

Special Purpose Sensors - Strip Gage Patterns

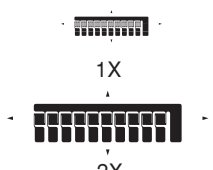

A strip gage consists of ten strain-sensitive grids mounted on a common backing. This type of gage offers a number of advantages in the study of local strain distributions and strain gradients. As an example, it is much easier, faster, and more accurate to install the ten-grid strip in a single operation than it would be to align and bond ten individual gages for the same purpose. In addition, the optical tooling employed in the manufacture of the strip gage ensures that all grids are precisely located. Grid spacing is also closer than can usually be achieved with individual gages, thus yielding better resolution of nonuniform strain fields.

Overall dimensions for the complete patterns vary with the grid and solder-tab configurations. When necessary, some types of the gages can be cut to produce smaller assemblies with fewer grids. Most sizes are offered in two different versions — with all grids oriented either parallel to, or perpendicular to, the long axis of the strip. As indicated in the gage listings, several types of strip gages are designed with a common tab, or bus, connected to all grids on one side. Since this arrangement affects measurement accuracy, and may not be compatible with some instrument systems, the following information should be considered when contemplating the use of such gages.

COMMON-TAB STRIP GAGES


Common-tab strip gages are generally not compatible with multi-channel instruments, particularly those incorporating individual bridge excitation supplies. When used with this type of instrumentation, they will yield significantly lower accuracy than a strip gage with electrically independent grids. Effects of the common tab include excessive initial unbalance of the Wheatstone bridge circuit (possibly beyond the balance range of the instrumentation), circulating currents when the grids are powered simultaneously from a common power supply, loss of leadwire temperature compensation, and reduced accuracy in shunt calibration. All of these effects should be carefully considered by the user before selecting strip gages with common tabs. Where greatest accuracy is required, strip gages with electrically independent grids should be employed, or common-tab strip gages may be used with single-channel instruments in conjunction with a switch and balance unit.


For further information, and practical recommendations on the use of common-tab strip gages, request Vishay Micro-Measurements Tech Note TN-516, Errors Due to Shared Leadwires in Parallel Strain Gage Circuits.


GAGE PATTERN				GAGE DESIGNATION	RES. IN OHMS	OPTIONS AVAILABLE
Actual size shown. Enlarged when necessary for definition.				Insert desired S-T-C number in spaces marked XX.	Tolerance is increased when Option W, E, SE, LE, or P is specified.	
ES = Each section CP = Complete pattern S = Section (S1= Sec 1) M = Matrix				inch		
				millimeter		
<div>020PF</div> <div></div>				Miniature ten-element strip gage for strain gradient determination. One tab common to all sections. Grid centerline spacing 0.035 in (0.89 mm). Similar to 020MT pattern but with grids rotated 90°. Resistance is measured between a single point on the common tab, and each individual grid tab.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH			
0.020 ES	0.100 CP	0.030 ES	0.385 CP			
0.51 ES	2.54 CP	0.76 ES	9.78 CP			
MATRIX SIZE	0.19L x 0.48W		4.8L x 12.2W	EA-XX-020PF-120 SA-XX-020PF-120	120 ± 1.0% 120 ± 2.0%	E, SE, L, LE
<div>020MT</div> <div></div>				Miniature ten-element strip gage for strain gradient determination. One tab common to all sections. Grid centerline spacing 0.035 in (0.89 mm). Similar to 020PF pattern but with grids rotated 90°. Resistance is measured between a single point on the common tab, and each individual grid tab.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH			
0.020 ES	0.385 CP	0.025 ES	0.100 CP			
0.51 ES	9.78 CP	0.64 ES	2.54 CP			
MATRIX SIZE	0.48L x 0.19W		12.2L x 4.8W	EA-XX-020MT-120 SA-XX-020MT-120	120 ± 1.0% 120 ± 2.0%	E, SE, L, LE

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ES = Each section S = Section (S1= Sec 1)	CP = Complete pattern M = Matrix	<div>inch millimeter</div>		

031MF 				Miniature ten-element strip gage with electrically independent grids. All grids parallel to long axis of pattern. Grid centerline spacing 0.080 in (2.03 mm). See also 031PJ pattern.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH	EA-XX-031MF-120 SA-XX-031MF-120	120 ± 0.5% 120 ± 1.0%	E, SE
0.031 ES	0.790 CP	0.032 ES	0.080 CP			
0.79 ES	20.07 CP	0.81 ES	2.03 CP			
MATRIX SIZE	0.94L x 0.19W		23.9L x 4.8W			


031MH 				Similar to 031MF pattern except alternate grids perpendicular to long axis of pattern. Grid centerline spacings 0.090 and 0.070 in (2.29 and 1.78 mm) alternately.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH	EA-XX-031MH-120 SA-XX-031MH-120	120 ± 0.5% 120 ± 1.0%	E, SE
0.031/0.020	0.790 CP	0.032/0.070	0.080 CP			
0.79/0.51	20.07 CP	0.81/1.78	2.03 CP			
MATRIX SIZE	0.90L x 0.16W		22.9L x 4.1W			


031MY 				Similar to 031MF pattern except produced in K alloy.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH	SK-XX-031MY-120	120 ± 1.0%	
0.031 ES	0.790 CP	0.032 ES	0.080 CP			
0.79 ES	20.07 CP	0.81 ES	2.03 CP			
MATRIX SIZE	0.93L x 0.22W		23.6L x 5.6W			

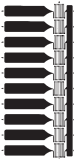


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031PJ 				Miniature ten-element strip gage with electrically independent grids. All grids perpendicular to long axis of pattern. Grid centerline spacing 0.080 in (2.03 mm). See also 031MF pattern.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH			
0.031 ES	0.090 CP	0.070 ES	0.790 CP			
0.79 ES	2.29 CP	1.78 ES	20.07 CP			
MATRIX SIZE	0.17L x 0.90W		4.3L x 22.7W	EA-XX-031PJ-120 SA-XX-031PJ-120	120 ± 0.5% 120 ± 1.0%	E, SE

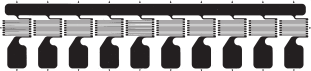
045PG 				Miniature ten-element strip gage with electrically independent grids. All grids perpendicular to long axis of pattern. Grid centerline spacing 0.095 in (2.41 mm).		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH			
0.045 ES	0.120 CP	0.085 ES	0.935 CP			
1.14 ES	3.05 CP	2.16 ES	23.75 CP			
MATRIX SIZE	0.21L x 1.00W		5.3L x 25.4W	EA-XX-045PG-120 EP-08-045PG-120 SA-XX-045PG-120 SK-XX-045PG-350	120 ± 0.5% 120 ± 0.5% 120 ± 1.0% 350 ± 1.0%	E, SE

062MD 				Ten-element strip gage with one tab common to all sections. All grids parallel to long axis of pattern. Grid centerline spacing 0.080 in (2.03 mm). Resistance is measured across each grid. See 062MW pattern for more compact geometry.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH			
0.062 ES	0.795 CP	0.062 ES	0.350 CP			
1.57 ES	20.19 CP	1.57 ES	8.89 CP			
MATRIX SIZE	0.91L x 0.43W		23.1L x 10.9W	EA-XX-062MD-120 EP-08-062MD-120	120 ± 0.5% 120 ± 0.5%	

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062MW 				Ten-element strip gage with one tab common to all sections. Similar to 062MD pattern but narrower geometry. All grids parallel to long axis of pattern. Grid centerline spacing 0.080 in (2.03 mm). Resistance is measured across each grid.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH			
0.062 ES	0.795 CP	0.050 ES	0.168 CP			
1.57 ES	20.19 CP	1.27 ES	4.27 CP			
MATRIX SIZE	0.90L x 0.25W		22.9L x 6.4W	EA-XX-062MW-120 EP-08-062MW-120	120 ± 0.5% 120 ± 0.5%	

125MW  HORIZONTAL POSITION				Ten-element strip gage with one tab common to all sections. All grids parallel to long axis of pattern. Grid centerline spacing is 0.160 in (4.06 mm). Resistance is measured across each grid.		
GAGE LENGTH	OVERALL LENGTH	GRID WIDTH	OVERALL WIDTH			
0.125 ES	1.590 CP	0.100 ES	0.336 CP			
3.18 ES	40.39 CP	2.54 ES	8.53 CP			
MATRIX SIZE	1.68L x 0.43W		42.7L x 10.9W	EA-XX-125MW-120	120 ± 0.5%	