

## Special Use Sensors—High-Temperature Strain Gages

ZWH-, ZWN-, and ZWP-Series strain gages are designed for dynamic and limited static strain measurement at high-temperature. These strain gages are manufactured using a round wire for superior bonding ability and performance. A high-fatigue wire (Option Z) is also available on each of the gages. These gages are supplied with a fiberglass-reinforced tape carrier which holds the grid and leads in place during installation and are bonded using ceramic cements or Rokide® flame spray. The shelf-life of these gages is 9 months.

### ZWH SPECIFICATIONS AND FEATURES

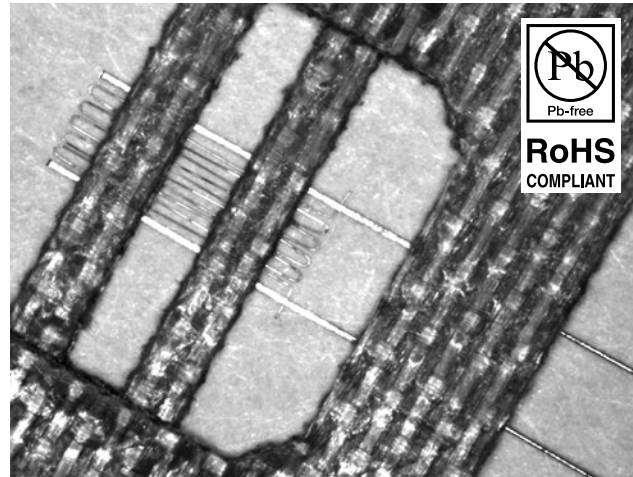
- Maximum operating temperature: 1500°F (816°C)
- Iron-Chrome-Aluminum alloy (Hoskins 875™)
- Resistance (nominal): 120 Ω
- Gage factor (nominal): 2.0
- Measurement type: Static (with compensating gage, half or full bridge)
- Standard leads: Hoskins 875™, 0.003-in diameter
- High resistivity and excellent oxidation resistance
- Recommended for high temperature static strain measurements where a compensating gage, half-bridge or full-bridge configuration is required

### ZWN SPECIFICATIONS AND FEATURES

- Maximum operating temperature: 1600°F (871°C)
- Nichrome V alloy
- Resistance (nominal): 120 Ω
- Gage factor (nominal): 2.0
- Measurement type: Dynamic
- Standard leads: Chromel, 0.003-in diameter
- High fatigue strength and excellent oxidation resistance
- Recommended for dynamic strain measurements on turbine blades and engines, exhaust systems, and power plant applications

### ZWP SPECIFICATIONS AND FEATURES

- Maximum operating temperature: 1900°F (1038°C)
- Platinum-Tungsten alloy
- Resistance (nominal): 120 Ω
- Gage factor (nominal): 4.0
- Measurement type: Dynamic
- Standard leads: Platinum/Nickel, 0.003-in diameter
- Excellent high-temperature oxidation resistance and low, stable temperature coefficients of resistance
- Widely used for test and failure analysis in aerospace and automotive applications



### APPLICATIONS


- Gas turbines
- Steam generation and turbines
- Automotive exhaust systems
- Many others


### ACCESSORIES USED DURING INSTALLATION

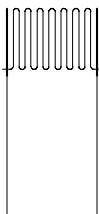
- CSM Degreaser
- SCP-2 Silicon Carbide Paper
- M-PREP Conditioner A
- M-PREP Neutralizer 5A
- CSP-1 Cotton Tip Applicators
- GSP-1 Gauze Sponges
- SSH-1 Surgical Shears
- STW-1 Tweezers
- Model 700 Welder
- Hand Welding Unit
- NCC-3 Ceramic Cement
- WC-16 Ceramic Cement
- HG-1 Ceramic Cement
- 1-KL-16-002 Nichrome Ribbon
- 326-GJF Fiberglass Insulated Cable
- GT-11 Camel's Hair Brush
- SPT-1 Spatula

## Special Use Sensors—High-Temperature Strain Gages

<b>GAGE PATTERN</b> Not actual size shown.				<b>GAGE DESIGNATION</b>	<b>RESISTANCE IN OHMS</b>
<b>DIMENSIONS</b>			inch millimeter		


				Linear pattern. Gages supplied on glass slides, 5 gages per package.	
<b>GAGE LENGTH</b>	<b>GRID WIDTH</b>	<b>OVERALL WIDTH</b>	<b>LEAD LENGTH (To top of gage)</b>	ZWH-NC-125-120	120
0.160	0.050	0.065	2.75		
4.1	1.3	1.7	70.0		
<b>FATIGUE LIFE</b>	1 × 10 <sup>6</sup> cycles at ±750 µε at room temperature				


				Linear pattern. Gages supplied on glass slides, 5 gages per package.	
<b>GAGE LENGTH</b>	<b>GRID WIDTH</b>	<b>OVERALL WIDTH</b>	<b>LEAD LENGTH (To top of gage)</b>	ZWH-NC-250-120	120
0.250	0.060	0.075	2.75		
6.4	1.5	1.9	70.0		
<b>FATIGUE LIFE</b>	1 × 10 <sup>6</sup> cycles at ±750 µε at room temperature				

				Linear pattern. Gages supplied on glass slides, 5 gages per package.	
<b>GAGE LENGTH</b>	<b>GRID WIDTH</b>	<b>OVERALL WIDTH</b>	<b>LEAD LENGTH (To top of gage)</b>	ZWN-NC-063-120	120
0.063	0.080	0.095	2.75		
1.6	2.0	2.4	70.0		
<b>FATIGUE LIFE</b>	1 × 10 <sup>6</sup> cycles at ±750 µε at room temperature				

Special Use Sensors—High-Temperature Strain Gages

<b>GAGE PATTERN</b> Not actual size shown.		<b>GAGE DESIGNATION</b>	<b>RESISTANCE IN OHMS</b>
<b>DIMENSIONS</b>	<input type="checkbox"/> inch <input type="checkbox"/> millimeter		

				Linear pattern. Gages supplied on glass slides, 5 gages per package.	
<b>GAGE LENGTH</b>	<b>GRID WIDTH</b>	<b>OVERALL WIDTH</b>	<b>LEAD LENGTH (To top of gage)</b>	ZWN-NC-125-120	120
0.130	0.055	0.070	2.75		
3.3	1.4	1.8	70.0		
<b>FATIGUE LIFE</b>	1 × 10 <sup>6</sup> cycles at ±750 µε at room temperature				

				Linear pattern. Gages supplied on glass slides, 5 gages per package.	
<b>GAGE LENGTH</b>	<b>GRID WIDTH</b>	<b>OVERALL WIDTH</b>	<b>LEAD LENGTH (To top of gage)</b>	ZWP-NC-063-120	120
0.063	0.070	0.085	2.75		
1.6	1.8	2.2	70.0		
<b>FATIGUE LIFE</b>	1 × 10 <sup>6</sup> cycles at ±750 µε at room temperature				



## Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Vishay Precision Group, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "VPG"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

The product specifications do not expand or otherwise modify VPG's terms and conditions of purchase, including but not limited to, the warranty expressed therein.

VPG makes no warranty, representation or guarantee other than as set forth in the terms and conditions of purchase. **To the maximum extent permitted by applicable law, VPG disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.**

Information provided in datasheets and/or specifications may vary from actual results in different applications and performance may vary over time. Statements regarding the suitability of products for certain types of applications are based on VPG's knowledge of typical requirements that are often placed on VPG products. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. You should ensure you have the current version of the relevant information by contacting VPG prior to performing installation or use of the product, such as on our website at [vpgsensors.com](http://vpgsensors.com).

No license, express, implied, or otherwise, to any intellectual property rights is granted by this document, or by any conduct of VPG.

The products shown herein are not designed for use in life-saving or life-sustaining applications unless otherwise expressly indicated. Customers using or selling VPG products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify VPG for any damages arising or resulting from such use or sale. Please contact authorized VPG personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Copyright Vishay Precision Group, Inc., 2014. All rights reserved.