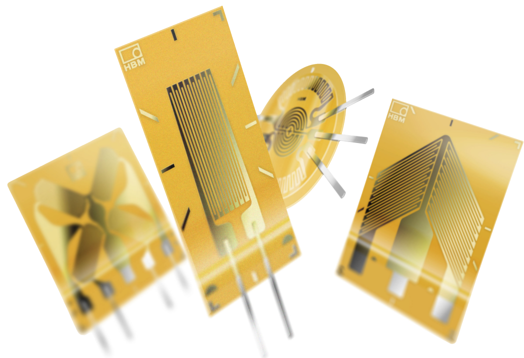
DATA SHEET

Y series
Strain gages for experimental stress analysis

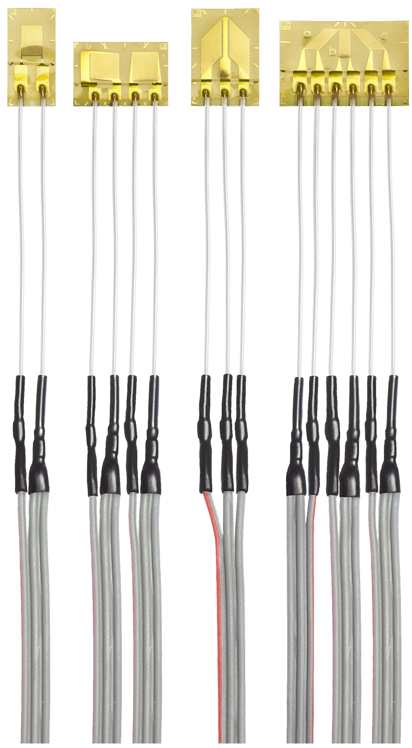
SPECIAL FEATURES

- Universal strain gage
- Excellent measuring properties
- Various connection configurations
- Flexible and therefore easy to handle
- Wide range of geometries in stock
- Many geometries are available with different nominal (rated) resistances (120, 350, 700, 1,000 Ω)



Also available with connection cables

- No soldering to the measuring point required
- Faster installation
- TPE cable in lengths from 0.5 m to 10 m in 3- or 4-wire configuration
- Fluoropolymer-insulated wire on the strain gage prevents the cable from sticking during installation



SPECIFICATIONS

Strain gage construction		Foil strain gage with embedded measuring grid	
Measuring grid Material Thickness	 µm	 Constantan approx. 3.8 or 5 (depending on the strain gage type)	
Carrier Material Thickness	 µm	 Polyimide 45 ±15	
Covering agent Material		 Polyimide	
Connections Solder tabs Leads Stranded wires Ribbon cables		 Integrated solder tabs Copper beryllium solder tabs with strain relief Nickel-plated copper leads, non-insulated, approx. 30 mm long Fluoropolymer-insulated stranded wires, cross-section 0.06 mm², outside diameter 0.6 mm, approx. 50 mm long Stranded wires crimped to AWG28 (TPE-insulated) ribbon cables in a 3- or 4-wire configuration in different lengths, cross-section 0.09 mm² and outside diameter of approx. 0.95 mm per wire	
Nominal (rated) resistance[1)]	Ω	120, 350, 700 or 1,000 (depending on the strain gage type)	
Resistance tolerance[1)2)] Strain gage with solder tabs Strain gage with leads and stranded wires	 % %	 ±0.3 ±0.35	
Gage factor		approx. 2	
Nominal value of gage factor		Specified on each package	
Gage factor tolerance[1)] with ≤1.5 mm measuring grid length with ≥3 mm measuring grid length	 % %	 ±1.5 ±1.0	
Temperature coefficient of gage factor[1)]	1/K	approx. $(115 \pm 10) \cdot 10^{-6}$	
Nominal value of gage factor temperature coefficient		Specified on each package	
Reference temperature	°C	23	
Operating temperature range		For static measurements (zero point related)	For dynamic measurements (not zero point related)
Strain gage with solder tabs, leads	°C	-70...+200	-200...+200
Strain gage with stranded wires	°C	-70...+200	-65...+200
Strain gage with ribbon cables	°C	-40...+120	-20...+120
Transverse sensitivity At reference temperature when using Z70 adhesive on strain gage type LY11-6/120	 %	Specified on each package -0.1	
Temperature response		Specified on each package	
Temperature response as required, adapted to coefficients of thermal expansion	1/K		
α for ferritic steel	1/K	$10.8 \cdot 10^{-6}$	
α for aluminum	1/K	$23 \cdot 10^{-6}$	
α for plastic	1/K	$65 \cdot 10^{-6}$	
α for austenitic steel	1/K	$16 \cdot 10^{-6}$	
α for titanium	1/K	$9 \cdot 10^{-6}$	
α for silica	1/K	$0.5 \cdot 10^{-6}$	
Tolerance of temperature response[1)]	1/K	$\pm 0.3 \cdot 10^{-6}$	
Adaptation of temperature response in the range[3)]	°C	-10 ... +120	

Maximum elongation[4]		Absolute strain value ε for positive direction	Absolute strain value ε for negative direction
At reference temperature when using Z70 adhesive on strain gage type LY11-6/120			
Strain gage with solder tabs, leads	µm/m	50,000 (≙ 5%)	50,000 (≙ 5%)
Strain gage with stranded wires, ribbon cables	µm/m	20,000 (≙ 2%)	25,000 (≙ 2.5%)
Fatigue strength[4]			
At reference temperature when using X60 adhesive on strain gage type LY61-6/120			
Achievable number of load cycles L_w with alternating strain $\varepsilon_w = \pm 1{,}000$ µm/m			
Strain gage with solder tabs, leads			
Variation of zero point ε_m Δ ≤300 µm/m		>>10^7 (test was aborted at 10^7)	
Variation of zero point ε_m Δ ≤30 µm/m		>10^7 (test was aborted at 10^7)	
Strain gage with stranded wires, ribbon cables			
Variation of zero point ε_m Δ ≤300 µm/m		>10^7 (test was aborted at 10^7)	
Variation of zero point ε_m Δ ≤30 µm/m		$5 \cdot 10^6$	
Minimum radius of curvature, longitudinal and transverse, at reference temperature			
Strain gage with leads	mm	0.3	
Strain gage with integrated solder tabs			
In the area of the measuring grid	mm	0.3	
In the area of the solder tabs	mm	2	
Strain gage with stranded wires, ribbon cables			
In the area of the measuring grid	mm	0.3	
In the area of the solder tabs	mm	10	
Suitable bonding material			
Cold curing adhesives		CA80, X60, X280	
Hot curing adhesives		P250, EP310N	

1) Strain gage properties without ribbon cables
2) With measuring grid lengths of 0.3, 0.6 and 1.5 mm, the nominal (rated) resistance may deviate by ±1%. For LY5x types the deviation is ±0.75%. For XY9x, RY9x and KY types it is ±0.5% (per chain)
3) Adaptation to plastic (code number 8) is only possible in the temperature range -10 … +50 °C
4) The data depend on the specific installation parameters and are therefore provided as representative examples only.

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