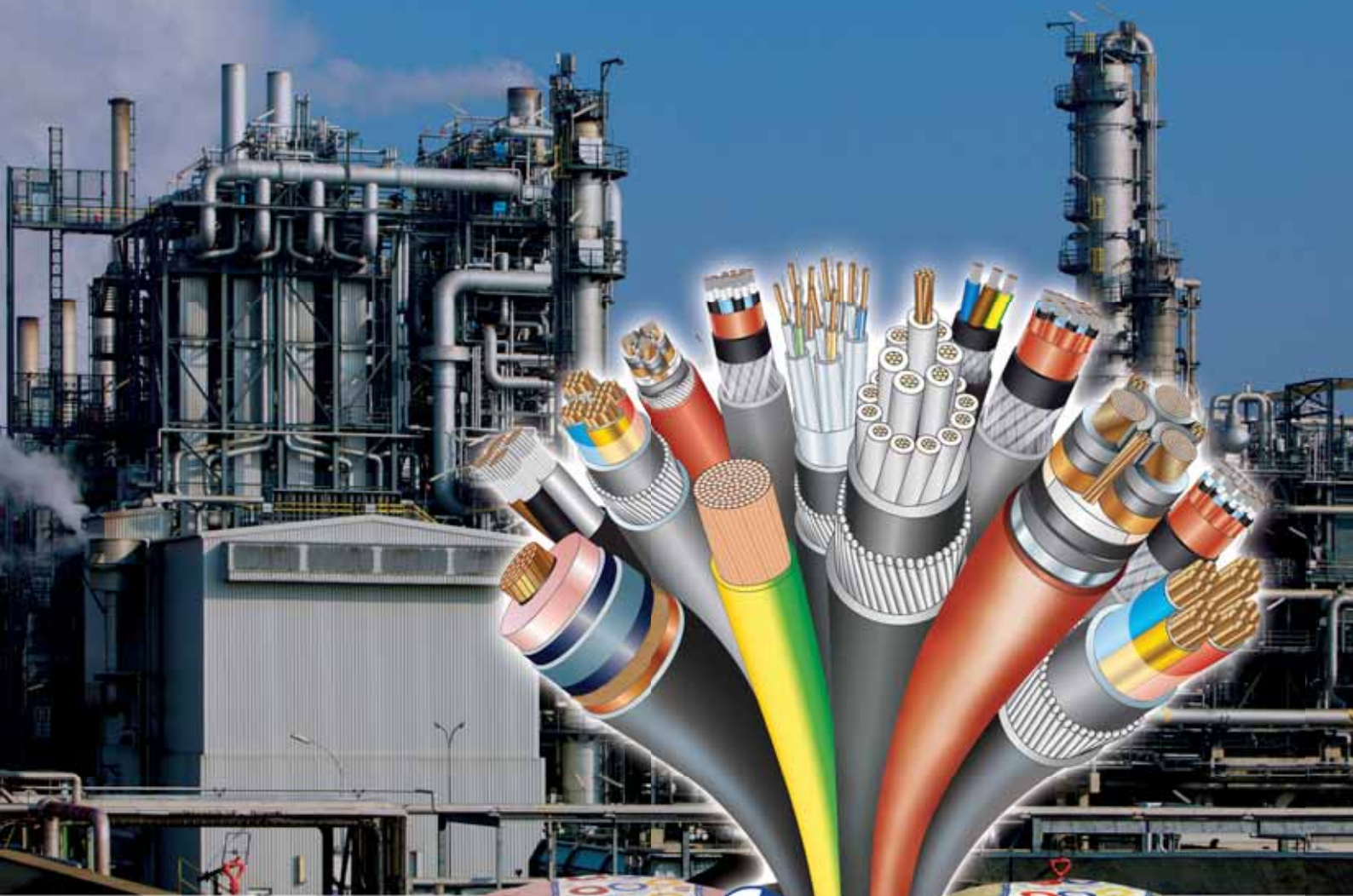


INSTRUMENTATION CABLES



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 up to 33 kV
 - Low Voltage cables
 - ❑ Power & Control Cables
 - ❑ 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

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 | |
|---------------------|--|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor Class 1/ 2 / 5 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 |
| | | Technical Data | Please refer table A |
| | | Voltage | 300/500 V |

| Conductor Size | Number of pairs | Thickness of Sheath | Approx Overall Diameter |
|------------------|-----------------|---------------------|-------------------------|
| mm ² | | 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 | |
|---------------------|---|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor class 1 / 2 / 5 | | For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference alongwith protection from mechanical damage |
| | 2) PE Insulation | | |
| | 3) Overall screen with Aluminium Mylar Tape & Tinned Copper drain wire | | |
| | 4) PVC Bedding | Technical Data | Please refer Table A |
| | 5) Galvanized steel wire Armour | Voltage | 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 ² | | 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 | |
|---------------------|--|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor Class 1/2/5 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 |
| | | Technical Data | Please refer Table A |
| | | Voltage | 300/500 V |

| Conductor Size | Number of pairs | Thickness of Sheath | Approx Overall Diameter |
|------------------|-----------------|---------------------|-------------------------|
| mm ² | | 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 | |
|---------------------|--|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor class 1/2/5 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 |
| | | Technical Data | Please refer Table A |
| | | Voltage | 300/500 V |

| Conductor Size | Number of pairs | Thickness of Bedding | Size of Armour wire | Thickness of Sheath | Approx Overall Diameter |
|------------------|-----------------|----------------------|---------------------|---------------------|-------------------------|
| mm ² | | 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 | |
|---------------------|--|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor Class 2 & 5 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 |
| | | Technical Data | Please refer Table B |
| | | Voltage | 300/500 V |

| Conductor Size | Number of pairs | Thickness of Sheath | Nominal Overall Diameter |
|------------------|-----------------|---------------------|--------------------------|
| mm ² | | 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 | |
|---------------------|---|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor class 2 & 5 2) PVC Insulation 3) Overall screen with Aluminium Mylar tape and 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 |
| | | Technical Data | Please refer Table B |
| | | Voltage | 300/500 V |

| Conductor Size | Number of pairs | Thickness of Bedding | Size of Armour wire | Thickness of Sheath | Approx Overall Diameter |
|------------------|-----------------|----------------------|---------------------|---------------------|-------------------------|
| mm ² | | 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 | For instrumentation purpose to reduce crosstalk and to protect signals from outside electromagnetic, electrostatic and radio frequency interference |
|---------------------|--|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor Class 2 & 5 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 | Technical Data | Please refer Table B |
| | | Voltage | 300/500 V |

| Conductor Size mm ² | 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 | |
|---------------------|--|-----------------------|---|
| Construction | 1) Oxygen Free Electronic Copper Conductor class 2 & 5 | | 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 | Technical Data | Please refer Table B |
| | 5) PVC Bedding | Voltage | 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 ² | | 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 | |
|---------------------|--|---|----------------------|
| Construction | 1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 & 2 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. | |
| | | Technical Data | Please refer Table C |
| | | Voltage | 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 ² | | 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.

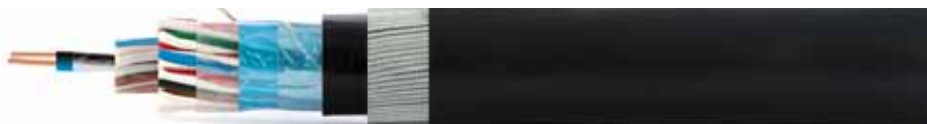


TABLE 10
Instrumentation Cable - OSCR Armoured

| Reference Standards | BS 50288-7:2005 | Applications | |
|---------------------|--|--|----------------------|
| Construction | 1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 & 2 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. | |
| | | Technical Data | Please refer Table C |
| | | Voltage | 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 ² | | 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 | |
|---------------------|--|---|----------------------|
| Construction | 1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 & 2 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. | |
| | | Technical Data | Please refer Table C |
| | | Voltage | 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 ² | | 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 | |
|---------------------|--|---|---|
| Construction | 1) Oxygen Free Electronic high conductivity grade Copper Conductor Class 1 & 2 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. | |
| | | | Technical Data Voltage |

| Conductor Size | Number of pairs | Thickness of Bedding | Size of Armour wire | Thickness of Sheath | Approximate overall diameter | Approximate Cable Weight |
|------------------|-----------------|----------------------|---------------------|---------------------|------------------------------|--------------------------|
| mm ² | | 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 ² (1/0.8 mm) | 0.5 mm ² (16/0.2 mm) | 1.0 mm ² (1/1.13 mm) | 1.5 mm ² (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 ²) | 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 ² (16/0.2 mm) | 0.75 mm ² (24/0.2 mm) | 1.5 mm ² (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 ²) | 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 ≥ 2.0 kVac or ≥ 3.0 kVdc | |
| Insulation resistance | BS EN 50289-1-4 | Material | Resistance M Ω /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 μ H/ Ω for up to 1 mm ² < 40 μ H/ Ω for 1,5 mm ² < 60 μ H/ Ω for 2,5 mm ² | |

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 Ω |
| Attenuation @ 39 KHz | FF 844 | < 3 dB/km |
| Capacitance Unbalance @ ≥ 30 m | FF 844 | ≥ 4 pF/m Average |

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

| Nominal conductor area (mm ²) | Resistance of conductor at 20°C (Ω /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 |





NUHAS OMAN LLC

P O Box 186, Postal Code 124,
Rusayl Industrial Estate, Sultanate of Oman
Tel : +968-24449007, 24449247, 24449249 Fax : +968 24446790
Email : marketing@nuhasoman.com Website:www.nuhasoman.com

(A Member of the Al Bahja Group)
AN ISO 9001: 2015 COMPANY



NO/MKT/CAT/004/Rev 3
Date 10/04/2021

