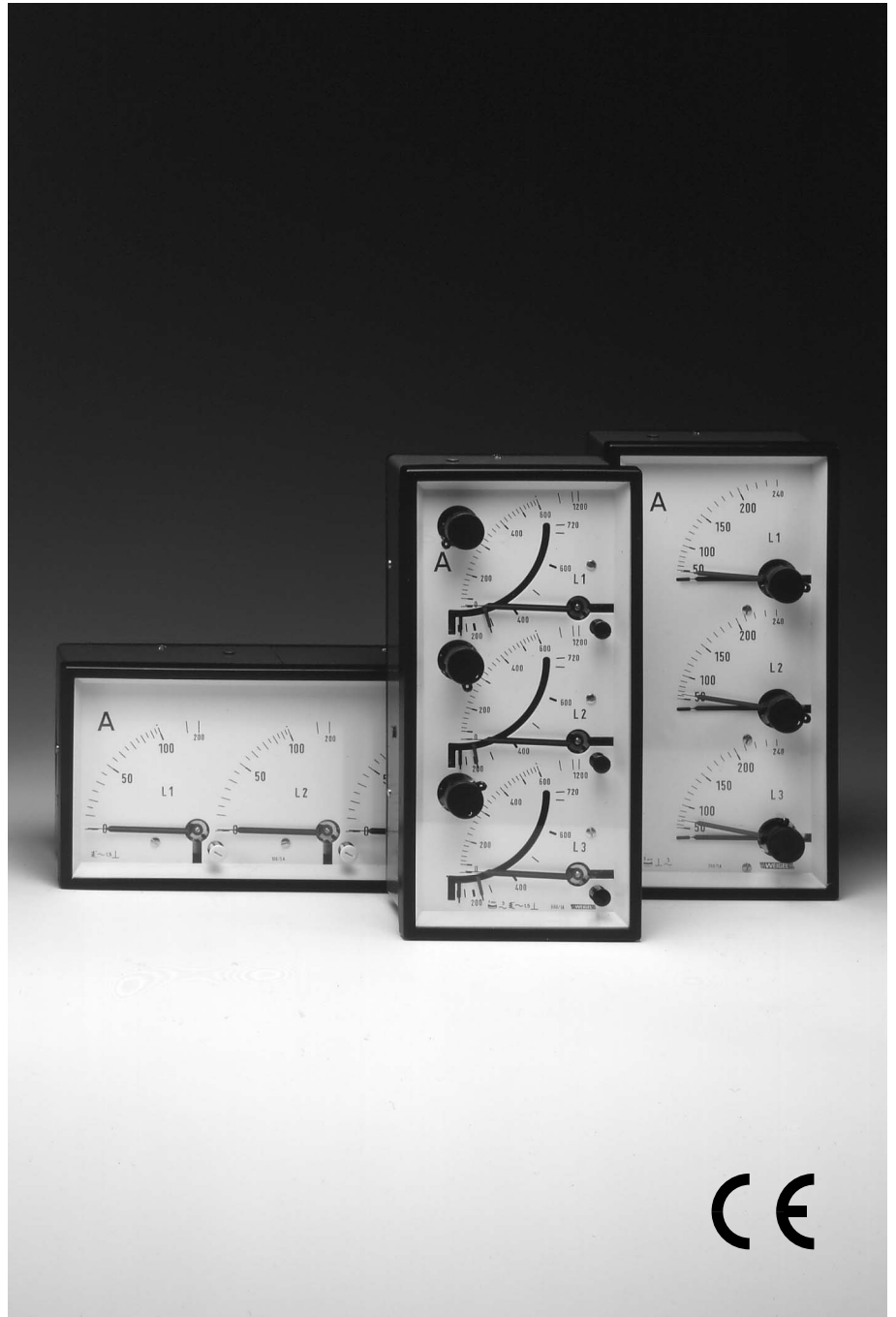


# Data Sheet

M Series  
050.D.251.04

## Triple Combination Meters with Moving-Iron, Bimetallic or Bimetallic/ Moving-Iron Movements

W 192 RnS  
W 192 RhS  
BI 192 RnS  
BI 192 RhS  
BIW 192 RnS  
BIW 192 RhS



**WEIGEL**

## Application

The moving-iron panel meters **W 192 RnS/RhS** (M series) are used in simultaneous measurement of three AC currents or AC voltages.

They indicate rms values practically independent of wave form even of high harmonics. Error of indication may occur by extreme wave forms (e.g. phase gating controls) and/or frequencies above 100 Hz.

The bimetallic maximum demand indicators **BI 192 RnS/RhS** monitor the most economic use of transformer stations and L.T. distribution feeders.

Bimetallic instruments are thermally inert. They indicate the mean rms value over 15 (8) minute periods enabling to evaluate continuous loads rather than short-time current peaks.

The high torque of the thermal movement offers the possibility to drive a red slave pointer linked to the indicator pointer. Thereby, the highest current reached in the circuit can be read off at any time. The slave pointer will be reset to the position of the indicator pointer by means of a sealable reset knob.

Where the instantaneous and maximum demand currents are required, the **BIW 192 RnS/RhS** instruments have three each thermal bimetallic and moving-iron movements installed diametrically in one case.

The meters are housed in pressed steel cases suitable to be mounted in switchboards, control panels, machine tool consoles and/or mosaic grid panels.

## Functional Principle

Moving-iron movements with shell-type systems, pivot suspension. Spring loaded jewel bearings and silicon oil damping for vibration and shock resistance. The moving-iron movement has a response time of approx. 1 s.

Bimetallic movements with resettable red slave pointers and a thermally delayed indication enabling to measure the means rms value within a time lag of 15 min (optional 8 min).

## Mechanical Data

case details	rectangular case suitable to be mounted in switchboards or mosaic grid panels, stackable
material of case	pressed steel
material of window	glass ▶
colour of bezel	black (similar to RAL 9005) ▶
position of use	vertical $\pm 5^\circ$ ▶
panel fixing	screw clamps
panel thickness	1 ... 15 mm
mounting	stackable next to each other

### terminals

voltmeters and ammeters  $\leq 3$  A  
hexagon studs, M3 screws and wire clamps C6

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

connector blades 6.3 x 0.8 for protective wire

### dimensions

bezel	192 mm x 96 mm		
case	184 mm x 90.5 mm		
depth	60 mm		
panel cutout	186 <sup>+1.1</sup> mm x 92 <sup>+0.8</sup> mm		
weight approx.	W 192 RnS W 192 RhS 0.9 kg	BI 192 RnS BI 192 RhS 0.7 kg	BIW 192 RnS BIW 192 RhS 1.0 kg

▶ for other ratings refer to "Options"

## Electrical Data

measuring unit	W 192 RnS/RhS	AC currents or AC voltages	
	BI/BIW 192 RnS/RhS	AC currents	
frequency range	50 ... 100 Hz		
power consumption per movement	moving-iron	bimetallic	bimetallic moving-iron
voltmeters	approx. 1.5 ... 3 VA	–	–
ammeters	approx. 0.5 ... 1 VA	–	–
at 1 A rated current	–	<1.3 VA	<2 VA
at 5 A rated current	–	<3.5 VA	<4.2 VA
overload capacity (acc. to DIN EN 60 051 - 1)	continuously 1.2 times rated voltage / current		
5 s max. moving-iron	voltmeters 2 times rated voltage		
	ammeters 10 times rated current		
1 s max. bimetallic	10 times rated current		

Saturating current transformers shall be used to protect the movements against overloads exceeding specified ratings.

response time	bimetallic	moving-iron
	15 min ▶	1 s approx.

measurement category CAT III

operating voltage refer to Measuring Ranges

pollution level 2

enclosure code IP 40 case front side  
IP 00 for terminals without protection against accidental contact  
IP 20 for terminals protected against accidental contact

## Measuring Ranges

### W 192 RnS/RhS

AC current <sup>1)</sup>	operating voltage	AC voltage	operating voltage
100 mA	300 V	6 V	100 V <sup>3)</sup>
150 mA	300 V	10 V	100 V <sup>3)</sup>
250 mA	300 V	15 V	100 V <sup>3)</sup>
400 mA	300 V	25 V	100 V <sup>3)</sup>
600 mA	300 V	40 V	100 V <sup>3)</sup>
1 A	300 V	60 V	100 V <sup>3)</sup>
1.5 A	300 V	100 V	100 V <sup>3)</sup>
2.5 A	300 V	150 V	300 V
4 A	300 V	250 V	300 V
6 A	300 V	400 V	300 V
10 A	300 V	500 V	300 V
15 A	300 V	600 V	600 V
25 A	300 V		
<b>for use on CT <sup>1)</sup></b>		<b>for use on VT <sup>2)</sup></b>	
N/1 A	300 V	sec. 100 V	300 V
N/5 A	300 V	sec. 110 V	300 V

Please state transformer ratio when ordering.

### BI/BIW 192 RnS/RhS

bimetallic <sup>2)</sup>	moving-iron <sup>1)</sup> (BIW)	operating voltage
1 A	1 A	300 V
5 A	5 A	300 V
<b>for use on CT</b>		
N/1 A	N/1 A	150 V
N/5 A	N/5 A	150 V

<sup>1)</sup> full-scale value = 2 times rated current (overload scaling) ▶

<sup>2)</sup> full-scale value = 1.2 times rated voltage (overload scaling) ▶

<sup>3)</sup> protective wire not required



## Triple Combination Meters with Moving-Iron, Bimetallic or Bimetallic/ Moving-Iron Movements

### Scaling

pointer	bar / knife-edge pointer		
pointer deflection	0 ... 90°		
scale characteristics	bimetallic	moving-iron	
	quadratic	practically linear	
	scales are calibrated down to 1/5 th of rated scale value		
overload scaling	bimetallic	moving-iron	
ammeters	1.2 times	2 times	
	rated current ♦	rated current ♦	
voltmeters for use on voltage transformers	–	1.2 times	
		rated voltage	
scale division	coarse–fine		
scale length	W 192 RnS	BI 192 RnS	BIW 192 RnS
	W 192 RhS	BI 192 RhS	BIW 192 RhS
	3x 72 mm	–	3x 74 mm
moving–iron			
bimetallic	–	3x 74 mm	3x 70 mm

### Accuracy at Reference Conditions

accuracy class	3 (bimetallic movement
acc. to DIN EN 60 051 - 1	referred to slave pointer)
	1.5 (moving-iron movement)

#### reference conditions

ambient temperature	23°C
position of use	nominal position ±1°
input	rated measuring value
frequency	50 Hz
wave form	sinusoidal, distortion factor <5%
others	DIN EN 60 051 - 1

#### influences

ambient temperature	23°C ± 2K
position of use	nominal position ± 5°
frequency	15 ... 100 Hz (voltage)
	15 ... 400 Hz (current)
stray magnetic field	0.5 mT

### Environmental

climatic suitability	climatic class 2 according to VDE/VDI 3540 sheet 2 ♦
operating temperature range	–25 ... +40°C ♦
storage temperature range	–25 ... +65°C
relative humidity	≤ 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
	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)

### Options

#### measuring range

special measuring range	deviating from standard series
calibration	for a definite frequency 100 ... 1000 Hz
thermal time delay	8 min (bimetallic)

#### case

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

#### performance

increased mechanical loads	shock 30 g, 11 ms
	vibration 5 g, 5 ... 55 Hz
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
terminal protection against accidental contact	protective sleeves
terminals	connector blades 6.3 x 0.8

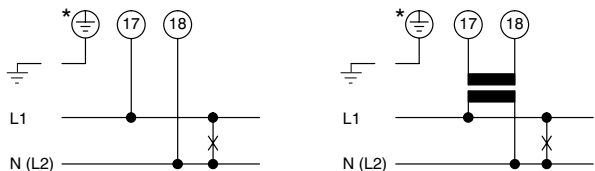
#### dial

blank dial	pencil marked initial and end values
scale division and figuring	0 ... 100%, full-scale values acc. to standardized series (1–1.2–1.5–2–2.5–3–4–5–6–7.5 and any decimal multiple of these numbers e.g. 150 m <sup>3</sup> /h) or deviating from standard series; captions optional

additional lettering	to be specified e.g. "generator"
additional figuring	to be specified
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 as specified
overload scaling	none or 1.5 times rated current (bimetallic)

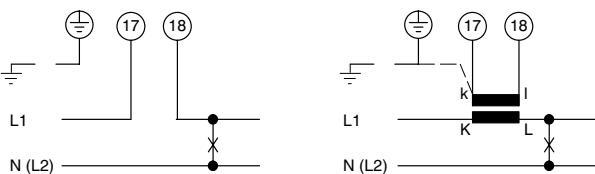
## Connections

### AC voltage

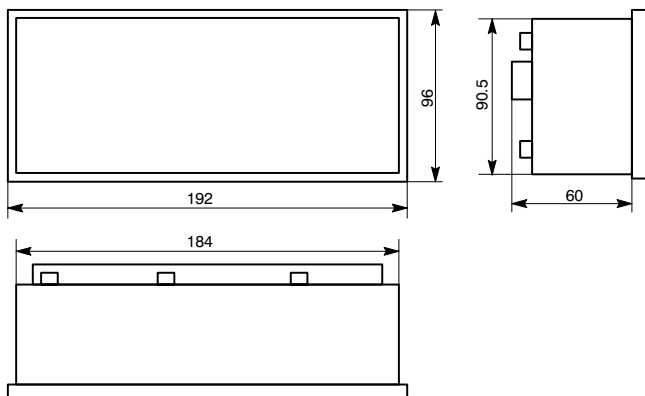


\* voltmeters >100 V

### AC current



## Dimensions



(scaled in mm)

### ordering example

BIW 192 RnS for use on current transformers 3x 300/5 A, thermal time lag 15 min, WEIGEL logo

## Ordering Information

<b>type</b> W BI BIW	triple combination meters with moving-iron movements bimetallic movements bimetallic/moving-iron movements
<b>front dimensions</b> 192	192 mm x 96 mm
<b>type identification</b> RnS RhS	movements arranged horizontally <sup>1)</sup> movements arranged vertically
<b>measuring ranges</b>	refer to preceding table
<b>special measuring range</b>	to special order <sup>2)</sup>
<b>calibration</b>	50 Hz for a defined frequency 100 ... 1000 Hz <sup>2)</sup>
<b>thermal time lag</b> (bimetallic)	15 min <sup>1)</sup> 8 min
<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> to special order 15 ... 165° <sup>2)</sup>
<b>mechanical loads</b>	shock 15 g, vibration 2.5 g <sup>1)</sup> shock 30 g, vibration 5 g
<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>terminal safety protection</b>	none <sup>1)</sup> protective sleeves
<b>terminals</b>	screws and wire clamps <sup>1)</sup> connector blades 6.3 x 0.8
<b>dial</b>	scale division and measuring range alike resp. full-scale values acc. to standardized series for use on transformer <sup>1)</sup> blank dial scale division and figuring 0 ... 100% acc. to standardized series <sup>2)</sup> deviating from standard <sup>2)</sup> additional lettering to be specified <sup>2)</sup> additional figuring to be specified <sup>2)</sup> coloured marks red, green or blue <sup>2)</sup> coloured sector red, green or blue <sup>2)</sup>
<b>logo</b>	WEIGEL <sup>1)</sup> none OEM logo <sup>2)</sup>
<b>overload scaling</b>	none (bimetallic and/or moving-iron) for 1.2 times rated current (bimetallic) <sup>1)</sup> for 2 times rated current (moving-iron) <sup>1)</sup> 1.5 times rated current (bimetallic)
<b>saturation current transformer</b>	none <sup>1)</sup> ESW 1/5 A, 4.25 VA ESW 5/5 A, 4.25 VA

<sup>1)</sup> Standard

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

## Weigel Meßgeräte GmbH

Postfach 720 154 • 90241 Nürnberg • Phone: 0911/42347-0  
Erlenstraße 14 • 90441 Nürnberg • Fax: 0911/42347-39  
Sales: Phone: 0911/42347-94  
Internet: <http://www.weigel-messgeraete.de>  
e-mail: [vertrieb@weigel-messgeraete.de](mailto:vertrieb@weigel-messgeraete.de)

– specifications subject to change without notice; date of issue 12/10 –

