

# ISOLATION AMPLIFIER



- 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 dials 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 $\Omega$ .  
Standard input current: 0/1...5 mA or 0/4...20 mA.  
Input resistance: norm. 50  $\Omega$  (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 ranges 0...1 VDC, a 50  $\Omega$  shunt (DP 2-1) is applied; in the ranges 0...10 VDC, a 500  $\Omega$  shunt (DP 2-2) is applied.

Using both signals simultaneously, the mA loop to ground must go through the internal shunt. Adjustment of 0 and 100% is possible at 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)	$\leq 1.3$ W
Max. consump. 2204--P (uni. supp.)..	$\leq 1.8$ 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
Tightness .....	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 $\Omega$

#### Voltage:

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

### 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 $\Omega$ / 12 VDC
Load stability .....	< $\pm 0.01\%$ of span / 100 $\Omega$
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 $\Omega$
Output resistance .....	50 $\Omega$ / 500 $\Omega$

### Observed authority requirements: Standard:

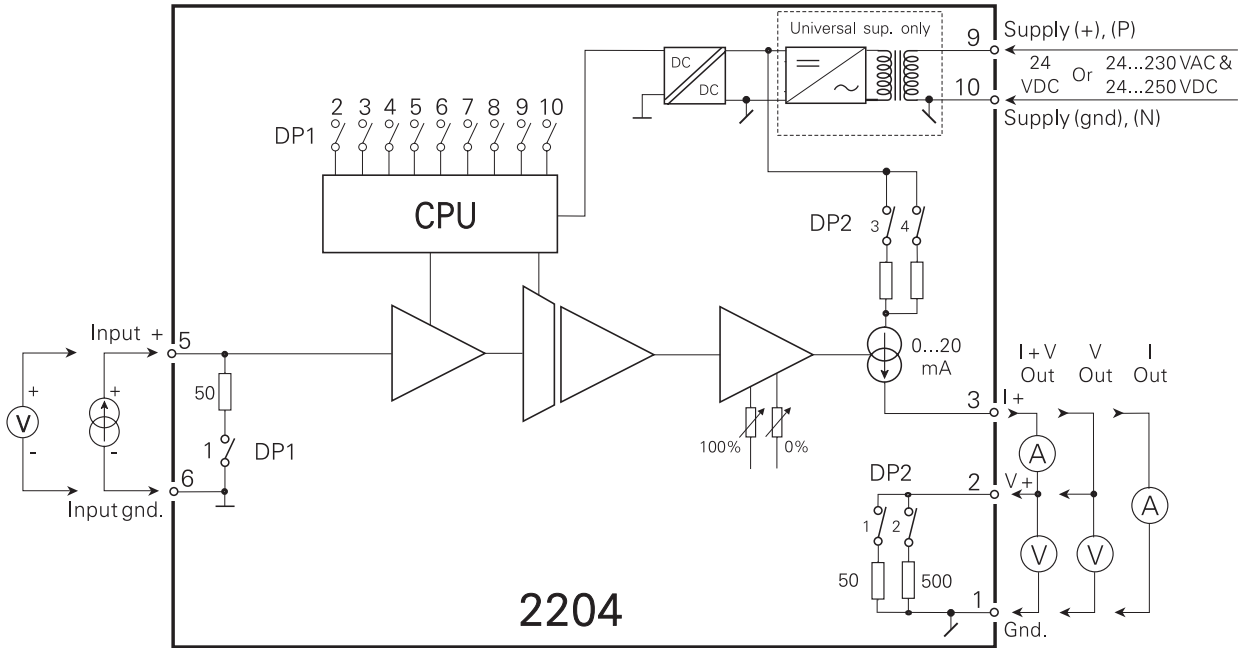
EMC 2004/108/EC	
Emission and immunity .....	EN 61326
LVD 73/23/EEC .....	EN 61010-1
PELV/SELV .....	IEC 364-4-41 and EN 60742

Of span = Of the presently selected range

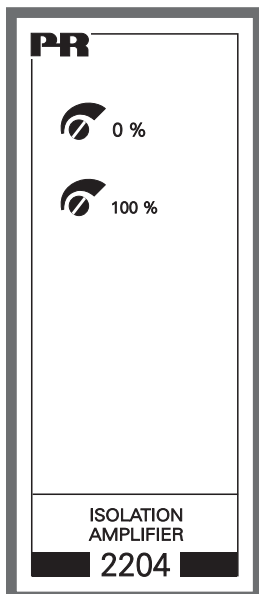
Order : 2204

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:



Front layout:



Programming:

INPUT PROGRAMMING	DP1 (10-pole) SW 1, 2, 3, 4, 5	
	SW ON	SW OFF
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
<b>For 20% offset on input,</b> set DP1 SW5 ON e.g. input 4...20 mA	1, 4, 5	2, 3

OUTPUT PROGRAMMING	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
<b>For 20% offset on output,</b> set DP1 SW9 ON e.g. output 4...20 mA	3	1, 2, 4	8, 9	6, 7, 10
<b>For reversed output set DP1,</b> SW10 ON e.g. output 20...4 mA	3	1, 2, 4	8, 9, 10	5, 6, 7

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