

Product Guide

M Series
100.U.101.06

Analog Panel Meters Universal Range

M Series

PSQ
PQ



with Moving-Coil Movement
90°- Dial

LSP



with Moving-Coil Movement
240°- Dial

LSSM3
LRSM3



with Stepper Motor
240°, 300°, or 360° Dial

GSQ
GQ



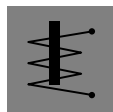
with Moving-Coil Rectifier
Movement
90°- Dial

LSG



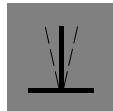
with Moving-Coil Rectifier
Movement
240°- Dial

WSQ
WQ



with Moving-Iron Movement
90°- Dial

FQ



Vibrating Reed
Frequency Meters

BI
BIW



Maximum Demand Indicators with
Bimetallic /
Bimetallic-Moving Iron Movements

LFUQ



Power Factor Meters
electronic circuit integrated

LDQ



Watt and VAR Meters
with electrodynamic movement





General Data

Analog Panel Meters

Application

reliable instrumentation technology for nearly any application under extreme environmental conditions

for mounting in	switchboards machine tools mosaic grid panels
for measuring	DC current or DC voltage, AC current or AC voltage, frequency, thermal maximum demand, power factor, active / reactive power
connection	direct or for use on transducers/shunts/transformers

Technical Data

scaling	lettering, custom - logo, coloured scales and dial illumination possible to special order			
case	according to DIN IEC 61 554 square form stackable suitable for use in mosaic grid panels			
material of case	pressed steel or flame-retardant plastics (.Q 48/L.SM3)			
window	glass or non-glaring glass			
bezel	black or gray option (not for L.SM3)			
position of use	vertical, horizontal option or to be specified between 15 to 165°			
panel fixing	screw clamps or plate springs (.Q 48)			
enclosure code	IP 52 case front or as an option IP 54 splash-water protected front L.SM3: IP 66 case, IP 67 case front			
terminal protection (not for L.SM3)	protective sleeves or full sized rear cover option			
marine application	optionally			
(all except LSSM3/LRSM3:)				
dimensions (in mm)	.Q 48	.Q 72	.Q 96	.Q 144
bezel	□ 48	□ 72	□ 96	□ 144
case	□ 45	□ 66.5	□ 90.5	□ 137
panel cutout	□ 45.2 ^{+0.3}	□ 68.3 ^{+0.4}	□ 92 ^{+0.8}	□ 138 ⁺¹
panel thickness	1 ... 15 mm on all meter sizes			
climatic suitability according to VDE/VDI 3540 sheet 2	climatic class 2 or as an option climatic class 3 (limited use in the tropics)			
operating temperature range	-25°C ... +23°C ... +40°C (climatic class 2) -10°C ... +23°C ... +55°C (climatic class 3)			
storage temperature range	-25 ... +65°C			
relative humidity	≤75% annual average, non-condensing			
shock	15 g or as an option 30 g, 11 ms			
vibration	2.5 g or as an option 5 g, 5 ... 55 Hz			

LSSM3/LRSM3

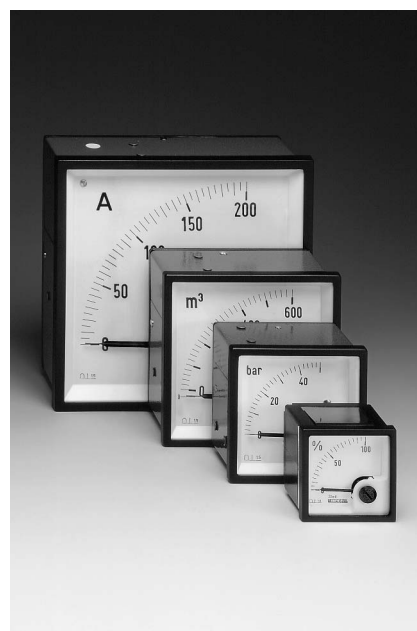
dimensions (in mm)	■ 072	■ 096	■ 144
bezel	□ 72	□ 96	□ 144
case	□ 66	□ 90	□ 137
panel cutout	□ 68 ^{+0.7}	□ 92 ^{+0.8}	□ 138 ⁺¹
weight approx.	0.17 kg	0.25 kg	0.35 kg
dimensions (in mm)	● 060	● 080	● 100
bezel	Ø 66	Ø 86	Ø 106
case	Ø 60	Ø 80	Ø 100
panel cutout	Ø 61 ^{+0.5}	Ø 81 ^{+0.5}	Ø 101 ^{+0.5}
weight approx.	0.12 kg	0.18 kg	0.22 kg



Short Form Data

Analog Meters with Moving - Coil Movement 90°- Dial

PSQ 48
PQ 72RS
PQ 96RS
PQ 144RS



Functional Principle

pivot and jewel moving-coil movement, core-magnet system

Measuring Ranges

DC current	0 ... 40 µA up to 0 ... 60 A (PSQ 48 up to 0 ... 25 A)
DC voltage	0 ... 40 mV up to 0 ... 600 V
for use on transducer	4 ... 20 mA mechanically suppressed zero, no zero adjustment 0/4 ... 20 mA electrically suppressed zero, with zero adjustment
for use with external shunt	0 ... 60 mV or 0 ... 150 mV (scaling to DIN series)
for use on multiplier	0 ... 25 V / 250 µA for multiplier 1 ... 10 kV
accuracy	class 1.5 or as an option class 1.0
pointer	bar / knife-edge pointer
pointer deflection	0 ... 90°

Others

	PSQ 48	PQ 72 RS	PQ 96 RS	PQ 144 RS
mounting depth	48 mm	57 mm	60 mm	60 mm
weight approx.	0.1 kg	0.2 kg	0.3 kg	0.6 kg

additional options

special measuring ranges, range adjustment, index marking pointer, 2nd measuring range, 2nd scale division, increased sensitivity, calibration to a firm internal resistance value or a lead resistance deviating from standard, off-set zero, expanded scale, coloured scales, dial illumination and others

additional data	refer to Data Sheet No. 010.D.101.##
additional meters with moving-coil movement	PQ 48/72/96/144 K (K-Series) refer to Data Sheet No. 410.D.101.## P 48/72/96/144 PrS (edgewise meters) refer to Data Sheet No. 010.D.201.## MP 48x24/72x24/96x24, P 144x36 (slim edgewise meters) refer to Data Sheet No. 010.D.301.##



Short Form Data

Analog Meters with Moving - Coil Movement 240°- Dial

LSP 48
LSP 72
LSP 96
LSP 144



Functional Principle

pivot and jewel moving - coil movement; swivel - coil system

Measuring Ranges

DC current	0 ... 100 μ A up to 0 ... 60 A (LSP 48 up to 0 ... 2.5 A)
DC voltage	0 ... 60 mV up to 0 ... 600 V
for use on transducer	4 ... 20 mA mechanically suppressed zero, no zero adjustment 0/4 ... 20 mA electrically suppressed zero, with zero adjustment
for use with external shunt	0 ... 60 mV or 0 ... 150 mV (scaling to DIN series)
accuracy	class 1.5 or as an option class 1.0
pointer	bold bar pointer (with knife - edge for class 1.0 meters)
pointer deflection	0 ... 240°

Others

mounting depth	LSP 48	LSP 72	LSP 96	LSP 144
	≤66 mm	≤60 mm	≤69 mm	≤70 mm
weight approx.	0.2 kg	0.3 kg	0.4 kg	0.9 kg

additional options

special measuring ranges, range adjustment, expanded scale, 2nd measuring range, 2nd scale division, increased sensitivity, calibration to a firm internal resistance value or a lead resistance deviating from standard, off - set zero, coloured scales, dial illumination and others

additional data	refer to Data Sheet No. 011.D.101.##
additional meters with moving - coil movement	LSP 72/96/144 K (K - Series, 240° - Dial) refer to Data Sheet No. 411.D.101.## PQ 48/72/96/144 K (K - Series, 90° - Dial) refer to Data Sheet No. 410.D.101.## P 48/72/96/144 PrS (edgewise meters) refer to Data Sheet No. 010.D.201.## MP 48x24/72x24/96x24, P 144x36 (slim edgewise meters) refer to Data Sheet No. 010.D.301.##



Short Form Data

Analog Meters with Stepper Motor with 240°, 300°, or 360° Dial

LSSM3-072
LSSM3-096
LSSM3-144
LSSM3-060
LSSM3-080
LSSM3-100
LSSM3-130
LRSM3-072
LRSM3-096
LRSM3-144
LRSM3-060
LRSM3-080
LRSM3-100
LRSM3-130



Functional Principle

Microprocessor - controlled high resolution stepper motor with integrated fine gear and pivoted shaft for rugged conditions.

Measuring Ranges

DC voltage	0/2 ... 10 V, 0 ... 6 V, -10 ... 0 +10 V
DC current	0/4 ... 20 mA, 2x 4 ... 20 mA, -20 ... 0 +20 mA
Temperature Pt100	0...100/120/150/200/250/300/400/500/600°C -30 ... 120°C
Frequency for encoder	2 Hz ... 10 kHz square - wave 24V/24V PNP, 12V/12V PNP speed generator >6V _{SS} coil >1 V _{SS} , >100 mV _{SS}

special measuring range on request	
accuracy class	better then 0.5 according to DIN EN 60 051 - 1
pointer	bold bar pointer
pointer deflection	0 ... 240° or optionally 0 ... 240° up to 300° as specified (LSSM3) 0 ... 360° without stop (LRSM3)
operation	2 rear side buttons or potentiometer for setting basic brightness, pointer brightness, and special functions

Others

climatic suitability	according to IEC60068-2-1/2
operating temperature	-20/-25°C ... +70°C (LSSM3/LRSM3) -40°C ... +70°C without pointer zero positioning on power fail
storage temperature	-40°C ... +70°C
relative humidity	≤ 95% at 55°C according to IEC60068-2-30
vibration and shock	
shock resistance	5g for 30ms and 10g for 18ms
vibration resistance	up to 4g
additional options	pointer illumination, illumination control input, alarm LED, binary input or output:

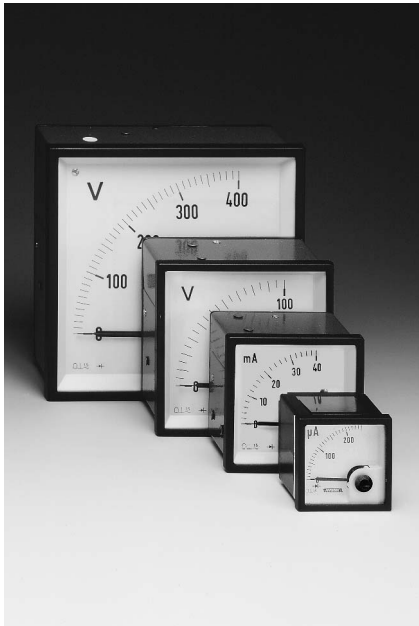
additional data	refer to Data Sheet No. 611.D.101.##
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Short Form Data

Analog Meters with Moving - Coil Rectifier Movement 90°- Dial

GSQ 48
GQ 72 RS
GQ 96 RS
GQ 144 RS



Functional Principle

pivot and jewel moving - coil movement;
series - connected rectifier incorporated

Measuring Ranges

AC current	0 ... 100 μA up to 0 ... 25 A
AC voltage	0 ... 1.5 V up to 0 ... 600 V
for use on VT	0 ... N/100 V or 0 ... N/110 V
for use on CT	0 ... N/1 A or 0 ... N/5 A (scaling to DIN series; no overload range)
frequency range	voltage 40 Hz ... 50 Hz ... 10 kHz current 50 Hz (others on request)
accuracy	class 1.5 or as an option class 1.0
pointer	bar / knife - edge pointer
pointer deflection	0 ... 90°

Others

same as PSQ 48, PQ 72/96/144 RS

additional data
additional meters
with moving - coil
rectifier movement

refer to Data Sheet No. 015.D.101.##
VQ 48/72/96/144 K (K-Series)
refer to Data Sheet No. 415.D.101.##
G 48/72/96/144 PrS (edgewise meters)
refer to Data Sheet No. 015.D.201.##
MG 48x24/72x24/96x24, G 144x36
(slim edgewise meters)
refer to Data Sheet No. 015.D.301.##



Short Form Data

Analog Meters with Moving - Coil Rectifier Movement 240°- Dial

LSG 48
LSG 72
LSG 96
LSG 144



Functional Principle

pivot and jewel moving - coil movement;
series - connected rectifier incorporated

Measuring Ranges

AC current	0 ... 100 μA up to 0 ... 25 A (0 ... 40 mA to 0 ... 600 mA not for LSG 48)
for use on CT	0 ... 1 A or 0 ... 5 A *) **)
AC voltage	0 ... 1.5 V up to 0 ... 600 V
for use on VT	0 ... 100 V or 0 ... 110 V *)
frequency range	voltage 40 Hz ... 50 Hz ... 10 kHz current 50 Hz (others on request)
accuracy	class 1.5 or as an option class 1.0
pointer	bold bar pointer (with knife - edge for class 1.0 meters)
pointer deflection	0 ... 240°

*) scaling to DIN series; no overload range
**) optional: with overload range
2-times rated current (LSG 72)
2 ... 5-times rated current (LSG 96/144)

Others

same as LSP 48/72/96/144

additional data
additional meters
with moving - coil
rectifier movement

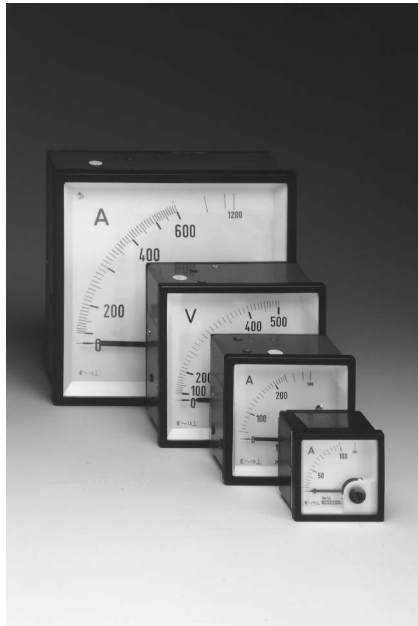
refer to Data Sheet No. 016.D.101.##
LSG 72/96/144 K (K-Series, 240° - Dial)
refer to Data Sheet No. 411.D.101.##
VQ 48/72/96/144 K (K-Series, 90° - Dial)
refer to Data Sheet No. 415.D.101.##
G 48/72/96/144 PrS (edgewise meters)
refer to Data Sheet No. 015.D.201.##
MG 48x24/72x24/96x24, G 144x36
(slim edgewise meters)
refer to Data Sheet No. 015.D.301.##



Short Form Data

Analog Meters with Moving - Iron Movement 90°- Dial

WSQ48
WQ 72RS
WQ 96RS
WQ 144RS



Functional Principle

pivot and jewel moving-iron movement, silicon oil damped

Measuring Ranges

AC current	0 ... 40 / 80 mA up to 0 ... 100 / 200 A (WSQ 48 up to 0 ... 40 / 80 A) *) **)
for use on CT	0 ... N / 1/2 A or 0 ... N / 5 / 10 A *) **)
AC voltage	0 ... 6 V up to 0 ... 600 V
for use on VT	0 ... 100 / 120 V or 0 ... 110 / 132 V *)
*)	scaling to DIN series with overload range
**)	optional: without overload range or with overload range 3, 4, 5-times rated current (not for WSQ 48)
power consumption	approx. 1.5 ... 3 VA (voltmeters) approx. 0.5 ... 1 VA (ammeters)
frequency range	16 ² / ₃ ... 100 Hz or as an option calibration to a definite frequency 100 ... 1000 Hz
accuracy	class 1.5 or as an option class 1.0
pointer	bar / knife-edge pointer
pointer deflection	0 ... 90°

Others

	WSQ48	WQ72RS	WQ96RS	WQ144RS
mounting depth	48 mm	57 mm	60 mm	60 mm
weight approx.	0.1 kg	0.2 kg	0.3 kg	0.6 kg

additional options

special measuring ranges, 2nd measuring range, 2nd scale division, index marking pointer, overload capacity up to 40 times rated current, coloured scales, dial illumination and others

<i>additional data</i>	refer to Data Sheet No. 020.D.101.##
<i>additional meters with moving-iron movements</i>	EQ 48/72/96/144 K (K-Series) refer to Data Sheet No. 420.D.101.## W 72/96/144 PrS (edgewise meters) refer to Data Sheet No. 020.D.201.## WQ 96/144 /2S (M-Series, 2 movements) refer to Data Sheet No. 023.D.101.##



Short Form Data

Analog Meters Frequency Meters with Vibrating Reed Movement

FQ 48
FQ 72
FQ 96
FQ 144



Functional Principle

Vibrating Reed Movement with reeds tuned to a definite value in the frequency span.

Measuring Ranges

frequency range	resolution	number of reeds
47 ... 50 ... 53 Hz	1 Hz	7 (FQ 48 only)
47 ... 50 ... 53 Hz	1/2 Hz	13 (except FQ 48)
44 ... 50 ... 56 Hz	1 Hz	13 (except FQ 48)
45 ... 50 ... 55 Hz	1/2 Hz	21 (except FQ 48/72)
57 ... 60 ... 63 Hz	1 Hz	7 (FQ 48 only)
57 ... 60 ... 63 Hz	1/2 Hz	13 (except FQ 48)
54 ... 60 ... 66 Hz	1 Hz	13 (except FQ 48)
55 ... 60 ... 65 Hz	1/2 Hz	21 (except FQ 48/72)
rated voltage	100 V up to 600 V or optionally from 57.7 V up to 600 V	
power consumption	0.4 ... <3 VA (depends on rated voltage)	
accuracy	class 0.5 acc. to DIN EN 60 051 - 1	

Others

reed arrangement	horizontal			
	FQ 48	FQ 72	FQ 96	FQ 144
mounting depth	61 mm	52 mm	58 mm	58 mm
weight approx.	0.15 kg	0.3 kg	0.4 kg	0.8 kg

<i>additional data</i>	refer to Data Sheet No. 030.D.101.##
<i>additional indicators for frequency</i>	ZQ 96/144 K (K-Series, electronic pointer-type frequency meters) refer to Data Sheet No. 432.D.101.## FQ 96/144 /2 (M-Series, vibrating reed frequency meters with 2 movements) refer to Data Sheet No. 031.D.101.##



Short Form Data

Analog Meters Maximum Demand Indicators with Bimetallic / Bimetallic - Moving - Iron Movements

BI 144
BIW 72 GD
BIW 96 GD
BIW144 GD



Functional Principle

BI 144	Bimetallic movement
BIW 72/96/144 GD	Bimetallic + moving-iron movement on common spindles

Measuring Ranges

AC current bimetallic & moving-iron	0 ... 1 / 1.2 A or 0 ... 5 / 6 A *)
for use on CT bimetallic & moving-iron	(scaling to DIN series) 0 ... N / 1 / 1.2 A or 0 ... N / 5 / 6 A *)
*) scaling with overload range or optionally without or with overload range 1.5 times rated current (bimetallic) with overload range 2 times rated current (moving-iron)	
thermal time lag (bimetallic)	15 min or 8 min option
frequency range	50 ... 100 Hz or as an option calibration to a definite frequency 100 ... 1000 Hz
accuracy bimetallic	acc. to DIN EN 60 051 - 1 class 3 (referred to slave pointer)
moving-iron	class 1.5

Others

accessories

saturating current transformers,
projection mounting outfit for BI 144,
multiple factor disc for BI 144, BIW 96/144 GD

three-point mounting set BI 96 RS

<i>additional data</i>	refer to Data Sheet No. 050.D.101.##
<i>additional meters with bimetallic movements</i>	BIQ/BIEQ 96 K (K-Series) refer to Data Sheet No. 450.D.101.## BI/BIW 192 RnS/RhS (M-Series, triple combination meters) refer to Data Sheet No. 050.D.251.##



Short Form Data

Analog Meters
Power Factor Meters
Electronic-Type
90°- Dial

LFUQ144



Functional Principle

pivot and jewel moving-coil movement with an integrated electronic circuit

Measuring Ranges

type	E	single phase AC system
	D	3 phase 3 wire balanced load
measuring ranges (cos ψ)		cap 0.5 ... 1 ... 0.5 ind
		cap 0.7 ... 1 ... 0.3 ind
rated voltage		100 [*] / 110 [*] / 115 V to 230 V (type E) / 230/400/415/440 V (type D)
rated current		1 or 5 A [*])
		[*]) also for use on transformers
rated frequency		50 Hz 60 Hz (for single phase AC system only)
power consumption		approx. 0.3 VA (current circuit at 5 A rated current) approx. 2.5 mA (voltage circuit)
accuracy		class 2.5 acc. to DIN EN 60 051 - 1

Others

mounting depth	60 mm
weight approx.	0.8 kg

<i>additional data</i>	refer to Data Sheet No. 060.D.101.##
<i>additional</i>	CQ 96/144 K (K-Series)
<i>power factor meters</i>	refer to Data Sheet No. 460.D.101.##

Weigel Meßgeräte GmbH

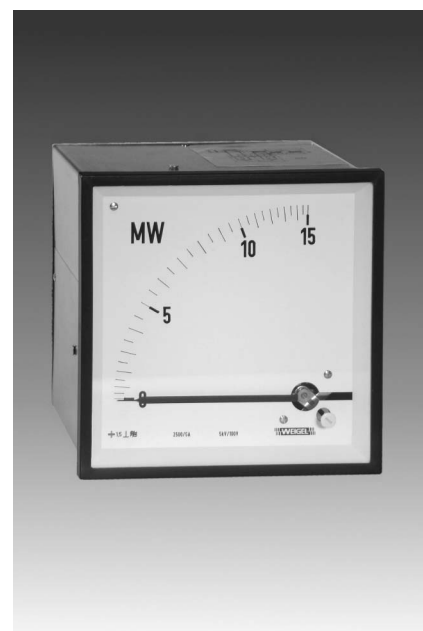
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Erlenstraße 14 • 90441 Nürnberg • Fax: 0911/42347-39
Sales: Phone: 0911/42347-94
Internet: <http://www.weigel-messgeraete.de>
e-mail: vertrieb@weigel-messgeraete.de



Short Form Data

Analog Meters
Electrodynamic
Watt and VAR Meters
90°- Dial

LDQ 144



Functional Principle

air-cored electrodynamic movement,
silicon oil damped, spring-loaded jewels

Measuring Ranges

type		active / reactive power
single phase AC system	EW 1	EB 1
3 phase 3 wire balanced load	DW 1	DB 1
3 phase 4 wire balanced load	VW 1	VB 1
3 phase 3 wire unbalanced load	DW 2	DB 2
3 phase 4 wire unbalanced load	VW 3	VB 3
select full-scale values between 0.6 and 1.2 times the calculated apparent power, preferably from standardized series 1 – 1.2 – 1.5 – 2 – 2.5 – 3 – 4 – 5 – 6 – 7.5 – 8 and any decimal multiple of these numbers.		
rated voltage	57.7 V ... 100; 110 V [*]) up to 500 V	
rated current	1 or 5 A [*]) also for use on transformers	
approx. power consumption		
each current circuit	18 – 20 mA	
each voltage circuit	2 VA (EW 1, EB 1, DW 1, DB 1, VW 1, VB 1) 3 VA (DW 2, DB 2, VW 3, VB 3)	
frequency range	40 ... 100 Hz or as an option calibration to a definite frequency 100 ... 400 Hz	
accuracy	class 1.5 or as an option class 1.0	
others		
mounting depth	116 mm	
weight approx.	1,2 kg	
additional option	off-set zero to measure reverse (import) and forward (export) power flow	

<i>additional data</i>	refer to Data Sheet No. 070.D.101.##
<i>additional</i>	LQ 96/144 K (K-Series, electronic type)
<i>Watt and VAR Meters</i>	refer to Data Sheet No. 470.D.101.##

– specifications subject to change without notice; date of issue 05/11 –

