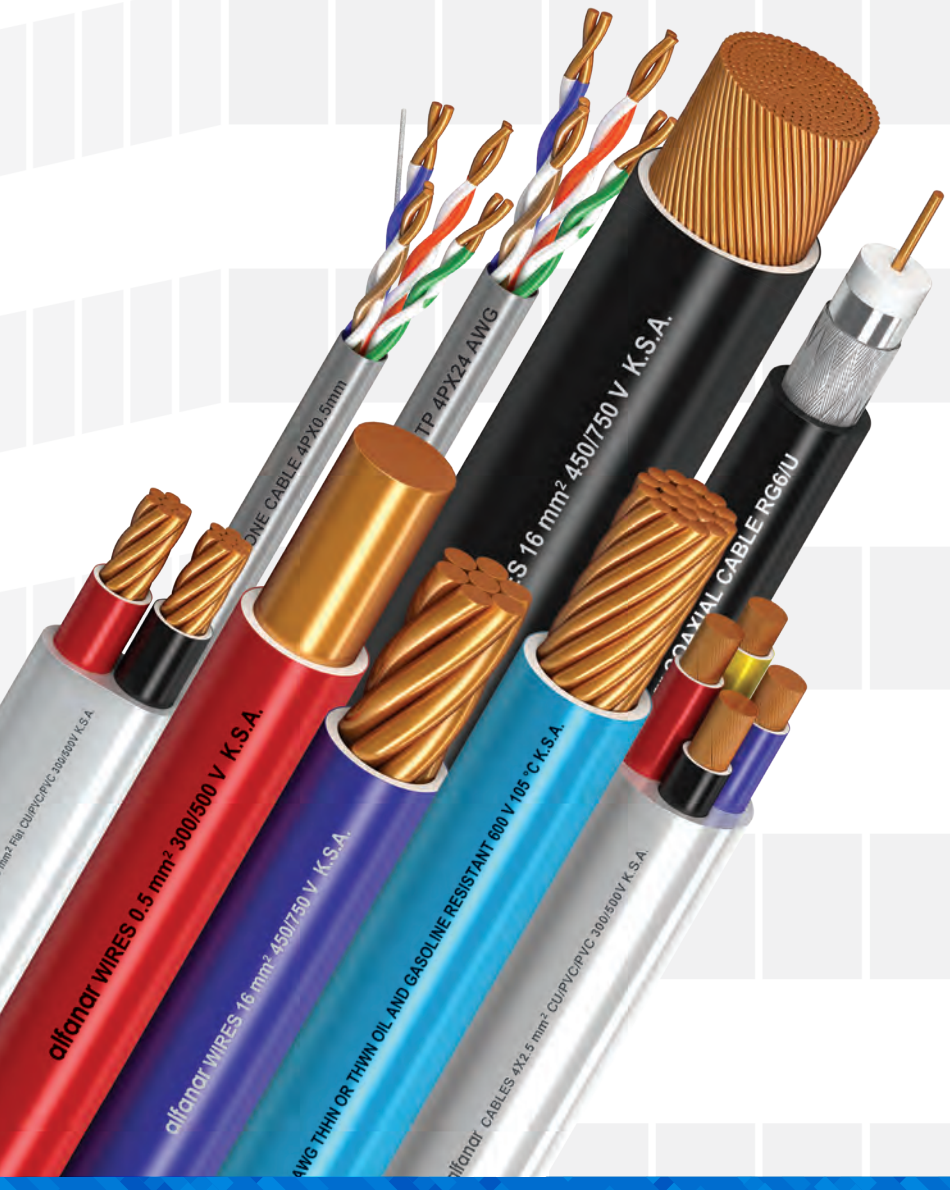
# Building Cables and Wires




## Technical Catalogue

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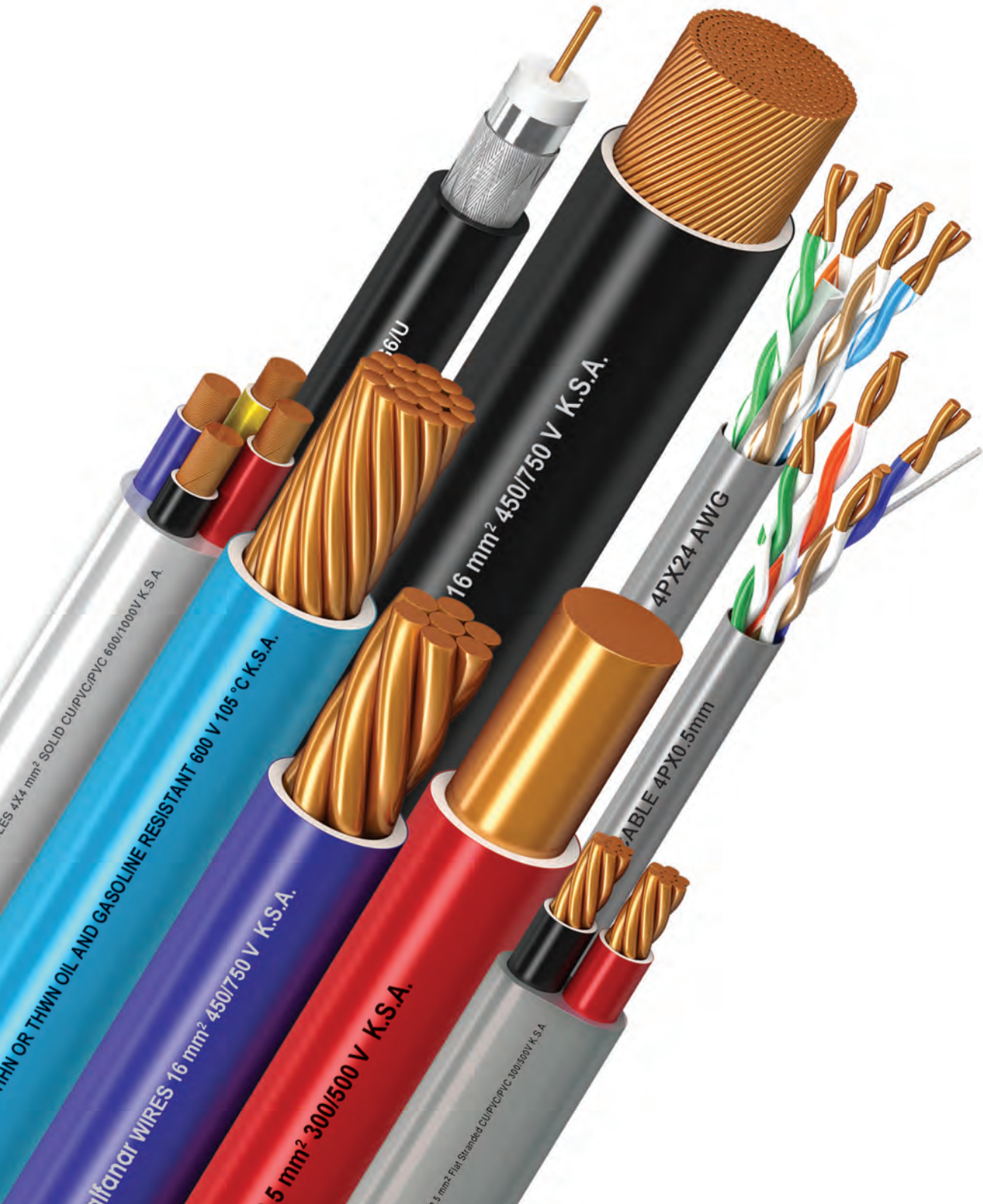
# Building Cables and Wires



# Introduction

**alfanar** is equipped with state-of-the-art manufacturing facilities such as latest machineries, instrumentation, quality control and testing laboratory, etc., for the production of cables, indoor wires, coaxial cables, telephone cables, LAN cables, low-voltage power & control cables, MV cables and HV cables in accordance with IEC, BS and UL standards.

In order to mak the highest quality, we apply the most advance cable manufacturing technologies thanks to our collaboration with internationally renowned experts in the field of cable manufacturing.

In all our products, we use highest quality raw material, such as copper rods supplied to us by some of the leading international manufacturers and distributors.

Backed by **alfanar electric**'s decades-long experience in the field of electrical systems, we can confidently assure our customers that we are able to supply to them a whole range of wires and cables.

At **alfanar**, we always aim at expanding our existing range of products in order to meet our customers requirements.

with a highly-committed approach, **alfanar** always endeavors to fully satisfy its customers by providing them with high quality products, efficient delivery and prompt after-sales services.

# Single Core PVC Insulated with Nylon Jacketed American Wires

American wires are used for general purpose applications such as for supplying power and lighting in residential and commercial buildings. They are installed in ducts, conduits and raceways in wet and dry locations.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# THHN/THWN PVC Insulated/Nylon Jacketed 600 V

## Heat, Moisture, Oil, and Gasoline Resistant American Wires

### APPLICATIONS

THHN/THWN building wires are used for general purpose applications such as supplying power and lighting in residential and commercial buildings. These cables can be installed in ducts, conduits and raceways, and in wet and dry locations. The applications for different wire types are classified as follows:

- THHN 105°C for dry locations, building wire
- THWN 75°C for wet locations, building wire
- TFFN 105°C for dry locations, flexible cord and fixture wire


### FEATURES

- THHN/THWN building wires have good resistant property against Oils, Gasoline, Water, Acids, Ozone, Sunlight and Abrasion.
- Meets UL 1581 ‹VW-1› Vertical Flame Test requirements
- Particularly thin and robust cable for improved conduit fill

### APPLICABLE STANDARDS

- UL 83 : Underwriters Laboratories Thermoplastic Insulated Wires and Cables
- UL 1581: Underwriters Laboratories Electrical Wires, Cables and Flexible Cords
- UL 1063: Underwriters Laboratories Thermoplastic Insulated Wires and Cables
- UL 62 : Underwriters Laboratories Flexible Cord and Fixture Wire

### CABLE CONSTRUCTION

**Conductor**

Plain annealed solid or stranded copper conductor.

**Insulation**

Color coded polyvinyl chloride (PVC), heat, moisture and flame retardant compound with temperature rating 105 ˚C

**Jacket**

Polyamide Nylon jacket is provided to protect PVC insulation against abrasions and scratches while pulling through conduits also it has good resistant against oil, gasoline and chemicals.

**Colors**

Standard THHN and THWN colors available in black, white, red, blue, green, yellow, pink, purple, orange, brown and gray.

**Additional colors are made per request subject to factory minimum order quantities.**

**Marking**

**alfanar** # AWG THHN OR THWN, OIL AND GASOLINE RESISTANT, 600 V 105 °C K.S.A.

**Packing**

Available in standard length of 500, 300 and 250 feet on coil (Other lengths available on request)

## TECHNICAL DATA

| Conductor | | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Normal Jacket Thick-ness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|---|---|
| Nominal Cross Section | | No. x Dia | | | | | | |
| AWG | $mm^2$ | No. x Dia | Ohms/km | mm | mm | mm | Kg/km | |
| 14 | 2.08 | 1 x 1.63 | 8.45 | 0.38 | 0.10 | 2.7 | 24 | C124AD10100NX[a]00UXX[b] |
| 12 | 3.31 | 1 x 2.05 | 5.31 | 0.38 | 0.10 | 3.1 | 36 | C125AD10100NX[a]00UXX[b] |
| 10 | 5.26 | 1 x 2.59 | 3.343 | 0.51 | 0.10 | 3.9 | 58 | C126AD10100NX[a]00UXX[b] |
| 18* | 0.82 | 19 x 0.235 | 21.9 | 0.38 | 0.10 | 2.2 | 12 | C222AD10100NX[a]00UXX[b] |
| 16* | 1.31 | 19 x 0.296 | 13.7 | 0.38 | 0.10 | 2.5 | 17 | C223AD10100NX[a]00UXX[b] |
| 14 | 2.08 | 19 x 0.37 | 8.62 | 0.38 | 0.10 | 2.9 | 24 | C224AD10100NX[a]00UXX[b] |
| 12 | 3.31 | 19 x 0.47 | 5.43 | 0.38 | 0.10 | 3.4 | 37 | C225AD10100NX[a]00UXX[b] |
| 10 | 5.26 | 19 x 0.59 | 3.409 | 0.51 | 0.10 | 4.2 | 59 | C226AD10100NX[a]00UXX[b] |
| 8 | 8.37 | 19 x 0.75 | 2.144 | 0.76 | 0.13 | 5.5 | 97 | C227AD10100NX[a]00UXX[b] |
| 6 | 13.3 | 19 x 0.944 | 1.348 | 0.76 | 0.13 | 6.4 | 195 | C228AD10100NX[a]00UXX[b] |

- Listed as TFFN
- Other sizes can be provided on specific request.
- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.

  $X^a$ : Insulation color (see Coding Key on page 74)

  $XX^b$ : Packing type (see Coding Key on page 74)

# Single Core PVC Insulated Wire UL-Style 1015 Type AWM (Appliance Wiring Material) 105°C 600 V

## Heat, Moisture, Oil, and Gasoline Resistant American Wires


### APPLICATIONS

Single-core AWM building wires are used for internal wiring of appliances, including wiring for refrigeration equipment, air-conditioning equipment, automatic washers, etc. Type AWM is permitted for use in 600 V applications and for dry locations at temperatures not exceeding 105°C.

### APPLICABLE STANDARDS

alfanar AWM wires are designed and tested to meet the latest edition of UL 758 and UL 1581 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CABLE CONSTRUCTION

**Conductor**

Plain annealed stranded copper conductor.

**Insulation**

Color coded polyvinyl chloride (PVC), heat, moisture and flame retardant compound with a temperature rating of 105°C.

**Colors**

Standard AWM wire colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray. Additional colors can be made on request subject to factory minimum order quantities.

**Flame retardancy**

alfanar AWM wires meet UL (VW-1) flame test requirements.

**Packing**

Available in standard lengths of 500 and 2500 feet on a plastic spool, plywood, or wooden drum, as per manufacturer's standard.

## TECHNICAL DATA

| Conductor | | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Normal Jacket Thick-ness | Approx. Net Weight | Item Code | Cutting length |
|---|---|---|---|---|---|---|---|---|
| Nominal Cross Section | | No. x Dia | | | | | | |
| AWG | $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | | |
| 18 | 0.82 | 19 x 0.232 | 21.8 | 0.76 | 2.7 | 15 | C222AD101000X00USW | 2500 Feet |
| 16 | 1.31 | 19 x 0.296 | 13.7 | 0.76 | 3.0 | 20 | C223AD101000X00USW | 2500 Feet |
| 14 | 2.08 | 13x0.408+6x0.96 | 8.62 | 0.76 | 3.4 | 30 | C224AD101000X00USW | 2500 Feet |
| 12 | 3.31 | 13x0.513+6x0.375 | 5.43 | 0.76 | 3.8 | 45 | C225AD101000X00UPW | 2500 Feet |
| 10 | 5.26 | 13x0.644+6x0.472 | 8.405 | 0.76 | 4.4 | 65 | C226AD101000X00UPW | 2500 Feet |
| 8 | 8.37 | 13x0.810+6x0.550 | 2.144 | 1.14 | 5.9 | 105 | C227AD101000X00US5 | 500 Feet |
| 6 | 13.3 | 13x1.020+6x0.750 | 1.348 | 1.52 | 7.6 | 165 | C228AD101000X00US5 | 500 Feet |
| 4 | 21.15 | 19x1.3 | 0.8481 | 1.52 | 8.8 | 245 | C329AD101000X00UP5 | 500 Feet |
| 3 | 26.7 | 19x1.45 | 0.6727 | 1.52 | 9.3 | 295 | C330AD101000X00UP5 | 500 Feet |
| 2 | 33.62 | 19x1.61 | 0.5335 | 1.52 | 10.0 | 360 | C331AD101000X00UM5 | 500 Feet |
| 1 | 42.41 | 19x1.8 | 0.4230 | 2.03 | 11.9 | 480 | C3I9AD101000X00UM5 | 500 Feet |
| 1/0 | 53.49 | 19x2 | 0.3354 | 2.03 | 12.7 | 585 | C368AD101000X00UM5 | 500 Feet |
| 2/0 | 67.23 | 19x2.25 | 0.2660 | 2.03 | 13.8 | 710 | C3J1AD101000X00UM5 | 500 Feet |
| 3/0 | 85.01 | 19x2.55 | 0.2110 | 2.03 | 15.1 | 895 | C3J7AD101000X00UM5 | 500 Feet |
| 4/0 | 107.2 | 19x2.75 | 0.1673 | 2.03 | 16.1 | 1090 | C3J2AD101000X00UM5 | 500 Feet |

The above data is approximate and subject to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
Xa: Insulation color (see Coding Key on page xx)

# Single Core Non-Sheathed Cables With Thermoplastic PVC Insulation

Wires are used for general purpose applications such as for supplying power and lighting in residential and commercial buildings. They are installed in ducts, conduits and raceways in wet and dry locations.


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# Single Core Non-Sheathed Cable

## with Solid Copper Conductor and PVC 70 ºC Insulation (H05V-U)

# 300/500 V

### APPLICATIONS

Suitable for power, lighting circuits and building wiring. The cable is intended for use in the indoor fixed installation, distribution in conduits as well as in closed installation ducts, and is ideal for the internal wiring of appliances and apparatus.


### APPLICABLE STANDARDS

**alfanar** H05V-U cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed solid copper conductor class 1 as per BS EN 60228 and IEC 60228

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per BS EN 50363-3 type TI1 and IEC 60227-1type PVC/C

#### Color

Standard H05V-U colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Flame retardancy

**alfanar** H05V-U cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

#### Packing

Available in standard length of 100 yards on coil (Other lengths available on request)

### TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 0.5 | 1 x 0.80 | 36 | 0.6 | 2 | 9 | C105PC101000X$^{a}$000XX$^{b}$ |
| 0.75 | 1 x 0.98 | 24.5 | 0.6 | 2.2 | 12 | C106PC101000X$^{a}$000XX$^{b}$ |
| 1.0 | 1 x 1.13 | 18.1 | 0.6 | 2.3 | 14 | C107PC101000X$^{a}$000XX$^{b}$ |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request
  X$^{a}$ : Insulation color (see Coding Key on page 74)
  XX$^{b}$ : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Heat Resistant Cable 300/500 V

## with Solid Copper Conductor and PVC 90 ºC Insulation (H05V2-U)

### APPLICATIONS

Suitable for fixed installation in lighting networks, power systems, for wiring in control boards, machines and instruments with higher operating temperature.


### APPLICABLE STANDARDS

**alfanar** H05V2-U cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed solid copper conductor class 1 as per BS EN 60228 and IEC 60228

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 90 °C at normal operation as per BS EN 50363-3 type TI3 and IEC 60227-1type PVC/E

#### Color

Standard H05V2-U colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Flame retardancy

**alfanar** H05V2-U cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

#### Packing

Available in standard length of 100 yards on coil (Other lengths available on request)

### TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 0.5 | 1 x 0.80 | 36 | 0.6 | 2 | 8 | C105MC101000X[a]000XX[b] |
| 0.75 | 1 x 0.98 | 24.5 | 0.6 | 2.2 | 11 | C106MC101000X[a]000XX[b] |
| 1.0 | 1 x 1.13 | 18.1 | 0.6 | 2.3 | 13 | C107MC101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

X[a] : Insulation color (see Coding Key on page 74)
XX[b] : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Cable 450/750 V

## with Solid Copper Conductor and PVC 70 ºC Insulation (H07V-U)

### APPLICATIONS

Suitable for power, lighting circuits and building wiring. The cable is intended for use in the indoor fixed installation, distribution in conduits as well as in closed installation ducts, and is ideal for the internal wiring of appliances and apparatus.


### APPLICABLE STANDARDS

**alfanar** H07V-U cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed solid copper conductor class 1 as per BS EN 60228 and IEC 60228

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per BS EN 50363-3 type TI1 and IEC 60227-1type PVC/C

#### Color

Standard H07V-U colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Flame retardancy

**alfanar** H07V-U cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

#### Packing

Available in standard length of 100 yards on coil (Other lengths available on request)

### TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 1.5 | 1 x 1.38 | 12.1 | 0.7 | 2.8 | 21 | C108PB101000X[a]000XX[b] |
| 2.5 | 1 x 1.78 | 7.41 | 0.8 | 3.4 | 32 | C110PB101000X[a]000XX[b] |
| 4 | 1 x 2.25 | 4.61 | 0.8 | 3.9 | 48 | C112PB101000X[a]000XX[b] |
| 6 | 1 x 2.76 | 3.08 | 0.8 | 4.4 | 68 | C113PB101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

X[a] : Insulation color (see Coding Key on page 74)
XX[b] : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Heat Resistant Cable 450/750 V

## with Solid Copper Conductor and PVC 90 °C Insulation (H07V2-U)

### APPLICATIONS

Suitable for fixed installation in lighting networks, power systems, for wiring in control boards, machines and instruments with higher operating temperature.


### APPLICABLE STANDARDS

**alfanar** H07V2-U cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed solid copper conductor class 1 as per BS EN 60228 and IEC 60228

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 90 °C at normal operation as per BS EN 50363-3 type TI3 and IEC 60227-1type PVC/E

#### Color

Standard H07V2-U colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Flame retardancy

**alfanar** H07V2-U cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

#### Packing

Available in standard length of 100 yards on coil (Other lengths available on request)

### TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 1.5 | 1 x 1.38 | 12.1 | 0.7 | 2.8 | 20 | C108MB101000X[a]000XX[b] |
| 2.5 | 1 x 1.78 | 7.41 | 0.8 | 3.4 | 31 | C110MB101000X[a]000XX[b] |
| 4 | 1 x 2.25 | 4.61 | 0.8 | 3.9 | 47 | C112MB101000X[a]000XX[b] |
| 6 | 1 x 2.76 | 3.08 | 0.8 | 4.4 | 67 | C113MB101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

X[a] : Insulation color (see Coding Key on page 74)
XX[b] : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Cable 450/750 V

## with Stranded Copper Conductor and PVC 70 °C Insulation (H07V-R)

### APPLICATIONS

Suitable for power, lighting circuits and building wiring. The cable is intended for use in the indoor fixed installation, distribution in conduits as well as in closed installation ducts, and is ideal for the internal wiring of appliances and apparatus.


### APPLICABLE STANDARDS

**alfanar** H07V-R are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed stranded copper conductor class 2 as per BS EN 60228 and IEC 60228

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per BS EN 50363-3 type TI1 and IEC 60227-1type PVC/C

#### Colors

Standard H07V-R colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Flame retardancy

**alfanar** H07V-R cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

#### Packing

Available in standard length of 100 yards on coil (Other lengths available on request)

## TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20°C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 1.5 | 7 x 0.52 | 12.1 | 0.7 | 3.0 | 22 | C208PB101000X[a]000XX[b] |
| 2.5 | 7 x 0.67 | 7.41 | 0.8 | 3.6 | 35 | C210PB101000X[a]000XX[b] |
| 4 | 7 x 0.85 | 4.61 | 0.8 | 4.2 | 51 | C212PB101000X[a]000XX[b] |
| 6 | 7 x 1.04 | 3.08 | 0.8 | 4.7 | 72 | C213PB101000X[a]000XX[b] |
| 10 | 7 x 1.43 | 1.83 | 1.0 | 5.7 | 109 | C314PB101000X[a]000XX[b] |
| 16 | 7 x 1.78 | 1.15 | 1.0 | 6.7 | 166 | C315PB101000X[a]000XX[b] |
| 25 | 7 x 2.24 | 0.727 | 1.2 | 8.3 | 259 | C316PB101000X[a]000XX[b] |
| 35 | 7 x 2.65 | 0.524 | 1.2 | 9.3 | 345 | C317PB101000X[a]000XX[b] |
| 50 | 19 x 1.86 | 0.387 | 1.4 | 10.9 | 475 | C318PB101000X[a]000XX[b] |
| 70 | 19 x 2.22 | 0.268 | 1.4 | 12.5 | 671 | C319PB101000X[a]000XX[b] |
| 95 | 19 x 2.66 | 0.193 | 1.6 | 14.5 | 925 | C345PB101000X[a]000XX[b] |
| 120 | 19 x 3.05 | 0.153 | 1.6 | 15.8 | 1156 | C346PB101000X[a]000XX[b] |
| 150 | 37 x 2.44 | 0.124 | 1.8 | 17.7 | 1425 | C347PB101000X[a]000XX[b] |
| 185 | 37 x 2.70 | 0.0991 | 2.0 | 19.8 | 1783 | C348PB101000X[a]000XX[b] |
| 240 | 37 x 3.12 | 0.0754 | 2.2 | 22.5 | 2333 | C349PB101000X[a]000XX[b] |
| 300 | 61 x 2.70 | 0.0601 | 2.4 | 25.3 | 2903 | C350PB101000X[a]000XX[b] |
| 400 | 61 x 3.15 | 0.047 | 2.6 | 28.3 | 3745 | C351PB101000X[a]000XX[b] |
| 500 | 61 x 3.38 | 0.0366 | 2.8 | 32.1 | 4830 | C352PB101000X[a]000XX[b] |
| 630 | 61 x 3.81 | 0.0283 | 2.8 | 35.7 | 6098 | C353PB101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

$X^a$ : Insulation color (see Coding Key on page 74)
$XX^b$ : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Heat Resistant Cable 450/750 V

## with Stranded Copper Conductor and PVC 90 °C Insulation (H07V2-R)

### APPLICATIONS

Suitable for fixed installation in lighting networks, power systems, for wiring in control boards, machines and instruments with higher operating temperature


### APPLICABLE STANDARDS

**alfanar** H07V2-R cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed stranded copper conductor class 2 as per BS EN 60228 and IEC 60228

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 90 °C at normal operation as per BS EN 50363-3 type TI3 and IEC 60227-1type PVC/E

#### Colors

Standard H07V2-R colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Flame retardancy

**alfanar** H07V2-R cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

#### Packing

Available in standard length of 100 yards on coil (Other lengths available on request)

## TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20°C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 1.5 | 7 x 0.52 | 12.1 | 0.7 | 3.0 | 21 | C208MB101000X[a]000XX[b] |
| 2.5 | 7 x 0.67 | 7.41 | 0.8 | 3.6 | 34 | C210MB101000X[a]000XX[b] |
| 4 | 7 x 0.85 | 4.61 | 0.8 | 4.2 | 50 | C212MB101000X[a]000XX[b] |
| 6 | 7 x 1.04 | 3.08 | 0.8 | 4.7 | 71 | C213MB101000X[a]000XX[b] |
| 10 | 7 x 1.43 | 1.83 | 1.0 | 5.7 | 108 | C314MB101000X[a]000XX[b] |
| 16 | 7 x 1.78 | 1.15 | 1.0 | 6.7 | 164 | C315MB101000X[a]000XX[b] |
| 25 | 7 x 2.24 | 0.727 | 1.2 | 8.3 | 257 | C316MB101000X[a]000XX[b] |
| 35 | 7 x 2.65 | 0.524 | 1.2 | 9.3 | 347 | C317MB101000X[a]000XX[b] |
| 50 | 19 x 1.86 | 0.387 | 1.4 | 10.9 | 471 | C318MB101000X[a]000XX[b] |
| 70 | 19 x 2.22 | 0.268 | 1.4 | 12.5 | 666 | C319MB101000X[a]000XX[b] |
| 95 | 19 x 2.66 | 0.193 | 1.6 | 14.5 | 919 | C345MB101000X[a]000XX[b] |
| 120 | 19 x 3.05 | 0.153 | 1.6 | 15.8 | 1145 | C346MB101000X[a]000XX[b] |
| 150 | 37 x 2.44 | 0.124 | 1.8 | 17.7 | 1417 | C347MB101000X[a]000XX[b] |
| 185 | 37 x 2.70 | 0.0991 | 2.0 | 19.8 | 1773 | C348MB101000X[a]000XX[b] |
| 240 | 37 x 3.12 | 0.0754 | 2.2 | 22.5 | 2320 | C349MB101000X[a]000XX[b] |
| 300 | 61 x 2.70 | 0.0601 | 2.4 | 25.3 | 2887 | C350MB101000X[a]000XX[b] |
| 400 | 61 x 3.15 | 0.047 | 2.6 | 28.3 | 3726 | C351MB101000X[a]000XX[b] |
| 500 | 61 x 3.38 | 0.0366 | 2.8 | 32.1 | 4806 | C352MB101000X[a]000XX[b] |
| 630 | 61 x 3.81 | 0.0283 | 2.8 | 35.7 | 6071 | C353MB101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

$X^a$ : Insulation color (see Coding Key on page 74)
$XX^b$ : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Cable

## with Flexible Copper Conductor and PVC 70 ºC Insulation (H05V-K)

# 300/500 V

### APPLICATION

Suitable for internal wiring of electric motors and transformers as well as other electrical appliances and lighting applications. It can be used in electronic appliances for measuring, regulating and controlling.


### APPLICABLE STANDARDS

**alfanar** H05V-K cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed flexible copper conductor class 5 as per BS EN 60228 and IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per BS EN 50363-3 type TI1 and IEC 60227-1type PVC/C

**Colors**

Standard H05V-K colors are available in black, white, red, blue, green, yellow, yellow/ green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

**Flame retardancy**

**alfanar** H05V-K cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

**Packing**

Available in standard length of 100 yards on coil (Other lengths available on request)

### TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 0.50 | 16 x 0.2 | 39 | 0.6 | 2.1 | 10 | C505PC101000X[a]000XX[b] |
| 0.75 | 24 x 0.2 | 26 | 0.6 | 2.3 | 13 | C506PC101000X[a]000XX[b] |
| 1.0 | 32 x 0.2 | 19.5 | 0.6 | 2.5 | 16 | C507PC101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as result of product development and/or changes in standard.
- Other sizes can be provided on specific request

  $X^a$ : Insulation color (see Coding Key on page 74)

  $XX^b$ : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Heat Resistant Cable 300/500 V

## with Flexible Copper Conductor and PVC 90 ºC Insulation (H05V2-K)

### APPLICATION

Used in power current installations, switch cabinets, motors and transformers subject to direct contact with high temperatures in varnishing machines and drying towers. Also suitable for the internal of electrical equipment such as lighting and heating apparatus


### APPLICABLE STANDARDS

**alfanar** H05V2-K cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed flexible copper conductor class 5 as per BS EN 60228 and IEC 60228

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 90 °C at normal operation as per BS EN 50363-3 type TI3 and IEC 60227-1type PVC/E

#### Colors

Standard H05V2-K colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Flame retardancy

**alfanar** H05V2-K cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

#### Packing

Available in standard length of 100 yards on coil (Other lengths available on request)

### TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20 °C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 0.50 | 16 x 0.2 | 39 | 0.6 | 2.1 | 9 | C505MC101000X[a]000XX[b] |
| 0.75 | 24 x 0.2 | 26 | 0.6 | 2.3 | 12 | C506MC101000X[a]000XX[b] |
| 1.0 | 32 x 0.2 | 19.5 | 0.6 | 2.5 | 15 | C507MC101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

X[a] : Insulation color (see Coding Key on page 74)
XX[b] : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Cable

## with Flexible Copper Conductor and PVC 70 ºC Insulation (H07V-K)

# 450/750 V

### APPLICATION

Suitable for internal wiring of electric motors and transformers as well as other electrical appliances and lighting applications. It can be used in electronic appliances for measuring, regulating and controlling.


### APPLICABLE STANDARDS

**alfanar** H07V-K cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed flexible copper conductor class 5 as per BS EN 60228 and IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per BS EN 50363-3 type TI1 and IEC 60227-1type PVC/C

**Colors**

Standard H07V-K colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.

**Additional colors are made per request subject to factory minimum order quantities**

**Flame retardancy**

**alfanar** H07V-K cables have been tested and approved with the flame performance Tstandards IEC 60332-1-2 and BS EN 60332-1.

**Packing**

Available in standard length of 100 yards on coil (Other lengths available on request)

## TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20°C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 1.5 | 30 x 0.25 | 13.3 | 0.7 | 3.0 | 24 | C508PB101000X[a]000XX[b] |
| 2.5 | 50 x 0.25 | 7.98 | 0.8 | 3.7 | 35 | C510PB101000X[a]000XX[b] |
| 4 | 56 x 0.30 | 4.95 | 0.8 | 4.2 | 50 | C512PB101000X[a]000XX[b] |
| 6 | 84 x 0.30 | 3.3 | 0.8 | 4.6 | 70 | C513PB101000X[a]000XX[b] |
| 10 | 84 x 0.4 | 1.91 | 1.0 | 6.2 | 119 | C514PB101000X[a]000XX[b] |
| 16 | 130 x 0.4 | 1.21 | 1.0 | 7.6 | 178 | C515PB101000X[a]000XX[b] |
| 25 | 196 x 0.4 | 0.780 | 1.2 | 9.1 | 273 | C516PB101000X[a]000XX[b] |
| 35 | 280 x 0.4 | 0.554 | 1.2 | 10.3 | 369 | C517PB101000X[a]000XX[b] |
| 50 | 400 x 0.4 | 0.386 | 1.4 | 12.6 | 548 | C518PB101000X[a]000XX[b] |
| 70 | 361 x 0.5 | 0.272 | 1.4 | 14.6 | 740 | C519PB101000X[a]000XX[b] |
| 95 | 475 x 0.5 | 0.206 | 1.6 | 17.0 | 996 | C545PB101000X[a]000XX[b] |
| 120 | 608 x 0.5 | 0.161 | 1.6 | 18.9 | 1255 | C546PB101000X[a]000XX[b] |
| 150 | 744 x 0.5 | 0.129 | 1.8 | 21.2 | 1563 | C547PB101000X[a]000XX[b] |
| 185 | 910 x 0.5 | 0.106 | 2.0 | 23.4 | 1912 | C548PB101000X[a]000XX[b] |
| 240 | 1190 x0.5 | 0.0801 | 2.2 | 26.9 | 2513 | C549PB101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

$X^a$ : Insulation color (see Coding Key on page 74)
$XX^b$ : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Heat Resistant Cable 450/750 V

## with Flexible Copper Conductor and PVC 90 ºC Insulation (H07V2-K)

### APPLICATION

Used in power current installations, switch cabinets, motors and transformers subject to direct contact with high temperatures in varnishing machines and drying towers. Also suitable for the internal of electrical equipment such as lighting and heating apparatus


### APPLICABLE STANDARDS

**alfanar** H07V2-K cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-31, IEC 60227-3 and SASO-GSO-IEC 60227-3 standards. However, alfanar can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed flexible copper conductor class 5 as per BS EN 60228 and IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 90 °C at normal operation as per BS EN 50363-3 type TI3 and IEC 60227-1type PVC/E

**Colors**

Standard H07V2-K colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

**Flame retardancy**

**alfanar** H07V2-K cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1

**Packing**

Available in standard length of 100 yards on coil (Other lengths available on request)

## TECHNICAL DATA

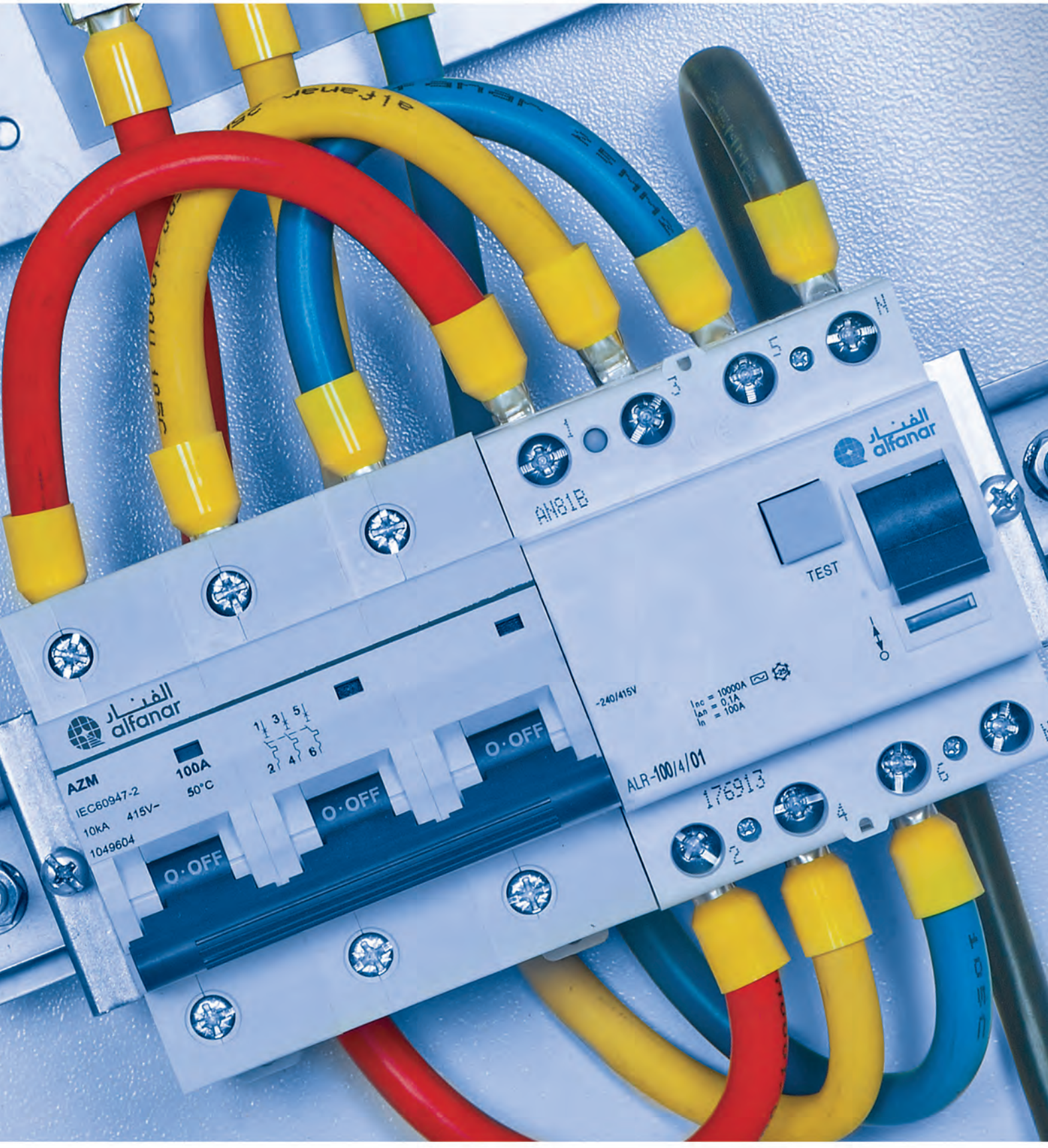
| Conductor | | Maximum DC Conductor Resistance at 20°C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 1.5 | 30 x 0.25 | 13.3 | 0.7 | 3.0 | 23 | C508MB101000X$^a$000XX$^b$ |
| 2.5 | 50 x 0.25 | 7.98 | 0.8 | 3.7 | 34 | C510MB101000X$^a$000XX$^b$ |
| 4 | 56 x 0.30 | 4.95 | 0.8 | 4.2 | 49 | C512MB101000X$^a$000XX$^b$ |
| 6 | 84 x 0.30 | 3.3 | 0.8 | 4.6 | 69 | C513MB101000X$^a$000XX$^b$ |
| 10 | 84 x 0.4 | 1.91 | 1.0 | 6.2 | 117 | C514MB101000X$^a$000XX$^b$ |
| 16 | 130 x 0.4 | 1.21 | 1.0 | 7.6 | 176 | C515MB101000X$^a$000XX$^b$ |
| 25 | 196 x 0.4 | 0.780 | 1.2 | 9.1 | 270 | C516MB101000X$^a$000XX$^b$ |
| 35 | 280 x 0.4 | 0.554 | 1.2 | 10.3 | 366 | C517MB101000X$^a$000XX$^b$ |
| 50 | 400 x 0.4 | 0.386 | 1.4 | 12.6 | 543 | C518MB101000X$^a$000XX$^b$ |
| 70 | 361 x 0.5 | 0.272 | 1.4 | 14.6 | 735 | C519MB101000X$^a$000XX$^b$ |
| 95 | 475 x 0.5 | 0.206 | 1.6 | 17.0 | 988 | C545MB101000X$^a$000XX$^b$ |
| 120 | 608 x 0.5 | 0.161 | 1.6 | 18.9 | 1246 | C546MB101000X$^a$000XX$^b$ |
| 150 | 744 x 0.5 | 0.129 | 1.8 | 21.2 | 1552 | C547MB101000X$^a$000XX$^b$ |
| 185 | 910 x 0.5 | 0.106 | 2.0 | 23.4 | 1899 | C548MB101000X$^a$000XX$^b$ |
| 240 | 1190 x0.5 | 0.0801 | 2.2 | 26.9 | 2496 | C549MB101000X$^a$000XX$^b$ |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

  $X^a$ : Insulation color (see Coding Key on page 74)

  $XX^b$ : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed PVC Insulated Cables For Panel Board/Switchgear Applications



Used as an internal connector in controllers, motor starters and rectifier equipment. It is designed for installation in switch control, metering, relay and instrumentation panels. It can be used in everything from automation and process control, building and construction to marine and defense, and transmission, distribution and power networks.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# Single Core Non-Sheathed Cable 600/1000 V

## with Flexible Plain Copper Conductor and PVC Insulation

### APPLICATION

It is suitable for use as an internal connector in controllers, motor starters and rectifier equipment. It is designed for installation in switch control, metering, relay and instrumentation panels. It can be used in everything from automation and process control, building and construction to marine and defense, and transmission, distribution and power networks.


### APPLICABLE STANDARDS

**alfanar** cables are designed and tested to meet or exceed the requirements of BS 6231. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed flexible copper conductor class 5 as per BS EN 60228 and IEC 60228

**Insulation**

**Type BK**

Extruded layer of Polyvinyl chloride (PVC) insulation Type TI1 with a temperature rating of 70°C at normal operation as per BS EN 50363-3

**Type CK**

Extruded layer of Special Polyvinyl chloride (PVC) insulation Type TI3 with a temperature rating of 105°C at normal operation as per BS EN 50363-3.

**Colors**

Standard colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.

**Additional colors are made per request subject to factory minimum order quantities**

**Flame retardancy**

The cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

**Packing**

Available in standard length of 100 yards on coil (Other lengths available on request)

## TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20°C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 0.5 | 16 x 0.2 | 39 | 0.8 | 2.6 | 12 | C505AA101000X[a]00BXX[b] |
| 0.75 | 24 x 0.2 | 26 | 0.8 | 2.8 | 15 | C506AA101000X[a]00BXX[b] |
| 1 | 32 x 0.2 | 19.5 | 0.8 | 2.9 | 18 | C507AA101000X[a]00BXX[b] |
| 1.5 | 30 x 0.25 | 13.3 | 0.8 | 3.2 | 23 | C508AA101000X[a]00BXX[b] |
| 2.5 | 50 x 0.25 | 7.98 | 0.8 | 3.7 | 34 | C510AA101000X[a]00BXX[b] |
| 4 | 56 x 0.30 | 4.95 | 0.8 | 4.2 | 50 | C512AA101000X[a]00BXX[b] |
| 6 | 84 x 0.30 | 3.3 | 0.8 | 4.6 | 69 | C513AA101000X[a]00BXX[b] |
| 10 | 84 x 0.4 | 1.91 | 1.0 | 6.2 | 118 | C514AA101000X[a]00BXX[b] |
| 16 | 130 x 0.4 | 1.21 | 1.0 | 7.6 | 180 | C515AA101000X[a]00BXX[b] |
| 25 | 196 x 0.4 | 0.780 | 1.2 | 9.1 | 276 | C516AA101000X[a]00BXX[b] |
| 35 | 280 x 0.4 | 0.554 | 1.2 | 10.3 | 371 | C517AA101000X[a]00BXX[b] |
| 50 | 400 x 0.4 | 0.386 | 1.4 | 12.6 | 544 | C518AA101000X[a]00BXX[b] |
| 70 | 361 x 0.5 | 0.272 | 1.4 | 14.6 | 736 | C519AA101000X[a]00BXX[b] |
| 95 | 475 x 0.5 | 0.206 | 1.6 | 17.0 | 990 | C545AA101000X[a]00BXX[b] |
| 120 | 608 x 0.5 | 0.161 | 1.6 | 18.9 | 1248 | C546AA101000X[a]00BXX[b] |
| 150 | 744 x 0.5 | 0.129 | 1.8 | 21.2 | 1554 | C547AA101000X[a]00BXX[b] |
| 185 | 910 x 0.5 | 0.106 | 2.0 | 23.4 | 1902 | C548AA101000X[a]00BXX[b] |
| 240 | 1190 x0.5 | 0.0801 | 2.2 | 26.9 | 2500 | C549AA101000X[a]00BXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

  $X^a$ : Insulation color (see Coding Key on page 74)

  $XX^b$ : Packing type (see Coding Key on page 74)

# Single Core Non-Sheathed Cable 600/1000 V

## with Flexible Tinned Copper Conductor and PVC Insulation

### APPLICATION

It is suitable for use as an internal connector in controllers, motor starters and rectifier equipment. It is designed for installation in switch control, metering, relay and instrumentation panels. It can be used in everything from automation and process control, building and construction to marine and defense, and transmission, distribution and power networks.


### APPLICABLE STANDARDS

**alfanar** cables are designed and tested to meet or exceed the requirements of BS 6231. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Tinned annealed flexible copper conductor class 5 as per BS EN 60228 and IEC 60228

**Insulation**

**Type BK**

Extruded layer of Polyvinyl chloride (PVC) insulation Type TI1 with a temperature rating of 70°C at normal operation as per BS EN 50363-3.

**Type CK**

Extruded layer of Special Polyvinyl chloride (PVC) insulation Type TI3 with a temperature rating of 105°C at normal operation as per BS EN 50363-3.

**Colors**

Standard colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.

**Additional colors are made per request subject to factory minimum order quantities**

**Flame retardancy**

The cables have been tested and approved with the flame performance standards IEC 60332-1-2 and BS EN 60332-1.

**Packing**

Available in standard length of 100 yards on coil (Other lengths available on request)

## TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20°C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| $mm^2$ | No. x mm | Ohms/km | mm | mm | Kg/km | |
| 0.5 | 16 x 0.2 | 40.1 | 0.8 | 2.6 | 12 | T505AA101000X[a]00BXX[b] |
| 0.75 | 24 x 0.2 | 26.7 | 0.8 | 2.8 | 15 | T506AA101000X[a]00BXX[b] |
| 1 | 32 x 0.2 | 20 | 0.8 | 2.9 | 18 | T507AA101000X[a]00BXX[b] |
| 1.5 | 30 x 0.25 | 13.7 | 0.8 | 3.2 | 23 | T508AA101000X[a]00BXX[b] |
| 2.5 | 50 x 0.25 | 8.21 | 0.8 | 3.7 | 34 | T510AA101000X[a]00BXX[b] |
| 4 | 56 x 0.30 | 5.09 | 0.8 | 4.2 | 50 | T512AA101000X[a]00BXX[b] |
| 6 | 84 x 0.30 | 3.39 | 0.8 | 4.6 | 69 | T513AA101000X[a]00BXX[b] |
| 10 | 80 x 0.4 | 1.95 | 1.0 | 6.2 | 118 | T514AA101000X[a]00BXX[b] |
| 16 | 126 x 0.4 | 1.24 | 1.0 | 7.6 | 180 | T515AA101000X[a]00BXX[b] |
| 25 | 193 x 0.4 | 0.795 | 1.2 | 9.1 | 276 | T516AA101000X[a]00BXX[b] |
| 35 | 280 x 0.4 | 0.565 | 1.2 | 10.3 | 371 | T517AA101000X[a]00BXX[b] |
| 50 | 392 x 0.4 | 0.393 | 1.4 | 12.6 | 544 | T518AA101000X[a]00BXX[b] |
| 70 | 354 x 0.5 | 0.277 | 1.4 | 14.6 | 736 | T519AA101000X[a]00BXX[b] |
| 95 | 466 x 0.5 | 0.210 | 1.6 | 17.0 | 990 | T545AA101000X[a]00BXX[b] |
| 120 | 600 x 0.5 | 0.164 | 1.6 | 18.9 | 1248 | T546AA101000X[a]00BXX[b] |
| 150 | 730 x 0.5 | 0.132 | 1.8 | 21.2 | 1554 | T547AA101000X[a]00BXX[b] |
| 185 | 196 x 0.5 | 0.108 | 2.0 | 23.4 | 1902 | T548AA101000X[a]00BXX[b] |
| 240 | 1164 x0.5 | 0.0817 | 2.2 | 26.9 | 2500 | T549AA101000X[a]00BXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

$X^a$ : Insulation color (see Coding Key on page 74)

$XX^b$ : Packing type (see Coding Key on page 74)

# Multi Core PVC Insulated PVC Sheathed Cables

Used for outdoor and indoor installations in damp and wet locations
for supplying power to electrical units and equipments


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# Multicore Cables 300/500 V

## with Solid Copper Conductor, PVC Insulated and PVC Sheathed (H05VV-U)

### APPLICATION

Suitable for domestic and light industrial wiring and can be installed on tray, free air or clipped direct. It should be installed into areas where there is low risk of mechanical damage. Also used for transferring electrical signals among different control units and also used in alarm systems


### APPLICABLE STANDARDS

**alfanar** H05VV-U cables are designed and tested to meet or exceed the requirements of IEC 60227-4 standard. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed solid copper conductor class 1 as per IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per IEC 60227-1type PVC/C

**Assembly**

The insulated cores are uniformly twisted together to form the cable core. The construction of the cable core will be as manufacturer's standard to obtain circular laid up core.

**Core Identification**

Standard H05VV-U core identification will be as follow:

| | | |
|---|---|---|
| Two cores | : | Red and Black |
| Three cores | : | Red, Yellow and Blue |
| Four cores | : | Red, Yellow, Blue and Black |
| Five cores | : | Red, Yellow, Blue, Black and Yellow/Green |

**Additional colors are made per request subject to factory minimum order quantities**

**Sheath**

Extruded layer of Polyvinyl chloride (PVC) compound applied over the laid up assembled cores with temperature rating 70 °C at normal operation as per IEC 60227-1 type ST4.

**Flame retardancy**

**alfanar** H05VV-U cables have been tested and approved with the flame performance standards IEC 60332-1-2

**Packing**

Available in standard length of 1000 meters on wooden drum (Other lengths are available upon request)

## TECHNICAL DATA

| Number of cores | Conductor | | Nominal Insulation Thickness | Thickness of Inner Covering | Nominal sheath Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|---|---|
| | Size | Cons. | | | | | | |
| No. | $mm^2$ | No. x mm | mm | mm | mm | mm | Kg/km | |
| 2 | 1 | 1 x 1.13 | 0.6 | 0.4 | 1.2 | 7.9 | 95 | C107PC10200PX[a]01FXX[b] |
| 3 | 1 | 1 x 1.13 | 0.6 | 0.4 | 1.2 | 8.3 | 110 | C107PC10300PX[a]04FXX[b] |
| 4 | 1 | 1 x 1.13 | 0.6 | 0.4 | 1.2 | 8.9 | 130 | C107PC10400PX[a]08FXX[b] |
| 5 | 1 | 1 x 1.13 | 0.6 | 0.4 | 1.2 | 9.5 | 150 | C107PC10500PX[a]12FXX[b] |
| 2 | 1.5 | 1 x 1.38 | 0.7 | 0.4 | 1.2 | 8.8 | 120 | C108PC10200PX[a]01FXX[b] |
| 3 | 1.5 | 1 x 1.38 | 0.7 | 0.4 | 1.2 | 9.2 | 140 | C108PC10300PX[a]04FXX[b] |
| 4 | 1.5 | 1 x 1.38 | 0.7 | 0.4 | 1.2 | 9.9 | 170 | C108PC10400PX[a]08FXX[b] |
| 5 | 1.5 | 1 x 1.38 | 0.7 | 0.4 | 1.2 | 10.7 | 200 | C108PC10500PX[a]12FXX[b] |
| 2 | 2.5 | 1 x 1.78 | 0.8 | 0.4 | 1.2 | 10 | 160 | C110PC10200PX[a]01FXX[b] |
| 3 | 2.5 | 1 x 1.78 | 0.8 | 0.4 | 1.2 | 10.5 | 195 | C110PC10300PX[a]04FXX[b] |
| 4 | 2.5 | 1 x 1.78 | 0.8 | 0.4 | 1.4 | 11.4 | 235 | C110PC10400PX[a]08FXX[b] |
| 5 | 2.5 | 1 x 1.78 | 0.8 | 0.4 | 1.4 | 12.3 | 280 | C110PC10500PX[a]12FXX[b] |
| 2 | 4 | 1 x 2.25 | 0.8 | 0.4 | 1.2 | 10.9 | 210 | C112PC10200PX[a]01FXX[b] |
| 3 | 4 | 1 x 2.25 | 0.8 | 0.4 | 1.4 | 11.5 | 255 | C112PC10300PX[a]04FXX[b] |
| 4 | 4 | 1 x 2.25 | 0.8 | 0.4 | 1.4 | 12.9 | 325 | C112PC10400PX[a]08FXX[b] |
| 5 | 4 | 1 x 2.25 | 0.8 | 0.6 | 1.4 | 14.4 | 495 | C112PC10500PX[a]12FXX[b] |
| 2 | 6 | 1 x 2.76 | 0.8 | 0.4 | 1.4 | 11.9 | 265 | C113PC10200PX[a]01FXX[b] |
| 3 | 6 | 1 x 2.76 | 0.8 | 0.4 | 1.4 | 13 | 345 | C113PC10300PX[a]04FXX[b] |
| 4 | 6 | 1 x 2.76 | 0.8 | 0.6 | 1.4 | 14.6 | 440 | C113PC10400PX[a]08FXX[b] |
| 5 | 6 | 1 x 2.76 | 0.8 | 0.6 | 1.4 | 15.8 | 530 | C113PC10500PX[a]12FXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

X[a] : Insulation color (see Coding Key on page 74)

XX[b] : Packing type (see Coding Key on page 74)

# Multicore Cables 600/1000 V

## with Solid Copper Conductor, PVC Insulated and PVC Sheathed

### APPLICATION

Suitable for domestic and light industrial wiring and can be installed on tray, free air or clipped direct. It should be installed into areas where there is low risk of mechanical damage. Also used for transferring electrical signals among different control units and also used in alarm systems


### APPLICABLE STANDARDS

**alfanar** solid power cables are designed and tested to meet or exceed the requirements of IEC 60502-1standard. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed solid copper conductor class 1 as per IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per IEC 60502-1type PVC/A

**Assembly**

The insulated cores are uniformly twisted together to form the cable core. The construction of the cable core will be as manufacturer's standard to obtain circular laid up core

**Core Identification**

Standard solid power cables core identification will be as follow:

| | | |
|---|---|---|
| Two cores | : | Red and Black |
| Three cores | : | Red, Yellow and Blue |
| Four cores | : | Red, Yellow, Blue and Black |
| Five cores | : | Red, Yellow, Blue, Black and Yellow/Green |

**Additional colors are made per request subject to factory minimum order quantities**

**Sheath**

Extruded layer of Polyvinyl chloride (PVC) compound applied over the laid up assembled cores with temperature rating 80 °C at normal operation as per IEC 60502-1 type ST1

**Flame retardancy**

**alfanar** solid power cables cables have been tested and approved with the flame performance standards IEC 60332-1-2

**Packing**

Available in standard length 1000 meters on wooden drums (Other lengths available on request)

## TECHNICAL DATA

| Number of cores | Conductor | | Nominal Insulation Thickness | Nominal sheath Thickness | Approx. Over-all Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|---|
| | Size | Cons. | | | | | |
| No. | $mm^2$ | No. x mm | mm | mm | mm | Kg/km | |
| 2 | 1.5 | 1 x 1.38 | 0.8 | 1.8 | 9.6 | 145 | C108PA10200CX[a]01IXX[b] |
| 3 | 1.5 | 1 x 1.38 | 0.8 | 1.8 | 10 | 170 | C108PA10300CX[a]04IXX[b] |
| 4 | 1.5 | 1 x 1.38 | 0.8 | 1.8 | 10.8 | 200 | C108PA10400CX[a]08IXX[b] |
| 5 | 1.5 | 1 x 1.38 | 0.8 | 1.8 | 11.7 | 240 | C108PA10500CX[a]12IXX[b] |
| 2 | 2.5 | 1 x 1.78 | 0.8 | 1.8 | 10.4 | 180 | C110PA10200CX[a]01IXX[b] |
| 3 | 2.5 | 1 x 1.78 | 0.8 | 1.8 | 11 | 220 | C110PA10300CX[a]04IXX[b] |
| 4 | 2.5 | 1 x 1.78 | 0.8 | 1.8 | 11.8 | 265 | C110PA10400CX[a]08IXX[b] |
| 5 | 2.5 | 1 x 1.78 | 0.8 | 1.8 | 12.7 | 315 | C110PA10500CX[a]12IXX[b] |
| 2 | 4 | 1 x 2.25 | 1 | 1.8 | 12.1 | 255 | C112PA10200CX[a]01IXX[b] |
| 3 | 4 | 1 x 2.25 | 1 | 1.8 | 12.8 | 315 | C112PA10300CX[a]04IXX[b] |
| 4 | 4 | 1 x 2.25 | 1 | 1.8 | 13.8 | 385 | C112PA10400CX[a]08IXX[b] |
| 5 | 4 | 1 x 2.25 | 1 | 1.8 | 15.1 | 465 | C112PA10500CX[a]12IXX[b] |
| 2 | 6 | 1 x 2.76 | 1 | 1.8 | 13.2 | 325 | C113PA10200CX[a]01IXX[b] |
| 3 | 6 | 1 x 2.76 | 1 | 1.8 | 14 | 405 | C113PA10300CX[a]04IXX[b] |
| 4 | 6 | 1 x 2.76 | 1 | 1.8 | 15.1 | 500 | C113PA10400CX[a]08IXX[b] |
| 5 | 6 | 1 x 2.76 | 1 | 1.8 | 16.5 | 610 | C113PA10500CX[a]12IXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

  $X^a$ : Insulation color (see Coding Key on page 74)

  $XX^b$ : Packing type (see Coding Key on page 74)

# Multicore Cables 300/500 V

## with Stranded Copper Conductor, PVC Insulated and PVC Sheathed (H05VV-R)

### APPLICATION

Used for industrial and wiring purposes. Useable in the open environments in outdoor and indoor applications, as well as supplying power to electrical units and equipment in different projects


### APPLICABLE STANDARDS

**alfanar** H05VV-R cables are designed and tested to meet or exceed the requirements of IEC 60227-4 standard. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed stranded copper conductor class 2 as per IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per IEC 60227-1type PVC/C

**Assembly**

The insulated cores are uniformly twisted together to form the cable core. The construction of the cable core will be as manufacturer's standard to obtain circular laid up core.

**Core Identification**

Standard H05VV-R core identification will be as follow:

| | | |
|---|---|---|
| Two cores | : | Red and Black |
| Three cores | : | Red, Yellow and Blue |
| Four cores | : | Red, Yellow, Blue and Black |
| Five cores | : | Red, Yellow, Blue, Black and Yellow/Green |

**Additional colors are made per request subject to factory minimum order quantities**

**Sheath**

Extruded layer of Polyvinyl chloride (PVC) compound applied over the laid up assembled cores with temperature rating 70 °C at normal operation as per IEC 60227-1 type ST4.

**Flame retardancy**

**alfanar** H05VV-R cables have been tested and approved with the flame performance standards IEC 60332-1-2

**Packing**

Available in standard length of 1000 meters on wooden drum (Other lengths are available upon request)

## TECHNICAL DATA

| Number of cores | Conductor | | Nominal Insulation Thickness | Thickness of Inner Covering | Nominal sheath Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|---|---|
| | Size | Cons. | | | | | | |
| No. | $mm^2$ | No. x mm | mm | mm | mm | mm | Kg/km | |
| 2 | 1.5 | 7 x 0.52 | 0.7 | 0.4 | 1.2 | 9.2 | 125 | C208PC10200PX[a]01FXX[b] |
| 3 | 1.5 | 7 x 0.52 | 0.7 | 0.4 | 1.2 | 9.6 | 145 | C208PC10300PX[a]04FXX[b] |
| 4 | 1.5 | 7 x 0.52 | 0.7 | 0.4 | 1.2 | 10.4 | 175 | C208PC10400PX[a]08FXX[b] |
| 5 | 1.5 | 7 x 0.52 | 0.7 | 0.4 | 1.2 | 11.2 | 210 | C208PC10500PX[a]12FXX[b] |
| 2 | 2.5 | 7 x 0.67 | 0.8 | 0.4 | 1.2 | 10.4 | 170 | C210PC10200PX[a]01FXX[b] |
| 3 | 2.5 | 7 x 0.67 | 0.8 | 0.4 | 1.2 | 11 | 205 | C210PC10300PX[a]04FXX[b] |
| 4 | 2.5 | 7 x 0.67 | 0.8 | 0.4 | 1.2 | 12 | 245 | C210PC10400PX[a]08FXX[b] |
| 5 | 2.5 | 7 x 0.67 | 0.8 | 0.4 | 1.2 | 13 | 295 | C210PC10500PX[a]12FXX[b] |
| 2 | 4 | 7 x 0.85 | 0.8 | 0.4 | 1.2 | 11.5 | 220 | C212PC10200PX[a]01FXX[b] |
| 3 | 4 | 7 x 0.85 | 0.8 | 0.4 | 1.2 | 12.2 | 270 | C212PC10300PX[a]04FXX[b] |
| 4 | 4 | 7 x 0.85 | 0.8 | 0.4 | 1.4 | 13.7 | 345 | C212PC10400PX[a]08FXXb |
| 5 | 4 | 7 x 0.85 | 0.8 | 0.6 | 1.4 | 15.2 | 425 | C212PC10500PX[a]12FXX[b] |
| 2 | 6 | 7 x 1.04 | 0.8 | 0.4 | 1.2 | 12.6 | 285 | C213PC10200PX[a]01FXX[b] |
| 3 | 6 | 7 x 1.04 | 0.8 | 0.4 | 1.4 | 13.8 | 365 | C213PC10300PX[a]04FXX[b] |
| 4 | 6 | 7 x 1.04 | 0.8 | 0.6 | 1.4 | 15.5 | 460 | C213PC10400PX[a]08FXX[b] |
| 5 | 6 | 7 x 1.04 | 0.8 | 0.6 | 1.4 | 16.8 | 560 | C213PC10500PX[a]12FXX[b] |
| 2 | 10 | 7 x 1.34 | 1 | 0.6 | 1.4 | 15.4 | 435 | C314PC10200PX[a]01FXX[b] |
| 3 | 10 | 7 x 1.34 | 1 | 0.6 | 1.4 | 16.3 | 540 | C314PC10300PX[a]04FXX[b] |
| 4 | 10 | 7 x 1.34 | 1 | 0.6 | 1.4 | 17.8 | 670 | C314PC10400PX[a]08FXX[b] |
| 5 | 10 | 7 x 1.34 | 1 | 0.6 | 1.4 | 19.5 | 815 | C314PC10500PX[a]12FXX[b] |
| 2 | 16 | 7 x 1.68 | 1 | 0.6 | 1.4 | 17.4 | 600 | C315PC10200PX[a]01FXX[b] |
| 3 | 16 | 7 x 1.68 | 1 | 0.8 | 1.4 | 18.9 | 775 | C315PC10300PX[a]04FXX[b] |
| 4 | 16 | 7 x 1.68 | 1 | 0.8 | 1.4 | 20.6 | 970 | C315PC10400PX[a]08FXX[b] |
| 5 | 16 | 7 x 1.68 | 1 | 0.8 | 1.6 | 22.5 | 1180 | C315PC10500PX[a]12FXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard
- Other sizes and temperature rating can be provided on specific request
- For voltage 450/750 V can be provided on specific request
- $X^a$ : Sheath color (see Coding Key on page 74)
- $XX^b$ : Packing type (see Coding Key on page 74)

# Multicore Cables 300/500 V

## with Flexible Copper Conductor, PVC Insulated and PVC Sheathed (H05VV-F)

### APPLICATION

Used for mobile electrical equipment and units, supply pumps and motors, etc., in which cables with high flexibility are required. These cables are also used in household appliances such as, washing machines, refrigerators, kitchen equipment, and in offices and prefabricated houses


### APPLICABLE STANDARDS

**alfanar** H05VV-F cables are designed and tested to meet or exceed the requirements of BS EN 50525-2-11 standards. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed flexible copper conductor class 5 as per BS EN 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per BS EN 50363-3 type TI1

**Assembly**

The insulated cores are uniformly twisted together to form the cable core. The construction of the cable core will be as manufacturer's standard to obtain circular laid up core.

**Core Identification**

Standard H05VV-F core identification will be as follow:

| | | |
|---|---|---|
| Two cores | : | Brown and Blue |
| Three cores | : | Brown, Blue and Yellow/Green |
| Four cores | : | Brown, Black, Grey and Blue |
| Five cores | : | Brown, Black, Grey, Blue and Yellow/Green |

**Additional colors are made per request subject to factory minimum order quantities**

**Sheath**

Extruded layer of Polyvinyl chloride (PVC) compound applied over the laid up assembled cores with temperature rating 70 °C at normal operation as per BS EN 50363-4-1 type TM2

**Flame retardancy**

**alfanar** H05VV-F cables have been tested and approved with the flame performance standards BS EN 60332-1.

**Packing**

Available in standard length of 1000 meters on wooden drum (Other lengths are available upon request)

## TECHNICAL DATA

| Number of cores | Conductor | | Nominal Insulation Thickness | Nominal sheath Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|---|
| | Size | Cons. | | | | | |
| No. | $mm^2$ | No. x mm | mm | mm | mm | Kg/km | |
| 2 | 0.75 | 24 x 0.2 | 0.6 | 0.8 | 6.3 | 58 | C506PC10200FX[a]03BXX[b] |
| 3 | 0.75 | 24 x 0.2 | 0.6 | 0.8 | 6.7 | 70 | C506PC10300FX[a]06BXX[b] |
| 4 | 0.75 | 24 x 0.2 | 0.6 | 0.8 | 7.3 | 85 | C506PC10400FX[a]10BXX[b] |
| 5 | 0.75 | 24 x 0.2 | 0.6 | 0.9 | 8.2 | 110 | C506PC10500FX[a]14BXX[b] |
| 2 | 1 | 32 x 0.2 | 0.6 | 0.8 | 6.7 | 68 | C507PC10200FX[a]03BXX[b] |
| 3 | 1 | 32 x 0.2 | 0.6 | 0.8 | 7.1 | 85 | C507PC10300FX[a]06BXX[b] |
| 4 | 1 | 32 x 0.2 | 0.6 | 0.9 | 7.9 | 110 | C507PC10400FX[a]10BXX[b] |
| 5 | 1 | 32 x 0.2 | 0.6 | 0.9 | 8.6 | 130 | C507PC10500FX[a]14BXX[b] |
| 2 | 1.5 | 30 x 0.25 | 0.7 | 0.8 | 7.6 | 95 | C508PC10200FX[a]03BXX[b] |
| 3 | 1.5 | 30 x 0.25 | 0.7 | 0.9 | 8.3 | 120 | C508PC10300FX[a]06BXX[b] |
| 4 | 1.5 | 30 x 0.25 | 0.7 | 1.0 | 9.3 | 150 | C508PC10400FX[a]10BXX[b] |
| 5 | 1.5 | 30 x 0.25 | 0.7 | 1.1 | 10.3 | 185 | C508PC10500FX[a]14BXX[b] |
| 2 | 2.5 | 50 x 0.25 | 0.8 | 1.0 | 9.3 | 145 | C510PC10200FX[a]03BXX[b] |
| 3 | 2.5 | 50 x 0.25 | 0.8 | 1.1 | 10.1 | 180 | C510PC10300FX[a]06BXX[b] |
| 4 | 2.5 | 50 x 0.25 | 0.8 | 1.1 | 11.1 | 225 | C510PC10400FX[a]10BXX[b] |
| 5 | 2.5 | 50 x 0.25 | 0.8 | 1.2 | 12.3 | 280 | C510PC10500FX[a]14BXX[b] |
| 2 | 4 | 56 x 0.3 | 0.8 | 1.1 | 10.7 | 200 | C512PB10200FX[a]03BXX[b] |
| 3 | 4 | 56 x 0.3 | 0.8 | 1.2 | 11.5 | 250 | C512PB10300FX[a]06BXX[b] |
| 4 | 4 | 56 x 0.3 | 0.8 | 1.2 | 12.6 | 315 | C512PB10400FX[a]10BXX[b] |
| 5 | 4 | 56 x 0.3 | 0.8 | 1.4 | 14.2 | 395 | C512PB10500FX[a]14BXX[b] |
| 2 | 6 | 84 x 0.3 | 0.8 | 1.2 | 12.0 | 265 | C513PB10200FX[a]03BXX[b] |
| 3 | 6 | 84 x 0.3 | 0.8 | 1.4 | 13.2 | 345 | C513PB10300FX[a]06BXX[b] |
| 4 | 6 | 84 x 0.3 | 0.8 | 1.4 | 14.5 | 430 | C513PB10400FX[a]10BXX[b] |
| 5 | 6 | 84 x 0.3 | 0.8 | 1.4 | 15.8 | 525 | C513PB10500FX[a]14BXX[b] |
| 2 | 10 | 80 x 0.4 | 1 | 1.4 | 15.2 | 430 | C514PB10200FX[a]03BXX[b] |
| 3 | 10 | 80 x 0.4 | 1 | 1.4 | 16.2 | 540 | C514PB10300FX[a]06BXX[b] |
| 4 | 10 | 80 x 0.4 | 1 | 1.4 | 17.8 | 680 | C514PB10400FX[a]10BXX[b] |
| 5 | 10 | 80 x 0.4 | 1 | 1.4 | 19.5 | 830 | C514PB10500FX[a]14BXX[b] |
| 2 | 16 | 126 x 0.4 | 1 | 1.4 | 17.3 | 600 | C515PB10200FX[a]03BXX[b] |
| 3 | 16 | 126 x 0.4 | 1 | 1.4 | 18.5 | 760 | C515PB10300FX[a]06BXX[b] |
| 4 | 16 | 126 x 0.4 | 1 | 1.4 | 20.4 | 965 | C515PB10400FX[a]10BXX[b] |
| 5 | 16 | 126 x 0.4 | 1 | 1.6 | 22.8 | 1205 | C515PB10400FX[a]14BXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard
- Other sizes and temperature rating can be provided on specific request
- For sizes 4 $mm^2$ and above available upon request with rated voltage 450/750 V as above table
- $X^a$ : Sheath color (see Coding Key on page 74)
- $XX^b$ : Packing type (see Coding Key on page 74)

# Multicore Cables 600/1000 V

## with Flexible Copper Conductor, PVC Insulated and PVC Sheathed

### APPLICATION

These control and power flexible cables are used indoors and outdoors, in cable ducts, in power and switching plants, industrial plants, underground applications where there is no risk of mechanical damage.


### APPLICABLE STANDARDS

**alfanar** flexible power cables are designed and tested to meet or exceed the requirements of IEC 60502-1 standard. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed flexible copper conductor class 5 as per IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per IEC 60502-1type PVC/A

**Assembly**

The insulated cores are uniformly twisted together to form the cable core. The construction of the cable core will be as manufacturer's standard to obtain circular laid up core.

**Core Identification**

Standard flexible power cables core identification will be as follow:

| | | |
|---|---|---|
| Two cores | : | Red and Black |
| Three cores | : | Red, Yellow and Blue |
| Four cores | : | Red, Yellow, Blue and Black |
| Five cores | : | Red, Yellow, Blue, Black and Yellow/Green |

**Additional colors are made per request subject to factory minimum order quantities**

**Sheath**

Extruded layer of Polyvinyl chloride (PVC) compound applied over the laid up assembled cores with temperature rating 80 °C at normal operation as per IEC 60502-1 type ST1

**Flame retardancy**

**alfanar** flexible power cables have been tested and approved with the flame performance standards IEC 60332-1-2.

**Packing**

Available in standard length of 1000 meters on wooden drum (Other lengths are available upon request)

## TECHNICAL DATA

| Number of cores | Conductor | | Nominal Insulation Thickness | Thickness of Inner Covering | Approx. Over-all Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|---|
| | Size | Cons. | | | | | |
| No. | $mm^2$ | No. x mm | mm | mm | mm | Kg/km | |
| 2 | 1.5 | 30 x 0.25 | 0.8 | 1.8 | 10.0 | 150 | C508PA10200CX[a]03IXX[b] |
| 3 | 1.5 | 30 x 0.25 | 0.8 | 1.8 | 10.5 | 170 | C508PA10300CX[a]06IXXb |
| 4 | 1.5 | 30 x 0.25 | 0.8 | 1.8 | 11.3 | 205 | C508PA10400CX[a]10IXX[b] |
| 5 | 1.5 | 30 x 0.25 | 0.8 | 1.8 | 12.2 | 245 | C508PA10500CX[a]14IXX[b] |
| 2 | 2.5 | 50 x 0.25 | 0.8 | 1.8 | 11.0 | 190 | C510PA10200CX[a]03IXX[b] |
| 3 | 2.5 | 50 x 0.25 | 0.8 | 1.8 | 11.6 | 220 | C510PA10300CX[a]06IXX[b] |
| 4 | 2.5 | 50 x 0.25 | 0.8 | 1.8 | 12.6 | 270 | C510PA10400CX[a]10IXX[b] |
| 5 | 2.5 | 50 x 0.25 | 0.8 | 1.8 | 13.6 | 320 | C510PA10500CX[a]14IXX[b] |
| 2 | 4 | 56 x 0.3 | 1 | 1.8 | 12.6 | 260 | C512PA10200CX[a]03IXX[b] |
| 3 | 4 | 56 x 0.3 | 1 | 1.8 | 13.3 | 310 | C512PA10300CX[a]06IXX[b] |
| 4 | 4 | 56 x 0.3 | 1 | 1.8 | 14.5 | 380 | C512PA10400CX[a]10IXX[b] |
| 5 | 4 | 56 x 0.3 | 1 | 1.8 | 15.8 | 455 | C512PA10500CX[a]14IXX[b] |
| 2 | 6 | 84 x 0.3 | 1 | 1.8 | 13.6 | 320 | C513PA10200CX[a]03IXX[b] |
| 3 | 6 | 84 x 0.3 | 1 | 1.8 | 14.4 | 390 | C513PA10300CX[a]06IXX[b] |
| 4 | 6 | 84 x 0.3 | 1 | 1.8 | 15.7 | 485 | C513PA10400CX[a]10IXX[b] |
| 5 | 6 | 84 x 0.3 | 1 | 1.8 | 17.1 | 585 | C513PA10500CX[a]14IXX[b] |
| 2 | 10 | 84 x 0.4 | 1 | 1.8 | 15.6 | 450 | C514PA10200CX[a]03IXX[b] |
| 3 | 10 | 84 x 0.4 | 1 | 1.8 | 16.6 | 565 | C514PA10300CX[a]06IXX[b] |
| 4 | 10 | 84 x 0.4 | 1 | 1.8 | 18.1 | 705 | C514PA10400CX[a]10IXX[b] |
| 5 | 10 | 84 x 0.4 | 1 | 1.8 | 19.8 | 855 | C514PA10500CX[a]14IXX[b] |
| 2 | 16 | 130 x 0.4 | 1 | 1.8 | 18.8 | 655 | C515PA10200CX[a]03IXX[b] |
| 3 | 16 | 130 x 0.4 | 1 | 1.8 | 20.0 | 820 | C515PA10300CX[a]06IXX[b] |
| 4 | 16 | 130 x 0.4 | 1 | 1.8 | 22.0 | 1030 | C515PA10400CX[a]10IXX[b] |
| 5 | 16 | 130 x 0.4 | 1 | 1.8 | 24.1 | 1260 | C515PA10400CX[a]14IXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard
- Other sizes and temperature rating can be provided on specific request
- $X^a$ : Sheath color (see Coding Key on page 74)
- $XX^b$ : Packing type (see Coding Key on page 74)

# Flat Cables

# 300/500 V

## with Stranded Copper Conductor, PVC Insulated and PVC Sheathed

### APPLICATION

Used for supplying power to fixed electrical equipment and appliances in various types of buildings. Due to its flat shape it occupies lesser space when fixed on external or internal walls of buildings and in outdoor electronic signboards


### APPLICABLE STANDARDS

**alfanar** Flat cables are designed and tested to meet or exceed the requirements of BS 6004 standard. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

**Conductor**

Plain annealed stranded copper conductor class 2 as per BS EN 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per BS EN 50363-3 type TI1

**Core Identification**

Standard Flat cables core identification will be as follow:

| | | |
|---|---|---|
| Two cores | : | Red and Black |
| Three cores | : | Red, Yellow and Blue |

**Additional colors are made per request subject to factory minimum order quantities**

**Sheath**

Extruded layer of Polyvinyl chloride (PVC) compound applied over the cable cores with temperature rating 70 °C at normal operation as per BS 7655 PVC Type 6

**Flame retardancy**

**alfanar** Flat cables have been tested and approved with the flame performance standards BS EN 60332-1.

**Packing**

Available in standard lengths of 100, 80, 50 and 40 yards coils (Other lengths available on request)

## TECHNICAL DATA

| Number of cores | Conductor | | Nominal Insulation Thickness | Thickness of Inner Covering | Approx. Over-all Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|---|
| | Size | Cons. | | | | | |
| No. | $mm^2$ | No. x mm | mm | mm | mm | Kg/km | |
| 2 | 1.5 | 7 x 0.52 | 0.7 | 0.9 | 4.8 x 7.8 | 75 | C208PCF0200PX[a]01BXX[b] |
| 3 | 1.5 | 7 x 0.52 | 0.7 | 0.9 | 4.8 x10.7 | 105 | C208PCF0300PX[a]04BXX[b] |
| 2 | 2.5 | 7 x 0.67 | 0.8 | 1.0 | 5.6x 9.2 | 115 | C210PCF0200PX[a]01BXX[b] |
| 3 | 2.5 | 7 x 0.67 | 0.8 | 1.0 | 5.6 x 12.8 | 160 | C210PCF0300PX[a]04BXX[b] |
| 2 | 4 | 7 x 0.85 | 0.8 | 1.0 | 6.2 x 10.3 | 155 | C212PCF0200PX[a]01BXX[b] |
| 3 | 4 | 7 x 0.85 | 0.8 | 1.1 | 6.4 x 14.7 | 225 | C212PCF0300PX[a]04BXX[b] |
| 2 | 6 | 7 x 1.04 | 0.8 | 1.1 | 6.9 x 11.6 | 210 | C213PCF0200PX[a]01BXX[b] |
| 3 | 6 | 7 x 1.04 | 0.8 | 1.1 | 6.9 x 16.4 | 305 | C213PCF0300PX[a]04BXX[b] |
| 2 | 10 | 7 x 1.43 | 1.0 | 1.2 | 8.1 x 13.8 | 315 | C314PCF0200PX[a]01BXX[b] |
| 3 | 10 | 7 x 1.43 | 1.0 | 1.2 | 8.1x 19.5 | 455 | C314PCF0300PX[a]04BXX[b] |
| 2 | 16 | 7 x 1.78 | 1.0 | 1.3 | 9.3 x 16 | 455 | C315PCF0200PX[a]01BXX[b] |
| 3 | 16 | 7 x 1.78 | 1.0 | 1.3 | 9.3 x 22.7 | 665 | C315PCF0300PX[a]04BXX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard
- Other sizes and temperature rating can be provided on specific request
- $X^a$ : Sheath color (see Coding Key on page 74)
- $XX^b$ : Packing type (see Coding Key on page 74)

# Signal, Communication, Data and Special Cables

Used for indoor installation and interconnection of transmission, telephone, telegraph and electronic equipment as well as media equipments


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# Telecommunication Indoor Telephone Cables J-YY ** X 2 X 0.5 P

## with Solid Copper Conductor, PVC Insulated and PVC Sheathed

### APPLICATION

Used for indoor installation and interconnection of transmission, telephone, telegraph and electronic equipment. They are suitable for leading underground cables o main distribution frames and joins from main distribution box to subscribers. Also it is used in local telephone networks as well as in private communication system.


### APPLICABLE STANDARDS

**alfanar** Indoor Telephone Cables are designed and tested to meet or exceed the requirements of IEC 60198-1 and IEC 60189-2 standards. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### SPECIAL FEATURES

- Suitable for permanent installation on and under plaster in dry and damp rooms.
- Suitable for permanent installation on external walls.
- Economic cable dimensions and cost effective.

### CONSTRUCTION

**Conductor**

Plain annealed solid copper conductor class 1 as per IEC 60228

**Insulation**

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation as per IEC60189-2

**Assembly**

**Pair twinning**

Two insulated wires uniformly twisted together to form a pair. Each pair has its own lay length (different) to reduce both the capacitance unbalance and cross talk characteristics.

**Core stranding**

The main unit are stranding together to form the cable core. The construction of the cable core will be as manufacturer's standard to obtain circular laid up core.

**Sheath**

Extruded layer of Polyvinyl chloride (PVC) compound applied over the cable cores with temperature rating 90 °C at normal operation as per IEC 60189-2 .A rip cord is provided with the core under outer jacket for easy stripping.

**Packing**

Available in standard length of 100 and 90 yard coils (Other lengths available on request)

## TECHNICAL DATA

| Number of Pairs | Conductor construction | | Max DC conductor resistance at 20 °C | Minimum insulation thickness | Minimum sheath thickness | Approx. overall diameter | Approx. net weight | Item Code |
|---|---|---|---|---|---|---|---|---|
| No. | No. | mm | Ohm/km | mm | mm | mm | Kg/km | |
| 1 | 1 | 0.5 | 97.8 | 0.15 | 0.6 | 3 | 12 | TEL01P50UEXX[a] |
| 2 | 1 | 0.5 | 97.8 | 0.15 | 0.6 | 4.3 | 21 | TEL02P50UEXX[a] |
| 3 | 1 | 0.5 | 97.8 | 0.15 | 0.6 | 4.5 | 26 | TEL03P50UEXX[a] |
| 4 | 1 | 0.5 | 97.8 | 0.15 | 0.6 | 4.9 | 32 | TEL04P50UEXX[a] |
| 5 | 1 | 0.5 | 97.8 | 0.15 | 0.6 | 5.4 | 39 | TEL05P50UEXX[a] |
| 6 | 1 | 0.5 | 97.8 | 0.15 | 0.7 | 6 | 48 | TEL06P50UEXX[a] |
| 8 | 1 | 0.5 | 97.8 | 0.15 | 0.7 | 6.4 | 59 | TEL08P50UEXX[a] |
| 10 | 1 | 0.5 | 97.8 | 0.15 | 0.7 | 7.2 | 72 | TEL10P50UEXX[a] |
| 12 | 1 | 0.5 | 97.8 | 0.15 | 0.7 | 7.7 | 86 | TEL12P50UEXX[a] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard
- XXa : Packing type (see Coding Key on page 75)

# Coaxial and Signal Cables Type RG6/U

## with Solid Copper Clad Steel Conductor, Foam Polyethylene Insulated, Braid Shielded and PVC Jacketed


### APPLICATION

Suitable for all areas required high frequency transmission technology applications as:

- Direct Broadcast Satellite (DBS).
- Analog, Digital and Hybrid Cable TV Systems
- FM Broadcast
- TV antenna cabling MATV, CATV and SATV.

### APPLICABLE STANDARDS

**alfanar** offers coaxial cables specially designed to meet the demands of Direct Broadcast Satellite (DBS) applications. The growth in small satellite installations has created the need for cables that will handle the increased bandwidth and special installation requirements for these types of systems. **alfanar** RG6/U cables are designed and tested to meet or exceed the requirements of MIL-C-17 standard.

### RG DESIGNATION CODE

Coaxial cables that conform to U.S. Government specifications are identified with an RG designation. The meaning of the individual components of the designation is:

**RG-6/U Cable:**

R : Radio Frequency
G : Government
6 : Government-assigned approval number
U : Universal specification

### CONSTRUCTION

**Conductor**

High conductivity annealed solid copper clad steel (CCS) conductor.

**Insulation**

Conductor covered with uniformly Physical cellular foam polyethylene.

**Shield**

Aluminum polyester tape with aluminum wire braids

**Sheath**

Extruded layer of flame retardant and sunlight resistant Polyvinyl chloride (PVC) compound with temperature rating 70 °C at normal operation.

**Packing**

Available in standard length of 1000 and 300 feet coils (Other lengths available on request)

## TECHNICAL DATA

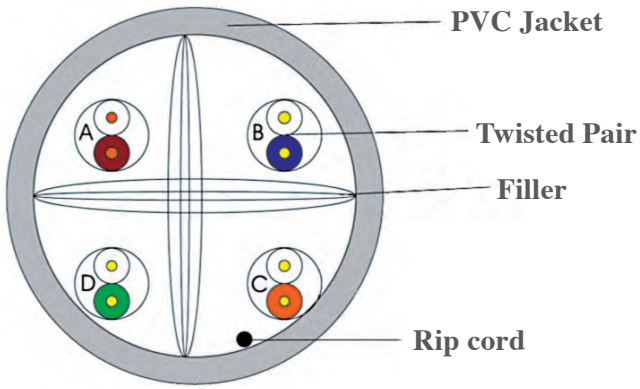
| Conductor diameter | Insulation diameter | Shielding | Outer diameter | Nominal impedance | Nominal capacitance | Nominal attenuation at 20 °C | | | Item Code |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | % | mm | Ω | Pf/M | MHz | | dB/100M | |
| 1.02 | 4.8 | 100% AL/PET<br>75% AL braid | 7 | 75 ± 2 | 52 ± 2 | 100 | ≤ | 6.5 | RG06ZFBXX[a] |
| | | | | | | 200 | ≤ | 9.1 | |
| | | | | | | 400 | ≤ | 12.9 | |
| | | | | | | 700 | ≤ | 17.2 | |
| | | | | | | 900 | ≤ | 19 | |
| | | | | | | 1000 | ≤ | 21 | |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard
- XXa : Packing type (see Coding Key on page 76)

# Data / CAT 6 UTP – 4Px 23 AWG Cables

## with Solid Copper Conductor, Polyethylene Insulated and PVC Jacketed

### Technical Specifications:





**Packing**
305 m/1000 ft per pull box / spool box

**Standard**
TIA/EIA 568-B.2 & ISO/IEC 11801, UL444

| Construction | |
|---|---|
| Conductor | Solid bare copper |
| AWG | 23 |
| Conductor Dia. Nom ( ±0.005) | 0.570 |
| Insulation | HDPE |
| Average Thickness (± 0.03mm) | 0.222 |
| Min. Point Thickness ( mm) | 0.198 |
| Insulating Diameter (mm) | 1.02 |
| Twisting Pair Dia. ( ± 0.01mm) | 2.04 |
| Filler | Polyster |
| Jacket | PVC |
| Average Thickness (± 0.03mm) | 0.60 |
| Min. Point Thickness ( mm) | 0.55 |
| Outer Dia. ( ±0.30 mm) | 6.20 |
| Rip Cord | YES |

Table 23

**Color:**
Insulation colors
Blue, white/blue
Orange, white/orange
Green, white/green
Brown, white/brown

**Jacket colors:**
As per customers request

**Item Code: CAT64UEXX**
XX : Packing type & cutting length
(see Coding Key on page 77)

**Marking:**
alfanar LAN Cables CAT 6 UTP 4P x 23 AWG 75 °C Verified To TIA/ EIA 568-B.2 & ISO/IEC 11801

## Performance:

| Electrical Characteristics | | | |
|---|---|---|---|
| Frequency (MHZ) | Return loss (Min dB) | Attenuation Max (dB/100m) | NEXT (Min dB) |
| 1 | 19.1 | 1.90 | 65.0 |
| 4 | 21.0 | 3.5 | 64.1 |
| 8 | 21.0 | 5.0 | 59.4 |
| 10 | 21.0 | 5.5 | 57.8 |
| 16 | 20.0 | 7.0 | 54.6 |
| 20 | 19.5 | 7.9 | 53.1 |
| 25 | 19.0 | 8.9 | 51.5 |
| 31.25 | 18.5 | 10.0 | 50.0 |
| 62.5 | 16.0 | 14.4 | 45.1 |
| 100 | 14.0 | 18.6 | 41.8 |
| 200 | 11.0 | 27.4 | 36.9 |
| 250 | 10.0 | 31.1 | 35.3 |

| Frequency (MHZ) | PSNEXT Min(dB) | ELFEXT Min(dB/100m) | Delay Max(ns/100m) |
|---|---|---|---|
| 1 | 62.0 | 64.2 | 570.0 |
| 4 | 61.8 | 52.1 | 552.0 |
| 8 | 57.0 | 46.1 | 546.0 |
| 10 | 55.5 | 44.2 | 545.0 |
| 16 | 52.2 | 40.1 | 543.0 |
| 20 | 50.7 | 38.2 | 542.0 |
| 25 | 49.1 | 36.2 | 541.0 |
| 31.25 | 47.5 | 34.3 | 540.0 |
| 62.5 | 42.7 | 28.3 | 538.0 |
| 100 | 39.3 | 24.2 | 537.0 |
| 200 | 34.3 | 18.2 | 536.0 |
| 250 | 32.7 | 16.2 | 536.0 |

| NVP@100 MHz:68% | |
|---|---|
| **Mechanical Characteristics** | |
| Test object | Jacket |
| Test material | PVC |
| Before | Tensile strength (mpa) >=13.8 |
| Aging | Elongation (%) >=100 |
| Aging condition | (Cxhrs) 100 × 240 |
| After | Tensile strength (mpa) >=85% of unaged |
| Aging | Elongation (%) >=85% of unaged |
| Cold bend ( -20±2 c× 4 hrs) | No crack |

# Photovoltaic Solar Cables 1.0/1.0 kV AC – 1.5 kV DC

## Flexible Tinned Copper Conductor, HFFR Insulation and HFFR Outer Sheath H1Z2Z2-K

### APPLICATION

Used for connecting photovoltaic systems such as solar panel arrays as well as being suitable for internal and external fixed installations or systems using conduit, but not in direct burial applications.

### APPLICABLE STANDARDS

**alfanar** Photovoltaic solar cables (H1Z2Z2-K) are designed and tested to meet or exceed the requirements of BS EN 50618 standard.

### CONSTRUCTION

**Conductor**

High quality annealed flexible tinned copper conductors. All conductors are in accordance with ES EN 60228 Class 5.

**Insulation**

Extruded layer of Halogen free cross-linked flame-retardant compound (HFFR). The insulation complies with requirements specified in BS EN 50618.

**Core Identification**

The insulated cores are identified by color coding Black.

**Sheath**

Extruded layer of Black Halogen free cross-linked flame-retardant compound (HFFR). The outer sheath complies with requirements specified in BS EN 50618.

**Flame retardancy**

alfanar Photovoltaic solar cables have been tested and approved to meet flame performance standard BS EN 60332-1-2.

**Low smoke emission**

alfanar Photovoltaic solar cables have been tested and approved to meet the low smoke emission standard BS EN 61034-2.

**Packing**

Available in a standard length of 1000 meters on a wooden drum (other lengths are available upon request).

## TECHNICAL DATA

| Size | Cons. | Maximum DC Condutor Resis-tance at 20° C | Nominal Insulation Thicness | Nominal Sheath Thickness | Approx. Overall Diameter | Approx. Net Weight | Current Carrying Capacity | | | Minimum Insulation Resistance at 20° C | Item Code |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Single Cable in Air | Single Cable on a Surface | Two loaded Cables Touching on a Surface | | |
| $mm^2$ | No. x mm | Ohms/ km | mm | mm | mm | Kg/km | A | A | A | Mohm.km | |
| 1.5 | 30x0.25 | 13.7 | 0.7 | 0.8 | 4.6 | 35 | 30 | 29 | 24 | 860 | T508TV10100TB50BXXa |
| 2.5 | 50x0.25 | 8.21 | 0.7 | 0.8 | 5.1 | 50 | 41 | 39 | 33 | 690 | T510TV10100TB50BXXa |
| 4 | 56x0.30 | 5.09 | 0.7 | 0.8 | 5.6 | 65 | 55 | 52 | 44 | 580 | T512TV10100TB50BXXa |
| 6 | 84x0.30 | 3.39 | 0.7 | 0.8 | 6.0 | 90 | 70 | 67 | 57 | 500 | T513TV10100TB50BXXa |
| 10 | 80 x 0.4 | 1.95 | 0.7 | 0.8 | 7.2 | 135 | 98 | 93 | 79 | 420 | T514TV10100TB50BXXa |
| 16 | 126x0.4 | 1.24 | 0.7 | 0.9 | 8.8 | 200 | 132 | 125 | 107 | 340 | T515TV10100TB50BXXa |
| 25 | 193x0.4 | 0.795 | 0.9 | 1.0 | 10.5 | 310 | 176 | 167 | 142 | 340 | T516TV10100TB50BXXa |
| 35 | 193x0.4 | 0.565 | 0.9 | 1.1 | 11.5 | 390 | 218 | 207 | 176 | 290 | T517TV10100TB50BXXa |
| 50 | 280x0.4 | 0.393 | 1.0 | 1.2 | 14.2 | 595 | 276 | 262 | 221 | 270 | T518TV10100TB50BXXa |
| 70 | 392x0.4 | 0.277 | 1.1 | 1.2 | 15.8 | 770 | 347 | 330 | 278 | 250 | T519TV10100TB50BXXa |
| 95 | 354x0.5 | 0.210 | 1.1 | 1.3 | 18.6 | 1060 | 416 | 395 | 333 | 220 | T545TV10100TB50BXXa |
| 120 | 466x0.5 | 0.164 | 1.2 | 1.3 | 20.7 | 1335 | 488 | 464 | 390 | 210 | T546TV10100TB50BXXa |
| 150 | 730x0.5 | 0.132 | 1.4 | 1.4 | 23.1 | 1620 | 566 | 538 | 453 | 210 | T547TV10100TB50BXXa |
| 185 | 466x0.5 | 0.108 | 1.6 | 1.6 | 24.9 | 1965 | 644 | 612 | 515 | 200 | T548TV10100TB50BXXa |
| 240 | 600x0.5 | 0.0817 | 1.7 | 1.7 | 27.3 | 2390 | 775 | 736 | 620 | 200 | T549TV10100TB50BXXa |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard.
- Other sizes can be provided on specific request

  $X^a$ : Insulation color (see Coding Key on page 74)

  $XX^b$ : Packing type (see Coding Key on page 74)

# IRRIGATION WIRE

# 600 V

## with Solid Plain Copper Conductor and PVC Insulation

### APPLICATION

Single conductor irrigation wire is employed for direct burial use in commercial sprinkler and irrigation systems, Golf courses, Public parks, Plantations and commercial produce farms.


### APPLICABLE STANDARDS

**alfanar** IRRIGATION WIRES are designed and tested to meet or exceed the requirements of UL493 standard. However, **alfanar** can also supply a range of alternative designs to meet customer-specified requirements.

### CONSTRUCTION

#### Conductor

Plain annealed solid copper conductor as per UL 1581

#### Insulation

Extruded layer of Polyvinyl chloride (PVC) insulation with temperature rating 70 °C at normal operation

#### Colors

Standard colors are available in black, white, red, blue, green, yellow, yellow/green, pink, violet, orange, brown and gray.
**Additional colors are made per request subject to factory minimum order quantities**

#### Packing

Available in standard length of 2500 feet on plywood (Other lengths available on request)

## TECHNICAL DATA

| Conductor | | Maximum DC Conductor Resistance at 20°C | Nominal Insulation Thickness | Approx. Overall Diameter | Approx. Net Weight | Item Code |
|---|---|---|---|---|---|---|
| Size | Cons. | | | | | |
| AWG | No. x mm | Ohms/km | mm | mm | Kg/Km | |
| 14 | 1 x 1.63 | 8.45 | 1.6 | 4.8 | 45 | C124PD101000X[a]000XX[b] |
| 12 | 1 x 2.05 | 5.31 | 1.6 | 5.3 | 58 | C125PD101000X[a]000XX[b] |
| 10 | 1 x 2.59 | 3.34 | 1.6 | 5.8 | 81 | C126PD101000X[a]000XX[b] |

- The above data is approximate and subjected to manufacturing tolerance. We reserve the right to change as a result of product development and/or changes in standard
- Other sizes and temperature rating can be provided on specific request
- Xa : Insulation color (see Coding Key on page xx)
- XXb : Packing type (see Coding Key on page 74)

# Technical Information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# Wire and Cable Ampacity Ratings

## AMPACITY

Ampacity is the maximum current (measured in amperes or more simply, amps) an insulated conductor can safely carry without exceeding its insulation and jacket temperature limitations. As the amount of current passing through a conductor is increased, the amount of heat produced in the conductor increases. The heat created in the conductor must be dissipated to the environment. If the heat cannot escape, the temperature of the conductor would continue to increase until the cable exceeds its temperature rating and deteriorates.

The ampacity of a cable should equal or exceed the maximum current the cable will be expected to carry during its service life, without exceeding its temperature rating. Temperature ratings depend on the heat resistance of the materials used for the insulation and jacket of the cable. The higher a material's heat resistance, the less likely it will deteriorate in higher temperatures.

Depending on the installation environment of the cable, ampacity ratings may need to be adjusted or derated to control heat flow. The rate at which heat is dissipated to the environment depends on many factors, but the two main requirements in the NEC for derating ampacity are ambient temperatures and number of current-carrying conductors. Ampacity ratings need to be derated if more than three current-carrying conductors are in a raceway or cable. More current-carrying conductors in an enclosed space may result in a greater ambient temperature. The ampacity of those conductors must be derated to account for this increase in ambient heat.

## Current Rating (Ampacity) For UL THHN/THWN American Wires

| Size | Conductor shape | No. of Strands | THHN 105 ºC Dry | | THWN 75 ºC Wet | |
|---|---|---|---|---|---|---|
| | | | In Free Air | In Conduit (Pipes) | In Free Air | In Conduit (Pipes) |
| AWG | - | No | Ampere | Ampere | Ampere | Ampere |
| 14 | Solid | 1 | 18 | 25 | 30 | 20 |
| 12 | Solid | 1 | 40 | 30 | 35 | 25 |
| 10 | Solid | 1 | 55 | 40 | 50 | 35 |
| 18 | Stranded | 19 | 18 | 14 | - | - |
| 16 | Stranded | 19 | 24 | 18 | - | - |
| 14 | Stranded | 19 | 35 | 25 | 30 | 20 |
| 12 | Stranded | 19 | 40 | 30 | 35 | 25 |
| 10 | Stranded | 19 | 55 | 40 | 50 | 35 |
| 8 | Stranded | 19 | 80 | 55 | 70 | 50 |
| 6 | Stranded | 19 | 105 | 75 | 95 | 65 |

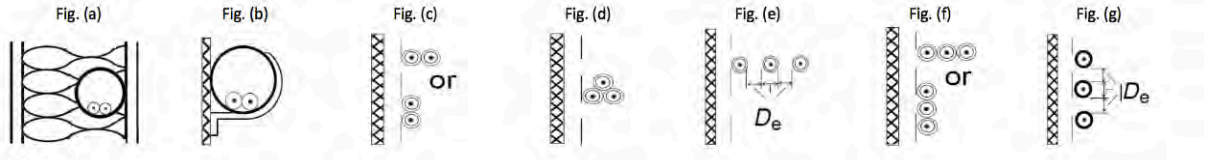
For ambient temperature other than 30 °C, please use the below derating factors to adjust the current value.

| Ambient Temp. ºC | | THHN 105 ºC Dry | THWN 75 ºC Wet |
|---|---|---|---|
| From | To | Correction Factors | |
| 21 | 25 | 1.04 | 1.05 |
| 26 | 30 | 1.00 | 1.00 |
| 31 | 35 | 0.96 | 0.94 |
| 36 | 40 | 0.91 | 0.88 |
| 41 | 45 | 0.87 | 0.82 |
| 46 | 50 | 0.82 | 0.75 |
| 51 | 55 | 0.76 | 0.67 |
| 56 | 60 | 0.71 | 0.58 |
| 61 | 70 | 0.58 | 0.33 |

# Current Carrying Capacity (Ampacity) for Single Core Non-Sheathed PVC Insulated Wires

| Size | 2 loaded conductors (Single-Phase circuit) | | | 3 loaded conductors (Three-Phase circuit) | | | |
|---|---|---|---|---|---|---|---|
| mm² | (a) | (b) | (c) | (d) | (e) | (f) | (g) |
| | A | A | A | A | A | A | A |
| Solid Conductors | | | | | | | |
| 0.5 | 3 | 3 | - | - | - | - | - |
| 0.75 | 6 | 6 | - | - | - | - | - |
| 1.00 | 10 | 10 | - | - | - | - | - |
| 1.50 | 13 | 15 | - | - | - | - | - |
| 2.50 | 17 | 21 | - | - | - | - | - |
| 4.00 | 23 | 28 | - | - | - | - | - |
| 6.00 | 30 | 36 | - | - | - | - | - |
| 10 | 40 | 50 | - | - | - | - | - |
| Stranded Conductors | | | | | | | |
| 1.5 | 13 | 15 | | | | | |
| 2.5 | 17 | 21 | - | - | - | - | - |
| 4 | 23 | 28 | - | - | - | - | - |
| 6 | 30 | 36 | - | - | - | - | - |
| 10 | 40 | 50 | - | - | - | - | - |
| 16 | 53 | 66 | - | - | - | - | - |
| 25 | 70 | 88 | 114 | 96 | 127 | 99 | 113 |
| 35 | 86 | 109 | 141 | 119 | 157 | 124 | 141 |
| 50 | 103 | 131 | 170 | 145 | 190 | 151 | 171 |
| 70 | 131 | 167 | 218 | 188 | 244 | 196 | 221 |
| 95 | 158 | 202 | 264 | 230 | 297 | 239 | 270 |
| 120 | 183 | 234 | 306 | 268 | 344 | 279 | 315 |
| 150 | 209 | - | 353 | 310 | 397 | 323 | 364 |
| 185 | 237 | - | 403 | 356 | 453 | 371 | 417 |
| 240 | 279 | - | 475 | 422 | 535 | 441 | 495 |
| 300 | 319 | - | 547 | 488 | 617 | 510 | 573 |
| 400 | - | - | 656 | 570 | 741 | 599 | 691 |
| 500 | - | - | 755 | 651 | 854 | 686 | 800 |
| 630 | - | - | 874 | 743 | 990 | 787 | 930 |
| Flexible Conductors | | | | | | | |
| 0.50 | 3 | 3 | - | - | - | - | - |
| 0.75 | 6 | 6 | - | - | - | - | - |
| 1.0 | 10 | 10 | - | - | - | - | - |
| 1.5 | 13 | 15 | - | - | - | - | - |
| 2.5 | 17 | 21 | - | - | - | - | - |
| 4 | 23 | 28 | - | - | - | - | - |
| 6 | 30 | 36 | - | - | - | - | - |
| 10 | 40 | 50 | - | - | - | - | - |
| 16 | 53 | 66 | - | - | - | - | - |
| 25 | 70 | 88 | 114 | 96 | 127 | 99 | 113 |
| 35 | 86 | 109 | 141 | 119 | 157 | 124 | 141 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 50 | 103 | 131 | 170 | 145 | 190 | 151 | 171 |
| 70 | 131 | 167 | 218 | 188 | 244 | 196 | 221 |
| 95 | 158 | 202 | 264 | 230 | 297 | 239 | 270 |
| 120 | 183 | 234 | 306 | 268 | 344 | 279 | 315 |
| 150 | 209 | - | 353 | 310 | 397 | 323 | 364 |
| 185 | 237 | - | 403 | 356 | 453 | 371 | 417 |
| 240 | 279 | - | 475 | 422 | 535 | 441 | 495 |




In conduit in a thermally insulated wall | In conduit on a wooden wall | Horizontal or vertical flat touched in free air | Trefoil in free air | Horizontal or vertical flat touched in free air | Horizontal flat spaced in free air | Vertical flat spaced in free air

**Laying Conditions:** Ambient air temperature of 40 ºC and ambient ground temperature of 35 ºC. In case of different laying conditions, appropriate correction (derating) factors have to be applied to cater for the actual installation conditions.

## Derating factors for ambient air temperature

| Insulation Type | Ambient air temperature ºC | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| PVC | 1.40 | 1.34 | 1.29 | 1.22 | 1.15 | 1.08 | 1.00 | 0.91 | 0.82 | 0.70 | 0.57 |

## Derating factors for ambient air temperature

| Insulation Type | Ambient air temperature ºC | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 |
| PVC | 1.31 | 1.25 | 1.19 | 1.13 | 1.06 | 1.00 | 0.92 | 0.85 | 0.75 | 0.65 |

## Current Carrying Capacity (Ampacity) for Multicore Cable with PVC Insulation

| Size | Two cores cables | | Three/Four cores cables | |
|---|---|---|---|---|
| | In Air | In Duct | In Air | In Duct |
| mm² | Ampere | Ampere | Ampere | Ampere |
| 1.5 | 21 | 19 | 18 | 15 |
| 2.5 | 28 | 24 | 23 | 20 |
| 4.0 | 38 | 32 | 32 | 26 |
| 6.0 | 48 | 40 | 40 | 33 |
| 10 | 65 | 53 | 55 | 43 |
| 16 | 86 | 70 | 72 | 57 |

• The above data is calculated at 40°C ambient air temperature and ambient ground temperature of 35ºC.

| Insulation Type | Ambient air temperature ºC | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| PVC | 1.40 | 1.34 | 1.29 | 1.22 | 1.15 | 1.08 | 1.00 | 0.91 | 0.82 | 0.70 | 0.57 |

| Insulation Type | Ambient air temperature ºC | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| PVC | 1.31 | 1.25 | 1.19 | 1.13 | 1.06 | 1.00 | 0.92 | 0.85 | 0.75 | 0.65 | 0.54 |

# Electrical Conductor

The central component of any cable, the conductor is the term for the metallic wire or wires that carry the signal and/or power through the cable.

## Metals

There is a wide range of metals that can be used as a conductor, however Copper (Cu) is by far the most common due to its relative low cost and availability. Other common options such as aluminum, steel or tinsel wire (mixed strands of copper and cotton) may offer advantages in strength, weight or flex-life, however they almost always come at the cost of reduced conductivity. Plated copper such as Tin Plated Copper (TPC), Silver Plated Copper (SPC) and Nickel Plated Copper (NPC) offer additional features such as elevated temperatures and improved conductivity or solderability. Purer conductors such as Oxygen Free High Conductivity (OFHC) plated copper can improve the signal performance, and are often used for audio frequencies, whilst High strength Copper Alloy (HSA) conductors can provide a much improved dynamic performance over standard copper conductors. A variety of other metals and alloys are often used for their unique conducting properties when exposed to heat. Commonly known as Resistance Wires, they are used in Thermocouple cables where combinations of resistance wires can be used to detect variations in temperature. Some of the most commonly used are Nickel- Chromium (NiCr), Copper-Nickel (CuNi) and Iron (Fe).

| Metal | Density Kg/m³ | Specific Heat J/Kg °C | Latent Heat or Fusion J/Kg | Melting Point °C |
|---|---|---|---|---|
| Aluminium | 2700 | 964 | 446000 | 660 |
| Brass | 8100 | - | - | 896 |
| Bronze | 8800 | - | - | 871 |
| Copper | 8890 | 428 | 168000 | 1083 |
| Iron | 7100 | 535 | 95400 | 1527 |
| Lead | 11340 | - | 24600 | 327 |
| Mamaganese | 7800 | - | - | 1260 |
| Mercurcy | 13600 | 138.3 | - | - |
| Monel Metal | 8800 | - | 19300 | 1455 |
| Nickel | 8900 | - | 19300 | 1455 |
| Silver | 10500 | 235 | 92000 | - |
| Steel | 7800 | - | - | 1499 |
| Tin | 7400 | 230 | 55800 | 232 |
| Zinc | 7000 | - | 11800 | 376 |

## Stranding

The simplest form of conductor is a single, solid strand, however although this offers the smallest diameter, the purest signal and the largest cross-sectional area, this is also the weakest option and solid conductors are prone to breaking after just a few bending cycles. To improve the durability and flexibility of a conductor it is common to strand multiple wires together, the more wires that are stranded together to make a given size, the more flexible the conductor will be. Metric sizes categories the number of strands into Classes, the higher the class, the more strands in the conductor:

- Class 1 Solid, round.
- Class 2 Stranded conductor, 7 strands (larger sizes will be 19 strands).
- Class 5 Multi-stranded conductor for flexible ‘general purpose’ installations.
- Class 6 Extra-multi-stranded conductor for improved flexibility / flex-life.

# Conductor Construction as Per IEC 60228 / BS EN 60228

## Class 1

### Solid Plain Copper Conductors for Single Core & Multi Core Cables

| Nominal Cross- section Area | No. of Strands | Nominal Wire Diameter | Maximum D.C. Resistance At 20 °C |
|---|---|---|---|
| mm² | - | mm | Ω/km |
| 0.5 | 1 | 0.80 | 36 |
| 0.75 | 1 | 0.98 | 24.5 |
| 1 | 1 | 1.13 | 18.1 |
| 1.5 | 1 | 1.38 | 12.1 |
| 2.5 | 1 | 1.78 | 7.41 |
| 4 | 1 | 2.25 | 4.61 |
| 6 | 1 | 2.76 | 3.08 |
| 10 | 1 | 3.57 | 1.83 |

## Class 2

### Stranded Plain Copper Conductors for Single Core & Multi Core Cables

| Nominal Cross- section Area | No. of Strands | Nominal Wire Diameter | Maximum D.C. Resistance At 20 °C |
|---|---|---|---|
| mm² | - | mm | Ω/km |
| 0.5 | 7 | 0.30 | 36 |
| 0.75 | 7 | 0.37 | 24.5 |
| 1 | 7 | 0.43 | 18.1 |
| 1.5 | 7 | 0.52 | 12.1 |
| 2.5 | 7 | 0.67 | 7.41 |
| 4 | 7 | 0.85 | 4.61 |
| 6 | 7 | 1.04 | 3.08 |
| 10 | 7 | 1.43 | 1.83 |
| 16 | 7 | 1.78 | 1.15 |
| 25 | 7 | 2.24 | 0.727 |
| 35 | 7 | 2.65 | 0.524 |
| 50 | 19 | 1.86 | 0.387 |
| 70 | 19 | 2.22 | 0.268 |
| 95 | 19 | 2.66 | 0.193 |
| 120 | 19 | 3.05 | 0.153 |
| 150 | 37 | 2.44 | 0.124 |
| 185 | 37 | 2.70 | 0.0991 |
| 240 | 37 | 3.12 | 0.0754 |
| 300 | 61 | 2.70 | 0.0601 |
| 400 | 61 | 3.15 | 0.047 |
| 500 | 61 | 3.38 | 0.0366 |
| 630 | 61 | 3.81 | 0.0283 |

# Class 5

## Flexible Plain Copper Conductors for Single Core & Multi Core Cables

| Nominal Cross- section Area | Maximum D.C. Resistance at 20 °C | |
|---|---|---|
| | Plain Copper conductor | Metal Coated Copper Conductor |
| mm² | Ω/km | Ω/km |
| 0.5 | 39 | 40.1 |
| 0.75 | 26 | 26.7 |
| 1 | 19.5 | 20 |
| 1.5 | 13.3 | 13.7 |
| 2.5 | 7.98 | 8.21 |
| 4 | 4.95 | 5.09 |
| 6 | 3.30 | 3.39 |
| 10 | 1.91 | 1.95 |
| 16 | 1.21 | 1.24 |
| 25 | 0.78 | 0.795 |
| 35 | 0.554 | 0.565 |
| 50 | 0.386 | 0.393 |
| 70 | 0.272 | 0.277 |
| 95 | 0.206 | 0.21 |
| 120 | 0.161 | 0.164 |
| 150 | 0.129 | 0.132 |
| 185 | 0.106 | 0.108 |
| 240 | 0.0801 | 0.0817 |

# Color Coding

Core Identification or Color Coding is used to identify conductors/cores for point-to-point wiring and for circuit diagrams. The standard colors used for core identification in the Saudi Arabian Distribution Network, which applies to our standard range of low voltage cables to IEC standard of this catalogue, are described in Table-1. The New Harmonized colors for core identification to (HD 308 S2) or IEC 60445 are described in Table-1 as well. Any other colors for core identification can be offered to our customers upon their request.

Table-1: Identification of conductors - National and Harmonized Color Codes

| Function (1) | IEC Color Code | New Harmonized Color Code | |
|---|---|---|---|
| | | HD 308 S2 | IEC 60445 |
| Phase of single-phase circuit (L) | Red | Brown | Black |
| Neutral of single- or three-phase circuit (N) | Black | Blue | Blue |
| Phase 1 of three-phase AC circuit (L1) | Red | Brown | Black |
| Phase 2 of three-phase AC circuit (L2) | Yellow | Black | Brown |
| Phase 3 of three-phase AC circuit (L3) | Blue | Grey | Grey |
| Protective conductors (PE) | Green-and-yellow | Green-and-yellow | Green-and-yellow |

(1) Function in a.c. Power circuits include lighting circuits.

Example for cables with Standard Color Coding and cables with Harmonized Color Coding to (HD 308 S2)

| IEC Color Code | New Harmonized Color Code to (HD 308 S2) | |
|---|---|---|
| | Without (PE) | With (PE) |
| **Two-core**<br>Red, Black  | **Two-core**<br>Brown, Blue  | |
| **Three-core**<br>Red, Yellow, Blue  | **Three-core**<br>Brown, Black, Grey  | **or**<br>Brown, Blue, G/Y  |
| **Four-core**<br>Red, Yellow, Blue, Black  | **Four-core**<br>Blue, Brown Black, Grey  | **or**<br>G/Y, Brown Black, Grey  |
| **Five-core**<br>Red, Yellow, Blue Black, G/Y  | | **Five-core**<br>G/Y, Blue, Brown Black, Grey  |

# Conversions

## American Wire Gauge

American Wire Gauge (AWG), also known as Brown & Sharpe Gage, is the United States' standard method for denoting the cross-sectional areas of round, solid conductors. The cross-sectional area is useful in determining a conductor's current-carrying capacity and resistivity. Rather than using fractional inches, gauges are based on whole numbers with 38 commonly known sizes (4/0 to 36 AWG). Sizes smaller than 36 AWG can be calculated in gauge, but wires larger than 4/0 are commonly expressed in 1,000 circular mils (kcmil or MCM) where one cmil is the area of a circle with a diameter of one mil (1/1,000 inch).

A fact that is often confusing to the beginner is that smaller gauge numbers correspond to larger conductor diameters: physical size and the AWG number are inversely proportional. This relationship was influenced from the number of drawing operations needed to produce a designated gauge size. Smaller wires were required to be drawn multiple times through drawing dies to be thinned out, while larger diameter wires required less processing. The relationship between gauge sizes is not linear, but logarithmic.

## How to convert AWG to mm

### Wire diameter calculation

The n gauge wire diameter dn in millimeters (mm) is equal to 0.127mm times 92 raised to the power of 36 minus gauge number n, divided by 39:

$$d_n\,(\text{mm}) = 0.127\ \text{mm} \times 92^{(36-n)/39}$$

where 0.127mm is the diameter of gauge #36.

### Wire cross sectional area calculation

The n gauge wire's cross sectional area An in square millimeters (mm2) is equal to ($\pi$) divided by 4 times the square wire diameter d in millimeters (mm):

$$A_n\,(\text{mm}^2) = (\pi/4) \times d_n^2 = 0.012668\ \text{mm}^2 \times 92^{(36-n)/19.5}$$

# Conversion Table

| Gauge | Equivalent cross-section $mm^2$ | Nearest available cross-section |
|---|---|---|
| AWG | $mm^2$ | $mm^2$ |
| 20 | 0.519 | 0.5 - 0.75 |
| 18 | 0.823 | 1.0 |
| 16 | 1.31 | 1.5 |
| 14 | 2.08 | 2.5 |
| 12 | 3.31 | 4 |
| 10 | 5.26 | 6 |
| 8 | 8.37 | 10 |
| 6 | 13.3 | 16 |
| 4 | 21.15 | 25 |
| 2 | 33.62 | 35 |
| 1 | 42.41 | 50 |
| 1/0 | 53.49 | 50 - 70 |
| 2/0 | 67.23 | 70 |
| 3/0 | 85.01 | 95 |
| 4/0 | 107.2 | 120 |

| Gauge | Equivalent cross-section $mm^2$ | Nearest available cross-section |
|---|---|---|
| MCM | $mm^2$ | $mm^2$ |
| 250 | 126.7 | 120 - 150 |
| 300 | 152 | 150 |
| 350 | 177.3 | 185 |
| 400 | 202.7 | 185 |
| 450 | 228 | 185 - 240 |
| 500 | 253 | 240 |
| 550 | 278.7 | 240 - 300 |
| 600 | 304 | 300 |
| 650 | 329.4 | 300 |
| 700 | 354.7 | 300 - 400 |
| 750 | 380 | 400 |
| 800 | 405.4 | 400 |
| 850 | 430.7 | 400 |
| 900 | 456 | 400 |
| 950 | 481.4 | 400 |
| 1000 | 506.7 | 400 - 630 |
| 1250 | 633.4 | 630 |
| 1500 | 760 | 800 |
| 1750 | 886.7 | 800 - 1000 |
| 2000 | 1013.4 | 1000 |

# Voltage Drop

When current flows in the cable conductor there is a voltage drop between the ends of conductors; it is the product of the current and impedance.

The tabulated voltage drop values are based on a load power factor of 85% lagging and given for a current of one meter run. For any given cable length, the values should be multiplied by the length (in meters) and by the current (in amperes) that the cables are to carry.

**EXAMPLE**:
150 meters of three core cable
PVC insulated (rated 85 ˚C)
PVC sheathed
installed in air
to carry 64 amperes load
supply voltage 380 volt
three phase system 60Hz

The formula applicable is the following:

$$Vap = \frac{Vp \times 1000}{I \times L}$$

Where

I = Current in amperes
L = Route length in meters
Vap = Approximate voltage drop/ampere/meter
Vp = Maximum permissible voltage drop (say 2.5% of 380 volts)

By Substituting current, route length and maximum permissible voltage drop.

$$Vap = \frac{9.5 \times 1000}{64 \times 150} = 0.99 \text{ mV}$$

To determine the suitable size of a conductor, select a cable from the tables on the next page such that the voltage drop value from this column is less than the calculated value of 0.99 mV.

# Voltage Drop

**The Voltage drop equations are as follow:**

**A - Single Phase circuit** $Vd = 2\ I \angle (R \cos Ø + X \sin Ø)\ V$

**B - Three Phase circuit** $Vd = \text{Sqrt}\ 3I \angle (R \cos Ø + X \sin Ø)\ V$

**WHERE**

Vd : Voltage Drop (V)
I : Load Current (A)
$\int$ : Route length
R : AC resistance (Ω/km)
X : Reactance (Ω/km)
COSØ : Power factor for load

**WHERE**

$X = \omega L 10^{-3}$

**WHERE**

$\omega = 2\ \pi\ f$
f = operating frequency Hz
L = inductance (mH/Km)
$\angle$ = route length (Km)

**RELATION BETWEEN COS Ø & SIN Ø AS FOLLOWS:**

| | | | | | |
|---|---|---|---|---|---|
| COSØ | 1 | 0.9 | 0.8 | 0.71 | 0.6 |
| SIN Ø | 0 | 0.44 | 0.6 | 0.71 | 0.8 |

**Voltage Drop for Stranded Single core**

| C.S.A MM2 | VOLTAGE DROP PVC 70 °C mV/Amp/Meter | VOLTAGE DROP PVC 85 °C mV/Amp/Meter |
|---|---|---|
| 1.5 | 20.25 | 21.24 |
| 2.5 | 12.46 | 13.06 |
| 4 | 7.8 | 8.17 |
| 6 | 5.25 | 5.5 |
| 10 | 3.17 | 3.32 |
| 16 | 2.04 | 2.13 |
| 25 | 1.33 | 1.39 |
| 35 | 0.99 | 1.04 |
| 50 | 0.75 | 0.79 |

The above data is based on:
Power factor: 0.8
Rated frequency: 60 Hz
Three phase.

# Wires & Cables Code Key

| 1 | 2 | 3&4 | 5 | 6 | 7 | 8&9 | 10 | 11 | 12 | 13 | 14&15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | 2 | 08 | H | B | 1 | 01 | 0 | 0 | 0 | B | 00 | 0 | S | 1 |

**EXAMPLE** C208HB101000B000S1

**DESCRIPTION** 1.5MM2 Stranded CU/PVC 85 C BLACK SPOOL 100 YARD

| | | |
|---|---|---|
| 1 | C | Copper |
| | A | Aluminium |
| | S | Steel |
| 2 | 1 | Solid |
| | 2 | Stranded |
| | 5 | Extra Flexible |
| | 6 | Flexible |
| 3&4 | 05 | 0.5mm2 |
| | 06 | 0.75mm2 |
| | 07 | 1mm2 |
| | 08 | 1.5mm2 |
| | 09 | 2mm2 |
| | 10 | 2.5mm2 |
| | 11 | 3mm2 |
| | 12 | 4mm2 |
| | 13 | 6mm2 |
| | 14 | 10mm2 |
| | 15 | 16mm2 |
| | 16 | 25mm2 |
| | 17 | 35mm2 |
| | 18 | 50mm2 |
| | 19 | 70mm2 |
| | 20 | 20AWG |
| | 21 | 19AWG |
| | 22 | 18AWG |
| | 23 | 16AWG |
| | 24 | 14AWG |
| | 25 | 12AWG |
| | 26 | 10AWG |
| | 27 | 8 AWG |
| | 28 | 6 AWG |
| | 29 | 4 AWG |
| | 30 | 12AWG |
| 5 | A | PVC105C Ins. |
| | P | PVC70C Ins. |
| | H | PVC85C Ins. |
| | F | PVC70C Flexible Ins. |
| | U | PVC120C Ins. |
| | M | PVC90C Ins. |
| 6 | A | 600/1000V |
| | B | 450/750V |
| | C | 300/500V |
| | D | 600 V |
| | E | 300/300V |
| | N | NONE |

| | | |
|---|---|---|
| 7 | 1 | Cores |
| | 2 | Pairs |
| | 3 | Triples |
| | 4 | Quads |
| | FB | Flat |
| | 15 | Bell Wire |
| 8&9 | 01 | Single unit |
| | 02 | Two unit |
| | 03 | Three unit |
| | 04 | Four unit |
| | so on | so onT |
| 10 | 0 | without Shield |
| | O | Overall Shield PET/ AL/PET |
| | I | Individual Shield PET/ AL/PET |
| | T | Individual & Overall Shield PET/AL/PET |
| | B | Overall Shield Braid |
| | R | Individual & Overall Shield Braid |
| | N | Copper Tape |
| | C | Copper Wire |
| 11 | W | Glavanized Steel Wire Armoured |
| | G | Glavanized Steel Tape Armoured |
| | O | without Armoured |
| 12 | N | Nylon Sheath |
| | A | PVC 105C Sheath |
| | P | PVC 70C Sheath |
| | H | PVC 85C Sheath |
| | F | PVC 70C Flexible Sheath |
| | M | PVC 90C Sheath |
| | C | PVC 80C Sheath |
| | O | without Sheath |
| 13 | B | Black |
| | L | Blue |
| | Y | Yellow |
| | R | Red |
| | W | White |
| | E | Gray |
| | G | Green |
| | O | Orange |
| | M | G/Y(Y/G) |
| | N | Brown |
| | T | Natural |
| | 0 | without Color |

| | | |
|---|---|---|
| 14&15 | 00 | Bare Coper&Single Wire |
| | 01 | 2C-RED-BLACK |
| | 02 | 2C-BLUE-BLACK |
| | 03 | 2C-BLUE-BROWN |
| | 04 | 3C-RED-YELLOW-BLUE |
| | 05 | 3C-BLUE-BROWN-BLACK |
| | 06 | 3C-G/Y-BLUE-BROWN |
| | 07 | 3C-BLUE-BLACK-RED |
| | 08 | 4C-RED-YELLOW-BLUE-BLACK |
| | 09 | 4C-BLUE-BROWN-BLACK-BLACK |
| | 10 | 4C-G/Y-BLACK-BLUE-BROWN |
| | 11 | 4C-BLUE-BROWN-BLACK-GRAY |
| | 12 | 5C-RED-YELLOW-BLUE-BLACK-G/Y |
| | 13 | 5C-G/Y-BLACK-BLUE-BROWN-BLACK |
| | 14 | 5C-G/Y-BLACK-BLUE-BROWN-GRAY |
| | 15 | 5C-RED-YELLOW-BLUE-BLACK-GREEN |
| | 16 | 6C-RED-YELLOW-BLUE-BLACK-BROWN-G/Y |
| | 17 | 6C-RED-YELLOW-BLUE-BLACK-WHITE-BROWN-G/Y |
| | 18 | 7C-RED-YELLOW-BLUE-BLACK-GREEN-BROWN-WHITE |
| | 19 | 7C-RED-YELLOW-BLUE-BLACK-WHTE-BROWN-G/Y |
| | 20 | 7C-G/Y-BLACK-BLUE-BROWN-BLACK-GRAY-WHITE |
| | 21 | Cores-Black No |
| | 22 | Cores-White No |
| | 23 | Cores-Black No+GY |
| | 24 | Cores-White No+GY |
| | 25 | 1P-BLACK/WHITE |
| | 26 | 1P-BLACK/BLUE |
| | 27 | PAIRS-(BLACK/WHITE)+NO |
| | 28 | PAIRS-(BLACK-BLUE)+NO |
| | 29 | 1T-BLACK/WHITE/RED |
| | 30 | 1T-BLACK/BLUE/BROWN |
| | 31 | TRIPLES-(BLACK/WHITE-RED)+NO |
| | 32 | TRIPLES-(BLACK/BROWN/BLUE)+NO |
| | 33 | 1Q-BLACK/WHITE/RED/BLUE |
| | 34 | 1Q-BLACK/BLUE/BROWN/GREEN |
| | 35 | QUADS-(BLACK/WHITE/RED/BLUE)+NO |
| | 36 | QUADS-(BLACK/BLUE/BROWN/GREEN)+NO |
| | 37 | 10C-RED-YELLOW-BLUE-BLACK-GREEN-BROWN-WHITE-GRAY-ORANGE-Y/G |
| | 50 | 1C-NATURAL |
| | 51 | 1C-RED |
| | 52 | 1C-BLUE |

| | | |
|---|---|---|
| 16 | 0 | All Standard |
| | c | Customer Request |
| | I | IEC |
| | B | BS |
| | U | UL |
| | F | Filling |
| | E | Earth Conductor |
| 17 | S | Spool without carton |
| | C | Carton with Spool |
| | N | Non Spool-Non Carton |
| | M | Wooden Drum |
| | R | Carton without Spool |
| 18 | 1 | 100 Yard |
| | 8 | 80 Yard |
| | 9 | 90 Yard |
| | 4 | 40 Yard |
| | 6 | 50 Yard |
| | 2 | 250 FEET |
| | 3 | 300 FEET |
| | 5 | 500 FEET |
| | 7 | 1000 FEET |
| | E | 50 Meter |
| | I | 150 Meter |
| | J | 200 Meter |
| | H | 100 Meter |
| | F | 500 Meter |
| | T | 300 Meter |
| | R | Meter |
| | P | 125 FEET |

1 - Conductor Material
2 - Conductor Type
3&4 - Conductor Size
5 - Insulation Material
6 - Rated Voltage
7 - Cable Construction
8&9 - No. of Cores
10 - Shielding
11 - Armouring
12 - Outer Sheath Material
13 - Insulation Color (X)
14&15 - Core Identification
16 - Design Standard
17 - Packing Type (X)
18 - Cutting Length (X)

الفنار alfanar

# Telephone Cables Code Key

| 1&2&3 | 4&5 | 6 | 7&8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|
| TEL | 04 | P | 50 | P | U | E | N | 1 |

**EXAMPLE** TEL04P50PUEN1
**DESCRIPTION** TELEPHONE 4PX0.5MM COPPER UNSHIELDED GRAY-AIR COIL 100 YARD

| | | |
|---|---|---|
| 1&2&3 | TEL | Telephone |
| 4&5 | 01 | One |
| | 02 | Two |
| | 03 | Three |
| | 04 | Four |
| | 05 | Five |
| | 06 | Six |
| | 07 | Seven |
| | 08 | Eight |
| | 09 | Nine |
| | 10 | Ten |
| | 11 | Eleven |
| | 12 | Twelve |
| 6 | P | Pair |
| | Q | Quad |
| 7&8 | 40 | 0.4mm |
| | 50 | 0.5mm |
| | 60 | 0.6mm |
| | 80 | 0.8mm |

| | | |
|---|---|---|
| 9 | P | Copper |
| | T | Tinned Copper |
| 10 | U | without Shield |
| | O | Overall Shield PET/AL/PET |
| | B | Overall Shield Braid |
| 11 | B | Black |
| | L | Blue |
| | Y | Yellow |
| | R | Red |
| | W | White |
| | E | Gray |
| | G | Green |
| | O | Orange |
| | M | G/Y(Y/G) |
| | N | Brown |
| | T | Natural |
| | 0 | without Color |
| 12 | S | Spool without carton |
| | C | Carton with Spool |
| | N | Non Spool-Non Carton |

| | | |
|---|---|---|
| | M | Wooden Drum |
| | R | Carton without Spool |
| 13 | 1 | 100 Yard |
| | 8 | 80 Yard |
| | 9 | 90 Yard |
| | 4 | 40 Yard |
| | 6 | 50 Yard |
| | 2 | 250 Feet |
| | 3 | 300 Feet |
| | 5 | 500 Feet |
| | 7 | 1000 Feet |
| | H | 100 Meter |
| | F | 500 Meter |
| | T | 300 Meter |
| | R | Meter |

1,2&3 - Product
4&5 - No. of Pairs or Quads
6 - Type
7&8 - Conductor Diameter
9 - Conductor Material
10 - Shielding
11 - Sheath Color
12 - Packing Type (X)
13 - Cutting Length (X)

# Coaxial Cables Coding Key

| 1&2 | 3&4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|
| RG | 06 | Z | F | B | S | 7 |

**EXAMPLE** RG06ZFBS7
**DESCRIPTION** RG6 COAXIAL CABLE - BLACK 1000 FEET ON SPOOL

| | | |
|---|---|---|
| 1&2 | RG | COAXIAL-MIL17 |
| | | COAXIAL-IEC96 |
| 3&4 | 06 | TYPE06 |
| | 11 | TYPE11 |
| | 59 | TYPE59 |
| | 58 | TYPE58 |
| | 07 | TYPE07-IEC |
| 5 | C | Copper |
| | B | Tinned Copper |
| | Z | Copper Clad steel |
| | M | Copper Clad Aluminium |
| 6 | F | Foam Polyethylene |
| | S | Solid Polyethylene |
| | T | Teflon |

| | | |
|---|---|---|
| 7 | B | Black |
| | L | Blue |
| | Y | Yellow |
| | R | Red |
| | W | White |
| | E | Gray |
| | G | Green |
| | O | Orange |
| | M | G/Y(Y/G) |
| | N | Brown |
| | T | Natural |
| | 0 | without Color |
| 8 | S | Spool without carton |
| | C | Carton with Spool |
| | N | Non Spool-Non Carton |
| | M | Wooden Drum |
| | R | Carton without Spool |

| | | |
|---|---|---|
| 9 | 1 | 100 Yard |
| | 8 | 80 Yard |
| | 9 | 90 Yard |
| | 4 | 40 Yard |
| | 6 | 50 Yard |
| | 2 | 250 Feet |
| | 3 | 300 Feet |
| | 5 | 500 Feet |
| | 7 | 1000 Feet |
| | H | 100 Meter |
| | F | 500 Meter |
| | T | 300 Meter |
| | R | Meter |

1&2 - Product
3&4 - Type
5 - Conductor Material
6 - Insulation Material
7 - Sheath Color
8 - Packing Type (X)
9 - Cutting Length (X)

# LAN Cables Coding Key

| 1&2&3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|
| CAT | 5 | e | 4 | U | E | C | 7 |

**EXAMPLE** CAT5e4UEC7
**DESCRIPTION** LAN CABLE CAT5e 4P UNSHIELDED GRAY-CARTON WITH SPOOL 1000 FEET

| | | |
|---|---|---|
| 1&2&3 | CAT | CATEGORY |
| 4 | 5 | Type5 |
| | 6 | Type6 |
| | 7 | Type7 |
| | so on | so on |
| 5 | e | enhancement |
| | + | Plus |
| | - | Blank |
| 6 | 4 | 4PAIR |
| | 2 | 2PAIR |
| | 8 | 8PAIR |
| 7 | U | without Shield |
| | F | Overall Shield PET/AL/PET |
| | S | Overall Shield Braid |

| | | |
|---|---|---|
| 8 | B | Black |
| | L | Blue |
| | Y | Yellow |
| | R | Red |
| | W | White |
| | E | Gray |
| | G | Green |
| | O | Orange |
| | M | G/Y(Y/G) |
| | N | Brown |
| | T | Natural |
| | 0 | without Color |
| 9 | S | Spool without carton |
| | C | Carton with Spool |
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| | 7 | 1000 Feet |
| | H | 100 Meter |
| | F | 500 Meter |
| | T | 300 Meter |
| | R | Meter |

1&2&3 - Category
4 - Product Type
5 - Type
6 - No. of Pair
7 - Shielding
8 - Sheath Color
9 - Packing Type (X)
10 - Cutting Length (X)

# Conversion Table

| Multiply | By | To Obtain |
|---|---|---|
| **Length- Imperial** | | |
| Miles | 0.0254 | mm |
| Inches | 2.54 | cm |
| Feet | 30.48 | cm |
| Yards | 0.9144 | meters |
| Miles | 1.6093 | Kilometers |
| **Length -Metric** | | |
| Millimeters | 39.37 | Mils |
| Centimeters | 0.3937 | Inches |
| Meters | 1.0936 | Yards |
| Kilometers | 0.62137 | Miles |
| **Area- Imperial** | | |
| Square mils | 0.000507 | Square mm |
| Circular mils | 0.7854 | Square mils |
| Square Inches | 6.4516 | Square cm |
| Square feet | 0.0929 | Square meters |
| Square yards | 0.8361 | Square meters |
| **Area-Metric** | | |
| Square millimeter | 0.00155 | Square inches |
| Square centimeters | 0.155 | Square inches |
| Square meters | 1.19599 | Square yards |
| **Volume- Imperial** | | |
| Cubic inches | 16.38716 | Cubic cm |
| Cubic feet | 0.028317 | Cubic meters |
| **Volume-US** | | |
| Quarts (liquid) | 0.9463 | liters |
| Gallons | 3.7854 | liters |
| **Volume -Metric** | | |
| Cubic cm | 0.06102 | Cubic inches |
| Cubic meters | 35.3145 | Cubic feet |
| Liters | 1.05668 | Quarts ( liquid US) |

| Multiply | By | To Obtain |
|---|---|---|
| **Weight-Imperial** | | |
| Ounces | 28.3495 | grams |
| Pounds (Av) | 453.59 | grams |
| Pounds (Av) | 0.45335 | kg |
| Tons ( short) | 907.19 | kg |
| Tons ( long) | 1016.05 | kg |
| **Weight-Metric** | | |
| Grams | 0.03527 | Ounces |
| Grams | 0.002205 | Pounds (Av) |
| Kilograms | 35.274 | Ounces |
| Kilograms | 2.2046 | Pounds (Av) |
| **Miscellaneous-Imperial** | | |
| Pounds per 100 feet | 1.48816 | kg/km |
| Pounds per sq. inch | 0.07031 | kg per sq. cm |
| Ohms per 1000 feet | 3.28083 | Ohms per kilometer |
| Decibels | 0.1153 | nepers |
| Decibels per mile | 0.62137 | Descibles per km |
| **Miscellaneous-Metric** | | |
| Kg/Km | 0.67197 | Pounds per 100 feet |
| Kg per sq. cm | 14.2234 | Pounds per sq. inch |
| Ohms per kilometer | 0.3048 | Ohms per 1000 feet |
| Ohms per kilometer | 1.6093 | Ohms per mile |
| Descibles per km | 1.6093 | Decibels per mile |
| **Temperature** | | |
| Cesius | 9/5 ( C ) +32 | Fahrenheit |
| Fahrenheit | 5/9 (F) -32 | Cesius |

# Glossary

## A

**AWG**
Abbreviation for American Wire Guage. A standard used in the determination of the physical size of a conductor determined by its circular mil area.

**Ampacity**
The maximum current an insulated wire or cable can safely carry without exceeding limitations of insulation material.

**AWM**
Designation for Appliance Wiring Material.

**ASTM**
Abbreviation for American Society for Testing and Materials.

**Ambient Temperature**
The normal temperature within a given area.

## B

**Building Wire**
Insulated wires used in building for lighting and power, 600 volts or less, usually not exposed to outdoor environment.

**Bare Conductor**
A conductor with no coating or cladding on the copper.

**Bedding**
A layer of material applied to a cable immediately below the armouring.

**Buried Cable**
A cable installed directly in the ground without use of underground conduit. Also called «direct burial cable».

## C

**Cable**
Multicore stranded insulated wires under protective sheath to conduct electrical energy.

**Conductor**
A material capable of easily transferring electrical charge.

**Current Rating**
The maximum continuous electrical flow of current

## D

**D.C.**
Abbreviation for direct current

**Decibel (dB)**
A unit to express differences of power level, power gain in amplifiers or power loss in passive circuits or cables.

**Dielectric Constant (K)**
The ratio of the capacitance of a capacitor (or consoles) with dielectric between the electrodes to the capacitance when air is between the electrode.

**Dielectric Strength**
The voltage which as insulation can withstand before breakdown occurs. Usually expressed as a voltage gradient.

**Duct**
An underground or overhead tube or conduit for carrying electrical cables.

## E

**Eccentricity**
A measure of the center of a conductor›s location with respect to the circular cross-section of the insulation expressed as a percentage of center displacement of one circle with the other.

**Elongation**
The fractional increase in length of a material stressed in tension.

**Embossing**
A means of identification or lettering using heat and pressure to leave raised lettering on the sheath material of the cable.

**EMF**
Abbreviation for Electro Motive Force-force determinating flow of electricity(Voltage)

# Glossary

## F

**Farad**
A measuring unit of electrical capacity.

**Film**
A thin plastic sheet.

**Flame Resistance**
Ability of the material to extinguish flame once the source of heat removed.

**Flat Cable**
A cable with two essentially flat surfaces.

**Foils**
A thin supporting film of continuous sheet such as plastic foil, metal foil, laminated foil etc. for static shielding, contracts and other electrical application.

## G

**Gauge**
A term used to denote physical size of a wire

**Ground Conductor**
An electrical conductor for the connection to the earth. Making a complete electrical circuit.

## H

**Heat Resistance**
Ability of a substance to maintain physical,chemical and electrical integrity under specified temperature conditions.

**Henry**
A measuring unit of inductance such that the induced voltage in numerically equal to the rate of change of current in amperes per second.

**Hertz (Hz)**
A measuring unit of the frequency equal to one cycle per second.

## I

**ICEA**
Abbreviation for Insulated Cable Engineers Association

**IEC**
Abbreviation for International Electrotechnical Commission.

**IEEE**
Abbreviation for Institute of Electrical and Electronics Engineers.

**Impedance**
Resistance to flow of an alternating current at particular frequency, It is a combination of resistance and reactance x, measured in ohms.

**Insulation**
A non conducting substance, named as dielectric, surrounding the conductor.

## J

**Jacket**
An overall covering of a cable, called also sheath which protects against the environment.

**Jumper**
A short length of conductor used to make a temporary connection between terminals, around break in a circuit, or around an instrument.

## K

**KV**
Abbreviation for kilovolt= 1000 volts.

**KW**
Abbreviation for kilowatt=1000 watts

## L

**Laser**
Light Amplification by Stimulated Emission of radiation. An electro-optic device that produces coherent light with a narrow range of wavelengths, typically centered 780 mm, 1310 mm, or 1550 mm.

**LAN**
Local Area Network- A network located in a localised area e.g. in an office, building, complex building whose communication technology provides a high-bandwidth, low-cost medium to which many nodes can be connected.

**LED**
Light Emitting Diode

**Leakage Current**
The undesirable flow of current through or over the surface of an insulation.

**Loop Resistance**
The total resistance of two conductors measured round trip from one end.

# Glossary

## M

**MCM**
Cross-section of greater AWG-sizes.
(1 MCM=1000 circular mils=0.5067 mm2

**Megaohm**
One million ohms.

**Mho**
The unit of conductivity. The reciprocal of an ohm

**MHz**
Megahertz (one million cycles per second).

**Micro phonics**
Noise in a system caused by mechanical vibration of component within the system.

**Mylar**
Dupont trademark for polyethylene terephalate (polyster) film used in the front of a tape.

## N

**National Electric Code (NEC)**
A set of regulation governing construction and installation of electrical wiring and apparatus.

**NEMA**
National Electrical Manufacturers Association.

**Nylon**
A group of polyamide polymers, used for wire and cable jacketing with good chemical and abrasion resistance.

## O

**Ohm**
Unit of resistance such that a constant current of one ampere produces a force of one volt.

**Overlap**
A certain portion of a foil or band which laps over the leading edge of a helica or longitudinally wrapping tape.

**Over Current**
The current which causes and excessive temperature rise in a conductor.

**Overload Capacity**
The maximum level of current, voltage, or power which a device can withstand before it is damaged.

**Oxygen Index**
Percentage of Oxygen necessary to support combustion of specified material.

## P

**Pair**
Two insulated wires of a single circuit laying up together

**Polyester**
Polyethylene terephthalate which is used extensively in the production of a high strength moisture resistant film used as a cable core wrapping material .

**Polyvinylchloride (PVC)**
A thermoplastic material composed of polymers of vinylchloride which may be rigid or elastomeric depending on specific formulation.

**Propagation**
Delay time required for an electrical wave to travel between two points on a transmission line.

## Q

**Quad**
A four-wire unit of insulated conductors.

## R

**Rated Temperature**
The maximum temperature at which an electric component can operate for extended period without loss of its operating properties.

**Rated Voltage**
The maximum voltage at which an electric component can operate for extended periods without degradation of performance or safety hazard.

**Reactance**
The opposition offered to the flow of alternating current by the inductance or capacitance of the component or circuit.

**Resistance**
In D.C. circuits, the opposition material offers to current, measured in ohms. In A.C. circuits, resistance is the real component of impedance, and may be higher than the value measured at D.C

# Glossary

## S

**Sheath**
The material, usually an extruded plastic or elastomer, applied outermost to a wire or cable, very often referred to as jacket.

**Solid Conductor**
A conductor consisting of a single wire.

**Stranded Conductor**
A conductor composed of individual groups of wires twisted together to form an entire unit.

## T

**Tensile Strength**
A term denoting the greatest longitudinal tensile stress a substance can bear without mechanical failure.

**Tinned Copper**
Tin coating over copper to aid in soldering and inhibit corrosion

**Twin Cable**
A cable composed of two separate insulated stranded conductor laid parallel under a common covering.

**THHN**
Thermoplastic insulated , High heat resistant 90˚C dry locations, Nylon jacketed cable.

**THWN**
Thermoplastic insulated, Heat and moisture resistant 75˚C Wet locations, Nylon jacketed cable.

## U

**UL**
Abbreviation for Underwriters Laboratories, Inc.

## V

**VDE**
West germany approval agency.

**Volt**
A unit of electromotive force.

**Voltage Drop**
The amount of voltage loss from original input to point of electrical device.

**VW-1**
A flammability rating established by Underwriters laboratories for wires and cables that pass a specially designed vertical flame test.

## W

**Wall Thickness**
The thickness of the applied insulation or jacket.

**Wire Gauge**
A system of numerical designation of wire of wire sizes

## X

**XLPE**
Cross-linked polyethylene.

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