eliwell

by Schneider Electric

# ICPlus

## 902 SMPS


EN **Electronic controllers for refrigeration units**

# USER INTERFACE


**ICPlus 902 SMPS**

## KEYS

| | |
|---|---|
| **UP**<br>**Press and release**<br>Scroll menu items<br>Increases values | **STANDBY (ESC)**<br>**Press and release**<br>Returns to the previous menu level<br>Confirms parameter value<br>**Press for at least 5 sec**<br>Activates the Standby function<br>(when outside the menus) |
| **DOWN**<br>**Press and release**<br>Scroll menu items<br>Decrease values | **SET (ENTER)**<br>**Press and release**<br>Displays alarms (if active)<br>Opens Machine Status menu<br>**Press for at least 5 sec**<br>Opens Programming menu<br>Confirm commands |

| ICONS | | | | | |
|---|---|---|---|---|---|
|  | **Reduced SET / Economy** | |  | **Alarm** | |
| | Flashing | economy Setpoint active | | Permanently on | alarm active |
| | Quick flashing | access to level 2 parameters | | Flashing: | alarm acknowledged |
| | Off | otherwise | | Off: | otherwise |
|  | **Compressor** | |  | **NOT USED** | |
| | Permanently on | compressor active | | | |
| | Flashing | a delay, a protection or a locked start-up | | | |
| | Off | otherwise | | | |
| °C | **°C** | | °F | **°F** | |
| | Permanently on | °C setting (**dro** = 0) | | Permanently on | °F setting (**dro** = 1) |
| | Off | otherwise | | Off: | otherwise |
| 1 | **HEAT status** | | 2 | **NOT USED** | |
| | Permanently on | compressor in HEAT | | | |
| | Off | otherwise | | | |

**NOTE**: When switched on, the device performs a Lamp Test; the display and LEDS will flash for several seconds to check that they all function correctly.

# ELECTRICAL CONNECTIONS

## ⚠ DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power from all equipment including connected devices, prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables and wires.
- Check the earthing connections on all earthed devices.
- Use only the specified voltage when operating this device and any associated products.

**Failure to follow these instructions will result in death or serious injury.**

## ⚠ DANGER

### LOOSE WIRING CAUSES ELECTRIC SHOCK

Tighten connections in conformance with the torque specifications.

**Failure to follow these instructions will result in death or serious injury.**

The table below displays the type and the size of cables for screw terminals with pitch **5.00** mm (0.197 in.) or **5.08** mm (0.2 in.).

| mm / in. 7 / 0.28 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $mm^2$ | 0.2…2.5 | 0.2…2.5 | 0.25…2.5 | 0.25…2.5 | 2 x 0.2…1 | 2 x 0.2…1.5 | 2 x 0.25…1 | 2 x 0.5...1.5 |
| *AWG* | *24…13* | *24…13* | *22...13* | *22...13* | *2 x 24…18* | *2 x 24…16* | *2 x 22…18* | *2 x 20...16* |

| | | | |
|---|---|---|---|
| Ø 3.5 mm (*0.14 in.*) | C | N•m | 0.5...0.6 |
| | | *lb-in* | *4.42...5.31* |

This device has been designed to operate outside of any hazardous location.
Only install this device in zones known to be free of hazardous atmosphere.

## ⚠ DANGER

### POTENTIAL FOR EXPLOSION

Only install this device in zones known to be free of hazardous atmosphere.

**Failure to follow these instructions will result in death or serious injury.**

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel.
No responsibility is assumed by Eliwell for any consequences arising out of the use of this material.

## ⚠ DANGER

### POTENTIAL OF OVERHEATING AND FIRE

- Do not use with loads other than those indicated in the technical specification.
- Do not exceed the maximum permitted current; for higher loads, use a contactor with sufficient power capacity.

**Failure to follow these instructions will result in death or serious injury.**

## ⚠ WARNING

### UNINTENDED EQUIPMENT OPERATION

- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and operate this equipment in an enclosure appropriately rated for its intended environment.
- Power line and output circuits must be wired and fused in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment.
- Do not use this equipment in safety-critical machine functions.
- Do not disassemble, repair, or modify this equipment.
- Do not mount devices in extremely damp and/or dirt-laden areas.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## ⚠ WARNING

### UNINTENDED EQUIPMENT OPERATION DUE TO CONNECTION

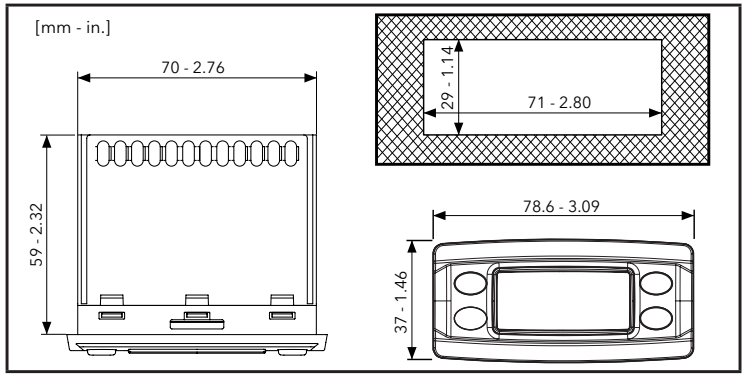
Signal leads (probes, communication and the signal electronic supply) must be routed separately from power and supply cables.

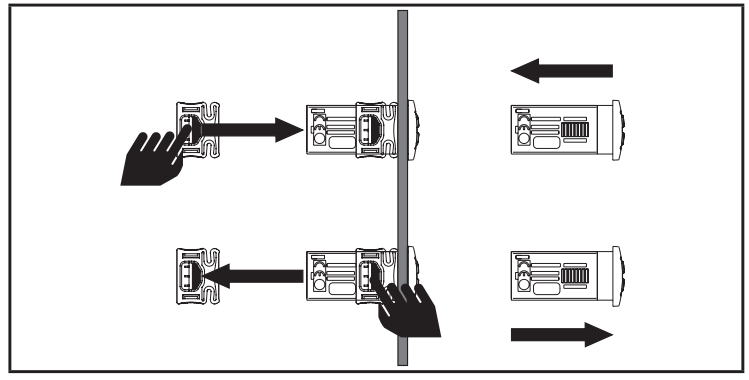
**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

NTC/PTC/Pt1000 probes have no connection polarity and can be extended using a normal bipolar cable (Note that extending the probes burdens the behaviour of the instrument in terms of EMC electromagnetic compatibility: specifically, if Pt1000 probes with cable longer than 3 m (9.84 ft) are used, an extreme care must be taken during wiring operations).

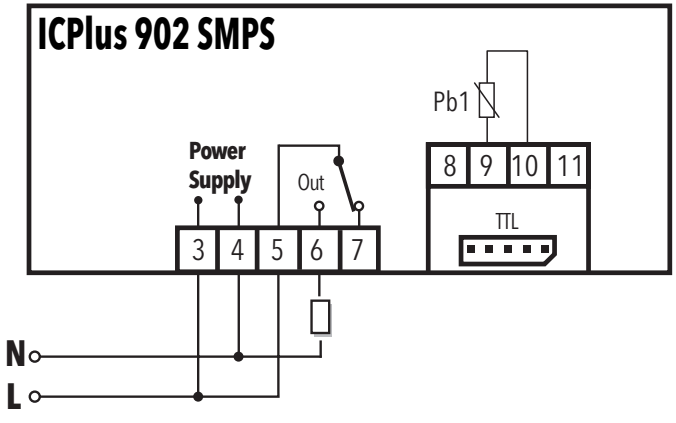
## MOUNTING - DIMENSIONS

The device is designed for panel mounting. Drill a 71x29 mm (2.80x1.14 in.) hole and insert the instrument; secure it with the special brackets provided. Do not install the instrument in damp and/or dirty places; in fact, it is suitable for use in places with ordinary or normal levels of pollution. Keep the area around the instrument cooling slots adequately ventilated.



## CONNECTION




| TERMINALS | |
|---|---|
| **3-4** | Power supply input 100...240 Vac |
| **5-6** | NO Out relay |
| **5-7** | NC Out relay |
| **9-10** | Pb1 Probe input |
| **TTL** | TTL input |

## TECHNICAL DATA (EN 60730-2-9)

| | |
|---|---|
| Classification: | operation (not safety) device for incorporation |
| Mounting: | panel mounting with 71x29 mm (2.80x1.14 in.) drilling template |
| Type of action: | 1.B |
| Pollution class: | 2 |
| Insulation material class: | IIIa |
| Overvoltage category: | II |
| Rated impulse voltage: | 2500 V |
| Temperature: | Operating: -5...55 °C (23...131 °F) - Storage: -30...85 °C (-22...185 °F) |
| Power supply: | SMPS 100 ... 240 Vac (±10%) 50/60 Hz |
| Consumption: | 4.5 W max |
| Fire resistance category: | D |
| Software class: | A |

**NOTE: check the power supply specified on the instrument label; contact our Sales Office for power supply and relay ratings.**

## FURTHER INFORMATION

### Input Characteristics

| | |
|---|---|
| Display range: | **NTC**: -50...110 °C (-58.0...230 °F); - **PTC**: -55.0...140 °C (-67.0...284 °F)<br>**Pt1000**: -55.0...150 °C (-67.0...302 °F) (on display with 3 digits + sign) |
| Accuracy: | - **NTC, PTC, Pt1000** (-55...70 °C / -67...158 °F): Better than 0.5% of full scale +1 digit<br>- **Pt1000** (70...150 °C / 158...302 °F): Better than 0.6% of full scale +1 digit |
| Resolution: | 0.1 °C / °F |
| Analogue inputs: | 1 NTC (default) / PTC / Pt1000 (See parameter **H00**) |

## Output Characteristics

Digital outputs: **EN60730** NO 8(4) NC 6(3) max 250 Vac

## Mechanical Characteristics

| | |
|---|---|
| Casing: | PC+ABS UL94 V-0 resin casing, polycarbonate window, thermoplastic resin keys |
| Dimensions: | front panel 78.6x37 mm (3.09x1.46 in.), depth 59 mm (2.32 in.) (without terminals) |
| Terminals: | screw/disconnectable terminals for cables with a diameter of 2.5 $mm^2$ (13 AWG) |
| Connectors: | TTL for connection of Copy Card (Max length = 3 m (9.84 ft)) |
| Humidity: | Operating / Storage: 10…90% RH (non-condensing) |

## Regulations

Food Safety: The device complies with standard EN 13485 as follows:

- suitable for storage
- application: air
- climate range A
- measurement class 1 in the range from -25 ... 15 °C (-13 ... 59 °F) (*****)

(*** exclusively using Eliwell probes)**

**NOTE**: The technical specifications given in this document regarding measurement (range, accuracy, resolution, etc.) refer to the instrument and not to any accessories provided, such as the probes.

## INSTRUMENT ON/OFF

The instrument can be switched off by pressing the ⏻ key for longer than 5 seconds. In this condition, the adjustment algorithms is disabled and the text **OFF** will appear on the display.

## ACCESSING AND USING THE MENUS

Resources are organised into menus. Press and release the set key to access the **Machine Status** menu.
To access the **Programming** menu, press the set key for more than 5 seconds. If no keys are pressed for over 15 seconds (Timeout), or if the ⏻ key is pressed, the last value to appear on the display is confirmed.

## PASSWORD

**Password PA2**: used to access **Installer** parameters. The password is not enabled by default (**PA2=0**).
To enable it (**PA2≠0**): press and hold set key for longer than 5 seconds, scroll through folders using ∧ and ∨ keys until you find the label **diS** and press set key to enter. Scroll through the parameters using ∧ and ∨ keys until you see the label **PS2**, press set key to display the value, modify it using ∧ and ∨ keys, then save it by pressing set or ⏻ keys.
If the password entered is incorrect, the label **PA2** will be displayed again. Repeat the procedure.

## 'PROGRAMMING' MENU

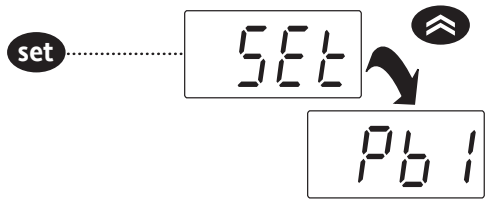
To access the **Programming** menu, press the set key for more than 5 seconds. If specified, an access will be requested: **PA2** for **Installer** parameters (see **PASSWORD** paragraph).

**Installer** parameters: When accessed, the display will show the first folder (**CP**). Press ∧ and ∨ keys to scroll through the folders on the current level. Select the desired folder using set key. Press ∧ and ∨ keys to scroll through the parameters in the current folder and select the parameter using set key.
Press ∧ and ∨ keys to modify it and set key to save the changes.

**NOTE**: Switch the instrument off and on again each time the parameter configuration is changed.

## MACHINE STATUS MENU

Access the **Machine Status** menu by pressing set key and releasing the key. If no alarms are active, the **SEt** label appears. Use the ∧ and ∨ keys to scroll through all the folders in the menu:




- **AL**: alarms folder (**only visible if an alarm is active**);
- **SEt**: Setpoint setting folder;
- **Pb1**: Probe 1 - Pb1 folder.

**Setting the Setpoint:** To display the Setpoint value press the set key when the **SEt** label is displayed. The Setpoint value appears on the display. To change the Setpoint value, press the ∧ and ∨ keys within 15 seconds. Press set key to confirm the modification.

**Displaying the probes:** When labels Pb1 is present, press the set key to view the value measured by the corresponding probe (**NOTE**: the value cannot be modified).

## LOCK SETPOINT MODIFICATION

The keypad can be locked by entering the "Basic Commands" menu using set key and pressing ⏻ and ∧ keys within 2 seconds, or by programming the **LOC** parameter (see **diS** folder). If the keypad is locked, the "Basic Commands" menu can be accessed and the Setpoint displayed, but the value cannot be modified.

## DIAGNOSTICS

Alarms are always indicated by the buzzer (if present) and the alarm icon (•). To switch off the buzzer, press and release any key; the corresponding icon will continue to flash.

**N.B.**: If alarm exclusion times have been set (see **AL** folder) the alarm will not be signalled.

## ALARMS

| Label | Description | Cause | Effects | Remedy |
|---|---|---|---|---|
| **E1** | Pb1 Probe error (Cold room) | • Measured values are outside operating range<br>• Probe inoperable/short-circuited/ open | • Display label **E1**<br>• Alarm icon permanently on<br>• Disable max/min alarm controller<br>• Compressor operation based on parameters **Ont** and **OFt** | • Check probe type (**H00**)<br>• Check probe wiring<br>• Replace probe |
| **AH1** | Pb1 probe HIGH Temperature alarm | Value read by Pb1 > 302 °C / °F. (see 'MAX/MIN TEMP. ALARMS') | • Registration **AH1** label in the AL folder<br>• No effect on regulation | Wait until temperature value read by Pb1 returns below 302 °C / °F |
| **AL1** | Pb1 probe LOW Temperature alarm | Value read by Pb1 < -58.0 °C / °F. (see 'MAX/MIN TEMP. ALARMS') | • Registration **AL1** label in the AL folder<br>• No effect on regulation | Wait until temperature value read by Pb1 to come back above -58.0 °C / °F |

## PARAMETERS TABLE

| PAR. | DESCRIPTION | RANGE | DEFAULT | M.U. |
|---|---|---|---|---|
| **SEt** | Temperature control SEtpoint. | LSE ... HSE | 0.0 | °C/°F |
| | COMPRESSOR ("CP" folder) | | | |
| **diF** | diFferential. Compressor relay activation differential. | 0.1...30.0 | 2.0 | °C/°F |
| **HSE** | Higher SEt. Maximum value that can be assigned to the Setpoint. | LSE...302 | 99.0 | °C/°F |
| **LSE** | Lower SEt. Minimum value that can be assigned to the Setpoint. | -55.0...HSE | -55.0 | °C/°F |
| **HC** | Control mode. **C**(0) = Cold; **H**(1) = Hot. | C/H | C | flag |
| **Ont** | Controller on time for inoperable probe.<br>• if **Ont** = 1 and **OFt** = 0, the compressor remains on;<br>• if **Ont** = 1 and **OFt**>0 it runs in duty cycle mode. | 0 ... 250 | 0 | min |
| **OFt** | Controller off time for inoperable probe.<br>• if **OFt** = 1 and **Ont** = 0, the controller remains off;<br>• if **OFt** = 1 and **Ont** > 0, it operates in duty cycle mode. | 0 ... 250 | 1 | min |
| **dOn** | Compressor relay activation delay after request. | 0 ... 250 | 0 | secs |
| **dOF** | Delay after switching off and subsequent activation. | 0 ... 250 | 0 | min |
| **dbi** | Delay between two consecutive compressor activations. | 0 ... 250 | 0 | min |
| **OdO** | Delay in activating outputs after the instrument is switched on or after a power outage.<br>**0** = Not active. | 0 ... 250 | 0 | min |
| | DISPLAY ('diS' folder) | | | |
| **LOC** | Basic commands modification lock. It is still possible to enter parameter programming mode and modify them. **n**(0) = No; **y**(1) = Yes. | n/y | n | flag |
| **PS2** | PAssword2: if **PS2≠0** is the access key to **Installer** parameters. | 0 ... 250 | 0 | num |
| **ndt** | Display with decimal point. **n**(0) = No (integers only); **y**(1) = Yes (with decimal point); | n/y | y | flag |
| **CA1** | Calibration 1. Temperature value to be added to the Pb1 value. | -12.0...12.0 | 0.0 | °C/°F |

| PAR. | DESCRIPTION | RANGE | DEFAULT | M.U. |
|---|---|---|---|---|
| **dro** | Select the unit of measurement used when displaying the temperature recorded by the probes. (**0** = °C, **1** = °F).<br>**NOTE**: switching between °C and °F or vice-versa DOES NOT modify the SEt, diF values, etc. (e.g. Setpoint = 10 °C becomes 10 °F) | 0/1 | 0 | flag |
| | CONFIGURATION ("CnF" folder) | | | |
| **H00** | Probe type selection. **0** = PTC; **1** = NTC; **2** = Pt1000. | 0/1/2 | 1 | num |

## LIABILITY AND RESIDUAL RISKS

ELIWELL CONTROLS SRL declines any liability for damage due to:

- installation/uses different from those specified and, in particular, not complying with the safety regulations and/or instructions given in this document;
- use on panels that do not provide adequate protection against electric shocks, water or dust when assembled;
- use on panels allowing access to dangerous parts without the use of tools;
- tampering with and/or modifying the product;
- installation/use on panels not complying with current standards and regulations.

## DISCLAIMER

## CONDITIONS OF USE

### Permitted use

For safety reasons, the instrument must be installed and used according to the instructions supplied and, in particular, parts under dangerous voltages must not be accessible in normal conditions. The device must be adequately protected from water and dust with regard to its application, and must only be accessible using tools (except for the front panel). The device is suitable for use in household refrigeration appliances and/or similar equipment and has been tested for safety aspects in accordance with the harmonised European reference standards.

### Improper use

Any use other than that expressly permitted is prohibited. The relay contacts provided are of a functional type and subject to failure: any protection devices required by product standards, or suggested by common sense for obvious safety requirements, must be installed externally to the instrument.

## DISPOSAL

The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

by Schneider Electric

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**MADE IN ITALY**

Certified System ™
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ENVIRONMENTAL SYSTEM CERTIFICATION
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