

MOTION**CATALOGUE**

2026

The background of the page is a grayscale photograph of an industrial facility, possibly a factory or warehouse, featuring high ceilings, structural beams, and large windows. Overlaid on this image are several large, semi-transparent red circles of varying sizes, creating a modern, abstract design. The text is positioned in the center-left area, within one of these red circles.

*Flexibility
Responsiveness
Trust*

MOTION CABLES

At MOTION**CABLES**, **every cable is** conceived as **an engineered component** — designed **for lasting, high-performance operation**. Our commitment is to deliver solutions of the highest quality, built on a foundation of profound technical knowledge and a relentless focus on control.

Our process goes far beyond simple reproduction. It is a meticulous journey that considers every fundamental aspect of design, from material selection and conductor structure to jacket compounds and shielding. This **deep understanding of all critical elements** is what allows us to transform raw materials into a high-performance cable that excels in dynamic, demanding environments.

The result is a cable engineered to ensure measurable reliability over time. Each product is a testament to our rigorous quality control and technical expertise, ensuring **it provides consistent, long-lasting performance for your applications.**

BEING DIFFERENT

There are various ways to achieve meaningful change, some of which are less obvious at first but whose value is proven through sustained effort.

Our approach to distinction is rooted in:

- **Proactive collaboration.**
- **Meticulous attention to detail.**
- **Careful selection of raw materials.**
- **Rigorous process control.**

Instead of following conventional approaches, we have consistently invested in control, customization, and testing.

This new edition explains our methods in detail, clarifying the technical rationale behind every design choice.

MOTION**CABLES** THINKS LIKE YOU

EVERY PROJECT COMES FROM A REAL NEED

The philosophy of MOTION**CABLES** is rooted in a practical approach. Each product is born from a specific customer request, not from standardized production or market trends. The goal is to solve real-world problems with customized and reliable solutions, suitable for demanding industrial sectors such as automation, robotics, and harsh environments. The entire range of cables is constantly evolving, following a single rule: real functionality for the customer.

For MOTION**CABLES**, reliability is not just a statement; it is demonstrated with verifiable facts. Every cable is designed in compliance with international standards, internally tested in simulated environments, and supported by comprehensive, traceable documentation. Mechanical, chemical, and electrical test data are archived for each lot, ensuring compliance.

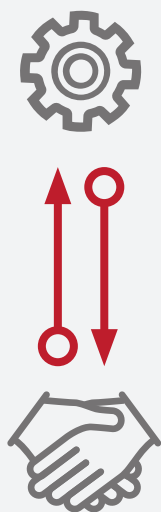
WHY DO WE THINK LIKE YOU?

- Because we understand the corporate dynamics related to the technical and operational management of cables.
- Because we know that reliability means preventing downtime and ensuring continuous operation.
- Because we know that a good supplier, means having prompt, precise, and documented answers.
- Because we know that, for you, quality is a fact, not a promise.

Every MOTIONCABLES solution is designed to anticipate issues, simplify integration, and ensure process continuity.

MOTION**CABLES** does more than just sell products; it acts as a true strategic partner. The company works closely with manufacturers, integrators, and large industrial groups, interpreting their requests, verifying them in the lab, and designing solutions that work perfectly in the intended environment. This approach makes it possible to anticipate problems, reduce project validation times, and offer unique solutions.

This dedication to standards has allowed the company to exceed expectations and gain recognition from certifying bodies and major international groups. With global certifications such as UL and CSA, and specific validations from key OEMs, MOTION**CABLES** products are already pre-approved for the most critical projects. This reduces qualification costs for customers and provides an extended guarantee of reliability on an international scale.



The development and production process is defined by a close **collaboration between the client's technical teams and our internal teams.**

The **four** main **phases** of this collaboration are:

- 1. Preliminary Analysis & Co-design:** Through technical meetings and co-design sessions, we precisely define the functional, environmental, and regulatory requirements.
- 2. Active Client Participation:** The client actively participates in initial tests, providing immediate feedback that allows us to optimize the project during the development phase.
- 3. Transparent Communication:** Dedicated digital platforms and shared technical reports ensure a constant flow of information, preventing misunderstandings and delays.
- 4. Agile Adaptations:** Thanks to our flexible production, requested modifications are implemented promptly, ensuring a quick response to market needs.

1

PRELIMINARY ANALYSIS

2

PROTOTYPING AND TESTING

3

TRANSPARENT COMMUNICATION

4

RAPID ADAPTATIONS

"Flexibility, Responsiveness, Trust."

The essence of our client relationships is rooted in being a reliable partner. We believe this means more than just providing excellent products; it's about ensuring continuous and timely support, fostering open communication, and demonstrating a constant capacity for adaptation. This is how we create shared value and build solid, long-lasting collaborations.

SMART **OEM'S** SERVICES

IT'S NOT JUST A CABLE: IT'S EVERYTHING YOU NEED IN BETWEEN

ONLINE TECHNICAL CONFIGURATORS

Guided cable selection based on: protocol, environment, motion, EMC requirements, and certifications.

- ◉ Downloadable versions in a technical PDF or STEP 3D format for CAD integration.
- ◉ Rapid Prototyping.
- ◉ Functional samples delivered in a timely manner (within 48-72 hours for protected product ranges).
- ◉ Technical support for the client's internal validation process.
- ◉ Full alignment with subsequent documentation, including datasheet, traceability, and CPF.

BENEFIT FOR THE OEM: A SIGNIFICANT REDUCTION IN TIME-TO-VALIDATION.

DIGITAL TRACKING

In advanced industrial settings, traceability is an integral part of quality. MOTION**CABLES** implements advanced identification systems for both individual cables and production batches.

- ◉ Each cable or package includes a unique QR code giving instant access to datasheet, test results, and certificates.
- ◉ Integrated RFID (on request): Enables rapid identification even in complex environments and ensures compatibility with MES/ERP systems.
- ◉ Digitally tracked lots: Every production run is archived and accessible for recalls, audits, and quality control.
- ◉ All of this is integrated into the Certified Performance File (CPF), which is provided with every project.

BENEFITS FOR OEMS: THIS ADVANCED TRACEABILITY SIMPLIFIES DOCUMENTATION, ACCELERATES AUDITS, AND PROVIDES FULL ASSURANCE ON ALL BATCHES AND SUPPLIES.



A reliable cable is just the beginning.

What truly makes a project high-performing is the entire system of services that supports it: configuration, prototyping, traceability, compliance, and logistics.

MOTION**CABLES** has developed an ecosystem of intelligent and integrated services designed to facilitate every phase, from engineering to mass production.

BUILT IN TECHNICAL SUPPORT: FROM AN R&D TO QUALITY

We're not just a vendor; we're a complete technical partner. We work side-by-side with your design, quality, and compliance departments to streamline the process from concept to mass production. Our services include:

- Initial design consultation.
- Technical file support.
- OEM technical dossiers.
- Safety data sheets and RoHS/REACH declarations are always available.
- We actively collaborate with technical offices, R&D, quality, and purchasing departments.

BENEFITS FOR THE OEM: OUR SERVICES PROVIDE REAL ENGINEERING SUPPORT, FEWER COMPLIANCE ROADBLOCKS, AND FASTER APPROVALS.

SMART LOGISTIC

Delivering a great cable is pointless if it arrives late, is unmanageable, or comes in unusable formats. That's why

MOTION**CABLES** offers tailored logistics services designed for the OEM's production environment. Available services include:

- Kanban and Call-off.
- Medium-to-long-term forecasting.
- Custom cutting.
- Pre-labeled cable kits.

All of this is managed by a reactive logistics system that can adapt to production peaks or urgencies very quickly.

BENEFITS FOR THE OEM: OUR LOGISTICS SERVICES OPTIMIZE INVENTORY, REDUCE WASTE, AND IMPROVE PRODUCTION EFFICIENCY.

A CABLE IS AN **OPERATIONAL GUARANTEE.**

At MOTION**CABLES**, we don't design simple components.

We design engineering solutions that operate reliably and consistently within your systems. Every meter of cable is born from a deep understanding of the reality in which it will operate: mechanical stresses, electromagnetic interference, repetitive cycles, and aggressive environments.

Our process starts not from a predefined product, but from the specific operational requirements of each customer.

In a sector where everything changes—technologies, regulations, production cycles—MOTION**CABLES** **has chosen to build its identity on a stable and concrete value: reliability.**

- ◉ We're not talking about an abstract concept, but **a measurable result.**
- ◉ Reliability means a cable that performs after millions of cycles, maintains signal integrity, and resists chemical or thermal stress.
- ◉ Reliability is when it doesn't interfere with the signal it's carrying.
- ◉ Reliability is when, under thermal or chemical stress, it continues to meet its initial specifications.

In other words:

**RELIABILITY IS
A TECHNICAL PROMISE
THAT WE CAN DEMONSTRATE**

MOTION**CABLES** METHOD

**WITH THE METHOD, WE BUILD
ENGINEERING CERTAINTIES, NOT JUST
SIMPLE CABLES.**



KNOWLEDGE

We analyze real-world conditions: temperature, motion, washdowns, EMC interference, and operational cycles



DESIGN

We select geometries, materials, and shielding based on the specific environment.



TESTING

We simulate dynamic cycles, extreme conditions, EMC coexistence, and chemical stresses.



CERTIFICATION

We issue test certificates, reports, data sheets, and approvals that are valid worldwide (UL, IEC, CSA, RoHS, REACH).

DESIGNING WITH THE TEST ALREADY IN MIND

For us, testing is not a final step — it's an integral part of the design process. Every test is anticipated, simulated, and integrated right from the cable's development phase.

When we design, we already know:

- ◉ How the cable will be tested.
- ◉ What stresses it will have to withstand.
- ◉ Where it might fail if we don't anticipate the problem.

This laboratory philosophy has generated our proprietary S.U.R.E.C.A.B.L.E. protocol and can be summarized as follows: **don't adapt the cable to the standard, but adapt it to your world.**

WE TRANSFORM YOUR NEEDS INTO INTEGRATED CERTAINTIES.

Your needs aren't just technical; they're operational, managerial, regulatory, and logistical. That's why we don't just offer you a cable that meets specifications; we also offer you:

- ◉ A codified process.
- ◉ Predictive testing.
- ◉ Ready-to-use documentation.
- ◉ Responsive technical support.
- ◉ Complete traceability.

Every element you need is already integrated into our design and production methods. We don't just give you an answer; we provide you with a tailored certainty.

HOW MOTION **CABLES** DESIGNS A NEW CABLE

THE EVOLUTIONARY SPIRAL OF QUALITY

Every MOTION **CABLES** cable is the result of a structured engineering process — not a standard production cycle. This journey isn't linear but cyclical and progressive: with each iteration, our expertise, our precision, and your assurance increase. We call it the evolutionary spiral of quality: a structured process that transforms every request into a product ready for your environment, your constraints, and your operational expectations.

THINK

HERE, WE TRANSFORM INFORMATION INTO DESIGN INTELLIGENCE.

Through risk modelling, material selection, and a specific design logic, we utilize preventative analysis tools like:

- ▶ FMEA (Failure Mode & Effects Analysis) – to anticipate potential failures.
- ▶ RAMS (Reliability, Availability, Maintainability, Safety) – to ensure long-term performance.
- ▶ Stress/Material Matrix – to match geometries, compounds, and shielding to specific requirements.

THE OBJECTIVE IS TO TURN INFORMATION INTO A PROACTIVE DESIGN STRATEGY.

KNOW

NORM AND USAGE ANALYSIS

Every project starts with a listening and technical analysis phase. We don't just want to know what you need; we want to understand where, how, and why you will use it.

We collect data on:

- ▶ Type of installation (fixed, mobile, robotic, chain).
- ▶ Environment (temperature, chemical agents, humidity, EMC interference).
- ▶ Applicable regulations (UL, IEC, CSA, RoHS, FDA, etc.).
- ▶ Previous experience (successes and problems).

OBJECTIVE: TO REPLICATE IN THE LABORATORY WHAT HAPPENS IN YOUR PLANT.

2

CERTIFY

INTERNATIONALLY RECOGNIZED COMPLIANCE

Every completed project is validated with documented compliance tests:

Available certifications:

- ▶ UL, CSA, CE, RoHS, REACH.
- ▶ TÜV, VDE, FDA (for food-grade cables).
- ▶ Tests according to IEC 60228, 60811, 60332, EN 50395, etc.

In addition, many cables are already approved by international OEMs.

OBJECTIVE: A GUARANTEE OF DIRECT INTEGRATION INTO CERTIFIED SYSTEMS.

6

1

DESIGN

3

ADVANCED SIMULATIONS TO ANTICIPATE FUTURE CRITICALITIES

This is the phase that sets us apart: we don't just test. We predict. We use:

- ▶ FEM models to predict thermal hot spots.
- ▶ Mechanical decay curves under accelerated stress.
- ▶ Dynamic EMC coexistence tests (real-world disturbances).
- ▶ Post-stress microscope analysis to highlight degenerative phenomena.

RESULT: A RELIABLE ENGINEERING ESTIMATE OF THE CABLE'S USEFUL LIFE WITH A BUILT-IN SAFETY MARGIN.

CUSTOM DESIGN: LAYOUT, SECTIONS, SHIELDING, JACKETS

This phase translates the technical logic into an industrializable design.

Each cable is designed with:

- ▶ Sections optimized to reduce dissipation and bulk.
- ▶ Jacket selected based on temperature, chemistry, and flexibility.
- ▶ Combined shielding (braid + tape + drain) for dynamic EMC tightness.
- ▶ Custom layout (hybrid: power + signals + bus).

OBJECTIVE: THE DESIGN IS NOT JUST COMPLIANT WITH THE STANDARDS BUT IS CONCEIVED TO WITHSTAND REALITY.

PRODUCE

4

PRODUCTION INTERCONNECTED WITH LABORATORIES

Every production phase is controlled, tracked, and digitally interconnected.

Our production:

- ▶ Uses dedicated lines for dynamic and high-precision cables.
- ▶ Integrates optical vision systems for real-time concentricity and ovality control.
- ▶ Tracks each batch with digital identification codes.

The laboratory is connected in real-time with production: every out-of-tolerance variation generates an immediate alert.

OBJECTIVE: EVERY METER PRODUCED IS ALSO A CERTIFIED METER.

FORESEE

7

5

VERIFY

ADVANCED TESTING ON ALL FUNCTIONAL PARAMETERS

Our testing isn't just "up to standard"; it's based on simulated reality. We verify:

- ▶ Dynamic cycles: bending, torsion, traction (up to 50 million).
- ▶ EMC integrity: with a VNA up to 1 GHz.
- ▶ Chemical resistance: immersion in detergents, acids, and greases.
- ▶ Accelerated aging: in climatic chambers from -40 to +180 °C.

Every result is archived in the CPF – Certified Performance File associated with the cable.

OBJECTIVE: TO GUARANTEE THE LIFESPAN EVEN BEFORE USE.

MOTIONTECHCORE: THE TECHNOLOGICAL CORE OF MOTIONCABLES

TESTING IS DESIGNING. VERIFYING IS PREVENTING

MOTIONTECHCORE is MOTIONCABLES' applied laboratory, combining scientific research and industrial testing to maximize reliability and durability.

In our experimental centre, we use a combination of Digital Twin, Artificial Intelligence, and experimental protocols to test every cable in extreme conditions, faithfully replicating real-world operating scenarios.

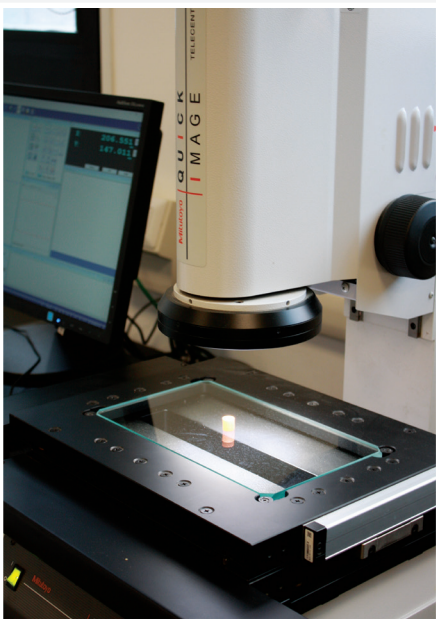
MOTIONTECHCORE is interconnected, scalable, and industrially-oriented, divided into three integrated operational areas:

- **Dynamic Tests:** Chain motion simulation, 3D torsion, cyclic bending.
- **Environmental and Chemical Tests:** Resistance to external agents, thermal variations, and humidity.
- **Electrical and EMC Tests:** Shielding, attenuation, dielectric strength, and losses.

Every production batch can be sampled, tested, and documented, even according to specific customer requirements. The facility is constantly evolving, with annual updates based on our R&D plan.

HIGH-TECH INSTRUMENTATION

To ensure measurement accuracy, we employ instrumentation typically used in certified research laboratories. Key equipments:



Tool	Main Function
VNA – Vector Network Analyser	Measures shielding attenuation, losses, and EMC coexistence
Programmable Climatic Chambers	Simulates -40 °C to +180 °C with cyclic thermal shocks
Spark Tester 15kV	Verifies jacket integrity over continuous length
Digital Microscopes	Analyses micro-cracks and material degeneration post-test
Bending and Torsion Test Bench	Performs cyclic tests with >50M dynamic movements
Vibrational and Thermo-Mechanical Test Benches	Applies combined multiple stresses
Tools for Accelerated Aging	Predicts useful life in severe environments

CONTINUOUS INVESTMENTS IN RESEARCH AND DEVELOPMENT

The laboratory functions both as a testing facility and a catalyst for innovation. Every year, MOTIONCABLES allocates an increasing share of its revenue to R&D, with two main goals:

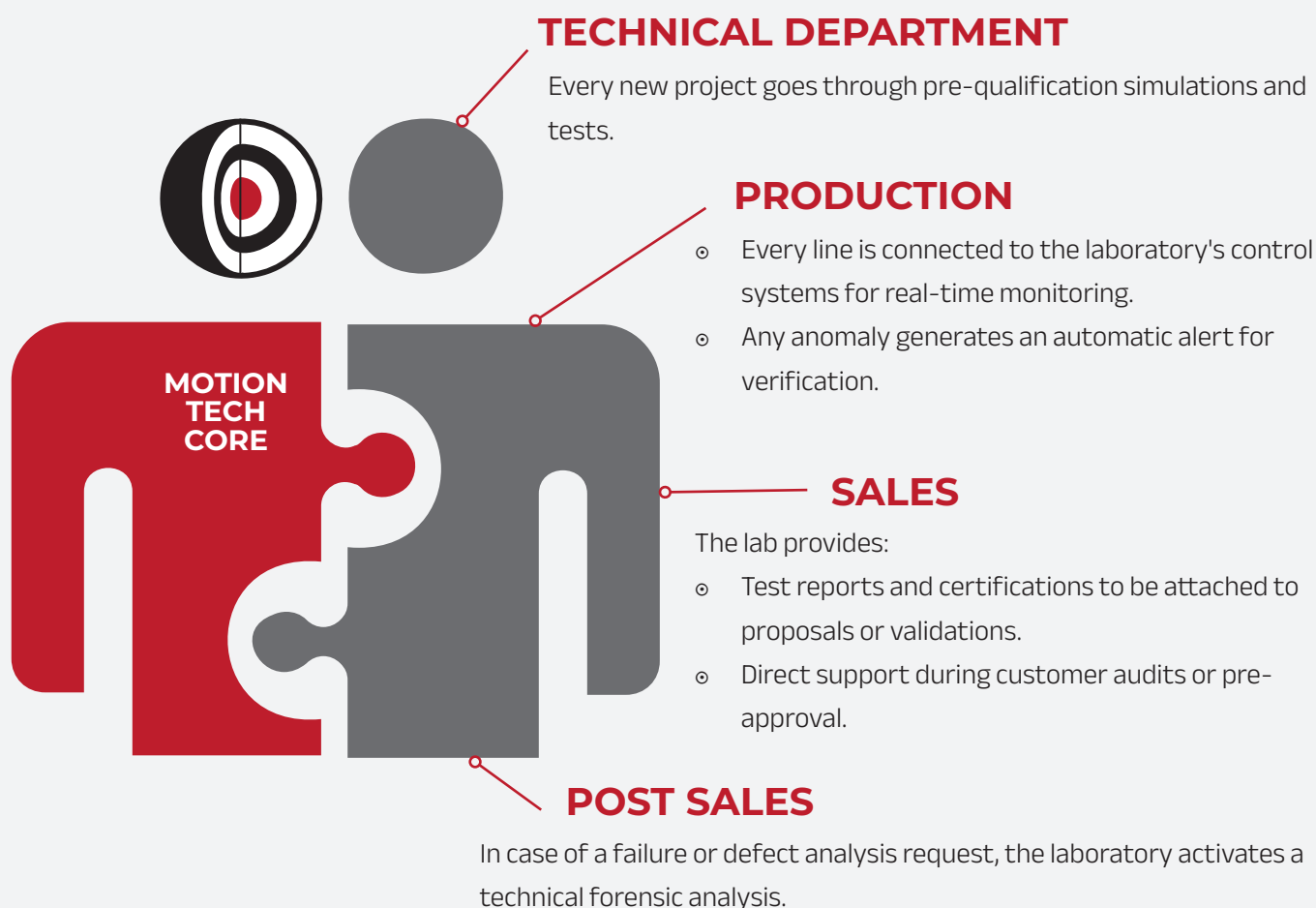
1. To **improve the performance** of existing cables, extending their lifespan and applicability.
2. To **design new solutions** in response to specific market demands.

This allows us to:

- **Anticipate** regulatory trends.
- **Reduce** the time-to-market for new products.
- **Propose** patentable or exclusive solutions for our OEM partners.

The laboratory works in continuous synergy with:

- The technical department.
- Quality and industrialization.
- Customers who require special validations.

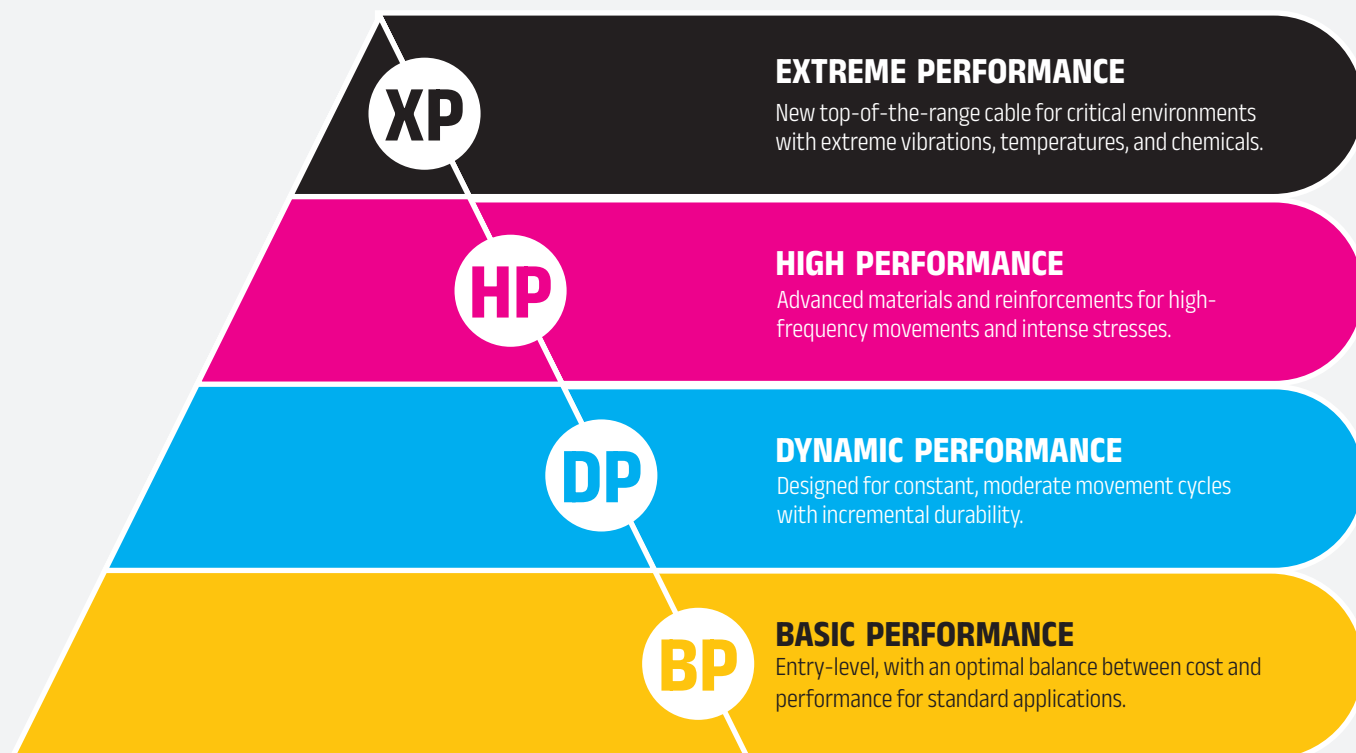


A CONTINUOUS AND REAL
CONNECTION BETWEEN THE
LABORATORY AND COMPANY
DEPARTMENTS

VALIDATION AND **PERFORMANCE** CLASSES

CATEGORIZING EACH CABLE BY APPLICATION STRESS AND SERVICE LIFE

To simplify cable selection and performance comparison, we have developed the M.A.S.T.E.R. classification system. Each cable is labelled with its class, making it simple for the customer to identify the reliability level.



This classification is based on the **M.A.S.T.E.R.** logic, a proprietary system that classifies **MOTIONCABLES** cables based on real performance, certified lifespan, and operating environment. **M.A.S.T.E.R.** identifies our proprietary testing framework:

MOTIONCABLES **A**PPPLICATION-**S**PECIFIC **T**ESTING FOR **E**NDURANCE & **R**ELIABILITY

M.A.S.T.E.R. It's more than just an acronym; it's a way to:

- Help you select the optimal cable specification for your application.
- Simplify communication between technical staff, buyers, integrators, and designers.
- Make every available option transparent and comparable.

The 4-level classification is built as a result of:

- **M**anaged and repeatable laboratory tests.
- **A**ssessed and documented performance parameters.
- **S**imulated operating lifespan.
- **T**ypical application environments.
- **E**nvironmental compatibility.
- **R**egulatory validations passed.

WHO CAN TAKE ADVANTAGE OF THE M.A.S.T.E.R. SYSTEM?



DESIGNERS

It clearly defines the required cable performance.



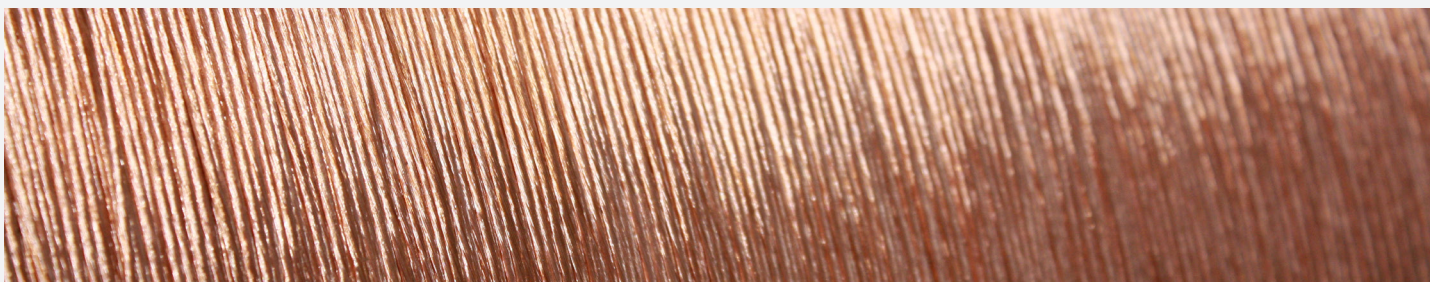
SALES OFFICE

It simplifies selection and allows for objective comparisons..



OEM CUSTOMER

It offers a coherent scheme to be integrated into specifications, technical documents, and proposals.



WHAT ARE THE DIFFERENCES BETWEEN EACH LEVEL?

Characteristic	BP	DP	HP	XP
Installation Type	Fixed	Moderate movement	Continuous movement	Robotic / 3D torsion
Environment	Standard	Light industrial	Continuous production	Extreme, variable, dynamic
Bending Test	No	Yes (2-5M)	Yes (10M)	Yes (20M+)
EMC Compatibility	Standard	Good	High (multiple shielding)	Extreme (dynamic VNA test)
Standard Jacket	PVC	PVC	PUR	Special PUR
Typical Certifications	CE, UL AWM, CSA	CE, UL AWM, CSA	CE, UL AWM, CSA	CE, UL AWM, CSA
Price Range	€	€€	€€€	€€€€

EVERY CLASSIFICATION IS RELATED TO SPECIFIC TEST

Class	Dynamic Tests	Environmental Tests	EMC Tests	Documentation
BP	Not required	Basic	Not critical	Basic datasheet
DP	Standard bending	Aging + humidity	Shielding tests	Cycle report + VDE
HP	Advanced Bending	Thermal shock + oils	Dynamic EMC + VNA	Full CPF
XP	Extreme Bending	UV + harsh chemical agents	Real-world coexistence	CPF + QR traceability

STANDARDS AND CERTIFICATION

GOING BEYOND THE STANDARD TO OVERCOME UNCERTAINTY

INTERNATIONAL STANDARDS AND APPLICATIONS BY CATEGORY

International standards form the backbone of our design, production, and validation processes, ensuring full regulatory compliance. Among the most relevant are:



IEC (International Electrotechnical Commission)

These standards are applied primarily to electrical and electronic components, as well as automation and control systems. For example, IEC 60204 for the safety of electrical machinery is indispensable for industrial control panels.



EN (European Norms)

These are harmonized directives that allow access to the European market. They include standards such as EN ISO 13849 for the functional safety of control systems.



UL (Underwriters Laboratory)

Safety standards typically required for products intended for the North American market, ensuring that components meet strict requirements for the prevention of fires, electric shocks, and other risks.



ISO (International Organization for Standardization)

It covers a broad range of areas, from quality management procedures (ISO 9001) and environmental requirements (ISO 14001) to specific standards for functional safety (ISO 26262, ISO 13849).



ASTM (American Society for Testing and Materials)

It provides technical specifications for materials and processes, which are essential to ensure the resistance, durability, and compatibility of materials used in industrial applications.

The categorization of standards is based on the application sector, including electrical, mechanical, functional safety, environmental, quality management, etc. This approach allows for the application of the most relevant standards to each specific component or process, **ensuring precise and targeted compliance**.

In today's industrial context, **the reliability of a product** or system is measured not only by its technical performance but also **by its compliance with internationally recognized standards and regulations**.

Going beyond standards allows us to reduce uncertainty and guarantee consistent safety and compatibility.

OEM APPROVALS: A STRATEGICAL COLLABORATIONS

In advanced automation and motion systems, cables are not passive components — they are essential elements for consistent system performance. At MOTION**CABLES**, we understand that for a machine to operate reliably over millions of cycles, its cables must be perfectly integrated, not just electrically, but mechanically and thermally.

This is why one of our most significant value propositions, and a key driver of our quality, is our deep collaboration with Original Equipment Manufacturers (OEMs) and end-users.

We don't simply offer a catalogue of standard cables. Our process begins long before production, often during the OEM's initial machine design phase. This collaborative approach ensures the cable solution is an integrated part of the system—not an afterthought that might compromise performance later.

WHY IS THIS INTENSE COLLABORATION A CRUCIAL QUALITY VALUE THAT WE PASS ON TO OUR CUSTOMER?

1. GUARANTEED SYSTEM COMPATIBILITY AND RELIABILITY

When you purchase a MOTION**CABLES** product, you're not getting a generic "high-flex" cable. You are receiving a product that has already proven itself under the exact conditions specified by the industry leaders and machine builders.

- **Minimizing Downtime:** Cables tested to OEM standards are pre-validated against the real-world stresses of automated systems. This significantly reduces the risk of unexpected cable failure, which is the leading cause of expensive machine downtime.
- **Predictable Service Life:** We can provide more accurate service life estimates (e.g., 10 million cycles at X travel speed) because those numbers are based on testing protocols that directly mimic the application, not just an arbitrary lab standard.

2. COMPLIANCE AND STANDARDIZATION

In specialized industries like Food & Beverage, Automotive, or Robotic, regulatory compliance is non-negotiable.

- **Simplified Integration:** By adhering to OEM-defined production and testing methods, our cables often come with an implicit approval for integration into complex, pre-certified machine designs. This simplifies your internal compliance checks and speeds up commissioning.
- **Traceability:** Our detailed testing and production records, mandated by the strict OEM protocols, provide a full chain of traceability for every batch, confirming that the cable meets all agreed-upon standards.

FROM METHOD TO INNOVATION

Every step of our method — from predictive design to real-world validation — feeds directly into the development of new product lines. Each family in our catalog is not just the outcome of standard engineering, but the result of measurable data collected in our MotionTechCore laboratory. By linking method and innovation, MOTIONCABLES transforms testing insights into next-generation cables, designed to perform reliably in specific industries such as robotics, automation, and food processing. This is how research becomes a tangible advantage for our partners: every new line is an evolution proven by numbers.

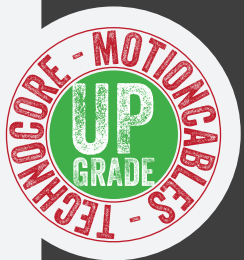
MOTIONCABLES: NEWS AND UPGRADES



MOTIONCABLES - TECHNOCORE - NEW!

This stamp marks the introduction of a brand new cable line, developed from the ground up to master a unique application or environment.

As these products evolve from proven cable families, we're providing a concise summary of their performance capabilities. Comprehensive technical data will follow shortly in a dedicated brochure.



MOTIONCABLES - TECHNOCORE - UPGRADE

This label identifies new developments from our TECHNOCORE lab — the result of applied R&D and advanced testing.

It combines advanced technology, extensive experience, and specialized design — delivering high-performance cable solutions backed by proven expertise.

SEE AT
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MOTIONSERVOCORE LCX

LOW CAPACITANCE EXTENDED SERVOMOTOR CABLES

Thanks to the adoption of an **optimized structure with ultra-low parasitic capacitance**, these cables offer superior electrical performance, making them ideal for connecting inverters and motors in servo-assisted systems. Best performances: **25% less than the best "Low Capacitance" cables and 60% less than standard market cables.**



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MOTIONCLEANLINE

MOTIONCABLES **CLEANLINE** cables are designed as a critical component for operational continuity and safety in the demanding Food & Beverage sector. The core innovation is the MOTIONGUM jacket — a smooth, non-porous compound that prevents residue and bacterial build-up, strictly adhering to EHEDG and FDA hygienic design standards. These cables are highly resistant to aggressive wash-downs (IP69 K), extreme thermal cycles (-40° C to +105° C), and corrosive cleaning agents. Offering high electrical performance (600/1000V) and exceptional dynamic flexibility (>10million flex cycles), the **CLEANLINE** range is a robust, long-term investment that reduces facility downtime, lowers operational costs, and minimizes the risk of product contamination. They are engineered to ensure certified hygiene and maximum reliability across all processing zones.



MOTION**THERMLINE**

MOTION**THERMLINE** cables are engineered for dynamic applications where thermal variability is a critical factor. They ensure operational continuity, resistance to thermal aging, and optimal dynamic behaviour (suitable for use in cable carriers and robotics).

The product line is structured into three families, differentiated by temperature range and jacket/insulation compound, covering requirements from cryogenic processes and extreme cold to industrial furnaces and aggressive thermal cycles.



MOTION**ROBOTLINE**

MOTION**ROBOTLINE** cables are engineered for dynamic robotic applications involving high torsion and thermal conditions from -50 °C to +90 °C.

They comply with UL AWM standards, and are available in shielded or unshielded versions, including hybrid layouts combining power, control, and high-frequency data (up to 100 MHz). The range is structured into three families based on the guaranteed torsion level, maximum reliability across all processing zones, differentiated by axes range and jacket/insulation compound.



MOTIONCABLES Achieves **ECOLAB** Certification

MOTION**CABLES** is proud to announce a pivotal achievement that reinforces our commitment to excellence and quality: securing the prestigious **ECOLAB Certification**.

This rigorous recognition confirms that the materials used in our cables are resistant to the

most common chemical agents and detergents utilized in the stringent sanitization and hygiene processes of the Food & Beverage (F&B) industry. The **ECOLAB certification** guarantees our customers that MOTION**CABLES'** products:



- Maintain structural integrity even after repeated, aggressive washdown cycles.
- Ensure operational continuity without degradation to the jacket or insulation.
- Are the ideal choice for machinery in critical "splash zone" and "washdown" areas.

In alignment with this certification, we are launching the new MOTION**CLEANLINE** family, specifically engineered for these critical environments, combining dynamic reliability with superior chemical resistance.

HOW TO READ OUR CATALOGUE

Cable Series, specific name, identification and a short description of the cable itself.

Performance Level (BP, DP, HP), Outer Jacket material (PVC TM5, PUR FRHF...), Operative tension range, Operative temperature range (minus to maximum).

3D render of a relevant type of the cables family described in the page. Colour, sequence of conductors, and other aspects shown are for illustrative purposes only.

Major approval and standards related to the cable's family. In the red band are summarized the mechanical features the cable withstand.

The table gives more detail about the mechanical and thermal conditions the cable can operate: cycles, speed, acceleration, torsion and temperature according installation.

MS HP 600
MOTIONHYBRID SERVO
Hybrid OCT Servomotor cables, PUR outer sheath, Oil Resistant, High Dynamic Application, Halogen Free

HP **PUR** **600 V** **-50 °C**
FRHF **1000 V** **+90 °C**

UL 21209 90 °C - 1000V AWM I/II A/B 90 °C - 1000V CE LABS Free

10 million **6.5 x 0.0** **600 m / min** **60 m / s²** **≤ 50 N / mm²** **± 30 ° / m** **50 m**

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	HP	Q2	1	5	10
CYCLES	100	100	100	100	100
MIN. BENDING RADIUS	x 0.0	12	6,5	7,5	10
MAXIMUM SPEED	m/s	100	600	300	200
MAXIMUM ACCELERATION	m/s²	2,0	50	30	15
PULLING FORCE	N/mm²	≤ 50	≤ 30	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +90	-40 / +90	-40 / +90	-40 / +90

ELECTRICAL PROPERTIES

Test Voltage: 4,0 kV x 5 min acc to EN 50195 (1.8kV)

Insulation Resistance: ≥ 10 MΩ x km @ 20 °C acc to EN 50195 (1.8kV)

Max. Short Circuit Temperature: 180 °C (≤ 1s)

Operating Voltage: 1000 V (UL/CSA) 1000 V (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

MAIN ADVANTAGES

Latest Generation One Cable Architecture	Integrated transmission of power, brake, and digital data over a single high-performance cable
High-Resistance PUR Jacket	Excellent mechanical and chemical integrity even in harsh environments
Reinforced Structure for Long-Travel Cable Carriers and High Accelerations	Superior mechanical reliability even under extreme conditions
Communication Pair for Digital Feedback (DSL / S2N0 / EnDat3...)	Precise motor control and real-time diagnostics
Quasi-Layer Composite Shielding	Noise immunity even in systems with high EMC emissions
Resistance to Mineral Oils, Coolants, and Chemical Agents	Ideal for wet areas or applications with industrial contaminants
Extended Temperature Range and Dimensional Stability	Consistent performance from -40°C to +90°C
Advanced Solution for Industry 4.0	Supports predictive diagnostics, reduced downtime, and system digitalization

50 | MOTIONCABLES CATALOGUE

Main electrical properties of the cable's family.

According to the performance level and outer jacket, here you will find a shorten indication about resistance to chemicals and environment.

Quick list of main advantages the cable family can provide.

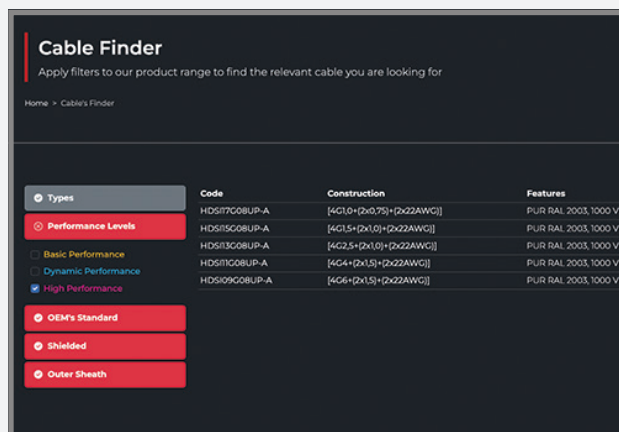
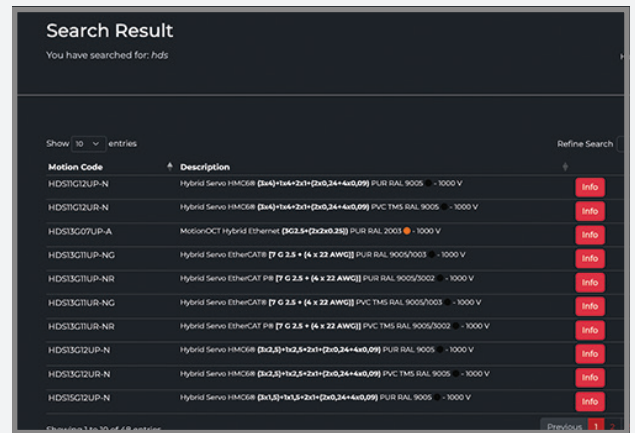
MOTIONCABLES ON-LINE

CABLE SEARCH, ADVANCED RESEARCH WITH CABLE FINDER AND OUR ON-LINE STOCK

CABLE SEARCH

Locate the **Search** icon (🔍) at the top right of any page. Click it to open the full-text search bar. Simply enter a keyword, part number, or specification, and our system will quickly deliver a results page with relevant data from our product database.

Use the "INFO" button to access a comprehensive, detailed view of any specific product.



CABLE FINDER - ADVANCED SEARCH

For a more filtered search, you can head to our "**Cable Finder**" page (a link is available on almost every page).

On this page, you can start using the available filtering options on the left side to refine the list of cables displayed on the right.

The more options you select, the more precise your search results will be.

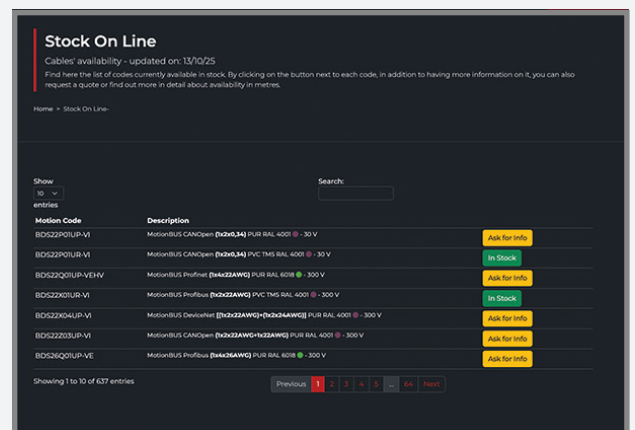
<https://www.motioncables.com/specialcables/cable-finder/en>

STOCK-ON-LINE

Last, but certainly not least, our **stock-on-line page** provides a daily updated view of our inventory.

A search box is available to help refine the results list.

Crucially, a colour-coded button to the right of each product code will immediately inform you whether the cable is ready in stock or if you should contact our sales team for the most accurate update on availability.



<https://www.motioncables.com/specialcables/stock-on-line/en>

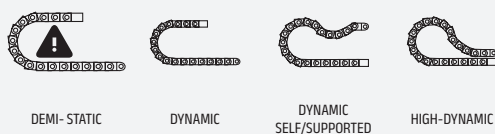
ICONS

Summary of the icons you will find in the catalogue pages, grouped by relevant area

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



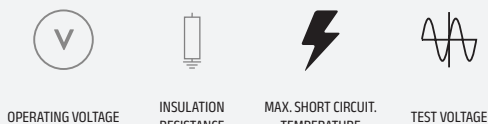
DURABILITY IN MECHANICAL & THERMAL CONDITIONS



BALANCED APPLICATION & STANDARD INTEGRATED COMPLIANCE



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.

TRADEMARKS

- DESINA stands for DEcentralised and Standardised INstallation Technology for Machine Tools and Production Systems.
- SIEMENS, 6FX5008..., 6FX8008Plus... are registered trademarks of SIEMENS AG and are used for comparison purposes only.
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- Control Techniques... is a registered trademark of Nidec Control Techniques Limited and is used for comparison purposes only.
- Yaskawa... is a registered trademark of Yaskawa Electric Corporation and is used for comparison purposes only.
- Rockwell... is a registered trademark of Rockwell Automation, Inc. and is used for comparison purposes only.

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Safety notice.

The cables and wires described in the catalogue are produced in accordance with national and international standards, as well as plant standards; application safety, as stipulated in the safety directives, standards, and statutory regulations, as amended, are provided. Following proper installation and usage guidelines, the possibility of product-specific dangers can be excluded. This catalogue describes general information for each product's use. Installation and processing must only be executed by qualified electricians.

MOTION**SERVO**

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MOTION**HYBRID**

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MOTION**FEEDBACK**

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MOTION**FIELDBUS**

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DRIVEConn® MT**SERVO**

MOTION**SERVO POWER**

MOTION**SERVO**



MOTION**SERVOCORE LCX**

MOTIONSERVO

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

MOTIONSERVO cables are designed to connect servo motors to their respective drives or inverters. In addition to transmitting electrical power, they can also include dedicated lines for brake control, motor thermal protection (thermistors, PTC, KTY), and other auxiliary signals. These cables are developed for high-stress industrial environments, making them suitable for both static installations and dynamic applications, such as in cable carriers.

Available in **Basic**, **Dynamic**, and **High Dynamic** Performance versions, all cables comply with the connection specifications of leading OEMs, including:

- 4 power conductors.
- 1 or more shielded pairs for command or feedback signals.
- Layout according to the standards of: Siemens®, SEW®, Lenze®, Bosch Rexroth®, and Schneider Electric®.
- Available cross-sections: from 0.50 to 185 mm².
- Insulation made from PP or XL-PE with a low dielectric constant.
- Sheath material: PVC(Basic), PVC TM5 (Dynamic), PUR FRHF (High Dynamic).
- Shielding: Tinned copper braid with >85% optical coverage.

All cables from the MOTIONSERVO family are available in three application levels:

Level	Name	Features
BP	BASIC PERFORMANCE	For fixed installation or occasional movement.
DP	DYNAMIC PERFORMANCE	For standard dynamic motion (light robotics, linear automation).
HP	HIGH DYNAMIC PERFORMANCE	For high dynamics, long travel distances, and high acceleration (CNC, packaging, advanced robotics).

Regardless of the application level, all products share these common characteristics and are resistant to:

- Industrial Oils.
- Flame.
- Water (for installation in humid or wet environments).
- Operating Temperature: from -40 °C to +90 °C (varies based on the jacket material).
- Rated Voltage: typically 600/1000V (UL), U_o/U 0.6/1.0 kV (IEC).
- Jacket Materials:
 - PUR FRHF (high flexibility, chemical resistance).
 - PVC TM5 (cost-effective).

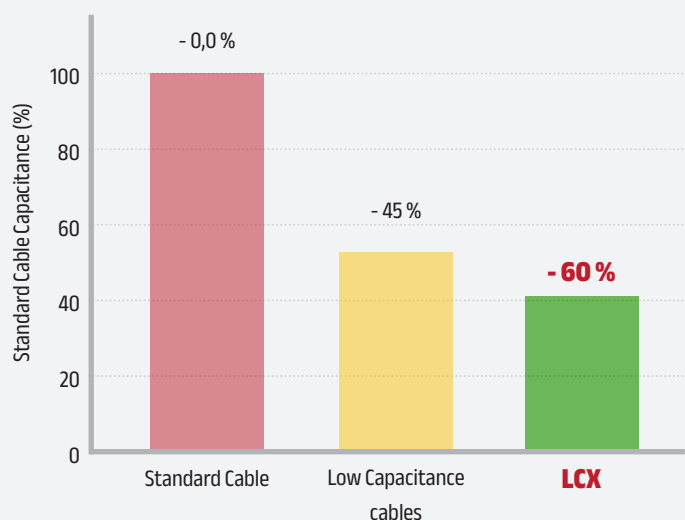
Configuration	Content	Typical Applications	Main Advantages	Available Levels
4-Pole (Power Only)	• 3 phases (U, V, W) • 1 PE (YE/GN)	• Motors without a brake or sensors • Conveyors, fans, pumps, simple axes	• Simple and cost-effective • Easy to install	BP DP HP
4-Pole + 1 Shielded Pair	• 3 phases (U, V, W) • 1 PE (YE/GN) • 1 shielded pair (brake or thermistor)	• Motors with a brake or thermal sensor • Standard automated systems	• Power + signal in a single cable • Optimal for cable carriers • Reduces wiring	BP DP HP
4-Pole + 2 Shielded Pairs	• 3 phases (U, V, W) • 1 PE (YE/GN) • 2 shielded pairs (brake + sensors)	• Systems with extended control • Motors with a brake + thermal protection	• Full versatility • Better signal management • Maximum integration	BP DP HP
4-Pole + 1 Shielded Triple	• 3 phases (U, V, W) • 1 PE (YE/GN) • 1 shielded triple (brake, thermistor, common)	• SEW® motors • Systems with a shared three-wire interface	• According to SEW® • A single cable for multiple functions • Robust for dynamic installation	BP DP HP



MOTION**SERVOCORE LCX**

LCX = Low Capacitance eXtended
NEW OEM-APPROVED TECHNOLOGY

Thanks to the adoption of an optimized structure with ultra-low parasitic capacitance (25% lower than existing Low Capacitance standards), these cables offer superior electrical performance, making them ideal for connecting inverters and motors in servo-assisted systems.



EFFECTIVE REDUCTION:

25% less than the best "Low Capacitance" cables
60% less than standard market cables

- ⊙ shared and approved project.
- ⊙ improved efficiency – lower electrical losses.
- ⊙ greater cabling distances between inverter and motor.
- ⊙ more stable and clean control signals.
- ⊙ reduction of parasitic currents and EMC disturbances.

Technological Benefit	User Advantages
Reduced parasitic capacitance	Less loss, greater efficiency
A more stable signal	More precise commands, fewer errors
Longer Cables Allowed	Drives can be placed farther from the motor without degradation
Inverter Protection	Less stress on bearings and components
Maximum Temperature 90 °C	Safe installation even in compact control panels
Rated Voltage 1000 V	Greater electrical robustness

MOTION**SERVOCORE LCX**

Why Choose the MOTION**SERVOCORE LCX** Family:

- ▶ OEM Approved.
- ▶ Optimized 4G + pairs layout, with >85% EMC shielding.
- ▶ Reduced linear capacitance: greater reliability and efficiency.
- ▶ Three performance levels for every type of installation (static, dynamic, robotic).
- ▶ Sustainable, compact, and safe solution.

MSP.BP 180 Series

MOTIONSERVO POWER

Servomotor cables, PVC sheath, Oil Resistant, Demi-static application - Acc.to SIEMENS® standards

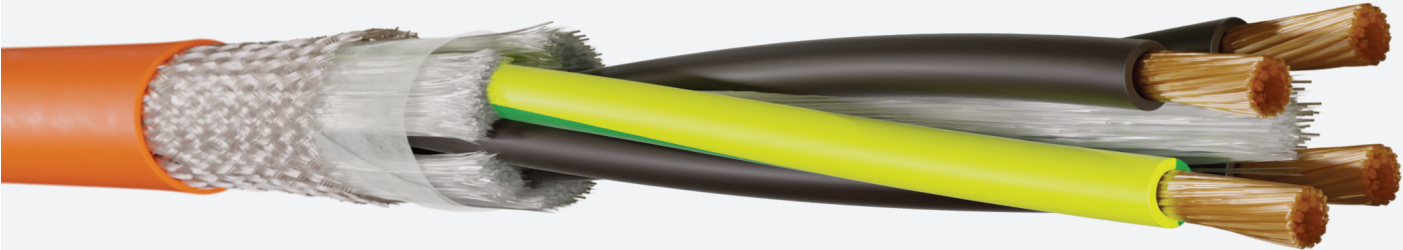
BASIC PERFORMANCE

BP

PVC

600 V
1000 V

-25°C
+90 °C



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 / sec²

ACCELERATION MAX.



≤ 50 N / mm²

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

CYCLES	m.u.	
	MIL	0,2
MIN. BENDING RADIUS	x O.D.	12
MAXIMUM SPEED	m/min	180
MAXIMUM ACCELERATION	m/s ²	2,0
PULLING FORCE	N/mm ²	≤ 50
TORSION	°/m	-
MAX. HORIZONTAL TRAVEL	m	-
TEMPERATURE	°C	-25 / +90

ELECTRICAL PROPERTIES



Test
Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation
Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Max. Short Circuit
Temperature

160 °C (≤ 1s)



Operating
Voltage

1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED

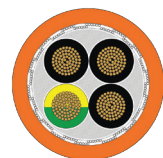


TEMPOR. OUTDOOR

MAIN ADVANTAGES

Optimized Low-Capacitance Geometry	Stable and reliable performance even over long cable runs
High-Density Copper Braid Shielding	Maximum immunity to EMC interference for clean signal transmission
Technical PVC Jacket, Flexible and Oil-Resistant	Long service life in industrial environments subject to mechanical stress or chemical agents
Compact Construction and Low Weight	Ease of routing in control cabinets or narrow cable passages
CE / UL / CSA Certifications	Global compatibility and reduced qualification time in international projects
Reinforced Electrical Insulation up to 1000 V	High operational safety, even under demanding conditions
Self-Extinguishing and Controlled Fire Behavior	Reliable protection in case of short circuits or overheating
Water-Resistant and Suitable for Temporary Outdoor Use	Safe operation even in humid environments or areas subject to splashing

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MotionCables code		EPlan Code	OEM code	Formation	Ø	Cu	DATA SHEET
				mm ²	mm	kg / km	
SFS15G04UR-A	●	MC. 117041521	6FX5008-1BB11	(4 G 1.5)	8.9	94	
SFS13G04UR-A	●	MC. 117041321	6FX5008-1BB21	(4 G 2.5)	10.6	142	
SFS11G04UR-A	●	MC. 117041121	6FX5008-1BB31	(4 G 4)	11.7	200	
SFS09G04UR-A	●	MC. 117040921	6FX5008-1BB41	(4 G 6)	14.4	310	
SFS07G04UR-A	●	MC. 117040721	6FX5008-1BB51	(4 G 10)	18.6	486	
SFS05G04UR-A	●	MC. 117040521	6FX5008-1BB61	(4 G 16)	22.8	770	
SFS03G04UR-A	●	MC. 117040321	6FX5008-1BB25	(4 G 25)	26.3	1167	
SFS02G04UR-A	●	MC. 117040221	6FX5008-1BB35	(4 G 35)	30.0	1540	
SFSA1G04UR-A	●	MC. 11704A121	6FX5008-1BB50	(4 G 50)	35.0	2247	



EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



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).

MSP.DP 300 Series

MOTIONSERVO POWER

Servomotor cables, PVC TM5 sheath, Oil Resistant, Dynamic Application

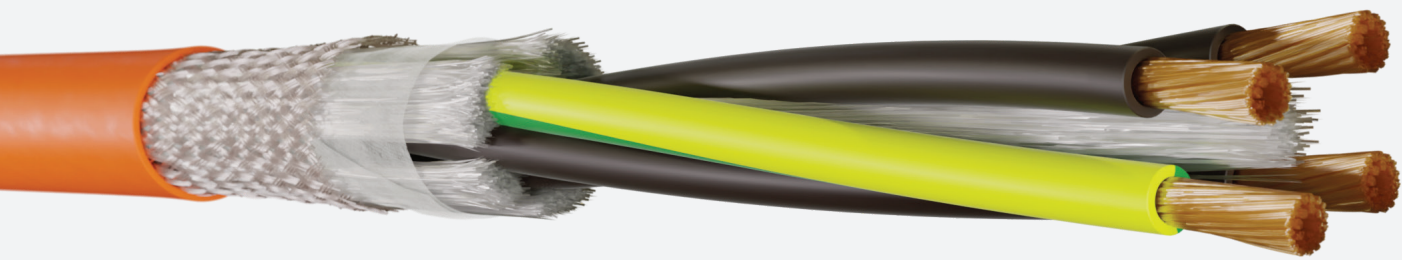
DP

DYNAMIC PERFORMANCE

PVC
TM5

600 V
1000 V

-30 °C
+90 °C



UL 21179
90 °C - 1000V

AWM I/II A/B
90 °C - 1000V

LABS
Free

5 million
CYCLES

7,5 x O.D.
MIN. BENDING RADIUS

300 m / min
MAX. SPEED

20 m / s²
ACCELERATION MAX.

≤ 50 N / mm²
PULLING FORCE

± 30 ° / m
TORSION

30 m
MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	1000 V (UL/CSA) U ₀ /U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT

FLAME RETARDANT

WATER RESISTANT

EMC PROTECTED

TEMPOR. OUTDOOR

MECHANICAL CRUSH

MAIN ADVANTAGES

Low-Capacitance Structure	Stable and precise performance even over long distances between inverter and motor
Flexible Construction for Continuous Motion	High mechanical durability in cable carriers with repeated cycles
High-Coverage Copper Braid Shielding	Reliable EMC protection against interference and signal noise
Low-Adhesion Technical PVC Outer Jacket	Smooth sliding and reduced friction inside the cable carrier
Resistant to Oils and Industrial Fluids	Ideal for production environments with lubricants or coolants
Self-Extinguishing according to IEC 60332-1-2	High safety in case of fire or over-temperature
Suitable for Damp and Wet Environments	Ensures service continuity under demanding operating conditions
Also Usable for Temporary Outdoor Applications	Versatility of use with adequate UV protection

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MotionCables code	EPlan Code	OEM code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg / km	
SDS15G04UR-A	● MC. 217041521		(4 G 1.5)	8.9	94	
SDS13G04UR-A	● MC. 217041321		(4 G 2.5)	10.6	142	
SDS11G04UR-A	● MC. 217041121		(4 G 4)	11.7	200	
SDS09G04UR-A	● MC. 217040921		(4 G 6)	14.4	310	
SDS07G04UR-A	● MC. 217040721		(4 G 10)	17.7	486	
SDS05G04UR-A	● MC. 217040521		(4 G 16)	22.4	770	
SDS03G04UR-A	● MC. 217040321		(4 G 25)	26.3	1167	
SDS02G04UR-A	● MC. 217040221		(4 G 35)	30.0	1540	
SDSA1G04UR-A	● MC. 21704A121		(4 G 50)	35.5	2247	



EPLAN

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SPAC CAVI

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MS.HP 600 Series

MOTIONSERVO POWER

Servomotor cables, PUR sheath, Oil Resistant, High Dynamic Application, Halogen Free - According to SIEMENS® standards

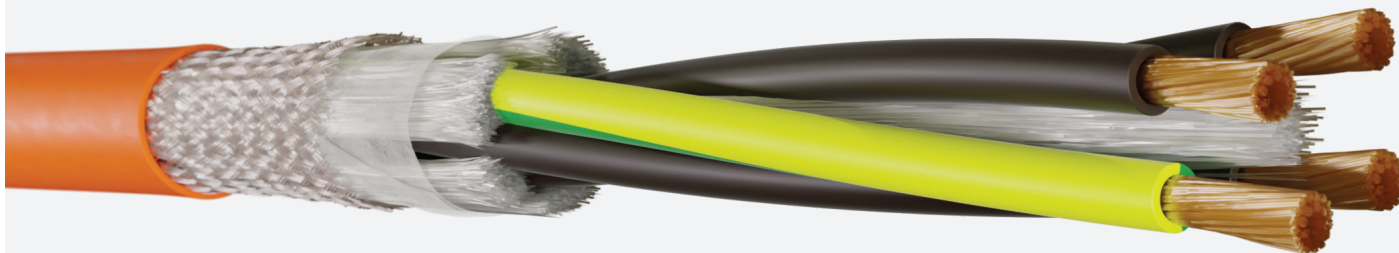
HIGH DYNAMIC PERFORMANCE

HP

PUR
FRHF

600 V
1000 V

-50 °C
+90 °C



UL 21209
90 °C - 1000V



AWM I/II A/B
90 °C - 1000V



LABS
Free



10 million

CYCLES



6,5 x O.D.

MIN. BENDING RADIUS



600 m / min

MAX. SPEED



60 m / s²

ACCELERATION MAX.



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



50 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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



Test
Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation
Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Max. Short
Circuit
Temperature

160 °C (≤ 1s)



Operating
Voltage

1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT

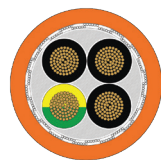


HALOGEN FREE

MAIN ADVANTAGES

Low-Capacitance Structure	Allows for long connections and signal stability even at high frequencies
High-Performance PUR Jacket	Excellent mechanical, chemical, and abrasion resistance
High-Dynamic Construction	Engineered for cable carriers with long travel distances and high accelerations
Full-Coverage Tinned Copper Shielding	Maximum EMC protection for high-precision servo systems
High Resistance to Oils, Coolants, and Chemical Agents	Suitable for use in harsh industrial environments and wet areas
Wide Operating Temperature Range	Reliability even in extreme climatic conditions, indoors or outdoors
Compatibility with Major Servo Systems	Universal solution for multi-brand applications
Robust and Flexible Construction	Long service life and reduced machine downtime

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



MotionCables code	EPlan Code	OEM code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg / km	
SDS15G04UP-A ●	MC. 317041531	6FX8008-1BB11	(4 G 1.5)	9.0	94	
SDS13G04UP-A ●	MC. 317041331	6FX8008-1BB21	(4 G 2.5)	10.7	142	
SDS11G04UP-A ●	MC. 317041131	6FX8008-1BB31	(4 G 4)	11.9	200	
SDS09G04UP-A ●	MC. 317040931	6FX8008-1BB41	(4 G 6)	14.4	310	
SDS07G04UP-A ●	MC. 317040731	6FX8008-1BB51	(4 G 10)	17.7	486	
SDS05G04UP-A ●	MC. 317040531	6FX8008-1BB61	(4 G 16)	21.6	770	
SDS03G04UP-A ●	MC. 317040331	6FX8008-1BB25	(4 G 25)	25.5	1167	
SDS02G04UP-A ●	MC. 317040231	6FX8008-1BB35	(4 G 35)	30.0	1540	
SDSA1G04UP-A ●	MC. 31704A131	6FX8008-1BB50	(4 G 50)	35.5	2247	
SDSA2G04UP-A ●	MC. 31704A231	6FX8008-1BB70	(4 G 75)	41.6	2800	
SDSA3G04UP-A ●	MC. 31704A331	6FX8008-1BB95	(4 G 95)	46.8	3600	



EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

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MS.BP 180 Series

MOTIONSERVO

Servomotor cables, PVC sheath, Oil Resistant, Demi-static application

BP

PVC

BASIC PERFORMANCE

600 V

1000 V

-25°C

+90 °C



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 / sec²
ACCELERATION MAX.

≤ 50 N / mm²
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 ²	2,0
PULLING FORCE	N/mm ²	≤ 50
TORSION	°/m	-
MAX. HORIZONTAL TRAVEL	m	-
TEMPERATURE	°C	-25 / +90

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	1000 V (UL/CSA) U ₀ /U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT

FLAME RETARDANT

WATER RESISTANT

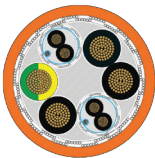
EMC PROTECTED

TEMPOR. OUTDOOR

MAIN ADVANTAGES

Optimized Low-Capacitance Geometry	Stable and reliable performance even over long cable runs
High-Density Copper Braid Shielding	Maximum immunity to EMC interference for clean signal transmission
Technical PVC Jacket, Flexible and Oil-Resistant	Long service life in industrial environments subject to mechanical stress or chemical agents
Compact Construction and Low Weight	Ease of routing in control cabinets or narrow cable passages
CE / UL / CSA Certifications	Global compatibility and reduced qualification time in international projects
Reinforced Electrical Insulation up to 1000 V	High operational safety, even under demanding conditions
Self-Extinguishing and Controlled Fire Behavior	Reliable protection in case of short circuits or overheating
Water-Resistant and Suitable for Temporary Outdoor Use	Safe operation even in humid environments or areas subject to splashing

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

		MotionCables code	EPLAN Code	OEM code	Formation	Ø	Cu	DATA SHEET
					mm ²	mm	kg / km	
Acc.to Siemens®		SFS15G06UR-A	MC.118061521	6FX5008-1BA11	[4 G 1.5 + (2 x 1.5)]	10.5	155	
		SFS13G06UR-A	MC.118061321	6FX5008-1BA21	[4 G 2.5 + (2 x 1.5)]	12.0	200	
		SFS11G06UR-A	MC.118061121	6FX5008-1BA31	[4 G 4 + (2 x 1.5)]	13.5	272	
		SFS09G06UR-A	MC.118060921	6FX5008-1BA41	[4 G 6 + (2 x 1.5)]	15.6	377	
		SFS07G06UR-A	MC.118060721	6FX5008-1BA51	[4 G 10 + (2 x 1.5)]	21.0	552	
		SFS05G06UR-A	MC.118060521	6FX5008-1BA61	[4 G 16 + (2 x 1.5)]	24.1	880	
		SFS03G06UR-A	MC.118060321	6FX5008-1BA25	[4 G 25 + (2 x 1.5)]	26.6	1210	
		SFS02G06UR-A	MC.118060221	6FX5008-1BA35	[4 G 35 + (2 x 1.5)]	30.9	1570	
		SFSA1G06UR-A	MC.11806A121	6FX5008-1BA50	[4 G 50 + (2 x 1.5)]	34.0	2299	
Acc.to Bosch Rexroth Indramat®		SFSI19G06UR-A	MC.119061921		[4 G 0.75 + (2 x 0.50)]	9.2	73	
		SFSI17G08UR-A	MC.119061721		[4 G 1.0 + 2 x (2 x 0.75)]	11.6	170	
		SFSI15G08UR-A	MC.119061521		[4 G 1.5 + 2 x (2 x 0.75)]	12.2	189	
		SFSI13G08UR-A	MC.119061321		[4 G 2.5 + 2 x (2 x 1.0)]	14.6	223	
		SFSI11G08UR-A	MC.119061121		[4 G 4 + (2 x 1) + (2 x 1.5)]	16.3	309	
		SFSI09G08UR-A	MC.119060921		[4 G 6 + (2 x 1) + (2 x 1.5)]	18.1	395	
		SFSI07G08UR-A	MC.119060721		[4 G 10 + (2 x 1) + (2 x 1.5)]	21.8	575	
		SFSI05G08UR-A	MC.119060521		[4 G 16 + 2 x (2 x 1.5)]	25.5	850	
		SFSI03G08UR-A	MC.119060321		[4 G 25 + 2 x (2 x 1.5)]	28.8	1250	
		SFSI02G08UR-A	MC.119060221		[4 G 35 + 2 x (2 x 1.5)]	30.9	1588	
		SFSIA1G08UR-A	MC.11906A121		[4 G 50 + 2 x (2 x 2.5)]	36.3	2351	
Acc.to Lenze®		SFSL19G06UR-A	MC.120061921		[4G0.75+(2x0.5)]	10.0	91	
		SFSL17G06UR-A	MC.120061721		[4G1.0+(2x0.5)]	10.8	91	
		SFSL15G06UR-A	MC.120061521		[4G1.5+(2x0.5)]	11.5	106	
		SFSL13G06UR-A	MC.120061321		[4G2.5+(2x0.5)]	13.2	153	
		SFSL11G06UR-A	MC.120061121		[4G4.0+(2x1.0)]	14.6	235	
		SFSL09G06UR-A	MC.120060921		[4G6.0+(2x1.0)]	16.8	316	
		SFSL07G06UR-A	MC.120060721		[4G10+(2x1.0)]	20.1	513	
		SFSL05G06UR-A	MC.120060521		[4G16+(2x1.0)]	23.8	710	



EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

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MS.DP 300 Series

MOTIONSERVO

Servomotor cables, PVC TM5 sheath, Oil Resistant, Dynamic Application

DP

DYNAMIC PERFORMANCE

PVC
TM5

600 V
1000 V

-30 °C
+90 °C



UL 21179
90 °C - 1000V

AWM I/II A/B
90 °C - 1000V

LABS Free

5 million
CYCLES

7,5 x O.D.
MIN. BENDING RADIUS

300 m / min
MAX. SPEED

20 m / s²
ACCELERATION MAX.

≤ 50 N / mm²
PULLING FORCE

± 30 ° / m
TORSION

30 m
MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM. SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
Max. Short Circuit Temperature	160 °C (≤ 1s)
Operating Voltage	1000 V (UL/CSA) U ₀ /U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT

FLAME RETARDANT

WATER RESISTANT

EMC PROTECTED

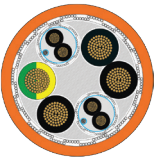
TEMPOR. OUTDOOR

MECHANICAL CRUSH

MAIN ADVANTAGES

Low-Capacitance Structure	Stable and precise performance even over long distances between inverter and motor
Flexible Construction for Continuous Motion	High mechanical durability in cable carriers with repeated cycles
High-Coverage Copper Braid Shielding	Reliable EMC protection against interference and signal noise
Low-Adhesion Technical PVC Outer Jacket	Smooth sliding and reduced friction inside the cable carrier
Resistant to Oils and Industrial Fluids	Ideal for production environments with lubricants or coolants
Self-Extinguishing according to IEC 60332-1-2	High safety in case of fire or over-temperature
Suitable for Damp and Wet Environments	Ensures service continuity under demanding operating conditions
Also Usable for Temporary Outdoor Applications	Versatility of use with adequate UV protection

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		MotionCables code	EPLAN Code	OEM code	Formation	Ø	Cu	DATA SHEET
					mm ²	mm	kg / km	
Acc.to Siemens®		SDS15G06UR-A	MC.218061521		[4 G 1.5 + (2 x 1.5)]	11.6	155	
		SDS13G06UR-A	MC.218061321		[4 G 2.5 + (2 x 1.5)]	13.4	200	
		SDS11G06UR-A	MC.218061121		[4 G 4 + (2 x 1.5)]	14.2	272	
		SDS09G06UR-A	MC.218060921		[4 G 6 + (2 x 1.5)]	16.5	377	
		SDS07G06UR-A	MC.218060721		[4 G 10 + (2 x 1.5)]	20.0	552	
		SDS05G06UR-A	MC.218060521		[4 G 16 + (2 x 1.5)]	23.5	880	
		SDS03G06UR-A	MC.218060321		[4 G 25 + (2 x 1.5)]	26.6	1210	
		SDS02G06UR-A	MC.218060221		[4 G 35 + (2 x 1.5)]	30.5	1570	
		SDSA1G06UR-A	MC.218060221		[4 G 50 + (2 x 1.5)]	34.5	2299	
		SDS19G06UR-A	MC.219061931		[4 G 0.75 + (2 x 0.50)]	9.2	73	
Acc.to Bosch Rexroth Indramat®		SDS17G08UR-A	MC.219061731		[4 G 1.0 + 2 x (2 x 0.75)]	11.6	170	
		SDS15G08UR-A	MC.219061531		[4 G 1.5 + 2 x (2 x 0.75)]	12.2	189	
		SDS13G08UR-A	MC.219061331		[4 G 2.5 + 2 x (2 x 1.0)]	14.6	223	
		SDS11G08UR-A	MC.219061131		[4 G 4 + (2 x 1) + (2 x 1.5)]	16.3	309	
		SDS09G08UR-A	MC.219060931		[4 G 6 + (2 x 1) + (2 x 1.5)]	18.1	395	
		SDS07G08UR-A	MC.219060731		[4 G 10 + (2 x 1) + (2 x 1.5)]	21.8	575	
		SDS05G08UR-A	MC.219060531		[4 G 16 + 2 x (2 x 1.5)]	25.5	850	
		SDS03G08UR-A	MC.219060331		[4 G 25 + 2 x (2 x 1.5)]	28.8	1250	
		SDS02G08UR-A	MC.219060231		[4 G 35 + 2 x (2 x 1.5)]	30.9	1588	
		SDSIA1G08UR-A	MC.21906A131		[4 G 50 + 2 x (2 x 2.5)]	36.3	2351	
Acc.to Lenze®		SDSL19G06UR-A	MC.220061721		[4G0.75+(2x0.5)]	9.30	91	
		SDSL17G06UR-A	MC.220061731		[4G1.0+(2x0.5)]	10.0	91	
		SDSL15G06UR-A	MC.220061531		[4G1.5+(2x0.5)]	11.0	106	
		SDSL13G06UR-A	MC.220061331		[4G2.5+(2x0.5)]	12.3	153	
		SDSL11G06UR-A	MC.220061131		[4G4.0+(2x1.0)]	14.6	235	
		SDSL09G06UR-A	MC.220060931		[4G6.0+(2x1.0)]	16.7	316	
		SDSL07G06UR-A	MC.220060731		[4G10+(2x1.0)]	19.4	513	
		SDSL05G06UR-A	MC.220060531		[4G16+(2x1.0)]	23.8	710	
Acc.to SEW®		SDSS15G07UR-A	MC.221061731		[4G1.5+(3x1.0)]	11.8	150	
		SDSS13G07UR-A	MC.221061531		[4G2.5+(3x1.0)]	13.4	213	
		SDSS11G07UR-A	MC.221061231		[4G4+(3x1.0)]	15.0	280	
		SDSS09G07UR-A	MC.221061131		[4G6+(3x1.5)]	17.0	390	
		SDSS07G07UR-A	MC.221060931		[4G10+(3x1.5)]	20.0	620	



EPLAN

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SPAC CAVI

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

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MS.HP 600 Series

MOTIONSERVO

Servomotor cables, PUR sheath, Oil Resistant, High Dynamic Application, Halogen Free

HP

HIGH DYNAMIC PERFORMANCE

PUR
FRHF

600 V
1000 V

-50 °C
+90 °C



UL 21209
90 °C - 1000V

AWM I/II A/B
90 °C - 1000V

LABS Free

APPROVED
UPON REQUEST

10 million
CYCLES

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

600 m / min
MAX. SPEED

60 m / s²
ACCELERATION MAX.

≤ 50 N / mm²
PULLING FORCE

± 30 ° / m
TORSION

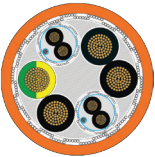
50 m
MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS						ELECTRICAL PROPERTIES				
	m.u.						Test Voltage 4,0 kV x 5 min acc.to EN 50395 Cl. 10.3			
CYCLES	MIL	0,2	1	5	10					
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10		Insulation Resistance ≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1			
MAXIMUM. SPEED	m/min	180	600	300	240					
MAXIMUM ACCELERATION	m/s²	2,0	50	30	15					
PULLING FORCE	N/mm²	≤ 50	≤ 20	≤ 20	≤ 20					
TORSION	°/m	-	± 30	± 30	± 30		Max. Short Circuit Temperature 160 °C (≤ 1s)			
MAX HORIZONTAL TRAVEL	m	-	3	15	50					
TEMPERATURE	°C	-50 / +90	-40 / +90	-40 / +90	-40 / +90		Operating Voltage 1000 V (UL/CSA) U ₀ /U 0.6/1.0 kV (IEC)			
RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS										
OIL RESISTANT	FLAME RETARDANT	COLD RESISTANT	ABRASION RESISTANT	EMC PROTECTED	WATER RESISTANT	UV RESISTANT	MICROBE RESISTANT	OZONE RESISTANT	MUD RESISTANT	HALOGEN FREE

MAIN ADVANTAGES

Low-Capacitance Structure	Allows for long connections and signal stability even at high frequencies
High-Performance PUR Jacket	Excellent mechanical, chemical, and abrasion resistance
High-Dynamic Construction	Engineered for cable carriers with long travel distances and high accelerations
Full-Coverage Tinned Copper Shielding	Maximum EMC protection for high-precision servo systems
High Resistance to Oils, Coolants, and Chemical Agents	Suitable for use in harsh industrial environments and wet areas
Wide Operating Temperature Range	Reliability even in extreme climatic conditions, indoors or outdoors
Compatibility with Major Servo Systems	Universal solution for multi-brand applications
Robust and Flexible Construction	Long service life and reduced machine downtime

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	MotionCables code	EPLAN Code	OEM code	Formation	Ø	Cu	DATA SHEET
				mm ²	mm	kg / km	
Acc.to Siemens® 	SDS15G06UP-A	MC.318061531	6FX8008-1BA11	[4 G 1.5 + (2 x 1.5)]	11.6	155	
	SDS13G06UP-A	MC.318061331	6FX8008-1BA21	[4 G 2.5 + (2 x 1.5)]	13.4	200	
	SDS11G06UP-A	MC.318061131	6FX8008-1BA31	[4 G 4 + (2 x 1.5)]	14.4	272	
	SDS09G06UP-A	MC.318060931	6FX8008-1BA41	[4 G 6 + (2 x 1.5)]	16.8	377	
	SDS07G06UP-A	MC.318060731	6FX8008-1BA51	[4 G 10 + (2 x 1.5)]	20.0	552	
	SDS05G06UP-A	MC.318060531	6FX8008-1BA61	[4 G 16 + (2 x 1.5)]	23.7	880	
	SDS03G06UP-A	MC.318060331	6FX8008-1BA25	[4 G 25 + (2 x 1.5)]	26.6	1210	
	SDS02G06UP-A	MC.318060231	6FX8008-1BA35	[4 G 35 + (2 x 1.5)]	30.5	1570	
	SDSA1G06UP-A	MC.31806A131	6FX8008-1BA50	[4 G 50 + (2 x 1.5)]	34.5	2299	
Acc.to Bosch Rexroth Indramat® 	SDSI19G08UP-A	MC.319061931		[4 G 0.75 + (2 x 0.50)]	8.5	73	
	SDSI17G08UP-A	MC.319061731	REL0105	[4 G 1.0 + 2 x (2 x 0.75)]	11.5	170	
	SDSI15G08UP-A	MC.319061531	REL0106	[4 G 1.5 + 2 x (2 x 0.75)]	11.7	189	
	SDSI13G08UP-A	MC.319061331	REL0107	[4 G 2.5 + 2 x (2 x 1.0)]	14.7	223	
	SDSI11G08UP-A	MC.319061131	REL0108	[4 G 4 + (2 x 1) + (2 x 1.5)]	16.3	309	
	SDSI09G08UP-A	MC.319060931	REL0109	[4 G 6 + (2 x 1) + (2 x 1.5)]	18.1	395	
	SDSI07G08UP-A	MC.319060731	REL0110	[4 G 10 + (2 x 1) + (2 x 1.5)]	21.8	575	
	SDSI05G08UP-A	MC.319060531	REL0111	[4 G 16 + 2 x (2 x 1.5)]	24.5	850	
	SDSI03G08UP-A	MC.319060331	REL0112	[4 G 25 + 2 x (2 x 1.5)]	28.8	1250	
	SDSI02G08UP-A	MC.319060231	REL0113	[4 G 35 + 2 x (2 x 1.5)]	30.9	1588	
	SDSIA1G08UP-A	MC.31906A131	INK0668	[4 G 50 + 2 x (2 x 2.5)]	36.3	2351	
Acc.to Lenze® 	SDSL19G06UP-A	MC.320061721		[4G0.75+(2x0.5)]	9.8	91	
	SDSL17G06UP-A	MC.320061731		[4G1.0+(2x0.5)]	10.5	91	
	SDSL15G06UP-A	MC.320061531		[4G1.5+(2x0.5)]	11.5	106	
	SDSL13G06UP-A	MC.320061331		[4G2.5+(2x0.5)]	13.2	153	
	SDSL11G06UP-A	MC.320061131		[4G4.0+(2x1.0)]	14.6	235	
	SDSL09G06UP-A	MC.320060931		[4G6.0+(2x1.0)]	17.5	316	
	SDSL07G06UP-A	MC.320060731		[4G10+(2x1.0)]	20.1	513	
	SDSL05G06UP-A	MC.320060531		[4G16+(2x1.0)]	23.8	710	
Acc.to SEW® 	SDSS15G07UP-A	MC.321061731		[4G1.5+(3x1.0)]	11.9	150	
	SDSS13G07UP-A	MC.321061531		[4G2.5+(3x1.0)]	13.4	213	
	SDSS11G07UP-A	MC.321061331		[4G4+(3x1.0)]	15.0	280	
	SDSS09G07UP-A	MC.321061131		[4G6+(3x1.5)]	16.8	390	
	SDSS07G07UP-A	MC.321060931		[4G10+(3x1.5)]	19.3	620	



EPLAN

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MS.LCXHP 600 Series

MOTIONSERVOCORE LCX

HP

HIGH DYNAMIC PERFORMANCE

PUR
FRHF

600 V
1000 V

-50 °C
+90 °C

Servomotor cables, PUR sheath, Oil Resistant, High Dynamic Application, Halogen Free - Increased Low Capacitance



UL 21209
90 °C - 1000V



AWM I/II A/B
90 °C - 1000V



LABS
Free



10 million

CYCLES



6,5 x O.D.

MIN. BENDING RADIUS



600 m / min

MAX. SPEED



60 m / s²

ACCELERATION MAX.



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



50 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	1000 V (UL/CSA) U ₀ /U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT	FLAME RETARDANT	COLD RESISTANT	ABRASION RESISTANT	EMC PROTECTED	WATER RESISTANT	UV RESISTANT	MICROBE RESISTANT	OZONE RESISTANT	MUD RESISTANT	HALOGEN FREE

MAIN ADVANTAGES

Optimized Ultra-Low Capacitance Structure (~25% compared to the best "Low Capacitance" standards)	Higher electrical efficiency and lower signal losses.
Up to 60% Reduction compared to Standard Market Cables	Stable performance over longer wiring distances between inverter and motor.
Balanced 4G+ Shielded Pairs Layout	Clean transmission of control signals and reduction of stray currents.
High Coverage EMC Shielding (~85%)	Excellent immunity to electromagnetic disturbances.
OEM Approval	Construction quality validated by major servo system manufacturers.
Three Performance Levels (Static, Dynamic, High Dynamic)	Scalable solutions optimized for different movement intensities.
Compact Architecture with Thermal Optimization	Better energy management and greater system efficiency.
Low Dispersion and Precise Power Control	High signal stability and maximum operational reliability.

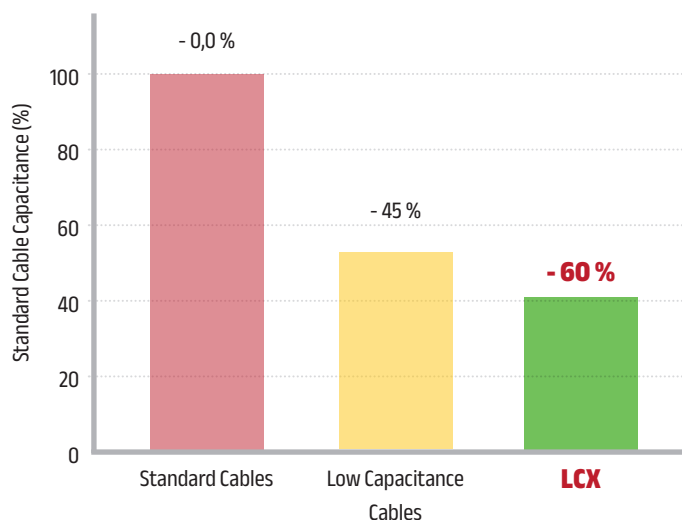


MotionCables code	EPlan Code	OEM code	Formation	Ø	Cu
			mm ²	mm	kg / km
SDS15G06UP-ALCX	MC.377061531		[4 G 1.5 + (2 x 1.5)]	13.4	200
SDS13G06UP-ALCX	MC.377061331		[4 G 2.5 + (2 x 1.5)]	14.4	272
SDS11G06UP-ALCX	MC.377061131		[4 G 4 + (2 x 1.5)]	16.8	377
SDS09G06UP-ALCX	MC.377060931		[4 G 6 + (2 x 1.5)]	20.0	552
SDS07G06UP-ALCX	MC.377060731		[4 G 10 + (2 x 1.5)]	23.7	880
SDS05G06UP-ALCX	MC.377060531		[4 G 16 + (2 x 1.5)]	26.6	1210



LCX = Low Capacitance eXtended NEW OEM-APPROVED TECHNOLOGY

Thanks to the adoption of an optimized structure with ultra-low parasitic capacitance (25% lower than existing Low Capacitance standards), these cables offer superior electrical performance, making them ideal for connecting inverters and motors in servo-assisted systems.



EFFECTIVE REDUCTION:

25% less than the best "Low Capacitance" cables
60% less than standard market cables

- shared and approved project.
- improved efficiency – lower electrical losses.
- greater cabling distances between inverter and motor.
- more stable and clean control signals.
- reduction of parasitic currents and EMC disturbances.

Why Choose the MOTION **SERVOCORE LCX** Family:

- ▶ OEM Approved.
- ▶ Optimized 4G + pairs layout, with >85% EMC shielding.
- ▶ Reduced linear capacitance: greater reliability and efficiency.
- ▶ Three performance levels for every type of installation (static, dynamic, robotic).
- ▶ Sustainable, compact, and safe solution.

Scan the QRcode
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digital version on
our website



EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



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).

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MOTION**HYBRID**

ONE CABLE SOLUTION - HYBRID CABLES FOR SMART AUTOMATION

MOTIONHYBRID

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

MOTION**HYBRID** cables represent the MOTION**CABLES** solution for modern, advanced automation requirements, integrating power, motor, and feedback lines into a single cable solution.

Careful design engineering ensures:

- Reduced space within cable carriers and automation cabinets.
- Optimized installation time.
- Maximum Electromagnetic Compatibility (EMC), thanks to total and partial shielding.
- Reliability and durability in severe industrial environments, even with flexing cycles exceeding 10.000.000.

These cables are developed to meet the specifications of major servo drive and control manufacturers, guaranteeing CE, UL, and CSA standard compliance. They are ideal for applications in:

- Automated production lines.
- Machine tools and high-precision industrial machinery.
- Export-oriented systems, with demands for international safety and certifications.

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	Polypropylene (PP) or Polyolefin	PVC	Flexibility, oil/fluid resistance, flame retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	Polypropylene (PP) or Polyolefin	PVC TM5	Designed for repeated bending, high performance in dynamic environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	Polypropylene (PP) or Polyolefin	Polyurethane (PUR FRHF)	High flexibility even at low temperatures, chemical resistance, halogen-free

ELECTRICAL & MATERIAL SPECIFICATIONS

CHARACTERISTIC	TECHNICAL SPECIFICATION
Conductors	Bare or tinned copper, extra-fine strands according to DIN VDE 0295 cl.6 / IEC 60228 cl.6, ensuring flexibility and resistance to mechanical fatigue.
Conductor Insulation	Special Polypropylene or Polyolefin, optimized to reduce parasitic capacitance.
Conductor Identification	Colour or numerical coding according to the technical datasheet, to facilitate installation and maintenance.
Textile Tape	Inserted for mechanical stability and protection against mechanical stress.
Shield	Tinned copper braid, optical coverage approx. 85%, for total EMC protection and interference reduction.
Additional Shield	ALU/PET tape, enhances shielding and protection against chemical agents.
Outer Jacket	PVC (BP), PVC TM5 (DP), PUR FRHF (HP), resistant to oils, solvents, UV radiation, and mechanical wear.
Jacket Colour	Orange RAL 2003, Green RAL 6018, Black RAL 9005.

INCREASED MAX
CONDUCTOR
TEMPERATURE

90°C

TECHNICAL BENEFIT OF THE MOTIONHYBRID FAMILY

- Motor and Feedback Integration in a single cable.
- Space-saving and reduced wiring time.
- Superior EMC Shielding, optimal in noisy industrial environments
- Resistance to Oils, Fluids, Chemicals, and UV.
- Applicable to static, dynamic, and highly dynamic installations.
- International compliance (CE, UL, CSA).

APPLICATION EXAMPLES

- Automated Production Lines.
- Machine Tools and CNC.
- Industry 4.0:
Smart Factory and installations with high wiring density.
- Multi-Axis Synchronized Systems.



CABLES TYPES ACCORDING TO STANDARDS

PROTOCOL	IMPEDANCE (Ω)	MAX FREQUENCY	MANUFACTURER	DETAILED DESCRIPTION
Endat 2.2	120±12	10 MHz	Heidenhain®	Bidirectional digital interface for absolute and incremental encoders. Synchronous serial transmission over 4 lines (CLOCK+/-, DATA+/-). Ideal for CNC, robotics, and machine tools; supports safety functions up to SIL 3.
Endat 3	120±10	Up to 100 MHz	Heidenhain®	Evolution of EnDat 2.2, featuring higher transmission speed, more efficient diagnostic data management, and support for integrated safety systems. Optimized for high-precision, high-speed applications.
Hiperface DSL	110±10	10 MHz	SICK®	Digital and analog protocol for encoders, suitable for high-speed servo and robotics applications.
SINAMICS	100±10	100 MHz	Siemens®	Digital feedback for SINAMICS drives, supports high-speed transmission and complex motor control.
IndraDyn-S	110±10	10 MHz	Bosch-Rexroth®	Servo drive and control system for robotics and automation, featuring precise digital feedback.
HMC 6	120±10	8 MHz	Heidenhain®	High-precision digital encoder for motors and linear systems, ideal for CNC and robotics.
ILM 62	100±10	100 MHz	Schneider Electric®	Digital encoder for motor position control, suitable for industrial production lines.
MOVILINK DDI	50±2	1000 MHz	SEW®	Digital protocol for SEW drives, enabling secure communication between servo and controller.

MS.HYB BP 180

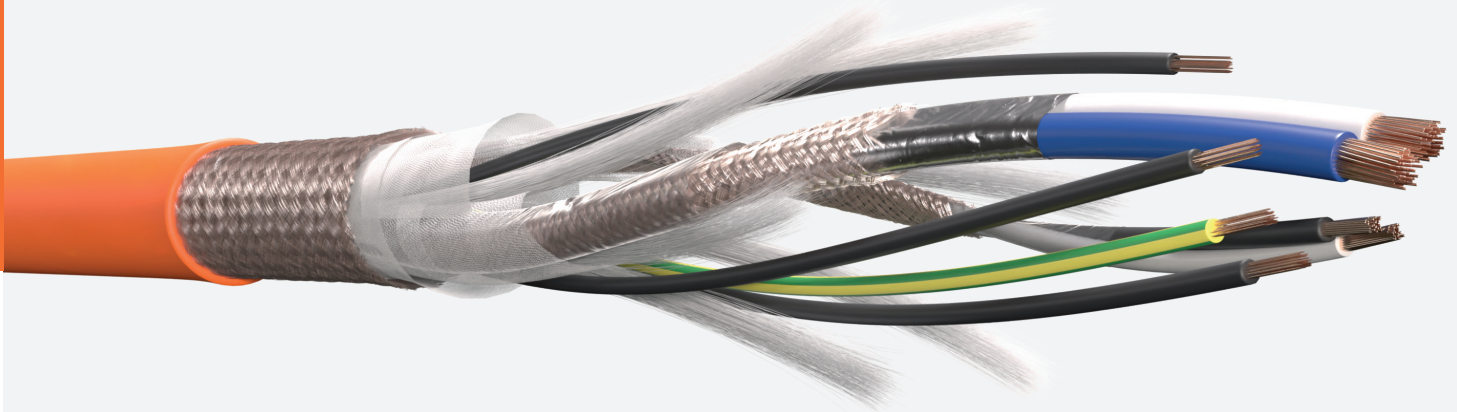
MOTION **HYBRID SERVO**

Hybrid OCT cables, PVC sheath, Oil Resistant, Demi-Static application

BASIC PERFORMANCE

BP

PVC

600 V
1000 V-25 °C
+90 °CUL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec²

ACCELERATION MAX.



≤ 50 N / mm²

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

CYCLES	m.u.	
	MIL	0,2
MIN. BENDING RADIUS	x O.D.	12
MAXIMUM. SPEED	m/min	180
MAXIMUM ACCELERATION	m/s²	2,0
PULLING FORCE	N/mm²	≤ 50
TORSION	°/m	-
MAX HORIZONTAL TRAVEL	m	-
TEMPERATURE	°C	+5 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

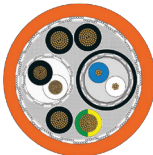
MAIN ADVANTAGES

One Cable Technology (Power + Signal)	A single cable for power, brake, and feedback: 50% reduction in cabling
Low-Capacitance Architecture	Higher electrical efficiency and stability of control signals
Full-Coverage Copper Shielding	Reliable protection against noise and EMC interference
Balanced Layout and Dedicated Communication Pair	Clean digital transmission, without loss of synchronization
Flexible PVC Outer Jacket	Ease of installation and good resistance in general industrial environments
Reduction in Overall Weight and Size	Optimized space in control cabinets and cable carriers
Compatibility with Major Digital Protocols	Direct interface with standard servo motors and OEM systems
Economical and Functional Solution	Perfect for lines with limited motion or semi-dynamic applications

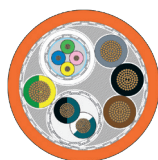
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Protocol: **HYPERFACE DSL®**

Manufacturer: **SICK®**



MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
≤ 50 m connection						
HFSS21G08UR-A ●	MC.122082131		[4 G 0.50 + (2 x 0.35) + (2 x 26 AWG)]	9.8	86	
HFSS17G08UR-A ●	MC.122081731		[4 G 1.0 + (2 x 0.75) + (2 x 26 AWG)]	11.5	113	
HFSS15G08UR-A ●	MC.122081531		[4 G 1.5 + (2 x 0.75) + (2 x 26 AWG)]	12.5	150	
HFSS13G08UR-A ●	MC.122081331		[4 G 2.5 + (2 x 1.0) + (2 x 26 AWG)]	13.8	195	
≤ 100 m connection						
HFSI17G08UR-A ●	MC.122081731		[4 G 1.0 + (2 x 0.75) + (2 x 22 AWG)]	12.5	125	
HFSI15G08UR-A ●	MC.122081531		[4 G 1.5 + (2 x 1.0) + (2 x 22 AWG)]	13.2	160	
HFSI13G08UR-A ●	MC.122081331		[4 G 2.5 + (2 x 1.0) + (2 x 22 AWG)]	14.5	200	
HFSI11G08UR-A ●	MC.122081131		[4 G 4 + (2 x 1.5) + (2 x 22 AWG)]	16.3	285	



HFSS122Z10UR-A ●	MC.156102221		[4G0.38 + (2x0.38) + (4x0.20)]	9.5	79	
HFSS119Z10UR-A ●	MC.156101921		[4G0.75 + (2x0.50) + (4x0.20)]	10.4	105	
HFSS115Z10UR-A ●	MC.156101521		[4G1.50 + (2x1.50) + (4x0.20)]	12.3	162	
HFSS113Z10UR-A ●	MC.156101321		[4G2.50 + (2x1.50) + (4x0.20)]	13.3	214	



EPLAN

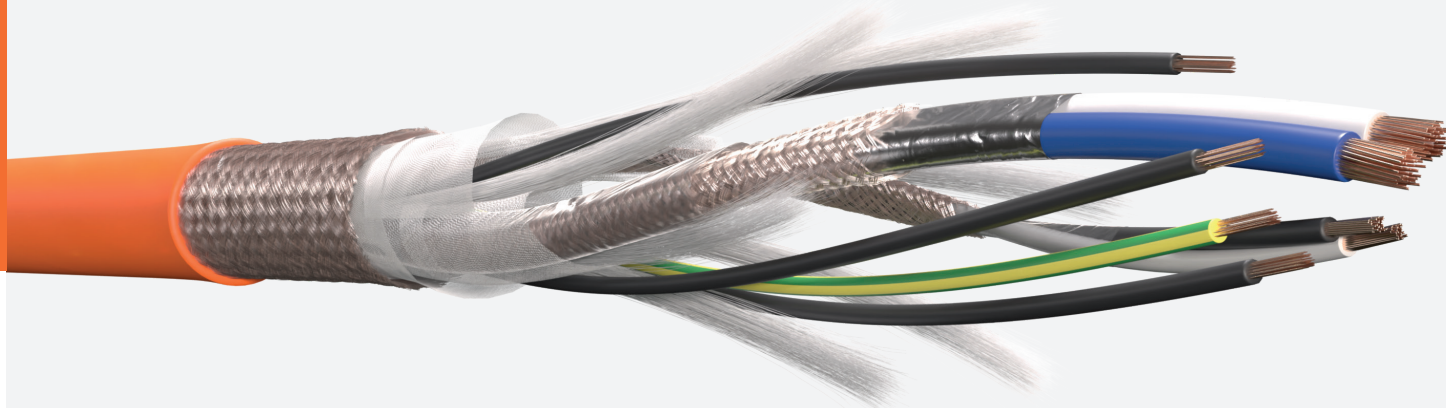
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

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

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UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION MAX.

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM. SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

High-Performance One Cable Technology	Simultaneous transmission of power, brake, and DSL signals in a single conductor
Flexible Architecture Optimized for Continuous Motion	High resistance to bending cycles and mechanical stress
Individually Twisted and Shielded Data Element	Stable and interference-free digital feedback
Multiple EMC Shielding	Total protection against high-frequency noise and harmonics
Low-Adhesion Technical PVC Outer Jacket	Smooth sliding in the cable carrier, reducing friction
Resistance to Oils and Coolants	Safe operation in lubricated or humid industrial environments
40-50% Reduced Cabling Compared to Traditional Systems	Lower installation times and reduced maintenance complexity
Water-Resistant and Suitable for Temporary Outdoor Use	Safe operation even in humid environments or areas subject to splashing

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

Protocol: **HYPERFACE DSL®**

Manufacturer: **SICK®**



MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
≤ 50 m connection						
HDSS21G08UR-A ●	MC.222082131		[4 G 0.50 + (2 x 0.35) + (2 x 26 AWG)]	9.8	86	
HDSS17G08UR-A ●	MC.222081731		[4 G 1.0 + (2 x 0.75) + (2 x 26 AWG)]	11.5	113	
HDSS15G08UR-A ●	MC.222081531		[4 G 1.5 + (2 x 0.75) + (2 x 26 AWG)]	12.5	150	
HDSS13G08UR-A ●	MC.222081331		[4 G 2.5 + (2 x 1.0) + (2 x 26 AWG)]	13.8	195	
≤ 100 m connection						
HDSI17G08UR-A ●	MC.222081731		[4 G 1.0 + (2 x 0.75) + (2 x 22 AWG)]	12.5	125	
HDSI15G08UR-A ●	MC.222081531		[4 G 1.5 + (2 x 1.0) + (2 x 22 AWG)]	13.2	160	
HDSI13G08UR-A ●	MC.222081331		[4 G 2.5 + (2 x 1.0) + (2 x 22 AWG)]	14.5	200	
HDSI11G08UR-A ●	MC.222081131		[4 G 4 + (2 x 1.5) + (2 x 22 AWG)]	16.3	285	

Protocol: **HMC6®**

Manufacturer: **HEIDENHAIN®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
HDS15G12UR-N ●	MC.223121525		[(3x1.50)+1G1.50+2x1.0+(2x0.30+2x2x0.15)]	12.5	86	
HDS13G12UR-N ●	MC.223121325		[(3x2.50)C+1G2.50+2x1.0+(2x0.30+2x2x0.15)]	14.2	113	
HDS11G12UR-N ●	MC.223121125		[(3x4.0)+1G4.0+2x1.0+(2x0.30+2x2x0.15)]	16.5	150	

Protocol: **EnDAT 2.2®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
HDSH15G12UR-A ●	MC255121521		[4G1.5+1x(2x0.75)+1x(2x0.30+2x2x0.15)]	13.0	165	
HDSH13G12UR-A ●	MC255121321		[4G2.5+1x(2x0.75)+1x(2x0.30+2x2x0.15)]	14.2	210	
HDSH11G12UR-A ●	MC255121121		[4G4+1x(2x0.75)+1x(2x0.30+2x2x0.15)]	16.5	285	

Protocol: **EnDAT 3®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
HDSE19G08UR-A ●	MC.322081731		[4G0.75+1x(2x0.34)+1x((2x24AWG))]	11.5	190	
HDSE15G08UR-A ●	MC.322081531		[4G1.5+1x(2x0.75)+1x((2x24AWG))]	13.2	255	
HDSE11G08UR-A ●	MC.322081331		[4G4+1x(2x1.0)+1x((2x24AWG))]	16.2	415	

Protocol: **ILM 62®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
HDN13Z14UR-VE ●	MC.275141322		5G2.5+2x(4x0.34)+1x(0.34)	14.8	186	



EPLAN

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SPAC CAVI

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

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MS.HYB HP 600

MOTION **HYBRID SERVO**

Hybrid OCT Servomotor cables, PUR outer sheath, Oil Resistant, High Dynamic Application, Halogen Free

HIGH DYNAMIC PERFORMANCE

HP**PUR
FRHF****600 V
1000 V****-50 °C
+90 °C**

HYBRID SERVO

UL 21209
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST

**10 million**

CYCLES

**6,5 x O.D.**

MIN. BENDING RADIUS

**600 m / min**

MAX. SPEED

**60 m / s²**

ACCELERATION MAX.

**≤ 50 N / mm²**

PULLING FORCE

**± 30 ° / m**

TORSION

**50 m**

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS**ELECTRICAL PROPERTIES**

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

**Test
Voltage**4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3**Insulation
Resistance**≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1**Max. Short
Circuit
Temperature**

160 °C (≤ 1s)

**Operating
Voltage**1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)**RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS**

OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES**Latest Generation One Cable Architecture**

Integrated transmission of power, brake, and digital data over a single high-performance cable

High-Resistance PUR Jacket

Excellent mechanical and chemical integrity even in harsh environments

Reinforced Structure for Long-Travel Cable Carriers and High Accelerations

Superior mechanical reliability even under extreme conditions

Communication Pair for Digital Feedback (DSL / S210 / EnDat 3...)

Precise motor control and real-time diagnostics

Dual-Layer Composite Shielding

Noise immunity even in systems with high EMC emissions

Resistance to Mineral Oils, Coolants, and Chemical Agents

Ideal for wet areas or applications with industrial contaminants

Extended Temperature Range and Dimensional Stability

Consistent performance from -40°C to +90°C

Advanced Solution for Industry 4.0

Supports predictive diagnostics, reduced downtime, and system digitalization

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

Protocol: **HYPERFACE DSL®**

Manufacturer: **SICK®**



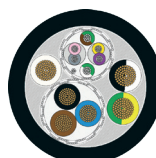
MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET	
			mm²	mm	kg/km		
≤ 50 m connection							
HDSS21G08UP-A ●	MC.322082131		[4 G 0.50 + (2 x 0.35) + (2 x 26 AWG)]	9.8	86		
HDSS17G08UP-A ●	MC.322081731		[4 G 1.0 + (2 x 0.75) + (2 x 26 AWG)]	11.5	113		
HDSS15G08UP-A ●	MC.322081531		[4 G 1.5 + (2 x 0.75) + (2 x 26 AWG)]	12.5	150		
HDSS13G08UP-A ●	MC.322081331		[4 G 2.5 + (2 x 1.0) + (2 x 26 AWG)]	13.8	195		
≤ 100 m connection							
HDS117G08UP-A ●	MC.322081731		[4 G 1.0 + (2 x 0.75) + (2 x 22 AWG)]	12.5	125		
HDS115G08UP-A ●	MC.322081531		[4 G 1.5 + (2 x 1.0) + (2 x 22 AWG)]	13.2	160		
HDS113G08UP-A ●	MC.322081331		[4 G 2.5 + (2 x 1.0) + (2 x 22 AWG)]	14.5	200		
HDS111G08UP-A ●	MC.322081131		[4 G 4 + (2 x 1.5) + (2 x 22 AWG)]	16.3	285		



Protocol: **HMC6®**

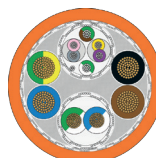
Manufacturer: **HEIDENHAIN®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
HDS15G12UP-N ●	MC.323121525		[(3x1.50)+1G1.50+2x1.0+(2x0.30+2x2x0.15)]	12.5	86	
HDS13G12UP-N ●	MC.323121325		[(3x2.50)C+1G2.50+2x1.0+(2x0.30+2x2x0.15)]	14.2	113	
HDS11G12UP-N ●	MC.323121125		[(3x4.0)+1G4.0+2x1.0+(2x0.30+2x2x0.15)]	16.5	150	



Protocol: **EnDAT 2.2®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm²	mm	kg/km	
HDSH15G12UP-A ●	MC355121531		[4G1.5+1x(2x0.75)+1x(2x0.30+2x2x0.15)]	13.0	165	
HDSH13G12UP-A ●	MC355121331		[4G2.5+1x(2x0.75)+1x(2x0.30+2x2x0.15)]	14.2	210	
HDSH11G12UP-A ●	MC355121131		[4G4+1x(2x0.75)+1x(2x0.30+2x2x0.15)]	16.5	285	



EPLAN

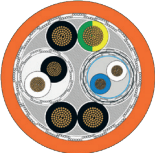
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).

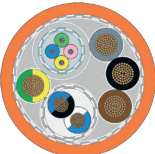


SPAC CAVI

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

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MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 HDSE19G08UP-A	● MC.322081731		[4G0.75+1x(2x0.34)+1x((2x24AWG))]	11.5	190	
HDSE15G08UP-A	● MC.322081531		[4G1.5+1x(2x0.75)+1x((2x24AWG))]	13.2	255	
HDSE11G08UP-A	● MC.322081331		[4G4+1x(2x1.0)+1x((2x24AWG))]	16.2	415	

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 HDSSI22Z10UP-A	● MC.356102231	6FX8008 Plus-1BE04	[4G0.38 + (2x0.38) + (4x0.20)]	9.5	79	
HDSSI19Z10UP-A	● MC.356101931	6FX8008 Plus-1BE08	[4G0.75 + (2x0.50) + (4x0.20)]	10.4	105	
HDSSI15Z10UP-A	● MC.356101531	6FX8008 Plus-1BE11	[4G1.50 + (2x1.50) + (4x0.20)]	12.3	162	
HDSSI13Z10UP-A	● MC.356101331	6FX8008 Plus-1BE21	[4G2.50 + (2x1.50) + (4x0.20)]	13.3	214	

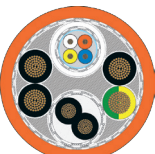


Protocol: **ILM 62®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 HDN13Z14UP-VE	 MC.375141332		5G2.5+2x(4x0.34)+1x(0.34)	14.8	186	

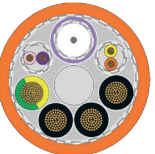
Protocol: **INDRADYN-S®**

Manufacturer: **BOSCH-REXROTH®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 HDSBR19Z10UP-A	 MC.357101931		[4G0.75+(2x0.50)+(4x24 AWG)]	11.8	139	
HDSBR15Z10UP-A	 MC.357101531		[4G1.5+(2x0.75)+(4x24 AWG)]	13.0	148	
HDSBR13Z10UP-A	 MC.357101331		[4G2.5+(2x0.75)+(4x24 AWG)]	15.8	159	

Protocol: **MOVILINK DDI®**

Manufacturer: **SEW®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 HDSS15G09UP-A	 MC.359091531		[4G1.5+2(2x1.0)+1 Coax RG58]	15.7	198	
HDSS13G09UP-A	 MC.359091331		[4G2.5+2(2x1.0)+1 Coax RG58]	16.7	236	
HDSS11G09UP-A	 MC.359091131		[4G4+2(2x1.0)+1 Coax RG58]	17.0	302	
HDSS09G09UP-A	 MC.359090931		[4G6+2(2x1.0)+1 Coax RG58]	19.7	410	
HDSS07G09UP-A	 MC.359090731		[4G10+2(2x1.0)+1 Coax RG58]	22.1	605	



EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

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

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MOTION **FEEDBACK**

MOTIONFEEDBACK

CABLES FOR FEEDBACK, ENCODERS, AND RESOLVERS – STATIC AND DYNAMIC VERSIONS, SHIELDED AND UNSHIELDED

In the world of smart automation, precision is everything. MOTIONFEEDBACK cables are engineered for the transmission of control and positioning signals for servomotors, incremental encoders, and resolvers, ensuring reliability, signal stability, and EMC compatibility even in industrial environments subjected to high mechanical stresses.

Used for connecting encoders, resolvers, brakes, and pulse generators, these cables guarantee stable and secure data transfer even in applications with high clock frequencies and continuous dynamic cycles, such as robotics, machine tools, and automated lines.

All MOTIONFEEDBACK cables are manufactured in compliance with CE, UL/CSA, and DESINA standards.

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	Polypropylene (PP)	PVC TM5	Designed for repeated bending, high performance in dynamic environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	Polypropylene (PP)	Polyurethane (PUR FRHF)	High flexibility even at low temperatures, chemical resistance, halogen-free

TECHNICAL BENEFIT OF THE MOTIONFEEDBACK FAMILY

- Precise and stable transmission of encoder/resolver signals
- Excellent EMC shielding and noise immunity
- High-performance materials for intensive dynamic cycles
- DESINA®, CE, UL, CSA compliance
- Shielded and unshielded versions for every requirement
- Cables free from cadmium, silicones, and harmful substances
- Superior mechanical lifespan in severe dynamic environments

ELECTRICAL & MATERIAL SPECIFICATIONS

CHARACTERISTIC	TECHNICAL SPECIFICATION
Conductors	Bare or tinned copper, extra-flexible
Insulation	Special PP (Polypropylene) – low capacitance, excellent electrical stability
Core Identification	According to manufacturer's standard or standard encoder/resolver coding
Shielding	Tinned copper braid with ≤ 85% coverage + optional polyester tape
Outer Jacket	PVC TM5 (DP series) or PUR FRHF (HP series) – standard colour Green RAL 6018, Orange RAL 2003
Certifications	CE, UL/CSA, DESINA®, RoHS – cadmium and silicone-free materials
Nominal Voltage	300V
Operating Temperature	-30 °C / +80 °C (PVC); -50 °C / +80 °C (PUR FRHF)
Minimum Bending Radius (DP)	6.5 × Outer Diameter
Oil Resistance	IEC 60811-2-1, Oil Res I & II
Minimum Bending Radius (HP)	Down to 7.5 × Outer Diameter

MAIN CHARACTERISTICS

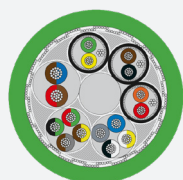
Function	Performance
Low Parasitic Capacitance (PP)	Precise transmission of pulse signals, even over long distances
High EMC Shielding (85%)	Protection from electromagnetic interference, signal stability
Mechanical Flexibility	Ideal for installation in cable carriers and dynamic applications
Chemical and Mechanical Resistance (PUR)	High resistance to oils, UV, hydrolysis, coolants, and abrasion
Eco-friendly Materials	Halogen-free, silicone-free, and substances non-harmful to paint wetting impairment
DESINA® Conformity	Compatibility with European industrial wiring standards

APPLICATION EXAMPLES

- Industrial Automation and Robotics.
- Machine Tools and CNC Systems.
- Incremental Encoders and Absolute Resolvers.
- Positioning Systems and Axis Control.
- Packaging, Logistics, and Automated Handling.
- Applications in Cable Carriers and Collaborative Robots (Cobots).

MOTION**FEEDBACK** – the range of cables for feedback, encoders, and resolvers engineered for maximum signal precision and mechanical durability in the static and dynamic applications of modern industrial automation.

CABLES TYPES



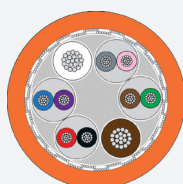
**DYNAMIC PERFORMANCE
ENCODER**

**PVC
TM5**

**30 ÷
300 V**

**-30 °C
+80 °C**

58



**HIGH DYNAMIC PERFORMANCE
ENCODER**

**PUR
FRHF**

**30 ÷
300 V**

**-50 °C
+80 °C**

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**DYNAMIC PERFORMANCE RESOLVER
DYNAMIC PERFORMANCE RESOLVER SH**

**PVC
TM5**

**30 ÷
300 V**

**-30 °C
+80 °C**

**66
68**



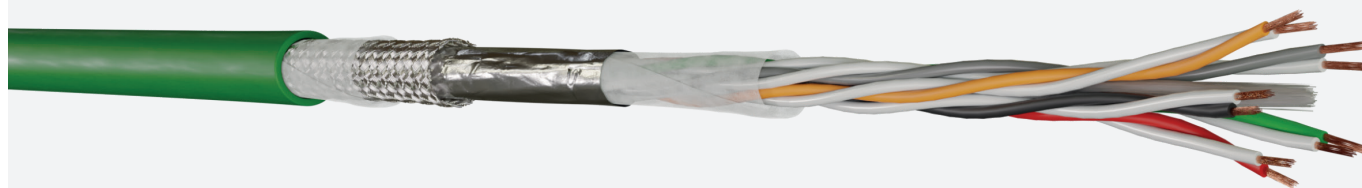
**HIGH DYNAMIC PERFORMANCE RESOLVER
HIGH DYNAMIC PERFORMANCE RESOLVER SH**

**PUR
FRHF**

**30 ÷
300 V**

**-50 °C
+80 °C**

**70
72**



UL 20293
80 °C -30V
UL 2464
80 °C -300V



AWM I/II A/B
80 °C - 30V
AWM I/II A/B
80 °C - 300V



LABS
Free



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED



20 m / s²

ACCELERATION MAX.



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +80	-5 / +80	-5 / +80

ELECTRICAL PROPERTIES



Test
Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation
Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Max. Short Circuit
Temperature

160 °C (≤ 1s)



Operating
Voltage

30 ÷ 300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Extra-Flexible Bare or Tinned Copper Conductors	High mechanical service life even with repeated bending
Low-Capacitance Polypropylene (PP) Insulation	Stable signal transmission, minimal dispersion, and interference
Copper Braid Shielding ≥85%	Excellent EMC protection and noise immunity
Flexible PVC TM5 Outer Jacket	Optimal balance between mechanical resistance and flexibility
Structure Optimized for Cable Carriers	Reliability in continuous motion cycles and dynamic installations
CE, UL/CSA, and DESINA® Certifications	Compliance with major international standards
Low Parasitic Capacitance	Clean transmission of high-frequency signals for encoders and resolvers
Cadmium, Silicone, and Halogen-Free Materials	Safety and compatibility with sensitive environments and industrial painting

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
EDS24X04UR-G	MC.224042427	1DC00	(2x2x0.22)	7.0	83	
EDS22X06UR-VE	MC.224062222	2DC00	(2x2x0.22+1x2x0.34)	7.2	38	
EDS25P08UR-VE	MC.224082622	1BD11	(8x2x0.18)	7.8	52	
EDS21X12UR-VE	MC.224122222	1BD21	(4x2x0.38+4x0.50)	8.9	80	
EDSI21X12UR-VE	MC.224122221	1BD41	[3x(2x0.14)+4x0.14+2x0.50]	8.8	69	
EDS21X16UR-VE	MC.224162222	1BD51	[3x(2x0.14)+4x0.14+2x0.50+4x0.22]	9.4	84	
EDS25X08UR-VE	MC.224082622	1BD61	(4x2x0.18)	6.4	34	
EDS25P02UR-VE	MC.224042622	1BD71	(2x2x0.18)	5.0	21	
EDS24X12UR-VE	MC.224122422	1BD81	(12x0.22)	6.9	48	

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
EDS17X10UR-A	MC.225101722	INK 0209	(4x2x0.25+2x1.0)	8.8	74	
EDS21X10UR-A	MC.225102222	INK 0448	(4x2x0.25+2x0.50)	8.5	70	
EDSI21X09UR-A	MC.225092222	INK 0208	(9x0.50)	8.8	75	
EDSI17X16UR-A	MC.225161722	INK 0532	[4x1.0+4x2x0.14+(4x0.14)]	9.7	81	

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
EDSF21X07UR-VE	MC.227072122		(1x2x0.18+5x0.50)	7.8	45	
EDSF21X09UR-VE	MC.227092122		(2x2x0.18+5x0.50)	7.8	47	
EDSF21X12UR-VE	MC.227122122		(3x2x0.18+6x0.50)	8.7	77	
EDSF17X12UR-VE	MC.227121722		(3x2x0.18+6x1.0)	8.7	88	
EDSF21X16UR-VE	MC.227162122		(5x2x0.18+6x0.50)	8.7	84	
EDSF21X10UR-VE	MC.227102122		(4x2x0.22+2x0.50)	7.6	72	
EDSF24P10UR-VE	MC.227102422		(10x2x0.22)	9.0	60	
EDSF28P10UR-VE	MC.227102822		(10x2x28AWG)	6.0	30	

**EPLAN**

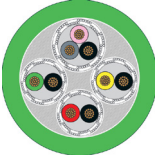
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).

**SPAC CAVI**

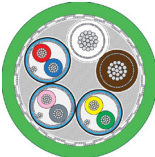
All the codes are available in the SPAC CAVI system (use MotionCables item code).

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).

Acc.TO: **LENZE®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDSL17Z10UR-VE ● MC.226101722			4x(2x0.14)+(2x1.0)	11.2	68	
EDSL26Z09UR-VE ● MC.226092622			3x(2x0.14)+(3x0.14)	9.2	42	
EDSL21Z14UR-VE ● MC.226142132			3x(2x0.14)+(4x0.14)+2x(2x0.50)	12.0	79	

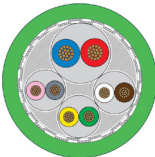
Acc.TO: **HEIDENHAIN®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDS21X08UR-VE ● MC.228082122			[3x(2x0.14)+2x(1x0.50)]	8.4	64	
EDSH17X08UR-VE ● MC.228081722			[3x(2x0.14)+2x(1x1.0)]	9.1	69	
EDSH21X12UR-VE ● MC.228122122			(4x2x0.14+4x0.50)	8.5	50	
EDSH21X16UR-VE ● MC.228162122			[4x2x0.14+(4x0.14)+4x0.50]	8.3	58	

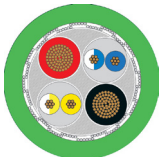
Acc.TO: **YASKAWA®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDS22X09UR-VE ● MC.232092222			(3x2x0.35+3G0.50)	9.0	50	
EDSY22P02UR-VE ● MC.232042222			(2x2x0.34)	7.0	30	
LDS22P03UR-VE ● MC.232062222			(3x2x0.34)	7.5	42	

Acc.TO: **SCHNEIDER-ELAU®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDS22X08UR-VE ● MC.234082222			(3x2x0.14+2x0.34)	7.0	29	
EDSE21X08UR-VE ● MC.234082122			(3x2x0.25+2x0.50)	8.3	44	

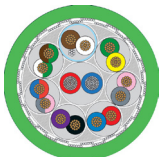
Acc.TO: **OMRON®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDS21X06UR-VE	● MC.228062122		(2x2x0.25+2x0.50)	6.5	33	
EDS17X06UR-VE	● MC.228061722		(2x2x0.25+2x1.0)	7.6	43	

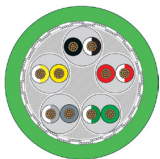
Acc.TO: **B&R®**

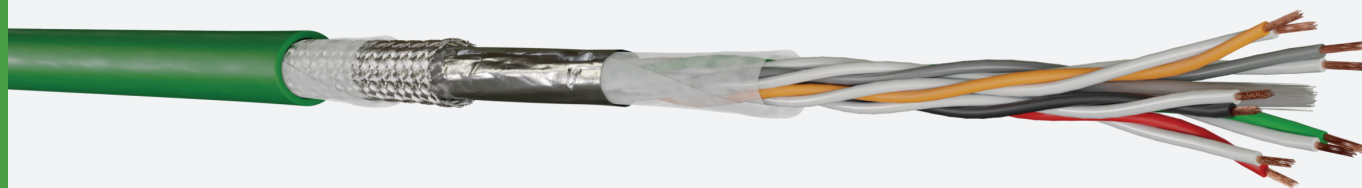
MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDSP21X12UR-VE	● MC.233122122		(5X2X0.14+2X0.50)	7.8	52	

Acc.TO: **CONTROL-TECHNIQUES®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDS17X16UR-VE	● MC.230161722		[6x2x0.34+1x(2x0.34)+1x2x1.0]	6.9	48	

Acc.TO: **ROCKWELL®**

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
 EDSR22P05UR-VE	● MC.231102222		(5x2x0.35)	8.7	75	



UPON REQUEST



10 million

CYCLES



6,5 x O.D.

MIN. BENDING RADIUS



600 m / min

MAX. SPEED

60 m / s²

ACCELERATION MAX.

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



50 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

30 ÷ 300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Ultra-Flexible Tinned Copper Conductors	Long service life even in extreme and robotic motion
Technical Ultra-Low Capacitance PP Insulation	High electrical stability and precision in signal transmission
Composite Shielding with Copper Braid and Polyester Tape	Total EMC protection, even in high-frequency systems
PUR FRFH (Halogen-Free Flame Retardant) Jacket	Exceptional resistance to oils, coolants, UV, abrasion, and chemical agents
Structure Optimized for Severe Motion	Consistent performance in intensive dynamic cycles and multi-axis movements
Stable Operation even at Low Temperatures (-50°C)	Flexibility maintained in cold environments or those with thermal variations
Shielded and Unshielded Versions	Solution suitable for any installation requirement or machine layout
Robust and Flexible Construction	Long service life and reduced machine downtime

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
EDS22X06UP-VE 	MC.324062232	2DC00 Plus	(2x2x0.22+1x2x0.34)	7.2	38	
EDSL22X06UP-VE 	MC.324062232L	2DC00 Plus	(2x2x0.20+1x2x0.38)	6.9	35	
EDS25P08UP-VE 	MC.324162632	1BD11	(8x2x0.18)	7.8	52	
EDS21X12UP-VE 	MC.324122232	1BD21	(4x2x0.38+4x0.50)	8.9	80	
EDSI21X12UP-VE 	MC.324122232	1BD41	[3x(2x0.14)+4x0.14+2x0.50]	8.8	69	
EDS21X16UP-VE 	MC.324162232	1BD51	[3x(2x0.14)+4x0.14+2x0.50+4x0.22]	9.4	84	
EDS25X08UP-VE 	MC.324082632	1BD61	(4x2x0.18)	6.4	34	
EDS25P02UP-VE 	MC.324042632	1BD71	(2x2x0.18)	5.0	21	
EDS24X12UP-VE 	MC.324122432	1BD81	(12x0.22)	6.9	48	

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
EDS17X10UP-A 	MC.325101732	INK 0209	(4x2x0.25+2x1.0)	8.8	74	
EDS21X10UP-A 	MC.325103232	INK 0448	(4x2x0.25+2x0.50)	8.5	70	
EDSI21X09UP-A 	MC.325093232	INK 0208	(9x0.50)	8.8	75	
EDSI17X16UP-A 	MC.325161732	INK 0532	[4x1.0+4x2x0.14+(4x0.14)]	9.7	81	

MotionCables Code	EPlan Code	OEM Code	Formation	∅	Cu	DATA SHEET
			mm ²	mm	kg/km	
EDSF21X07UP-VE 	MC.327072132	LX66L-0003-0462	(1x2x0.18+5x0.50)	7.8	45	
EDSF21X09UP-VE 	MC.327092132	LX66L-0003-0461	(2x2x0.18+5x0.50)	7.8	47	
EDSF21X12UP-VE 	MC.327132132	LX66L-0003-0312	(3x2x0.18+6x0.50)	8.7	77	
EDSF17X12UP-VE 	MC.327121732	LX66L-0003-0401	(3x2x0.18+6x1.0)	8.7	88	
EDSF21X16UP-VE 	MC.327162132	LX66L-0003-0369	(5x2x0.18+6x0.50)	8.7	84	
EDSF21X10UP-VE 	MC.327102132	LX66L-0003-0482	(4x2x0.22+2x0.50)	7.6	72	
EDSF24P10UP-VE 	MC.327102432		(10x2x0.22)	9.0	60	
EDSF28P10UP-VE 	MC.327102832	LX66L-0003-0283	(10x2x28AWG)	6.0	30	

**EPLAN**

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).

**SPAC CAVI**

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

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Acc.TO: **LENZE®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDSL17Z10UP-VE	● MC.326101732		4x(2x0.14)+(2x1.0)	11.2	68	
EDSL26Z09UP-VE	● MC.326092632		3x(2x0.14)+(3x0.14)	9.2	42	
EDSL21Z14UP-VE	● MC.326142132		3x(2x0.14)+(4x0.14)+2x(2x0.50)	12.0	79	

Acc.TO: **HEIDENHAIN®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDS21X08UP-VE	● MC.328082132		[3x(2x0.14)+2x(1x0.50)]	8.4	64	
EDSH17X08UP-VE	● MC.328082132		[3x(2x0.14)+2x(1x1.0)]	9.1	69	
EDSH21X12UP-VE	● MC.328082132		(4x2x0.14+4x0.50)	8.5	50	
EDSH21X16UP-VE	● MC.328082132		[4x2x0.14+(4x0.14)+4x0.50]	8.3	58	

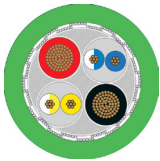
Acc.TO: **YASKAWA®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDS22X09UP-VE	● MC.332092232		(3x2x0.35+3G0.50)	9.0	50	
EDSY22P02UP-VE	● MC.332042232		(2x2x0.34)	7.0	30	
LDS22P03UP-VE	● MC.332062232		(3x2x0.34)	7.5	42	

Acc.TO: **SCHNEIDER-ELAU®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDS22X08UP-VE	● MC.334082232		(3x2x0.14+2x0.34)	7.0	29	
EDSE21X08UP-VE	● MC.334082132		(3x2x0.25+2x0.50)	8.3	44	

Acc.TO: **OMRON®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDS21X06UP-VE ● MC.328062132			(2x2x0.25+2x0.50)	6.5	33	
EDS17X06UP-VE ● MC.328061732			(2x2x0.25+2x1.0)	7.6	43	

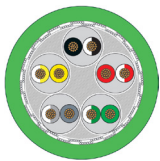
Acc.TO: **B&R®**

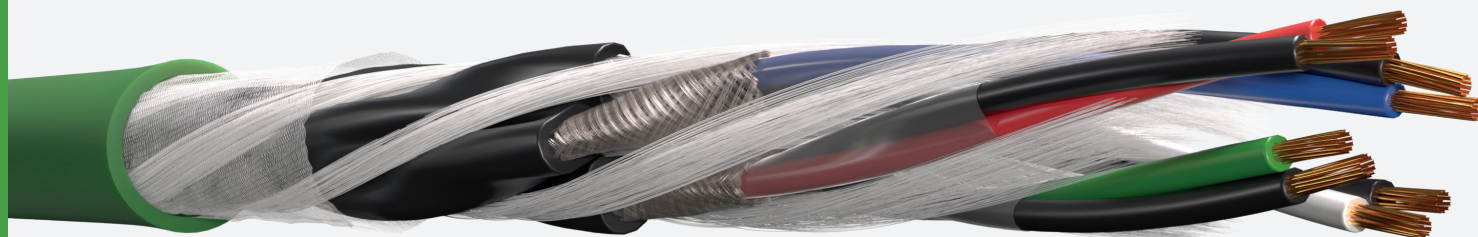
MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDSP21X12UP-VE ● MC.333122132			(5x2x0.14+2x0.50)	7.8	52	

Acc.TO: **CONTROL-TECHNIQUES®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDS17X16UP-VE ● MC.330161732			[6x2x0.34+1x(2x0.34)+1x2x1.0]	6.9	48	

Acc.TO: **ROCKWELL®**

MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm²	mm	kg/km	
 EDSR22P05UP-VE ● MC.331102232			(5x2x0.35)	8.7	75	



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION MAX.

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-5 / +80	-30 / +80	-30 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Optimized Low-Capacitance Geometry	Stable and reliable performance even over long cable runs
High-Density Copper Braid Shielding	Maximum immunity to EMC interference for clean signal transmission
Technical PVC Jacket, Flexible and Oil-Resistant	Long service life in industrial environments subject to mechanical stress or chemical agents
Compact Construction and Low Weight	Ease of routing in control cabinets or narrow cable passages
CE / UL / CSA Certifications	Global compatibility and reduced qualification time in international projects
Reinforced Electrical Insulation up to 300 V	High operational safety, even under demanding conditions
Self-Extinguishing and Controlled Fire Behavior	Reliable protection in case of short circuits or overheating
Water-Resistant and Suitable for Temporary Outdoor Use	Safe operation even in humid environments or areas subject to splashing

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	MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
				mm ²	mm	kg / km	
	RDN24P03UR-V	● MC.235062422		3 x (2 x 0.25)	8.3	36	
	RDN24P04UR-V	● MC.235082422		4 x (2 x 0.25)	9.0	47	
	RDN24P05UR-V	● MC.235102422		5 x (2 x 0.25)	10.3	57	
	RDN24P06UR-V	● MC.235122422		6 x (2 x 0.25)	11.7	68	
	RDN24P09UR-V	● MC.235182422		9 x (2 x 0.25)	13.6	103	
	RDN22P03UR-V	● MC.235062222		3 x (2 x 0.34)	9.4	41	
	RDN22P04UR-V	● MC.235082222		4 x (2 x 0.34)	10	55	
	RDN22P05UR-V	● MC.235102222		5 x (2 x 0.34)	11.2	70	
	RDN22P06UR-V	● MC.235122222		6 x (2 x 0.34)	12.6	85	
	RDN22P09UR-V	● MC.235182222		9 x (2 x 0.34)	15.7	125	

FEEDBACK



EPLAN

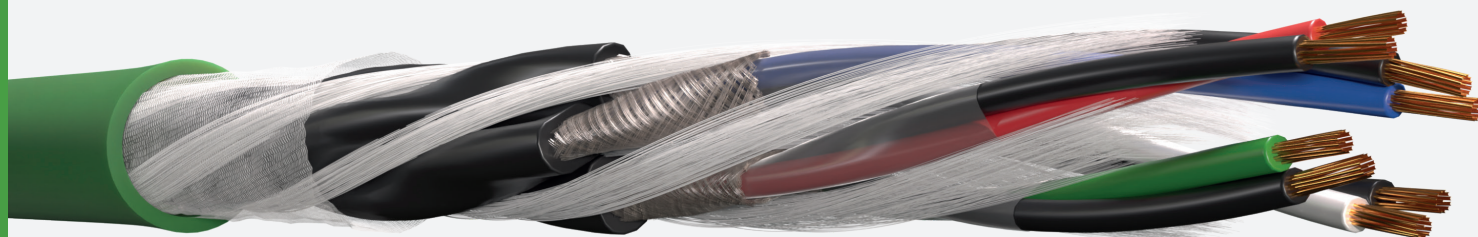
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

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UPON REQUEST



10 million

CYCLES



6,5 x O.D.

MIN. BENDING RADIUS



600 m / min

MAX. SPEED

60 m / s²

ACCELERATION MAX.

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



50 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Ultra-Flexible Tinned Copper Conductors	Long service life even in extreme and robotic motion
Technical Ultra-Low Capacitance PP Insulation	High electrical stability and precision in signal transmission
Composite Shielding with Copper Braid and Polyester Tape	Total EMC protection, even in high-frequency systems
PUR FRFH (Halogen-Free Flame Retardant) Jacket	Exceptional resistance to oils, coolants, UV, abrasion, and chemical agents
Structure Optimized for Severe Motion	Consistent performance in intensive dynamic cycles and multi-axis movements
Stable Operation even at Low Temperatures (-50°C)	Flexibility maintained in cold environments or those with thermal variations
Shielded and Unshielded Versions	Solution suitable for any installation requirement or machine layout
Robust and Flexible Construction	Long service life and reduced machine downtime

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MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg / km	
RDN24P03UP-V	● MC.335062432		3 x (2 x 0.25)	8.3	36	
RDN24P04UP-V	● MC.335082432		4 x (2 x 0.25)	9.0	47	
RDN24P05UP-V	● MC.335102432		5 x (2 x 0.25)	10.3	57	
RDN24P06UP-V	● MC.335122432		6 x (2 x 0.25)	11.7	68	
RDN24P09UP-V	● MC.335182432		9 x (2 x 0.25)	13.6	103	
RDN22P03UP-V	● MC.335062232		3 x (2 x 0.34)	9.4	41	
RDN22P04UP-V	● MC.335082232		4 x (2 x 0.34)	10	55	
RDN22P05UP-V	● MC.335102232		5 x (2 x 0.34)	11.2	70	
RDN22P06UP-V	● MC.335122232		6 x (2 x 0.34)	12.6	85	
RDN22P09UP-V	● MC.335182232		9 x (2 x 0.34)	15.7	125	

FEEDBACK



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5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION MAX.

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +80	-5 / +80	-5 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

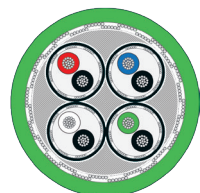


MECHANICAL CRUSH

MAIN ADVANTAGES

Optimized Low-Capacitance Geometry	Stable and reliable performance even over long cable runs
High-Density Copper Braid Shielding	Maximum immunity to EMC interference for clean signal transmission
Technical PVC Jacket, Flexible and Oil-Resistant	Long service life in industrial environments subject to mechanical stress or chemical agents
Compact Construction and Low Weight	Ease of routing in control cabinets or narrow cable passages
CE / UL / CSA Certifications	Global compatibility and reduced qualification time in international projects
Reinforced Electrical Insulation up to 300 V	High operational safety, even under demanding conditions
Self-Extinguishing and Controlled Fire Behavior	Reliable protection in case of short circuits or overheating
Water-Resistant and Suitable for Temporary Outdoor Use	Safe operation even in humid environments or areas subject to splashing

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MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg / km	
RDS24P03UR-VE ●	MC.236062222		[3 x (2 x 0.25)]	8.8	66	
RDS24P04UR-VE ●	MC.236082222		[4 x (2 x 0.25)]	9.5	80	
RDS24P05UR-VE ●	MC.236102222		[5 x (2 x 0.25)]	10.8	98	
RDS24P06UR-VE ●	MC.236122222		[6 x (2 x 0.25)]	12.2	113	
RDS24P09UR-VE ●	MC.236182222		[9 x (2 x 0.25)]	14.1	155	
RDS22P03UR-VE ●	MC.236062222		[3 x (2 x 0.34)]	9.9	76	
RDS22P04UR-VE ●	MC.236082222		[4 x (2 x 0.34)]	10.5	98	
RDS22P05UR-VE ●	MC.236102222		[5 x (2 x 0.34)]	11.7	115	
RDS22P06UR-VE ●	MC.236122222		[6 x (2 x 0.34)]	13.1	135	
RDS22P09UR-VE ●	MC.236182222		[9 x (2 x 0.34)]	16.2	185	



FEEDBACK



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UPON REQUEST



10 million

CYCLES



6,5 x O.D.

MIN. BENDING RADIUS



600 m / min

MAX. SPEED

60 m / s²

ACCELERATION MAX.

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



50 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT

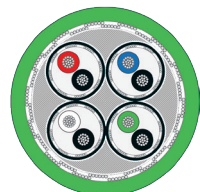


HALOGEN FREE

MAIN ADVANTAGES

Ultra-Flexible Tinned Copper Conductors	Long service life even in extreme and robotic motion
Technical Ultra-Low Capacitance PP Insulation	High electrical stability and precision in signal transmission
Composite Shielding with Copper Braid and Polyester Tape	Total EMC protection, even in high-frequency systems
PUR FRFH (Halogen-Free Flame Retardant) Jacket	Exceptional resistance to oils, coolants, UV, abrasion, and chemical agents
Structure Optimized for Severe Motion	Consistent performance in intensive dynamic cycles and multi-axis movements
Stable Operation even at Low Temperatures (-50°C)	Flexibility maintained in cold environments or those with thermal variations
Shielded and Unshielded Versions	Solution suitable for any installation requirement or machine layout
Robust and Flexible Construction	Long service life and reduced machine downtime

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MotionCables Code	EPlan Code	OEM Code	Formation	Ø	Cu	DATA SHEET
			mm ²	mm	kg / km	
RDS24P03UP-VE ●	MC.336062232		[3 x (2 x 0.25)]	8.8	66	
RDS24P04UP-VE ●	MC.336082232		[4 x (2 x 0.25)]	9.5	80	
RDS24P05UP-VE ●	MC.336102232		[5 x (2 x 0.25)]	10.8	98	
RDS24P06UP-VE ●	MC.336122232		[6 x (2 x 0.25)]	12.2	113	
RDS24P09UP-VE ●	MC.336182232		[9 x (2 x 0.25)]	14.1	155	
RDS22P03UP-VE ●	MC.336062232		[3 x (2 x 0.34)]	9.9	76	
RDS22P04UP-VE ●	MC.336082232		[4 x (2 x 0.34)]	10.5	98	
RDS22P05UP-VE ●	MC.336102232		[5 x (2 x 0.34)]	11.7	115	
RDS22P06UP-VE ●	MC.336122232		[6 x (2 x 0.34)]	13.1	135	
RDS22P09UP-VE ●	MC.336182232		[9 x (2 x 0.34)]	16.2	185	



FEEDBACK



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75

DRIVEConn[®] MT**BUS**

DRIVEConn[®] MTBUS

FIELD BUS CABLES FOR AUTOMATION & MOTION NETWORKS

In a highly automated industrial environment, the quality and integrity of data transmission are crucial for the efficiency and safety of the entire plant. The DRIVEConn[®] MTBUS range is engineered to meet the electrical, mechanical, and EMC requirements of the major industrial Fieldbus protocols, ensuring high performance even in harsh environments.

The DRIVEConn[®] MTBUS line offers high-performance cables designed to meet the electrical and EMC parameters mandated by Fieldbus standards. Each configuration is optimized for signal integrity, mechanical resilience, and regulatory compliance.

Whether for fixed installations, dynamic use, or high-stress applications, MOTIONCABLES ensures complete adherence to OEM and international specifications (UL, CSA, IEC, ODVA, PI, CiA), making DRIVEConn[®] cables a solid choice for high-performance automation systems.

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	PE, Foam-Skin PE, or PP	PVC	Flexibility, Oil/Fluid Resistance, Flame Retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	PE, Foam-Skin PE, or PP	PVC TM5	Designed for Repeated Bending, High performance in Dynamic Environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	PE, Foam-Skin PE, or PP	Polyurethane (FRHF PUR)	High flexibility even at low temperatures, Chemical Resistance, Halogen-Free

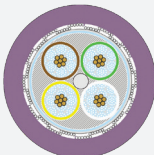
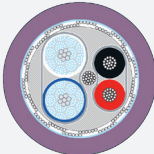
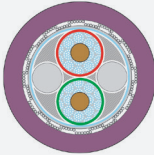
ELECTRICAL & MATERIAL SPECIFICATIONS

CHARACTERISTIC	TECHNICAL SPECIFICATION
Nominal Voltage	30 ÷ 1000 V (UL style)
Impedance	90 Ω to 150 Ω (±10–15% based on standard)
Guaranteed Bandwidth	Up to 500 MHz (PROFINET Cat.6)
Conductor Material	Bare or Tinned Flexible Copper
Insulation	PE, Foam-Skin PE, or PP (Low Dielectric Constant)
Outer Jacket	PVC, PVC TM5 or PUR FRHF
Flame Resistance	UL VW-1 / IEC 60332-1-2
Oil Resistance	According to IEC 60811-2-1 / UL Oil Res I & II
Operating Temperature	-50 °C to +80 °C (PUR), -30 °C to +80 °C (PVC)
Minimum Bending Radius	Down to 7.5 × Outer Diameter (HP versions)

QUALITY CONTROL & TEST PARAMETERS

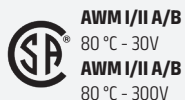
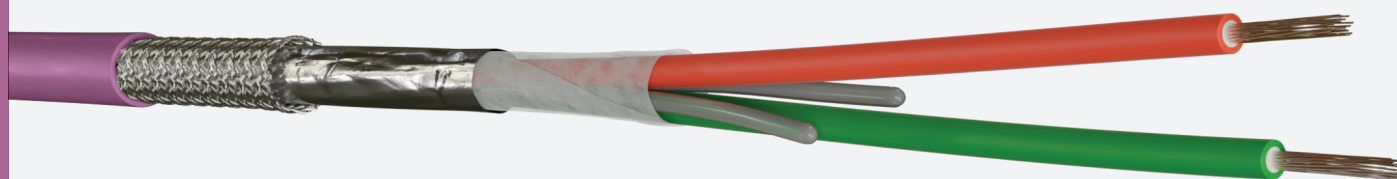
Characteristic Impedance	Time Domain Reflectometry (TDR)
Attenuation	Measured across standard bands (10–500 MHz)
Crosstalk (NEXT/FEXT)	Testing on adjacent pairs (Ethernet)
Linear Capacitance	Measured in pF/m
EMC Shielding	Optical verification and EMI/RFI testing
Conductor Continuity & Integrity	100% Electrical testing
Mechanical Tests	Flexing cycles (≤ 5 million for HP), tensile stress, abrasion

PROTOCOL ANALYSIS AND ELECTRICAL REQUIREMENTS

	PROTOCOL	ORIGIN/ STANDARD	TPOLOGY	IMPEDANCE	TRANSMISSION SPEED	APPLIED FOR
		Bosch / CiA	Bus RS-485	$120 \Omega \pm 10\%$	Up to 1 Mbps	Stable Impedance Dynamic Bending Radius
		Rockwell / ODVA	Linear (with power supply)	$120 \Omega \pm 10\%$	Up to 0.5 Mbps	Data/Power Separation Dual Shielding
		Siemens / PI	RS-485 Linear Bus	$150 \Omega \pm 15\%$	Up to 12 Mbps	AWG 22 Low Attenuation at 12 MHz

APPLICATION EXAMPLES

SECTOR	APPLICATION	PROTOCOL
Automotive	Assembly lines / Interconnected PLCs	PROFIBUS / PROFINET
Machine Tools	Motion Control, encoders	ETHERCAT / CANopen
Packaging	Modular systems / Decentralized I/O	DeviceNet
Advanced Robotics	High-dynamic systems	PROFINET / ETHERCAT (HP)



200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Operating
Voltage

30 ÷ 300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Balanced Pair Geometry

Ensures high signal stability and interference-free transmission

Low Dielectric Constant Insulation

Improves signal quality and reduces capacitive losses

High-Coverage Shielding

Effective protection against electromagnetic and radio frequency interference

High-Flexibility and High-Purity Conductors

Ensures electrical continuity and long-term reliability

Construction Structure Optimized for Industrial Bus Networks

Maximum compatibility with major communication protocols

Outer Materials Resistant to Oils and Chemical Agents

Increased durability and safety in industrial installations

Compliance with International Standards

Suitability for certified plants and complex production environments

Robust and Flexible Construction

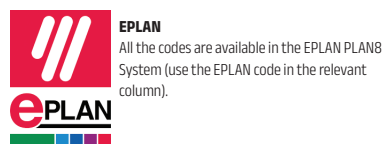
Long service life and reduced machine downtime

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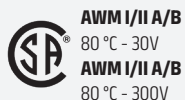
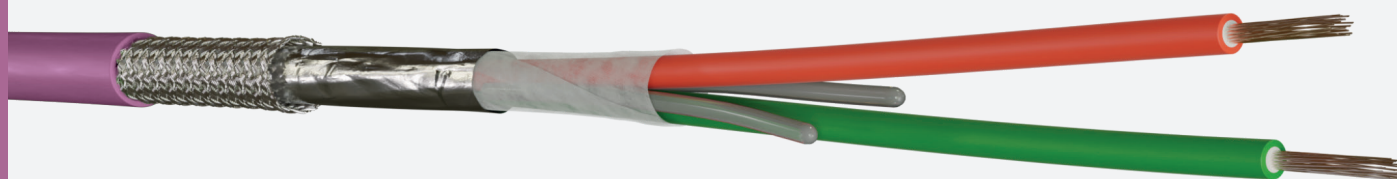
Fieldbus standard	MotionCables code	EPlan Code	Formation	Ø mm	Cu kg/km	Res Ω/km	Cap. nF/km	Op. Tension	Serie's Data Sheet
 120 Ω	BFSC24Q01UR-VI	MC.137042423	(1x4x0.25)	6.5	28	≤ 85.0	44	30 V	
	BFSC24P02UR-VI	MC.137042423	(2x2x0.25)	7.6	35	≤ 85.0	44	30 V	
	BFSC22Q01UR-VI	MC.137042223	(1x4x0.34)	6.7	32	≤ 59.0	42	30 V	
	BFSC21P01UR-VI	MC.137042123	(1x2x0.50)	7.5	42	≤ 39.0	42	30 V	
 120 Ω	BFS22X04UR-VI	MC.138042213	[(1x2x22AWG)+(1x2x24AWG)]	7.0	28	≤ 59.0	40	300 V	
	BFS15X04UR-VI	MC.138041513	[(1x2x18AWG)+(1x2x15AWG)]	11.1	96	≤ 13.7.0	40	300 V	
 150 Ω	BFS24X01UR-VI	MC.141022413	(1x2x24 AWG)	7.8	26	≤ 85,0	30	300 V	
	BFS22X01UR-VI	MC.141022213	(1x2x22 AWG)	8.0	28	≤ 55,0	30	300 V	

ATTENUATION

FREQUENCY	CANOPEN®			DEVICENET®		PROFIBUS®	
	0.50 mm² db/100 m	0.34 mm² db/100m	0.25 mm² db/100m	22 AWG db/100m	18 AWG db/100m	22 AWG db/100m	24 AWG db/100m
MHz	1.0	≤ 1.3	≤ 1.7	≤ 1.9			
	4.0	≤ 2.8	≤ 3.1	≤ 3.9			
	10.0	≤ 3.8	≤ 5.2	≤ 6.5			
	16.0	≤ 4.5	≤ 5.9	≤ 8.4			
	20.0	≤ 6.2	≤ 7.1	≤ 9.5			
	31.25						
	62.5						
	100.0						
KHz	100.0			≤ 0.9	≤ 0.4		
	500.0			≤ 1.6	≤ 0.8		
	1000.0			≤ 2.1	≤ 1.3		
	9,6					≤ 0,22	≤ 0,30
	38,4					≤ 0,36	≤ 0,50
	4					≤ 2.00	≤ 2,40
	16					≤ 4.00	≤ 4,80



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5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m/min

MAX. SPEED



20 m/s²

ACCELERATION



≤ 50 N/mm²

PULLING FORCE



30 °/m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s²	2,0	20	5
PULLING FORCE	N/mm²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +80	-5 / +80	-5 / +80

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Operating Voltage	30 ÷ 300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



MAIN ADVANTAGES

Cable Architecture Optimized for High Frequencies	Ensures signal integrity even under dynamic stress conditions
Ultra-Low Parasitic Capacitance Insulation	Cleaner and more precise transmission in data and control lines
High-Efficiency Dual Shielding	Maximum immunity to EMC noise and signal protection in mixed power-data paths
Impedance Control across the Entire Structure	Stable and synchronized communication in industrial networks
Flexible Construction Resistant to Mechanical Stress	Ideal for cable carriers and installations subject to continuous motion
High-Durability Jacketing Materials	Protection against oils, fluids, and aggressive agents with a long service life
Transmission Quality Verified in Production	Guarantee of consistent performance and system reliability over time
Robust and Flexible Construction	Long service life and reduced machine downtime

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

Fieldbus standard	MotionCables code	Eplan Code	Formation	Ø mm	Cu kg/km	Res Ω/km	Cap. nF/km	Op. Tension V	Serie's Data Sheet
 120 Ω	BDESC24Q01UR-VI	MC.237042423	(1x4x0.25)	6.5	28	≤ 85.0	44	30 V	
	BDESC24P02UR-VI	MC.37022423P	(2x2x0.25)	7.6	35	≤ 85.0	44	30 V	
	BDESC22Q01UR-VI	MC.237042223	(1x4x0.34)	6.7	32	≤ 59.0	42	30 V	
	BDS22P01UR-VI	MC.237042223P	(1x2x0.34)	6.80	22	≤ 53.2	40	30 V	
	BDS22Z03UR-VI	MC.237032213	(1x2x0.34+1x0.34)	7.10	30	≤ 53.2	40	30 V	
	BDESC21P01UR-VI	MC.237022123	(1x2x0.50)	7.5	42	≤ 39.0	42	30 V	
 120 Ω	BDS22X04UR-VI	MC238042223	[(1x2x22AWG)+(1x2x24AWG)]	7.0	28		40	300 V	
	BDS15X04UR-VI	MC238042223	[(1x2x18AWG)+(1x2x15AWG)]	11.1	96		40	300 V	
 150 Ω	BDS24X01UR-VI	MC.241022223	(1x2x24 AWG)	7.8	26	≤ 85.0	30	300 V	
	BDS22X01UR-VI	MC.241022223	(1x2x22 AWG)	8.0	28	≤ 55.0	30	300 V	

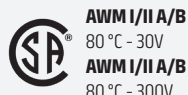
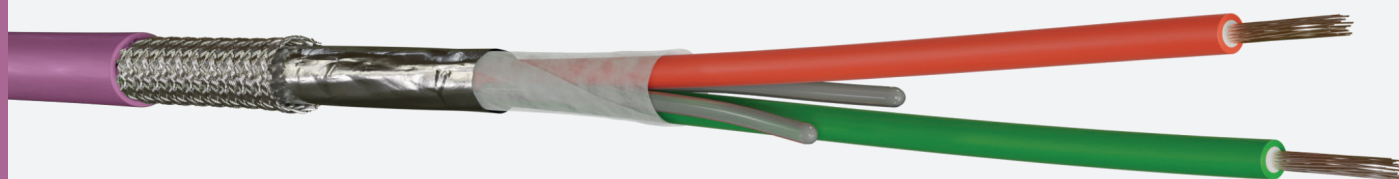
ATTENUATION

	CANOPEN®			DEVICENET®		PROFIBUS®	
	0.50 mm² db/100 m	0.34 mm² db/100m	0.25 mm² db/100m	22 AWG db/100m	18 AWG db/100m	22 AWG db/100m	24 AWG db/100m
MHz	1.0	≤ 1.3	≤ 1.7	≤ 1.9			
	4.0	≤ 2.8	≤ 3.1	≤ 3.9			
	10.0	≤ 3.8	≤ 5.2	≤ 6.5			
	16.0	≤ 4.5	≤ 5.9	≤ 8.4			
	20.0	≤ 6.2	≤ 7.1	≤ 9.5			
	31.25						
	65.5						
	100.0						
KHz	100.0			≤ 0.9	≤ 0.4		
	500.0			≤ 1.6	≤ 0.8		
	1000.0			≤ 2.1	≤ 1.3		
	9,6					≤ 0,22	≤ 0,30
	38,4					≤ 0,36	≤ 0,50
	4					≤ 2.00	≤ 2,40
	16					≤ 4.00	≤ 4,80

EPLAN
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).

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

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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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s²	2,0	50	30	15
PULLING FORCE	N/mm²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Operating
Voltage

30 ÷ 300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Perfectly Balanced and Constant Impedance

Total transmission stability even in high-frequency systems

Advanced Insulation with Ultra-Low Dielectric Constant

Signal purity and precision in data propagation

High-Efficiency Multi-Layer Shielding

Complete immunity to EMC interference even in the presence of drives and inverters

Symmetric Structure with Controlled Pitch

Elimination of reflections and internal interference

Outer Materials Resistant to Hydrocarbons, Abrasion, and UV Rays

Reliability even under severe environmental conditions

Construction Optimized for Complex and Robotic Motion

Mechanical stability and electrical integrity in repetitive and rapid cycles

Quality Certified according to Major Industrial Standards

Safety, performance, and compliance in every advanced application

Robust and Flexible Construction

Long service life and reduced machine downtime

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

Fieldbus standard	MotionCables code	Eplan Code	Formation	Ø mm	Cu kg/km	Res Ω/km	Cap. nF/km	OP. Tension V	Serie's Data Sheet
 120 Ω	BDESC24P01UP-VI	MC.337042433	(1x4x0.25)	6.0	28	≤ 85.0	44	30 V	
	BDESC22P01UP-VI	MC.337042433P	(2x2x0.25)	6.8	35	≤ 85.0	44	30 V	
	BDESC21P01UP-VI	MC.337042233	(1x4x0.34)	7.5	32	≤ 59.0	42	30 V	
	BDS22Z03UP-VI	MC.337032233	(1x2x0.34+1x0.34)	7.10	30	≤ 53.2	40	30 V	
	BDS22P01UP-VI	MC.337042233	(1x2x0.34)	6.80	22	≤ 53.2	40	30 V	
	BDESC17P01UP-VI	MC.337042333	(1x2x0.50)	10.0	42	≤ 39.0	42	30 V	
 120 Ω	BDS22X04UP-VI	MC.338042233	[(1x2x22AWG)+(1x2x24AWG)]	11.60	28		40	300 V	
	BDS15X04UP-VI	MC.338041533	[(1x2x18AWG)+(1x2x15AWG)]	11.1	96		40	300 V	
 150 Ω	BDS24X01UP-VI	MC.341022433	(1x2x24 AWG)	7.8	26	≤ 85,0	30	300 V	
	BDS22X01UP-VI	MC.341022233	(1x2x22 AWG)	8.0	28	≤ 55,0	30	300 V	

ATTENUATION

	CANOPEN®			DEVICENET®		PROFIBUS®	
	0.50 mm² db/100 m	0.34 mm² db/100m	0.25 mm² db/100m	22 AWG db/100m	18 AWG db/100m	22 AWG db/100m	24 AWG db/100m
MHz	1.0	≤ 1.3	≤ 1.7	≤ 1.9			
	4.0	≤ 2.8	≤ 3.1	≤ 3.9			
	10.0	≤ 3.8	≤ 5.2	≤ 6.5			
	16.0	≤ 4.5	≤ 5.9	≤ 8.4			
	20.0	≤ 6.2	≤ 7.1	≤ 9.5			
	31.25						
	65.5						
	100.0						
KHz	100.0			≤ 0.9	≤ 0.4		
	500.0			≤ 1.6	≤ 0.8		
	1000.0			≤ 2.1	≤ 1.3		
	9,6					≤ 0,22	≤ 0,30
	38,4					≤ 0,36	≤ 0,50
	4					≤ 2.00	≤ 2,40
	16					≤ 4.00	≤ 4,80

EPLAN
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SPAC
AUTOMAZIONE
SPAC CAVI
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MOTIONBUS - ETHERNET

CAT.5E | CAT.6 | CAT.7 — FOR HIGH-SPEED INDUSTRIAL COMMUNICATION

The MOTIONBUS ETHERNET cable family is engineered for high-reliability Industrial Ethernet applications with robust EMC compatibility. Whether the network utilizes PROFINET, EtherNet/IP, Modbus TCP, or EtherCAT, our cables ensure seamless integration, high performance, and full support for PoE / PoE+ / PoE++, even in critical environments or with dynamic motion.

All cables are available in BP (Basic Performance), DP (Dynamic Performance), and HP (High Performance) versions to match the plant's specific mechanical and installation requirements.

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	PE or Foam-Skin PE	PVC	Flexibility, Oil/Fluid Resistance, Flame Retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	PE or Foam-Skin PE	PVC TM5	Designed for Repeated Bending, High performance in Dynamic Environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	Polypropylene (PP)	Polyurethane (FRHF PUR)	High flexibility even at low temperatures, Chemical Resistance, Halogen-Free

ELECTRICAL & MATERIAL SPECIFICATIONS

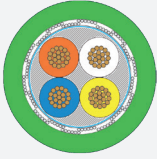
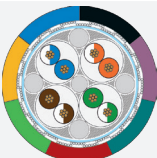
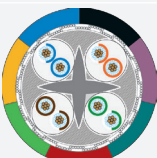
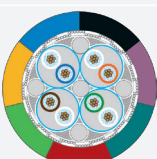
CHARACTERISTIC	TECHNICAL SPECIFICATION
Conductor	Flexible Copper
Insulation	PE or Foam-Skin PE (Low Dielectric Constant)
Twisted Pairs	2 or 4 pairs (Protocol-dependent)
Shielding	Individual pair (TAPE) + overall braid (Cat.6/7)
Outer Jacket	PVC (BP), PVC TM5 (DP), PUR FRHF (HP)
Characteristic Impedance	100 Ω ± 10%
Nominal Voltage	30 ÷ 1000 V (UL CSA)
Operating Temperature	-50 °C to +80 °C (PUR) / -30 °C to +80 °C (PVC)
Flame Resistance	IEC 60332-1-2 / UL VW-1
Oil Resistance	IEC 60811-2-1, Oil Res I & II
Minimum Bending Radius	Down to 7.5 × Outer Diameter (HP)

PoE READY - POWER OVER ETHERNET

All MOTIONBUS ETHERNET cables comply with PoE power requirements as per IEEE 802.3:

Standard	Max Power	Required Cable Type	Minimum Category
PoE (802.3af)	15.4 W	2 active pairs	CAT.5e
PoE+ (802.3at)	25.5 W	2 active pairs	CAT.5e or CAT.6
PoE++ (802.3bt)	Up to 60-100 W	4 active pairs	CAT.6 or CAT.7

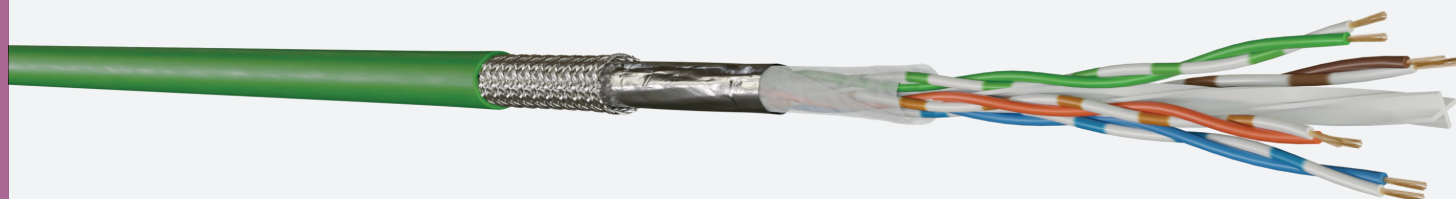
PROTOCOL ANALYSIS AND ELECTRICAL REQUIREMENTS

	PROTOCOL	ORIGIN/STANDARD	IMPEDANCE	SUPPORTED PoE	APPLIED FOR
		PI (Ethernet-based)	100 Ω $\pm$ 15%	100 MHz (Cat.5e) – 500 MHz (Cat.6)	Verified Category (Cat.5e/6) NEXT/FEXT
		Beckhoff / Ether-CAT Tech. Group	100 Ω $\pm$ 10%	100 MHz	Low Parasitic Capacitance High Flexibility
		Beckhoff / Ether-CAT P Tech. Group	100 Ω $\pm$ 10%	100 MHz	Low Parasitic Capacitance High Flexibility
	 CAT 5e	IEEE	100 Ω $\pm$ 10%	PoE / PoE+	PROFINET Class A/B, Ethernet/IP
	 CAT 6	IEEE	100 Ω $\pm$ 10%	PoE / PoE+ / PoE++	PLCs, HMIs, Industrial Switches
	 CAT 7	IEEE	100 Ω $\pm$ 10%	PoE / PoE+ / PoE++	EMC-critical systems, High-speed automation

APPLICATION EXAMPLES

SECTOR	APPLICATION	RECOMMENDED CATEGORY
Machine Tools / CNC	Axis control via EtherCAT or Modbus TCP	CAT.6 DP / HP
Factory Automation	PLCs, sensors, I/O modules, PROFINET networks	CAT.5e BP / DP
Robotics / Pick & Place	Switch-to-robot communication	CAT.6 / CAT.7 HP
Automotive	Assembly lines and Quality Control	CAT.6 DP
Food / Pharmaceutical Industry	Washdown areas or areas with chemical agents	CAT.6 / CAT.7 HP (PUR)
Industrial Video Surveillance	PoE++ IP Cameras	CAT.6 / CAT.7 DP / HP

Fieldbus cables, PVC TM5 sheath, Oil Resistant, Dynamic Application



UL 20601
80 °C - 300V
UL 2570
80 °C - 1000V



AWM I/II A/B
80 °C - 300V
AWM I/II A/B
80 °C - 1000V



LABS
Free



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +80	-5 / +80	-5 / +80

ELECTRICAL PROPERTIES



Test
Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation
Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Operating
Voltage

30 ÷ 300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Balanced Pair Geometry	Ensures high signal stability and interference-free transmission
Low Dielectric Constant Insulation	Improves signal quality and reduces capacitive losses
High-Coverage Shielding	Effective protection against electromagnetic and radio frequency interference
High-Flexibility and High-Purity Conductors	Ensures electrical continuity and long-term reliability
Construction Structure Optimized for Industrial Bus Networks	Maximum compatibility with major communication protocols
Outer Materials Resistant to Oils and Chemical Agents	Increased durability and safety in industrial installations
Compliance with International Standards	Suitability for certified plants and complex production environments
Robust and Flexible Construction	Long service life and reduced machine downtime

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

Fieldbus standard	MotionCables code	EPlan Code	Formation	∅ mm	Cu kg/km	Res Ω/km	Cap. nF/km	Op. Tension V	Series Data Sheet
 CAT 5e 100 Ω	DDS24P04UR-*LV	○ MC24008242*	(4 x 2 x 26 AWG)	7.2	75	≤ 87.6	50	300 V	
	DDS26P04UR-*HV	○ MC24008262*	(4 x 2 x 26 AWG)	6.2	54	≤ 140	48	1000 V	
 CAT 6 100 Ω	DFSH26P04UR-*HV	○ MC.26608262*	(4 x 2 x 26 AWG)	7.2	64	≤ 140	47	1000 V	
 CAT 7 100 Ω	DFSHH26P04UR-*LV	○ MC.26808262*	[4 x (2 x 26 AWG)]	6.4	46	≤ 140	47	300 V	
 PROFINET 100 Ω	BDS22Q01UR-VEHV	● MC239042222	(1 x 4 x 22 AWG)	6.5	33	≤ 55.0	51	1000 V	
	BDS22Q01UR-VE	● MC239042222	(1 x 4 x 22 AWG)	6.5	33	≤ 55.0	51	300 V	
 EtherCAT 100 Ω	BDSE22Q01UR-NGHV	● MC.2580422216	(1 x 4 x 22 AWG)	6,7	33	≤ 55.0	51	1000 V	
 EtherCAT 100 Ω	BDSE22Q01UR-NRHH	● MC.2780422216	(1 x 4 x 22 AWG)	6,7	33	≤ 55.0	51	1000 V	

* The cable's outersheath could be in different colour: Green RAL 6018 - Water Blue RAL 5021 - Sky Blue RAL 5015 - Yellow RAL 1021 - Black RAL 9005 - Red RAL 3000 - Violet, RAL 4001.

ATTENUATION

	CAT 5e		CAT 6		CAT 7	PROFINET®	ETHERCAT®
	24 AWG db/100m	26 AWG db/100m	24 AWG db/100m	26 AWG db/100 m	26 AWG db/100m	22 AWG db/100 m	22 AWG db/100 m
1.0	≤ 2,9	≤ 3,2	≤ 2,9	≤ 3,2	≤ 3,0	≤ 2.1	≤ 2.1
4.0	≤ 5,2	≤ 6,0	≤ 5,2	≤ 6,0	≤ 5,6	≤ 4.1	≤ 4.1
10.0	≤ 8,0	≤ 9,5	≤ 8,0	≤ 9,5	≤ 8,8	≤ 6.5	≤ 6.5
16.0	≤ 10,2	12,1	≤ 10,2	12,1	≤ 11,1	≤ 8.3	≤ 8.3
20.0	≤ 11.5	≤ 13,5	≤ 11.5	≤ 13,5	12,4	≤ 9.3	≤ 9.3
MHz 31.25	≤ 14,5	≤ 17,1	≤ 14,5	≤ 17,1	≤ 15,6	≤ 11.7	≤ 11.7
62.5	≤ 21,2	≤ 24,8	≤ 21,2	≤ 24,8	≤ 22,3	≤ 17.0	≤ 17.0
100	≤ 26,9	≤ 32,0	≤ 26,9	≤ 32,0	≤ 28,5	≤ 32.0	≤ 32.0
155			≤ 34,0	≤ 39,1	≤ 36,0		
200			≤ 39,7	≤ 44,8	≤ 46,5		
250			≤ 44,9	≤ 50,7	≤ 67,9		



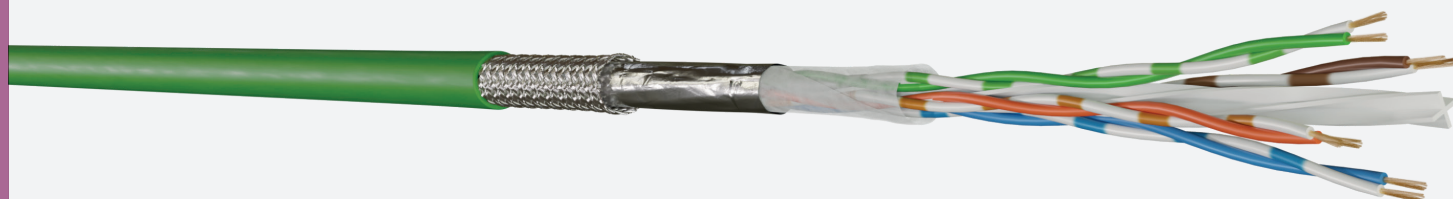
EPLAN
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



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).

Fieldbus cables, PUR sheath, Oil Resistant, High-Dynamic Application, Halogen-Free



UL 20549
80 °C - 300V
UL 21223
80 °C - 1000V

UL 21576



AWM I/II A/B
80 °C - 300V
AWM I/II A/B
80 °C - 1000V

LABS
Free

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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3

Insulation
Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1

Operating
Voltage

30 ÷ 300 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Balanced Pair Geometry	Ensures high signal stability and interference-free transmission
Low Dielectric Constant Insulation	Improves signal quality and reduces capacitive losses
High-Coverage Shielding	Effective protection against electromagnetic and radio frequency interference
High-Flexibility and High-Purity Conductors	Ensures electrical continuity and long-term reliability
Construction Structure Optimized for Industrial Bus Networks	Maximum compatibility with major communication protocols
Outer Materials Resistant to Oils and Chemical Agents	Increased durability and safety in industrial installations
Compliance with International Standards	Suitability for certified plants and complex production environments
Robust and Flexible Construction	Long service life and reduced machine downtime

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

Fieldbus standard	MotionCables code	EPlan Code	Formation	Ø mm	Cu kg/km	Res Ω/km	Cap. nF/km	Op. Tension V	Serie's Data Sheet
 CAT 5e 100 Ω	DDS24P04UP-*LV	○ MC34008243*	(4 x 2 x 26 AWG)	7.2	75	≤ 87.6	50	300 V	
	DDS26P04UP-*HV	○ MC34008263*	(4 x 2 x 26 AWG)	6.2	54	≤ 140	48	1000 V	
 CAT 6 100 Ω	DDSH26P04UP-*HV	○ MC.36608263*	(4 x 2 x 26 AWG)	7.2	64	≤ 140	47	1000 V	
 CAT 7 100 Ω	DDSHH26P04UP-*LV	○ MC.36808263*	[4 x (2 x 26 AWG)]	6.4	46	≤ 140	47	300 V	
 PROFINET 100 Ω	BDS22Q01UP-VEHV	● MC339042232	(1 x 4 x 22 AWG)	6.5	33	≤ 55.0	51	1000 V	
	BDS22Q01P-VE	● MC339042232	(1 x 4 x 22 AWG)	6.5	33	≤ 55.0	51	300 V	
 EtherCAT 100 Ω	BDSE22Q01UP-NGHV	● MC.2580422316	(1 x 4 x 22 AWG)	6.5	33	≤ 55.0	51	1000 V	
 EtherCAT 100 Ω	BDSE22Q01UP-NRHH	● MC.2780422316	(1 x 4 x 22 AWG)	4,8	16	≤ 55.0	51	1000 V	

* The cable's outersheath could be in different colour: Green RAL 6018 - Water Blue RAL 5021 - Sky Blue RAL 5015 - Yellow RAL 1021 - Black RAL 9005 - Red RAL 3000 - Violet, RAL 4001.

ATTENUATION

	CAT 5e		CAT 6		CAT 7	PROFINET®	ETHERCAT®
	24 AWG db/100m	26 AWG db/100m	24 AWG db/100m	26 AWG db/100 m	26 AWG db/100m	22 AWG db/100 m	22 AWG db/100 m
1.0	≤ 2,9	≤ 3,2	≤ 2,9	≤ 3,2	≤ 3,0	≤ 2.1	≤ 3.2
4.0	≤ 5,2	≤ 6,0	≤ 5,2	≤ 6,0	≤ 5,6	≤ 4.1	≤ 6.6
10.0	≤ 8,0	≤ 9,5	≤ 8,0	≤ 9,5	≤ 8,8	≤ 6.5	≤ 9.7
16.0	≤ 10,2	12,1	≤ 10,2	12,1	≤ 11,1	≤ 8.3	12.1
20.0	≤ 11.5	≤ 13,5	≤ 11.5	≤ 13,5	12,4	≤ 9.3	≤ 13.7
31.25	≤ 14,5	≤ 17,1	≤ 14,5	≤ 17,1	≤ 15,6	≤ 11.7	≤ 17.2
62.5	≤ 21,2	≤ 24,8	≤ 21,2	≤ 24,8	≤ 22,3	≤ 17.0	≤ 25.2
100	≤ 26,9	≤ 32,0	≤ 26,9	≤ 32,0	≤ 28,5	≤ 32.0	≤ 32.0
155			≤ 34,0	≤ 39,1	≤ 36,0		
200			≤ 39,7	≤ 44,8	≤ 46,5		
250			≤ 44,9	≤ 50,7	≤ 67,9		



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MOTION **STANDARD**

MOTION **CONTROL**

MOTION **MULTIWIRE**

MOTION **WIRE**

MOTION **POWER**

MOTIONCONTROL

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS FROM 2 TO 65 CONDUCTORS.

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 extensive contact area of the copper braiding is recommended.

**INCREASED
OPERATIVE
TENSION TO**

600 V

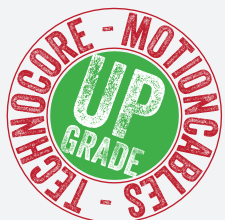
PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	Polypropylene (PP)	PVC TM5	Designed for repeated bending, high performance in dynamic environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	Polypropylene (PP)	Polyurethane (PUR FRHF)	High flexibility even at low temperatures, chemical resistance, halogen-free

CONSTRUCTION

- ▶ Bare Copper wire, finely stranded acc. to DIN VDE 0295 cl.5 / IEC 60228 cl. 5 extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- ▶ Core insulation: Special-PP.
- ▶ Core identification: according to DIN 47100 colour codification (See DIN 47100 table at page 244).
- ▶ Tape: Fleece Tape.
- ▶ Shield: tinned copper wire braid, approx. optical coverage 85% .
- ▶ Separator: Fleece Tape.
- ▶ Outer sheath: PVC TM5 (level DP), PUR FRHF (level HP). Outer sheath colour: Grey RAL 7001 (level DP), Black RAL 9005 (level HP).

MAIN PROPERTIES

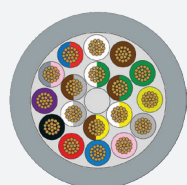
- ▶ Resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents.
- ▶ Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen.
- ▶ Designed for min. 100.000 bending cycles these cables are produced to high quality specifications.
- ▶ The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.



All MOTION**C**ONTROL cables have been designed to **operate up to 600 V**, enabling a simplification of distribution systems:

Advantage	Description
Increased Compatibility	Connection between AC and DC circuits without the need for isolating components
Reduced Cable Count	Enables consolidation within control panels
Insulation Optimization	Utilizes materials with a low dielectric constant ($\epsilon_r \leq 2,3$)
Superior Service Life	MTBF > 100.000 hours, resulting in a 40% reduction in failures

CABLES TYPES



**DYNAMIC PERFORMANCE
UNSHIELDED**

**PVC
TM5**

600 V

**-30 °C
+80 °C**

94



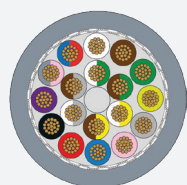
**HIGH DYNAMIC PERFORMANCE
UNSHIELDED**

**PUR
FRHF**

600 V

**-50 °C
+80 °C**

96



**DYNAMIC PERFORMANCE
SHIELDED**

**PVC
TM5**

600 V

**-30 °C
+80 °C**

98



**HIGH DYNAMIC PERFORMANCE
SHIELDED**

**PUR
FRHF**

600 V

**-50 °C
+80 °C**

100



**DYNAMIC PERFORMANCE
SHIELDED TWISTED PAIRS**

**PVC
TM5**

600 V

**-30 °C
+80 °C**

102



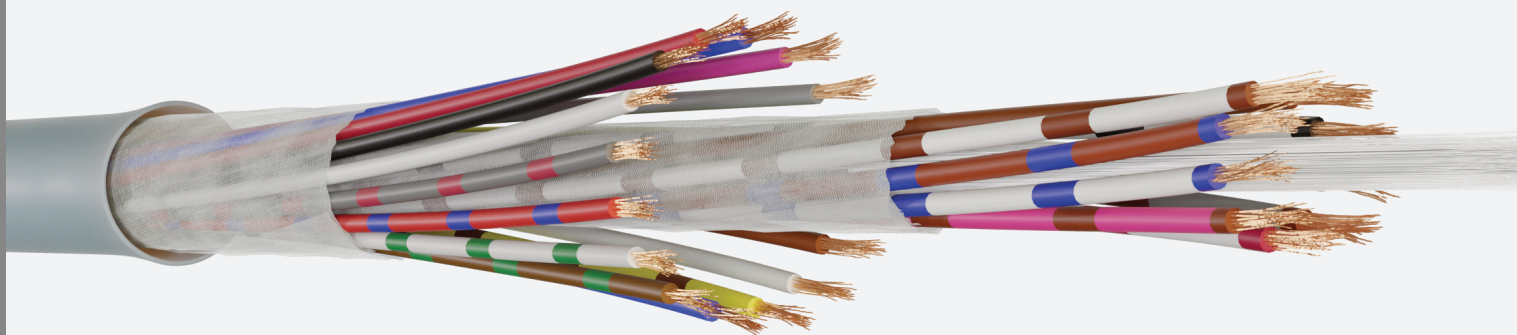
**HIGH DYNAMIC PERFORMANCE
SHIELDED TWISTED PAIRS**

**PUR
FRHF**

600 V

**-50 °C
+80 °C**

104

UL 2570
80 °C - 600VAWM I/II A/B
80 °C - 600VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +80	-5 / +80	-5 / +80

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

High-Conductivity Flexible Copper Conductors

Stable signal transmission for automation with standard requirements.

Low Dielectric Constant Insulation

Reduced losses and better signal quality even over medium-to-long distances.

Ordered Layer Construction

Compact structure and easily manageable during installation.

Flexible PVC TM5 Jacket

Good resistance to abrasion, oils, and mechanical agents in standard industrial environments.

Low-Adhesion Surface

Easy sliding in cable trays and ease of wiring in confined spaces.

Suitable for Control Voltages up to 600 V

Allows for the integration of signals and auxiliary power in a single cable.

No EMC Shielding

Ideal for installations in protected environments or those with a low risk of electromagnetic interference.

Compatibility with Decentralized Networks

Suitable for digital and analog signals in remote I/O, PLCs, and field modules.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,14	LDN26X02UR-G	● MC.21022627	2 x 0.14	26	3.7	3
	LDN26X03UR-G	● MC.21032627	3 x 0.14	26	3.8	4
	LDN26X04UR-G	● MC.21042627	4 x 0.14	26	4.1	6
	LDN26X05UR-G	● MC.21052627	5 x 0.14	26	4.4	7
	LDN26X07UR-G	● MC.21072627	7 x 0.14	26	4.7	10
	LDN26X08UR-G	● MC.21082627	8 x 0.14	26	5.0	11
	LDN26X10UR-G	● MC.21102627	10 x 0.14	26	5.7	14
	LDN26X12UR-G	● MC.21122627	12 x 0.14	26	5.9	17
	LDN26X14UR-G	● MC.21142627	14 x 0.14	26	6.3	19
	LDN26X18UR-G	● MC.21182627	18 x 0.14	26	6.8	24
	LDN26X25UR-G	● MC.21252627	25 x 0.14	26	8.1	34
	LDN26X37UR-G	● MC.21372627	37 x 0.14	26	9.6	50
0,25	LDN24X02UR-G	● MC.21022427	2 x 0.25	24	4.1	4
	LDN24X03UR-G	● MC.21032427	3 x 0.25	24	4.3	6
	LDN24X04UR-G	● MC.21042427	4 x 0.25	24	4.5	8
	LDN24X05UR-G	● MC.21052427	5 x 0.25	24	4.8	11
	LDN24X07UR-G	● MC.21072427	7 x 0.25	24	5.5	15
	LDN24X08UR-G	● MC.21082427	8 x 0.25	24	5.9	18
	LDN24X10UR-G	● MC.21102427	10 x 0.25	24	6.2	21
	LDN24X12UR-G	● MC.21122427	12 x 0.25	24	6.8	25
	LDN24X14UR-G	● MC.21142427	14 x 0.25	24	7.0	30
	LDN24X18UR-G	● MC.21182427	18 x 0.25	24	7.7	38
	LDN24X25UR-G	● MC.21252427	25 x 0.25	24	8.9	53
	LDN24X37UR-G	● MC.21372427	37 x 0.25	24	9.8	78
0,34	LDN22X02UR-G	● MC.21022227	2 x 0.34	22	4.6	7
	LDN22X03UR-G	● MC.21032227	3 x 0.34	22	4.8	10
	LDN22X04UR-G	● MC.21042227	4 x 0.34	22	5.1	13
	LDN22X05UR-G	● MC.21052227	5 x 0.34	22	5.5	16
	LDN22X07UR-G	● MC.21072227	7 x 0.34	22	6.4	23
	LDN22X08UR-G	● MC.21082227	8 x 0.34	22	6.8	26
	LDN22X10UR-G	● MC.21102227	10 x 0.34	22	7.2	33
	LDN22X12UR-G	● MC.21122227	12 x 0.34	22	7.8	40
	LDN22X14UR-G	● MC.21142227	14 x 0.34	22	8.1	46
	LDN22X18UR-G	● MC.21182227	18 x 0.34	22	8.9	59
	LDN22X25UR-G	● MC.21252227	25 x 0.34	22	10.4	82
	LDN22X37UR-G	● MC.21372227	37 x 0.34	22	11.5	121

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website**



EPLAN

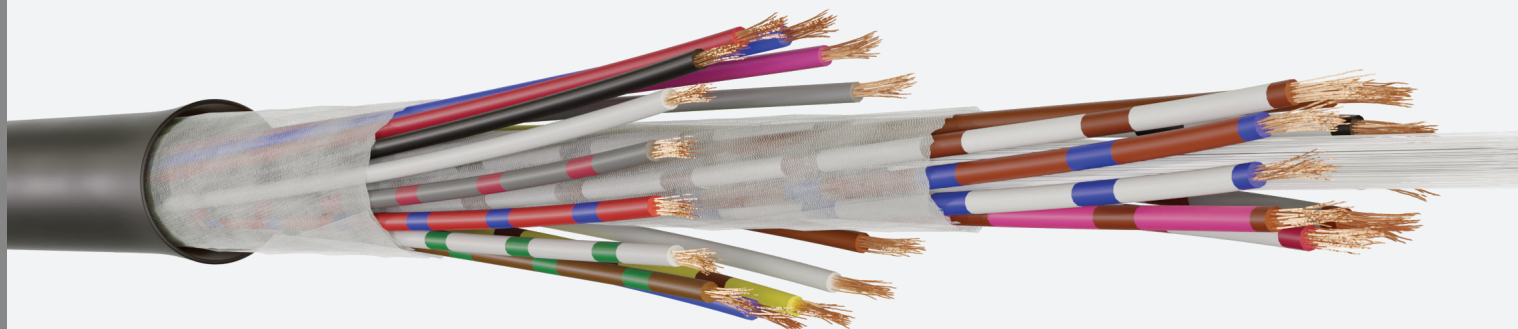
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SPAC CAVI

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UL 21223
80 °C - 600VAWM I/II A/B
80 °C - 600VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Copper Conductors

Signal stability even with repeated bending.

Low Dielectric Constant Insulation

Low attenuation and fast response in control signals.

Layered Construction

High flexibility with good mechanical resistance.

Anti-Abrasion PUR FRHF Jacket

Long service life even in harsh industrial environments.

Anti-Adhesion Surface

Smooth sliding in cable carriers and movable conduits.

Halogen-Free and Silicone-Free Materials

Compatibility with sensitive environments and painting processes.

No EMC Shielding

Designed for protected routing or separation from sources of interference.

Optimized for Moving Applications

Ideal for axis control, pneumatic systems, and mobile modules.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0.14	LDN26X02UP-N ●	MC.31022635	2 x 0.14	26	3.7	3
	LDN26X03UP-N ●	MC.31032635	3 x 0.14	26	3.8	4
	LDN26X04UP-N ●	MC.31042635	4 x 0.14	26	4.1	6
	LDN26X05UP-N ●	MC.31052635	5 x 0.14	26	4.4	7
	LDN26X07UP-N ●	MC.31072635	7 x 0.14	26	4.7	10
	LDN26X08UP-N ●	MC.31082635	8 x 0.14	26	5.0	11
	LDN26X10UP-N ●	MC.31102635	10 x 0.14	26	5.7	14
	LDN26X12UP-N ●	MC.31122635	12 x 0.14	26	5.9	17
	LDN26X14UP-N ●	MC.31142635	14 x 0.14	26	6.3	19
	LDN26X18UP-N ●	MC.31182635	18 x 0.14	26	6.8	24
	LDN26X25UP-N ●	MC.31252635	25 x 0.14	26	8.1	34
	LDN26X37UP-N ●	MC.31372635	37 x 0.14	26	9.6	50
0.25	LDN24X02UP-N ●	MC.31022435	2 x 0.25	24	4.1	4
	LDN24X03UP-N ●	MC.31032435	3 x 0.25	24	4.3	6
	LDN24X04UP-N ●	MC.31042435	4 x 0.25	24	4.5	8
	LDN24X05UP-N ●	MC.31052435	5 x 0.25	24	4.8	11
	LDN24X07UP-N ●	MC.31062435	7 x 0.25	24	5.5	15
	LDN24X08UP-N ●	MC.31082435	8 x 0.25	24	5.9	18
	LDN24X10UP-N ●	MC.31102435	10 x 0.25	24	6.2	21
	LDN24X12UP-N ●	MC.31122435	12 x 0.25	24	6.8	25
	LDN24X14UP-N ●	MC.31142435	14 x 0.25	24	7.0	30
	LDN24X18UP-N ●	MC.31182435	18 x 0.25	24	7.7	38
	LDN24X25UP-N ●	MC.31252435	25 x 0.25	24	8.9	53
	LDN24X37UP-N ●	MC.31372435	37 x 0.25	24	9.8	78
0.34	LDN22X02UP-N ●	MC.31022235	2 x 0.34	22	4.6	7
	LDN22X03UP-N ●	MC.31032235	3 x 0.34	22	4.8	10
	LDN22X04UP-N ●	MC.31042235	4 x 0.34	22	5.1	13
	LDN22X05UP-N ●	MC.31052235	5 x 0.34	22	5.5	16
	LDN22X07UP-N ●	MC.31072235	7 x 0.34	22	5.8	23
	LDN22X08UP-N ●	MC.31082235	8 x 0.34	22	6.8	26
	LDN22X10UP-N ●	MC.31102235	10 x 0.34	22	7.2	33
	LDN22X12UP-N ●	MC.31122235	12 x 0.34	22	7.8	40
	LDN22X14UP-N ●	MC.31142235	14 x 0.34	22	8.1	46
	LDN22X18UP-N ●	MC.31182235	18 x 0.34	22	8.9	59
	LDN22X25UP-N ●	MC.31252235	25 x 0.34	22	10.4	82
	LDN22X37UP-N ●	MC.31372235	37 x 0.34	22	11.5	121

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EPLAN

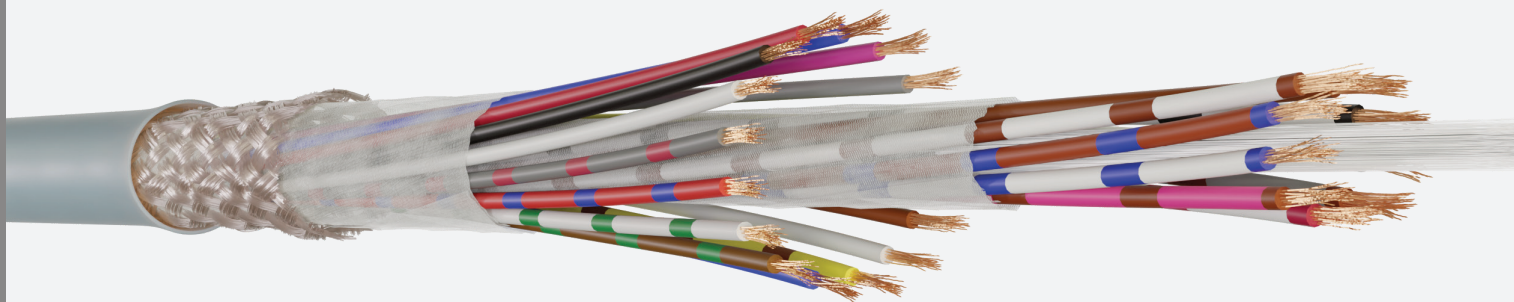
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SPAC CAVI

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UL 2570
80 °C - 600VAWM I/II A/B
80 °C - 600VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +80	-5 / +80	-5 / +80

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

High-Conductivity Flexible Copper Conductors

Reliable signal transmission even over medium-to-long distances.

Low Dielectric Value Insulation

Good signal integrity for precise commands and feedback.

Concentric Layered Construction

Stable and neat structure even in environments with contained vibrations.

High-Coverage Copper Braid Shielding

Effective protection against external electromagnetic interference.

Oil and Abrasion-Resistant PVC Jacket

Guaranteed durability in dynamic applications.

Anti-Adhesion Surface

Facilitated sliding in cable trays or complex control cabinets.

Suitable for Control Voltages up to 600 V

Integration of signal and auxiliary power in a single line.

Suitable for Sensitive Signals

Protects analog or digital signals in mixed EMC environments.

Sez.	MotionCables code		EPlan Code	Formation	AWG	Ø	Cu
mm²				mm²		mm	kg / km
0,14	LDS26X02UR-G	●	MC.22022627	(2 x 0.14)	26	4.1	10
	LDS26X03UR-G	●	MC.22032627	(3 x 0.14)	26	4.2	11
	LDS26X04UR-G	●	MC.22042627	(4 x 0.14)	26	4.5	13
	LDS26X05UR-G	●	MC.22052627	(5 x 0.14)	26	4.8	16
	LDS26X07UR-G	●	MC.22072627	(7 x 0.14)	26	5.1	19
	LDS26X08UR-G	●	MC.22082627	(8 x 0.14)	26	5.4	21
	LDS26X10UR-G	●	MC.22102627	(10 x 0.14)	26	6.1	27
	LDS26X12UR-G	●	MC.22122627	(12 x 0.14)	26	6.3	30
	LDS26X14UR-G	●	MC.22142627	(14 x 0.14)	26	6.7	33
	LDS26X18UR-G	●	MC.22182627	(18 x 0.14)	26	7.2	41
	LDS26X25UR-G	●	MC.22252627	(25 x 0.14)	26	8.5	54
	LDS26X37UR-G	●	MC.22372627	(37 x 0.14)	26	10.0	75
0,25	LDS24X02UR-G	●	MC.22022427	(2 x 0.25)	24	4.6	12
	LDS24X03UR-G	●	MC.22032427	(3 x 0.25)	24	4.8	15
	LDS24X04UR-G	●	MC.22042427	(4 x 0.25)	24	5.0	18
	LDS24X05UR-G	●	MC.22052427	(5 x 0.25)	24	5.3	21
	LDS24X07UR-G	●	MC.22072427	(7 x 0.25)	24	6.0	27
	LDS24X08UR-G	●	MC.22082427	(8 x 0.25)	24	6.4	30
	LDS24X10UR-G	●	MC.22102427	(10 x 0.25)	24	6.7	43
	LDS24X12UR-G	●	MC.22122427	(12 x 0.25)	24	7.3	45
	LDS24X14UR-G	●	MC.22142427	(14 x 0.25)	24	7.5	49
	LDS24X18UR-G	●	MC.22182427	(18 x 0.25)	24	8.2	64
	LDS24X25UR-G	●	MC.22252427	(25 x 0.25)	24	9.4	88
	LDS24X37UR-G	●	MC.22372427	(37 x 0.25)	24	10.3	115
0,34	LDS22X02UR-G	●	MC.22022227	(2 x 0.34)	22	5.1	16
	LDS22X03UR-G	●	MC.22032227	(3 x 0.34)	22	5.3	19
	LDS22X04UR-G	●	MC.22042227	(4 x 0.34)	22	5.6	24
	LDS22X05UR-G	●	MC.22052227	(5 x 0.34)	22	6.0	28
	LDS22X07UR-G	●	MC.22072227	(7 x 0.34)	22	6.9	38
	LDS22X08UR-G	●	MC.22082227	(8 x 0.34)	22	7.3	42
	LDS22X10UR-G	●	MC.22102227	(10 x 0.34)	22	7.7	51
	LDS22X12UR-G	●	MC.22122227	(12 x 0.34)	22	8.3	59
	LDS22X14UR-G	●	MC.22142227	(14 x 0.34)	22	8.6	72
	LDS22X18UR-G	●	MC.22182227	(18 x 0.34)	22	9.4	85
	LDS22X25UR-G	●	MC.22252227	(25 x 0.34)	22	10.9	122
	LDS22X37UR-G	●	MC.22372227	(37 x 0.34)	22	12.0	162

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EPLAN

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SPAC CAVI

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

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UL 21223
80 °C - 600VAWM I/II A/B
80 °C - 600VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Copper Conductors

Consistent electrical performance even during intensive motion.

Low Dielectric Constant Insulation

High signal quality for precise synchronization.

Layered Structure with Shielding

Protection and mechanical robustness in cable carriers.

High-Coverage Copper Braid

High EMC immunity in disturbed environments.

Oil and Chemical-Resistant PUR Jacket

Long service life even in oily environments or with coolants.

Anti-Adhesion Surface

Prevents wear from prolonged friction.

Halogen-Free and Silicone-Free Materials

Suitable for cleanrooms, food automation, and painting processes.

Ideal for Dynamic Feedback Systems

Supports encoders, motors, and high-frequency control.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,14	LDS26X02UP-N ●	MC.32022635	(2 x 0.14)	26	4.1	10
	LDS26X03UP-N ●	MC.32032635	(3 x 0.14)	26	4.2	11
	LDS26X04UP-N ●	MC.32042635	(4 x 0.14)	26	4.5	13
	LDS26X05UP-N ●	MC.32052635	(5 x 0.14)	26	4.8	16
	LDS26X07UP-N ●	MC.32072635	(7 x 0.14)	26	5.1	19
	LDS26X08UP-N ●	MC.32082635	(8 x 0.14)	26	5.4	21
	LDS26X10UP-N ●	MC.32102635	(10 x 0.14)	26	6.1	27
	LDS26X12UP-N ●	MC.32122635	(12 x 0.14)	26	6.3	30
	LDS26X14UP-N ●	MC.32142635	(14 x 0.14)	26	6.7	33
	LDS26X18UP-N ●	MC.32182635	(18 x 0.14)	26	7.2	41
	LDS26X25UP-N ●	MC.32252635	(25 x 0.14)	26	8.5	54
	LDS26X37UP-N ●	MC.32372635	(37 x 0.14)	26	10.0	75
0,25	LDS24X02UP-N ●	MC.32022435	(2 x 0.25)	24	4.6	12
	LDS24X03UP-N ●	MC.32032435	(3 x 0.25)	24	4.8	15
	LDS24X04UP-N ●	MC.32042435	(4 x 0.25)	24	5.0	18
	LDS24X05UP-N ●	MC.32052435	(5 x 0.25)	24	5.3	21
	LDS24X07UP-N ●	MC.32072435	(7 x 0.25)	24	6.0	27
	LDS24X08UP-N ●	MC.32082435	(8 x 0.25)	24	6.4	30
	LDS24X10UP-N ●	MC.32102435	(10 x 0.25)	24	6.7	43
	LDS24X12UP-N ●	MC.32122435	(12 x 0.25)	24	7.3	45
	LDS24X14UP-N ●	MC.32142435	(14 x 0.25)	24	7.5	49
	LDS24X18UP-N ●	MC.32182435	(18 x 0.25)	24	8.2	64
	LDS24X25UP-N ●	MC.32252435	(25 x 0.25)	24	9.4	88
	LDS24X37UP-N ●	MC.32372435	(37 x 0.25)	24	10.3	115
0,34	LDS22X02UP-N ●	MC.32022235	(2 x 0.34)	22	5.1	16
	LDS22X03UP-N ●	MC.32032235	(3 x 0.34)	22	5.3	19
	LDS22X04UP-N ●	MC.32042235	(4 x 0.34)	22	5.6	24
	LDS22X05UP-N ●	MC.32052235	(5 x 0.34)	22	6.0	28
	LDS22X07UP-N ●	MC.32072235	(7 x 0.34)	22	6.9	38
	LDS22X08UP-N ●	MC.32082235	(8 x 0.34)	22	7.3	42
	LDS22X10UP-N ●	MC.32102235	(10 x 0.34)	22	7.7	51
	LDS22X12UP-N ●	MC.32122235	(12 x 0.34)	22	8.3	59
	LDS22X14UP-N ●	MC.32142235	(14 x 0.34)	22	8.6	72
	LDS22X18UP-N ●	MC.32182235	(18 x 0.34)	22	9.4	85
	LDS22X25UP-N ●	MC.32252235	(25 x 0.34)	22	10.9	122
	LDS22X37UP-N ●	MC.32372235	(37 x 0.34)	22	12.0	162

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UL 2570
80 °C - 600VAWM I/II A/B
80 °C - 600VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +80	-5 / +80	-5 / +80

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Flexible Copper Conductors	Transmission reliability for control and I/O signals.
Twisted Pairs without Shielding	Reduction of internal crosstalk even without EMC protection.
Low Dielectric Constant Insulation	High transmission quality even on parallel channels.
Compact Twisted-Pair Structure	Best electrical balance for multi-signal systems.
Flexible PVC Jacket	Good mechanical resistance for fixed installation in control cabinets and cable trays.
Low-Adhesion Surface	Ease of installation in neat bundles or vertical cable trays.
No EMC Shielding	Ideal for environments with low electromagnetic interference.
Optimized for Digital or Analog Signals	Suitable for sensors, I/O modules, and internal machine connections.

Sez.	MotionCables code		EPlan Code	Formation	AWG	Ø	Cu
mm²				mm²		mm	kg / km
0,14	LDS26P02UR-G	●	MC.23042627	(2 x 2 x 0.14)	26	5.8	17
	LDS26P03UR-G	●	MC.23062627	(3 x 2 x 0.14)	26	6.1	20
	LDS26P04UR-G	●	MC.23082627	(4 x 2 x 0.14)	26	6.5	24
	LDS26P05UR-G	●	MC.23102627	(5 x 2 x 0.14)	26	7.0	28
	LDS26P06UR-G	●	MC.23122627	(6 x 2 x 0.14)	26	7.6	33
	LDS26P10UR-G	●	MC.23202627	(10 x 2 x 0.14)	26	9.7	49
	LDS26P12UR-G	●	MC.23242627	(12 x 2 x 0.14)	26	10.1	55
	LDS26P14UR-G	●	MC.23282627	(14 x 2 x 0.14)	26	10.5	62
	LDS26P18UR-G	●	MC.23362627	(18 x 2 x 0.14)	26	12.0	83
	LDS26P25UR-G	●	MC.23502627	(25 x 2 x 0.14)	26	14.0	110
	LDS26P30UR-G	●	MC.23602627	(30 x 2 x 0.14)	26	14.4	125
	LDS26P50UR-G	●	MC.231002627	(50 x 2 x 0.14)	26	18.5	192
0,25	LDS24P02UR-G	●	MC.23042427	(2 x 2 x 0.25)	24	6.0	27
	LDS24P03UR-G	●	MC.23062427	(3 x 2 x 0.25)	24	6.5	33
	LDS24P04UR-G	●	MC.23082427	(4 x 2 x 0.25)	24	7.0	39
	LDS24P05UR-G	●	MC.23102427	(5 x 2 x 0.25)	24	7.5	45
	LDS24P06UR-G	●	MC.23122427	(6 x 2 x 0.25)	24	8.5	53
	LDS24P07UR-G	●	MC.23142427	(7 x 2 x 0.25)	24	9.0	58
	LDS24P08UR-G	●	MC.23162427	(8 x 2 x 0.25)	24	9.5	64
	LDS24P10UR-G	●	MC.23202427	(10 x 2 x 0.25)	24	10.5	72
	LDS24P12UR-G	●	MC.23242427	(12 x 2 x 0.25)	24	11.0	79
	LDS24P14UR-G	●	MC.23282427	(14 x 2 x 0.25)	24	11.4	94
	LDS24P18UR-G	●	MC.23362427	(18 x 2 x 0.25)	24	12.3	120
	LDS24P25UR-G	●	MC.23502427	(25 x 2 x 0.25)	24	15.0	160
	LDS24P30UR-G	●	MC.23602427	(30 x 2 x 0.25)	24	17.5	185
	LDS24P50UR-G	●	MC.231002427	(50 x 2 x 0.25)	24	22.0	310
	0,34	LDS22P02UR-G	●	MC.23042227	(2 x 2 x 0.34)	22	7.0
LDS22P03UR-G		●	MC.23062227	(3 x 2 x 0.34)	22	7.3	42
LDS22P04UR-G		●	MC.23082227	(4 x 2 x 0.34)	22	7.6	48
LDS22P05UR-G		●	MC.23102227	(5 x 2 x 0.34)	22	8.6	54
LDS22P06UR-G		●	MC.23122227	(6 x 2 x 0.34)	22	9.3	63
LDS22P07UR-G		●	MC.23142227	(7 x 2 x 0.34)	22	9.6	68
LDS22P08UR-G		●	MC.23162227	(8 x 2 x 0.34)	22	10.0	75
LDS22P10UR-G		●	MC.23202227	(10 x 2 x 0.34)	22	11.5	100
LDS22P12UR-G		●	MC.23242227	(12 x 2 x 0.34)	22	11.8	120
LDS22P14UR-G		●	MC.23282227	(14 x 2 x 0.34)	22	12.2	133
LDS22P18UR-G		●	MC.23362227	(18 x 2 x 0.34)	22	14.0	167
LDS22P25UR-G		●	MC.23502227	(25 x 2 x 0.34)	22	17.1	222
LDS22P30UR-G		●	MC.23602227	(30 x 2 x 0.34)	22	17.9	220
LDS22P50UR-G		●	MC.231002227	(50 x 2 x 0.34)	22	22.5	440

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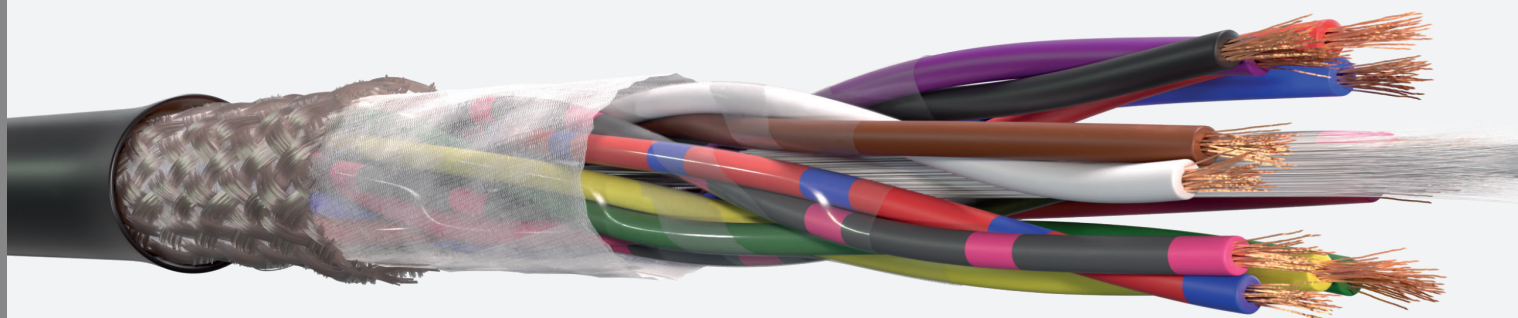
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SPAC CAVI

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UL 21223
80 °C - 600VAWM I/II A/B
80 °C - 600VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

High-Purity Extra-Flexible Copper

Stable signal even in the presence of vibrations and torsion.

Twisted Pairs with Optimized Pitch

Reduced crosstalk for clear and reliable communication.

High-Coverage Copper Braid Shielding

Maximum EMC protection even in complex electronic environments.

Flexible and Resistant PUR FRHF Jacket

Exceptional durability in intense dynamic cycles.

Anti-Adhesion Surface

Smooth sliding without the risk of sticking.

Halogen-Free and Silicone-Free Materials

Perfect for electronics and sensitive applications.

Optimized for High-Precision Feedback

Ideal for encoders, servo motors, and position control.

Electrical Stability over Long Distances

Consistent performance even in long lines or at high frequency.

Sez.	MotionCables code	EPLAN Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,14	LDS26P02UP-N ●	MC.33042635	(2 x 2 x 0.14)	26	5.8	17
	LDS26P03UP-N ●	MC.33062635	(3 x 2 x 0.14)	26	6.1	20
	LDS26P04UP-N ●	MC.33082635	(4 x 2 x 0.14)	26	6.5	24
	LDS26P05UP-N ●	MC.33102635	(5 x 2 x 0.14)	26	7.0	28
	LDS26P06UP-N ●	MC.33122635	(6 x 2 x 0.14)	26	7.6	33
	LDS26P10UP-N ●	MC.33202635	(10 x 2 x 0.14)	26	9.7	49
	LDS26P12UP-N ●	MC.33242635	(12 x 2 x 0.14)	26	10.1	55
	LDS26P14UP-N ●	MC.33282635	(14 x 2 x 0.14)	26	10.5	62
	LDS26P18UP-N ●	MC.33362635	(18 x 2 x 0.14)	26	12.0	83
	LDS26P25UP-N ●	MC.33502635	(25 x 2 x 0.14)	26	14.0	110
	LDS26P30UP-N ●	MC.33602635	(30 x 2 x 0.14)	26	14.4	125
	LDS26P50UP-N ●	MC.331002635	(50 x 2 x 0.14)	26	18.5	192
0,25	LDS24P02UP-N ●	MC.33042435	(2 x 2 x 0.25)	24	6.0	27
	LDS24P03UP-N ●	MC.33062435	(3 x 2 x 0.25)	24	6.5	33
	LDS24P04UP-N ●	MC.33082435	(4 x 2 x 0.25)	24	7.0	39
	LDS24P05UP-N ●	MC.33102435	(5 x 2 x 0.25)	24	7.5	45
	LDS24P06UP-N ●	MC.33122435	(6 x 2 x 0.25)	24	8.5	53
	LDS24P07UP-N ●	MC.33142435	(7 x 2 x 0.25)	24	9.0	58
	LDS24P08UP-N ●	MC.33162435	(8 x 2 x 0.25)	24	9.5	64
	LDS24P10UP-N ●	MC.33202435	(10 x 2 x 0.25)	24	10.5	72
	LDS24P12UP-N ●	MC.33242435	(12 x 2 x 0.25)	24	11.0	79
	LDS24P14UP-N ●	MC.33282435	(14 x 2 x 0.25)	24	11.4	94
	LDS24P18UP-N ●	MC.33362435	(18 x 2 x 0.25)	24	12.3	120
	LDS24P25UP-N ●	MC.33502435	(25 x 2 x 0.25)	24	15.0	160
	LDS24P30UP-N ●	MC.33602435	(30 x 2 x 0.25)	24	17.5	185
	LDS24P50UP-N ●	MC.331002435	(50 x 2 x 0.25)	24	22.0	310
0,34	LDS22P02UP-N ●	MC.33042235	(2 x 2 x 0.34)	22	7.0	34
	LDS22P03UP-N ●	MC.33062235	(3 x 2 x 0.34)	22	7.3	42
	LDS22P04UP-N ●	MC.33082235	(4 x 2 x 0.34)	22	7.6	48
	LDS22P05UP-N ●	MC.33102235	(5 x 2 x 0.34)	22	8.6	54
	LDS22P06UP-N ●	MC.33122235	(6 x 2 x 0.34)	22	9.3	63
	LDS22P07UP-N ●	MC.33142235	(7 x 2 x 0.34)	22	9.6	68
	LDS22P08UP-N ●	MC.33162235	(8 x 2 x 0.34)	22	10.0	75
	LDS22P10UP-N ●	MC.33202235	(10 x 2 x 0.34)	22	11.5	100
	LDS22P12UP-N ●	MC.33242235	(12 x 2 x 0.34)	22	11.8	120
	LDS22P14UP-N ●	MC.33282235	(14 x 2 x 0.34)	22	12.2	133
	LDS22P18UP-N ●	MC.33362235	(18 x 2 x 0.34)	22	14.0	167
	LDS22P25UP-N ●	MC.33502235	(25 x 2 x 0.34)	22	17.1	222
	LDS22P30UP-N ●	MC.33602235	(30 x 2 x 0.34)	22	17.9	220
	LDS22P50UP-N ●	MC.331002235	(50 x 2 x 0.34)	22	22.5	440

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EPLAN

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SPAC CAVI

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

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MOTIONMULTIWIRE

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

The MOTIONMULTIWIRE series includes the most widely cables used in the wiring to control and power machine and industrial machines in general. Suitable for a pose that goes from fixed (BP version with PVC sheath) to high-end (HP version with PUR sheath), they have flexibility, reduced bending radius and chemical resistance in general. The tinned copper braid shield with a high coverage factor preserves the electromagnetic disturbance cable. The whole series is UL / CSA approved.

**INCREASED MAX
CONDUCTOR
TEMPERATURE**

90°C

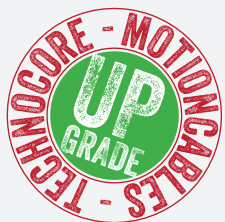
PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	Polypropylene (PP)	PVC	Flexibility, Oil/Fluid Resistance, Flame Retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	Polypropylene (PP)	PVC TM5	Designed for Repeated Bending, High performance in Dynamic Environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	Polypropylene (PP)	Polyurethane (PUR FRHF)	High flexibility even at low temperatures, Chemical Resistance, Halogen-Free

CONSTRUCTION

- ▶ Bare Copper wire, finely stranded acc. to DIN VDE 0295 cl.5 / IEC 60228 cl. 5 extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6.
- ▶ Core insulation: Special-PP.
- ▶ Core identification: generally black conductors with white progressive numbers + Green/Yellow.
- ▶ Tape: Fleece Tape.
- ▶ Shield: tinned copper wire braid, approx. optical coverage 85%.
- ▶ Separator: Fleece Tape.
- ▶ Outer sheath: PVC (BP), PVC TM5 (DP), PUR FRHF (level HP). Outer sheath colour: Grey RAL 7001 (level BP & DP), Black RAL 9005 (level HP).

MAIN PROPERTIES

- ▶ Resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents.
- ▶ Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen.
- ▶ Designed for min. 100.000 bending cycles these cables are produced to high quality specifications.
- ▶ The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.

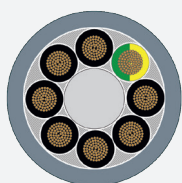


All MOTION**MULTIWIRE** cables have been designed to meet the industry's evolution towards greater miniaturization and installation density, offering:

Enhanced Feature	MOTION MULTIWIRE Value	Standard Market Value
Max. Operating temperature	90 °C	70 – 80 °C

This upgrade ensures greater thermal safety and reliability, particularly near compact motors or high heat-dissipating equipment.

CABLES TYPES



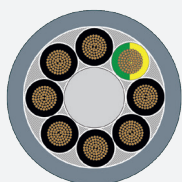
**BASIC PERFORMANCE
UNSHIELDED**

PVC

**600 V
1000 V**

**-25 °C
+90 °C**

108



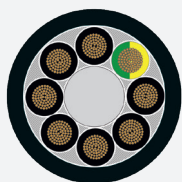
**DYNAMIC PERFORMANCE
UNSHIELDED**

**PVC
TM5**

**600 V
1000 V**

**-30 °C
+90 °C**

110



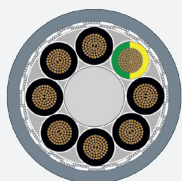
**HIGH DYNAMIC PERFORMANCE
UNSHIELDED**

**PUR
FRHF**

**600 V
1000 V**

**-50 °C
+90 °C**

112



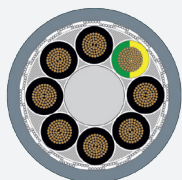
**BASIC PERFORMANCE
SHIELDED**

PVC

**600 V
1000 V**

**-25 °C
+90 °C**

114



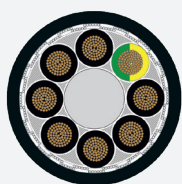
**DYNAMIC PERFORMANCE
SHIELDED**

**PVC
TM5**

**600 V
1000 V**

**-30 °C
+90 °C**

116



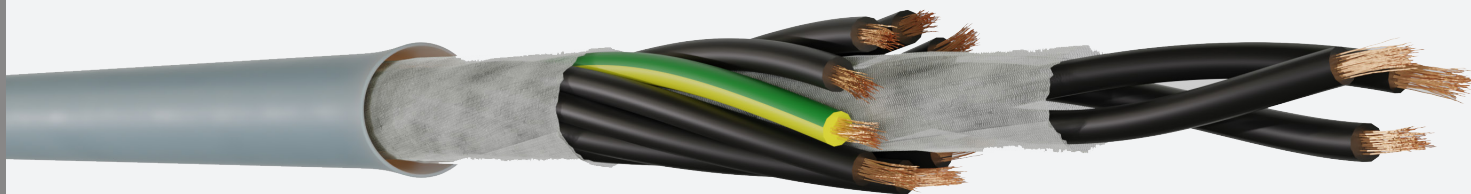
**HIGH DYNAMIC PERFORMANCE
SHIELDED**

**PUR
FRHF**

**600 V
1000 V**

**-50 °C
+90 °C**

118

UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/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

Finely Stranded Copper Conductors

Reliable signal transmission for control and low-dynamic power applications.

Polypropylene (PP) Insulation

Good electrical resistance and thermal stability up to 90 °C

RAL 7001 Gray PVC Outer Jacket

Basic protection against oils and abrasion in standard industrial environments.

Unshielded Structure (No EMC Shielding)

Greater flexibility and simplicity in environments with low risk of interference.

Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)

Supports both signals and power with a single cable.

CE / UL / CSA Compliance

Usable on systems certified according to international standards.

Metric Marking on Outer Jacket

Facilitates correct cutting during installation and managing lengths.

Progressive Conductor Numbering + G/Y (Green/

Faster and more traceable wiring in control cabinets and cable trays

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,50	MFN21X02UR-G	● MC.14022117	2 x 0.50	21	5.5	10
	MFN21G03UR-G	● MC.14032117	3 G 0.50	21	5.5	14
	MFN21G04UR-G	● MC.14042117	4 G 0.50	21	6.2	19
	MFN21G05UR-G	● MC.14052117	5 G 0.50	21	6.7	24
	MFN21G07UR-G	● MC.14072117	7 G 0.50	21	7.9	34
	MFN21G12UR-G	● MC.14122117	12 G 0.50	21	9.3	58
	MFN21G18UR-G	● MC.14182117	18 G 0.50	21	11.2	86
	MFN21G25UR-G	● MC.14252117	25 G 0.50	21	13.2	120
	MFN21G34UR-G	● MC.14342117	34 G 0.50	21	14.7	163
	MFN21G41UR-G	● MC.14412117	41 G 0.50	21	16.3	197
0,75	MFN19X02UR-G	● MC.14041917	2 x 0.75	19	5.9	14
	MFN19G03UR-G	● MC.14061917	3 G 0.75	19	6.2	22
	MFN19G04UR-G	● MC.14081917	4 G 0.75	19	6.7	29
	MFN19G05UR-G	● MC.14051917	5 G 0.75	19	7.3	36
	MFN19G07UR-G	● MC.14071917	7 G 0.75	19	8.6	50
	MFN19G12UR-G	● MC.14121917	12 G 0.75	19	10.1	86
	MFN19G18UR-G	● MC.14181917	18 G 0.75	19	12.2	130
	MFN19G25UR-G	● MC.14251917	25 G 0.75	19	14.4	180
	MFN19G34UR-G	● MC.14341917	34 G 0.75	19	16.1	245
	MFN19G41UR-G	● MC.14411917	41 G 0.75	19	17.8	295
1,0	MFN17X02UR-G	● MC.14021717	2 x 1.0	18	6.2	19
	MFN17G03UR-G	● MC.14031717	3 G 1.0	18	6.5	29
	MFN17G04UR-G	● MC.14041717	4 G 1.0	18	7.1	38
	MFN17G05UR-G	● MC.14051717	5 G 1.0	18	7.7	48
	MFN17G07UR-G	● MC.14071717	7 G 1.0	18	9.1	67
	MFN17G12UR-G	● MC.14121717	12 G 1.0	18	11.1	115
	MFN17G18UR-G	● MC.14181717	18 G 1.0	18	12.9	173
	MFN17G25UR-G	● MC.14251717	25 G 1.0	18	15.7	240
	MFN17G34UR-G	● MC.14341717	34 G 1.0	18	17.5	326
	MFN17G41UR-G	● MC.14411717	41 G 1.0	18	19	394
1,50	MFN15X02UR-G	● MC.14041517	2 x 1.5	16	6.8	29
	MFN15G03UR-G	● MC.14031517	3 G 1.5	16	7.2	43
	MFN15G04UR-G	● MC.14041517	4 G 1.5	16	7.8	58
	MFN15G05UR-G	● MC.14051517	5 G 1.5	16	8.5	72
	MFN15G07UR-G	● MC.14071517	7 G 1.5	16	10.1	101
	MFN15G12UR-G	● MC.14121517	12 G 1.5	16	12.4	173
	MFN15G18UR-G	● MC.14181517	18 G 1.5	16	14.4	259
	MFN15G25UR-G	● MC.14251517	25 G 1.5	16	17.6	360
	MFN15G34UR-G	● MC.14341517	34 G 1.5	16	19.6	490
	MFN15G41UR-G	● MC.14411517	41 G 1.5	16	21.7	590
2,50	MFN13X02UR-G	● MC.14021317	2 x 2.5	14	8.0	48
	MFN13G03UR-G	● MC.14031317	3 G 2.5	14	8.5	72
	MFN13G04UR-G	● MC.14041317	4 G 2.5	14	9.2	96
	MFN13G05UR-G	● MC.14051317	5 G 2.5	14	10.1	120
	MFN13G07UR-G	● MC.14071317	7 G 2.5	14	12.5	168
	MFN13G12UR-G	● MC.14121317	12 G 2.5	14	14.9	288
	MFN13G18UR-G	● MC.14181317	18 G 2.5	14	17.8	432
	MFN13G25UR-G	● MC.14251317	25 G 2.5	14	21.7	600
	MFN13G34UR-G	● MC.14341317	34 G 2.5	14	24.2	816
	MFN13G41UR-G	● MC.14411317	41 G 2.5	14	26.7	984

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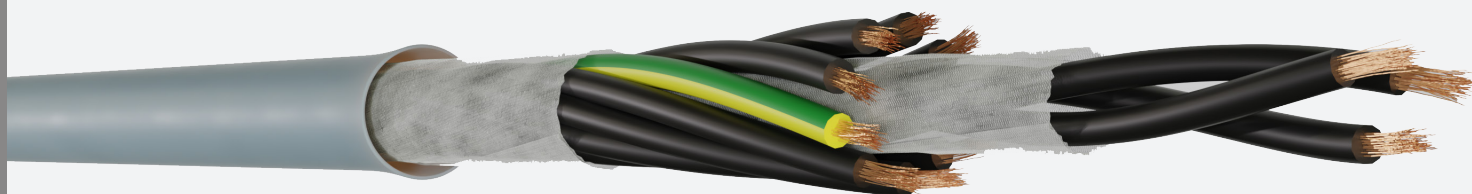
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SPAC CAVI

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UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Finely Stranded Copper Conductors	Increased flex resistance for installations with light motion.
Polypropylene (PP) Insulation	Consistent signal protection even under dynamic conditions.
RAL 7001 Gray PVC TM5 Jacket	Resistance to oils, chemical agents, and abrasion superior to standard PVC.
No EMC Shielding	Maximum flexibility and simple installation where no interference is present.
Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)	Supports both signals and power with a single cable.
CE / UL / CSA Compliance	Usable on systems certified according to international standards.
Metric Marking on Outer Jacket	Precise cutting of lengths directly in production.
Conductor Numbering + Y/G	Intuitive and fast wiring in control cabinet or on the machine.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,50	MDN21X02UR-G ●	MC.24022127	2 x 0.50	21	5.2	10
	MDN21G03UR-G ●	MC.24032127	3 G 0.50	21	5.5	14
	MDN21G04UR-G ●	MC.24042127	4 G 0.50	21	6.2	19
	MDN21G05UR-G ●	MC.24052127	5 G 0.50	21	6.7	24
	MDN21G07UR-G ●	MC.24072127	7 G 0.50	21	7.3	34
	MDN21G12UR-G ●	MC.24122127	12 G 0.50	21	9.3	58
	MDN21G18UR-G ●	MC.24182127	18 G 0.50	21	10.6	86
	MDN21G25UR-G ●	MC.24252127	25 G 0.50	21	12.9	120
	MDN21G34UR-G ●	MC.24342127	34 G 0.50	21	14.7	163
	MDN21G41UR-G ●	MC.24412127	41 G 0.50	21	16.3	197
0,75	MDN19X02UR-G ●	MC.24021927	2 x 0.75	19	5.9	14
	MDN19G03UR-G ●	MC.24031927	3 G 0.75	19	6.2	22
	MDN19G04UR-G ●	MC.24041927	4 G 0.75	19	6.5	29
	MDN19G05UR-G ●	MC.24051927	5 G 0.75	19	7.3	36
	MDN19G07UR-G ●	MC.24071927	7 G 0.75	19	8.6	50
	MDN19G12UR-G ●	MC.24121927	12 G 0.75	19	10.1	86
	MDN19G18UR-G ●	MC.24181927	18 G 0.75	19	12.2	130
	MDN19G25UR-G ●	MC.24251927	25 G 0.75	19	14.4	180
	MDN19G34UR-G ●	MC.24341927	34 G 0.75	19	16.1	245
	MDN19G41UR-G ●	MC.24411927	41 G 0.75	19	17.8	295
1,0	MDN17X02UR-G ●	MC.24021727	2 x 1.0	18	6.2	19
	MDN17G03UR-G ●	MC.24031727	3 G 1.0	18	6.5	29
	MDN17G04UR-G ●	MC.24041727	4 G 1.0	18	7.1	38
	MDN17G05UR-G ●	MC.24051727	5 G 1.0	18	7.7	48
	MDN17G07UR-G ●	MC.24071727	7 G 1.0	18	9.1	67
	MDN17G12UR-G ●	MC.24121727	12 G 1.0	18	11.1	115
	MDN17G18UR-G ●	MC.24181727	18 G 1.0	18	12.9	173
	MDN17G25UR-G ●	MC.24251727	25 G 1.0	18	15.7	240
	MDN17G34UR-G ●	MC.24341727	34 G 1.0	18	17.5	326
	MDN17G41UR-G ●	MC.24411727	41 G 1.0	18	19	394
1,50	MDN15X02UR-G ●	MC.24021527	2 x 1.5	16	6.8	29
	MDN15G03UR-G ●	MC.24031527	3 G 1.5	16	6.9	43
	MDN15G04UR-G ●	MC.24041527	4 G 1.5	16	7.8	58
	MDN15G05UR-G ●	MC.24051527	5 G 1.5	16	8.5	72
	MDN15G07UR-G ●	MC.24071527	7 G 1.5	16	10.1	101
	MDN15G12UR-G ●	MC.24121527	12 G 1.5	16	12.4	173
	MDN15G18UR-G ●	MC.24181527	18 G 1.5	16	14.4	259
	MDN15G25UR-G ●	MC.24251527	25 G 1.5	16	17.6	360
	MDN15G34UR-G ●	MC.24341527	34 G 1.5	16	19.6	490
	MDN15G41UR-G ●	MC.24411527	41 G 1.5	16	21.7	590
2,50	MDN13X02UR-G ●	MC.24021327	2 x 2.5	14	8.0	48
	MDN13G03UR-G ●	MC.24031327	3 G 2.5	14	8.5	72
	MDN13G04UR-G ●	MC.24041327	4 G 2.5	14	9.2	96
	MDN13G05UR-G ●	MC.24051327	5 G 2.5	14	10.1	120
	MDN13G07UR-G ●	MC.24071327	7 G 2.5	14	12.5	168
	MDN13G12UR-G ●	MC.24121327	12 G 2.5	14	14.9	288
	MDN13G18UR-G ●	MC.24181327	18 G 2.5	14	17.8	432
	MDN13G25UR-G ●	MC.24251327	25 G 2.5	14	21.7	600
	MDN13G34UR-G ●	MC.24341327	34 G 2.5	14	24.2	816
	MDN13G41UR-G ●	MC.24411327	41 G 2.5	14	26.7	984

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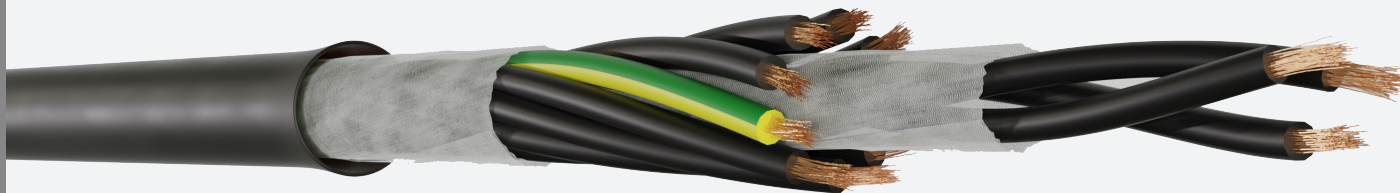
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UL 21209
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Copper Conductors (Class 6)

Ideal for intensive dynamic applications (robotics, cable carriers).

Polypropylene (PP) Insulation

Electrical stability even at high frequencies or distances.

RAL 9005 Black PUR FRHF Jacket

Exceptional resistance to oils, cutting, abrasion, and aggressive chemical agents.

No EMC Shielding

Superior flexibility where electromagnetic protection is not a priority.

Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)

Compatibility with advanced systems and power applications.

CE / UL / CSA Compliance

Guarantee of global quality and installability.

Metric Marking on Outer Jacket

Simplifies logistics and management of lengths in production.

Progressive Numbering + Y/G

Speed and reduced error risk in wiring.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,50	MDN21X02UP-N ●	MC.34022135	2 x 0.50	21	6.2	10
	MDN21G03UP-N ●	MC.34032135	3 G 0.50	21	6.5	14
	MDN21G04UP-N ●	MC.34042135	4 G 0.50	21	6.9	19
	MDN21G05UP-N ●	MC.34052135	5 G 0.50	21	7.4	24
	MDN21G07UP-N ●	MC.34072135	7 G 0.50	21	8.6	34
	MDN21G12UP-N ●	MC.34122135	12 G 0.50	21	10.0	58
	MDN21G18UP-N ●	MC.34182135	18 G 0.50	21	11.8	86
	MDN21G25UP-N ●	MC.34252135	25 G 0.50	21	13.8	120
	MDN21G34UP-N ●	MC.34342135	34 G 0.50	21	15.5	163
	MDN21G41UP-N ●	MC.34412135	41 G 0.50	21	16.7	197
0,75	MDN19X02UP-N ●	MC.34021935	2 x 0.75	19	6.6	14
	MDN19G03UP-N ●	MC.34031935	3 G 0.75	19	6.9	22
	MDN19G04UP-N ●	MC.34041935	4 G 0.75	19	7.4	29
	MDN19G05UP-N ●	MC.34051935	5 G 0.75	19	8.0	36
	MDN19G07UP-N ●	MC.34071935	7 G 0.75	19	9.3	50
	MDN19G12UP-N ●	MC.34121935	12 G 0.75	19	10.8	86
	MDN19G18UP-N ●	MC.34181935	18 G 0.75	19	12.8	130
	MDN19G25UP-N ●	MC.34251935	25 G 0.75	19	14.5	180
	MDN19G34UP-N ●	MC.34341935	34 G 0.75	19	16.9	245
	MDN19G41UP-N ●	MC.34411935	41 G 0.75	19	18.2	295
1,0	MDN17X02UP-N ●	MC.34021735	2 x 1.0	18	6.9	19
	MDN17G03UP-N ●	MC.34031735	3 G 1.0	18	7.2	29
	MDN17G04UP-N ●	MC.34041735	4 G 1.0	18	7.5	38
	MDN17G05UP-N ●	MC.34051735	5 G 1.0	18	8.4	48
	MDN17G07UP-N ●	MC.34071735	7 G 1.0	18	9.8	67
	MDN17G12UP-N ●	MC.34121735	12 G 1.0	18	11.7	115
	MDN17G18UP-N ●	MC.34181735	18 G 1.0	18	13.5	173
	MDN17G25UP-N ●	MC.34251735	25 G 1.0	18	16.1	240
	MDN17G34UP-N ●	MC.34341735	34 G 1.0	18	17.9	326
	MDN17G41UP-N ●	MC.34411735	41 G 1.0	18	19.4	394
1,50	MDN15X02UP-N ●	MC.34021535	2 x 1.5	16	7.5	29
	MDN15G03UP-N ●	MC.34031535	3 G 1.5	16	7.9	43
	MDN15G04UP-N ●	MC.34041535	4 G 1.5	16	8.5	58
	MDN15G05UP-N ●	MC.34051535	5 G 1.5	16	9.2	72
	MDN15G07UP-N ●	MC.34071535	7 G 1.5	16	11.0	101
	MDN15G12UP-N ●	MC.34121535	12 G 1.5	16	12.7	173
	MDN15G18UP-N ●	MC.34181535	18 G 1.5	16	14.7	259
	MDN15G25UP-N ●	MC.34251535	25 G 1.5	16	18.0	360
	MDN15G34UP-N ●	MC.34341535	34 G 1.5	16	20.0	490
	MDN15G41UP-N ●	MC.34411535	41 G 1.5	16	21.9	590
2,50	MDN13X02UP-N ●	MC.34021335	2 x 2.5	14	8.7	48
	MDN13G03UP-N ●	MC.34031335	3 G 2.5	14	9.2	72
	MDN13G04UP-N ●	MC.34041335	4 G 2.5	14	9.9	96
	MDN13G05UP-N ●	MC.34051335	5 G 2.5	14	11.1	120
	MDN13G07UP-N ●	MC.34071335	7 G 2.5	14	13.1	168
	MDN13G12UP-N ●	MC.34121335	12 G 2.5	14	15.7	288
	MDN13G18UP-N ●	MC.34181335	18 G 2.5	14	17.2	432
	MDN13G25UP-N ●	MC.34251335	25 G 2.5	14	21.9	600
	MDN13G34UP-N ●	MC.34341335	34 G 2.5	14	24.4	816
	MDN13G41UP-N ●	MC.34411335	41 G 2.5	14	26.7	984

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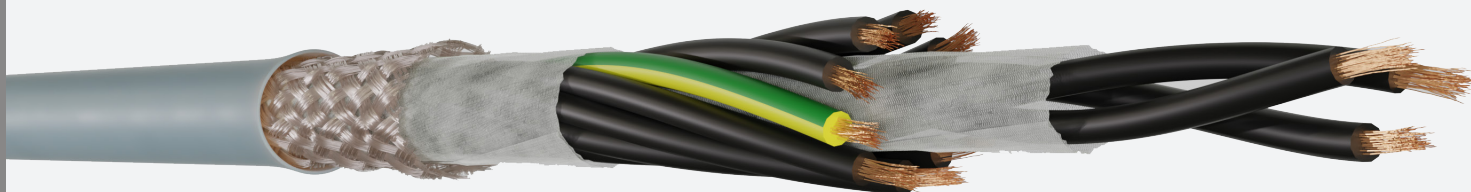
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

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

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UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/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

Finely Stranded Copper Conductors

Stable transmission even in the presence of external interference.

Polypropylene (PP) Insulation

Good signal protection and temperature rating up to 90

RAL 7001 Gray PVC Outer Jacket

Resistance to light industrial oils and wear from contact.

Copper Braid Shielding (≥85% Coverage)

Effective protection from EMC disturbances in mixed or sensitive environments.

Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)

Suitable for control or power lines in industrial environments.

CE / UL / CSA Compliance

Compliant with major international regulations.

Metric Marking on Outer Jacket

Facilitates management and correct cutting during installation.

Progressive Conductor Numbering + G/Y (Green/Yellow)

Simplifies identification and verification during wiring.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,50	MFS21X02UR-G	● MC.15022117	(2 x 0.50)	21	5.9	33
	MFS21G03UR-G	● MC.15032117	(3 G 0.50)	21	6.2	39
	MFS21G04UR-G	● MC.15042117	(4 G 0.50)	21	6.6	46
	MFS21G05UR-G	● MC.15052117	(5 G 0.50)	21	7.1	54
	MFS21G07UR-G	● MC.15072117	(7 G 0.50)	21	8.3	70
	MFS21G12UR-G	● MC.15122117	(12 G 0.50)	21	9.7	100
	MFS21G18UR-G	● MC.15182117	(18 G 0.50)	21	11.7	153
	MFS21G25UR-G	● MC.15252117	(25 G 0.50)	21	13.7	202
	MFS21G34UR-G	● MC.15342117	(34 G 0.50)	21	15.2	258
	MFS21G41UR-G	● MC.15412117	(41 G 0.50)	21	16.8	311
0,75	MFS19X02UR-G	● MC.15021917	(2 x 0.75)	19	6.3	41
	MFS19G03UR-G	● MC.15031917	(3 G 0.75)	19	6.6	48
	MFS19G04UR-G	● MC.15041917	(4 G 0.75)	19	7.1	59
	MFS19G05UR-G	● MC.15051917	(5 G 0.75)	19	7.7	69
	MFS19G07UR-G	● MC.15071917	(7 G 0.75)	19	9.0	90
	MFS19G12UR-G	● MC.15121917	(12 G 0.75)	19	10.5	129
	MFS19G18UR-G	● MC.15181917	(18 G 0.75)	19	12.7	205
	MFS19G25UR-G	● MC.15251917	(25 G 0.75)	19	14.9	271
	MFS19G34UR-G	● MC.15341917	(34 G 0.75)	19	16.6	332
	MFS19G41UR-G	● MC.15411917	(41 G 0.75)	19	18.3	391
1,0	MFS17X02UR-G	● MC.15021717	(2 x 1.0)	18	6.6	46
	MFS17G03UR-G	● MC.15031717	(3 G 1.0)	18	6.9	57
	MFS17G04UR-G	● MC.15041717	(4 G 1.0)	18	7.5	70
	MFS17G05UR-G	● MC.15051717	(5 G 1.0)	18	8.1	81
	MFS17G07UR-G	● MC.15071717	(7 G 1.0)	18	9.5	110
	MFS17G12UR-G	● MC.15121717	(12 G 1.0)	18	11.6	182
	MFS17G18UR-G	● MC.15181717	(18 G 1.0)	18	13.4	254
	MFS17G25UR-G	● MC.15251717	(25 G 1.0)	18	16.3	365
	MFS17G34UR-G	● MC.15341717	(34 G 1.0)	18	18.1	463
	MFS17G41UR-G	● MC.15411717	(41 G 1.0)	18	19.6	542
1,50	MFS15X02UR-G	● MC.15021517	(2 x 1.5)	16	7.2	58
	MFS15G03UR-G	● MC.15031517	(3 G 1.5)	16	7.6	75
	MFS15G04UR-G	● MC.15041517	(4 G 1.5)	16	8.2	91
	MFS15G05UR-G	● MC.15051517	(5 G 1.5)	16	8.9	112
	MFS15G07UR-G	● MC.15071517	(7 G 1.5)	16	11.0	145
	MFS15G12UR-G	● MC.15121517	(12 G 1.5)	16	12.9	247
	MFS15G18UR-G	● MC.15181517	(18 G 1.5)	16	14.9	348
	MFS15G25UR-G	● MC.15251517	(25 G 1.5)	16	18.2	498
	MFS15G34UR-G	● MC.15341517	(34 G 1.5)	16	20.2	700
	MFS15G41UR-G	● MC.15411517	(41 G 1.5)	16	22.3	844
2,50	MFS13X02UR-G	● MC.15021317	(2 x 2.5)	14	8.4	95
	MFS13G03UR-G	● MC.15031317	(3 G 2.5)	14	8.9	115
	MFS13G04UR-G	● MC.15041317	(4 G 2.5)	14	9.6	155
	MFS13G05UR-G	● MC.15051317	(5 G 2.5)	14	10.9	185
	MFS13G07UR-G	● MC.15071317	(7 G 2.5)	14	12.9	250
	MFS13G12UR-G	● MC.15121317	(12 G 2.5)	14	15.8	388
	MFS13G18UR-G	● MC.15181317	(18 G 2.5)	14	18.3	552
	MFS13G25UR-G	● MC.15251317	(25 G 2.5)	14	22.3	750
	MFS13G34UR-G	● MC.15341317	(34 G 2.5)	14	24.8	1016
	MFS13G41UR-G	● MC.15411317	(41 G 2.5)	14	27.3	1234

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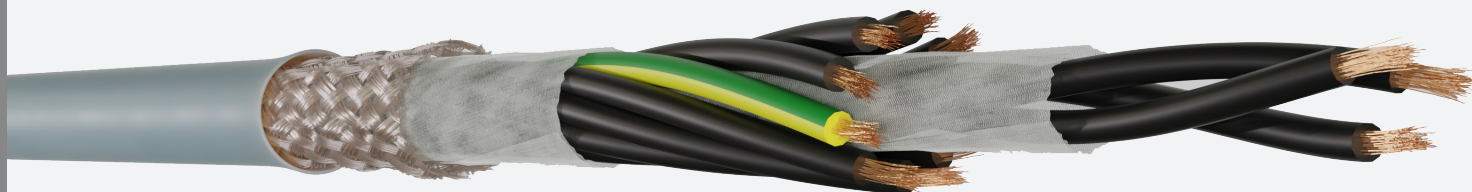
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SPAC CAVI

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UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Finely Stranded Copper Conductors	Reliable performance even after thousands of flex cycles.
Polypropylene (PP) Insulation	Electrical stability even in environments with thermal variations.
RAL 7001 Gray PVC TM5 Jacket	High resistance to abrasion, oils, and chemical agents.
Copper Braid Shielding	Effective protection against EMC disturbances in complex industrial environments.
Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)	Guaranteed safety for mixed power/control systems.
CE / UL / CSA Compliance	Suitable for use in certified control cabinets or export systems.
Metric Marking on Outer Jacket	Facilitates reel management and length optimization.
Progressive Numbering + Y/G	Reduces errors in conductor connection.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,50	MDS21X02UR-G	MC.25022127	(2 x 0.50)	21	5.9	33
	MDS21G03UR-G	MC.25032127	(3 G 0.50)	21	6.2	39
	MDS21G04UR-G	MC.25042127	(4 G 0.50)	21	6.6	46
	MDS21G05UR-G	MC.25052127	(5 G 0.50)	21	7.1	54
	MDS21G07UR-G	MC.25072127	(7 G 0.50)	21	8.3	70
	MDS21G12UR-G	MC.25122127	(12 G 0.50)	21	9.7	100
	MDS21G18UR-G	MC.25182127	(18 G 0.50)	21	11.7	153
	MDS21G25UR-G	MC.25252127	(25 G 0.50)	21	13.7	202
	MDS21G34UR-G	MC.25342127	(34 G 0.50)	21	15.2	258
	MDS21G41UR-G	MC.25412127	(41 G 0.50)	21	16.8	311
0,75	MDS19X02UR-G	MC.25021927	(2 x 0.75)	19	6.3	41
	MDS19G03UR-G	MC.25031927	(3 G 0.75)	19	6.6	48
	MDS19G04UR-G	MC.25041927	(4 G 0.75)	19	7.1	59
	MDS19G05UR-G	MC.25051927	(5 G 0.75)	19	7.7	69
	MDS19G07UR-G	MC.25071927	(7 G 0.75)	19	9.0	90
	MDS19G12UR-G	MC.25121927	(12 G 0.75)	19	10.5	129
	MDS19G18UR-G	MC.25181927	(18 G 0.75)	19	12.7	205
	MDS19G25UR-G	MC.25251927	(25 G 0.75)	19	14.9	271
	MDS19G34UR-G	MC.25341927	(34 G 0.75)	19	16.6	332
	MDS19G41UR-G	MC.25411927	(41 G 0.75)	19	18.3	391
1,0	MDS17X02UR-G	MC.25021727	(2 x 1.0)	18	6.6	46
	MDS17G03UR-G	MC.25031727	(3 G 1.0)	18	6.9	57
	MDS17G04UR-G	MC.25041727	(4 G 1.0)	18	7.5	70
	MDS17G05UR-G	MC.25051727	(5 G 1.0)	18	8.1	81
	MDS17G07UR-G	MC.25071727	(7 G 1.0)	18	9.5	110
	MDS17G12UR-G	MC.25121727	(12 G 1.0)	18	11.6	182
	MDS17G18UR-G	MC.25181727	(18 G 1.0)	18	13.4	254
	MDS17G25UR-G	MC.25251727	(25 G 1.0)	18	16.3	365
	MDS17G34UR-G	MC.25341727	(34 G 1.0)	18	18.1	463
	MDS17G41UR-G	MC.25411727	(41 G 1.0)	18	19.6	542
1,50	MDS15X02UR-G	MC.25021527	(2 x 1.5)	16	7.2	58
	MDS15G03UR-G	MC.25031527	(3 G 1.5)	16	7.6	75
	MDS15G04UR-G	MC.25041527	(4 G 1.5)	16	8.2	91
	MDS15G05UR-G	MC.25051527	(5 G 1.5)	16	8.9	112
	MDS15G07UR-G	MC.25071527	(7 G 1.5)	16	11.0	145
	MDS15G12UR-G	MC.25121527	(12 G 1.5)	16	12.9	247
	MDS15G18UR-G	MC.25181527	(18 G 1.5)	16	14.9	348
	MDS15G25UR-G	MC.25251527	(25 G 1.5)	16	18.2	498
	MDS15G34UR-G	MC.25341527	(34 G 1.5)	16	20.2	700
	MDS15G41UR-G	MC.25411527	(41 G 1.5)	16	22.3	844
2,50	MDS13X02UR-G	MC.25021327	(2 x 2.5)	14	8.4	95
	MDS13G03UR-G	MC.25031327	(3 G 2.5)	14	8.9	115
	MDS13G04UR-G	MC.25041327	(4 G 2.5)	14	9.6	155
	MDS13G05UR-G	MC.25051327	(5 G 2.5)	14	10.9	185
	MDS13G07UR-G	MC.25071327	(7 G 2.5)	14	12.9	250
	MDS13G12UR-G	MC.25121327	(12 G 2.5)	14	15.8	388
	MDS13G18UR-G	MC.25181327	(18 G 2.5)	14	18.3	552
	MDS13G25UR-G	MC.25251327	(25 G 2.5)	14	22.3	750
	MDS13G34UR-G	MC.25341327	(34 G 2.5)	14	24.8	1016
	MDS13G41UR-G	MC.25411327	(41 G 2.5)	14	27.3	1234

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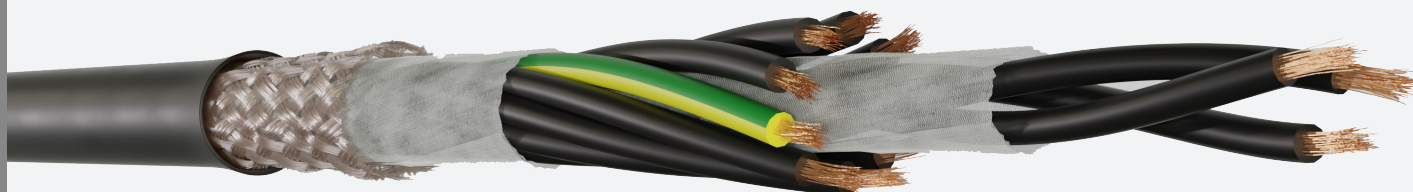
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SPAC CAVI

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UL 21209
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Copper Conductors (Class 6)

Signal stability even with intensive and continuous motion.

Polypropylene (PP) Insulation

Ensures low attenuation and clean transmission.

RAL 9005 Black PUR FRHF Jacket

Resistance to aggressive substances, abrasion, and high mechanical stress.

Copper Braid Shielding (≥85% Coverage)

Maximum EMC protection in systems with high electromagnetic interference.

Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)

Electrical safety on combined control and power lines.

CE / UL / CSA Compliance

Installable on machinery destined for the global market.

Metric Marking on Outer Jacket

Facilitates precise cutting and reduces waste during cabling.

Progressive Conductor Numbering + Y/G

Clarity in line identification for complex installations.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,50	MDS21X02UP-N ●	MC.35022135	(2 x 0.50)	21	6.6	33
	MDS21G03UP-N ●	MC.35032135	(3 G 0.50)	21	6.9	39
	MDS21G04UP-N ●	MC.35042135	(4 G 0.50)	21	7.3	46
	MDS21G05UP-N ●	MC.35052135	(5 G 0.50)	21	7.8	54
	MDS21G07UP-N ●	MC.35072135	(7 G 0.50)	21	9.0	70
	MDS21G12UP-N ●	MC.35122135	(12 G 0.50)	21	10.8	100
	MDS21G18UP-N ●	MC.35182135	(18 G 0.50)	21	12.3	153
	MDS21G25UP-N ●	MC.35252135	(25 G 0.50)	21	14.3	202
	MDS21G34UP-N ●	MC.35342135	(34 G 0.50)	21	16.1	258
	MDS21G41UP-N ●	MC.35412135	(41 G 0.50)	21	17.3	311
0,75	MDS19X02UP-N ●	MC.35021935	(2 x 0.75)	19	7.0	41
	MDS19G03UP-N ●	MC.35031935	(3 G 0.75)	19	7.3	48
	MDS19G04UP-N ●	MC.35041935	(4 G 0.75)	19	7.8	59
	MDS19G05UP-N ●	MC.35051935	(5 G 0.75)	19	8.4	69
	MDS19G07UP-N ●	MC.35071935	(7 G 0.75)	19	9.7	90
	MDS19G12UP-N ●	MC.35121935	(12 G 0.75)	19	11.6	129
	MDS19G18UP-N ●	MC.35181935	(18 G 0.75)	19	13.3	205
	MDS19G25UP-N ●	MC.35251935	(25 G 0.75)	19	15.5	271
	MDS19G34UP-N ●	MC.35341935	(34 G 0.75)	19	17.5	332
	MDS19G41UP-N ●	MC.35411935	(41 G 0.75)	19	18.8	391
1,0	MDS17X02UP-N ●	MC.35021735	(2 x 1.0)	18	7.3	46
	MDS17G03UP-N ●	MC.35031735	(3 G 1.0)	18	7.6	57
	MDS17G04UP-N ●	MC.35041735	(4 G 1.0)	18	8.2	70
	MDS17G05UP-N ●	MC.35051735	(5 G 1.0)	18	8.8	81
	MDS17G07UP-N ●	MC.35071735	(7 G 1.0)	18	10.2	110
	MDS17G12UP-N ●	MC.35121735	(12 G 1.0)	18	12.2	182
	MDS17G18UP-N ●	MC.35181735	(18 G 1.0)	18	14.0	254
	MDS17G25UP-N ●	MC.35251735	(25 G 1.0)	18	16.7	365
	MDS17G34UP-N ●	MC.35341735	(34 G 1.0)	18	18.5	463
	MDS17G41UP-N ●	MC.35411735	(41 G 1.0)	18	20	542
1,50	MDS15X02UP-N ●	MC.35021535	(2 x 1.5)	16	7.9	58
	MDS15G03UP-N ●	MC.35031535	(3 G 1.5)	16	8.3	75
	MDS15G04UP-N ●	MC.35041535	(4 G 1.5)	16	8.9	91
	MDS15G05UP-N ●	MC.35051535	(5 G 1.5)	16	9.6	112
	MDS15G07UP-N ●	MC.35071535	(7 G 1.5)	16	11.6	145
	MDS15G12UP-N ●	MC.35121535	(12 G 1.5)	16	13.5	247
	MDS15G18UP-N ●	MC.35181535	(18 G 1.5)	16	15.8	348
	MDS15G25UP-N ●	MC.35251535	(25 G 1.5)	16	18.6	498
	MDS15G34UP-N ●	MC.35341535	(34 G 1.5)	16	20.8	700
	MDS15G41UP-N ●	MC.35411535	(41 G 1.5)	16	22.5	844
2,50	MDS13X02UP-N ●	MC.35021335	(2 x 2.5)	14	9.1	95
	MDS13G03UP-N ●	MC.35031335	(3 G 2.5)	14	9.6	115
	MDS13G04UP-N ●	MC.35041335	(4 G 2.5)	14	10.3	155
	MDS13G05UP-N ●	MC.35051335	(5 G 2.5)	14	11.6	185
	MDS13G07UP-N ●	MC.35071335	(7 G 2.5)	14	13.6	250
	MDS13G12UP-N ●	MC.35121335	(12 G 2.5)	14	16.3	388
	MDS13G18UP-N ●	MC.35181335	(18 G 2.5)	14	18.8	552
	MDS13G25UP-N ●	MC.35251335	(25 G 2.5)	14	22.5	750
	MDS13G34UP-N ●	MC.35341335	(34 G 2.5)	14	25.0	1016
	MDS13G41UP-N ●	MC.35411335	(41 G 2.5)	14	27.3	1234

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EPLAN

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SPAC CAVI

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MOTIONWIRE

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

Single core power cables for fixed installation (with limited movement) or mobile chains and machine parts with axial movement. Suitable for dry and/or wet environments. The resistance to oils and industrial fluids is optimized depending on the level of performance. The choice of specific conductors and insulation provides great flexibility by allowing you to choose the product best suited to the final application. The cables are UL / CSA approved.

**INCREASED MAX
CONDUCTOR
TEMPERATURE**

90°C

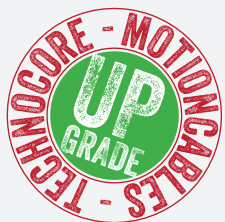
PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	XLPE	PVC	Flexibility, Oil/Fluid Resistance, Flame Retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	XLPE	PVC TM5	Designed for Repeated Bending, High performance in Dynamic Environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	XLPE	Polyurethane (PUR FRHF)	High flexibility even at low temperatures, Chemical Resistance, Halogen-Free

CONSTRUCTION

- ▶ Bare Copper wire, finely stranded acc. to DIN VDE 0295 cl.5 / IEC 60228 cl. 5 extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- ▶ Core insulation: XLPE, Black RAL 9005.
- ▶ Shield: tinned copper wire braid, approx. optical coverage 85%
- ▶ Separator: Fleece Tape.
- ▶ Outer sheath: PVC (BP), PVC TM5 (DP), PUR FRHF (level HP). Outer sheath colour: Grey RAL 7001 (level BP & DP), Black RAL 9005 (level HP), YELLOW/GREEN RAL 1021/ RAL 6029 (BP, DP, HP).

MAIN PROPERTIES

- ▶ Resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents.
- ▶ Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen.
- ▶ Designed for min. 100.000 bending cycles these cables are produced to high quality specifications.
- ▶ The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.



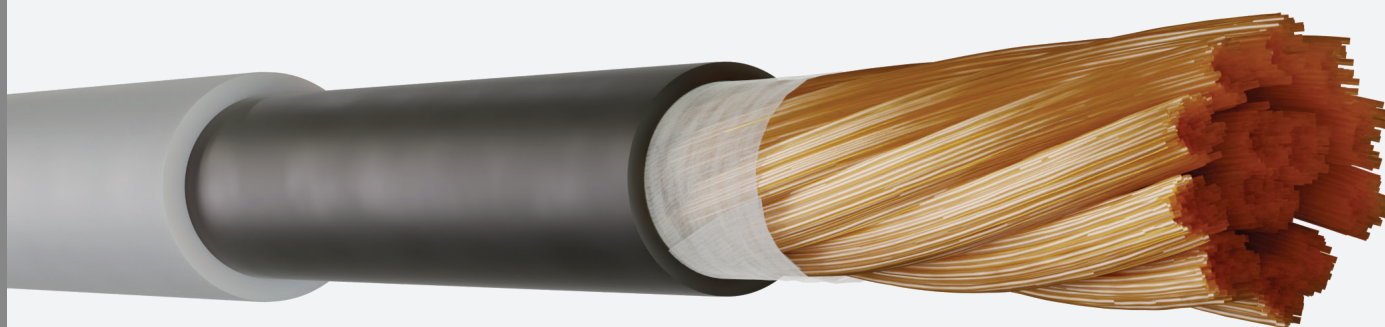
All MOTIONWIRE cables have been designed to meet the industry's evolution towards greater miniaturization and installation density, offering:

Enhanced Feature	MOTIONWIRE Value	Standard Market Value
Max. operating temperature	90 °C	70 – 80 °C

This upgrade ensures greater thermal safety and reliability, particularly near compact motors or high heat-dissipating equipment.

CABLES TYPES

	BASIC PERFORMANCE UNSHIELDED	PVC	600 V 1000 V	-25 °C +90 °C	122
	DYNAMIC PERFORMANCE UNSHIELDED	PVC TM5	600 V 1000 V	-30 °C +90 °C	124
	HIGH DYNAMIC PERFORMANCE UNSHIELDED	PUR FRHF	600 V 1000 V	-50 °C +90 °C	126
	BASIC PERFORMANCE SHIELDED	PVC	600 V 1000 V	-25 °C +90 °C	128
	DYNAMIC PERFORMANCE SHIELDED	PVC TM5	600 V 1000 V	-30 °C +90 °C	130
	HIGH DYNAMIC PERFORMANCE SHIELDED	PUR FRHF	600 V 1000 V	-50 °C +90 °C	132

UL 11846
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec²

ACCELERATION



≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/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

Flexible Copper Conductors Class 5

Ease of installation and good conductivity for general power systems.

XLPE Insulation with High Thermal Resistance

Increased safety even near heat sources (up to 90 °)

RAL 7001 Gray PVC Jacket

Basic protection against light oils and abrasion in standard environments.

Compact and Flexible Construction

Ease of installation even in narrow or curved conduits.

Suitable for Dry or Damp Environments

Application versatility for control cabinets, conduits, and machinery.

Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)

Safety of use for power and distribution systems.

CE / UL / CSA Compliance

Global installability according to international standards.

External Metric Marking (on the Jacket)

Precise cutting and simplified management of lengths.

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CFN09X01UR-G	●	MC.16010917	1 x 6	10	6.7	58
CFN07X01UR-G	●	MC.16010717	1 x 10	8	7.7	96
CFN05X01UR-G	●	MC.16010517	1 x 16	6	9.3	154
CFN03X01UR-G	●	MC.16010317	1 x 25	4	11.1	240
CFN02X01UR-G	●	MC.16010217	1 x 35	2	12.9	336
CFNA1X01UR-G	●	MC.1601A117	1 x 50	1	15.3	480
CFNA2X01UR-G	●	MC.1601A217	1 x 70	2/0	17.3	672
CFNA3X01UR-G	●	MC.1601A317	1 x 95	3/0	19.2	912
CFNA4X01UR-G	●	MC.1601A417	1 x 120	4/0	21.2	1152
CFNA5X01UR-G	●	MC.1601A517	1 x 150	250	23.7	1440
CFNB1X01UR-G	●	MC.1601B117	1 x 185	350	26.3	1776
CFNB2X01UR-G	●	MC.1601B217	1 x 240	450	27.4	2304
CFNB3X01UR-G	●	MC.1601B317	1 x 300	550	34.2	2880

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CFN09X01UR-GV	●	MC.16010919	1 x 6	10	6.7	58
CFN07X01UR-GV	●	MC.16010719	1 x 10	8	7.7	96
CFN05X01UR-GV	●	MC.16010519	1 x 16	6	9.3	154
CFN03X01UR-GV	●	MC.16010319	1 x 25	4	11.1	240
CFN02X01UR-GV	●	MC.16010219	1 x 35	2	12.9	336
CFNA1X01UR-GV	●	MC.1601A119	1 x 50	1	15.3	480
CFNA2X01UR-GV	●	MC.1601A219	1 x 70	2/0	17.3	672
CFNA3X01UR-GV	●	MC.1601A319	1 x 95	3/0	19.2	912
CFNA4X01UR-GV	●	MC.1601A419	1 x 120	4/0	21.2	1152
CFNA5X01UR-GV	●	MC.1601A519	1 x 150	250	23.7	1440
CFNB1X01UR-GV	●	MC.1601B119	1 x 185	350	26.3	1776
CFNB2X01UR-GV	●	MC.1601B219	1 x 240	450	27.4	2304
CFNB3X01UR-GV	●	MC.1601B319	1 x 300	550	34.2	2880

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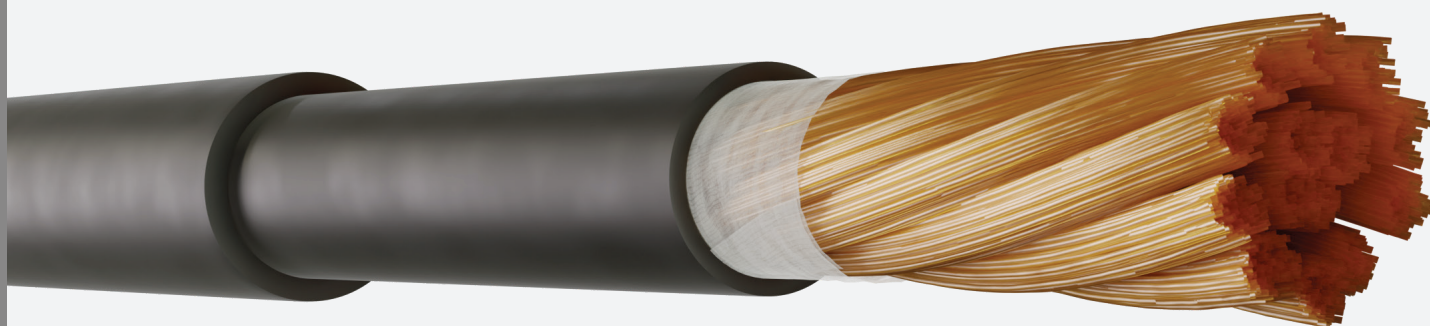
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SPAC CAVI

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and standards are the exclusive
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UL 11846
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Flexible Copper Conductors Class 5	Ease of installation and good conductivity for general power systems.
XLPE Insulation with High Thermal Resistance	Increased safety even near heat sources (up to 90 °C)
RAL 9005 Black PVC Jacket	Basic protection against light oils and abrasion in standard environments.
Compact and Flexible Construction	Ease of installation even in narrow or curved conduits.
Suitable for Dry or Damp Environments	Application versatility for control cabinets, conduits, and machinery.
Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)	Safety of use for power and distribution systems.
CE / UL / CSA Compliance	Global installability according to international standards.
External Metric Marking (on the Jacket)	Precise cutting and simplified management of lengths.

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CDN09X01UR-N	●	MC.26010927	1 x 6	10	6.7	58
CDN07X01UR-N	●	MC.26010727	1 x 10	8	7.7	96
CDN05X01UR-N	●	MC.26010527	1 x 16	6	9.3	154
CDN03X01UR-N	●	MC.26010327	1 x 25	4	11.1	240
CDN02X01UR-N	●	MC.26010227	1 x 35	2	12.9	336
CDNA1X01UR-N	●	MC.2601A127	1 x 50	1	15.3	480
CDNA2X01UR-N	●	MC.2601A227	1 x 70	2/0	17.3	672
CDNA3X01UR-N	●	MC.2601A327	1 x 95	3/0	19.2	912
CDNA4X01UR-N	●	MC.2601A427	1 x 120	4/0	21.2	1152
CDNA5X01UR-N	●	MC.2601A527	1 x 150	250	23.7	1440
CDNB1X01UR-N	●	MC.2601B127	1 x 185	350	26.3	1776
CDNB2X01UR-N	●	MC.2601B227	1 x 240	450	27.4	2304
CDNB3X01UR-N	●	MC.2601B327	1 x 300	550	34.2	2880

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CDN09X01UR-GV	●	MC.26010929	1 x 6	10	6.7	58
CDN07X01UR-GV	●	MC.26010729	1 x 10	8	7.7	96
CDN05X01UR-GV	●	MC.26010529	1 x 16	6	9.3	154
CDN03X01UR-GV	●	MC.26010329	1 x 25	4	11.1	240
CDN02X01UR-GV	●	MC.26010229	1 x 35	2	12.9	336
CDNA1X01UR-GV	●	MC.2601A129	1 x 50	1	15.3	480
CDNA2X01UR-GV	●	MC.2601A229	1 x 70	2/0	17.3	672
CDNA3X01UR-GV	●	MC.2601A329	1 x 95	3/0	19.2	912
CDNA4X01UR-GV	●	MC.2601A429	1 x 120	4/0	21.2	1152
CDNA5X01UR-GV	●	MC.2601A529	1 x 150	250	23.7	1440
CDNB1X01UR-GV	●	MC.2601B129	1 x 185	350	26.3	1776
CDNB2X01UR-GV	●	MC.2601B229	1 x 240	450	27.4	2304
CDNB3X01UR-GV	●	MC.2601B329	1 x 300	550	34.2	2880

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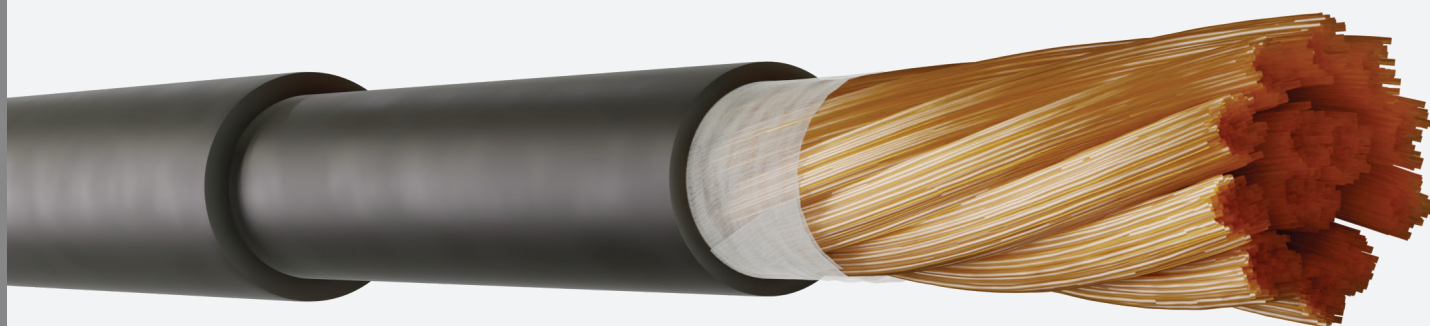
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SPAC CAVI

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UL 11773
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Copper Conductors Class 6

High resistance to repeated flexing in cable carriers.

XLPE Insulation

Excellent electrical performance even at high temperatures.

RAL 9005 Black PUR FRHF Jacket

Maximum resistance to cutting, oils, greases, and aggressive chemical substances.

Construction Designed for High Cyclicality

Ideal for robotics, machine tools, and dynamic automation.

Exceptional Flexibility even at Low Temperatures

Usable in cold storage rooms or cold environments.

Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)

Safety even on power lines in advanced systems.

CE / UL / CSA Compliance

Globally usable in systems with certification requirements.

Metric Marking on the Jacket

Facilitates precision in wiring and length management.

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CDN09X01UP-N	●	MC.36010935	1 x 6	10	6.7	58
CDN07X01UP-N	●	MC.36010735	1 x 10	8	7.7	96
CDN05X01UP-N	●	MC.36010535	1 x 16	6	9.3	154
CDN03X01UP-N	●	MC.36010335	1 x 25	4	11.1	240
CDN02X01UP-N	●	MC.36010235	1 x 35	2	12.9	336
CDNA1X01UP-N	●	MC.3601A135	1 x 50	1	15.8	480
CDNA2X01UP-N	●	MC.3601A235	1 x 70	2/0	17.3	672
CDNA3X01UP-N	●	MC.3601A335	1 x 95	3/0	19.2	912
CDNA4X01UP-N	●	MC.3601A435	1 x 120	4/0	21.2	1152
CDNA5X01UP-N	●	MC.3601A535	1 x 150	250	23.7	1440
CDNB1X01UP-N	●	MC.3601B135	1 x 185	350	26.3	1776
CDNB2X01UP-N	●	MC.3601B235	1 x 240	450	27.4	2304
CDNB3X01UP-N	●	MC.3601B335	1 x 300	550	34.2	2880

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CDN09X01UP-GV	●	MC.36010939	1 x 6	10	6.7	58
CDN07X01UP-GV	●	MC.36010739	1 x 10	8	7.7	96
CDN05X01UP-GV	●	MC.36010539	1 x 16	6	9.3	154
CDN03X01UP-GV	●	MC.36010339	1 x 25	4	11.1	240
CDN02X01UP-GV	●	MC.36010239	1 x 35	2	12.9	336
CDNA1X01UP-GV	●	MC.3601A139	1 x 50	1	15.8	480
CDNA2X01UP-GV	●	MC.3601A239	1 x 70	2/0	17.3	672
CDNA3X01UP-GV	●	MC.3601A339	1 x 95	3/0	19.2	912
CDNA4X01UP-GV	●	MC.3601A439	1 x 120	4/0	21.2	1152
CDNA5X01UP-GV	●	MC.3601A539	1 x 150	250	23.7	1440
CDNB1X01UP-GV	●	MC.3601B139	1 x 185	350	26.3	1776
CDNB2X01UP-GV	●	MC.3601B239	1 x 240	450	27.4	2304
CDNB3X01UP-GV	●	MC.3601B339	1 x 300	550	34.2	2880

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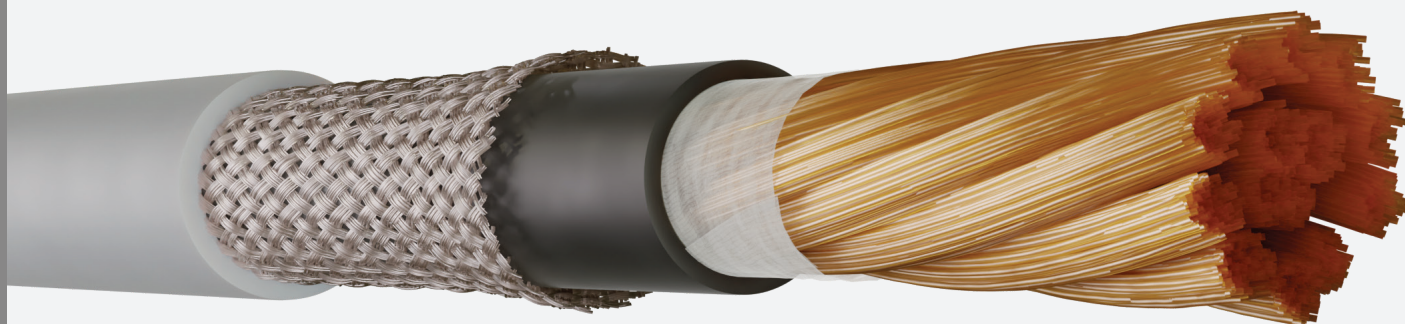
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

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UL 11846
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

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

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/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

Flexible Copper Conductors Class 5	Good conductivity even over medium-to-long distances.
Thermo-Resistant XLPE Insulation	Thermal protection up to 90 °C
RAL 7001 Gray PVC Jacket	Resistance to abrasion and light chemical agents.
Copper Braid Shielding (≥85% Coverage)	Protection from EMC disturbances and improved signal integrity.
Flexibility for Installation in Cabinets or Conduits	Ease of routing in confined or complex spaces.
Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)	Suitable for power lines in disturbed environments.
CE / UL / CSA Compliance	Compatible with export systems and international standards.
Metric Marking on the Jacket	Facilitates correct cutting and length control during wiring.

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CFS09X01UR-G	●	MC.17010917	(1 x 6)	10	7.3	79
CFS07X01UR-G	●	MC.17010717	(1 x 10)	8	8.3	122
CFS05X01UR-G	●	MC.17010517	(1 x 16)	6	9.9	183
CFS03X01UR-G	●	MC.17010317	(1 x 25)	4	11.7	269
CFS02X01UR-G	●	MC.17010217	(1 x 35)	2	13.5	399
CFS1X01UR-G	●	MC.1701A117	(1 x 50)	1	15.9	581
CFA2X01UR-G	●	MC.1701A217	(1 x 70)	2/0	18.1	766
CFA3X01UR-G	●	MC.1701A317	(1 x 95)	3/0	20.0	1011
CFA4X01UR-G	●	MC.1701A417	(1 x 120)	4/0	22.0	1271
CFA5X01UR-G	●	MC.1701A517	(1 x 150)	250	24.5	1711
CFSB1X01UR-G	●	MC.1701B117	(1 x 185)	350	27.1	2101
CFSB2X01UR-G	●	MC.1701B217	(1 x 240)	450	28.2	2640
CFSB3X01UR-G	●	MC.1701B317	(1 x 300)	550	35.0	2970

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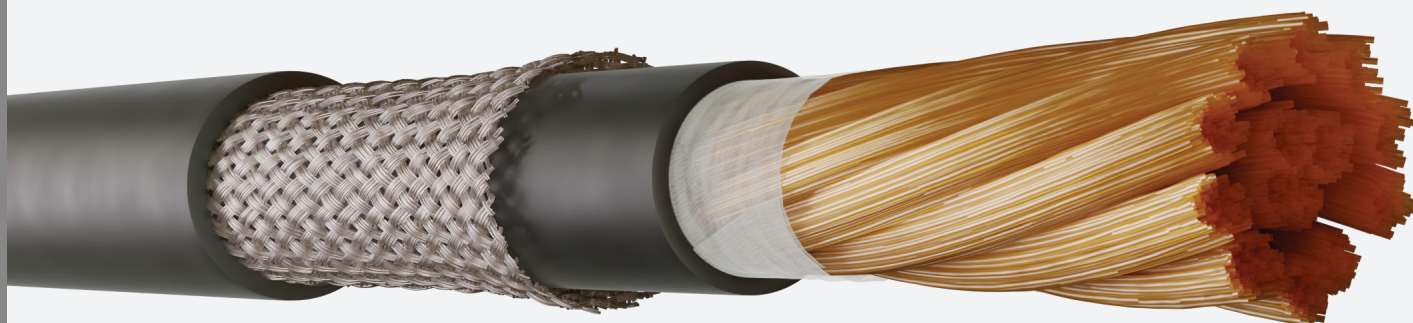
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SPAC CAVI

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UL 11846
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	250 °C (≤ 1s)
	Operating Voltage	1000 V (UL/CSA) U ₀ /U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT	FLAME RETARDANT	WATER RESISTANT	EMC PROTECTED	TEMPOR. OUTDOOR	MECHANICAL CRUSH

MAIN ADVANTAGES

Flexible Copper Conductors Class 5	Suitable for frequent movement while maintaining conductivity.
XLPE Insulation	Thermal protection and effective insulation even under critical conditions.
RAL 9005 Black PVC TM5 Jacket	High resistance to abrasion, oils, and coolants.
High-Coverage Copper Braid Shielding	EMC protection for power systems in disturbed environments.
Above-Average Flexibility	Simple installation even in complex or movable sections.
Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)	Safe lines even for power supply in the presence of disturbances.
CE / UL / CSA Compliance	Compliant with major international requirements.
Metric Marking on the Jacket	Allows for precise cuts and efficient reel management.

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CDS09X01UR-N	●	MC.27010927	(1 x 6)	10	7.3	79
CDS07X01UR-N	●	MC.27010727	(1 x 10)	8	8.3	122
CDS05X01UR-N	●	MC.27010527	(1 x 16)	6	9.9	183
CDS03X01UR-N	●	MC.27010327	(1 x 25)	4	11.7	269
CDS02X01UR-N	●	MC.27010227	(1 x 35)	2	13.5	399
CDSA1X01UR-N	●	MC.2701A127	(1 x 50)	1	15.9	581
CDSA2X01UR-N	●	MC.2701A227	(1 x 70)	2/0	18.1	766
CDSA3X01UR-N	●	MC.2701A327	(1 x 95)	3/0	20.0	1011
CDSA4X01UR-N	●	MC.2701A427	(1 x 120)	4/0	22.0	1271
CDSA5X01UR-N	●	MC.2701A527	(1 x 150)	250	24.5	1711
CDSB1X01UR-N	●	MC.2701B127	(1 x 185)	350	27.1	2101
CDSB2X01UR-N	●	MC.2701B227	(1 x 240)	450	28.2	2640
CDSB3X01UR-N	●	MC.2701B327	(1 x 300)	550	35.0	2970

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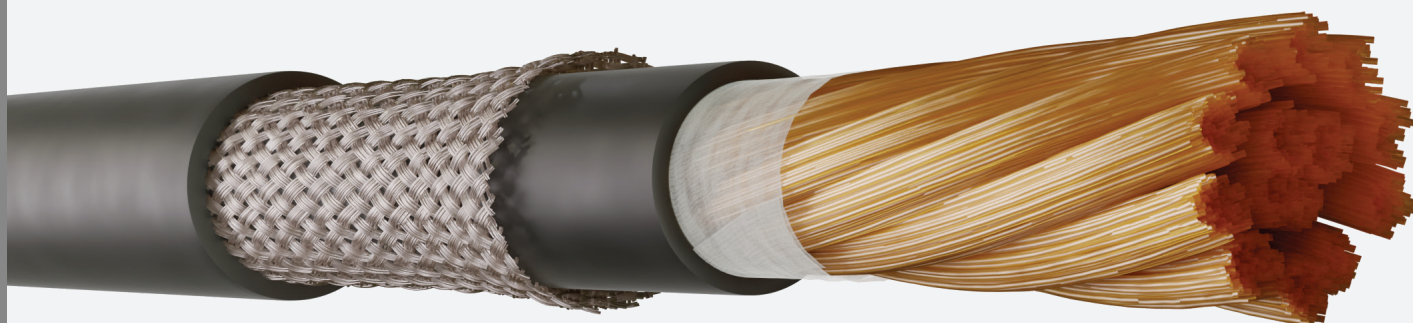
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SPAC CAVI

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UL 11773
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Copper Conductors Class 6

Signal stability even under conditions of extreme stress.

XLPE Insulation

Excellent thermal performance and insulation over long distances.

RAL 9005 Black PUR FRHF Jacket

Superior resistance to oils, coolants, mechanical stress, and aggressive chemical agents.

Copper Braid Shielding (≥ 85% Coverage)

Maximum EMC protection for motors, inverters, and sensitive equipment.

Construction Optimized for Dynamic Flexing

Ideal for high-cycle applications in disturbed environments.

Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)

Safety and stability even in environments with high electrical stress.

CE / UL / CSA Compliance

Perfect for systems subject to global approvals.

Robust and Flexible Construction

Long service life and reduced machine downtime.

MotionCables code		EPlan Code	Formation	AWG Kcmil	Ø	Cu
			mm ²		mm	kg / km
CDS09X01UP-N	●	MC.37010935	(1 x 6)	10	7.3	79
CDS07X01UP-N	●	MC.37010735	(1 x 10)	8	8.3	122
CDS05X01UP-N	●	MC.37010535	(1 x 16)	6	9.9	183
CDS03X01UP-N	●	MC.37010335	(1 x 25)	4	11.7	269
CDS02X01UP-N	●	MC.37010235	(1 x 35)	2	13.5	399
CDSA1X01UP-N	●	MC.3701A135	(1 x 50)	1	15.9	581
CDSA2X01UP-N	●	MC.3701A235	(1 x 70)	2/0	18.1	766
CDSA3X01UP-N	●	MC.3701A335	(1 x 95)	3/0	20.0	1011
CDSA4X01UP-N	●	MC.3701A435	(1 x 120)	4/0	22.0	1271
CDSA5X01UP-N	●	MC.3701A535	(1 x 150)	250	24.5	1711
CDSB1X01UP-N	●	MC.3701B135	(1 x 185)	350	27.1	2101
CDSB2X01UP-N	●	MC.3701B235	(1 x 240)	450	28.2	2640
CDSB3X01UP-N	●	MC.3701B335	(1 x 300)	550	35.0	2970

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SPAC CAVI

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MOTIONPOWER

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS.

Multi core power cables for fixed (with limited movements) or mobile installation in cable chains and moving machine parts with axial displacement. Suitable for dry and / or humid environments. The resistance to industrial oils and fluids is optimized depending on the performance level. The choice of specific conductors and insulation guarantees great flexibility allowing you to choose the most suitable product for the final application. The cables are UL / CSA approved.

**INCREASED MAX
CONDUCTOR
TEMPERATURE**

90°C

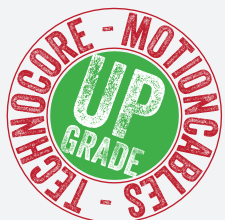
PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	Polypropylene (PP)	PVC	Flexibility, Oil/Fluid Resistance, Flame Retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	Polypropylene (PP)	PVC TM5	Designed for Repeated Bending, High performance in Dynamic Environments
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	Polypropylene (PP)	Polyurethane (PUR FRHF)	High flexibility even at low temperatures, Chemical Resistance, Halogen-Free

CONSTRUCTION

- ▶ Bare Copper wire, finely stranded acc. to DIN VDE 0295 cl.5 / IEC 60228 cl. 5 extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6.
- ▶ Core insulation: Special-PP.
- ▶ Core identification: generally black conductors with white progressive numbers + Green/Yellow.
- ▶ Tape: Fleece Tape.
- ▶ Shield: tinned copper wire braid, approx. optical coverage 85%.
- ▶ Separator: Fleece Tape.
- ▶ Outer sheath: PVC (BP), PVC TM5 (DP), PUR FRHF (level HP). Outer sheath colour: Grey RAL 7001 (level BP & DP), Black RAL 9005 (level HP).

MAIN PROPERTIES

- ▶ Resistant to: UV radiation, Oil, Grease, Coolants, Hydraulic Fluids, Microbes, Numerous Alkalis and Solvents.
- ▶ Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen.
- ▶ Designed for min. 100.000 bending cycles these cables are produced to high quality specifications.
- ▶ The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.



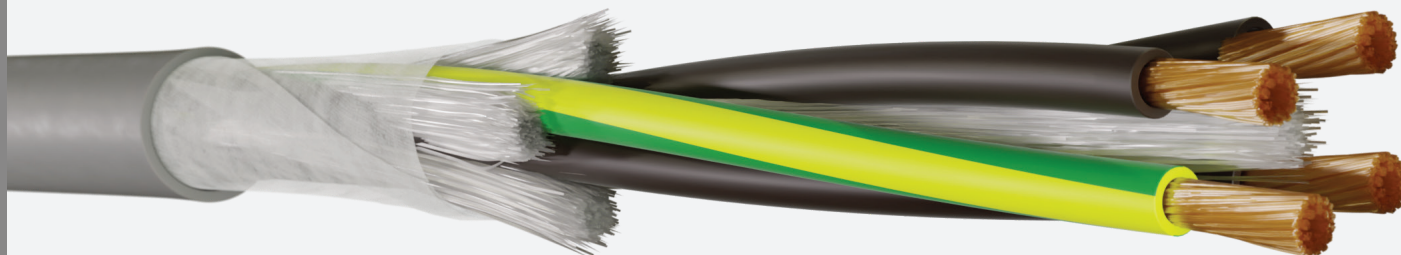
All **MOTIONPOWER** cables have been designed to meet the industry's evolution towards greater miniaturization and installation density, offering:

Enhanced Feature	MOTIONPOWER Value	Standard Market Value
Max. Operating temperature	90 °C	70 – 80 °C

This upgrade ensures greater thermal safety and reliability, particularly near compact motors or high heat-dissipating equipment.

CABLES TYPES

	BASIC PERFORMANCE UNSHIELDED	PVC	600 V 1000 V	-25 °C +90 °C	136
	DYNAMIC PERFORMANCE UNSHIELDED	PVC TM5	600 V 1000 V	-30 °C +90 °C	138
	HIGH DYNAMIC PERFORMANCE UNSHIELDED	PUR FRHF	600 V 1000 V	-50 °C +90 °C	140
	BASIC PERFORMANCE SHIELDED	PVC	600 V 1000 V	-25 °C +90 °C	142
	DYNAMIC PERFORMANCE SHIELDED	PVC TM5	600 V 1000 V	-30 °C +90 °C	144
	HIGH DYNAMIC PERFORMANCE SHIELDED	PUR FRHF	600 V 1000 V	-50 °C +90 °C	146

UL 21179
90 °C - 1000VAWMI I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec²

ACCELERATION



≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/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

Flexible Copper Class 5

Reliable for power distribution to motors, pumps, and devices in systems up to 1000 V.

Polypropylene (PP) Insulation

Improves electrical stability, reduces dielectric losses, and resists thermal aging.

RAL 7001 Gray PVC Jacket

Resistant to light industrial oils, abrasion, and moderate environmental conditions (dry or semi-damp indoor).

Compact Multi-Conductor Construction

Easy to install in conduits and cable trays in standard electrical and automation systems.

Maximum Conductor Temperature 90°C

Safe near hot electrical components, such as transformers, inverters, or loaded control cabinets.

Compliant with UL / CSA / CE

Suitable for internationally certified industrial installations (Europe and North America).

High Resistance to Occasional Flexing

Although designed for fixed installation, it withstands minimal vibrations or movements without

Progressive Metric Marking

Quick identification of remaining lengths: facilitates correct cutting and management of cable sections.

MotionCables code		EPlan Code	Formation	AWG	Ø	Cu
			mm ²		mm	kg / km
PFN11G03UR-G	●	MC.18031117	3 G 4	12	11.0	58
PFN11G04UR-G	●	MC.18041117	4 G 4	12	11.7	96
PFN11G05UR-G	●	MC.18051117	5 G 4	12	14.8	154
PFN11G07UR-G	●	MC.18071117	7 G 4	12	16.5	240
PFN09G04UR-G	●	MC.18040917	4 G 6	10	14.4	336
PFN07G04UR-G	●	MC.18040717	4 G 10	8	18.6	480
PFN05G04UR-G	●	MC.18040517	4 G 16	6	22.8	672
PFN03G04UR-G	●	MC.18040317	4 G 25	4	26.3	912
PFN02G04UR-G	●	MC.18040217	4 G 35	2	30.0	1152
PFNA1G04UR-G	●	MC.1804A117	4 G 50	1	35.0	1440
PFNA2G04UR-G	●	MC.1804A217	4 G 70	2/0	41.0	1776
PFNA3G04UR-G	●	MC.1804A317	4 G 95	3/0	46.0	2304
PFNA4G04UR-G	●	MC.1804A417	4 G 120	4/0	53.0	2880

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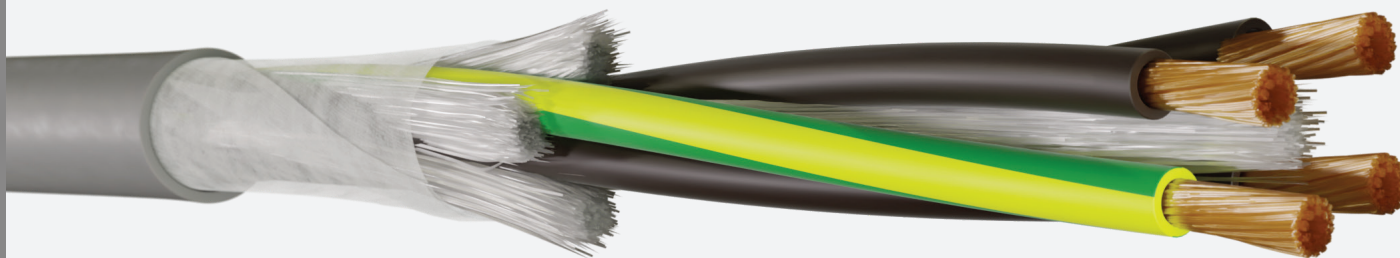
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SPAC CAVI

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UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED



20 m / s²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

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

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	1000 V (UL/CSA) U ₀ /U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT	FLAME RETARDANT	WATER RESISTANT	EMC PROTECTED	TEMPOR. OUTDOOR	MECHANICAL CRUSH

MAIN ADVANTAGES

Extra-Flexible Copper Class 6	Designed to handle repeated movement or light vibrations without deterioration.
Special PP Insulation	Low capacitance and reliable insulation under dynamic conditions.
RAL 7001 Gray PVC TM5 Jacket	Higher resistance to abrasion and industrial oils compared to standard PVC.
Good Installation Flexibility	Ideal for narrow passages or short-travel mobile connections.
Compatible with Damp Indoor Environments	Functional even in control cabinets, machine tools, or conduits subject to condensation.
Maximum Conductor Temperature 90 °C	Safe even in enclosed spaces or near heat sources.
Compliant with UL / CSA / CE	Suitable for international markets and integration into exported machinery.
Continuous Metric Marking	Precise cutting and simplified length control during installation.

MotionCables code		EPlan Code	Formation	AWG	Ø	Cu
			mm ²		mm	kg / km
PDN11G03UR-G	●	MC.28031127	3 G 4	12	11.0	58
PDN11G04UR-G	●	MC.28041127	4 G 4	12	11.7	96
PDN11G05UR-G	●	MC.28051127	5 G 4	12	14.8	154
PDN11G07UR-G	●	MC.28071127	7 G 4	12	16.5	240
PDN09G04UR-G	●	MC.28040927	4 G 6	10	14.4	336
PDN07G04UR-G	●	MC.28040727	4 G 10	8	18.6	480
PDN05G04UR-G	●	MC.28040527	4 G 16	6	22.8	672
PDN03G04UR-G	●	MC.28040327	4 G 25	4	26.3	912
PDN02G04UR-G	●	MC.28040227	4 G 35	2	30.0	1152
PDNA1G04UR-G	●	MC.2804A127	4 G 50	1	35.0	1440
PDNA2G04UR-G	●	MC.2804A227	4 G 70	2/0	41.0	1776
PDNA3G04UR-G	●	MC.2804A327	4 G 95	3/0	46.0	2304
PDNA4G04UR-G	●	MC.2804A427	4 G 120	4/0	53.0	2880

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EPLAN

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SPAC CAVI

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UL 21209
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

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

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Conductors Class 6

Excellent mechanical performance in cable carriers and systems with continuous motion.

RAL 9005 Black PUR FRHF Jacket

Extreme resistance to oils, cutting, abrasion, chemical substances, and coolants.

Technical PP Insulation

High dielectric stability and thermal resistance for high-stress environments.

Suitable for Damp and Wet Environments

Perfect for use in factories subject to wash-downs, condensation, or spray exposure.

High Durability in Flex Cycles

Designed to exceed 10 million cycles in dynamic or robotic systems.

Maximum Conductor Temperature 90°C

Safety even in installations on or near the motor or heat sources.

UL / CSA / CE Certified

Compliant with the technical requirements of systems intended for global markets.

Progressive Metric Marking

Supports correct wiring, reducing errors in cutting or installation length.

MotionCables code		EPlan Code	Formation	AWG	Ø	Cu
			mm ²		mm	kg / km
PDN11G03UP-N	●	MC.38031135	3 G 4	12	11.0	58
PDN11G04UP-N	●	MC.38041135	4 G 4	12	11.7	96
PDN11G05UP-N	●	MC.38051135	5 G 4	12	14.8	154
PDN11G07UP-N	●	MC.38071135	7 G 4	12	16.5	240
PDN09G04UP-N	●	MC.38040935	4 G 6	10	14.4	336
PDN07G04UP-N	●	MC.38040735	4 G 10	8	18.6	480
PDN05G04UP-N	●	MC.38040535	4 G 16	6	22.8	672
PDN03G04UP-N	●	MC.38040335	4 G 25	4	26.3	912
PDN02G04UP-N	●	MC.38040235	4 G 35	2	30.0	1152
PDNA1G04UP-N	●	MC.3804A135	4 G 50	1	35.0	1440
PDNA2G04UP-N	●	MC.3804A235	4 G 70	2/0	41.0	1776
PDNA3G04UP-N	●	MC.3804A335	4 G 95	3/0	46.0	2304
PDNA4G04UP-N	●	MC.3804A435	4 G 120	4/0	53.0	2880

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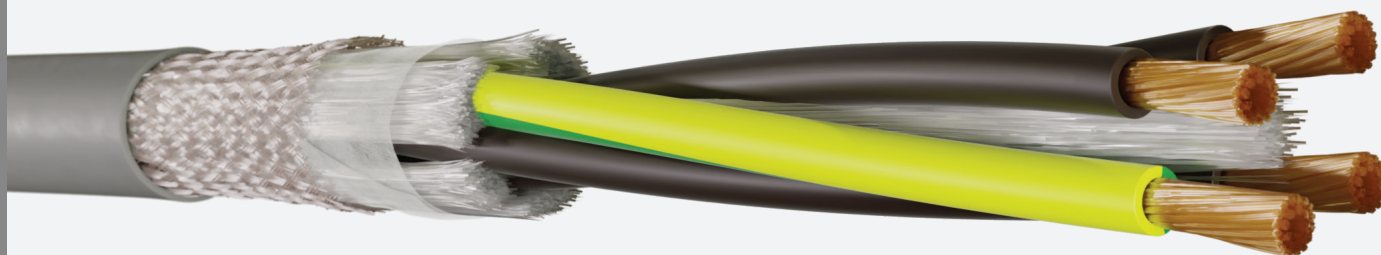
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SPAC CAVI

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UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/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

Flexible Copper Class 5

Reliable performance in power distribution in systems up to 1000 V, even in mixed environments.

High-Coverage Copper Braid Shielding

Effective EMC protection against external interference and unwanted coupling.

Low Dielectric Constant PP Insulation

Maintenance of signal integrity even over long runs and in disturbed environments.

RAL 7001 Gray PVC Jacket

Good mechanical and chemical resistance for standard and semi-damp industrial environments.

Indoor Industrial Installation

Economical and safe solution for automation, HVAC, power train, and control cabinets.

Maximum Conductor Temperature 90°C

Safe management of internal temperatures in dense cabinets and conduits.

UL / CSA / CE Certified

Meets regulatory requirements for international systems (Europe / North America).

Progressive Metric Marking

Facilitates measurement and correct cable positioning during installation.

MotionCables code		EPlan Code	Formation	AWG	∅	Cu
			mm ²		mm	kg / km
PFS11G03UR-G	●	MC.19031117	(3 G 4)	12	11.5	79
PFS11G04UR-G	●	MC.19041117	(4 G 4)	12	12.3	122
PFS11G05UR-G	●	MC.19051117	(5 G 4)	12	15.3	183
PFS11G07UR-G	●	MC.19071117	(7 G 4)	12	17.0	269
PFS09G04UR-G	●	MC.19040917	(4 G 6)	10	14.9	399
PFS07G04UR-G	●	MC.19040717	(4 G 10)	8	19.2	581
PFS05G04UR-G	●	MC.19040517	(4 G 16)	6	23.3	766
PFS03G04UR-G	●	MC.19040317	(4 G 25)	4	26.9	1011
PFS02G04UR-G	●	MC.19040217	(4 G 35)	2	30.6	1271
PFSA1G04UR-G	●	MC.1904A117	(4 G 50)	1	35.6	1711
PFSA2G04UR-G	●	MC.1904A217	(4 G 70)	2/0	41.6	2101
PFSA3G04UR-G	●	MC.1904A317	(4 G 95)	3/0	46.6	2640
PFSA4G04UR-G	●	MC.1904A417	(4 G 120)	4/0	53.6	2970

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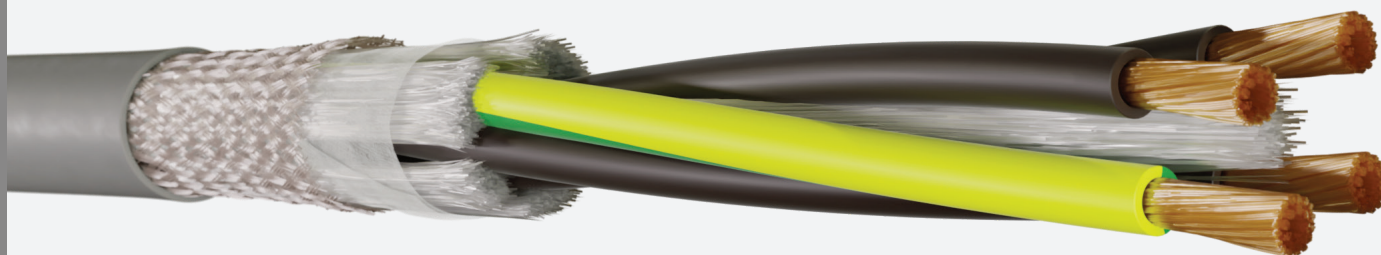
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UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



300 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	300	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR



MECHANICAL CRUSH

MAIN ADVANTAGES

Extra-Flexible Conductors Class 6	Ideal for light or cyclical movements in conduits or moving machinery.
Copper Braid Shielding (High Coverage)	Reliable EMC performance in environments disturbed by motors, inverters, and transformers.
High-Performance PVC TM5 Jacket	Resistance to oils, lubricants, and more severe industrial environmental conditions.
PP Insulation for Low Capacitance	Maintains electrical efficiency even at high frequencies.
Improved Flexibility compared to Standard Cables	Reduces installation stress on complex or moving paths.
UL / CSA / CE Certifications	Compliant with major standards for automation, power distribution, and machinery export.
Compatible with Motor Power Systems	Optimal for connections from control cabinet to servo motors or actuators.
Continuous Metric Marking	Facilitates assembly, identification, and management of cable sections on site.

MotionCables code		EPlan Code	Formation	AWG	Ø	Cu
			mm ²		mm	kg / km
PDS11G03UR-G	●	MC.29031127	(3 G 4)	12	11.5	79
PDS11G04UR-G	●	MC.29041127	(4 G 4)	12	12.3	122
PDS11G05UR-G	●	MC.29051127	(5 G 4)	12	15.3	183
PDS11G07UR-G	●	MC.29071127	(7 G 4)	12	17.0	269
PDS09G04UR-G	●	MC.29040927	(4 G 6)	10	14.9	399
PDS07G04UR-G	●	MC.29040727	(4 G 10)	8	19.2	581
PDS05G04UR-G	●	MC.29040527	(4 G 16)	6	23.3	766
PDS03G04UR-G	●	MC.29040327	(4 G 25)	4	26.9	1011
PDS02G04UR-G	●	MC.29040227	(4 G 35)	2	30.6	1271
PDSA1G04UR-G	●	MC.2904A127	(4 G 50)	1	35.6	1711
PDSA2G04UR-G	●	MC.2904A227	(4 G 70)	2/0	41.6	2101
PDSA3G04UR-G	●	MC.2904A327	(4 G 95)	3/0	46.6	2640
PDSA4G04UR-G	●	MC.2904A427	(4 G 120)	4/0	53.6	2970

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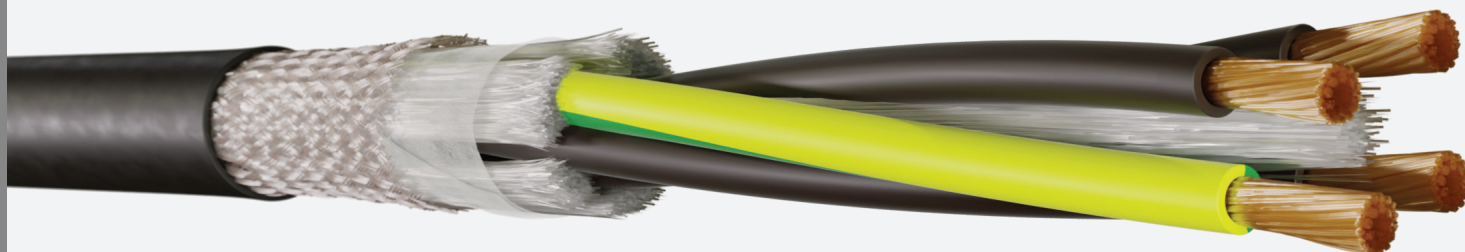
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UL 21209
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Extra-Flexible Copper Class 6

High mechanical performance even in cyclical movements and complex torsion.

Copper Braid Shielding (High Coverage)

High-level EMC protection for installations with inverters, motors, and high-current lines.

Black PUR FRHF Outer Jacket

Resists aggressive oils, greases, solvents, and intense mechanical stress.

Low-Capacitance PP Insulation

Stable electrical performance even in systems with long distances or high power.

High Dynamic Flexibility

Works perfectly in cable carriers and machinery with repeated movements.

Conductor Temperature up to 90°C

Ideal for environments with thermal dissipation or continuous operation under load.

UL / CSA / CE Compliant

Suitable for international applications in sectors such as automotive, packaging, and machine tools.

Continuous Metric Marking

Supports correct installation, simplifies length control, and reduces wiring errors

MotionCables code		EPlan Code	Formation	AWG	Ø	Cu
			mm ²		mm	kg / km
PDS11G03UP-N	●	MC.39031135	(3 G 4)	12	11.5	162
PDS11G04UP-N	●	MC.39041135	(4 G 4)	12	12.3	224
PDS11G05UP-N	●	MC.39051135	(5 G 4)	12	15.3	302
PDS11G07UP-N	●	MC.39071135	(7 G 4)	12	17.0	357
PDS09G04UP-N	●	MC.39040935	(4 G 6)	10	14.9	286
PDS07G04UP-N	●	MC.39040735	(4 G 10)	8	19.2	485
PDS05G04UP-N	●	MC.39040535	(4 G 16)	6	23.3	723
PDS03G04UP-N	●	MC.39040335	(4 G 25)	4	26.9	1089
PDS02G04UP-N	●	MC.39040235	(4 G 35)	2	30.6	1540
PDSA1G04UP-N	●	MC.3904A135	(4 G 50)	1	35.6	2069
PDSA2G04UP-N	●	MC.3904A235	(4 G 70)	2/0	41.6	2928
PDSA3G04UP-N	●	MC.3904A335	(4 G 95)	3/0	46.6	4055
PDSA4G04UP-N	●	MC.3904A435	(4 G 120)	4/0	53.6	5225

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MOTION **UL LISTED**

MOTION **UL WIRE**

MOTION **UL MULTIWIRE**

MOTION **UL POWER**

MOTION **UL ETHERNET**

MOTION **ULWIRE**

SINGLE WIRE FOR STATIC AND DYNAMIC APPLICATIONS

UL LISTED single-core power cables, suitable for fixed or mobile applications, built according to NFPA 79 and NFPA 70 specifications.

The MOTION **UL WIRE** series includes THHW / TFF (Thermoplastic High Heat Resistant Water), MTW, <HAR> cables.

The cables can operate in cable chain, fixed, and channel.

All cables are oil-resistant, industrial fluids and can work in environments with high humidity.

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	PVC	PVC LISTED	Flexibility, oil/fluid resistance, flame retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	PVC	PVC LISTED	Designed for repeated bending, high performance in dynamic environments

CONSTRUCTION

- ▶ Bare Copper Wire, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- ▶ Core insulation: PVC.
- ▶ Outer sheath: PVC LISTED (BP, DP). Outer sheath colour: Black RAL 9005.

MAIN PROPERTIES

- ▶ Resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvent.
- ▶ UL 1277 / UL 1063 / NEC 336.10 / NFPA 79 (ed. 2012) - UL MTW / TC-ER/CSA C22.2
- ▶ Flame Retardant: UL/CSA FT1, UL VW1.
- ▶ Flame Resistance: FT4/IEEE.
- ▶ The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.

CABLES TYPES



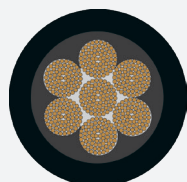
**BASIC PERFORMANCE
UNSHIELDED**

**PVC
LISTED**

600 V

**-25 °C
+90 °C**

152



**DYNAMIC PERFORMANCE
UNSHIELDED**

**PVC
LISTED**

600 V

**-30 °C
+90 °C**

154

FEATURES

- **THHW/TFF** - Thermoplastic High Heat resistant Water
- **MTW** - Machine Tool Wiring
- **<HAR>**



HAZARDOUS AREA CLASSIFICATION:

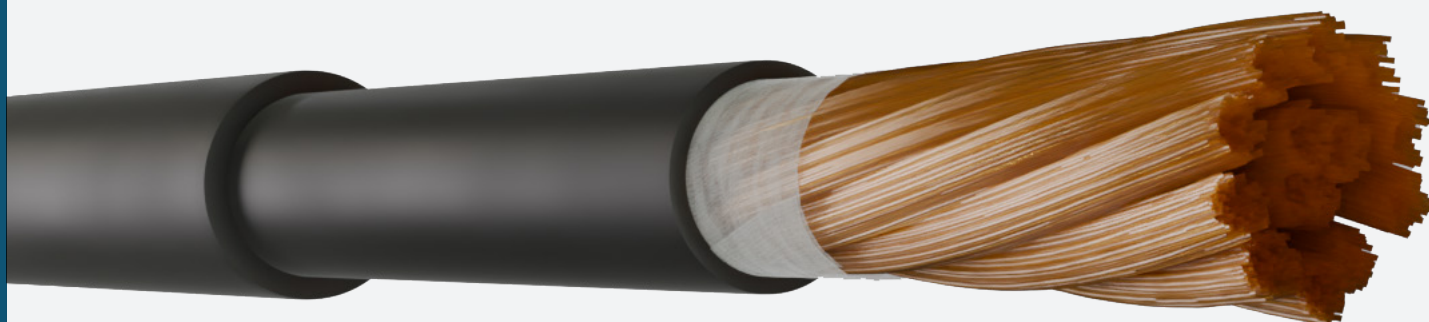
NEC

Class I Div.2 - Class II Div 2

acc.to: art 501 and art. 502 NFPA 70

MOTION **UL WIRE**Single Wire, PVC sheath, Oil Resistant, Demi-Static Application - **THHW / TFF MTW <HAR>**

BASIC PERFORMANCE

BP**PVC
LISTED****600 V****-25 °C
+90 °C****UL LISTED****UL 1015**
90 °C - 600V**LABS
Free****200.000**

DEMI-STATIC

**12 x O.D.**

MIN. BENDING RADIUS

**180 m/min**

MAX. SPEED

**2.0 m/sec²**

ACCELERATION

**≤ 50 N / mm²**

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

**Test
Voltage**4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3**Insulation
Resistance**≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1**Max. Short
Circuit
Temperature**

160 °C (≤ 1s)

**Operating
Voltage**

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES**Flexible Copper Conductor Class 5**

Excellent flexibility for internal and fixed wiring in machine tools.

PVC Insulation and Jacket

Good chemical and mechanical resistance for industrial use.

Nominal Voltage 600 V (MTW), 1000 V (AWM), 0.6/1.0 kV (IEC)

Wide range of application due to compatibility with international standards.

UL / CSA / HAR / AWM / CE Approvals

Regulatory compliance ensuring safety and reliability.

Conformity to ANSI/NFPA 70, 79; CSA C22.1; UL 508a

Suitability for industrial electrical and automation installations.

Excellent Mechanical and Chemical Resistance

High durability even in harsh environments.

VW-1, FT1, IEC 60332-1-2 Certified

Guaranteed fire safety.

Lower Cost compared to Shielded Versions

Economical solution for applications less sensitive to interference.

MotionCables code	EPlan Code	Formation	AWG Kcmil	Ø	Cu
		mm ²		mm	kg / km
CFNW17X01UR-N	MC.114011725	1 x 1,0	18	2.9	10
CFNW15X01UR-N	MC.114011525	1 x 1,5	16	3.2	14
CFNW13X01UR-N	MC.114011325	1 x 2,5	14	3.6	24
CFNW11X01UR-N	MC.114011125	1 x 4,0	12	4.3	38
CFNW09X01UR-N	MC.114010925	1 x 6	10	4.8	58
CFNW07X01UR-N	MC.114010725	1 x 10	8	6.6	96
CFNW05X01UR-N	MC.114010525	1 x 16	6	8.3	154
CFNW03X01UR-N	MC.114010325	1 x 25	4	9.8	240
CFNW02X01UR-N	MC.114010225	1 x 35	2	11.0	336
CFNWA1X01UR-N	MC.11401A125	1 x 50	1	13.8	480
CFNWA2X01UR-N	MC.11401A225	1 x 70	2/0	15.9	672
CFNWA3X01UR-N	MC.11401A325	1 x 95	3/0	17.4	912
CFNWA4X01UR-N	MC.11401A425	1 x 120	4/0	18.5	1152
CFNWA5X01UR-N	MC.11401A525	1 x 150	250	20.8	1440
CFNWB1X01UR-N	MC.11401B125	1 x 185	350	22.6	1776
CFNWB2X01UR-N	MC.11401B225	1 x 240	450	27.4	2304
CFNWB3X01UR-N	MC.11401B325	1 x 300	550	29.9	2880

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HAZARDOUS AREA CLASSIFICATION:

NEC Class I Div.2 - Class
II Div 2

acc.to: art 501 and art. 502
NFPA 70



EPLAN

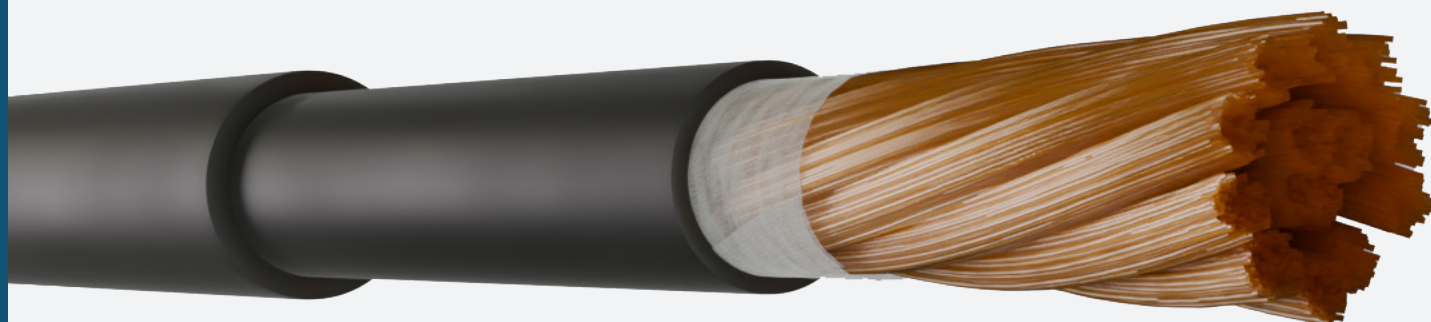
All the codes are available
in the EPLAN PLAN8 System
(use the EPLAN code in the
relevant column).



SPAC CAVI

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

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UL 1015
90 °C - 600V



LABS
Free



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



240 m / min

MAX. SPEED



20 m / s²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	240	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT	FLAME RETARDANT	FIRE RESISTANT	WATER RESISTANT	EMC PROTECTED	TEMPOR. OUTDOOR

MAIN ADVANTAGES

Flexible Copper Conductor Class 6	Excellent flexibility for continuous motion cables.
PVC Insulation and Jacket	High mechanical and chemical resistance for dynamic industrial environments.
Nominal Voltage 600 V (MTW), 1000 V (AWM), 0.6/1.0 kV (IEC)	Compatible with moving power and control circuits.
UL / CSA / HAR / AWM / CE Approvals	Wide certification for continuous moving installation in industrial systems.
Conformity to ANSI/NFPA 70, 79; CSA C22.1; UL 508a	Meets US and Canadian regulations for safety and reliability.
Excellent Mechanical and Chemical Resistance	Long service life even under repeated mechanical stress conditions.
VW-1, FT1, IEC 60332-1-2 Certified	Fire protection in dynamic applications.
Competitive Cost for Mobile Applications	Economical solution for mobile wiring not sensitive to EMI.

MotionCables code	EPlan Code	Formation	AWG Kcmil	Ø	Cu
		mm²		mm	kg / km
CDNW17X01UR-N	MC.214011725	1 x 1,0	18	2.9	10
CDNW15X01UR-N	MC.214011525	1 x 1,5	16	3.2	14
CDNW13X01UR-N	MC.214011325	1 x 2,5	14	3.6	24
CDNW11X01UR-N	MC.214011125	1 x 4,0	12	4.3	38
CDNW09X01UR-N	MC.214010925	1 x 6	10	4.8	58
CDNW07X01UR-N	MC.214010725	1 x 10	8	6.6	96
CDNW05X01UR-N	MC.214010525	1 x 16	6	8.3	154
CDNW03X01UR-N	MC.214010325	1 x 25	4	9.8	240
CDNW02X01UR-N	MC.214010225	1 x 35	2	11.0	336
CDNWA1X01UR-N	MC.21401A125	1 x 50	1	13.8	480
CDNWA2X01UR-N	MC.21401A225	1 x 70	2/0	15.9	672
CDNWA3X01UR-N	MC.21401A325	1 x 95	3/0	17.4	912
CDNWA4X01UR-N	MC.21401A425	1 x 120	4/0	18.5	1152
CDNWA5X01UR-N	MC.21401A525	1 x 150	250	20.8	1440
CDNWB1X01UR-N	MC.21401B125	1 x 185	350	22.6	1776
CDNWB2X01UR-N	MC.21401B225	1 x 240	450	27.4	2304
CDNWB3X01UR-N	MC.21401B325	1 x 300	550	29.9	2880

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acc.to: art 501 and art. 502
NFPA 70



EPLAN

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SPAC CAVI

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MOTION **UL MULTIWIRE**

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

Unshielded and shielded multicore control cables, UL / CSA LISTED, approved for use in the North American and Canada market.

Suitable for fixed or mobile installation, built according to NFPA 79 and NFPA 70 specifications.

The MOTION **UL MULTIWIRE** series features:

- Tray Cable (Exposed Run)
- MTW, DB (Direct Burial)
- Sun Resistant
- Oil Resistant
- Wet Resistant
- Flame Resistant and Fire Retardant
- High Flexible (on request)

The NEC installation code (NFPA 70 2017) permits the use of TC-ER cables in locations Class I div. 2 and Class II div. 2.

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	PVC	PVC LISTED	Flexibility, Oil/Fluid Resistance, Flame Retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	PVC	PVC LISTED	Designed for Repeated Bending, High performance in Dynamic Environments

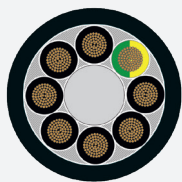
CONSTRUCTION

- ▶ Bare Copper Wire or tinned, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6.
- ▶ Core insulation: PVC.
- ▶ Core identification: generally black conductors with white progressive numbers + Green/Yellow.
- ▶ Tape: Fleece Tape.
- ▶ Shield: tinned copper wire braid, approx. optical coverage 85%.
- ▶ Outer sheath: PVC LISTED (BP, DP). Outer sheath colour: Black RAL 9005.

MAIN PROPERTIES

- ▶ Resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvent.
- ▶ UL 1277 / UL 1063 / NEC 336.10 / NFPA 79 (ed. 2012) - UL MTW / TC-ER/CSA C22.2.
- ▶ Flame Retardant: UL/CSA FT1, UL VW1.
- ▶ Flame Resistance: FT4/IEEE.
- ▶ The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.

CABLES TYPES



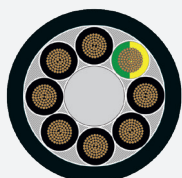
**BASIC PERFORMANCE
UNSHIELDED**

**PVC
LISTED**

600 V

**-25 °C
+90 °C**

158



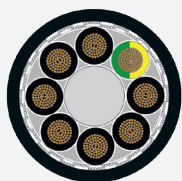
**DYNAMIC PERFORMANCE
UNSHIELDED**

**PVC
LISTED**

600 V

**-30 °C
+90 °C**

160



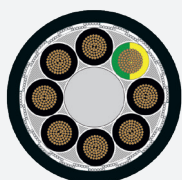
**BASIC PERFORMANCE
SHIELDED**

**PVC
LISTED**

600 V

**-25 °C
+90 °C**

162



**DYNAMIC PERFORMANCE
SHIELDED**

**PVC
LISTED**

600 V

**-30 °C
+90 °C**

164

FEATURES

- **TC-ER** Tray - Cable Exposed Run
- **MTW** Machine Tool Wiring
- **DB** Direct Burial
- **SR** Sun Resistant
- **OR** Oil Resistant
- **WR** Wet Resistant
- **FR** Flame Resistant- Fire Retardant
- **FLEX** High Flexible



HAZARDOUS AREA CLASSIFICATION:

NEC

Class I Div.2 - Class II Div 2

acc.to: art 501 and art. 502 NFPA 70

UL LISTED

MOTION **UL MULTIWIRE**

UL/CSA Listed multicore control cables, for demi-static application

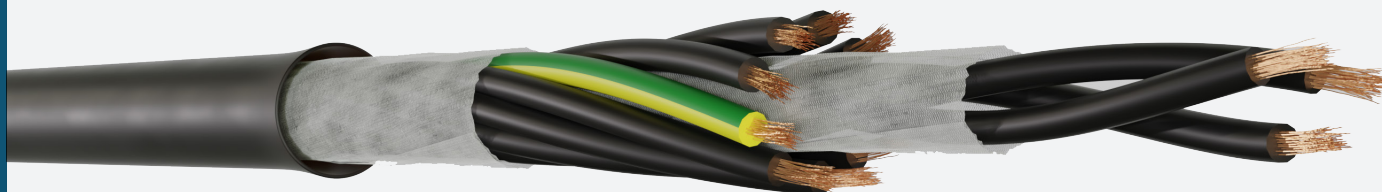
UL Listed – TC-ER-HL / CIC / MTW / WTTC / AWM – Direct Burial – Sun & Oil Resistant

BASIC PERFORMANCE

BP

PVC
LISTED

600 V

-25 °C
+90 °CUL 2587
90 °C – 600VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Approvals: TC-ER-HL / CIC / MTW / WTTC / AWM / Direct Burial / Sun & Oil Resistant	Maximum regulatory coverage for certified US/Canada systems, including in Hazardous Locations.
Compliant with NFPA 70 (NEC), NFPA 79, CSA C22.1, UL 508A	Safety and legality of use for installers, integrators, and machine builders.
TC-ER – Exposed Run Classification	Installable in open wiring between conduits and machinery without the use of metallic tubing.
Suitable for ±150°/m Torsion and Non-Cyclical Motion (up to 5 m)	Compatible with occasional non-continuous movements, for example in semi-mobile machinery.
Operating Temperature: +90°C (dry), +75°C (wet), -40°C (fixed installation)	Stability in industrial environments, tunnels, construction sites, and outdoor control cabinets.
Wide Operating Temperature Range	Reliability even in extreme climatic conditions, indoors or outdoors.
Compatibility with Major Servo Systems	Universal solution for multi-brand applications.
Robust and Flexible Construction	Long service life and reduced machine downtime.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Norm	Ø	Cu
mm ²			mm ²			mm	kg / km
0,50	MFNW21X02UR-G	MC. 112022125	2 x 0.50	21	UL1063 MTW UL 1077 TRAY	7.1	10
19 AWG	MFNW21G03UR-G	MC. 112032125	3 G 0.50	21		7.5	15
	MFNW21G04UR-G	MC. 112042125	4 G 0.50	21		8.0	20
	MFNW21G05UR-G	MC. 112052125	5 G 0.50	21		8.7	24
	MFNW21G07UR-G	MC. 112072125	7 G 0.50	21		9.9	34
	MFNW21G08UR-G	MC. 112082125	8 G 0.50	21		10.9	39
	MFNW21G12UR-G	MC. 112122125	12 G 0.50	21		12.0	58
	MFNW21G18UR-G	MC. 112182125	18 G 0.50	21		13.9	87
	MFNW21G25UR-G	MC. 112252125	25 G 0.50	21		16.6	120
0,75	MFNW19X02UR-G	MC. 112021925	2 x 0.75	19	UL1063 MTW UL 1077 TRAY	7.6	15
21 AWG	MFNW19G03UR-G	MC. 112031925	3 G 0.75	19		8.0	22
	MFNW19G04UR-G	MC. 112041925	4 G 0.75	19		8.6	29
	MFNW19G05UR-G	MC. 112051925	5 G 0.75	19		9.4	36
	MFNW19G07UR-G	MC. 112071925	7 G 0.75	19		10.7	51
	MFNW19G08UR-G	MC. 112081925	8 G 0.75	19		11.9	58
	MFNW19G12UR-G	MC. 112121925	12 G 0.75	19		13.0	87
	MFNW19G18UR-G	MC. 112181925	18 G 0.75	19		15.1	130
	MFNW19G25UR-G	MC. 112251925	25 G 0.75	19		18.1	18
1,0	UFN17X02UCR-N	MC. 112021725	2 x 1.0	18	UL1063 MTW UL 1077 TRAY	8.1	19
18 AWG	UFN17G03UCR-N	MC. 112031725	3 G 1.0	18		8.7	29
	UFN17G04UCR-N	MC. 112041725	4 G 1.0	18		9.4	38
	UFN17G05UCR-N	MC. 112051725	5 G 1.0	18		10.4	48
	UFN17G07UCR-N	MC. 112071725	7 G 1.0	18		12.4	67
	UFN17G08UCR-N	MC. 112081725	8 G 1.0	18		14.2	77
	UFN17G12UCR-N	MC. 112121725	12 G 1.0	18		15.2	115
	UFN17G18UCR-N	MC. 112181725	18 G 1.0	18		18.0	173
	UFN17G25UCR-N	MC. 112251725	25 G 1.0	18		22.0	240
1,5	UFN15X02UCR-N	MC. 112021525	2 x 1.5	16	UL1063 MTW UL 1077 TRAY	8.7	29
16 AWG	UFN15G03UCR-N	MC. 112031525	3 G 1.5	16		9.4	43
	UFN15G04UCR-N	MC. 112041525	4 G 1.5	16		10.1	58
	UFN15G05UCR-N	MC. 112051525	5 G 1.5	16		11.3	72
	UFN15G07UCR-N	MC. 112071525	7 G 1.5	16		14.2	101
	UFN15G08UCR-N	MC. 112081525	8 G 1.5	16		15.4	115
	UFN15G12UCR-N	MC. 112121525	12 G 1.5	16		16.5	173
	UFN15G18UCR-N	MC. 112181525	18 G 1.5	16		19.5	259
	UFN15G25UCR-N	MC. 112251525	25 G 1.5	16		23.8	360
2,5	UFN13X02UCR-N	MC. 112021325	2 x 2.5	14	UL1063 MTW UL 1077 TRAY	9.5	48
14 AWG	UFN13G03UCR-N	MC. 112031325	3 G 2.5	14		10.3	72
	UFN13G04UCR-N	MC. 112041325	4 G 2.5	14		11.1	96
	UFN13G05UCR-N	MC. 112051325	5 G 2.5	14		12.4	120
	UFN13G07UCR-N	MC. 112071325	7 G 2.5	14		15.5	168
	UFN13G08UCR-N	MC. 112081325	8 G 2.5	14		16.8	192
	UFN13G12UCR-N	MC. 112121325	12 G 2.5	14		18.1	288
	UFN13G18UCR-N	MC. 112181325	18 G 2.5	14		21.1	432
	UFN13G25UCR-N	MC. 112251325	25 G 2.5	14		25.1	600

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NFPA 70



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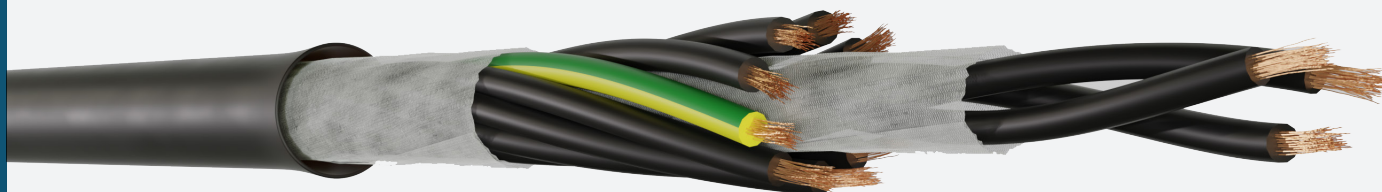
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UL 2587
90 °C - 600V



LABS
Free



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



240 m / min

MAX. SPEED



20 m / s²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	240	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT	FLAME RETARDANT	FIRE RESISTANT	WATER RESISTANT	EMC PROTECTED	TEMPOR. OUTDOOR

MAIN ADVANTAGES

Approvals: TC-ER-HL / CIC / MTW / WTTC / AWM / Direct Burial / Sun & Oil Resistant	Total versatility for dynamic systems, wind turbines, control cabinets, and UL/CSA certified machinery.
TC-ER and MTW Classification	Simple and direct wiring between conduits and equipment, including in motion.
WTTC Certification (Wind Turbine Tray Cable)	Guaranteed performance in the typical torsion of wind energy systems. Mechanical reliability.
Operating Temperature: +90°C (dry), +75°C (wet), -5°C (non-cyclical mobile)	Optimized for dynamic environments requiring mechanical robustness and reliability.
Torsion ±150°/m + Non-Cyclical Motion	Excellent for occasional movements up to 5 m in industrial environments.
Oil and UV Resistant PVC LISTED Jacket - Metric Marking	Simple to install, even in contaminated or outdoor environments.
Direct Burial + Sun Res + Oil Res	Direct burial installation without additional conduits. Long outdoor service life.
Class I Div. 1 / Div. 2 for Hazardous Locations	NEC conformity for explosive or high-risk environments (oil, chemical, energy plants).

Sez.	MotionCables code	EPlan Code	Formation	AWG	Norm	Ø	Cu
mm²			mm²			mm	kg / km
0,50	MDNW21X02UCR-N	MC. 212022125	2 x 0.50	21	UL1063 MTW UL 1077 TRAY	7.1	10
21 AWG	MDNW21G03UCR-N	MC. 212032125	3 G 0.50	21		7.5	15
	MDNW21G04UCR-N	MC. 212042125	4 G 0.50	21		8.0	20
	MDNW21G05UCR-N	MC. 212052125	5 G 0.50	21		8.7	24
	MDNW21G07UCR-N	MC. 212072125	7 G 0.50	21		9.9	34
	MDNW21G08UCR-N	MC. 212082125	8 G 0.50	21		10.9	39
	MDNW21G12UCR-N	MC. 212122125	12 G 0.50	21		12.0	58
	MDNW21G18UCR-N	MC. 212182125	18 G 0.50	21		13.9	87
	MDNW21G25UCR-N	MC. 212252125	25 G 0.50	21		16.6	120
0,75	MDNW19X02UCR-N	MC. 212021925	2 x 0.75	19	UL1063 MTW UL 1077 TRAY	7.6	15
19 AWG	MDNW19G03UCR-N	MC. 212031925	3 G 0.75	19		8.0	22
	MDNW19G04UCR-N	MC. 212041925	4 G 0.75	19		8.6	29
	MDNW19G05UCR-N	MC. 212051925	5 G 0.75	19		9.4	36
	MDNW19G07UCR-N	MC. 212071925	7 G 0.75	19		10.7	51
	MDNW19G08UCR-N	MC. 212081925	8 G 0.75	19		11.9	58
	MDNW19G12UCR-N	MC. 212121925	12 G 0.75	19		13.0	87
	MDNW19G18UCR-N	MC. 212181925	18 G 0.75	19		15.1	130
	MDNW19G25UCR-N	MC. 212251925	25 G 0.75	19		18.1	18
1,0	UDN17X02UCR-N	MC. 212021725	2 x 1.0	18	UL1063 MTW UL 1077 TRAY	8.1	19
18 AWG	UDN17G03UCR-N	MC. 212031725	3 G 1.0	18		8.7	29
	UDN17G04UCR-N	MC. 212041725	4 G 1.0	18		9.4	38
	UDN17G05UCR-N	MC. 212051725	5 G 1.0	18		10.4	48
	UDN17G07UCR-N	MC. 212071725	7 G 1.0	18		12.4	67
	UDN17G08UCR-N	MC. 212081725	8 G 1.0	18		14.2	77
	UDN17G12UCR-N	MC. 212121725	12 G 1.0	18		15.2	115
	UDN17G18UCR-N	MC. 212181725	18 G 1.0	18		18.0	173
	UDN17G25UCR-N	MC. 212251725	25 G 1.0	18		22.0	240
1,5	UDN15X02UCR-N	MC. 212021525	2 x 1.5	16	UL1063 MTW UL 1077 TRAY	8.7	29
16 AWG	UDN15G03UCR-N	MC. 212031525	3 G 1.5	16		9.4	43
	UDN15G04UCR-N	MC. 212041525	4 G 1.5	16		10.1	58
	UDN15G05UCR-N	MC. 212051525	5 G 1.5	16		11.3	72
	UDN15G07UCR-N	MC. 212071525	7 G 1.5	16		14.2	101
	UDN15G08UCR-N	MC. 212081525	8 G 1.5	16		15.4	115
	UDN15G12UCR-N	MC. 212121525	12 G 1.5	16		16.5	173
	UDN15G18UCR-N	MC. 212181525	18 G 1.5	16		19.5	259
	UDN15G25UCR-N	MC. 212251525	25 G 1.5	16		23.8	360
2,5	UDN13X02UCR-N	MC. 212021325	2 x 2.5	14	UL1063 MTW UL 1077 TRAY	9.5	48
14 AWG	UDN13G03UCR-N	MC. 212031325	3 G 2.5	14		10.3	72
	UDN13G04UCR-N	MC. 212041325	4 G 2.5	14		11.1	96
	UDN13G05UCR-N	MC. 212051325	5 G 2.5	14		12.4	120
	UDN13G07UCR-N	MC. 212071325	7 G 2.5	14		15.5	168
	UDN13G08UCR-N	MC. 212081325	8 G 2.5	14		16.8	192
	UDN13G12UCR-N	MC. 212121325	12 G 2.5	14		18.1	288
	UDN13G18UCR-N	MC. 212181325	18 G 2.5	14		21.1	432
	UDN13G25UCR-N	MC. 212251325	25 G 2.5	14		25.1	600

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HAZARDOUS AREA CLASSIFICATION:

NEC Class I Div.2 - Class
II Div 2

acc.to: art 501 and art. 502
NFPA 70



EPLAN

All the codes are available
in the EPLAN PLAN8 System
(use the EPLAN code in the
relevant column).



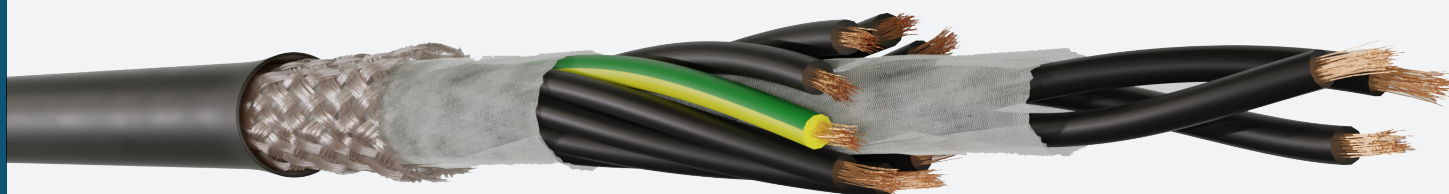
SPAC CAVI

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).*

UL/CSA Listed shielded multicore control cables, for demi-static application

UL Listed - TC-ER-HL / CIC / MTW / WTTC / AWM - Direct Burial - Sun & Oil Resistant

UL 2587
90 °C - 600VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Approvals: TC-ER-HL / CIC / MTW / WTTC / AWM / Direct Burial / Sun & Oil Resistant

Compliant with NFPA 70 (NEC), NFPA 79, CSA C22.1, UL 508A

TC-ER (Exposed Run) Classification

EMC Protection: Tinned Copper Braid Shielding (85% Coverage)

Operating Temperature: +90°C (dry), +75°C (wet), -40°C (fixed installation)

Oil-Resistant PVC LISTED Jacket - Black RAL 9005

Direct Burial Certification

Suitable for Class I Div. 1 (TC-ER-HL)

A single family of certified cables for fixed installations in complex industrial environments.

Ensures legal and safe use in industrial electrical systems in the USA and Canada. Perfect for exporting OEMs.

Installable outside of conduits without metallic sheaths or ducts. Solution compliant with NEC Art. 336, 392, 501.

High performance in environments disturbed by inverters, motors, drives, and sensitive signals.

Wide thermal range for use in control cabinets, tunnel installations, or non-climatized environments.

Resistant to oils, UV, chemical agents, with metric marking to facilitate installation.

Suitable for direct burial without additional protection: fixed outdoor installations or utility tunnels.

Usable in high-risk explosion environments, such as oil & gas, refineries, and chemical plants.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Norm	Ø	Cu
mm²			mm²			mm	kg / km
0,50	MFSW21X02UR-G	MC.113022125	(2x0.50)	21	UL1063 MTW UL 1077 TRAY	7.9	24
21 AWG	MFSW21G03UR-G	MC.113032125	(3G0.50)	21		8.3	30
	MFSW21G04UR-G	MC.113042125	(4G0.50)	21		8.8	37
	MFSW21G05UR-G	MC.113052125	(5G0.50)	21		9.5	43
	MFSW21G07UR-G	MC.113072125	(7G0.50)	21		10.8	62
	MFSW21G08UR-G	MC.113082125	(8G0.50)	21		11.8	71
	MFSW21G12UR-G	MC.113122125	(12G0.50)	21		12.9	94
	MFSW21G18UR-G	MC.113182125	(18G0.50)	21		14.8	130
	MFSW21G25UR-G	MC.113252125	(25G0.50)	21		18.0	180
0,75	MFSW19X02UR-G	MC.113021925	(2x0.75)	19	UL1063 MTW UL 1077 TRAY	8.4	31
19 AWG	MFSW19G03UR-G	MC.113031925	(3G0.75)	19		8.8	39
	MFSW19G04UR-G	MC.113041925	(4G0.75)	19		9.4	48
	MFSW19G05UR-G	MC.113051925	(5G0.75)	19		10.2	57
	MFSW19G07UR-G	MC.113071925	(7G0.75)	19		11.6	82
	MFSW19G08UR-G	MC.113081925	(8G0.75)	19		12.8	93
	MFSW19G12UR-G	MC.113121925	(12G0.75)	19		13.9	126
	MFSW19G18UR-G	MC.113181925	(18G0.75)	19		16.0	177
	MFSW19G25UR-G	MC.113251925	(25G0.75)	19		19.5	247
1,0	UFS17X02UCR-N	MC.113021725	(2 x 1.0)	18	UL1063 MTW UL 1077 TRAY	8.5	48
18 AWG	UFS17G03UCR-N	MC.113031725	(3 G 1.0)	18		8.9	60
	UFS17G04UCR-N	MC.113041725	(4 G 1.0)	18		9.7	72
	UFS17G05UCR-N	MC.113051725	(5 G 1.0)	18		10.5	87
	UFS17G07UCR-N	MC.113071725	(7 G 1.0)	18		11.4	112
	UFS17G12UCR-N	MC.113081725	(8 G 1.0)	18		13.9	147
	UFS17G18UCR-N	MC.113121725	(12 G 1.0)	18		15.5	196
	UFS17G25UCR-N	MC.113181725	(18 G 1.0v)	18		17.9	264
	UFS17G34UCR-N	MC.113251725	(25 G 1.0)	18		20.3	351
1,5	UFS15G41UCR-N	MC.113021525	(2 x 1.5)	16	UL1063 MTW UL 1077 TRAY	9.2	60
16 AWG	UFS15X02UCR-N	MC.113031525	(3 G 1.5)	16		9.7	77
	UFS15G03UCR-N	MC.113041525	(4 G 1.5)	16		10.5	97
	UFS15G04UCR-N	MC.113051525	(5 G 1.5)	16		11.4	117
	UFS15G05UCR-N	MC.113071525	(7 G 1.5)	16		12.4	171
	UFS15G07UCR-N	MC.113081525	(8 G 1.5)	16		15.4	196
	UFS15G12UCR-N	MC.113121525	(12 G 1.5)	16		16.9	264
	UFS15G18UCR-N	MC.113181525	(18 G 1.5)	16		19.6	360
	UFS15G25UCR-N	MC.113251525	(25 G 1.5)	16		23.4	491
2,5	UFS13G34UCR-N	MC.113021325	(2 x 2.5)	14	UL1063 MTW UL 1077 TRAY	10	85
14 AWG	UFS13G41UCR-N	MC.113031325	(3 G 2.5)	14		10.5	111
	UFS13X02UCR-N	MC.113041325	(4 G 2.5)	14		11.4	141
	UFS13G03UCR-N	MC.113051325	(5 G 2.5)	14		12.5	165
	UFS13G04UCR-N	MC.113071325	(7 G 2.5)	14		14.6	248
	UFS13G05UCR-N	MC.113081325	(8 G 2.5)	14		16.8	282
	UFS13G07UCR-N	MC.113121325	(12 G 2.5)	14		18.5	379
	UFS13G12UCR-N	MC.113181325	(18 G 2.5)	14		22.6	540
	UFS13G18UCR-N	MC.113251325	(25 G 2.5)	14		25.5	710

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II Div 2

acc.to: art 501 and art. 502
NFPA 70



EPLAN

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relevant column).



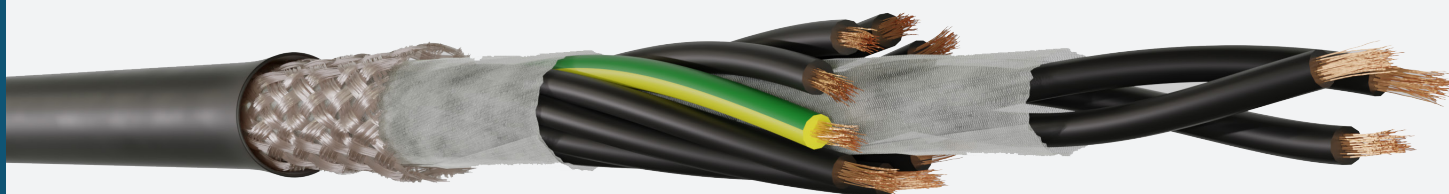
SPAC CAVI

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UL/CSA Listed shielded multicore control cables, for dynamic application

UL Listed – TC-ER-HL / CIC / MTW / WTTC / AWM – Direct Burial – Sun & Oil Resistant

UL 2587
90 °C – 600VLABS
Free

5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



240 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
	MIL	0,2	5	1
CYCLES				
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	240	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Full Approvals: TC-ER-HL / CIC / MTW / WTTC / AWM / Direct Burial / Sun & Oil Resistant	A single certified cable for cable carriers, wind turbines, dynamic systems, and critical environments.
WTTC Classification (Wind Turbine Tray Cable)	Specific for installations inside wind turbine towers, tolerating torsion and vibrations.
EMC Shielding: Tinned Copper Braid (85% Coverage)	Protection against interference in continuous motion, ideal for signals and power.
Operating Temperature: +90°C (dry), +75°C (wet), -5°C (non-cyclical mobile)	Optimized for dynamic environments where mechanical robustness and reliability are required.
Torsional Resistance ±150°/m	Designed for mobile connections between nacelle and tower, as well as for industrial robotics.
PVC LISTED Outer Jacket Resistant to Oils, UV, Abrasion	Materials suitable for severe industrial environments and outdoor installations.
Direct Burial and Open Wiring Certified	Also suitable for direct burial and in exposed runs without conduits.
Usage in Hazardous Locations – Class I Div. 1 / Div. 2	Compliant with NEC Art. 501 – guaranteed safety in ATEX and similar environments.

Sez.	MotionCables code	EPlan Code	Formation	AWG	Norm	Ø	Cu
mm²			mm²			mm	kg / km
0,50	MDSW21X02UR-G	MC.213022125	(2x0.50)	21	UL1063 MTW UL 1077 TRAY	7.9	24
21 AWG	MDSW21G03UR-G	MC.213032125	(3G0.50)	21		8.3	30
	MDSW21G04UR-G	MC.213042125	(4G0.50)	21		8.8	37
	MDSW21G05UR-G	MC.213052125	(5G0.50)	21		9.5	43
	MDSW21G07UR-G	MC.213072125	(7G0.50)	21		10.8	62
	MDSW21G08UR-G	MC.213082125	(8G0.50)	21		11.8	71
	MDSW21G12UR-G	MC.213122125	(12G0.50)	21		12.9	94
	MDSW21G18UR-G	MC.213182125	(18G0.50)	21		14.8	130
	MDSW21G25UR-G	MC.213252125	(25G0.50)	21		18.0	180
0,75	MDSW19X02UR-G	MC.213021925	(2x0.75)	19	UL1063 MTW UL 1077 TRAY	8.4	31
19 AWG	MDSW19G03UR-G	MC.213031925	(3G0.75)	19		8.8	39
	MDSW19G04UR-G	MC.213041925	(4G0.75)	19		9.4	48
	MDSW19G05UR-G	MC.213051925	(5G0.75)	19		10.2	57
	MDSW19G07UR-G	MC.213071925	(7G0.75)	19		11.6	82
	MDSW19G08UR-G	MC.213081925	(8G0.75)	19		12.8	93
	MDSW19G12UR-G	MC.213121925	(12G0.75)	19		13.9	126
	MDSW19G18UR-G	MC.213181925	(18G0.75)	19		16.0	177
	MDSW19G25UR-G	MC.213251925	(25G0.75)	19		19.5	247
1,0	UDS17X02UCR-N	MC.213021725	(2 x 1.0)	18	UL1063 MTW UL 1077 TRAY	8.5	48
18 AWG	UDS17G03UCR-N	MC.213031725	(3 G 1.0)	18		8.9	60
	UDS17G04UCR-N	MC.213041725	(4 G 1.0)	18		9.7	72
	UDS17G05UCR-N	MC.213051725	(5 G 1.0)	18		10.5	87
	UDS17G07UCR-N	MC.213071725	(7 G 1.0)	18		11.4	112
	UDS17G12UCR-N	MC.213081725	(8 G 1.0)	18		13.9	147
	UDS17G18UCR-N	MC.213121725	(12 G 1.0)	18		15.5	196
	UDS17G25UCR-N	MC.213181725	(18 G 1.0)	18		17.9	264
	UDS17G34UCR-N	MC.213251725	(25 G 1.0)	18		20.3	351
1,5	UDS15G41UCR-N	MC.213021525	(2 x 1.5)	16	UL1063 MTW UL 1077 TRAY	9.2	60
16 AWG	UDS15X02UCR-N	MC.213031525	(3 G 1.5)	16		9.7	77
	UDS15G03UCR-N	MC.213041525	(4 G 1.5)	16		10.5	97
	UDS15G04UCR-N	MC.213051525	(5 G 1.5)	16		11.4	117
	UDS15G05UCR-N	MC.213071525	(7 G 1.5)	16		12.4	171
	UDS15G07UCR-N	MC.213081525	(8 G 1.5)	16		15.4	196
	UDS15G12UCR-N	MC.213121525	(12 G 1.5)	16		16.9	264
	UDS15G18UCR-N	MC.213181525	(18 G 1.5)	16		19.6	360
	UDS15G25UCR-N	MC.213251525	(25 G 1.5)	16		23.4	491
2,5	UDS13G34UCR-N	MC.213021325	(2 x 2.5)	14	UL1063 MTW UL 1077 TRAY	10	85
14 AWG	UDS13G41UCR-N	MC.213031325	(3 G 2.5)	14		10.5	111
	UDS13X02UCR-N	MC.213041325	(4 G 2.5)	14		11.4	141
	UDS13G03UCR-N	MC.213051325	(5 G 2.5)	14		12.5	165
	UDS13G04UCR-N	MC.213071325	(7 G 2.5)	14		14.6	248
	UDS13G05UCR-N	MC.213081325	(8 G 2.5)	14		16.8	282
	UDS13G07UCR-N	MC.213121325	(12 G 2.5)	14		18.5	379
	UDS13G12UCR-N	MC.213181325	(18 G 2.5)	14		22.6	540
	UDS13G18UCR-N	MC.213251325	(25 G 2.5)	14		25.5	710

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II Div 2

acc.to: art 501 and art. 502
NFPA 70



EPLAN

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(use the EPLAN code in the
relevant column).



SPAC CAVI

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MotionCables item code).

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MOTION **UL POWER**

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

UL LISTED power multicore cables, suitable for fixed or mobile applications, built according to NFPA 79 and NFPA 70 specifications.

The MOTION **UL POWER** series includes:

TC-ER, MTW, DB, SR, OR, WR, FR, FLEX, CIC, WTTC, PR2 cables.

The cables can operate in cable chain, fixed, and trays. All cables are oil-resistant, industrial fluids and can work in environments with high humidity.

The NEC installation code (NFPA 70 2017) permits the use of TC-ER cables in locations Class I div. 2 and Class II div. 2.

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	PVC	PVC LISTED	Flexibility, Oil/Fluid Resistance, Flame Retardant
DYNAMIC PERFORMANCE	Dynamic installation (cable carriers)	PVC	PVC LISTED	Designed for Repeated Bending, High performance in Dynamic Environments

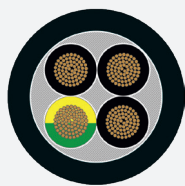
CONSTRUCTION

- ▶ Bare Copper Wire, finely stranded acc. to DIN VDE 0295 Class 5 / IEC 60228 Class 5, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6.
- ▶ Core insulation: PVC.
- ▶ Core identification: generally black conductors with white progressive numbers + Green/Yellow.
- ▶ Shield: tinned copper wire braid, approx. optical coverage 85% .
- ▶ Tape: Polyester tape.
- ▶ Outer sheath: PVC LISTED. Outer sheath colour: Black RAL 9005 .

MAIN PROPERTIES

- ▶ Resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvent.
- ▶ UL 1277 / UL 1063 / NEC 336.10 / NFPA 79 (ed. 2012) - UL MTW / TC-ER/CSA C22.2
- ▶ Flame Retardant: UL/CSA FT1, UL VW1
- ▶ Flame Resistance: FT4/IEEE
- ▶ The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.

CABLES TYPES



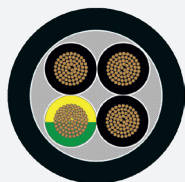
**BASIC PERFORMANCE
UNSHIELDED**

**PVC
LISTED**

600 V

**-25 °C
+90 °C**

168



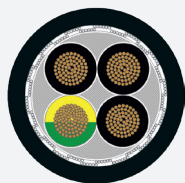
**DYNAMIC PERFORMANCE
UNSHIELDED**

**PVC
LISTED**

600 V

**-30 °C
+90 °C**

170



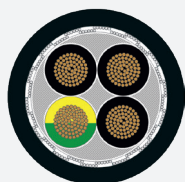
**BASIC PERFORMANCE
SHIELDED**

**PVC
LISTED**

600 V

**-25 °C
+90 °C**

172



**DYNAMIC PERFORMANCE
SHIELDED**

**PVC
LISTED**

600 V

**-30 °C
+90 °C**

174

FEATURES

- **TC-ER** Tray - Cable Exposed Run
- **MTW** Machine Tool Wiring
- **DB** Direct Burial
- **SR** Sun Resistant
- **OR** Oil Resistant
- **WR** Wet Resistant

- **FR** Flame Resistant- Fire Retardant
- **FLEX** High Flexible
- **CIC** Cable In Conduit
- **WTTC** Wind Turbine Tray Cable
- **PR2** Oil Resistant II



HAZARDOUS AREA CLASSIFICATION:

NEC Class I Div.2 - Class II Div 2
acc.to: art 501 and art. 502 NFPA 70



UL 2587
90 °C - 600V



LABS
Free



200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

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

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT	FLAME RETARDANT	FIRE RESISTANT	WATER RESISTANT	EMC PROTECTED	TEMPOR. OUTDOOR

MAIN ADVANTAGES

Certifications: UL Listed / CSA / CE / TC-ER / CIC / MTW / AWM / WTTC / Direct Burial	Usable in industrial systems in North America, Canada, and the EU.
Reference Standards: ANSI/NFPA 70 (NEC), NFPA 79, CSA C22.1	Perfectly compliant with UL / CSA control cabinets and systems.
TC-ER (Exposed Run) Classification	Allows for "open wiring" between conduit and machine without metallic conduit.
No Shielding	Ideal for power supply and control lines in environments not disturbed by EMC.
PVC LISTED Jacket Resistant to Oil and UV, available in Black	Resistant to industrial agents and external environments.
Thermal Range: +90°C (dry), +75°C (wet), -40°C (fixed installation)	Electrical and mechanical stability over time.
Direct Burial Installation	Suitable for underground laying in civil and industrial systems.
Suitable for Class I, Div. 2 Installations (Hazardous Locations)	Safe for explosive atmospheres classified according to NEC.

MotionCables code	EPlan Code	Formation	AWG Kcmil	Ø	Cu
		mm²		mm	kg / km
UFN11G03UCR-N	MC.115031125	3 G 4	12	11.3	115
UFN11G04UCR-N	MC.115041125	4 G 4	12	12.4	154
UFN11G05UCR-N	MC.115051125	5 G 4	12	14.7	192
UFN11G07UCR-N	MC.115071125	7 G 4	12	15.7	269
UFN09G03UCR-N	MC.115030925	3 G 6	10	12.5	173
UFN09G04UCR-N	MC.115040925	4 G 6	10	14.5	230
UFN09G05UCR-N	MC.115050925	5 G 6	10	15.9	288
UFN07G03UCR-N	MC.115030725	3 G 10	8	17.0	288
UFN07G04UCR-N	MC.115040725	4 G 10	8	18.6	384
UFN07G05UCR-N	MC.115050725	5 G 10	8	20.6	480
UFN05G03UCR-N	MC.115030525	3 G 16	6	20.7	461
UFN05G04UCR-N	MC.115040525	4 G 16	6	23.8	614
UFN05G05UCR-N	MC.115050525	5 G 16	6	26.3	768
UFN03G04UCR-N	MC.115040325	4 G 25	4	27.3	960
UFN02G04UCR-N	MC.115040225	4 G 35	2	30.2	1344
UFNA1G04UCR-N	MC.11504A125	4 G 50	1	36.7	1920
UFNA2G04UCR-N	MC.11504A225	4 G 70	2/0	41.7	2688
UFNA3G04UCR-N	MC.11504A325	4 G 95	3/0	46.7	3648
UFNA4G04UCR-N	MC.11504A425	4 G 120	4/0	49.3	4608
UFNA5G04UCR-N	MC.11504A525	4 G 150	250	54.9	5760

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HAZARDOUS AREA CLASSIFICATION:

NEC Class I Div.2 - Class
II Div 2

acc.to: art 501 and art. 502
NFPA 70



EPLAN

All the codes are available
in the EPLAN PLAN8 System
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relevant column).



SPAC CAVI

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UL 2587
90 °C - 600V



LABS
Free



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



240 m / min

MAX. SPEED



20 m / s²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	240	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES



Test
Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation
Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Max. Short
Circuit
Temperature

160 °C (≤ 1s)



Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Certifications: UL Listed / CSA / CE / TC-ER / CIC / MTW / AWM / WTTC / Direct Burial

Full regulatory coverage for dynamic systems.

Reference Standards: NEC (NFPA 70), NFPA 79, CSA C22.1, UL 508A

Suitable for automated machinery with occasional or adjustable movements.

TC-ER / Exposed Run Classification

Can be installed without metallic conduits, even in non-continuous moving parts.

No Shielding

Economical for applications where EMC compatibility is not critical.

Flexible PVC LISTED Jacket Resistant to Oil and UV - Black

Robust and durable in severe industrial conditions.

Operating Temperature: +90°C / -5°C (occasional mobile)

Stable performance in environments with thermal variations.

Direct Burial Approved (UL 1277)

Underground installation without additional protection.

Hazardous Locations - Class I Div. 2

Compliant for installation in explosion-risk environments.

MotionCables code	EPlan Code	Formation	AWG Kcmil	Ø	Cu
		mm²		mm	kg / km
UDN11G03UCR-N	MC.215031125	3 G 4	12	11.7	115
UDN11G04UCR-N	MC.215041125	4 G 4	12	12.7	154
UDN11G05UCR-N	MC.215051125	5 G 4	12	14.9	192
UDN11G07UCR-N	MC.215071125	7 G 4	12	17.8	269
UDN09G03UCR-N	MC.215030925	3 G 6	10	13.9	173
UDN09G04UCR-N	MC.215040925	4 G 6	10	15.0	230
UDN09G05UCR-N	MC.215050925	5 G 6	10	16.8	288
UDN07G03UCR-N	MC.215030725	3 G 10	8	19.3	384
UDN07G04UCR-N	MC.215040725	4 G 10	8	22.8	480
UDN07G05UCR-N	MC.215050725	5 G 10	8	24.9	614
UDN05G03UCR-N	MC.215030525	3 G 16	6	28	768
UDN05G04UCR-N	MC.215040525	4 G 16	6	27.8	960
UDN05G05UCR-N	MC.215050525	5 G 16	6	32.3	1344
UDN03G04UCR-N	MC.215040325	4 G 25	4	36.7	1920
UDN02G04UCR-N	MC.215040225	4 G 35	2	41.7	2688
UDNA1G04UCR-N	MC.21504A125	4 G 50	1	46.7	3648
UDNA2G04UCR-N	MC.21504A225	4 G 70	2/0	49.3	4608
UDNA3G04UCR-N	MC.21504A325	4 G 95	3/0	46.7	3648
UDNA4G04UCR-N	MC.21504A425	4 G 120	4/0	49.3	4608
UDNA5G04UCR-N	MC.21504A525	4 G 150	250	54.9	5760

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**NEC Class I Div.2 - Class
II Div 2**

acc.to: art 501 and art. 502
NFPA 70



EPLAN

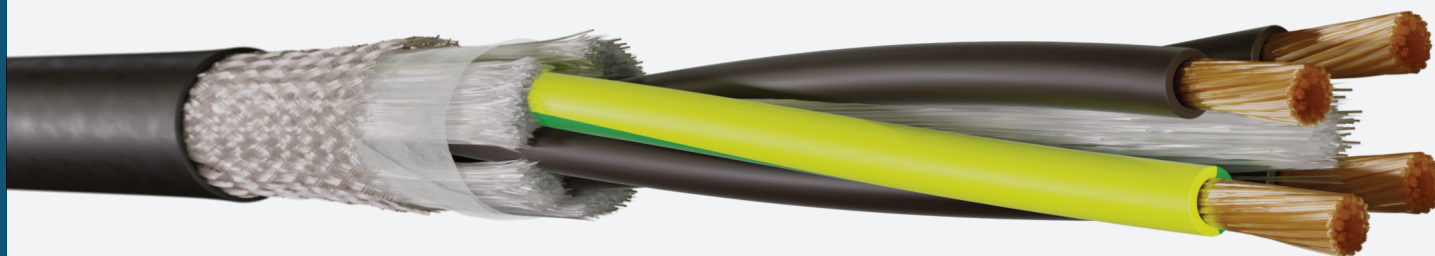
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UL 2587
90 °C - 600V



LABS
Free



200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec²

ACCELERATION



≤ 50 N / mm²

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/s²

2,0

PULLING FORCE

N/mm²

≤ 50

TORSION

°/m

-

MAX. HORIZONTAL TRAVEL

m

-

TEMPERATURE

°C

+5 / +90



Test
Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation
Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Max. Short
Circuit
Temperature

160 °C (≤ 1s)



Operating
Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Full Approvals: UL Listed / CSA / CE / TC-ER / CIC / MTW / AWM / WTTC / Direct Burial

A single cable family compliant with all standards for the USA, Canada, and Europe.

Compliant with: ANSI/NFPA 70 (NEC), NFPA 79, CSA C22.1, UL 508A

Safety and compatibility for industrial systems, machine-side wiring, control cabinets, and conduits.

TC-ER (Tray Cable - Exposed Run) Classification

Installation possible without metallic conduits, simplifying time and cost.

Shielding: Tinned Copper Braid (85% Coverage)

Advanced protection against electromagnetic interference (EMC) from inverters and motors.

PVC LISTED Jacket Resistant to Oils and UV - Black

Resists industrial contaminants and atmospheric agents, also suitable for outdoor installation.

Operating Temperature: +90°C (dry), +75°C (wet), -40°C (fixed installation)

Ideal for systems with high operating temperatures.

Direct Burial Certified

Can be buried directly without conduits.

Suitability for Class I, Division 2 (Hazardous Locations)

Compliant with NEC Art. 501 for installations in explosion-risk areas.

MotionCables code	EPlan Code	Formation	AWG Kcmil	Ø	Cu
		mm ²		mm	kg / km
UFS11G03UCR-N	MC.116031125	(3 G 4)	12	11.9	161
UFS11G04UCR-N	MC.116041125	(4 G 4)	12	13.0	224
UFS11G05UCR-N	MC.116051125	(5 G 4)	12	15.2	265
UFS11G07UCR-N	MC.116071125	(7 G 4)	12	16.5	350
UFS09G03UCR-N	MC.116030925	(3 G 6)	10	13.9	243
UFS09G04UCR-N	MC.116040925	(4 G 6)	10	15.3	311
UFS09G05UCR-N	MC.116050925	(5 G 6)	10	16.7	378
UFS07G04UCR-N	MC.116040725	(4 G 10)	8	22.4	485
UFS07G05UCR-N	MC.116050725	(5 G 10)	8	24.6	601
UFS05G04UCR-N	MC.116040525	(4 G 16)	6	28.1	745
UFS05G05UCR-N	MC.116050525	(5 G 16)	6	31.0	919
UFS03G04UCR-N	MC.116040325	(4 G 25)	4	37.7	1111
UFS02G04UCR-N	MC.116040225	(4 G 35)	2	44.2	1564
UFSA1G04UCR-N	MC.11604A125	(4 G 50)	1	47.7	2205
UFSA2G04UCR-N	MC.11604A225	(4 G 70)	2/0	50.3	3500
UFSA3G04UCR-N	MC.11604A325	(4 G 95)	3/0	55.9	3995
UFSA4G04UCR-N	MC.11604A425	(4 G 120)	4/0	49.3	4970
UFSA5G04UCR-N	MC.11604A525	(4 G 150)	250	54.9	6140

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acc.to: art 501 and art. 502
NFPA 70



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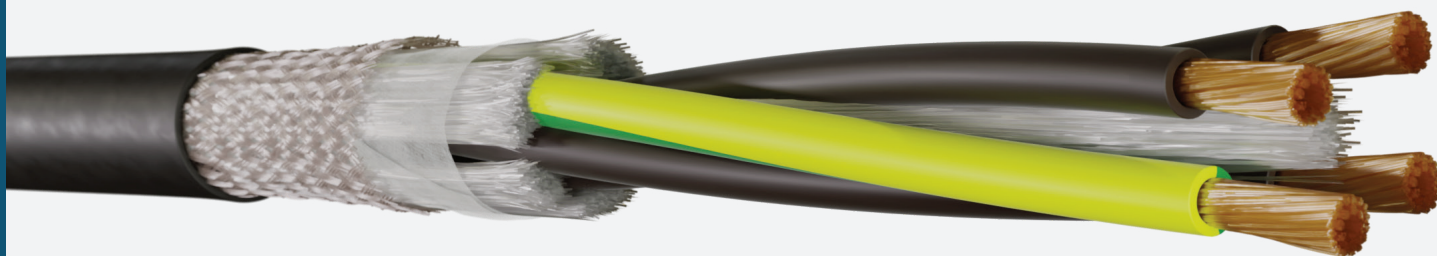
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UL 2587
90 °C - 600V



LABS
Free



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



240 m / min

MAX. SPEED



20 m / s²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.			
CYCLES	MIL	0,2	5	1
MIN. BENDING RADIUS	x O.D.	12	7,5	10
MAXIMUM SPEED	m/min	180	240	180
MAXIMUM ACCELERATION	m/s ²	2,0	20	5
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	15	30
TEMPERATURE	°C	-30 / +90	-5 / +90	-5 / +90

ELECTRICAL PROPERTIES

	Test Voltage	4,0 kV x 5 min acc.to EN 50395 Cl. 10.3
	Insulation Resistance	≥ 1.0 GΩ x km @ 20 °C acc.to EN 50395 Cl. 8.1
	Max. Short Circuit Temperature	160 °C (≤ 1s)
	Operating Voltage	600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL RESISTANT	FLAME RETARDANT	FIRE RESISTANT	WATER RESISTANT	EMC PROTECTED	TEMPOR. OUTDOOR

MAIN ADVANTAGES

Approvals: UL Listed / CSA / CE / TC-ER / CIC / MTW / AWM / WTTC / Direct Burial	Suitable for mobile installations in systems with UL/CSA certification.
Applicable Standards: ANSI/NFPA 70 (NEC), NFPA 79, CSA C22.1, UL 508A	Compliant for dynamic machine-side applications.
TC-ER (Exposed Run) Classification	Allows connections without metallic conduits, even in mobile runs.
Shielding: Tinned Copper Braid 85% Coverage	High EMC protection for sensitive signals and control lines.
PVC LISTED Jacket (High Flexibility), Resistant to Oil and UV	Designed to withstand repeated movements and occasional torsion.
Permitted Torsion: ±150°/m - Non-Cyclical Use	Engineered for cable carriers and short-length mobile connections.
Direct Burial Certified	Also usable in permanent underground installation.
Suitability for Class I Div. 2 Environments (Hazardous Locations)	NEC compliance for zones with explosive vapors or gases.

MotionCables code	EPlan Code	Formation	AWG Kcmil	Ø	Cu
		mm ²		mm	kg / km
UDS11G03UCR-N	MC.116031125	(3 G 4)	12	11.9	161
UDS11G04UCR-N	MC.116041125	(4 G 4)	12	13.0	224
UDS11G05UCR-N	MC.116051125	(5 G 4)	12	15.2	265
UDS11G07UCR-N	MC.116071125	(7 G 4)	12	16.5	350
UDS09G03UCR-N	MC.116030925	(3 G 6)	10	13.9	243
UDS09G04UCR-N	MC.116040925	(4 G 6)	10	15.3	311
UDS09G05UCR-N	MC.116050925	(5 G 6)	10	16.7	378
UDS07G04UCR-N	MC.116040725	(4 G 10)	8	22.4	485
UDS07G05UCR-N	MC.116050725	(5 G 10)	8	24.6	601
UDS05G04UCR-N	MC.116040525	(4 G 16)	6	28.1	745
UDS05G05UCR-N	MC.116050525	(5 G 16)	6	31.0	919
UDS03G04UCR-N	MC.116040325	(4 G 25)	4	37.7	1111
UDS02G04UCR-N	MC.116040225	(4 G 35)	2	44.2	1564
UDSA1G04UCR-N	MC.11604A125	(4 G 50)	1	47.7	2205
UDSA2G04UCR-N	MC.11604A225	(4 G 70)	2/0	50.3	3500
UDSA3G04UCR-N	MC.11604A325	(4 G 95)	3/0	55.9	3995
UDSA4G04UCR-N	MC.21504A425	4 G 120	4/0	49.3	4608
UDSA5G04UCR-N	MC.21504A525	4 G 150	250	54.9	5760

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II Div 2**

acc.to: art 501 and art. 502
NFPA 70



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MOTION **UL ETHERNET**

FOR STATIC AND DYNAMIC APPLICATIONS – SHIELDED AND UNSHIELDED VERSIONS

The new MOTION **UL ETHERNET** family is MOTION **CABLES**' response to the demands of global industrial Ethernet communication, where reliability, regulatory compliance, and installation safety are paramount. Developed and certified according to UL 13, UL 444, and CSA C22.2 No. 214 standards, this line includes CE • UL AWM • UL LISTED (PLTC / CMG / CMX) cables suitable for static, dynamic, and highly dynamic applications. All MOTION **UL ETHERNET** cables are tested and approved for SUN RESISTANT, Weatherometer Test for Type CMX Cable (300-hour), and FT4 / VW-1 flame performance, complying with NFPA 70 (NEC) for installations in cable trays and severe industrial environments. The MOTION **UL ETHERNET** range is designed to integrate the following into a single platform:

- International Compliance (CE + UL AWM + UL LISTED)
- Suitability for Outdoor Environments (SUN RESISTANT)
- Weatherometer Test for Type CMX Cable (300-hour)
- Complete UL Safety with successfully passed physical, electrical, and flame tests

Each cable is engineered to ensure stable Ethernet signal transmission (up to 10 Gbit/s), mechanical and chemical resistance, and EMC immunity for Profinet, EtherCAT, EtherCAT P, and Ethernet Cat.6 / Cat.7 protocols.

PERFORMANCE LEVEL	Certifications	UL LISTED References	Installation Type	Primary Applications
BASIC PERFORMANCE	CE • UL AWM • UL LISTED	PLTC / CMG UL 13 • UL 444	Static Installation	Industrial Ethernet backbones, cabinets, PLCs, static systems
DYNAMIC PERFORMANCE	CE • UL AWM • UL LISTED	PLTC / CMG UL 13 • UL 444	Dynamic Installation	Automated machinery, modular lines, light mobile systems
HIGH DYNAMIC PERFORMANCE	CE • UL AWM • UL LISTED	CMX – UL 444	Flexible / Cable Carrier Installation	High-cycle systems, severe dynamic environments

MAIN MOTION **UL ETHERNET** FEATURES

FEATURE	CERTIFIED PRESTATION
Global Certifications	CE • UL AWM • UL LISTED (PLTC / CMG / CMX)
Official UL References	UL 13 • UL 444 • CSA C22.2 No. 214
UV Resistance	SUN RESISTANT – 720 h test passed (QMTT2 Compound)
Weatherometer Test for Type CMX Cable (300-hour)	Passed for outdoor use
Flame test	UL 1685 FT4 / IEEE 1202 (PLTC / CMG) • UL VW-1 / FT1 (CMX)
Cold Bend & Cold Impact	Passed for all UL models (–40 °C)
Crush & Jacket Peel Test	Compliant with UL 444 / UL 13 – High mechanical resistance
Ink Durability & Shrinkback	Tests passed – Stable and permanent marking
Sunlight / UV Exposure	720 h test passed – Suitable for outdoor installations
AC Leakage Through Jacket	Compliant with UL 444 – No electrical leakage detected

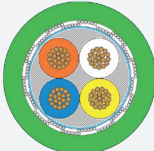
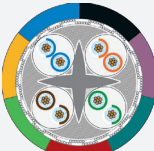
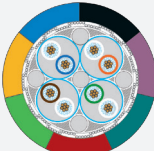
MOTIONUL ETHERNET TECHNICAL ADVANTAGES

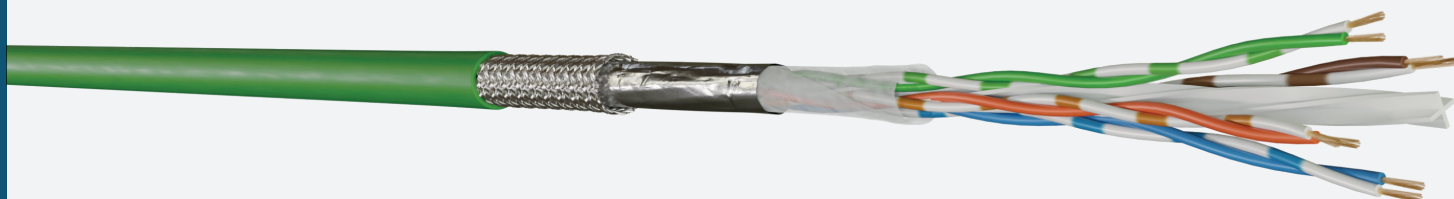
DISTINGUISHING FEATURE	CONCRETE ADVANTAGE
Triple Certification (CE • UL AWM • UL LISTED)	The only industrial Ethernet family compliant with EU / US / Canadian standards
Sunlight Resistant / Exposed Run	Suitable for outdoor installations and environments with direct UV exposure
High EMC Protection	Stable data transmission even in electrically noisy environments
Categories Cat.6 / Cat.7	Communication up to 10 Gbit/s – Profinet / EtherCAT protocols
Mechanical and chemical resistance	High durability in robotic systems and dynamic production lines
UL Safety Tested	All flame, impact, press, and bending tests passed
Global Installability	Approved for cable trays, conduits, and NFPA 70 (NEC) environments

APPLICATION EXAMPLES

- Industrial automation and control.
- Industrial Ethernet networks (Profinet, EtherCAT, EtherCAT P).
- Robotics, AGVs, mobile systems, and cable carriers (or: energy chains).
- Installations destined for USA / Canada (UL LISTED PLTC – CMG – CMX).
- Packaging lines, logistics, automatic machinery.
- Industry 4.0 and Smart Factory applications.

PROTOCOL ANALYSIS AND ELECTRICAL REQUIREMENTS

	PROTOCOL	ORIGIN/ STANDARD	IMPEDANCE	SUPPORTED PoE	APPLIED FOR
		PI (Ethernet-based)	100 Ω $\pm$ 15%	PoE / PoE+ / PoE++	Verified Category (Cat.5e/6) NEXT/FEXT
		Beckhoff Ether-CAT Tech. Group	100 Ω $\pm$ 10%	PoE / PoE+ / PoE++	Low Parasitic Capacitance High Flexibility
		Beckhoff Ether-CAT P Tech. Group	100 Ω $\pm$ 10%	PoE / PoE+ / PoE++	Low Parasitic Capacitance High Flexibility
		IEEE	100 Ω $\pm$ 10%	PoE / PoE+ / PoE++	PLCs, HMIs, Industrial Switches
		IEEE	100 Ω $\pm$ 10%	PoE / PoE+ / PoE++	EMC-critical systems, High-speed automation



UL 20601
80°C 300V
UL 2570
80°C 1000V



LABS
Free



200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED



2.0 m/sec²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

CYCLES	m.u.	
	MIL	0,2
MIN. BENDING RADIUS	x O.D.	12
MAXIMUM SPEED	m/min	180
MAXIMUM ACCELERATION	m/s ²	2,0
PULLING FORCE	N/mm ²	≤ 50
TORSION	°/m	-
MAX. HORIZONTAL TRAVEL	m	-
TEMPERATURE	°C	+5 / +80

ELECTRICAL PROPERTIES



Test Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Operating Voltage

300 ÷ 1000 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Low-Capacitance Structure	Allows for long connections and signal stability even at high frequencies
High-Performance PUR Jacket	Excellent mechanical, chemical, and abrasion resistance
High-Dynamic Construction	Engineered for cable carriers with long travel distances and high accelerations
Full-Coverage Tinned Copper Shielding	Maximum EMC protection for high-precision servo systems
High Resistance to Oils, Coolants, and Chemical Agents	Suitable for use in harsh industrial environments and wet areas
Wide Operating Temperature Range	Reliability even in extreme climatic conditions, indoors or outdoors
Compatibility with Major Servo Systems	Universal solution for multi-brand applications
Robust and Flexible Construction	Long service life and reduced machine downtime

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

Fieldbus standard	MotionCables code	EPlan Code	Formation	Norm	Ø mm	Cu kg/km	Res Ω/km	Cap. nF/km	Op. Tension V	Series's Data Sheet
 CAT 7 100 Ω	DFSHH26P04UR-*LV	MC.14008262*	[4 x (2 x 26 AWG)]	UL 444 CMX	6.3	60	≤ 140	48	300 V	
 PROFI NET 100 Ω	BFSW22Q01UR-VEHV	MC.176042212	[1 x (4 x 0,34)]	UL 13 PLTC & UL 444 CMG	6.5	60	≤ 55.0	51	1000 V	
 Safety Over EtherCAT 100 Ω	BFSEW22Q01UR-NGHV	MC.176042216	[1 x (4 x 0,34)]	UL 13 PLTC & UL 444 CMG	6,7	60	≤ 55.0	51	1000 V	
 EtherCAT 100 Ω	BFSEW22Q01UR-NRHH	MC.176042217	[1 x (4 x 0,34)]	UL 13 PLTC & UL 444 CMG	6,7	60	≤ 55.0	51	1000 V	

* The cable's outersheath could be in different colour: Green RAL 6018 - Water Blue RAL 5021 - Sky Blue RAL 5015 - Yellow RAL 1021 - Black RAL 9005 - Red RAL 3000 - Violet, RAL 4001.



EPLAN

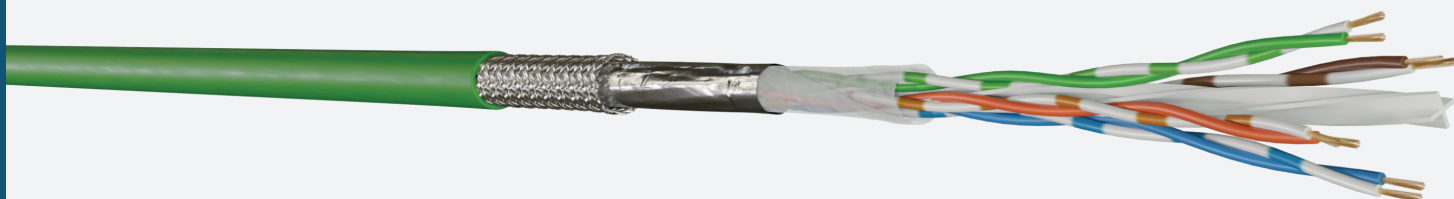
All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



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).

Fieldbus cables, shielded, PUR LISTED sheath, oil resistant, dynamic application - **PLTC UL13 - CMG UL 444**

UL 20549
80°C 300V
UL 21223
80°C 1000V



LABS
Free



5 million

CYCLES



7,5 x O.D.

MIN. BENDING RADIUS



240 m / min

MAX. SPEED



20 m / s²

ACCELERATION



≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



30 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

	m.u.				
CYCLES	MIL	0,2	1	5	10
MIN. BENDING RADIUS	x O.D.	12	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAXIMUM ACCELERATION	m/s ²	2,0	50	30	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +80	-40 / +80	-40 / +80	-40 / +80



Test Voltage

4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3



Insulation Resistance

≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1



Operating Voltage

600 V (UL/CSA)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



FIRE RESISTANT



WATER RESISTANT



EMC PROTECTED



TEMPOR. OUTDOOR

MAIN ADVANTAGES

Low-Capacitance Structure	Allows for long connections and signal stability even at high frequencies
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Wide Operating Temperature Range	Reliability even in extreme climatic conditions, indoors or outdoors
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Robust and Flexible Construction	Long service life and reduced machine downtime

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

Fieldbus standard	MotionCables code	EPlan Code	Formation		Ø mm	Cu kg/km	Res Ω/km	Cap. ηF/km	Op. Tension V	Serie's Data Sheet
 CAT 6 100 Ω	DDSH26P04UP-*HV	MC.34008243*	[4 x (2 x 26 AWG)]	UL 444 CMX	7.2	64	≤ 140	47	1000 V	
 CAT 7 100 Ω	DDSHH26P04UP-*LV	MC.34008263*	[4 x (2 x 26 AWG)]	UL 13 PLTC & UL 444 CMG	6.4	46	≤ 140	47	300 V	
 PROFI NET 100 Ω	BDSEW22Q01UP-VEHV	MC.3760422102	[1 x (4 x 0,34)]	UL 13 PLTC & UL 444 CMG	6.5	57	≤ 55.0	51	1000 V	
 EtherCAT 100 Ω	BDSEW22Q01UP-NGHV	MC.3760422116	[1 x (4 x 0,34)]	UL 13 PLTC & UL 444 CMG	6,7	57	≤ 55.0	51	1000 V	
 EtherCAT 100 Ω	BDSEW22Q01UP-NRHV	MC.3760422117	[1 x (4 x 0,34)]	UL 13 PLTC & UL 444 CMG	6,7	57	≤ 55.0	51	1000 V	

* The cable's outersheath could be in different colour: Green RAL 6018 - Water Blue RAL 5021 - Sky Blue RAL 5015 - Yellow RAL 1021 - Black RAL 9005 - Red RAL 3000 - Violet, RAL 4001.



EPLAN

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MOTION**VFD**

MOTIONVFD

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 extensive contact area of the copper braiding is recommended.

**INCREASED MAX
CONDUCTOR
TEMPERATURE**

90°C

PERFORMANCE LEVEL	Suggested Usage Conditions	Insulation	Outer Sheath	Key Features
BASIC PERFORMANCE	Static or Demi-Static installation	XL-PE	PVC	Flexibility, oil/fluid resistance, flame retardant
HIGH DYNAMIC PERFORMANCE	Severe dynamic, robotics	XL-PE	Polyurethane (PUR FRFH)	High flexibility even at low temperatures, chemical resistance, 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.
- Installation: Static and occasional dynamic use.

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.
- Installation: Flexible / continuous dynamic motion.

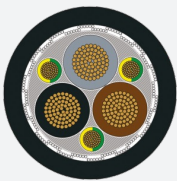
APPLICATION EXAMPLES

- 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.

TECHNICAL BENEFIT

Characteristic	Tangible Benefit
Cross-linked XLPE Insulation	Low capacitance, reduced dV/dt
Symmetrical Construction	No induced current on the PE (Protective Earth)
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 Certifications	International compatibility
Dynamic Versions	Long service life in flexible/moving applications

CABLES TYPES



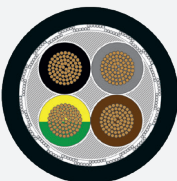
BASIC PERFORMANCE
SERIES: 500 - 600 - 700

PVC
TM5

600 V
1000 V

-25 °C
+90 °C

186



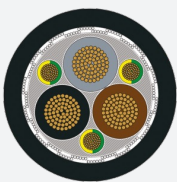
BASIC PERFORMANCE
SERIES: 550 - 650 - 750

PVC
TM5

600 V
1000 V

-25 °C
+90 °C

188



HIGH DYNAMIC PERFORMANCE
SERIES 800

PUR
FRFH

600 V
1000 V

-50 °C
+90 °C

190

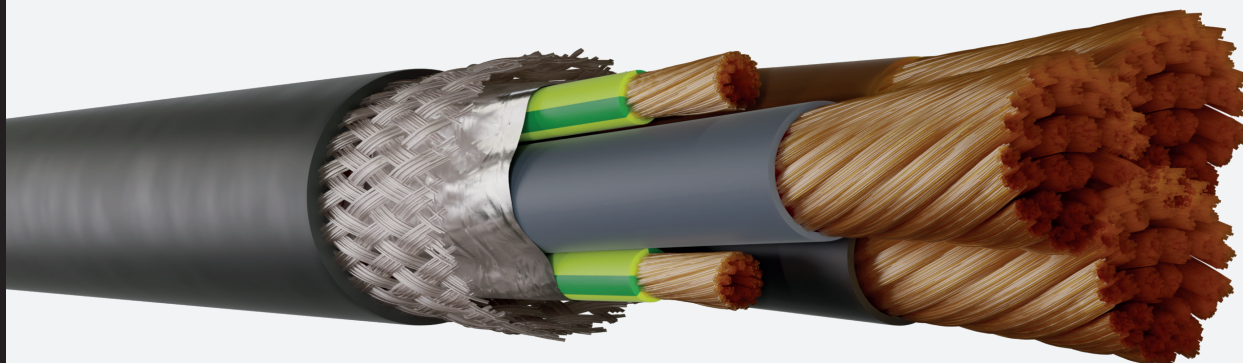
MOTION **INVERTER VFD**

BP

BASIC PERFORMANCE

PVC
TM5600 V
1000 V-25 °C
+90 °C

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

UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

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 ²	2,0
PULLING FORCE	N/mm ²	≤ 50
TORSION	°/m	-
MAX. HORIZONTAL TRAVEL	m	-
TEMPERATURE	°C	+5 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/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

Symmetrical 3+3G Structure

Perfect balance of electric fields and reduction of return currents to ground.

Low Electrical Capacitance Insulation

Higher transmission efficiency with VFD drives and reduction of the dV/dt effect.

High-Flexibility PVC Outer Jacket

Ease of installation and long service life even in semi-dynamic or mobile installations.

Full Shielding (Foil + Copper Braid)

Effective EMC protection against high-frequency disturbances and interference.

Construction according to HD 308 S2

Phase conductors colored according to European standard for maximum recognition and safety.

High Thermal Resistance up to 90°C

Constant performance even in continuous duty cycles or with high temperatures.

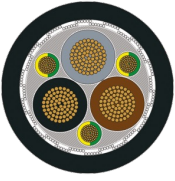
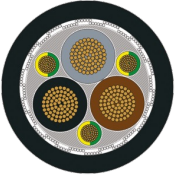
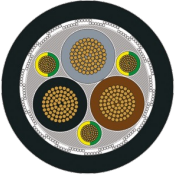
CE, UL, CSA, NFPA 79, TC-ER Compliance

Suitable for industrial installations in Europe, the USA, and Canada.

Controlled Mechanical Flexibility

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 Kcmil	Ø mm	Cu kg / km	DATA SHEET
			mm ²				
 Series 500 CE	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	
 Series 600 CE - UL AWM	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	
 Series 700 CE - UL AWM UL LISTED - WTTTC - CIC	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	



EPLAN

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

UL 21179
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

200.000

DEMI-STATIC



12 x O.D.

MIN. BENDING RADIUS



180 m/min

MAX. SPEED

2.0 m/sec²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



-

TORSION



-

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

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

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



WATER RESISTANT



EMC PROTECTED

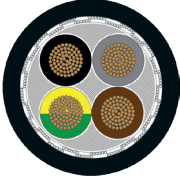
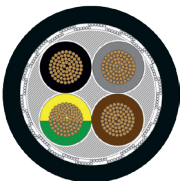
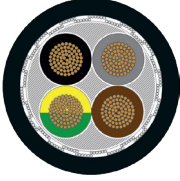


TEMPOR. OUTDOOR

MAIN ADVANTAGES

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

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

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



EPLAN

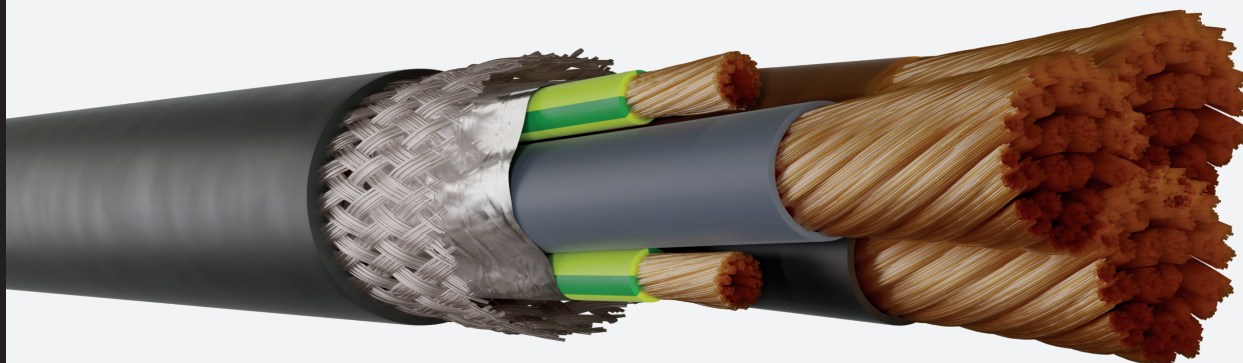
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SPAC CAVI

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Low capacitance cables for inverter systems, PUR FRFH sheath, Oil Resistant, Demi-Static Application - **Series 800 - Halogen Free**UL 21209
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST



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

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

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

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Symmetrical 3+3G Structure

Perfect balance of electric fields and reduction of return currents to ground.

Low Electrical Capacitance Insulation

Higher transmission efficiency with VFD drives and reduction of the dV/dt effect.

High-Flexibility PVC or PUR Outer Jacket

Ease of installation and long service life even in semi-dynamic or mobile installations.

Full Shielding (Foil + Copper Braid)

Effective EMC protection against high-frequency disturbances and interference.

Construction according to HD 308 S2

Phase conductors colored according to European standard for maximum recognition and safety.

High Thermal Resistance up to 90°C

Constant performance even in continuous duty cycles or with high temperatures.

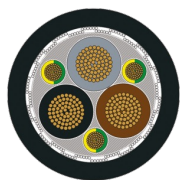
CE, UL, CSA, NFPA 79, TC-ER Compliance

Suitable for industrial installations in Europe, the USA, and Canada.

Controlled Mechanical Flexibility

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



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SPAC CAVI

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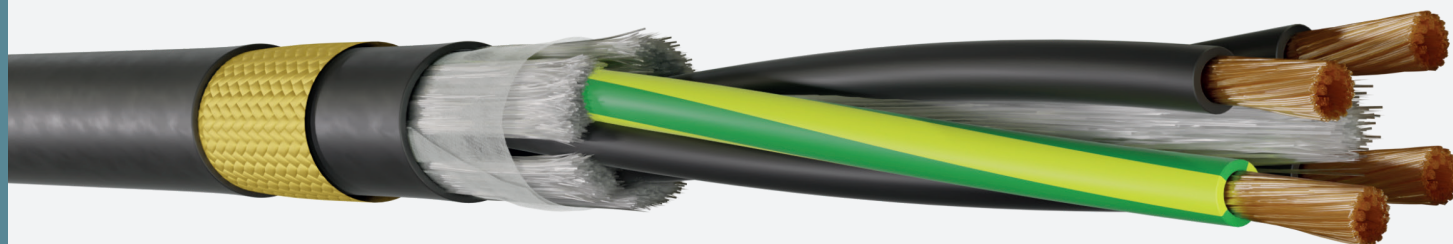
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MOTION **SPECIAL APPLICATION**



MOTION **DRUM**
MOTION **ROBOTLINE**
MOTION **THERMLINE**
MOTION **CLEANLINE**
MOTION **XP**

LABS
Free

UPON REQUEST



5 million

CYCLES



5 x O.D.

MIN. BENDING RADIUS



240 m / min

MAX. SPEED

20 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



± 30 ° / m

TORSION



50 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

	m.u.				
CYCLES	MIL	0,2	5	5	5
MIN. BENDING RADIUS	x O.D.	12	5	5	10
MAXIMUM SPEED	m/min	120	240	240	150
MAXIMUM ACCELERATION	m/s ²	2,0	20	20	15
PULLING FORCE	N/mm ²	≤ 50	≤ 20	≤ 20	≤ 20
TORSION	°/m	-	± 30	± 30	± 30
MAX. HORIZONTAL TRAVEL	m	-	3	15	50
TEMPERATURE	°C	-50 / +90	-40 / +90	-40 / +90	-40 / +90

ELECTRICAL PROPERTIES

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl. 10.3Insulation
Resistance≥ 1.0 GΩ x km @ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

250 °C (≤ 1s)

Operating
Voltage

U0/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



OIL RESISTANT



FLAME RETARDANT



COLD RESISTANT



ABRASION RESISTANT



EMC PROTECTED



WATER RESISTANT



UV RESISTANT



MICROBE RESISTANT



OZONE RESISTANT



MUD RESISTANT



HALOGEN FREE

MAIN ADVANTAGES

Reinforced Construction for High Mechanical Stress	Long service life even in applications with strong accelerations, tension, and torsion.
Excellent Dynamic Flexibility	Ideal for reeling systems, mobile trolleys, and systems with repeated movements.
Outer Jacket Resistant to Oils, Abrasion, and Weathering	Constant reliability in industrial and port environments, even under severe outdoor conditions.
Low Dielectric Constant Insulating Materials	Stable electrical performance and reduced losses even over long distances.
Balanced Structure with Flexible Strands	Increased resistance to mechanical fatigue and reduced stress on internal conductors.
Shielded and Unshielded Versions	Adaptability to power, signal, or control requirements, with high EMC compatibility.
Wide Operating Temperature Range	Guaranteed functionality even in conditions of intense cold or prolonged heat.
CE- UL AWM Industrial Certifications	International conformity for global applications in cranes, ports, machine tools, and automated logistics.

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

MotionCables code	EPLAN Code	Formation	∅	Cu	Pulling Force	Weight	DATA SHEET
		mm ²	mm	kg / km	N	kg	
MDND15G04UP-N	MC3440415195	4 G 1.5	13.6	58	210	295	
MDND15G05UP-N	MC3440515195	5 G 1.5	14.0	72	263	330	
MDND15G07UP-N	MC3440715195	7 G 1.5	14.5	100	366	425	
MDND15G12UP-N	MC3441215195	12 G 1.5	19.5	173	630	595	
MDND15G18UP-N	MC3441815195	18 G 1.5	22.3	260	945	775	
MDND15G24UP-N	MC3442415195	24 G 1.5	23.6	345	1260	1050	
MDND15G30UP-N	MC3443015195	30 G 1.5	26.9	432	1575	1150	
MDND13G04UP-N	MC3440413195	4 G 2.5	15.0	96	350	365	
MDND13G05UP-N	MC3440513195	5 G 2.5	16.0	120	438	420	
MDND13G07UP-N	MC3440713195	7 G 2.5	21.0	168	613	580	
MDND13G12UP-N	MC3441213195	12 G 2.5	24.0	288	1050	770	
MDND13G18UP-N	MC3441813195	18 G 2.5	26.5	432	1575	1080	
MDND13G24UP-N	MC3442413195	24 G 2.5	30.5	576	2100	1460	
MDND13G30UP-N	MC3443013195	30 G 2.5	32.6	720	2625	1610	
MDND13G36UP-N	MC3443613195	36 G 2.5	34.8	864	3150	1350	
PDND11G04UP-N	MC3440411195	4 G 4	15.4	154	560	470	
PDND09G04UP-N	MC3440409195	4 G 6	16.4	230	840	625	
PDND07G04UP-N	MC3440407195	4 G 10	19.6	384	1400	930	
PDND05G04UP-N	MC3440405195	4 G 16	21.6	614	2240	1320	
PDND03G04UP-N	MC3440403195	4 G 25	27.9	960	3500	1870	
PDND02G04UP-N	MC3440402195	4 G 35	30.3	1344	4900	2500	
PDNDA1G06UP-N	MC34406A1195	3 X 50 + 3 G 25/3	32.4	1670	5400	2740	
PDNDA2G06UP-N	MC34406A2195	3 X 70 + 3 G 35/3	35.9	2304	6300	3750	



EPLAN

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SPAC CAVI

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MOTIONROBOTLINE

DYNAMIC RELIABILITY FOR ARTICULATED ROBOTICS



THE ROBOLINE CONCEPT: PHILOSOPHY AND APPLICATIONS

MOTIONROBOTLINE cables are engineered for dynamic robotic applications involving high torsion and thermal conditions from -40°C to $+90^{\circ}\text{C}$.

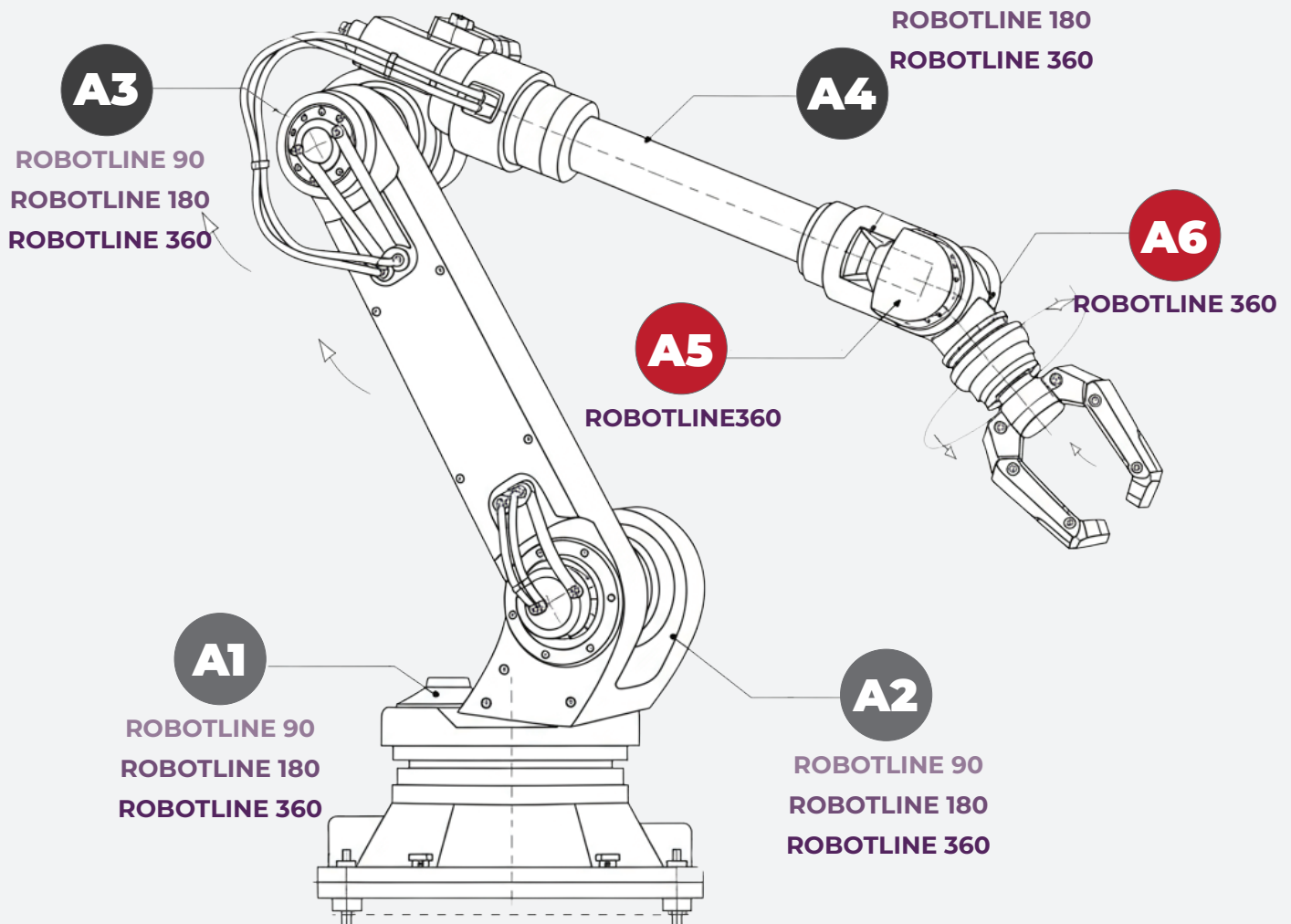
They are UL AWM Recognized compliant, available in shielded and unshielded versions, and customizable in hybrid configurations (power + signals + high-frequency data up to 100 MHz). The range is structured into three families based on the guaranteed torsion level.

Family	Torsion Level	Axes Covered
ROBOTLINE 90	$\pm 90^{\circ}/\text{m}$	Axes 1-3
ROBOTLINE 180	$\pm 180^{\circ}/\text{m}$	Axes 1-4
ROBOTLINE 360	$\pm 360^{\circ}/\text{m}$	Axes 1-6

MOTION EM-TORSION MESH SHIELDING SYSTEM

For the shielded versions, MOTIONCABLES has developed the patented **Motion EM-Torsion MESH Shield**:

- It is a braid optimized for torsion up to Axis 6, which maintains attenuation stability even after millions of cycles.
- Unlike spiral shields, which are affected by the Lenz Effect (electromagnetic induction generating eddy currents and increasing attenuation losses), the braided shield maintains shielding continuity without compromising high-frequency performance.
- Tested up to 100 MHz with controlled impedance for data signals.





MOTION**ROBOTLINE** 360



APPLICATIONS

AXES 1-6

EXTREME TORSION

Typical applications:
foundry, metallurgy, high-speed handling, complex robots with simultaneous movements



MOTION**ROBOTLINE** 180



APPLICATIONS

AXES 1-4

MEDIUM-HIGH TORSION

Typical applications:
welding, painting,
automotive handling,
packaging lines.



MOTION**ROBOTLINE** 90



APPLICATIONS

AXES 1-3

MODERATE TORSION

Typical applications: pick
& place, light handling,
primary packaging.

MOTION**ROBOTLINE** characteristics can be applied to the following cables' families:

MOTION**SERVO**

MOTION**HYBRID**

MOTION**FEEDBACK**

MOTION**BUS**

MOTION**STANDARD**

MOTIONROBOTLINE: MATERIAL AND CONSTRUCTION

- ◉ **Outer Jacket:**
High-mechanical-strength polyurethane, optimized for torsion and abrasion.
- ◉ **Conductor Insulation:**
XL-PE for thermal and electrical stability.
- ◉ **Optional Shielding System:**
Motion Braiding Torsion Shield (for shielded versions).
- ◉ **Custom Options:**
Hybrid configurations (power + signals + twisted data pairs with controlled impedance up to 100 MHz).

THE ROBOTLINE CONCEPT: PHILOSOPHY AND APPLICATIONS

- ◉ **Automotive Robotics:** Welding, handling, painting.
- ◉ **Foundry and Metallurgy Robotics:** Extreme torsion in hot and harsh environments.
- ◉ **Food and Pharmaceutical Robotics:** Handling, packaging, and high-speed pick & place.
- ◉ **Logistics Automation:** Articulated robots for palletizing and material handling.

MOTIONROBOTLINE cables offer not only environmental resistance but also excellent electrical and dynamic characteristics.

Feature	ROBOTLINE 90	ROBOTLINE 180	ROBOTLINE 360	Benefit
Torsion Level	±90°/m (Axes 1–3)	±180°/m (Axes 1–4)	±360°/m (Axes 1–6)	Complete coverage for articulated robots
Operating Temp.	–40 to +90 °C	–40 to +90 °C	–40 to +90 °C	Thermal reliability
Torsion Cycles	> 5 Million	> 7 Million	> 10 Million	High durability
Shielding	Opt. Motion Braiding	Opt. Motion Braiding	Opt. Motion Braiding	Data integrity up to 100 MHz
Compliance	UL AWM Recognized	UL AWM Recognized	UL AWM Recognized	International standard

ADVANTAGES OF THE MOTION EM-TORSION® MESH SHIELD SYSTEM

- ◉ **Resistance to Extreme Torsion:** Optimized braid that follows movement without gapping.
- ◉ **Maintenance of EMC Performance:** Constant shielding; no high-frequency degradation.
- ◉ **Reduction of Attenuation Losses:** Avoids the inductive effect typical of spirals (Lenz's Law).

WHY BRAID SHIELDING IS BETTER THAN SPIRALS FOR TORSION CABLES

When a shielded cable must transmit high-frequency signals (e.g., data up to 100 MHz), shielding quality is critical for preventing electromagnetic interference (EMC). There are two main systems:

1. **SPIRAL SHIELDING** (Helical Winding of Metallic Wires):
2. **BRAID SHIELDING** (Motion Braiding Torsion Shield):

1. SPIRAL SHIELDING (HELICAL WINDING OF METALLIC WIRES):

The wires are helically wound around the cable. When the cable is subjected to torsion, **the winding tends to stretch or compress, creating less-shielded areas**. Furthermore, according to Lenz's Law, when a variable electromagnetic field passes through the spiral, induced currents are generated along the spiral, creating an opposing field. This effect increases impedance and increases attenuation losses, especially at high frequencies.

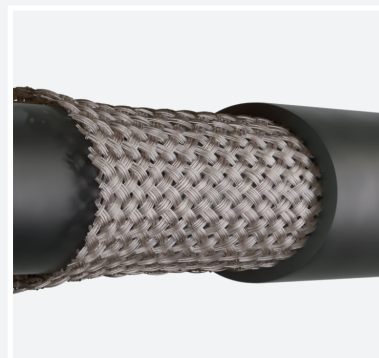
Result: Spiral shielding progressively reduces its effectiveness and degrades data transmission.



2. BRAID SHIELDING (MOTION BRADING TORSION SHIELD):

The wires are interwoven in a criss-cross pattern, forming a regular mesh. **The braid does not gap or tighten during torsion, maintaining a uniform 360° coverage of the cable**. The weave distributes induced currents into micro-closed loops and drastically reduces the inductive effects described by Lenz's Law.

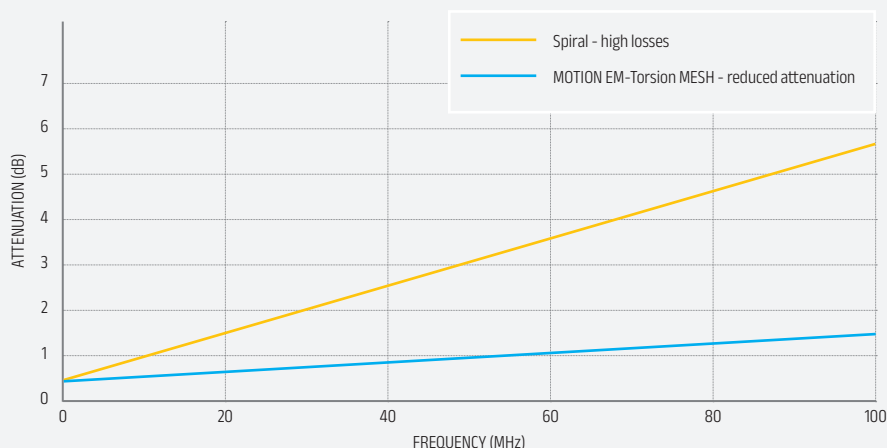
Result: The shield maintains its efficiency even after millions of cycles and guarantees constant attenuation at high frequencies.



IN SUMMARY:

- **Spirals:** Behave like a "spring" that deforms under torsion and, due to Lenz's Law, amplifies attenuation losses.
- **Motion EM-Torsion MESH Shield Braid:** Maintains stable coverage, does not suffer from the inductive effect, and therefore ensures stable EMC protection over time, even under extreme torsion.
- **Long-Term Reliability:** Tested on torsions up to Axis 6.

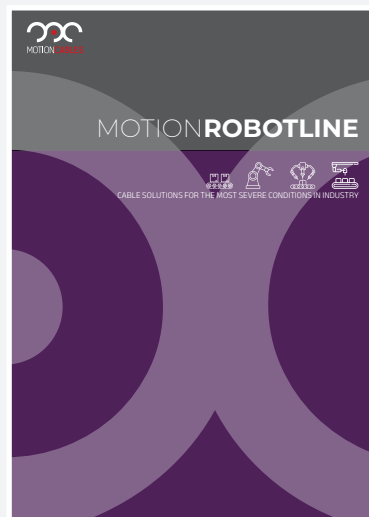
COMPARISON OF SHIELDING ATTENUATION



Further information about codes and applications could be found in our relevant brochure:

MOTION**ROBOTLINE**. You can download the brochure in pdf format from our website at:

<https://www.motioncables.com/specialcables/downloads/en>



MOTION**THERMLINE**

THERMAL SAFETY, DYNAMIC PERFORMANCE, AND RELIABILITY FOR INDUSTRY



THE THERMLINE CONCEPT: PHILOSOPHY AND APPLICATIONS

In the modern industrial sector, managing temperature extremes is crucial: deep-freeze cells, pasteurization tunnels, industrial furnaces, turbines, and foundry lines. MOTION**THERMLINE** cables are designed for dynamic applications—in cable carriers, robotics, and continuous motion—and resist repeated thermal cycles, steam, hot water, and chemical agents, without compromising flexibility or service life. MOTION**THERMLINE** cables are engineered for dynamic applications **where thermal variability is a critical factor**.

They ensure operational continuity, resistance to thermal aging, and optimal dynamic behaviour (suitable for use in cable carriers and robotics). The product line is structured into **three families, differentiated by temperature range and jacket/insulation compound**, covering requirements from cryogenic processes and extreme cold to industrial furnaces and aggressive thermal cycles.

MOTION**THERMLINE** 125



MOTION**THERMLINE** 105



MOTION**THERMLINE 90**



MOTION**THERMLINE 125**



APPLICATIONS

Cold Extremes:

Deep-freezing, cryogenic transport, -40 °C food logistics.

Hot Extremes:

Hot-fill, sterilization, pasteurization tunnels.

Industrial:

Turbines, foundries, thermal testing lines.

Pharmaceutical/Biotech:

Autoclaves, Lyophilization.

MOTION**THERMLINE 105**



APPLICATIONS

Food & Beverage:

Bakery, drying, packaging machinery.

Robotics:

Axes near heat sources.

Industrial:

Presses, machine tools, moderate heat treatment.

MOTION**THERMLINE 90**



APPLICATIONS

Packaging:

Conveyors, sensors, motors not in extreme zones.

Intermediate Refrigeration:

Cells and machinery with hot water washdowns.

General Automation:

Moderate temperature cable carrier applications.

MOTION**THERMLINE** characteristics can be applied to the following cables' families:

MOTION**SERVO**

MOTION**HYBRID**

MOTION**FEEDBACK**

MOTION**BUS**

MOTION**STANDARD**

MOTIONTHERMLINE: DESIGN AND INSTALLATION

- ◉ **Smooth:**
non-porous surface, easy to clean.
- ◉ **Custom colours:**
for identifying thermal lines.
- ◉ **Compatible with:**
cable carriers and robotics.
- ◉ **Recommendations:**
 - Minimum bending radius $7.5 \times \emptyset$;
 - Protection from surfaces $>150^\circ\text{C}$;
 - Periodic inspections.

THE THERMLINE CONCEPT: PHILOSOPHY AND APPLICATIONS

Typical Applications:

- ◉ **Food & Beverage:** hot-fill, pasteurization, sterilization, ovens, steam cleaning.
- ◉ **Heavy Industry:** turbines, foundries, heat treatment, hot presses.
- ◉ **Extreme Temperature Logistics:** cold storage rooms, deep-freezing, cryogenic transport.
- ◉ **Robotics and Automation:** dynamic axes near heat sources or in sub-zero environments.

MOTION**THERMLINE** cables offer not only environmental resistance but also excellent electrical and dynamic characteristics.

Characteristic	THERMLINE 125	THERMLINE 105	THERMLINE 90	Benefit
Nominal Voltage	600 / 1000 V	600 / 1000 V	600 / 1000 V	Industrial Compatibility
Insulation	MotionGum	XL-PE	XL-PE	Dielectric Stability
Temp. Range	-50 to +125 °C (peaks +150 °C)	-30 to +105 °C (peaks +125 °C)	-5 to +90 °C (peaks +105 °C)	Full Coverage
Dynamic Cycles	>5 million	>5 million	>10 million	Robotics & Cable Carriers
Bending Radius	$10 \times \emptyset$	$10 \times \emptyset$	$7.5 \times \emptyset$	Compact Installations
Mechanical Strength	$>15 \text{ N/mm}^2$	$>15 \text{ N/mm}^2$	$>15 \text{ N/mm}^2$	Vibration Resistance
Chemical Resistance	Excellent	Very Good	Good	Sanitation and Detergents

PERFORMANCE COMPARISON TABLES

Family	Temp. Range	Jacket	Insulation	Key Applications
THERMLINE 125	-50 to +125 °C (peaks +150 °C)	MotionGum	MotionGum	Cryogenic, Hot-fill, Sterilization, Ovens, Foundries
THERMLINE 105	-30 to +105 °C (peaks +125 °C)	MotionTherm PU-105	XL-PE	Bakery, Robotics, Presses, Thermal Automation
THERMLINE 90	-5 to +90 °C (peaks +105 °C)	MotionTherm PN-90	XL-PE	Packaging, Conveyors, Intermediate Refrigeration

RESISTANCE TO THERMAL PROCESSES AND SANITATION

- ⊙ **THERMLINE 125:**
>1000 hot/cold shock cycles without insulation loss.
- ⊙ **THERMLINE 105:**
Resistant to steam and alkaline detergents without degradation.
- ⊙ **THERMLINE 90:**
Stable against hot wash-downs up to 90 °C with common detergents.

LONG-TERM ADVANTAGES

- ⊙ **Thermal reliability**
across the entire -50/+125 °C spectrum.
- ⊙ **Longer service life**
and reduced machine downtime.
- ⊙ **High dynamic performance** (>10 million cycles).
- ⊙ **Modular range to cover all requirements.**
- ⊙ **Lower operating costs.**

Further information about codes and applications could be found in our relevant brochure: **MOTIONTHERMLINE**. You can download the brochure in pdf format from our website at: <https://www.motioncables.com/specialcables/downloads/en>



MOTION**CLEANLINE**

SPECIFIC AND TECHNOLOGICALLY ADVANCED SOLUTION FOR THE FOOD INDUSTRY



THE CLEANLINE CONCEPT: PHILOSOPHY AND APPLICATIONS

MOTION**CLEANLINE** encapsulates in its name the product's philosophy: cables that are clean, safe, and designed for longevity.

They are utilized in demanding applications such as:

- Bottling and packaging lines;
- Machinery for processing meat, dairy, and bakery products;
- Fruit and vegetable processing plants;
- Freezing and refrigeration equipment.

ECOLAB®

Every MOTION**CLEANLINE** cable is designed to prevent dirt accumulation, minimize contamination risks, and ensure electrical reliability even after years of use.

HYGIENIC ZONE

1

MOTION**CLEANULTRA**

Food is in direct contact with equipment and electrical components



SPLASH ZONE

2

MOTION**CLEANPRO**

Drips or splashes of food could return to the food manufacturing process, causing contamination.



NO-PRODUCT ZONE

3

MOTION**CLEANMAX**

No contact with food.

MOTION**CLEANULTRA**
HYGIENIC ZONE



APPLICATIONS

Electrical equipment or components that need to be washed as part of regular maintenance

MOTION**CLEANPRO**
SPLASH ZONE



APPLICATIONS

Areas that need to be washed down

MOTION**CLEANMAX**
NO-PRODUCT ZONE



APPLICATIONS

Conveyor belt for packaged products

MOTION**CLEANLINE** characteristics can be applied to the following cables' families:

MOTION**SERVO**

MOTION**HYBRID**

MOTION**FEEDBACK**

MOTION**BUS**

MOTION**STANDARD**

MOTIONGUM JACKET MATERIAL: TECHNICAL PROPERTIES

The MOTION**GUM** jacket represents the technological core of MOTION**CLEANLINE** cables. Key properties include:

- ◉ **Smooth, non-porous surface:** Prevents the build-up of organic residues.
- ◉ **High chemical resistance:** Withstands alkaline detergents, organic acids, animal fats, and industrial oils.
- ◉ **Controlled elasticity:** Maintains flexibility even at low temperatures (−40 °C).
- ◉ **Thermal stability:** Resists up to +80 °C continuously, with peaks up to +105 °C.
- ◉ **Food compatibility:** Complies with FDA regulations and EHEDG recommendations.

RESISTANCE TO INDUSTRIAL SANITATION PROCESSES

Food processing plants require wash-downs several times a day using:

- ◉ High-pressure jets (IP69K);
- ◉ Alkaline and acidic detergents;
- ◉ Steam sanitization;
- ◉ Dry ice cleaning (−78 °C).

MOTION**CLEANLINE** cables maintain their:

- ◉ Jacket integrity;
- ◉ Electrical insulation;
- ◉ Mechanical robustness.

Internal tests show over 1.000 simulated wash cycles with no performance degradation.

MOTION**CLEANLINE** cables offer not only environmental resistance but also excellent electrical and dynamic characteristics.

FEATURE	TYPICAL CLEANLINE VALUE	PRATICAL BENEFIT
Nominal Voltage	600/1000V	Compatibility with most food machinery
Conductor Insulation	XLPE	Dielectric stability and low capacitance
Operating Temperature	−40 °C to +105°C (peaks +125°C)	Resistance to extreme thermal cycles
Flexing Cycles	>10 million	Ideal for drag chain applications
Minimum Bending Radius	7.5 × Cable Ø	Compact and flexible installations
Mechanical Tensile Strength	>15 N/mm ²	Durability in high-vibration and stress environments

HYGIENIC DESIGN PRINCIPLES APPLIED TO CABLES

MOTION**CLEANLINE** cables adhere to EHEDG principles:

ABSENCE OF MICRO-FISSURES

The MotionGum jacket is uniform and continuous.

COMPATIBILITY WITH OPEN INSTALLATIONS

Reduces the need for closed, condensation-prone conduits.

DEEP BLUE COLORATION

Easily detectable in case of breakage or accidental drop

WASHABLE SURFACE

Prevents the accumulation of biofilm or residues.

PERFORMANCE COMPARISON TABLES

CHEMICAL SUBSTANCE	MOTIONGUM RESISTANCE
Caustic Soda (2–5%)	Resistant
Nitric Acid ($\leq 10\%$)	Resistant
Hydrogen Peroxide	Resistant
Animal Fats	Resistant
Vegetable Oils	Resistant

USAGE ZONE	CLEANLINE	RATIONALE
Hygienic Design Zone	☑	Smooth jacket, EHEDG compliant
Splash Zone	☑	Resistance to intense sprays and wash-downs
Non-Product Zone	☑	Versatility and mechanical robustness

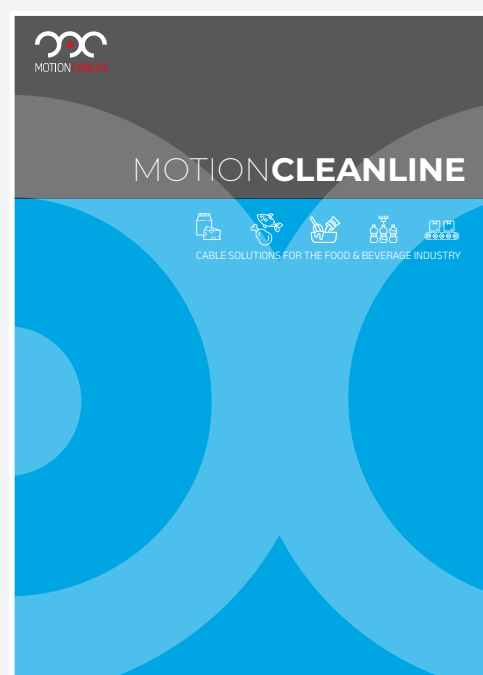
INSTALLATION & MAINTENANCE GUIDELINES

- **Avoid tight cable routing:** Leave space for cleaning.
- **Minimize cable slack:** Reduces accumulation points.
- **Use hybrid configurations when possible:**
Fewer connections equals better hygiene.
- **Install in hygienic zones with sufficient slope:**
Prevents water pooling.
- **Periodically check the jacket surface:**
Ensures hygiene and integrity.

LONG-TERM ADVANTAGES

- **Superior lifespan:**
Resists extreme cleaning cycles without degradation.
- **Reduced downtime:**
Fewer failures, greater production continuity.
- **Certified hygiene:** Compliant with industry standards.
- **Operational savings:**
Faster cleaning times, less detergent usage.
- **Product safety:** Contamination risk minimized

Further information about codes and applications could be found in our relevant brochure: MOTION**CLEANLINE**. You can download the brochure in pdf format from our website at: <https://www.motioncables.com/specialcables/downloads/en>



MOTIONXP

SINGLE-CORE, MULTI-CORE, AND QUAD-CORE CABLES FOR DYNAMIC APPLICATIONS AND HARSH ENVIRONMENTS



The MOTIONXP line is engineered to confront the most severe conditions in modern industry: continuous motion, high mechanical stress, chemically aggressive environments, and temperature extremes.

Each cable is the result of advanced engineering design, featuring selected materials and optimized geometries to ensure dynamic flexibility, robustness, and long-term electrical stability.

Tested at the MOTIONCABLES Research & Test Center, MOTIONXP cables are the ideal solution for offshore installations, oil & gas, mining, steel production, heavy-duty robotics, and industrial automation.

MOTIONXP product families:

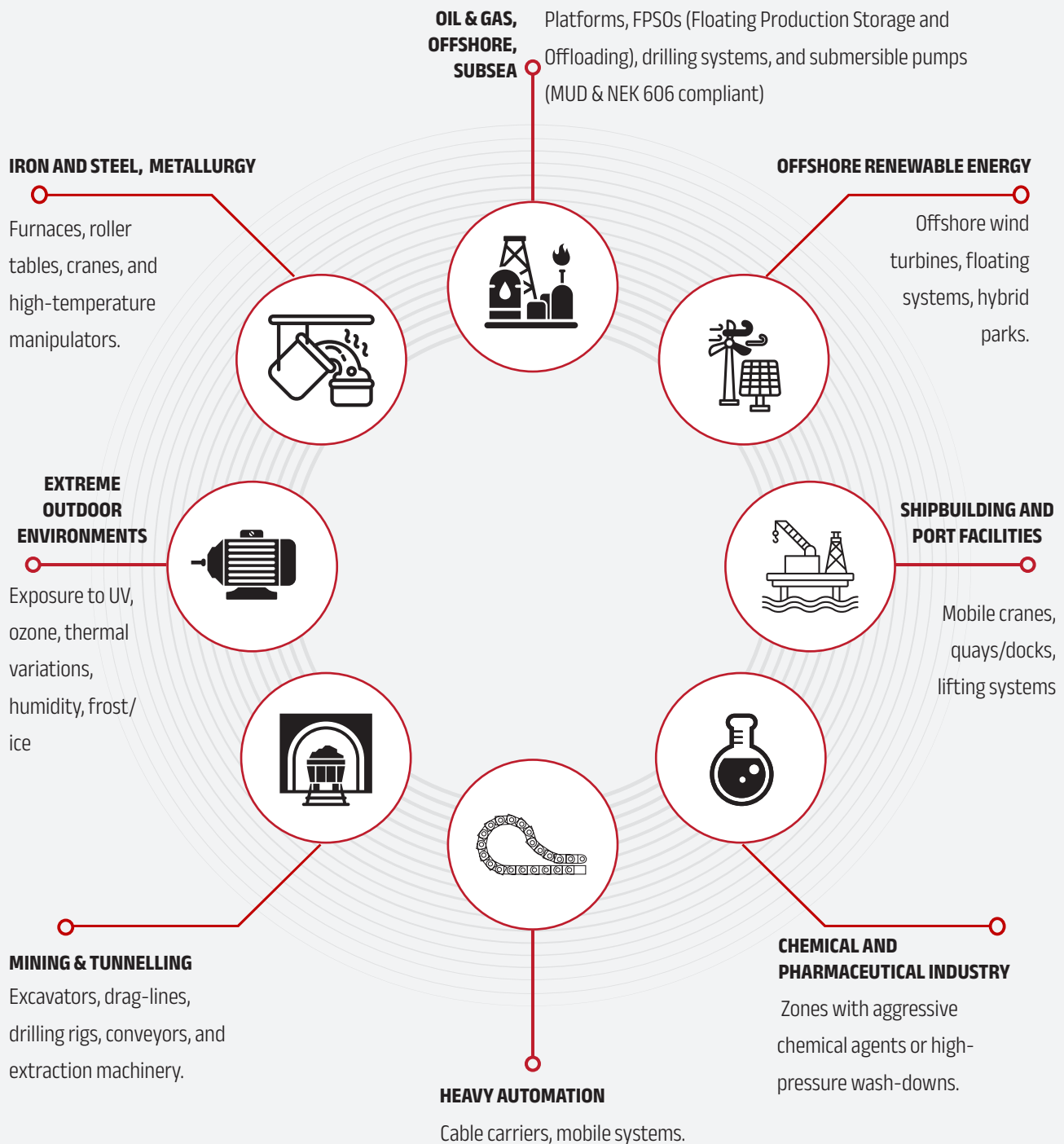
Family	Type	Available Cross-Sections	Configurations	Shielding	Primary Applications
MOTIONWIRE XP®	Single-core Power Cables	4 ÷ 400 mm ²	Single conductor	Shielded / Unshielded	Power connections, energy distribution, motor and inverter supply lines
MOTIONMULTIWIRE XP®	Multi-core and Control Bundles	0,50 ÷ 2,50 mm ²	2 ÷ 48 Insulated conductors	Shielded / Unshielded	Control wiring, signals, sensors, and actuators in dynamic environments
MOTIONPOWER XP®	Four-core Power Cables with Ground	4 ÷ 240 mm ²	4G symmetrical	Shielded / Unshielded	Motor power supply, inverters, mobile systems, and heavy dynamic installations

ELECTRICAL & MATERIAL SPECIFICATIONS

CHARACTERISTIC	TECHNICAL SPECIFICATION
Conductor	Flexible Copper Class 6 – Extra-flexible (IEC 60228)
Insulation	XLPE – Low capacitance and high thermal stability
Outer Jacket	PUR FRHF or TPE-U Heavy Duty – High mechanical and chemical resistance
Nominal Voltage	0.6 / 1 kV
Operating Temperature	–50 °C to +90 °C (peaks +105 °C)
Dynamic Acceleration	Up to 6 G
Linear Speed	Up to 600 m/min
Static Bending Radius	4 × Outer Diameter
Dynamic Bending Radius	5 × Outer Diameter
Mechanical Resistance	High resistance to Flexing, Tensile Stress, Impact, and Abrasion
Chemical Resistance	Industrial Oils, Hydrolysis, Coolants, MUD (Drilling Fluid), Light Acids
Environmental Resistance	UV, Ozone, Fungi, Bacteria, Marine Agents, and Salt
Flame Properties	IEC 60332-1-2 / UL VW-1 / LSZH optional

DEMANDING OPERATING ENVIRONMENTS

MOTION**XP** cables are designed for operation in harsh environments where electrical and mechanical reliability is critical for safety and operational continuity. Primary applications:



VALIDATION & TESTING SUMMARY – MOTIONCABLES RESEARCH & TEST CENTER

Test Parameter	MOTIONCABLES Test Method	Typical MOTIONXP® Result
Dynamic Cycles in Cable Carrier	Continuous Flex Test at 5×Ø	≥ 10 million cycles (no visible cracking)
Torsion Tests	±90°/m at 60 cycles/min	Passed – mechanical and electrical integrity confirmed
MUD Resistance	IEC 60092-360 / NEK 606	Compliant – “Severe” level
Oil and Hydrolysis Resistance	IEC 60811-2-1 / ISO 1817	Excellent
UV Resistance	ISO 4892-2 (720 h)	No surface degradation
Cold Bend / Cold Impact	IEC 60811-504 / –40°C	Passed
Tensile and Impact Tests	IEC 60811-506	Passed
Flame Test	IEC 60332-1-2 / UL VW-1 / FT1	Passed
100% Electrical Tests	Automatic Continuity Test and Insulation Resistance	Compliant with IEC 60245 / UL 758
HALT (Highly Accelerated Life Test)	Multi-stress: Torsion, Heat, etc.	Passed – L50 life margin >2× standard

VALIDATION & TESTING SUMMARY – MOTIONCABLES RESEARCH & TEST CENTER

All cables in the MOTIONXP series are validated in the MOTIONCABLES Research & Test Centre, which integrates state-of-the-art electrical, mechanical, and environmental testing systems.

Testing Methodologies and Tools:

- Dynamic Flex and Torsion Tests with in-line electrical monitoring.
- HALT (Highly Accelerated Life Test) to determine thermal and mechanical endurance limits.
- Multiple Chemical Resistance Tests (Oil, MUD, Hydrolysis, Ozone, UV, Fungus).
- Cyclic Thermal and Climatic Tests from –50 °C to +180°C.
- 100% Automated Electrical Tests: continuity, insulation, conductor resistance.
- Flame Tests (UL VW-1, IEC 60332).
- Dimensional and Metallographic Checks on conductors, insulation, and jackets.

Laboratory Output:

- Certified MOTIONCABLES Test Report with results and degradation curves.
- Dynamic Life Certificate (MC-DLT) with estimated service life (L50).
- Regulatory and Process Conformity Certificate (CE, UL, Lloyd's, NEK).

Every MOTIONXP cable is thus not only tested, but validated to ensure measurable and repeatable performance over time.

CONFORMITY UPON NORMS AND CERTIFICATIONS

Standard / Body	Reference	Scope of Application
CE	Directives 2014/35/EU – 2011/65/EU	European low voltage and RoHS conformity
IEC 60228 / 60332 / 60811	IEC International Standards	Conductors, mechanical tests, flame test
NEK 606 / IEC 60092-360	Oil & Gas / Offshore	MUD resistance, synthetic oils, and drilling fluids
UL 758 / UL 1277 / UL 1063	North America	AWM / TC-ER / Power & Control cables
CSA C22.2 N°210 / N°239	Canada	AWM / Industrial Power
Lloyd's Register	Marine & Offshore	Marine and dynamic certification
ISO 4892 / ISO 1817 / ISO 846	Outdoor Environments	UV, hydrolysis, biological resistance

VALIDATION & TESTING SUMMARY – MOTIONCABLES RESEARCH & TEST CENTER

MOTIONXP is the synthesis of power, endurance, and reliability.

Engineered to tackle the most difficult industrial environments, MOTIONXP cables offer electrical stability, long dynamic life, and maximum protection against mechanical, thermal, and chemical agents.

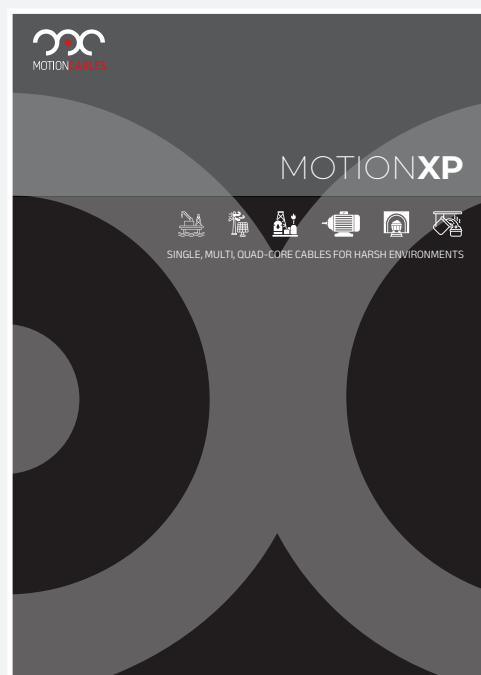
From the offshore sector to advanced robotics, they represent the ultimate choice for those who demand extreme performance and total safety.

MOTIONXP – Engineered for Extreme Motion and Harsh Environments. Tested. Certified.

Further information about codes and applications could be found in our relevant brochure:

MOTIONXP. You can download the brochure in pdf format from our website at:

<https://www.motioncables.com/specialcables/downloads/en>



MOTIONTECH APPENDIX

- ⦿ AN UNCONVENTIONAL GUIDE TO SELECTING THE RIGHT CABLE
- ⦿ IN MOTION: HOW A CABLE SURVIVES AUTOMATION
- ⦿ THE PARADOX OF FLEXIBILITY: WHEN SOFT MEANS STRONG
- ⦿ WHEN ELECTROMAGNETIC INTERFERENCE RUINS EVERYTHING
- ⦿ WHERE OIL SHOWS NO MERCY: THE CHEMISTRY OF FAILURE
- ⦿ ZERO ERRORS IN MOTION: ANATOMY OF A CABLE FOR CABLE CARRIERS
- ⦿ THE SMART CABLE: 5 SIGNALS THAT SPEAK WITHOUT WORDS
- ⦿ THE BEHIND-THE-SCENES OF MOTIONCABLES QUALITY
- ⦿ MOTIONTECHCORE: MOTIONCABLES RESEARCH & TEST CENTER

APPROVALS, REFERENCE TABLES, AND OTHER TECHNICAL USEFUL INFO

- ⦿ EMC FUNCTIONAL SAFE: INTERNAL CERTIFICATION QUALITY
- ⦿ UL & NFPA MARKING EXPLAINED
- ⦿ DESINA, CE & UKCA MARKING: A QUICK OVERVIEW
- ⦿ LLOYD, NSAI, UL APPROVALS & ECOLAB
- ⦿ MATERIAL CHARACTERISTICS
- ⦿ CABLES' MAIN ATTRIBUTES: OIL, FLAME, MOVEMENT
- ⦿ MM², AWG & KCMILS SECTION COMPARISON CHART
- ⦿ ELECTRICAL RESISTANCE TABLES
- ⦿ DIN 47100 COLOUR CODE - IEC AND VDE COLOURS ABBREVIATION
- ⦿ CENELEC HD 308 S2, CEI-UNEL 00722, DIN 4075, CEI/IEC 60446
- ⦿ GUIDELINES FOR A PROPER CABLES' HANDLING
- ⦿ GUIDELINES FOR A PROPER CABLES' INSTALLATION IN CABLE CARRIERS
- ⦿ PACKINGS - DRUMS' DIMENSIONS AND CAPABILITIES

AN UNCONVENTIONAL GUIDE TO SELECTING THE RIGHT CABLE

NO STANDARD SCHEMAS: PRACTICAL CHECKS AND 5 PROVOCATIVE QUESTIONS USING THE CRITERIA OF A REAL DESIGNER

FORGET THE TEMPLATES; WHAT YOU NEED ARE REAL ANSWERS.

When a designer is faced with selecting a cable, catalogues present a seemingly infinite number of codes, tables, and certifications. But in practice, what truly matters? A more hands-on approach is needed, one that considers the real-world factors.

This guide provides you with practical checkpoints and questions that will prompt you to think critically before making your final choice.

QUESTION 1: WHERE WILL THE CABLE FAIL?

It's not a trivial matter. Understanding where the cable will operate is the **key factor** that determines everything.

- Is it in a cable carrier?
- Will it be exposed to oils or chemical agents?
- Will it pass through dusty, wet, or mechanically stressful environments?

Choose the jacket and compound based on these conditions, not solely on what the data-sheets tell you.

QUESTION 2: HOW MANY TIMES WILL IT MOVE?

A static cable and a dynamic cable require **fundamentally different characteristics**.

- If the motion is continuous, you need a cable designed for at least 10 million cycles.

However, if the cable only moves during installation, its flexibility can be at a minimum.

QUESTION 3: WHICH SIGNAL IS THE MOST SENSITIVE?

Power, data signals, sensors, commands... Each type of signal requires specific protection.

- Is shielding against interference necessary?
- Is an hybrid cable with multiple separated conductors required?

Don't choose the cheapest cable; **choose the one that protects your signal**.

QUESTION 4: HOW MUCH SPACE DO YOU HAVE?

The cable's diameter and its rigidity are crucial if you need to route it through narrow conduits or into confined spaces.

QUESTION 5: WHAT'S THE REAL BUDGET?

Don't think only about the cost per meter. Consider the total cost of installation, maintenance, replacement, and machine downtime. A higher-performance cable may cost more upfront, but it can save you thousands over time

FINAL PRACTICAL CHECK

Key Aspect	What to Check	Why It Matters
Mechanical Durability	Certified number of flexing/torsion cycles	Longevity in dynamic environments
Chemical Compatibility	That the jacket and compound are tested for oils, solvents, and aggressive agents	To prevent swelling and degradation
EMI Shielding	Type and effectiveness of the shielding	Protection against electromagnetic interference
Operating Temperature	The temperature range in which the cable maintains performance	Reliability in hot or cold environments
Compatible Connectors	Availability of pre-assembled cables with suitable connectors	Ease of installation and maintenance

Provocative Advice:

Never rely solely on the datasheet. Talk to the manufacturer, and ask for real-world test data, usage examples, and application case studies. A good designer knows that theory is only the beginning.

CONCLUSION – CABLE SELECTION IS AN ART, NOT A FORMULA

With this guide, we didn't want to just teach you "what to choose," but how to think critically and practically. This is the only way you can truly make a difference in your project.

IN MOTION: HOW A CABLE SURVIVES AUTOMATION

A TECHNICAL JOURNEY THROUGH THE LIFE OF A CABLE IN AN INDUSTRIAL SYSTEM. DYNAMIC DATA, REAL-WORLD STRESS, AND COMMON FAILURES—AND HOW TO PREVENT THEM.

In an automated system, as robots move, presses close, and slides glide, a silent protagonist works without ever stopping: the cable.

Every day, it is bent, pulled, twisted, and impacted. It performs thousands of motion cycles, often in dirty, confined, and hostile environments. Yet, no one notices...Until it breaks.

A broken cable is not just a component to replace; it can shut down a line, damage a motor, or cause an entire machine to malfunction.

This is why **the design of a cable for automation is not just a technical matter. It is a matter of survival.**



THE DYNAMIC ENVIRONMENT: CABLE'S REAL ENEMIES

Every dynamic application presents unique challenges.



Here are the 5 PRIMARY STRESSES

a cable faces daily.

1. CYCLIC BENDING

In cable carriers, the cable is forced to bend thousands (or millions) of times at variable speeds. The jacket wears out and the conductors break.

2. ALTERNATING TENSION AND COMPRESSION

Every acceleration creates micro-stretching. If the cable doesn't have a stable core or the right layout, the internal conductors can migrate or deform.

3. TORSION

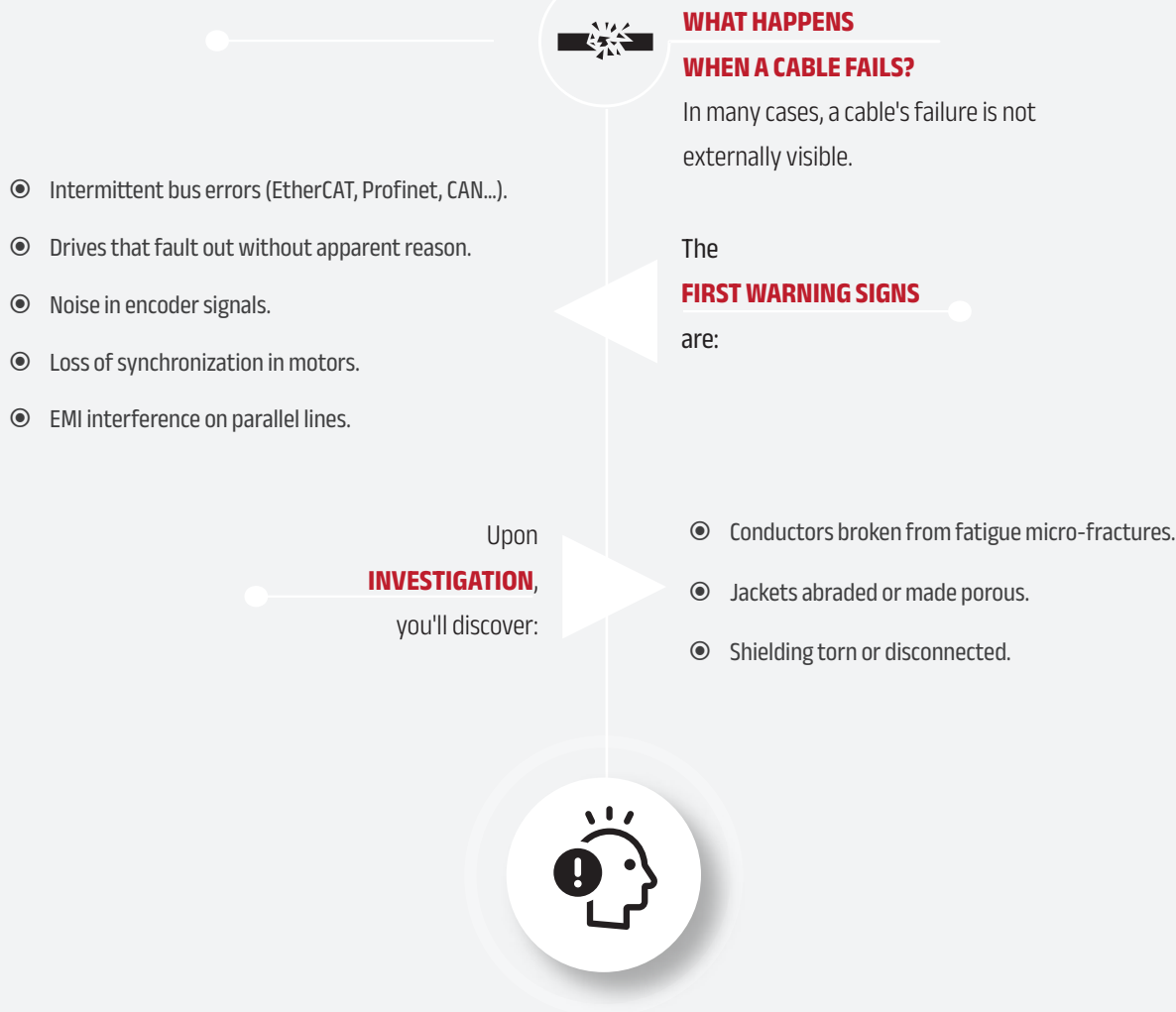
In many robotic applications, the cable not only bends but also rotates around its own axis. Even a few repeated degrees of rotation can cause damage.

4. ABRASION AND IMPACT

In production environments, contact with sharp edges, oils, metal residue, or other surfaces can damage the jacket and leave the conductors exposed.

5. THERMAL SHOCK AND CHEMICAL AGENTS

High temperatures, industrial oils, coolants, or welding sparks can compromise the cable's integrity in just a few months.



*In production, **every hour of downtime costs**. A cable not designed to last can cost more in machine downtime than in the initial purchase.*

HOW MOTIONCABLES DESIGNS FOR SURVIVAL

Behind every cable we design is an engineering philosophy that accounts for dynamic mechanics and extreme conditions. Some key elements include:

- **Optimized Axial Layout:** Conductors are arranged to evenly distribute stress.
- **Anti-Torsion Central Core:** Stabilizes the internal geometry of dynamic cables.
- **Extra-Fine Flexible Conductors:** Up to class 6 (IEC 60228) or higher, for extreme bending.
- **Special PUR or TPE Jackets:** With very high resistance to abrasion, oils, and micro-sparks.
- **Flexible Braided Shields + EMI Drain Wire:** Reduces breakage from bending and protects against electromagnetic interference.
- **Real-world tests in cable carriers** up to 10 million cycles.

THE PARADOX OF FLEXIBILITY: WHEN SOFT MEANS STRONG

A DEEP DIVE INTO THE MECHANICAL AND CHEMICAL CHARACTERISTICS THAT MAKE A CABLE FLEXIBLE YET INDESTRUCTIBLE. THIS IS MORE ABOUT TECHNICAL STORYTELLING THAN A DATASHEET.

INTRODUCTION – AN UNSEEN STRENGTH

In traditional mechanics, robustness is often associated with rigidity. A piece of steel, an aluminium joint, a welded frame: all are examples of apparent strength. But in automation, a cable that's too rigid is a design flaw. It breaks sooner, creates resistance, and impedes movement. In the worst cases, it transmits mechanical stress to actuators or connectors, causing cascading failures.

THIS, THEN, IS THE PARADOX:

THE MOST RESILIENT CABLE ISN'T THE HARDEST ONE, BUT THE MOST FLEXIBLE.

That's because true strength in automation lies in its ability to follow motion without ever breaking. Flexibility isn't an opinion; it's engineering.

But what makes a cable truly flexible without becoming fragile or vulnerable?

See the four points below for a more proper answer.

1. INTERNAL STRUCTURE

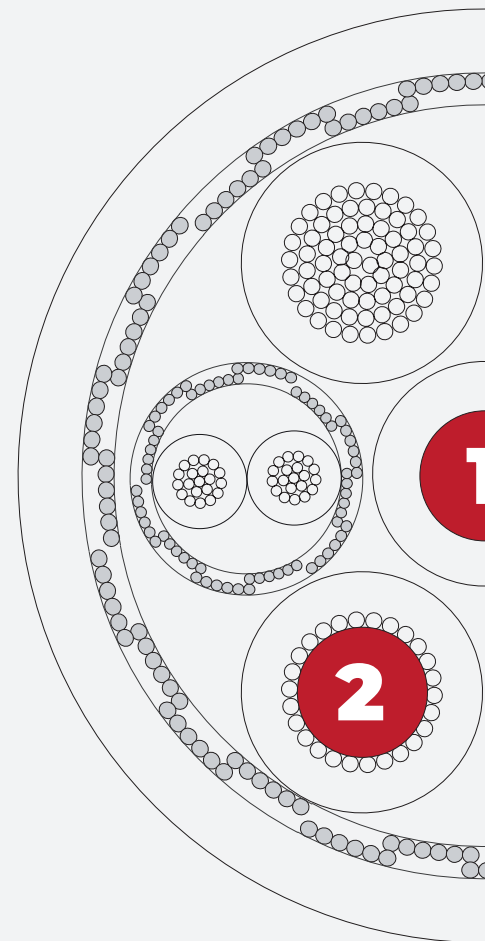
The conductors aren't arranged linearly; they're assembled around a central core. This allows for:

- Distributing bending stress over the entire length.
- Avoiding stress concentrations that would damage the insulation.

2. MULTI-STRANDED, ULTRA-FINE COPPER

The electrical core of a flexible cable is class 6 or higher tinned copper (IEC 60228), composed of hundreds of microscopic strands.

- The smaller the diameter of a single strand, the more the cable resists cyclic bending.
- This copper also has greater elasticity and fatigue resistance.



THE CHEMISTRY OF FLEXIBILITY: WHEN A MATERIAL MAKES A DIFFERENCE

Jacket Material	Flexibility	Chemical Resistance	Dynamic Life
Standard PVC	Low	Medium	100,000 - 500,000 cycles
PUR (Polyurethane)	High	High	1 - 10 million cycles
TPE	Very High	High/Variable	up to 10 million+ cycles
Silicone	Extremely High	Good, but mechanically fragile	>10 million cycles in low-abrasion environments

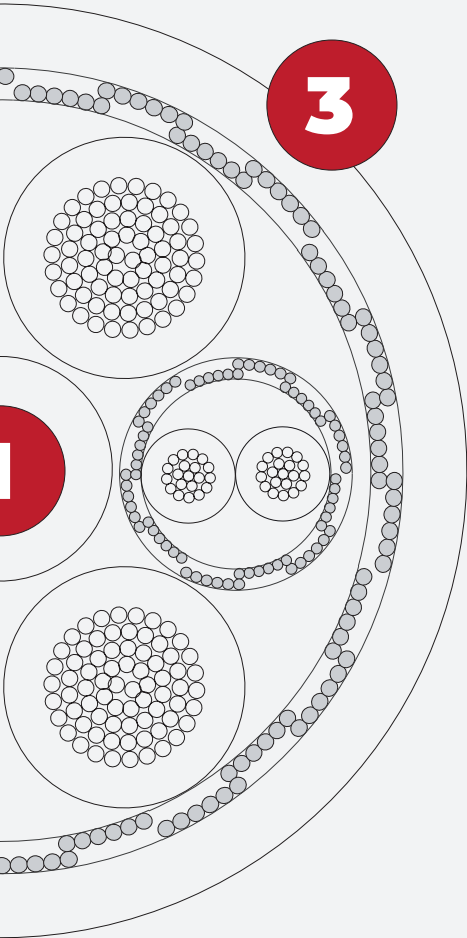
Each compound is tailored to the application, balancing: Flexibility, Oil resistance, Cut resistance and Thermal resistance.

HOW TO SPOT A FAKE FLEXIBLE CABLE

Many cables appear to be "flexible"... When new. But beware:

- ⦿ A jacket that's soft to the touch doesn't guarantee fatigue resistance.
- ⦿ A cable that bends easily can have strands that are too thick.
- ⦿ Initial flexibility tells you nothing about its performance after 500,000 cycles.

THE REAL TEST IS TIME. AND CYCLES.



3. "SMART" OUTER JACKETS

Materials like PUR (Polyurethane) and TPE-U are used instead of standard PVC. They offer:

- ⦿ High elasticity
- ⦿ Resistance to abrasion and cuts
- ⦿ Dimensional stability even in humid or chemically aggressive environments.

These materials are soft to the touch but outlast many "rigid" materials in the long run.

4. ABSENCE OF MECHANICAL MEMORY

A good flexible cable doesn't "remember" the imposed shape (be it a bend, a flex, or a twist). It's specifically engineered to return to its neutral state without accumulating internal stress. This is what prevents the cable from coiling or twisting permanently, which is a common cause of failure in less advanced cables.

MOTIONCABLES: THE ENGINEERING OF FLEXIBILITY

All our dynamic cables are designed with a clear objective: maximum flexibility without sacrificing durability, precision, and chemical resistance. Our cables are rigorously tested in:

- Cable carriers at speeds up to 4 m/s
- Robotic torsion of $\pm 180^\circ/\text{m}$
- Harsh environments with synthetic oils, welding, and cold down to -40°C

OUR FLEXIBILITY ISN'T AESTHETIC. IT'S STRATEGIC.

CONCLUSION – SOFT IS THE NEW STRONG

A rigid cable seems robust, until it's put in motion. A flexible cable, designed with expertise, lasts longer, follows the system better, and protects the electronics.

In a world where production never stops, choosing the right flexibility means choosing reliability.

WHEN ELECTROMAGNETIC INTERFERENCE RUINS EVERYTHING

A PRACTICAL ANALYSIS OF INDUSTRIAL NOISE AND THE INVISIBLE STRATEGIES (SHIELDING, GEOMETRIES, AND COMPOUNDS) THAT MAKE ALL THE DIFFERENCE.

In a modern plant, everything communicates: sensors, motors, PLCs, and field-buses. But sometimes, something goes wrong: an encoder starts giving erratic values, the servo skips a position or the PLC receives intermittent signals. And production stops.

Nothing is broken. Nothing is visible. Just... **Noise**.

Welcome to the world of electromagnetic interference. A world where electronics work, but can't hear.

INDUSTRIAL NOISE: A PRACTICAL, NOT A THEORETICAL, DEFINITION

In an automation environment, noise isn't a theoretical concept. It's a real physical problem that manifests itself in **three main forms**:



1. Radiated Interference

Emitted by motors, inverters, welders, or switching power supplies. These can "leak" into adjacent cables like a radio wave, disturbing analogue or digital signals.

2. Conducted Interference

Travels along power conductors and propagates through the power supply. It can re-enter control signals through common grounds or shields.

3. Capacitive or Inductive Coupling

Occurs between nearby cables (e.g., power and signal) or even within the same cable if it's poorly designed.

WHEN ELECTRONICS GO "DEAF"

Here are some typical signs of EMI interference in industrial systems:

- ⦿ **Servos that fault out** without apparent reason
- ⦿ **Unstable field-buses** (Profinet, EtherCAT, CAN)
- ⦿ **Fluctuating values** from encoders or analogue sensors

- ⦿ **Relays** or digital outputs that **activate on their own**
- ⦿ Repeated **checksum or CRC errors in data**

The right cable can solve all of this.

The wrong cable will amplify it.

MOTIONCABLES: SMART SHIELDING, ANTI-INTERFERENCE GEOMETRIES

1. Differentiated Shielding by Function

- ⦿ High-coverage (>85%) tinned copper braid for general shielding.
- ⦿ Aluminium/polyester (PET-AL) foil for high-frequency shielding.
- ⦿ Dual shielding (foil + braid) for critical data or hybrid cables.

2. Physical Separation of Signals

- ⦿ In hybrid cables (carrying signal, power, and feedback), we separate the internal bundles with filling barriers, insulated cores, or specific dielectric materials.

3. Calibrated Twist and Lay Length

- ⦿ Conductors are twisted with a differentiated lay length to prevent internal coupling.
- ⦿ Helical geometries are used to cancel out emission lobes.

4. Ground Continuity

- ⦿ The design is engineered to ensure electrical continuity of the shield all the way to the connector.
- ⦿ This prevents passive "antennas" created by poorly terminated shielding.

5. Compounds with Low Dielectric Constant

- ⦿ Internal insulators made of PE or PP reduce parasitic capacitance and unwanted filtering effects.
- ⦿ TPE/PUR jackets protect the shielding, even under mechanical stress.

CHECKLIST: SHIELDING ONLY PROTECTS YOU IF...

- ☑ It's continuous and well-grounded (on both sides, when necessary).
- ☑ It has a coverage of over 80%.
- ☑ It's designed for the type of interference expected (high or low frequency).
- ☑ Adjacent cables are well-separated physically or individually shielded.
- ☑ The mechanical layout avoids "ground loops" or EMI loops.

BEYOND THE CABLE: THE INTERCONNECTION MAKES THE DIFFERENCE

A poorly terminated shielded cable is just like a leaky pipe. MOTIONCABLES offers fully pre-assembled solutions where:

- ⦿ Shields are connected 360° to EMC cable glands.
- ⦿ Connectors are chosen based on the type of signal and frequency.
- ⦿ Shielding continuity and resistance tests are certified.



EMI PROTECTION LEVELS BY SIGNAL CATEGORY

Signal Type	Sensitivity to EMI	Typical Interference Source	Recommended Shielding	Additional Technical Notes
AC Power (motors)	LOW (emits, doesn't suffer)	Inverters, PWM, inrush currents	None or copper braid to contain emissions	Possible inductive coupling on adjacent signals
Encoder Feedback	HIGH	Radiated or conducted EMI from motors	Dual shielding (foil + braid)	Tightly twisted pair; pay attention to grounding
Analog Signals (0–10V, 4–20 mA)	VERY HIGH	Inverters, welding, switching PSUs	Braid ≥ 85% or individual shielding	Layout separate from power, shield connected to ground
Fieldbuses (Profinet, CAN, Ether-CAT, Profi-bus)	HIGH	Crosstalk, capacitive coupling	Dual shielding + calibrated twist	EMC connectors + 360° shielding; pay attention to terminations
Digital I/O (24V, PWM)	MEDIUM	Switching power supplies, inductive loads	Standard shielding + physical separation	Less sensitive but should be shielded if near analog signals
Hybrid Cables (power + signals + data)	CRITICAL	Internal (coupling) and external	Combined shielding + internal separation	Internal distances and dielectric materials are fundamental

TYPES OF SHIELDS

- ☉ **Copper Braid:** Good for low frequencies, provides mechanical protection, and drains conducted EMI.
- ☉ **Aluminium Foil (PET-AL):** Effective at high frequencies, lighter, and less mechanically resistant.
- ☉ **Dual Shielding:** Offers maximum protection, and is used in high-noise environments or critical hybrid cables.
- ☉ **Individual Shielding:** Used in multi-core cables to isolate sensitive individual signals (e.g., multiple sensors).

CONCLUSION

Noise Isn't Seen, but It Costs You

In the industrial world, a plant can grind to a halt not because of human error, but because of a silent disturbance. Electronics go deaf, and no one knows why—**until you look inside the cable.**

WHERE OIL SHOWS NO MERCY: THE CHEMISTRY OF FAILURE

A SECTION DEDICATED TO REAL CHEMICAL RESISTANCE: SYNTHETIC OILS, EMULSIONS, REFRIGERANTS, AND HOW TO DESIGN FOR SURVIVAL.

In many workshops, factories, and production lines, cables don't break from bending or tearing. They slowly dissolve, swell, and crack. They don't explode. But they surrender.

The cause? Oils. And not just any oils, but high-penetration, synthetic ones, full of additives and capable of getting in everywhere. No label warns you when it's too late. But the signs are always there. Always.

COMMONLY USED INDUSTRIAL OILS

- **PAO or ester-based synthetic oils**, used in high-efficiency gearboxes and axes.
- **Alkaline cooling emulsions**, loaded with biocides and surfactants.
- **Aggressive solvent-based detergents** in automatic wash-downs.

These agents don't simply wet the cable; they attack it at a molecular level. If the compound isn't compatible, the damage is only a matter of time.

CONSEQUENCES ON 'INCOMPATIBLE' CABLES

JACKET SWELLING

Oil penetrates altering material's structure

MECHANICAL CREEP

cable loses elasticity and deforms

SURFACE CRACKS

Micro-cracks that turn into break points

INSULATION EXPOSURE

loss of electrical protection

COPPER CONDUCTOR

BREAKAGE

due to contamination

**Result: short circuits, malfunctions
AND PLANT DOWNTIME.**

CHECKLIST: CHOOSING THE RIGHT CABLE IN AN OILY ENVIRONMENT

- ✓ Is the oil used known for its aggressiveness (synthetic, ester-based, high pH)?
- ✓ Will the cable be exposed to continuous splashing, immersion, or oil vapour?
- ✓ Is the jacket material compatible (PUR > TPE > PVC)?
- ✓ Is the shielding encapsulated or exposed?
- ✓ Are there available tests for that specific oil?

HOW TO DESIGN A CABLE THAT CAN WITHSTAND OILS PROPERLY

1. Choosing the right jacket material

Jacket Material	Resistance to Synthetic Oils	Notes
Standard PVC	LOW	Economical, but unsuitable for oily environments.
PUR (Polyurethane)	HIGH	Excellent resistance to oils and abrasion.
TPE-U	MEDIUM/HIGH	Good alternative where flexibility is also required.
TPR / TPE-O	VARIABLE	Depends on the specific formulation.

MOTION**CABLES** uses specially selected and immersion-tested PUR according to DIN EN 50363-10-2 or equivalent standards.

2. Using a Closed and Compact Structure

- ☉ No cavities where oil can infiltrate.
- ☉ Hydrophobic fillers that repel liquids and moisture.
- ☉ Co-extruded jackets with encapsulated shielding.

3. Running Accelerated Testing in Real-World Environments

Every oil-resistant cable is laboratory-tested for:

- ☉ Mechanical resistance after 1000-hour oil immersion.
- ☉ Accelerated aging in the presence of oxygen, UV, and oils. Dielectric strength after chemical stress.

EMI PROTECTION LEVELS BY SIGNAL CATEGORY

Oil/Fluid Family	Common Products example	PVC	TPE TPV	PUR	TPE-U	SIL	Technical Notes
Standard mineral oils	Esso Nuto, Shell Tellus						PVC can harden over time; PUR offers excellent mechanical stability.
PAO/ester-based synthetic oils	Mobil SHC, Klüber Synth, Fuchs Renolin						Extremely aggressive towards PVC and silicone.
Cooling emulsions (oils + water + additives)	Blaser, Castrol Hysol, Cimcool						Be aware of alkaline pH (>8.5) and the accumulation effect.
Straight cutting oils (non-emulsified)	Fuchs Ecocut, Shell Macron						Slow but very destructive penetration for PVC and silicone.
Hydraulic oils with anti-wear additives (ZnDTP)	Tellus S2, Total Azolla, Eni Arnica						Additives can accelerate the degradation of PVC.
Oil mists (pneumatic lubrication, axes)	Aeroshell, Mobil DTE, WD-40						The aerosol form penetrates micro-cracks and can attack standard jackets.
Industrial detergents / degreasers	Henkel Bonderite, P3, detergenti pH > 10						They require specific tests; caution is advised in environments with cyclical washdowns.

Icon legend

 **Excellent**  **Good** - No degradation detected in prolonged tests (>1000h), with a stable behaviour  **Medium / Variable** - Compatibility is dependent on temperature, concentration or exposure cycle.  **Poor** - Obvious degradation upon immersion, swelling and loss of elasticity.

ZERO ERRORS IN MOTION: ANATOMY OF A CABLE FOR CABLE CARRIERS

INTELLIGENT DESIGN FOR DYNAMIC ENVIRONMENTS: CONSIDERATIONS ON RADIUS, TORSION, LIFESPAN, AND INTERNAL LAYOUT

In dynamic industrial environments, every cycle is a fatigue test. Cables are there, flexing and closing in on themselves **hundreds of thousands of times a day**. A design flaw isn't immediately visible. But after 2 million cycles, 4 months, or 600 kilometres of travel... It breaks. Silently. And then everything stops. You have to **find the perfect balance between freedom and control**. A good cable for a cable carrier isn't just flexible. It is:

- ☉ **Predictable** in its mechanical behaviour.
- ☉ **Designed to repeat the motion**, millions of times.
- ☉ **Inert at just the right point**—it doesn't slide too much, nor does it get stiff.

At MOTION**CABLES**, we design every detail of these cables with an almost mechanical philosophy:

The cable isn't just a conductor. It's a moving component.

CHECKLIST: QUESTIONS BEFORE DESIGNING A DYNAMIC CABLE

- ☒ How many annual cycles will the cable perform?
- ☒ How long is the chain running length (in meters)?
- ☒ What's the maximum operating temperature?
- ☒ Is there any axial torsion during the cycle?
- ☒ There are liquids, dust, swarf and chips present?

Every answer influences the internal layout, the jacket, and the shielding.

CONCLUSION

A cable for a cable carrier must not only transmit power or data. **It must survive the repeated motion, with surgical precision, millions of times.**

At MOTION**CABLES**, every dynamic **cable is conceived as a kinematic element**, designed to endure as a structural component, **not a sacrificial accessory**.

1 - THE INTERNAL LAYOUT IS EVERYTHING

1



Twisted conductors with optimized lay length:

Prevents torsion build-up.

Flexible, shaped fillers:

Prevents collapse and ovalisation.

Central strain relief element (Kevlar or similar):

Absorbs longitudinal fatigue.

Slides smoothly on the guide
but doesn't slip internally.
Resists micro-fractures
from -50°C to +90°C.
Doesn't create a memory effect
that causes the radius to collapse.

2

2 - THE JACKET IS NOT JUST A SKIN



3 - THE MINIMUM BEND RADIUS ISN'T IMPROVISED

3



Cable Type	Dynamic Suggested Radius
Flexible signal cable	$10 \times D$
Hybrid cable (signal + power)	$12 \times D$
Fiber optic cable	$15 \times D$
Torsion cable (robot axis 6)	$10-15 \times D + \text{twist}$

It's not enough to say "10 million cycles."

You need to know:
At what **speed**?
With what **acceleration**?
At what **temperature**?
At what **radial load**?

4

4 - THE CYCLE IS A SCIENCE, NOT A NUMBER



5 - THE DETAILS MAKE THE DIFFERENCE

5



Extra-fine copper conductors:

(class 6 or higher): Flex resistance.

Elastic anti-crack insulation:

(modified polyolefin).

Indelible laser marking:

to prevent abrasion from movement.

Floating spiral shielding:

Doesn't break the copper but absorbs movement.

COMPARATIVE CHART: FLEXIBLE STANDARD VS TRUE DYNAMIC JACKETS

Characteristic	Standard Flexible Jacket (e.g., PVC, TPE-based)	True Dynamic Jacket (e.g., Dynamic PUR, MotionCables TPE-U)
Flex Cycle Resistance	Up to 1–2 million cycles	10–20+ million cycles (real-world tests)
Behaviour in Tight Radius	Tendency to collapse or flatten	Controlled elastic return no ovalization
Friction Against Guide Walls	Medium/High risk of gripping/jamming	Low friction Smooth travel
Memory Effect	High Especially in the cold	Controlled elastic memory maintains shape in the chain
Longitudinal Tensile Resistance	Limited risk of stretching	Integrated reinforcements force transmission to the core
Micro-cracking Resistance	Low especially with oils or cold	Very high no fractures under stress
Working Temperature (Useful range)	-30°C to +90°C	-50°C to +90°C (peaks +120°C)
Compatibility with Oils / Swarf and Chips	Variable Visible degradation	Excellent Tested on mineral/synthetic/ester-based oils
Behaviour in Rapid Accelerations	Possible deformation	Geometric stability up to 20 m/s ²
Expected Lifespan in Cable Carriers	3–12 months in cyclical environments	24–60+ months (Depends on the cycle)
Initial Cost	Lower	Medium / High (But better ROI over the lifecycle)

TECHNICAL NOTES

The above chart data are based on tests conducted in controlled environments (EN 50396, IEC 60245, MOTIONCABLES internal tests).

The real difference doesn't emerge in the first 100,000 cycles, but after millions, when internal stresses accumulate damage.

The concept of 'flexible' vs 'dynamic' is fundamental: many cables are soft when new, but they break under cyclical fatigue.

THE SMART CABLE: 5 SIGNALS THAT SPEAK WITHOUT WORDS

HOW TO INTERPRET THE SYMPTOMS OF AN AGED, OVERHEATED, OR STRESSED CABLE.

A cable isn't just a wire wrapped in a jacket: it's a living indicator of your plant's condition. If you learn to "read" it, it can save you from sudden and costly machine downtime.

But what are the warning signs? And how do you interpret them?

MOTION**CABLES** guides you with a simple, visual checklist to become a true expert in "cable language."



SIGNAL 1: THE SWEATING JACKET

SYMPTOM:

Presence of surface cracks, swelling, or oily residue.

WHAT IT MEANS:

The jacket is losing elasticity, likely due to exposure to aggressive oils or incompatible chemical agents. It can also indicate progressive thermal degradation or exposure to UV rays.

RECOMMENDED ACTIONS:

- Inspect the chemical compatibility (see chemical table).
- Check if the jacket complies with the one specified for the environment.
- Evaluate preventive replacement.



SIGNAL 2: THE UNRAVELING INSULATION

SYMPTOM:

Partially exposed conductors or insulation with micro-cracks.

WHAT IT MEANS:

- Repeated mechanical stresses, bending beyond the limit, or unforeseen torsions.
- Thermal stress or aggressive agents have weakened the insulating material.

RECOMMENDED ACTIONS:

- Check the bend radius.
- Verify if the jacket has sustained abrasion from swarf/chips or moving parts.
- If the damage is visible, replace the cable immediately to prevent short circuits.



SIGNAL 3: THE HEAT THAT WON'T DISSIPATE

SYMPTOM:

the jacket appears discoloured, deformed, or slightly melted in specific spots

WHAT IT MEANS:

- Electrical overload or poor thermal dissipation.
- Issues in the power supply system or with the connections.

RECOMMENDED ACTIONS:

- Monitor the operating temperature.
- Evaluate if the cable is oversized for the application.
- Inspect the connections and terminals for oxidation or looseness.



SIGNAL 4: THE TREACHEROUS TORSION

SYMPTOM:

The cable shows signs of irregular twisting, abnormal bends, or knots.

WHAT IT MEANS:

- The cable has been subjected to torsional movements not foreseen by the design.
- This can lead to the breakage of internal conductors and intermittent failures.

RECOMMENDED ACTIONS:

- Check the bend radius.
- Verify if the jacket has sustained abrasion from swarf/chips or moving parts.
- If the damage is visible, replace the cable immediately to prevent short circuits.



SIGNAL 5: THE INVISIBLE NOISE

SYMPTOM:

Signal interference, communication errors, or increased electrical noise.

WHAT IT MEANS:

- Shielding problems or deterioration of the conductive jackets.
- External electromagnetic contamination or degradation of the shielding.

RECOMMENDED ACTIONS:

- Verify shielding integrity (continuity or resistance test).
- Replace the cable with one that has more robust shielding if the electromagnetic environment is severe.
- Use filters or compensation systems.

MOTION**TECHCORE**: MOTIONCABLES RESEARCH & TEST CENTER

TECHNOLOGICAL MISSION

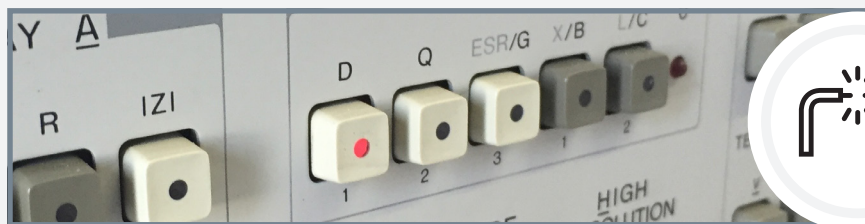
At the heart of **MOTIONCABLES** is an applied research centre dedicated to the science of durability: **MOTIONTECHCORE**. Each cable is subjected to electrical, mechanical, chemical and thermal stresses to anticipate its behaviour in the field and certify that it survives millions of cycles in continuous motion. The centre is divided into **SIX INTEGRATED FUNCTIONAL AREAS**, each equipped with proprietary instrumentation and methodologies based on IEC, CEI, UL, ISO and EN standards.

1

ELECTRICAL AND COMMUNICATION TESTS

ADDED VALUE MOTIONCABLES

Electrical tests are repeated before and after dynamic tests, to quantify the progressive degradation of signal and insulation parameters.



OBJECTIVE: ENSURE ELECTRICAL INTEGRITY, EMC COMPATIBILITY AND TRANSMISSION STABILITY. TESTS (INSTRUMENTATION AND FUNCTIONAL CHARACTERISTICS) PERFORMED:

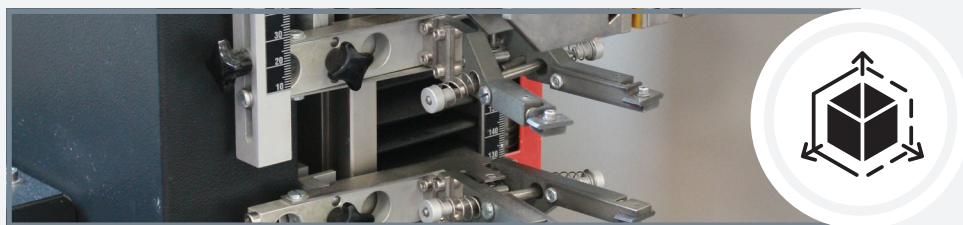
- ◉ **VOLTAGE DIELECTRIC:** measured using voltage generators up to 15 kV AC/DC for dielectric strength and partial discharge tests.
- ◉ **LF ELECTRICAL PARAMETER:**
measured using Calibrated Digital Multimeter
 - ▶ **ELECTRICAL RESISTANCE:** According to IEC 60228
 - ▶ **CAPACITANCE**
 - ▶ **INDUCTANCE**
- ◉ **INSULATION RESISTANCE:**
measured using HiPot Insulation Meter up to 10 kVdc
- ◉ **HF ELECTRICAL PARAMETER:**
measured using Calibrated Digital Multimeter
 - ▶ **CHARACTERISTIC IMPEDANCE:**
measured using TDR /VNA analysers up to 4.5 GHz
 - ▶ **ATTENUATION:**
measured using LAN NETWORK analyser up to 1 GHz
 - ▶ **REFLECTION** measured using LAN NETWORK analyser up to 1 GHz
 - ▶ **NEXT/FEXT crosstalk** measured using LAN NETWORK analyser up to 1 GHz
 - ▶ **EMC compatibility**, measured using measure system according to EN 61000 for measures up 100 m lengths.

2

DIMENSIONAL AND MATERIAL ANALYSIS

ADDED VALUE MOTIONCABLES

Dimensional data is integrated into thermomechanical FEM models.



OBJECTIVE: GEOMETRIC CONTROL AND CONSTANCY VERIFICATION OF INSULATING COMPOUNDS AND SHEATHS:

- ◉ **HARDNESS:** Shore A/D hardness testers, density meters, analytical balances (0.001 g).
- ◉ **STRUCTURAL COMPOSITION:** measured using FT-IR spectrometry for compositional traceability.
- ◉ **TENSILE & ELONGATION:** measured using dynamo-meter with load cell up to 1 kN and estensimeter up to 1 m.
- ◉ **DIMENSIONAL FEATURES:** Laser profilometers and 3D optical systems (accuracy $\pm 1 \mu\text{m}$).

3

DYNAMIC AND MECHANICAL TESTS



OBJECTIVE: TO SIMULATE REAL OPERATING LIFE IN CONTINUOUS MOTION AND TWISTING:

- ◉ **LIFECYCLE IN LONG TRAVEL DRAG CHAIN**
travel 110 m Speed 6 m/s
acceleration 30 m/s^2 bending radius 40–250 mm
- ◉ **LIFECYCLE IN SHORT TRAVEL DRAG CHAIN**
travel 2 m Speed 10 m/s
acceleration 60 m/s^2 bending radius 40 – 100 mm
- ◉ **TORSION CYCLES**
performed on Torsion systems
 $\pm 720^\circ/\text{m}$ up to 60 cycles/minute.
- ◉ **ALTERNATE BENDING CYCLES**
performed Tick-Tock system
 $\pm 135^\circ/\text{m}$ up to 60 cycles/minute.
- ◉ **FLEXURE ON PULLEYS**
travel 10 m Speed 6 m/s
acceleration 30 m/s^2 bending radius 80–300 mm).
- ◉ **COMBINED FLEXURE + TORSION + TENSILE TESTS FOR ROBOTIC APPLICATIONS**

4

ENVIRONMENTAL AND CHEMICAL-PHYSICAL TESTS

ADDED VALUE MOTIONCABLES

We use the internal Triple Stress Simulation (TSS) protocol that simultaneously integrates thermal, mechanical and chemical stresses — unique in the industry.



OBJECTIVE: TO VERIFY THE RESISTANCE OF MATERIALS IN EXTREME ENVIRONMENTS:

- ◉ **FLUID RESISTANCE** performed by Immersion tanks in synthetic oils, refrigerants, solvents (IEC 60811-404).
- ◉ **ENVIRONMENTAL ENDURANCE**
 - ▶ Climate chambers $-60 \div +250$ °C, humidity 10–98 %.
 - ▶ UV-Xenon and ozone chambers (ISO 4892-2)
 - ▶ Salt tanks (ASTM B117) and thermal shock tests (ΔT 200 °C/min).
 - ▶ Combined cycles (oil + heat + movement) for multiple stresses

5

SAFETY, FLAME

ADDED VALUE MOTIONCABLES

Correlation between combustion properties and residual mechanical strength



OBJECTIVE: TO ENSURE COMPLIANCE AND SAFETY IN ALL CONDITIONS:

- ◉ Vertical/horizontal flame spread (IEC 60332-1-2/3, UL VW-1, FT1/FT2).

5

HALT ACCELERATED TESTING

ADDED VALUE MOTIONCABLES

Methodology borrowed from the aerospace sector, applied to industrial dynamic cables



OBJECTIVE: QUICKLY IDENTIFY STRUCTURAL LIMITATIONS AND PROCESS DEFECTS

- ◉ **HALT** (Highly Accelerated Life Test): combination of torsion, vibration, heat, electric shock.

SYNOPTIC TABLE TEST CAPABILITIES

Category	Parameters	Range / Capacity	Standard	Purpose
Electric	Impedance, attenuation, stiffness, leakage	≤15 kV / 1 GHz	IEC 60228, UL 2556	Electrical integrity
Dimensional	Ø, thicknesses, hardness, density	±1 µm / 0–100 ShA/D	IEC 60811, ISO 48	Geometric constancy
Dynamic	Bending, twisting, pulling, vibration	10 m / 6 m/s / ±720°	EN 50396, ISO 527	Mechanical durability
Environmental	T, RH, UV, O3, Oil	–60 ÷ +200 °C RH 10–98 %	IEC 60811-504, ISO 4892	Resistance in the field
Safety	Flame, gas, burst, flue gas	10 bar / OI ≥ 30 %	IEC 60332, UL VW-1	CPR and safety
Predictive	Strain, temp., fatigue	AI Multi-Sensor	IEC 60068, MC-HALT	Remaining service life

OUTPUTS AND RELEASABLE CERTIFICATIONS

Document Type	Description	Purpose
Official Test Report (MC-TR)	Detailed document with set-ups, tools, results, deviations, photographs, graphs.	Mechanical/electrical performance certification.
Dynamic Life Certificate (MC-DLT)	Certificate of durability in millions of cycles, test performed on cable and torsion bench.	Guaranteed service life validation.
HALT/HASS Summary Report	Synthetic report with degradation curves and failure modes.	Predictive analytic and reliability.
Material Characterization Datasheet	FTIR analysis of compounds.	Material traceability.
Technical Test Dossier (TTD)	Comprehensive collection for audits and OEM customers.	Third-party verification and benchmarking.

APPROVALS, REFERENCE TABLES, AND OTHER TECHNICAL USEFUL INFO

EMC FUNCTIONAL SAFE:

INTERNAL CERTIFICATION QUALITY



IMMUNITY TO FTB*
DISTURBS

IEC 61800-3
IEC 61800-4
IEC 61800-5

In the modern industrial context, the Electromagnetic Compatibility (EMC) of drive systems is crucial for ensuring operational continuity, functional safety, and regulatory compliance. IEC Standard 61800-3, which governs the EMC requirements for power converters in variable-speed electric drive systems, includes the Fast Transient Burst (FTB) immunity test as one of the most significant evaluations.

This test assesses the resilience of drive systems to high-frequency impulsive interference simulated directly on the power conductors, realistically replicating disturbances present in complex industrial environments, such as those generated by contactor, disconnectors, and inductive loads. In this scenario, the quality and structure of the electrical cable play a fundamental role.

MOTIONCABLES: TESTED ACCORDING TO IEC 61800

Our cables have undergone FTB tests according to IEC 61800 under two critical operating conditions:

- Non-moved cables (fixed installation).
- Cables after flexing cycles in cable carriers (dynamic environments).

FIXED INSTALLATION

Cables tested directly on complete drive systems (drive + motor) in standard configurations. They ensure excellent shielding performance and power transmission immune to impulsive disturbances. Verification of shielding continuity and transfer impedance stability.

INSTALLATION IN DYNAMIC ENVIRONMENTS (CABLE CARRIER)

Subjected to intensive flexing cycles (>5 million cycles) in simulated environments with high mechanical stress, they demonstrate mechanical resistance without degradation of EMC performance, even after wear from tension, bending, and torsion.

EMC TESTING ON HYBRID CABLES

A particularly relevant aspect is the application of EMC tests to hybrid cables, which integrate:

- Power conductors for motor supply
- Data elements for encoder feedback (incremental, sin/cos, Hiperface, EnDat, etc.)

These cables, increasingly common in advanced automation, represent a significant technical challenge: the coexistence of high-voltage power lines and low-power, high-sensitivity signals requires precise design and thorough EMC verification.

At MOTIONCABLES, these hybrid cables are tested in their actual configuration, including:

- **Direct FTB injection on the cable**, with verification of effects on encoder signals
- **Analysis of the internal signal**, control of the **integrity** of multiple shields and electromagnetic decoupling between sections
- **Post-flexing test in a cable carrier**, to certify that the integrated shielding (both global and local) maintains its effectiveness even after intense mechanical stress

This ensures that MOTIONCABLES hybrid cables are suitable not only from a mechanical perspective but also EMC-functional-safe for use in advanced motion control and robotics systems.

*A fast transient burst (FTB), also known as an Electrical Fast Transient (EFT), is a series of high-frequency, short-duration electrical pulses or spikes that occur on power and signal lines due to the rapid switching of inductive loads. These bursts can disrupt or damage electronic equipment, so Electrical Fast Transient Immunity (EFT) testing (acc.to IEC 6100 4-4) is used to ensure devices can withstand these disturbances.

UL & NFPA MARKING EXPLAINED

UL AND NFPA MARKING

The UL Listed refers to a type of cable for fixed installation in both commercial and industrial sectors. The listed cables not only must comply with UL standards, but also be in accordance with the **NEC (National Electric Code)**.

The NEC provides a list of detailed rules on the correct installation and use of cables. The cables can be used for connections between the various elements, equipment, electric tools, machines or for the feeding of the structure in accordance with the NFPA 79 and NFPA 70

UL LISTED CODIFICATION EXAMPLES:

MTW	Machine Tool Wiring
TC	Tray Cable
PLTC	Power Limited Tray Cables
WTTC	Wind Turbine Tray Cable
THHW	Thermoplastic High Heat resist. Water
THWN	Thermoplastic High Wet resist. Nylon
ER	Exposed Run
DB	Direct Burial

MARKING FOR AWM CABLES

AWM

Abbreviation for **Appliance Wiring Material**, comprises a series of specific cables for installation in an industrial environment for the connection and the supply of electric instruments, control cabinets

USA	CANADA	CANADA & USA		
			Recognition Marks	
			Listing Marks	UL test and certification
			Validity Marks	
(UL certified products) UL mark	(CSA conforming products) C-UL mark	(UL certified products/ CSA conforming products) C-UL mark		
 NRTL	 US	 NRTL /C	 C US	CSA test and certification
(UL conforming products) CSA NRTL / CSA us mark	(CSA certified products) CSA mark	(CSA certified products/ UL conforming products) CSA NRTL / CSA us mark		

and industrial machineries. The AWM does not apply to on-site wiring cables. The cables marked AWM are to be used as determined by the reference style. The use of "listed" or "recognized" cables allows the producer of an automatic machine or other electrical instrument not an immediate if not much more simple, functional procedure in obtaining the "UL listing" for that product.

NFPA

NFPA 79 is a section of the **NEC** (National Electric Code) that defines the types of cables to be used on automatic machines. It applies to individual components and to configurations of components that operate together on different machines. The application of NFPA 79 includes all electrical and electronic components of an automatic machine operating at a maximum voltage of 600V.

DESINA, CE & UKCA

MARKING: A QUICK OVERVIEW



DESINA (DistributEd and Standardised INstAllation technology)

DESINA is an acronym that applies to automatic machines and automated production systems construction. **DESINA** is a specification for standardizing electrical, hydraulic and pneumatic components and their interconnection on the most common CNC-controlled platforms. **DESINA** specifies the installation, and the characteristics of the various parts to obtain a unified system, independent of a specific Fieldbus protocol and capable of operating even in harsh environments. **DESINA** is not a further Fieldbus specification.

RAL 2003	ORANGE - Shielded servo-cable
RAL 6018	GREEN - Measuring systems cable, Shielded
RAL 4001	VIOLET - Field Bus, hybrid cable with fibre optic
RAL 1021	YELLOW - Sensor Unshielded cable
RAL 9005	BLACK - Output Unshielded cable
RAL 7040	GREY - Unshielded 24V control cable



THE CE MARKING

The manufacturer must apply the CE marking to products that fall within specific application directives of the European Community (EU). The affixing of the CE marking confirms that the product complies with the requirements established by the European directives.

The mark serves as evidence for the supervisory authorities and is too often misinterpreted as a symbol of "safety and quality", which causes the customer to request it even without any legal justification.



UKCA MARKING

The **UKCA (UK Conformity Assessed)** marking is the new UK product mark that must be used for products placed on the market in Great Britain (England, Wales and Scotland) to demonstrate their compliance with the technical regulations in force in the UK.

You can continue to use the CE marking for goods placed on the market in Great Britain until 1 January 2025. The UKCA mark must be used for placing on the market in Great Britain from that date.

The UKCA mark can also be used before this deadline. The UKCA mark covers the majority of products which previously required CE marking and is in force from 1 January 2021 for all new products placed on the market - and will be in force for all products placed on the UK market from 1 January 2025, replacing or adding to the CE marking.

The UKCA mark alone cannot be used for goods placed on the market in Northern Ireland, which requires CE marking or the UK(NI) mark.

LLOYD, NSAI, UL & ECOLAB APPROVALS



MOTION**CABLES** has achieved significant approval from **Lloyd's Register** for its specialty cables intended for the maritime sector.

This certification recognizes

the reliability and quality of MOTION**CABLES**, particularly for dynamic laying applications in marine environments, where ensuring resistance and performance even in extreme conditions is essential. It is a confirmation of the high performance of MOTION**CABLES**, which have undergone rigorous testing to ensure they meet

the most demanding specifications for the maritime field. Specialty Cables for Dynamic Laying in Marine Environments
MOTION**CABLES**' specialty cables are ideal for dynamic laying maritime applications, such as those where the cable is subject to constant movement and flexing, typical of vessels and offshore platforms.

These cables are used for:

- ⦿ Automation and control systems for motors onboard vessels.
- ⦿ Critical communications for navigation and

ADVANTAGES OF LLOYD'S REGISTER APPROVAL

Advantage	Benefits
High Environmental Resistance	Ensures performance in harsh environments, such as high salinity and extreme marine conditions.
Reliability and Safety	Reduces the risk of failures, increasing the safety of onboard operations.
Long Durability	Reduced maintenance needs due to the extended lifespan of the cables.
Dynamic Laying Performance	Ideal for applications with frequent movements and stresses.

The approval from **Lloyd's Register** reinforces MOTION**CABLES**' position as a supplier of high-quality cabling solutions for the maritime sector. The certified cables are designed to ensure excellent performance in extreme environmental conditions and dynamic laying applications, offering reliability, durability, and safety for naval systems. Thanks to this certification, MOTION**CABLES** provides customers with the assurance of using cables designed to last and optimize performance onboard vessels.





MOTION**CABLES** has achieved approval from the NSAI (National Standards Authority of Ireland) for compliance with **STANDARD R118 for its specialty cables.**

This certification attests to the ability of MOTION**CABLES**' products to meet the high safety and performance requirements demanded in the automotive sector, particularly regarding resistance to fire, extreme temperatures, and mechanical stress.

Applications of R118 Specialty Cables

The R118 certified specialty cables are designed for various applications in the transportation sector, including:

- ⦿ Power supply and energy management systems.
- ⦿ Wiring harnesses for electric, hybrid, or industrial vehicles.
- ⦿ Electronic control, diagnostics, and sensor systems.
- ⦿ Vehicle onboard safety systems.

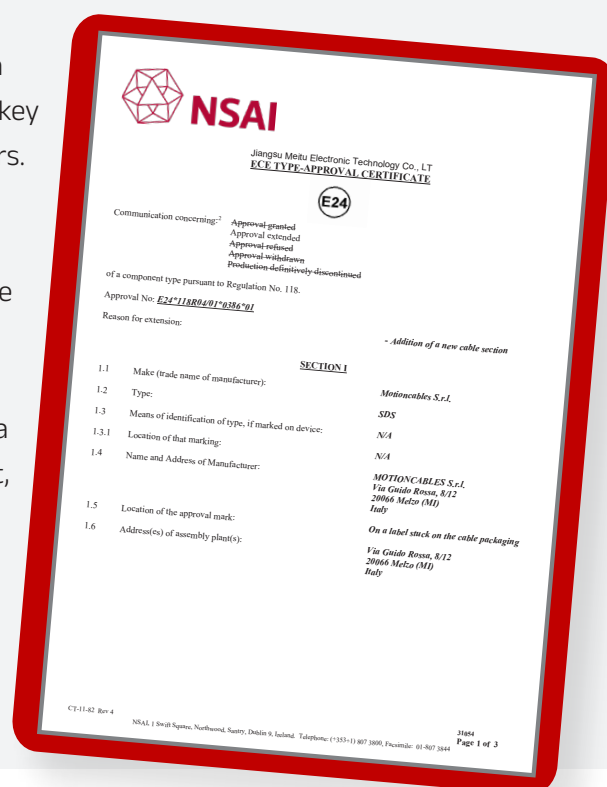
KEY ADVANTAGES OF R118 CERTIFICATION

Advantage	Benefits
Advanced Safety	Significantly reduced risks in the event of fire.
High Environmental Resistance	Ideal for harsh environments, with strong temperature variations and vibrations.
Operational Durability	Extended useful life, with less maintenance.
International Regulatory Compliance	The cables comply with the standards required for vehicle approval on a global scale

The approval obtained from **NSAI** for compliance with Standard R118 solidifies MOTION**CABLES**' position as a key partner for the automotive and transportation sectors.

The certified cables offer safety, reliability, and long-lasting performance, ensuring full compliance with the highest international standards.

Thanks to this certification, MOTION**CABLES** provides a concrete response to the needs of an evolving market, where quality and protection against fire risk are increasingly central requirements.





This broad compliance allows for flexible, legal, and safe installation in electrical systems across North America (USA and Canada), fully satisfying requirements set by standards like **NFPA 70** (NEC) and **UL 508A**. Whether for fixed wiring, continuous motion (TC-ER), or hazardous locations (**HL**), **MOTIONCABLES** provides a single-source solution that streamlines export procedures and reduces qualification time for your machinery.





MOTION**CABLES** is proud to announce a pivotal achievement that reinforces our commitment to excellence and quality: securing the prestigious **ECOLAB Certification**.

This rigorous recognition confirms that the materials used in our cables are resistant to the most common chemical agents and detergents utilized in the stringent sanitization and hygiene processes of the Food & Beverage (F&B) industry.

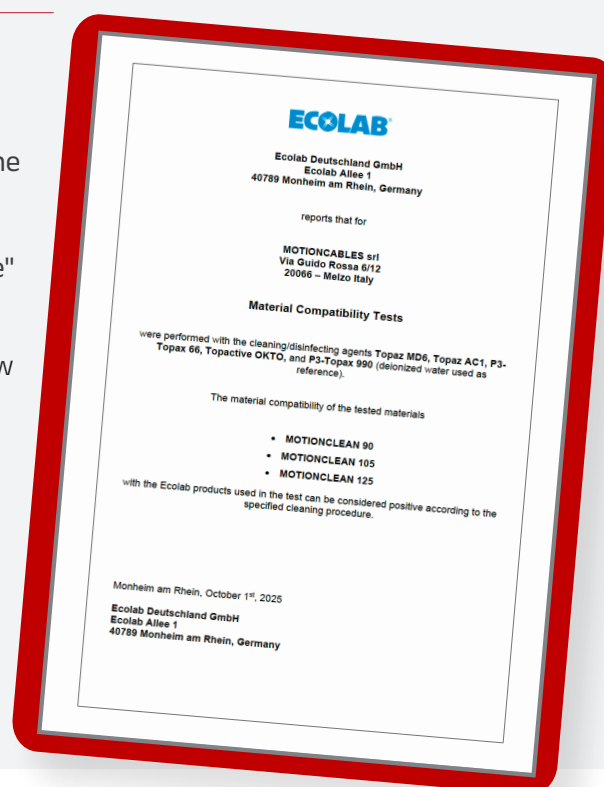
The **ECOLAB certification** guarantees our customers that MOTION**CABLES**' products:

- High-pressure jets (IP69K);
- Alkaline and acidic detergents;
- Steam sanitization;
- Dry ice cleaning (-78°C).
- Bottling and packaging lines;
- Machinery for processing meat, dairy, and bakery products;
- Fruit and vegetable processing plants;
- Freezing and refrigeration equipment.

KEY ADVANTAGES OF ECOLAB CERTIFICATION ON OUR PRODUCTS

- Maintain structural integrity even after repeated, aggressive washdown cycles.
- Ensure operational continuity without degradation to the jacket or insulation.
- Are the ideal choice for machinery in critical "splash zone" and "washdown" areas.

In alignment with this certification, we are launching the new MOTION**CLEANLINE** family, specifically engineered for these critical environments, combining dynamic reliability with superior chemical resistance..



OUR COMMITMENT TO SUSTAINABILITY AND GREEN ENERGY

At MOTION**CABLES**, we believe that industrial innovation must go hand-in-hand with environmental responsibility. Our commitment to sustainability is rooted in our operating philosophy, which guides us toward a more resource-efficient and environmentally friendly production model.

STRATEGIC ADOPTION OF GREEN POLICIES

MOTION**CABLES** has adopted comprehensive green policies aimed at reducing our environmental footprint across all operational phases. This commitment is evidenced by:

- 🕒 **Optimizing Production Processes:** Implementing energy-efficient machinery and waste reduction protocols.
- 🕒 **Eco-friendly Material Selection:** Prioritizing the use of recyclable materials where technically feasible, and adhering strictly to regulations such as RoHS and REACH.
- 🕒 **Promoting a Circular Economy:** Focusing on the long service life and durability of our cables (like the ThermalLine and MOTIONXP series) to minimize the need for frequent replacements and reduce resource consumption.
- 🕒 **Investing in Solar Energy:** Photovoltaic Systems

A cornerstone of our sustainability strategy is the significant investment in renewable energy generation. MOTION**CABLES** has installed photovoltaic solar panel systems on the rooftops of both our production facilities.

CONSEQUENCES OF OUR POLICIES: CONCRETE ENVIRONMENTAL AND OPERATIONAL ADVANTAGES

- 🕒 **Reduced Carbon Footprint:** By generating a substantial portion of our energy needs from the sun, we significantly reduce our reliance on fossil fuels, leading to a direct and measurable decrease in CO₂ emissions.
- 🕒 **Energy Independence and Stability:** The solar panels enhance our energy resilience, providing a stable, self-generated power source that mitigates the impact of volatile energy market prices.
- 🕒 **Operational Efficiency:** The systems are integrated with our energy management protocols, ensuring that the power generated is used efficiently across our high-tech manufacturing processes.
- 🕒 **Demonstrating Leadership:** This visible investment reinforces MOTION**CABLES**' leadership in the industrial cable sector, demonstrating a tangible commitment to safeguarding the environment for future generations.

In summary, MOTION**CABLES** is engineering the future of motion not only through superior cable technology but also through conscious, sustainable manufacturing practices, with solar energy being a vital component of our green transition

MATERIAL CHARACTERISTICS

MATERIALS				ELECTRICAL				THERMIC					
	VDE Abb.	Material	Density	Breakdown Voltage	Volume Resistivity	Dielectric Constant	Working Temperature		Flame Resist.	Oxygen Index			
			g/m ²	kV/mm	Ω/cm	50Hz	Permissible °C -/+	short circuit °C		(% O ₂)			
							-	+					
THERMOPLASTICS	Y	PVC	PVC	1,35 - 1.5	25	10 ¹³ - 10 ¹⁵	3,6 - 6	30	70	+ 100	self extinguish	23 - 42	
	Yw	PVC	PVC 90 °C	1,35 - 1.5	25		4 - 6,5	20	90	+ 120			
	Yw	PVC	PVC 105 °C	1,35 - 1.5	25		4,5 - 6,5	20	105	+ 120			24 - 42
	Yk	PVC	PVC cold resistant	1,2 - 1,4	25		4,5 - 6,5	40	70	+ 100			
	2Y	LDPE	Low Density Polyethylene	0,92 - 0,94	70	10 ¹⁷	2,3	50	70	+ 100	flammable	≤ 22	
	2Y	HDPE	High Density Polyethylene	0,94 - 0,98	85	10 ¹⁷	2,3	50	100	+ 120			
	2X	VPE	Cross-Linked Polyethylene	0,92	50	10 ¹² - 10 ¹⁶	4 - 6	35	90	+ 100			18 - 30
	02Y		Foamed Polyethylene	,0,65	30	10 ¹⁷	,155	40	70				
	3Y	PS	Polystirole	1.05	30	10 ¹⁶	2.5	50	80				
	4Y	PA	Polyamyde	1.02 - 1,1	30	10 ¹⁵	4	60	105	+ 125		≤ 22	
	9Y	PP	Polypropylene	0,91	75	10 ¹⁶	2,3 - 2,4	10	90	+ 140			
	11Y	PUR	Polyurethane	1,15 - 1,2	20	10 ¹⁰ - 10 ¹²	4 - 7	55	80	+ 100			20 - 26
	12Y	TPE-E	Polyester-Elastomer	1,2 - 1,4	40	> 10 ¹⁰	3,7 - 5,1	50	100	+ 140			
		TPE-O	Polyolefin-Elastomer	0,89 - 1.0	30	> 10 ¹⁴	2,7 - 3,6			+ 130		≤ 25	
ELASTOMERS	G	NR SBR	Natural Rubber	1.5 - 1,7	20	10 ¹² - 10 ¹⁵	3 - 5	65	60	+ 120	flammable	≤ 22	
	2G	SIR	Silicone Rubber	1,2 - 1,3	20	10 ¹⁵	3 - 4	60	180	+ 260	high flash point	25 - 35	
	3G	EPR	Ethylene-Propylen Rubber	1,3 - 1.55	20	10 ¹⁴	3 - 3,8	30	90	+ 160	flammable	≤ 22	
	4G	EVA	Ethylen-Vynylacetat Rubber	1,3 - 1.5	30	10 ¹²	5 - 6,5	30	125	+ 200			
	5G	CR	Polychloroprene Compound	1,4 - 1,65	20	10 ¹⁰	6 - 8,5	40	100	+ 140	self extinguish	30 - 35	
	6G	CSM	Chlorsulfonated Polyeth. cmp	1,3 - 1,6	25	10 ¹²	6 - 9	30	80	+ 140			
FLUOROPOLYMERS	10Y	PVDF	Polyvinylidlene Fluoride Dyflor	1,7 - 1,9	25	10 ¹⁴	9 - 7	40	135	+ 160	self extinguish	40 - 45	
	7Y	ETFE	Ethylene-Tetrafluorethylene	1,6 - 1,8	36	10 ¹⁶ - 10 ¹⁸	2,6	100	150	+ 180		30 - 35	
	6Y	FEP	Fluorine Ethylene Propylene	2,0 - 2,3	25	10 ¹⁸	2,1	100	205	+ 230			
	5YX	PFA	Perfluoraloxypolymeric	2,0 - 2,3	25	10 ¹⁸	2,1	190	260	+ 280			> 95
	5Y	PTFE	Polytetrafluorethylene	2,0 - 2,3	20	10 ¹⁸	2,1	190	260	+ 300			
H.F.	H	nXlink	Halogen Free Not Cross link	1,4 - 1,6	25	10 ¹² - 10 ¹⁴	3,4 - 5	30	70	+ 100	self extinguish	≤ 40	
	HX	Xlink	Halogen Free Cross Linked	1,4 - 1,6	25	10 ¹³ - 10 ¹⁴	3,4 - 5	30	90	+ 150			

MATERIAL CHARACTERISTICS

MECHANICAL			WEATHER		CHEMICALS												
Tensile Strength	Elongation at break	Shore Hardness	Weather Resistance	Cold Resistance	Water	Oil and Greases	Solvents	Alcohol	Acids	VDE Abb.							
N/mm²	%																
10 - 25	130 - 350	70-95 (A)	medium (black outer sheath)	moderate - good						Y	PVC						
				very good	★★★	★★★	★	★★	★★	Yw	PVC						
										Yw	PVC						
										Yk	PVC						
10 - 20	400 -600	43-50 (D)		good					2Y	LDPE							
20 - 30	500-1000	60-63 (D)			★★★★	★★	★★	★★★★	★★★	2Y	HDPE						
12.5 - 20	300 - 400	40-45 (D)								2X	VPE						
8 - 12	350 - 450	-	-							02Y							
55 - 65	300 - 400	35-50 (D)	medium - good	moderate - good	★★★	★★★	★★★	★★	★★	3Y	PS						
50 - 60	50 - 170	-	good	good	★	★★★	★★★★	★	★★	4Y	PA						
20 - 35	300	55-60 (D)	moderate		★★★★	★★★★	★★	★★★	★★★	9Y	PP						
30 - 45	500 - 700	70-100 (A)	very good	very good	★★★★	★★★★	★★	★★	★★	11Y	PUR						
30	> 300	85 (A) - 70 (D)			★	★★★★	★★	★	★★	12Y	TPE-E						
20		55 (A) - 70 (D)			★★★★	★★	★★	★★	★★		TPE-O						
5 - 10	300 - 600	60 - 70 (A)	moderate	very good	★★★					G	NR SBR						
		40 - 80 (A)	good							2G	SIR						
	200 - 400	65 - 85 (A)	very good	good						3G	EPR						
8 - 12	250 - 350	70 - 80 (A)	good							4G	EVA						
10 - 20	400 - 700	55 - 70 (A)	very good	moderate - good												5G	CR
	350 - 600	60 - 70 (A)		moderate												6G	CSM
50 - 80	150	75 - 80 (D)	very good	very good	★★★★	★★★★	★★★★	★★★★	10Y	PVDF							
40 - 50		70 - 75 (D)							7Y	ETFE							
15 - 25	250								6Y	FEP							
25 - 30		55 - 60 (D)							5YX	PFA							
80	50								5Y	PTFE							
8 - 13	150 - 250	65 - 95 (A)	medium (good with black outer sheath)	average	★	★	★	★	★	H	nXlink						
					★★★	★★★	★	★	★	HX	Xlink						

THERMOPLASTICS

ELASTOMERS

FLUOROPOLYMERS

H.F.

★ not resistant ★★ medium resistance ★★★ good resistance ★★★★ very good resistance

CABLES' MAIN ATTRIBUTES: OIL, FLAME, MOVEMENT

OIL RESISTANCE



Level	Test method	BP	DP	HP	XP
VDE 0281 Part 1					
O - I	In oil for 7 days @ 60°C ± 30% Unaged Tensile Strength ± 30% Unaged Elongation	positive	positive	positive	positive
UL Oil Resistance I					
O - II	In oil for 4 days @ 100°C 50% Unaged Tensile Strength 50% Unaged Elongation	positive	positive	positive	positive
VDE 0472 Sect. 803B					
O - III	In oil for 7 days @ 90°C ± 25% Unaged Tensile Strength ± 25% Unaged Elongation	positive	positive	positive	positive
UL Oil Resistance II					
O - IV	In oil for 60 days @ 75°C 65% Unaged Tensile Strength 65% Unaged Elongation	positive	positive	positive	positive
VDE 0472 Sect. 803A					
O - V	In oil for 7 day @ 100°C ± 25% Unaged Tensile Strength ± 25% Unaged Elongation	-	-	positive	positive

FLAME RESISTANCE



Level	Test method	BP	DP	HP	XP
F - I	FT2 (UL 1581): Horizontal Flame Test One 30-second flame application. Cable must not emit flame or glowing particles	positive	positive	positive	positive
F - II	IEC 60332-1-2 / Vertical Flame Test Une 60-second flame applications Cable must self-extinguish.	positive	positive	positive	positive
F - III	VW-1 (UL 1581): Vertical Flame Test Five 15-second flame applications. Cable must self-extinguish. Cable must not emit flame or glowing particles.	positive	positive	positive	positive
F - IV	FT1 (UL 1581): Vertical Flame Test Three 60-second flame applications. Cable must self-extinguish. Cable must not emit flame or glowing particles..	positive	positive	positive	positive
F - V	IEC 60332-3-24 Vertical. Tray Test Exposed to flame for 20 min. Damage cannot exceed 2.5 mt.	-	-	-	-
	UL 1581: Vertical Tray Test Exposed to flame for 20 min. Cable must not emit flame or glowing particles				

Level	Test method	BP	DP	HP	XP
M - I	Cable Chain Test (MotionCables method) Length: 2000 mm Acceleration: 60 m/sec ² Speed: 600 m/min	10K cycles	5 MIL. cycles	10 MIL. cycles	20 MIL. cycles
M - II	Cable Chain Test (MotionCables method) Length: 5000 mm Acceleration: 40 m/sec ² Speed: 300 m/min	5 K cycles	5 MIL. cycles	10 MIL. cycles	20 MIL. cycles
M - III	Cable Chain Test (MotionCables method) Length: 110000 mm Acceleration: 10 m/sec ² Speed: 180 m/min	-	3 MIL. cycles	5 MIL. cycles	10 MIL. cycles
M - IV	Flexing Endurance Test EN 50289-3-9 Length: 5000 mm Acceleration: 40 m/sec ² Speed: 300 m/min	-	-	100 K cycles	200 K cycles
M - V	Repeated Bending Test EN 50289-3-9 Pulley Diameter: 3 x cable O.D. Rotation Angle: ± 135 ° Load: 1000 g	-	-	5 K cycles	10 K cycles
M - VI	Alternative cable torsion with tension Test EN 50289-3-10 Sample Length: 300 mm. Rotation Angle: ± 540 ° Load: 1000 g	-	-	5 K cycles	10 K cycles

MOVEMENT & FLEXIBILITY

MM2, AWG & KCMILS SECTION COMPARISON CHART

AWG	Diameter		Cross-Section		R @ 20 °C	Weight
	Mils	mm	Circ Mils	mm ²	Ω/km	g/m
44	2.0	0.05	4.00	0.0020	8498	0.0180
43	2.2	0.055	4.84	0.0025	7021	0.0218
42	2.5	0.063	6.25	0.0032	5446	0.0281
41	2.8	0.071	7.84	0.0039	4330	0.0352
40	3.1	0.079	9.61	0.0049	3540	0.0433
39	3.5	0.089	12.3	0.0062	2780	0.0552
38	4.0	0.102	16.0	0.0081	2130	0.0720
37	4.5	0.114	20.3	0.0103	1680	0.0912
36	5.0	0.127	25.0	0.0127	1360	0.1126
35	5.6	0.142	31.4	0.0159	1080	0.1412
34	6.3	0.160	39.7	0.0201	857	0.1785
33	7.1	0.180	50.4	0.0255	675	0.2276
32	8.0	0.203	64.0	0.0324	532	0.2886
31	8.9	0.226	79.2	0.0401	430	0.3571
30	10.0	0.254	100	0.0507	340	0.4508
29	11.3	0.287	128	0.0649	266	0.5758
28	12.6	0.320	159	0.0806	214	0.7157
27	14.2	0.361	202	0.102	169	0.9076
26	15.9	0.404	253	0.128	135	1.1383
25	17.9	0.455	320	0.162	106	1.4433
24	20.1	0.511	404	0.205	84.2	1.8153
23	22.6	0.574	511	0.259	66.6	2.3064
22	25.3	0.643	640	0.324	53.2	2.8867
21	28.5	0.724	812	0.411	41.9	3.6604
20	32.0	0.813	1020	0.519	33.2	4.6128
19	35.9	0.912	1290	0.653	26.4	5.8032
18	40.3	1.024	1620	0.823	21.0	7.3209
17	45.3	1.150	2050	1.04	16.6	9.2404
16	50.8	1.291	2580	1.31	13.2	11.6212
15	57.1	1.450	3260	1.65	10.4	14.6885
14	64.1	1.630	4110	2.08	8.28	18.4512
13	72.0	1.830	5180	2.63	6.56	23.3616
12	80.8	2.053	6530	3.31	5.21	29.4624
11	90.7	2.305	8230	4.17	4.14	37.0512
10	101.9	2.588	10380	5.26	3.277	46.7232
9	114.4	2.906	13090	6.63	2.600	58.9248
8	125.5	3.264	16510	8.37	2.061	74.4000

AWG	Diameter		Cross-Section		R @ 20 °C	Weight
	Mils	mm	Circ Mils	mm ²	Ω/km	g/m
7	114.3	3.655	20820	10.55	1.634	93.744
6	162.0	4.115	26240	13.30	1.296	118.1472
5	181.9	4.620	33090	16.77	1.028	148.8
4	204.3	5.189	41740	21.15	0.8152	187.488
3	229.4	5.287	52260	26.67	0.6466	235.592
2	257.6	6.543	66360	33.62	0.5128	299.088
1	289.3	7.348	83690	42.41	0.4065	376.464
1/0	324.9	8.252	105600	53.49	0.3223	474.672
2/0	364.8	9.266	133100	67.43	0.2557	599.664
3/0	409.6	10.400	167800	85.01	0.2028	755.904
4/0	460.0	11.680	211600	107.22	0.1608	953.808
kcmil				mm ²	Ω/km	g/m
250	-	-	-	127	0.1357	1129.75
300	-	-	-	152	0.1134	1352.14
350	-	-	-	177	0.0974	1574.53
400	-	-	-	203	0.0849	1805.82
450	-	-	-	228	0.0756	2028.21
500	-	-	-	253	0.0681	2250.60
550	-	-	-	279	0.0618	2481.89
600	-	-	-	304	0.0567	2704.28
650	-	-	-	329	0.0524	2926.68
700	-	-	-	355	0.0486	3157.96
750	-	-	-	380	0.0454	3380.35
800	-	-	-	405	0.0426	3602.75
900	-	-	-	456	0.0378	4056.43
1000	-	-	-	507	0.0340	4510.10
1100	-	-	-	557	0.0310	4954.89
1200	-	-	-	608	0.0284	5408.57
1250	-	-	-	633	0.0272	5630.96
1300	-	-	-	659	0.0262	5862.25
1400	-	-	-	709	0.0243	6307.03
1500	-	-	-	760	0.0227	6760.71
1600	-	-	-	811	0.0213	7214.39
1700	-	-	-	861	0.0200	7659.17
1800	-	-	-	912	0.0189	8112.85
1900	-	-	-	963	0.0179	8566.53
2000	-	-	-	1010	0.0171	8984.63

ELECTRICAL RESISTANCE TABLES

IEC 60228 class 1 / 2

Nominal Cross Section mm ²	Minimum number of wires in the conductor						Max conductor Res. at 20 °C	
	Circular (non-compact) conductor		Circular compact conductor		Shaped conductor		Copper Conductor	
	Cu	Al	Cu	Al	Cu	Al	Plain Wires Ω/km	Metal-coated wires Ω/km
0,5	7	-	-	-	-	-	36,7	36
0,75	7	-	-	-	-	-	24,8	24,5
1	7	-	-	-	-	-	18,2	18,1
1,5	7	-	6	-	-	-	12,1	12,2
2,5	7	-	6	-	-	-	7,41	7,56
4	7	7	6	-	-	-	4,7	4,61
6	7	7	6	-	-	-	3,11	3,08
10	7	7	6	-	-	-	1,84	1,83
16	7	7	6	6	-	-	1,16	1,15
25	7	7	6	6	6	6	0,734	0,727
35	7	7	6	6	6	6	0,529	0,524
50	19	19	6	6	6	6	0,391	0,387
70	19	19	12	12	12	12	0,27	0,268
95	19	19	15	15	15	15	0,195	0,193
120	37	37	18	15	18	15	0,154	0,153
150	37	37	18	15	18	15	0,126	0,124
185	37	37	30	30	30	30	0,1	0,0991
240	61	61	34	30	34	30	0,0762	0,0754
300	61	61	34	30	34	30	0,0607	0,0601
400	61	61	53	53	53	53	0,0475	0,047
500	61	61	53	53	53	53	0,0369	0,0366
630	91	91	53	53	53	53	0,0286	0,0283
800	91	91	53	53	-	-	0,0224	0,0221
1000	91	91	53	53	-	-	0,0177	0,0176

IEC 60228 DIN VDE 0295 class 5 / 6

Nominal cross- section mm ²	Maximum diameter of wires in the conductor		Maximum conductor resistance at 20 °C	
	Class 5 mm	Class 6 mm	Plain Wires Ω/km	Metal Coated Wires Ω/km
0,08	-	0,10	243,0	250,0
0,14	-	0,10	138,0	142,0
0,25	-	0,10	79,0	82,0
0,34	-	0,16	57,0	59,0
0,38	-	0,16	48,5	52,8
0,5	0,21	0,16	39	40,1
0,75	0,21	0,16	26	26,7
1	0,21	0,16	19,5	20
1,5	0,26	0,16	13,3	13,7
2,5	0,26	0,16	7,98	8,21
4	0,31	0,16	4,95	5,09
6	0,31	0,21	3,3	3,39
10	0,41	0,21	1,91	1,95
16	0,41	0,21	1,21	1,24
25	0,41	0,21	0,78	0,795
35	0,41	0,21	0,554	0,565
50	0,41	0,31	0,386	0,393
70	0,51	0,31	0,272	0,277
95	0,51	0,31	0,206	0,21
120	0,51	0,31	0,161	0,164
150	0,51	0,31	0,129	0,132
185	0,51	0,41	0,106	0,108
240	0,51	0,41	0,0801	0,0817
300	0,51	0,41	0,0641	0,0654
400	0,51	-	0,0486	0,0495
500	0,61	-	0,0384	0,0391
630	0,61	-	0,0287	0,0292

DIN 47100 COLOUR CODE

IEC AND VDE COLOURS ABBREVIATION

N° Color		N° 1 st conductor	2 nd conductor	Upon request	
single core		pairs			
1 White	23 White/Red	1 White	Brown	23 Orange	White/Orange
2 Brown	24 Brown/Red	2 Green	Yellow	24 Orange/Green	Orange/Yellow
3 Green	25 White/Black	3 Grey	Pink	25 Orange/Grey	Orange/Blue
4 Yellow	26 Brown/Black	4 Blue	Red	26 Orange/Black	Orange/Red
5 Grey	27 Grey/Green	5 Black	Purple	27 Orange/Pink	Orange/Purple
6 Pink	28 Yellow/Grey	6 Grey/Pink	Red/Blue	28 Purple/White	Purple/Brown
7 Blue	29 Pink/Green	7 White/Green	Brown/Green	29 Purple/Green	Purple/Yellow
8 Red	30 Yellow/Pink	8 White/Yellow	Yellow/Brown	30 Purple/Grey	Purple/Pink
9 Black	31 Green/Blu	9 White/Grey	Grey/Brown	31 Purple/Blue	Purple/Red
10 Purple	32 Yellow/Blue	10 White/Pink	Pink/Brown	32 Purple/Black	Green/Yellow
11 Grey/Pink	33 Green/Red	11 White/Blue	Brown/Blue		
12 Red/Blue	34 Yellow/Red	12 White/Red	Brown/Red		
13 White/Green	35 Green/Black	13 White/Black	Brown/Black		
14 Brown/Green	36 Yellow/Black	14 Grey/Green	Yellow/Grey		
15 White/Yellow	37 Grey/Blue	15 Pink/Green	Yellow/Pink		
16 Yellow/Brown	38 Pink/Blue	16 Green/Blue	Yellow/Blue		
17 White/Grey	39 Grey/Red	17 Green/Red	Yellow/Red		
18 Grey/Brown	40 Pink/Red	18 Green/Black	Yellow/Black		
19 White/Pink	41 Grey/Black	19 Grey/Blue	Pink/Blue		
20 Pink/Brown	42 Pink/Black	20 Grey/Red	Pink/Red		
21 White/Blue	43 Blue/Black	21 Grey/Black	Pink/Black		
22 Brown/Blue	44 Red/Black	22 Blue/Black	Red/Black		

Over 45 conductors colours upon request

COLOURS ABBREVIATIONS

Colour	German Abbreviation	Abbreviation acc.to IEC 60757	
Black	SW	BK	
Brown	BR	BN	
Red	RT	RD	
Orange	OR	OG	
Yellow	GE	YE	
Green	GN	GN	
Blue	BL	BU	
Violet	VI	VT	
Grey	GR	GY	
White	WS	WH	
Pink	RS	PK	
Turquoise	TK	TQ	
Green/Yellow	GNGE	GNYE	

CENELEC HD 308 S2, CEI-UNEL 00722, DIN 4075, CEI/IEC 60446

	Cable with YG	Cable without YG
2 CORES		
3 CORES		
4 CORES		
5 CORES		

CENELEC HD 308 S2 CEI-UNEL 00722

Colour code for low voltage cables up to 5 cores

Core type	Alphanumerical		Colour	
	old	new	old	new
AC				
Phase 1	R	L1	black	N.D.
Phase 2	S	L2	red	N.D.
Phase 3	T	L3	blue	N.D.
Mid-Point	MP	N	grey	Pale Blue
DC				
Positive	L +	+	-	N.D.
Negative	L -	-	-	N.D.
Mid-Point	M	-	-	Pale Blue
Protection	-	PE	-	Y/G
Neutral with protection	-	PEN	-	Y/G
Earth	-	E	-	N.D.
Earth external	-	TE	-	N.D.
Clamps	-	a L1 a L2 a L3 a N	-	

DIN 4075 CEI/IEC 60446

Core identification for Phase, Mid-Point, PEN and Protective conductor through letter and colour

N.D. Not Defined

GUIDELINES FOR A PROPER CABLES' HANDLING

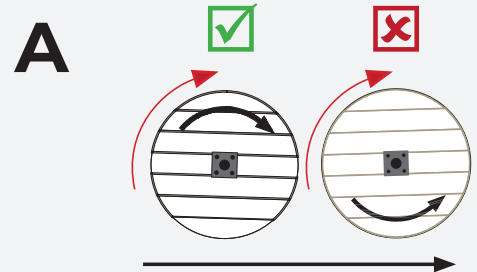
INSTALLATION

Effective cable management during installation is critical to mitigate potential issues and damage over time.

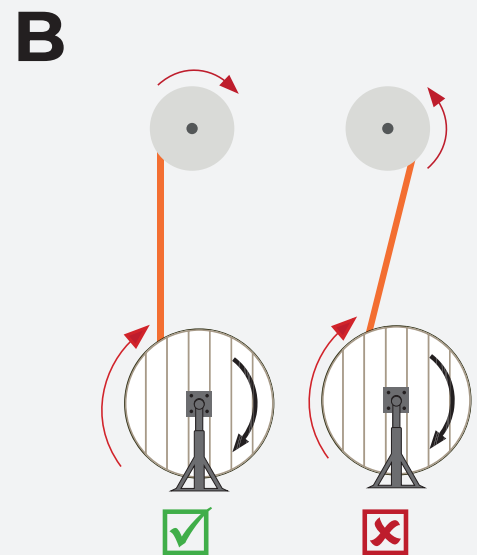
To ensure a successful and reliable installation, please observe the following guidelines:

- ⦿ Do not roll the cable spool in the reverse direction (A).
- ⦿ Avoid transferring the cable from one reel to another against its inherent winding direction (B).
- ⦿ When changing cable direction using pulleys, maintain a minimum distance of 20 times the cable diameter between changes (C).
- ⦿ Use pulleys with a flat profile to prevent cable damage.
- ⦿ Prevent over-tensioning of the cable during installation.
- ⦿ Avoid abrupt changes in the cable's radius of curvature.
- ⦿ Regularly inspect for misalignment and prevent the introduction of twists into the cable.

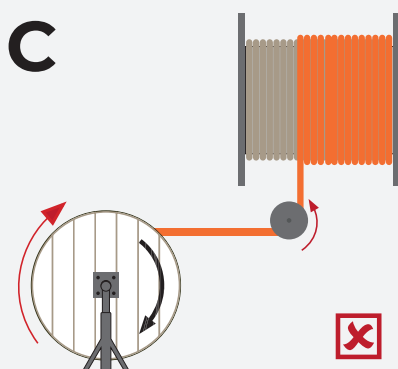
It is strongly recommended that the cable be uncoiled from the reel and allowed to lie flat on the ground for a short period before installation. This practice will help relieve induced twists and ensure optimal performance.



DO NOT roll the drum in the opposite direction to its natural direction (A).



DO NOT pass the cable from one drum to another inducing a direction opposite to the natural one (B).



DO NOT change the direction of the cable via a pulley less than 20 times the diameter of the cable (C).

GUIDELINES FOR A PROPER CABLES' HANDLING

PROPER CABLE HANDLING AND STORAGE

Cable Unwinding Procedure: To ensure correct installation and prevent dangerous twisting or bending, the cable must be unwound from a reel mounted on a dedicated unwinder. Under no circumstances should the cable be unwound from a reel placed on its side.

Minimizing Induced Twisting: To avoid induced twisting in the cable, do not pass it through concave-shaped pulleys. Additionally, ensure that changes in the direction of pull occur at a minimum distance of 20 times the cable's external diameter.

Storage of Partially Used Reels: If the cable is not fully utilized, it is recommended to store it on the original reel provided by the manufacturer.

Storage Environment: Regardless of short-term or long-term storage, reels must be stored in a dry and cool area to maintain cable integrity.

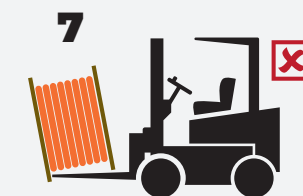
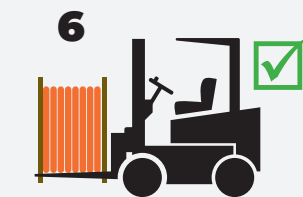
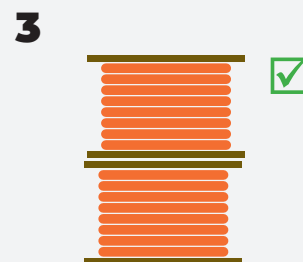
Protection of Cable Terminations: Cable terminations must remain sealed (as delivered) to prevent the infiltration of water, dirt, and atmospheric agents, which can degrade cable performance.

Safe Forklift Operation for Reel Movement: When using a forklift to move a reel, ensure that both flanges of the reel are fully supported by the forks.

Prohibition of Single-Flange Support: Under no circumstances should a reel be moved by resting it solely on a single flange, as this can lead to damage.

Prevention of Forklift Contact with Cable: The forks of the forklift must never come into contact with the cable itself, as this poses a significant risk of tearing the insulation or breaking the cable conductors.

Horizontal Reel Storage Practices: When storing spools horizontally, it is crucial to prevent the flanges from overlapping. Overlapping flanges can cause the spool drum to become misaligned and potentially break.



GUIDELINES FOR A PROPER CABLES' INSTALLATION IN CABLE CARRIERS

The installation of cables in cable carriers is a delicate process requiring meticulous attention to detail to ensure longevity and optimal performance. The following are recommendations for cable installation, particularly for MOTIONCABLES:

1. Storage Conditions

Store cables in dry, enclosed, and temperature-controlled environments, adhering to the manufacturer's technical specifications.

Avoid exposure to humidity and extreme temperatures to preserve cable quality.

2. Acclimatization Prior to Use

Before installation, allow cables to acclimatize to room temperature (approximately 20–25°C) for at least 24 hours. This helps prevent mechanical stress during assembly.

3. Storage in Original Drums

Keep cables in their original drums until the point of installation. Avoid rewinding them onto different reels to prevent cable damage.

Prevent mechanical stress during transportation or storage.

4. Compatibility with the Cable Carrier

Select a cable carrier that respects the technical characteristics of the cable, such as weight, diameter, bend radius, and dynamics. Utilize appropriate carriers to avoid damage.

5. Minimum Bend Radius

Do not exceed the minimum bend radius specified by the manufacturer. Generally, the minimum radius is $R \geq 7.5 \times D$, where D is the outer diameter of the cable.

6. Absence of Torsion

During installation, avoid twisting the cables. Employ tangential unwinding from the drum without pulling the cables laterally.

7. Internal Positioning within the Carrier

Cables should be positioned side by side without direct contact or friction between them to prevent damage to the outer jacket and ensure smooth movement within the carrier.

8. Clearance Between Cables

Leave at least 10% of the cable diameter as clearance on each side. Do not exceed 50% free space in the total width to avoid interference between cables.

9. Physical Separation

If possible, use separators or guide channels to keep cables separate, reducing the risk of abrasion or mechanical damage.

10. Avoid Overlapping

Do not overlap cables of different diameters and materials. Each cable must have its own space to move freely.

11. Vertical Carriers

If installation occurs in vertical carriers, ensure a free space of at least 20% of the outer diameter above and below each cable.

12. Free Longitudinal Movement

Avoid the use of internal fixings or guides that impede cable movement. The cable must be able to move freely within the carrier.

13. Fixing via Outer Jacket Only

Cables should be fixed only at their ends, acting on the outer jacket without blocking the internal conductors.

14. Distance from Articulation Point

The cable fixing point should be positioned at a distance of at least 20 times the cable diameter from the first articulation point of the carrier to avoid mechanical stress.

15. Post-Installation Checks

After a few cycles, perform tests to verify cable tension, alignment, and position in the inner/outer radius of the carrier. Ensure the cable moves correctly without obstructions.

16. Periodic Maintenance

Conduct checks every 6 months to ensure cables are correctly centered, that there is no damage to the outer jacket, and that the cable carrier is functioning optimally.

17. Replacement in Case of Damage

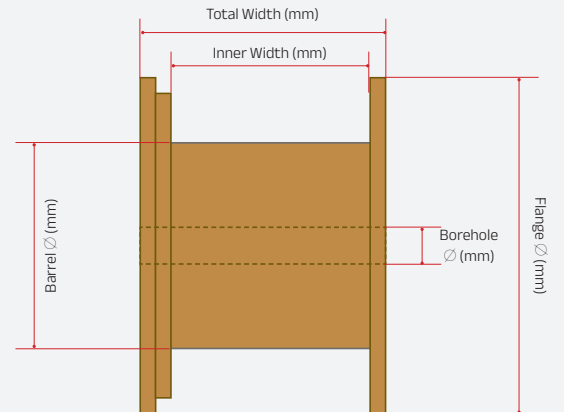
In the event of carrier breakage or cable damage, replace all cables. Internal damage can result from crushing or twisting, compromising the cable's functionality.

Conclusion:

Carefully follow these guidelines to ensure the correct installation of cables in cable carriers, preserving their lifespan, reliability, and performance over time. When applied correctly, these recommendations will reduce the risk of damage and ensure greater operational safety and efficiency.

PACKINGS - DRUMS' DIMENSIONS AND CAPABILITIES

Size	Flange Ø mm	Barrel Ø mm	Borehole Ø mm	Total Width mm	Internal Width mm	Load Capacity kg	Net Weight kg
05	500	150	56	470	410	100	8
06	630	315	56	415	315	250	17
07	710	355	80	520	400	250	25
08	800	400	80	520	400	400	31
09	900	450	80	690	560	750	47
10	1000	500	80	710	560	900	71
12	1250	630	80	890	670	1700	144
14	1400	710	80	890	670	2000	175
16	1600	800	80	1100	850	3000	280
18	1800	1000	100	1100	840	4000	380
20	2000	1250	100	1350	1045	5000	550
22	2240	1400	125	1450	1140	6000	710
25/14	2500	1400	125	1450	1140	7500	875
25/16	2500	1600	125	1450	1130	7500	900
28/18	2800	1800	140	1635	1280	10000	1175



Ø	05	06	07	08	09	10	12	14	16	18	20	22	25/14	25/16	28/18
6	1130	110	2024	2755											
7	815	840	1480	2340											
8	630	640	1064	1463	2730										
9	460	470	890	1152	2202	2866									
10	390	388	680	980	1768	2349									
11	320	315	564	760	1404	1910									
12	260	254	470	643	1206	1540									
13	220	138	385	542	1032	1339	2727								
14	190	190	360	454	880	1159	2265	2967							
15	170	180	300	430	749	1000	1990	2480							
16	150	140	239	358	632	860	1756	2205							
17	130	134	228	294	603	736	1545	1960							
18	110	102	218	280	505	705	1355	1737							
19	105	96	172	228	485	599	1184	1535	2722						
20	100	92	165	220	402	576	113	1352	2435	2830					
21	80	90	159	210	384	485	990	1304	2172	2527					
22		65	122	167	315	468	856	1145	1930	2248					
23		62	117	160	304	386	827	999	1870	2172	2954				
24		60	113	156	294	377	709	967	1657	1927	2608				
25		58	110	150	285	365	688	839	1608	1867	2522				
26		56	80	116	226	299	668	814	1420	1650	2218				
27			78	113	220	290	567	700	1244	1450	2150	2860			
28			76	109	215	282	550	680	1210	1410	1880	2777			
29			74	106	209	226	462	663	1180	1370	1826	2450		2976	
30			70	103	162	220	450	564	1028	1200	1583	2383		2893	
31				76	157	214	438	550	1003	1166	1540	2086		2558	
32				74	153	209	428	537	866	1009	1500	2035	2978	2490	
33				72	150	204	352	450	846	985	1289	1984	2908	2428	
34					146	158	344	440	828	962	1257	1726	2605	2134	
35					108	154	336	430	710	824	1227	1685	2547	2083	2890
36					105	150	329	422	692	806	1040	1646	2270	2035	2820
37					103	148	265	348	678	788	1017	1418	2223	1774	2760
38						144	259	340	664	772	994	1386	1969	1735	2432
39						110	254	334	560	653	972	1356	1930	1697	2380
40						105	249	327	549	640	812	1328	1892	1486	2330
41						102	244	264	539	627	795	1130	1664	1435	2036
42						100	190	259	529	615	779	1107	1633	1406	1995
43							187	254	437	510	763	1065	1574	1175	1692
44							183	249	430	502	750	1065	1574	1175	1692
45							180	245	422	492	610	890	1373	1153	1660
46							177	240	415	484	600	874	1349	1130	1630
47							174	187	408	475	589	858	1326	1110	1600
48							130	184	330	386	578	842	1144	930	1366
49							127	180	325	380	568	828	1125	914	1342
50							125	178	319	373	558	878	1107	898	1320
51							123	175	314	367	442	666	1089	883	1298
52							120	172	310	360	435	655	1072	869	1276
53								170	305	356	428	644	912	715	1072
54								126	230	280	420	634	898	700	1056
55								124	235	276	414	624	885	690	1040
56								122	232	270	408	614	872	680	1022
57								121	228	267	400	488	860	688	1006
58								119	225	263	304	480	720	658	990
59								117	222	260	300	473	710	649	815
60									220	256	295	466	700	640	803
61									216	252	290	460	690	610	790
62									160	190	287	453	680	500	780

