Armoured Power and Control Cables to BS6883

Low Smoke Zero Halogen
Single-Core - T.A.C EPR, SW4, TPBWB. SW4 600/1000 V
Multicore - T.A.C EPR, SW4, GSWB, SW4 600/1000 V

Application

Armoured cables for fixed wiring in ships and in mobile and fixed offshore units (e.g. drilling rigs, oil platforms, etc.). For use in regularly occupied areas such as accommodation facilities, control rooms and computer suites. Any application where life may be endangered by smoke and noxious fumes and where vital, sensitive equipment may be damaged by acid forming gases.

Specifications

- In accordance with BS6883
- **Conductor:** Tinned annealed copper. Stranded to BS EN 60228 Class 2 or flexible to BS EN 60228 Class 5
- **Insulation:** EPR complying with BS7655 GP4
- **Core Identification:** The cores shall be identified by numbers unless requested otherwise
- **Inner Sheath:** Will be the same material as the outer sheath, based generally on the requirements of BS7655 section 2.6 Type SW4. Enhanced oil resistance, low smoke zero halogen, minimum tear resistance
- **Armour:** wire braid in the following optional materials:
  - Galvanised mild steel to BS EN 10257-1
  - Tinned phosphor bronze to BS EN 12166
  - Copper to BS EN 13602

N.B. Galvanised mild steel should not be used on single-core cables where used for a.c. circuits.

- **Outer Sheath:** As inner sheath. Identification legend will include manufacturers name, voltage, BS6883, number of cores and c.s.a. cable sheath class (e.g. SW4), IEC 60332 and UK00A code where applicable
- Standard sheath colour is 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 IEC60332-3-22 Category A (reduced propagation)
- **Temperature Rating:** 90°C maximum conductor operating temperature
- **Voltage Rating:** 600/1000 V

For flexible conductors add suffix F to part number, these will not be covered by the UK00A code.

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Multicore - T.A.C EPR, SW4, GSWB, SW4 600/1000 V

Anixter Number	UK00A Code	Nominal Cond Area mm^2	Nominal Cond Stranding #/mm	Diameter Over Inner Sheath Minimum mm	Diameter Over Inner Sheath Maximum mm	Minimum O/D mm	Maximum O/D mm	Approx Weight kg/km	Anixter No Prysmian E1XF Gland	Anixter Number Hawke Gland
Single-Core 6591									E1BP-E1XF	E1DZ-UNI
BS6883-1C-0500(F)*	WA150	50	19/1.78	13.7	15.2	18.1	20.1	846	-25	-25
BS6883-1C-0700(F)*	WA170	70	19/2.14	15.4	17.1	19.9	22.4	1102	-25	-25
BS6883-1C-0950(F)*	WA195	95	37/1.78	17.7	19.4	22.4	24.9	1422	-25	-25
BS6883-1C-1200(F)*	WA10A	120	37/2.03	19.6	21.5	24.5	27.0	1761	-32	-32
BS6883-1C-1500(F)*	WA10B	150	37/2.25	21.6	23.7	26.8	29.4	2124	-32	-32
BS6883-1C-1850(F)*	WA10C	185	37/2.52	24.0	26.3	30.0	33.3	2694	-32	-32
BS6883-1C-2400(F)*	WA10D	240	61/2.25	27.1	29.4	33.3	36.6	3413	-40	-40
BS6883-1C-3000(F)*	WA10E	300	61/2.52	30.0	32.9	36.5	40.0	4173	-40	-40
Two Core 6582										
BS6883-2C-0015	WB202	1.5	30/0.25	8.4	9.5	12.4	14.0	268	-20S	-20S
BS6883-2C-0025	WB203	2.5	7/0.67	9.2	10.3	13.2	14.7	314	-20S	-20S
BS6883-2C-0040	WB204	4.0	7/0.85	11.3	12.6	15.5	17.2	430	-20	-20
BS6883-2C-0060	WB206	6.0	7/1.04	12.4	13.8	16.8	18.5	523	-20	-20
BS6883-2C-0100	WB210	10	7/1.35	14.5	15.9	18.9	20.6	687	-25	-25
BS6883-2C-0160	WB216	16	7/1.70	16.8	18.3	21.3	23.5	925	-25	-25
BS6883-2C-0250	WB225	25	19/1.35	20.5	22.4	25.4	27.9	1365	-32	-32
Three Core 6583										
BS6883-3C-0015	WB302	1.5	30/0.25	8.9	10.0	12.9	14.4	298	-20S	-20S
BS6883-3C-0025	WB303	2.5	7/0.67	9.8	11.0	14.0	15.5	360	-20S	-20S
BS6883-3C-0040	WB304	4.0	7/0.85	12.0	13.4	16.2	17.9	490	-20	-20
BS6883-3C-0060	WB306	6.0	7/1.04	13.2	14.6	17.6	19.4	601	-25	-25
BS6883-3C-0100	WB310	10.0	7/1.35	15.4	17.0	19.9	22.2	821	-25	-25
BS6883-3C-0160	WB316	16.0	7/1.70	17.9	19.4	22.6	24.8	1113	-25	-25
BS6883-3C-0250	WB325	25.0	19/1.35	22.1	24.1	27.2	29.8	1687	-32	-32
BS6883-3C-0350	WB335	35.0	19/1.53	24.1	26.1	30.1	33.1	2120	-32	-32
BS6883-3C-0500	WB350	50.0	19/1.78	27.8	29.8	34.0	36.9	2736	-40	-40
BS6883-3C-0700	WB370	70.0	19/2.14	31.9	34.3	38.5	41.8	3660	-50S	-40
BS6883-3C-0950	WB395	95.0	37/1.78	36.8	39.2	43.8	47.2	4773	-50	-50
BS6883-3C-1200	WB30A	120.0	37/2.03	40.6	43.4	48.0	51.9	5925	-50	-50
BS6883-3C-1500	WB30B	150.0	37/2.25	45.0	47.9	52.7	56.8	7178	-63S	-63
BS6883-3C-1850	WB30C	185.0	37/2.52	50.2	53.6	58.3	62.9	8881	-63	-63
BS6883-3C-2400	WB30D	240.0	61/2.25	56.8	60.3	65.3	70.1	11325	-75S	-75

* Add F to the part number for flexible conductors e.g. BS6883-1C-1850F.
The UK00A code only relates to the stranded conductor.

Continued overleaf...

Armoured Power and Control Cables to BS6883

Low Smoke Zero Halogen (continued)
Single-Core - T.A.C EPR, SW4, TPBWB. SW4 600/1000 V
Multicore - T.A.C EPR, SW4, GSWB, SW4 600/1000 V

Anixter Number	UK00A Code	Nominal Cond Area mm^2	Nominal Cond Stranding #/mm	Diameter Over Inner Sheath Minimum mm	Diameter Over Inner Sheath Maximum mm	Minimum O/D mm	Maximum O/D mm	Approx Weight kg/km	Anixter No Prysmian E1XF Gland	Anixter No Hawke Gland
									E1BP-E1XF	E1DZ-UNI
Four Core 6584										
BS6883-4C-0015	WB402	1.5	30/0.25	9.7	10.9	13.9	15.4	342	-20S	-20S
BS6883-4C-0025	WB403	2.5	7/0.67	10.7	12.0	14.9	16.4	419	-20	-20
BS6883-4C-0040	WB404	4.0	7/0.85	13.2	14.6	17.6	19.3	586	-20	-20
BS6883-4C-0060	WB406	6.0	7/1.04	14.7	16.2	19.3	21.1	737	-25	-25
BS6883-4C-0100	WB410	10.0	7/1.35	17.2	18.7	21.9	24.1	1013	-25	-25
BS6883-4C-0160	WB416	16.0	7/1.70	19.9	21.8	24.8	27.1	1382	-32	-32
BS6883-4C-0250	WB425	25.0	19/1.35	24.6	26.6	30.6	33.6	2191	-40	N/A
BS6883-4C-0350	WB435	35.0	19/1.53	26.9	28.9	33.1	36.0	2654	-40	-40
BS6883-4C-0500	WB450	50.0	19/1.78	30.9	33.3	37.5	40.6	3434	-50S	-40
BS6883-4C-0700	WB470	70.0	19/2.14	35.5	37.9	42.4	46.0	4625	-50	-50
BS6883-4C-0950	WB495	95.0	37/1.78	40.9	43.7	48.3	52.1	6020	-50	-50
BS6883-4C-1200	WB40A	120.0	37/2.03	45.4	48.3	53.1	57.2	7525	-63S	-63
BS6883-4C-1500	WB40B	150.0	37/2.25	50.3	53.5	58.4	62.9	9125	-63	-63
BS6883-4C-1850	WB40C	185.0	37/2.52	56.0	59.5	64.5	69.4	11221	-75S	-75

Armoured Power and Control Cables to BS6883

Low Smoke Zero Halogen
Single-Core - T.A.C EPR, SW4, TPBWB. SW4 600/1000 V
Multicore - T.A.C EPR, SW4, GSWB, SW4 600/1000 V

Anixter Number	UK00A Code	Nominal Cond Area mm^2	Nominal Cond Stranding #/mm	Diameter Over Inner Sheath Minimum mm	Diameter Over Inner Sheath Maximum mm	Minimum O/D mm	Maximum O/D mm	Approx Weight kg/km	Anixter No Prysmian E1XF Gland	Anixter Number Hawke Gland
Seven Core 6587									E1BP-E1XF	E1DZ-UNI
BS6883-7C-0015	WB702	1.5	30/0.25	11.8	13.2	16.0	17.7	476	-20	-20
BS6883-7C-0025	WB703	2.5	7/0.67	13.1	14.4	17.4	19.1	590	-20	-20
Twelve Core 6580/12										
BS6883-12C-0015	WBA02	1.5	30/0.25	15.7	17.2	20.2	22.4	732	-25	-25
BS6883-12C-0025	WBA03	2.5	7/0.67	17.7	19.3	22.4	24.8	935	-25	-25
Nineteen Core 6580/19										
BS6883-19C-0015	WBB02	1.5	30/0.25	18.6	20.1	22.5	24.8	935	-25	-25
BS6883-19C-0025	WBB03	2.5	7/0.67	20.9	22.7	25.8	28.0	1287	-32	-32
Twenty Seven Core 6580/27										
BS6883-27C-0015	LBC02	1.5	30/0.25	22.7	24.5	27.8	30.0	1359	-32	-32
BS6883-27C-0025	LBC03	2.5	7/0.67	25.4	27.6	31.4	34.5	1854	-40	-40
Thirty Seven Core 6580/37										
BS6883-37C-0015	LBD02	1.5	30/0.25	25.5	27.3	31.5	34.2	1805	-40	-40
BS6883-37C-0025	-	2.5	7/0.67	28.7	30.9	34.9	38.1	2349	-40	-40

For further technical information refer to page 6:28.

Continuous current ratings for groups of circuits (up to six cables bunched) for twin and multicore EPR insulated cables, run open or enclosed. Also applicable to mica taped fire resistant types.

CURRENT RATINGS

Nominal Conductor Area	Twin Cables			Three & Four Core Cables	
	Current Rating Single Phase a.c. or d.c.	Voltage Drop Per Ampere Per Metre		Current Rating Three Phase a.c.	Voltage Drop Per Ampere Per Metre
		d.c.	Single Phase a.c.		
mm^2	A	mV	mV	A	mV
1.0	14	54	54	12	47
1.5	18	35	35	15	30
2.5	25	18	18	21	16
4.0	34	12	12	29	10
6.0	43	7.8	7.8	36	6.7
10	60	4.6	4.6	50	4.0
16	81	2.7	2.7	67	2.3
25	105	1.7	1.7	89	1.5
35	135	1.2	1.2	105	1.1
50	165	0.98	1.0	135	0.89
70	200	0.68	0.70	170	0.64
95	250	0.49	0.53	205	0.50
120	290	0.39	0.43	240	0.44
150	330	0.31	0.36	270	0.38
185	370	0.25	0.32	305	0.34
240	445	0.19	0.27	365	0.31
300	505	0.15	0.24	415	0.29

Where more than six cables are bunched, a rating factor of 0.85 should be applied to the current rating.

For ambient temperatures other than 45°C, the following rating factors should be applied:

Ambient air temp °C	35	40	45	50	55	60	65	70	75	80
Rating factor	1.11	1.05	1.0	0.94	0.88	0.82	0.75	0.67	0.58	0.47

Technical Information

600/1000 V EPR Insulated cables to BS6883 Armoured and Non-Armoured, Multicore

CABLE TYPES:

Multicore TCU/EPR/SW4 “657*” Type 600/1000 V to BS6883

Multicore TCU/EPR/SW4/GSWB/SW4 “658*” Type to BS6883

ELECTRICAL CHARACTERISTICS

Conductor Size	Maximum d.c. Conductor Resistance @ 20°C	Maximum a.c. Conductor Resistance @ 90°C	Reactance @ 60 Hz	Impedance @ 90°C, 60 Hz
mm^2	ohms/km	ohms/km	ohms/km	ohms/km
1.5	12.2	15.6	0.142	15.6
1.5*	13.7	17.5	0.142	17.5
2.5	7.56	9.64	0.133	9.64
4.0	4.70	5.99	0.133	5.99
6.0	3.11	3.97	0.126	3.97
10	1.84	2.35	0.118	2.35
16	1.16	1.48	0.112	1.48
25	0.734	0.936	0.107	0.941
35	0.529	0.674	0.104	0.684
50	0.391	0.499	0.103	0.510
70	0.270	0.344	0.102	0.358
95	0.195	0.271	0.099	0.288
120	0.154	0.214	0.097	0.235
150	0.126	0.175	0.097	0.200
185	0.100	0.140	0.097	0.170
240	0.0762	0.108	0.096	0.144
300	0.0607	0.087	0.096	0.129

* Class 5 (30/0.25mm) flexible conductors.

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.

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.