

PR
electronics



2204

Isolation amplifier

No. 2204V104-UK

From ser. no. 970205001



EAC

CE

- DK** ▶ PR electronics A/S tilbyder et bredt program af analoge og digitale signalbehandlingsmoduler til industriel automation. Programmet består af Isolatorer, Displays, Ex-barrierer, Temperaturtransmittere, Universaltransmittere mfl. Vi har modulerne, du kan stole på i selv barske miljøer med elektrisk støj, vibrationer og temperaturudsving, og alle produkter opfylder de strengeste internationale standarder. Vores motto »Signals the Best« er indbegrebet af denne filosofi - og din garanti for kvalitet.
- UK** ▶ PR electronics A/S offers a wide range of analog and digital signal conditioning devices for industrial automation. The product range includes Isolators, Displays, Ex Interfaces, Temperature Transmitters, and Multifunctional Devices. You can trust our products in the most extreme environments with electrical noise, vibrations and temperature fluctuations, and all products comply with the most exacting international standards. »Signals the Best« is the epitome of our philosophy - and your guarantee for quality.
- FR** ▶ PR electronics A/S offre une large gamme de produits pour le traitement des signaux analogiques et numériques dans tous les domaines industriels. La gamme de produits s'étend des transmetteurs de température aux afficheurs, des isolateurs aux interfaces SI, jusqu'aux modules universels. Vous pouvez compter sur nos produits même dans les conditions d'utilisation sévères, p.ex. bruit électrique, vibrations et fluctuations de température. Tous nos produits sont conformes aux normes internationales les plus strictes. Notre devise »SIGNALS the BEST« c'est notre ligne de conduite - et pour vous l'assurance de la meilleure qualité.
- DE** ▶ PR electronics A/S verfügt über ein breites Produktprogramm an analogen und digitalen Signalverarbeitungsgeräte für die industrielle Automatisierung. Dieses Programm umfasst Displays, Temperaturtransmitter, Ex- und galvanische Signaltrenner, und Universalgeräte. Sie können unsere Geräte auch unter extremen Einsatzbedingungen wie elektrisches Rauschen, Erschütterungen und Temperaturschwingungen vertrauen, und alle Produkte von PR electronics werden in Übereinstimmung mit den strengsten internationalen Normen produziert. »Signals the Best« ist Ihre Garantie für Qualität!

ISOLATION AMPLIFIER

Type 2204

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GENERAL

WARNING

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 electrical 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.



**HAZARDOUS
VOLTAGE**

WARNING

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:

Dismantlement of the device for setting of DIP switches and jumpers.

General mounting, connection and disconnection of wires.

Troubleshooting the device.



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



**INSTAL-
LATION**

WARNING

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: Warning / demand. Potentially lethal situations.



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



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 troubleshoot 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. The packing should always follow the device until this has been permanently mounted. Check at the receipt of the device whether the type corresponds to the one ordered.

ENVIRONMENT

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

All devices fall under Installation Category II, Pollution Degree 1, and Insulation Class II.

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

Mounting and connection of the device should comply with national legislation for mounting of electric materials, i.a. 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.

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.

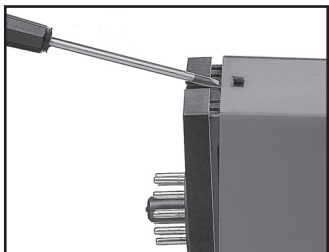
CLEANING

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

LIABILITY

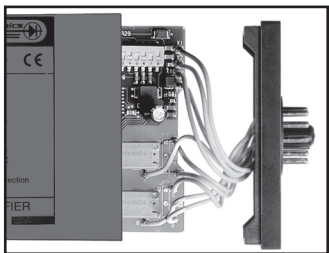
To the extent the instructions in this manual are not strictly observed, the customer cannot advance a demand against PR electronics A/S that would otherwise exist according to the concluded sales agreement.

HOW TO DISMANTLE SYSTEM 2200



Picture 1:

The back panel of the module is detached from the housing by way of a screw-driver.



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.

ISOLATION AMPLIFIER 2204

- *Input galvanically separated from output and supply*
- *Current or voltage input*
- *Signal conversion*
- *Current and voltage output*
- *24 VDC supply or universally supplied*
- *Applicable in PELV/SELV circuits*

Applications

Galvanic separation of analogue signals (ground loop elimination).

● Measurement of floating signals. ● Signal conversion within the ranges: 0...10 VDC or 0...50 mA on the input and 0...20 mA and 0...10 VDC in fixed ranges on the output.

Technical characteristics

General

The 2204 uses microprocessor technology for the selection of gain and zero offset, yet the signal conditioning is analogue with a fast response time of less than 25 ms.

In standard ranges, the 2204 is programmable by use of internal dipswitches within the input and output ranges of the order schedule. Provided that front adjustments are still sealed, the unit needs no adjustment after programming. Universally supplied units have a 3-port galvanic separation between input, supply, and output.

Input

Current or voltage in standard or special ranges within the measuring range.

Standard input voltage: 0/0.2...1 V, 0/0.5...2.5 V and 0/2...10 V.

Input resistance: typ. 10 M Ω .

Standard input current: 0/1...5 mA or 0/4...20 mA.

Input resistance: norm. 50 Ω (0/4...20 mA).

Output

The output can be ordered for standard currents and voltages or special versions within the signal range.

Standard output current (pin 3) 0/4...20 mA and 0/1...5 mA acc. to order schedule with the possibility of reversal. Current limit: 23...28 mA.

Standard voltage output (pin 2) is achieved by short-circuiting pins 2 and 3. The current signal is available between pins 2 and 1. For voltage signals in the range 0...1 VDC, a 50 Ω shunt (DP 2-1) is applied; in the range 0...10 VDC, a 500 Ω shunt (DP 2-2) is applied. If both signals are used simultaneously, the mA loop to ground must go through the internal shunt. Adjustment of 0 and 100% is possible in the front $\pm 10\%$, but please note that the basic calibration is thereby lost.

Electrical specifications

Specifications range:

-20°C to +60°C

Common specifications:

Supply voltage, DC	19.2...28.8 VDC
Supply voltage, universal	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. consumption 2204--D (24 VDC)	≤ 1.3 W
Max. consumption 2204--P (uni. supply)	≤ 1.8 W
Isolation, test / operation	3.75 kVAC / 250 VAC
Signal / noise ratio	Min. 60 dB
Response time (0...90%)	< 25 ms
Temperature coefficient	< $\pm 0.01\%$ of span/°C
Linearity error	< $\pm 0.1\%$ of span
Effect of supply voltage change	< $\pm 0.002\%$ of span/%V
EMC immunity influence	< $\pm 0.5\%$ of span
Relative air humidity	< 95% RH (non cond.)
Dimensions (HxWxD)	80.5 x 35.5 x 84.5 mm
Protection degree	IP50
Weight DC / universally supplied	110 g / 160 g

Input:**Current:**

Measurement range.....	0...50 mADC
Min. measurement range (span).....	4 mADC
Max. offset	20% of max. value
Input resistance.....	Nom. 50 Ω

Voltage:

Measurement range.....	0...10 VDC
Min. measurement range (span).....	0.2 VDC
Max. offset	20% of max. value
Input resistance.....	10 M Ω

Output:**Current output:**

Signal ranges.....	0...5 mA / 0...20 mA
Min. measurement range (span).....	4 mA / 16 mA
Max. offset	20% of max. value
Load (max.).....	20 mA / 600 Ω / 12 VDC
Load stability.....	< $\pm 0.01\%$ of span / 100 Ω
Current limit.....	23...28 mA

Voltage output through internal shunt:

Signal ranges.....	0...0.25V / 0...1V / 0...2.5V / 0...10V
Min. measurement range (span).....	0.2 V / 0.8 V / 2.0 V / 8.0 V
Max. offset	20% of max. value
Load (min.).....	500 k Ω
Output resistance.....	50 Ω / 500 Ω

Observed authority requirements:

EMC 2004/108/EC	EN 61326-1
LVD 2006/95/EC.....	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011.....	EN 61326-1

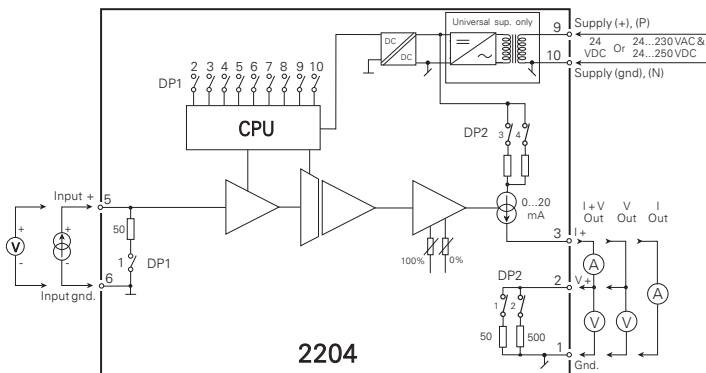
Standard:

Of span = Of the presently selected range

Order: 2204

Type	Input	Output	Supply
2204	0...20 mA : A	Special : 0	24 VDC : D
	4...20 mA : B	0...20 mA : 1	24...230 VAC & : P
	0...1 V : C	4...20 mA : 2	24...250 VDC
	0.2...1 V : D	0...5 mA : 3	
	0...10 V : E	0...1 V : 4	
	2...10 V : F	0.2...1 V : 5	
	Special : X	0...10 V : 6	
		2...10 V : 7	

BLOCK DIAGRAM



PROGRAMMING

INPUT PROGRAMING	DP1 (10-pole) SW 1, 2, 3, 4, 5	
	SW ON	SW OFF
0...0.5 mA	1, 3	2, 4, 5
0...20 mA	1, 4	2, 3, 5
0...1 V	2, 3	1, 4, 5
0...2.5 V	2, 4	1, 3, 5
0...10 V	2, 3, 4	1, 5
For 20% offset on input, set DP1 SW5 ON e.g. input 4...20 mA	1, 4, 5	2, 3

OUTPUT PROGRAMING	DP2 (4-pole) SW 1 - 4		DP1 (10-pole) SW 6, 7, 8, 9, 10	
	SW ON	SW OFF	ON	OFF
0...5 mA	4	1, 2, 3	7	6, 8, 9, 10
0...20 mA	3	1, 2, 4	8	6, 7, 9, 10
0...5 mA / 0...250 mV	1, 4	2, 3	6	7, 8, 9, 10
0...20 mA / 0...1 V	1, 3	2, 4	6, 7	8, 9, 10
0...5 mA / 0...2.5 V	2, 4	1, 3	6, 8	7, 9, 10
0...20 mA / 0...10 V	2, 3	1, 4	6, 7, 8	9, 10
For 20% offset on output, set DP1 SW9 ON e.g. output 4...20 mA	3	1, 2, 4	8, 9	6, 7, 10
For reversed output set DP1, SW10 ON e.g. output 20...4 mA	3	1, 2, 4	8, 9, 10	6, 7

Note: At other spans than the above-mentioned, DP1 and DP2 have a different setting which applies to the delivered special range.



Displays Programmable displays with a wide selection of inputs and outputs for display of temperature, volume and weight, etc. Feature linearization, scaling, and difference measurement functions for programming via PReset software.



Ex interfaces Interfaces for analog and digital signals as well as HART signals between sensors / I/P converters / frequency signals and control systems in Ex zone 0, 1 & 2 and for some devices in zone 20, 21 & 22.



Isolation Galvanic isolators for analog and digital signals as well as HART signals. A wide product range with both loop-powered and universal isolators featuring linearization, inversion, and scaling of output signals.






























Temperature A wide selection of transmitters for DIN form B mounting and DIN rail devices with analog and digital bus communication ranging from application-specific to universal transmitters.



Universal PC or front programmable devices with universal options for input, output and supply. This range offers a number of advanced features such as process calibration, linearization and auto-diagnosis.



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