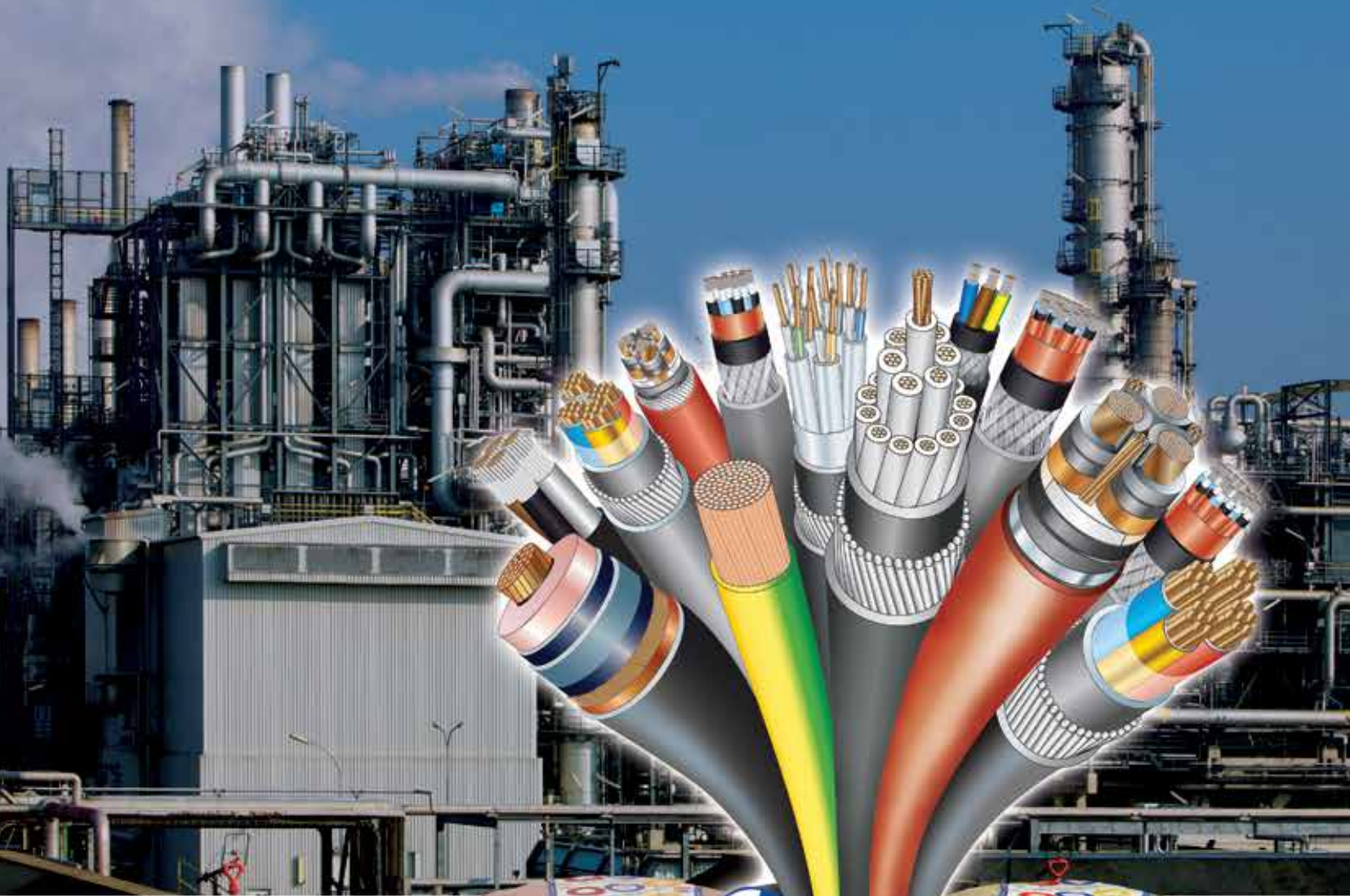


# INSTRUMENTATION CABLES



**NUHAS OMAN**  
**CABLES & WIRES**

**QUALITY & RELIABILITY**



NUHAS OMAN - SPECIALITY WIRES & CABLES



شركة نحاس عمان للأسلاك والكابلات المتخصصة

## COMPANY PROFILE

Nuhas Oman LLC, a member of the Al-Bahja Group of Companies, is an ISO 9001:2015 BASEC, UK certified integrated quality producer of LV and MV Cables, Wires & Conductors and Oxygen Free High Conductivity Continuous Cast Copper Rods in the Sultanate of Oman.

Nuhas is also certified to ISO 14001:2015 and ISO 45001:2018 by Bureau Veritas, Oman for HSE management system.

Our current capabilities are:

1. World-class Speciality Insulated Wires and Cables manufactured in state of art facility.
2. Oxygen Free High Conductivity Continuous Copper rod produced by UPCAST® System.
3. Nuhas Oman offers wide range of Cables :
  - Medium Voltage cables (Copper & Aluminium Conductor) up to 33 kV
  - Low Voltage cables
    - Power & Control Cables (Copper & Aluminium Conductor)
    - Instrumentation Cables
    - Flexible cords and Building wires
    - LPCB approved Fire Resistant Cables
    - LPCB approved Fire Alarm Cables
    - Offshore & Shipboard Cables
    - Multi layer sheathed chemical resistant Cables
    - Rubber Flexible Cables
    - Photovoltaic (Solar) Cables

Our product range meet the requirements of a broad spectrum of applications including - Industrial, Power & Control, Petrochemical, Oil & Gas, Ship Building and Offshore Platforms, Building & Construction, Hospitals, Hotels, Entertainment & Security etc. Nuhas Oman Cables are type test approved by BSI,U.K; KEMA,Netherlands; DEKRA,VDE,UL,LPCB & DNV-GL complying with relevant international BS & IEC Specifications. Our Cables are approved by various utilities, large corporates and global consultants such as Distribution Code Review Panel (DCRP),Oman; NAMA Holding (Mazoon,MEDC,Majan,Tanweer,DPC), Ministry of Electricity & Water,JSRS, Petroleum Development Oman (PDO), Oman Oil Refineries Petroleum Industries Company (ORPIC),Duqm Refinery, Daleel Petroleum,Oman Oil Company,Oman LNG, Oman Gas Company, Ministry of Transport, Ministry of Communications, Ministry of Defence, Royal Oman Police (ROP), Royal Court Affairs (RCA), Ministry of Health, Special Economic Zone Authority Duqm (SEZAD), Muscat Municipality, Occidental (Oxy), BP, Shell, Petrofac, Atkins, Parsons, Worley Parsons, SSH, Khatib and Alami, Mott MacDonald, Renardet etc.

Abu Dhabi Water & Electricity Authority (ADWEA), Abu Dhabi National Oil Company (ADNOC), Qatar General Electricity & Water Authority (Kahramaa), Qatar Civil Defense, Kuwait National Petroleum Company (KNPC), Electricity Distribution Directorate, Kingdom of Bahrain, Ministry of Electricity & Water authority,Kuwait; Saudi Electricity Company, KEO International, Arab Engineering Bureau, COWI etc.

New product development is a continuing activity at Nuhas Oman.

Nuhas is the first producer in the Middle East to have been certified by DNV-GL,Norway capable of manufacturing power, control and instrumentation cables for shipboard,high speed/light craft and off-shore applications. Nuhas Oman manufactures FRC 500 Fire Resistant LV cables and FRC 300 Fire Alarm screened cables which are type approved by LPCB, UK. Nuhas Oman also offers Power, Control & Instrumentation Cables with multilayer (AL-HDPE-PA) sheath as an alternative to Lead sheathed cables for better chemical protection mainly used in Petrochemical industry.

Nuhas is committed to deliver quality products that conform to relevant International standards. Our quality cycle commences from the time of sourcing of raw materials and consumables, in-process production controls and certification of finished goods prior to delivery. A well-equipped in-house quality assurance facility ensures that all products delivered meet stringent quality controls and parameters. Our state-of-the-art laboratory is equipped for testing as per required standards as well as individual customer specifications.

Our production and quality management systems are manned by a team of experienced professionals backed with relevant industry experience. Nuhas Oman is committed to excellence in the management of health, safety, environment and labor practices. We are committed to promoting and protecting the welfare of our employees through "Safety First" work practices and providing a healthy workplace. Nuhas Oman also ensures compliance with the laws and regulations of the land. Nuhas Oman endeavors to be a responsible corporate citizen and fulfills its responsibilities through its Corporate Social Responsibility initiatives. Our global client base extending from Far East Asia, Indian sub-continent, the GCC, Africa to Europe is testimony to customer confidence and satisfaction. The company is committed to meet the challenges of the Domestic & Global markets for supply of world class Cables & Wires, while maintaining the sanctity of our pristine environment.





**TABLE 1**  
**Instrumentation Cable - Unarmoured Type - 1**  
 Cu / PE / Osc / PVC

Reference Standards	PAS (BS) 5308-1	Applications	
<b>Construction</b>	1) <b>Oxygen Free Electronic Copper Conductor Class 1/ 2 / 5</b> 2) PE Insulation 3) Overall screen with Aluminium Mylar Tape & Tinned Copper drain wire 4) PVC outer sheathing		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference
		<b>Technical Data</b>	Please refer table A
		<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Sheath	Approx Overall Diameter
mm <sup>2</sup>		mm	mm
0.50 (1/0.8)	1	0.8	6.5
	2	0.8	7.3
	5	1.1	11.9
	10	1.2	15.3
0.50 (16/0.2)	1	0.8	7.2
	2	0.8	8.1
	5	1.1	13.4
	10	1.2	17.5
1.0 (1/1.13)	1	0.8	7.6
	2	0.8	8.6
	5	1.2	14.5
	10	1.2	18.7
1.5 (7/0.53)	1	0.8	8.5
	2	0.9	9.9
	5	1.2	16.7
	10	1.3	22.0

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 2**  
**Instrumentation Cables - Armoured Type -2**  
**Cu / PE / Osc / SWA / PVC**

Reference Standards	PAS (BS) 5308-1	Applications	
<b>Construction</b>	1) <b>Oxygen Free Electronic Copper</b> <b>Conductor class 1 / 2 / 5</b> 2) PE Insulation 3) Overall screen with Aluminium Mylar Tape & Tinned Copper drain wire 4) PVC Bedding 5) Galvanized steel wire Armour 6) PVC Outer sheathing		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference alongwith protection from mechanical damage
		<b>Technical Data</b>	Please refer Table A
		<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approx Overall Diameter
mm <sup>2</sup>		mm	mm	mm	mm
0.50 (1/0.8)	1	0.8	0.9	1.3	11.0
	2	0.8	0.9	1.3	11.8
	5	1.1	0.9	1.4	16.5
	10	1.2	1.25	1.6	21.1
0.50 (16/0.2)	1	0.8	0.9	1.3	11.7
	2	0.8	0.9	1.3	12.6
	5	1.1	0.9	1.5	18.2
	10	1.2	1.25	1.6	23.3
1.0 (1/1.13)	1	0.8	0.9	1.3	12.1
	2	0.8	0.9	1.4	13.3
	5	1.2	1.25	1.5	20.0
	10	1.2	1.25	1.7	24.7
1.5 (7/0.53)	1	0.8	0.9	1.4	13.2
	2	0.9	0.9	1.4	14.6
	5	1.2	1.25	1.6	22.4
	10	1.3	1.6	1.8	28.8

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 3**  
**Instrumentation cables Unarmoured Type -1**  
**Cu/PE/ISc/OSc/PVC**

Reference Standards	PAS (BS) 5308-1	Applications	
<b>Construction</b>	1) <b>Oxygen Free Electronic Copper Conductor Class 1/2/5</b> 2) PE Insulation 3) Individual pair screened with Aluminium Mylar Tape & Tinned Copper drain wire 4) Overall screen with Aluminium mylar Tape & Tinned Copper drain wire 5) PVC outer sheathing		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference
		<b>Technical Data</b>	Please refer Table A
		<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Sheath	Approx Overall Diameter
mm <sup>2</sup>		mm	mm
0.50 (1/0.8)	2	0.9	10.6
	5	1.2	13.8
	10	1.2	18.6
0.50 (16/0.2)	2	1.1	12.3
	5	1.2	15.5
	10	1.3	21.5
1.0 (1/1.13)	2	1.1	13.1
	5	1.2	15.5
	10	1.3	23.0
1.5 (7/0.53)	2	1.2	15.0
	5	1.3	19.1
	10	1.5	26.9

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 4**  
**Instrumentation cables - Armoured Type -2**  
**Cu / PE /Isc /Osc /SWA /PVC**

Reference Standards	PAS (BS) 5308-1	Applications	
<b>Construction</b>	1) <b>Oxygen Free Electronic Copper Conductor class 1/2/5</b> 2) PE Insulation 3) Individual pair screen with Aluminium Mylar Tape & Tinned Copper drain wire 4) Overall screened with Aluminium Mylar Tape & Tinned Copper drain wire 5) PVC Bedding 6) Galvanized steel wire Armour 7) PVC Outer sheathing		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference alongwith protection from mechanical damage
		<b>Technical Data</b>	Please refer Table A
		<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approx Overall Diameter
mm <sup>2</sup>		mm	mm	mm	mm
0.50 (1/0.8)	2	0.8	0.9	1.3	11.8
	5	1.1	0.9	1.4	16.5
	10	1.2	1.25	1.6	21.1
0.50 (16/0.2)	2	1.1	0.9	1.5	17.1
	5	1.2	1.25	1.6	21.3
	10	1.3	1.6	1.8	28.3
1.0 (1/1.13)	2	1.1	0.9	1.5	17.9
	5	1.2	1.25	1.6	22.3
	10	1.3	1.6	1.8	29.8
1.5 (7/0.53)	2	1.2	1.25	1.6	20.8
	5	1.3	1.6	1.7	25.8
	10	1.5	1.6	1.9	33.9

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 5**  
**Instrumentation cables Unarmoured Type - 1**  
**Cu /PVC /Osc /PVC**

Reference Standards	PAS (BS) 5308-2	Applications	
<b>Construction</b>	1) <b>Oxygen Free Electronic Copper Conductor Class 2 &amp; 5</b> 2) PVC Insulation 3) Overall screen with Aluminium Mylar tape & Tinned Copper drain wire 4) PVC outer sheathing		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference
		<b>Technical Data</b>	Please refer Table B
		<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Sheath	Nominal Overall Diameter
mm <sup>2</sup>		mm	mm
0.50 (16/0.2)	1	0.8	7.2
	2	0.8	8.1
	5	1.1	13.4
	10	1.2	17.5
0.75 (24/0.2)	1	0.8	7.5
	2	0.8	8.5
	5	1.2	14.6
	10	1.3	19.0
1.5 (7/0.53)	1	0.8	8.5
	2	0.9	9.9
	5	1.2	16.7
	10	1.3	22.0

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.





**TABLE 6**  
**Instrumentation cables - Armoured Type 2**

Cu /PVC /Osc /SWA /PVC

Reference Standards	PAS (BS) 5308-2	Applications	
<b>Construction</b>	1) <b>Oxygen Free Electronic Copper Conductor class 2 &amp; 5</b>		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference alongwith protection from mechanical damage
	2) PVC Insulation		
	3) Overall screen with Aluminium Mylar tape and Tinned Copper drain wire		
	4) PVC Bedding	<b>Technical Data</b>	Please refer Table B
	5) Galvanized steel wire Armour	<b>Voltage</b>	300/500 V
	6) PVC Outer sheathing		

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approx Overall Diameter
mm <sup>2</sup>		mm	mm	mm	mm
0.50 (16/0.2)	1	0.8	0.9	1.3	11.7
	2	0.8	0.9	1.3	12.6
	5	1.1	0.9	1.5	18.2
	10	1.2	1.25	1.6	23.2
0.75 (24/0.2)	1	0.8	0.9	1.3	12.0
	2	0.8	0.9	1.4	13.2
	5	1.2	1.25	1.5	20.1
	10	1.3	1.6	1.7	25.7
1.5 (7/0.53)	1	0.8	0.9	1.4	13.2
	2	0.9	0.9	1.4	14.6
	5	1.2	1.25	1.6	22.5
	10	1.3	1.6	1.8	28.8

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 7**  
**Instrumentation cables - Unarmoured Type 1**  
**Cu /PVC /Isc /Osc /PVC**

Reference Standards	PAS (BS) 5308-2	Applications	
<b>Construction</b>	<b>1) Oxygen Free Electronic Copper Conductor Class 2 &amp; 5</b> 2) PVC Insulation 3) Individual pair screen with Aluminium Mylar Tape and Tinned Copper drain wire 4) Overall screened with Aluminium Mylar Tape and Tinned Copper drain wire 5) PVC outer sheathing		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference
		<b>Technical Data</b>	Please refer Table B
		<b>Voltage</b>	300/500 V

Conductor Size mm <sup>2</sup>	Number of pairs	Thickness of Sheath mm	Approx Overall Diameter mm
0.50 (16/0.2)	2	1.1	12.3
	5	1.2	15.5
	10	1.3	21.5
0.75 (24/0.2)	2	1.1	13.1
	5	1.2	16.6
	10	1.3	23.1
1.5 (7/0.53)	2	1.2	15.0
	5	1.3	19.1
	10	1.5	26.9

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 8**  
**Instrumentation cables - Armoured Type 2**  
 Cu /PVC /Isc /Osc /SWA /PVC

Reference Standards	PAS (BS) 5308-2	Applications	
<b>Construction</b>	1) <b>Oxygen Free Electronic Copper Conductor class 2 &amp; 5</b>		For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference alongwith protection from mechanical damage
	2) PVC Insulation		
	3) Individual pair screen with Aluminium Mylar Tape and Tinned Copper drain wire		
	4) Overall screened with Aluminium Mylar Tape and Tinned Copper drain wire	<b>Technical Data</b>	Please refer Table B
	5) PVC Bedding	<b>Voltage</b>	300/500 V
	6) Galvanized steel wire Armour		
	7) PVC Outer sheathing		

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approx Overall Diameter
mm <sup>2</sup>		mm	mm	mm	mm
0.50 (16/0.2)	2	1.1	0.9	1.5	17.1
	5	1.2	1.25	1.6	21.3
	10	1.3	1.6	1.8	28.3
0.75 (24/0.2)	2	1.1	0.9	1.5	17.9
	5	1.2	1.25	1.6	22.4
	10	1.3	1.6	1.8	29.9
1.5 (7/0.53)	2	1.2	1.25	1.6	20.8
	5	1.3	1.6	1.7	25.8
	10	1.5	1.6	1.9	33.9

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 9**  
**Instrumentation Cable - IOSCR Armoured**

Reference Standards	BS 50288-7:2005	Applications	
<b>Construction</b>	<b>1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 &amp; 2</b> 2) XLPE Insulation 3) Individual pair screen with Aluminium Mylar Tape & Tinned Copper drain wire 4) Overall screened with Aluminium Mylar Tape & Tinned Copper drain wire 5) PVC Bedding 6) Galvanized steel wire Armour 7) PVC Outer sheathing	Used for communication, data and voice transmission signals and services within industrial process manufacturing plants.  For the interconnection of electrical equipment and instruments, typically in process industries like Oil & Gas, Chemical & Petrochemical, Water treatment etc.  Armored cables are for use in outdoor installation for direct burial or installed in duct and suitable for wet and damp areas.	
		<b>Technical Data</b>	Please refer Table C
		<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approximate overall diameter	Approximate Cable Weight
mm <sup>2</sup>		mm	mm	mm	mm	kg/km
0.5 (1/0.8)	2	1.0	0.9	1.4	14.0	330
	5	1.1	0.9	1.5	17.0	480
	10	1.3	1.25	1.6	23.0	870
	20	1.4	1.25	1.8	28.5	1320
0.75 (1/0.98)	2	1.0	0.9	1.4	14.5	350
	5	1.1	0.9	1.5	18.0	530
	10	1.3	1.25	1.7	24.5	970
	20	1.5	1.25	1.8	30.0	1480
1 (1/1.13)	2	1.0	0.9	1.4	15.0	380
	5	1.1	0.9	1.5	18.5	580
	10	1.3	1.25	1.7	25.5	1060
	20	1.5	1.25	1.8	31.5	1630
1.5 (7/0.53)	2	1.1	0.9	1.5	17.0	470
	5	1.2	0.9	1.6	21.0	710
	10	1.4	1.25	1.8	29.0	1330
	20	1.7	1.6	2.0	37.5	2320
2.5 (7/0.67)	2	1.2	0.9	1.5	19.5	580
	5	1.3	1.25	1.7	25.0	1060
	10	1.6	1.6	1.9	34.5	1940
	20	1.9	1.6	2.1	44.0	3090

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.



**TABLE 10**  
**Instrumentation Cable - OSCR Armoured**

Reference Standards	BS 50288-7:2005	Applications		
<b>Construction</b>	<b>1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 &amp; 2</b> 2) XLPE Insulation 3) Overall screened with Aluminium Mylar Tape & Tinned Copper drain wire 4) PVC Bedding 5) Galvanized steel wire Armour 6) PVC Outer sheathing	Used for communication, data and voice transmission signals and services within industrial process manufacturing plants. For the interconnection of electrical equipment and instruments, typically in process industries like Oil & Gas, Chemical & Petrochemical, Water treatment etc. Armored cables are for use in outdoor installation for direct burial or installed in duct and suitable for wet and damp areas.		
			<b>Technical Data</b>	Please refer Table C
			<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approximate overall diameter	Approximate Cable Weight
mm <sup>2</sup>		mm	mm	mm	mm	kg/km
0.5 (1/0.8)	1	0.8	0.9	1.3	10.0	190
	2	0.9	0.9	1.3	11.0	230
	5	1.0	0.9	1.4	15.5	400
	10	1.2	0.9	1.5	20.5	630
	20	1.3	1.25	1.7	26.0	1070
0.75 (1/0.98)	1	0.8	0.9	1.3	10.5	200
	2	0.9	0.9	1.3	11.5	250
	5	1.1	0.9	1.5	16.5	460
	10	1.2	1.25	1.6	22.0	820
	20	1.4	1.25	1.7	27.5	1230
1 (1/1.13)	1	0.8	0.9	1.3	10.5	210
	2	0.9	0.9	1.3	12.0	270
	5	1.1	0.9	1.5	17.5	510
	10	1.3	1.25	1.6	23.5	920
	20	1.4	1.25	1.8	29.0	1390
1.5 (7/0.53)	1	0.9	0.9	1.3	12.0	260
	2	0.9	0.9	1.4	13.0	330
	5	1.1	0.9	1.5	19.5	620
	10	1.3	1.25	1.7	26.5	1150
	20	1.5	1.25	1.8	33.5	1790
2.5 (7/0.67)	1	0.9	0.9	1.3	13.0	310
	2	1.0	0.9	1.4	15.0	420
	5	1.2	1.25	1.6	23.0	930
	10	1.5	1.25	1.8	31.5	1560
	20	1.7	1.6	2.0	40.0	2720

**Note :** The above cables can also be manufactured & supplied with LSOH or LSLH/FRLS on request.




**TABLE 11**
**Fire Resistant Instrumentation Cable - IOSCR Armoured**

Reference Standards	BS 50288-7:2005	Applications	
<b>Construction</b>	<b>1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 &amp; 2</b> 2) Mica Glass Tape + XLPE Insulation 3) Individual pair screen with Aluminium Mylar Tape & Tinned Copper drain wire 4) Overall screened with Aluminium Mylar Tape & Tinned Copper drain wire 5) LSOH Bedding 6) Galvanized steel wire Armour 7) LSOH Outer sheathing	Used for communication, data and voice transmission signals and services within industrial process manufacturing plants. For the interconnection of electrical equipment and instruments, typically in process industries like Oil & Gas, Chemical & Petrochemical, Water treatment etc. Fire resistant cables are for maintenance of power supply during a fire is required for defined period of time Armored cables are for use in outdoor installation for direct burial or installed in duct and suitable for wet and damp areas.	
		<b>Technical Data</b>	Please refer Table C
		<b>Voltage</b>	300/500 V

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approximate overall diameter	Approximate Cable Weight
mm <sup>2</sup>		mm	mm	mm	mm	kg/km
0.5 (1/0.8)	2	1.0	0.9	1.4	15.5	390
	5	1.1	0.9	1.5	19.5	580
	10	1.3	1.25	1.6	26.5	1050
	20	1.4	1.25	1.8	33.0	1600
0.75 (1/0.98)	2	1.0	0.9	1.4	16.5	420
	5	1.1	0.9	1.5	20.0	630
	10	1.3	1.25	1.7	28.0	1160
	20	1.5	1.25	1.8	35.0	1780
1 (1/1.13)	2	1.0	0.9	1.4	17.0	440
	5	1.1	0.9	1.5	21.0	680
	10	1.3	1.25	1.7	29.0	1250
	20	1.5	1.25	1.8	36.5	1940
1.5 (7/0.53)	2	1.1	0.9	1.5	19.0	530
	5	1.2	0.9	1.6	23.5	820
	10	1.4	1.25	1.8	32.5	1530
	20	1.7	1.6	2.0	42.0	2680
2.5 (7/0.67)	2	1.2	0.9	1.5	21.5	650
	5	1.3	1.25	1.7	27.5	1190
	10	1.6	1.6	1.9	38.5	2190
	20	1.9	1.6	2.1	48.5	3490

Note: The above cables can also be manufactured & supplied with LSLH/FRLS on request.


**TABLE 12**
**Fire Resistant Instrumentation Cable - OSCR Armoured**

Reference Standards	BS 50288-7:2005	Applications	
<b>Construction</b>	<b>1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 &amp; 2</b> 2) Mica Glass Tape + XLPE Insulation 3) Overall screened with Aluminium Mylar Tape & Tinned Copper drain wire 4) LSOH Bedding 5) Galvanized steel wire Armour 6) LSOH Outer sheathing	Used for communication, data and voice transmission signals and services within industrial process manufacturing plants. For the interconnection of electrical equipment and instruments, typically in process industries like Oil & Gas, Chemical & Petrochemical, Water treatment etc. Fire resistant cables are for maintenance of power supply during a fire is required for defined period of time. Armored cables are for use in outdoor installation for direct burial or installed in duct and suitable for wet and damp areas.	
			<b>Technical Data</b> <b>Voltage</b>

Conductor Size	Number of pairs	Thickness of Bedding	Size of Armour wire	Thickness of Sheath	Approximate overall diameter	Approximate Cable Weight
mm <sup>2</sup>		mm	mm	mm	mm	kg/km
0.5 (1/0.8)	1	0.8	0.9	1.3	11.0	220
	2	0.9	0.9	1.3	12.0	270
	5	1.0	0.9	1.4	17.5	490
	10	1.2	0.9	1.5	23.5	780
	20	1.3	1.25	1.7	30.0	1330
0.75 (1/0.98)	1	0.8	0.9	1.3	11.5	230
	2	0.9	0.9	1.3	12.5	300
	5	1.1	0.9	1.5	19.0	550
	10	1.2	1.25	1.6	25.5	990
	20	1.4	1.25	1.7	32.0	1500
1 (1/1.13)	1	0.8	0.9	1.3	11.5	250
	2	0.9	0.9	1.3	13.0	310
	5	1.1	0.9	1.5	19.5	600
	10	1.3	1.25	1.6	26.5	1090
	20	1.4	1.25	1.8	33.5	1670
1.5 (7/0.53)	1	0.9	0.9	1.3	13.0	290
	2	0.9	0.9	1.4	14.5	380
	5	1.1	0.9	1.5	21.5	720
	10	1.3	1.25	1.7	30.0	1340
	20	1.5	1.25	1.8	37.5	2100
2.5 (7/0.67)	1	0.9	0.9	1.3	14.0	340
	2	1.0	0.9	1.4	16.0	470
	5	1.2	1.25	1.6	25.0	1050
	10	1.5	1.25	1.8	34.5	1760
	20	1.7	1.6	2.0	44.5	3080

Note: The above cables can also be manufactured & supplied with LSLH/FRLS on request.

## Instrumentation Cables - Technical data

**TABLE A**

PROPERTIES AS PER PAS (BS) 5308-1

Electrical Properties	Unit	Cross sectional area of conductor			
		0.5 mm <sup>2</sup> (1/0.8 mm)	0.5 mm <sup>2</sup> (16/0.2 mm)	1.0 mm <sup>2</sup> (1/1.13 mm)	1.5 mm <sup>2</sup> (7/0.53 mm)
Maximum Mutual Capacitance					
a) Cables without screens	pF/m	75	75	75	85
b) Cables with only collective screens (except one-pair and two-pair)	pF/m	75	75	75	85
c) One-pair and two-pair cables collectively screened and all cables with individual pair screens	pF/m	115	115	115	120
L/R ratio (max)	μH/ohm	25	25	25	40
Max. DC conductor Resistance at 20°C	ohm/km	36.8	39.7	18.4	12.3
Minimum Insulation Resistance					
a) Core to core/screen/armour for 1 km	GΩ	5	5	5	5
b) Screen to screen for 1 km	MΩ	1	1	1	1

Conductor nominal area (mm <sup>2</sup> )	Nom. Insulation thickness (mm)	Maximum core diameter (mm)
0.5 (1/0.8)	0.50	1.90
0.5 (16/0.2)	0.60	2.35
1.0 (1/1.13)	0.60	2.45
1.5 (7/0.53)	0.60	3.00

**TABLE B**

PROPERTIES AS PER PAS (BS) 5308-2

Electrical Properties	Unit	Cross sectional area of conductor		
		0.5 mm <sup>2</sup> (16/0.2 mm)	0.75 mm <sup>2</sup> (24/0.2 mm)	1.5 mm <sup>2</sup> (7/0.53 mm)
Maximum Mutual Capacitance				
a) Mutual capacitance of pairs or adjacent cores	pF/m	250	250	250
b) Between any core and core screen	pF/m	450	450	450
L/R ratio (max)	μH/ohm	25	25	40
Max. DC conductor Resistance at 20°C	ohm/km	39.7	26.5	12.3
Minimum Insulation Resistance				
a) Core to core/screen/armour for 1 km	MΩ	25	25	25
b) Screen to screen for 1 km	MΩ	1	1	1

Conductor nominal area (mm <sup>2</sup> )	Nom. Insulation thickness (mm)	Maximum core diameter (mm)
0.5 (16/0.2)	0.60	2.35
0.75 (24/0.2)	0.60	2.55
1.5 (7/0.53)	0.60	3.00

**TABLE C**  
**(PROPERTIES AS PER BS EN 50288-7)**

Parameter	Test method	Requirement	
Conductor resistance	BS EN 50289-1-2	BS EN 60228 for multicore cables and maximum shall be increased by 2% for multi-pair, multi-triple and multi-quad cables.	
Dielectric strength	BS EN 50289-1-3	Duration 1 minute. For 500 V rating $\geq 2.0$ kVac or $\geq 3.0$ kVdc	
Insulation resistance	BS EN 50289-1-4	Material	Resistance M $\Omega$ /km
		PVC	10
		Polyethylene	1000
		Polypropolene	1000
		HFFR	10
		XPLE	1000
Mutual capacitance	BS EN 50289-1-5	Polyolefin Others	< 150 nf/km < 250 nf/km
Capacitance Unbalance (pairs/quads)	BS EN 50289-1-5	Polyolefin	500 pf / 500 m
Inductance	BS EN 50289-1-12	Only to be used for L/R	
Inductance to resistance ratio(L/R)	BS EN 50289-1-12 BS EN 50289-1-2	< 25 $\mu$ H/ $\Omega$ for up to 1 mm <sup>2</sup> < 40 $\mu$ H/ $\Omega$ for 1,5 mm <sup>2</sup> < 60 $\mu$ H/ $\Omega$ for 2,5 mm <sup>2</sup>	

**TABLE D**  
**Foundation Fieldbus Cable - As per BS EN 50288-7, ISA SP 50, FF 844**

Parameter	Test method	Requirement
Charecteristic Impedence @ 31.25 KHz	FF 844	100 $\pm$ 20 $\Omega$
Attenuation @ 39 KHz	FF 844	< 3 dB/km
Capacitance Unbalance @ $\geq 30$ m	FF 844	$\geq 4$ pF/m Average

**TABLE E**  
**Maximum DC resistance of conductor as per BS EN 60228**

Nominal conductor area (mm <sup>2</sup> )	Resistance of conductor at 20°C ( $\Omega$ /km)
0.5	36.0
0.75	24.5
1.0	18.1
1.5	12.1
2.5	7.41

**TABLE F**  
**PAIR IDENTIFICATION (AS PER PAS 5308-1)**

Two-pair cables without individual pair screens (quads) shall be colour coded in clockwise order of rotation:  
Black, Blue, Green, Brown. All other cables up to 50 pairs shall be colour coded in accordance with below table.

Pair no.	a-wire	b-wire	Pair no.	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







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