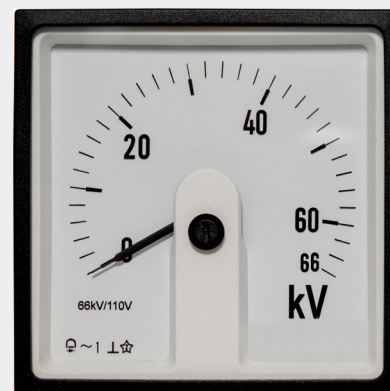
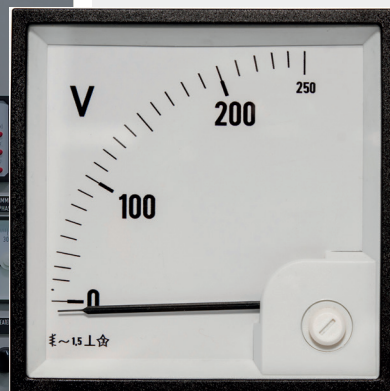
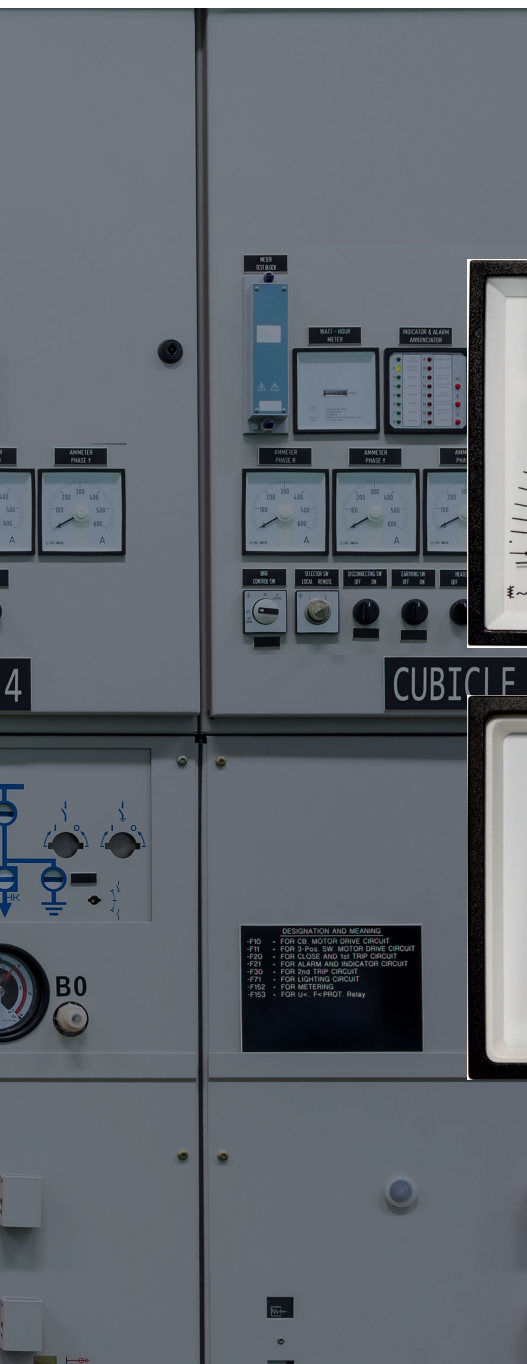


# SIMPLE MEASUREMENT IN ELECTRICAL NETWORK

ANALOG METERS FOR  
DISPLAYING THE MOST  
IMPORTANT ELECTRICAL DATA

## CATALOGUE



### SIRAX ANALOG METER SERIES

SIRAX BM100 • SIRAX BM200/250 • SIRAX BM300/350 • SIRAX BM400 • SIRAX BM500/550  
SIRAX BM600/650 • SIRAX BM700/750 • SIRAX BM800/850 • SIRAX BM900 • SIRAX BM910 • SIRAX BM920

## SIRAX BM100

### Analog Meters with Moving-Iron measuring mechanism and 90° scale

#### Description

The analog display measuring devices with moving iron measuring mechanism SIRAX BM100 in a polycarbonate housing and 90° scale are intended for measuring AC currents in the frequency range of 15 ... 400 Hz and AC voltages in the frequency range of 15 ... 100 Hz.

They show the rms value regardless of the shape of the curve, even with a high harmonic content. Only with extreme curve shapes (e.g. phase gating controls) and frequencies greater than 100 Hz can the class accuracy no longer be maintained.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.



#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 90° scale
- Near linear scale
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 25\text{mm}$
Panel fixing	Swivel screw

##### Connections

Voltmeter or Ammeter $< 30\text{A}$	M4 screws and wire clamps form E3
Ammeter $> 30\text{A}$	Threaded studs M6 with nuts
Ammeter $> 60\text{A}$	Threaded studs M8 with nuts

##### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 90°

##### Scale characteristics

practically linear  
above 10% of rated full-scale value

##### Scale division

Coarse-fine

##### Scale length

□48	□72	□96	□144
41mm	63mm	97mm	146mm

##### Overload scaling

2 times the nominal current

##### Ammeter

1.2 times the nominal voltage

##### Voltmeters

for transformer connection

#### Electrical Data

##### Measuring unit

AC Voltage and AC Current

##### Frequency range

AC Voltage 15 ... 100 Hz

AC Current 15 ... 400 Hz

##### Power consumption

##### Voltmeters

$< 4.5\text{ VA}$

##### Ammeters $\leq 15\text{ A}$

$< 0.5\text{ VA}$

##### Ammeters $> 15\text{ A}$

$< 0.8\text{ VA}$

##### Overload capacity

acc. to DIN EN 60 051

##### Continuously

120%  $I_n$ , 120%  $U_n$

##### Short time voltage measurement

2 x for 0.5s: 9 overloads

2 x for 5s: 1 overload (max. 1000 V)

##### Short time current measurement

10 x for 0.5s: 9 Overloads

10 x for 5s: 1 Overload (max. 200 A)

##### External magnetic field

0.4 kA/m

#### Reference conditions

##### Accuracy class

1.5% acc. to DIN EN 60 051

##### Reference temperature

23 °C /  $\pm 2^\circ\text{C}$

##### Position of use

Nominal position  $\pm 1^\circ$

##### Input variable

Rated measuring value

##### Wave form

Sinusoidal, distortion factor  $< 5\%$

##### Frequency

45 ... 65 Hz

##### Other conditions

DIN EN 60 051-1

# SIRAX BM100

## Analog Meters with Moving-Iron measuring mechanism and 90° scale

### Environmental conditions

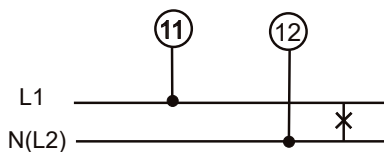
Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

### Safety

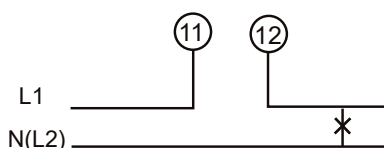
EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	III
Pollution degree	2
Maximal working voltage (phase-earth)	600 V (for □72, □96, □144) 300 V (for □48)
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV (for □72, □96, □144) 2 kV (for □48)
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Electrical connections

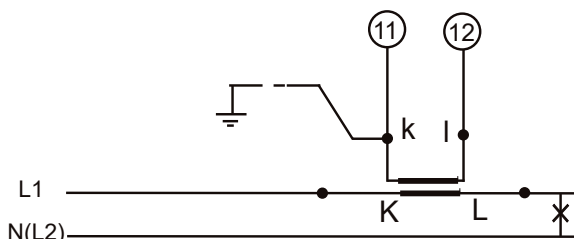
AC Voltage (directly connected)



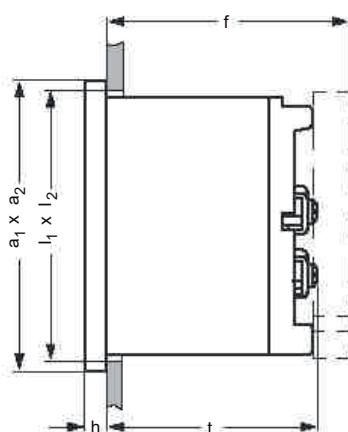
AC Current (directly connected)



AC Current (for use on current transformer)



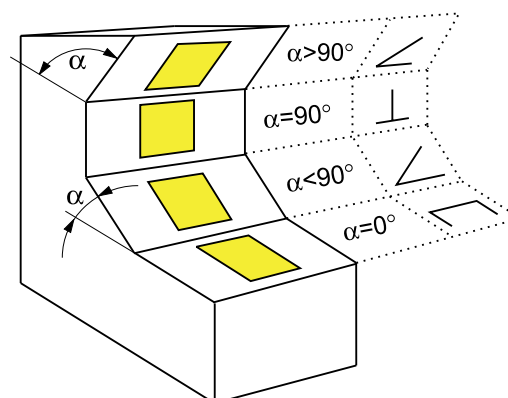
### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]			Installation depth (f) including back cover [mm]	
	a <sub>1</sub> x a <sub>2</sub>	h						
□48	48 x 48	5.5	45 <sup>+0.6</sup> x 45 <sup>+0.6</sup>	54	72	--	62.5	75 (bis 60A)
□72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	54	62	66	62.5	70
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	54	62	66	62.5	70
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	54	62	67	62.5	70

### Working position

Code	Working position	Code	Working position	Code	Working position
A	α = 0°	D	α = 45°	G	α = 90°
B	α = 15°	E	α = 60°	H	α = 105°
C	α = 30°	F	α = 75°	I	α = 120°



# Analog Meters with Moving-Iron measuring mechanism and 90° scale

## Measurement ranges

Frontframe dimensions [mm]	48 x 48	72 x 72	96 x 96	144 x 144
Scale lenght [mm]	41	63	97	146
Weight [kg]	0.1	0.16	0.2	0.4
Type	□48	□72	□96	□144
Measuring range	self-consumption			
AC Current				
100 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
150 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
250 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
400 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
600 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
1 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
1.5 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
2.5 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
4 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
6 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
10 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
15 A	< 0.8 VA	< 0.8 VA	< 0.8 VA	< 0.8 VA
20 A	< 0.8 VA	< 0.8 VA	< 0.8 VA	< 0.8 VA
25 A	< 0.8 VA	< 0.8 VA	< 0.8 VA	< 0.8 VA
40 A	--	< 0.8 VA	< 0.8 VA	< 0.8 VA
50 A	--	< 0.8 VA	< 0.8 VA	< 0.8 VA
60 A	--	< 0.8 VA	< 0.8 VA	< 0.8 VA
100 A	--	< 0.8 VA	< 0.8 VA	< 0.8 VA
AC Current for transformer				
X/5A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
X/1A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
AC Voltage				
6 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
10 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
15 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
25 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
40 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
60 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
100 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
120 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
132 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
150 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
250 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
300 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
400 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
500 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
600 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
800 V <sup>1)</sup>	--	< 4.5 VA	< 4.5 VA	< 4.5 VA
1000 V <sup>1)</sup>	--	< 4.5 VA	< 4.5 VA	< 4.5 VA
AC Voltage for transformer				
X/100V	--	< 4.5 VA	< 4.5 VA	< 4.5 VA
X/110V	--	< 4.5 VA	< 4.5 VA	< 4.5 VA

<sup>1)</sup> Applies only to phase-to-phase voltage measurements in a 3-phase network

# SIRAX BM100

## Analog Meters with Moving-Iron measuring mechanism and 90° scale

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
<b>SIRAX BM100, Analog meters with movin-iron measuring mechanism and 90° scale</b>			BM100-
<b>Features, Selection</b>			
<b>01 Dimensions Frontframe</b>			
□48 (48 x 48 mm)	A		1
□72 (72 x 72 mm)			2
□96 (96 x 96 mm)			3
□144 (144 x 144 mm)			4
<b>02 Measuring input</b>			
AC Current	B		1
AC Current for transformer	C		2
AC Voltage	D		3
AC Voltage for transformer	E		4
<b>03 Measuring range</b>			
AC Current			
100 mA		C, D, E	01
150 mA		C, D, E	02
250 mA		C, D, E	03
400 mA		C, D, E	04
600 mA		C, D, E	05
1 A		C, D, E	06
1.5 A		C, D, E	07
2.5 A		C, D, E	08
4 A		C, D, E	09
6 A		C, D, E	10
10 A		C, D, E	11
15 A		C, D, E	12
20 A		C, D, E	13
25 A		C, D, E	14
40 A		C, D, E	15
50 A		A, C, D, E	16
60 A		A, C, D, E	17
100 A		A, C, D, E	18
Special range AC Current			
100mA ... >1A ... <100A		A, C, D, E	B1
AC Current for transformer			
5A/5A		B, D, E	19
6A/5A		B, D, E	20
10A/5A		B, D, E	21
20A/5A		B, D, E	22
30A/5A		B, D, E	23
40A/5A		B, D, E	24
50A/5A		B, D, E	25

# **Analog Meters with Moving-Iron measuring mechanism and 90° scale**

60A/5A		B, D, E	26
80A/5A		B, D, E	27
100A/5A		B, D, E	28
150A/5A		B, D, E	29
160A/5A		B, D, E	30
200A/5A		B, D, E	31
300A/5A		B, D, E	32
400A/5A		B, D, E	33
500A/5A		B, D, E	34
600A/5A		B, D, E	35
630A/5A		B, D, E	36
800A/5A		B, D, E	37
1000A/5A		B, D, E	38
1200A/5A		B, D, E	39
1500A/5A		B, D, E	40
2000A/5A		B, D, E	41
3000A/5A		B, D, E	42
4000A/5A		B, D, E	43
5000A/5A		B, D, E	44
6000A/5A		B, D, E	45
8000A/5A		B, D, E	46
10000A/5A		B, D, E	47
1A/1A		B, D, E	48
5A/1A		B, D, E	49
6A/1A		B, D, E	50
10A/1A		B, D, E	51
15A/1A		B, D, E	52
20A/1A		B, D, E	53
30A/1A		B, D, E	54
40A/1A		B, D, E	55
50A/1A		B, D, E	56
60A/1A		B, D, E	57
80A/1A		B, D, E	58
100A/1A		B, D, E	59
150A/1A		B, D, E	60
200A/1A		B, D, E	61
300A/1A		B, D, E	62
400A/1A		B, D, E	63
500A/1A		B, D, E	64
600A/1A		B, D, E	65
800A/1A		B, D, E	66
1000A/1A		B, D, E	67
1200A/1A		B, D, E	68
1500A/1A		B, D, E	69
2000A/1A		B, D, E	70

# SIRAX BM100

## Analog Meters with Moving-Iron measuring mechanism and 90° scale

3000A/1A		B, D, E	71
4000A/1A		B, D, E	72
5000A/1A		B, D, E	73
6000A/1A		B, D, E	74
8000A/1A		B, D, E	75
10000A/1A		B, D, E	76
Special range AC Current for transformer			
... A / 5 A		B, D, E	B2
... A / 1 A		B, D, E	B3
AC Voltage			
6 V		B, C, E	77
10 V		B, C, E	78
15 V		B, C, E	79
25 V		B, C, E	80
40 V		B, C, E	81
60 V		B, C, E	82
100 V		B, C, E	83
120 V		B, C, E	84
132 V		B, C, E	85
150 V		B, C, E	86
250 V		B, C, E	87
300V		B, C, E	88
400 V		B, C, E	89
500 V		B, C, E	90
600 V		B, C, E	91
800 V		B, C, E	92
1000 V		B, C, E	93
Special range AC Voltage			
6 V ... <100 V		B, C, E	B4
AC Voltage for transformer			
4000V/100V		A, B, C, D	94
6000V/100V		A, B, C, D	95
10000V/100V		A, B, C, D	96
15000V/100V		A, B, C, D	97
20000V/100V		A, B, C, D	98
40000V/100V		A, B, C, D	99
60000V/100V		A, B, C, D	A1
150000V/100V		A, B, C, D	A2
250000V/100V		A, B, C, D	A3
400000V/100V		A, B, C, D	A4
4000V/110V		A, B, C, D	A5
6000V/110V		A, B, C, D	A6
15000V/110V		A, B, C, D	A7
150000V/110V		A, B, C, D	A8
250000V/110V		A, B, C, D	A9

# Analog Meters with Moving-Iron measuring mechanism and 90° scale

	Special range AC Voltage for transformer			
	... V / 100 V		A, B, C, D	B5
	... V / 110 V		A, B, C, D	B6
<b>04</b>	<b>Working position</b>			
	$\alpha = 0^\circ$			A
	$\alpha = 15^\circ$			B
	$\alpha = 30^\circ$			C
	$\alpha = 45^\circ$			D
	$\alpha = 60^\circ$			E
	$\alpha = 75^\circ$			F
	$\alpha = 90^\circ$ (vertical)			G
	$\alpha = 105^\circ$			H
	$\alpha = 120^\circ$			I
<b>05</b>	<b>Front window</b>			
	Glass			1
<b>06</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
<b>07</b>	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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## SIRAX BM150

### Analog Meters with Moving-Iron measuring mechanism, change-over switch and 90° scale

#### Description

The analog display measuring devices with moving iron movement and change-over switch SIRAX BM400 in a polycarbonate housing and 90 ° scale are suitable for measuring alternating currents in the frequency range of 15 ... 400 Hz and alternating voltages in the frequency range of 15 ... 100 Hz..

They show the rms value regardless of the shape of the curve, even with a high harmonic content. Only with extreme curve shapes (e.g. phase gating controls) and frequencies >100 Hz can the class accuracy no longer be maintained.

With the built-in switch with 4 or 6 positions, voltages in 1-phase, 3-phase 3 or 4-wire networks can be displayed.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.



#### Features

- 3-phase 3- and 4-wire current and voltage measurement possible
- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 90° scale
- Near linear scale
- Easy replacement of the glass window, the front bezel and the scale

Scale characteristics

practically linear  
above 10% of rated full-scale value

Scale division

Coarse-fine

Scale length

□72	□96
54mm	97mm

Overload scaling

2 times the nominal current

Ammeter

Voltmeters

1.2 times the nominal voltage

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 25\text{mm}$
Panel fixing	Swivel Screw

##### Connections

Voltmeter or Ammeter	M4 screws and wire clamps form E3
----------------------	-----------------------------------

##### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 90°

##### Electrical Data

Measuring unit	AC Voltage and AC Current
Frequency range	AC Voltage 15 ... 100 Hz AC Current 15 ... 400 Hz
Power consumption	
Voltmeters	<4.5 VA
Ammeters	<0.5 VA
Overload capacity	acc. to DIN EN 60 051
Continuously	120% $I_n$ , 120% $U_n$
Short time voltage measurement	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload
Short time current measurement	10 x for 0.5s: 9 overloads 10 x for 5s: 1 overload
External magnetic field	0.4 kA/m

##### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value

# SIRAX BM150

## Analog Meters with Moving-Iron measuring mechanism, change-over switch and 90° scale

Wave form	Sinusoidal, distortion factor <5%
Frequency	45 ... 65 Hz
Other conditions	DIN EN 60 051-1

### Environmental conditions

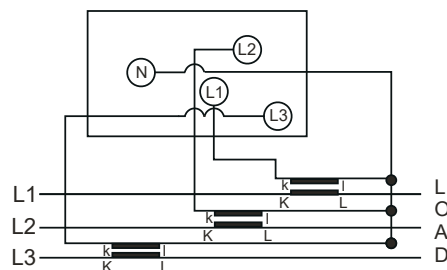
Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

### Safety

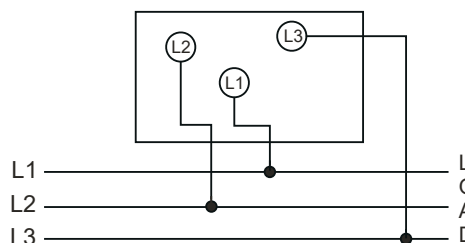
EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	600 V CATIII
Pollution degree	2
Rated insulation voltage	1 kV
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV
Housing protection class	IP40 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Electrical connections

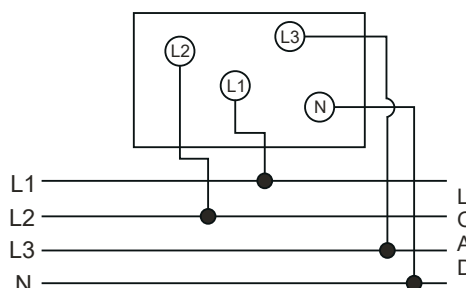
AC Ammeters with Selector Switch



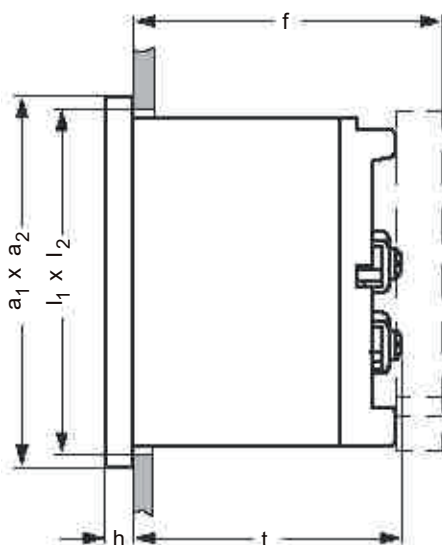
AC Voltmeters 3 Phase 3 Wire



AC Voltmeters 3 Phase 4 Wire



### Dimensions

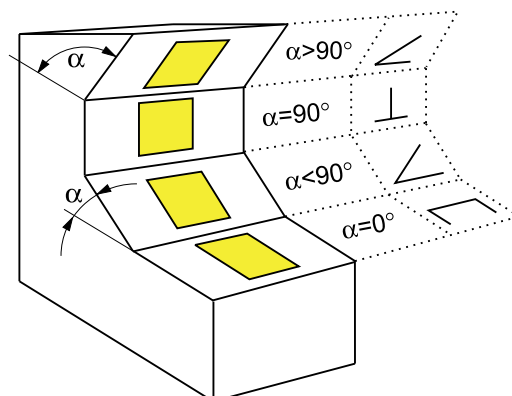


Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	53	64
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	53	64

## Analog Meters with Moving-Iron measuring mechanism, change-over switch and 90° scale

### Working position

Code	Working position	Code	Working position	Code	Arbeitsposition
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$



### Measurement ranges

Dimensions frontframe [mm]	72 x 72	96 x 96
Scale length [mm]	63	97
Weight [kg]	0.22	0.26
Type	□72	□96
AC voltage	100 V, 120 V, 150 V, 300 V, 500 V, 600 V	
AC current	1 A, 5 A	

### Change-over switch position

Network	Number Switch positions	Switch position
1-Phase	4	OFF / L1 / L2 / L3
3-Phase, 3-Wire	4	OFF / L1-L2 / L2-L3 / L3-L1
3-Phase, 4-Wire	6	L1-L3 / L2-L3 / L1-L2 / L1-LN / L2-LN / L3-LN

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM150, Analog meter with moving-iron measuring mechanism, change-over switch and 90° scale			BM150-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□72 (72 x 72 mm)			1
□96 (96 x 96 mm)			2
<b>02 Change-over switch position</b>			
1-Phase (OFF / L1 / L2 / L3)			1
3-Phase, 3-wire (OFF / L1-L2 / L2-L3 / L3-L1)			2
3-Phase, 4-wire (L1-L3 / L2-L3 / L1-L2 / L1-LN / L2-LN / L3-LN)			3
<b>03 Measuring input</b>			
AC Current			1
AC Voltage			2
<b>04 Measuring range</b>			
AC current			
1 A			1
5 A			2
AC voltage			
100 V			3
120 V			4
150 V			5
300 V			6
500 V			7
600 V			8

**Analog Meters with Moving-Iron measuring mechanism, change-over switch and 90° scale**

<b>05</b>	<b>Working position</b>			
	$\alpha = 0^\circ$			A
	$\alpha = 15^\circ$			B
	$\alpha = 30^\circ$			C
	$\alpha = 45^\circ$			D
	$\alpha = 60^\circ$			E
	$\alpha = 75^\circ$			F
	$\alpha = 90^\circ$ (vertical)			G
	$\alpha = 105^\circ$			H
	$\alpha = 120^\circ$			I
<b>06</b>	<b>Front window</b>			
	Glass			1
<b>07</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (customized)			2
<b>08</b>	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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## SIRAX BM200

### Analog Meters with Moving-Coil Movement and 90° Scale

#### Description

The analog display measuring devices with moving coil measuring mechanism SIRAX BM200 in a polycarbonate housing and 90° scale are intended for measuring DC currents or DC voltages.

The moving-coil measuring mechanism consists of a core magnet system with point bearings spring-loaded on both sides.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.

#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 90° scale
- Linear scale
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels			
Material of case	Polycarbonate			
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free			
Material of window	Glass			
Front frame (bezel)	Polycarbonate black			
Position of use	Vertical $\pm 5^\circ$			
Mounting	stackable next to each other			
Panel thickness	$\leq 25\text{mm}$			
Panel fixing	Swivel screw			
Weight	□48	□72	□96	□144
	0.15kg	0.20kg	0.25kg	0.40kg

##### Connections

Voltmeter or Ammeter $< 30\text{A}$	M4 screws and wire clamps form E3
Ammeter $> 30\text{A}$	Threaded studs M6 with nuts
Ammeter $> 60\text{A}$	Threaded studs M8 with nuts



#### Scaling

Pointer	knife-edge pointer	
Pointer deflection	0 ... 90°	
Scale characteristics	Linear	
Scale division	Coarse-fine	
Scale length	<input type="checkbox"/> 48	<input type="checkbox"/> 72

Skala

Interchangeable

#### Electrical Data

Measuring unit	DC Voltage and DC Current		
Overload capacity	acc. to DIN EN 60 051		
Continuously	120% $I_n$ , 120% $U_n$		
Short time voltage measurement	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload (max. 1000 V)		
Short time current measurement	10 x for 0.5s: 9 overloads 10 x for 5s: 1 overload (max. 200 A)		
External magnetic field	0.4 kA/m		
Burden	Connection to Shunt	Power Consumption: 6mA Lead resistance: 0.06W	$\pm 10\%$
	1A...60A	Voltage drop: 60mV	$\pm 10\%$
	$\geq 1\text{V}$	1000 W/V	$\pm 5\%$

#### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value
Other conditions	DIN EN 60 051-1

# SIRAX BM200

## Analog Meters with Moving-Coil Movement and 90° Scale

### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	III
Pollution degree	2
Maximal working voltage (phase-earth)	600 V (for □72, □96, □144) 300 V (for □48)
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV (for □72, □96, □144) 2 kV (for □48)

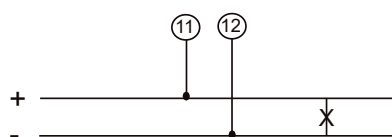
Housing protection class

IP52 Housing on the front  
IP00 Connections without contact protection  
IP20 Connections with contact protection  
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

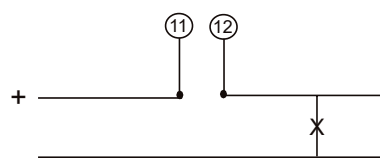
Safety terminal protection

### Electrical connections

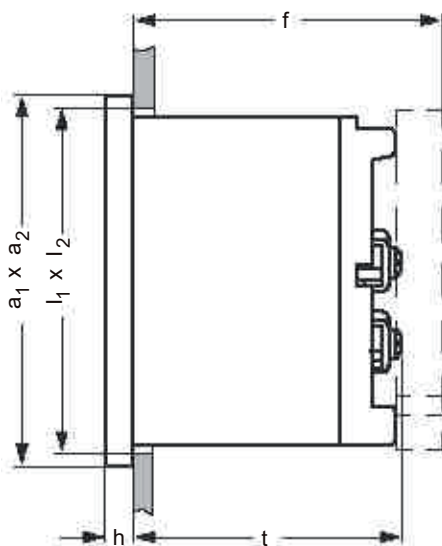
DC Voltage



DC Current



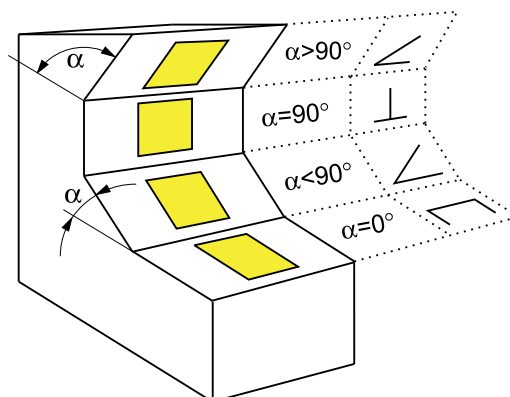
### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]			Installation depth (f) including back cover [mm]		
	a <sub>1</sub> x a <sub>2</sub>	h		l <sub>1</sub> x l <sub>2</sub>					
□48	48 x 48	5.5	45 <sup>+0.6</sup> x 45 <sup>+0.6</sup>	54	72	--	62.5	75	--
□72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	54	67	67	62.5	70	70
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	54	67	67	62.5	70	70
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	54	67	67	62.5	70	70

### Working position

Code	Working position	Code	Working position	Code	Arbeitsposition
A	α = 0°	D	α = 45°	G	α = 90°
B	α = 15°	E	α = 60°	H	α = 105°
C	α = 30°	F	α = 75°	I	α = 120°



# SIRAX BM200

## Analog Meters with Moving-Coil Movement and 90° Scale

### Measurement ranges

Type	□48 (48 x 48mm)	□72 (72 x 72mm)	□96 (96 x 96mm)	□144 (144 x 144mm)
Internal resistance ±10% or voltage drop				
Measuring range	self-consumption			
DC Current				
15 μA <sup>1)</sup>	140 mV	140 mV	140 mV	140 mV
25 μA <sup>1)</sup>	240 mV	240 mV	240 mV	240 mV
40 μA <sup>1)</sup>	374 mV	374 mV	374 mV	374 mV
60 μA <sup>1)</sup>	424 mV	424 mV	424 mV	424 mV
60 μA <sup>1)</sup>	600 mV	600 mV	600 mV	600 mV
100 μA	400 mV	400 mV	400 mV	400 mV
150 μA	600 mV	600 mV	600 mV	600 mV
250 μA	140 mV	140 mV	140 mV	140 mV
400 μA	540 mV	540 mV	540 mV	540 mV
500 μA	540 mV	540 mV	540 mV	540 mV
600 μA	540 mV	540 mV	540 mV	540 mV
1 mA	37 mV	37 mV	37 mV	37 mV
1.5 mA	196 mV	196 mV	196 mV	196 mV
2.5 mA	196 mV	196 mV	196 mV	196 mV
4 mA	196 mV	196 mV	196 mV	196 mV
5 mA	196 mV	196 mV	196 mV	196 mV
6 mA	196 mV	196 mV	196 mV	196 mV
10 mA	196 mV	196 mV	196 mV	196 mV
15 mA	11 mV	11 mV	11 mV	11 mV
20 mA	60 mV	60 mV	60 mV	60 mV
25 mA	60 mV	60 mV	60 mV	60 mV
40 mA	60 mV	60 mV	60 mV	60 mV
60 mA	60 mV	60 mV	60 mV	60 mV
100 mA	60 mV	60 mV	60 mV	60 mV
150 mA	60 mV	60 mV	60 mV	60 mV
250 mA	60 mV	60 mV	60 mV	60 mV
400 mA	60 mV	60 mV	60 mV	60 mV
600 mA	60 mV	60 mV	60 mV	60 mV
1 A	60 mV	60 mV	60 mV	60 mV
1.5 A	60 mV	60 mV	60 mV	60 mV
2.5 A	60 mV	60 mV	60 mV	60 mV
4 A	60 mV	60 mV	60 mV	60 mV
5 A	60 mV	60 mV	60 mV	60 mV
6 A	60 mV	60 mV	60 mV	60 mV
10 A	60 mV	60 mV	60 mV	60 mV
15 A	60 mV	60 mV	60 mV	60 mV
20 A	60 mV	60 mV	60 mV	60 mV
25 A	60 mV	60 mV	60 mV	60 mV
30 A	60 mV	60 mV	60 mV	60 mV
40 A	60 mV	60 mV	60 mV	60 mV
60 A	72 mV	72 mV	72 mV	72 mV
100 A	--	60 mV	60 mV	60 mV
for transformer connection				
4...20 mA	60 mV	60 mV	60 mV	60 mV

# SIRAX BM200

## Analog Meters with Moving-Coil Movement and 90° Scale

Type	□48 (48 x 48mm)	□72 (72 x 72mm)	□96 (96 x 96mm)	□144 (144 x 144mm)
Internal resistance ±10% or voltage drop				
Measuring range	self-consumption			
DC Voltage				
15 mV <sup>1) 2)</sup>	3330 Ω / V	3330 Ω / V	3330 Ω / V	3330 Ω / V
25 mV <sup>1) 2)</sup>	3330 Ω / V	3330 Ω / V	3330 Ω / V	3330 Ω / V
40 mV <sup>1) 2)</sup>	3330 Ω / V	3330 Ω / V	3330 Ω / V	3330 Ω / V
50 mV <sup>2)</sup>	3330 Ω / V	3330 Ω / V	3330 Ω / V	3330 Ω / V
60 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
75 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
100 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
150 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
250 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
400 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
600 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
1 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
1.5 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
2.5 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
4 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
6 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
10 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
15 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
25 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
30 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
40 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
50 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
60 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
100 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
150 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
200 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
250 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
300 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
400 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
500 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
600 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
800 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
1000 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
for Shunt connection				
60 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
75 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
150 mV <sup>2)</sup>	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V

<sup>1)</sup> Accuracy class 2.5

<sup>2)</sup> Total lead resistance of 0.035 ohm or less considered for mV ranges while calibration



# SIRAX BM200

## Analog Meters with Moving-Coil Movement and 90° Scale

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM200, Analog meters with moving-coil movement and 90° Scale			BM200-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□48 (48 x 48 mm)	A		1
□72 (72 x 72 mm)			2
□96 (96 x 96 mm)			3
□144 (144 x 144 mm)			4
<b>02 Measuring input</b>			
DC Current	B		1
DC Current for transformer connection	C		2
DC Voltage	D		3
DC Voltage for Shunt connection	E		4
<b>03 Measuring range</b>			
DC Current			
15 µA		C, D, E	01
25 µA		C, D, E	02
40 µA		C, D, E	03
50 µA		C, D, E	04
60 µA		C, D, E	05
100 µA		C, D, E	06
150 µA		C, D, E	07
250 µA		C, D, E	08
400 µA		C, D, E	09
500 µA		C, D, E	10
600 µA		C, D, E	11
Special range DC Current			
0 ... >100 µA ... <600 µA		C, D, E	80
1 mA		C, D, E	12
1.5 mA		C, D, E	13
2.5 mA		C, D, E	14
4 mA		C, D, E	15
5 mA		C, D, E	16
6 mA		C, D, E	17
10 mA		C, D, E	18
15 mA		C, D, E	19
20 mA		C, D, E	20
25 mA		C, D, E	21

# SIRAX BM200

## Analog Meters with Moving-Coil Movement and 90° Scale

40 mA		C, D, E	22
60 mA		C, D, E	23
100 mA		C, D, E	24
150 mA		C, D, E	25
250 mA		C, D, E	26
400 mA		C, D, E	27
600 mA		C, D, E	28
Special range DC Current			
0 ... >1 mA ... <600 mA		C, D, E	81
1 A		C, D, E	29
1.5 A		C, D, E	30
2.5 A		C, D, E	31
4 A		C, D, E	32
5 A		C, D, E	33
6 A		C, D, E	34
10 A		C, D, E	35
15 A		C, D, E	36
20 A		C, D, E	37
25 A		C, D, E	38
30 A		C, D, E	39
40 A		C, D, E	40
60 A		C, D, E	41
100 A		A, C, D, E	42
Special range DC Current			
0 ... >1 A ... <100 A		C, D, E	82
DC Current for transformer connection			
4 ... 20 mA		B, D, E	43
DC Voltage			
15 mV		B, C, E	44
25 mV		B, C, E	45
40 mV		B, C, E	46
50 mV		B, C, E	47
60 mV		B, C, E	48
75 mV		B, C, E	49
100 mV		B, C, E	50
150 mV		B, C, E	51
250 mV		B, C, E	52
400 mV		B, C, E	53
600 mV		B, C, E	54

# SIRAX BM200

## Analog Meters with Moving-Coil Movement and 90° Scale

Special range DC Voltage			
0 ... >60 mV ... <600 mV		B, C, E	83
1 V		B, C, E	55
1.5 V		B, C, E	56
2.5 V		B, C, E	57
4 V		B, C, E	58
6 V		B, C, E	59
10 V		B, C, E	60
15 V		B, C, E	61
25 V		B, C, E	62
30 V		B, C, E	63
40 V		B, C, E	64
50 V		B, C, E	65
60 V		B, C, E	66
100 V		B, C, E	67
150 V		B, C, E	68
200 V		B, C, E	69
250 V		B, C, E	70
300 V		B, C, E	71
400 V		B, C, E	72
500 V		B, C, E	73
600 V		B, C, E	74
800 V		B, C, E	75
1000 V		B, C, E	76
Special range DC Voltage			
0 ... >1 V ... <1000 V		B, C, E	84
DC Voltage for Shunt connection			
60 mV		B, C, D	77
75 mV		B, C, D	78
150 mV		B, C, D	79
<b>04</b>	<b>Working position</b>		
	$\alpha = 0^\circ$		A
	$\alpha = 15^\circ$		B
	$\alpha = 30^\circ$		C
	$\alpha = 45^\circ$		D
	$\alpha = 60^\circ$		E
	$\alpha = 75^\circ$		F
	$\alpha = 90^\circ$		G
	$\alpha = 105^\circ$		H
	$\alpha = 120^\circ$		I

# SIRAX BM200

## Analog Meters with Moving-Coil Movement and 90° Scale

---

05	<b>Zero Position</b>			
	Left			1
	Centre			2
	Shifted			3
06	<b>Front window</b>			
	Glass			1
07	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
08	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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## SIRAX BM250

### Analog Meters with Moving-Coil Movement and 240° Scale

#### Description

The analog display measuring devices with moving coil measuring mechanism SIRAX BM250 in a polycarbonate housing and 240° scale are intended for measuring DC currents or DC voltages.

The moving-coil measuring mechanism consists of a core magnet system with point bearings spring-loaded on both sides.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.

#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 240° scale
- Linear scale
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels			
Material of case	Polycarbonate			
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free			
Material of window	Glass			
Front frame (bezel)	Polycarbonate black			
Position of use	Vertical $\pm 5^\circ$			
Mounting	stackable next to each other			
Panel thickness	$\leq 25\text{mm}$			
Panel fixing	Swivel screw			
Weight	□48	□72	□96	□144
	0.13kg	0.25kg	0.30kg	0.43kg

##### Connections

Voltmeter or Ammeter $< 30\text{A}$	M4 screws and wire clamps form E3
Ammeter $> 30\text{A}$	Threaded studs M6 with nuts
Ammeter $> 60\text{A}$	Threaded studs M8 with nuts



#### Scaling

Pointer	knife-edge pointer	
Pointer deflection	0 ... 240°	
Scale characteristics	Linear	
Scale division	Coarse-fine	
Scale length	<input type="checkbox"/> 48	<input type="checkbox"/> 72

#### Skala

Interchangeable

#### Electrical Data

Measuring unit	DC Voltage and DC Current
Overload capacity	acc. to DIN EN 60 051
Continuously	120% $I_n$ , 120% $U_n$
Short duration voltage	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload (max. 1000 V)
Short duration current	10 x for 0.5s: 9 overloads 10 x for 5s: 1 overload (max. 200 A)
External magnetic field	0.5 mT

#### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value
Other conditions	DIN EN 60 051-1

# SIRAX BM250

## Analog Meters with Moving-Coil Movement and 240° Scale

### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	III
Pollution degree	2
Maximal working voltage (phase-earth)	600 V (for □72, □96, □144) 300 V (for □48)
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV (for □72, □96, □144) 2 kV (for □48)

Housing protection class

IP52 Housing on the front

IP00 Connections without contact protection

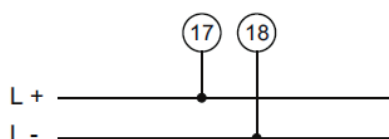
IP20 Connections with contact protection

Safety terminal protection

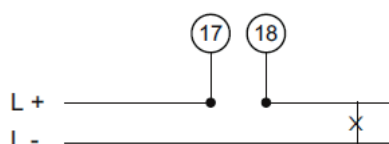
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Electrical connections

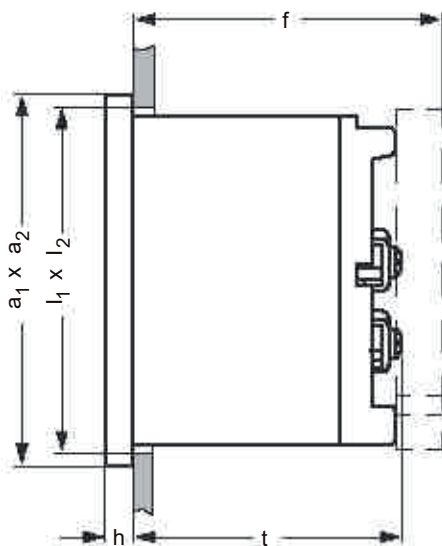
DC Voltage



DC Current



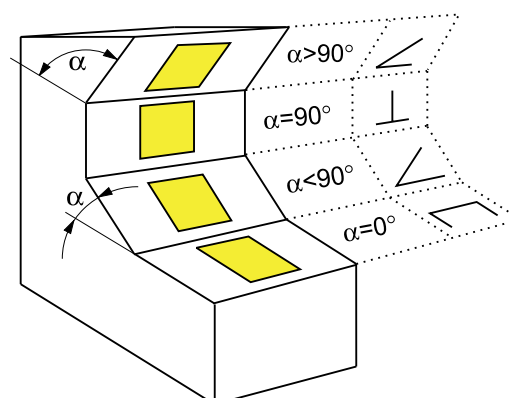
### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]			Installation depth (f) including back cover [mm]		
	a <sub>1</sub> x a <sub>2</sub>	h		I <sub>1</sub> x I <sub>2</sub>			<6A 6...60A 60...100A		
□48	48 x 48	5.5	45 <sup>+0.6</sup> x 45 <sup>+0.6</sup>	53	68	78	64	64	70
□72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	53	68	--	64	64	--
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	53	68	78	64	64	70
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	53	68	78	64	64	70

### Working position

Code	Working position	Code	Working position	Code	Arbeitsposition
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ vertical
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$



# SIRAX BM250

## Analog Meters with Moving-Coil Movement and 240° Scale

### Measurement ranges

Type	□48 (48 x 48mm)	□72 (72 x 72mm)	□96 (96 x 96mm)	□144 (144 x 144mm)
Internal resistance ±10% or voltage drop				
Measuring range	self-consumption			
DC Current				
50 μA <sup>1)</sup>	540 mV	540 mV	540 mV	540 mV
60 μA <sup>1)</sup>	540 mV	540 mV	540 mV	540 mV
75 μA	540 mV	540 mV	540 mV	540 mV
100 μA	970 mV	970 mV	970 mV	970 mV
150 μA	970 mV	970 mV	970 mV	970 mV
250 μA	810 mV	810 mV	810 mV	810 mV
400 μA	900 mV	900 mV	900 mV	900 mV
600 μA	900 mV	900 mV	900 mV	900 mV
1 mA	500 mV	500 mV	500 mV	500 mV
1.5 mA	500 mV	500 mV	500 mV	500 mV
2.5 mA	500 mV	500 mV	500 mV	500 mV
4 mA	500 mV	500 mV	500 mV	500 mV
5 mA	40 mV	40 mV	40 mV	40 mV
6 mA	40 mV	40 mV	40 mV	40 mV
10 mA	75 mV	75 mV	75 mV	75 mV
15 mA	60 mV	60 mV	60 mV	60 mV
20 mA	60 mV	60 mV	60 mV	60 mV
25 mA	60 mV	60 mV	60 mV	60 mV
40 mA	60 mV	60 mV	60 mV	60 mV
60 mA	60 mV	60 mV	60 mV	60 mV
100 mA	60 mV	60 mV	60 mV	60 mV
150 mA	60 mV	60 mV	60 mV	60 mV
200 mA	60 mV	60 mV	60 mV	60 mV
250 mA	60 mV	60 mV	60 mV	60 mV
300 mA	60 mV	60 mV	60 mV	60 mV
400 mA	60 mV	60 mV	60 mV	60 mV
500 mA	60 mV	60 mV	60 mV	60 mV
600 mA	60 mV	60 mV	60 mV	60 mV
750 mA	60 mV	60 mV	60 mV	60 mV
1 A	60 mV	60 mV	60 mV	60 mV
1.5 A	60 mV	60 mV	60 mV	60 mV
2.5 A	60 mV	60 mV	60 mV	60 mV
4 A	60 mV	60 mV	60 mV	60 mV
5 A	60 mV	60 mV	60 mV	60 mV
6 A	60 mV	60 mV	60 mV	60 mV
10 A	60 mV	60 mV	60 mV	60 mV
15 A	60 mV	60 mV	60 mV	60 mV
20 A	60 mV	60 mV	60 mV	60 mV
25 A	60 mV	60 mV	60 mV	60 mV
30 A	60 mV	60 mV	60 mV	60 mV
40 A	--	--	60 mV	60 mV
60 A	--	--	60 mV	60 mV
100 A	--	--	60 mV	60 mV
for transformer connection				
4...20 mA	60 mV	60 mV	60 mV	60 mV

# SIRAX BM250

## Analog Meters with Moving-Coil Movement and 240° Scale

Type	□48 (48 x 48mm)	□72 (72 x 72mm)	□96 (96 x 96mm)	□144 (144 x 144mm)
Internal resistance ±10% or voltage drop				
Measuring range	self-consumption			
DC Voltage				
60 mV	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
75 mV	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
100 mV	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
150 mV	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
250 mV	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
400 mV	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
600 mV	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
1 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
1.5 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
2.5 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
4 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
6 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
10 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
15 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
25 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
30 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
40 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
60 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
100 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
150 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
200 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
250 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
300 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
400 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
500 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
600 V	1000 Ω / V	1000 Ω / V	1000 Ω / V	1000 Ω / V
for Shunt connection				
50 mV <sup>2)</sup>	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
60 mV <sup>2)</sup>	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
75 mV <sup>2)</sup>	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V
150 mV <sup>2)</sup>	200 Ω / V	200 Ω / V	200 Ω / V	200 Ω / V

<sup>1)</sup> Accuracy class 2.5

<sup>2)</sup> Total lead resistance of 0.035 ohm or less considered for mV ranges while calibration



# SIRAX BM250

## Analog Meters with Moving-Coil Movement and 240° Scale

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
<b>SIRAX BM250, Analog meters with moving-coil movement and 240° Scale</b>			BM250-
<b>Features, Selection</b>			
<b>01 Dimensions Frontframe</b>			
□48 (48 x 48 mm)	A		1
□72 (72 x 72 mm)	B		2
□96 (96 x 96 mm)			3
□144 (144 x 144 mm)			4
<b>02 Measuring input</b>			
DC Current	C		1
DC Current for transformer connection	D		2
DC Voltage	E		3
DC Voltage for Shunt connection	F		4
<b>03 Measuring range</b>			
DC Current			
50 µA		D, E, F	01
60 µA		D, E, F	02
75 µA		D, E, F	03
100 µA		D, E, F	04
150 µA		D, E, F	05
250 µA		D, E, F	06
400 µA		D, E, F	07
600 µA		D, E, F	08
Special range DC Current			
0 ... >100 µA ... <600 µA		D, E, F	74
1 mA		D, E, F	09
1.5 mA		D, E, F	10
2.5 mA		D, E, F	11
4 mA		D, E, F	12
5 mA		D, E, F	13
6 mA		D, E, F	14
10 mA		D, E, F	15
15 mA		D, E, F	16
20 mA		D, E, F	17
25 mA		D, E, F	18
40 mA		D, E, F	19
60 mA		D, E, F	20
100 mA		D, E, F	21

# SIRAX BM250

## Analog Meters with Moving-Coil Movement and 240° Scale

150 mA		D, E, F	22
250 mA		D, E, F	23
300 mA		D, E, F	24
400 mA		D, E, F	25
500 mA		D, E, F	26
600 mA		D, E, F	27
750 mA		D, E, F	28
Special range DC Current			
0 ... >1 mA ... <750 mA		D, E, F	75
1 A		D, E, F	29
1.5 A		D, E, F	30
2.5 A		D, E, F	31
4 A		D, E, F	32
5 A		D, E, F	33
6 A		D, E, F	34
10 A		D, E, F	35
15 A		D, E, F	36
20 A		D, E, F	37
25 A		D, E, F	38
30 A		D, E, F	39
40 A		A, B, D, E, F	40
60 A		A, B, D, E, F	41
100 A		A, B, D, E, F	42
Special range DC Current			
0 ... >1 A ... <100 A		D, E, F	76
DC Current for transformer connection			
4 ... 20 mA		C, E, F	43
DC Voltage			
60 mV		C, D, F	44
75 mV		C, D, F	45
100 mV		C, D, F	46
150 mV		C, D, F	47
250 mV		C, D, F	48
400 mV		C, D, F	49
600 mV		C, D, F	50
Special range DC Voltage			
0 ... >100 mV ... <600 mV		C, D, F	77
1 V		C, D, F	51
1.5 V		C, D, F	52

# SIRAX BM250

## Analog Meters with Moving-Coil Movement and 240° Scale

2.5 V		C, D, F	53
4 V		C, D, F	54
6 V		C, D, F	55
10 V		C, D, F	56
15 V		C, D, F	57
25 V		C, D, F	58
30 V		C, D, F	59
40 V		C, D, F	60
60 V		C, D, F	61
100 V		C, D, F	62
150 V		C, D, F	63
200 V		C, D, F	64
250 V		C, D, F	65
300 V		C, D, F	66
400 V		C, D, F	67
500 V		C, D, F	68
600 V		C, D, F	69
Special range DC Voltage			
0 ... >1 V ... <600 V		C, D, F	78
DC Voltage for Shunt connection			
50 mV		C, D, E	70
60 mV		C, D, E	71
75 mV		C, D, E	72
150 mV		C, D, E	73
<b>04 Working position</b>			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 30^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$ (vertical)			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I
<b>05 Zero Position</b>			
Left			1
Centre			2
Shifted			3

# SIRAX BM250

## Analog Meters with Moving-Coil Movement and 240° Scale

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<b>06</b>	<b>Front window</b> Glass			1
<b>07</b>	<b>Scalefactor</b> Standard			1
	Customized			2
<b>08</b>	<b>Contact protection</b> without back cover			1
	with back cover			2



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## SIRAX BM300

### Analoganzeigegeräte mit Drehspulmesswerk, Gleichrichter und 90° Skala

#### Beschreibung

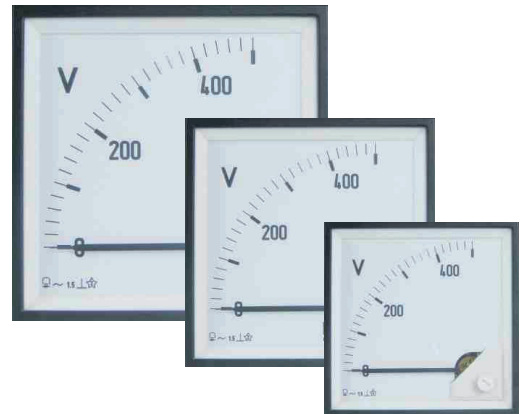
Die analogen Anzeigemessgeräte mit Drehspulmesswerk und Gleichrichter SIRAX BM300 im Kunststoffgehäuse und 90° Skala eignen sich zur Messung von Wechselströmen oder Wechselfspannungen.

Das Gerät misst Durchschnittswerte und ist kalibriert, um RMS-Werte anzuzeigen, wobei eine sinusförmige Wellenform für Frequenzen von 40 ... 10000 Hz angenommen wird (Wechselstrom für einen Frequenzbereich von 40 ... 1000 Hz und Wechselfspannung für einen Frequenzbereich von 40 ... 1000 Hz).

Das Drehspulmesswerk besteht aus einem Kernmagnet-System mit beidseitig gefederten Spitzenlagern und vorgeschaltetem Gleichrichter.

Die Messgeräte sind für den Einbau in Schalttafel, Maschinenkonsolen oder Mosaikrastern bis zu einer Plattendicke von höchstens 25mm ausgelegt.

Der Frontrahmen, die Frontscheibe und die Skala können leicht ausgetauscht werden.



#### Eigenschaften

- Robustes Kunststoffgehäuse mit hoher Brennbarkeitsklasse UL94-V0
- Einfache Montage über Schwenkschraube
- Schneller, einfacher Anschluss über Schrauben und Klemmbügel
- Vollflächige Rückwandabdeckung als Berührungsschutz
- 90°-Skala
- lineare Skala
- Problemloses Ersetzen der Frontscheibe, des Frontrahmens und der Skala

#### Anzeige

Zeiger

Zeigerausschlag

Skalenverlauf

Skaleneinteilung

Skalenlänge

Balkenzeiger mit Schneide

0 ... 90°

Linear (nicht für Strommessgeräte >750mA)

Grob - fein

□48	□72	□96	□144
41mm	61mm	97mm	146mm

Skala

Austauschbar (nicht für Strommessgeräte >750mA)

#### Technische Daten

##### Mechanische Daten

Bauform	Quadratisches Gehäuse für den Einbau in Schalttafeln, Maschinenkonsolen oder Mosaikrastern			
Gehäusematerial	Polycarbonat			
Brennbarkeitsklasse	UL94 V-0, selbstverlöschend, nicht tropfend, halogenfrei			
Frontscheibe	Tafelglas			
Frontrahmen	Polycarbonat schwarz			
Einbaulage	senkrecht $\pm 5^\circ$			
Montage	anreihbar, "dicht an dicht" möglich			
Plattendicke	$\leq 25\text{mm}$			
Befestigung	Schwenkschraube			
Gewicht	□48	□72	□96	□144
	0.11kg	0.15kg	0.20kg	0.25kg

##### Elektrische Daten

Messgrösse	Wechselstrom oder Wechselfspannung
Überlastgrenze	nach DIN EN 60 051
dauernd	120% In, 120% Un
kurzzeitige Spannungsmessung	2 x für 5s
kurzzeitige Strommessung	10 x für 5s
magnetisches Fremdfeld	0.4 kA/m

##### Referenzbedingungen

Genauigkeitsklasse	1.5% nach DIN EN 60 051
Referenztemperatur	23 °C / ± 2 °C
Einbaulage	Nenneinbaulage ±1°
Eingangsgrösse	Messbereichsnennwert
Kurvenform	Sinus, Klirrfaktor <5%
Frequenz	45 ... 65 Hz
Andere Bedingungen	DIN EN 60 051-1

#### Anschlüsse

Spannungsmessgerät oder

Strommessgerät <6A

Strommessgerät >6A

Schraube M4 und Klemmbügel Form E3

Gewindebolzen M6 mit Mutter

SIRAX BM300

Analoganzeigergeräte mit Drehspulmesswerk, Gleichrichter und 90° Skala

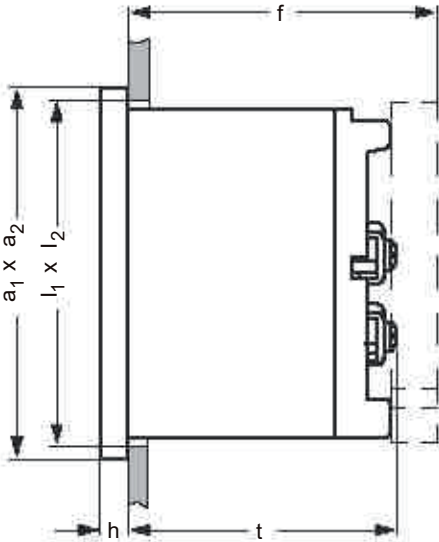
Umgebungsbedingungen

Klimaeignung	Klimaklasse 2 nach DIN EN 60 051 Klimaklasse 3 nach VDE/VDI 3540
Betriebstemperatur	-10 ... +55 °C
Lagertemperatur	-25 ... +65 °C
Relative Luftfeuchte	≤75% im Jahresmittel, keine Betauung
Schock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm Amplitude (entspricht 1.5g bei 50 Hz)

Sicherheit

EMV-Festigkeit	gemäss EN 61 000-6-2
EMV-Emission	gemäss EN 61 000-6-4
Sicherheit	gemäss EN 60 010-1
Installationskategorie	600 V CATIII
Verschmutzungsgrad	2
Maximale Arbeitsspannung (Phase-Erde)	1000 V (für □72, □96, □144) 660 V (für □48)
Isolationsklasse	A (gemäss VDE 0110)
Isolationsprüfspannung	3 kV (für □72, □96, □144) 2 kV (für □48)

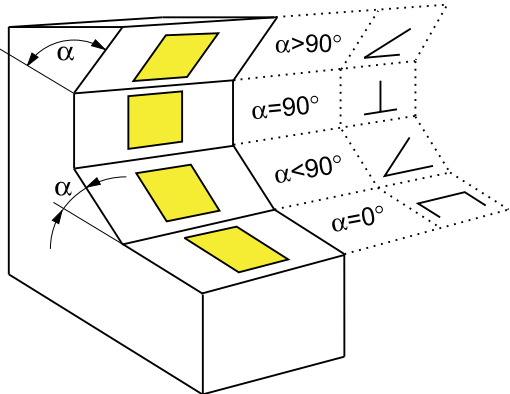
Dimensionen



Front [mm]	Nennabmessung [mm]		Ausschnitt [mm]	Einbautiefe (t) inkl. Anschluss [mm]	Einbautiefe (f) inkl. Rückenabdeckung [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□48	48 x 48	5.5	45 <sup>+0.6</sup> x 45 <sup>+0.6</sup>	54	62.5
□72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	54	62.5
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	54	62.5
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	54	62.5

Arbeitsposition

Code	Arbeits- position	Code	Arbeits- position	Code	Arbeits- position
A	α = 0°	D	α = 45°	G	α = 90°
B	α = 15°	E	α = 60°	H	α = 105°
C	α = 30°	F	α = 75°	I	α = 120°



# Analoganzeigergeräte mit Drehspulmesswerk, Gleichrichter und 90° Skala

## Messbereiche

Typ	□48 (48 x 48mm)	□72 (72 x 72mm)	□96 (96 x 96mm)	□144 (144 x 144mm)
Innenwiderstand ±20% oder Spannungsabfall				
Messbereich	Eigenverbrauch			
Wechselstrom				
100 µA	1.30 V	1.30 V	1.30 V	1.30 V
150 µA	2.40 V	2.40 V	2.40 V	2.40 V
250 µA	2.40 V	2.40 V	2.40 V	2.40 V
400 µA	2.40 V	2.40 V	2.40 V	2.40 V
600 µA	2.40 V	2.40 V	2.40 V	2.40 V
1 mA	2.40 V	2.40 V	2.40 V	2.40 V
1.5 mA	1.40 V	1.40 V	1.40 V	1.40 V
2.5 mA	1.40 V	1.40 V	1.40 V	1.40 V
4 mA	1.40 V	1.40 V	1.40 V	1.40 V
6 mA	1.40 V	1.40 V	1.40 V	1.40 V
10 mA	1.40 V	1.40 V	1.40 V	1.40 V
15 mA	1.70 V	1.70 V	1.70 V	1.70 V
25 mA	1.70 V	1.70 V	1.70 V	1.70 V
40 mA	1.70 V	1.70 V	1.70 V	1.70 V
60 mA	1.70 V	1.70 V	1.70 V	1.70 V
100 mA	1.70 V	1.70 V	1.70 V	1.70 V
150 mA	1.33 V	1.33 V	1.33 V	1.33 V
250 mA	0.80 V	0.80 V	0.80 V	0.80 V
400 mA	0.50 V	0.50 V	0.50 V	0.50 V
600 mA	0.33 V	0.33 V	0.33 V	0.33 V
750 mA	0.27 V	0.27 V	0.27 V	0.27 V
1 A <sup>1)</sup>	0.20 V	0.20 V	0.20 V	0.20 V
1.5 A <sup>1)</sup>	0.14 V	0.14 V	0.14 V	0.14 V
2.5 A <sup>1)</sup>	0.80 V	0.80 V	0.80 V	0.80 V
4 A <sup>1)</sup>	0.50 V	0.50 V	0.50 V	0.50 V
6 A <sup>1)</sup>	0.03 V	0.03 V	0.03 V	0.03 V
10 A <sup>1)</sup>	0.02 V	0.02 V	0.02 V	0.02 V
Wechselspannung				
6 V	900 Ω / V	900 Ω / V	900 Ω / V	1000 Ω / V
10 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
15 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
25 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
40 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
60 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
100 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
150 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
250 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
400 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
500 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
600 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V

<sup>1)</sup> Skalen sind nicht linear und nicht austauschbar

# SIRAX BM300

## Analoganzeigergeräte mit Drehspulmesswerk, Gleichrichter und 90° Skala

### Bestellangaben

Bezeichnung	Sperrcode	unmöglich bei Sperrcode	Artikel-Nr. / Merkmal
SIRAX BM300, Analoganzeigergeräte mit Drehspulmesswerk, Gleichrichter und 90° Skala			BM300-
<b>Markmal</b>			
<b>01 Dimension Frontrahmen</b>			
□48 (48 x 48 mm)			1
□72 (72 x 72 mm)			2
□96 (96 x 96 mm)			3
□144 (144 x 144 mm)			4
<b>02 Messeingang</b>			
Wechselstrom	A		1
Wechselspannung	B		2
<b>03 Messbereich</b>			
Wechselstrom			
100 µA		B	01
150 µA		B	02
250 µA		B	03
400 µA		B	04
600 µA		B	05
Sonderbereich Wechselstrom			
0 ... >100 µA ... <600 µA		B	40
1 mA		B	06
1.5 mA		B	07
2.5 mA		B	08
4 mA		B	09
6 mA		B	10
10 mA		B	11
15 mA		B	12
25 mA		B	13
40 mA		B	14
60 mA		B	15
100 mA		B	16
150 mA		B	17
250 mA		B	18
400 mA		B	19
600 mA		B	20
750 mA		B	21
Sonderbereich Wechselstrom			
0 ... >1 mA ... <750 mA		B	41



# Analoganzeigergeräte mit Drehspulmesswerk, Gleichrichter und 90° Skala

1 A		B	22
1.5 A		B	23
2.5 A		B	24
4 A		B	25
6 A		B	26
10 A		B	27
Sonderbereich Wechselstrom			
0 ... >1 A ... <10 A		B	42
Anschluss an Stromwandler			
...A/1A		B	43
...A/5A		B	44
Wechselspannung			
6 V		A	28
10 V		A	29
15 V		A	30
25 A		A	31
40 V		A	32
60 V		A	33
100 V		A	34
150 V		A	35
250 V		A	36
400 V		A	37
500 V		A	38
600 V		A	39
Sonderbereich Wechsspaltung			
0 ... >6 V ... <600 V		A	45
Anschluss an Spannungswandler			
.../100V		A	46
.../110V		A	47
<b>04 Arbeitsposition</b>			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 30^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I

**Analoganzeigergeräte mit Drehspulmesswerk, Gleichrichter und 90° Skala**

<b>05</b>	<b>Nullposition</b>			
	Links			1
	Zentrum			2
	Versetzt			3
<b>06</b>	<b>Frontscheibe</b>			
	Tafelglas			1
<b>07</b>	<b>Skalenwert</b>			
	Standard			1
	Nicht Standard (kundenspezifisch)			2
<b>08</b>	<b>Berührungsschutz</b>			
	ohne Rückwandabdeckung			1
	mit Rückwandabdeckung			2



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SIRAX BM350  
Analog Meters with Moving-Coil Movement, Rectifier and 240° Scale

Description

The analog display measuring devices with moving coil measuring mechanism and rectifier SIRAX BM350 in a polycarbonate housing and 240° scale are intended for measuring AC currents or AC voltages.

The device measure average values and are calibrated to indicate RMS values, assuming a sinusoidal waveform for frequencies from 40...10000 Hz (AC current for frequency range of 40...1000 Hz and AC voltage for frequency range of 40...1000 Hz).

The moving-coil measuring mechanism consists of a core magnet system with spring-loaded point bearings spring-loaded and an upstream rectifier.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.



Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screws
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 240° scale
- Linear scale
- Easy replacement of the glass window, the front bezel and the scale

Technical Data

Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels											
Material of case	Polycarbonate											
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free											
Material of window	Glass											
Front frame (bezel)	Polycarbonate black											
Position of use	Vertical $\pm 5^{\circ}$											
Mounting	stackable next to each other											
Panel thickness	$\leq 25\text{mm}$											
Panel fixing	Swivel screws											
Weight	<table><tr><td>□48</td><td>□72</td><td>□96</td><td>□144</td></tr><tr><td>0.13kg</td><td>0.25kg</td><td>0.30kg</td><td>0.43kg</td></tr></table>	□48	□72	□96	□144	0.13kg	0.25kg	0.30kg	0.43kg			
□48	□72	□96	□144									
0.13kg	0.25kg	0.30kg	0.43kg									

Connections

Voltmeter or Ammeter  $<10\text{A}$  M4 screws and wire clamps form E3

Scaling

Pointer	Knife-edge pointer	
Pointer deflection	0 ... 240°	
Scale characteristics	Linear	
Scale division	Coarse-fine	
Scale length	<div><div></div>48</div>	<div><div></div>72</div>

Scale Interchangeable

Electrical Data

Measuring unit	AC Voltage and AC Current
Overload capacity	acc. to DIN EN 60 051
Continuously	120% $I_n$ , 120% $U_n$
Short time voltage measurement	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload
Short time current measurement	10 x for 0.5s: 9 overloads 10 x for 5s: 1 overload
External magnetic field	0.4 kA/m

Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value
Wave form	Sinusoidal, distortion factor $<5\%$
Frequency	45 ... 65 Hz
Other conditions	DIN EN 60 051-1

SIRAX BM350

Analog Meters with Moving-Coil Movement, Rectifier and 240° Scale

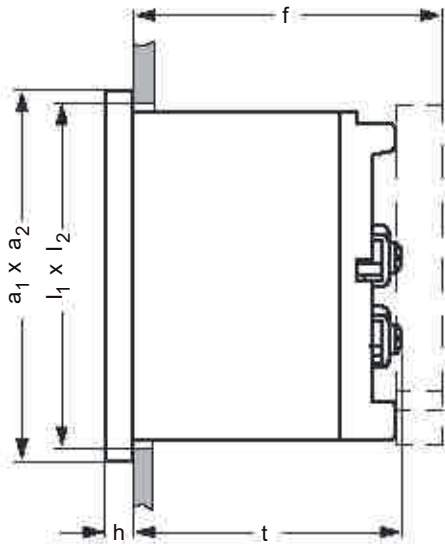
Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s² (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Maximal working voltage (phase-earth)	1000 V (for □72, □96, □144) 660 V (for □48)
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV (for □48, □72, □96, □144)
Insulation resistance	> 50 MΩ at 500 V DC

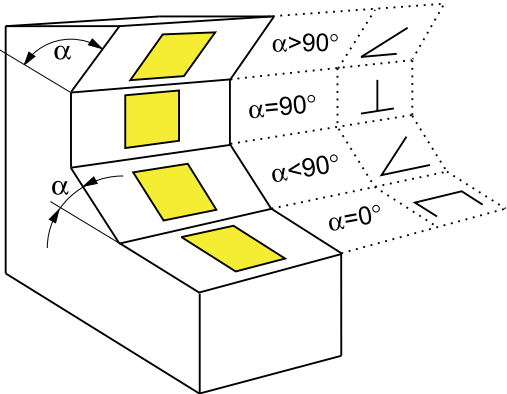
Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□48	48 x 48	5.5	45 <sup>+0.6</sup> x 45 <sup>+0.6</sup>	53	64
□72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	53	64
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	53	64
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	53	64

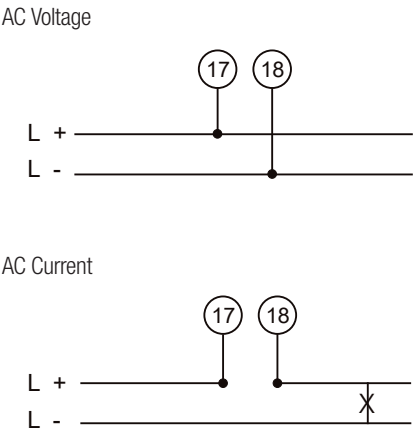
Working position

Code	Working position	Code	Working position	Code	Arbeitsposition
A	α = 0°	D	α = 45°	G	α = 90° vertical
B	α = 15°	E	α = 60°	H	α = 105°
C	α = 30°	F	α = 75°	I	α = 120°



Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

Electrical connections



# SIRAX BM350

## Analog Meters with Moving-Coil Movement, Rectifier and 240° Scale

### Measurement ranges

Type	□48 (48 x 48mm)	□72 (72 x 72mm)	□96 (96 x 96mm)	□144 (144 x 144mm)
Drop voltage ±10% or power consumption				
Measuring range	self-consumption			
AC Current				
100 mA	1.80 V	1.80 V	1.80 V	1.80 V
1 A	75 mV	75 mV	75 mV	75 mV
5 A	75 mV	75 mV	75 mV	75 mV
10 A	75 mV	75 mV	75 mV	75 mV
AC Voltage				
6 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
10 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
15 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
25 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
30 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
40 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
60 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
100 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
150 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
250 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
300 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
400 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
500 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V
600 V	900 Ω / V	900 Ω / V	900 Ω / V	900 Ω / V

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM350, Analog meters with moving-coil movement, rectifier and 240° Scale			BM350-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□48 (48 x 48 mm)			1
□72 (72 x 72 mm)			2
□96 (96 x 96 mm)			3
□144 (144 x 144 mm)			4
<b>02 Measuring input</b>			
AC Current	A		1
AC Voltage	B		2
<b>03 Measuring range</b>			
AC Current			
100 mA		B	01
1 A		B	02
5 A		B	03
10 A		B	04

# SIRAX BM350

## Analog Meters with Moving-Coil Movement, Rectifier and 240° Scale

Special range AC current			
0 ... >1A ... <10A		B	05
Connection to current transformer			
...A/1A		B	06
...A/5A		B	07
AC Voltage			
6 V		A	05
10 V		A	06
15 V		A	07
25 V		A	08
30 V		A	09
40 V		A	10
60 V		A	11
100 V		A	12
150 V		A	13
250 V		A	14
300 V		A	15
400 V		A	16
500 V		A	17
600 V		A	18
Special range AC voltage			
0 ... >6V ...<600V		A	22
Connection to voltage converter			
.../100V		A	23
.../110V		A	24
04	<b>Working position</b>		
	$\alpha = 0^\circ$		A
	$\alpha = 15^\circ$		B
	$\alpha = 30^\circ$		C
	$\alpha = 45^\circ$		D
	$\alpha = 60^\circ$		E
	$\alpha = 75^\circ$		F
	$\alpha = 90^\circ$ (vertical)		G
	$\alpha = 105^\circ$		H
	$\alpha = 120^\circ$		I
05	<b>Zero Position</b>		
	Left		1
	Centre		2
	Shifted		3

# SIRAX BM350

## Analog Meters with Moving-Coil Movement, Rectifier and 240° Scale

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<b>06</b>	<b>Front window</b> Glass			1
<b>07</b>	<b>Scalefactor</b> Standard			1
	Non Standard (Customized)			2
<b>08</b>	<b>Contact protection</b> without back cover			1
	with back cover			2



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## SIRAX BM400

### Analog Meters for clamping to 35mm DIN rails and 90° scale

#### Description

The analog meters SIRAX BM400 are designed for clamping to 35 mm DIN rails and have a mounting width of 45 mm. The meters are suitable for the measurement of current and voltage in distribution installations.

#### Functional Principle

- Moving-iron movements with shell-type system, silicon oil damping and spring loaded jewel bearings, pivot suspension.
- Moving-coil movement with core-type magnetic system, dual spring loaded jewel bearings, pivot suspension.

#### Features

- Robust thermoplastic housing with high flammability class UL94-V0
- Quick assembly to 35 mm DIN rail and easy connection using screws and clamps
- Near linear scale for AC current and AC voltage
- Linear scale for DC current and DC voltage

#### Technical Data

##### Mechanical Data

Case details	Projecting case clamping to 35mm mounting rail complying with DIN EN 50022
Material and color of case	Thermoplastic / Ivory
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Polycarbonate
Position of use	Vertical $\pm 5^\circ$
Terminals	Brass Hexagon studs, M4 screw and self lifting wire clamps E3
Dimensions	85mm x 45mm x 65mm (L x W x H)
Weight	0.1kg (applies to all options)

##### Scaling

Pointer	knife-edge pointer
Dial	white
Pointer deflection	0 ... 90°
Scale characteristics	near linear above 10% of nominal full-scale value for AC current or voltage Linear for DC current or voltage
Scale division	Coarse-fine
Scale length	38mm
Overload scaling	
Ammeter	2 times rated current
Voltmeters for use on voltage transformer	1.2 times rated voltage



#### Electrical Data

Measuring unit	AC current or AC voltage DC current or DC voltage
Power consumption	
Voltmeters	approx. 1.5 ... 3 VA
Ammeters	approx. 0.5 ... 1 VA
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated current/voltage (5s max.)
Short duration (5s max.)	
Voltmeters	2 times rated voltage max. 1000V
Ammeters	10 times rated current
Frequency	15 ... 400Hz (current) 15 ... 100Hz (voltage)
Stray magnetic field	0.5 mT

#### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ$ C
Position of use	Nominal position $\pm 1^\circ$
Input quantity	Rated value of measured quantity
Wave form	Sinusoidal, distortion factor <5%
Frequency	45 ... 65 Hz
Other conditions	DIN EN 60 051-1

#### Environmental conditions

Climatic suitability	Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)



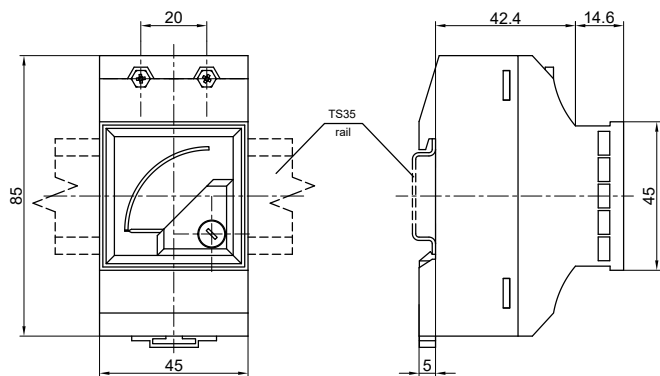
SIRAX BM400

Analog Meters for clamping to 35mm DIN rails and 90° scale

Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Protection class	I
Installation category	CATIII
Pollution degree	2
Operating voltage	600 V (for AC current/voltage) 300 V (for DC current/voltage)
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection

Dimensions



Measurement ranges

Dimensions [L x W x H]	85mm x 45mm x 65mm
Scale lenght [mm]	38
Weight [kg]	0.1
Measuring range current and voltage	
AC current <sup>1)</sup>	AC voltage
1 A	100 V
1.5 A	120 V
2.5 A	150 V
4 A	250 V
5 A	300 V
6 A	400 V
10 A <sup>3)</sup>	500 V
15 A <sup>3)</sup>	600 V
25 A <sup>3)</sup>	
For use on current transformer	For use on voltage transformer <sup>2)</sup>
.../1 A	.../100 V
.../5 A	.../110 V

DC current		DC voltage	
1 mA	60 mV	100 mV <sup>3)</sup>	1000 Ω/V
1.5 mA	60 mV	150 mV	1000 Ω/V
2.5 mA	60 mV	250 mV	1000 Ω/V
4 mA	60 mV	400 mV	1000 Ω/V
5 mA	60 mV	600 mV	1000 Ω/V
6 mA	60 mV	1 V	1000 Ω/V
10 mA	60 mV	1.5 V	1000 Ω/V
15 mA	60 mV	2.5 V	1000 Ω/V
20 mA	60 mV	4 V	1000 Ω/V
25 mA	60 mV	6 V	1000 Ω/V
40 mA	60 mV	10 V	1000 Ω/V
60 mA	60 mV	15 V	1000 Ω/V
100 mA	60 mV	25 V	1000 Ω/V
150 mA	60 mV	40 V	1000 Ω/V
250 mA	60 mV	60 V	1000 Ω/V
400 mA	60 mV	100 V	1000 Ω/V
600 mA	60 mV	150 V	1000 Ω/V
1 A <sup>3)</sup>	60 mV	250 V	1000 Ω/V
1.5 A <sup>3)</sup>	60 mV	400 V	1000 Ω/V
2.5 A <sup>3)</sup>	60 mV	500 V	1000 Ω/V
4 A <sup>3)</sup>	60 mV	600 V	1000 Ω/V
6 A <sup>3)</sup>	60 mV		
For use with external shunt			
		60 mV	1000 Ω/V
		100 mV	1000 Ω/V
		150 mV	1000 Ω/V
a total lead resistance of 0.05 Ω is considered in the calibration of the indicator for connecting leads 1 m, 2 x 0.75 mm <sup>2</sup>			

<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> the resistance values are limited to a tolerance of ±20%

# SIRAX BM400

## Analog Meters for clamping to 35mm DIN rails and 90° scale

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM400, Analog Meters for clamping to 35mm DIN rails and 90° scale			BM400-
Features, Selection			
<b>01 Measuring input</b>			
AC Current	A		1
DC Current	B		2
AC Voltage	C		3
DC Voltage	D		4
<b>02 Measuring range</b>			
AC or DC Current			
1 mA		A, C, D	01
1.5 mA		A, C, D	02
2.5 mA		A, C, D	03
4 mA		A, C, D	04
5 mA		A, C, D	05
6 mA		A, C, D	06
10 mA		A, C, D	07
15 mA		A, C, D	08
20 mA		A, C, D	09
25 mA		A, C, D	10
40 mA		A, C, D	11
60 mA		A, C, D	12
100 mA		A, C, D	13
150 mA		A, C, D	14
250 mA		A, C, D	15
400 mA		A, C, D	16
600 mA		A, C, D	17
Special range AC or DC current			
0 ... >1 mA ... <600 mA		A, C, D	18
1 A		C, D	19
1.5 A		C, D	20
2.5 A		C, D	21
4 A		C, D	22
5 A		C, D	23
6 A		C, D	24
10 A		C, D	25

# SIRAX BM400

## Analog Meters for clamping to 35mm DIN rails and 90° scale

12 A		C, D	26
15 A		C, D	27
Special range AC or DC current			
0 ... >1 A ... <15 A		C, D	28
AC Current for transformer			
.../1A		B, C, D	29
.../5A		B, C, D	30
AC or DC Voltage			
100 mV		A, B, D	31
150 mV		A, B, D	32
250 mV		A, B, D	33
400 mV		A, B, D	34
600 mV		A, B, D	35
Special range AC or DC voltage			
0 ... >100 mV ... <600 mV		A, B, D	36
1 V		A, B, D	37
1.5 V		A, B, D	38
2.5 V		A, B, D	39
4 V		A, B, D	40
6 V		A, B, D	41
10 V		A, B, D	42
15 V		A, B, D	43
25 V		A, B, D	44
40 V		A, B, D	45
60 V		A, B, D	46
100 V		A, B	47
120 V		A, B, D	48
150 V		A, B	49
250 V		A, B	50
300 V		A, B, D	51
400 V		A, B	52
500 V		A, B	53
600 V		A, B	54
Special range AC or DC voltage			
0 ... >1 V ... <600 V		A, B	55
AC Voltage for transformer			
.../100V		A, B, D	56
.../110V		A, B, D	57

**Analog Meters for clamping to 35mm DIN rails and 90° scale**

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03	<b>Scalefactor</b>			
	Standard (like scale division and measuring range)			1
	Non Standard (Customized)			2



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# SIRAX BM500

## Analog Bimetallic Ammeters with maximal Current Indicator

### Description

The analog bimetallic ammeters with maximal current indicator SIRAX BM500 in a polycarbonate housing and 90° scale are intended for thermal monitoring of transformers, cables and other electrical devices which have a slow reaction to current changes.

They indicate the mean rms current value during the measuring period of the meter over 8 min, 15 min or 20 min and deflects a resettable red slave pointer which shows the maximum value reached. These meters do not react to short current pulses essentially.

Bimetallic instruments have a specific inertia due to their thermal time lag making these instruments especially suitable to indicate maximum demands or control long-lasting peak loads.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.

### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 90° scale
- User accessible reset Knob
- Easy replacement of the glass window and the front bezel

### Technical Data

#### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 25\text{mm}$
Panel fixing	Swivel screw

#### Connections

Ammeter	M4 screws and wire clamps form E3
---------	-----------------------------------

#### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 90°



Scale division

Scale length

Coarse-fine

□72	□96
63mm	97mm

### Electrical Data

Measuring unit	AC Current
Frequency	40 ... 65 Hz
Thermal time delay	8, 15, 20, 30 minutes
Power consumption	
1 A rated current	<1.6 VA
5 A rated current	<2.5 VA
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated current
Short duration	10 x for 0.5 sec: 9 overloads 10 x for 5 sec: 1 overload)
External magnetic field	0.4 kA/m

### Reference conditions

Accuracy class	3% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value
Wave form	Sinusoidal, distortion factor <5%
Frequency	45 ... 65 Hz
Other conditions	DIN EN 60 051-1

### Environmental conditions

Climatic suitability	Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

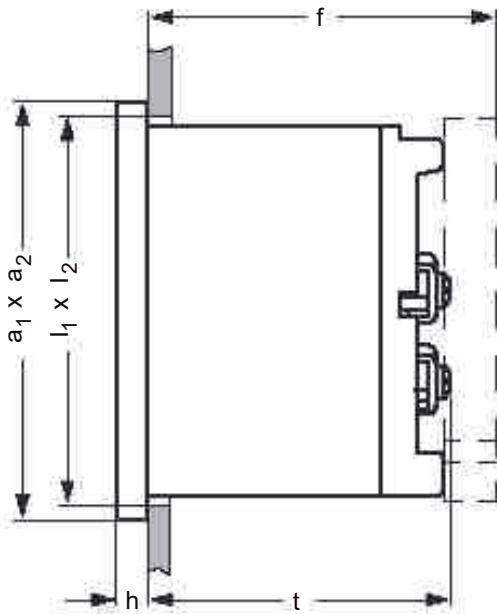
# SIRAX BM500

## Analog Bimetallic Ammeters with maximal Current Indicator

### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Dimensions

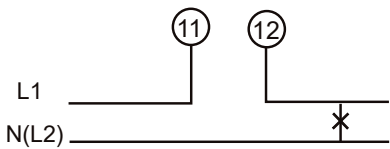


### Working position

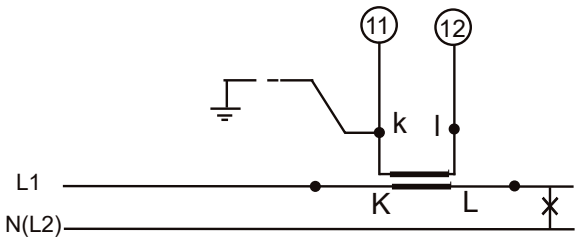
Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$

### Electrical connections

AC Current (directly connected)



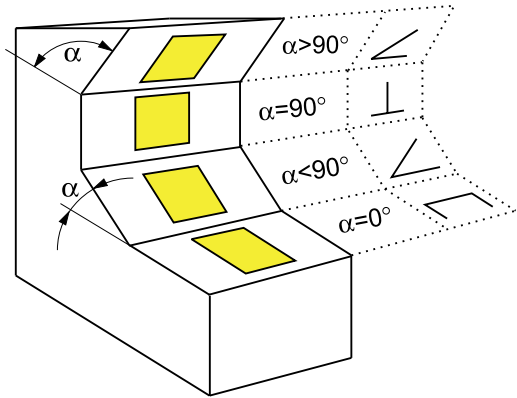
AC Current (for use on current transformer)



Front [mm]	Nominal Dimensions [mm]		Cutout [mm] $l_1 \times l_2$	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	$a_1 \times a_2$	h			
□72	72 x 72	5.5	$68^{+0.7} \times 68^{+0.7}$	54	62.5
□96	96 x 96	5.5	$92^{+0.8} \times 92^{+0.8}$	54	62.5

### Measurement ranges

Frontframe dimensions [mm]	72 x 72	96 x 96
Scale lenght [mm]	63	97
Weight [kg]	0.22	0.26
Type	□72	□96
Measuring range AC current	1 A	
	5 A	
Measuring range for transformer connection	.. x/1 A	
	.. x/5 A	



# SIRAX BM500

## Analog Bimetallic Ammeters with maximal Current Indicator

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM500, Analog Bimetallic Ammeters with maximal Current Indicator			BM500-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□72 (72 x 72 mm)			1
□96 (96 x 96 mm)			2
<b>02 Measuring range</b>			
AC Current			
1 A			01
5 A			02
Connection to current transformer			
1 A / 1 A			03
5 A / 1 A			04
6 A / 1 A			05
10 A / 1 A			06
15 A / 1 A			07
20 A / 1 A			08
30 A / 1 A			09
40 A / 1 A			10
50 A / 1 A			11
60 A / 1 A			12
80 A / 1 A			13
100 A / 1 A			14
150 A / 1 A			15
200 A / 1 A			16
300 A / 1 A			17
400 A / 1 A			18
500 A / 1 A			19
600 A / 1 A			20
800 A / 1 A			21
1000 A / 1 A			22
1200 A / 1 A			23
1500 A / 1 A			24
1600 A / 1 A			25
2000 A / 1 A			26
3000 A / 1 A			27
4000 A / 1 A			28
5000 A / 1 A			29
6000 A / 1 A			30
10000 A / 1 A			31
1 A / 5 A			32
5 A / 5 A			33
6 A / 5 A			34

# SIRAX BM500

## Analog Bimetallic Ammeters with maximal Current Indicator

10 A / 5 A			35
15 A / 5 A			36
20 A / 5 A			37
30 A / 5 A			38
40 A / 5 A			39
50 A / 5 A			40
60 A / 5 A			41
80 A / 5 A			42
100 A / 5 A			43
150 A / 5 A			44
200 A / 5 A			45
300 A / 5 A			46
400 A / 5 A			47
500 A / 5 A			48
600 A / 5 A			49
800 A / 5 A			50
1000 A / 5 A			51
1200 A / 5 A			52
1500 A / 5 A			53
1600 A / 5 A			54
2000 A / 5 A			55
3000 A / 5 A			56
4000 A / 5 A			57
5000 A / 5 A			58
6000 A / 5 A			59
10000 A / 5 A			60
Special range AC current 0 ... >1 A ... <10000 A			61
<b>03 Calibration delay time</b>			
8 min			1
15 min			2
20 min			3
30 min			4
<b>04 Working position</b>			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 35^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$ (vertical)			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I
<b>05 Front window</b>			
Glass			1



# SIRAX BM500

## Analog Bimetallic Ammeters with maximal Current Indicator

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06	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
07	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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## SIRAX BM550

### Combined Analog Bimetallic and Moving-Iron Ammeters with maximal Current Indicator

#### Description

The combined analog bimetallic and moving-iron ammeters with maximal current indicator SIRAX BM550 in a polycarbonate housing and 90° scale are intended for thermal monitoring of transformers, cables and other electrical devices which have a slow reaction to current changes.

They indicate the mean rms current value during the measuring period of the meter over 8 min, 15 min or 20 min and deflects a resettable red slave pointer which shows the maximum value reached. These meters do not react to short current pulses essentially.

The combined analog bimetallic and moving-iron instruments have a specific inertia due to their thermal time lag making these instruments especially suitable to indicate maximum demands or control long-lasting peak loads and there is additionally a moving-iron movement fitted in the opposite corner of the meter housing to get the instantaneous reading of the load current.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.

#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 90° scale
- User accessible reset Knob
- Easy replacement of the glass window and the front bezel

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 25\text{mm}$
Panel fixing	swivel screw

##### Connections

Ammeter	M4 screws and wire clamps form E3
---------	-----------------------------------

##### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 90°



Over Range  
Scale division  
Scale length

2 times  
Coarse-fine

<input type="checkbox"/> 72	<input type="checkbox"/> 96
52 / 61 mm	71 / 97 mm

#### Electrical Data

Measuring unit	AC Current
Frequency	40 ... 65 Hz
Thermal time delay	8, 15, 20, 30 minutes
Power consumption	
1 A rated current	<2.5 VA
5 A rated current	<3.4 VA
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated current
Short duration	10 x for 0.5 sec: 9 overloads 10 x for 5 sec: 1 overload)
External magnetic field	0.4 kA/m

#### Reference conditions

Accuracy class	3% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value
Wave form	Sinusoidal, distortion factor <5%
Frequency	45 ... 65 Hz
Other conditions	DIN EN 60 051-1

#### Environmental conditions

Climatic suitability	Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

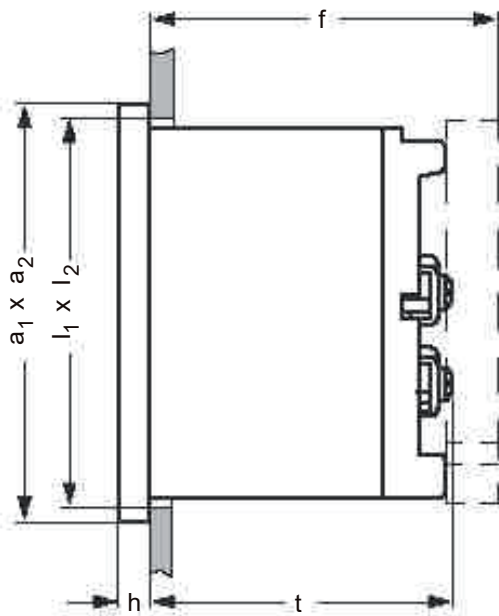
# SIRAX BM550

## Combined Analog Bimetallic and Moving-Iron Ammeters with maximal Current Indicator

### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	1000 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Dimensions

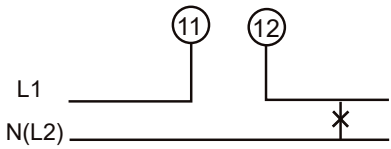


### Working position

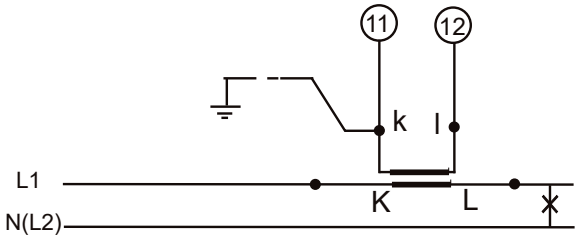
Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$

### Electrical connections

AC Current (directly connected)



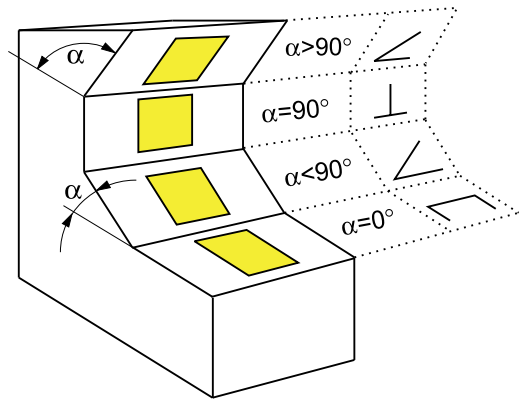
AC Current (for use on current transformer)



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	$a_1 \times a_2$	h			
□72	72 x 72	5.5	$68^{+0.7} \times 68^{+0.7}$	54	62.5
□96	96 x 96	5.5	$92^{+0.8} \times 92^{+0.8}$	54	62.5

### Measurement ranges

Frontframe dimensions [mm]	72 x 72	96 x 96
Scale length [mm]	52 / 61	71 / 97
Weight [kg]	0.26	0.30
Type	□72	□96
Measuring range AC current	1 A	
	5 A	
Measuring range for transformer connection	.. x/1 A	
	.. x/5 A	



# SIRAX BM550

## Combined Analog Bimetallic and Moving-Iron Ammeters with maximal Current Indicator

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM550, Analog Bimetallic and Moving-Iron Ammeters with maximal Current Indicator			BM550-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□72 (72 x 72 mm)			1
□96 (96 x 96 mm)			2
<b>02 Measuring range</b>			
1 A			01
5 A			02
Connection to current transformer			
1 A / 1 A			03
5 A / 1 A			04
6 A / 1 A			05
10 A / 1 A			06
15 A / 1 A			07
20 A / 1 A			08
30 A / 1 A			09
40 A / 1 A			10
50 A / 1 A			11
60 A / 1 A			12
80 A / 1 A			13
100 A / 1 A			14
150 A / 1 A			15
200 A / 1 A			16
300 A / 1 A			17
400 A / 1 A			18
500 A / 1 A			19
600 A / 1 A			20
800 A / 1 A			21
1000 A / 1 A			22
1200 A / 1 A			23
1500 A / 1 A			24
1600 A / 1 A			25
2000 A / 1 A			26
3000 A / 1 A			27
4000 A / 1 A			28
5000 A / 1 A			29

# SIRAX BM550

## Combined Analog Bimetallic and Moving-Iron Ammeters with maximal Current Indicator

6000 A / 1 A			30
10000 A / 1 A			31
1 A / 5 A			32
5 A / 5 A			33
6 A / 5 A			34
10 A / 5 A			35
15 A / 5 A			36
20 A / 5 A			37
30 A / 5 A			38
40 A / 5 A			39
50 A / 5 A			40
60 A / 5 A			41
80 A / 5 A			42
100 A / 5 A			43
150 A / 5 A			44
200 A / 5 A			45
300 A / 5 A			46
400 A / 5 A			47
500 A / 5 A			48
600 A / 5 A			49
800 A / 5 A			50
1000 A / 5 A			51
1200 A / 5 A			52
1500 A / 5 A			53
1600 A / 5 A			54
2000 A / 5 A			55
3000 A / 5 A			56
4000 A / 5 A			57
5000 A / 5 A			58
6000 A / 5 A			59
10000 A / 5 A			60
Special range AC current 0 ... >1 A ... <10000 A			61
<b>03 Calibration delay time</b>			
8 min			1
15 min			2
20 min			3
30 min			4

# SIRAX BM550

## Combined Analog Bimetallic and Moving-Iron Ammeters with maximal Current Indicator

<b>04</b>	<b>Working position</b>			
	$\alpha = 0^\circ$			A
	$\alpha = 15^\circ$			B
	$\alpha = 35^\circ$			C
	$\alpha = 45^\circ$			D
	$\alpha = 60^\circ$			E
	$\alpha = 75^\circ$			F
	$\alpha = 90^\circ$ (vertical)			G
	$\alpha = 105^\circ$			H
	$\alpha = 120^\circ$			I
	$\alpha = 165^\circ$			J
	$\alpha = 180^\circ$			K
<b>05</b>	<b>Front window</b>			
	Glass			1
<b>06</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
<b>07</b>	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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## SIRAX BM600

### Analog Panel Pointer Frequency meter with 90° Scale

#### Description

The analog panel pointer frequency meter SIRAX BM600 in a polycarbonate housing and 90° scale are intended for measuring of frequencies in the range of 45...450 Hz.

For maximum accuracy, the essential measuring range is obtained by suppressing the unwanted frequency span.

Frequencies are measured with a built in electronic transducer & moving coil indicator. Moving coil movement has pivots of very high hardness. Movement is suspended between spring loaded sapphire jewels. Movement is properly shielded & critically damped by eddy currents induced in coil former.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.



#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 90° linear scale
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels				
Material of case	Polycarbonate				
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free				
Material of window	Glass				
Front frame (bezel)	Polycarbonate black				
Position of use	Vertical $\pm 5^\circ$				
Mounting	stackable next to each other				
Panel thickness	$\leq 25\text{mm}$				
Panel fixing	Swivel screw				
Weight	<table border="1"> <tr> <td>□72</td><td>□96</td></tr> <tr> <td>0.21kg</td><td>0.28kg</td></tr> </table>	□72	□96	0.21kg	0.28kg
□72	□96				
0.21kg	0.28kg				

Connections/terminals M4 screws and wire clamps form E3

##### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 90°
Scale characteristics	Linear
Scale division	Coarse-fine

Scale length

□72	□96
63mm	97mm

#### Electrical Data

Measuring unit	Frequency
Input quantity	Alternating voltage in sine waveform
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated voltage
Short time voltage measurement	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload
External magnetic field	0.4 kA/m
Permissible voltage fluctuation	$\pm 15\%$
Power consumption	$\leq 7\text{ VA}$

#### Reference conditions

Accuracy class	0.5% acc. to DIN EN 60 051
Reference temperature	$23^\circ\text{C} \pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value
Preheating time	$\geq 3\text{ min}$
Other conditions	DIN EN 60 051-1

#### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	$-10 \dots +55^\circ\text{C}$
Storage temperature	$-25 \dots +65^\circ\text{C}$
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	$150\text{ m/s}^2 (15\text{g}) / 11\text{ ms}$
Vibration	$10 \dots 55 \dots 10\text{ Hz}$ , 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

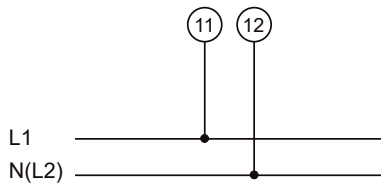
# SIRAX BM600

## Analog Panel Pointer Frequency meter with 90° Scale

### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

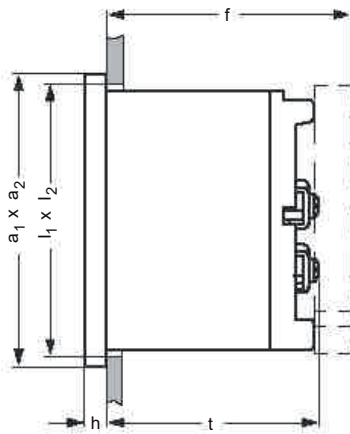
### Electrical connections



### Measurement ranges

Dimensions frontframe [mm]	72 x 72	96 x 96
Scale length [mm]	63	97
Weight [kg]	0.21	0.28
Type	□72	□96
Frequency range	45...50...55 Hz 45...55...65 Hz 45...60...65 Hz 360...400...440 Hz 380...400...420 Hz	
Rated input voltage	57.7 V 63.5 V 100 V 110 V 115 V 120 V 127 V 208 V 220 V 230 V 240 V 289 V 380 V 400 V 415 V 440 V 500 V	

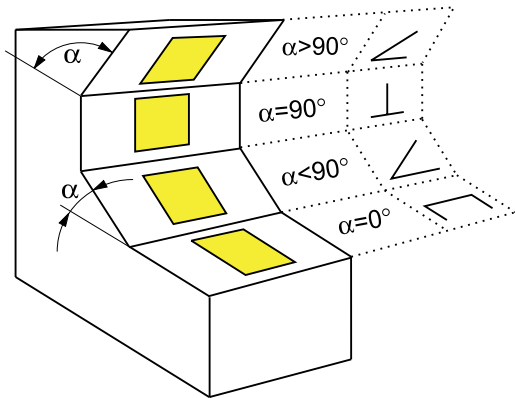
### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	$a_1 \times a_2$	$h$			
□72	72 x 72	5.5	$68^{+0.7} \times 68^{+0.7}$	54	62.5
□96	96 x 96	5.5	$92^{+0.8} \times 92^{+0.8}$	54	62.5

### Working position

Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$





# SIRAX BM600

## Analog Panel Pointer Frequency meter with 90° Scale

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM600, Analog Panel Pointer Frequency meter with 90° Scale			BM600-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□72 (72 x 72 mm)			1
□96 (96 x 96 mm)			2
<b>02 Frequency range</b>			
45 ... 50 ... 55 Hz			01
45 ... 55 ... 65 Hz			02
45 ... 60 ... 65 Hz			03
360 ... 400 ... 440 Hz			04
380 ... 400 ... 420 Hz)			05
<b>03 Rated voltage</b>			
57.7 V			01
63.5 V			02
100 V			03
110 V			04
115 V			05
120 V			06
127 V			07
208 V			08
220 V			09
230 V			10
240 V			11
289 V			12
380 V			13
400 V			14
415 V			15
440 V			16
500 V			17
<b>04 Working position</b>			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 30^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$ (vertical)			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I

# SIRAX BM600

## Analog Panel Pointer Frequency meter with 90° Scale

<b>05</b>	<b>Front window</b> Glass			1
<b>06</b>	<b>Scalefactor</b> Standard			1
	Non Standard (Customized)			2
<b>07</b>	<b>Contact protection</b> without back cover			1
	with back cover			2



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## SIRAX BM650

### Analog Panel Pointer Frequency meter with 240° Scale

#### Description

The analog panel pointer frequency meter SIRAX BM650 in a polycarbonate housing and 240° scale are intended for measuring of frequencies in the range of 45...450 Hz.

For maximum accuracy, the essential measuring range is obtained by suppressing the unwanted frequency span.

Frequencies are measured with a built in electronic transducer & moving coil indicator. Moving coil movement has pivots of very high hardness. Movement is suspended between spring loaded sapphire jewels. Movement is properly shielded & critically damped by eddy currents induced in coil former.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.



#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- 240° linear scale
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels				
Material of case	Polycarbonate				
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free				
Material of window	Glass				
Front frame (bezel)	Polycarbonate black				
Position of use	Vertical $\pm 5^\circ$				
Mounting	stackable next to each other				
Panel thickness	$\leq 25\text{mm}$				
Panel fixing	Swivel screw				
Weight	<table border="1"> <tr> <td>□96</td><td>□144</td></tr> <tr> <td>0.28kg</td><td>0.49kg</td></tr> </table>	□96	□144	0.28kg	0.49kg
□96	□144				
0.28kg	0.49kg				

Connections/terminals M4 screws and wire clamps form E3

##### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 240°
Scale characteristics	Linear
Scale division	Coarse-fine

Scale length

□96	□144
142mm	230mm

#### Electrical Data

Measuring unit	Frequency
Input quantity	Alternating voltage in sine waveform
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated voltage
Short time voltage measurement	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload
External magnetic field	0.4 kA/m
Permissible voltage fluctuation	$\pm 15\%$
Power consumption	$\leq 7\text{ VA}$

#### Reference conditions

Accuracy class	0.5% acc. to DIN EN 60 051
Reference temperature	$23^\circ\text{C} \pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input variable	Rated measuring value
Preheating time	$\geq 5\text{ min}$
Other conditions	DIN EN 60 051-1

#### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	$-10 \dots +55^\circ\text{C}$
Storage temperature	$-25 \dots +65^\circ\text{C}$
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	$150\text{ m/s}^2$ (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

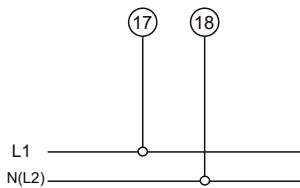
# SIRAX BM650

## Analog Panel Pointer Frequency meter with 240° Scale

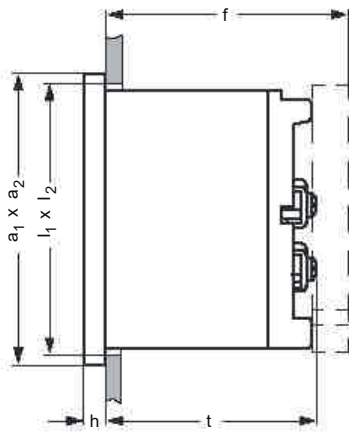
### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Electrical connections



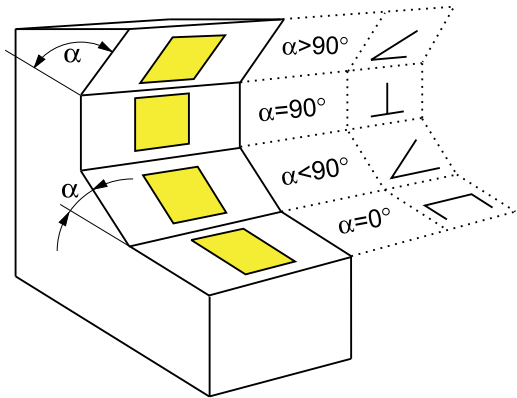
### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	53	64
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	53	64

### Working position

Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$



# SIRAX BM650

## Analog Panel Pointer Frequency meter with 240° Scale

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM650, Analog Panel Pointer Frequency meter with 240° Scala			BM650-
Features, Selection			
<b>01. Dimensions Frontframe</b>			
□96 (96 x 96 mm)			1
□144 (144 x 144 mm)			2
<b>02 Frequency range</b>			
45...50...55 Hz			01
45...55...65 Hz			02
45...60...65 Hz			03
360...400...440 Hz			04
380...400...420 Hz)			05
<b>03 Rated voltage</b>			
57.7 V			01
63.5 V			02
100 V			03
110 V			04
115 V			05
120 V			06
127 V			07
208 V			08
220 V			09
230 V			10
240 V			11
289 V			12
380 V			13
400 V			14
415 V			15
440 V			16
500 V			17
<b>04. Working position</b>			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 30^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$ (vertical)			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I

# SIRAX BM650

## Analog Panel Pointer Frequency meter with 240° Scale

<b>05. Front window</b>			
Glass			1
<b>06 Scalefactor</b>			
Standard			1
Non Standard (Customized)			2
<b>07 Contact protection</b>			
without back cover			1
with back cover			2



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# SIRAX BM700

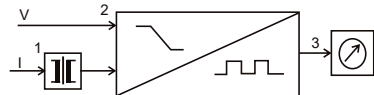
## Analog Power Factor meter with 90° Scale

### Description

The analog panel power factor meter SIRAX BM700 in a polycarbonate housing and 90° scale are intended for measuring of the phase angle between the voltage and current in single-phase or 3-phase AC power networks.

These meters are calibrated to correspond to the cosine of the angle, i.e. the power factor.

The measuring system comprises a moving coil indicator & phase angle converter attached to the case of indicating instrument. Moving coil movements has pivots of very high hardness. Movement is suspended between spring loaded sapphire jewels. Movement is properly shielded & critically damped by eddy currents induced in coil former.



A current transformer 1 of the phase angle converter provides input current to the electronic circuit. Both the input voltage and the current are passed to a bistable flip-flop stage 2.

The pulse duty cycle of flip-flop is proportional to the phase angle  $\phi$ . A low pass filter allows the mean value which is proportional to the phase angle and is fed to the moving coil movement 3.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.

### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- Easy replacement of the glass window, the front bezel and the scale

### Technical Data

#### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 25\text{mm}$



Panel fixing  
Connections/terminals

Swivel screw  
M4 screws and wire clamps form E3

#### Scaling

Pointer  
Pointer deflection  
Scale characteristics  
Scale division  
Scale length

knife-edge pointer  
0 ... 90°  
Non-Linear  
Coarse-fine

□72	□96
61 mm	97 mm

#### Electrical Data

Measuring unit	Power factor
Frequency	49 ... 51 Hz for single phase 45 ... 65 Hz for 3 phase
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated voltage / current
Short time duration current	10 x for 0.5s: 9 overloads 10 x for 5s: 1 overload
Short time duration voltage	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload
External magnetic field	0.4 kA/m
Permissible voltage fluctuation	$\pm 15\%$
Permissible current fluctuation	20 ... 120 %
Power consumption voltage	$\leq 3.0\text{ VA}$
Power consumption current	$\leq 1.0\text{ VA}$

# SIRAX BM700

## Analog Power Factor meter with 90° Scale

### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / ± 2 °C
Position of use	Nominal position ±1°
Waveform	Sinewave
Current	95 ... 100 % rated current
Voltage	+ 2 % rated voltage
Preheating time	≥ 5 min at min 80% of rated current and 100% of rated voltage
Frequency	50 Hz ±0.1 %
Distortion factor	< 1 %
Other conditions	DIN EN 60 051-1

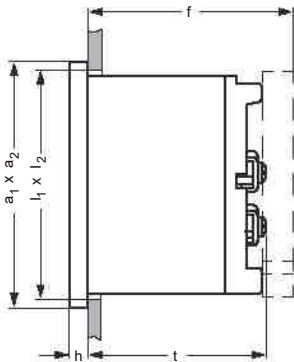
### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

### Safety

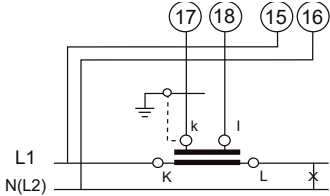
EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Dimensions

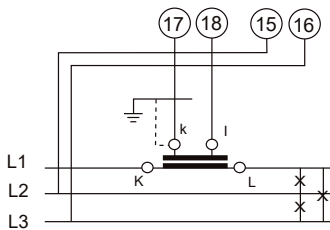


### Electrical connections

Single phase



3 phase balanced load



### Measurement ranges

Dimensions frontframe [mm]	72 x 72	96 x 96
Scale length [mm]	61	97
Type	□72	□96
System type	Single phase system 3 phase system balanced loadb	
Measuring ranges	COSφ cap 0.5...1...0.5 ind COSφ cap 0.8...1...0.3 ind COSφ cap 0.8...1...0.8 ind	
Rated voltages	57.7 V 63.5 V 100 V 110 V 115 V 120 V 127 V 220 V	230 V 240 V 289 V 380 V 400 V 415 V 440 V 500 V
Rated currents	1 A 5 A	

Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h			
□72	72 x 72	5.5	68 <sup>+0.8</sup> x 68 <sup>+0.8</sup>	82.5	--
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	53	62.5

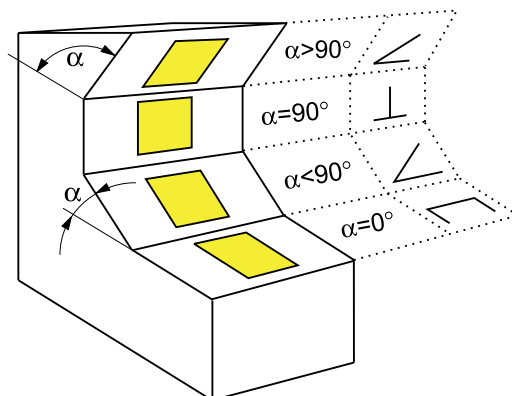


# SIRAX BM700

## Analog Power Factor meter with 90° Scale

### Working position

Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$



### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM700, Analog Power factor meter with 90° Scala			BM700-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□72 (72 x 72 mm)			1
□96 (96 x 96 mm)			2
<b>02 System type</b>			
Single phase system			1
3 phase system balanced load			2
<b>03 Measuring ranges</b>			
COSφ cap 0.5...1...0.5 ind			1
COSφ cap 0.8...1...0.3 ind			2
COSφ cap 0.8...1...0.8 ind			3
<b>04 Rated voltage</b>			
57.7 V			01
63.5 V			02
100 V			03
110 V			04
110 V			05
127 V			06
220 V			07
230 V			08
240 V			09
289 V			10
380 V			11
415 V			12
440 V			13
500 V			14

# SIRAX BM700

## Analog Power Factor meter with 90° Scale

<b>05</b>	<b>Rated voltage</b>			
	1 A			1
	5 A			2
<b>06</b>	<b>Working position</b>			
	$\alpha = 0^\circ$			A
	$\alpha = 15^\circ$			B
	$\alpha = 30^\circ$			C
	$\alpha = 45^\circ$			D
	$\alpha = 60^\circ$			E
	$\alpha = 75^\circ$			F
	$\alpha = 90^\circ$ (vertical)			G
	$\alpha = 105^\circ$			H
	$\alpha = 120^\circ$			I
<b>07</b>	<b>Front window</b>			
	Glass			1
<b>08</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
<b>09</b>	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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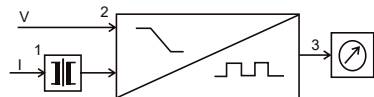
SIRAX BM750  
Analog Power Factor meter with 240° Scale

Description

The analog panel power factor meter SIRAX BM750 in a polycarbonate housing and 240° scale are intended for measuring of the phase angle between the voltage and current in single-phase or 3-phase AC power networks.

These meters are calibrated to correspond to the cosine of the angle, i.e. the power factor.

The measuring system comprises a moving coil indicator & phase angle converter attached to the case of indicating instrument. Moving coil movements has pivots of very high hardness. Movement is suspended between spring loaded sapphire jewels. Movement is properly shielded & critically damped by eddy currents induced in coil former.



A current transformer 1 of the phase angle converter provides input current to the electronic circuit. Both the input voltage and the current are passed to a bistable flip-flop stage 2.

The pulse duty cycle of flip-flop is proportional to the phase angle  $\phi$ . A low pass filter allows the mean value which is proportional to the phase angle and is fed to the moving coil movement 3.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.

Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- Easy replacement of the glass window, the front bezel and the scale

Technical Data

Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 25\text{mm}$



Panel fixing  
Weight

Swivel screw

□96	□144
0.28kg	0.49kg

Connections/terminals

M4 screws and wire clamps form E3

Scaling

Pointer  
Pointer deflection  
Scale characteristics  
Scale division  
Scale length

knife-edge pointer  
0 ... 240°  
Non-Linear  
Coarse-fine

□96	□144
142mm	230mm

Electrical Data

Measuring unit  
Frequency  
  
Overload capacity  
Continuously  
Short time duration  
  
External magnetic field  
Permissible voltage fluctuation  
Permissible current fluctuation  
Power consumption voltage  
Power consumption current

Power factor  
49 ... 51 Hz for single phase  
45 ... 65 Hz for 3 phase  
acc. to DIN EN 60 051  
1.2 times rated voltage / current  
2 x for 0.5s: 9 overloads  
2 x for 5s: 1 overload  
0.4 kA/m  
 $\pm 15\%$   
20 ... 120 %  
 $\leq 3.5\text{ VA}$   
 $\leq 1.0\text{ VA}$

# SIRAX BM750

## Analog Power Factor meter with 240° Scale

### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / ± 2 °C
Position of use	Nominal position ±1°
Waveform	Sinewave
Current	95 ... 100 % rated current
Voltage	+ 2 % rated voltage
Preheating time	≥ 5 min at min 80% of rated current and 100% of rated voltage
Frequency	50 Hz ±0.1 %
Distortion factor	< 1 %
Other conditions	DIN EN 60 051-1

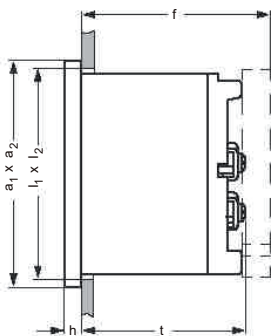
### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperatur	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

### Safety

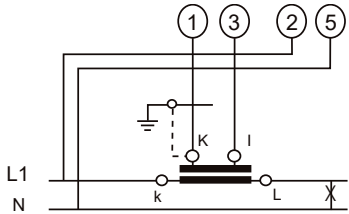
EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

### Dimensions

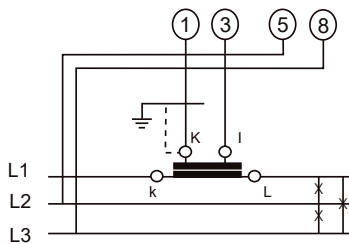


### Electrical connections

Single phase



3 phase balanced load



### Measurement ranges

Dimensions frontframe [mm]	96 x 96	144 x 144
Scale lenght [mm]	142	230
Weight [kg]	0.28	0.49
Type	□96	□144
System type	Single phase system 3 phase system balanced loadb	
Measuring ranges	COSφ cap 0.5...1...0.5 ind COSφ cap 0.8...1...0.3 ind COSφ cap 0.8...1...0.8 ind	
Rated voltages	single phase: 57.7 V 63.5 V 100 V 110 V 115 V 120 V 127 V 220 V 230 V 240 V 289 V	3 phase: 100 V 110 V 220 V 380 V 400 V 415 V 440 V 500 V
Rated currents	1 A 5 A	

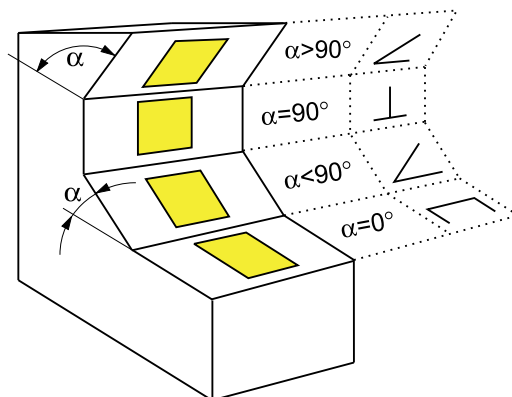
Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h			
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	53	64
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	53	64

# SIRAX BM750

## Analog Power Factor meter with 240° Scale

### Working position

Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$



### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM750, Analog Power factor meter with 240° Scala			BM750-
<b>Features, Selection</b>			
<b>01 Dimensions Frontframe</b>			
□96 (96 x 96 mm)			1
□144 (144 x 144 mm)			2
<b>02 System type</b>			
Single phase system	A		1
3 phase system balanced load	B		2
<b>03 Measuring ranges</b>			
COSφ cap 0.5...1...0.5 ind			1
COSφ cap 0.8...1...0.3 ind			2
COSφ cap 0.8...1...0.8 ind			3
<b>04 Rated voltage</b>			
57.7 V		B	01
63.5 V		B	02
100 V			03
110 V			04
127 V		B	05
220 V			06
230 V		B	07
240 V		B	08
289 V		B	09
380 V		A	10
415 V		A	11
440 V		A	12
500 V		A	13

# SIRAX BM750

## Analog Power Factor meter with 240° Scale

05	<b>Rated voltage</b>			
	1 A			1
	5 A			2
06	<b>Working position</b>			
	$\alpha = 0^\circ$			A
	$\alpha = 15^\circ$			B
	$\alpha = 30^\circ$			C
	$\alpha = 45^\circ$			D
	$\alpha = 60^\circ$			E
	$\alpha = 75^\circ$			F
	$\alpha = 90^\circ$			G
	$\alpha = 105^\circ$			H
	$\alpha = 120^\circ$			I
07	<b>Front window</b>			
	Glass			1
08	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
09	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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## SIRAX BM800

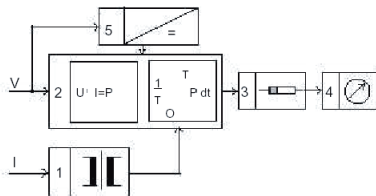
### Analog Power meter with 90° Scale

#### Description

The analog power meters SIRAX BM800 in polycarbonate housing and 90° scale are used to measure active or reactive power in single-phase or three-phase AC networks.

The devices can differentiate between energy output and energy consumption, as well as inductive and capacitive reactive power and are suitable for both sinusoidal and non-sinusoidal currents.

They consist of a moving-coil measuring mechanism with a core magnet system with pointed bearings spring-loaded on both sides and a measuring attachment.



The power converter uses one, two or three multiplier systems 2 depending on the measurement of balanced or unbalanced load AC systems. Current transformers 1 adapt the input current to the multiplier electronics. The multipliers form the product of the instantaneous values of current and voltage (TDM principle). Subsequently, the product resultant is integrated, thereby suppressing the AC ripple. A DC voltage output signal is fed to the moving-coil movement 3. Power supply is obtained from voltage input in block 4.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.

#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other



Panel thickness	≤25mm
Panel fixing	Swivel screw
Connections/terminals	M4 screws and wire clamps form E3

##### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 90°
Scale characteristics	Non-Linear
Scale division	Coarse-fine
Scale length	97 mm

##### Electrical Data

Measuring unit	Active and reactive power
Response time	4 s max.
Active power factor	$\cos \phi$ 1 ... 0.5 ind
Reactive power factor	$\sin \phi$ 1 ... 0.5 ind
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated voltage / current
Short time duration current	10 x for 5s
Short time duration voltage	2 x for 5s
External magnetic field	0.4 kA/m
Permissible voltage fluctuation	$\pm 15\%$
Permissible current fluctuation	20 ... 120 %
Power consumption current	≤ 0.2 VA
Power consumption voltage	
Network system A, B, C, G, H	≤ 3.0 VA
Network system F	≤ 3.5 VA
Network system D, I	≤ 3.4 VA
Network system E, J	≤ 4.3 VA

##### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C $\pm$ 2 °C
Position of use	Nominal position $\pm 1^\circ$

# SIRAX BM800

## Analog Power meter with 90° Scale

Input	full-scale power value $P_N$
Calibration factor	$\lambda = P_N / P_s$
Power factor	$\cos\varphi = 1 \pm 0.01$ for Watt meters $\sin\varphi = 1 \pm 0.01$ for Var meters
Current	20 ... 120 % rated current
Voltage	+ 2 % rated voltage
Preheating time	$\geq 5$ min at min 80% of rated current and 100% of rated voltage
Frequency	45 ... 65 Hz (50 Hz $\pm 0.1$ % for Type F)
Distortion factor	< 1 %
Other conditions	DIN EN 60 051-1 Electrical and mechanical zero point in the meter are not necessarily identical. Zero adjustment should be done only when voltage is applied and current circuit not energised.

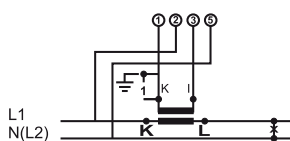
### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

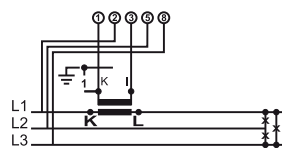
### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

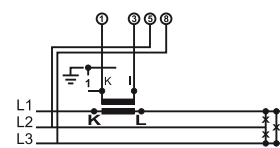
### Electrical connections



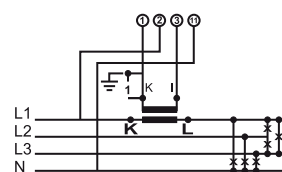
Active and reactive power  
singlephase Network



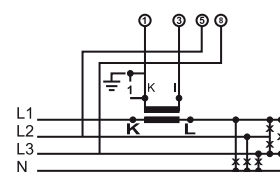
Active power, 3-phase, 3-wire Network  
balanced load



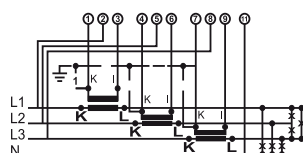
Reactive power, 3-phase, 3-wire Network  
balanced load



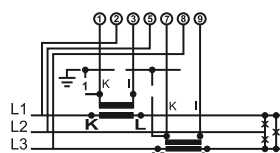
Active power, 3-phase, 4-wire Network  
balanced load



Reactive power, 3-phase, 4-wire Network  
balanced load



Active and reactive power  
3-phase, 4-wire Network  
unbalanced load



Active and reactive power  
3-phase, 3-wire Network  
unbalanced load

### Measurement ranges

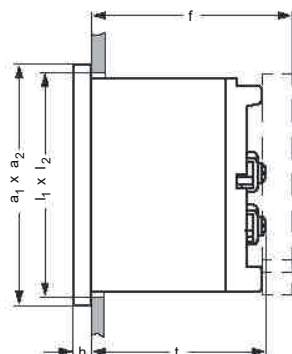
Dimensions frontframe [mm]	96 x 96	
Scale length [mm]	97	
Type	□96	
Network System type	Singlephase-System, active power Singlephase-System, reactive power 3-phase 3-wire, active power, balanced load 3-phase 3-wire, reactive power, balanced load 3-phase 3-wire, active power, unbalanced load 3-phase 3-wire, reactive power, unbalanced load 3-phase 4-wire, active power, balanced load 3-phase 4-wire, reactive power, balanced load 3-phase 4-wire, active power, unbalanced load 3-phase 4-wire, reactive power, unbalanced load	
Rated voltage	57.7 V 63.5 V 100 V 110 V 115 V 120 V 127 V 220 V	230 V 240 V 289 V 380 V 400 V 415 V 440 V 500 V
Rated current	x A / 1 A x A / 5 A	



# SIRAX BM800

## Analog Power meter with 90° Scale

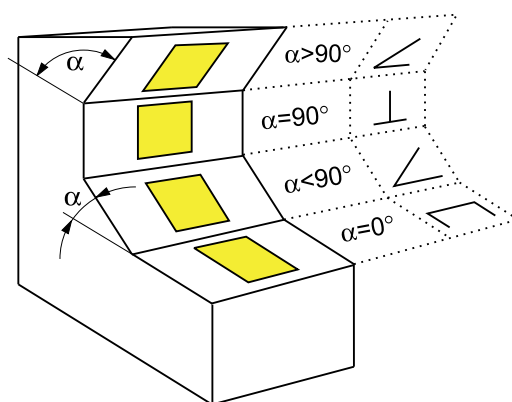
### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	106	111.5

### Working position

Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$



### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM800, Analog power meter with 90° Scale			BM800-
Features, Selection			
<b>01 Dimensions Frontframe</b> □96 (96 x 96 mm)			1
<b>02 Network system</b> Singlephase system, active power			A
3-phase 3-wire system, active power, balanced load			B
3-phase 3-wire system, active power, unbalanced load			C
3-phase 4-wire system, active power, balanced load			D
3-phase 4-wire system, active power, unbalanced load			E
Singlephase system, reactive power			F
3-phase 3-wire System, reactive power, balanced load			G
3-phase 3-wire System, reactive power, unbalanced load			H
3-phase 4-wire System, reactive power, balanced load			I
3-phase 4-wire System, reactive power, unbalanced load			J
<b>03 Measuring ranges</b> Specify while ordering			X

# SIRAX BM800

## Analog Power meter with 90° Scale

04	Input ranges			
	Rated voltage			
	57.7 V			01
	63.5 V			02
	100 V			03
	110 V			04
	127 V			05
	220 V			06
	230 V			07
	289 V			08
	380 V			09
	415 V			10
	440 V			11
	500 V			12
	Rated current			
	5A/5A			13
	10A/5A			14
	15A/5A			15
	20A/5A			16
	30A/5A			17
	50A/5A			18
	75A/5A			19
	100A/5A			20
	150A/5A			21
	200A/5A			22
	300A/5A			23
	400A/5A			24
	600A/5A			25
	800A/5A			26
	1000A/5A			27
	1200A/5A			28
	1500A/5A			29
	1600A/5A			30
	2000A/5A			31
	3000A/5A			32
	4000A/5A			33
	6000A/5A			34
	10000A/5A			35
	20000A/5A			36

# SIRAX BM800

## Analog Power meter with 90° Scale

Special range rated current			
5 A ...<200000 A / 5A			61
5A/1A			37
10A/1A			38
15A/1A			39
20A/1A			40
30A/1A			41
50A/1A			42
75A/1A			43
100A/1A			44
150A/1A			45
200A/1A			46
300A/1A			47
400A/1A			48
600A/1A			49
800A/1A			50
1000A/1A			51
1200A/1A			52
1500A/1A			53
1600A/1A			54
2000A/1A			55
3000A/1A			56
4000A/1A			57
6000A/1A			58
10000A/1A			59
20000A/1A			60
Special range rated current			
5 A ...<200000 A / 1A			62
<b>05</b>	<b>Working position</b>		
	$\alpha = 0^\circ$		A
	$\alpha = 15^\circ$		B
	$\alpha = 30^\circ$		C
	$\alpha = 45^\circ$		D
	$\alpha = 60^\circ$		E
	$\alpha = 75^\circ$		F
	$\alpha = 90^\circ$ (vertical)		G
	$\alpha = 105^\circ$		H
	$\alpha = 120^\circ$		I

# SIRAX BM800

## Analog Power meter with 90° Scale

<b>06</b>	<b>Zero Position</b>			
	Left			1
	Centre			2
	Shifted			3
<b>07</b>	<b>Front window</b>			
	Glass			1
<b>08</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
<b>09</b>	<b>Contact protection</b>			
	without back cover			1
	with back cover			2



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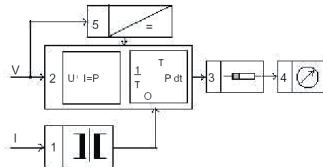
# SIRAX BM850

## Analog Power meter with 240° Scale

### Description

The analog power meters SIRAX BM850 in plastic housing and 240° scale are used to measure active or reactive power in single-phase or three-phase AC networks. The devices can differentiate between energy output and energy consumption, as well as inductive and capacitive reactive power and are suitable for both sinusoidal and non-sinusoidal currents.

They consist of a moving-coil measuring mechanism with a core magnet system with pointed bearings spring-loaded on both sides and a measuring attachment.



The power converter uses one, two or three multiplier systems 2 depending on the measurement of balanced or unbalanced load AC systems. Current transformers 1 adapt the input current to the multiplier electronics. The multipliers form the product of the instantaneous values of current and voltage (TDM principle). Subsequently, the product resultant is integrated, thereby suppressing the AC ripple. A DC voltage output signal is fed to the moving-coil movement 3. Power supply is obtained from voltage input in block 4.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm. The bezel, the glass window and the dial can be easily exchanged on site.

### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using spring clips
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- Easy replacement of the glass window, the front bezel and the scale

### Technical Data

#### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 25\text{mm}$
Panel fixing	Spring clamps
Connections/terminals	M4 screws and wire clamps form E3



### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 240°
Scale characteristics	Non-Linear
Scale division	Coarse-fine
Scale length	142 mm

### Electrical Data

Measuring unit	Active and reactive power
Response time	4 s
Active power factor	$\cos\phi$ 1 ... 0.5 ind
Reactive power factor	$\sin\phi$ 1 ... 0.5 ind
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated voltage / current
Short time duration current	10 x for 5s
Short time duration voltage	2 x for 5s
External magnetic field	0.4 kA/m
Permissible voltage fluctuation	$\pm 15\%$
Permissible current fluctuation	20 ... 120 %
Power consumption current	$\leq 0.2\text{ VA}$
Power consumption voltage	
Network system A, B, C, G, H	$\leq 3.0\text{ VA}$
Network system F	$\leq 3.5\text{ VA}$
Network system D, I	$\leq 3.4\text{ VA}$
Network system E, J	$\leq 4.3\text{ VA}$

### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C $\pm$ 2 °C
Position of use	Nominal position $\pm 1^\circ$
Input	full-scale power value $P_N$
Calibration factor	$\lambda = P_N / P_s$
Power factor	$\cos\phi = 1 \pm 0.01$ for Watt meters $\sin\phi = 1 \pm 0.01$ for Var meters

# SIRAX BM850

## Analog Power meter with 240° Scale

Current	20 ... 120 % rated current
Voltage	+ 2 % rated voltage
Preheating time	≥ 5 min at min 80% of rated current and 100% of rated voltage
Frequency	45 ... 65 Hz (50 Hz $\pm 0.1$ % for Type F)
Distortion factor	< 1 %
Other conditions	DIN EN 60 051-1

Electrical and mechanical zero point in the meter are not necessarily identical. Zero adjustment should be done only when voltage is applied and current circuit not energised.

### Environmental conditions

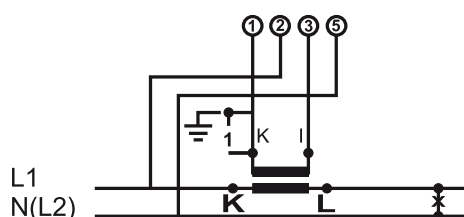
Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperatur	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation

Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

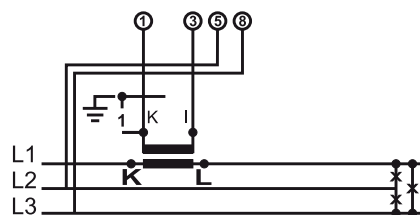
### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

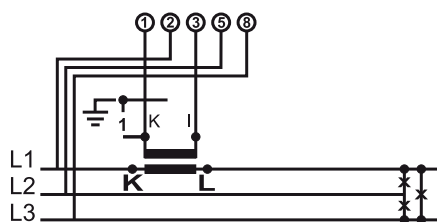
### Electrical connections



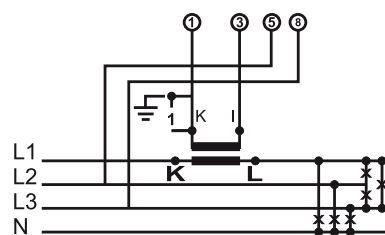
Active and reactive power measurement in singlephase Network



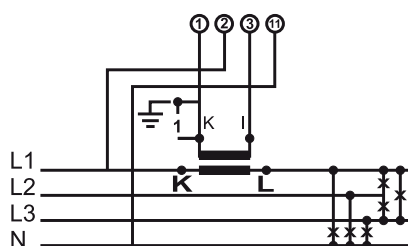
Reactive power measurement in 3-phase, 3-wire Network balanced load



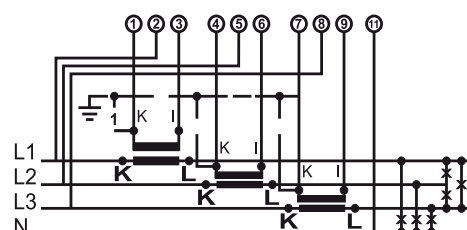
Active power measurement in 3-phase, 3-wire Network balanced load



Reactive power measurement in 3-phase, 4-wire Network balanced load



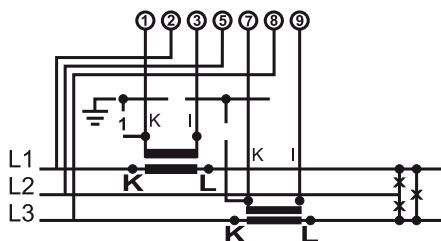
Active power measurement in 3-phase, 4-wire Network balanced load



Active and reactive power measurement in 3-phase, 4-wire Network unbalanced load

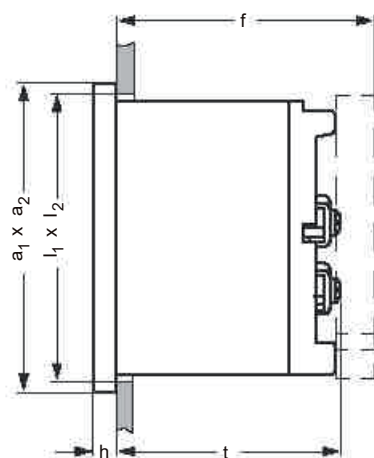
# SIRAX BM850

## Analog Power meter with 240° Scale



Active and reactive power measurement in 3-phase, 3-wire Network  
unbalanced load

### Dimensions



### Measurement ranges

Dimensions frontframe [mm]	96 x 96			
Scale length [mm]	97			
Type	□96			
Network System type	Singlephase-System, active power Singlephase-System, reactive power 3-phase 3-wire, active power, balanced load 3-phase 3-wire, reactive power, balanced load 3-phase 3-wire, active power, unbalanced load 3-phase 3-wire, reactive power, unbalanced load 3-phase 4-wire, active power, balanced load 3-phase 4-wire, reactive power, balanced load 3-phase 4-wire, active power, unbalanced load 3-phase 4-wire, reactive power, unbalanced load			
Rated voltage	57.7 V	115 V	230 V	400 V
	63.5 V	120 V	240 V	415 V
	100 V	127 V	289 V	440 V
	110 V	220 V	380 V	500 V
Rated current	x A / 1 A			
	x A / 5 A			

Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h			
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	106	111.5

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM850, Analog power meter with 240° Scale			BM850-
Features, Selection			
<b>01 Dimensions Frontframe</b> □96 (96 x 96 mm)			1
<b>02 Network system</b> Singlephase system, active power			A
3-phase 3-wire system, active power, balanced load			B
3-phase 3-wire system, active power, unbalanced load			C
3-phase 4-wire system, active power, balanced load			D
3-phase 4-wire system, active power, unbalanced load			E
Singlephase system, reactive power			F
3-phase 3-wire Systeme, reactive power, balanced load			G
3-phase 3-wire Systeme, reactive power, unbalanced load			H
3-phase 4-wire Systeme, reactive power, balanced load			I
3-phase 4-wire Systeme, reactive power, unbalanced load			J

# SIRAX BM850

## Analog Power meter with 240° Scale

03	<b>Measuring ranges</b> Specify while ordering			X
04	<b>Measuring ranges</b>			
	Rated voltage			
	57.7 V			01
	63.5 V			02
	100 V			03
	110 V			04
	127 V			05
	220 V			06
	230 V			07
	289 V			08
	380 V			09
	415 V			10
	440 V			11
	500 V			12
	Rated current			
	5A/5A			13
	10A/5A			14
	15A/5A			15
	20A/5A			16
	30A/5A			17
	50A/5A			18
	75A/5A			19
	100A/5A			20
	150A/5A			21
	200A/5A			22
	300A/5A			23
	400A/5A			24
	600A/5A			25
	800A/5A			26
	1000A/5A			27
	1200A/5A			28
	1500A/5A			29
	1600A/5A			30
	2000A/5A			31
	3000A/5A			32
	4000A/5A			33
	6000A/5A			34
	10000A/5A			35
	20000A/5A			36
	Special range rated current			
	5 A ...<200000 A / 5A			61
	5A/1A			37
	10A/1A			38



# SIRAX BM850

## Analog Power meter with 240° Scale

15A/1A			39
20A/1A			40
30A/1A			41
50A/1A			42
75A/1A			43
100A/1A			44
150A/1A			45
200A/1A			46
300A/1A			47
400A/1A			48
600A/1A			49
800A/1A			50
1000A/1A			51
1200A/1A			52
1500A/1A			53
1600A/1A			54
2000A/1A			55
3000A/1A			56
4000A/1A			57
6000A/1A			58
10000A/1A			59
20000A/1A			60
Special range rated current 5 A ...<200000 A / 1A			62
<b>05 Working position</b>			
α = 0°			A
α = 15°			B
α = 30°			C
α = 45°			D
α = 60°			E
α = 75°			F
α = 90°			G
α = 105°			H
α = 120°			I
<b>06 Zero Position</b>			
Left			1
Centre			2
Shifted			3
<b>07 Front window</b>			
Glass			1
<b>08 Scalefactor</b>			
Standard			1
Non Standard (Customized)			2

# SIRAX BM850

## Analog Power meter with 240° Scale

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09	Contact protection			
	without back cover			1
	with back cover			2



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## SIRAX BM900

### Analog Elapsed Time Meter (Hours Run Meter)

#### Description

The analog elapsed time meter SIRAX BM900 in a plastic housing are suitable for measuring the running time of machines, devices and other devices. They are used to monitor the plant / equipment ON / OFF time, which enables the user to check functions such as monitoring production efficiency, costs and service time. The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 40mm. The time is measured in steps of 0.01 to 99999.99 hours. The counter cannot be reset to prevent accidental resetting.

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black
Position of use	Vertical $\pm 5^\circ$
Mounting	stackable next to each other
Panel thickness	$\leq 40$ mm
Panel fixing	Swivel screw
Connections/terminals	M4 screws and wire clamps form E3

##### Display

Measurement display	Numeral
Digit height	4 mm
Digit color	Pre-decimal places white on black Decimal places in black on white
Running display	with gear

##### Electrical Data

Measuring unit	Time in Hours
Counting range	00000.00 ... 99999.99
Input range	AC voltage 100 ... 125 VAC 200 ... 250 VAC 380 ... 440 VAC
Nominal frequency	50 / 60 Hz
External magnetic field	0.5 mT
Perm. Voltage fluctuation	$\pm 20$ % nominal voltage
Power consumption (burden)	0.75 VA (110 VAC) 1.70 VA (415 VAC)



##### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C $\pm$ 2 °C
Position of use	Nominal position $\pm 1^\circ$
Input range	full scale value

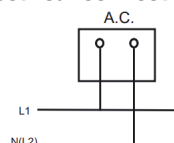
##### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

##### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	600 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection

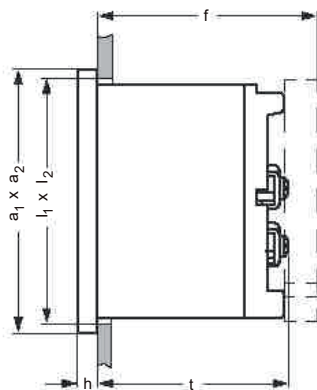
##### Electrical connections



# SIRAX BM900

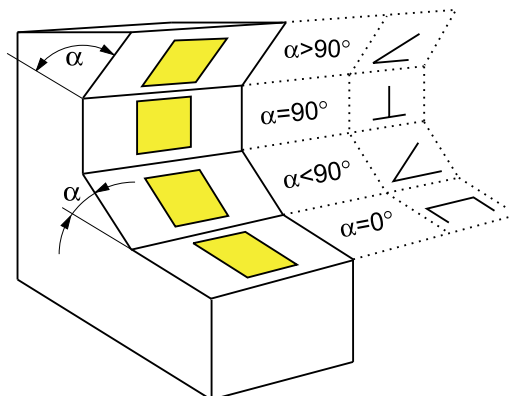
## Analog Elapsed Time Meter (Hours Run Meter)

### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□72	72 x 72	5.5	68 <sup>+0.8</sup> x 68 <sup>+0.8</sup>	53	64
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>		

### Working position



Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM900, Analog Elapsed Time Meter			BM900-
<b>Merkmal</b>			
<b>01 Features, Selection</b>			
□72 (72 x 72 mm)			1
□96 (96 x 96 mm)			2
<b>02 Inputrange</b>			
100 ... 125 VAC			1
200 ... 250 VAC			2
380 ... 440 VAC			3
<b>03 Working position</b>			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 30^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$ (vertical)			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I

# SIRAX BM900

## Analog Elapsed Time Meter (Hours Run Meter)

04	Front window Glass			1
05	Contact protection without back cover			1
	with back cover			2



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## SIRAX BM910

### Analog 2 in 1 Moving Iron Movement Meter

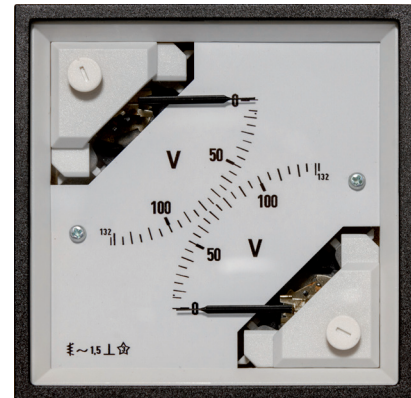
#### Description

The analog 2 in 1 moving iron movement meter SIRAX BM300 in a polycarbonate housing and 90° scale are suitable for measuring AC currents for frequency range of 15 ... 400 Hz and AC voltages for frequency range of 15 ... 100 Hz. Moving iron meters indicate rms-values practically independent of waveform even of high harmonics. Error of indication may occur for extreme waveforms (e.g. phase gating controls) & for frequencies above 100Hz.

Moving iron movement has pivots of very high hardness. Movement suspended between spring loaded sapphire jewel and silicon jewel. Movement is critically damped by use of silicon oil.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.



#### Features

- Two different meters in one case
- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- Near linear scale
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels				
Material of case	Polycarbonate				
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free				
Material of window	Glass				
Front frame (bezel)	Polycarbonate black				
Position of use	Vertical $\pm 5^\circ$				
Mounting	stackable next to each other				
Panel thickness	$\leq 25\text{mm}$				
Panel fixing	Swivel screw				
Weight	<table border="1"> <tr> <td>□96</td><td>□144</td></tr> <tr> <td>0.2 kg</td><td>0.4 kg</td></tr> </table>	□96	□144	0.2 kg	0.4 kg
□96	□144				
0.2 kg	0.4 kg				

##### Connections

Voltmeter <30A	M4 screws and wire clamps form E3
Ammeter >30A	Threaded studs M6 with nuts

#### Scaling

Pointer	knife-edge pointer
Pointer deflection	0 ... 90°
Scale characteristics	Near linear above 10% of nominal full scale value
Scale division	Coarse-fine
Scale length	54 mm

#### Electrical Data

Measuring unit	AC Voltage and AC Current
Power consumption	
Voltmeter	< 4.5 VA
Ammeter <15A	< 0.5 VA
Ammeter >15A	< 0.8 VA
Over range	
Voltmeter	1.2 times nominal voltage
Ammeter	2 times nominal current
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated voltage/current
Short time voltage measurement	2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload
Short time current measurement	10 x for 0.5s: 9 overloads 10 x for 5s: 1 overload
External magnetic field	0.4 kA/m

#### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	23 °C / $\pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input Waveform	Rated value of measured quantity sine wave, distortion factor $\leq 5\%$
Frequency	45 ... 65 Hz
Other conditions	DIN EN 60 051-1

# SIRAX BM910

## Analog 2 in 1 Moving Iron Movement Meter

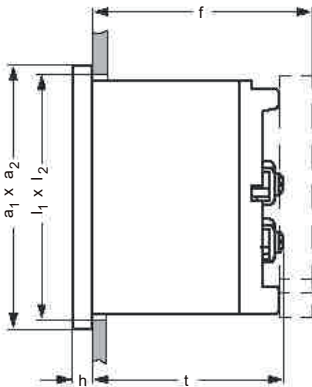
### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s² (15g) / 11 ms
Vibration	10 ... 55 ... 10 Hz, 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	600 V CATIII
Pollution degree	2
Rated insulation voltage	1000 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	3 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

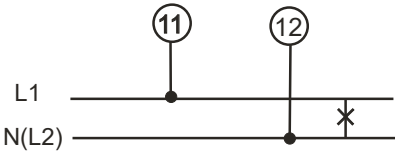
### Dimensions



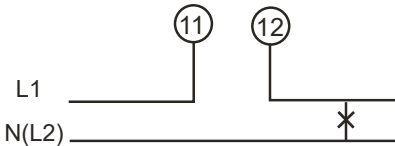
Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	53	64
□144	144 x 144	5.5	138 <sup>+1</sup> x 138 <sup>+1</sup>		

### Electrical connections

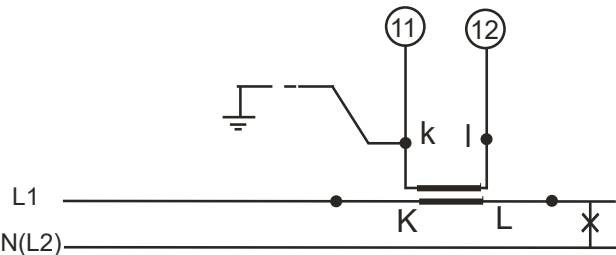
AC Voltage



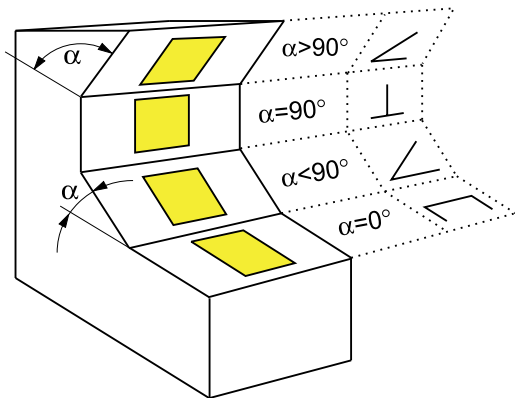
AC Current



AC Current for use on current transformer



### Working position



Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$

# SIRAX BM910

## Analog 2 in 1 Moving Iron Movement Meter

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM910, Analog 2 in 1 Moving Iron Movement Meter			BM910-
Merkmal			
<b>01 Features, Selection</b>			
□96 (96 x 96 mm)			1
□144 (144 x 144 mm)			2
<b>02 Measuring input 1</b>			
AC Current	A		1
AC Current for transformer connection	B		2
AC Voltage	C		3
AC Voltage for transformer connection	D		4
<b>03 Measuring input 2</b>			
AC Current	E		1
AC Current for transformer connection	F		2
AC Voltage	G		3
AC Voltage for transformer connection	H		4
<b>04 Measuring range input 1</b>			
AC Current			
100 mA		B,C,D,E,F,G,H	01
150 mA		B,C,D,E,F,G,H	02
250 mA		B,C,D,E,F,G,H	03
400 mA		B,C,D,E,F,G,H	04
600 mA		B,C,D,E,F,G,H	05
1 A		B,C,D,E,F,G,H	06
1.5 A		B,C,D,E,F,G,H	07
2.5 A		B,C,D,E,F,G,H	08
3 A		B,C,D,E,F,G,H	09
4 A		B,C,D,E,F,G,H	10
5 A		B,C,D,E,F,G,H	11
6 A		B,C,D,E,F,G,H	12
10 A		B,C,D,E,F,G,H	13
15 A		B,C,D,E,F,G,H	14
20 A		B,C,D,E,F,G,H	15
25 A		B,C,D,E,F,G,H	16
30 A		B,C,D,E,F,G,H	17
40 A		B,C,D,E,F,G,H	18



# SIRAX BM910

## Analog 2 in 1 Moving Iron Movement Meter

50 A		B,C,D,E,F,G,H	19
60 A		B,C,D,E,F,G,H	20
Special range AC Current			
0 ... <60 A		B,C,D,E,F,G,H	21
AC Current for transformer connection			
... / 1 A		A,C,D,E,F,G,H	22
... / 5 A		A,C,D,E,F,G,H	23
AC Voltage			
6 V		A,B,D,E,F,G,H	24
10 V		A,B,D,E,F,G,H	25
15 V		A,B,D,E,F,G,H	26
25 V		A,B,D,E,F,G,H	27
40 V		A,B,D,E,F,G,H	28
60 V		A,B,D,E,F,G,H	29
100 V		A,B,D,E,F,G,H	30
120 V		A,B,D,E,F,G,H	31
132 V		A,B,D,E,F,G,H	32
150 V		A,B,D,E,F,G,H	33
250 V		A,B,D,E,F,G,H	34
300 V		A,B,D,E,F,G,H	35
400 V		A,B,D,E,F,G,H	36
500 V		A,B,D,E,F,G,H	37
600 V		A,B,D,E,F,G,H	38
Special range AC Voltage			
0 ... <600 V		A,B,D,E,F,G,H	39
AC Voltage for transformer connection			
... / 100 V		A,B,C,E,F,G,H	40
... / 110 V		A,B,C,E,F,G,H	41
<b>05 Measuring range input 2</b>			
AC Current			
100 mA		A,B,C,D,F,G,H	01
150 mA		A,B,C,D,F,G,H	02
250 mA		A,B,C,D,F,G,H	03
400 mA		A,B,C,D,F,G,H	04
600 mA		A,B,C,D,F,G,H	05
1 A		A,B,C,D,F,G,H	06
1.5 A		A,B,C,D,F,G,H	07
2.5 A		A,B,C,D,F,G,H	08

# SIRAX BM910

## Analog 2 in 1 Moving Iron Movement Meter

3 A		A,B,C,D,F,G,H	09
4 A		A,B,C,D,F,G,H	10
5 A		A,B,C,D,F,G,H	11
6 A		A,B,C,D,F,G,H	12
10 A		A,B,C,D,F,G,H	13
15 A		A,B,C,D,F,G,H	14
20 A		A,B,C,D,F,G,H	15
25 A		A,B,C,D,F,G,H	16
30 A		A,B,C,D,F,G,H	17
40 A		A,B,C,D,F,G,H	18
50 A		A,B,C,D,F,G,H	19
60 A		A,B,C,D,F,G,H	20
Special range AC Current			
0 ... <60 A		A,B,C,D,F,G,H	21
AC Current for transformer connection			
... / 1 A		A,B,C,D,E,G,H	22
... / 5 A		A,B,C,D,E,G,H	23
AC Voltage			
6 V		A,B,C,D,E,F,H	24
10 V		A,B,C,D,E,F,H	25
15 V		A,B,C,D,E,F,H	26
25 V		A,B,C,D,E,F,H	27
40 V		A,B,C,D,E,F,H	28
60 V		A,B,C,D,E,F,H	29
100 V		A,B,C,D,E,F,H	30
120 V		A,B,C,D,E,F,H	31
132 V		A,B,C,D,E,F,H	32
150 V		A,B,C,D,E,F,H	33
250 V		A,B,C,D,E,F,H	34
300 V		A,B,C,D,E,F,H	35
400 V		A,B,C,D,E,F,H	36
500 V		A,B,C,D,E,F,H	37
600 V		A,B,C,D,E,F,H	38
Special range AC Voltage			
0 ... <600 V		A,B,C,D,E,F,H	39
AC Voltage for transformer connection			
... / 100 V		A,B,C,D,E,F,G	40
... / 110 V		A,B,C,D,E,F,G	41

# SIRAX BM910

## Analog 2 in 1 Moving Iron Movement Meter

<b>06</b>	<b>Working position</b>			
	$\alpha = 0^\circ$			A
	$\alpha = 15^\circ$			B
	$\alpha = 30^\circ$			C
	$\alpha = 45^\circ$			D
	$\alpha = 60^\circ$			E
	$\alpha = 75^\circ$			F
	$\alpha = 90^\circ$ (vertical)			G
	$\alpha = 105^\circ$			H
	$\alpha = 120^\circ$			I
<b>07</b>	<b>Front window</b>			
	Glass			1
<b>08</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2
<b>09</b>	<b>Contact protection</b>			
	without back cover			1
	with back cover			2

In case of Ammeter / Ammeter 1st meter could be upto 60A but 2nd one will be only upto 10A



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SIRAX BM920  
Synchroscope

Description

The SIRAX BM920 synchroscope is an electronic measuring device that uses an illuminated display to show the frequency and phase deviation between voltages in two separate AC systems (e.g. a generator and a busbar). It is also checked whether the two systems are live or not.

The frequency deviation is indicated by a moving light point and the size of the deviation is indicated by the speed and direction of the movement.

If the light point moves clockwise, it indicates that the frequency of the incoming system is too high. If the light point moves counterclockwise, this means that the frequency is too low. A constant red glowing point indicates a frequency deviation and a phase deviation. Exact synchronization is achieved when the two green LEDs light up at the 12 o'clock position.

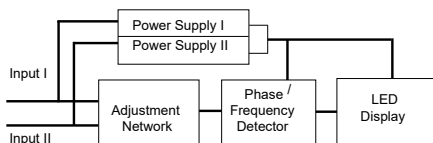
Example:

If 'T' is the time required for one revolution, the frequency difference can be calculated as  $1/T = \Delta f$ . The bus frequency is 50 Hz. The vector spot needs 10 seconds for one clockwise rotation.  $1/10 = 0.1\text{ Hz}$ . The frequency difference = 0.1 Hz. From this we can conclude that the generator frequency is 50.1 Hz.

Favorable condition for switching on the generator

1. Make sure that the frequency difference between two inputs is within the user's requirements. Measure the time in seconds (T) it takes for the illuminated dot to rotate completely.  
The frequency difference will be  $\Delta f = 1/T$  (Hz).
2. If the frequency difference is within acceptable limits, wait until the SYNC marker LEDs (two green LEDs at 12 o'clock position) light up.  
The generator can now be safely switched on.

Functional Principle

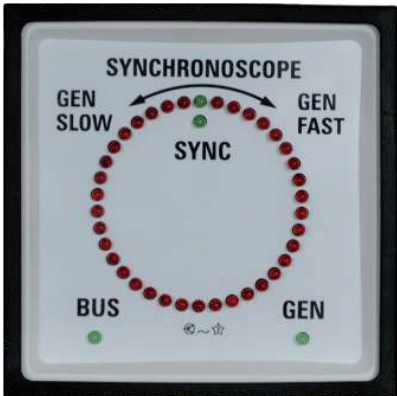


The Bus & Gen inputs are fed to the Frequency & Phase detection network. The output duty cycle of the network corresponds to the frequency difference between Bus and Generator Voltage. The detector network also determines the actual phase difference.

Technical Data

Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black



Position of use	Vertical $\pm 5^\circ$				
Mounting	stackable next to each other				
Panel thickness	$\leq 40\text{ mm}$				
Panel fixing	Swivel screw				
Connections/terminals	M4 screws and wire clamps form E3				
Gewicht	<table border="1"><tr><td>□96</td><td>□144</td></tr><tr><td>0.60kg</td><td>0.70kg</td></tr></table>	□96	□144	0.60kg	0.70kg
□96	□144				
0.60kg	0.70kg				

Electrical Data

Measuring unit	Frequency and phase difference
Nominal voltage	100 ... 500 VAC
Frequency range	35 ... 70 Hz
Pull in / drop out frequency	$\pm 9$ Hz
Power consumption	max. 6 VA

Referenzbedingungen

Reference temperature	23 °C / $\pm 3$ °C
Input voltage	nominal voltage $\pm 2\%$
Nominal frequency	50 Hz $\pm 1\%$

Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	150 m/s <sup>2</sup> (15g) / 11 ms
Vibration	10 ... 150 ... 10 Hz, 0.15 mm amplitude, 5 cycles, 10 octave per minute

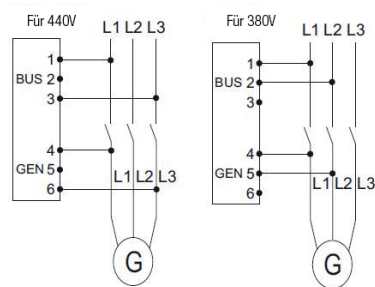
# SIRAX BM920

## Synchroscope

### Safety

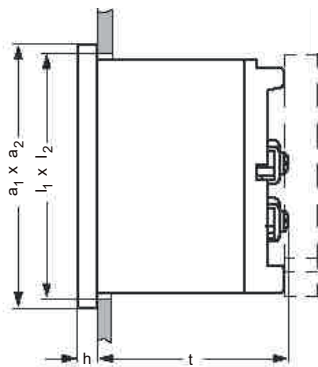
EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection

### Electrical connections



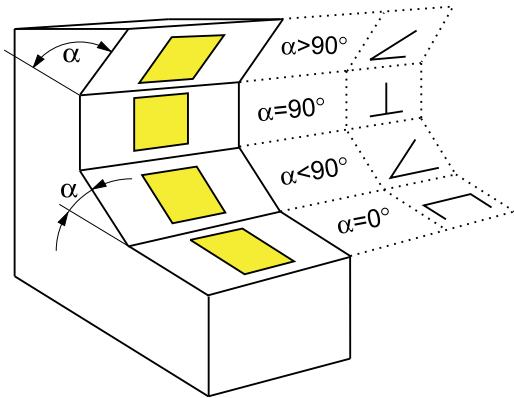
Type	Terminal	
BUS	1-3	1-2
GEN	4-6	4-5
Input range	110V	100V
	120V	120V
	240V	220V
	240V	240V
	400V	380V
	450V	400V
	480V	415V

### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>	
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	106
□144	144 x 144	8.5	138 <sup>+1</sup> x 138 <sup>+1</sup>	

### Working position



Code	Working position	Code	Working position	Code	Working position
A	$\alpha = 0^\circ$	D	$\alpha = 45^\circ$	G	$\alpha = 90^\circ$ (vertical)
B	$\alpha = 15^\circ$	E	$\alpha = 60^\circ$	H	$\alpha = 105^\circ$
C	$\alpha = 30^\circ$	F	$\alpha = 75^\circ$	I	$\alpha = 120^\circ$

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM920, Synchroscope			BM920-
Features, Selection			
01. Dimensions Frontframe			
□96 (96 x 96 mm)			1
□144 (144 x 144 mm)			2

# SIRAX BM920

## Synchroscope

<b>02</b>	<b>Inputrange</b>			
	Terminal 1-3 / 4-6	Terminal 1-2 / 4-5		
	110 V	100 V		1
	120 V	120 V		2
	240 V	220 V		3
	240 V	240 V		4
	400 V	380 V		5
	450 V	400 V		6
	480 V	415 V		7
	Other inputranges on request (... V / ... V)			X
<b>03</b>	<b>Working position</b>			
	$\alpha = 0^\circ$			A
	$\alpha = 15^\circ$			B
	$\alpha = 30^\circ$			C
	$\alpha = 45^\circ$			D
	$\alpha = 60^\circ$			E
	$\alpha = 75^\circ$			F
	$\alpha = 90^\circ$ (vertical)			G
	$\alpha = 105^\circ$			H
	$\alpha = 120^\circ$			I
<b>04</b>	<b>Front window</b>			
	Glass			1
<b>05</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2



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## SIRAX BM930

### Frequency Meters with Vibrating Reed Movement

#### Description

The reed frequency measuring devices with vibration measuring mechanism SIRAX BM930 in a polycarbonate housing are suitable for the measurement of frequencies in the range of 45 ... 65 Hz.

The devices are built with a mechanical resonance type consisting of an electro-magnet and a tuned steel tongue (reeds). The steel tongue consists of a series of thin steel strips that are attached to a steel plate.

The measuring devices are designed for installation in control panels, machine consoles or mosaic grids up to a panel thickness of no more than 25mm.

The bezel, the glass window and the dial can be easily exchanged on site.



#### Features

- Robust polycarbonate housing with high flammability class UL94-V0
- Simple assembly using swivel screw
- Quick and easy connection using screws and clamps
- Full-surface rear wall cover as protection against accidental contact
- Easy replacement of the glass window, the front bezel and the scale

#### Technical Data

##### Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels				
Material of case	Polycarbonate				
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free				
Material of window	Glass				
Front frame (bezel)	Polycarbonate black				
Position of use	Vertical $\pm 5^\circ$				
Mounting	stackable next to each other				
Panel thickness	$\leq 25\text{mm}$				
Panel fixing	Swivel screw				
Weight	<table border="1"> <tr> <td>□72</td><td>□96</td></tr> <tr> <td>0.21 kg</td><td>0.28 kg</td></tr> </table>	□72	□96	0.21 kg	0.28 kg
□72	□96				
0.21 kg	0.28 kg				
Connections/terminals	M4 screws and wire clamps form E3				

##### Scaling

Display type	Reed movement
Reed arrangement	horizontal
Scale division	Coarse–fine

##### Electrical Data

Measuring unit	Frequency
Input quantity	Alternating voltage in sine waveform
Overload capacity	acc. to DIN EN 60 051
Continuously	1.2 times rated voltage
Short time voltage measurement	2 x für 0.5s
External magnetic field	0.5 mT
Permissible voltage fluctuation	$\pm 15\%$
Power consumption	$< 5\text{ VA}$

##### Reference conditions

Accuracy class	1.5% acc. to DIN EN 60 051
Reference temperature	$23^\circ\text{C} \pm 2^\circ\text{C}$
Position of use	Nominal position $\pm 1^\circ$
Input	rated measuring value rated voltage $\pm 2\%$
Other conditions	DIN EN 60 051-1

##### Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	$-10 \dots +55^\circ\text{C}$
Storage temperature	$-25 \dots +65^\circ\text{C}$
Relative humidity	$\leq 75\%$ annual average, non condensation
Shock	$150\text{ m/s}^2$ (15g) / 11 ms
Vibration	$10 \dots 55 \dots 10\text{ Hz}$ , 0.15 mm amplitude (correspond to 1.5g at 50 Hz)

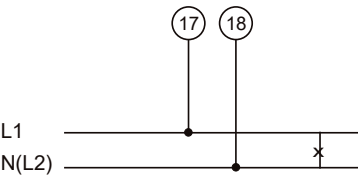
# SIRAX BM930

## Frequency Meters with Vibrating Reed Movement

### Safety

EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	600 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection
Safety terminal protection	Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc. to VDE 0410

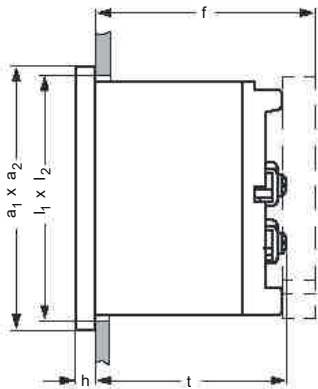
### Electrical connections



### Measurement ranges

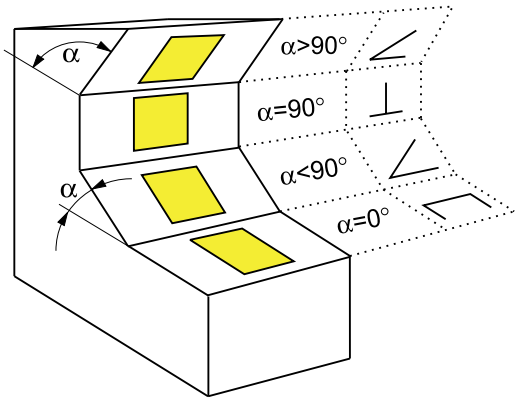
Dimensions frontframe [mm]	72 x 72	96 x 96
Weight [kg]	0.21	0.28
Type	□72	□96
Frequency range	45...50...55 Hz 45...55...65 Hz 55...60...65 Hz 47...50...53 Hz	
Rated input voltage	100 V 110 V 220 V 230 V 240 V 400 V 415 V 440 V	

### Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]	Installation depth (f) including back cover [mm]
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>		
□72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	53	64
□96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>		

### Working position



Code	orking position	Code	orking position	Code	orking position
A	α = 0°	D	α = 45°	G	α = 90° (vertical)
B	α = 15°	E	α = 60°	H	α = 105°
C	α = 30°	F	α = 75°	I	α = 120°



# SIRAX BM930

## Frequency Meters with Vibrating Reed Movement

### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM930, Frequency Meters with Vibrating Reed Movement			BM930-
Features, Selection			
<b>01 Dimensions Frontframe</b>			
□72 (72 x 72 mm)			1
□96 (96 x 96 mm)			2
<b>02 Frequency range</b>			
45 ... 50 ... 55 Hz			1
45 ... 55 ... 65 Hz			2
55 ... 60 ... 65 Hz			3
47 ... 50 ... 53 Hz			4
<b>03 Rated voltage</b>			
100 V			01
110 V			02
220 V			03
230 V			04
240 V			05
400 V			06
415 V			07
440 V			08
Special range rated voltage 57.7 V ... 600 V			09
<b>04 Working position</b>			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 30^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$ (vertical)			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I
<b>05 Front window</b>			
Glass			1
<b>06 Scalefactor</b>			
Standard			1
Non Standard (Customized)			2

# SIRAX BM930

## Frequency Meters with Vibrating Reed Movement

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07	Contact protection			
	without back cover			1
	with back cover			2



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SIRAX BM950  
Analog Panel Meter - ANSI

Description

The analog panel meter SIRAX BM950 provides accurate indication and measurement of electrical as well as electronic parameters in industrial, educational and medical field as per the respective standards. The devices are available in 3 case sizes i.e. 2 1/2", 3 1/2" and 4 1/2".

The range of the analog panel meters offers AC and DC ammeters, voltmeters and frequency meters utilizing a high torque pivot and jewel movement, with a accuracy of 1.5% and true RMS measurement.

Features and Benefits

- Robust polycarbonate housing with high flammability class UL94-V0
- ANSI standard case sizes
- Moving iron and moving coil mechanism
- True RMS measurement
- Measuring and indication of AC and DC current and voltage signals
- High torque pivot and jewel movement
- Simple panel mounting
- Easy replacement of the dial
- Compliant with ANSI C39.1

Applications

- Energy management
- Utility power monitoring
- Embedded generation
- Switchgear
- Control panels
- Distribution systems
- Process control
- Motor monitoring
- Building management
- Marine

Technical Data

Mechanical Data

Movement	High torque pivot and jewel moving coil and moving iron
Case details	ANSI standard case sizes (2 1/2", 3 1/2", 4 1/2")
Material of case	Polycarbonate matt black
Material of window	Shatterproof polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Panel mounting	stackable next to each other
Fixing (surface mounting)	4 corner studs 4-40 UNC or 6-32 UNC
Terminal bolts	1/4 "UNC" - 28

Scaling

Scale and Pointer for electrical measuring instruments	acc. to ANSI C39.1
Dials	matt white



Scale	black printed
Pointer	knife-edge pointer
Scale balance	within 1% of scale length

Electrical Data

Measuring ranges	AC and DC current AC and DC voltage Frequency
------------------	---

Input Ratings

DC Moving Coil Ammeters	50 µA ... 60 A
DC Moving Coil Voltmeters	50 mV ... 600 V
AC Moving Iron Ammeters	100 mA ... 50 A
AC Moving Iron Voltmeters	6 V ... 600 V
Frequency Meters	45 ... 65 Hz 360 ... 440 Hz

Overload capacity

Voltmeters	Continuous 2 x for 0.5s: 9 overloads 2 x for 5s: 1 overload
Ammeters	10 x for 0.5s: 9 overloads
DC Center Zero Voltmeter	10 x for 5s: 1 overload

Accuracy

DC Ammeters and Voltmeters	1.5% 0 ... 100% of full scale deflection
AC Ammeters and Voltmeters	1.5% 10 ... 100% of full scale deflection
Frequency Meters	0.5% of end scale value

# SIRAX BM950

## Analog Panel Meter - ANSI

### Environmental conditions

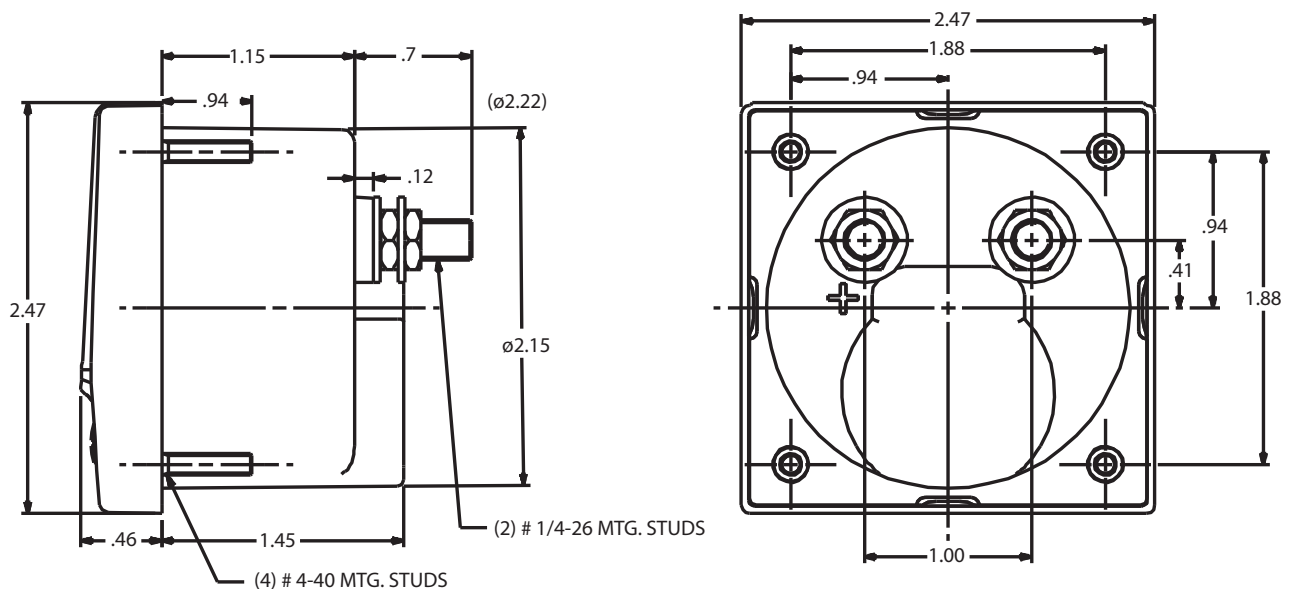
Performance	acc. to ANSI C39.1 and DIN EN 60 051
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	25% ... 80% nominal range of use
Vibration	acc. to C39.1 cl. 5.13

### Safety

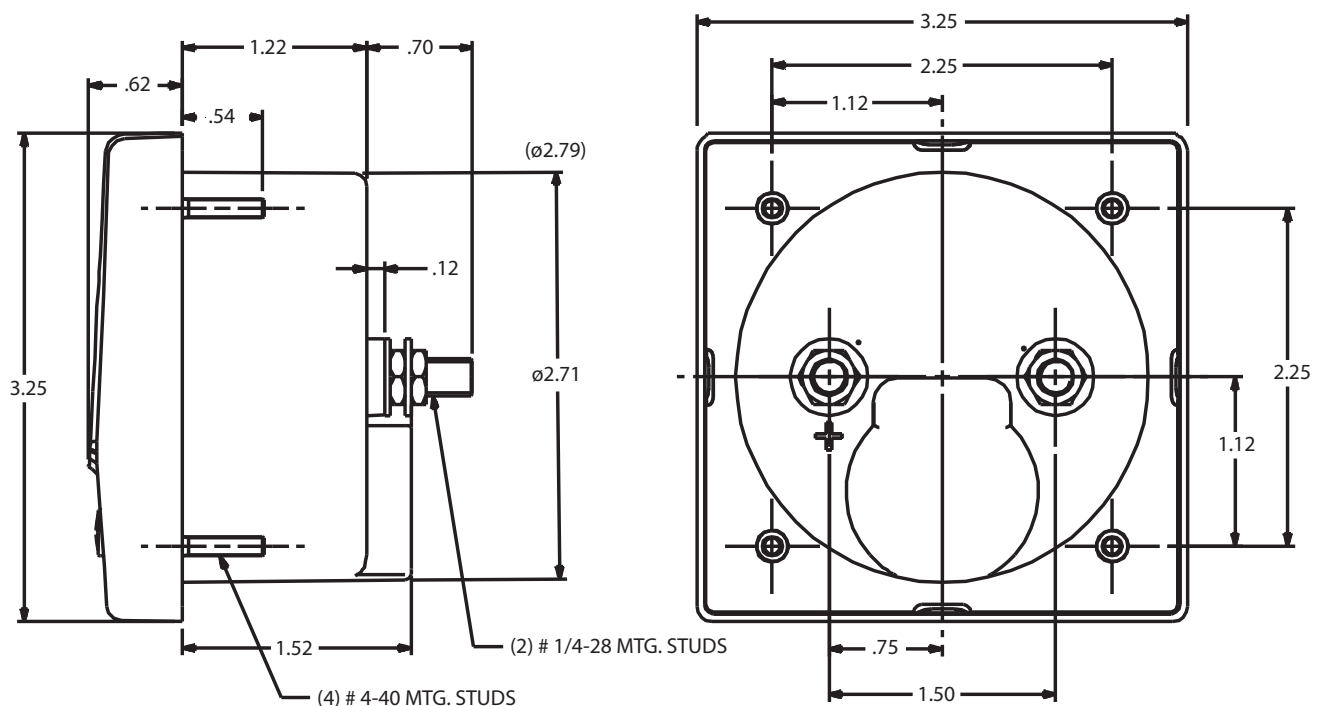
EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety requirements and protective measures for Electrical indicating instruments and their accessories	acc. to EN 60 010-1 and BS EN 61 326 DIN 40050 / 8-70 VDE 0110 / 11-72 VDE 0410 / 10-76
Housing protection class	IP50

### Dimensions (all dimension are in inches)

SIRAX BM950 - 2 1/2"



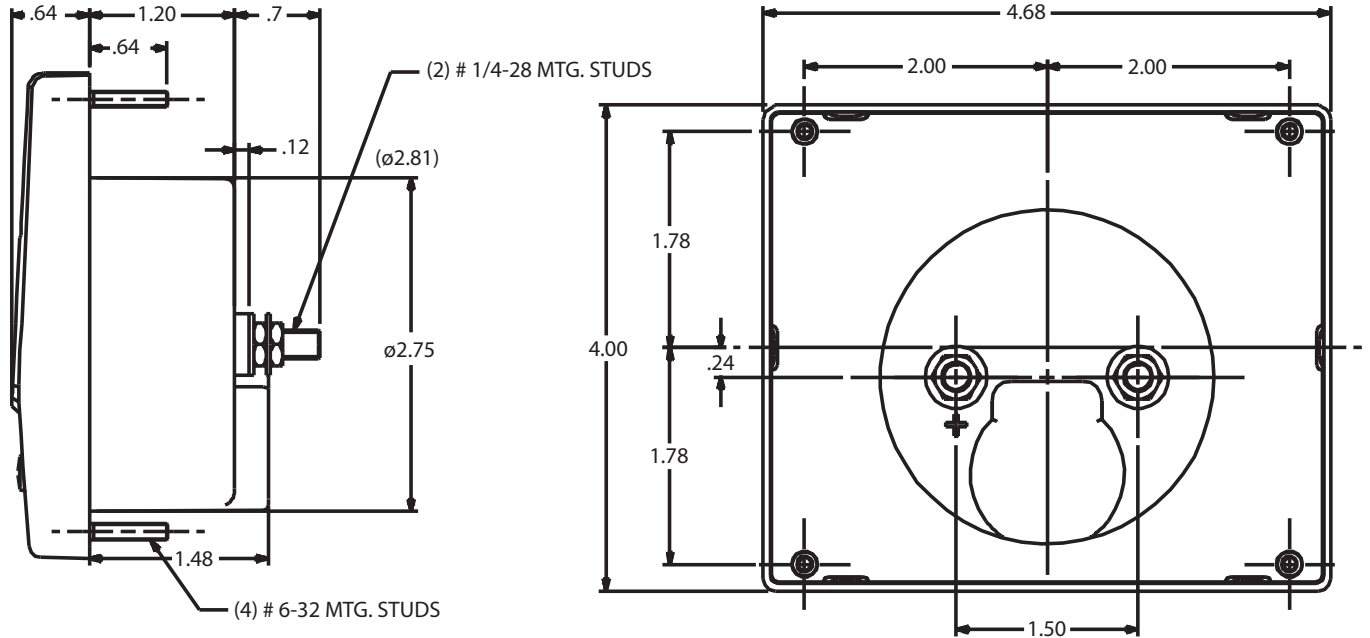
SIRAX BM950 - 3 1/2"



# SIRAX BM950

## Analog Panel Meter - ANSI

SIRAX BM950 - 4 1/2"



### Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM950, Analog Panel Meter - ANSI			BM950-
Features, Selection			
<b>01 Dimensions type</b>			
2 1/2"			1
3 1/2"			2
4 1/2"			3
<b>02 Meter type</b>			
Moving Iron	A		1
Moving coil	B		2
Frequency	C		3
<b>03 Measuring input</b>			
DC Voltage	D	A	1
DC Current	E	A	2
AC Voltage	F	B	3
AC Current	G	B	4
Frequency	H	A, B	5
<b>04 Measuring range</b>			
DC and AC Current			
50 µA		A, C, D, F, H	01
60 µA		A, C, D, F, H	02

# SIRAX BM950

## Analog Panel Meter - ANSI

100 µA		A, C, D, F, H	03
150 µA		A, C, D, F, H	04
250 µA		A, C, D, F, H	05
400 µA		A, C, D, F, H	06
500 µA		A, C, D, F, H	07
600 µA		A, C, D, F, H	08
1 mA		A, C, D, F, H	09
1.5 mA		A, C, D, F, H	10
2.5 mA		A, C, D, F, H	11
4 mA		A, C, D, F, H	12
5 mA		A, C, D, F, H	13
6 mA		A, C, D, F, H	14
10 mA		A, C, D, F, H	15
15 mA		A, C, D, F, H	16
20 mA		A, C, D, F, H	17
25 mA		A, C, D, F, H	18
40 mA		A, C, D, F, H	19
60 mA		A, C, D, F, H	20
100 mA		C, D, F, H	21
150 mA		C, D, F, H	22
250 mA		C, D, F, H	23
400 mA		C, D, F, H	24
600 mA		C, D, F, H	25
1 A		C, D, F, H	26
1.5 A		C, D, F, H	27
2.5 A		C, D, F, H	28
4 A		C, D, F, H	29
5 A		C, D, F, H	30
6 A		C, D, F, H	31
10 A		C, D, F, H	32
15 A		C, D, F, H	33
20 A		C, D, F, H	34
25 A		C, D, F, H	35
30 A		C, D, F, H	36
40 A		C, D, F, H	37
50 A		C, D, F, H	38
60 A		C, D, F, H	39
Special range DC and AC Current on request			
Customer value		C, D, F, H	40

# SIRAX BM950

## Analog Panel Meter - ANSI

DC and AC Voltage			
50 mV		B, C, E, F, H	41
60 mV		B, C, E, F, H	42
75 mV		B, C, E, F, H	43
100 mV		B, C, E, F, H	44
150 mV		B, C, E, F, H	45
250 mV		B, C, E, F, H	46
400 mV		B, C, E, F, H	47
600 mV		B, C, E, F, H	48
1 V		B, C, E, F, H	49
1.5 V		B, C, E, F, H	50
2.5 V		B, C, E, F, H	51
4 V		B, C, E, F, H	52
6 V		C, E, G, H	53
10 V		C, E, G, H	54
15 V		C, E, G, H	55
25 V		C, E, G, H	56
30 V		C, E, G, H	57
40 V		C, E, G, H	58
50 V		C, E, G, H	59
60 V		C, E, G, H	60
100 V		C, E, G, H	61
120 V		C, E, G, H	62
132 V		C, E, G, H	63
150 V		C, E, G, H	64
200 V		C, E, G, H	65
250 V		C, E, G, H	66
300 V		C, E, G, H	67
400 V		C, E, G, H	68
500 V		C, E, G, H	69
600 V		C, E, G, H	70
Special range DC and AC Current on request			
Customer value		C, E, G, H	71
Frequency			
45 ... 50 ... 55 Hz		A, B, D, E, F, G	72
45 ... 55 ... 65 Hz		A, B, D, E, F, G	73
55 ... 60 ... 65 Hz		A, B, D, E, F, G	74
360 ... 400 ... 440 Hz		A, B, D, E, F, G	75
380 ... 400 ... 420 Hz		A, B, D, E, F, G	76
Special range DC and AC Current on request			
Customer value		A, B, D, E, F, G	77

# SIRAX BM950

## Analog Panel Meter - ANSI

<b>05</b>	<b>Rated input voltage for Frequency</b>		A, B, D, E, F, G	01
	57.7 V		A, B, D, E, F, G	02
	63.5 V		A, B, D, E, F, G	03
	100 V		A, B, D, E, F, G	04
	110 V		A, B, D, E, F, G	05
	115 V		A, B, D, E, F, G	06
	120 V		A, B, D, E, F, G	07
	127 V		A, B, D, E, F, G	08
	208 V		A, B, D, E, F, G	09
	220 V		A, B, D, E, F, G	10
	230 V		A, B, D, E, F, G	11
	240 V		A, B, D, E, F, G	12
	289 V		A, B, D, E, F, G	13
	380 V		A, B, D, E, F, G	14
	400 V		A, B, D, E, F, G	15
	415 V		A, B, D, E, F, G	16
	440 V		A, B, D, E, F, G	17
	500 V		A, B, D, E, F, G	18
	Special range rated input voltage for frequency on request			
	Customer value		A, B, D, E, F, G	18
<b>06</b>	<b>Scalefactor</b>			
	Standard			1
	Non Standard (Customized)			2



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