

**Electrical safety:** Norm IEC/EN 61010-1, 150 V Cat. II - Pol. 2

**Protection index:** IP40 following EN 60529

**Environmental specification:**

- Climatic category: normal (N)
- Operating temperature: -10°C to +55°C
- Storage temperature: -40°C to +70°C
- Relative humidity: 20 to 96 % RH, non-condensing

## ■ Resistance boxes

### ● Individual resistance boxes

Box	Model
$\Omega \times 0,1$	P03.1975.21A
$\Omega \times 1$	P03.1975.22A
$\Omega \times 10$	P03.1975.23A
$\Omega \times 100$	P03.1975.24A
$\Omega \times 1000$	P03.1975.25A
$k\Omega \times 10$	P03.1975.26A
$k\Omega \times 100$	P03.1975.27A
$M\Omega \times 1$	P03.1975.28A

### ● 4, 5, 6, and 7-decade resistance boxes

Box	Model
BR04	P01.1974.01
BR05	P01.1974.02
BR06	P01.1974.03
BR07	P01.1974.04

## ■ Switch with 7 ratios

Model	P03.1975.31A
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## ■ Capacitance boxes

### ● Individual capacitance boxes

Box	Model
$1 \mu F \times 10$	P03.1996.11A
$0.1 \mu F \times 10$	P03.1996.12A
$0.01 \mu F \times 10$	P03.1996.13A

### ● 5-decade capacitance box

Box	Model
BC05	P01.1974.21

## ■ Inductance boxes

### ● 7-decade inductance box

Box	Model
BL07	P01.1974.51

## ■ Zero galvanometer

Model	P03.1976.11A
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## ■ Dual switch box

Model	P03.1975.29A
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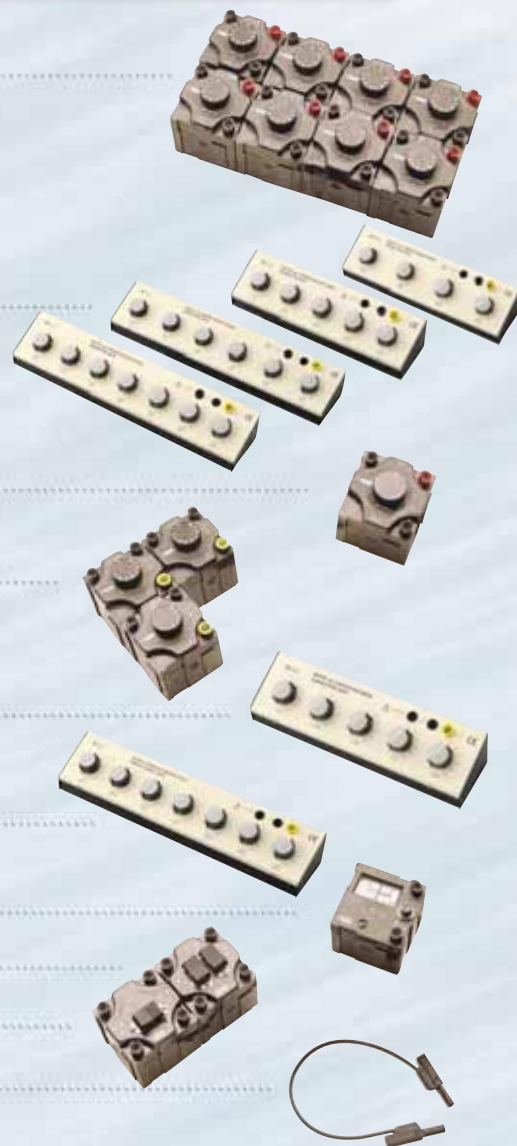
## ■ Simple inverter box

Model	P03.1975.30A
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## ■ Safety lead IEC/EN 61010-2-031

Model	P01.2950.56
Length 25 cm with 2 safety plugs	
$\varnothing$ 4 mm with rear connection.	

NB: each box is supplied with a lead IEC/EN 61010-2-031

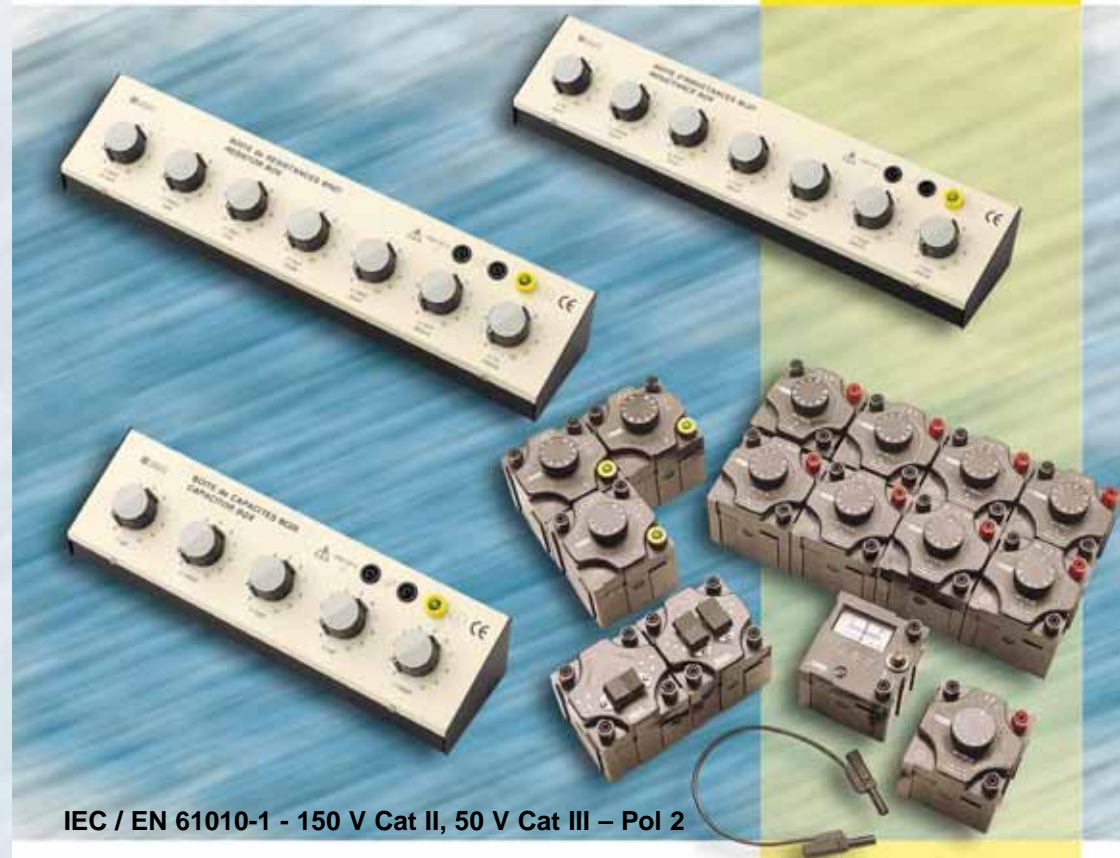


906 211 059 - E-01 - 0202 - Characteristics subject to modifications according to technological developments.

# Resistance, capacitance and inductance,...

for educational and general purpose use

# Decade boxes



IEC / EN 61010-1 - 150 V Cat II, 50 V Cat III – Pol 2

**Modular boxes for simulation or substitution in general industrial laboratory, R&D, maintenance, and educational use**

- Selection by rotary switch with guilt contacts (stators giving a clear indication of the dial setting)
- Stop position to prevent accidental switching from 10 to 1
- Male earth terminal with safety blank
- Outputs on  $\varnothing$  4 mm safety terminals
- Link leads IEC/EN 61010-2-031



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## Resistance boxes

### Individual resistance boxes

8 individual boxes with 11-position switch (0 = short circuit)  
3 safety terminals Ø 4 mm per box

Box	Range	I max.	Accuracy	Model
$\Omega \times 0.1$	0.1 to 1 $\Omega$	1 A	1 % $\pm$ 5 m $\Omega$	P03.1975.21A
$\Omega \times 1$	1 to 10 $\Omega$	750 mA	1 % $\pm$ 5 m $\Omega$	P03.1975.22A
$\Omega \times 10$	10 to 100 $\Omega$	250 mA	0.5 %	P03.1975.23A
$\Omega \times 100$	100 to 1000 $\Omega$	75 mA	0.5 %	P03.1975.24A
$\Omega \times 1000$	1 to 10 k $\Omega$	25 mA	0.5 %	P03.1975.25A
k $\Omega \times 10$	10 to 100 k $\Omega$	7.5 mA	0.5 %	P03.1975.26A
k $\Omega \times 100$	100 to 1000 k $\Omega$	2 mA	0.5 %	P03.1975.27A
M $\Omega \times 1$	1 to 10 M $\Omega$	0.2 mA	0.5 %	P03.1975.28A

- Temperature coefficient:  
 $\pm 50$  ppm for the ranges  $> 1 \Omega$ ,  $\pm 100$  ppm for the 1  $\Omega$  range and  $\pm 25$  ppm for the 0.1  $\Omega$  range

- Residual resistor:  
15 m $\Omega \pm$  5 m $\Omega$  suppressed from the first value  
- Dimensions: 72 x 72 x 90 mm - Weight: 220 g

### 4, 5, 6 and 7-decade resistance boxes

Resistance in desk-type box  
Connection: safety terminals Ø 4 mm

Front panel and metallic box connected to a safety earth socket with failsafe system

**BR04** Model: P01.1974.01

Decade	Range	I max.
1	1 $\Omega$ to 10 $\Omega$	700 mA
2	10 $\Omega$ to 100 $\Omega$	200 mA
3	100 $\Omega$ to 1 k $\Omega$	70 mA
4	1 k $\Omega$ to 10 k $\Omega$	20 mA

- Resistance range: 11.11 k $\Omega$   
- Accuracy: 1 %  
- Dimensions: 310 x 90 x 80 mm - Weight: 1 kg

**BR05** Model: P01.1974.02

Decade	Range	I max.
1	1 $\Omega$ to 10 $\Omega$	700 mA
2	10 $\Omega$ to 100 $\Omega$	200 mA
3	100 $\Omega$ to 1 k $\Omega$	70 mA
4	1 k $\Omega$ to 10 k $\Omega$	20 mA
5	10 k $\Omega$ to 100 k $\Omega$	7 mA

- Resistance range: 111.11 k $\Omega$   
- Accuracy: 1 %  
- Dimensions: 310 x 90 x 80 mm - Weight: 1 kg

**BR06** Model: P01.1974.03

Decade	Range	I max.
1	1 $\Omega$ to 10 $\Omega$	700 mA
2	10 $\Omega$ to 100 $\Omega$	200 mA
3	100 $\Omega$ to 1 k $\Omega$	70 mA
4	1 k $\Omega$ to 10 k $\Omega$	20 mA
5	10 k $\Omega$ to 100 k $\Omega$	7 mA
6	100 k $\Omega$ to 1 M $\Omega$	1 mA

- Resistance range: 1.11111 k $\Omega$   
- Accuracy: 1 %  
- Dimensions: 410 x 90 x 80 mm - Weight: 1.4 kg

**BR07** Model: P01.1974.04

Decade	Range	I max.
1	1 $\Omega$ to 10 $\Omega$	700 mA
2	10 $\Omega$ to 100 $\Omega$	200 mA
3	100 $\Omega$ to 1 k $\Omega$	70 mA
4	1 k $\Omega$ to 10 k $\Omega$	20 mA
5	10 k $\Omega$ to 100 k $\Omega$	7 mA
6	100 k $\Omega$ to 1 M $\Omega$	1 mA
7	1 M $\Omega$ to 10 M $\Omega$	0.1 mA

- Resistance range: 11.11111 k $\Omega$   
- Accuracy: 1 %  
- Dimensions: 410 x 90 x 80 mm - Weight: 1.4 kg

## Inductance Box

### 7-decade inductance box

Inductance custom wound ferrite core, ensure a high 'Q' factor, typical 55 to 100.  
The voltage applied depends largely on the frequency of use. The voltage must be limited

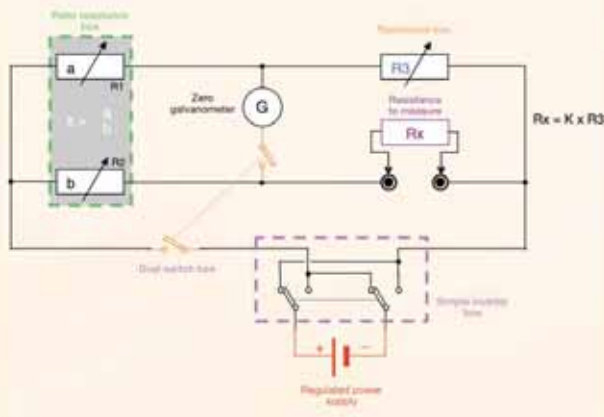
Decade	Max. range	I DC Q	Meas. factor	Max. frequency	Resistance	Accuracy
1	1 $\mu$ H to 10 $\mu$ H	300 mA	120	1.2 MHz	2 $\Omega$	5%
2	10 $\mu$ H to 100 $\mu$ H	200 mA	140	500 kHz	5 $\Omega$	5%
3	100 $\mu$ H to 1 mH	100 mA	80	150 kHz	13 $\Omega$	5%
4	1 mH to 10 mH	100 mA	150	50 kHz	34 $\Omega$	5%
5	10 mH to 100 mH	70 mA	65	10 kHz	55 $\Omega$	5%
6	100 mH to 1 H	50 mA	100	10 kHz	220 $\Omega$	5%
7	1 H to 10 H	40 mA	50	10 kHz	1500 $\Omega$	10%

- Dimensions: 410 x 90 x 80 mm - Weight: 1.4 kg

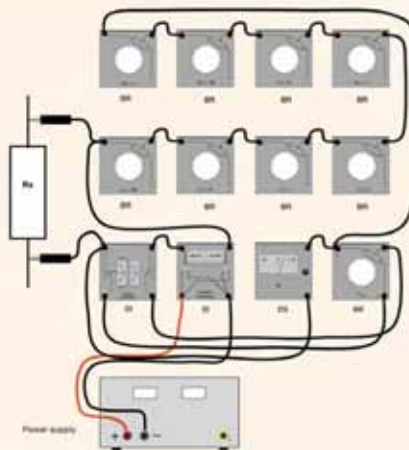
**BL07** Model: P01.1974.51

to prevent saturation of the core and overheating.  
Connection: safety terminals Ø 4 mm  
Front panel and metallic box connected to a safety earth socket with failsafe system.

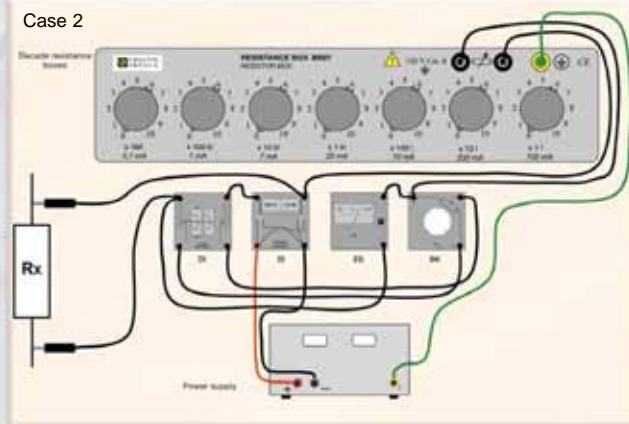
## Wheatstone Bridge: theoretical diagram



Case 1



Case 2



BR Resistance box  
DI Dual switch box  
SI Simple inverter box

ZG Zero galvanometer  
BK Ratio resistance box

## K ratio resistance box

### Switch with 7 ratios

Model: P03.1975.31A

- K = 1/1000 - 1/100 - 1/10 - 1 - 10 - 100 - 1000  
- Accuracy:  $\pm 0.2$  %  
- Temperature coefficient:  $\pm 10$  ppm  
- 3 safety terminals Ø 4 mm  
- Dimensions: 72 x 72 x 90 mm - Weight: 220 g

I max.	25 mA	75 mA	250 mA	750 mA
K	1	10	100	1000

## Capacitance boxes

### Individual capacitance boxes

3 individual boxes with 11-position switch (including 0)  
2 safety terminals Ø 4 mm and 1 earth terminal

Box	Range	Loss angle	Accuracy
1 $\mu$ F x 10	1 to 10 $\mu$ F	$< 10^2$	P03.1996.11A
0,1 $\mu$ F x 10	0,1 to 1 $\mu$ F	$< 10^2$	P03.1996.12A
0,01 $\mu$ F x 10	0,01 to 1 $\mu$ F	$< 10^2$	P03.1996.13A

- Dimensions: 72 x 72 x 90 mm  
- Weight: 220 g  
- Accuracy: 2 %

### 5-decade capacitance box

Capacitor polystyrene and polypropylene, high accuracy temperature coefficient 125 ppm/ $^{\circ}$ C and high insulated  
Connection: safety terminals Ø 4 mm  
Front panel and metallic box connected to a safety earth socket with failsafe system.

BC05

Model: P01.1974.21

Decade	Range
1	0.1 nF to 1 nF
2	1 nF to 10 nF
3	10 nF to 100 nF
4	100 nF to 1 $\mu$ F
5	1 $\mu$ F to 10 $\mu$ F

- Capacitance range: 11.111  $\mu$ F  
- Residual capacitance: typical 20 pF  
- Accuracy:  $\pm 1$  % (low residual capacitance)  
- Max. operating voltage: 300 V DC, 230 V AC (50 Hz)  
- Dimensions: 310 x 90 x 80 mm - Weight: 1 kg

## Zero galvanometer

Model: P03.1976.11A

- Equipment with taut ribbon suspension  
- Dial with anti-parallax mirror  
• Scale length: 20 mm  
• 10 divisions both sides of zero  
- 2 ranges with press button:  
• Rest (x1):  $\pm 1$  mA i.e 100  $\mu$ A/div  
• Work (x100):  $\pm 10$   $\mu$ A i.e 1  $\mu$ A/div  
- 2 safety terminals Ø 4 mm  
• I max.: 1 mA  
• Internal resistance: 180  $\Omega$  (dual range)  
• Accuracy:  $\pm 2.5$ % of the scale range  
• Dimensions: 72 x 72 x 63 mm - Weight: 220 g

## Dual switch box

Model: P03.1975.29A

- 2 switches with 3 positions: open - closed - fugitive (button)  
- 4 safety terminals Ø 4 mm  
• P max.: 50 VA - I max.: 5 A - U max.: 250 V  
• Dimensions: 72 x 72 x 63 mm - Weight: 220 g

## Simple inverter box

Model: P03.1975.30A

- 1 bipolar inverter with 3 positions: open - closed - inverted  
- 4 safety terminals Ø 4 mm  
• P max.: 50 VA - I max.: 5 A - U max.: 250 V  
• Dimensions: 72 x 72 x 63 mm - Weight: 220 g