

ε **AW-Series** (AWM, AWMD, AWH, AWHU, AW, AWC)
Weldable Strain Gauges

These strain gauges have strain sensing elements fully encapsulated in corrosion-resisting metal tubes made of stainless steel or Inconel (except AW-6-350). The strain gauge backings are also made of the same material, and the gauges are installed by spot welding to metal specimens using a dedicated spot welder.

■ TYPE

AWM -196~+300° C Quarter bridge 3-wire



AWM-8-1A Gauge base : Inconel 600
AWM-8-1B Gauge base : SUS304

AWMD -196~+800° C for dynamic strain Full bridge



AWMD-5 Gauge base : Inconel 600
AWMD-8 Gauge base : Inconel 600

AWH -196~+600° C for static strain Full bridge
-196~+650° C for dynamic strain



AWH-4-7A/AWH-8-7A Gauge base: Inconel 600
AWH-4-7B/AWH-8-7B Gauge base: SUS304

AW-6 -196~+300° C Quarter bridge 3-wire



AW-6-350-11-4FB01LT

AWHU -196~+800° C Full bridge



AWHU-5 Gauge base: Inconel 600
AWHU-8 Gauge base: Inconel 600



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	④Gauge base*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 B : SUS304 Applicable thermal expansion coefficient of 17ppm/°C or closer	E: Ground earth F: Compression fittings K: Narrow gauge width W=3mm (excluding AWHU) M: Small junction type of sleeve B Φ 2.0mm L=20mm AWHU and AWMD-5 are normally provided with small junction P: NDIS type plug attached*2 R: Bend of gauge backing or pipe Z: Filter-less (AWMD)
AWMD : dynamic only 800°C	5 : 5mm 8 : 8mm	2 : RT ~ +350°C 3 : RT ~ +400°C 4 : RT ~ +450°C		
AWH : static 600°C dynamic 650°C	4 : 4mm 8 : 8mm	5 : RT ~ +500°C 6 : RT ~ +550°C 7 : RT ~ +600°C		
AWHU : static/dynamic 800°C	5 : 5mm 8 : 8mm	8 : RT ~ +650°C 9 : RT ~ +800°C 10 : Others		
		NB1: Dynamic use AWMD is not applicable. NB2: RT Room temperature		

⑥MI cable	⑦Supplied cable length	⑧Temperature compensation materials or High-pass filter
2 : Φ1.6mm 2m Core cable of heat-resistive copper	No marks: Φ 4.1mm shielded vinyl cable of 0.5m 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 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 1.6Hz 7.2Hz 16Hz

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

*2: For option code P, NDIS plug is attached to the end of cables following Temperature-compensation board or High-pass filter.



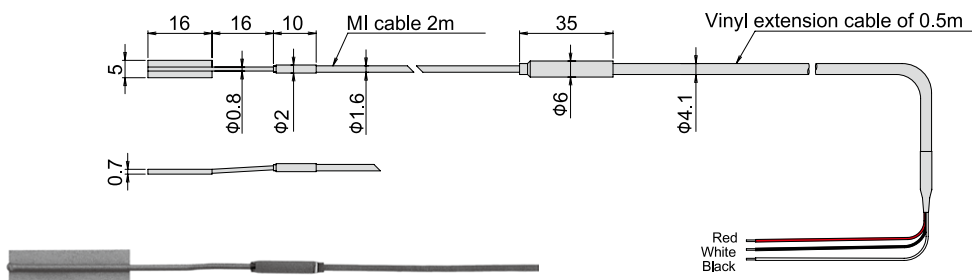
AWM-8

The AWM is usable up to 300°C for both static and dynamic strain 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 Dimension (mm)	Materials	Operating temperature (°C)	Temperature compensation range (°C)	Test specimen	Applicable coefficient of linear thermal expansion ($\times 10^{-6}/^{\circ}\text{C}$)	Resistance in (Ω)
AWM-8-1A-2-11.0	8	L16xW5xT0.7	Inconel 600	For static/dynamic use -196~+300°C	Room-temperature ~ +300°C	Mild steel equivalent	11 $\times 10^{-6}/^{\circ}\text{C}$	120
AWM-8-1B-2-17.0			SUS304			SUS304 equivalent	17 $\times 10^{-6}/^{\circ}\text{C}$	

Leadwire 1.6 mm dia. MI cable 2 m, 4.1 mm dia. shielded vinyl cable 0.5 m (Quarter bridge with 3-wire)
Minimum order quantity is 1 strain gauge.

External dimensions



AWMD-5 / AWMD-8

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 signals can be neglected.

Type	Gauge length (mm)	Gauge base Dimension (mm)	Materials	Operating temperature (°C)	Temperature compensation range (°C)	Test specimen	Applicable coefficient of linear thermal expansion ($\times 10^{-6}/^{\circ}\text{C}$)	Resistance in (Ω)
AWMD-5-AKM-2(6F)-1.6Hz [*]	5	L10xW3xT0.7	Inconel 600	for dynamic use -196~+800°C	N/A	Inconel 600 equivalent	12 $\times 10^{-6}/^{\circ}\text{C}$	60
AWMD-8-A-2-1.6Hz [*]	8	L16xW5xT0.7	Inconel 600					120

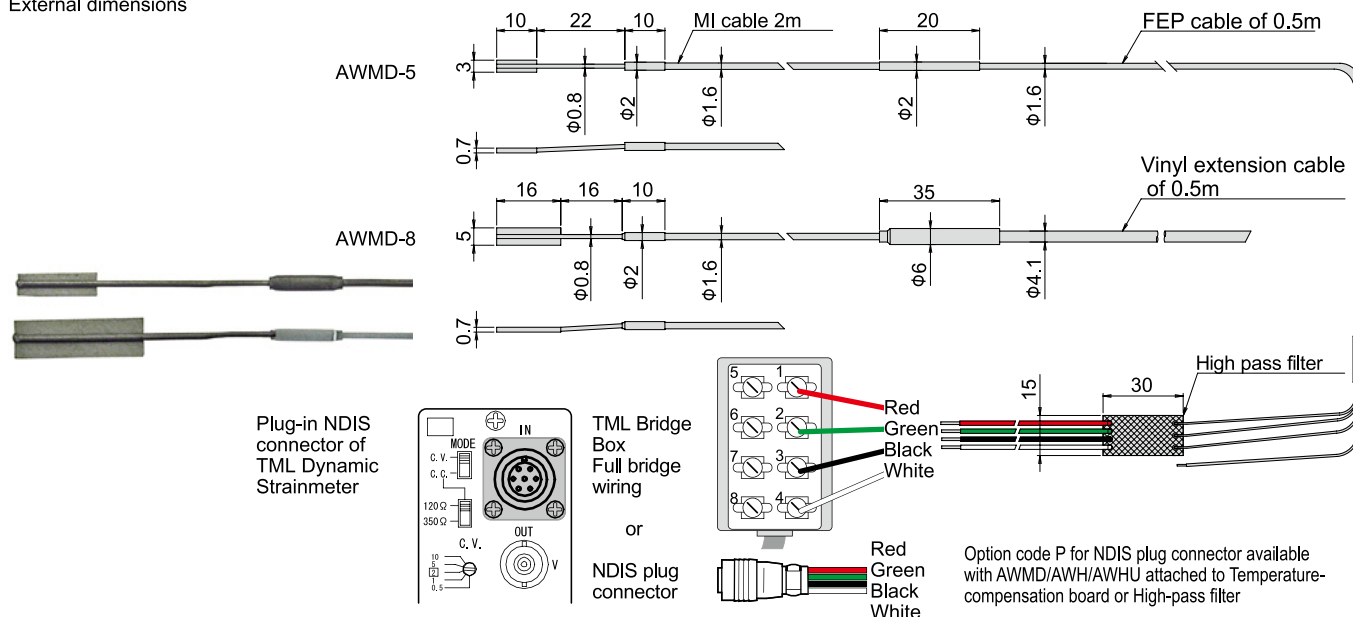
*: High-pass filter only for AWMD Either one available among 1.6, 7.2 or 16Hz.

Leadwire AWMD-5 : 1.6 mm dia. MI cable 2 m, 1.6 mm dia. shielded fluorinated resin (FEP) cable 0.5 m (Full bridge)

AWMD-8 : 1.6 mm dia. MI cable 2 m, 4.1 mm dia. shielded vinyl cable 0.5 m (Full bridge)

Minimum order quantity is 1 strain gauge.

External dimensions



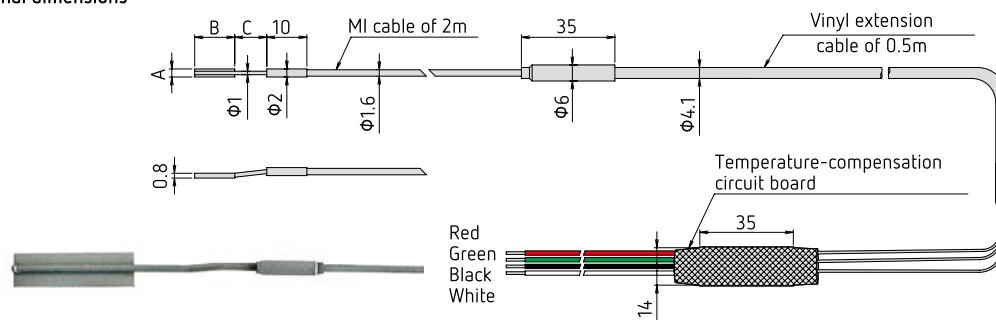
AWH-4 / AWH-8

The backing material of these gauges is available in either of Inconel 600 or stainless steel to be selected according to the material to be measured. The sensing part has half bridge configuration with active element and dummy element, and it is measured in full bridge method using the attached temperature compensation circuit board. This gauge is applicable to static measurement in temperature up to 600°C and applicable to dynamic measurement up to 650°C.

Type	Gauge length (mm)	Gauge base Dimension (mm)	Materials	Operating temperature (°C)	Temperature compensation range (°C)	Test specimen	Applicable coefficient of linear thermal expansion ($\times 10^{-6}/^{\circ}\text{C}$)	Resistance in (Ω)
AWH-4-7A-2-11.0	4	L10xW3xT0.8	Inconel 600	static : $-196\sim+600^{\circ}\text{C}$ dynamic : $-196\sim+650^{\circ}\text{C}$	static : RT $\sim+600^{\circ}\text{C}$ dynamic : N/A	Mild steel equivalent	$11\times 10^{-6}/^{\circ}\text{C}$	60
AWH-4-7B-2-17.0			SUS304			SUS304 equivalent	$17\times 10^{-6}/^{\circ}\text{C}$	
AWH-8-7A-2-11.0	8	L16xW5xT0.8	Inconel 600			Mild steel equivalent	$11\times 10^{-6}/^{\circ}\text{C}$	
AWH-8-7B-2-17.0			SUS304			SUS304 equivalent	$17\times 10^{-6}/^{\circ}\text{C}$	

Leadwire 1.6 mm dia. MI cable 2 m, 4.1 mm dia. shielded vinyl cable 0.5 m (Full bridge)
Minimum order quantity is 1 strain gauge.

External dimensions



Type	A	B	C
AWH-4	3	10	8
AWH-8	5	16	16

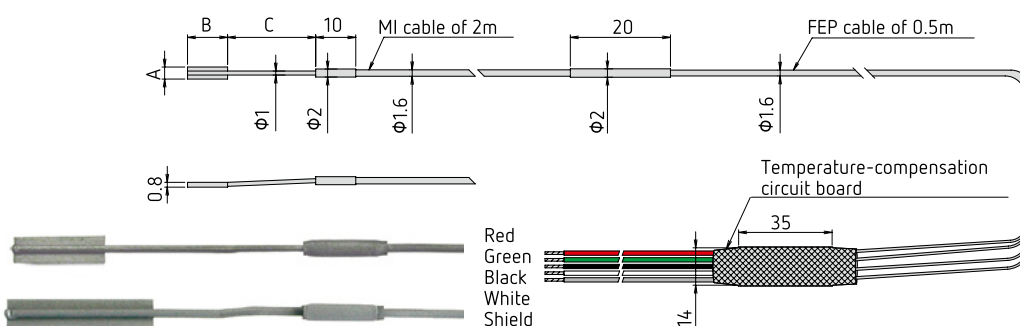
AWHU-4 / AWHU-8

These gauges can be used in temperature up to 800°C for both static and dynamic measurement. However, owing to the construction of the sensing element, measurement is recommended in temperature at 600°C or above. The sensing part has half bridge configuration with active element and dummy element, and it is measured in full bridge method using the attached temperature compensation circuit board. Since these gauges have small backings and thin sleeves and cables as standard specifications, they are applicable to narrow and/or curved areas.

Type	Gauge length (mm)	Gauge base Dimension (mm)	Materials	Operating temperature (°C)	Temperature compensation range (°C)	Test specimen	Applicable coefficient of linear thermal expansion ($\times 10^{-6}/^{\circ}\text{C}$)	Resistance in (Ω)
AWHU-5-9AKM-2(6F)-12.7	5	L10xW3xT0.8	Inconel 600	For static/dynamic use $-196\sim+800^{\circ}\text{C}$	Room-temperature $\sim+800^{\circ}\text{C}$	Inconel 600 equivalent	$11\times 10^{-6}/^{\circ}\text{C}$	60
AWHU-8-9AKM-2(6F)-12.7	8	L16xW3xT0.8						120

Leadwire 1.6 mm dia. MI cable 2 m, 1.6 mm dia. shielded fluorinated resin (FEP) cable 0.5 m (Full bridge)
Minimum order quantity is 1 strain gauge.

External dimensions



Type	A	B	C
AWHU-5	3	10	22
AWHU-8	3	16	16

Note

Our AWH and AWHU series strain gauges are adjusted to make the thermal output as small as possible in consideration of the material to be measured, the MI cable length and the range of measurement temperature. These strain gauges will be supplied on made-to-order basis except AWH-4-7A-2-11.0 and AWH-8-7A-2-11.0.

* Lead wire lengths other than the standard length are available on request. (Made to order: MI cable length is in increments of 1 meter. Vinyl cable length is in increments of 0.5 meters.)



AW-6-350

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

Type	Gauge length (mm)	Gauge base		Operating temperature (°C)	Temperature compensation range (°C)	Test specimen	Applicable coefficient of linear thermal expansion ($\times 10^{-6}/^{\circ}\text{C}$)	Resistance in (Ω)
		Dimension (mm)	Materials					
AW-6-350-11-4FB01LT	6	L24xW5	SUS304	-196~+300°C	+10 ~ +100°C	Mild steel	11 $\times 10^{-6}/^{\circ}\text{C}$	350

Leadwire $\Phi 0.2\text{mm}$ Twisted cross-linked fluorinated resin (PTFE) sheathed leadwire of 0.1m standard (Quarter bridge with 3-wire)

* Lead wire lengths other than the standard length are available on request. (Made to order.)

Minimum order quantity is 5 strain gauges .

External dimensions

