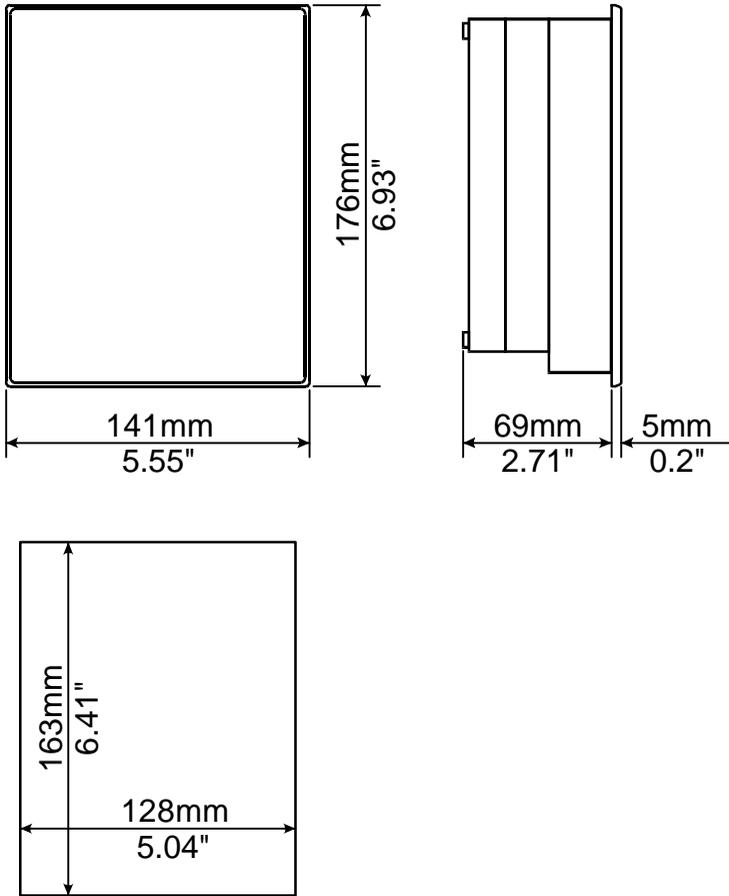
EH-TD10

Figure 1 - Dimensions
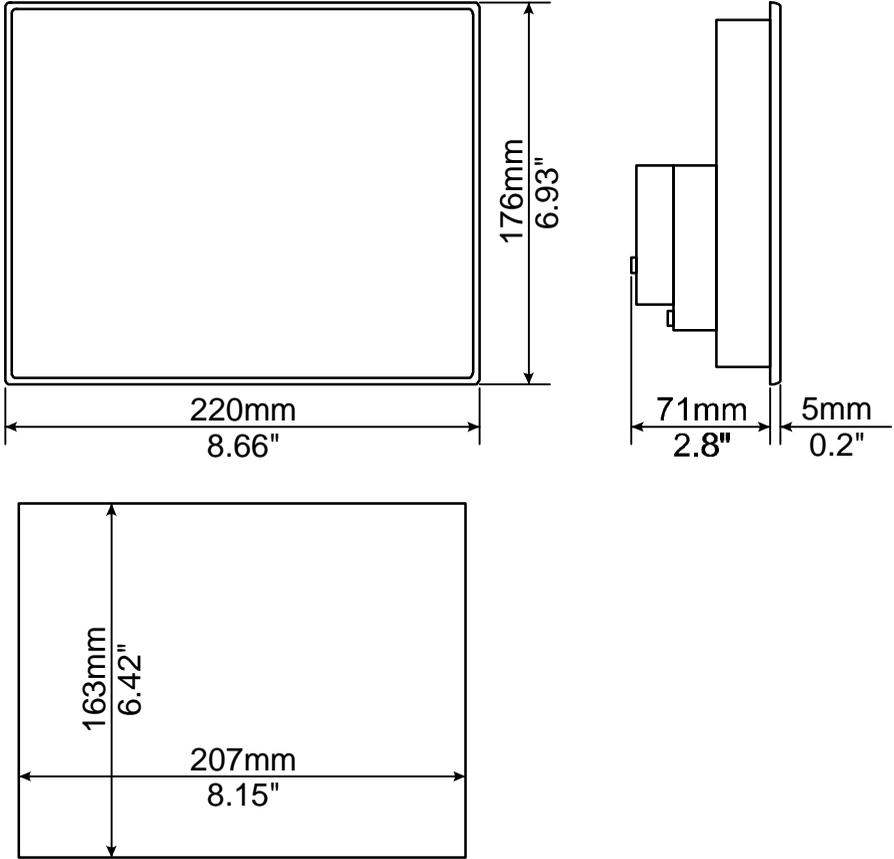
EH-OP05

Figure 2 - Dimensions

EH-OP10

Figure 3 – Dimensions

EH-OP20, EH-OP30

220mm
8.66"

275mm
10.83"

74mm
2.91"

5mm
0.2"

207mm
8.15"

262mm
10.31"
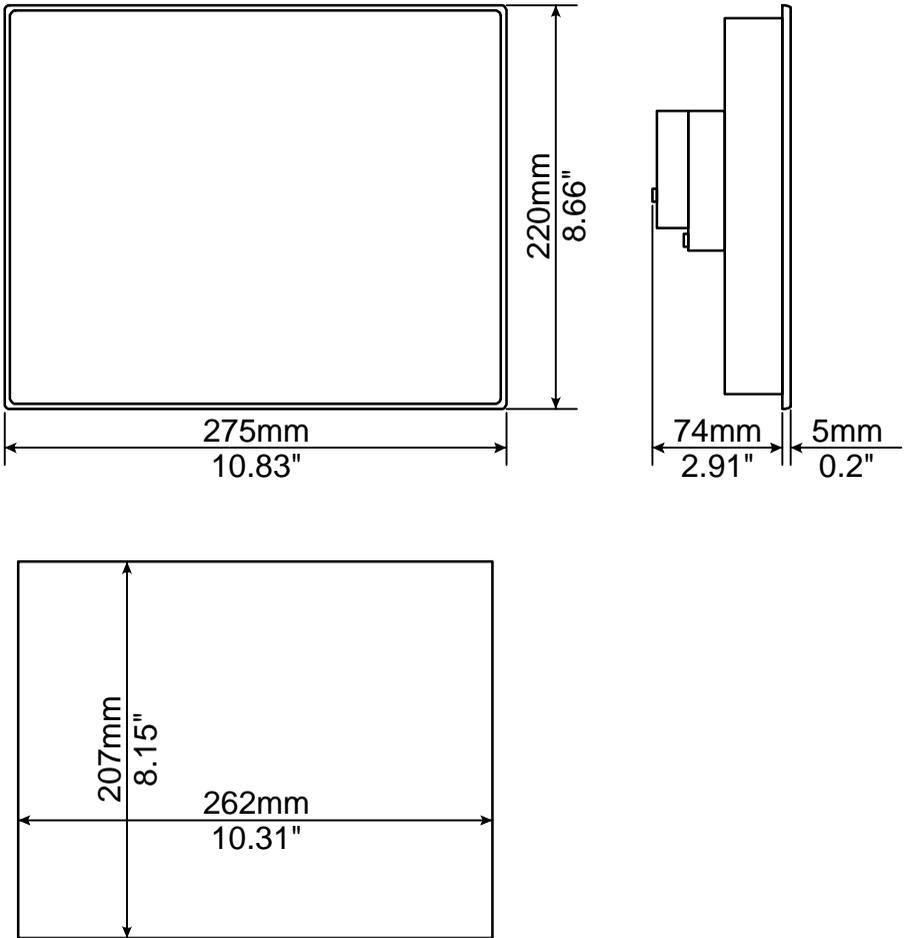
Figure 4 – Dimensions

EH-TP10, EH-TP20

147mm
5.79"

187mm
7.36"

84mm
3.31"

4mm
0.16"

136mm
5.35"

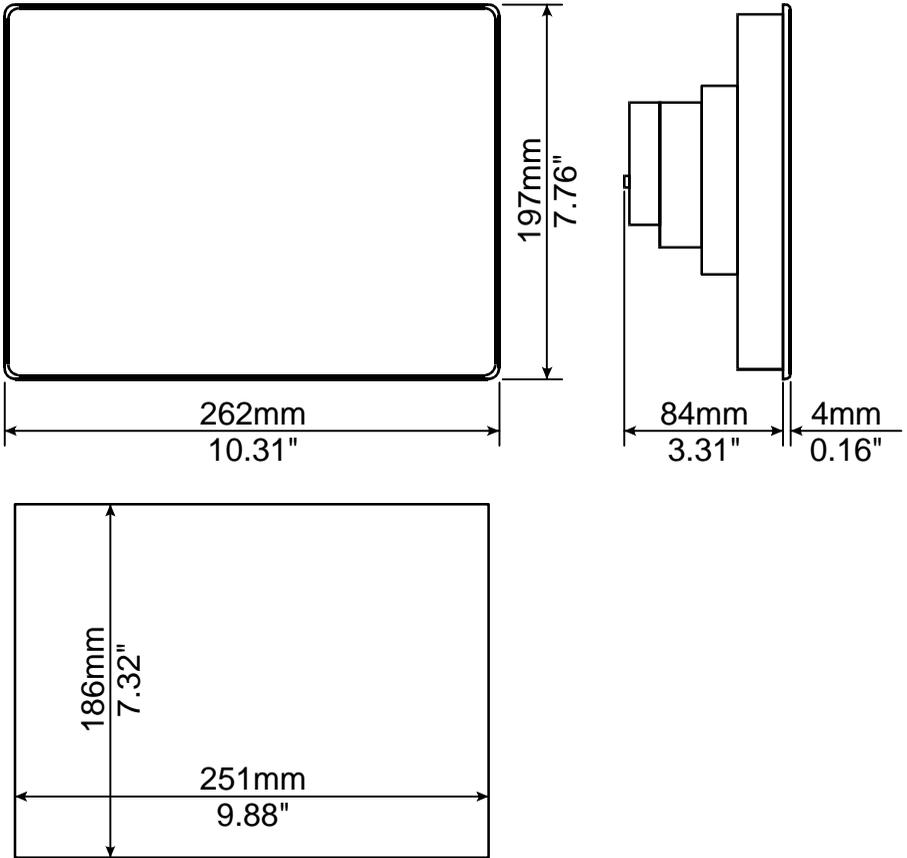176mm
6.93"
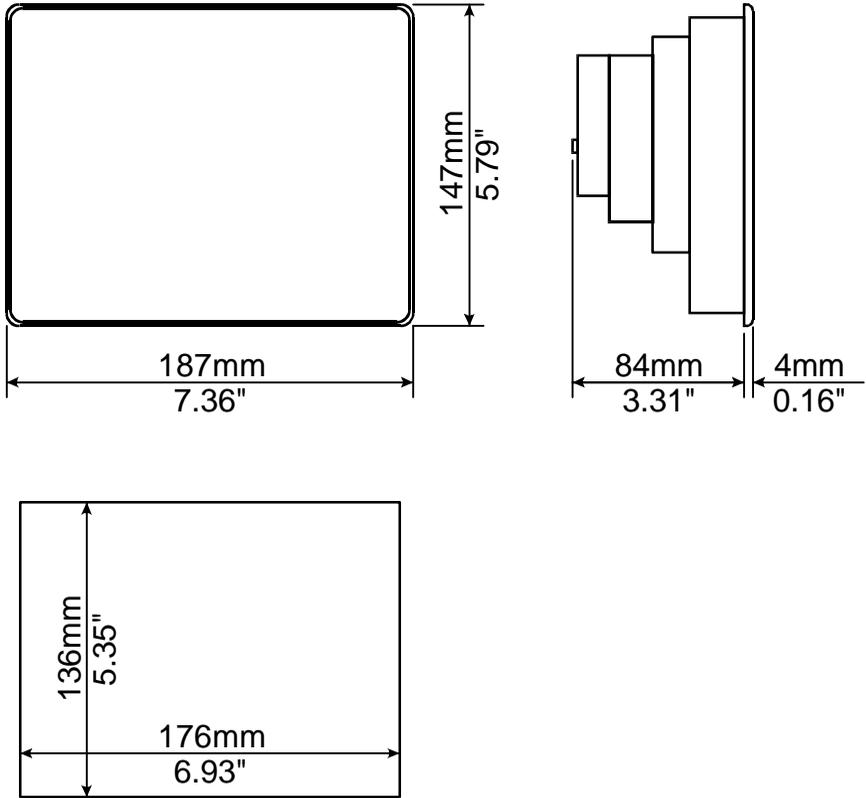
Figure 5 - Dimensions

EH-TP25

Figure 6 - Dimensions

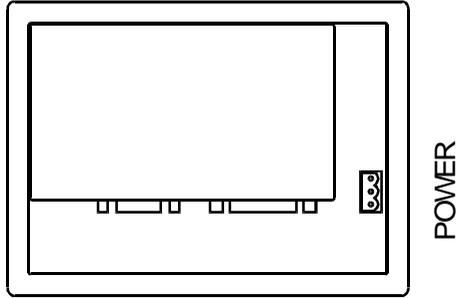**EH-TP30, EH-TP40, EH-TP50**
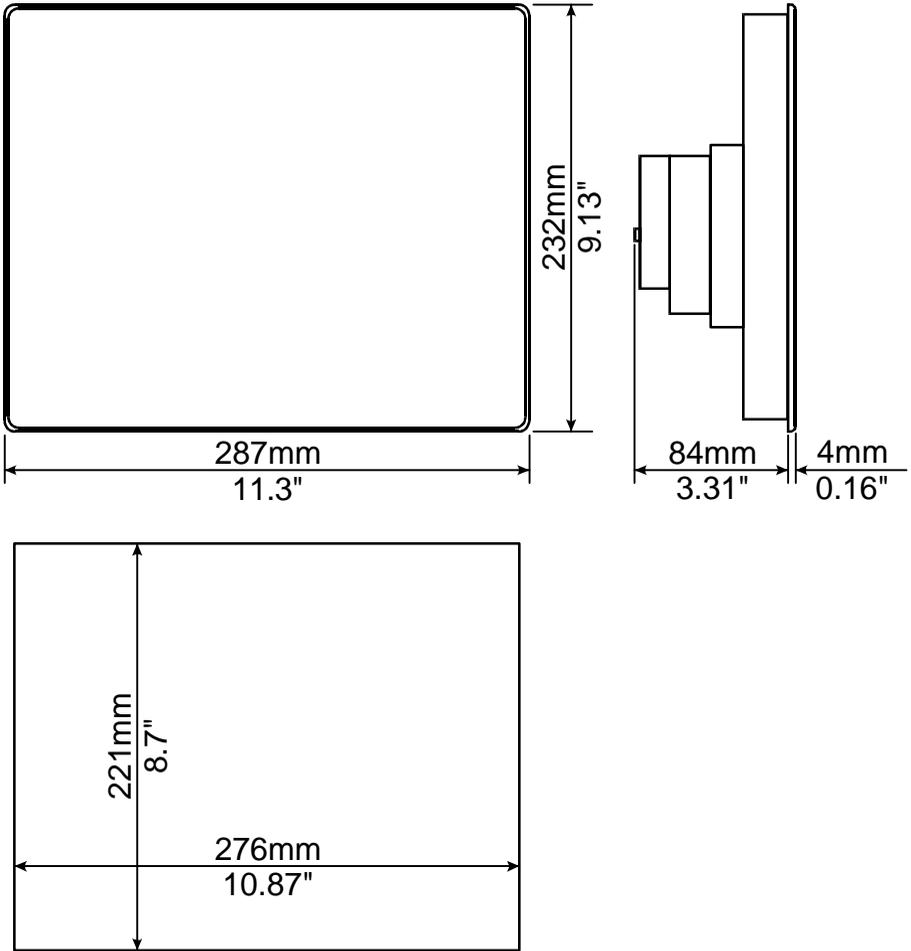
Figure 7 - Dimensions

EH-TP60
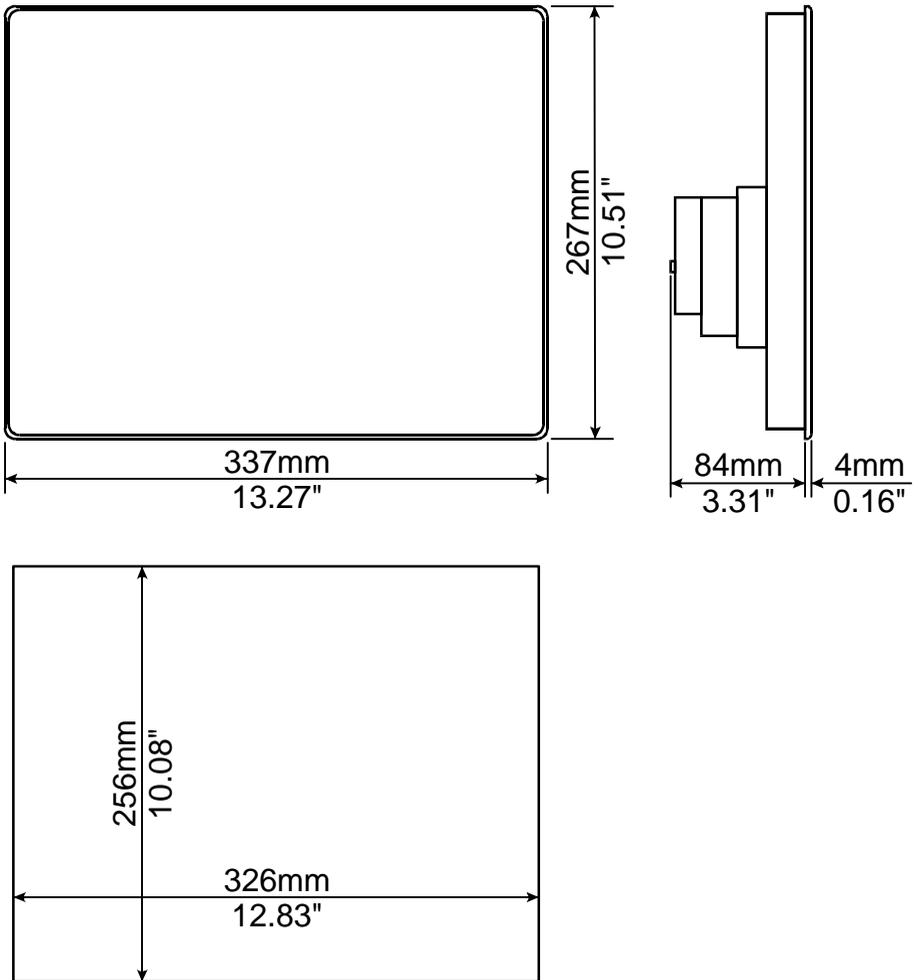
Figure 8 - Dimensions

Connections

EH-TD10

POWER

AUX PORT   PLC PORT

Figure 9 - Connectors

EH-OP05

PC/PRINTER PORT

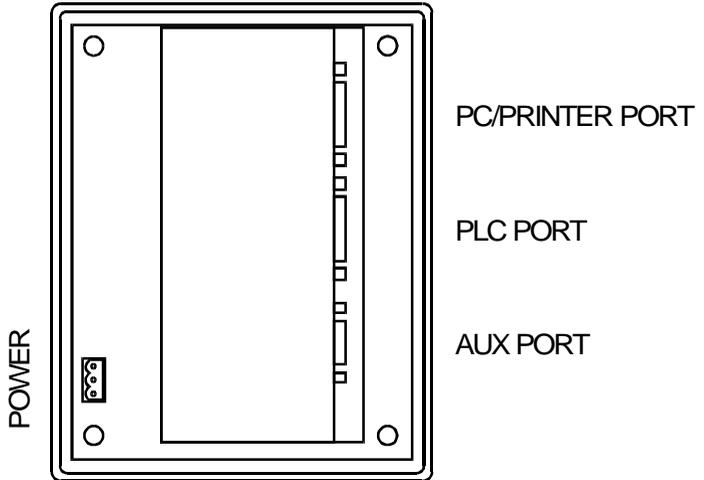PLC PORT

AUX PORT

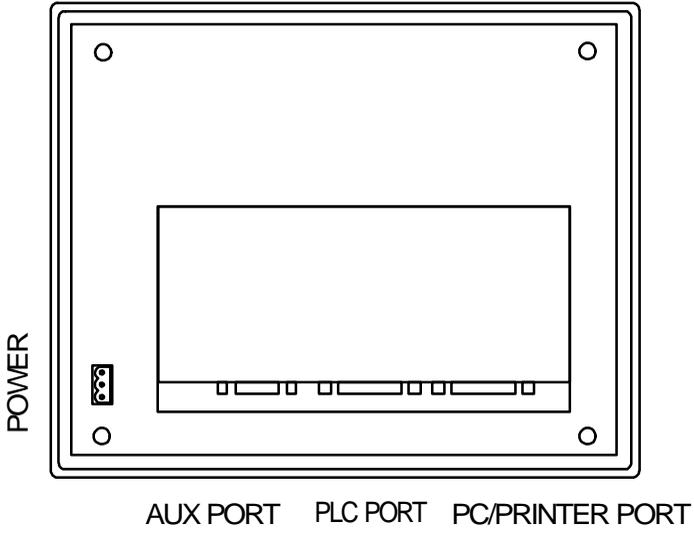POWER

Figure 10 - Connectors

EH-OP10

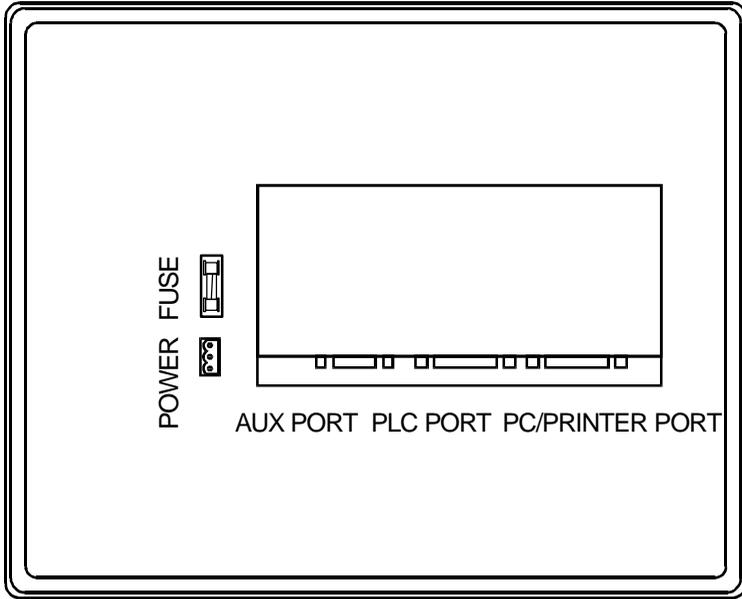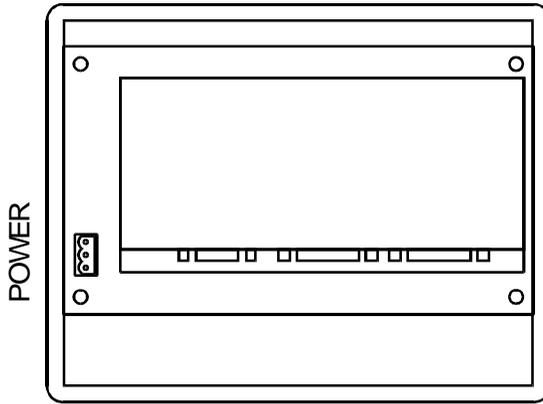Figure 11 – Connectors

EH-OP20, EH-OP30

Figure 12 - Connectors

EH-TP10, EH-TP20

AUX PORT   PLC PORT PC/PRINTER PORT

Figure 13 – Connectors

EH-TP25

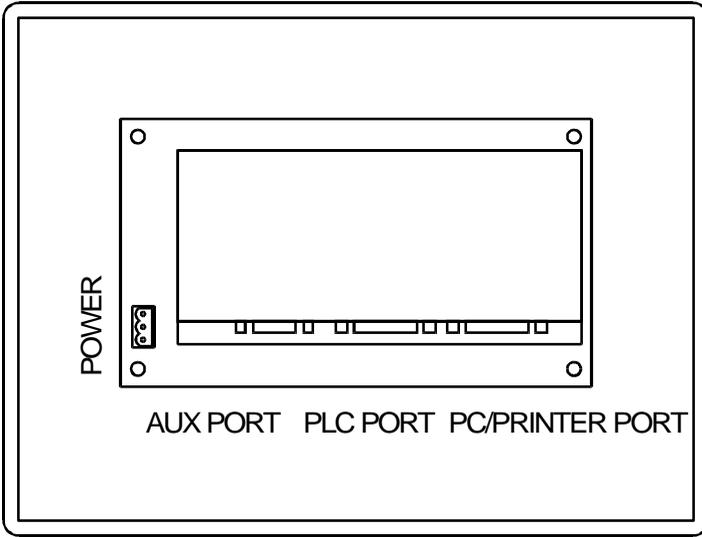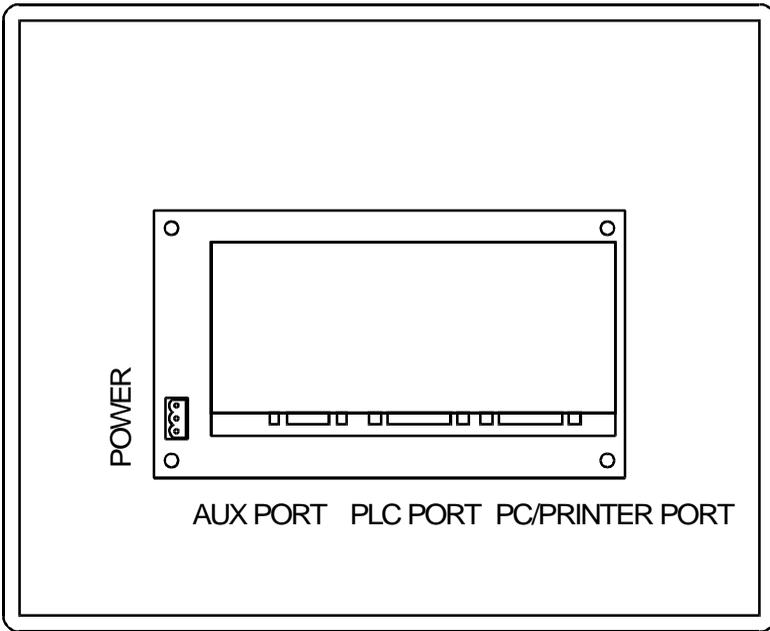Figure 14 – Connectors

EH-TP30, EH-TP40, EH-TP50

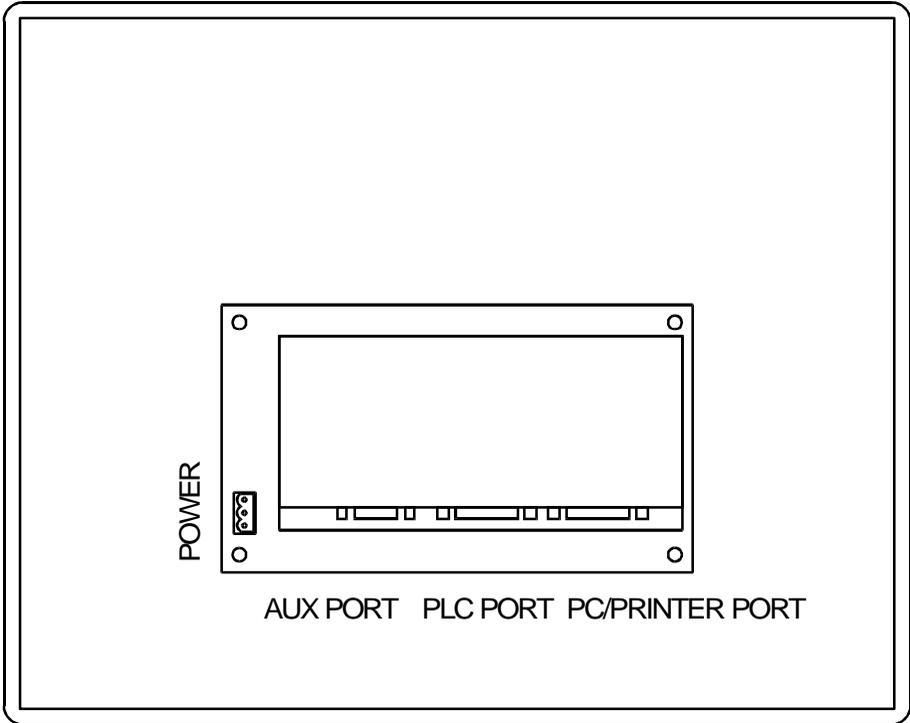Figure 15 - Connectors

EH-TP60

Figure 16 – Connectors

Power Supply and Grounding

The power supply terminal block is shown in the figure below. The terminal block is included with the panel.
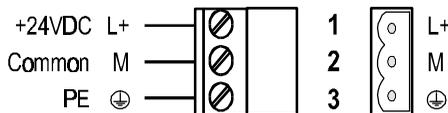

Figure 17 - Power supply terminal block

Note: Ensure that the power supply has enough power capacity for the operation of the equipment.

The unit must always be grounded to protection earth (PE). Grounding helps limit the effects of noise due to electromagnetic interference on the control system.

Earth connection will have to be done using either the screw or the faston terminal located near the power supply terminal block. A yellow label helps identify the ground connection. Also connect to ground the terminal 3 on the power supply terminal block.

The power supply circuit may be floating or grounded. In the latter case, connect to ground the power source common as shown in figure 18 with a dashed line.

When using the floating power scheme, note that the panels internally connect the power common to ground with a 1 MΩ resistor in parallel with a 10 nF capacitor.

The power supply must have double or reinforced insulation.

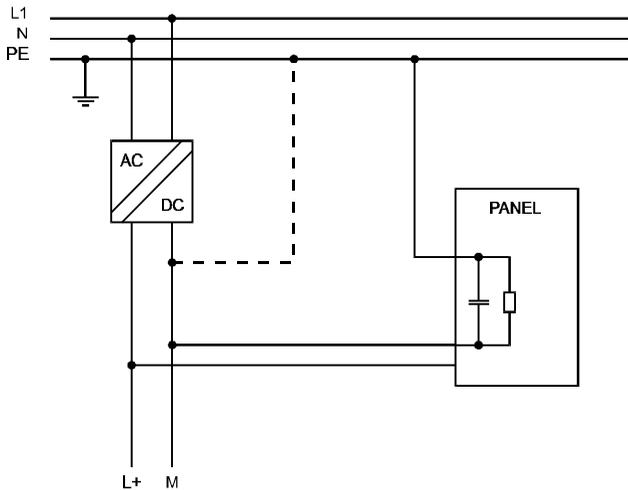The suggested wiring for the power supply is shown in figure 18.

Figure 18 - Power supply

All the electronic devices in the control system must be properly grounded. Grounding must be performed according to applicable regulations.

PLC Port

The PLC Port is used to communicate with the PLC or with another type of controller; if the panel is configured as a UniNET client, then this port may be used for the network connection.

Different electrical standards are available for the signals in the PLC port connector: RS-232, RS-422, RS-485 or Current Loop 20 mA. The cable used selects the appropriate signals. It is always necessary to use the correct cable type for the PLC to be connected.

Note: Without the proper cable, communication with the PLC will not be possible.

The connector is a D-15 pin male. Pin assignment is shown in the table below.

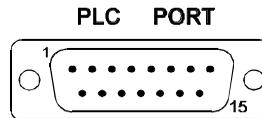| Pin	Description
1	Frame Ground
2	RXD
3	TXD
4	+5 V output (Max 100mA)
5	GND
6	CHA-
7	CHB-
8	TX+ 20 mA
9	TX- 20 mA
10	RTS
11	CTS
12	RX+ 20 mA
13	RX- 20 mA
14	CHA+
15	CHB+

Figure 19 - PLC Port connector and pin assignment

The communication cable must be chosen according to the type of device being connected.

PC/Printer Port

The function of the PC/Printer Port depends on the mode of operation of the panel.

Configuration Mode	programming port
Operation Mode, UniNET Server	connection to UniNET
Operation Mode, UniNET not active or Client node	connection to serial printer

Only RS232 signals are available on the PC/Printer Port. The connector is a D-15 pin female. Pin assignment is shown in the table below.

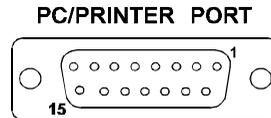| Pin	Description
1	Frame Ground
2	RXD
3	TXD
4	+5 V output (max 100mA)
5	GND
6	Reserved
7	Reserved
8	Reserved
9	Reserved
10	RTS
11	CTS
12	Reserved
13	Reserved
14	Reserved
15	Reserved

PC/PRINTER PORT

Figure 20 - PC/Printer Port connector and pin assignment

Use cable CA114 to connect the panel to a PC for programming. The diagram is shown in the figure below. The connector is a D-9 pin female.
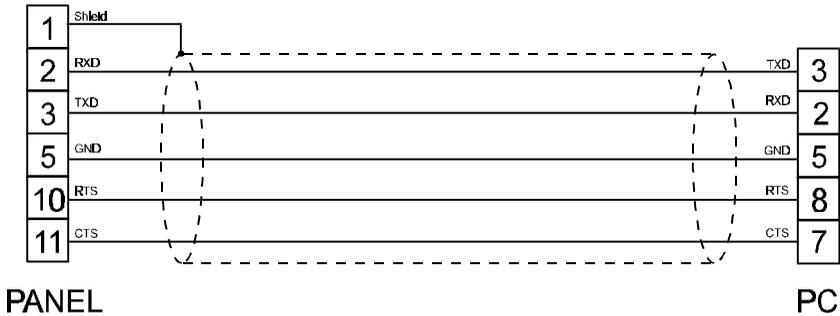
Figure 21 - Programming cable CA114

When the panel is in Operation Mode and is not used as a UniNET Server, you can attach a serial printer to the PC/Printer Port. The communication parameters for the printer are defined by the application program (project file).

Note: The communication cable to the printer depends on the communication interface of the printer.

AUX Port

The AUX Port is a communication port specially designed for industrial network communication. The AUX Port connector is a 9 pin D sub type. The functionality of the AUX Port depends on the optional communication module which is plugged into the unit.

Note: The pin assignment of the Aux Port connector is described in the manual of the communication module.

The procedure to mount the communication modules is the following:
1) Turn off the unit.
2) Partially unscrew with a screwdriver the 2 screws holding the rear cover. The screws are labelled 'A' in Figure 22.
3) Remove the cover.
4) Plug the module in the red connectors; make sure the connectors are locked.
5) Replace the rear cover.
6) Fix the 2 screws 'A'.
7) Stick in the area 'B' the label describing the functionality of the AUX Port. The label is delivered with the modules.
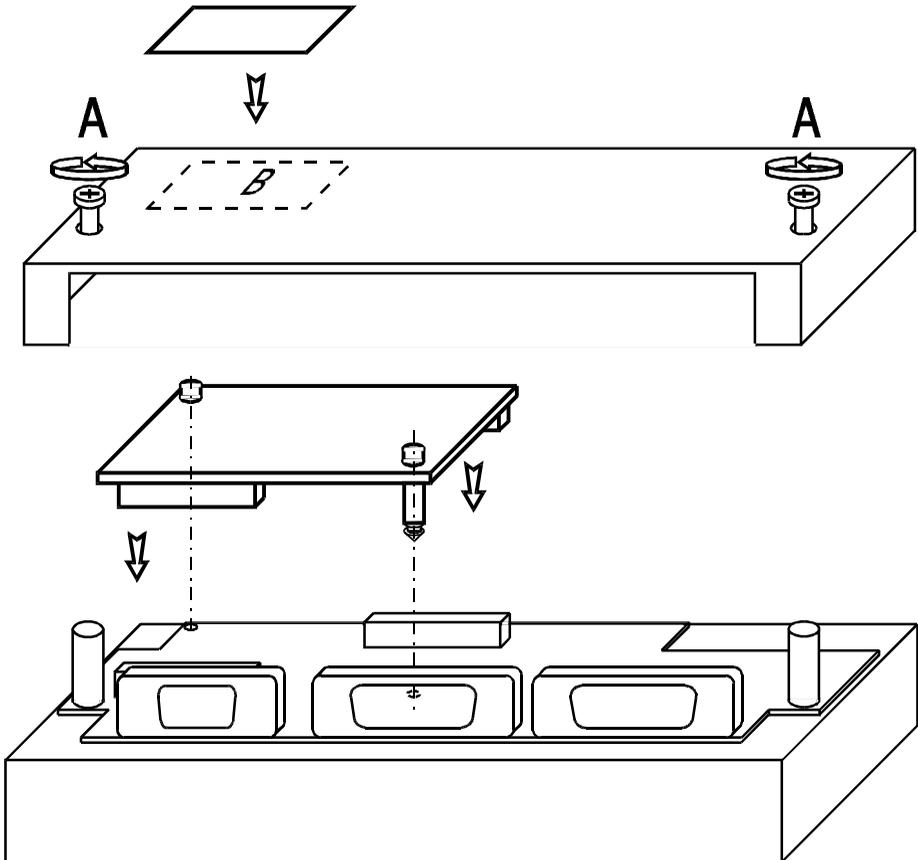
Figure 22- Mounting the communication modules

Models without the PC/Printer Port

Some EH-HMI models, see Table 1, do not have the PC/Printer Port. The
PLC Port will be referred to as the PLC/PC Port and will be used as a
programming port when the panel is in Configuration Mode. You must use a
gender changer with the CA114 cable to program these units.

Battery Replacement

Some models require the use of the lithium battery for data back-up.
The following information is maintained by the battery:
- hardware real-time clock (date and time)
- event list
- recipe data

EH-HMI panels signal the battery status in more than one way:
- blinking of the status LED indicator
- with the 'Battery' field in System Menu (BATTERY OK or LOW)
- with the value of the S6 bit in the RDA

When the panel signals that the battery is low, you should replace the battery as soon as possible.

> *Note: Replacing the battery will cause the loss of the data maintained by the battery.*

To replace the battery, follow the procedure listed below:
1) Turn off the power to the panel.
2) Use a screwdriver to loose the four screws securing the block composed by the two metal units.
3) Remove the block.
4) Remove the battery.
5) Replace the battery with a new one.

> *Note: CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the applicable regulations.*

6) Replace the block; tighten the four screws
7) Apply power to the panel and check that battery good status is signaled.

Removing the Legends

The keyboard legends can be removed in one step by grasping the exposed portion of the legend (located at the bottom rear or side of the unit) and sliding it downward.
Use the blank legends that come with the panel or other with equivalent thickness and consistency. Do not use legend strips thicker than the ones included in the panel.

Dedicated LEDs

The table below shows the name and the symbol (when available) of the LEDs dedicated to special functions which may be available in the EH-HMI operator panels.

LED			
Name/symbol	**Color**	**Status**	**Meaning**
Status LED	red	OFF	No hardware problem detected
		BLINK	Battery low
		ON	Hardware fault
	green	OFF	No keys are pressed
		ON	While any key is pressed (visual feedback)
RUN	green	OFF	Hardware fault
		ON	Unit in operation
COM	green	BLINK	Communication error
		ON	Communication OK
ALARM	red	OFF	No alarms
		BLINK	Alarm requires acknowledgment
		ON	Alarm active

Table 2 - Dedicated LEDs

Usage and Safety Guidelines

Applicable Regulations

Regulations and recommendations have been issued in Europe covering the main safety-related issues in control systems which include operator interfaces.
EN 60204-1 lists some important guidelines applicable when using operator interfaces.

9.2.4   Suspension of safeguards
9.2.5.3   Stop
9.2.5.4   Emergency stop
9.2.5.6   Hold-to-run controls
9.2.5.7   Two-hand controls
9.4   Control function in case of failure

Do not use operator interfaces to directly command motors, valves or other actuators not equipped with safeguards and potentially harmful to persons or equipment in case of fault to the unit.

The units are intended to be mounted on the front panel of a metallic cabinet. The service personnel, when operating directly on the powered unit, must be electrostatically discharged.
All safety related regulations must be observed.

> *CAUTION!* *Don't open the panel rear cover when the power supply is applied.*

Installation Environment

The equipment is not intended for continuous exposure to direct sunlight. This might accelerate the aging process of the front panel film.

The equipment is not intended for installation in contact with corrosive chemical compounds. Check the resistance of the front panel film to a specific compound before installation.

Do not use tools of any kind (screwdrivers etc.) to operate the keyboard of the panel or the touch screen.

In order to meet the front panel protection classifications, the proper installation procedure must be followed:

- The borders of the cutout must be flat.
- Screw up each fixing screw until the plastic bezel corner gets in contact with the panel.
- The cutout for the panel must be of the dimensions indicated in this manual.
- Two types of gaskets are delivered with the EH-HMI panels, depending on the model, rectangular or linear.

Applying the rectangular gasket

- The gasket should be applied around the cutout prepared for the panel. Be careful not to place it under tension.
- The gasket should be replaced every time the panel is dismounted and remounted in its place.
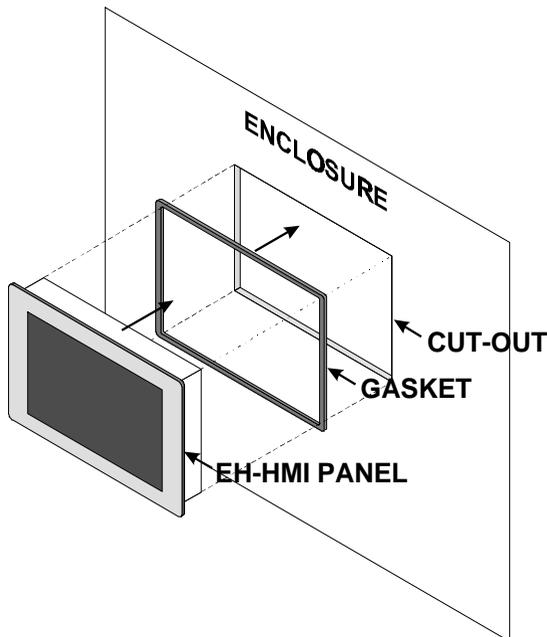
Applying the two linear gaskets:

Thin strip:
- The gasket should be applied around the cutout prepared for the panel.
- The gasket should be applied starting from the middle of the lower side being careful not to place it under tension.
- The two ends of the gasket should meet without overlap.
- The gasket should be replaced every time the panel is dismounted and remounted in its place.

Thick strip:
- The gasket should be applied on the operator panel just behind the bezel.
- The gasket should be applied starting from the 1/3 of the lower side being careful not to place it under tension.
- The two ends of the gasket should meet without overlap.
- The gasket should be replaced every time the panel is dismounted and remounted in its place.
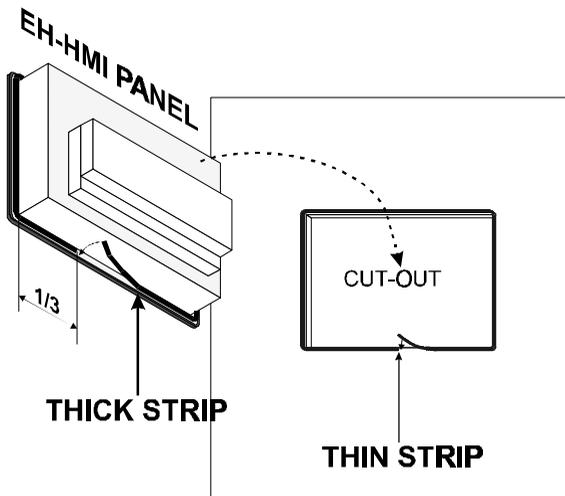
Cleaning Faceplates

The equipment must be cleaned only with a soft cloth and neutral soap product. Do not use solvents.

GETTING STARTED

EH-HMI panels must be programmed with the programming package EH-VIEW.

To program a panel, you will have to connect the panel to a personal computer running the EH-VIEW software package; the panel must be in Configuration mode to be programmed. Use the cable CA114 to connect the panel to a personal computer.

The software package EH-VIEW is a Windows™ application and must be properly installed. The Windows™ environment is not included in the software package EH-VIEW and must already be installed on the personal computer.

The software package can use either the communication ports COM1 or COM2 on the personal computer. Check that the EH-VIEW program is correctly configured to communicate with the communication port to which the cable is attached.
The communication parameters between the panel and the personal computer are:
Speed: 9600 (models PC/Printer Port support also speeds
                of 19200 and 38400 baud)
Parity: None
Stop bit: 1
The EH-VIEW software defaults to the correct parameters.

The version of the EH-VIEW being used must be compatible with the firmware version of the panel to be programmed. Call for more information on compatibility between firmware and programming software.

Command Summary

The chapter describes the keyboard commands recognized by EH-HMI panels. Commands are classified according to the operating modes of the unit.

Note: The standard command assignment is described in this chapter. All the commands, except those defined for Configuration Mode, can be charged, deleted and/or extended using the Keyboard Macro Editor facility of the programming software.

Some models do not have a CLEAR key on the keyboard; the same operation can be performed by pressing the keys ◀ (←) and ▶ (→) at the same time.

All the EH-HMI models, except the EH-TPs, have at least 4 arrow keys and the Enter key. Panels with touch screen will show system defined touch keys on the screen whenever it is required (Figure **23**).
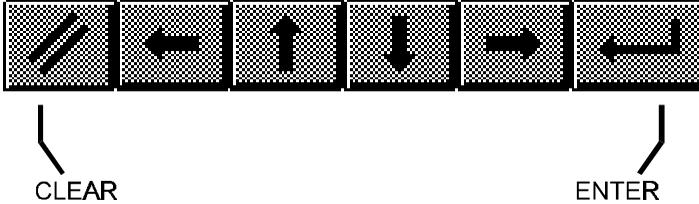

Figure 23 - Default touch keys for the panels with touchscreen

Some of the keys described in this chapter may not be available in each EH-HMI model. The functions associated to them may, however, can be implemented using the Keyboard Macro Editor or using an alternative predefined key.

Models without numeric keypad and without touch screen allow numeric data entry using arrow keys and/or using the Keyboard Macro Editor.

Touch screen panels will automatically show a numeric keypad whenever the data entry phase is activated.

> **Note**: The text '2 s' associated to a key means that the key has to be held for two seconds to activate the associated function.

Configuration Mode

ENTER   shows the type and version of the communication driver
             stored in the unit (if any)
ENTER 2 s   returns to Operation Mode if a valid communication driver and
             a valid project are stored in the unit (the key must be pressed
             for 2 seconds)

Operation Mode

▲ (↑)	scroll page up
▼ (↓)	scroll page down
◀ (←)	previous page
▶ (→)	next page
ENTER 2 s	recall the Command Menu
0 / ⟲	enter Data Entry Mode
9 / 🖶	print page/cancel print
6 / 0-ᴵᴵ· [(2)]	recall Password Insert Mode
3 / ⏲ [(2)]	recall Date/Time Insert Mode

To recall the Configuration Mode in the EH-TP models, touch the screen in an area where no touch cells have been defined and hold for 2 seconds.

Command Menu

▲ (↑)	select up
▼ (↓)	select down
◀ (←)	select left
▶ (→)	select right
ENTER	activate selection
CLEAR [(1)]	return to Page Mode

System Menu

▲ (↑)	select up
▼ (↓)	select down
◀ (←)	activate selection
▶ (→)	activate selection
ENTER	return to Page Mode when EXT is selected
CLEAR [(1)]	return to Page Mode

Data Entry Mode

When in Data Entry Mode, the meaning of the keys changes depending on whether a field has been selected for Data Entry or not. A field is selected when the Data Entry procedure has been started on that field. If no field has been selected for Data Entry, the key assignment is shown in the table below.

▲ (↑)	move to field in previous row
▼ (↓)	move to field in next row
◀ (←)	previous field
▶ (→)	next field
0÷9 . +/-	select field a numeric field for Data Entry and enter numeric value
ENTER	select a field for Data Entry
CLEAR [(1)]	cancel entry and return to Page Mode

After a field has been selected for Data Entry, the keys are interpreted as follows.

▲ (↑)	increment digit / scroll up ASCII / select message up
▼ (↓)	increment digit / scroll down ASCII / select message down
◀ (←)	move cursor left in ASCII field
▶ (→)	move cursor right in ASCII field
0÷9 . +/-	numeric entry
ENTER	confirm entry and return to Page Mode
CLEAR [(1)]	cancel entry and return to Page Mode

Alarm Mode

▲ (↑)	previous alarm in the list
▼ (↓)	next alarm in the list
ENTER 2 s	acknowledge current alarm
CLEAR [(1)]	return to page Mode
9 / 🖨	alarm list printout/cancel print

Event Mode

▲ (↑)	scroll up
▼ (↓)	scroll down
CLEAR [(1)]	return to page Mode
9 / 🖨	event list printout/cancel print

Password Entry Mode

▲ (↑)	increment digit
▼ (↓)	decrement digit
◄ (←)	next digit
0÷9	numeric password entry
ENTER	confirm password and return to Page Mode
CLEAR [(1)]	cancel entry and return to Page Mode
ESC	end entry and return to Page Mode

Time and Date Set Mode

▲ (↑)	increment field value
▼ (↓)	decrement field value
ENTER	field select
CLEAR [(1)]	return to Page Mode

Direct Page Selection Mode

◄ (←)	decrement page
► (→)	increment page
0÷9	page number entry
ENTER	confirm entry and go to selected page
CLEAR [(1)]	cancel entry and return to Page Mode

Notes:
(1)   it is equivalent to the key ESC/ ⤷ , when available
(2)   available only in certain models.

Troubleshooting

In case it is be impossible to switch the operator panel to Configuration Mode due to problems in the start-up phase, follow the procedure described below:
1. Switch off the unit
2. Press and hold any 3 keys
3. Turn on the unit and hold the keys pressed until Configuration Mode will be shown on the screen.

For keyless models such as the EH-TP's, follow the procedure below:
1. Switch off the unit
2. Touch in the middle of the left-hand side of the display screen with the left hand
3. Switch on the operator panel and tap with the right hand in the middle of the right-hand side of the display screen for a period of about one second
4. Continue until the screen shows Configuration Mode.

Touchscreen Calibration

Standard calibration:
1. Recall Configuration Mode
2. Touch the CLEAR key on the screen until a small round symbol appears on the top right corner of the screen
3. Touch and hold the symbol until it moves to the bottom left-hand corner of the screen
4. Touch and hold the symbol until the indication to touch the ◀ (←) key is displayed on the screen
5. Touch and hold the key ◀ (←) until the indication to touch the ▼(↓) key is displayed on the screen
6. Touch and hold the key ▼ (↓) until the indication to touch the Enter key is displayed on the screen
7. Touch and hold the Enter key until the panel switches to Operation Mode (if a valid project is loaded in the memory).

Emergency calibration:
The Emergency calibration procedure should be used in all cases when it it is not possible to perform a calibration using the standard procedure.
1. Switch of the unit
2. turn on the unit
3. tap in the middle of the touchscreen with a frequency of about one second until the operator panel will enter the Calibration Mode
4. perform the standard calibration procedure.