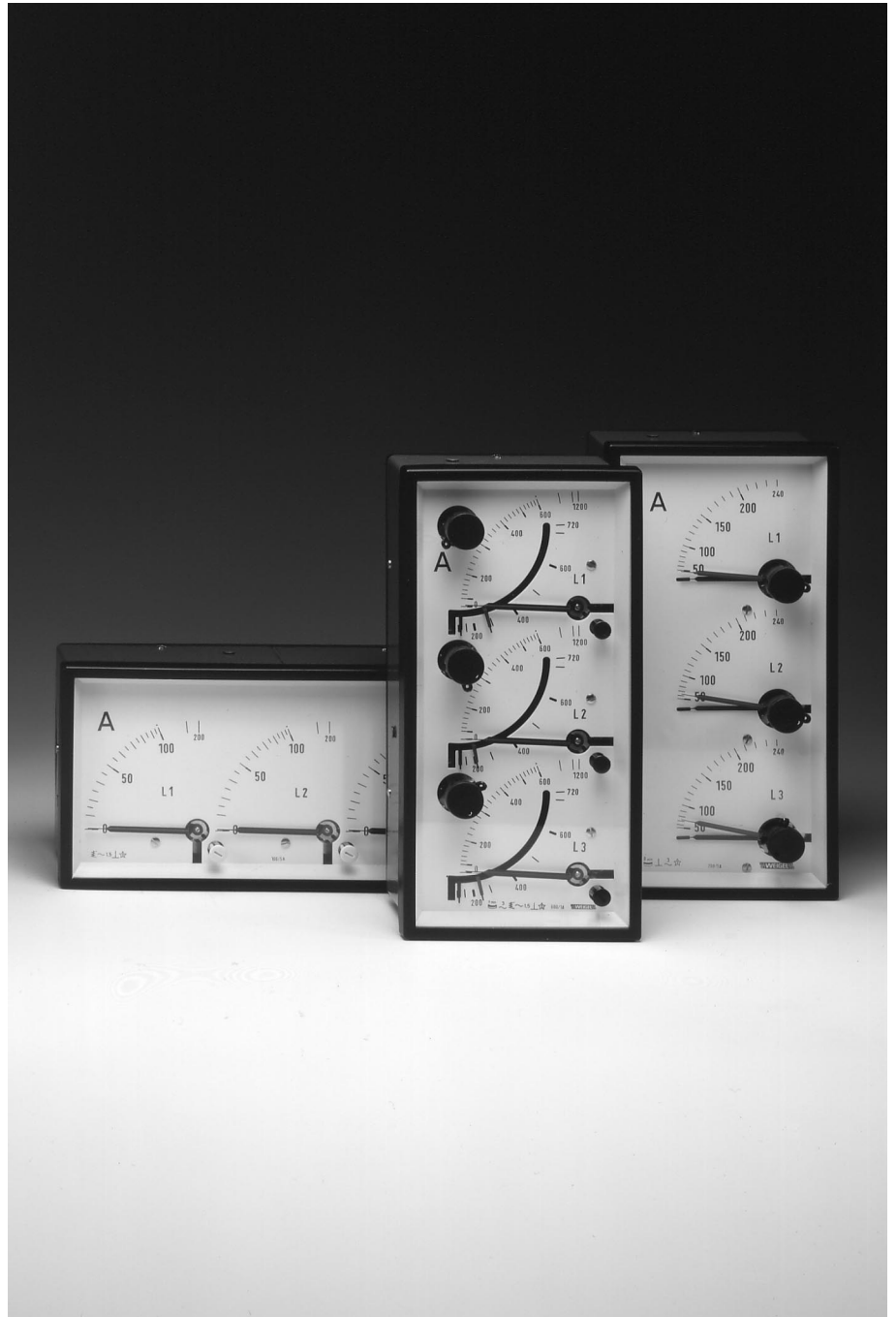


Data Sheet

M – Series
050.D.251.01

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 mean 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 ≤ 3 A
hexagon studs, M3 screws and wire clamps C6

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

dimensions

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

♦ for other ratings refer to "Options"

Electrical Data

measuring unit	AC currents or voltages		
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)	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 15 min ♦	moving-iron 1 s approx.	
protection class	I		
enclosure code	IP 40 case IP 00 for terminals without protection against accidental contact IP 20 for terminals protected against accidental contact		
insulation class	group A according to VDE 0110		
rated insulation voltage	660 V ♦		
dielectric test	2 kV ♦ based on 50 Hz, 1 min acc. to DIN 57 410		

Measuring Ranges

W 192 RnS/RhS

AC current ¹⁾	AC voltage
100 mA	6 V
150 mA	10 V
250 mA	15 V
400 mA	25 V
600 mA	40 V
1 A	60 V
1.5 A	100 V
2.5 A	150 V
4 A	250 V
6 A	400 V
10 A	500 V
15 A	600 V
25 A	
for use on current transformer ¹⁾	for use on voltage transformer ²⁾
N/1 A	100 V sec.
N/5 A	110 V sec.

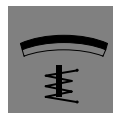
Please state transformer ratio when ordering.

BI/BIW 192 RnS/RhS

bimetallic ²⁾	moving-iron ¹⁾ (BIW)
1 A	1 A
5 A	5 A
for use on current transformer	
N/1 A	N/1 A
N/5 A	N/5 A

¹⁾ full-scale value = 2 times rated current (overload scaling) ♦

²⁾ full-scale value = 1.2 times rated voltage (overload scaling) ♦



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 quadratic	moving–iron practically linear	
	scales are calibrated down to 1/5th of rated scale value		
overload scaling ammeters	bimetallic 1.2 times rated current ⬇	moving–iron 2 times rated current ⬇	
voltmeters for use on voltage transformers	–	1.2 times rated voltage	
scale division	coarse–fine		
scale length	W 192 RnS W 192 RhS 3x 72 mm	BI 192 RnS BI 192 RhS – 3x 74 mm	BIW 192 RnS BIW 192 RhS 3x 74 mm 3x 70 mm
moving–iron bimetallic	–	–	–

Accuracy at Reference Conditions

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

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

influences

ambient temperature	–25°C ... +23°C ... +40°C
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 ⬇
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 43 700	measuring and control instruments for panel mounting; nominal case and cutout dimensions
DIN 43 701	electrical switchboard instruments
DIN 43 718	bezels and front panels
DIN 43 802	scales and pointers for electrical measuring instruments
DIN 16 257	nominal position of use and position symbols applicable for measuring instruments

⬇ for other ratings refer to "Options"

DIN 57 410 / VDE 0410	safety requirements for electrically operated measuring, control and laboratory equipment
DIN EN 60 051	direct acting indicating electrical measuring instruments and their accessories
DIN VDE 01 10	dimensioning of clearances and creepage distances
DIN VDE 04 11	protective measures for electronically operated measuring equipment
DIN 40 050	enclosure codes; protection of electrical equipment against ingress of solid foreign bodies and of water
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
with operating temperature range	–10 ... +55°C

marine application

marine application	non–certified
dielectric test	3 kV based on 50 Hz, 1 min acc. to DIN 57 410
terminal protection against accidental contact	protective sleeves connector blades 6.3 x 0.8

terminals

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 m³/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)

Accessories

saturating current transformer

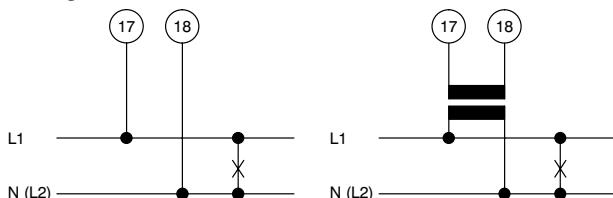
saturating current transformer accuracy class 3, 50 Hz to protect the
movements against overloads up to 100 times rated current (1 s max).
with base fixing attachment for panel mounting

ESW 1/5 A, 4.25 VA

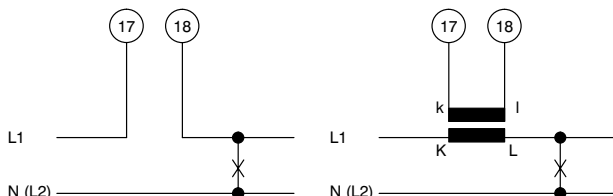
ESW 5/5 A, 4.25 VA

Connections

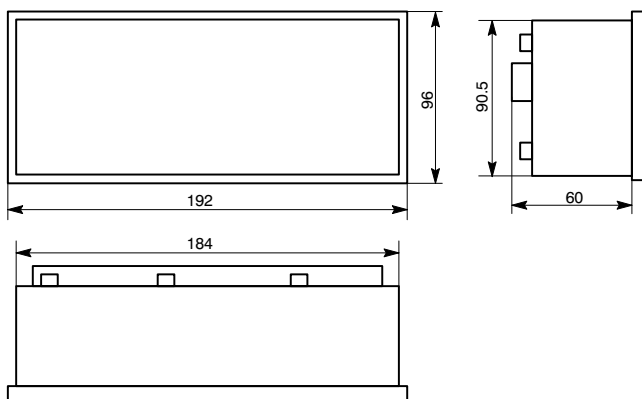
AC voltage



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

type W BI BIW	triple combination meters with moving-iron movements bimetallic movements bimetallic/moving-iron movements
front dimensions 192	192 mm x 96 mm
type identification RnS RhS	movements arranged horizontally *) movements arranged vertically
measuring ranges	refer to preceding table
special measuring range	to special order **)
calibration	50 Hz for a defined frequency 100 ... 1000 Hz **)
thermal time lag (bimetallic)	15 min *) 8 min
window	glass *) non-glaring glass
colour of bezel	black (similar to RAL 9005) *) gray (similar to RAL 7037)
position of use	vertical *) to special order 15 ... 165° **)
mechanical loads	shock 15 g, vibration 2.5 g *) shock 30 g, vibration 5 g
climatic suitability	class 2, -25 ... +40°C *) class 3, -10 ... +55°C
marine application	none *) non-certified
dielectric test	2 kV *) 3 kV
terminal safety protection	none *) protective sleeves
terminals	screws and wire clamps *) connector blades 6.3 x 0.8
dial	scale division and measuring range alike resp. full-scale values acc. to standardized series for use on transformer *) blank dial scale division and figuring 0 ... 100% acc. to standardized series **) deviating from standard **) additional lettering to be specified **) additional figuring to be specified **) coloured marks red, green or blue **) coloured sector red, green or blue **)
logo	WEIGEL *) none OEM logo **)
overload scaling	none (bimetallic and/or moving-iron) for 1.2 times rated current (bimetallic) *) for 2 times rated current (moving-iron) *) 1.5 times rated current (bimetallic)
saturating current transformer	none *) ESW 1/5 A, 4.25 VA ESW 5/5 A, 4.25 VA

*) standard

**) Please clearly add the desired specifications.

- specifications subject to change without notice; date of issue 09/93 -

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