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Control and Instrumentation Cables

Multipair PE Insulated Instrumentation Cable

# BS5308 Part 1 Type 1

Collective Screen, Unarmoured 300/500V



## Application

These cables are designed to connect electrical instrument circuits and provide communication services in and around process plants (e.g. petrochemical industry etc.). Not suitable for direct buried applications (see cables types 2 and 3).

## Specifications

- In accordance with BS 5308 Part 1.
- **Conductors:** Solid (Class 1), stranded (Class 2) or flexible (Class 5) copper conductors to BS EN 60228.
- **Insulation:** Polythene insulation Type 03 to BS6234.
- **Pair Identification:** See colour code chart 1 on page 4:22.
- 100mm maximum pair lay length (minimum 10 twists per metre).
- **Binder Tape:** p.e.t.p. tape 50% overlap.
- **Collective Screen:** tinned copper drain wire(s) under and in contact with aluminium/p.e.t.p. laminated tape applied metallic side down.
- **Outer Sheath:** PVC outer sheath Type TM.1 to BS EN 50363-4-1. In addition, outer sheath displays following characteristics:  
Minimum oxygen index: 30%.  
Maximum HCL Emission @ 800°C: 15%.
- Flame retardant to BS EN 60332-3-24 & IEC60332-3-24 Category C (NMV1.5).
- **Voltage Rating:** 300/500V.
- **Temperature Rating:** 65°C maximum conductor operating temperature.

Control & Instrumentation Cables  
**Multipair PE Insulated Instrumentation Cable**  
**BS5308 Part 1 Type 1**

Collective Screen, Unarmoured 300/500V

Anixter Number	Number of Pairs/ Triple	Nominal Cond Area	Nominal Cond Stranding	Insulation Thickness	Nominal O/D	Approx Cable Weight	Min Bending Radius (fixed bend)
		mm <sup>2</sup>	#/mm	mm	mm	kg/km	mm
A7-M21-0001LF	1P	0.50	16/0.20	0.60	7.00	60	60
A7-M21-0002LF	2P(Quad)	0.50	16/0.20	0.60	7.90	80	70
A7-M21-0005LF	5P	0.50	16/0.20	0.60	13.10	200	110
A7-M21-0010LF	10P	0.50	16/0.20	0.60	17.20	340	140
A7-M21-0020LF	20P	0.50	16/0.20	0.60	22.30	570	180
A7-M21-0001TLF	1T	0.50	16/0.20	0.60	7.30	68	60
A7-M31-0001LF	1P	0.75	24/0.20	0.60	7.30	75	60
A7-M31-0002LF	2P(Quad)	0.75	24/0.20	0.60	8.30	100	70
A7-M31-0005LF	5P	0.75	24/0.20	0.60	14.30	250	120
A7-M31-0010LF	10P	0.75	24/0.20	0.60	18.70	450	150
A7-M31-0020LF	20P	0.75	24/0.20	0.60	24.50	920	200
A7-M31-0001TLF	1T	0.75	24/0.20	0.60	7.70	80	70
A7-L11-0001LF	1P	1.00	1/1.13	0.60	7.40	85	60
A7-L11-0002LF	2P(Quad)	1.00	1/1.13	0.60	8.40	115	70
A7-L11-0005LF	5P	1.00	1/1.13	0.60	14.20	290	120
A7-L11-0010LF	10P	1.00	1/1.13	0.60	18.40	500	150
A7-L11-0020LF	20P	1.00	1/1.13	0.60	24.40	950	200
A7-L11-0001TLF	1T	1.00	1/1.13	0.60	7.70	105	70
A7-L31-0001LF	1P	1.50	7/0.53	0.60	8.30	100	70
A7-L31-0002LF	2P(Quad)	1.50	7/0.53	0.60	9.70	150	80
A7-L31-0005LF	5P	1.50	7/0.53	0.60	16.40	360	140
A7-L31-0010LF	10P	1.50	7/0.53	0.60	21.60	670	180
A7-L31-0020LF	20P	1.50	7/0.53	0.60	28.50	1230	230
A7-L31-0001TLF	1T	1.50	7/0.53	0.60	8.90	120	80

N.B. The above part numbers apply to cables with blue outer sheaths. For black outer add -02, for green outer add -04.

15, 30 and 50 pair cables of the above type are also covered in BS5308 Part 1 and details are available upon request.

0.5mm<sup>2</sup> cables are also available with solid conductors (1/0.8mm). Details available upon request.

For low smoke zero halogen alternative see page 4:10.

For further technical information refer to page 4:22.

# Technical Information for BS5308 Part 1

## IDENTIFICATION OF PAIRS

Two-pair unscreened and collectively screened cables shall be laid up in quad formation and colour coded in clockwise order of rotation: black, blue, green, brown. All other unscreened or collectively screened cables up to 50 pair shall be colour coded as given in colour code chart 1 below:

### COLOUR CODE CHART 1

Pair Number	a-Wire	b-Wire	Pair Number	a-Wire	b-Wire
1	Black	Blue	26	White	Yellow
2	Black	Green	27	Red	Yellow
3	Blue	Green	28	Orange	Yellow
4	Black	Brown	29	Black	Grey
5	Blue	Brown	30	Blue	Grey
6	Green	Brown	31	Green	Grey
7	Black	White	32	Brown	Grey
8	Blue	White	33	White	Grey
9	Green	White	34	Red	Grey
10	Brown	White	35	Orange	Grey
11	Black	Red	36	Yellow	Grey
12	Blue	Red	37	Black	Violet
13	Green	Red	38	Blue	Violet
14	Brown	Red	39	Green	Violet
15	White	Red	40	Brown	Violet
16	Black	Orange	41	White	Violet
17	Blue	Orange	42	Red	Violet
18	Green	Orange	43	Orange	Violet
19	Brown	Orange	44	Yellow	Violet
20	White	Orange	45	Grey	Violet
21	Red	Orange	46	Black	Turquoise
22	Black	Yellow	47	Blue	Turquoise
23	Blue	Yellow	48	Green	Turquoise
24	Green	Yellow	49	Brown	Turquoise
25	Brown	Yellow	50	White	Turquoise

Single triple cables will be identified black, blue, green.

N.B. The cables are suitable for operation at voltage up to and including 300Vrms core-earth and 500Vrms core-core, but are not intended for direct connection to a low impedance source, e.g. public mains electricity supply.

# Technical Information for BS5308 Part 1

## ELECTRICAL CHARACTERISTICS

### MAXIMUM MUTUAL CAPACITANCE VALUES

	Conductor Size				
	0.5mm <sup>2</sup> pF/m	0.75mm <sup>2</sup> pF/m	1.0mm <sup>2</sup> pF/m	1.5mm <sup>2</sup> pF/m	2.5mm <sup>2</sup> pF/m
Cables without Screens	75	75	75	85	85
Cables with Collective Screen Only except 1 pair, 2 pair and 1 triple)	75	75	75	85	85
One Pair, One Triple and Two Pair Collectively Screened and all Cables with individually Screened Pairs	115	115	115	120	120

### MAXIMUM D.C. CONDUCTOR RESISTANCE @ 20°C

Conductor Size	Conductor Stranding	Resistance @ 20°C Maximum
mm <sup>2</sup>	#/mm	Ω/km
0.5	1/0.8	36.8
0.5	16/0.2	39.7
0.75	24/0.2	26.5
1.0	1/1.13	18.4
1.5	7/0.53	12.3
2.5	7/0.67	7.56

pF/m = pico Farads per metre  
 Ω/km = ohms per km  
 μH/Ω = micro Henrys per ohm

### MAXIMUM L/R RATIO

Conductor Size	Conductor L/R Ratio (for adjacent cores)
mm <sup>2</sup>	
0.5	25μH/Ω
0.75	25μH/Ω
1.0	25μH/Ω
1.5	40μH/Ω
2.5	65μH/Ω

### INFORMATION ON HANDLING AND USAGE AT LOW TEMPERATURES

Attention is drawn to the fact that as the temperature decreases PVC compounds become increasingly stiff and brittle, with the result that if the cable is bent quickly into a small radius, or is struck sharply at temperatures in the region of 0°C or lower, there is a risk of shattering the PVC components. To avoid the risk of damage during handling, therefore, it is desirable that the cables specified in this standard should be installed only when both the cable and the ambient temperatures are above 0°C and have been so for the previous 24 hrs, or where special precautions have been taken to maintain the cable above this temperature. However, after installation, they will operate satisfactorily at temperatures between -40°C and +65°C providing that at temperatures below 0°C they are not subject to movement or impact. The manufacturer should be consulted for precise instructions if the cable is to be stored and/or used outside these temperature limits.