Assemblies motor and signal cable

for use on Rockwell / Allen-Bradley systems

SANGEL®
Systemtechnik

Liebe Leser,

mit dieser Broschüre stellen wir Ihnen unser Angebot an konfektionierten Leitungen für Rockwell- bzw. Allen-Bradley-Antriebe und Automatisierungsanwendungen vor. Um Ihren Bedarf dieser Systemleitungen noch attraktiver bedienen zu können, bündeln wir die Bestellungen. Damit schaffen wir insgesamt eine bessere Kostensituation, auch für Sie. Neben der etablierten Systeme bieten wir auch die Leitungen für die neuartigen DSL-Systeme mit Einkabellösung an. Damit Sie als Kunde sich nicht umgewöhnen müssen und die beste Kompatibilität haben, liefern wir Ihnen die Leitungen mit den gleichen Steckverbindern wie sie auch der Systemhersteller selbst einsetzt. Qualität zum fairen Preis, dafür stehen wir.

Bei Fragen zur Auswahl und zu Sonderwünschen sprechen Sie uns an. Wir freuen uns auf Sie.

Dear reader,

with this brochure we like to introduce our range of assembled cables for Rockwell / Allen-Bradley drive and automation systems. To serve your needs in an attractive way we bundle orders. This means a better cost situation, also for you. Beside the established systems we offer also cables for the new DSL systems with single cable solution. All assemblies are deliverd with connectors also used by the manufacturers. Quality for a fair price. That‘s Sangel.

If there are any questions concerning our range or special requests, please contact us. We are looking forward to you.

Maschinenbau

Medizintechnik

Erneuerbare Energien

Mobile Automation

Index

Our scope for your system design

SANGEL® – System connection

Montageservice

Wir stehen Ihnen auch vor Ort zur Seite und garantieren so eine sichere Montage.

Installation service

We assume responsibility and remain at your side; that's what we do with our installation service.

Industrieleuchten

LED-Industrieleuchten sorgen für klare Sicht im Maschinenraum und am Montageplatz. Und das energieeffizient.

Industrial luminaires

Our LED-industrial luminaires ensure bright view inside the machine or at the workbench. And this in an energy-efficient way.

Steckverbinder

Wir halten ein großes Spektrum an Steckverbindern für Antriebs- und Kommunikationssysteme vor. Bedienen Sie sich.

Connector

We keep an ample range of drive and motor connectors as well as connectors for communication systems available. Help yourself.

Kabel / Leitungen

Die Konfektion erstellen Sie selbst, dann liefern wir die richtige Leitung entsprechend der einschlägigen Standards.

Cables

You assemble on your own, we supply the right cable attending the corresponding standard.

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Antriebssysteme

In Ihrem geregelten Antriebssystem verbinden wir Servoumrichter und Motor. Und das für alle Herstellerstandards.

Drive systems

In your controlled drive system we connect the converter with the motor. For all manufacturer standards.

Industrielle Kommunikation

Für Feldbussysteme und industrielle Netzwerke haben wir die richtige Verbindung. Wir kennen die Standards.

Industrial Communication

We have the right connection for fieldbus and industrial networks. We are aware of the standards.

Kundenspezifisch

Kommen Standards nicht zum Tragen sind individuelle Konfektionen gefragt. Maßgeschneidert nur für Sie.

Customized

Standards are not possible to apply and individual cord sets are required. Tailored just for you.

Aktor / Sensor

M8- und M12- Verbindungen über Verteiler mit oder ohne Buskoppler sind als Standard etabliert. Unsere Komponenten verbinden Ihre Peripherie.

Actuator / Sensor

M8 and M12 connections via distribution boxes with a bus coupling or without are established standards. Our components connect your periphery.

Installation modules

We split your installation in modules. That's how we reduce your installation and administrative costs.

SANGEL® Systemtechnik

NFPA79 – What is it and what do I need to keep in mind?

NFPA stands for „ National Fire Protection Association „. The numbers are used to distinguish a variety of national standards. The regulating body is „OSHA„ (Occupational Safety and Health Administration). NFPA79 is an American sub- standard of NFPA70 , also referred to as NEC (National Electric Code). NFPA79 is essentially the equivalent of Europe`s EN60204-1 „ Safety of machinery - Electrical equipment of machines „. Historically, U.S. regulations always focus on preventing fires. This goes back to the beginning of electricity, when insurance companies were concerned with the risks. Back then, electricity was only expected to cause damage due to fires.

Contents

NFPA79 regulates:

- Construction of supply lines and connections
- Earthing
- Construction of control-and protective functions
- Arrangement and mounting of control units
- Construction of electrical conductors and cables
- Fundamentales of wiring
- Construction of motors and safety features
- Accessories and lightning protection
- Markings
- Tests
- Servo controllers and motors

With respect to singles conductors and cables, NFPA79 specifies the material of the conductor, the imprint, dimensioning re. current and temperature, normative general conditions in e.g. NFPA70 (NEC) and exceptions. NFPA79 generally tries to control circumstances resulting from industrial use not adequately covered by other regulations.

Problems with individual wires and cables

The AWM wires regulated by UL758 are designed for building wires and cables. Therefore they are prohibited in the 2007 issue of NFPA79. In practice, this distinction is not strictly made and becomes even more blurred when the regulations are implemented, particulary abroad. AWM wires have therefore also developed into a standard in industry. This was remedied in the 2012 issue of NFPA79. Section 12.9.2 in issue 2012 allows the use of AWM wires under specific conditions:

1) As a component of an assembly (finished products), identified as suitable for a specific purpose

2) Where AWM was identified as suitable and is used with approved equipment and corresponds with the use indicated by the equipment manufacturer

3) Where the construction meets all application requirements in sections 12.2 to 12.6 with the following possible deviations

a. Multi-wire conductors with a smaller cross-section than specified in 12.2.2 have a minimum of 7 wires (strands) → is irrelevant in servo applications

b. The conductor insulation and the cable sheathing are not made from material specified under 12.3.1, however meet the requirements of the intended use and comply with non-flammability according to UL1581 for Class FT2 (Flame propagation is measured on the conductor fastened horizontally) or VW-1 (flame propagation measured on the conductor fastened vertically).

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Competence of the equipment manufacturer

It becomes apparent the equipment manufacturer is clearly seen and reinforced as overall responsible. Queried about NFPA79 there`s often uncertainty on which cable material may be used. This question usually stems from machine builders who wish to export to the USA and wish to avoid any uncertainties through auditors. Here, European cable manufacturers are also caught flat-footed and do not manufacture explicit bulk goods which comply with NFPA79. Only selected lines procured from the USA are offered.

In conclusion, with respect to cable construction, the focus of NFPA79 is on flammability and potential mechanical damage. In addition to some specific provisions, the gap in NFPA79 is widening, allowing the use of cables which are not designed in compliance with NFPA79 but comply with nonflammability FT2 or VW-1. You can typically find nonflammability information in the data sheet of cables.

General conditions and market forces

The standard reference of NFPA79 back to NFPA70 and the UL standards required by classifications causes great uncertainty in respect to the construction of wires and cables. For raw materials from Europe it`s advisable to use UL-recognized materials. This ensures compliance with the corresponding limits in NFPA79 and the product construction is regulated by standard. This satisfies one main consideration for NFPA79 with respect to wires and cables. The UL approval also facilitates the local testing in the USA. The only thing still needed, is separately presenting the product`s suitability for the purpose and the requirements. It is therefore up to the system manufacturers to define the requirements. After all, this is where the expertise in application lies. Comparing the flame classes FT2 or VW-1 in the UL1581 „Reference Standard for Electrical Wires, Cables, and Flexible Cords" is advisable. This is how to meet exception 3b in section 12.9.2 of NFPA79 from 2012.

Alternatively, NFPA-compliant bulk material may be procured from the USA in individual cases. This will only work in individual cases, as the availbale portfolio of servo cables is very limited. These materials are then UL-listed. However, the bulk materials will have a PVC or TPE sheath, limiting their drag chain capabilities. Another fact is, that european cables do not contain halogen and thus don't emit toxic steam while burning. In the USA helogen is permitted, the focus is preventing the cable from burning. These properties hide a dilemma, the plastics for the cable sheath are not available in Europe.
To procure NFPA-compliant cables from the USA is expensive and takes a long time. Important is, that requirements of the intended application are corrensponding with the machine documentation and that installation guidelines and flame-retardance are fulfilled. The requirements of industrial application are as well fulfilled by the european products.

We recommend

The regulation encourages making use of leeway. Regulations cannot be more specific, since the cases of application are too diverses. If the conclusive description for application in the manual and the product requirements are coresponding, the NFPA-compliance is met.

UL-Wiring harnesses

Upon request we will also supply your wire approved according to UL-Wiring harnesses. We are certified to do so. This requires a parts list from the customer, which then also leads the certified manufacturing process to the final product. The cables will then have a UL label. Additionally, this measure facilitates the acknowledgement by the AHJ-officer in the USA.

Tamper-proof motor connector

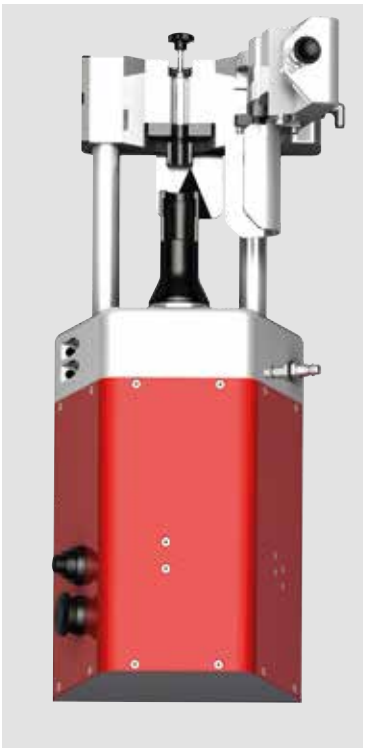
Tamper-proof like an overmolded connector. That's LockTec. A plastic body seals the entire connector in an irreversible way. Manipulation leads inevitably to the damage of the plastic body and clarifies the facts in the case of a warranty claim. Optionally with private label.

Your advantages

- Tamper-proof like an overnmolded
- Private labelling
- Alternative for small quantities
- Free assembly possible
- Signal and Power - hugh variety of configurations
- SpringTec (Ø 18) available
- M23 and M40 as well with SpeedTec-safety lock

Crimping machine with monitoring

Connector sealing



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Sangel delivers the same technology - LockTec

With us, you get same technology as you get it with the drive manufacturerer itself. The connector is tamper-proof with a plastic-housing. The connectors are internally equally designed, as the sister products with screw sealing from Intercontec are. All contact and assembly properties are based on the same design standards. The only difference is the screw machanism to close and fasten the sealing of the connector. The sealing of the Locktec-connector is pressed and the entire connector is housed in a pre-moulded plastic. Which is a beautiful finishing of the connector. It is not possible to open the connector again, so it is prevented from manipulation. This is achieved by 2 particular properties of the Locktec-connector. First the sealing (gasket) of the connector is pressed and thus not removable and secondly the plastic housing has a one way click-mechanism. These two facts prevent the connector from reopening without damaging it.

Motor cables for static application

Base cable for use on Rockwell / Allen-Bradley drive systems of the series 2090 - **Single Cable Solution**

Note
This motor cables have been specially designed for use with DSL technology.

Wire construction

Overall screen	tinned copper braid
Inner shield:	aluminum laminated plastic foil
Cover:	≥80%
Sheath color:	orange
Sheath material:	PVC

Power cores

Conductor:	bare copper	
Insulation:	0,75-10,0mm²:	PP

Signal wires

Conductor:	bare copper
Insulation:	PP
Stranding:	twisted pairs

Technical Specifications

Temperature Range

Not moving:	-20°C bis +80°C
Moves:	0°C bis +80°C

Bending radius

Not moving:	5x OD
Moves:	18x OD
Max acceleration:	2m/s²
Bending cycles:	≥100.000
Nominal voltage (UL/CSA):	1000 V

Power cores

Nominal voltage (VDE):	600/1000 V
Test voltage:	4000 V

Singnal wires

Nominal voltage (VDE):	24 V
Test voltage:	1000 V
Insulation resistance :	500 MOhm x km

Catalogue no.	Building	Color code	Outside diameter
13110001	(4x1,5+(2x0,75)+(2xAWG22))	1,2,3, gn/ye, 5+6, wh+bu	12,2mm ± 0,4mm
13110002	(4x2,5+(2x1,0)+(2xAWG22))	1,2,3, gn/ye, 5+6, wh+bu	13,8mm ± 0,4mm

Assemblies Rockwell / Allen-Bradley Standard, single-cable solution

Manufacturer description	Catalogue no.	Sangel description	Connector side engine Service Pack	Cable	Connector side regulator Service Pack

DSL cable with brake , plug with speedtec latch

CSBM1DF	15070001	Motor cable RO 4x2,5+2x1,0+2xAWG22 PVC or	15070028 Plug size 1, 9-pin	13110002 PVC, 4x1,5+2x0,75+2xAWG22	open end
CSBM1DF	15070002	Motor cable RO 4x1,5+2x0,75+2xAWG22 PVC or	15070028 Plug size 1, 9-pin	13110001 PVC, 4x2,5+2x1,0+2xAWG22	open end

Motor cables for mobile use

Base cable for use on Rockwell / Allen-Bradley drive systems of the series 2090 - **Single Cable Solution**

Note
This motor cables have been specially designed for use with DSL technology.

Wire construction

Overall screen	tinned copper braid
Inner shield:	metalic fleece
Cover:	≥85%
Sheath color:	orange
Sheath material:	PUR

Power cores

Conductor:	bare copper	
Insulation:	0,75-10,0mm²:	PP

Singnal wires

Conductor:	bare copper
Insulation:	PP
Stranding:	twisted pairs

Technical Specifications

Temperature Range

Not moving:	-40°C bis +80°C
Moves:	-20°C bis +80°C

Bending radius

Not moving:	5x OD
Moves:	7x OD
Max acceleration:	30m/s²
Bending cycles:	≥5 Mio.
Nominal voltage (UL/CSA):	1000 V

Power cores

Nominal voltage (VDE):	1000 V
Test voltage:	4000 V

Singnal wires

Nominal voltage (VDE):	24 V
Test voltage:	3000 V
Insulation resistance :	500 MOhm x km

Catalogue no.	Building	Color code	Outside diameter
13110003	(4x1,0+(2x0,75)+(2xAWG22))	1,2,3, gn/ye, 5+6, wh+bu	11,6mm ± 0,4mm
13110004	(4x1,5+(2x0,75)+(2xAWG22))	1,2,3, gn/ye, 5+6, wh+bu	12,7mm ± 0,4mm
13110005	(4x2,5+(2x0,75)+(2xAWG22))	1,2,3, gn/ye, 5+6, wh+bu	13,9mm ± 0,4mm
13110006	(4x4+(2x0,75)+(2xAWG22))	1,2,3, gn/ye, 5+6, wh+bu	15,9mm ± 0,4mm
13110007	(4x10+(2x0,75)+(2xAWG22))	1,2,3, gn/ye, 5+6, wh+bu	20,9mm ± 0,5mm
13110008	(4x0,75+(2x0,75)+(2xAWG22))	bn, bl, gr, gn/ye, 5+6, wh+bu	11,0mm ± 0,4mm

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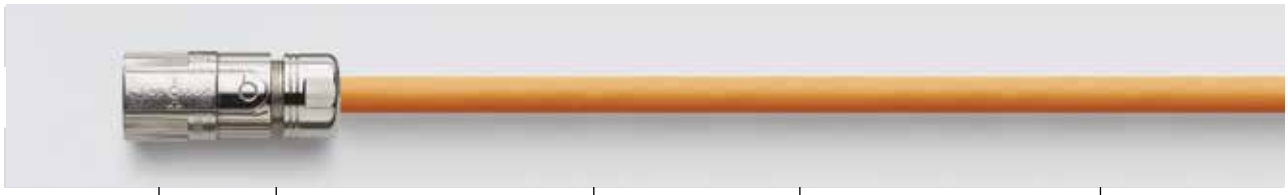
Assemblies Rockwell / Allen-Bradley standard, singel-cable solution

Manufacturer description	Catalogue no.	Sangel description	Connector side engine Service Pack	Cable	Connector side regulator Service Pack

DSL cable with brake, plug with Speedtec latch

CSBM1DF	15070003	Motor cable RO 4x1,5+2x0,75+2xAWG22 PUR or	15070028 Plug size 1, 9-pin	13110004 PUR, 4x1,5+2x0,75+2xAWG22	open end
CSBM1DF	15070004	Motor cable RO 4x2,5+2x1,0+2xAWG22 PUR or	15070028 Plug size 1, 9-pin	13110005 PUR, 4x2,5+2x0,75+2xAWG22	open end
CSBM1DF	15070005	Motor cable RO 4x1,0+2x0,75+2xAWG22 PUR or	15070028 Plug size 1, 9-pin	13110003 PUR, 4x1,0+2x0,75+2xAWG22	open end

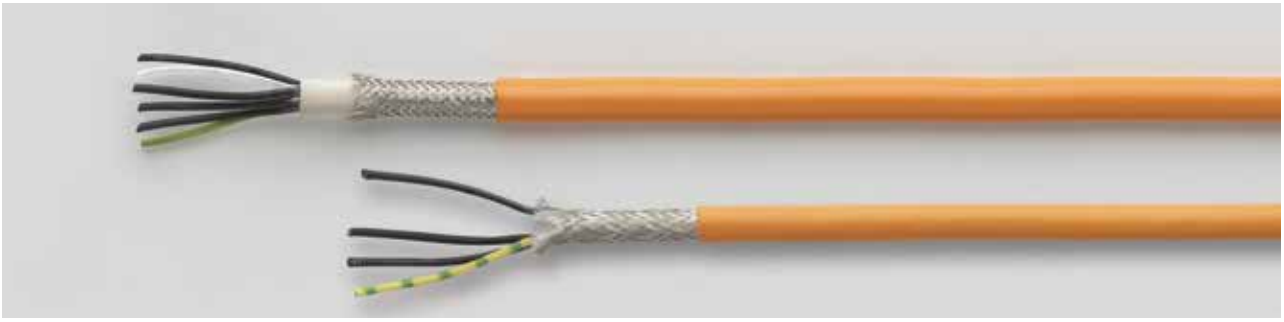
DSL cable without brake, plug with Speedtec latch



CSWM1DF	15070006	Motor cable RO 4x1,5+2xAWG22 PUR or	15070028 Plug size1, 9-pin	13110004 PUR, 4x1,5+2x0,75+2xAWG22	open end
CSWM1DF	15070007	Motor cable RO 4x2,5+2xAWG22 PUR or	15070028 Plug size1, 9-pin	13110005 PUR, 4x2,5+2x0,75+2xAWG22	open end
CSWM1DF	15070008	Motor cable RO 4x1,0+2xAWG22 PUR or	15070028 Plug size1, 9-pin	13110003 PUR, 4x1,0+2x0,75+2xAWG22	open end

Servomotor cables for dynamic applcation

Base cable for use on Rockwell / Allen-Bradley drive systems of the series 2090



Use

This high-quality pre-assembled sensor connection cable is specially made for applications with static routing. The special PVC outer jacket allows use in a variety of industrial environments of general machine and plant construction.

Special festure

These assemblies can be manufactured in any length and with customer-specific changes.

Note

Please have the drive or control manufacturer note the maximum permissible cable length.

Wire construction

Overall screen:	tinned copper braid
Inner shield:	tinned copper braid
Cover:	≥80%
Sheath color:	orange
Sheath material:	PVC

Power cores

Conductor:	bare copper
Insulation:	PVC
Core identification:	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye

Singnal wires

Conductor:	bare copper
Insulation:	TPE-E
Core identification:	black+white
Stranding:	twisted pairs

Technische Daten

Temperature Range

Not moving:	-20°C bis +80°C
Moves:	0°C bis +60°C

Bending radius

Not moving:	10x OD
Moves:	15x OD
Max acceleration:	2m/s²
Bending cycles:	≥100.000
Nominal voltage UL/CSA:	1000 V

Power cores

Nominal voltage VDE LA:	600/1000 V
Test voltage:	4000 V

Singnal wires

Nominal voltage VDE SA:	24 V
Test voltage:	1000 V
Insulation resistance:	10 MOhm x km

Catalogue no.	Building	Color code	Outside diameter in mm	Weight ca. kg/km	Copper weight
11070025	(4x1,5)	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye	9,7 +/- 0,4	164	94
11070026	(4x2,5)	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye	11,1 +/- 0,4	219	142
11070109	(4x4)	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye	12,9 +/- 0,4	310	207
11070111	(4x10)	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye	19,3 +/- 0,7	620	486
11070027	(4x1,5+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye, bk+wh	11,55 +/- 1,6	248	155
11070028	(4x2,5+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye, bk+wh	12,9 +/- 1,3	310	204
11070114	(4x6+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye, bk+wh	16 +/- 0,9	564	365
11070115	(4x10+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L-, gn/ye, bk+wh	20,3	853	584

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Assemblies Rockwell standard

Manufacturer description	Catalog no.	Sangel description	Connector side engine Service Pack	Cable	Connector side regulator Service Pack

Base cable with brake, plug with union nut

CPBM4DF-16	11070923	Motor cable RO Br. 4x1,5+2x1,5 Cir./ferrule PVC	11071283 Plug size 1, 9-pin	11070027 PVC, 4x1,5+2x1,5	open end
CPBM4DF-14	11070924	Motor cable RO Br. 4x2,5+2x1,5 Cir./ferrule PVC	11071283 Plug size 1, 9-pin	11070028 PVC, 4x2,5+2x1,5	open end

Base cable with brake, plug with LockTec / Speedtec latch

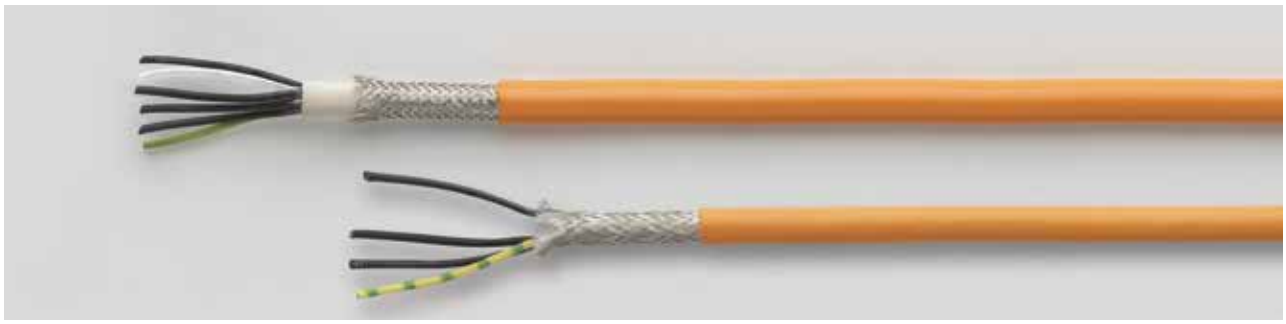
CPBM7DF-16	15070009	Motor cable RO Br. 4x1,5+2x1,5Cir./ ferrule STec PVC lock	15070029 Plug size 1, 9-pin	11070027 PVC, 4x1,5+2x1,5	open end
CPBM7DF-14	15070010	Motor cable RO Br. 4x2,5+2x1,5Cir./ ferrule STec PVC lock	15070029 Plug size 1, 9-pin	11070028 PVC, 4x2,5+2x1,5	open end

Base cable without brake, plug with LockTec / Speedtec latch

CPWM7DF-16	15070011	Motor cable RO 4x1,5 Cir./ferrule STec PVC lock	15070029 Plug size 1, 9-pin	11070025 PVC, 4x1,5	open end
CPWM7DF-14	15070012	Motor cable RO 4x2,5 Cir./ferrule STec PVC lock	15070029 Plug size 1, 9-pin	11070026 PVC, 4x2,5	open end

Servo motor cables for mobile use

Base cable for use on Rockwell / Allen-Bradley drive systems of the series 2090



Use

This high-quality assembled motor connection cable is specially made for with moving application. The special PUR outer jacket allows use in a variety of industrial environments of general machine and plant construction.

Special festure

These assemblies can be manufactured in any length and with customer-specific changes.

Note

Please note the installation instructions for installing the connections in cable drag chains, as well as the drive or control manufacturer for maximum allowable cable length.

Wire construction

Overall screen	tinned copper braid
Inner shield:	Stranded layer of tinned copper wires
Cover:	≥80%
Sheath color:	orange
Sheath material:	PUR

Power cores

Conductor:	Bare copper wire according to DIN VDE 0295 Kl. 6
Insulation:	Polyolefin
Core identification:	1, 2, 3, gn/ye

Singnal wires

Conductor:	Bare copper fine wire according to DIN VDE 0295 Kl. 6
Insulation:	polyolefin
Core identification:	black+white

Technical Specifications

Temperature Range

Not moving:	-40°C bis +80°C
Moves:	-20°C bis +60°C

Bending radius

Moves:	10 x OD
Max acceleration:	5 m/s²
Bending cycles:	≥5 Mio.

Nominal voltage

UL/CSA:	1000 V

Power cores

Nominal voltage

VDE LA:	600/1000 V
Test voltage:	3000 V

Singnal wires

Nominal voltage

VDE SA:	24 V
Test voltage:	1500 V

Catalogue no.	Building	Color code	Outside diameter in mm	Weight ca. kg/km	Copper weight ca. kg/km
11070032	(4x1,5)	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye	9 +/- 0,3	130	90
11070031	(4x2,5)	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye	10,5 +/- 0,3	190	132
11070041	(4x4)	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye	12,2 +/- 0,4	265	197
11070043	(4x10)	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye	16,8 +/- 0,5	600	447
11070034	(4x1,5+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye, bk+wh	11,2 +/- 0,3	210	146
11070038	(4x2,5+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye, bk+wh	12,7 +/- 0,4	260	170
11070033	(4x6+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye, bk+wh	16,1 +/- 0,5	465	365
11070040	(4x10+(2x1,5))	U/L1/C/L+, V/L2, W/L3/D/L, gn/ye, bk+wh	18,5 +/- 0,5	670	560

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Assemblies Rockwell standard

Manufacturer description	Catalogue no.	Sangel description	Connector side engine Service Pack	Cable	Connector side regulator Service Pack

Base cable with brake, plug with union nut

CPBM4DF-16	11070838	Motor cable RO Br. 4x1,5+2x1,5 Cir./ ferrule PUR	11071283 Plug size 1, 9-pin	11070034 PUR, 4x1,5+2x1,5	open end
CPBM4DF-14	11070839	Motor cable RO Br. 4x2,5+2x1,5 Cir./ ferrule PUR	11071283 Plug size 1, 9-pin	11070038 PUR, 4x2,5+2x1,5	open end

Base cable with brake, plug with LockTec / Speedtec latch

CPBM7DF-16	15070013	Motor cable RO Br. 4x1,5+2x1,5Cir./ ferrule STec PUR lock	15070029 Plug size 1, 9-pin	11070034 PUR, 4x1,5+2x1,5	open end
CPBM7DF-14	15070014	Motor cable RO Br.4x2,5+2x1,5Cir./ ferrule STec PUR lock	15070029 Plug size 1, 9-pin	11070038 PUR, 4x2,5+2x1,5	open end

Base cable without brake, plug with LockTec / Speedtec latch

CPWM7DF	15070015	Motor cable RO 4x1,5 Cir./ferrule STec PUR lock	15070029 Plug size 1, 9-pin	11070032 PUR, 4x1,5	open end
CPWM7DF	15070016	Motor cable RO 4x2,5 Cir./ferrule STec PUR lock	15070029 Plug size 1, 9-pin	11070031 PUR, 4x2,5	open end

Extension cable with brake, plug with LockTec / Speedte latch and coupling

CPBM7E7	15070017	Motor extn. RO Br . 4x1.5 + 2x1.5 Cir . STEC PUR lock	15070029 Plug size 1, 9-pin	11070034 PUR, 4x1,5+2x1,5	15070032 Clutch size 1, 9-pin
CPBM7E7	15070018	Motor extn. RO Br . 4x2.5 + 2x1.5 Cir . STEC PUR lock	15070029 Plug size 1, 9-pin	11070038 PUR, 4x2,5+2x1,5	15070032 Clutch size 1, 9-pin

SANGEL® Systemtechnik

Encoder cables for static application

Base cable for use on Rockwell / Allen-Bradley drive systems of the series 2090 - **Incremental Encoder**

Use
This high-quality pre-assembled sensor connection cable is specially made for applications with static routing. The special PVC outer jacket allows use in a variety of industrial environments of general machine and plant construction.

Special feature
These assemblies can be manufactured in any length and with customer-specific changes.

Note
Please have the drive or control manufacturer note the maximum permissible cable length.

Wire construction

Insulation:	PP
Overall screen	tinned copper braid
Cover:	≥85%
Conductor:	Tinned copper
Sheath color:	green
Sheath material:	PVC

Technical Specifications

Temperature Range

Not moving:	-40°C bis +80°C
Moves:	-5°C bis +80°C

Bending radius

Not moving:	5x OD
Moves:	10x OD
Max acceleration:	5 m/s²
Bending cycles:	≥100.000

Power cores

Test voltage:	1000 V

Singnal wires

Test voltage:	1000 V
Insulation resistance:	≥20 MOhm x km

Catalogue no.	Building	Color code	Outside diameter in mm	Weight ca. kg/km	Copper weight ca. kg/km
15070025	(7x2xAWG26+2xAWG22+2xAWG16)	bk+wh/bk, rd+wh/rd, gn+wh/gn, bu+wh/bu, ye+wh/ye, bn+wh/bn, vt+wh/vt, og+wh/og, gy+wh/gy	10,7 +/- 0,3	156	77,6

E-Mail
sales@sangel.com

Hotline
+49 521.911750

Assemblies Rockwell / Allen-Bradley standard

Manufacture description	Catalogue no.	Sangel description	Connector side engine Service Pack	Cable	Connector side regulator Service Pack

Basic cable, connector with union nut

CFBM4D7-CD	11071498	Encoder cable RO 17pol. Cir. / ferrule PVC	11072048 Plug size 1, 17-pin	15070025	open end

Basic cable, plug with LockTec / Speedtec latch

CFBM7DF-CD	15070019	Encoder cable RO Cir. STec / ferrule PVC lock	15070030 Plug size 1, 17-pin	15070025	open end

Basic cable, plug with LockTec / Speedtec, DSUB connectors

CFBM4DD-CD	15070033	Encoder cable RO Cir . STEC / ferrule PVC lock DSUB	15070030 Plug size 1, 17-pin	15070025	11072196 DSUB, 15-pin HD

Encoder cables for mobile use

Base cable for use on Rockwell / Allen-Bradley drive systems of the series 2090 - **Incremental Encoder**

Use
This high-quality ready-made encoder cables are designed for with moving application. The PUR outer jacket allows use in a variety of environments of general machine and plant construction.

Special festure
These assemblies can be manufactured in any length and with customer-specific changes.

Note
Please note the installation instructions for installing the connections in cable drag chains , as well as the drive or control manufacturer for maximum allowable cable length.

Wire construction

Insulation:	polyolefin polymer
Overall screen	tinned copper braid
Cover:	≥85%
Conductor:	Tinned copper
Sheath color:	green
Sheath material:	PUR

Technical Specifications

Temperature Range

Not moving:	-30°C bis 80°C
Moves:	-10°C bis +80°C

Bending radius

Moves:	10x OD
Max acceleration:	20 m/s²
Bending cycles:	≥5 Mio.
Nominal voltage VDE:	250 V
Test voltage:	1000 V

Catalogue no.	Building	Color code	Outside diameter in mm	Weight ca. kg/km	Copper weight ca. kg/km
15070026	(7x2xAWG26+2xAWG22+ 2xAWG16)	bk+wh/bk, rd+wh/rd, gn+wh/gn, bu+wh/bu, ye+wh/ye, bn+wh/bn, vt+wh/vt, og+wh/og, gy+wh/gy	10 +/- 1	127	87

Assemblies Rockwell / Allen-Bradley standard

Manufacture description	Catalogue no.	Sangel description	Connector side engine Service Pack	Cable	Connector side regulator Service Pack

Basic cable, connector with union nut

CFBM4DF-CO	11070853	Encoder cable RO Cir . / ferrule PUR	11072048 Plug size 1, 17-pin	15070026	open end

Basic cable, connector with union nut and DSUB connectors

CFBM4DD-CO	11070854	Encoder cable RO Cir . / DSUB PUR	11072048 Plug size 1, 17-pin	15070026	11072196 DSUB, 15-pin HD

Basic cable, plug with LockTec / Speedtec latch

CFBM7DF-CD	15070020	Encoder cable RO Cir . STEC / ferrule PUR lock	15070030 Plug size 1, 17-pin	15070026	open end

Basic cable, plug with LockTec / Speedtec latch and DSUB connectors

CFBM7DD-CD	15070021	Encoder cable RO Cir . STEC / DSUB PUR lock	15070030 Plug size 1, 17-pin	15070026	11072196 DSUB, 15-pin HD

Encoder cables for mobile use

Base cable for use on Rockwell / Allen-Bradley drive systems of the series 2090 - **High Resolution Encoder** / **Resolver**

Use
This high-quality ready-made encoder cables are designed for applications with moving application. The PUR outer jacket allows use in a variety of environments of general machine and plant construction.

Special feature
These assemblies can be manufactured in any length and with customer-specific changes.

Note
Please note the installation instructions for installing the connections in cable drag chains , as well as the drive or control manufacturer for maximum allowable cable length.

Line construction

Insulation:	PP
Overall screen	tinned copper braid
Cover:	≥85%
Conductor:	Tinned copper
Sheath color:	green
Sheath material:	PUR

Technical Specifications

Temperature Range

Not moving:	-40°C bis 80°C
Moves:	-20°C bis +80°C

Bending radius

Not moving:	5,0x OD
Moves:	7,5x OD
Max acceleration:	50 m/s²
Bending cycles:	≥5 Mio.
Nominal voltage	
UL:	300 V
Test voltage:	1500 V / 800V

Catalogue no.	Building	Color code	Outside diameter in mm	Weight ca. kg/km	Copper weight ca. kg/km
15070027	(7x2xAWG22)	bk+wh/bk, rd+wh/rd, gn+wh/gn, bu+wh/u,ye+wh/ye, og+wh/og, gy+wh/gy	10,50 +/- 0,2	139	72

Assemblies Rockwell / Allen-Bradley standard

Manufacture description	Catalogue no.	Sangel description	Connector side engine Service Pack	Cable	Connector side regulator Service Pack

Basic cable, plug with LockTec / Speedtec latch

CFBM7DF-CE	15070022	Encoder cable RO Cir . SpTec / ferrule (CE) lock	15070030 Plug size 1, 17-pin	15070027	open end

Basic cable, plug with LockTec / Speedtec latch and DSUB connectors

CFBM7DD-CE	15070023	Encoder cable RO Cir . STEC / DSUB (CE) lock	15070030 Plug size 1, 17-pin	15070027	11072196 DSUB, 15-pin, HD

Extension cable, plug with LockTec / Speedtec latch release and coupling

CFBM7E7-CE	15070024	Encoder extension RO Cir . STEC (CE) lock	15070030 Plug size 1, 17-pin	15070027	15070031 Clutch size 1, 17-pin

What we connect – lasts

BUREAU VERITAS
Certification

Zertifikat

SANGEL
Systemtechnik

SANGEL Systemtechnik GmbH
Schillerstraße 44
D-33609 Bielefeld

Bureau Veritas Certification bestätigt, dass das Management System der oben genannten Organisation beurteilt wurde und die in den folgenden Normen und Regelwerken festgelegten Anforderungen erfüllt.

Normen/Regelwerke

DIN EN ISO 9001:2008

Anwendungsbereich

Konstruktion, Herstellung, Handel und Logistik von mechatronischen Maschineninstallationen und Industrieleuchten.

07.01.2003
03.12.2014 02.12.2017
30.01.2015 29.01.2018

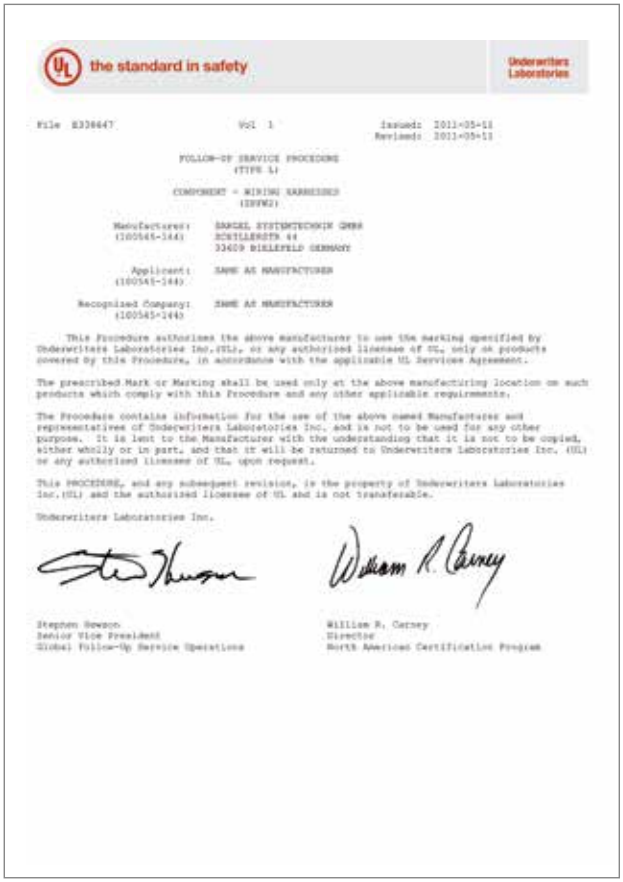
Local Technical Manager
Datum 30.01.2015

DE004525-1

DAkkS

Bureau Veritas Certification Germany GmbH
Veritaskai 1 · D-21079 Hamburg

Certification according to
DIN ISO 9001:2008



the standard in safety

Underwriters Laboratories

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FOLLOW-UP SERVICE PROCEDURE
(TYPE 1)

COMPONENT - WIRING HARNESSES
(ZDYW2)

Manufacturer: (100545-144) SANGEL SYSTEMTECHNIK GMBH
SCHILLERSTR 44
33609 BIELEFELD GERMANY

Applicant: (100545-144) SAME AS MANUFACTURER

Recognized Company: (100545-144) SAME AS MANUFACTURER

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Membership

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Notes

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