

## Low-temperature Gages

# KFL

- Gage Factor Approx. 2.1
- Applicable Linear Expansion Coefficients 5, 11, 16, 23
- Self-temperature-compensation Range -196 to 50°C

### Applicable Adhesives and Operating Temperature Ranges

UC-26: -196 to 50°C (mainly for concrete and lumber)  
 UC-27A: -269 to 70°C (mainly for metal)  
 PC-6: -269 to 150°C  
 CC-33A: -196 to 150°C




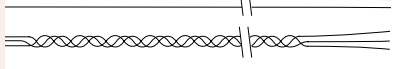
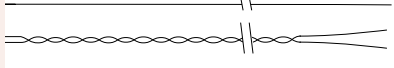




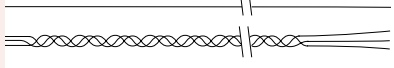
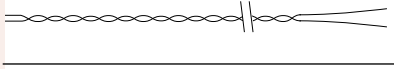

### ■ Low-temperature Foil Strain Gages

The gage element is made of NiCr alloy, which exhibits excellent characteristics under low-temperature environments and is sandwiched between polyimide films. Thus, the KFL gages are suitable for strain measurement of tanks and vessels containing low-temperature liquids such as LNG and LPG.




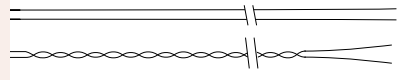
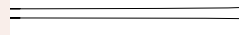



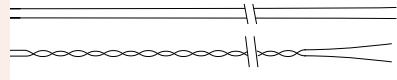

### ■ Types, lengths and codes of leadwire cables pre-attached to KFL gages

Type	2 polyester-coated copper wires	3 polyester-coated copper wires	Middle-temp. 2-wire cable	Middle-temp. 3-wire cable	Fluoroplastic-coated high/low-temp. 3-wire cable
Length	C1, D25				
2 cm	N2C2	N2C3			
3	N3C2	N3C3			
4	N4C2	N4C3			
5	N5C2	N5C3			
10	N10C2	N10C3			
15	N15C2	N15C3	R15C2	R15C3	F15C3
30	N30C2	N30C3	R30C2	R30C3	F30C3
50	N50C2	N50C3	R50C2	R50C3	F50C3
1 m	N1M2	N1M3	R1M2	R1M3	F1M3
2			R2M2	R2M3	F2M3
3			R3M2	R3M3	F3M3
4			R4M2	R4M3	F4M3
5			R5M2	R5M3	F5M3
6			R6M2	R6M3	F6M3
8			R8M2	R8M3	F8M3
10			R10M2	R10M3	F10M3
15			R15M2	R15M3	F15M3
20			R20M2	R20M3	F20M3
30 m			R30M2	R30M3	F30M3
Oprg. temp. range	-269 to 150°C		-100 to 150°C		-269 to 150°C
Remarks	Twisted for 50cm and 1m long		L-11	L-12	L-3




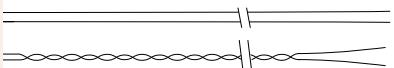
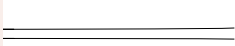



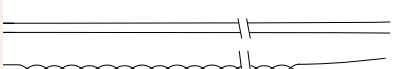

# KFL Gages ● Uniaxial 120Ω

Pattern	Leadwire Cable – Type and Shape	Operating Temp. Range	Leadwire Length	Model	
<b>KFL-5-120-C1-11</b> 16 23  <b>Uniaxial</b> ● Base Size 10 x 3.7 mm ● Gage Length 5 mm ● Gage Resistance 120Ω ● Pieces per Pack 10	Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-269 to 150°C	1m	KFL-5-120-C1-11 F1M3	
			3m	KFL-5-120-C1-11 F3M3	
			5m	KFL-5-120-C1-11 F5M3	
		Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-5-120-C1-11 R1M3
		3m		KFL-5-120-C1-11 R3M3	
		5m		KFL-5-120-C1-11 R5M3	
		Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-5-120-C1-11 R1M2
		3m		KFL-5-120-C1-11 R3M2	
		5m		KFL-5-120-C1-11 R5M2	
		3 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-5-120-C1-11 N30C3
		50cm		KFL-5-120-C1-11 N50C3	
		50cm*1m		KFL-5-120-C1-11 N1M3	
		2 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-5-120-C1-11 N30C2
		50cm		KFL-5-120-C1-11 N50C2	
		50cm*1m		KFL-5-120-C1-11 N1M2	
	Silver-clad copper wires 	-269 to 150°C	25mm	KFL-5-120-C1-11	
<b>KFL-2-120-C1-11</b> 16 23  <b>Uniaxial</b> ● Base Size 6 x 3.7 mm ● Gage Length 2 mm ● Gage Resistance 120Ω ● Pieces per Pack 10	Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-269 to 150°C	1m	KFL-2-120-C1-11 F1M3	
			3m	KFL-2-120-C1-11 F3M3	
			5m	KFL-2-120-C1-11 F5M3	
		Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-2-120-C1-11 R1M3
		3m		KFL-2-120-C1-11 R3M3	
		5m		KFL-2-120-C1-11 R5M3	
		Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-2-120-C1-11 R1M2
		3m		KFL-2-120-C1-11 R3M2	
		5m		KFL-2-120-C1-11 R5M2	
		3 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-2-120-C1-11 N30C3
		50cm		KFL-2-120-C1-11 N50C3	
		50cm*1m		KFL-2-120-C1-11 N1M3	
		2 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-2-120-C1-11 N30C2
		50cm		KFL-2-120-C1-11 N50C2	
		50cm*1m		KFL-2-120-C1-11 N1M2	
	Silver-clad copper wires 	-269 to 150°C	25mm	KFL-2-120-C1-11	

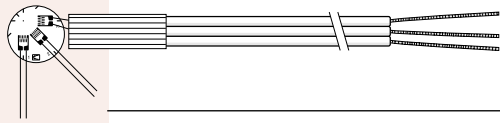


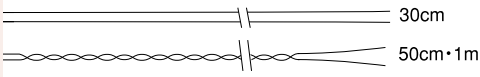
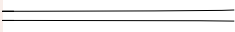



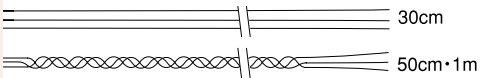
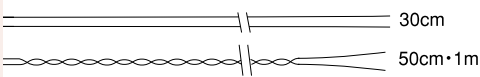

# KFL Gages ● Uniaxial 120Ω




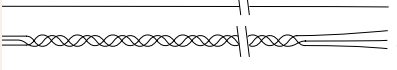
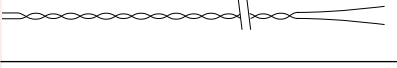




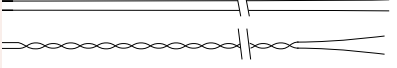

Pattern	Leadwire Cable – Type and Shape	Operating Temp. Range	Leadwire Length	Model		
<b>KFL-1-120-C1-11</b> 16 23	Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-269 to 150°C	1m	KFL-1-120-C1-11 F1M3		
			3m	KFL-1-120-C1-11 F3M3		
			5m	KFL-1-120-C1-11 F5M3		
	Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-1-120-C1-11 R1M3		
			3m	KFL-1-120-C1-11 R3M3		
			5m	KFL-1-120-C1-11 R5M3		
		Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-1-120-C1-11 R1M2	
				3m	KFL-1-120-C1-11 R3M2	
				5m	KFL-1-120-C1-11 R5M2	
	2 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-1-120-C1-11 N30C2		
			50cm	KFL-1-120-C1-11 N50C2		
			1m	KFL-1-120-C1-11 N1M2		
<b>Uniaxial</b> ● Base Size 4 x 2.7 mm ● Gage Length 1 mm ● Gage Resistance 120Ω ● Pieces per Pack 10	Silver-clad copper wires 	-269 to 150°C	25mm	KFL-1-120-C1-11		
	<b>KFL-05-120-C1-11</b> 16 23	Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-269 to 150°C	1m	KFL-05-120-C1-11 F1M3	
				3m	KFL-05-120-C1-11 F3M3	
				5m	KFL-05-120-C1-11 F5M3	
		Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-05-120-C1-11 R1M3	
				3m	KFL-05-120-C1-11 R3M3	
				5m	KFL-05-120-C1-11 R5M3	
			Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-05-120-C1-11 R1M2
					3m	KFL-05-120-C1-11 R3M2
					5m	KFL-05-120-C1-11 R5M2
		2 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-05-120-C1-11 N30C2	
				50cm	KFL-05-120-C1-11 N50C2	
1m				KFL-05-120-C1-11 N1M2		
<b>Uniaxial</b> ● Base Size 3.3 x 2.7 mm ● Gage Length 0.5 mm ● Gage Resistance 120Ω ● Pieces per Pack 10	Silver-clad copper wires 	-269 to 150°C	25mm	KFL-05-120-C1-11		




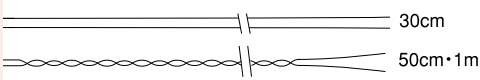



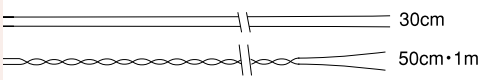
# KFL Gages ● Uniaxial 120Ω/Triaxial 120Ω

Pattern	Leadwire Cable – Type and Shape	Operating Temp. Range	Leadwire Length	Model	
<b>KFL-02-120-C1-11</b> 16 23  <b>Uniaxial</b> ● Base Size 2.5 x 2.2 mm ● Gage Length 0.2 mm ● Gage Resistance 120Ω ● Pieces per Pack 10	Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-269 to 150°C	1m	FL-02-120-C1-11 F1M3	
			3m	KFL-02-120-C1-11 F3M3	
			5m	KFL-02-120-C1-11 F5M3	
		Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-02-120-C1-11 R1M3
		3m		KFL-02-120-C1-11 R3M3	
		5m		KFL-02-120-C1-11 R5M3	
		Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-02-120-C1-11 R1M2
		3m		KFL-02-120-C1-11 R3M2	
		5m		KFL-02-120-C1-11 R5M2	
		2 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-02-120-C1-11 N30C2
		50cm		KFL-02-120-C1-11 N50C2	
		1m		KFL-02-120-C1-11 N1M2	
	Silver-clad copper wires 	-269 to 150°C	25mm	KFL-02-120-C1-11	
<b>KFL-1-120-D25-11</b> 16 23  <b>Triaxial, 0°/90°/45°</b> ● Base Size 8 mmφ ● Gage Length 1 mm ● Gage Resistance 120Ω ● Pieces per Pack 5	Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-269 to 150°C	1m	KFL-1-120-D25-11 F1M3	
			3m	KFL-1-120-D25-11 F3M3	
			5m	KFL-1-120-D25-11 F5M3	
		Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-1-120-D25-11 R1M3
		3m		KFL-1-120-D25-11 R3M3	
		5m		KFL-1-120-D25-11 R5M3	
		Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-1-120-D25-11 R1M2
		3m		KFL-1-120-D25-11 R3M2	
		5m		KFL-1-120-D25-11 R5M2	
		2 polyester-coated copper wires 	-269 to 150°C	30cm	KFL-1-120-D25-11 N30C2
		50cm		KFL-1-120-D25-11 N50C2	
		1m		KFL-1-120-D25-11 N1M2	
	Silver-clad copper wires 	-269 to 150°C	25mm	KFL-1-120-D25-11	




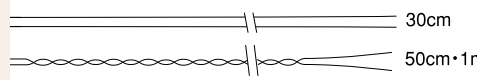
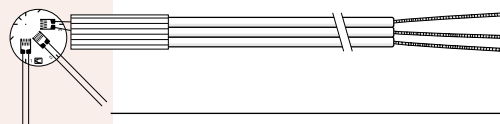


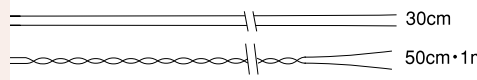
# KFL Gages ● Triaxial 120Ω/Uniaxial 350Ω

Pattern	Leadwire Cable – Type and Shape	Operating Temp. Range	Leadwire Length	Model	
<b>KFL-05-120-D25-11</b> 16 23  <b>Triaxial, 0°/90°/45°</b> ● Base Size 7.5 mmφ ● Gage Length 0.5 mm ● Gage Resistance 120Ω ● Pieces per Pack 5	 Fluoroplastic-coated high/low-temp. 3-wire cable L-3	-269 to 150°C	1m	KFL-05-120-D25-11 F1M3	
			3m	KFL-05-120-D25-11 F3M3	
			5m	KFL-05-120-D25-11 F5M3	
		 Middle-temperature 3-wire cable L-12	-100 to 150°C	1m	KFL-05-120-D25-11 R1M3
		3m		KFL-05-120-D25-11 R3M3	
		5m		KFL-05-120-D25-11 R5M3	
		 Middle-temperature 2-wire cable L-11	-100 to 150°C	1m	KFL-05-120-D25-11 R1M2
		3m		KFL-05-120-D25-11 R3M2	
		5m		KFL-05-120-D25-11 R5M2	
		 2 polyester-coated copper wires	-269 to 150°C	30cm	KFL-05-120-D25-11 N30C2
		50cm		KFL-05-120-D25-11 N50C2	
		1m		KFL-05-120-D25-11 N1M2	
	 Silver-clad copper wires	-269 to 150°C	25mm	KFL-05-120-D25-11	
<b>KFL-5-350-C1-11</b> 16 23  <b>Uniaxial</b> ● Base Size 10 x 3.7 mm ● Gage Length 5 mm ● Gage Resistance 350Ω ● Pieces per Pack 10	 Fluoroplastic-coated high/low-temp. 3-wire cable L-3	-269 to 150°C	1m	KFL-5-350-C1-11 F1M3	
			3m	KFL-5-350-C1-11 F3M3	
			5m	KFL-5-350-C1-11 F5M3	
		 Middle-temperature 3-wire cable L-12	-100 to 150°C	1m	KFL-5-350-C1-11 R1M3
		3m		KFL-5-350-C1-11 R3M3	
		5m		KFL-5-350-C1-11 R5M3	
		 Middle-temperature 2-wire cable L-11	-100 to 150°C	1m	KFL-5-350-C1-11 R1M2
		3m		KFL-5-350-C1-11 R3M2	
		5m		KFL-5-350-C1-11 R5M2	
		 3 polyester-coated copper wires	-269 to 150°C	30cm	KFL-5-350-C1-11 N30C3
		50cm		KFL-5-350-C1-11 N50C3	
		1m		KFL-5-350-C1-11 N1M3	
	 2 polyester-coated copper wires	-269 to 150°C	30cm	KFL-5-350-C1-11 N30C2	
	50cm		KFL-5-350-C1-11 N50C2		
	1m		KFL-5-350-C1-11 N1M2		
	 Silver-clad copper wires	-269 to 150°C	25mm	KFL-5-350-C1-11	

Pattern	Leadwire Cable - Type and Shape	Operating Temp. Range	Leadwire Length	Model	
<b>KFL-2-350-C1-11</b> 16 23	Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-296 to 150°C	1m	KFL-2-350-C1-11 F1M3	
			3m	KFL-2-350-C1-11 F3M3	
			5m	KFL-2-350-C1-11 F5M3	
	Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-2-350-C1-11 R1M3	
			3m	KFL-2-350-C1-11 R3M3	
			5m	KFL-2-350-C1-11 R5M3	
	Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-2-350-C1-11 R1M2	
			3m	KFL-2-350-C1-11 R3M2	
			5m	KFL-2-350-C1-11 R5M2	
	3 polyester-coated copper wires 	-296 to 150°C	30cm	KFL-2-350-C1-11 N30C3	
			50cm	KFL-2-350-C1-11 N50C3	
			1m	KFL-2-350-C1-11 N1M3	
	2 polyester-coated copper wires 	-296 to 150°C	30cm	KFL-2-350-C1-11 N30C2	
			50cm	KFL-2-350-C1-11 N50C2	
			1m	KFL-2-350-C1-11 N1M2	
	<b>Uniaxial</b> ● Base Size 6 x 3.7 mm ● Gage Length 2 mm ● Gage Resistance 350Ω ● Pieces per Pack 10	Silver-clad copper wires 	-296 to 150°C	25mm	KFL-2-350-C1-11
<b>KFL-1-350-C1-11</b> 16 23		Fluoroplastic-coated high/low-temp. 3-wire cable L-3 	-296 to 150°C	1m	KFL-1-350-C1-11 F1M3
				3m	KFL-1-350-C1-11 F3M3
				5m	KFL-1-350-C1-11 F5M3
	Middle-temperature 3-wire cable L-12 	-100 to 150°C	1m	KFL-1-350-C1-11 R1M3	
			3m	KFL-1-350-C1-11 R3M3	
			5m	KFL-1-350-C1-11 R5M3	
	Middle-temperature 2-wire cable L-11 	-100 to 150°C	1m	KFL-1-350-C1-11 R1M2	
			3m	KFL-1-350-C1-11 R3M2	
			5m	KFL-1-350-C1-11 R5M2	
	2 polyester-coated copper wires 	-296 to 150°C	30cm	KFL-1-350-C1-11 N30C2	
			50cm	KFL-1-350-C1-11 N50C2	
			1m	KFL-1-350-C1-11 N1M2	
	<b>Uniaxial</b> ● Base Size 4 x 2.7 mm ● Gage Length 1 mm ● Gage Resistance 350Ω ● Pieces per Pack 10	Silver-clad copper wires 	-296 to 150°C	25mm	KFL-1-350-C1-11




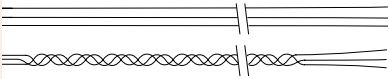
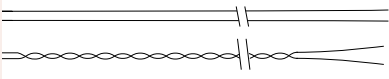
Pattern	Leadwire Cable – Type and Shape	Operating Temp. Range	Leadwire Length	Model		
<b>KFL-05-350-C1-11</b> 16 23	Fluoroplastic-coated high/low-temp. 3-wire cable L-3	-296 to 150°C	1m	KFL-05-350-C1-11 F1M3		
			3m	KFL-05-350-C1-11 F3M3		
			5m	KFL-05-350-C1-11 F5M3		
		Middle-temperature 3-wire cable L-12	-100 to 150°C	1m	KFL-05-350-C1-11 R1M3	
				3m	KFL-05-350-C1-11 R3M3	
				5m	KFL-05-350-C1-11 R5M3	
		Middle-temperature 2-wire cable L-11	-100 to 150°C	1m	KFL-05-350-C1-11 R1M2	
					3m	KFL-05-350-C1-11 R3M2
					5m	KFL-05-350-C1-11 R5M2
	2 polyester-coated copper wires	-296 to 150°C	30cm	KFL-05-350-C1-11 N30C2		
			 50cm•1m	50cm	KFL-05-350-C1-11 N50C2	
				1m	KFL-05-350-C1-11 N1M2	
<b>Uniaxial</b> ● Base Size 3.5 x 2.7 mm ● Gage Length 0.5 mm ● Gage Resistance 350Ω ● Pieces per Pack 10	Silver-clad copper wires	-296 to 150°C	25mm	KFL-05-350-C1-11		
<b>KFL-02-350-C1-11</b> 16 23	Fluoroplastic-coated high/low-temp. 3-wire cable L-3	-296 to 150°C	1m	KFL-02-350-C1-11 F1M3		
			3m	KFL-02-350-C1-11 F3M3		
			5m	KFL-02-350-C1-11 F5M3		
		Middle-temperature 3-wire cable L-12	-100 to 150°C	1m	KFL-02-350-C1-11 R1M3	
				3m	KFL-02-350-C1-11 R3M3	
				5m	KFL-02-350-C1-11 R5M3	
		Middle-temperature 2-wire cable L-11	-100 to 150°C	1m	KFL-02-350-C1-11 R1M2	
					3m	KFL-02-350-C1-11 R3M2
					5m	KFL-02-350-C1-11 R5M2
	2 polyester-coated copper wires	-296 to 150°C	30cm	KFL-02-350-C1-11 N30C2		
			 50cm•1m	50cm	KFL-02-350-C1-11 N50C2	
				1m	KFL-02-350-C1-11 N1M2	
<b>Uniaxial</b> ● Base Size 3 x 2.7 mm ● Gage Length 0.2 mm ● Gage Resistance 350Ω ● Pieces per Pack 10	Silver-clad copper wires	-296 to 150°C	25mm	KFL-02-350-C1-11		

# KFL Gages ● Triaxial 350Ω

Pattern	Leadwire Cable – Type and Shape	Operating Temp. Range	Leadwire Length	Model
<b>KFL-1-350-D25-11</b> 16 23  Triaxial, 0°/90°/45° ● Base Size 8 mmφ ● Gage Length 1 mm ● Gage Resistance 350Ω ● Pieces per Pack 5	Fluoroplastic-coated high/low-temp. 3-wire cable L-3	-296 to 150°C	1m	KFL-1-350-D25-11 F1M3
			3m	KFL-1-350-D25-11 F3M3
			5m	KFL-1-350-D25-11 F5M3
	Middle-temperature 3-wire cable L-12	-100 to 150°C	1m	KFL-1-350-D25-11 R1M3
			3m	KFL-1-350-D25-11 R3M3
			5m	KFL-1-350-D25-11 R5M3
	Middle-temperature 2-wire cable L-11	-100 to 150°C	1m	KFL-1-350-D25-11 R1M2
			3m	KFL-1-350-D25-11 R3M2
			5m	KFL-1-350-D25-11 R5M2
	2 polyester-coated copper wires	-296 to 150°C	30cm	KFL-1-350-D25-11 N30C2
			50cm	KFL-1-350-D25-11 N50C2
			1m	KFL-1-350-D25-11 N1M2
Silver-clad copper wires	-296 to 150°C	25mm	KFL-1-350-D25-11	
<b>KFL-05-350-D25-11</b> 16 23  Uniaxial, 0°/90°/45° ● Base Size 7.5 mmφ ● Gage Length 0.5 mm ● Gage Resistance 350Ω ● Pieces per Pack 5	Fluoroplastic-coated high/low-temp. 3-wire cable L-3	-296 to 150°C	1m	KFL-05-350-D25-11 F1M3
			3m	KFL-05-350-D25-11 F3M3
			5m	KFL-05-350-D25-11 F5M3
	Middle-temperature 3-wire cable L-12	-100 to 150°C	1m	KFL-05-350-D25-11 R1M3
			3m	KFL-05-350-D25-11 R3M3
			5m	KFL-05-350-D25-11 R5M3
	Middle-temperature 2-wire cable L-11	-100 to 150°C	1m	KFL-05-350-D25-11 R1M2
			3m	KFL-05-350-D25-11 R3M2
			5m	KFL-05-350-D25-11 R5M2
	2 polyester-coated copper wires	-296 to 150°C	30cm	KFL-05-350-D25-11 N30C2
			50cm	KFL-05-350-D25-11 N50C2
			1m	KFL-05-350-D25-11 N1M2
Silver-clad copper wires	-296 to 150°C	25mm	KFL-05-350-D25-11	



# KFL Gages ● Uniaxial 350Ω for concrete and lumber

Pattern	Leadwire Cable – Type and Shape	Operating Temp. Range	Leadwire Length	Model
<b>KFL-30-350-C1-11</b> 5	Fluoroplastic-coated high/low-temp. 3-wire cable L-3	-296 to 150°C	1m	KFL-30-350-C1-11 F1M3
			3m	KFL-30-350-C1-11 F3M3
			5m	KFL-30-350-C1-11 F5M3
	Middle-temperature 3-wire cable L-12	-100 to 150°C	1m	KFL-30-350-C1-11 R1M3
			3m	KFL-30-350-C1-11 R3M3
			5m	KFL-30-350-C1-11 R5M3
	Middle-temperature 2-wire cable L-11	-100 to 150°C	1m	KFL-30-350-C1-11 R1M2
			3m	KFL-30-350-C1-11 R3M2
			5m	KFL-30-350-C1-11 R5M2
	3 polyester-coated copper wires	-296 to 150°C	30cm	KFL-30-350-C1-11 N30C3
			50cm	KFL-30-350-C1-11 N50C3
			1m	KFL-30-350-C1-11 N1M3
	2 polyester-coated copper wires	-296 to 150°C	30cm	KFL-30-350-C1-11 N30C2
			50cm	KFL-30-350-C1-11 N50C2
			1m	KFL-30-350-C1-11 N1M2
<b>Uniaxial (for concrete &amp; lumber)</b> ● Base Size 36 x 5.2 mm ● Gage Length 30 mm ● Gage Resistance 350Ω ● Applicable Linear Expansion Coefficients 5 (lumber) 11 (concrete) ● Pieces per Pack 10	Silver-clad copper wires	-296 to 150°C	25mm	KFL-30-350-C1-11