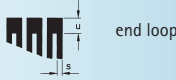


## Series K Strain Gages

Technical data			
Type		LK11, LK13, DK11, DK13, XK51, XK53, XK11, XK13, MK11	LK21, LK23, LK41, DK21, DK23, XK61, XK21, MK21
strain gage construction		foil strain gage with embedded measuring grid, with integrated leads	foil strain gage open face, with integrated solder tabs
measuring grid material	$\mu\text{m}$	Constantan foil	
measuring grid thickness		5	
carrier material	$\mu\text{m}$	phenolic resin, glass fibre reinforced	
carrier base thickness	$\mu\text{m}$	25 $\pm$ 8	35 $\pm$ 10
carrier cover thickness	$\mu\text{m}$		-
connections		nickel plated Cu leads, approx. 30mm in length	-
nominal resistance	$\Omega$		350
resistance tolerance <sup>2)</sup>	%	$\pm 0,35$	$\pm 0,3$
gage factor			approx. 2
nominal value of gage factor			specified on each package
gage factor tolerance	%		$\pm 0,7$
temperature coefficient of the gage factor	1/K		ca. $(115 \pm 10) \cdot 10^{-6}$
nominal value of temperature coefficient of gage factor			specified on each package
reference temperature	$^{\circ}\text{C}$		23
operation temperature range for static, i.e. zero point related measurements	$^{\circ}\text{C}$	-	70 ... + 200
operation temperature range for dynamic, i.e. not zero point related measurements	$^{\circ}\text{C}$	-	200 ... + 200
transverse sensitivity within reference temperature range using adhesive Z 70 on strain gage type LK 11-6/120	%		- 0,9
temperature variation			specified on each package
temperature variation acc. to selection, adjusted to thermal expansion coefficient $\alpha$			
$\alpha$ for ferretic	1/K		$10,8 \cdot 10^{-6}$
$\alpha$ für Aluminum	1/K		$23 \cdot 10^{-6}$
other adaptations on request			
temperature variation tolerance	1/K		$\pm 0,3 \dots 10^{-6}$
adjustment of the temperature variation within range	$^{\circ}\text{C}$		-10 ... + 120
creep adjustment The end loop length „u“ corresponds to a multiple of the grid line width s		ID letter	
		A: u = 1s	M: u = 7s
		C: u = 2s	O: u = 8s
		E: u = 3s	Q: u = 9s
		G: u = 4s	S: u = 10s
		I: u = 5s	U: u = 11s
		K: u = 6s	W: u = 12s
mechanical hysteresis <sup>1)</sup> at reference temperature and strain $\epsilon = \pm 1000 \mu\text{m}/\text{m}$ on strain gage type LK11E-3/350			
at 1st load cycle and adhesive Z 70	$\mu\text{m}/\text{m}$		1,1
at 3rd load cycle and adhesive Z 70	$\mu\text{m}/\text{m}$		0,8
maximum elongation <sup>1)</sup> at reference temperature using adhesive Z 70 on strain gage type LK 11-6/120			
strain limit $\epsilon$ for positive direction	$\mu\text{m}/\text{m}$		20 000 ( $\Delta \leq 2 \%$ )
strain limit $\epsilon$ for negative direction	$\mu\text{m}/\text{m}$		50 000 ( $\Delta \leq 5 \%$ )
fatigue life <sup>1)</sup> at reference temperature using adhesive Z 70 on strain gage type LK 11-6/120 stress cycle value $L_N$ at alternating strain $\epsilon_a = \pm 1000 \mu\text{m}/\text{m}$ and zero zero point drift $\Delta \epsilon_m \leq 300 \mu\text{m}/\text{m}$ $\Delta \epsilon_m \leq 30 \mu\text{m}/\text{m}$			$\gg 10^7$ $3 \cdot 10^6$
minimum radius of curvature, longitudinal and transverse, at reference temperature	mm		3
usable bonding materials			
cold curing adhesives			Z 70; X 60; X 280
hot curing adhesives			EP 250; EP 310

<sup>1)</sup> The data depend on the various parameters of the specific application and are therefore stated for representative examples only.

<sup>2)</sup> With measuring grid lengths of 0.6 mm, the nominal resistance may deviate by  $\pm 1\%$ .