



# Data Sheet

K Series  
411.D.101.04

## Analog Meters with Moving-Coil Movement 240° – Dial

LSP 72 K  
LSP 96 K  
LSG 72 K  
LSG 96 K

with Slide-In-Dial



**WEIGEL**

## Application

The 240° moving-coil panel meters **LSP 72/96 K** (K series) are used for the measurement of DC currents or DC voltages; the moving-coil rectifier meters **LSG 72/96 K** measure sinusoidal AC currents or AC voltages.

The instruments cases are injection moulded in flame retardant thermoplastic. The meters are suitable to be mounted in switchboards, control panels, machinery and/or mosaic grid panels.

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

## Movements

Moving-coil movement with a swivel coil system; dual spring loaded jewel bearings for vibration and shock resistance.

The models LSG 72/96 K are AC rectified.

## Mechanical Data

case details	square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic grid panels, stackable	
material of case	polycarbonate thermoplastics, self-extinguishing, non-dripping with UL rating of 94 V – 0	
material of window	glass ▶	
colour of bezel	black (similar to RAL 9005) ▶	
position of use	vertical ±5° ▶	
panel fixing	screw clamps	
mounting	stackable next to each other	
panel thickness	≤ 40 mm	
terminals	hexagon studs with M3 (LSP/G 72 K) or M4 (LSP/G 96 K) screws and wire clamps E3 ▶	
<b>dimensions</b>	<b>LSP/G 72 K</b>	<b>LSP/G 96 K</b>
bezel	□ 72 mm	□ 96 mm
case	□ 66 mm	□ 90 mm
depth	53 mm	53 mm / 104 mm *)
panel cutout	□ 68 <sup>+0.7</sup> mm	□ 92 <sup>+0.8</sup> mm
weight approx.	0.25 kg	0.3 kg

\*) LSG 96 K including built-in miniature current transformer

## Electrical Data

measuring unit	LSP	DC current or DC voltage
	LSG	AC current or AC voltage
frequency range	LSG	voltage 40 Hz ... 50 Hz ... 10 kHz current 50 Hz (others on request)
overload capacity (acc. to DIN EN 60 051)		
continuously		1.2 times rated voltage / current
5 s max.		
voltmeters		2 times rated voltage
ammeters		10 times rated current
pollution level		2
operating voltage		600 V ▶
excess voltage category		CAT II ▶
enclosure code		IP 52 case IP 00 for terminals without protection against accidental contact IP 20 for terminals protected against accidental contact ▶

▶ also refer to "Options"

## Measuring Ranges

current	internal resistance*) / voltage drop approx.		voltage	sensitivity*)	
	LSP	LSG		LSP	LSG
100 µA	6500 Ω	1.5 V	60 mV	200 Ω/V	–
150 µA	4900 Ω	1.5 V	100 mV	200 Ω/V	–
250 µA	2500 Ω	1.5 V	150 mV	200 Ω/V	–
400 µA	2500 Ω	1.5 V	250 mV	200 Ω/V	–
600 µA	1700 Ω	1.5 V	400 mV	1 kΩ/V	–
1 mA	270 Ω	1.5 V	600 mV	1 kΩ/V	–
1.5 mA	225 Ω	1.5 V	1 V	1 kΩ/V	–
2.5 mA	135 Ω	1.5 V	1.5 V	1 kΩ/V	900 Ω/V
4 mA	85 Ω	1.5 V	2.5 V	1 kΩ/V	900 Ω/V
5 mA	12 Ω	1.5 V	4 V	1 kΩ/V	900 Ω/V
6 mA	60 mV	1.5 V	6 V	1 kΩ/V	900 Ω/V
10 mA	60 mV	1.5 V	10 V	1 kΩ/V	900 Ω/V
15 mA	60 mV	1.5 V	15 V	1 kΩ/V	900 Ω/V
20 mA	60 mV	1.5 V	25 V	1 kΩ/V	900 Ω/V
25 mA	60 mV	1.5 V	40 V	1 kΩ/V	900 Ω/V
40 mA	60 mV	1.5 V	60 V	1 kΩ/V	900 Ω/V
60 mA	60 mV	1.5 V	100 V	1 kΩ/V	900 Ω/V
100 mA	60 mV	1.5 V	150 V	1 kΩ/V	900 Ω/V
150 mA	60 mV	1.5 V	250 V	1 kΩ/V	900 Ω/V
250 mA	60 mV	1.5 V	400 V	1 kΩ/V	900 Ω/V
400 mA	60 mV	1.5 V	500 V	1 kΩ/V	900 Ω/V
600 mA	60 mV	1.5 V	600 V	1 kΩ/V	900 Ω/V
1 A **)	60 mV	0.2 V	▶	▶	
1.5 A **)	60 mV	0.2 V			
2.5 A **)	60 mV	0.2 V			
4 A **)	60 mV	0.3 V			

### LSG for use on transformer

N/1 A **)	–	0.2 V	sec. 100 V	–	900 Ω/V
N/5 A **)	–	0.3 V	sec. 110 V	–	900 Ω/V

(scaling without overload range) ▶

### LSP for use on transducer ("live zero")

0/4 ... 20 mA electrically suppressed zero with zero adjustment, voltage drop approx. 900 mV

### LSP for use with external shunt

60 mV	sensitivity*)	200 Ω/V
150 mV	sensitivity*)	200 Ω/V

a total lead resistance of 0.050 Ω is considered in the calibration of the indicator for interconnecting leads 1 m, 2x 0.75 mm<sup>2</sup> ▶

\*) the resistance values are limited to a tolerance of ±20% ▶

\*\*) separate (LSG 72 K) resp. built-in (LSG 96 K) miniature current transformer 50 Hz, 10 mA sec. included

## Scaling

scale	flat dial	
pointer	bar / knife-edge pointer	
colour of pointer	black ▶	
pointer deflection	0 ... 240°	
colour of dial	white ▶	
scale characteristics	linear	
scale division	coarse-fine	
scale length	LSP/G 72 K	LSP/G 96 K
	106 mm	142 mm



## Analog Meters with Moving-Coil Movement 240° – Dial

### Accuracy at Reference Conditions

accuracy class 1.5 according to DIN EN 60 051 ▶

#### reference conditions

ambient temperature 23°C ± 1K  
 position of use nominal position ± 1° ▶  
 input rated measuring value  
 frequency LSG 50 ± 2 Hz  
 wave form LSG sinusoidal, distortion factor < 5%  
 others DIN EN 60 051

#### influences

ambient temperature -25°C ... +23°C ... +40°C  
 position of use nominal position ± 5°  
 frequency LSG 40 Hz ... 50 Hz ... 10 kHz  
 stray magnetic field 0.5 mT

### Environmental

climatic suitability climatic class 2 ▶  
 according to VDE/VDI 3540 sheet 2 ▶  
 operating temperature range -25 ... +40°C ▶  
 storage temperature range -25 ... +65°C  
 temperature range  
 relative humidity ≤ 75% annual average, non-condensing  
 shock resistance 15 g, 11 ms  
 vibration resistance 2.5 g, 5 ... 55 Hz

### Rules and Standards

DIN 43 700 measuring and control instruments for panel mounting; nominal case and cutout dimensions  
 DIN 43 701 electrical switchboard instruments  
 DIN 43 718 bezels and front panels  
 DIN 43 802 scales and pointers for electrical measuring instruments  
 DIN 16 257 nominal position of use and position symbols applicable for measuring instruments  
 DIN 40 050 enclosure codes; protection of electrical equipment against ingress of solid foreign bodies and of water  
 DIN EN 60 051 direct acting indicating electrical measuring instruments and their accessories  
 DIN EN 61 010 safety requirements for electrically operated measuring, control and laboratory equipment  
 VDE/VDI 3540 sheet 2 reliability of measuring and control equipment (classification of climates)

### Options

**measuring range**  
 special measuring range deviating from standard  
 measuring range adjustment adjustment potentiometer installed in voltmeters LSP/LSG 96 K, adjustment range approx. ± 10% or ± 20 ... 50%; ammeters and LSP/G 72 K on request  
 accuracy class 1.0 with fine scale division (as far as practicable)

adjustment of internal resistance to ± 1% at 23°C  
 lead resistance calibration to > 0.05Ω  
 increased sensitivity to 2 kΩ/V, 5 kΩ/V or 10 kΩ/V for voltmeters 1 ... 600 V (as far as practicable)

#### case

window non-glaring glass  
 colour of bezel gray (similar to RAL 7037)  
 position of use horizontal or to be specified 15° ... 165°  
 terminals connector blades 6.3 x 0.8

#### performance

climatic suitability limited use in the tropics  
 climatic class 3 according to VDE/VDI 3540  
 with operating temperature range -25 ... +55°C  
 marine application non-certified  
 enclosure code at least IP 53 (front of case with meter mounted)

#### electrical data

operating voltage up to 1000 V  
 excess voltage up to CAT III  
 category

#### terminal protection

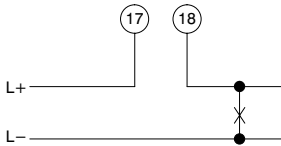
full-sized rear cover or protective sleeves  
 safe against accidental backhanded and fingertip contact  
 complying with VBG 4 / DIN 57 106, section 100

#### dial

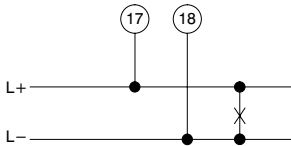
blank dial pencil marked initial and end values  
 scale division 0 ... 100%, linear, full-scale values acc. to DIN series (1-1.2-1.5-2-2.5-3-4-5-6-7.5 and any decimal multiple of these numbers e.g. 150 m³/h) or deviating from DIN series; special calibration from customer's non-linear graph or chart; scaling of voltmeters in ohms; captions optional  
 2<sup>nd</sup> scale division including figuring  
 coloured dial dial plate black; pointer, DIN scale division and figuring yellow or white non-glaring glass window included  
 additional lettering to be specified e.g. "generator"  
 additional figuring to be specified  
 coloured marks red, green or blue for important scale values  
 coloured sector red, green or blue within scale division  
 logo on the dial none or to be specified  
 zero position centre zero or off-set zero  
 overload scaling 2 to 5 times rated current  
 LSG ammeters for use on CT  
 expanded scale expanded initial scale division (electronically) up to approx. 5% of full-scale value in centre scale  
**dial illumination** by two lamps 6 V, 12 V or 24 V, dial translucent (LSP/LSG 96 K only; LSP/LSG 72 K on request)

## Connections

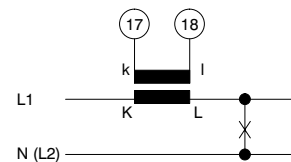
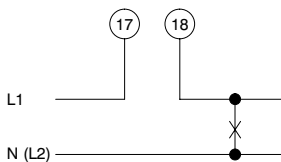
### DC current



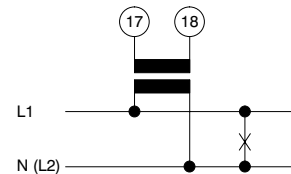
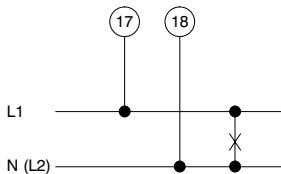
### DC voltage



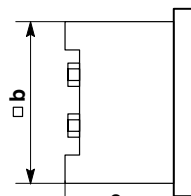
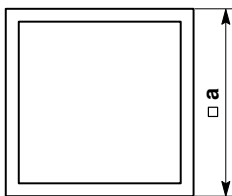
### AC current



### AC voltage



## Dimensions



dimensions (in mm)	LSP/G 72 K	LSP/G 96 K
a	72	96
b	66	90
c	53	53 / 104 *

\*) LSG 96 K including built-in miniature current transformer

## Ordering Information

type LSP LSG	240° moving-coil panel meter measuring DC current or DC voltage measuring AC current or AC voltage
front dimensions 72 K 96 K	72 mm x 72 mm 96 mm x 96 mm
measuring ranges	refer to preceding table
special measuring range	to be specified **)
measuring range adjustment (voltmeters)	none *) adjustment range $\pm 10\%$ approx. ***) adjustment range $\pm 20 \dots 50\%$ approx. ***)

accuracy class	1.5 *) 1.0 with fine scale division
adjustments	internal resistance to $\pm 20\%$ *) internal resistance to $\pm 1\%$ at 23 °C lead resistance $> 0.05 \Omega$
sensitivity (voltmeters)	1 k $\Omega/V$ *) increased to 2 k $\Omega/V$ increased to 5 k $\Omega/V$ increased to 10 k $\Omega/V$
window	glass *) non-glaring glass
colour of bezel	black (similar to RAL 9005) *) gray (similar to RAL 7037)
position of use	vertical *) to special order 15 ... 165°
climatic suitability	class 2, -25 ... +40 °C *) class 3, -25 ... +55 °C
marine application	none *) non-certified
enclosure code	IP 52 *) IP 53 at least
terminal safety protection	none *) full-sized rear cover ***) protective sleeves
terminals	screws and wire clamps *) connector blades 6.3 x 0.8
dial	scale division and measuring range alike resp. full-scale values to DIN series blank dial scale division and figuring 0 ... 100% deviating from DIN series **) calibration fr. non-linear graph or chart **) scaling in ohms for voltmeters **) 2 <sup>nd</sup> scale division **) black dial, yellow scale division black dial, white scale division additional lettering to be specified **) additional figuring to be specified **) coloured marks red, green or blue **) coloured sector red, green or blue **)
logo on dial	WEIGEL *) none OEM logo **)
zero position	left-hand zero *) centre zero or off-set zero **)
expanded initial scale	none *) up to approx. 5%, electronically
overload scaling LSG ammeters for CT use	without overload range *) 2 to 5 times rated current
dial illumination	none *) by 2 lamps 6 V, 12 V or 24 V ***)

\*) standard

\*\*) Please clearly add the desired specifications.

\*\*\*) LSP/G 96 K only

### ordering example

LSP 72 K, measuring range 0 ... 20 mA, scale 0 ... 100 A,  
window non-glaring glass, WEIGEL logo

- specifications subject to change without notice; date of issue 03/05 -

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