

# MOTION**VFD**



CABLE SOLUTIONS FOR VARIABLE FREQUENCY DRIVES





# MOTION**CABLES**: LEADING THE WAY IN **SPECIAL CABLE** **SOLUTIONS**

MOTION**CABLES** specializes in the design, manufacturing, and qualification of high-performance special cables, particularly focusing on applications requiring constant movement, extreme environmental resistance, and maximum data integrity.

Our mission goes beyond mere compliance; we provide products validated to operate reliably under the most severe real-world conditions, including combined and extreme stress scenarios.

This commitment is rooted in MOTION**TECHCORE**, our dedicated Research & Test Center, where an engineering-driven approach ensures that every cable is tested and classified before shipment.

By subjecting our cables to over 60 rigorous tests, from dimensional checks and material analysis to dynamic movement (e.g., drag chain, torsion) and system-level validation, we guarantee a product that maintains its performance throughout its planned operational life.

MOTION**CABLES** thus acts as a technical partner, providing not just components, but verified solutions that directly enhance system reliability and reduce the overall total cost of ownership (TCO) for the customer.

# KEY ADVANTAGES OF MOTIONCABLES

MOTION**CABLES** leverages its MOTION**TECHCORE** research center to deliver verified, high-performance special cables, offering the following key benefits:

## **GUARANTEED LONG-TERM RELIABILITY**

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Products are qualified through accelerated aging and dynamic testing (millions of cycles) to ensure stable performance over the full operational life, minimizing unscheduled downtime.

## **PERFORMANCE CLASSIFICATION**

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Cables are objectively categorized into four classes (Electrical, Dynamic, Environment, Safety) based on real-world test data, enabling quick and precise selection for specific application needs.

## **SYSTEM FUNCTIONALITY ASSURANCE**

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Validation includes the entire system (Drive–Cable–Motor), confirming reliable performance and compatibility within the customer's actual industrial environment.

## **SUPERIOR ENVIRONMENTAL RESISTANCE**

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Proven resistance to oils, chemicals, temperature extremes, UV, and salt fog, ensuring cable integrity in harsh and contaminated settings (e.g., machine tools, offshore).

## **REDUCED TOTAL COST OF OWNERSHIP (TCO)**

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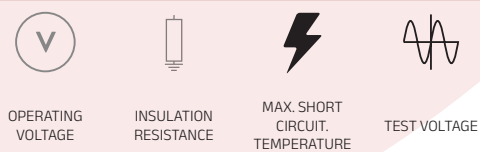
High durability, predictable life expectancy, and validated technical parameters simplify design and maintenance, leading to fewer failures and lower inventory costs.

# ICONS

## RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



## ELECTRICAL PROPERTIES



Use the icons for a fast summary and a general idea of the related product features. More details on product characteristics are available in the proper sections of each product page.

**Disclaimer:** This document does not constitute a warranty of performance under all operating conditions. Final responsibility for product selection, installation and system integration rests with the system designer or end user.

# MOTION **VFD** SERIES

## ADVANTAGES AND CHARACTERISTICS OF VFD

**Variable Frequency Drives** (VFDs) are electronic devices that control the speed and torque of AC electric motors by varying the output frequency and voltage. Widely used in pumps, fans, conveyor belts, and industrial machinery, they deliver significant energy savings, precise process control, and soft-start capabilities. However, the high-frequency switching they generate creates electrical stress that can damage motors, cables, and nearby equipment — making the choice of a dedicated VFD cable a critical engineering decision.

The **MOTION INVERTER VFD** series by **MOTIONCABLES** addresses exactly these challenges. Available in six models (500 to 750 BP VFD), all cables feature cross-linked XLPE insulation rated up to 90 °C, double shielding (aluminium/polyester tape + tinned copper braid), and symmetrical construction to neutralise induced currents. The range covers both European (CE/EAC) and North American (UL AWM, UL Listed, CSA, NFPA) certifications, offering a complete solution for any industrial environment — oil-resistant, flame-retardant, and non-hygroscopic as standard.

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# MOTIONVFD SERIES

## ADVANTAGES AND CHARACTERISTICS OF VFD

**Variable Frequency Drives** (commonly known as VFDs) are among the most useful devices in the industrial world. They allow control of the speed of a three-phase AC electric motor, making it possible to modify the motor load behaviour whenever necessary, according to the working requirements and the device being driven by the motor (e.g. a pump, a fan, a conveyor belt or a lathe, each with different operating characteristics).

By modifying the output frequency and voltage, the VFD enables the motor to change its RPM (Revolutions Per Minute) to effectively respond to these requirements. **The great advantage of VFDs is therefore to increase precision in process control, giving the operator the ability to manage motor speed to a tolerance of 0.1%.**

When a VFD operates on a motor by modulating its speed, it also allows for considerable energy savings (it can be seen as a “green” solution in engineering) and is also useful when it is necessary to start a motor before bringing it to full power (avoiding overload and overheating situations).

All these positive aspects have **a leading player beyond the driver and the motor: the cable.**

The choice of a suitable and correct cable will give the systems concerned longevity and consistent performance.

## WHERE ARE VFDs USED?

### ⊙ PUMP

- » Cold and Hot Water
- » Condensate Water
- » Booster

### ⊙ CONVEYOR BELTS

### ⊙ COOLING TOWERS

### ⊙ AIR RECIRCULATION FANS

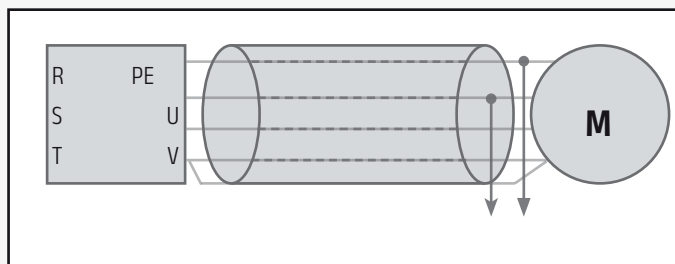
### ⊙ AIR EXTRACTION FANS

- » Laboratories
- » Hospitals
- » Clean Rooms

### ⊙ CENTRIFUGAL FANS

The cable is called upon both to perform its function as a **current conductor**, but above all to allow the system to express its full potential without incurring damage or machine downtime.

The choice of a **cable specifically designed for use in VFDs** is therefore linked to a series of aspects which, if underestimated, can cause damage and problems to the entire installation.



# THREE **PROBLEMS** RELATED TO VFDs

INTERFERENCE CAUSES INTERMITTENT FAULTS



## **PREMATURE MOTOR FAILURE**



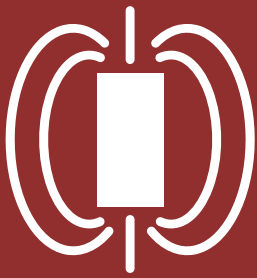
## **PREMATURE CABLE FAILURE**



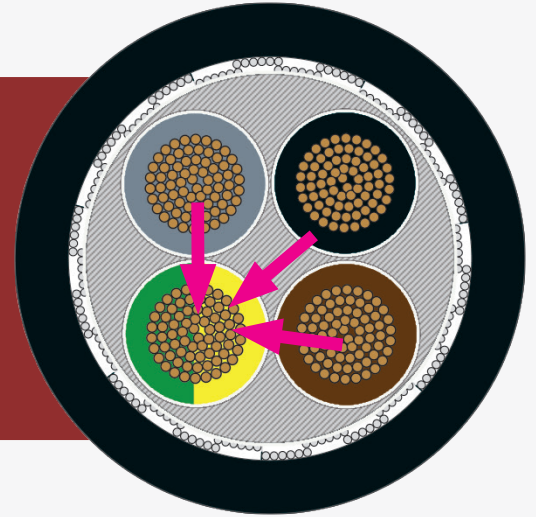
## **OTHER EQUIPMENTS MALFUNCTION**

THEIR COMMON CAUSE:  
**HIGH FREQUENCY  
OUTPUT FROM THE  
INVERTER**

# WHY IS HIGH FREQUENCY A PROBLEM?



## ELECTROMAGNETIC RADIATION



A standard cable can act as an antenna emitting electromagnetic radiation, which has negative effects on control instruments and alarms.

This is increased by:

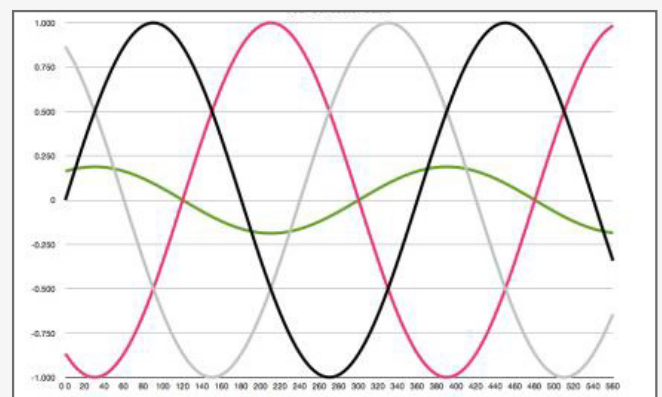
- ⦿ Incorrect type of cable used.
- ⦿ Absence of shielding in the cable.
- ⦿ Incorrect type of terminations used.
- ⦿ Length of the cable from driver to motor.
- ⦿ Equipment design.

## ELECTROMAGNETIC INDUCTION

The variable frequency produces a magnetic field and an induced current on the earth/ground conductor.

This causes:

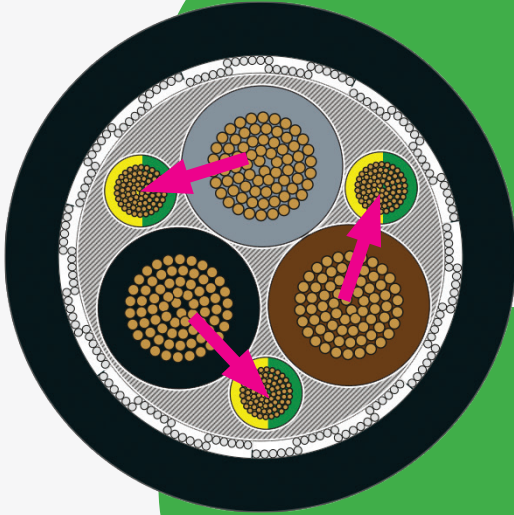
- ⦿ Premature bearing damage.
- ⦿ Interferences: Between PLCs and between PLC and Network.
- ⦿ Sensors and Encoders.
- ⦿ Risk of electrocution.



An induced current remains on the ground cable, discharging onto the bearings, the structure, or returning to the drive causing signal interference.

- Earth Core
- Phase A
- Phase B
- Phase C

# HOW TO **SOLVE THE PROBLEM?**

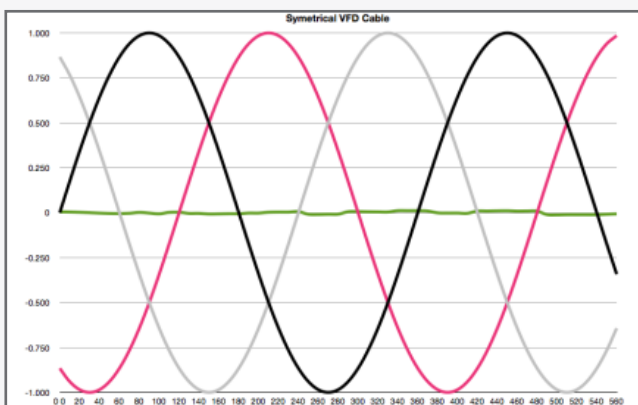


## **SOLUTION 1**

**CABLE WITH OVERALL SHIELD — ALUMINIUM/  
POLYESTER TAPE + TINNED COPPER BRAID**

## **SOLUTION 2**

**SYMMETRICAL CONSTRUCTION + OVERALL  
SHIELD (AL/PE TAPE + TINNED COPPER BRAID)  
+ X-LINKED INSULATION**



- Earth Core
- Phase A
- Phase B
- Phase C

The overall-shielded cable creates a wide low-impedance area at high frequencies.

The symmetrical construction eliminates induced voltage. The symmetrical design cancels any induced current on the ground conductor, protecting instruments and people.

# WHY CHOOSE A DEDICATED CABLE

As we have seen, the use of non-specialised cables for connecting VFDs to motors inevitably leads to premature motor failures, chaos on process sensors, degraded safety and risk of electrocution.

The specification of a suitable VFD cable can avoid all these problems, but currently there is no single standard to follow: this is why it is important to be informed on all aspects in order to make the most correct decision.

## THE 6-POINT METHOD

When assessing whether or not a VFD cable is needed, here are 6 questions that will certainly help you in your choice:

**1**

**Is the motor to be controlled?  
Is this therefore a VFD  
application?**

If the answer is yes, then the choice of the correct cable is fundamental, as it is essential to choose the one that provides the best cost/benefit ratio.

**2**

**What is the ideal impedance the  
cable must have to align with  
the motor?**

The impedance from cable to motor is generally low, and it is best to choose the one with the lowest possible impedance: selecting a cable with XLPE insulation ensures minimised impedance.

**3**

**Does your system motor have a  
power of 100 HP or more?**

The more powerful the motor, the greater the voltage flowing through the cable. Symmetrical construction always offers an adequate cross-section capable of handling higher amperage.

**4**

**What is the operating voltage of  
the VFD?**

The cable must be capable of handling it.

**5**

**Are there instruments,  
communication systems or  
alarms located near the point  
where the motor and drive will  
be installed?**

If they are far away, no problem, but if not, it is essential to use a cable with adequate shielding (tape and braid) to avoid any interference.

**6**

**What is the length of the cable  
to be installed?**

The ratio between cross-section and distance is critically important: if the latter is too large, the cable will act like a large capacitor (which charges with energy when the system is started). The energy arriving from the drive will be discharged either onto the bearings or the motor itself, with serious risk of damage.

# ADVANTAGES OF OUR VFD CABLES



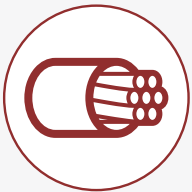
## SYMMETRIC DESIGN

The symmetrical split-earth structure ensures correct voltage distribution and reduces the inductive effect.



## DOUBLE SHIELDING

A shield consisting of an aluminium/polyester tape coupled with a high-coverage tinned copper braid offers the best protection against EMC interference.



## INSULATION

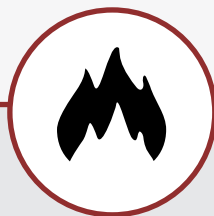
The use of cross-linked material, with an operating temperature of up to 90 °C, ensures:

- ⦿ Low impedance.
- ⦿ Greater electrical stability compared to the more common PVC.
- ⦿ Greater installation length.
- ⦿ Reduction of voltage peaks (extends motor life).
- ⦿ Substantial reduction of the corona effect (safeguards bearings).
- ⦿ Increased efficiency of power transfer between drive and motor.



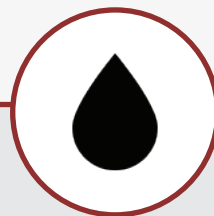
## HIGH FLEXIBILITY IN LAYING

The construction and materials used give the cables — despite their size — high flexibility.



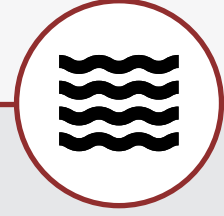
## FLAME RESISTANCE

All types of our VFD cables are flame-resistant and — in the UL Listed version — non-flame propagating.



## RESISTANCE TO INDUSTRIAL OILS

All types of our VFD cables are resistant to industrial oils.i.



## NON HYGROSCOPIC

All types of our VFD cables are resistant to water and humidity

# ADVANTAGES OF **CROSS-LINKED** INSULATION

In addition to the advantages described regarding low capacitance, cross-linked insulation material allows us to reach an operating temperature of up to 90 °C.

This remarkable value brings with it a significant advantage: the ability to use a smaller cable cross-section compared to a standard cable, since cross-linked material offers a higher current-carrying capacity.

This aspect should not be underestimated with regard to installation footprint, system dimensioning, and cost/quality ratio.

| Installation Type                                                                                                                                                                        | Current-carrying capacity for 3 loaded cores |                             |                            |                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------|----------------------------|------------------------------|
|                                                                                                                                                                                          | PVC<br>conductor<br>section                  | PVC<br>70 °C<br>Current (A) | XLPE<br>current<br>section | XLPE<br>90 °C<br>Current (A) |
|  <p>Free air, spaced from wall/ceiling or on cable tray. IEC 60364.5.52</p> <p>Ref. Table B.52.12</p> | mm²                                          |                             | mm²                        |                              |
|                                                                                                                                                                                          | 1,0                                          | 13,6                        |                            |                              |
|                                                                                                                                                                                          | 1,5                                          | 18,5                        | 1,0                        | 17                           |
|                                                                                                                                                                                          | 2,5                                          | 25                          | 1,5                        | 23                           |
|                                                                                                                                                                                          | 4,0                                          | 34                          | 2,5                        | 32                           |
|                                                                                                                                                                                          | 6,0                                          | 43                          | 4,0                        | 42                           |
|                                                                                                                                                                                          | 10                                           | 60                          | 6,0                        | 54                           |
|                                                                                                                                                                                          | 16                                           | 80                          | 10                         | 75                           |
|                                                                                                                                                                                          | 25                                           | 101                         | 16                         | 100                          |
|                                                                                                                                                                                          | 35                                           | 126                         | 25                         | 127                          |
|                                                                                                                                                                                          | <b>50</b>                                    | <b>153</b>                  | <b>35</b>                  | <b>158</b>                   |
|                                                                                                                                                                                          | 70                                           | 196                         | 50                         | 192                          |
|                                                                                                                                                                                          | 95                                           | 238                         | 70                         | 246                          |
|                                                                                                                                                                                          | 120                                          | 276                         | 95                         | 298                          |
|                                                                                                                                                                                          | 150                                          | 319                         | 120                        | 346                          |
|                                                                                                                                                                                          | 185                                          | 364                         | 150                        | 399                          |
|                                                                                                                                                                                          | 240                                          | 430                         | 185                        | 456                          |
|                                                                                                                                                                                          | 300                                          | 497                         | 240                        | 538                          |
|                                                                                                                                                                                          |                                              |                             | 300                        | 621                          |

**Key insight:**

**Instead of a 50 mm² PVC cable, you can use  
a 35 mm² XLPE cable  
=  
Savings in space, weight and cost**



# MOTION **INVERTER VFD**

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

This type of low-capacitance incremental feedback and position indicator cable is designed to transmit control pulses for precise servo motor positioning and travel. They also serve as connection cables for tachometers, brakes, and pulse generators in plant, mechanical, and automation technology. For use in drag chains, always adhere to the manufacturer's assembly guidelines. To ensure optimal electromagnetic compatibility (EMC), a double-sided and all-around

**INCREASED MAX  
CONDUCTOR  
TEMPERATURE**

**90°C**

| PERFORMANCE                         | Suggested                          | Insulation | Outer Sheath            | Key Features                                                                       |
|-------------------------------------|------------------------------------|------------|-------------------------|------------------------------------------------------------------------------------|
| <b>BASIC<br/>PERFORMANCE</b>        | Static or Demi-Static installation | XL-PE      | PVC                     | Flexibility,<br>oil/fluid resistance,<br>flame retardant                           |
| <b>HIGH DYNAMIC<br/>PERFORMANCE</b> | Severe dynamic, robotics           | XL-PE      | Polyurethane (PUR FRFH) | High flexibility even at low temperatures,<br>chemical resistance,<br>halogen-free |

## **CE SERIES: EUROPEAN STANDARD**

### **VFD 500 BP / 550 BP**

Shielded multi-core cables with XLPE insulation and PVC jacket, ideal for static installation in European industrial facilities. They ensure EMC reliability and long service life even in harsh environments.

#### **Key Features:**

- Structure 3+3G (500) or 4G (550) (Core Count).
- Low-capacitance XLPE, PVC TM5 jacket.
- Double shielding (tape + braid).
- CE, EAC, RoHS compliance.
- Resistance to oils and moisture.
- Installation: Static or Demi-Static.

## **CE + UL AWM SERIES: MULTI-STANDARD CERTIFICATION**

### **VFD 600 BP / 650 BP**

Multi-Standard Cables (CE, UL AWM, CSA) for European and North American Markets. These cables are designed for installations destined for both the European and North American markets. They represent the best compromise between electrical performance, flexibility, and broad regulatory compatibility.

#### **Key Features:**

- XLPE (Cross-Linked Polyethylene) insulation rated at 90° C.
- Oil-resistant PVC jacket, Black RAL 9005.
- Compliance:  
UL 758 – AWM Style 20886 – CSA C22.2 No. 210 – NFPA 79.
- Flame Test: UL FT1 / IEC 60332-1-2.
- High-coverage dual shielding.
- Installation: Static or Demi-Static.

CE + UL LISTED TC-ER + UL AWM SERIES:  
FOR USA / CANADA

VFD 700 BP / 750 BP

Dual-certified cables (UL LISTED (TC-ER) and UL AWM), certified for installation in compliance with NFPA 70 (NEC). Suitable for severe industrial environments or classified as Hazardous Area (Class I Div.2 / Class II Div.2).

Key Features:

- UL 1277 / UL 1063 / UL AWM – TC-ER DIRECT BURIAL.
- Construction 3+3G (700) or 4G (750) (Core Count).
- Oil-resistant PVC jacket, UV and SUN RESISTANT.
- Resistance to oils, moisture, and flame (UL FT4 / IEEE 1202).
- Dual EMC shielding.

APPLICATION EXAMPLES

- Industrial Automation and Robotics.
- Machine Tools and CNC.
- Packaging Lines and Automated Logistics.
- HVAC Systems and Variable Speed Pumps.
- AGVs / AMRs (Autonomous/Automated. Guided Vehicles) and Industrial Mobile Systems.
- Decentralized Inverters and Compact Motors.

CE + UL AWM SERIES – CPE CABLES: FOR  
CONTINUOUS FLEXING

VFD 800 BP

High-performance series designed for dynamic installation, robotics, and cable carriers. Constructed with cross-linked XLPE insulation and a PUR jacket, these cables combine flexibility, mechanical resistance, and multi-standard compliance.

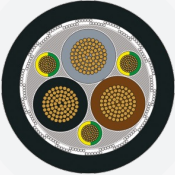
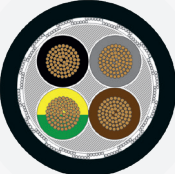
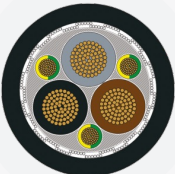
Key Features:

- Low-capacitance XLPE.
- High mechanical and thermal resistance (-40 °C / +90 °C).
- CE + UL AWM compliance.
- Total shielding (foil + tinned copper braid ≤ 85%).
- Flame Test: UL FT1 / IEC 60332-1-2.

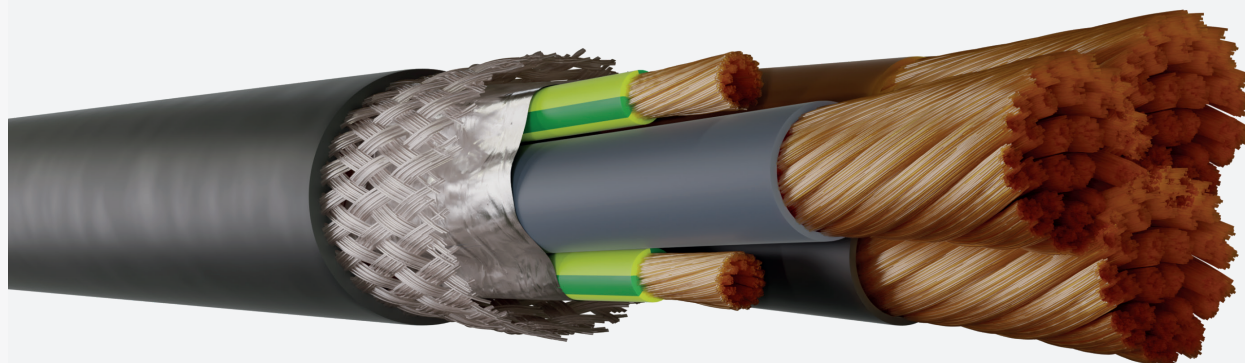
TECHNICAL BENEFIT

| Characteristic           | Tangible Benefit                         |
|--------------------------|------------------------------------------|
| Cross-linked XLPE        | Low capacitance, reduced dV/dt           |
| Symmetrical              | No induced current on the PE (Protective |
| Dual EMC Shielding       | Immunity to high-frequency disturbances  |
| PVC TM5 / PUR FRHF       | Mechanical and chemical resistance       |
| High Temperature (90 °C) | Increased thermal efficiency             |
| CE – UL – CSA            | International compatibility              |
| Dynamic Versions         | Long service life in flexible/moving     |

CABLES TYPES

|                                                                                     |                                                      |                     |                         |                          |           |
|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------|-------------------------|--------------------------|-----------|
|  | <b>BASIC PERFORMANCE<br/>SERIES: 500 - 600 - 700</b> | <b>PVC<br/>TM5</b>  | <b>600 V<br/>1000 V</b> | <b>-25 °C<br/>+90 °C</b> | <b>18</b> |
|  | <b>BASIC PERFORMANCE<br/>SERIES: 550 - 650 - 750</b> | <b>PVC<br/>TM5</b>  | <b>600 V<br/>1000 V</b> | <b>-25 °C<br/>+90 °C</b> | <b>20</b> |
|  | <b>HIGH DYNAMIC<br/>PERFORMANCE</b>                  | <b>PUR<br/>FRFH</b> | <b>600 V<br/>1000 V</b> | <b>-50 °C<br/>+90 °C</b> | <b>22</b> |

Low capacitance cables for inverter systems, PVC sheath, Oil Resistant, Demi-Static Application - **Series: 500 - 600 - 700**



UL 21179  
90 °C - 1000V



AWM I/II A/B  
90 °C - 1000V



LABS  
Free



200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec<sup>2</sup>

ACCELERATION



≤ 50 N / mm<sup>2</sup>

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

#### DURABILITY IN MECHANICAL & THERMAL CONDITIONS

#### ELECTRICAL PROPERTIES

|                        |                   |          |
|------------------------|-------------------|----------|
|                        | m.u.              |          |
| CYCLES                 | MIL               | 0,2      |
| MIN. BENDING RADIUS    | x O.D.            | 12       |
| MAXIMUM SPEED          | m/min             | 180      |
| MAXIMUM ACCELERATION   | m/s <sup>2</sup>  | 2,0      |
| PULLING FORCE          | N/mm <sup>2</sup> | ≤ 50     |
| TORSION                | °/m               | -        |
| MAX. HORIZONTAL TRAVEL | m                 | -        |
| TEMPERATURE            | °C                | +5 / +90 |



Test  
Voltage

4,0 kV x 5 min  
acc.to EN 50395



Insulation  
Resistance

≥ 1.0 GΩ x km @  
20 °C



Max. Short  
Circuit  
Temperature

250 °C ( ≤ 1s)



Operating  
Voltage

1000 V (UL/CSA)  
U<sub>0</sub>/U 0.6/1.0 kV

#### RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED

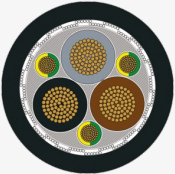
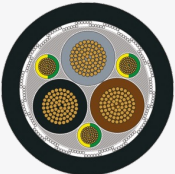
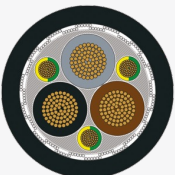


TEMPOR. OUTDOOR

#### MAIN ADVANTAGES

|                                               |                                                                                             |
|-----------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Symmetrical 3+3G Structure</b>             | Perfect balance of electric fields and reduction of return currents to ground.              |
| <b>Low Electrical Capacitance Insulation</b>  | Higher transmission efficiency with VFD drives and reduction of the dV/dt effect.           |
| <b>High-Flexibility PVC Outer Jacket</b>      | Ease of installation and long service life even in semi-dynamic or mobile installations.    |
| <b>Full Shielding (Foil + Copper Braid)</b>   | Effective EMC protection against high-frequency disturbances and interference.              |
| <b>Construction according to HD 308 S2</b>    | Phase conductors colored according to European standard for maximum recognition and safety. |
| <b>High Thermal Resistance up to 90°C</b>     | Constant performance even in continuous duty cycles or with high temperatures.              |
| <b>CE, UL, CSA, NFPA 79, TC-ER Compliance</b> | Suitable for industrial installations in Europe, the USA, and Canada.                       |
| <b>Controlled Mechanical Flexibility</b>      | Ideal for fixed or semi-mobile systems with long-term reliability.                          |

Scan the QRcode for a more detailed digital version on our website

|                                                                                                                                                          | MotionCables code | EPlan Code    | Formation        | AWG<br>Kcmil | Ø     | Cu      | DATA SHEET                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------|------------------|--------------|-------|---------|---------------------------------------------------------------------------------------|
|                                                                                                                                                          |                   |               | mm <sup>2</sup>  |              | mm    | kg / km |                                                                                       |
|  <p><b>Series 500</b><br/>CE</p>                                        | PFSI15G06R-N      | MC.1431061525 | (3x1.5 + 3G0.25) | 16           | 10.0  | 80      |    |
|                                                                                                                                                          | PFSI13G06R-N      | MC.1431061325 | (3x2.5 + 3G0.5)  | 14           | 11.5  | 121     |                                                                                       |
|                                                                                                                                                          | PFSI11G06R-N      | MC.1431061125 | (3x4.0 + 3G0.75) | 12           | 13.0  | 176     |                                                                                       |
|                                                                                                                                                          | PFSI09G06R-N      | MC.1431060925 | (3x6.0 + 3G1.0)  | 10           | 14.4  | 247     |                                                                                       |
|                                                                                                                                                          | PFSI07G06R-N      | MC.1431060725 | (3x10.0 + 3G1.5) | 8            | 17,6  | 402     |                                                                                       |
|                                                                                                                                                          | PFSI05G06R-N      | MC.1431060525 | (3x16 + 3G2.5)   | 6            | 20.0  | 621     |                                                                                       |
|                                                                                                                                                          | PFSI03G06R-N      | MC.1431060325 | (3x25 + 3G4.0)   | 4            | 23,6  | 949     |                                                                                       |
|                                                                                                                                                          | PFSI02G06R-N      | MC.1431060225 | (3x35 + 3G6.0)   | 2            | 27    | 1303    |                                                                                       |
|                                                                                                                                                          | PFSIA1G06R-N      | MC.143106A125 | (3x50 + 3G10.0)  | 1            | 32,5  | 1877    |                                                                                       |
|                                                                                                                                                          | PFSIA2G06R-N      | MC.143106A225 | (3x70 + 3G10.0)  | 2/0          | 36.5  | 2523    |                                                                                       |
|                                                                                                                                                          | PFSIA3G06R-N      | MC.143106A325 | (3x95 + 3G16.0)  | 3/0          | 40.4  | 3443    |                                                                                       |
|                                                                                                                                                          | PFSIA4G06R-N      | MC.143106A425 | (3x120 + 3G16.0) | 4/0          | 43,8  | 4190    |                                                                                       |
|                                                                                                                                                          | PFSIA5G06R-N      | MC.143106A525 | (3x150 + 3G25.0) | 250          | 50,4  | 5341    |                                                                                       |
|                                                                                                                                                          | PFSIB1G06R-N      | MC.143106B125 | (3x185 + 3G35.0) | 350          | 56.0  | 6678    |                                                                                       |
|                                                                                                                                                          | PFSIB2G06R-N      | MC.143106B225 | (3x240 + 3G50.0) | 450          | 63.0  | 8250    |                                                                                       |
|  <p><b>Series 600</b><br/>CE - UL AWM</p>                             | PFSI15G06UR-N1    | MC.162061525  | (3x1.5 + 3G0.25) | 16           | 10.0  | 80      |  |
|                                                                                                                                                          | PFSI13G06UR-N1    | MC.162061325  | (3x2.5 + 3G0.5)  | 14           | 11.5  | 121     |                                                                                       |
|                                                                                                                                                          | PFSI11G06UR-N1    | MC.162061125  | (3x4.0 + 3G0.75) | 12           | 13.0  | 176     |                                                                                       |
|                                                                                                                                                          | PFSI09G06UR-N1    | MC.162060925  | (3x6.0 + 3G1.0)  | 10           | 14.4  | 247     |                                                                                       |
|                                                                                                                                                          | PFSI07G06UR-N1    | MC.162060725  | (3x10.0 + 3G1.5) | 8            | 17,6  | 402     |                                                                                       |
|                                                                                                                                                          | PFSI05G06UR-N1    | MC.162060525  | (3x16 + 3G2.5)   | 6            | 20.0  | 621     |                                                                                       |
|                                                                                                                                                          | PFSI03G06UR-N1    | MC.162060325  | (3x25 + 3G4.0)   | 4            | 23,6  | 949     |                                                                                       |
|                                                                                                                                                          | PFSI02G06UR-N1    | MC.162060225  | (3x35 + 3G6.0)   | 2            | 27    | 1303    |                                                                                       |
|                                                                                                                                                          | PFSIA1G06UR-N1    | MC.16206A125  | (3x50 + 3G10.0)  | 1            | 32,5  | 1877    |                                                                                       |
|                                                                                                                                                          | PFSIA2G06UR-N1    | MC.16206A225  | (3x70 + 3G10.0)  | 2/0          | 36.5  | 2523    |                                                                                       |
|                                                                                                                                                          | PFSIA3G06UR-N1    | MC.16206A325  | (3x95 + 3G16.0)  | 3/0          | 40.4  | 3443    |                                                                                       |
|                                                                                                                                                          | PFSIA4G06UR-N1    | MC.16206A425  | (3x120 + 3G16.0) | 4/0          | 43,8  | 4190    |                                                                                       |
|                                                                                                                                                          | PFSIA5G06UR-N1    | MC.16206B125  | (3x150 + 3G25.0) | 250          | 50,4  | 5341    |                                                                                       |
|                                                                                                                                                          | PFSIB1G06UR-N1    | MC.16206B225  | (3x185 + 3G35.0) | 350          | 56.0  | 6678    |                                                                                       |
|                                                                                                                                                          | PFSIB2G06UR-N1    | MC.16206A425  | (3x240 + 3G50.0) | 450          | 63.0  | 8250    |                                                                                       |
|  <p><b>Series 700</b><br/>CE - UL AWM<br/>UL LISTED - WTTTC - CIC</p> | UFS05G06VFDR-N    | MC.164060525  | (3x16 + 3G2.5)   | 6            | 20.70 | 606     |  |
|                                                                                                                                                          | UFS03G06VFDR-N    | MC.164060325  | (3x25 + 3G4.0)   | 4            | 24.40 | 917     |                                                                                       |
|                                                                                                                                                          | UFS02G06VFDR-N    | MC.164060225  | (3x35 + 3G6.0)   | 2            | 27.00 | 1279    |                                                                                       |
|                                                                                                                                                          | UFSA1G06VFDR-N    | MC.16406A125  | (3x50 + 3G10.0)  | 1            | 32.00 | 1881    |                                                                                       |
|                                                                                                                                                          | UFSA2G06VFDR-N    | MC.16406A225  | (3x70 + 3G10.0)  | 2/0          | 36.50 | .474    |                                                                                       |
|                                                                                                                                                          | UFSA3G06VFDR-N    | MC.16406A325  | (3x95 + 3G16.0)  | 3/0          | 39.80 | 3384    |                                                                                       |
|                                                                                                                                                          | UFSA4G06VFDR-N    | MC.16406A425  | (3x120 + 3G16.0) | 4/0          | 44.70 | 4127    |                                                                                       |
|                                                                                                                                                          | UFSA5G06VFDR-N    | MC.16406A525  | (3x150 + 3G25.0) | 250          | 48.20 | 5269    |                                                                                       |
|                                                                                                                                                          | UFSB1G06VFDR-N    | MC.16406B125  | (3x185 + 3G35.0) | 350          | 52.10 | 6584    |                                                                                       |
|                                                                                                                                                          | UFSB2G06VFDR-N    | MC.16406B225  | (3x240 + 3G50.0) | 450          | 58.50 | 8639    |                                                                                       |

Low capacitance cables for inverter systems, PVC sheath, Oil Resistant, Demi-Static Application - **Series 550 - 650 - 750**



UL 21179  
90 °C - 1000V



AWM I/II A/B  
90 °C - 1000V



LABS  
Free



200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec<sup>2</sup>

ACCELERATION



≤ 50 N / mm<sup>2</sup>

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

#### DURABILITY IN MECHANICAL & THERMAL CONDITIONS

#### ELECTRICAL PROPERTIES

##### CYCLES

m.u.



MIL

0,2

##### MIN. BENDING RADIUS

x O.D.

12

##### MAXIMUM SPEED

m/min

180

##### MAXIMUM ACCELERATION

m/s<sup>2</sup>

2,0

##### PULLING FORCE

N/mm<sup>2</sup>

≤ 50

##### TORSION

°/m

-

##### MAX. HORIZONTAL TRAVEL

m

-

##### TEMPERATURE

°C

+5 / +90



Test  
Voltage

4,0 kV x 5 min  
acc.to EN 50395 Cl.



Insulation  
Resistance

≥ 1.0 GΩ x km @  
20 °C



Max. Short  
Circuit  
Temperature

250 °C ( ≤ 1s)



Operating  
Voltage

1000 V (UL/CSA)  
U<sub>0</sub>/U 0.6/1.0 kV (IEC)

#### RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED

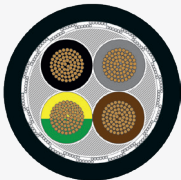
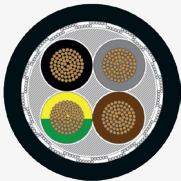
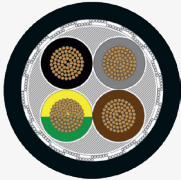


TEMPOR. OUTDOOR

#### MAIN ADVANTAGES

|                                                                   |                                                                                               |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Symmetrical 4G Structure with Central Protective Conductor</b> | Better distribution of electric fields and reduction of stray currents.                       |
| <b>Low Dielectric Constant Insulation</b>                         | Reduction of capacitive losses and optimization of compatibility with inverters.              |
| <b>Flexible PVC Outer Jacket</b>                                  | Ease of wiring and resistance to abrasion, oils, and industrial substances.                   |
| <b>Full-Coverage Shielding (Foil + Tinned Copper Braid)</b>       | Immunity to electromagnetic disturbances and transmission stability even over long distances. |
| <b>Phase Conductors Colored according to HD 308 S2</b>            | European color standardization for safe and intuitive installation.                           |
| <b>High Thermal and Mechanical Withstand</b>                      | Resistance to stress, vibrations, and repeated thermal cycling.                               |
| <b>CE - UL - CSA - AWM - NFPA 79 Certifications</b>               | Suitable for industrial systems intended for international markets.                           |
| <b>High Dynamic Flexibility</b>                                   | Ideal solution for cable carriers, robotics, and continuous motion applications.              |

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|                                                                                                                                                          | MotionCables code     | EPLAN Code    | Formation       | AWG<br>Kcmil | Ø     | Cu      | DATA SHEET                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-----------------|--------------|-------|---------|---------------------------------------------------------------------------------------|
|                                                                                                                                                          |                       |               | mm <sup>2</sup> |              | mm    | kg / km |                                                                                       |
|  <p><b>Series 550</b><br/>CE</p>                                        | <b>PFS15G04R-N</b>    | MC.1431041525 | (4G1.5)         | 16           | 10.5  | 80      |    |
|                                                                                                                                                          | <b>PFS13G04R-N</b>    | MC.1431041325 | (4G2.5)         | 14           | 12.3  | 120     |                                                                                       |
|                                                                                                                                                          | <b>PFS11G04R-N</b>    | MC.1431041125 | (4G4)           | 12           | 14.0  | 200     |                                                                                       |
|                                                                                                                                                          | <b>PFS09G04R-N</b>    | MC.1431040925 | (4G6)           | 10           | 15.6  | 260     |                                                                                       |
|                                                                                                                                                          | <b>PFS07G04R-N</b>    | MC.1431040725 | (4G10)          | 8            | 19.6  | 450     |                                                                                       |
|                                                                                                                                                          | <b>PFS05G04R-N</b>    | MC.1431040525 | (4G16)          | 6            | 22.0  | 695     |                                                                                       |
|                                                                                                                                                          | <b>PFS03G04R-N</b>    | MC.1431040325 | (4G25)          | 4            | 26.0  | 1145    |                                                                                       |
|                                                                                                                                                          | <b>PFS02G04R-N</b>    | MC.1431040225 | (4G35)          | 2            | 29.4  | 2100    |                                                                                       |
|                                                                                                                                                          | <b>PFSA1G04R-N</b>    | MC.143104A125 | (4G50)          | 1            | 35.7  | 2345    |                                                                                       |
|                                                                                                                                                          | <b>PFSA2G04R-N</b>    | MC.143104A225 | (4G70)          | 2/0          | 40.0  | 2800    |                                                                                       |
|                                                                                                                                                          | <b>PFSA3G04R-N</b>    | MC.143104A325 | (4G95)          | 3/0          | 44.1  | 3850    |                                                                                       |
|                                                                                                                                                          | <b>PFSA4G04R-N</b>    | MC.143104A425 | (4G120)         | 4/0          | 46.8  | 5400    |                                                                                       |
|                                                                                                                                                          | <b>PFSA5G04R-N</b>    | MC.143104A525 | (4G150)         | 250          | 54.6  | 6000    |                                                                                       |
|                                                                                                                                                          | <b>PFSB1G04R-N</b>    | MC.143104B125 | (4G185)         | 350          | 60.9  | 7250    |                                                                                       |
|                                                                                                                                                          | <b>PFSB2G04R-N</b>    | MC.143104B225 | (4G240)         | 450          | 68.0  | 10500   |                                                                                       |
|  <p><b>Series 650</b><br/>CE - UL AWM</p>                             | <b>PFS15G04UR-N</b>   | MC.162041525  | (4G1.5)         | 16           | 10.5  | 80      |  |
|                                                                                                                                                          | <b>PFS13G04UR-N</b>   | MC.162041325  | (4G2.5)         | 14           | 12.3  | 120     |                                                                                       |
|                                                                                                                                                          | <b>PFS11G04UR-N</b>   | MC.162041125  | (4G4)           | 12           | 14.0  | 200     |                                                                                       |
|                                                                                                                                                          | <b>PFS09G04UR-N</b>   | MC.162040925  | (4G6)           | 10           | 15.6  | 260     |                                                                                       |
|                                                                                                                                                          | <b>PFS07G04UR-N</b>   | MC.162040725  | (4G10)          | 8            | 19.6  | 450     |                                                                                       |
|                                                                                                                                                          | <b>PFS05G04UR-N</b>   | MC.162040525  | (4G16)          | 6            | 22.0  | 695     |                                                                                       |
|                                                                                                                                                          | <b>PFS03G04UR-N</b>   | MC.162040325  | (4G25)          | 4            | 26.0  | 1145    |                                                                                       |
|                                                                                                                                                          | <b>PFS02G04UR-N</b>   | MC.162040225  | (4G35)          | 2            | 29.4  | 2100    |                                                                                       |
|                                                                                                                                                          | <b>PFSA1G04UR-N</b>   | MC.16204A125  | (4G50)          | 1            | 35.7  | 2345    |                                                                                       |
|                                                                                                                                                          | <b>PFSA2G04UR-N</b>   | MC.16204A225  | (4G70)          | 2/0          | 40.0  | 2800    |                                                                                       |
|                                                                                                                                                          | <b>PFSA3G04UR-N</b>   | MC.16204A325  | (4G95)          | 3/0          | 44.1  | 3850    |                                                                                       |
|                                                                                                                                                          | <b>PFSA4G04UR-N</b>   | MC.16204A425  | (4G120)         | 4/0          | 46.8  | 5400    |                                                                                       |
|                                                                                                                                                          | <b>PFSA5G04UR-N</b>   | MC.16204A425  | (4G150)         | 250          | 54.6  | 6000    |                                                                                       |
|                                                                                                                                                          | <b>PFSB1G04UR-N</b>   | MC.16204B125  | (4G185)         | 350          | 60.9  | 7250    |                                                                                       |
|                                                                                                                                                          | <b>PFSB2G04UR-N</b>   | MC.16204B225  | (4G240)         | 450          | 68.0  | 10500   |                                                                                       |
|  <p><b>Series 750</b><br/>CE - UL AWM<br/>UL LISTED - WTTTC - CIC</p> | <b>UFS13G04VFDR-N</b> | MC.164041325  | (4G2.5)         | 14           | 11.70 | 124     |  |
|                                                                                                                                                          | <b>UFS11G04VFDR-N</b> | MC.164041125  | (4G4.0)         | 12           | 13.10 | 194     |                                                                                       |
|                                                                                                                                                          | <b>UFS09G04VFDR-N</b> | MC.164040925  | (4G6.0)         | 10           | 15.10 | 279     |                                                                                       |
|                                                                                                                                                          | <b>UFS07G04VFDR-N</b> | MC.164040725  | (4G10.0)        | 8            | 19.20 | 449     |                                                                                       |
|                                                                                                                                                          | <b>UFS05G04VFDR-N</b> | MC.164040525  | (4G16.0)        | 6            | 22.70 | 696     |                                                                                       |
|                                                                                                                                                          | <b>UFS03G04VFDR-N</b> | MC.164040325  | (4G25.0)        | 4            | 26.20 | 1058    |                                                                                       |
|                                                                                                                                                          | <b>UFS02G04VFDR-N</b> | MC.164040225  | (4G35.0)        | 2            | 29.10 | 1453    |                                                                                       |
|                                                                                                                                                          | <b>UFSA1G04VFDR-N</b> | MC.16404A125  | (4G50.0)        | 1            | 34.50 | 2073    |                                                                                       |
|                                                                                                                                                          | <b>UFSA2G04VFDR-N</b> | MC.16404A225  | (4G70.0)        | 2/0          | 37.80 | 2875    |                                                                                       |
|                                                                                                                                                          | <b>UFSA3G04VFDR-N</b> | MC.16404A325  | (4G95.0)        | 3/0          | 44.50 | 3858    |                                                                                       |
|                                                                                                                                                          | <b>UFSA4G04VFDR-N</b> | MC.16404A425  | (4G120.0)       | 4/0          | 48.30 | 4837    |                                                                                       |
|                                                                                                                                                          | <b>UFSA5G04VFDR-N</b> | MC.16404A525  | (4G150.0)       | 250          | 52.10 | 6008    |                                                                                       |
|                                                                                                                                                          | <b>UFSB1G04VFDR-N</b> | MC.16404B125  | (4G185.0)       | 350          | 56.40 | 7371    |                                                                                       |
|                                                                                                                                                          | <b>UFSB2G04VFDR-N</b> | MC.16404B225  | (4G240.0)       | 450          | 63.20 | 9.522   |                                                                                       |



#### EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the

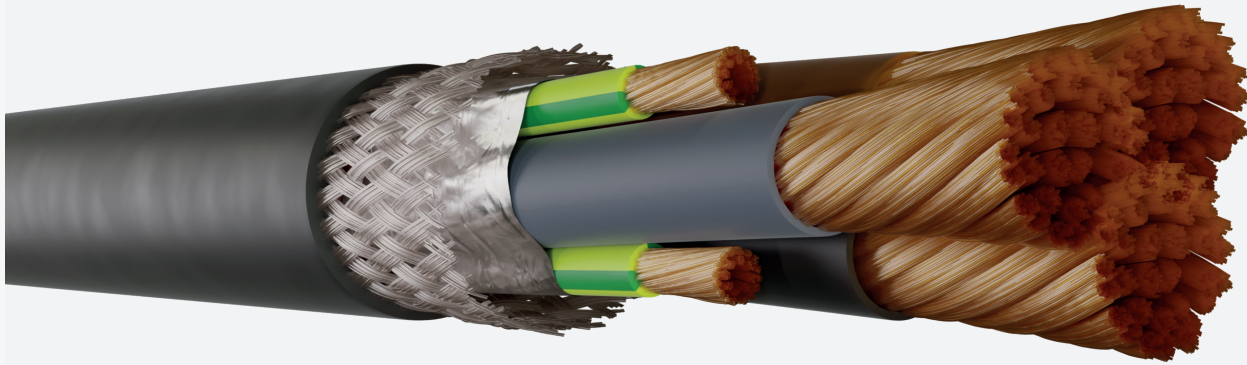


#### SPAC CAVI

All the codes are available in the SPAC CAVI system (use MotionCables item code).

The names of trademarks and standards are provided for reference or information purposes only. These trademarks and standards are the exclusive property of their respective owners (see the complete list on the back cover).

Low capacitance cables for inverter systems, PUR FRFH sheath, Oil Resistant, Demi-Static Application - **Series 800 - Halogen Free**



**UL 21209**  
90 °C - 1000V



**AWM I/II A/B**  
90 °C - 1000V



**LABS  
Free**



UPON



**10 million**  
CYCLES



**6,5 x O.D.**  
MIN. BENDING RADIUS



**600 m / min**  
MAX. SPEED



**60 m / s²**  
ACCELERATION



**≤ 50 N / mm²**  
PULLING FORCE



**± 30 ° / m**  
TORSION



**50 m**  
MAX. HORIZ. TRAVEL

|                               | m.u.   |           |           |           |           |
|-------------------------------|--------|-----------|-----------|-----------|-----------|
| <b>CYCLES</b>                 | MIL    | 0,2       | 1         | 5         | 10        |
| <b>MIN. BENDING RADIUS</b>    | x O.D. | 12        | 6,5       | 7,5       | 10        |
| <b>MAXIMUM SPEED</b>          | m/min  | 180       | 600       | 300       | 240       |
| <b>MAXIMUM ACCELERATION</b>   | m/s²   | 2,0       | 50        | 30        | 15        |
| <b>PULLING FORCE</b>          | N/mm²  | ≤ 50      | ≤ 20      | ≤ 20      | ≤ 20      |
| <b>TORSION</b>                | °/m    | -         | ± 30      | ± 30      | ± 30      |
| <b>MAX. HORIZONTAL TRAVEL</b> | m      | -         | 3         | 15        | 50        |
| <b>TEMPERATURE</b>            | °C     | -50 / +90 | -40 / +90 | -40 / +90 | -40 / +90 |



**Test Voltage** 4,0 kV x 5 min  
acc.to EN 50395



**Insulation Resistance** ≥ 1.0 GΩ x km @  
20 °C



**Max. Short Circuit** 250 °C ( ≤ 1s)



**Operating Voltage** 1000 V (UL/CSA)  
U<sub>0</sub>/U 0.6/1.0 kV



OIL RESISTANT



FLAME



COLD RESISTANT



ABRASION



EMC PROTECTED



WATER



UV RESISTANT



MICROBE



OZONE



MUD RESISTANT

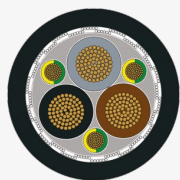


HALOGEN FREE

## MAIN ADVANTAGES

|                                                 |                                                                                             |
|-------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Symmetrical 3+3G Structure</b>               | Perfect balance of electric fields and reduction of return currents to ground.              |
| <b>Low Electrical Capacitance Insulation</b>    | Higher transmission efficiency with VFD drives and reduction of the dV/dt effect.           |
| <b>High-Flexibility PVC or PUR Outer Jacket</b> | Ease of installation and long service life even in semi-dynamic or mobile installations.    |
| <b>Full Shielding (Foil + Copper Braid)</b>     | Effective EMC protection against high-frequency disturbances and interference.              |
| <b>Construction according to HD 308 S2</b>      | Phase conductors colored according to European standard for maximum recognition and safety. |
| <b>High Thermal Resistance up to 90°C</b>       | Constant performance even in continuous duty cycles or with high temperatures.              |
| <b>CE, UL, CSA, NFPA 79, TC-ER Compliance</b>   | Suitable for industrial installations in Europe, the USA, and Canada.                       |
| <b>Controlled Mechanical Flexibility</b>        | Ideal for fixed or semi-mobile systems with long-term reliability.                          |

Scan the QRcode for a more detailed digital version on our website



**Series 800**  
CE - UL AWM

| MotionCables code    | EPlan Code   | Formation        | AWG<br>Kcmil | Ø    | Cu      | DATA SHEET |
|----------------------|--------------|------------------|--------------|------|---------|------------|
|                      |              | mm <sup>2</sup>  |              | mm   | kg / km |            |
| <b>PDSI15G06UP-N</b> | MC.343061535 | (3x1.5 + 3G0.25) | 16           | 10.0 | 80      |            |
| <b>PDSI13G06UP-N</b> | MC.343061335 | (3x2.5 + 3G0.5)  | 14           | 11.5 | 121     |            |
| <b>PDSI11G06UP-N</b> | MC.343061135 | (3x4.0 + 3G0.75) | 12           | 13.0 | 176     |            |
| <b>PDSI09G06UP-N</b> | MC.343060935 | (3x6.0 + 3G1.0)  | 10           | 14.4 | 247     |            |
| <b>PDSI07G06UP-N</b> | MC.343060735 | (3x10.0 + 3G1.5) | 8            | 17.6 | 402     |            |
| <b>PDSI05G06UP-N</b> | MC.343060535 | (3x16 + 3G2.5)   | 6            | 20.0 | 621     |            |
| <b>PDSI03G06UP-N</b> | MC.343060335 | (3x25 + 3G4.0)   | 4            | 23.6 | 949     |            |
| <b>PDSI02G06UP-N</b> | MC.343060235 | (3x35 + 3G6.0)   | 2            | 27.0 | 1303    |            |
| <b>PDSIA1G06UP-N</b> | MC.34306A135 | (3x50 + 3G10.0)  | 1            | 32.5 | 1877    |            |
| <b>PDSIA2G06UP-N</b> | MC.34306A235 | (3x70 + 3G10.0)  | 2/0          | 36.5 | 2523    |            |
| <b>PDSIA3G06UP-N</b> | MC.34306A335 | (3x95 + 3G16.0)  | 3/0          | 40.4 | 3443    |            |
| <b>PDSIA4G06UP-N</b> | MC.34306A435 | (3x120 + 3G16.0) | 4/0          | 43.8 | 4190    |            |
| <b>PDSIA5G06UP-N</b> | MC.34306A535 | (3x150 + 3G25.0) | 250          | 50.4 | 5341    |            |
| <b>PDSIB1G06UP-N</b> | MC.34306B235 | (3x185 + 3G35.0) | 350          | 56.0 | 6678    |            |
| <b>PDSIB2G06UP-N</b> | MC.34306B235 | (3x240 + 3G50.0) | 450          | 63.0 | 8250    |            |



#### EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the



#### SPAC CAVI

All the codes are available in the SPAC CAVI system (use MotionCables item code).

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