

Torsion-resistant robot cables

**Highly
resistant to
torsion**

ORP-TW Cable Series

UL758 Style2517



Torsion-resistant robot cables specially designed for use in rotating driven sections of industrial machinery and medical devices, etc.

Features

Resistant to twisting over
50,000,000 times*

This series achieves unprecedented
torsion resistance for robot cables.

※With a torsion pitch of 500 mm

ORP-TW Cable Series

The lineup of 50 types in total

Conductor sizes: 0.05~0.5 mm²
Number of pairs: 3~8 pairs

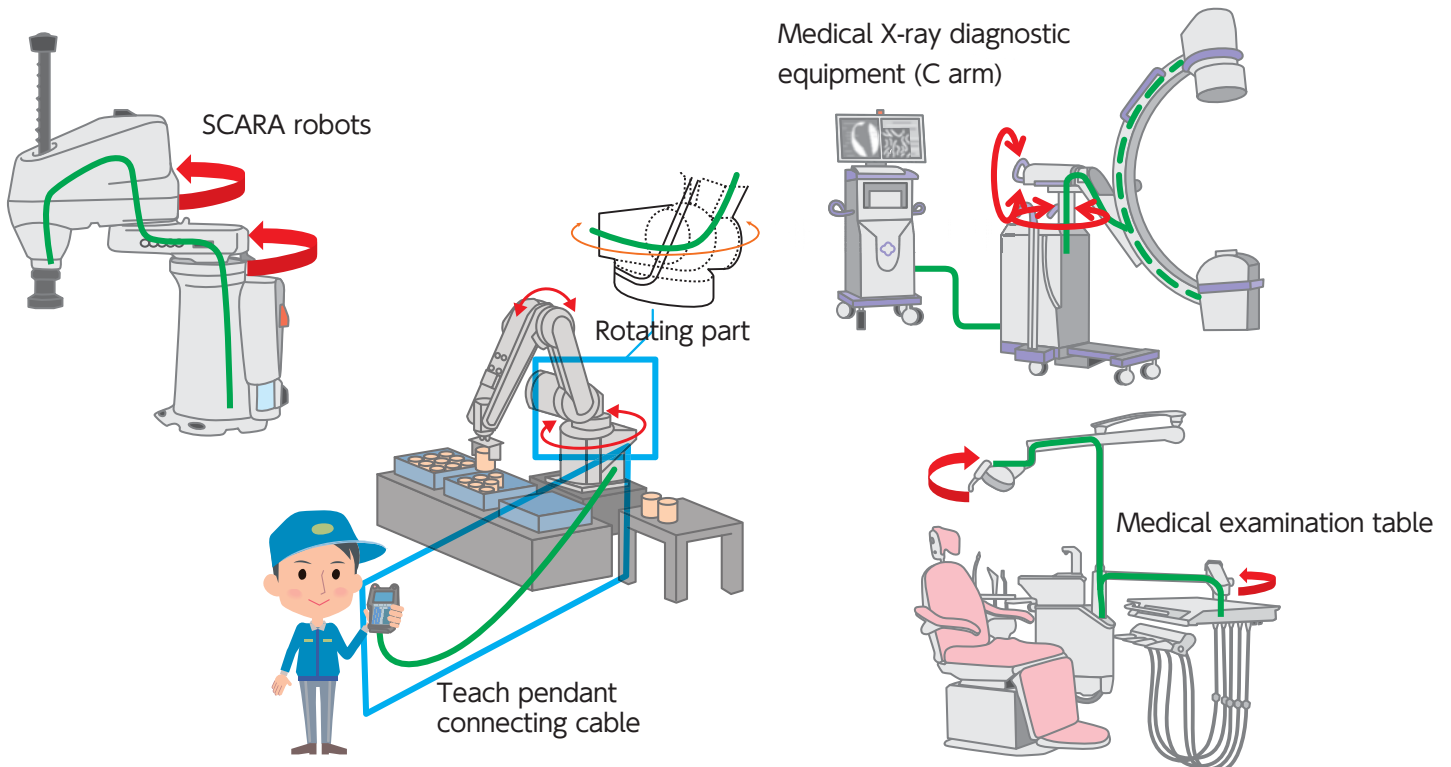
Durable against local torsion

Even with a torsion pitch of only
100 mm, the cables can endure
twisting over 10 million times.

Special robust shielding

The cables use special conductors
with excellent flexibility and high-
tensility, and shielded with outstanding
durability.

Applications



Specifications

Materials & structure

Conductor	Tin-plated soft copper stranded wire
Insulator	Special elastomer
Insulator identification	Depends on the core wire identification (pairings) and configuration of core wires (pairs).
Shielding	Special braiding
Jacket material (color)	Oil-proof PVC (black matte)

Usage environment

Application	Indoor, between and within devices
Operating temperature range	-10 to 105°C

Core wire identification (combination)

Pair No.		1	2	3	4	5	6	7	8
Insulator color configuration	Core wire ①	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green
	Core wire ②	White	Brown	Black	Gray	Orange	Brown	Black	Gray

Applicable standard

UL758 Style 2517(rated at 105°C, 300 V)

Jacket marking

ORP-TW □ SQ △△ OKI ELECTRIC CABLE  AWM2517 105C 300V VW-1 #####

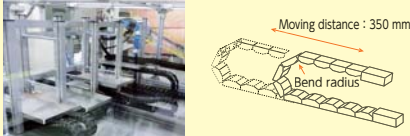
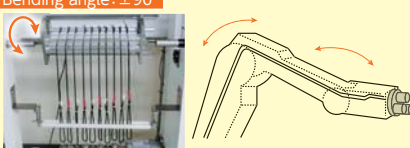
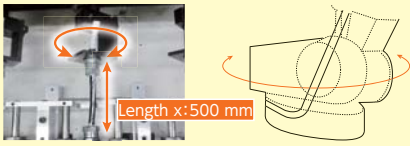
□part: Conductor cross-section area (mm²) 0.05/0.1/0.2/0.3/0.5 △△part: Shield code(unshielded: blank; shielded: -SB)
#####part: Lot No.

Characteristics

Electrical performance

Conductor cross-section area	mm ² (AWG size)	0.05 (30)	0.1 (28)	0.2 (25)	0.3 (23)	0.5 (21)
Conductor resistance	Ω /km (20°C)	≤ 340	≤ 205	≤ 102	≤ 68	≤ 45
Insulator resistance	M Ω -km (20°C)	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100
Withstanding Voltage	V/min	AC2000	AC2000	AC2000	AC2000	AC2000

Movement performance^{※1}

Mode	Performance	[Reference for comparison] ORP Slim Cable	Test conditions
Slide-bending	Over 30,000,000 times	Over 100,000,000 times	<ul style="list-style-type: none"> Bend radius R: 6 times cable outer diameter Sliding speed: 70 times/min Moving distance: 350 mm Count: 1 retuning(back-and-forth) motion=1 time 
Swing-bending	Over 3,000,000 times	Over 20,000,000 times	<ul style="list-style-type: none"> Bend radius R: 8 times cable outer diameter Bending angle: ±90° Bending speed: 40 times/min Load: 4.9N Count: 1 retuning(back-and-forth) motion = 1 time 
Twisting	Over 50,000,000 times (pitch:500 mm) Over 10,000,000 times (pitch:100 mm)	Over 20,000,000 times (pitch:500 mm) Over 500,000 times (pitch:100 mm)	<ul style="list-style-type: none"> Twisting angle: ±180° Twisting speed: 90 times/min Pitch: 500 mm/100 mm Count: ±180° returning(back-and-forth motion=1 time 

※1 Test conditions and process are based on our company's own methods. These data are reference values only, and are not guaranteed values.

Unshielded

●Product code indication

ORP-TW ① SQ×② P(2517)

①: Conductor mm² ②: Number of pairs (See table below.)

Structure

Conductor			Insulator Outer diameter ^{※2} mm	② Number of pairs	Outer diameter ^{※2} mm	Approximate weight kg/km	Allowable current ^{※3} A(30°C)
① mm ²	AWG size	Configura- tion					
0.05	30	30/0.05	0.66	3	4.8	22	1.2
				4	5.1	26	1.1
				5	5.4	29	1.0
				6	5.8	33	1.0
				8	6.6	41	0.8
0.1	28	49/0.05	0.74	3	5.1	25	1.6
				4	5.4	32	1.4
				5	5.8	34	1.3
				6	6.2	39	1.2
				8	7.1	51	1.1
0.2	25	102/0.05	0.93	3	5.9	37	2.6
				4	6.2	48	2.3
				5	6.7	51	2.1
				6	7.2	59	2.0
				8	8.3	84	1.8
0.3	23	108/0.06	1.09	3	6.3	47	3.5
				4	6.9	60	3.2
				5	7.7	67	2.9
				6	8.0	81	2.7
				8	9.4	105	2.4
0.5	21	177/0.06	1.36	3	7.4	67	4.9
				4	8.0	83	4.7
				5	8.7	99	4.2
				6	9.4	115	3.8
				8	11.1	150	3.3

※2 The insulator outer diameters and the outer diameters are standard values.

※3 The allowable current values are calculated with a straight installation of the cable in the air. They are not guaranteed values.

Shielded

●Product code indication

ORP-TW ① SQ×② P(SB)(2517)

①: Conductor mm² ②: Number of pairs (See table below.)

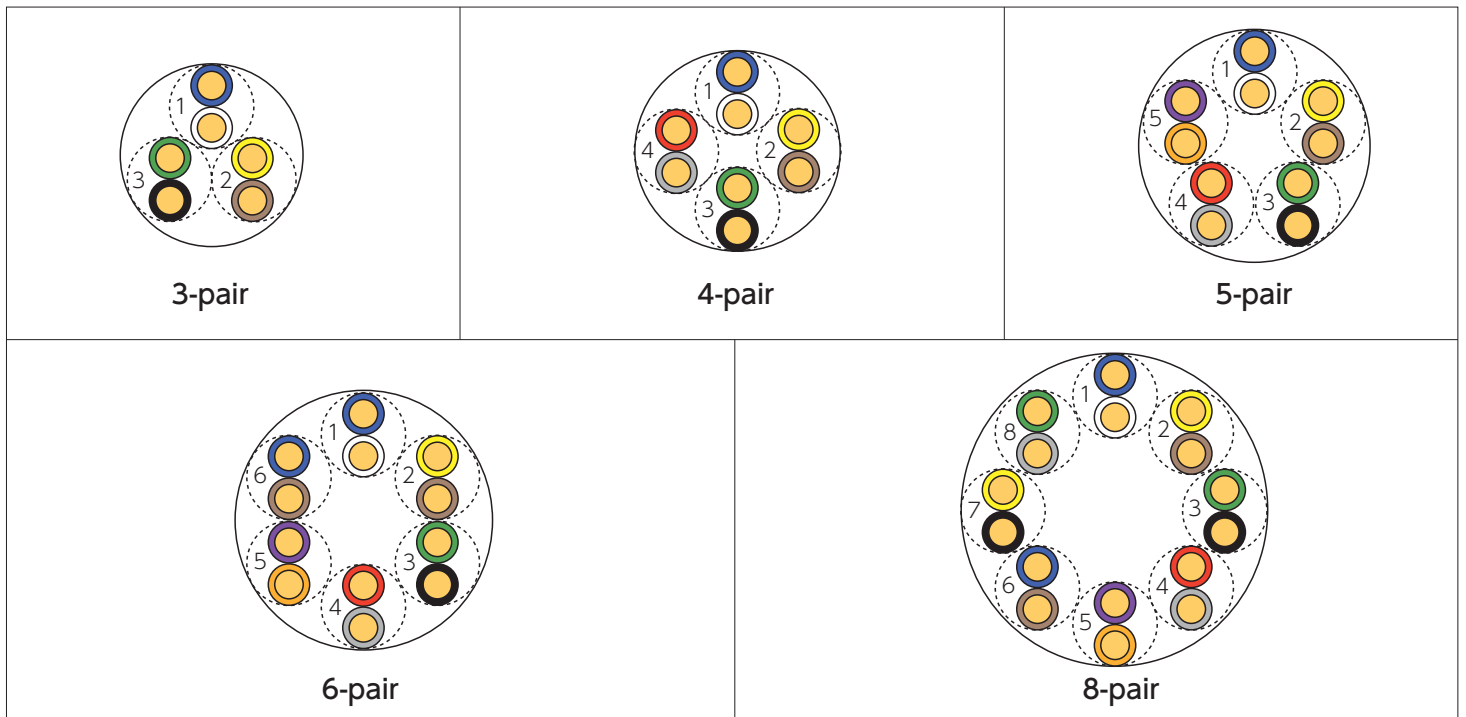
Structure

Conductor			Insulator Outer diameter ^{※2} mm	② Number of pairs	Outer diameter ^{※2} mm	Approximate weight kg/km	Allowable current ^{※3} A(30°C)
① mm ²	AWG size	Configura- tion					
0.05	30	30/0.05	0.66	3	5.5	31	1.2
				4	5.8	35	1.1
				5	6.1	39	1.0
				6	6.4	43	1.0
				8	7.3	51	0.8
0.1	28	49/0.05	0.74	3	5.8	32	1.6
				4	6.1	42	1.4
				5	6.5	44	1.3
				6	6.9	49	1.2
				8	7.8	63	1.1
0.2	25	102/0.05	0.93	3	6.6	47	2.6
				4	6.9	58	2.3
				5	7.4	62	2.1
				6	7.9	71	2.0
				8	9.0	92	1.8
0.3	23	108/0.06	1.09	3	7.0	58	3.5
				4	7.6	72	3.2
				5	8.3	80	2.9
				6	8.7	95	2.7
				8	10	120	2.4
0.5	21	177/0.06	1.36	3	8.1	78	4.9
				4	8.7	96	4.7
				5	9.4	115	4.2
				6	10.1	135	3.8
				8	11.8	165	3.3

※2 The insulator outer diameters and the outer diameters are standard values.

※3 The allowable current values are calculated with a straight installation of the cable in the air. They are not guaranteed values.

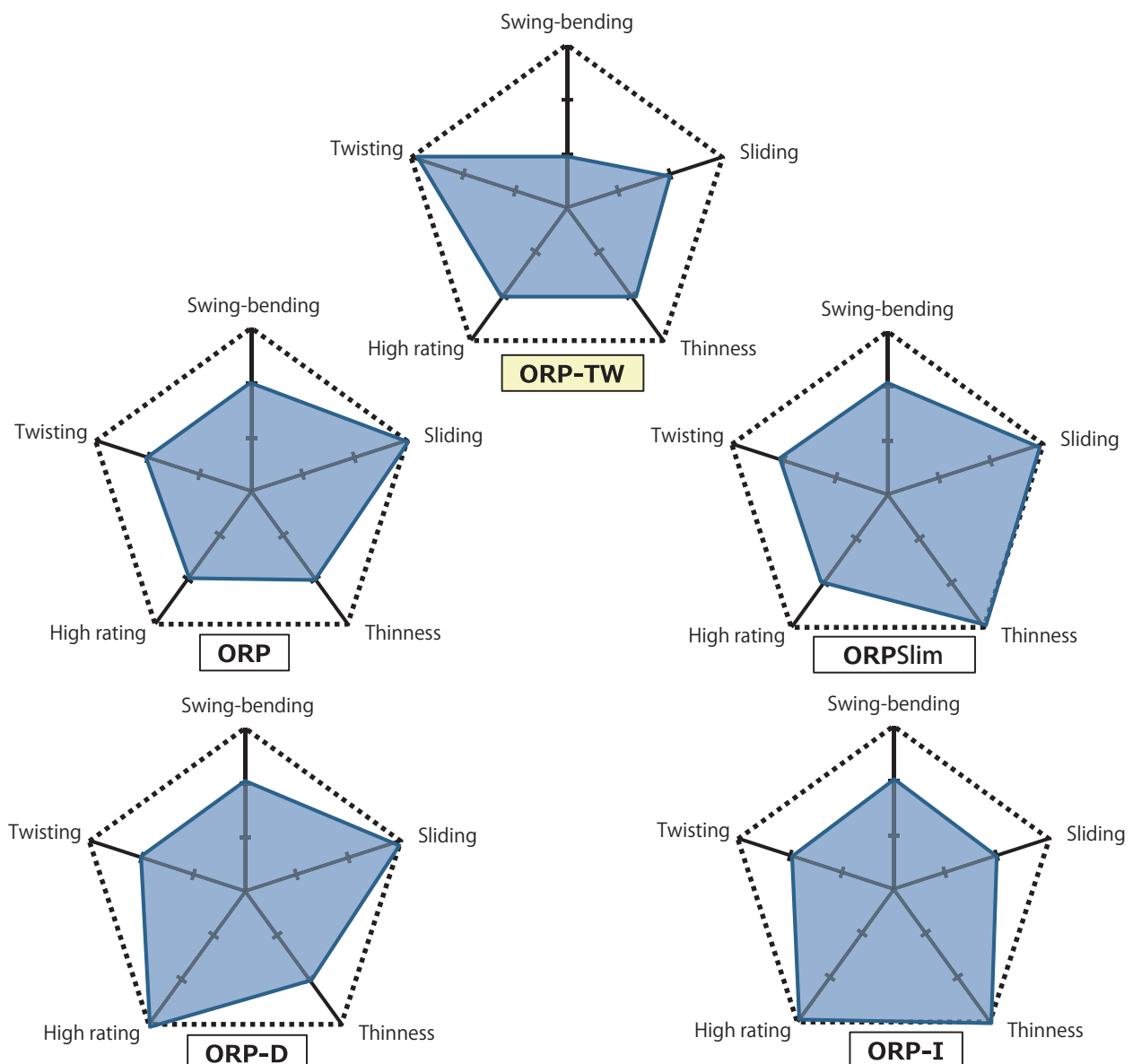
Configuration of core wires(pairs)^{※4}



※4 The circles with broken lines indicate pairings (twisted pairs) and the numbers indicate pair No.

Positioning in relation to other ORP series

Series	Application	Series summary	Movement durability			Thickness	Rating
			Swing-bending	Sliding	Twisting		
ORP-TW Cables	For controllers (torsion-resistant type)	Robot cables designed specifically for durability against twisting motion.	★	★★	★★★★	★★	105°C 300V
ORP Cables	For controllers (standard type)	Basic robot cables designed to accommodate all robot movements (sliding, swinging, twisting).	★★	★★★★	★★	★★	80°C 300V
ORP Slim Cables	For controllers (small-diameter type)	Top-class small-diameter robot cables based on the ORP cable series, with diameter and weight reduced by approximately 20%.	★★	★★★★	★★	★★★★	80°C 300V
ORP-D Cables	For power supply	Power-supply robot cables with a voltage rating of 600 V, but a diameter as thin as that of 300V-rated cables.	★★	★★★★	★★	★★	105°C 600V
ORP-I Series	For internal wiring in devices	Insulated core cables for wiring in moving parts within devices.	★★	★★	★★	★★★★	105°C 600V



Locations

Head office

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Factories in Japan:

Gunma Factory
Okaya Factory

Subsidiaries:

Oki Electric Cable Wire Harness Co., Ltd.
Oki Electric Cable Service Co., Ltd.
Mogami Wire & Cable Corp.

OKI Electric Cable America Corporation
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TEL +1-847-250-9296

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TEL +86-512-5299-2059



Head office



Okaya Factory



Gunma Factory

Oki Electric Cable Co., Ltd., has been certified by ISO9001 Quality Management System.
Oki Electric Cable's Gunma and Okaya factories have acquired the ISO14001 environmental management system certification.
Printed product colors may differ slightly from the actual product colors.
Information in this document is as of May 2018 and may change without prior notice.

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