

PERFORMANCE  
MADE  
SMARTER

# Product manual 2222

## *Switchmode power supply*



EAC

UK  
CA

CE

TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

No. 2222V104-UK  
From serial no.: 191087001

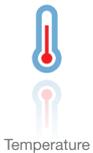
**PR**  
electronics

# 6 Product Pillars

## *to meet your every need*

### Individually outstanding, unrivalled in combination

With our innovative, patented technologies, we make signal conditioning smarter and simpler. Our portfolio is composed of six product areas, where we offer a wide range of analog and digital devices covering over a thousand applications in industrial and factory automation. All our products comply with or surpass the highest industry standards, ensuring reliability in even the harshest of environments and have a 5-year warranty for greater peace of mind.



Our range of temperature transmitters and sensors provides the highest level of signal integrity from the measurement point to your control system. You can convert industrial process temperature signals to analog, bus or digital communications using a highly reliable point-to-point solution with a fast response time, automatic self-calibration, sensor error detection, low drift, and top EMC performance in any environment.



We deliver the safest signals by validating our products against the toughest safety standards. Through our commitment to innovation, we have made pioneering achievements in developing I.S. interfaces with SIL 2 Full Assessment that are both efficient and cost-effective. Our comprehensive range of analog and digital intrinsically safe isolation barriers offers multifunctional inputs and outputs, making PR an easy-to-implement site standard. Our backplanes further simplify large installations and provide seamless integration to standard DCS systems.



We provide inexpensive, easy-to-use, future-ready communication interfaces that can access your PR installed base of products. All the interfaces are detachable, have a built-in display for readout of process values and diagnostics, and can be configured via push-buttons. Product specific functionality includes communication via Modbus and Bluetooth and remote access using our PR Process Supervisor (PPS) application, available for iOS and Android.



Our unique range of single devices covering multiple applications is easily deployable as your site standard. Having one variant that applies to a broad range of applications can reduce your installation time and training, and greatly simplify spare parts management at your facilities. Our devices are designed for long-term signal accuracy, low power consumption, immunity to electrical noise and simple programming.



Our compact, fast, high-quality 6 mm isolators are based on microprocessor technology to provide exceptional performance and EMC-immunity for dedicated applications at a very low total cost of ownership. They can be stacked both vertically and horizontally with no air gap separation between units required.



Our display range is characterized by its flexibility and stability. The devices meet nearly every demand for display readout of process signals and have universal input and power supply capabilities. They provide a real-time measurement of your process value no matter the industry and are engineered to provide a user-friendly and reliable relay of information, even in demanding environments.

# Switchmode power supply

## 2222

### Table of contents

|                                    |    |
|------------------------------------|----|
| Warning .....                      | 4  |
| Symbol identification .....        | 4  |
| Safety instructions .....          | 5  |
| How to dismantle system 2200 ..... | 6  |
| Application .....                  | 7  |
| Technical characteristics .....    | 7  |
| Mounting .....                     | 7  |
| Input .....                        | 7  |
| Output .....                       | 7  |
| Electrical specifications .....    | 8  |
| Order .....                        | 9  |
| Block diagram .....                | 9  |
| Document history .....             | 10 |

## Warning



**GENERAL**

This device is designed for connection to hazardous electric voltages. Ignoring this warning can result in severe personal injury or mechanical damage. To avoid the risk of electric shock and fire, the safety instructions of this manual must be observed and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the following. Prior to the commissioning of the device, this manual must be examined carefully. Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## Warning



**HAZARD-  
OUS  
VOLTAGE**

Until the device is fixed, do not connect hazardous voltages to the device. The following operations should only be carried out on a disconnected device and under ESD-safe conditions:

- General mounting, wire connection and disconnection.
- Troubleshooting the device.



**Repair of the device and replacement of circuit breakers must be done by PR electronics A/S only.**

## Warning



**INSTAL-  
LATION**

To keep the safety distances, devices with two built-in relays must not be connected to both hazardous and non-hazardous voltages on the same device's relay contacts. SYSTEM 2200 must be mounted in socket type S3B Releco (order no 7023).

## Symbol identification



**Triangle with an exclamation mark:** Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage. Warning / demand. Potentially lethal situations.



**The CE mark** proves the compliance of the device with the essential requirements of the directives.



**The UKCA mark** proves the compliance of the device with the essential requirements of the statutory requirements.



**The double insulation symbol** shows that the device is protected by double or reinforced insulation.

# Safety instructions

## Definitions

**Hazardous voltages** have been defined as the ranges: 75 to 1500 Volt DC, and 50 to 1000 Volt AC.

**Technicians** are qualified persons educated or trained to mount, operate, and also trouble-shoot technically correct and in accordance with safety regulations.

**Operators**, being familiar with the contents of this manual, adjust and operate the knobs or potentiometers during normal operation.

## Receipt and unpacking

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until this has been permanently mounted.

## Environment

Avoid direct sun light, dust, high temperatures, mechanical vibrations and shock, and rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation.

The device must be installed in pollution degree 2 or better.

The device is designed to be safe up to an altitude of 2 000 m.

The device is designed for indoor use.

## Mounting

Only technicians, who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these, should connect the device. Should there be any doubt as to the correct handling of the device, please contact your local distributor or, alternatively,

**PR electronics A/S**  
**[www.prelectronics.com](http://www.prelectronics.com)**

Mounting and connection of the device should comply with national legislation for mounting of electric materials, i.e. wire cross section, protective fuse, and location.

Descriptions of input / output and supply connections are shown in the block diagram and side label.

The following apply to fixed hazardous voltages-connected devices:

The max. size of the protective fuse is 10 A and, together with a power switch, it should be easily accessible and close to the device. The power switch should be marked with a label telling it will switch off the voltage to the device.

Year of manufacture can be taken from the first two digits in the serial number.

## Calibration and adjustment

During calibration and adjustment, the measuring and connection of external voltages must be carried out according to the specifications of this manual. The technician must use tools and instruments that are safe to use.

## Normal operation

Operators are only allowed to adjust and operate devices that are safely fixed in panels, etc., thus avoiding the danger of personal injury and damage. This means there is no electrical shock hazard, and the device is easily accessible.

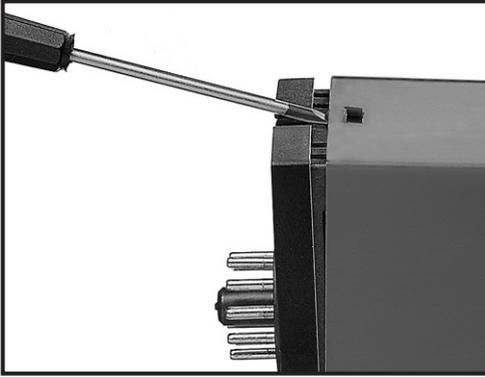
## Cleaning

When disconnected, the device may be cleaned with a cloth moistened with distilled water.

## Liability

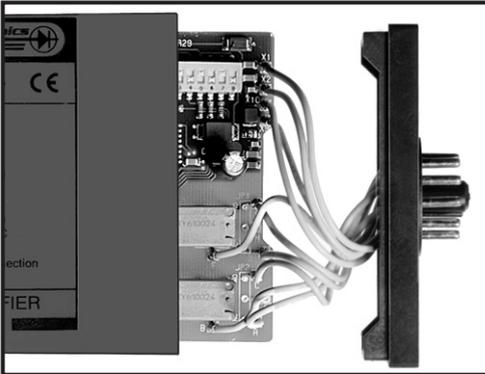
To the extent the instructions in this manual are not strictly observed, the customer cannot advance a demand against PR electronics A/S that would otherwise exist according to the concluded sales agreement.

## How to dismantle system 2200



**Picture 1:**

The back panel of the module is detached from the housing by way of a screwdriver.



**Picture 2:**

After this, the back panel can be pulled out together with the PCB, but please notice the position of the PCB as there is a number of different positions in the house. Do not pull the wires unnecessarily, instead pull the PCB.

Switches and jumpers can now be moved.

When assembling the back plate and housing, please make sure no wires are stuck.

## Switchmode power supply 2222

- 230 or 115 VAC primary voltage
- 24 VDC output voltage
- Double isolation by 3.75 kVAC
- 48 Watt output power, short circuit-protected
- Thermal protection against overload
- DIN rail mounting on a standard 11-pole relay socket

### Application

- General 24 VDC supply for equipment that requires a stabilised DC voltage.
- Separation of circuits in safety installations according to the PELV/SELV norm.
- Two units can be connected in series to achieve a plus / minus supply or a higher output voltage.
- The small mechanical dimensions of the switchmode power supply allow for a high DC output power, even in narrow spaces.

### Technical characteristics

- The power supply is based on primary switchmode technology to achieve a high efficiency.
- Galvanic isolation between the primary and the secondary voltage is achieved through the double-isolated safety transformer. A thermal fuse protects the input circuit when the internal temperature exceeds 100°C.
- A 1 A fuse on the input protects the switchmode power supply against a short overload.
- The DC output is protected against a short circuit by an electronic current limiter that activates at an output current of 2.5 A.
- A green LED on the front of the module indicates an active primary voltage.

### Mounting

- To achieve maximum cooling of the module, mounting in a vertical position at a distance of minimum 10 mm between neighbouring units is recommended.

### Input

- AC power supply according to the specifications.

### Output

- DC voltage of 24 V. An internally mounted potentiometer allows for a  $\pm 5\%$  adjustment of the output voltage.

## Electrical specifications

### Environmental conditions

|                                 |                      |
|---------------------------------|----------------------|
| Operating temperature . . . . . | -20 to +60°C         |
| Relative air humidity . . . . . | < 95% RH (non-cond.) |
| Protection degree . . . . .     | IP30                 |

### Mechanical specifications

|  |                       |
|--|-----------------------|
| Dimensions (HxWxD) (D is excl. pins) . . . . . | 80.5 x 35.5 x 84.5 mm |
| Weight . . . . .                               | 210 g                 |

### Common specifications

|  |                              |
|--|------------------------------|
| Max. consumption . . . . .                       | 60 VA                        |
| Efficiency . . . . .                             | ≥ 80%                        |
| Fuse . . . . .                                   | 1 A T / 250 VAC              |
| Thermal overload protection . . . . .            | 100°C                        |
| Isolation test / operation . . . . .             | 3.75 kVAC / 250 VAC          |
| PELV/SELV . . . . .                              | IEC 61140                    |
| Power derating . . . . .                         | 1% / °C amb. (T amb. > 40°C) |
| Transient stability (10% - max. load) . . . . .  | < 500 mV                     |
| Temperature coefficient . . . . .                | 0.05%/°C                     |
| Effect of supply voltage change (±10%) . . . . . | < 1%                         |
| EMC immunity influence . . . . .                 | < ±0.5%                      |

### Electrical specifications - INPUT

|                          |                   |
|--------------------------|-------------------|
| Supply voltage . . . . . | 207...253 VAC     |
|                          | 102.4...132.2 VAC |
| Frequency . . . . .      | 50...60 Hz        |

### Electrical specifications - OUTPUT

|  |                      |
|--|----------------------|
| Output voltage . . . . .                 | 24 VDC               |
| Adjustment . . . . .                     | ±5%                  |
| Output power (max.) . . . . .            | 48 W                 |
| Output current . . . . .                 | 2 A / 24 VDC         |
| Load stability (0 - max. load) . . . . . | < 1.5% / A           |
| Electronic current limit . . . . .       | Nom. 2.5 A           |
| Output ripple . . . . .                  | ≤ 40 mVRMS (100 kHz) |

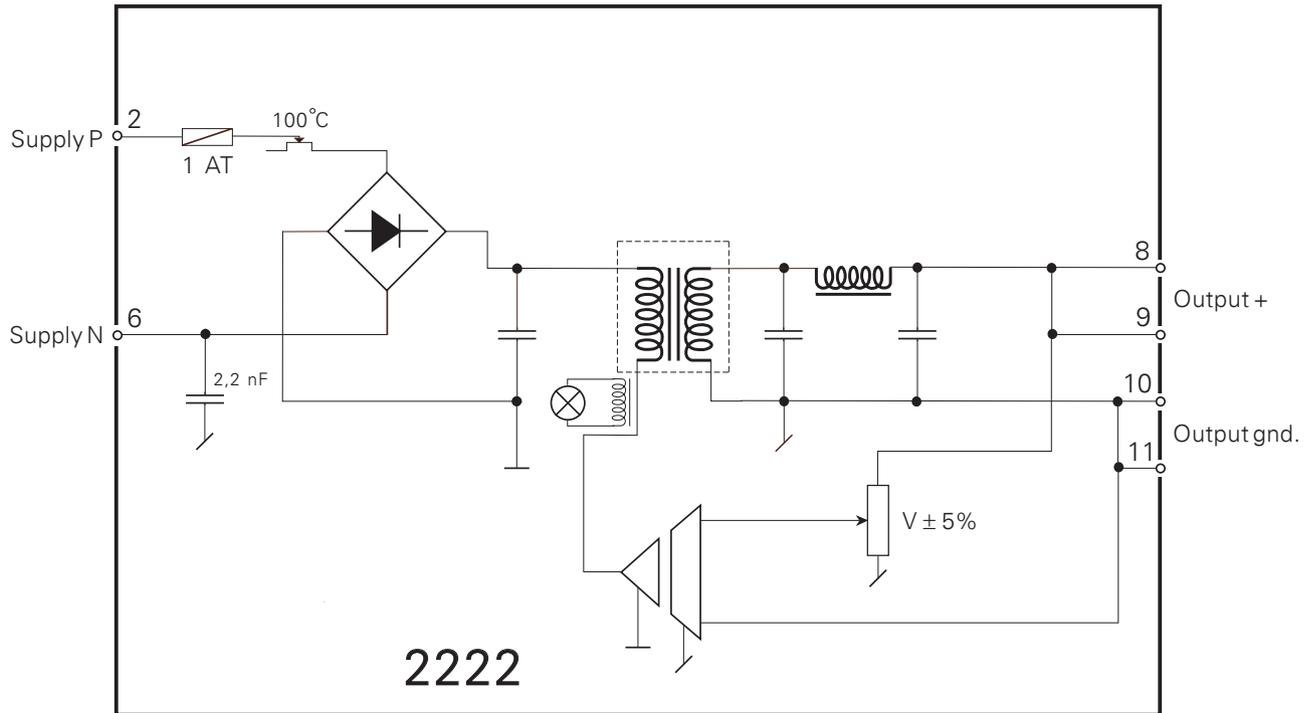
### Observed authority requirements

|                |                              |
|----------------|------------------------------|
| EMC . . . . .  | 2014/30/EU & UK SI 2016/1091 |
| LVD . . . . .  | 2014/35/EU & UK SI 2016/1101 |
| RoHS . . . . . | 2011/65/EU & UK SI 2012/3032 |
| EAC . . . . .  | TR-CU 020/2011               |

**Order**

| Type | Input       | Output     |
|------|-------------|------------|
| 2222 | 115 VAC : A | 24 VDC : 1 |
|      | 230 VAC : B |            |

**Block diagram**



## Document history

The following list provides notes concerning revisions of this document.

| <b>Rev. ID</b> | <b>Date</b> | <b>Notes</b> |
|----------------|-------------|--------------|
| 104            | 2232        | UKCA added.  |

# We are near you, *all over the world*

**Our trusted red boxes are supported wherever you are**

All our devices are backed by expert service and a 5-year warranty. With each product you purchase, you receive personal technical support and guidance, day-to-day delivery, repair without charge within the warranty period and easily accessible documentation.

We are headquartered in Denmark, and have offices and authorized partners the world over. We are a local

business with a global reach. This means that we are always nearby and know your local markets well. We are committed to your satisfaction and provide **PERFORMANCE MADE SMARTER** all around the world.

For more information on our warranty program, or to meet with a sales representative in your region, visit [prelectronics.com](http://prelectronics.com).

# Benefit today from *PERFORMANCE MADE SMARTER*

PR electronics is the leading technology company specialized in making industrial process control safer, more reliable and more efficient. Since 1974, we have been dedicated to perfecting our core competence of innovating high precision technology with low power consumption. This dedication continues to set new standards for products communicating, monitoring and connecting our customers' process measurement points to their process control systems.

Our innovative, patented technologies are derived from our extensive R&D facilities and from having a great understanding of our customers' needs and processes. We are guided by principles of simplicity, focus, courage and excellence, enabling some of the world's greatest companies to achieve PERFORMANCE MADE SMARTER.