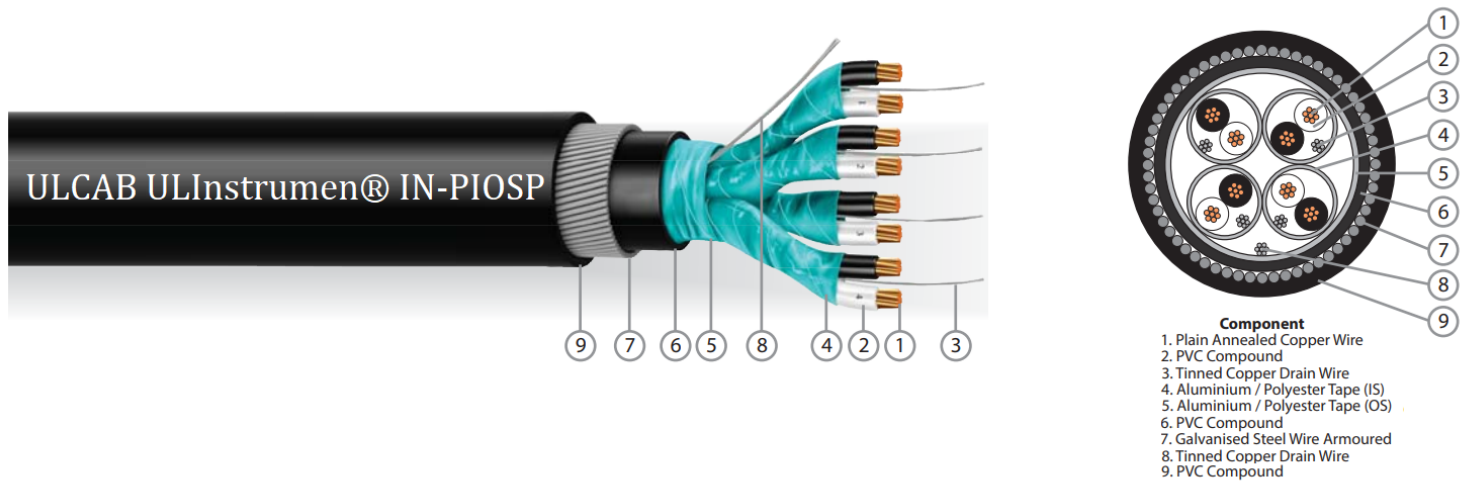


# Instrumentation and connection cables

## ULInstrumen® IN-PIOSP

CU / PVC / IS / OS / PVC / SWA / PVC ( PAIRS & TRIADS )

PVC Insulated, Individual Aluminium Foil Screened, Overall Aluminium Foil Screened, PVC Bedded, Galvanised Steel Wire Armoured, PVC Sheathed Cable, 300 / 500V, BS EN50288-7



### CONSTRUCTION

Conductor:	Plain Annealed Copper, Class 2 Stranded Circular
Insulation:	Polyvinyl Chloride (PVC) Compound Type TI51
Insulation Colour:	Pair/s - Black/White with Black numberings Triad/s - Red/Black/White with Black numberings
Cores Twisted:	Cores twisted to form a pair, triad or quad
Wrap Film:	Polyester Binder Tape
Individual Screen:	Aluminium/Polyester Tape, with a Tinned Copper Drain Wire 0.5mm <sup>2</sup> (7/0.3mm) (IS)
Lay Up:	Multi-pairs, triads or quads are assembled together in concentric layers to form the cable core
Wrap Film:	Polyester Binder Tape
Overall Screen:	Aluminium/Polyester Tape, with a Tinned Copper Drain Wire 0.5mm <sup>2</sup> (7/0.3mm) (OS)
Bedding:	Polyvinyl Chloride (PVC) Compound Type ST2
Bedding Colour:	Black
Armour:	Galvanized Steel Wire Armoured (SWA)
Outer Sheath:	Flame Retardancy Polyvinyl Chloride (PVC) Compound Type ST2 FR
Outer Sheath Colour:	Black or Blue

### ELECTRICAL CHARACTERISTICS

Operating Voltage, U <sub>o</sub> /U:	300/500V
Operating Temperature:	-15°C to 70°C (PVC Insulated)
Final Short Circuit Temperature:	160°C (PVC Insulated)
Test Voltage:	2kV for 1 minute

### REFERENCE STANDARDS

Design Specification:	BS EN50288-7
Conductor:	IEC60228, BS EN60228
Flame Retardancy:	IEC60332-3

### INSTALLATION REFERENCE

Min. Bending Radius (mm):	10 x cable overall diameter
Max. Pulling Tension (N/mm <sup>2</sup> ):	70

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### Electrical Properties of Instrumentation Cables

Electrical Properties at 20°C

	Unit of Measure	Conductor Size (Pair Cables)				
		0.5mm <sup>2</sup>	0.75mm <sup>2</sup>	1.0mm <sup>2</sup>	1.5mm <sup>2</sup>	2.5mm <sup>2</sup>
Operating Temperature (Max):						
PVC Insulation	°C			70		
XLPE & LSZH Insulation	°C			90		
Rated Voltage U <sub>0</sub> /U <sub>M</sub>						
	V			300/500		
Test Voltage:						
Core To Core for 1 Minute	V			2000		
Core To Screen for 1 Minute	V			1000		
Conductor Resistance (Max):						
	Ω/km	36.7	25.0	18.5	12.3	7.6
Insulation Resistance (Min):						
Individual Conductor (between each conductor and remaining bunched conductors/screened and/or armour) (PVC Insulated)	MΩ • km			10		
Individual Screens (between screens) (PVC Insulated)	MΩ • km			1		
Individual Conductor (between each conductor and remaining bunched conductors/screened and/or armour) (XLPE & LSZH Insulated)	MΩ • km			1000		
Individual Screens (between screens) (XLPE & LSZH Insulated)	MΩ • km			1		
Mutual Capacitance at 1KHz (Max):						
PVC Insulation	nf/km			250		
XLPE & LSZH Insulation	nf/km			150		
Capacitance Unbalanced at 1KHz (Max)						
	pf/500m			500		
Maximum Inductance/Resistance Ratio (L/R)						
	μH/Ω	25	25	25	40	60

Note 1: Cables with Maximum Operating Temperature of 105°C are available upon request.

Note 2: For 600/1000V cables, the Test Voltage will be 3.5kV/5min.

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	No. of Pairs	Nominal Conductor Area (mm <sup>2</sup> )	No. and Diameter of Wires (no./mm)	Radial Thickness of Insulation (mm)	Diameter Under Armour (mm)	Armour Wire Diameter (mm)	IN-XIOSP		IN-PIOSP	
							Cable Overall Diameter (mm)	Approx. Weight (kg/km)	Cable Overall Diameter (mm)	Approx. Weight (kg/km)
SINGLE & MULTI-PAIRS	1P	0.5	7 / 0.3	0.6	7.2	0.9	11.9	264	11.9	269
	2P		7 / 0.3	0.6	11.2	0.9	16.1	428	16.1	438
	3P		7 / 0.3	0.6	11.8	0.9	16.7	472	16.7	487
	4P		7 / 0.3	0.6	12.9	0.9	17.8	533	17.8	553
	5P		7 / 0.3	0.6	14.1	1.25	19.9	703	19.9	728
	6P		7 / 0.3	0.6	15.3	1.25	21.1	775	21.1	805
	8P		7 / 0.3	0.6	17.2	1.25	23.2	913	23.2	954
	10P		7 / 0.3	0.6	19.5	1.25	25.5	1056	25.5	1106
	12P		7 / 0.3	0.6	20.2	1.25	26.2	1128	26.2	1188
	16P		7 / 0.3	0.6	22.4	1.25	28.6	1337	28.6	1417
	20P		7 / 0.3	0.6	25.1	1.25	31.3	1549	31.3	1649
	24P		7 / 0.3	0.6	27.9	1.25	34.3	1779	34.3	1900
	36P		7 / 0.3	0.6	32.0	1.6	39.3	2490	39.3	2670
	SINGLE & MULTI-PAIRS		1P	0.75	7 / 0.37	0.6	7.6	0.9	12.3	280
2P		7 / 0.37	0.6		11.9	0.9	16.8	459	16.8	470
3P		7 / 0.37	0.6		12.6	0.9	17.5	510	17.5	527
4P		7 / 0.37	0.6		13.8	0.9	18.9	593	18.9	615
5P		7 / 0.37	0.6		15.1	1.25	20.9	766	20.9	794
6P		7 / 0.37	0.6		16.5	1.25	22.5	868	22.5	901
8P		7 / 0.37	0.6		18.5	1.25	24.5	1009	24.5	1053
10P		7 / 0.37	0.6		21.0	1.25	27.2	1180	27.2	1235
12P		7 / 0.37	0.6		21.7	1.25	27.9	1274	27.9	1340
16P		7 / 0.37	0.6		24.2	1.25	30.4	1498	30.4	1586
20P		7 / 0.37	0.6		27.1	1.25	33.5	1763	33.5	1873
24P		7 / 0.37	0.6		30.1	1.25	36.7	2024	36.7	2155
36P		7 / 0.37	0.6		35.1	1.6	42.6	2902	42.6	3100
SINGLE & MULTI-PAIRS		1P	1.0		7 / 0.43	0.6	8.0	0.9	12.7	296
	2P	7 / 0.43		0.6	12.5	0.9	17.4	489	17.4	500
	3P	7 / 0.43		0.6	13.3	0.9	18.4	562	18.4	580
	4P	7 / 0.43		0.6	14.6	1.25	20.4	741	20.4	765
	5P	7 / 0.43		0.6	15.9	1.25	21.7	826	21.7	856
	6P	7 / 0.43		0.6	17.4	1.25	23.4	936	23.4	971
	8P	7 / 0.43		0.6	19.6	1.25	25.6	1101	25.6	1148
	10P	7 / 0.43		0.6	22.3	1.25	28.5	1297	28.5	1356
	12P	7 / 0.43		0.6	23.1	1.25	29.3	1405	29.3	1476
	16P	7 / 0.43		0.6	25.7	1.25	32.1	1670	32.1	1765
	20P	7 / 0.43		0.6	28.8	1.25	35.2	1947	35.2	2065
	24P	7 / 0.43		0.6	32.0	1.6	39.3	2462	39.3	2603
	36P	7 / 0.43		0.6	37.3	1.6	44.8	3234	44.8	3447

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SINGLE & MULTI-PAIRS	1P	1.5	7 / 0.53	0.6	8.6	0.9	13.3	329	13.3	336
	2P		7 / 0.53	0.6	13.6	0.9	18.7	556	18.7	569
	3P		7 / 0.53	0.6	14.5	1.25	20.3	737	20.3	756
	4P		7 / 0.53	0.6	15.9	1.25	21.7	834	21.7	861
	5P		7 / 0.53	0.6	17.4	1.25	23.4	955	23.4	988
	6P		7 / 0.53	0.6	19.0	1.25	25.0	1066	25.0	1106
	8P		7 / 0.53	0.6	21.4	1.25	27.6	1272	27.6	1324
	10P		7 / 0.53	0.6	24.4	1.25	30.6	1492	30.6	1558
	12P		7 / 0.53	0.6	25.3	1.25	31.7	1641	31.7	1720
	16P		7 / 0.53	0.6	28.2	1.25	34.6	1951	34.6	2057
	20P		7 / 0.53	0.6	31.6	1.6	38.9	2535	38.9	2666
	24P		7 / 0.53	0.6	35.6	1.6	43.1	2961	43.1	3118
	36P		7 / 0.53	0.6	41.0	1.6	48.7	3850	48.7	4087
	SINGLE & MULTI-PAIRS		1P	2.5	7 / 0.67	0.7	9.8	0.9	14.7	394
2P		7 / 0.67	0.7		15.8	1.25	21.6	779	21.6	797
3P		7 / 0.67	0.7		16.9	1.25	22.9	908	22.9	935
4P		7 / 0.67	0.7		18.5	1.25	24.5	1042	24.5	1078
5P		7 / 0.67	0.7		20.4	1.25	26.6	1203	26.6	1249
6P		7 / 0.67	0.7		22.3	1.25	28.5	1352	28.5	1407
8P		7 / 0.67	0.7		25.2	1.25	31.6	1623	31.6	1697
10P		7 / 0.67	0.7		28.8	1.25	35.2	1909	35.2	2001
12P		7 / 0.67	0.7		29.9	1.6	37.2	2321	37.2	2431
16P		7 / 0.67	0.7		33.8	1.6	41.3	2851	41.3	2998
20P		7 / 0.67	0.7		37.9	1.6	45.6	3545	45.6	3545
24P		7 / 0.67	0.7		42.2	2.0	50.9	4225	50.9	4445
36P		7 / 0.67	0.7		49.1	2.0	58.2	5598	58.2	5928

\* Other pairs, triads and quads configurations are available upon request.

\* Class 5 conductors are available upon request.

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No. of Triads	Nominal Conductor Area (mm <sup>2</sup> )	No. and Diameter of Wires (no./mm)	Radial Thickness of Insulation (mm)	IN-XIOSP		IN-PIOSP	
				Cable Overall Diameter (mm)	Approximate Weight (kg/km)	Cable Overall Diameter (mm)	Approximate Weight (kg/km)
1T	0.5	7 / 0.3	0.6	12.2	282	12.2	290
6T		7 / 0.3	0.6	23.0	904	23.0	949
16T		7 / 0.3	0.6	31.3	1593	31.3	1711
24T		7 / 0.3	0.6	38.6	2370	38.6	2549
1T	0.75	7 / 0.37	0.6	12.7	302	12.7	310
6T		7 / 0.37	0.6	24.3	1005	24.3	1053
16T		7 / 0.37	0.6	33.5	1829	33.5	1959
24T		7 / 0.37	0.6	41.7	2776	41.7	2971
1T	1.0	7 / 0.43	0.6	13.1	325	13.1	334
6T		7 / 0.43	0.6	25.4	1102	25.4	1155
16T		7 / 0.43	0.6	35.2	2034	35.2	2174
24T		7 / 0.43	0.6	43.9	3088	43.9	3298
1T	1.5	7 / 0.53	0.6	13.9	367	13.9	377
6T		7 / 0.53	0.6	27.4	1293	27.4	1351
16T		7 / 0.53	0.6	39.0	2667	39.0	2823
24T		7 / 0.53	0.6	47.8	3698	47.8	3932
1T	2.5	7 / 0.67	0.7	15.3	443	15.3	457
6T		7 / 0.67	0.7	31.4	1655	31.4	1737
16T		7 / 0.67	0.7	45.7	3578	45.7	3797
24T		7 / 0.67	0.7	56.9	5383	56.9	5711

SINGLE & MULTI-TRIADS

\* Other pairs, triads and quads configurations are available upon request.

\* Class 5 conductors are available upon request.