



# Data Sheet

Edgewise Series  
010.D.201.08

## Analog Meters Edgewise with Moving-Coil Movement

P 48 PrS  
P 72 PrS  
P 96 PrS  
P 144 PrS



**WEIGEL**

## Application

The edgewise moving-coil panel meters **P 48/72/96/144 PrS** with a curved dial are used for measurement of DC currents and voltages. The edgewise case styles provide a high ratio of scale length to panel area.

These instruments are suitable to be mounted in switchboards, control panels, machine tool consoles and mosaic panels.

## Movements

Self-shielding moving-coil movements with core-type magnet (P 72/96/144 PrS) resp. swivel coil (P 48 PrS), pivot suspended. Spring loaded jewel bearings for vibration and shock resistance.

## Mechanical Data

case details	edgewise case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels, stackable
material of case	pressed steel (P 72/96/144 PrS) thermoplastics (P 48 PrS)
material of window	glass ▶
colour of bezel	black (similar to RAL 9005) ▶
position of use	vertical $\pm 5^\circ$ ▶
panel fixing	screw clamps
mounting	stackable next to each other (except P 144 PrS)

### terminals

voltmeters and ammeters  $\leq 3$  A  
connector blades 6.3 x 0.8 (P 48 PrS)  
hexagon studs, M3 screws and wire clamps C6 (P 72/96 PrS)  
hexagon studs, M5 screws and wire clamps C10 (P 144 PrS)

ammeters  $>3$  A  
hexagon studs, M5 screws and wire clamps C10

voltmeters  $\geq 300$  V (P 72/96 PrS)  
connector blades 6.3 x 0.8 for protective wire

dimensions (in mm)	P 48 PrS	P 72 PrS	P 96 PrS	P 144 PrS
bezel	48 x 24	72 x 36	96 x 48	144 x 72
case	43 x 17	66 x 32	91 x 43	137 x 67
depth	75	94	107	174
panel cutout	45 <sup>+0.6</sup> x 22.2 <sup>+0.3</sup>	68 <sup>+0.7</sup> x 33 <sup>+0.6</sup>	92 <sup>+0.8</sup> x 45 <sup>+0.6</sup>	138 <sup>+1.0</sup> x 68 <sup>+0.7</sup>
panel thickness	1 ... 25	1 ... 25	1 ... 12	1 ... 40
weight approx.	0.08 kg	0.2 kg	0.45 kg	1.0 kg

## Electrical Data

measuring unit	DC voltages or DC currents
overload capacity (acc. to DIN EN 60 051 - 1)	
continuously	1.2 times rated voltage / current
5 s max. voltmeters	2 times rated voltage
5 s max. ammeters	10 times rated current
measurement category	CAT III
operating voltage	refer to Measuring Ranges
pollution level	2
enclosure code	IP 52 case front side (P 48/72/96 PrS) ▶ IP 50 case front side (P 144 PrS) IP 00 for terminals without protection against accidental contact IP 20 for terminals protected against accidental contact

▶ also refer to "Options"

## Measuring Ranges

### For mains use

DC current ▶	internal resistance / voltage drop approx.			
	P 48 PrS	P 72 PrS	P 96 PrS	P 144 PrS
50 $\mu$ A	1000 $\Omega^1$ )	6500 $\Omega^1$ )	6500 $\Omega^1$ )	—
60 $\mu$ A	1040 $\Omega^1$ )	5500 $\Omega^1$ )	5500 $\Omega^1$ )	—
100 $\mu$ A	1000 $\Omega^1$ )	4900 $\Omega^1$ )	4900 $\Omega^1$ )	2000 $\Omega^1$ )
150 $\mu$ A	835 $\Omega^1$ )	3600 $\Omega^1$ )	3600 $\Omega^1$ )	2000 $\Omega^1$ )
250 $\mu$ A	500 $\Omega^1$ )	2200 $\Omega^1$ )	2200 $\Omega^1$ )	1080 $\Omega^1$ )
400 $\mu$ A	310 $\Omega^1$ )	1300 $\Omega^1$ )	1300 $\Omega^1$ )	497 $\Omega^1$ )
600 $\mu$ A	210 $\Omega^1$ )	250 $\Omega^1$ )	250 $\Omega^1$ )	163 $\Omega^1$ )
1 mA	32 mV	48 $\Omega^1$ )	48 $\Omega^1$ )	69 $\Omega^1$ )
1.5 mA	46 mV	60 mV	60 mV	26.5 $\Omega^1$ )
2.5 mA	46 mV	60 mV	60 mV	10.8 $\Omega^1$ )
4 mA	46 mV	60 mV	60 mV	7.1 $\Omega^2$ )
5 mA	46 mV	60 mV	60 mV	5.8 $\Omega^2$ )
6 mA	46 mV	60 mV	60 mV	2.4 $\Omega^2$ )
10 mA	46 mV	60 mV	60 mV	1.6 $\Omega^2$ )
15 mA	46 mV	60 mV	60 mV	4 $\Omega^2$ )
20 mA	46 mV	60 mV	60 mV	3 $\Omega^2$ )
25 mA	46 mV	60 mV	60 mV	2.4 $\Omega^2$ )
40 mA	46 mV	60 mV	60 mV	60 mV
60 mA	46 mV	60 mV	60 mV	60 mV
100 mA	46 mV	60 mV	60 mV	60 mV
150 mA	46 mV	60 mV	60 mV	60 mV
250 mA	46 mV	60 mV	60 mV	60 mV
400 mA	46 mV	60 mV	60 mV	60 mV
600 mA	46 mV	60 mV	60 mV	60 mV
1 A	46 mV	60 mV	60 mV	60 mV
1.5 A	—	60 mV	60 mV	60 mV
2.5 A	—	60 mV	60 mV	60 mV
4 A	—	60 mV	60 mV	60 mV
6 A	—	60 mV	60 mV	60 mV
10 A	—	60 mV	60 mV	60 mV
15 A	—	60 mV	60 mV	60 mV
25 A	—	60 mV	60 mV	60 mV
40 A	—	—	60 mV	60 mV
60 A	—	—	—	60 mV
operating voltage	P 48 PrS 300 V	P 72 PrS 300 V	P 96 PrS 300 V	P 144 PrS 150 V

### for use with external shunt

60 mV		
150 mV		
sensitivity	P 48/72/96 PrS 1000 $\Omega/V^1$ )	P 144 PrS —
current consumption	—	6 mA
total lead resistance	0,050 $\Omega$ ▶	0,06 $\Omega$
for connecting leads 1 m, 2 x 0.75 mm <sup>2</sup>		
DC voltage >5V	P 48/72/96 PrS	P 144 PrS
6 V, 10 V, 15 V, 25 V, 40 V, 60 V, 100 V, 150 V		
operating voltage	300 V	150 V
250 V		
operating voltage	300 V	—
400 V, 500 V, 600 V		
operating voltage	600 V	—
sensitivity ▶	1000 $\Omega/V^1$ )	1000 $\Omega/V^1$ )

1) The resistance values are limited to a tolerance of  $\pm 20\%$

2) The resistance values are limited to a tolerance of  $\pm 30\%$



## Analog Meters Edgewise with Moving-Coil Movement

### Not for mains use

DC voltage  $\leq 5V$       P 48 PrS      P 72/96 PrS      P 144 PrS

<b>40 mV</b>				
sensitivity $\blacktriangleright$	–	3300 $\Omega/V^1$	–	–
operating voltage	–	300 V	–	–
<b>60 mV, 100 mV, 150 mV, 250 mV, 400 mV, 600 mV, 1 V, 1.5 V, 2.5 V, 4 V</b>				
sensitivity $\blacktriangleright$	1000 $\Omega/V^1$	1000 $\Omega/V^1$	1000 $\Omega/V^1$	1000 $\Omega/V^1$
operating voltage	300 V	300 V	150 V	150 V

for use on transducer ("live zero")

**4 ... 20 mA** mechanically suppressed zero, without zero adjustment, voltage drop approx. 46 mV (P 48 PrS) approx. 60 mV (P 72/96 PrS) internal resistance  $3 \Omega \pm 30\%$  (P 144 PrS)

**0/4 ... 20 mA** electrically suppressed zero (P 72/96/144 PrS), with zero adjustment, voltage drop approx. 900 mV

operating voltage	<b>P 48 PrS</b>	<b>P 72 PrS</b>	<b>P 96 PrS</b>	<b>P 144 PrS</b>
	300 V	300 V	300 V	150 V

### Scaling

pointer	bar / knife - edge pointer			
response time	1 s for full - scale deflection			
scale arrangement	horizontal (left - hand zero)			
scale characteristics	linear (P 48/72/96 PrS) approximate linear (P 144 PrS)			
scale division	coarse - fine			
scale length	<b>P 48 PrS</b>	<b>P 72 PrS</b>	<b>P 96 PrS</b>	<b>P 144 PrS</b>
	30 mm	45 mm	67 mm	96 mm

### Accuracy at Reference Conditions

accuracy class 1.5  $\blacktriangleright$  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 $\pm 2K$
position of use	nominal position $\pm 5^\circ$
stray magnetic field	0.5 mT

### Environmental

climatic suitability	climatic class 2 $\blacktriangleright$ according to VDE/VDI 3540 sheet 2
operating temperature range	–25 ... +40°C $\blacktriangleright$
storage temperature range	–25 ... +65°C (P 48/72/96 PrS)
temperature range	–25 ... +55°C (P 144 PrS)
relative humidity	$\leq 75\%$ annual average, non-condensing
shock resistance	15 g, 11 ms
vibration resistance	2.5 g, 5 ... 55 Hz (P 48/72/96 PrS) 1.5 g, 5 ... 55 Hz (P 144 PrS)

### 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 Part 1: General requirements
DIN EN 61 326 - 1	Electrical equipment for measurement, control and laboratory use – EMC requirements Part 1: General requirements
DIN IEC 61 554	Panel mounted equipment – Electrical measuring instruments – Dimensions for panel mounting
VDE/VDI 3540 sheet 2	reliability of measuring and control equipment (classification of climates) (non - condensing)

## Options

### measuring range

special measuring range	deviating from standard
measuring range adjustment	adjustment potentiometer installed in voltmeters, adjustment range approx. $\pm 10\%$ or $\pm 20 \dots 50\%$ (except P 48/72 PrS), ammeters on request
2 <sup>nd</sup> measuring range	with 3 <sup>rd</sup> terminal for voltmeters, 2 <sup>nd</sup> figuring and 1 or 2 scale divisions (except P 48/72 PrS)
additional measuring ranges	on request
accuracy class	1.0 with fine scale division (as far as possible)
adjustment of internal resistance	to $\pm 1\%$ at 23 °C
increased sensitivity	to 2 k $\Omega$ /V, 5 k $\Omega$ /V, 10 k $\Omega$ /V or 20 k $\Omega$ /V for voltmeters $\geq 1$ V (as far as possible)
lead resistance	calibration of a total value $>0.05\Omega$

### case

window	non-glaring glass
colour of bezel	gray (similar to RAL 7037)
position of use	horizontal or on request 15...165°

### performance

climatic suitability	limited use in the tropics, climatic class 3 according to VDE/VDI 3540 sheet 2
with operating temperature range	-10 ... +55 °C
marine application	non-certified
enclosure code	IP 54 splash - water protected front (without zero adjustment)
terminal protection against accidental contact	protective sleeves B6 for P 48 PrS SW6, SW10 (ammeters $>3A$ ) for P 72/96 PrS

### dial

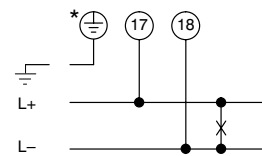
scale arrangement	vertical (bottom zero)
blank dial	pencil - marked on initial and end values
scale division and figuring	0 ... 100%, linear, full-scale values acc. to standardized series (1 - 1.2 - 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 7.5 and their decimal multiples e.g. 150 m <sup>3</sup> /h) or deviating from standard; special calibration from customer's non-linear graph or chart; scaling of voltmeters in ohms; captions on request
2 <sup>nd</sup> scale division	linear including figuring, non-linear including figuring
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
zero position	centre zero or off-set zero, mechanically suppressed zero, no zero adjustment, max. 40% of full-scale value for ammeters $\geq 100 \mu A$ , voltmeters $\geq 60$ mV electrically suppressed zero for voltmeters $\geq 6$ V (P 72/96/144 PrS only)
expanded scale for P 72/96/144 PrS	expanded initial scale division by means of electronic circuits up to approx. 5% of full-scale value in centre of scale

**dial illumination**  
for P 48/144 PrS  
for P 96 PrS

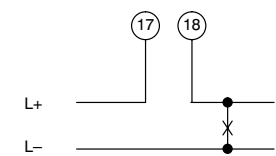
dial translucent  
internal LED 24 V DC  
1 lamp 6 V, 12 V or 24 V

## Connections

### DC voltage



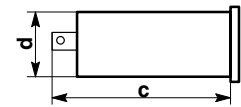
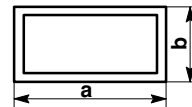
### DC current



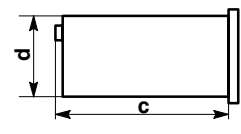
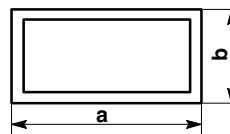
\* P 72/96 PrS voltmeters  $\geq 300$  V

## Dimensions

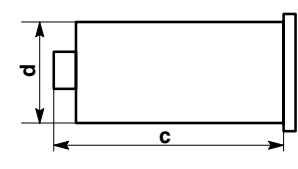
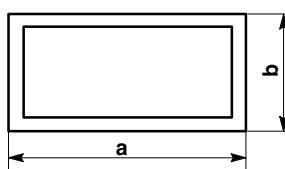
### P 48 PrS



### P 72/96 PrS



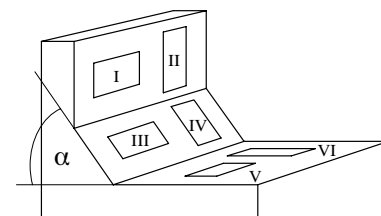
### P 144 PrS



### dimensions (in mm) P 48 PrS P 72 PrS P 96 PrS P 144 PrS

	P 48 PrS	P 72 PrS	P 96 PrS	P 144 PrS
a	48	72	96	144
b	24	36	48	72
c	75	94	107	174
d	17	32	43	67

### scales and position of use



┌	<b>vertical mounting</b>
I	horizontal scale (standard)
II	vertical scale
∠	<b>inclined mounting</b>
III	horizontal scale
IV	vertical scale
└	<b>horizontal mounting</b>
V	horizontal scale
VI	vertical scale

## Ordering Information

<b>type</b> P	edgewise - type moving - coil panel meter
<b>front dimensions</b> 48 PrS 72 PrS 96 PrS 144 PrS	48 mm x 24 mm 72 mm x 36 mm 96 mm x 48 mm 144 mm x 72 mm
<b>measuring ranges</b>	refer to preceding table
<b>"live zero"</b>	4 ... 20 mA mechan. suppressed zero <sup>1)</sup> 0/4 ... 20 mA electrically suppressed zero <sup>3)</sup>
<b>special measuring range</b>	on request <sup>2)</sup>
<b>measuring range adjustment</b>	none <sup>1)</sup> voltage $\pm 10\%$ voltage $\pm 20 \dots 50\%$
<b>2<sup>nd</sup> measuring range</b>	none <sup>1)</sup> 1 scale division, 2 <sup>nd</sup> figuring 2 scale divisions, 2 figurings
<b>accuracy class</b>	1.5 <sup>1)</sup> 1.0 with fine scale division as far as possible
<b>adjustment</b>	internal resistance to $\pm 20\%$ <sup>1)</sup> internal resistance to $\pm 1\%$ at 23° C lead resistance $> 0.05 \Omega$
<b>sensitivity, voltmeters</b>	1 k $\Omega/V$ <sup>1)</sup> to approx. 2 k $\Omega/V$ to approx. 5 k $\Omega/V$ to approx. 10 k $\Omega/V$ to approx. 20 k $\Omega/V$ as far as possible
<b>window</b>	glass <sup>1)</sup> non-glaring glass
<b>colour of bezel</b>	black (similar to RAL 9005) <sup>1)</sup> gray (similar to RAL 7037)
<b>position of use</b>	vertical <sup>1)</sup> horizontal on request 15 ... 165° <sup>2)</sup>
<b>climatic suitability</b>	class 2, -25 ... +40° C <sup>1)</sup> class 3, -10 ... +55° C
<b>marine application</b>	none <sup>1)</sup> non-certified
<b>enclosure code</b>	IP 52 (P 48/72/96 PrS) / IP 50 (P 144 PrS) <sup>1)</sup> IP 54 splash - water protected front
<b>terminal protection</b>	none <sup>1)</sup> protective sleeves B6, SW6 resp. SW10
<b>scale arrangement</b>	horizontal <sup>1)</sup> vertical

<b>dial</b>	scale division & measuring range alike <sup>1)</sup> blank dial scale division and figuring 0 ... 100% linear acc. to standardized series <sup>2)</sup> linear deviating from standard <sup>2)</sup> calibration fr. non-linear graph or chart <sup>2)</sup> scaling in ohms for voltmeters <sup>2)</sup> 2 scale divisions <sup>2)</sup> additional lettering on request <sup>2)</sup> additional figuring on request <sup>2)</sup> coloured marks red, green or blue <sup>2)</sup> coloured sector red, green or blue <sup>2)</sup>
<b>dial illumination</b> for P 48/144 PrS for P 96 PrS	none <sup>1)</sup> internal LED 24 V DC 1 lamp 6 V, 12 V or 24 V
<b>logo</b>	WEIGEL <sup>1)</sup> none OEM logo <sup>2)</sup>
<b>zero position</b>	left hand zero position <sup>1)</sup> centre or off - set zero position <sup>2)</sup> mechan. suppressed z.p. <sup>2)</sup> ( $\geq 100 \mu A / 60 mV$ ) electrically suppressed z.p. <sup>2)</sup> ( $\geq 6V$ )

<sup>1)</sup> Standard

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

<sup>3)</sup> P 72/96/144 PrS only

### ordering example

P 72 PrS, measuring range 0 ... 20 mA, horizontal scale 0 ... 100%, vertical mounting, window non - glaring glass, WEIGEL logo

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– specifications subject to change without notice; date of issue 02/16 –

