

# Armoured Instrumentation Cables to BS7917

Fire Resistant, Pairs/Triples/Quads - Individually Screened.

Low Smoke Zero Halogen

TAC, MGT, EPR, SCRN, ZH, GSWB, SW4 150/250 V



## Application

Control and instrumentation cable for use in fixed installations in ships and offshore units where fire resistance and circuit integrity is essential.

## Specifications

- In accordance with BS7917. Fire resistant properties relevant to IEC60331
- **Conductor:** Tinned annealed copper. Stranded to BS EN 60228 Class 2 or flexible to BS EN 60228 Class 5
- **Insulation:** Mica Glass Tape, EPR complying with BS7655 GP4
- **Core Identification:** Black and white pairs. Triples black, white and red. Quads, black, white, red, blue
- **Screening:** Aluminium mylar tape wrapped over each pair/triple/quad in contact with tinned copper drain wire
- **Inner Sheath:** Zero halogen rubber complying generally with BS7655
- **Armour:** Galvanised steel wire braid to BS EN 10257-1
- **Outer Sheath:** Low smoke zero halogen Type SW4 to BS7655 section 2.6. Enhanced oil resistance, low smoke zero halogen
- **Identification:** Legend will include manufacturers name, voltage, number of pairs/triples/quads, c.s.a., IEC 60331, and UK00A code where applicable
- Standard sheath colours are grey, blue or black. Other colours available on request
- Oxygen index > 32%. Temperature index 250°C, HCL emission < 0.5% of weight of compound at 800°C
- Flame retardant to IEC 60332-3-22 Category A (reduced propagation)
- Fire resistant to IEC60331 (enhanced to 1000°C for 3 hours)
- **Temperature Rating:** 90°C maximum conductor operating temperature
- **Voltage Rating:** 150/250 V

# Armoured Instrumentation Cables to BS7917

Fire Resistant, Pairs/Triples/Quads - Individually Screened.

Low Smoke Zero Halogen

TAC, MGT, EPR, SCRIN, ZH, GSWB, SW4 150/250 V

Anixter Number	UK00A Code	Nominal Cond Area mm <sup>2</sup>	Nominal Cond Stranding #/mm	Number of Pairs/ Triples Quads	Diameter Over Inner Sheath		Min O/D mm	Max O/D mm	Approx Weight kg/km	Anixter No Prysmian E1XF Gland	Anixter Number Hawke Gland
					Min mm	Max mm					
<b>Pairs</b>											
BS7917-3P-0007-I-6	GMH00	0.75	24/0.2	3PR	14.0	16.0	18.1	20.5	584	-25	E1BP-E1XF
BS7917-3P-0007-I-9	GPH00	0.75	24/0.2	3PR	14.0	16.0	18.1	20.5	584	-25	-25
BS7917-7P-0007-I-6	GMJ00	0.75	24/0.2	7PR	19.0	21.1	23.5	26.4	982	-32	E1DZ-UNI
BS7917-7P-0007-I-9	GPJ00	0.75	24/0.2	7PR	19.0	21.1	23.5	26.4	982	-32	-32
BS7917-12P-0007-I-6	GMK00	0.75	24/0.2	12PR	23.8	26.4	28.7	31.9	1504	-32	-32
BS7917-12P-0007-I-9	GPK00	0.75	24/0.2	12PR	23.8	26.4	28.7	31.9	1504	-32	-32
<b>Triples</b>											
BS7917-1P-0010-I-6	GMF01	1.0	32/0.2	1PR	7.9	9.2	11.6	13.5	286	-20S	-20S
BS7917-1P-0010-I-9	GPF01	1.0	32/0.2	1PR	7.9	9.2	11.6	13.5	286	-20S	-20S
BS7917-1P-0015-I-##	N/A	1.5	7/0.53	1PR	9.6	10.8	13.6	15.2	320	-20S	-20S
BS7917-2P-0015-I-##	N/A	1.5	7/0.53	2PR	14.9	16.5	19.3	21.5	602	-25	-25
BS7917-3P-0015-I-##	N/A	1.5	7/0.53	3PR	15.9	17.5	20.4	22.8	732	-25	-25
BS7917-5P-0015-I-##	N/A	1.5	7/0.53	5PR	19.5	21.4	24.2	26.7	1031	-32	-25
BS7917-7P-0015-I-##	N/A	1.5	7/0.53	7PR	21.5	23.6	26.5	29.1	1242	-32	-32
BS7917-10P-0015-I-##	N/A	1.5	7/0.53	10PR	27.4	29.6	33.6	36.7	1877	-40	-40
BS7917-12P-0015-I-##	N/A	1.5	7/0.53	12PR	28.6	30.8	34.8	37.9	2039	-40	-40
BS7917-20P-0015-I-##	N/A	1.5	7/0.53	20PR	36.1	38.4	42.9	46.7	3232	-50	-50
<b>Quads</b>											
BS7917-3T-0007-I-6	GMS00	0.75	24/0.2	3TR	15.0	17.0	19.2	21.6	783	-25	-25
BS7917-3T-0007-I-9	GPS00	0.75	24/0.2	3TR	15.0	17.0	19.2	21.6	783	-25	-25
BS7917-7T-0007-I-6	GMT00	0.75	24/0.2	7TR	19.9	22.3	24.4	27.4	1329	-32	-32
BS7917-7T-0007-I-9	GPT00	0.75	24/0.2	7TR	19.9	22.3	24.4	27.4	1329	-32	-32
BS7917-12T-0007-I-6	GMU00	0.75	24/0.2	12TR	26.9	29.7	32.0	35.8	2258	-50S	-50
BS7917-12T-0007-I-9	GPU00	0.75	24/0.2	12TR	26.9	29.7	32.0	35.8	2258	-50S	-50
BS7917-1T-0010-I-6	GMR01	1.0	32/0.2	1TR	8.9	10.2	12.6	14.5	305	-20S	-20S
BS7917-1T-0010-I-9	GPR01	1.0	32/0.2	1TR	8.9	10.2	12.6	14.5	305	-20S	-20S
BS7917-1T-0015-I-##	N/A	1.5	7/0.53	1TR	10.1	11.4	14.2	15.8	336	-20	-20

## For black outer sheath insert suffix -2, for blue outer sheath insert suffix -6, for grey outer sheath insert suffix -9.  
For further technical information please refer to page 6.33.

Marine and Offshore Cables  
**Technical Information**

150/250 V EPR and MICA/EPR Insulated Cables to BS6883/BS7917 Armoured and Non-Armoured

**CABLE TYPES:**

EPR insulated 150/250 V instrumentation cable.

MICA/EPR insulated 150/250 V instrumentation cable.

**ELECTRICAL CHARACTERISTICS**

Electrical Characteristic	Unit	Cable					
		Flame Retardant EPR Insulated Conductor Size (mm <sup>2</sup> )			Type Fire Resistant MICA/EPR Insulated Conductor Size (mm <sup>2</sup> )		
		0.75	1.0	1.5	0.75	1.0	1.5
Maximum d.c. conductor resistance @ 20°C	ohms/km	25.3	18.6	12.4	25.3	18.6	12.4
Maximum a.c. conductor resistance @ 90°C	ohms/km	32.3	23.7	15.9	32.3	23.7	15.9
Maximum LOOP self-inductance (up to 1kHz)	mH/km	0.860	0.819	0.778	0.912	0.867	0.823
Maximum L/R ratio	μH/ohm	21.0	27.0	38.0	22.0	29.0	40.0
<b>Maximum mutual capacitance:</b>							
Cables with collective screen only (except one-pair, one triple & one quad)	pF/m	88	96	105	80	86	94
One-pair collectively screened and all cables with individually screened pairs	pF/m	104	115	128	93	102	114
One triple/quad collectively screened and all cables with individually screened triples/quads	pF/m	92	101	111	83	91	100

Resistances for 0.75mm<sup>2</sup> (24/0.2mm) and 1.0mm<sup>2</sup> (32/0.2mm) Class 5 conductors will be as follows:

	0.75mm <sup>2</sup>	1.0mm <sup>2</sup>
Maximum d.c. conductor resistance @ 20°C ohms/km	27.2	20.4
Maximum a.c. conductor resistance @ 90°C ohms/km	34.7	26.0

# Installation Guide for Offshore Cables

## General Precautions

Cables described in this section should not be installed at temperatures below minus 15°C, nor in any situation where the cooling air temperature exceeds 75°C. The cables meet the IEE requirement concerning impervious sheathing for cables installed on decks, exposed to weather, in damp or wet situations, in machinery compartments and in general, where water condensation or harmful vapours (including oil vapour) may be present. The sheathing compounds will withstand normal handling, installation and service but in areas where mechanical stress is envisaged unarmoured cables should be fitted in pipes or conduit or trunking. Alternatively, armoured and sheathed cables should be used. Cables should be protected from avoidable risks of mechanical damage and routed away from heat sources such as boilers, hot pipes and resistors. Cable runs should be selected to avoid action from condensed moisture or drips. Cables should not be installed across expansion joints, but where this is unavoidable a proportioned loop of cable should be arranged, suitably supported and having an internal radius not less than twelve times its diameter. For services with duplicate supplies, the cables should

follow different paths and be separated as far apart as is reasonably practical. Cables and wiring for mains and emergency power, lighting, internal communications or signalling should be routed away from galleys, machinery spaces and other high fire-risk areas except when supplying equipment in those places. In situations offering considerable risk of mechanical damage, such as storage spaces, cables should be protected by steel casing, trunking or conduit if the structure or attached parts do not afford sufficient protection, even to armoured cables. Any metal casing so used should be sufficiently protected against corrosion. All cable supports and accessories should be robust and constructed from corrosion-resistant material, or suitably treated to resist corrosion. Metals or alloys with low melting points (e.g. aluminium) should not be used. Cables passing through watertight decks or bulkheads should be provided with deck-tubes, watertight glands, multi-transit assemblies, or fire-retardant packed boxes as appropriate to meet the requirements of the Authority approving the installation.

# Installation Guide for Offshore Cables

## General Precautions

Where cables pass through non-watertight bulkheads, beams or other steel structure, the holes should be glanded or bushed with non-corroding materials to prevent damage to both cables and structure. The means of fixing of conductors and terminals should be capable of withstanding the thermal and dynamic effects of short circuits. When single-core cables, having a current rating greater than 250A need to be installed close to a steel bulkhead, the clearance between cable and metal surface should be at least 50mm,

unless the cables belonging to the same a.c. circuit are installed in trefoil. In the interests of safety and circuit reliability, it is assumed that installers will adhere to the IEE Regulations and Recommendations for the Electrical Equipment of Ships and of Mobile and Fixed Offshore installations. Particular attention should be paid to recommendations concerning cables, with regard to their effect on navigational and radio equipment.

### MINIMUM BENDING RADIUS

Ideally cables should be bent as little as possible and never to radii less than the following:

Type of Cable*	Minimum Bending Radius
Instrumentation	8 x diameter
Power & Control up to 3.3/3.3 kV **	
Armoured up to 25mm D	4 x diameter
Armoured over 25mm D	6 x diameter
Unarmoured up to 10mm D	3 x diameter
Unarmoured over 10mm up to 25mm D	4 x diameter
Unarmoured over 25mm D	6 x diameter
Power cable 3.8/6.6 kV and above **	
Un-screened	12 x diameter
Screened - single-core	20 x diameter
Screened - three core	15 x diameter

\* All fire survival (FS) cables - 8 x diameter. \*\* 4 x diameter Class 2 flexible cables.