



**PROSENSE
PEC Series
Gas Control Panel
User Manual
PEC 600 (602 / 604 / 606)**

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WARNING!
READ THIS DOCUMENT BEFORE INSTALLING THE DEVICE!

This manual should be read carefully by all persons who are or will be responsible for the installation, use, or servicing of this product.

This appliance will operate as designed if installed, used, and maintained in accordance with the manufacturer's instructions. Otherwise, it may not function as designed, and persons whose safety depends on this device may be exposed to serious hazards, injury, or death.

The warranties given by Prosense with respect to this product will be void if the product is not installed, used, and serviced in accordance with the instructions in this user manual. Please protect yourself and others by following the instructions.



WARNING!

Devices that generate inductive or capacitive loads, such as motors, ventilation fans, etc., should not be connected directly to the panel. External relays must be placed between the panel and the device to drive such high-load generating devices.

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1 Introduction

Prosense PEC Series Gas Control Panel provides safety against gas leaks and explosions by continuously reading the gas level in the environment from the detectors. The PEC Series Panel continuously transmits the values measured by the detector to the control unit. If the necessary connections are made properly to the control units, PEC Series Panels can activate the alarm relays and shut down the gas valves or electrical switches before the amount of gas in the detectors reaches the lower explosion limit.

Prosense PEC Series Gas Control Panel has three alarms that can be adjusted according to the measurement level and a fault output to monitor the overall status. The relays can be adjusted independently of each other to perform the desired function. The panel has five relays to perform these functions. There is a FAULT relay to check the status of the panel and connected detectors. The other three are alarm relays called ALARM-1, ALARM-2 and ALARM-3. AUX relay can be assigned to a desired alarm or faults state and can be used simultaneously by assigned fault or alarm conditions.

Prosense PEC Series Gas Control Panel is produced with 5 different options:

PEC602	2 x 4-20mA Analog Channel
PEC604	4 x 4-20mA Analog Channel
PEC606	6 x 4-20mA Analog Channel
PEC616	16 x RS485 MODBUS RTU Detector
PEC632	32 x RS485 MODBUS RTU Detector

Table 1: PEC Series Panel Models

The PEC Series Gas Control Panel continuously shows the status of each detector on a 16x2 LCD screen. This screen is also used for users to define the features required for the gas detectors in the system, such as gas type, measurement unit and measurement range. It also shows information and warnings for the general status of the panel, fault and alarm alerts.

2 Technical Specifications

Main power input	24 VDC
Power Consumption	24VDC/250mA - 6.75W max. (excluding panel-mounted detectors)
Entries	PEC602: 2 x 4-20mA Analog Kanal
	PEC604: 4 x 4-20mA Analog Kanal
	PEC606: 6 x 4-20mA Analog Kanal
	PEC616: 16 x RS485 MODBUS RTU Detector
	PEC632: 32 x RS485 MODBUS RTU Detector
Relay Outputs	FAULT, ALARM1, ALARM2, ALARM3, AUX
Switching value	3A, 24VDC
Screen	LCD (16x2) display
LED indicators	POWER, FAULT, ALARM LED
MODBUS output	Remote monitoring connection for models PEC602, PEC604, PEC606
MODBUS input	Detector connection for models PEC616, PEC632
Operating Temperature	-10 - 60C ⁰
Moisture	15 - 95% non-condensing
Panel Box	ABS IP20 (546 X 276 X 186 mm)
Weight	300 g
Main Power Input Fuse	2A
Opening time	2 minutes
Latency	It can detect any situation within 2 minutes.
Exceptions	Fault (The fault relay is de-energized.)
	Alarm (Alarm relays are energized.)
	Overrange (The upper limit relay is energized.)
EMC Compliance	EN 61326-1 Group-1 Class-A
Program Version	v3.02.1.03
Special Conditions	It should not be installed in an explosive atmosphere.
Clock battery	RTC 3V/10mA

Table 2: Technical Specifications

3 Installation

PEC Series Gas Control Panel should never be installed in an environment with an explosive atmosphere and should be in an easily accessible place. PEC Series Gas Control Panel should not be installed near high voltage cables, welding stations or frequency converters.

PEC Series Gas Control Panel box is manufactured according to the specifications specified in IP20 standards. On the back of the panel there is a mechanism that can be used for rail mounting. Preferably, it should be mounted on a suitable rail in a panel.

4 Connections

PEC Series Gas Control Panel connections must be made on the panel main board. The connection pins are marked by labels on the device. Their functions are given in table-3.

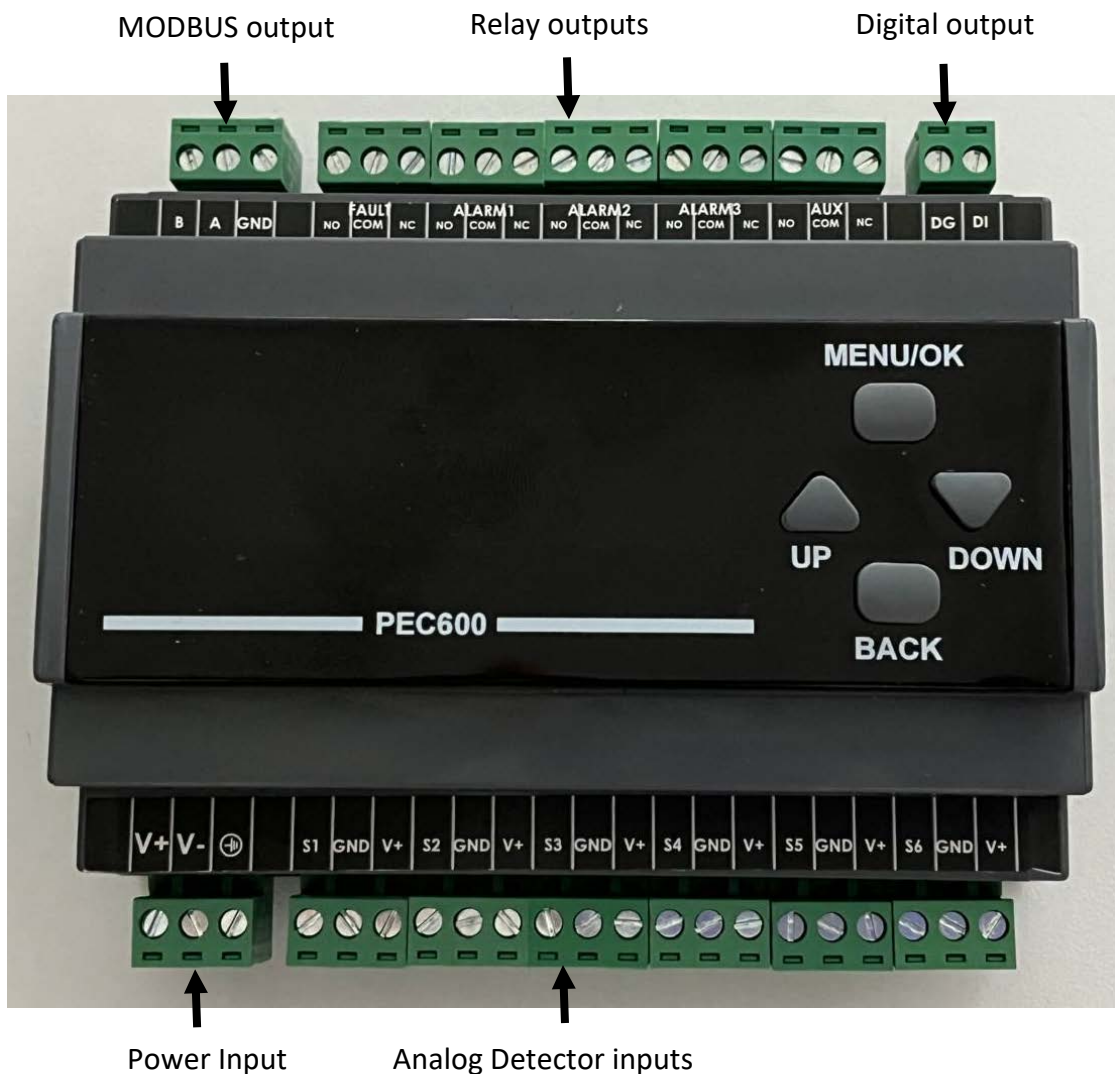


Diagram 1: DPX Series Gas Control Panel Motherboard

4.1 MODBUS Output:

PEC Series Gas Control Panel has RS485 MODBUS output to communicate with other devices and computer programs. This output only works in PEC602, PEC604, PEC606 models with analog detector connection. Other devices can read MODBUS registers by connecting through this port. On the PEC616 and PEC632 models, the MODBUS output is used for detector serial communication connection and cannot be used to communicate with other master devices.

4.2 Analog Channel Inputs:

PEC Series Gas Control Panel has input terminals for connecting detectors with 4-20mA analog output. The model PEC602 has 2 analog channels, the model PEC604 has 4 analog channels and the PEC606 has 6 analog channel inputs.

The panel must be connected to the detectors via V+, V-(GND) and S via a three-wire cable. The panel channels provide 24VDC power to the detector from the V+ and GND terminals and read the output signal of the detector from the S port. Therefore, the connections must be made correctly so as not to damage the detectors. The pin designations are as follows:

Detector Pin	Panel Pin	Usage
S	S	4-20mA measuring mark
GND	GND	Power (V-)
V+	V+	Power (V+)

Table 3: Connector Definitions

An example wiring diagram is shown in Diagram-2:

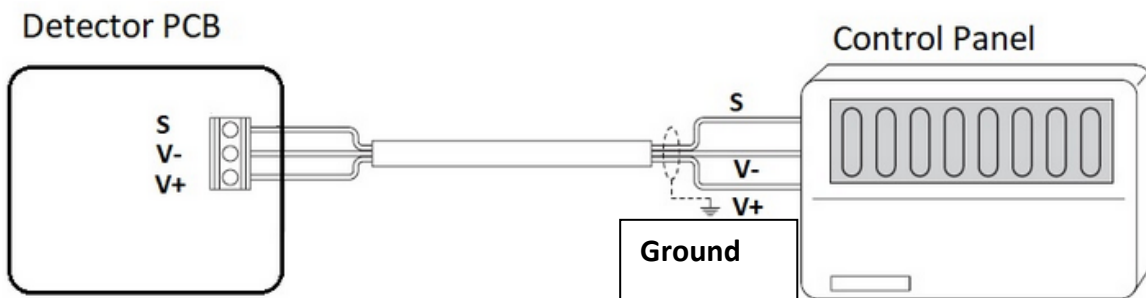


Diagram 2: Panel – Detector Analog Connection

Detectors should be connected with a three-wire 1.5mm² cross-section cable. Since there will be a weakening of the supply voltage with the distance, the cable diameter (surface) should be increased as the distance between the panel and the detector increases. Table 4 gives examples of cable types and reachable distances:

Cable cross-section	Cable type Nearest equivalent	Cable resistance Ω/km	Longest distance (L) Meter
0.5mm ²	20AWG	36.8 Ω/km	400
1.0mm ²	17AWG	19.5 Ω/km	750
1.5mm ²	16AWG	12.7 Ω/km	1000
2.0mm ²	14AWG	10.1 Ω/km	1200
2.5mm ²	13AWG	8.0 Ω/km	1500

Table 4: Distances That Can Be Reached By Cable Type

For connection, it is recommended to use armored cable suitable for industrial applications. The best practices have been achieved by carrying 3-core copper cables with a cross section of 1.5-2.5mm² and connecting them with an explosion-proof cable gland, depending on the distance between the control panel and the detector. 2.5 mm² (20 to 13 AWG) conductors may give better results. It must be ensured that the cable gland is installed correctly and fully tightened.

4.3 Relay Outputs

There are 5 relay outputs on the PEC Series Gas Control Panel main board. These are used to monitor FAULT, ALARM1, ALARM2, ALARM3 states. In addition, the AUX relay operation can be assigned to the preferred state and used as an additional relay output. Relay output terminals are indicated by labeling on the main board.

Relay outputs are given as "Normally Open" (NO), "Normally Closed" (NC) and common (COM) pins. The user can use it by connecting a cable to the desired output (NO or NC).

The fault relay is set to Normally Open – Energized. In the event of a power failure, the fault relay will be de-energized to recognize the power failure. The relay settings are as follows:

Relay Name	State	Assignment
FAULT	HATA (FAULT)	Cannot be changed
ALARM-1	ALARM-1	Cannot be changed
ALARM-2	ALARM-2	Cannot be changed
ALARM-3	ALARM-3	Cannot be changed
AUX	Additional Relay	Assigned to one of the above states

Table 5: Relays And the Events and Regions to Which They Are Assigned

Rules for activating relays:

FAULT: The fault relay is activated when there is any fault in one of the detectors or on the panel itself.

ALARM1: The Alarm-1 relay is activated when any of the detectors reaches the first specified alarm level (AL1).

ALARM2 : When any of the detectors reaches the specified second alarm level (AL2), the Alarm-2 relay is activated.

ALARM3 : When any of the detectors reaches the specified third alarm level (AL3), the Alarm-3 relay is activated.

AUX : This relay can be used as an additional relay output assigned to one of the ERROR, ALARM1, ALARM2, ALARM3 states. For example, when it is set for Alarm-1, when any detector detects gas at the alalm1 level, the AUX relay will be activated along with the Alarm-1 relay.

Note: Relays should not be used to directly control devices that generate inductive or capacitive loads, such as motors, ventilation fans, etc. External relays must be placed between the panel and the device to drive such high-load generating devices. Panel relays must be used to drive external relays.

5 Indicators

PEC Series Gas Control Panel has LED warning lights described below:

Status LED	Colour	Explanation
POWER	Green	The system is working
FAULT	Yellow	A fault has been identified in the detectors or on the panel itself
SYS-FAULT	Yellow	An error has been identified in the system (process / motherboard)

Table 6: LED light indicators showing the overall status of the panel



Diagram 3: Panel LED indicators

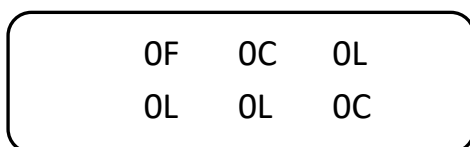
There are four buttons on the side of the LCD screen to set panel parameters and display detector details. Its functions are given in table 7:

Button	During setup	During viewing
MENU	Enters the menu for panel adjustments.	-
UP	Moves up on the menu.	Moves up the detector list
DOWN	Moves down on the menu.	Moves down the detector list
EXIT	Cancels changes or exits the menu	-

Table 7: Panel buttons and their functions

5.1 Display Indications

The PEC Series Gas Control Panel has an LCD display to show the overall panel status and detector details. The Panel Status screen provides a summary report on the panel and related components:



The first character on the screen, which is divided into six tabs, indicates the measurement amount, and the second character indicates the unit of measurement. If the relevant channel cannot measure because it is closed or incorrect, the relevant status is indicated by a single letter.

When the panel is first turned on, all channels will be closed. User must be setup channels. The letters and their meaning are as follows:

Abbreviation	Meaning
C	Closed Channel
F	Fault
A	Alarm
O	Overrange
L	% LEL

Table 8: Display abbreviations and their meanings

The status of the detectors can be displayed by changing the screen with the Up and Down button:

OL OL OL
OL OL OC

CH:1
LEL: 0

In case of any error, the F icon is shown next to the corresponding detector. Yellow LED lights up on the front panel. Entering the detector details will list the error status:

OL OF OL
OL OL OC

CH:2
LEL: 0 FAULT

In case of any alarm, the A icon appears next to the corresponding detector on the panel display. When the detector details are displayed, the alarm level and the triggered alarm levels are listed:

56A OF OL
OL OL OC

CH:1 A1-A2-A3
LEL: 56

When any detector is exposed to gas above the measurement level, the O icon appears next to the relevant detector on the panel display. Overrange status is indicated also on detector details screen:

100O OF OL
OL OL OC

CH:1 A1-A2-A3
LEL: 100 OVERRANGE

5.2 Fault:

The panel warns of a FAULT in the following cases:

- Failure of any of the detector connections
- Any of the detector measurement level falls below the minimum level
- Failure of any of the detectors
- Failure of any of the panel test process
- The panel main power input does not supply energy to the panel
- When the panel is running on battery power
- In case of failure of the panel main power supply

For detectors connected to 4-20mA analog input channels, the Panel detects this as an error when the input signal drops below 4mA. Detectors connected to MODBUS channels notify the panel of the fault status via digital communication. The panel activates the FAULT relay and the FAULT LED in case of any fault.

If the panel encounters a fault that is unable to perform its functions, it activates the SYS-FAULT LED and the FAULT Relay.

The fault relay is normally set to energy, and when the panel detects any error, the relay is de-energized. When the panel is de-energized and shuts down, the fault relay will also be de-energized, so the fault relay remains active and it is possible to warn about the error.

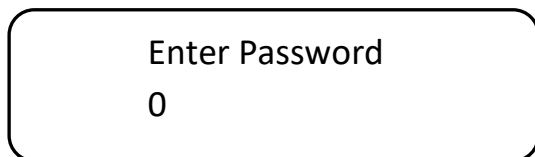
6 Programming

The panel must be adjusted in accordance with the site requirements and the connected detectors. The user must set the connected detectors, alarm levels and relay parameters for each detector. For each detector, the measurement unit, measuring range and alarm levels must be defined. These adjustments can be made via the menu using the buttons on the side of the screen.

6.1 Panel Settings:

The user must change the panel parameters in accordance with the requirements of the facility in which it will be used. In particular, the panel passwords should be changed to a value other than the factory settings to keep the panel secure. To change panel passcode, select "3. The "Settings" step must be selected:

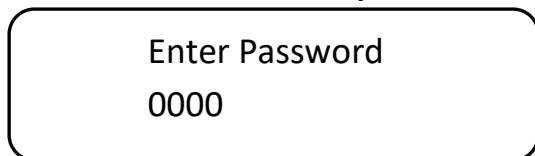
The password must be entered to get to the menu steps:



Enter Password
0

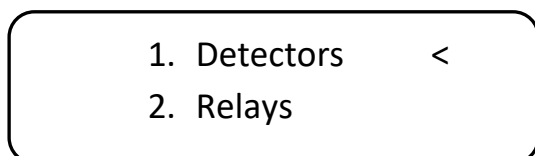
The registered password in the factory settings is **0000**. The user can change this password.

The user must not forget the password provided. In order to reset the password, the panel must be sent to the factory for service.



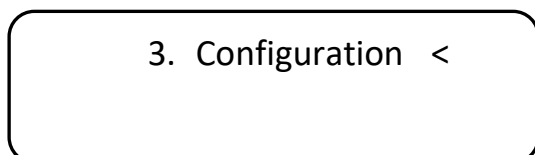
Enter Password
0000

When navigating through the menu steps, a cursor on the right shows the line that is active.



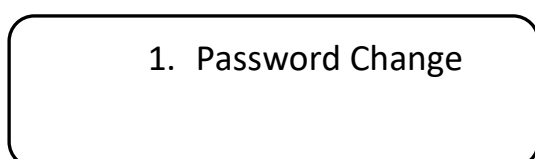
1. Detectors <
2. Relays

To change the password, step 3 must be selected:



3. Configuration <

Then the password change menu is selected:



1. Password Change

The panel software first asks for the saved password:

Current Password
0

After entering this password, the new password is prompted and saved:

New Password
0

6.2 Detector Settings:

The PEC Series Gas Control Panel can manage both analog and Modbus coupled detectors. Since the connection mechanisms and monitoring methods of the detectors are different, their settings are made in different menu steps. To be able to adjust the settings of analogue connected detectors select menu option 1:

1- Detectors

After entering the detector menu, configuration step number 1 should be selected again:

Detectors
1. Configuration

The channel to be adjusted, to which the detector is connected, must be selected.

Configuration
Channel: 1

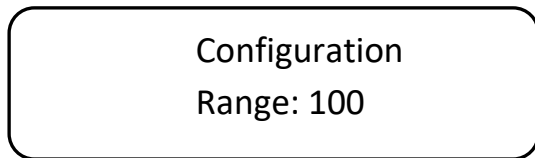
In order for the relevant channel to be monitored, it must first be Open.

Configuration
Channel: Open

The unit of measure can be only %LEL. Other units are not supported.

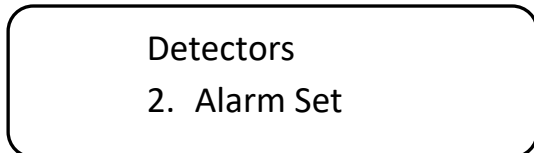
Configuration
Unit : %LEL

It is necessary to specify the measuring range. Using the up and down buttons, the range at which the detector measures should be recorded.

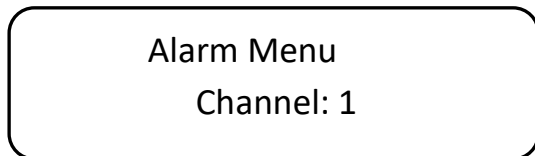


6.3 Alarm Settings:

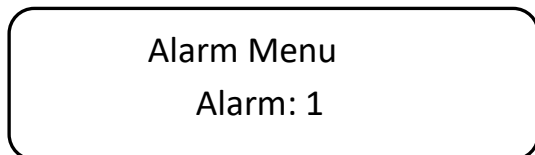
Alarm levels for detectors can be found in the Detector menu option 2. You need to do it from step "2. Alarm Set":



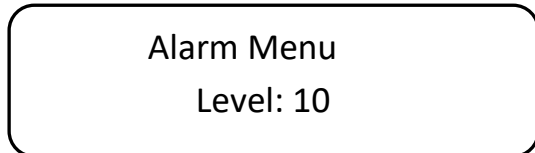
In the alarm menu, first of all, the related channel must be selected:



Select the desired alarm level to be set



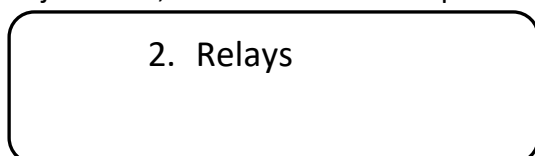
The alarm level is adjusted using the up and down buttons.



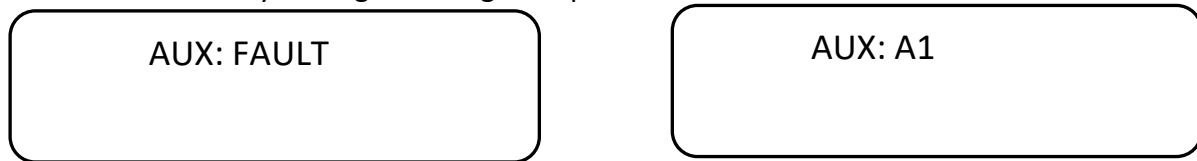
The settings are saved by pressing the Menu/OK button.

6.4 Relay Settings:

The PEC Series Control Panel accommodates five relay outputs. Four of them are assigned to events: FAULT, ALARM-1, ALARM-2 and ALARM-3. When the relevant situation arises, it is automatically triggered to produce a switching signal (dry contact). Alarm relays are activated when the alarm levels set for the detectors are reached during measurement operation. The AUX relay will operate depending on assigned state which is determined by the user. The user can use the AUX relay as a second output by assigning it to the desired event. To make the adjustment, enter the second step in the menu, "2. Relays":



The display shows actual status which AUX relay is assigned. The user can change the event to which the AUX relay is assigned using the up and down buttons:



Changes are saved by pressing the Menu/OK button.

6.5 What to do in case of alarm?

In case of any alarm, the steps to be taken in accordance with the security procedures should be followed. These steps should be reviewed before the alarm state and reinforced with drills. Recommended: Stay calm and follow the steps below:

- 1- Remove all flame sources from the environment. (including cigarettes, pipes, etc.)
- 2- Turn off all gas-powered devices.
- 3- Turn off the sources that supply gas to the environment using the main valve.
- 4- Do not turn on any electrical appliances, lamps or gas control panels, or turn them off if they are on.
- 5- Open doors and windows that can be used to ventilate the environment.
- 6- If the control panel is in the same room as the place where the gas alarm is, do not reset the panel.

If the gas level cannot be lowered below the alarm level, or if the source of the gas leak cannot be found or if the leak cannot be repaired immediately, evacuate the building and notify the gas provider and emergency services. If the alarm stops and the cause of the alarm has been determined and the source of the problem has been resolved, the gas supply should be reopened and the environment should be checked again after checking that all gas devices used are turned off.

7 Manufacturer's declaration



EU Declaration of Conformity

Prosense Teknoloji San A. Ş. declares the PEC Series products to be in accordance with the following standards and directives.

Name and address of Manufacturer: Prosense Teknoloji San A. Ş.
Cumhuriyet Mah. Mermer Sok No:16
34876 - Kartal – İstanbul – Türkiye

Description of Devices: PEC Series Gas Control Panel

Applied Harmonized international standards:

EN/IEC 50270:2015 Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases and oxygen

Applied European Directives:

2014/30/EU Electromagnetic Compatibility (EMC)
2014/35/EU Low Voltage (LVD)

Each PEC Series gas control panel device which Production Quality Assurance procedures and Type Examination procedures have been applied has been shown to conform to an approved Type and to the applicable classification rules and essential principles before being supplied. This declaration is being made on the basis of the following certificates:

Quality Management Certificate: **18ISO0073**
Production Quality Assurance Certificate: **ExVeritas 18PQAN0072**

Authorised Signatory: Firat Celep
Production Manager

Date: **03.05.2025**

8 Warranty

All products are designed and manufactured to the latest internationally recognized standards by Prosense under a Quality Management system that is ISO 9001 certified. As such Prosense warrants its products against defective parts and workmanship and will repair or (at its option) replace any instruments which are or may become defective under proper use within 12 months from date of shipment from Prosense Technology. The Product will be returned repaired or replaced if it is determined by Prosense that the part failed due to defective materials or workmanship. Warrant is only valid if product is shipped prepaid to Prosense at Kartal, Istanbul TURKEY, in a package equal to or in the original container accompanied by a detailed description of any issue. Prosense reserves the right to charge for any site attendance where any fault is not found with the equipment in case return of goods is not practicable. Prosense shall not be liable for any loss or damage whatsoever or howsoever occasioned which may be a direct or indirect result of the use or operation of the Contract Goods by the Buyer or any Party.

This warranty covers instrument and parts sold to the Buyer only by authorized distributors, dealers and representatives as appointed by Prosense Technology. The warranties set out in this clause are not pro rata, i.e. the initial warranty period is not extended by virtue of any works carried out there under.

8.1 Exclusions

If gas sensors are part of the Product, the gas sensor is covered by a twelve (12) month limited warranty of the manufacturer. The gas sensors are covered by this limited warranty is subject to inspection by Prosense for extended exposure to excessive gas concentrations if a claim by the user is made under this limited warranty. Should such inspection indicate that the gas sensor has been expended rather than failed prematurely, this limited warranty shall not apply to the Product.

This limited warranty does not cover consumable items, such as batteries, or items subject to wear or periodic replacement, including lamps, fuses, valves, vanes, sensor elements, cartridges, sinters or filter elements. This warranty does not cover damage caused by accident, abuse, abnormal operating conditions or poisoning of sensor.

8.2 Warranty Limitation and Exclusion

Prosense will have no further obligation under this limited warranty. All warranty obligations of Prosense are void in below cases:

- if the Product has been subject to abuse, misuse, negligence, or accident
- if the Distributor or User fails to perform any of the duties set forth in this limited warranty
- if the Product has not been operated in accordance with instructions
- if the Product serial number has been removed or altered

8.3 Limitation of Liability

In no event will Prosense Technology be liable for any incidental damages, consequential damages, special damages, punitive damages, statutory damages, indirect damages, loss of profits, loss of revenues, or loss of use, even if informed of the possibility of such damages.

It is understood and agreed that Prosense' liability, whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the amount of the purchase price paid by the purchaser for the product. Under no circumstances shall Prosense be liable for special, indirect, or consequential damages. The price stated for the product is a consideration limiting Prosense' liability. No action, regardless of form, arising out of the transactions under this warranty may be brought by the purchaser more than one year after the cause of actions has occurred. To the extent permitted by applicable law, these limitations and exclusions will apply regardless of whether liability arises from breach of contract, warranty, tort (including but not limited to negligence), by operation of law, or otherwise.