

HIGH TEMPERATURE WELDABLE STRAIN GAUGE

series "AW"



WELDABLE STRAIN GAUGE(AWM/AWMD/AWH/AWHU)

These gauges are fully encapsulated in a corrosion-resisting metal tube for use in various environments, including gas-filled atmospheres and underwater. These gauges can be easily installed by using dedicated spot welder W-50R.

AW series coding system

①	②	③	④	⑤	⑥	⑦	⑧
AWM	- 8 -	1	B		- 2		- 17.0
AWMD	- 5 -	A	KM		- 2	(6F)	- 1.6Hz*
AWMD	- 8 -	A			- 2		- 1.6Hz*
AWH	- 8 -	7	A		- 2		- 11.0
AWHU	- 5 -	9	A KM		- 2	(6F)	- 12.7

*High-pass filter only for AWMD Either one available among 1.6, 7.2 or 16Hz

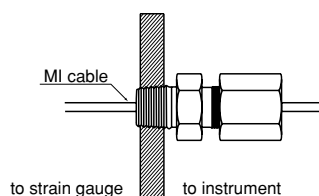
①Type	②Gauge length	③Temperature compensation range	④Backing materials*1	⑤Option
AWM : static/dynamic 300°C	8 : 8mm	0 : -196°C~RT 1 : RT~+300°C	A : Inconel 600 Applicable thermal expansion coefficient of 11ppm/°C or closer	E : Ground earth F : Compression fittings K : Narrow gauge width W=3mm (5mm standard) M : Small junction type of sleeve B φ 2.0mm L=20mm AWHU and AWMD-5 are normally provided with small junction
AWMD : dynamic only 800°C	5 : 5mm 8 : 8mm	2 : RT~+350°C 3 : RT~+400°C 4 : RT~+450°C 5 : RT~+500°C	B : AWH SUS321 AWM SUS304 Applicable thermal expansion coefficient of 17ppm/°C or closer	P : NDIS type plug attached*2 R : Bend of gauge backing or pipes Z : Filter-less (AWMD)
AWH : static 600°C dynamic 650°C	4 : 4mm 8 : 8mm	6 : RT~+550°C 7 : RT~+600°C 8 : RT~+650°C 9 : RT~+800°C 10 : Others		
AWHU : static/dynamic 800°C	5 : 5mm 8 : 8mm	NB1: Dynamic use AWMD is not applicable NB2: RT Room temperature		

*1 Select code A for thermal expansion coefficient of 11ppm/°C or closer, or B for coefficient of 17ppm/°C or closer.

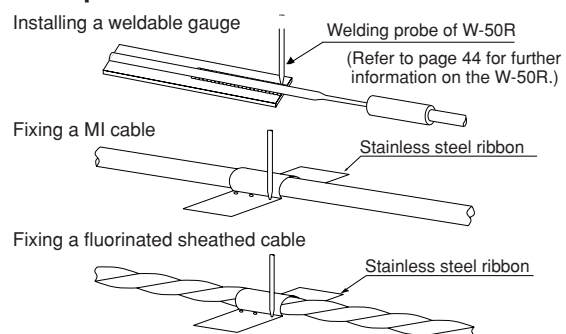
*2 For option code P, NDIS plug with φ 3mm shielded chloroprene cable of 2m is positioned to Temperature-compensation board or High-pass filter. Available with AWMD-8/AWH/AWHU

⑥MI cable	⑦Supplied cable length	⑧Temperature compensation materials or High-pass filter
2 : φ 1.6mm 2m Core cable of heat-resistant copper	No marks : φ 4.1mm shielded vinyl cable of 0.5m long Except for standard length, required length is given in bracket. Example: 4.5m long to (4.5) (6F) φ 1.6mm shielded fluoroethylene propylene cable (FEP) of 0.5m long for AWHU-5, -8, AWMD-5 Except for standard length, required length is given after suffix 6F. Example: 4.5m long to (6F4.5)	Materials available for temperature-compensation 10.9 : SUS430 or equivalent 11.0 : Mild steel (ferritic) or equivalent 12.7 : INCONEL 600 or equivalent 17.0 : SUS304 or equivalent High-pass filter for only AWMD 1.6 : 1.6Hz 7.2 : 7.2Hz 16 : 16 Hz

Option code F for Compression fittings available with AWM/AWMD/AWH/AWHU



Examples of installation



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Operational temperature AWM -196~+300°C AWMD -196~+800°C

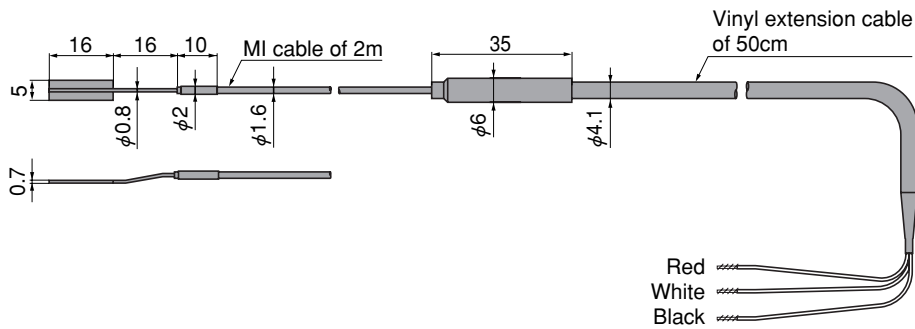
WELDABLE STRAIN GAUGE (AWM · AWMD)

■AWM-8 Quarter bridge with 3-wire system

The AWM is usable up to 300°C for both static and dynamic measurement. The backing material is available in Inconel 600 or SUS304 which should be selected according to the test specimen material.

Type	Gauge length (mm)	Gauge base		Operational temperature < Temperature compensation range > (°C)	Resistance in Ω
		Dimension (mm)	Materials		
Static/Dynamic measurement 300°C	AWM- 8-1A-2-11.0	8	16×5	-196~+300 < Room-temperature~+300 >	120
	AWM- 8-1B-2-17.0				

AWM-8



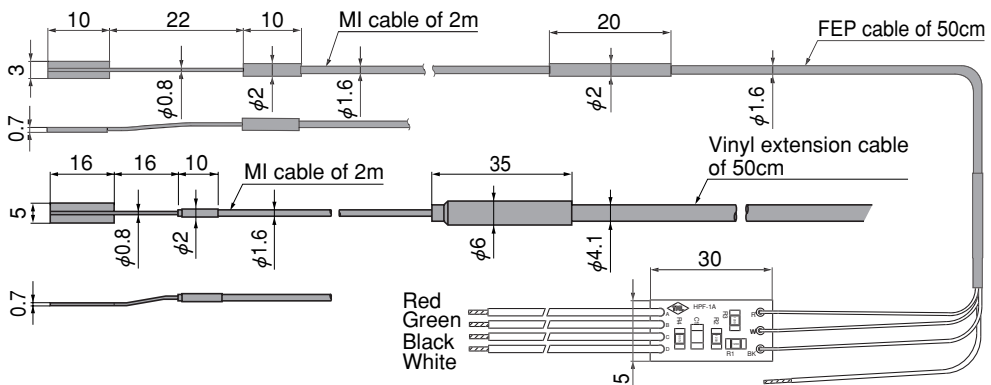
■AWMD-5, AWMD-8 (for dynamic measurement only : -196 to +800°C) Full bridge

The AWMD is applicable up to 800°C and it is dedicated to dynamic strain measurement. A high pass filter is a standard accessory. Using the high pass filter, unnecessary direct current component or low frequency component (thermal output, drift etc.) in the measurement signal can be neglected. The DC exciting dynamic strainmeter (DC-96A/DC-97A) or the smart strain recorder (DC-104R, DC-204R), Multi-Recorder TMR-200 should be used for measurement.

Type	Gauge length (mm)	Gauge base		Operational temperature < Temperature compensation range > (°C)	Resistance in Ω
		Dimension (mm)	Materials		
Dynamic use only 800°C	AWMD-5-AKMS-2 (6F) -1.6Hz*	5	10×3	-196~+800 < ————— >	60
	AWMD-8-A-2-1.6Hz*	8	16×5		120

*Either one available among 1.6, 7.2 or 16Hz

AWMD-5



Option code P for NDIS plug connector (available with AWMD/AWH/AWHU) attached to Temperature-compensation board or High-pass filter

High-pass filter



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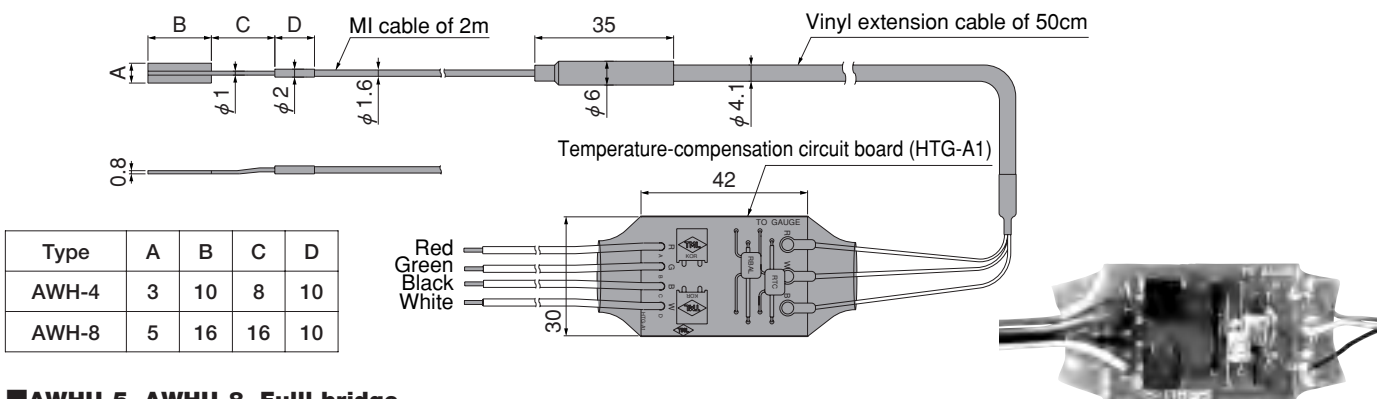
Operational temperature AWH Static $-196\sim+600^{\circ}\text{C}$ Dynamic $-196\sim+650^{\circ}\text{C}$ AWHU $-196\sim+800^{\circ}\text{C}$

WELDABLE STRAIN GAUGE (AWH · AWHU)

■AWH-4, AWH-8 Full bridge

The backing material is available in Inconel 600 or SUS321 which should be selected according to the test specimen material. Although it has a half bridge construction consisting of active and dummy gauges, the measurement is made by the full bridge method using the supplied temperature compensation circuit board. The maximum operational temperature is 600°C for static measurement and 650°C for dynamic measurement.

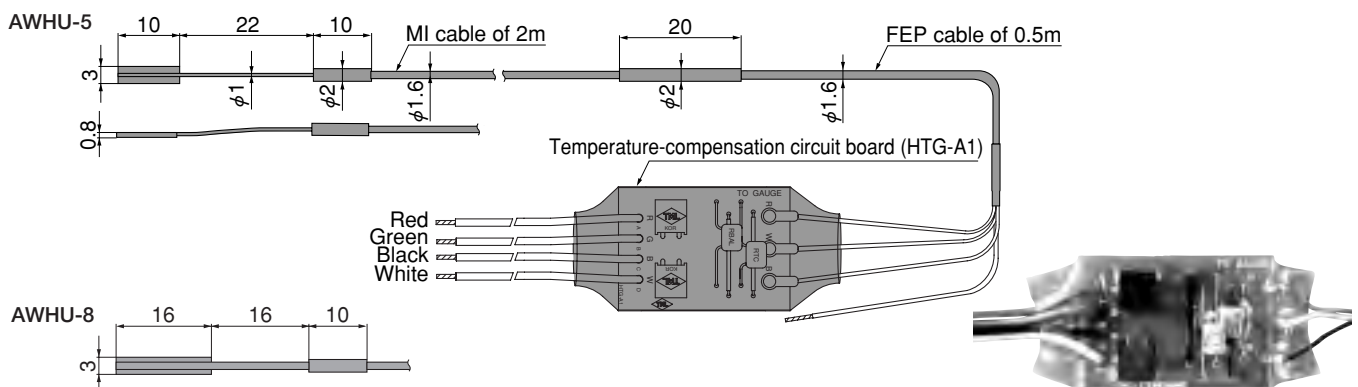
Type	Gauge length (mm)	Gauge base		Operational temperature <Temperature compensation range> ($^{\circ}\text{C}$)	Resistance in Ω
		Dimension (mm)	Materials		
Static measurement 600°C	AWH-4-7A-2-11.0	4	10×3	Static $-196\sim+600$ <Room-temperature $\sim+600$ >	60
	AWH-4-7B-2-17.0				
Dynamic measurement 650°C	AWH-8-7A-2-11.0	8	16×5	Dynamic $-196\sim+650$ <Room-temperature $\sim+650$ >	120
	AWH-8-7B-2-17.0				



■AWHU-5, AWHU-8 Full bridge

These gauges are usable up to 800°C for both static and dynamic measurement. Although it has a half bridge construction consisting of active and dummy gauges, the measurement is made by the full bridge method using the supplied temperature compensation circuit board. The gauge base, junction part and cable of this gauge are constructed small as a standard specification and it is suited for being mounted on a narrow or a curved part.

Type	Gauge length (mm)	Gauge base		Operational temperature <Temperature compensation range> ($^{\circ}\text{C}$)	Resistance in Ω
		Dimension (mm)	Materials		
Static/Dynamic measurement 800°C	AWHU-5-9AKM-2 (6F)-12.7	5	10×3	$-196\sim+800$ <Room-temperature $\sim+800$ >	60
	AWHU-8-9AKM-2 (6F)-12.7	8	16×5		120



HIGH TEMPERATURE WELDABLE STRAIN GAUGE

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Operational temperature AW -196~+300°C AWC -20~+100°C

WELDABLE STRAIN GAUGE(AW · AWC)

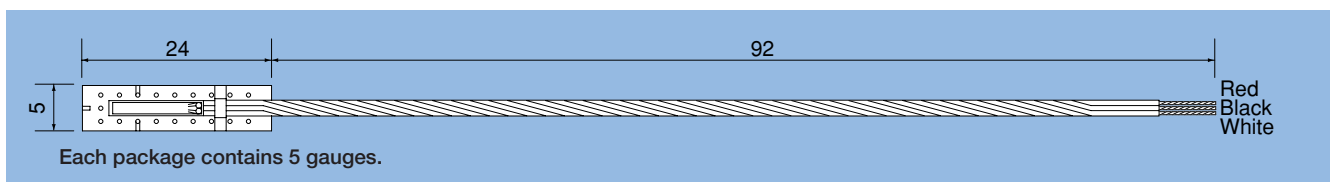
These gauges have corrosion-resisting stainless steel backing with thickness of 0.08mm. They are easily installed by using dedicated spot welder W-50R.

■AW-6-350-11-01LT Quarter bridge with 3-wire system

This gauge is suited for strain measurement in high temperature up to 300°C, for measurement of specimen to which adhesion is not applicable or for long term measurement.

Extension leadwire: ϕ 0.2mm fluorinated resin sheath (PTFE) of 0.1m standard

Type	Gauge length (mm)	Materials of gauge base	Operational temperature (°C)	Temperature compensation range (°C)	Test specimen	Resistance in Ω
AW-6-350-11-01LT	6	SUS 304	-196~+300	+10~+100	Mild steel	350



■AWC-2B-11-3LQ 1-Gauge 4-Wire system

■AWC-8B-11-3LT Quarter bridge with 3-wire system

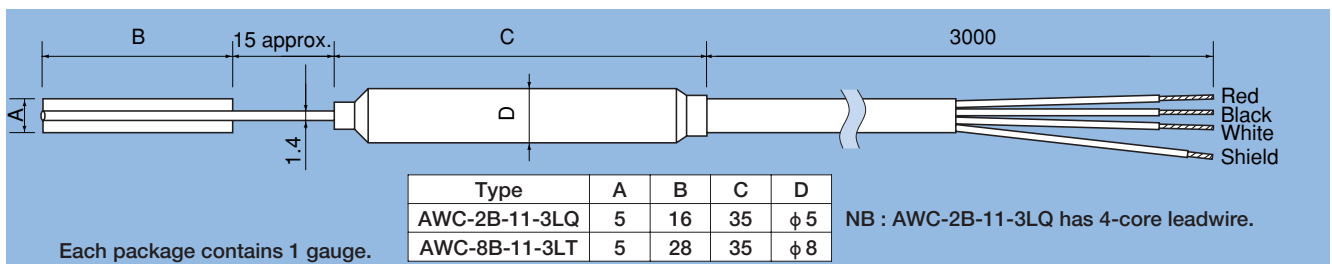
These gauges are fully encapsulated in a stainless steel tube. It enables long term strain measurement in harsh environment.

Extension leadwire:

AWC-2B-11-3LQ : ϕ 3mm 0.05mm² 4-core shielded chloroprene of 3m standard

AWC-8B-11-3LT : ϕ 5mm 0.3mm² 3-core shielded vinyl of 3m standard

Type	Gauge length (mm)	Materials of gauge base	Operational temperature (°C)	Temperature compensation range (°C)	Test specimen	Resistance in Ω
AWC-2B-11-3LQ	2	SUS 304	-20~+100	0~+100	Mild steel	120
AWC-8B-11-3LT	8			+10~+100		



SPOT WELDER W-50R



■SPECIFICATIONS

Welding energy	1~10 watt sec./5~50 watt sec. continuous 60 watt sec. Max. (110V ac. 50Hz)
Output voltage	approx. 32V Max.
Output pulse width	approx. 5 msec.
Repetition use	2 welds/sec. at 50 watt sec.
Rated output	20 min./1.5 welds/sec. at 50 watt sec.
Welding probe	III type probe
Welding force	4.9~19.8N
Welding tip	Arm ϕ 3mm, Nose ϕ 1mm
Cable length	2m
Operation environment	0~+50°C 85%RH or less (no condensation) allowed

This is a capacitive charge spot welder used for installing weldable strain gauges and fixing lead wires. The welding energy is controlled in 2 ranges of 1~10/5~50 watt second continuously, and a stabilizing circuit cancels the effect of changes in the power source voltage. Projecting parts such as electrical cables is packed inside, it is extremely convenient for field applications.

Power source	90~110V ac., 50/60Hz 550VA peak (160msec.), 210VA/2 welds/sec.
Dimensions	300(W)X195(H)X195(D)mm
Weight	13 kg.
Standard accessory	
Operation manual	1
AC Power cable(CR-01)	1
Welding tip	3
Protective cap	2
Abrasive paper (#400)	5
Hexagon head wrench (M2.5)	1
Carrying belt	1