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 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 our company or local representative for the extension leadwires and the leadwire-integrated strain gauges.

Standard leadwire length for leadwire-integrated strain gauges

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

·OPTION -F Leadwire with CE marking
Leadwire with CE marking (compliant to RoHS2 Directive)
Identification code "-F" is appended to the type number of the leadwire.

Leadwire selection

¶ Vinyl leadwires (Standard lengths: 1m, 3m, 5m)

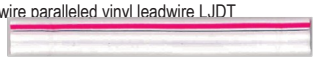
Vinyl leadwires are widely used as strain gauge leadwires, and are available in a variety of types. Because the vinyl insulation can be colored, these wires allow color-coding for rosette gauges. Stranded core wires are flexible and easy to handle, and allow easy wire connection and terminal attachment.

·Small diameter vinyl wires (Code to order -LH, -LHT)

These leadwires feature a thin vinyl insulated materials 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 (Code to order -LTSA, -LTSB)

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

Type number of leadwires (Option code -F for CE marking)	Core/Diameter (cross section) (mm)	Applicable temperature	Total resistance of lead wire	Outer insulated dimensions (mm)	Length per roll	Colors
0.08mm^2 paralleled vinyl lead wire LJB/LJB-F 	7/0.12 (0.08mm^2)	-20~+80°C	0.44Ω/m	1.1×2.2	200m	Red, White, Green, Black, Yellow Blue, Red-White
0.08mm^2 3-wire paralleled vinyl leadwire LJBT/LJBT-F 	7/0.12 (0.08mm^2)			1.1×3.3		White wire and whichever color Blue, Orange, Red, Green, Black or Yellow stripe is selectable. (*)
0.11mm^2 paralleled vinyl lead wire LJC/LJC-F 	10/0.12 (0.11mm^2)	-20~+80°C	0.32Ω/m	1.4×2.8	200m	Grey
0.11mm^2 3-wire paralleled vinyl leadwire LJCT/LJCT-F 	10/0.12 (0.11mm^2)			1.4×4.2	100m	Grey, One wire with Blue stripe (*)
0.3mm^2 paralleled vinyl leadwire LJD 	12/0.18 (0.3mm^2)	-20~+80°C	0.12Ω/m	1.9×3.8	200m	Grey
0.3mm^2 3-wire paralleled vinyl leadwire LJDT 	12/0.18 (0.3mm^2)			1.9×5.7	100m	White, One wire with Red stripe (*)
0.02mm^2 twisted vinyl leadwire LH	5/0.07 (0.02mm^2)	-20~+80°C	1.8Ω/m	Φ0.8	—	Red, Green, White
0.02mm^2 3-wire twisted vinyl leadwire LHT/LHT-F 	5/0.07 (0.02mm^2)			Φ1.0		Red-Green-White
3.2mm-dia. 2-core shielded vinyl leadwire LS 	7/0.12 (0.08mm^2)	-20~+80°C	0.44Ω/m	Φ3.2	200m	Outer : White Core wire : Green-Green
3mm-dia. 3-core shielded vinyl leadwire LTSA 	7/0.12 (0.08mm^2)	-20~+80°C	0.44Ω/m	Φ3	200m	Outer : Red, White or Green Core wire : Red-Black-White
5mm-dia. 3-core shielded vinyl leadwire LTSB 	7/0.26 (0.3mm^2)	-20~+80°C	0.1Ω/m	Φ5	200m	Outer : Black Core wire : Red-Black-White
0.08mm^2 polypropyrene 4-wire paralleled leadwire LQM/ LQM-F 	7/0.12 (0.08mm^2)	-20~+100°C	0.44Ω/m	0.9×4.0	200m	White, One wire with Red, Black, or Blue stripe
3-wire paralleled special vinyl leadwire LXT/ LXT-F 	7/0.12 (0.08mm^2)	-20~+150°C	0.44Ω/m	0.9×2.7	—	Red-Black-White

N.B.: * Stripe is for distinction of independent wire in quarter bridge 3-wire connection.

Strain Gauge Extension Leadwires

¶ Enamel leadwires (Standard lengths: 0.3m, 0.5m, 1m)

Enamel leadwires have a single core insulated with a resin. Heat resistance and handling methods vary depending on resin. 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 resin, it must be handled with care.

·Polyurethane leadwires

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

·Polyester leadwires

Polyester leadwires are harder than polyurethane wires. It cannot be removed with a soldering iron.

·Polyimide leadwires

Polyimide leadwires are harder than the polyester wire. A soldering iron cannot be used for post-processing.

Leadwire type	Core/Diameter(*1)	Applicable temperature	Total resistance of leadwire	Outer insulated dimensions	Colors
Polyurethane leadwire(*2) LP/LP-F	1/0.14 1/0.18	-10~+120°C	2.5Ω/m 1.5Ω/m	Φ0.16mm Φ0.20mm	**Red, Brown, Green**
Polyester leadwire(*2) LU/LU-F	1/0.14 1/0.18	-196~+200°C	2.5Ω/m 1.5Ω/m	Φ0.16mm Φ0.20mm	**Brown**
Polyimide leadwire LE/LE-F	1/0.14 1/0.18	-269~+300°C	2.5Ω/m 1.5Ω/m	Φ0.16mm Φ0.20mm	**Brown**

N.B.: *1: Two types with different core diameters, which are 0.14 mm and 0.18 mm, are available for each enamel wire.
*2: Attachment of lead wire cannot be performed on stacked-type two-element or three-element gauges.

¶ Cross-linked Vinyl leadwires (Standard lengths: 1m, 3m, 5m)

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

¶ Cross-linked Polyethylene leadwires (Standard lengths: 1m, 3m, 5m)

The cross-linked polyethylene leadwire offers higher durability than the cross-linked vinyl leadwire. Cross-linked polyethylene 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 insulated dimensions	Length per roll	Colors
2-wire twisted cross-linked vinyl leadwire LJRA	7/0.16 (0.14mm^2)	-20~+100°C	0.24Ω/m	Φ3.0mm	—	White
3-wire twisted cross-linked vinyl leadwire LJRTA	7/0.127 (0.09mm^2)	-20~+100°C	0.4Ω/m	Φ2.0mm	200m	Red-Green-Black
3-wire twisted cross-linked polyethylene leadwire LJQTA	7/0.127 (0.09mm^2)	-65~+125°C	0.4Ω/m	Φ2.0mm	—	Red-Yellow-Black Red-Yellow-White Red-Yellow-Blue

¶ Special leadwire for temperature-integrated gauge (Standard lengths: 1m, 3m, 5m)

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 propely.

Leadwire type	Core/Diameter (Cross section)	Applicable temperature	Total resistance of leadwire	Outer insulated dimensions	Length per roll	Colors
Temperature-integrated 3-wire paralleled vinyl leadiwre TLJBT/TLJBT-F 	7/0.12 (0.08mm^2)	-20~+80°C	0.44Ω/m(*1)	1.2×3.6mm	—	Red-White-Blue
Temperature-integrated 3-wire twisted fluorinated resin (FEP) leadwire 6FB□TLT (*2) 	1/0.2	-269~+200°C	1.2Ω/m(*1)	Φ1.1mm	—	Red-White-Blue

N.B.: *1: Total resistance of copper wire per meter
*2: □ is filled with the lead wire length in meter
*: For the method of connection to a strainmeter, refer to the operation manual of the strainmeter.

¶ Fluorinated resin leadwire (Standard lengths: 1m, 3m, 5m)

With a fluorinated resin leadwires, these leadwires can be used in a wide range of temperature from extremely low to high temperatures. Fluorinated resin resists most chemicals. A surface treatment (tetra-etching) is not required by 6FAS_LT(-F).

Leadwire type	Core/Diameter (Cross section)	Applicable temperature	Total resistance of leadwire	Outer insulated dimensions	Length per roll	Suffix code of leadwire	Colors
3-wire twisted fluorinated resin (FEP) leadwire 6FA□LT/6FA□LT-F (*1)(*3) 	7/0.18 (0.18mm^2)	-269~+200°C	0.2Ω/m	Φ2.0mm	100m	-6FA_LT	Red-Green-Blue
3-wire twisted fluorinated resin (FEP) leadwire 6FAS□LT/6FAS□LT-F (*1)(*3)(*4) 	7/0.18 (0.18mm^2)	-269~+200°C	0.2Ω/m	Φ2.0mm	100m	-6FAS_LT	Red-Green-Blue
3-wire twisted fluorinated resin (FEP) single-core leadwire 6FB□LT/6FB□LT-F (*1)(*3) 	1/0.2	-269~+200°C	1.2Ω/m	Φ1.1mm	—	-6FB_LT	Red-Green-Blue
3-wire twisted fluorinated resin (FEP) leadwire 6FC□LT/6FC□LT-F (*1)(*3)	7/0.08 (0.04mm^2)	-269~+200°C	1.1Ω/m	Φ1.0mm	—	-6FC_LT	Red-Black-White
3-wire twisted fluorinated resin (FEP) leadwire 6FCS□LT/6FCS□LT-F (*1)(*3)(*4)	7/0.08 (0.04mm^2)	-269~+200°C	1.1Ω/m	Φ1.0mm	—	-6FCS_LT	Red-Black-White
3-wire twisted fluorinated resin (FEP) leadwire 6FD□LTS/6FD□LTS-F (*1)(*3) 	7/0.08 (0.04mm^2)	-269~+200°C	1.1Ω/m	Φ1.5mm	—	-6FD_LTS	Red-Black-White
3-wire twisted fluorinated resin (PTFE) leadwire 4FA□LT/4FA□LT-F (*1)(*3) 	7/0.16 (0.14mm^2)	-269~+260°C(*2)	0.24Ω/m	Φ1.9mm	100m	-4FA_LT	Red-Grey-White
3-wire twisted fluorinated resin (PTFE) single-core leadwire 4FB□LT/4FB□LT-F (*1)(*3) 	1/0.2	-269~+260°C(*2)	1.05Ω/m	Φ1.1mm	—	-4FB_LT	Red-Black-White

N.B.: *1: □ is filled with the lead wire length in meter
*2: PTFE leadwire is available for use in 300°C for a short term
*3: Suffix code LT(CT) means connecting terminal joint, while LT(TA) means insulation with film
*4: for easy application of coating: Surface treatment (tetra-etching) is not required when applying coating

How are Integral Leadwires Jointed

Most TML strain gauges are available with extension leadwires pre-attached for customer convenience. We have several methods for connecting leadwires to be chosen depending on conditions such as the type of strain gauge and leadwire, measurement environments and so on.

Different joints

·Integral type

A vinyl leadwire is jointed to polyimide insulated gauge leads of a strain gauge. The solder joints are covered with the vinyl insulation of the leadwire. This is our standard method of integral leadwire attachment.

·Heat-shrinkable tubing

A soldered joint between gauge leads and leadwire is protected with a heat shrinkable tube. The heat shrinkable tubes are available in three ratings of temperature among 80°C, 200°C and 260°C.

·Connecting terminals joint type

Gauge leads and leadwires are jointed using foil shape connecting terminals. Measurement in high temperature is possible by using a high temperature solder with melting point of 300°C or more for the joint.

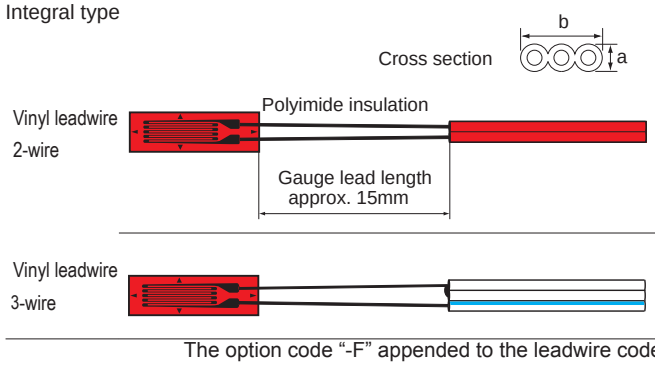
·Insulation film type

A soldered joint between gauge leads and leadwires is covered with an insulation film of glass cloth base. The film is resistive to heat up to 300°C, so this method is suited to measurement in high temperature.

·Direct type

A vinyl leadwire is jointed directly to gauge leads, which are made of nickel plated copper. The solder joints are covered with vinyl insulation of a leadwire up to the end of the gauge base.

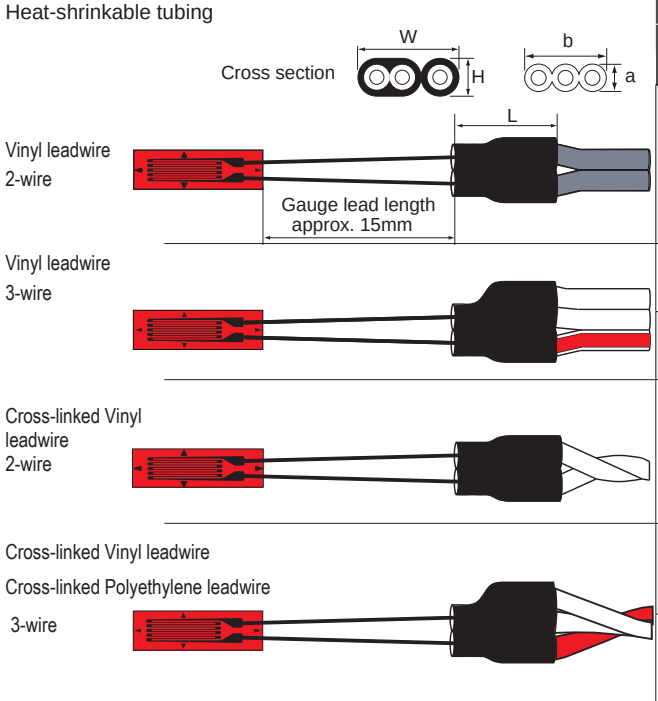
Integral type



Leadwire				
Construction		Dimension a	Dimension b	Code to order
2-wire paralleled	7/0.12	1.1	2.2	-LJB/-LJB-F
	10/0.12	1.4	2.8	-LJC/-LJC-F
2-wire twisted	5/0.07	0.4	–	-LH
3-wire paralleled	7/0.12	1.1	3.3	-LJBT/-LJBT-F
	10/0.12	1.4	4.2	-LJCT/-LJCT-F

The option code "-F" appended to the leadwire code indicates that lead-free solder is used for the leadwire.

Heat-shrinkable tubing

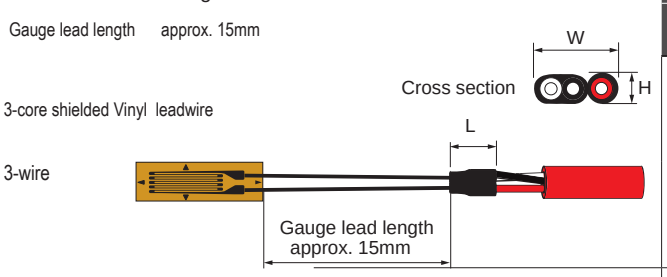


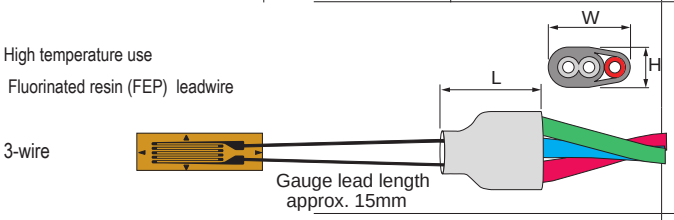
Leadwire				Heat-shrinkable tube			Code to order
Construction		Dimension a	Dimension b	Dimension L	Dimension H	Dimension W	
2-wire paralleled	12/0.18	1.9	3.8	11	3	6	-LJD
3-wire paralleled	12/0.18	1.9	5.7	11	3	7	-LJDT
3-wire twisted	5/0.07	0.4	–	5	0.8	1.6	-LHT -LHT-F
Cross-linked vinyl 2-wire twisted	7/0.16	0.9	–	11	2	4	-LJRA
Cross-linked vinyl 3-wire twisted	7/0.127	1.1	–	11	2	4	-LJRTA
Cross-linked polyethylene 3-wire twisted	7/0.12	0.8	–	11	2	4	-LJQTA -LJQTA-F

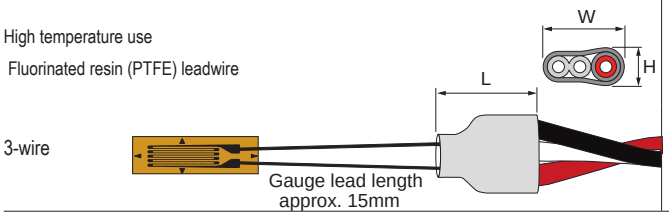
The option code "-F" appended to the leadwire code indicates that lead-free solder is used for the leadwire.

Heat-shrinkable tubing

Gauge lead length approx. 15mm





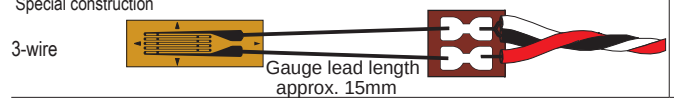


Leadwire			Heat-shrinkable tube			Code to order
Construction		Dimension	Dimension			
			L	H	W	
3-wire twisted	7/0.12	Φ3	10	2	4	-LTSA -LTSA-F
	7/0.26	Φ5	12.5	3	6	-LTSB
FEP (Fluorinated-ethylenepropylene) 3-wire twisted	1/0.2	Φ1.1	11	2	2	-6FB○LT -6FB○LT-F
	7/0.18	Φ2	11	3	4	-6FAS○LT -6FAS○LT-F
PTFE (Polytetra-fluoroethylene) 3-wire twisted	1/0.2	Φ1.1	11	2	2	-4FB○LT -4FB○LT-F
	7/0.16	Φ1.9	11	2.5	4	-4FA○LT -4FA○LT-F

Connecting terminals joint type

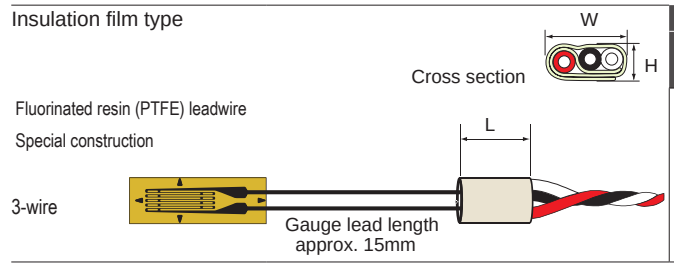
Fluorinated resin (PTFE) leadwire

Special construction



Leadwire			Code to order
Construction		Dimension	
PTFE(Polytetrafluoro-ethylene) 3-wire twisted	1/0.2	Φ1.1	-4FB○LT(CT) -4FB○LT-F(CT)

Insulation film type



Leadwire			Heat-shrinkable tube			Code to order
Construction		Dimension	Dimension			
			L	H	W	
PTFE(Polytetrafluoro-ethylene) 3-wire twisted	7/0.16	Φ1.9	13	1.5	4	-4FA○LT(TA) -4FA○LT-F(TA)

N.B.:
Figures in Leadwire construction column show "Number of cores/ Diameter of one conductor leadwire in mm". For example, "7/0.12" represents "7core / 0.12mm diameter for one conductor leadwire". All dimensions of the Leadwire Heat-shrinkable tube and Film are approximate values in mm.
"○" in the "Code to order" is filled with the leadwire length in meter.

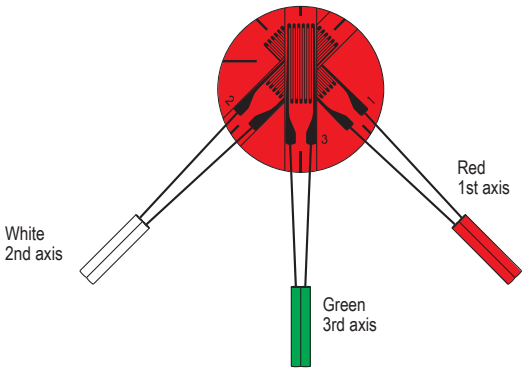
How are Integral Leadwires Jointed

Leadwire colors of 3-element Rosette strain gauge

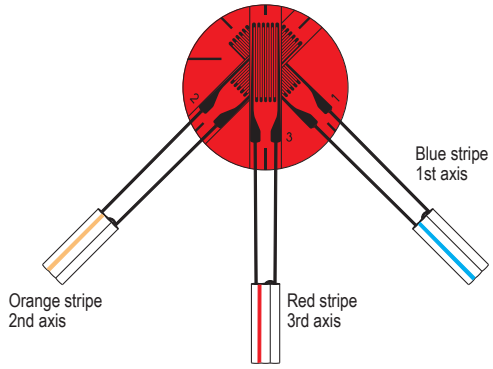
These are generally used leadwires.

The option code “-F” appended to the leadwire type indicates that lead-free solder is used for the leadwire.

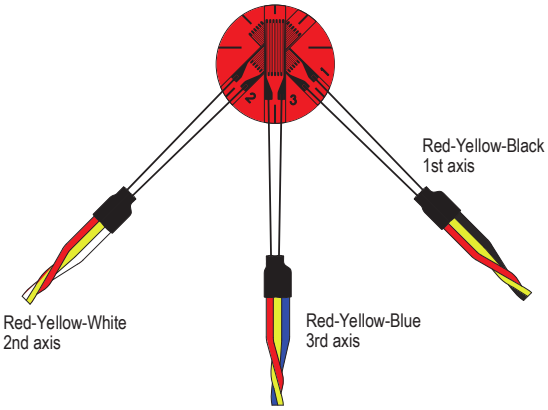
7/0.12 (0.08mm ^{2}) Paralleled vinyl leadwire
Suffix code : -LJB/-LJB-F



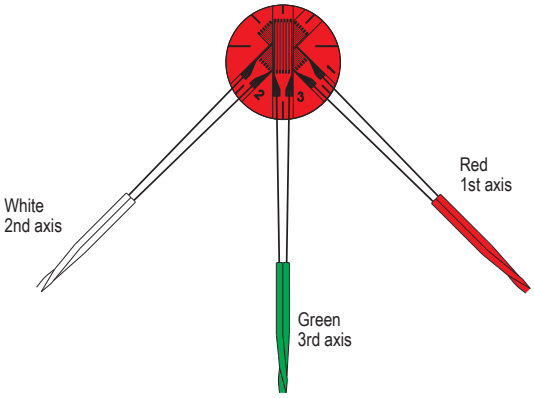
7/0.12 (0.08mm ^{2}) 3-wire Paralleled vinyl leadwire
Suffix code : -LJBT/-LJBT-F



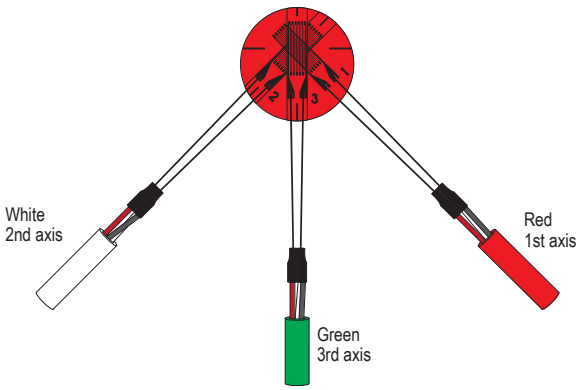
7/0.127 (0.09mm ^{2}) 3-wire twisted cross-linked polyethylene leadwire
Suffix code : -LJQTA/-LJQTA-F



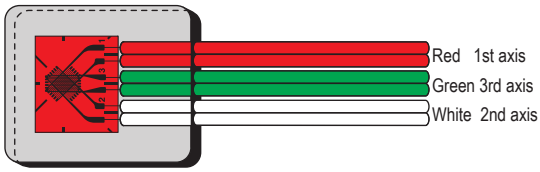
5/0.07 (0.02mm ^{2}) 2-wire twisted vinyl leadwire
Suffix code : -LH



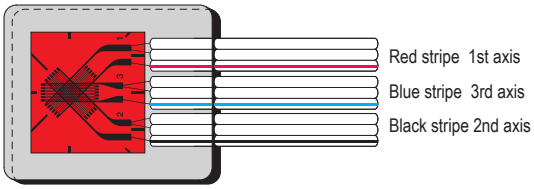
3mm-dia. 3-core shielded vinyl leadwire
Suffix code : -LTSA/-LTSA-F



7/0.12 (0.08mm ^{2}) Paralleled vinyl leadwire
Suffix code : -LDBB-F



7/0.12 (0.08mm ^{2}) 3-wire Paralleled vinyl leadwire
Suffix code : -LDBTB-F



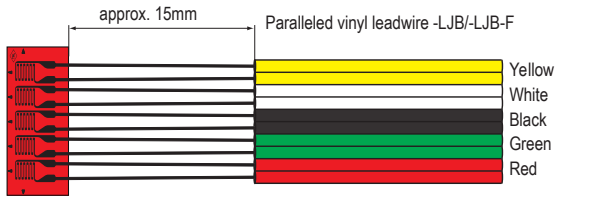
Insulated leadwire colors

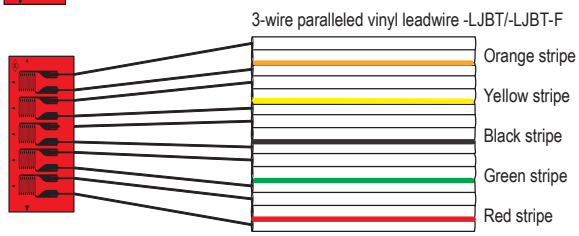
These are generally used leadwires.

The option code “-F” appended to the leadwire type indicates that lead-free solder is used for the leadwire.

Stress concentration measurement use

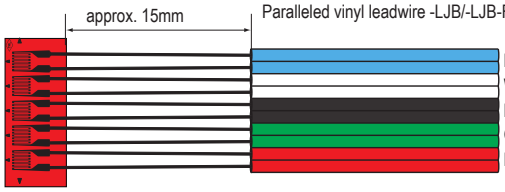
FXV 5-element single axis integrated

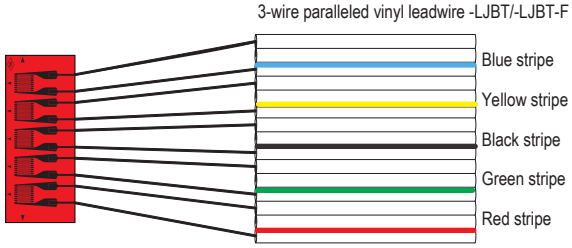




Color stripes are marked on independent wire of each axis with 3-wire system.

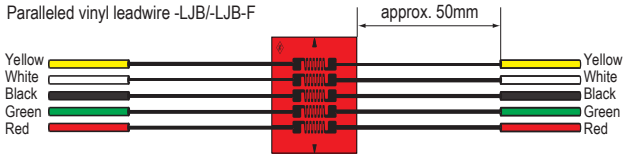
FYV 5-element single axis integrated

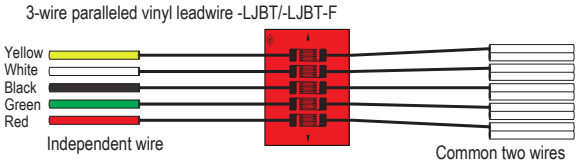




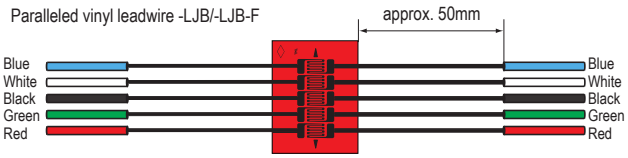
Color stripes are marked on independent wire of each axis with 3-wire system.

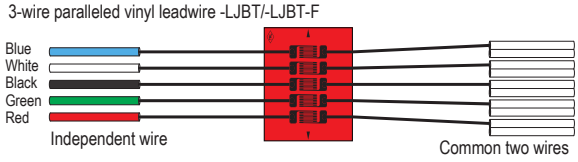
FBXV 5-element single axis integrated





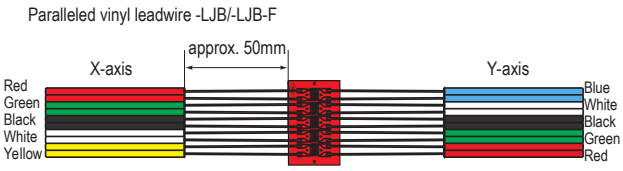
FBYV 5-element single axis integrated

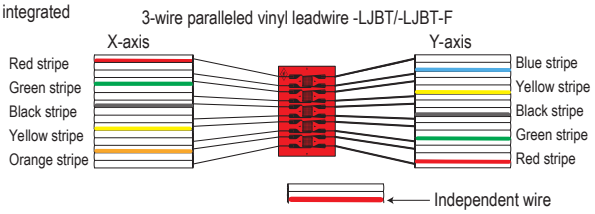




Stress concentration measurement use

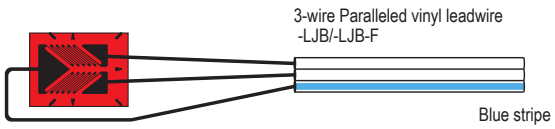
10-element 2-axis cross integrated





Color stripes are marked on independent wire of each axis with 3-wire system.

Torque measurement use (Integral type) LJB



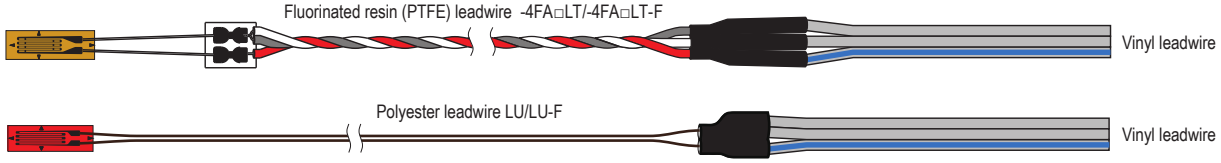
Temperature gauge

TFL (Connecting terminal joint type) -6FB□LT(CT)

Color of leadwire insulation may vary depending on the leadwire type.

Single element strain gauge with different leadwire

Color of leadwire insulation may vary depending on the leadwire type.



Combination Use of Strain Gauges and Dedicated Leadwires

Option –F: Lead-free solder
Use of lead-free solder is selectable for strain gauges and leadwires. When it is selected, the option code "-F" is added to the type number of strain gauge and leadwire separately.
The GOBLET and PF/P/YEF/YF/PFLW/PLW/UBF/FAC series gauges are only available with the use of lead-free solder because they are CE marked with their exclusive leadwires. The CF/CEF/ZF/EF/BTM series gauges are CE marked because they use high melting point solder and RoHS2 Directive is not applied.
A strain gauge with option code "–F" is a RoHS-compliant product. Since the issuance of technical document is required for the RoHS compliance, please contact us for the details of CE marking availability for the product.

Leadwire name	Paralleled vinyl leadwire	3-wire paralleled vinyl leadwire	Paralleled vinyl leadwire	3-wire paralleled vinyl leadwire	Paralleled viny leadwire	3-wire paralleled vinyl leadwire	Twisted vinyl leadwire	3-wire twisted vinyl leadwire	Twisted vinyl leadwire	3.2mm-dia. 2-core shielded vinyl leadwire	3mm-dia. 3-core shielded vinyl leadwire	5mm-dia. 3-core shielded vinyl leadwire
Suffix code	LJB	LJBT	LJC	LJCT	LJD	LJDT	LH	LHT	LJAY	LS	LTSA	LTSB
Option (-F)	-F	-F	-F	-F			-F	-F	-F	-F	-F	-F
Number of cores/ Core diameter(mm)	7/0.12	7/0.12	10/0.12	10/0.12	12/0.18	12/0.18	5/0.07	5/0.07	7/0.12	7/0.12	7/0.12	7/0.26
Cross sectional area (mm^2)	**0.08**	**0.08**	**0.11**	**0.11**	**0.3**	**0.3**	**0.02**	**0.02**	**0.08**	**0.08**	**0.08**	**0.3**
Operating temperature range (°C)	-20 ~ +80	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**	**-20~ +80**

Strain Gauge Series	CE compliance	Operating temperature range °C	Temperature compensation range °C	The table below shows the maximum operating temperature of the strain gauge in combined use with the dedicated leadwire. (°C)											
F	CE	-196 ~ +150	+10～+100	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
GOBLET	CE	-196 ~ +150	+10～+100	**80**	**80**	**80**	**80**	-	-	-	**80**	-	-	**80**	**80**
PF	CE	-20 ~ + 80	+10～+80	**80**	**80**	**80**	**80**	-	-	-	-	-	-	**80**	**80**
P	CE	-20 ~ + 80	+10～+80	**80**	**80**	**80**	**80**	-	-	-	-	-	-	**80**	**80**
FLM	Non	-20 ~ + 80	+10～+80	-	**80**	-	**80**	-	**80**	-	**80**	-	-	**80**	**80**
QMF	CE	-30 ~ + 200	0～+150	-	-	-	-	-	-	-	-	**80**	**80**	**80**	-
MF(Single)	Non	-20 ~ + 80	-	-	-	-	-	-	-	-	-	**80**	**80**	**80**	-
YEF GOBLET	CE	-30 ~ + 80	-	**80**	**80**	**80**	**80**	-	-	-	**80**	-	-	**80**	**80**
YF	CE	-20 ~ + 80	-	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	-	-
YHF	CE	-30 ~ + 80	-	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	-	-
LF GOBLET	CE	-30 ~ + 80	+10～+80	**80**	**80**	**80**	**80**	-	-	-	**80**	-	-	**80**	**80**
PFLW	CE	-20 ~ + 80	+10～+80	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
PLW	CE	-20 ~ + 80	+10～+80	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
GF GOBLET	CE	-30 ~ + 80	+10～+80 (approx.)	**80**	**80**	**80**	**80**	-	-	-	**80**	-	-	**80**	**80**
BF GOBLET	CE	-30 ~ + 200	+10～+80	**80**	**80**	**80**	**80**	-	-	-	**80**	-	-	**80**	**80**
UBF	CE	(Static) :-30～+120 (Dynamic):-30～+150	-	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
DSF	CE	-60 ~ + 200	-	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
CF	CE	-269 ~ +80	-196～ +80(approx.)	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
CEF	CE	-269 ~ +200	-196～ +80(approx.)	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
QF/CTE	CE	-20 ~ +200	+10～+100	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
GOBLET	CE	-30 ~ +200	+10～+100	**80**	**80**	**80**	**80**	-	-	-	-	-	-	**80**	**80**
ZF	CE	-20 ~ +300	+10～+100	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
EF(Single)	CE	-196 ~ +300	+10～+150	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
EF(Rosette)	Non	-196 ~ +200	0～+150	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	-	-	**80**	**80**
BTM	CE	-10 ~ + 80	-	**80**	**80**	**80**	**80**	-	-	-	-	-	-	-	-
FAC	CE	-30 ~ + 80	-	-	-	-	-	-	-	-	-	-	-	-	-
TF	CE	-20 ~ +200	-	-	**80**	-	**80**	-	-	-	-	-	-	-	-

Remarks: Strain gauges of the following series are available only with the dedicated leadwires which are the most suited to the series. Please also refer to the description about each series in this catalog. The option –F (use of lead-free solder) is available. To specify this option, attach the suffix "-F" to the end of each type number of the dedicated leadwire.

Series WF	Operating temperature	0~+80°C	Leadwire :	LDBB-F	Parallel vinyl leadwire
				LDBTB-F	3-wire paralleled vinyl leadwire 7/0.12(0.08mm^2)
Series WFLM	Operating temperature	-20~+80°C	Leadwire :	LJQTA	3-wire twisted cross-linked polyethylene leadwire 2 meters 7/0.127(0.09mm^2)
Note) WFLM series is not available with option –F.					
Series PMF	Operating temperature	-20~+60°C	Leadwire :	LJRTA	3-wire twisted cross-linked vinyl leadwire 2 metersl 7/0.127(0.09mm^2)
Temperature-integrated PMF			Leadwire :	TLJBT	3-wire parallel vinyl leadwire 7/0.12 (0.08mm^2)
Series PMFLS	Operating temperature	-20~+60°C	Leadwire :	LTSC	4-wire shielded Chloroprene cable (3-wire connection) 2 meters, 6mm dia.

	Polypropylene 4-wire parallel leadwire (with modular plug)	3-wire parallel special vinyl leadwire	2-wire twisted cross-linked vinyl leadwire	3-wire twisted cross-linked vinyl leadwire	3-wire twisted cross-linked polyethylene leadwire	Temperature-integrated 3-wire parallel vinyl leadwire	Temperature-integrated 3-wire twisted fluorinated resin (FEP) single-core leadwire	Polyurethane leadwire	Polyester leadwire	Polyimide leadwire	3-wire twisted fluorinated resin (FEP) leadwire	3-wire twisted fluorinated resin (FEP) leadwire (Surface treatment (tetra-etching) is not required)	3-wire twisted fluorinated resin (FEP) single-core leadwire	3-wire twisted fluorinated resin (FEP) leadwire	3-wire twisted fluorinated resin (FEP) leadwire (Surface treatment (tetra-etching) is not required)	1.5mm dia. 3-core shielded fluorinated resin (FEP) leadwire	3-wire twisted fluorinated resin (PTFE) leadwire	3-wire twisted fluorinated resin (PTFE) single-core leadwire	
	LQM	LXT	LJRA	LJRTA	LJQTA	TLJBT	6FB □TLT	LP	LU	LE	6FA □LT	6FAS □LT	6FB □LT	6FC □LT	6FCS □LT	6FD □LTS	4FA □LT	4FB □LT	
	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	-F	
	7/0.12	7/0.12	7/0.16	7/0.127	7/0.127	7/0.12	1/0.2	1/0.14 1/0.18	1/0.14 1/0.18	1/0.14 1/0.18	7/0.18	7/0.18	1/0.2	7/0.08	7/0.08	7/0.08	7/0.16	1/0.2	
	0.08	**0.08**	**0.14**	**0.09**	**0.09**	**0.08**					**0.18**	**0.18**		**0.04**	**0.04**	**0.04**	**0.14**		
	-20~ +100	**-20~ +150**	**-20~ +100**	**-20~ +100**	**-65~ +125**	**-20~ +80**	**-269~ +200**	**-10~ +120**	**-196~ +200**	**-269~ +300**	**-269~ +200**	**-269~ +200**	**-269~ +200**	**-269~ +200**	**-269~ +200**	**-269~ +200**	**-269~ +260**	**-269~ +260**	
	The table below shows the maximum operating temperature of the strain gauge in combined use with the dedicated leadwire. (°C)																		Strain Gauge Series
	100	**150**	**100**	**100**	**125**	**80**	**150**	**120**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**-**	**150**	**150**	**F (-F)**
	100	**150**	**-**	**-**	**125**	**80**	**150**	**120**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**-**	**150**	**150**	GOBLET
	80	**80**	**-**	**-**	**80**	**80**	**-**	**80**	**80**	**80**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**PF**
	80	**80**	**-**	**-**	**80**	**-**	**-**	**80**	**80**	**80**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**P**
	80	**80**	**-**	**80**	**80**	**80**	**80**	**-**	**-**	**-**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**FLM**
	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**200**	**-**	**-**	**QMF**
	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**80**	**-**	**-**	**MF**(Single)
	80	**80**	**-**	**-**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**YEF** GOBLET
	80	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**YF**
	80	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**YHF**
	80	**80**	**-**	**-**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**LF** GOBLET
	80	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**PFLW**
	80	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**PLW**
	80	**80**	**-**	**-**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**GF** GOBLET
	100	**150**	**-**	**-**	**125**	**80**	**200**	**120**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**200**	**200**	**BF** GOBLET
	100	**120** **150**	**100**	**100**	**120** **125**	**80**	**120** **150**	**120**	**120** **150**	**120** **150**	**120** **150**	**120** **150**	**120** **150**	**120** **150**	**120** **150**	**-**	**120** **150**	**120** **150**	**UBF**
	100	**150**	**100**	**100**	**125**	**80**	**200**	**120**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**200**	**200**	**DSF**
	80	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**-**	**80**	**80**	**CF**
	100	**150**	**100**	**100**	**125**	**80**	**200**	**120**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**200**	**200**	**CEF**
	100	**150**	**100**	**100**	**125**	**80**	**200**	**120**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**200**	**200**	**QF (-F)/CTE**
	100	**150**	**-**	**-**	**125**	**80**	**200**	**120**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**200**	**200**	GOBLET
	100	**150**	**100**	**100**	**125**	**80**	**200**	**120**	**200**	**300**	**200**	**200**	**200**	**200**	**200**	**-**	**260**	**260**	**ZF**
	100	**150**	**100**	**100**	**125**	**80**	**200**	**120**	**200**	**300**	**200**	**200**	**200**	**200**	**200**	**-**	**260**	**260**	**EF**(Single)
	100	**150**	**100**	**100**	**125**	**80**	**200**	**120**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**200**	**200**	**EF**(Rosette)
	-	**-**	**80**	**80**	**80**	**-**	**-**	**80**	**-**	**80**	**80**	**80**	**80**	**-**	**-**	**-**	**80**	**80**	**BTM**
	-	**-**	**-**	**-**	**-**	**-**	**-**	**80**	**-**	**80**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**FAC**
	-	**-**	**-**	**100**	**125**	**-**	**-**	**120**	**-**	**200**	**200**	**200**	**200**	**200**	**200**	**-**	**200**	**200**	**TF**

Standard length of the leadwire is 1 m, 3 m or 5 m.

Designation of leadwire-integrated strain gauge exampled

FLT-05A -11 -F -3 LJCT -F

- FLT-05A: Strain Gauge F series (FLT: for shearing strain measurement)
- -11: Self-temperature-compensated material (-11: Mild steel Thermal expansion 11ppm/°C)
- -F: Option F : LEAD-free soldering of strain gauge
- -3: Length of leadwire LJCT 3: 3m
- LJCT: 3-wire paralleled vinyl leadwire
- -F: Option F : LEAD-free soldering of leadwire