



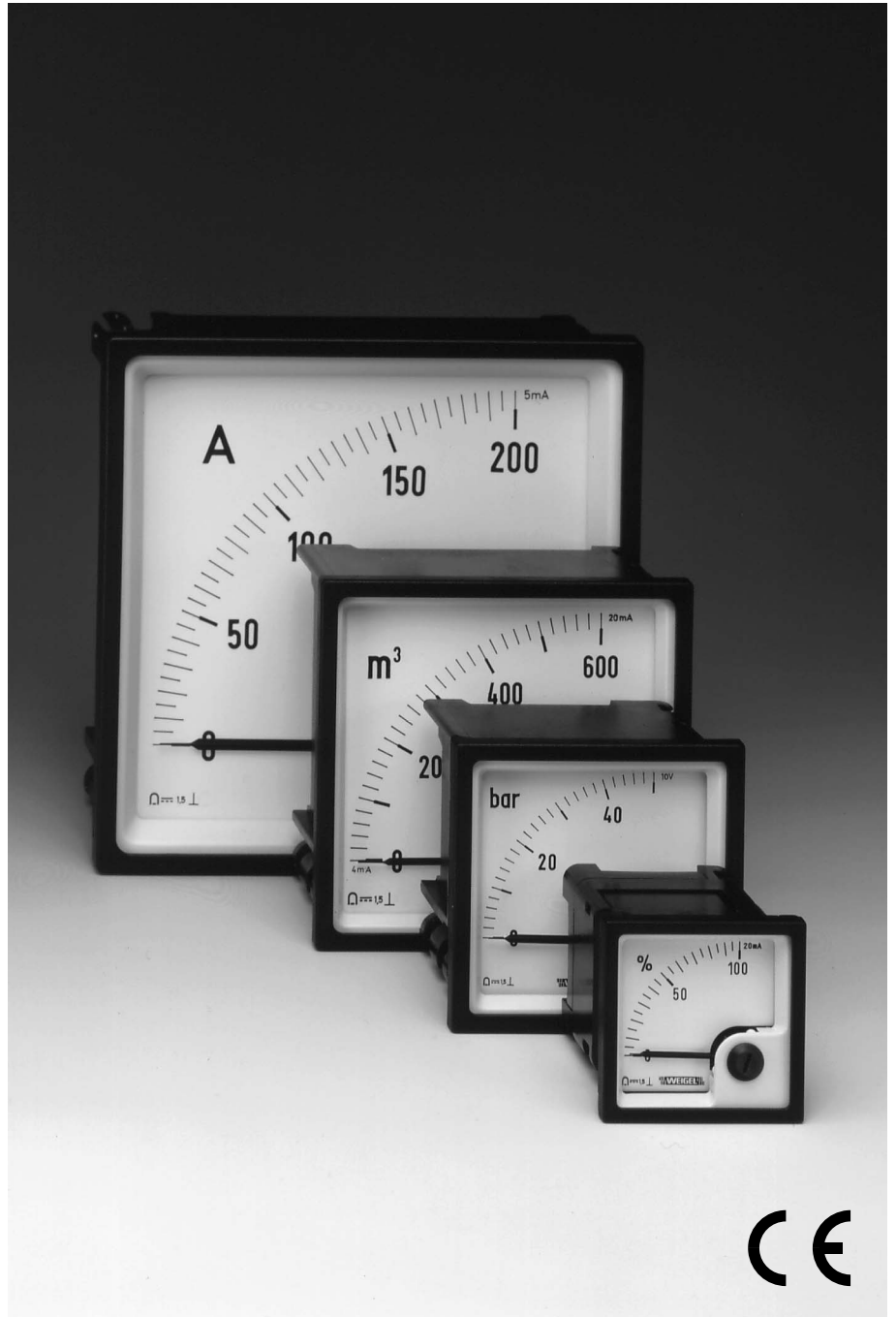
# Data Sheet

K Series  
410.D.101.11

## Analog Meters with Moving-Coil Movement 90° Dial

PQ 48 K  
PQ 72 K  
PQ 96 K  
PQ 144 K

with Slide-In Dial



**WEIGEL**

## Application

The moving-coil panel meters **PQ 48/72/96/144 K** (K series) housed in moulded thermoplastic cases are suitable for the measurement of DC currents and voltages.

The instruments are suitable to be mounted in switchboards, control panels, machine tool consoles and mosaic panels. The bezel, the glass window and the dial can be easily exchanged on-site.

## Movements

Self-shielding moving-coil movements with core-type magnet and pivot suspension. Spring loaded jewel bearings for vibration and shock resistance.

## Mechanical Data

|                                    |  |                      |                      |                     |
|------------------------------------|--|----------------------|----------------------|---------------------|
| case details                       | moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels, stackable |                      |                      |                     |
| material of case                   | polycarbonate thermoplastics, flame retardant with UL rating of 94 V-0   |                      |                      |                     |
| material of window                 | glass  |                      |                      |                     |
| colour of bezel                    | black (similar to RAL 9005)  |                      |                      |                     |
| position of use                    | vertical $\pm 5^\circ$   |                      |                      |                     |
| panel fixing                       | screw clamps or spring clamps (except PQ 144 K)  |                      |                      |                     |
| mounting                           | stackable next to each other   |                      |                      |                     |
| panel thickness                    | $\leq 40$ mm   |                      |                      |                     |
| <b>terminals</b>                   |  |                      |                      |                     |
| voltmeters and ammeters $\leq 4$ A | hexagon studs, M4 screws and wire clamps E3  |                      |                      |                     |
| ammeters $\leq 60$ A               | threaded studs M6 with nuts  |                      |                      |                     |
| ammeters 100 A                     | threaded studs M8 with nuts  |                      |                      |                     |
| <b>dimensions</b> (in mm)          | <b>PQ 48 K</b>   | <b>PQ 72 K</b>       | <b>PQ 96 K</b>       | <b>PQ 144 K</b>     |
| bezel                              | □ 48   | □ 72                 | □ 96                 | □ 144               |
| case                               | □ 42.5   | □ 66                 | □ 90                 | □ 136               |
| depth                              | 53   | 53                   | 53                   | 53                  |
| panel cutout                       | □ 45 <sup>+0.6</sup>   | □ 68 <sup>+0.7</sup> | □ 92 <sup>+0.8</sup> | □ 138 <sup>+1</sup> |
| weight approx.                     | 0.11 kg  | 0.15 kg              | 0.2 kg               | 0.25 kg             |

## Electrical Data

|   |  |
|---|--|
| measuring unit                            | DC voltage or current  |
| overload capacity acc. to DIN EN 60 051-1 |  |
| continuously                              | 1.2 times rated voltage / current  |
| 5 s max.                                  | 2 times rated voltage, 10 times rated current  |
| measurement category                      | CAT III  |
| operating voltage                         | refer to Measuring Ranges  |
| pollution level                           | 2  |
| enclosure code                            | IP 52 case front side<br>IP 00 for terminals without protection against accidental contact<br>IP 20 for terminals protected against accidental contact |

also refer to "Options"

## Measuring Ranges

### For mains use

| DC current          | voltage drop approx. |                | DC voltage $>5V$          |                 |
|---------------------|----------------------|----------------|---------------------------|-----------------|
|                     | PQ 48 K              | PQ 72/96/144 K | sensitivity <sup>1)</sup> |                 |
| 100 $\mu$ A         | 270 mV               | 400 mV         | 6 V                       | 1 k $\Omega$ /V |
| 1 mA                | 30 mV                | 40 mV          | 10 V                      | 1 k $\Omega$ /V |
| 1.5 mA              | 90 mV                | 200 mV         | 15 V                      | 1 k $\Omega$ /V |
| 2.5 mA              | 90 mV                | 200 mV         | 25 V                      | 1 k $\Omega$ /V |
| 4 mA                | 90 mV                | 200 mV         | 40 V                      | 1 k $\Omega$ /V |
| 5 mA                | 100 mV               | 200 mV         | 60 V                      | 1 k $\Omega$ /V |
| 6 mA                | 100 mV               | 200 mV         | 100 V                     | 1 k $\Omega$ /V |
| 10 mA               | 100 mV               | 200 mV         | 150 V                     | 1 k $\Omega$ /V |
| 15 mA               | 15 mV                | 15 mV          | 250 V                     | 1 k $\Omega$ /V |
| 20 mA               | 60 mV                | 60 mV          | 400 V <sup>2)3)</sup>     | 1 k $\Omega$ /V |
| 25 mA               | 60 mV                | 60 mV          | 500 V <sup>2)3)</sup>     | 1 k $\Omega$ /V |
| 40 mA               | 60 mV                | 60 mV          | 600 V <sup>2)3)</sup>     | 1 k $\Omega$ /V |
| 60 mA               | 60 mV                | 60 mV          |                           |                 |
| 1 A                 | 60 mV                | 60 mV          |                           |                 |
| 1.5 A               | 60 mV                | 60 mV          |                           |                 |
| 2.5 A               | 60 mV                | 60 mV          |                           |                 |
| 4 A                 | 60 mV                | 60 mV          |                           |                 |
| 6 A                 | 60 mV                | 60 mV          |                           |                 |
| 10 A                | 60 mV                | 60 mV          |                           |                 |
| 15 A                | 60 mV                | 60 mV          |                           |                 |
| 25 A                | 60 mV                | 60 mV          |                           |                 |
| 40 A <sup>2)</sup>  | –                    | 60 mV          |                           |                 |
| 60 A <sup>2)</sup>  | –                    | 60 mV          |                           |                 |
| 100 A <sup>2)</sup> | –                    | 60 mV          |                           |                 |

### for use with external shunt

60 mV current consumption 15 mA approximately,  
150 mV a total lead resistance of 0.035  $\Omega$  is considered in the calibration of the indicator for interconnecting leads 1 m, 2x 1 mm<sup>2</sup>

### Not for mains use

| DC voltage $\leq 5V$                          | sensitivity <sup>1)</sup> |
|---|---------------------------|
| 60 mV; 100 mV; 150 mV; 250 mV; 400 mV; 600 mV | 1 k $\Omega$ /V           |
| 1 V; 1.5 V; 2.5 V; 4 V; 5 V                   | 1 k $\Omega$ /V           |

### for use on transducer ("live zero")

4 ... 20 mA mechanically suppressed zero, without zero adjustment, voltage drop approx. 60 mV  
0/4 ... 20 mA<sup>2)</sup> electrically suppressed zero, with zero adjustment, voltage drop approx. 900 mV

## Operating Voltages

| measuring ranges                                | operating voltage |                |                |                 |
|---|-------------------|----------------|----------------|-----------------|
| DC current                                      | PQ 48 K           | PQ 72 K        | PQ 96 K        | PQ 144 K        |
| 100 $\mu$ A                                     |                   |                |                |                 |
| 1; 1.5; 2.5; 4; 5; 6; 10; 15; 20; 25; 40; 60 mA | 150 V             | 150 V          | 150 V          | 150 V           |
| 1; 1.5; 2.5; 4; 6; 10; 15; 25 A                 | 150 V             | 150 V          | 150 V          | 150 V           |
| 40; 60; 100 A <sup>2)</sup>                     | –                 | 150 V          | 150 V          | 150 V           |
| <b>DC voltage</b>                               | <b>PQ 48 K</b>    | <b>PQ 72 K</b> | <b>PQ 96 K</b> | <b>PQ 144 K</b> |
| 60; 100; 150; 250; 400; 600 mV                  | 150 V             | 150 V          | 150 V          | 150 V           |
| 1; 1.5; 2.5; 4; 6; 10; 15; 25; 40; 60; 100 V    | 150 V             | 150 V          | 150 V          | 150 V           |
| 150 V   | 150 V             | 150 V          | 150 V          | 150 V           |
| 250 V   | 300 V             | 300 V          | 300 V          | 600 V           |
| 400; 500; 600 V <sup>2)3)</sup>                 | –                 | –              | 600 V          | 600 V           |

<sup>1)</sup> the resistance values are limited to a tolerance of  $\pm 20\%$

<sup>2)</sup> not for PQ 48 K

<sup>3)</sup> not for PQ 72 K



## Analog Meters with Moving-Coil Movement 90° Dial

### Scaling

|                       |                          |         |         |          |
|-----------------------|--------------------------|---------|---------|----------|
| pointer               | bar / knife-edge pointer |         |         |          |
| pointer deflection    | 0 ... 90°                |         |         |          |
| scale characteristics | linear                   |         |         |          |
| scale division        | coarse-fine              |         |         |          |
| scale length          | PQ 48 K                  | PQ 72 K | PQ 96 K | PQ 144 K |
|                       | 41 mm                    | 61 mm   | 97 mm   | 146 mm   |

### Accuracy at Reference Conditions

accuracy class 1.5 according to DIN EN 60 051 - 1

#### reference conditions

|                     |                                  |
|---------------------|----------------------------------|
| ambient temperature | 23 °C                            |
| position of use     | nominal position $\pm 1^\circ$ ♦ |
| input               | rated measuring value            |
| others              | DIN EN 60 051 - 1                |

#### influences

|                      |                                |
|----------------------|--------------------------------|
| ambient temperature  | 23 °C $\pm 2$ K                |
| position of use      | nominal position $\pm 5^\circ$ |
| stray magnetic field | 0.5 mT                         |

### Environmental

|                             |   |
|-----------------------------|---|
| climatic suitability        | climatic class 3 acc. to VDE/VDI 3540 sheet 2 |
| operating temperature range | -10 ... +55 °C                                |
| storage temperature range   | -25 ... +65 °C                                |
| relative humidity           | $\leq 75\%$ annual average, non-condensing    |
| shock resistance            | 15 g, 11 ms                                   |
| vibration resistance        | 2.5 g, 5 ... 55 Hz                            |

### Rules and Standards

|                 |   |
|-----------------|---|
| DIN 43 718      | Measurement and control; front-frames and frontpanels of measurement and control equipment; principal dimensions    |
| DIN 43 802      | Line scales and pointers for indicating electrical measuring instruments; general requirements                      |
| DIN 16 257      | Nominal positions and position symbols used for measuring instruments   |
| DIN EN 60 051   | Direct acting indicating analogue electrical measuring instruments and their accessories                            |
| -1              | Part 1: Definitions and general requirements common to all parts  |
| -2              | Part 2: Special requirements for ammeters and voltmeters  |
| -9              | Part 9: Recommended test methods  |
| DIN EN 60 529   | Enclosure codes by housings (IP-code)   |
| DIN EN 61 010-1 | Safety requirements for electrical measuring, control and laboratory equipment<br>Part 1: General requirements      |
| DIN EN 61 326-1 | Electrical equipment for measurement, control and laboratory use – EMC requirements<br>Part 1: General requirements |
| DIN IEC 61 554  | Panel mounted equipment –<br>Electrical measuring instruments –<br>Dimensions for panel mounting                    |

VDE/VDI 3540 sheet 2 reliability of measuring and control equipment (classification of climates) (non-condensing)

### Options

#### case

|                       |  |
|-----------------------|--|
| window                | non-glaring glass  |
| colour of bezel       | gray (similar to RAL 7037)   |
| index marking pointer | red, front adjustable  |
| position of use       | on request 15° ... 165°  |
| marine application    | non-certified or with approbation by "Germanischer Lloyd" (except EQ 48 K) |

#### dial

|                             |   |
|-----------------------------|---|
| non-calibrated              | with dial symbols                             |
| blank dial                  | pencil-marked on initial and end values       |
| scale division and figuring | 0 ... 100%                                    |
| linear scale division       | non-standard captions on request              |
| additional lettering        | on request e.g. "generator"                   |
| additional figuring         | on request                                    |
| coloured marks              | red, green or blue for important scale values |
| coloured sector             | red, green or blue within scale division      |
| logo on the dial            | none or on request                            |
| dial illumination           | on request                                    |

#### others

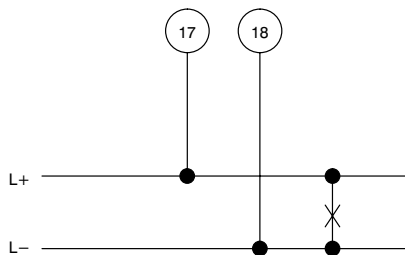
|                          |   |
|--------------------------|---|
| zero position            | centre zero or off-set zero   |
| increased sensitivity    | 4 k $\Omega$ /V for voltmeters 1 ... 600 V<br>10 k $\Omega$ /V for voltmeters 1.5 ... 150 V |
| adjustment of resistance | to $\pm 1\%$ at 23 °C   |
| operating voltage        | higher operating voltage on request   |

#### terminal protection against accidental contact

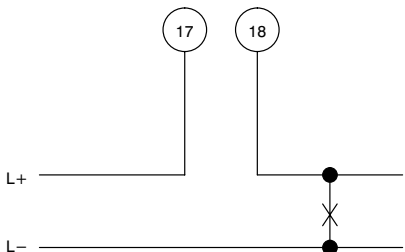
full-sized rear cover (not for directly connected ammeters >5 A), protective sleeves (for meters with hexagon studs and M4 screws with wire clamps)

## Connections

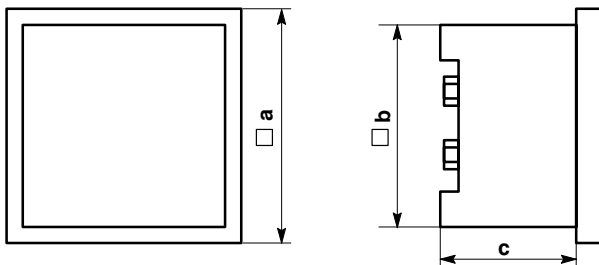
### DC voltage



### DC current



## Dimensions



| dimensions (in mm) | PQ 48 K | PQ 72 K | PQ 96 K | PQ 144 K |
|--------------------|---------|---------|---------|----------|
| a                  | 48      | 72      | 96      | 144      |
| b                  | 42.5    | 66      | 90      | 136      |
| c                  | 53      | 53      | 53      | 53       |

### ordering example

PQ 72 K, measuring range 0 ... 20 mA, window non-glaring glass, dial with linear scale division 0 ... 100°C, red mark at 37°C, no logo

## Ordering Information

|  |  |
|--|--|
| <b>type</b><br>PQ  | moving-coil panel meter  |
| <b>front dimensions</b><br>48 K<br>72 K<br>96 K<br>144 K | 48 mm x 48 mm<br>72 mm x 72 mm<br>96 mm x 96 mm<br>144 mm x 144 mm   |
| <b>measuring ranges</b>                                  | refer to preceding table   |
| <b>"live zero"</b>                                       | 4 ... 20 mA mechan. suppressed zero <sup>1)</sup><br>0/4 ... 20 mA electric. suppressed zero <sup>3)</sup>   |
| <b>window</b>  | glass <sup>1)</sup><br>non-glaring glass   |
| <b>colour of bezel</b>                                   | black (similar to RAL 9005) <sup>1)</sup><br>gray (similar to RAL 7037)  |
| <b>position of use</b>                                   | vertical <sup>1)</sup><br>on request 15 ... 165° <sup>2)</sup>   |
| <b>panel fixing</b>                                      | screw clamps <sup>1)</sup><br>spring clamps (except PQ 144 K)  |
| <b>marine application</b>                                | none <sup>1)</sup><br>non-certified<br>with approbation by<br>"Germanischer Lloyd" (except PQ 48 K)  |
| <b>terminal protection</b>                               | none <sup>1)</sup><br>full-sized rear cover<br>protective sleeves  |
| <b>index marking pointer</b>                             | none <sup>1)</sup><br>red, front adjustable  |
| <b>zero position</b>                                     | left hand zero position <sup>1)</sup><br>centre or off-set zero position <sup>2)</sup>   |
| <b>increased sensitivity</b>                             | 1 kΩ/V <sup>1)</sup><br>4 kΩ/V for voltmeters 1 ... 600 V<br>10 kΩ/V for voltmeters 1.5 ... 150 V  |
| <b>adjustment of resistance</b>                          | ±20% <sup>1)</sup><br>to ±1% at 23°C   |
| <b>dial</b>  | scale division & measuring range alike <sup>1)</sup><br>no dial<br>non-calibrated, with dial symbols<br>blank dial<br>scale division and figuring 0 ... 100%<br>linear scale division <sup>2)</sup><br>additional lettering on request <sup>2)</sup><br>additional figuring on request <sup>2)</sup><br>coloured mark red, green or blue <sup>2)</sup><br>coloured sector red, green or blue <sup>2)</sup> |
| <b>logo</b>  | WEIGEL <sup>1)</sup><br>none<br>OEM logo <sup>2)</sup>   |

<sup>1)</sup> Standard

<sup>2)</sup> Please clearly add the desired specifications.

<sup>3)</sup> not for PQ 48 K

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– specifications subject to change without notice; date of issue 04/11 –

