



Analog Edgewise Meters with Moving-Coil Movement for Railway Applications

P 96 PrS Bahn



Application

The edgewise moving-coil panel meters **P 96 PrS Bahn** with a curved dial are used for measurement of DC currents or DC voltages.

The meters **for railway application** are specially used in rail vehicles where robustness and reliability are mandatory.

Typical applications are display of rotational speed, temperature, pressure, velocity or other physical quantities.

The moving-coil movements are characterized by a low power consumption, high precision and excellent damping, also in extreme environmental conditions.

Movements

Moving-coil movement with core-type magnet and bilateral pivot suspensions.

Mechanical Data

design	edgewise case suitable to be mounted in control panels, machine tool consoles or mosaic panels, stackable
case	material pressed steel surface thick-film passivated
front window	non-glaring glass
colour of bezel	black (similar to RAL 9005)
position of use	any
panel fixing	screw clamps DIN-B
mounting	stackable next to each other
terminals	
voltmeters and ammeters ≤ 3 A	hexagon studs, M3 screws and wire clamps
ammeters > 3 A up to ≤ 25 A	hexagon studs, M5 screws and wire clamps
ammeters > 25 A	hexagon studs, M6 screws and wire clamps
protection ground	connector blades 6.3 x 0.8
dimensions	
bezel	96 mm x 48 mm
case	91 mm x 43 mm
case depth including hexagon studs	99 mm with M3, 102 mm with M5, M6
panel depth including clamps	107 ... 118 mm (depends on panel thickness)
panel cutout	92 ^{+0.8} mm x 45 ^{+0.6} mm
panel thickness	1 ... 12 mm
weight approx.	0.45 kg

Electrical Data

measuring unit	DC voltage or DC current
overload capacity (according to DIN EN 60 051) continuously	1.2 times rated voltage / current
5 s max.	
voltmeters	2 times rated voltage
ammeters	10 times rated current
measurement category	CAT III
operating voltage	refer to Measuring Ranges
pollution level	2

enclosure code	IP 52 case front IP 00 for terminals without protection against accidental contact IP 20 for terminals protected against accidental contact
dial illumination	LED 24 V DC dimmable, approx. 1.2 VA colour white

Measuring Ranges

DC current **voltage drop approx.** **operating voltage**

1 mA	48 mV	150 V
1.5 mA	60 mV	150 V
2.5 mA	60 mV	150 V
4 mA	60 mV	150 V
5 mA	60 mV	150 V
6 mA	60 mV	150 V
10 mA	60 mV	150 V
15 mA	60 mV	150 V
20 mA	60 mV	150 V
25 mA	60 mV	150 V
40 mA	60 mV	150 V
60 mA	60 mV	150 V
100 mA	60 mV	150 V
150 mA	60 mV	150 V
250 mA	60 mV	150 V
400 mA	60 mV	150 V
600 mA	60 mV	150 V
1 A	60 mV	150 V
1.5 A	60 mV	150 V
2.5 A	60 mV	150 V
4 A	60 mV	150 V
6 A	60 mV	150 V
10 A	60 mV	150 V
15 A	60 mV	150 V
25 A	60 mV	150 V
40 A	60 mV	150 V

for use on transducer

4 ... 20 mA	60 mV	150 V
mechanically suppressed zero		

DC voltage **sensitivity** **operating voltage**

60 mV	1000 Ω/V ±20%	50 V
100 mV	1000 Ω/V ±20%	50 V
150 mV	1000 Ω/V ±20%	50 V
250 mV	1000 Ω/V ±20%	50 V
400 mV	1000 Ω/V ±20%	50 V
600 mV	1000 Ω/V ±20%	50 V
1 V	1000 Ω/V ±20%	50 V
1.5 V	1000 Ω/V ±20%	50 V
2.5 V	1000 Ω/V ±20%	50 V
4 V	1000 Ω/V ±20%	50 V
6 V	1000 Ω/V ±20%	50 V
10 V	1000 Ω/V ±20%	50 V
15 V	1000 Ω/V ±20%	50 V
25 V	1000 Ω/V ±20%	50 V
40 V	1000 Ω/V ±20%	50 V
60 V	1000 Ω/V ±20%	100 V
72 V	1000 Ω/V ±20%	100 V

for use with external shunt

60 mV	1000 Ω/V ±20%	150 V
150 mV	1000 Ω/V ±20%	150 V

A total lead resistance of 0.05 Ω for interconnecting leads 1 m, 2 x 0.75 mm² is considered in the calibration.

also refer to "Options"



Analog Edgewise Meters with Moving-Coil Movement for Railway Applications

Scaling

pointer	bar pointer
pointer colour	orange to RAL 2007 ↗
response time	1 s for full-scale deflection
scale arrangement	vertical (bottom zero) ↗
scale characteristics	linear
scale division	coarse-fine
scale length	67 mm
dial colour	black ↗
scale figuring	white ↗

Accuracy at Reference Conditions

accuracy class 1.5 according to DIN EN 60 051 - 1

reference conditions

ambient temperature	23 °C ± 1K
input	rated measuring value
others	DIN EN 60 051 - 1

influences

ambient temperature	-25 °C ... +23 °C ... +40 °C
stray magnetic field	0.5 mT

Environmental

climatic suitability	category 1, class B according to DIN EN 61 373
operating temperature range	-25 ... +55 °C
storage temperature range	-25 ... +65 °C

Rules and Standards

DIN EN 50 121 ...	Railway applications – Electromagnetic compatibility
-1	Part 1: General
-3 - 2	Part 3-2: Rolling stock – Apparatus
-4	Part 4: Emission and immunity of the signalling and telecommunications apparatus
DIN EN 50155	Railway applications – Electronic equipment used on rolling stock
DIN EN 60051 ...	Direct acting indicating analogue electrical instruments and their accessories
-1	Part 1: Definitions and general requirements common to all parts
-2	Part 2: Special requirements for ammeters and voltmeters
DIN EN 60068 - 1	Environmental testing – Part 1: General and guidance
DIN EN 60068 ...	Environmental testing – Tests –
-2 - 1	Part 2-1: Test A: Cold
-2 - 2	Part 2-2: Test B: Dry heat
-2 - 27	Part 2-27: Test Ea and guidance: Shock
-2 - 30	Part 2-30: Test Db: Damp heat, cyclic (12 h + 12 h cycle)
-2 - 47	Part 2-47: Mounting of specimens for vibration, impact and similar dynamic tests
-2 - 64	Part 2-64: Test Fh: Vibration, broadband random and guidance

DIN EN 61 010 - 1	Safety requirements for electrical equipment for measurement, control, and laboratory use Part 1: General requirements
DIN EN 61 373	Railway applications – Rolling stock equipment – Shock and vibration tests category 1 class B
DIN IEC 61 554	Devices for mounting in control stands Electrical measuring devices Dimensions for mounting in control stands
DIN 16 257	Nominal position of use and position symbols applicable for measuring instruments
DIN 43 718	Measuring, control, regulate; bezels and front panels for MSR devices; main dimensions
DIN 60 529	Enclosure codes by housings (IP-code)

Options

measuring range

special measuring range	on request
sensitivity adjustment	to ± 1% at 23 °C
lead resistance	calibration of a total value > 0.05 Ω

case

front window	glass
colour of bezel	gray (similar to RAL 7037)

performance

enclosure code	IP 55 splash-water protected front (with rear zero adjustment)
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accessories

terminal protection against accidental contact	protective sleeves for hexagon studs SW6 (for M3 screws) SW10 (for M5/M6 screws)
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pointer

other colour on request

dial

scale arrangement	horizontal (left-hand zero)
dial background	other colour on request
scale figuring	other colour on request
dial illumination	other colour on request
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 ³ /h) or deviating from standard; special calibration from non-linear graph or chart; scaling of voltmeters in ohms; 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

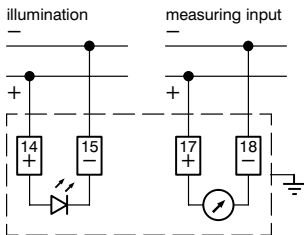
zero position

centre zero or off-set zero,
mechanically suppressed zero, no zero
adjustment, max. 40% of full-scale value

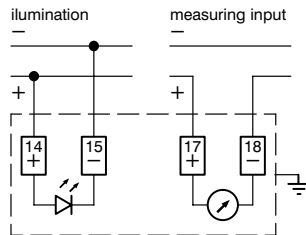
↗ for other ratings refer to "Options"

Connections

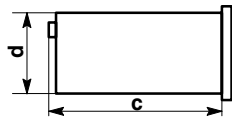
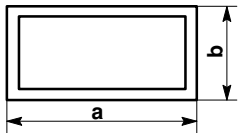
DC voltage



DC current



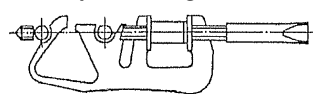
Dimensions



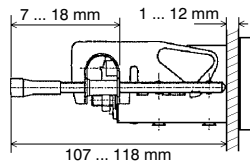
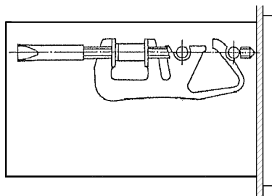
dimensions P 96 PrS Bahn

a	96 mm
b	48 mm
c	99 mm (M3)
	102 mm (M5, M6)
d	43 mm

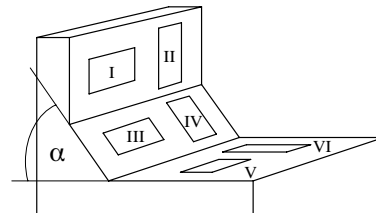
DIN-B panel fixing



DIN-B panel fixing mounting details



scales and position of use



- ⊥ vertical mounting
 - I horizontal scale
 - II vertical scale
- ∠ inclined mounting
 - III horizontal scale
 - IV vertical scale
- ⊥ horizontal mounting
 - V horizontal scale
 - VI vertical scale

Ordering Information

Type P 96 PrS Bahn	edgewise moving - coil panel meter for railway applications for DC voltage or DC current 96 mm x 48 mm
measuring ranges	refer to preceding table
sp. measuring range	on request **)
adjustment	to internal resistance to $\pm 20\%$ *) to internal resistance to $\pm 1\%$ at 23°C for lead resistance $> 0.05 \Omega$
front window	non - glaring glass *) glass
colour of bezel	black (similar to RAL 9005) *) gray (similar to RAL 7037)
enclosure code (case front)	IP 52 *) IP 55 splash - water protected front
terminal protection	none *) protective sleeves SW6 or SW10
scale arrangement	vertical *) horizontal
dial	scale division & measuring range alike *) scale division and figuring according to standardized series **) 0 ... 100% linear deviating from standard **) calibration fr. non - linear graph or chart **) scaling in ohms for voltmeters **) additional lettering on request ***) additional figuring on request ***) coloured marks red, green or blue **) coloured sector red, green or blue **)
pointer colour	orange *) other colour on request **)
dial colour	black *) other colour on request **)
figuring colour	white *) other colour on request **)
dial illumination	white *) other colour on request **)
logo	WEIGEL *) none OEM logo **)
zero position	bottom or left - hand zero *) centre zero or off - set zero **) mechanically suppressed zero **)

*) standard

**) Please clearly add the desired specifications.

ordering example

P 96 PrS Bahn, measuring range 0 ... 20 mA, horizontal scale 0 ... 100%, front window non - glaring glass, OEM logo (template included)

WEIGEL – MESSGERÄTE GmbH

P.O.B. 720 154 • D-90241 Nürnberg • Telephone: 0911 / 423 47-0
Erlenstraße 14 • D-90441 Nürnberg • Fax: 0911 / 423 47-39
Internet: <http://www.weigel-messgeraete.de>
e-mail: vertrieb@weigel-messgeraete.de

– specifications subject to change without notice; date of issue 02/10 –

