

STRAIN GAUGE EXTENSION LEADWIRES

Strain gauges are connected to strain measuring instruments using extension leadwires. We offer various types of leadwires to be selected depending on the usage conditions. In addition, most of TML strain gauges are available with extension leadwires preattached at our factory. Those leadwire-integrated strain gauges greatly save the leadwire connection works during the strain gauge installation. Please feel free to contact TML or local representatives for the extension leadwires and the leadwire-integrated strain gauges.

Standard leadwire length for leadwire-integrated strain gauges

The standard lengths of our integral leadwires are 1m, 3m and 5m except enamel leadwires. The standard lengths of enamel leadwires are 0.3m, 0.5m and 1m. Other lengths than the standard lengths may be available on request. Enamel leadwires are not available in a length more than 1m.

Leadwire selection

¶ Vinyl leadwires

Vinyl leadwires are widely used as strain gauge leadwires, and are available in a variety of types. Because the vinyl sheath can be colored, these wires allow color-coding for rosette gauges. The stranded core wires are flexible and easy to handle, and allow easy wire connection and terminal attachment.

•Small diameter vinyl wires : -LH, -LHT

These leadwires feature a thin vinyl sheath and small diameter core wires to achieve an outside diameter of 0.4mm. They are used for wiring in tight spaces. The stranded wires are flexible and minimize breakage due to repeated bending.

•Shielded vinyl wires : -LTSA, -LTSB

These are 3-core wires with shield made of aluminium foil or braided copper wire. The outer sheaths are made of vinyl. These leadwires offer a noise shielding function.

Leadwire type	Core/Diameter (cross section)	Applicable temperature	Total resistance of leadwire	Outer sheath dimensions	Length per roll*1	Suffix code of leadwire	Colors
0.08mm ² paralleled vinyl lead wire	7/0.12 (0.08mm ²)	-20 ~+80°C	0.44Ω/m	1.1 x 2.2mm	200m*2	-L(for UF) -LJB	Red, White, Green, Black, Yellow Blue, Red-White
0.08mm ² 3-wire paralleled vinyl leadwire				1.1 x 3.3mm		-LJBT -LT(for UF)	White, One wire with Blue, Red or Orange stripe*3
0.08mm ² twisted vinyl leadwire	7/0.12 (0.08mm ²)	-20 ~+80°C	0.44Ω/m	φ 1.6mm		-LJA	Red, Green, Yellow
0.08mm ² 3-wire twisted vinyl leadwire				φ 1.9mm		-LJAT	Red-Green-Yellow, Red-Green-Blue, Red-Green-White
0.11mm ² paralleled vinyl lead wire	10/0.12 (0.11mm ²)	-20 ~+80°C	0.32Ω/m	1.4 x 2.8mm	200m	-L, -LJC(for UF)	Grey
0.11mm ² 3-wire paralleled vinyl leadwire				1.4 x 4.2mm		-LT -LJCT(for UF)	Grey, One wire with Blue stripe*3
0.3mm ² paralleled vinyl leadwire	12/0.8 (0.3mm ²)	-20 ~+80°C	0.12Ω/m	1.9 x 3.8mm	200m	-LJD	Grey
0.3mm ² 3-wire paralleled vinyl leadwire				1.9 x 5.7mm		-LJDT	White, One wire with Red stripe*3
0.5mm ² paralleled vinyl leadwire	20/0.8 (0.5mm ²)	-20 ~+80°C	0.07Ω/m	2.5 x 5.0mm	100m	-LJG	Grey
0.5mm ² 3-wire paralleled vinyl leadwire				2.1 x 6.3mm		-LJGT	White, One wire with Blue stripe*3
0.02mm ² Twisted vinyl leadwire	5/0.07 (0.02mm ²)	-20 ~+100°C	1.8 Ω/m	φ 0.8mm		-LH	Red, Green, White
0.02mm ² 3-wire twisted vinyl leadwire				φ 1.0mm		-LHT	Red-Green-White
3mm-dia. 3-core shielded vinyl leadwire	7/0.12 (0.08mm ²)	-20 ~+80°C	0.44Ω/m	φ 3mm	200m	-LTSA	Outer sheath: Red, White or Green Core wire sheath: Red-Black-White
5mm-dia. 3-core shielded vinyl leadwire	7/0.26 (0.3mm ²)	-20 ~+80°C	0.1 Ω/m	φ 5mm	200m	-LTSB	Outer sheath: Black Core wire sheath: Red-Black-White
0.08mm ² polypropylene 4-paralleled leadwire	7/0.12 (0.08mm ²)	-20 ~+100°C	0.44Ω/m	0.9 x 4.0mm	200m	-LQM	White, One wire with Red, Blue or Black stripe*3
0.08mm ² polypropylene 6-paralleled leadwire	7/0.12 (0.08mm ²)	-20 ~+100°C	0.44Ω/m	0.9 x 6.0mm	100m	-LHM	White, One wire with Red stripe*3

N.B.: *1 : Lead wires are supplied by one roll each *2 : For Red only, 400m for the other colors

*3 : Stripe is for distinction of independent wire in quarter bridge.

¶ Enamel leadwires

Enamel leadwires have a single core covered with a resin sheath. Heat resistance and handling methods vary depending on the sheath type. Because the wire mass and diameter are small, enamel leadwires are used for strain measurement of rotating specimens and/or measurement of multiple points located in close proximity. Since the enamel leadwire contains one core covered with a thin sheath, it must be handled with care.

•Polyurethane leadwires (-LP, -LJP, -LJPT)

Polyurethane leadwires allow easy post-processing because the sheath can be removed with a soldering iron. The sheath is not strong, therefore, polyurethane wires must be handled with special care.

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•Polyester leadwires : -LU, -LJU, -LJUT

Polyester leadwires have a stronger sheath than polyurethane wires, it cannot be removed with a soldering iron.

•Polyimide leadwires : -LE, -LJE, -LJET

Polyimide leadwires have a stronger sheath than polyester wire. A soldering iron cannot be used for post-processing.)

Leadwire type	Core/Diameter	Applicable temperature	Total resistance of leadwire	Outer sheath dimensions	Length per roll*1	Suffix code of leadwire	Colors
0.14mm-dia. Polyurethane leadwire	1/0.14	-10 ~+120°C	2.5Ω/m	φ 0.16mm		-LP, -LJP -LJPT	
0.18mm-dia. Polyurethane leadwire	1/0.18		1.5Ω/m	φ 0.20mm			
0.14mm-dia. Polyester leadwire	1/0.14	-196 ~+200°C	2.5Ω/m	φ 0.16mm		-LU, -LJU -LJUT	
0.18mm-dia. Polyester leadwire	1/0.18		1.5Ω/m	φ 0.20mm			
0.14mm-dia. Polyimide leadwire	1/0.14	-269 ~+300°C	2.5Ω/m	φ 0.16mm		-LE, -LJE -LJET	
0.18mm-dia. Polyimide leadwire	1/0.18		1.5Ω/m	φ 0.20mm			

¶ Cross-linked Vinyl sheathed leadwires : -LJRA, -LJRTA, -LRT, -LT

The cross-linked vinyl sheath provides improved resistance against environmental elements. It is often used for underwater measurement in ordinary temperature.

¶ Cross-linked Polyethylene sheathed leadwires : -LJQTA, -LT

The cross-linked polyethylene sheath offers higher durability than the cross-linked vinyl sheath. Cross-linked polyethylene sheathed leadwires can be used in steam, warm water and concrete with virtually no insulation degradation.

Leadwire type	Core/Diameter (Cross section)	Applicable temperature	Total resistance of leadwire	Outer sheath dimensions	Length per roll*1	Suffix code of leadwire	Colors
0.14mm ² 2-wire twisted cross-linked vinyl sheathed leadwire	7/0.16 (0.14mm ²)	-20 ~+100°C	0.24Ω/m	φ 3.0mm		-LJRA	White
0.09mm ² 3-wire twisted cross-linked vinyl sheathed leadwire	7/0.127 (0.09mm ²)		0.4Ω/m	φ 2.0mm		200m	-LJRTA -LRT, -LT
0.09mm ² 3-wire twisted cross-linked polyethylene sheathed leadwire	7/0.127 (0.09mm ²)	-60 ~+125°C	0.4Ω/m	φ 2.0mm		-LJQTA -LT	Red-Yellow-Black, Red-Yellow-Blue, Red-Yellow-White

N.B.: *1 : Lead wires are sold by one roll each

¶ Fluorinated resin sheathed leadwire : -6FA, -6FB, -6FC, -4FA, -4FB

With a fluorinated resin sheath, these leadwires can be used in a wide range of temperature from extremely low to high temperatures. Fluorinated resin resists most chemicals. Surface treatment (tetra-etching) is required for some coatings.

Leadwire type	Core/Diameter (Cross section)	Applicable temperature	Total resistance of leadwire	Outer sheath dimensions	Length per roll*1	Suffix code of leadwire	Colors
0.18mm ² 3-wire twisted fluorinated resin (FEP) sheathed leadwire	7/0.18 (0.18mm ²)	-269 ~+200°C	0.2Ω/m	φ 2.0mm	100m	-6FA- <u>LT</u> *2	Red-Green-Blue
0.09mm ² 3-wire twisted fluorinated resin (FEP) sheathed leadwire	1/0.2 (0.09mm ²)		1.2Ω/m	φ 1.1mm		-6FB- <u>LT</u>	Red-Green-Blue
0.04mm ² 3-wire twisted fluorinated resin (FEP) sheathed leadwire	7/0.08 (0.04mm ²)	-269 ~+200°C	1.1Ω/m	φ 1.0mm		-6FC- <u>LT</u>	Red-Black-White
0.14mm ² 3-wire twisted fluorinated resin (PTFE) sheathed leadwire	7/0.16 (0.14mm ²)	-269 ~+260°C*3	0.24Ω/m	φ 1.9mm	100m	-4FA- <u>LT</u> *4	Red-Grey-White
0.2mm-dia. 3-wire twisted fluorinated resin (PTFE) sheathed leadwire	1/0.2		1.05Ω/m	φ 1.1mm		-4FB- <u>LT</u> *4 -LT (for AW-6-11)	Red-Black-White

N.B.: *1 : Leadwires are sold by one roll each *2 : LT is filled with required length *3 : PTFE leadwire is available in 300°C for short-term use. *4 : Suffix code LT (CT) is provided with connecting terminal joint, and another LT(TA) with insulation film

¶ Special leadwire for temperature-integrated gauge : -LT, -6FB

Special leadwire for temperature-integrated gauge consists of 2-core copper and 1-core constantan. To extend this wire, the exclusive leadwire should be applied properly.

Leadwire type	Core/Diameter (Cross section)	Applicable temperature	Total resistance of leadwire	Outer sheath dimensions	Length per roll*1	Suffix code of leadwire	Colors
0.08mm ² 3-wire paralleled vinyl leadwire	7/0.12 (0.08mm ²)	-20 ~+80°C	0.44Ω/m	1.2x3.6mm		- <u>LT</u> *1	Red-White-Blue
0.2mm-dia. 3-wire twisted fluorinated resin (FEP) sheathed leadwire	1/0.2	-269 ~+200°C	1.05Ω/m	φ 1.1mm		-6FB- <u>LT</u> *1	Red-White-Blue

N.B.: *1 : LT is filled with required length

¶ Special 3-wire paralleled leadwire : -LXT

Leadwire type	Core/Diameter (Cross section)	Applicable temperature	Total resistance of leadwire	Outer sheath dimensions	Length per roll*1	Suffix code of leadwire	Colors
0.08mm ² 3-wire paralleled special vinyl sheathed leadwire	7/0.12 (0.08mm ²)	-20 ~+150°C	0.44Ω/m	0.9x7.2mm		- <u>LXT</u> *1	Red-Black-White

N.B.: *1 : LXT is filled with required length