www.eupen.com

MSR-Instrumentation cables

For Industrial Applications

2023

Kabelwerk EUPEN AG

Einleitung / Introduction

Moderne Industrieanlagen stellen hohe Anforderungen an die verwendeten Komponenten. Dabei spielen die Instrumentation und dementsprechend die Kabel für die Mess-, Steuer- und Regeltechnik eine entscheidende Rolle. Für die Bezeichnung der Produktfamilie Instrumentation haben wir das Kürzel **„MSR“** für **„Messen-Steuern-Regeln“** eingeführt.

Wir bieten ein breites Spektrum an hochwertigen Instrumentationskabeln nach **verschiedenen Normen**, wie **EN 50288-7, VDE 0815** und **NF M 87-202** oder auch nach **kundenspezifischen Vorgaben**. Auch ein individuell angepasstes Kabeldesign ist möglich. Wir bieten Instrumentationskabel in den folgenden Ausführungen an:

- **Leiterform:** Kupferleiter der Kl.1 (massiv), Kl.2 (mehrdrähtig) oder Kl.5 (flexibel), blank oder verzinnt.
- **Isolation:** aus Polyethylen (unvernetzt „PE“ oder vernetzt „VPE“), oder aus Polyvinylchlorid „PVC“. Falls Funktionserhalt gefordert ist, können wir eine keramisierende Isolationsmischung oder die Kombination Mica/VPE anbieten.
- **Verseilelemente:** Paare-, Dreier- oder Vierer.
- **Einzel- und/oder Gesamtabschirmung** (Aluminium kaschierte Folien-, Kupferband- oder Geflechtabschirmung)
- **Bewehrungen:** aus Stahldraht, Stahlband oder Stahldrahtgeflecht.
- **Sonderausführungen mit Bleimantel** zum Schutz gegen stark belastetes Erdreich sowie gegen aggressive Chemikalien wie Säuren, Basen, aliphatische und aromatische Kohlenwasserstoffe.
- **Außenmantel:** in PVC Ausführung oder mit halogenfreien Mischungen für besondere Anforderungen im Brandfall.

Unsere „Construction Guideline“ dient der genaueren Definition des Produktes und einer gemeinsamen Sprache zwischen dem Kunden und Eupen Cable.

Modern industrial plants set high demands on their main components. Instrumentation, and consequently the cables for measurement and control technology, play a vital role. To designate the product group instrumentation cables, we choose the abbreviation **“MSR”** which stands for **“Measuring-Steering-Regulating”.**

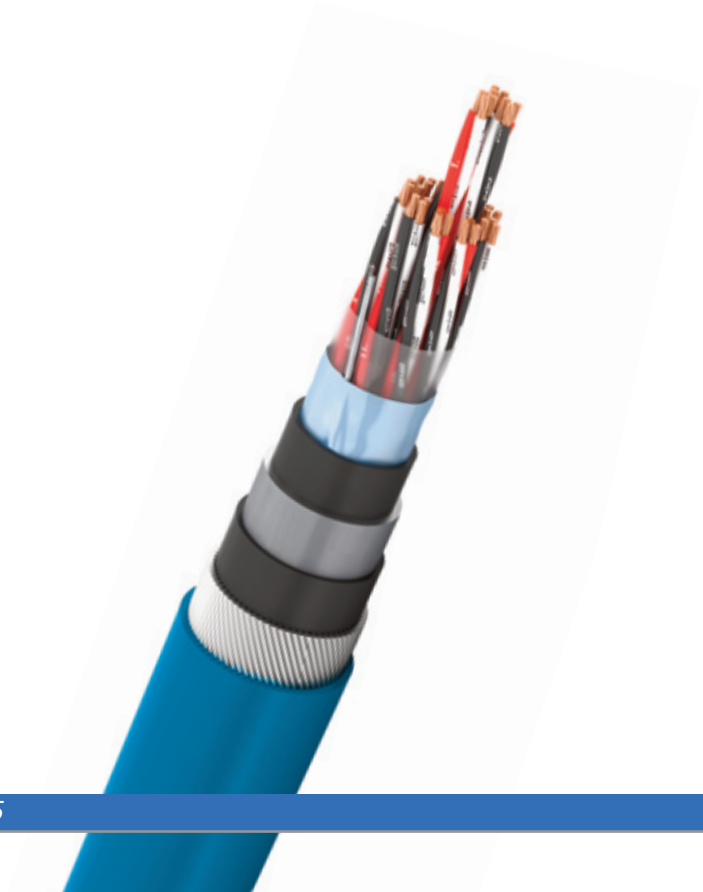
We are offering a broad range of instrumentation cables according to **various standards** such as **EN 50288-7, VDE 0815** and **NF M 87-202** or following **customer specifications**. Eupen Cable is also able to customize the cable design. We can offer instrumentation cables in the following designs:

- **Conductors:** solid (class 1), stranded (class 2) or flexible (class 5) bare or tinned conductors
- **Insulation:** Polyethylene (PE) or cross-linked Polyethylene (XLPE) or Polyvinylchloride (PVC). If circuit integrity is required, we can offer a ceramic-forming insulation compound or a combination of Mica tape and XLPE.
- **Stranding of the insulated cores:** in pairs, triples or quads.
- **Screen:** with individual or overall screen (aluminum laminated foil, copper braid or tape).
- **Armour:** with steel tape, steel wire or steel wire braid.
- **As special construction with a lead sheath** as protection against contaminated soil or against aggressive chemicals such as acids, bases, aliphatic or aromatic hydrocarbons.
- **Outer sheath:** Polyvinylchloride (PVC) or halogen-free compound for special requirements in case of fire.

Our “Construction guideline” can be a useful help to specify the required product and thus simplify the coordination between the customer and Eupen Cable.

Inhaltsverzeichnis / Table of contents

Instrumentation Construction Guideline	**6**
Instrumentation cables according to **EN 50288-7**	**12**
- Cables with XLPE insulation and PVC outer sheath 300V	**13**
- Armoured cables with XLPE insulation and PVC outer sheath 300V	**31**
- Cables with halogen free insulation and halogen free outer sheath 300V	**49**
- Cables with circuit integrity 300V-500V	**67**
- Cables with twisted cores 500V	**73**
Instrumentation cables according to **VDE 0815**	**79**
Instrumentation cables according to **AFNOR NF M 87-202** 250V	**87**



Construction guideline

1) SUMMARY OF ABBREVIATIONS FOR CABLE CONSTRUCTION ELEMENTS

MSR - : EUPEN code for INSTRUMENTATION CABLES

JE - : cable for INDUSTRIAL ELECTRONICS

RD - : cable for CONTROL SYSTEMS

INSULATION MATERIALS:

2Y : Polyethylene (PE)

2X : Crosslinked Polyethylene (XLPE)

Y : Polyvinylchloride (PVC)

H : Halogen-free, fire-retardant compound

HX : Cross-linked, halogen-free fire-retardant compound

INDIVIDUAL SCREENS:

Pimf : **P**AIR **i**n **m**etal **f**oil

Timf : **T**RIPLE **i**n **m**etal **f**oil

Qimf : **Q**UAD **i**n **m**etal **f**oil

OVERALL SCREENS:

(St) : Aluminium laminated synthetic foil in contact with a tinned copper drain wire

(C) : Copper wire braid

(St)C : Aluminium foil + tinned copper wire braid

(CuB) : Copper tape

CABLING:

Bd : Cabling elements forming a bundle and bundles assembled together

Bd Z : Bundles identified by means of a numbered tape

Bd Si : SIMATIC ring coding of bundels

METALLIC BARRIERS:

K : Lead alloy sheath

(L) : Aluminium laminated sheath, also called composite layer sheath (Copolymer coated Alu-tape, laminated to the 2Y- or H-sheath)

METALLIC ARMOURINGS:

B : Double steel tape armour

Q : Galvanized steel wire braid

R : Galvanized round steel wire armour

OUTER SHEATH MATERIALS:

2Y : Polyethylene or High Density Polyethylene (PE or HDPE)

Y : Polyvinylchloride (PVC)

Yö : Hydrocarbon-resistant Polyvinylchloride (PVC RH)

YW : Heat-resistant PVC (max. 90°C)

H : Halogen-free, fire-retardant compound

v : Reinforced wall thickness of outer sheath

Construction guideline

2) APPLICABLE STANDARDS

- Cable constructions & properties can be based on the following standards:

EN	**50288-7**
NF	**M87-202**
VDE	**0815/0816**
IEC	**60502-1**

- The behaviour of the cable under fire conditions can be defined according to the following standards:

Scope	
a) Fire resistance	IEC 60331
b) Fire retardance test on cable bundles	IEC 60332-3 Cat C / Cat A
c) Flame retardance test on single cables or single insulated cores	IEC 60332-1
d) Smoke density test	IEC 601034-1+2
e) Corrosivity of combustion gases (halogen content ...)	IEC 60754-2

3) CONDUCTORS

According to **IEC 60228**:
* Solid (Class 1)
* Stranded (Class 2)
* Flexible (Class 5)

• **Selection criteria for the choice of conductor construction:**

* Flexibility * Type of Termination / Connection

• Typical constructions:

	Standard construction			Optional construction	
Conductor size	Stranded, cl.2	Diam. mm	R_{dc}@20 °C (Ω/km)	Solid, cl.1	Flexible, cl.5
0,50 mm²	7x0,30 mm	0,9	36,0	1x0,8 mm	16x0,20 mm
0,75 mm²	7x0,37 mm	1,1	24,5	1x0,98 mm	23x0,20 mm
1,00 mm²	7x0,43 mm	1,3	18,1	1x1,13 mm	31x0,20 mm
1,50 mm²	7x0,52 mm	1,6	12,1	1x1,39 mm	28x0,25 mm
2,50 mm²	7x0,66 mm	2,0	7,41	1x1,76 mm	46x0,25 mm

Other cross sections and constructions on request.

4) INSULATION MATERIALS

* **2Y** : Polyethylene (PE)
* **2X** : Crosslinked Polyethylene (XLPE)
* **Y** : Polyvinylchloride (PVC)
* **H** : Halogen-free, fire-retardant compound
* **HX** : Cross-linked halogen-free, fire-retardant compound
* **m2X** : Mica tape + cross-linked Polyethylene (XLPE)

• **Selection criteria for insulation compounds:**

* Electrical Properties
* Temperature Rating
* Behaviour under Fire Conditions
* Termination Methods

Construction guideline

5) INSULATION WALL THICKNESS & ELECTRICAL PROPERTIES

The insulation wall thickness is selected acc. to specified parameters such as:

* Applicable standards (see pt. 2)

* Voltage rating and related test voltage

* Mutual capacitance

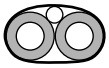
6) CABLING ELEMENTS AND INDIVIDUAL SCREENING

Cabling elements:

- **CORE** consisting of one insulated conductor
- **PAIR** consisting of 2 stranded cores forming a loop
- **TRIPLE** consisting of 3 stranded cores
- **STAR-QUAD** consisting of 4 stranded cores, 2 diametrically opposed cores forming a pair

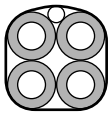
INDIVIDUALLY SCREENED cabling elements are expressed as follows:

* **Pimf** : **P**AIR **i**n **m**etal **f**oil



* **Timf** : **T**RIPLE **i**n **m**etal **f**oil

* **Qimf** : **Q**UAD **i**n **m**etal **f**oil



Standard IDENTIFICATION of cabling elements (others on request):

a) Unscreened or overall screened cables:

- CORE : WHITE, each core continuously numbered
- PAIR : BLACK / WHITE, each core numbered
- TRIPLE : BLACK / WHITE / RED, each core numbered
- QUAD : BLACK / WHITE / RED / BROWN, 2 diametrically opposed cores numbered with the same number

b) Individually screened cabling elements:

- Colour code as a)
- Identification of each individually screened cabling element by means of a numbered tape

The stranding elements need to be balanced-out in order to reduce crosstalk, therefore pairs, triples and quads are twisted with a different pitch.

Construction guideline

7) LAYING-UP OF CABLING ELEMENTS

In most of the cases, cables are laid up in concentric LAYERS.
For certain cable types, the cabling elements are laid up in BUNDLES **(Bd)**.
The bundles can be identified for example by means of a numbered tape **(Bd Z)** or by SIMATIC ring coding **(Bd Si)**.

8) OVERALL SCREENING

Overall screenings are applied to prevent or reduce the external interferences caused by electric or electronic devices like motors, machineries, power cables ...

Standard solution:

* **(St)** : Aluminium laminated synthetic foil in contact with a tinned copper drain wire

Optional solution:

* **(C)** : Copper wire braid
* **(St)C** : Aluminium foil, metallized face in contact with a tinned copper wire braid
* **(CuB)** : Copper tape

9) METALLIC BARRIER AGAINST AGGRESSIVE LIQUIDS

When used in petrochemical installations, cables often require an additional metallic covering to make them transversally tight against aggressive liquids or polluted water.

* **K** : - Lead Alloy „E“ sheath acc. to EEMUA 133 or
  - Kb-Pb Lead Alloy sheath acc. to VDE
* **(L)** : - Aluminium laminated sheath (copolymer-coated aluminium tape laminated to PE outer sheath)

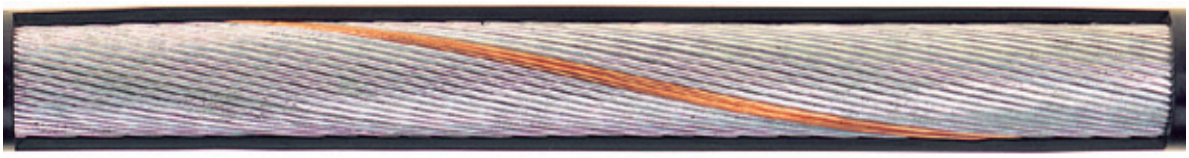
Construction guideline

10) ARMOURINGS

Very often, the cables require an armouring as additional protection against mechanical impacts during installation and operation. Those armourings can also fulfill electrical functions as earthing interconnection, screen or interference protection.

a) GALVANIZED STEEL WIRE ARMOURING **R**

A concentric layer of galvanized round steel wires, providing over 90 % optical coverage.



* GOOD MECHANICAL PROTECTION
* GOOD TENSILE STRENGTH
* FAIR BENDING properties
* GOOD RODENT PROTECTION

b) DOUBLE STEEL TAPE ARMOURING **B**

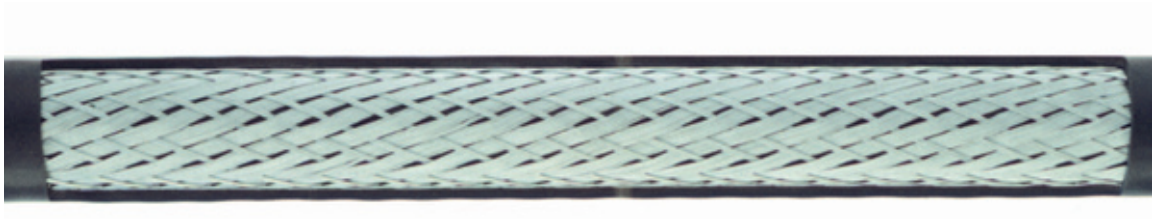
Two layers of galvanized or bare steel tapes, providing 100 % coverage of the cable core.

* Diam. of cable core under armouring: min. 8 mm
* GOOD protection against PRESSURE & SHOCKS
* GOOD RODENT PROTECTION
* COST SAVING and light-weight
* Armouring providing BEST LOW FREQUENCY INDUCTION-PROTECTION
* Not resistant to tractive force

Construction guideline

c) GALVANIZED STEEL WIRE BRAID **Q**

A galvanized steel wire braid providing min. 82 % optical coverage (min. wire diam. 0,3 mm).



* GOOD MECHANICAL PROTECTION
* FAIR TENSILE STRENGTH
* LIGHT WEIGHT
* Armouring allowing SMALLEST BENDING RADIUS of cable
* No diameter limitation for cable core to be braided

11) OUTER SHEATH MATERIALS

* **2Y**	:	Polyethylene or High Density Polyethylene (PE or HDPE)
* **Y**	:	Polyvinylchloride (PVC)
* **Yö**	:	Hydrocarbon resistant Polyvinylchloride (PVC RH)
* **H**	:	Halogen-free, fire-retardant compound
* **v**	:	Reinforced wall thickness of outer sheath

• Selection criteria:

* Behaviour under fire condition
* Temperature rating (during installation and operation)
* Site conditions (oil-resistant, termite-repellent ...)

* PREFERENTIAL COLOURS FOR OUTER SHEATHS:

BLACK	:	Best UV-resistance
BLUE	:	For intrinsically safe circuits
GREY	:	Standard
OTHERS	:	On request

• The nominal thickness of the outer sheath is in accordance with the applicable standard

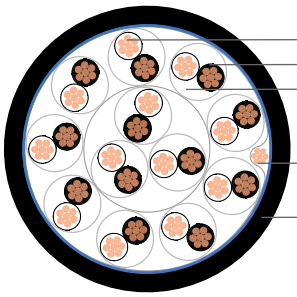
Instrumentation cables
according to **EN 50288-7**

Cables with XLPE insulation and PVC outer sheath 300V

MSR-2X(St)Y

Reference standard: EN 50288-7
XLPE insulated, pair twisted, overall screened, unarmoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pair(s)
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Y 4x2x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

MSR-2X(St)Y

Number of pairs	Insulation thickness Minimum mm	Outer sheath thickness Nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
1	0,26	0,8	5,6	39
2	0,26	0,9	8,3	73
4	0,26	0,9	9,4	99
8	0,26	1,0	12,5	168
12	0,26	1,1	14,7	236
16	0,26	1,1	16,2	302
24	0,26	1,2	20,0	428
Cross section 0,75 mm² / 7				
1	0,26	0,8	6,0	45
2	0,26	0,9	8,9	90
4	0,26	1,0	10,4	129
8	0,26	1,1	13,9	222
12	0,26	1,1	16,1	308
16	0,26	1,2	18,0	409
24	0,26	1,3	22,0	570
Cross section 1,0 mm² / 7				
1	0,26	0,8	6,4	53
2	0,26	0,9	9,6	104
4	0,26	1,0	11,2	158
8	0,26	1,1	15,0	275
12	0,26	1,2	17,6	393
16	0,26	1,2	19,5	510
24	0,26	1,3	24,0	720
Cross section 1,3 mm² / 7				
1	0,26	0,9	7,0	64
2	0,26	1,0	10,4	130
4	0,26	1,0	12,0	189
8	0,26	1,1	16,1	333
12	0,26	1,2	19,0	478
16	0,26	1,3	21,1	628
24	0,26	1,4	26,1	897

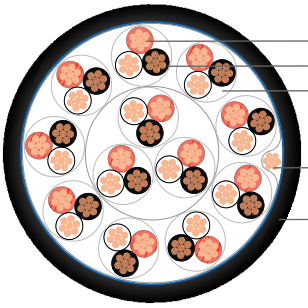
MSR-2X(St)Y

Number of pairs	Insulation thickness Minimum mm	Outer sheath thickness Nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 1,5 mm² / 7				
1	0,35	0,9	7,6	73
2	0,35	1,0	11,4	152
4	0,35	1,1	13,4	225
8	0,35	1,2	18,0	399
12	0,35	1,3	21,0	565
16	0,35	1,4	23,6	755
24	0,35	1,5	29,3	1077
Cross section 2,5 mm² / 7				
1	0,35	0,9	8,4	96
4	0,35	1,1	15,0	313
12	0,35	1,4	24,0	821

MSR-2X(St)Y

Reference standard: EN 50288-7
XLPE insulated, triple twisted, overall screened, unarmoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triple(s)
   colour identification: BLACK/WHITE/RED, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Y 4x3x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

MSR-2X(St)Y

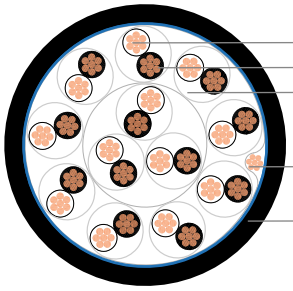
Number of triples	Insulation thickness Minimum mm	Outer sheath thickness Nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² /7				
1	0,26	0,8	5,9	46
2	0,26	0,9	9,1	89
4	0,26	1,0	10,6	133
8	0,26	1,1	14,1	232
12	0,26	1,1	16,4	322
16	0,26	1,2	18,4	425
24	0,26	1,3	22,5	598
Cross section 0,75 mm² /7				
1	0,26	0,8	6,3	55
2	0,26	0,9	9,8	112
4	0,26	1,0	11,4	174
8	0,26	1,1	15,3	303
12	0,26	1,2	18,1	435
16	0,26	1,3	20,2	574
24	0,26	1,4	24,8	814
Cross section 1,3 mm² /7				
1	0,26	0,9	7,4	77
2	0,26	1,0	11,6	171
4	0,26	1,0	13,3	257
8	0,26	1,2	18,2	472
12	0,26	1,3	21,3	676
16	0,26	1,4	23,9	897
24	0,26	1,5	29,7	1295

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)Yv

Reference standard: EN 50288-7
XLPE insulated, pair twisted, overall screened, unarmoured, reinforced PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pair(s)
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Outer sheath: reinforced, flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Yv 12x2x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

MSR-2X(St)Yv

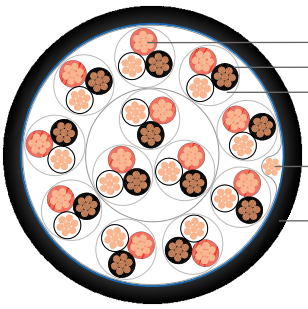
Number of pairs	Insulation thickness Minimum mm	Outer sheath thickness Nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
1	0,26	1,8	7,6	68
2	0,26	1,8	10,2	112
4	0,26	1,8	11,3	142
8	0,26	1,8	14,2	218
12	0,26	1,8	16,2	286
16	0,26	1,8	17,7	358
24	0,26	1,8	21,3	487
Cross section 0,75 mm² / 7				
1	0,26	1,8	8,0	77
2	0,26	1,8	10,8	128
4	0,26	1,8	12,1	171
8	0,26	1,8	15,4	271
12	0,26	1,8	17,6	363
16	0,26	1,8	19,3	463
24	0,26	1,8	23,0	621
Cross section 1,3 mm² / 7				
1	0,26	1,8	8,8	96
2	0,26	1,8	12,1	172
4	0,26	1,8	13,7	237
6	0,26	1,8	15,9	337
8	0,26	1,8	17,6	389
12	0,26	1,8	20,3	534
16	0,26	1,8	22,1	677
24	0,26	1,8	26,9	945

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)Yv

Reference standard: EN 50288-7
XLPE insulated, triple twisted, overall screened, unarmoured, reinforced PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triple(s)
   colour identification: BLACK/WHITE/RED, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Outer sheath: reinforced, flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Yv 12x3x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

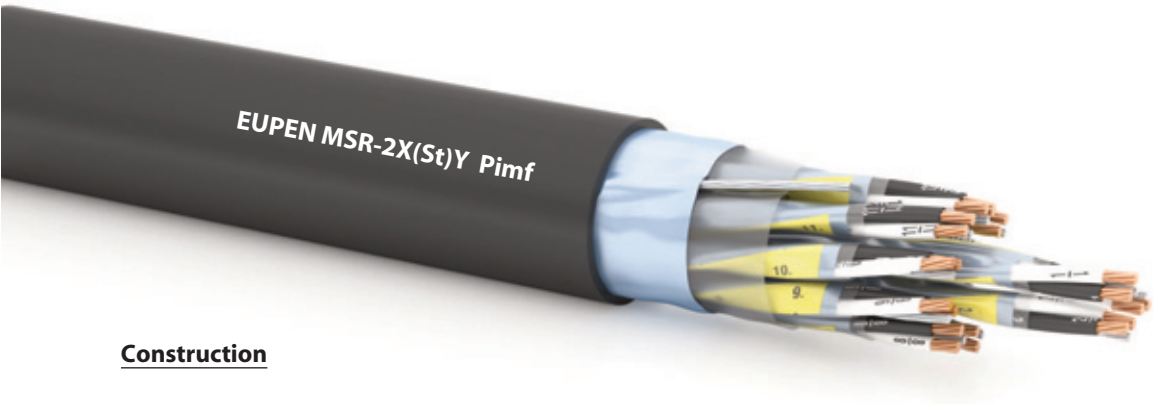
MSR-2X(St)Yv

Number of triples	Insulation thickness Minimum mm	Outer sheath thickness Nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² /7				
1	0,26	1,8	7,9	78
2	0,26	1,8	11,0	132
4	0,26	1,8	12,3	177
8	0,26	1,8	15,6	280
12	0,26	1,8	17,9	379
16	0,26	1,8	19,6	479
24	0,26	1,8	23,5	650
Cross section 0,75 mm² /7				
1	0,26	1,8	8,3	88
2	0,26	1,8	11,7	158
4	0,26	1,8	13,2	221
8	0,26	1,8	16,8	355
12	0,26	1,8	19,4	488
16	0,26	1,8	21,3	624
24	0,26	1,8	25,6	860
Cross section 1,3 mm² /7				
1	0,26	1,8	9,2	114
2	0,26	1,8	13,3	218
4	0,26	1,8	15,1	310
8	0,26	1,8	19,5	526
12	0,26	1,8	22,3	725
16	0,26	1,8	24,6	940
24	0,26	1,8	30,3	1336

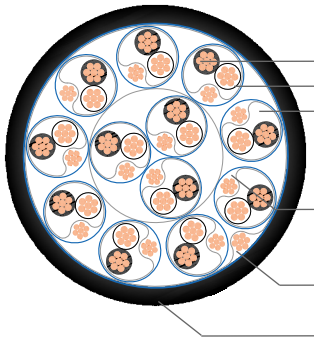
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)Y Pimf

Reference standard: EN 50288-7
XLPE insulated, pair twisted, individual & overall screened, unarmoured, PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: - insulation: BLACK/WHITE, each core numbered
   - additional black numbered yellow tape above each individual screened pair
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Y Pimf 12x2x1,0 mm² 300V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

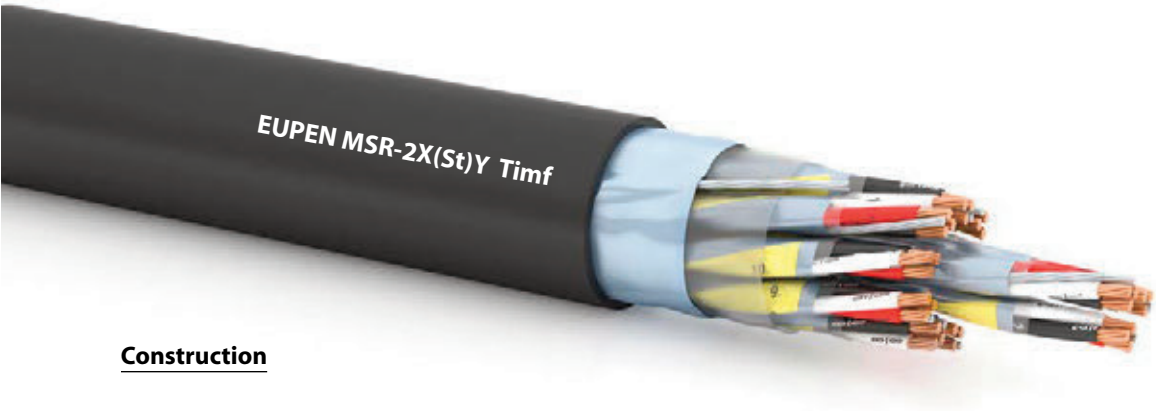
MSR-2X(St)Y Pimf

Number of pairs	Insulation thickness Minimum mm	Nominal Outer sheath thickness mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
2	0,26	0,9	9,3	90
4	0,26	1,0	10,8	138
8	0,26	1,1	14,4	241
12	0,26	1,2	17,0	342
16	0,26	1,2	18,8	440
24	0,26	1,4	23,2	633
Cross section 0,75 mm² / 7				
2	0,26	1,0	10,2	111
4	0,26	1,0	11,7	168
8	0,26	1,1	15,7	292
12	0,26	1,2	18,5	417
16	0,26	1,3	20,7	551
24	0,26	1,4	25,4	778
Cross section 1,0 mm² / 7				
2	0,26	1,0	10,9	129
4	0,26	1,0	12,5	196
8	0,26	1,2	17,1	353
12	0,26	1,3	20,1	507
16	0,26	1,3	22,1	652
24	0,26	1,5	27,7	947
Cross section 1,3 mm² / 7				
2	0,26	1,0	11,6	150
4	0,26	1,1	13,6	232
8	0,26	1,2	18,3	414
12	0,26	1,3	21,4	586
16	0,26	1,4	24,0	777
24	0,26	1,6	30,0	1131
Cross section 1,5 mm² / 7				
2	0,35	1,0	12,7	169
4	0,35	1,1	14,9	271
8	0,35	1,3	20,4	488
12	0,35	1,4	23,8	692
16	0,35	1,5	26,7	919
24	0,35	1,7	33,4	1332
Cross section 2,5 mm² / 7				
2	0,35	1,1	14,3	237

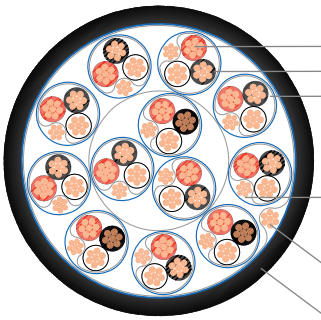
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)Y Timf

Reference standard: EN 50288-7
XLPE insulated, triple twisted, individual & overall screened, unarmoured, PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triples
   colour identification: - insulation: BLACK/WHITE/RED, each core numbered
   - additional black numbered yellow tape above each individual screened triple
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Y Timf 12x3x1,3 mm² 300V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

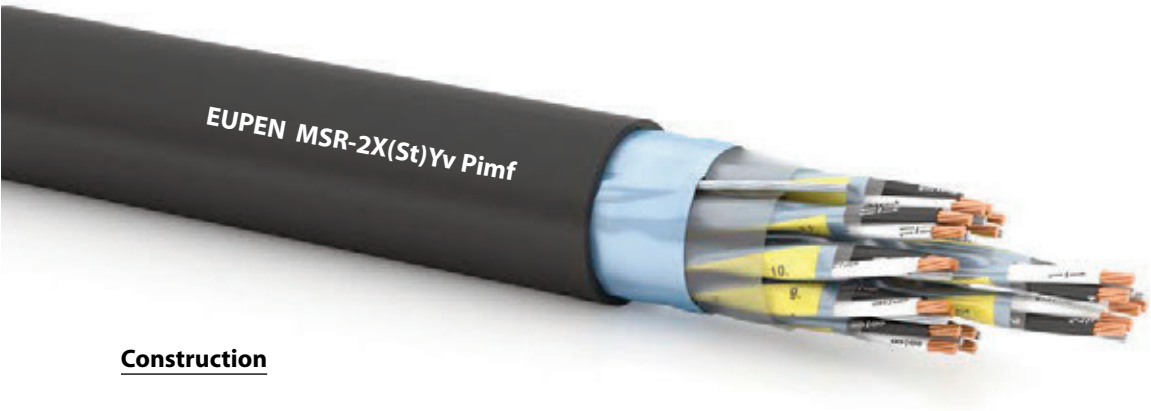
MSR-2X(St)Y Timf

Number of triples	Insulation thickness min. mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
2	0,26	1,0	10,4	114
4	0,26	1,0	12,0	171
8	0,26	1,1	16,1	302
12	0,26	1,2	18,9	433
16	0,26	1,3	21,0	564
24	0,26	1,5	26,2	819
Cross section 0,75 mm² / 7				
2	0,26	1,0	11,2	137
4	0,26	1,1	13,1	218
8	0,26	1,2	17,6	383
12	0,26	1,3	20,7	549
16	0,26	1,4	23,0	715
24	0,26	1,6	28,7	1044
Cross section 1,3 mm² / 7				
2	0,26	1,0	12,9	188
4	0,26	1,1	15,1	308
8	0,26	1,3	20,7	563
12	0,26	1,4	24,2	803
16	0,26	1,5	27,1	1067
24	0,26	1,7	34,0	1553

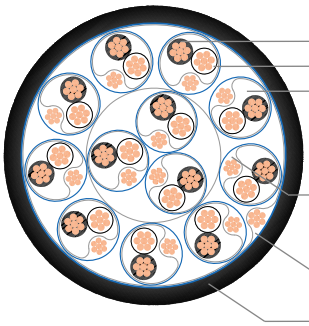
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)Yv Pimf

Reference standard: EN 50288-7
XLPE insulated, pair twisted, individual & overall screened, unarmoured, reinforced PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: - insulation: BLACK/WHITE, each core numbered
   - additional black numbered yellow tape above each individual screened pair
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Outer sheath: reinforced, flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Yv Pimf 12x2x1,3 mm² 300V + year + meter-marking or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

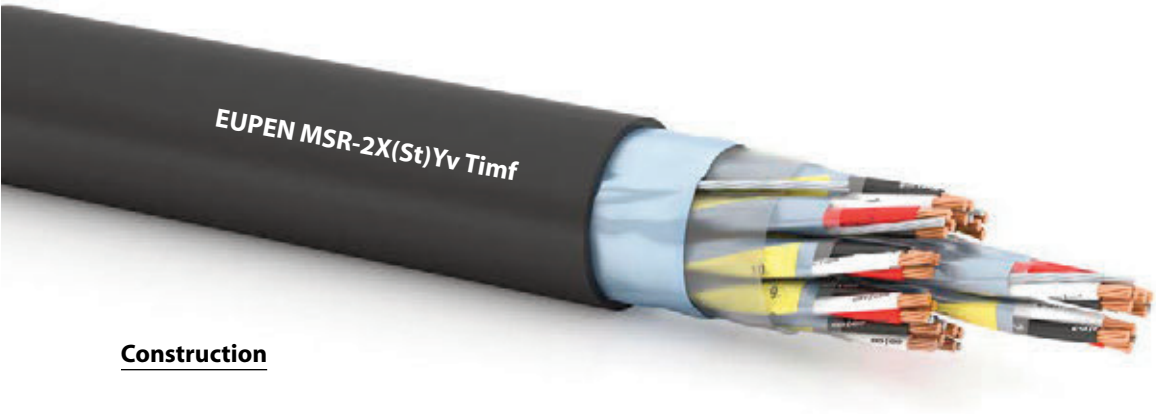
MSR-2X(St)Yv Pimf

Number of pairs	Insulation thickness Minimum mm	Outer sheath thickness Nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
2	0,26	1,8	11,2	134
4	0,26	1,8	12,5	182
8	0,26	1,8	15,9	291
12	0,26	1,8	18,3	392
16	0,26	1,8	20,1	496
24	0,26	1,8	24,0	676
Cross section 0,75 mm² / 7				
2	0,26	1,8	11,9	152
4	0,26	1,8	13,4	215
8	0,26	1,8	17,2	345
12	0,26	1,8	19,8	472
16	0,26	1,8	21,8	603
24	0,26	1,8	26,2	825
Cross section 1,3 mm² / 7				
2	0,26	1,8	13,3	193
4	0,26	1,8	15,1	280
8	0,26	1,8	19,6	468
12	0,26	1,8	22,4	636
16	0,26	1,8	24,8	821
24	0,26	1,8	30,4	1158

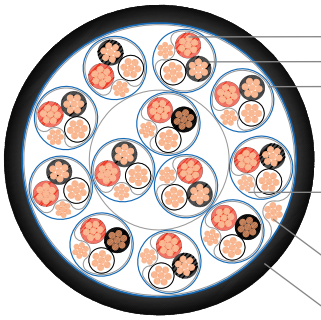
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)Yv Timf

Reference standard: EN 50288-7
XLPE insulated, triple twisted, individual & overall screened, unarmoured, reinforced PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triples
   colour identification: - insulation: BLACK/WHITE/RED, each core numbered
   - additional black numbered yellow tape above each individual screened triple
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Outer sheath: reinforced, flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Yv Timf 12x3x1,3 mm² 300V + year + meter-marking or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

MSR-2X(St)Yv Timf

Number of triples	Insulation thickness Minimum mm	Nominal Outer sheath thickness mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
2	0,26	1,8	12,1	156
4	0,26	1,8	13,7	219
8	0,26	1,8	17,6	358
12	0,26	1,8	20,2	489
16	0,26	1,8	22,0	612
24	0,26	1,8	26,8	855
Cross section 0,75 mm² / 7				
2	0,26	1,8	12,9	182
4	0,26	1,8	14,6	263
8	0,26	1,8	18,9	435
12	0,26	1,8	21,8	601
16	0,26	1,8	23,8	757
24	0,26	1,8	29,1	1070
Cross section 1,3 mm² / 7				
2	0,26	1,8	14,6	238
4	0,26	1,8	16,6	359
8	0,26	1,8	21,8	610
12	0,26	1,8	25,0	842
16	0,26	1,8	27,7	1096
24	0,26	1,8	34,2	1558

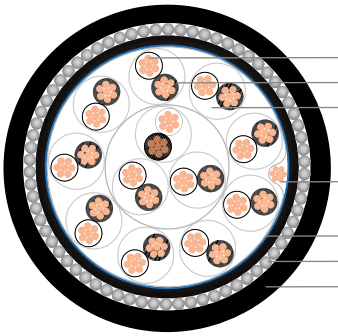
All information given is indicative only and not binding and can be subject to change without notice.

Armoured cables with XLPE insulation and PVC outer sheath 300V

MSR-2X(St)YRY

Reference standard: EN 50288-7
XLPE insulated, pair twisted, overall screened, armoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pair(s)
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: flame-retardant PVC
6. Armoring: one layer of galvanized steel wires
7. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YRY 12x2x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications and suitable for strong mechanical requirements

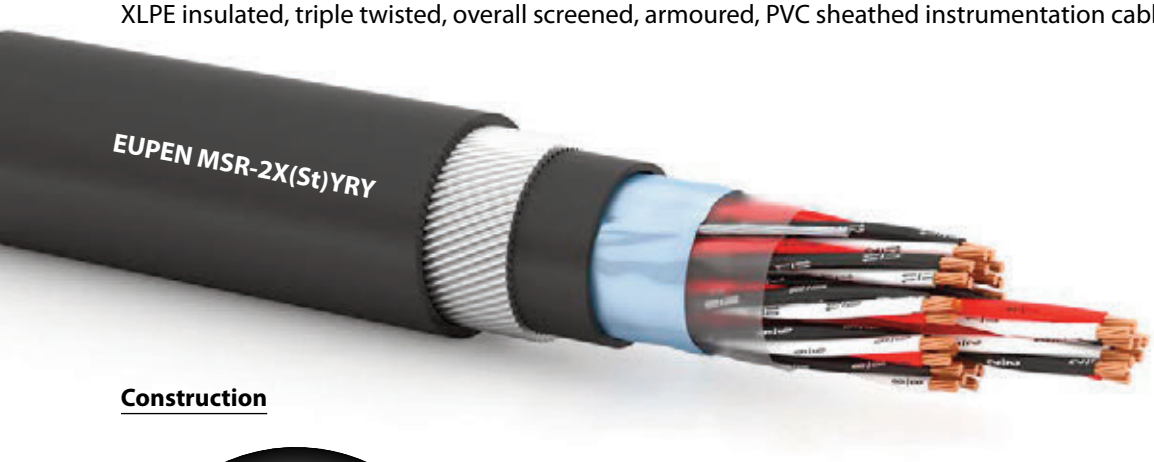
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YRY

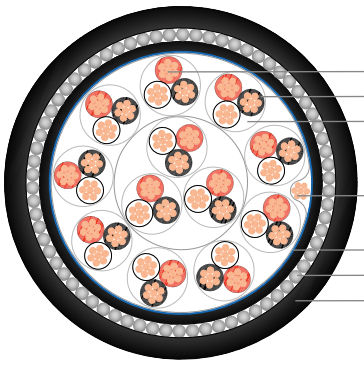
Number of pairs	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
1	0,26	0,8	5,3	0,9	1,3	9,7	193
2	0,26	0,8	7,9	0,9	1,3	12,3	288
4	0,26	0,8	9,0	0,9	1,4	13,6	341
8	0,26	0,8	11,9	0,9	1,4	16,5	475
12	0,26	1,0	14,3	0,9	1,5	19,1	612
16	0,26	1,0	15,8	0,9	1,5	20,6	717
24	0,26	1,0	19,4	1,25	1,6	25,1	1083
Cross section 0,75 mm² / 7							
1	0,26	0,8	5,7	0,9	1,3	10,1	207
2	0,26	0,8	8,5	0,9	1,3	12,9	317
4	0,26	0,8	9,8	0,9	1,4	14,4	387
8	0,26	1,0	13,5	0,9	1,5	18,3	578
12	0,26	1,0	15,7	0,9	1,5	20,5	721
16	0,26	1,0	17,4	0,9	1,5	22,2	851
24	0,26	1,0	21,4	1,25	1,7	27,3	1299
Cross section 1,0 mm² / 7							
1	0,26	0,8	6,1	0,9	1,3	10,5	228
2	0,26	0,8	9,2	0,9	1,4	13,8	353
4	0,26	0,8	10,6	0,9	1,4	15,2	436
8	0,26	1,0	14,6	0,9	1,5	19,4	659
12	0,26	1,0	17,0	0,9	1,5	21,8	827
16	0,26	1,0	18,9	1,25	1,6	24,6	1151
24	0,26	1,0	23,4	1,25	1,7	29,3	1513
Cross section 1,3 mm² / 7							
1	0,26	0,8	6,5	0,9	1,3	10,9	243
2	0,26	0,8	9,8	0,9	1,4	14,4	388
4	0,26	0,8	11,4	0,9	1,4	16,0	481
8	0,26	1,0	15,7	0,9	1,5	20,5	746
12	0,26	1,0	18,4	1,25	1,6	24,1	1106
16	0,26	1,0	20,5	1,25	1,6	26,2	1319
24	0,26	1,1	25,5	1,25	1,7	31,4	1756
Cross section 1,5 mm² / 7							
1	0,35	0,8	7,1	0,9	1,3	11,5	266
2	0,35	0,8	10,8	0,9	1,4	15,4	432
4	0,35	1,0	13,0	0,9	1,5	17,8	574
8	0,35	1,0	17,4	0,9	1,6	22,4	851
12	0,35	1,0	20,4	1,25	1,6	26,1	1245
16	0,35	1,0	22,8	1,25	1,7	28,7	1514
24	0,35	1,1	28,5	1,25	1,8	34,6	2030

MSR-2X(St)YRY

Reference standard: EN 50288-7
XLPE insulated, triple twisted, overall screened, armoured, PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triple(s)
   colour identification: BLACK/WHITE/RED, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: flame-retardant PVC
6. Armoring: one layer of galvanized steel wires
7. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YRY 12x3x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications and suitable for strong mechanical requirements

MSR-2X(St)YRY

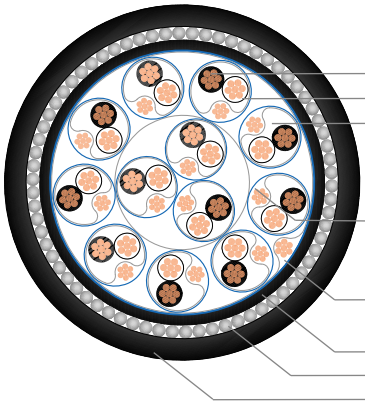
Number of triples	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
1	0,26	0,8	5,9	0,9	1,3	10,3	216
2	0,26	0,8	8,7	0,9	1,3	13,1	319
4	0,26	0,8	10,0	0,9	1,4	14,6	398
8	0,26	1,0	13,7	0,9	1,5	18,5	594
12	0,26	1,0	16,0	0,9	1,5	20,8	743
16	0,26	1,0	17,8	1,25	1,6	23,5	1030
24	0,26	1,0	21,9	1,25	1,7	27,8	1341
Cross section 0,75 mm² / 7							
1	0,26	0,8	6,0	0,9	1,3	10,4	225
2	0,26	0,8	9,4	0,9	1,4	14,0	367
4	0,26	0,8	10,8	0,9	1,4	15,4	453
8	0,26	1,0	14,9	0,9	1,5	19,7	694
12	0,26	1,0	17,5	0,9	1,6	22,5	893
16	0,26	1,0	19,4	1,25	1,6	25,1	1220
24	0,26	1,0	24,0	1,25	1,7	29,9	1611
Cross section 1,3 mm² / 7							
1	0,26	0,8	6,9	0,9	1,3	11,3	268
2	0,26	0,8	11,0	0,9	1,4	15,6	457
4	0,26	1,0	13,1	0,9	1,4	17,7	603
8	0,26	1,0	17,6	0,9	1,5	22,4	921
12	0,26	1,0	20,7	1,25	1,6	26,4	1368
16	0,26	1,0	23,1	1,25	1,7	29,0	1667
24	0,26	1,1	28,9	1,25	1,8	35,0	2261

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YRY Pimf

Reference standard: EN 50288-7
XLPE insulated, pair twisted, individual & overall screened, armoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: - insulation: BLACK/WHITE, each core numbered
   - additional black numbered yellow tape above each individual screened pair
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Inner sheath: flame-retardant PVC
7. Armoring: one layer of galvanized steel wires
8. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YRY Pimf 12x2x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications and suitable for strong mechanical requirements

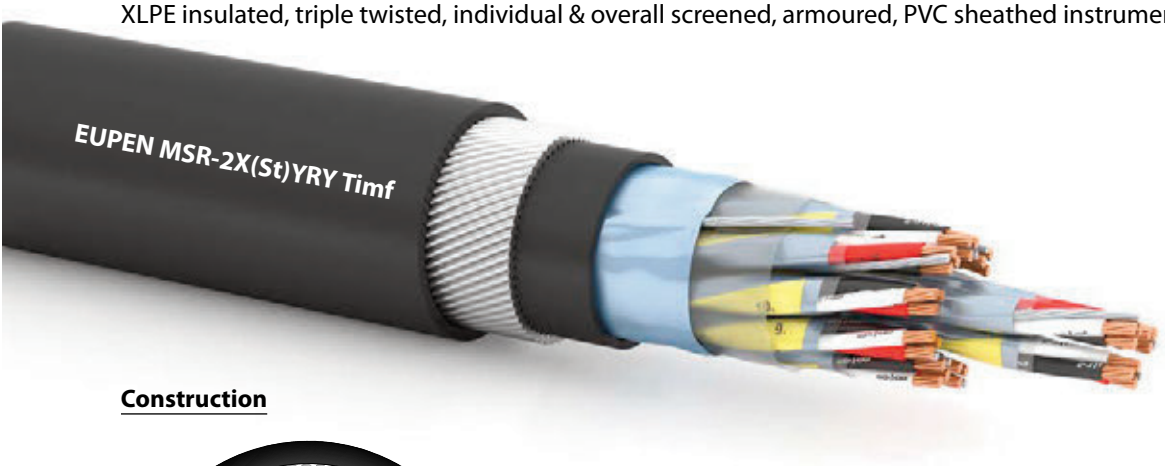
MSR-2X(St)YRY Pimf

Number of pairs	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
2	0,26	0,8	8,9	0,9	1,4	13,5	335
4	0,26	0,8	10,2	0,9	1,4	14,8	403
8	0,26	1,0	14,0	0,9	1,5	18,8	611
12	0,26	1,0	16,4	0,9	1,5	21,2	762
16	0,26	1,0	18,2	1,25	1,6	23,9	1057
24	0,26	1,0	22,4	1,25	1,7	28,3	1380
Cross section 0,75 mm² / 7							
2	0,26	0,8	9,6	0,9	1,4	14,2	366
4	0,26	0,8	11,1	0,9	1,4	15,7	454
8	0,26	1,0	15,3	0,9	1,5	20,1	691
12	0,26	1,0	17,9	1,25	1,6	23,6	1020
16	0,26	1,0	19,9	1,25	1,6	25,6	1211
24	0,26	1,1	24,8	1,25	1,8	30,9	1612
Cross section 1,0 mm² / 7							
2	0,26	0,8	10,3	0,9	1,4	14,9	406
4	0,26	1,0	12,3	0,9	1,4	16,9	521
8	0,26	1,0	16,5	0,9	1,5	21,3	773
12	0,26	1,0	19,3	1,25	1,6	25,0	1152
16	0,26	1,0	21,5	1,25	1,7	27,4	1383
24	0,26	1,1	26,9	1,25	1,8	33,0	1848
Cross section 1,3 mm² / 7							
2	0,26	0,8	11,0	0,9	1,4	15,6	443
4	0,26	1,0	13,2	0,9	1,5	18,0	582
8	0,26	1,0	17,7	1,25	1,6	23,4	1017
12	0,26	1,0	20,8	1,25	1,7	26,7	1291
16	0,26	1,0	23,2	1,25	1,7	29,1	1548
24	0,26	1,1	29,0	1,25	1,8	35,1	2084
Cross section 1,5 mm² / 7							
2	0,35	1,0	12,5	0,9	1,5	17,3	515
4	0,35	1,0	14,5	0,9	1,5	19,3	654
8	0,35	1,0	19,6	1,25	1,6	25,3	1136
12	0,35	1,0	23,0	1,25	1,7	28,9	1462
16	0,35	1,1	25,9	1,25	1,8	32,0	1783
24	0,35	1,2	32,4	1,6	2,0	39,6	2671

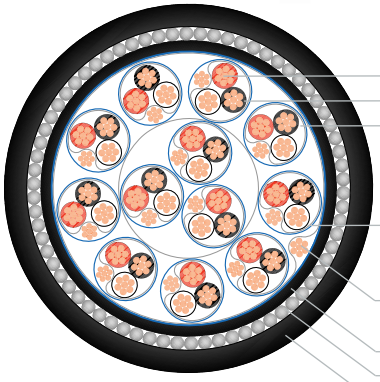
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YRY Timf

Reference standard: EN 50288-7
XLPE insulated, triple twisted, individual & overall screened, armoured, PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triples
   colour identification: - insulation: BLACK/WHITE/RED, each core numbered
   - additional black numbered yellow tape above each individual screened triple
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Inner sheath: flame-retardant PVC
7. Armoring: one layer of galvanized steel wires
8. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YRY Timf 12x3x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications and suitable for strong mechanical requirements

MSR-2X(St)YRY Timf

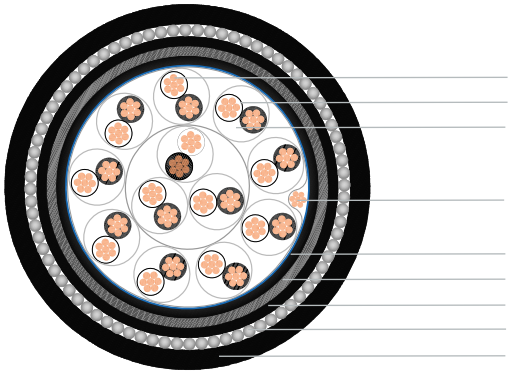
Number of triples	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
2	0,26	0,8	9,8	0,9	1,4	14,4	376
4	0,26	0,8	11,4	0,9	1,4	16,0	464
8	0,26	1,0	15,7	0,9	1,5	20,5	716
12	0,26	1,0	18,3	1,25	1,6	24,0	1050
16	0,26	1,0	20,4	1,25	1,6	26,1	1244
24	0,26	1,1	25,4	1,25	1,8	31,5	1669
Cross section 0,75 mm² / 7							
2	0,26	0,8	10,6	0,9	1,4	15,2	420
4	0,26	1,0	12,7	0,9	1,5	17,5	559
8	0,26	1,0	17,0	0,9	1,6	22,0	826
12	0,26	1,0	19,9	1,25	1,6	25,6	1209
16	0,26	1,0	22,2	1,25	1,7	28,1	1460
24	0,26	1,1	27,7	1,25	1,8	33,8	1959
Cross section 1,30 mm² / 7							
2	0,26	1,0	12,7	0,9	1,4	17,3	534
4	0,26	1,0	14,7	0,9	1,5	19,5	693
8	0,26	1,0	19,9	1,25	1,6	25,6	1222
12	0,26	1,0	23,4	1,25	1,7	29,3	1586
16	0,26	1,1	26,3	1,25	1,8	32,4	1943
24	0,26	1,2	33,0	1,6	1,9	40,0	2896

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YKYRY

Reference standard: EN 50288-7
XLPE insulated, pair twisted, overall screened, lead protected and armoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. First inner sheath: flame-retardant PVC
6. Metallic sheath (humidity barrier): lead alloy type "E"
7. Second inner sheath: flame-retardant PVC
8. Armoring: one layer of galvanized steel wires
9. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YKYRY 12x2x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	15 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1 (IEC 60332-3 Cat. A or Cat.C on request)

Application

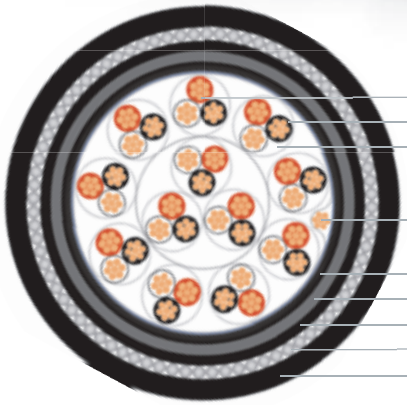
Transmission of analog and digital signals for indoor and outdoor applications. Suitable for strong mechanical and chemical requirements, especially in petrochemical environment.

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YKYRY

Reference standard: EN 50288-7
XLPE insulated, triple twisted, overall screened, lead protected and armoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triples
   colour identification: BLACK/WHITE/RED, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. First inner sheath: flame-retardant PVC
6. Metallic sheath (humidity barrier): lead alloy type "E"
7. Second inner sheath: flame-retardant PVC
8. Armoring: one layer of galvanized steel wires
9. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YKYRY 12x3x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	15 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1 (IEC 60332-3 Cat. A or Cat.C on request)

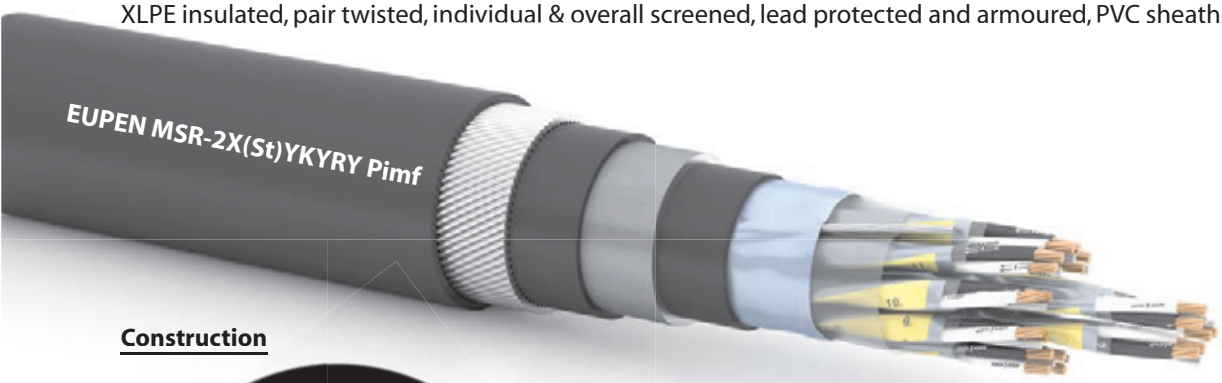
Application

Transmission of analog and digital signals for indoor and outdoor applications. Suitable for strong mechanical and chemical requirements, especially in petrochemical environment.

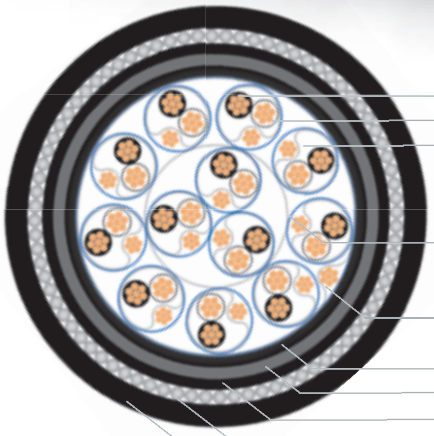
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YKYRY Pimf

Reference standard: EN 50288-7
XLPE insulated, pair twisted, individual & overall screened, lead protected and armoured, PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: - insulation: BLACK/WHITE, each core numbered
   - additional black numbered yellow tape above each individual screened pair
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. First inner sheath: flame-retardant PVC
7. Metallic sheath (humidity barrier): lead alloy, type "E"
8. Second inner sheath: flame-retardant PVC
9. Armoring: one layer of galvanized steel wires
10. Outer sheath: flame-retardant PVC
    Outer sheath color: black or blue or according to customer specification
    Outer sheath marking: EUPEN MSR-2X(St)YKYRY Pimf 12x2x1,0 mm² 300V + year + meter-marking or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	15 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1 (IEC 60332-3 Cat. A or Cat.C on request)

Application

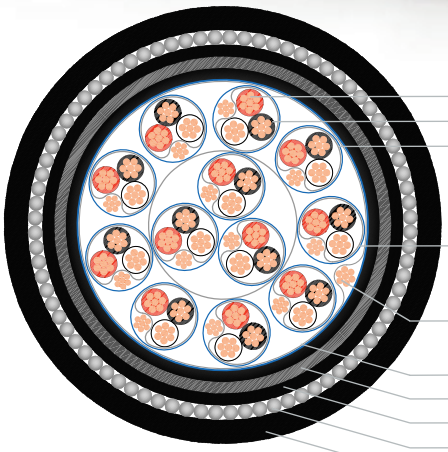
Transmission of analog and digital signals for indoor and outdoor applications. Suitable for strong mechanical and chemical requirements, especially in petrochemical environment.

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YKYRY Timf

Reference standard: EN 50288-7
XLPE insulated, triple twisted, individual & overall screened, lead protected and armoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triples
   colour identification: - insulation: BLACK/WHITE/RED, each core numbered
   - additional black numbered yellow tape above each individual screened triple
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. First inner sheath: flame-retardant PVC
7. Metallic sheath (humidity barrier): lead alloy, type "E"
8. Second inner sheath: flame-retardant PVC
9. Armoring: one layer of galvanized steel wires
10. Outer sheath: flame-retardant PVC
    Outer sheath color: black or blue or according to customer specification
    Outer sheath marking: EUPEN MSR-2X(St)YKYRY Timf 12x3x1,0 mm² 300V + year + meter-marking or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	15 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1 (IEC 60332-3 Cat. A or Cat.C on request)

Application

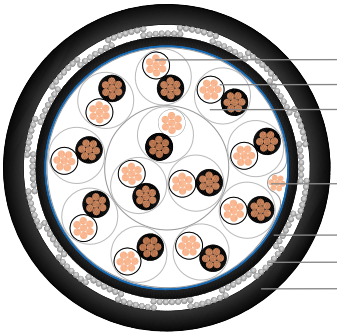
Transmission of analog and digital signals for indoor and outdoor applications. Suitable for strong mechanical and chemical requirements, especially in petrochemical environment.

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YQY

Reference standard: EN 50288-7
XLPE insulated, pair twisted, overall screened, steel wire braid armoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pair(s)
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: flame-retardant PVC
6. Armoring: galvanized steel wire braid
7. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YQY 12x2x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications and suitable for strong mechanical requirements

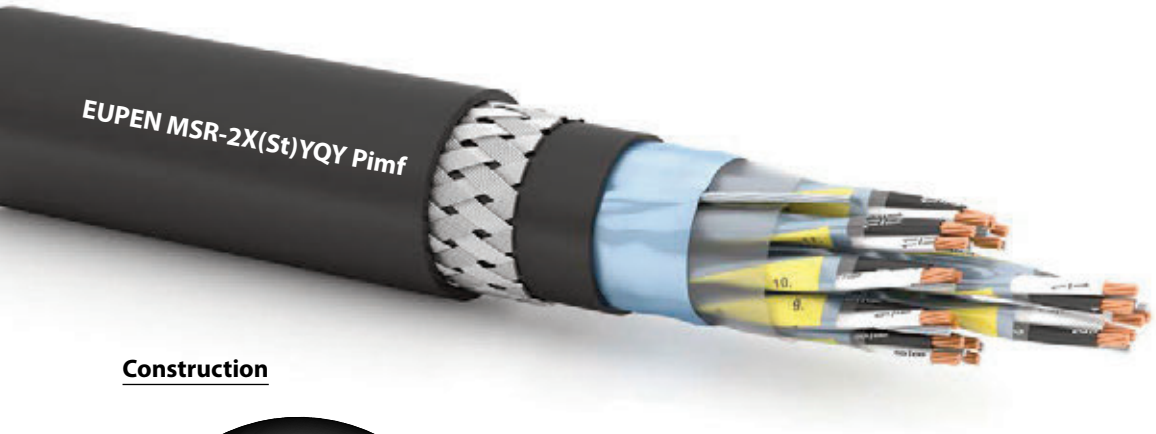
MSR-2X(St)YQY

Number of pairs	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steel wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter . approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
1	0,26	0,8	5,3	0,3	1,3	9,1	132
2	0,26	0,8	7,9	0,3	1,3	11,7	191
4	0,26	0,8	9,0	0,3	1,3	12,8	235
8	0,26	0,8	11,9	0,3	1,4	15,9	333
12	0,26	1,0	14,3	0,3	1,5	18,5	457
16	0,26	1,0	15,8	0,3	1,5	20,0	534
24	0,26	1,0	19,4	0,3	1,6	23,8	713
Cross section 0,75 mm² / 7							
1	0,26	0,8	5,7	0,3	1,3	9,5	140
2	0,26	0,8	8,5	0,3	1,3	12,3	209
4	0,26	0,8	9,8	0,3	1,4	13,8	273
8	0,26	1,0	13,5	0,3	1,4	17,5	417
12	0,26	1,0	15,7	0,3	1,5	19,9	539
16	0,26	1,0	17,4	0,3	1,5	21,6	657
24	0,26	1,0	21,4	0,3	1,6	25,8	869
Cross section 1,3 mm² / 7							
1	0,26	0,8	6,5	0,3	1,3	10,3	162
2	0,26	0,8	9,8	0,3	1,4	13,8	274
4	0,26	0,8	11,4	0,3	1,4	15,4	351
8	0,26	1,0	15,7	0,3	1,5	19,9	564
12	0,26	1,0	18,4	0,3	1,5	22,6	730
16	0,26	1,0	20,5	0,3	1,6	24,9	918
24	0,26	1,1	25,5	0,3	1,7	30,1	1280

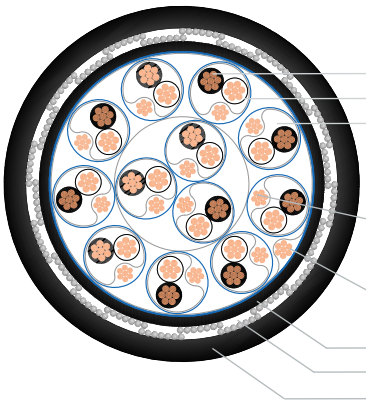
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YQY-Pimf

Reference standard: EN 50288-7
XLPE insulated, pair twisted, individual & overall screened, steel wire braid armoured, PVC sheathed instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: - insulation: BLACK/WHITE, each core numbered
   - additional black numbered yellow tape above each individual screened pair
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Inner sheath: flame-retardant PVC
7. Armoring: galvanized steel wire braid
8. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YQY Pimf 12x2x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

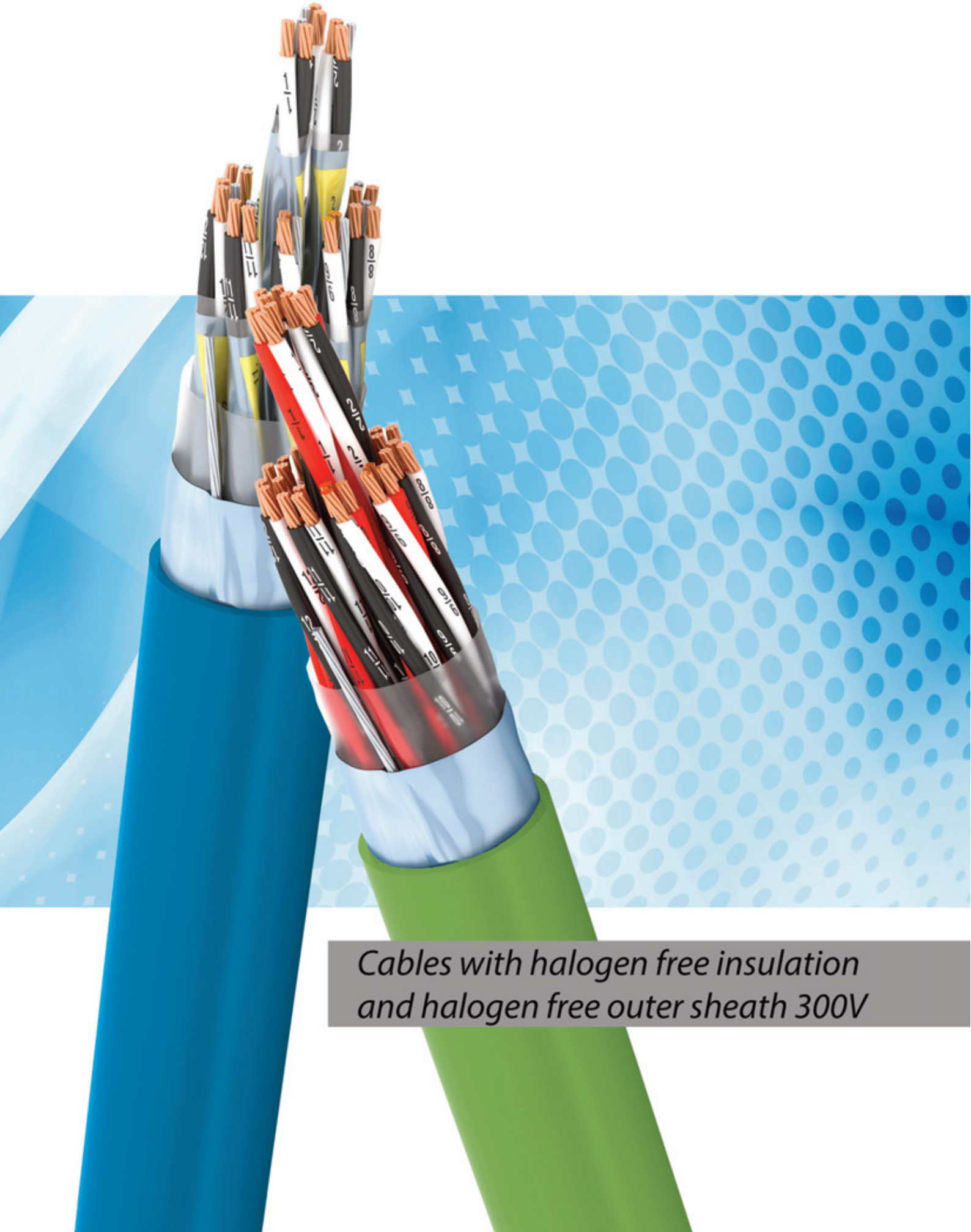
Application

Transmission of analog and digital signals for indoor and outdoor applications and suitable for strong mechanical requirements

MSR-2X(St)YQY-Pimf

Number of pairs	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over Inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
2	0,26	0,8	8,9	0,3	1,3	12,7	228
4	0,26	0,8	10,2	0,3	1,4	14,2	284
8	0,26	1,0	14,0	0,3	1,5	18,2	448
12	0,26	1,0	16,4	0,3	1,5	20,6	585
16	0,26	1,0	18,2	0,3	1,6	22,6	703
24	0,26	1,0	22,4	0,3	1,7	27,0	950
Cross section 0,75 mm² / 7							
2	0,26	0,8	9,6	0,3	1,4	13,6	256
4	0,26	0,8	11,1	0,3	1,4	15,1	329
8	0,26	1,0	15,3	0,3	1,5	19,5	520
12	0,26	1,0	17,9	0,3	1,6	22,3	677
16	0,26	1,0	19,9	0,3	1,6	24,3	829
24	0,26	1,1	24,8	0,4	1,7	29,8	1232
Cross section 1,3 mm² / 7							
2	0,26	0,8	11,0	0,3	1,4	15,0	312
4	0,26	1,0	13,2	0,3	1,4	17,2	426
8	0,26	1,0	17,7	0,3	1,5	21,9	662
12	0,26	1,0	20,8	0,3	1,6	25,2	879
16	0,26	1,0	23,2	0,3	1,7	27,8	1102
24	0,26	1,1	29,0	0,4	1,8	34,2	1644

All information given is indicative only and not binding and can be subject to change without notice.

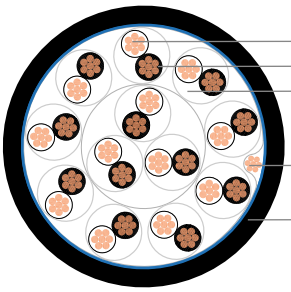


Cables with halogen free insulation and halogen free outer sheath 300V

MSR-2X(St)H

Reference standard: EN 50288-7
XLPE insulated, pair twisted, overall screened, unarmoured, halogen-free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pair(s)
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30mm)
5. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)H 12x2x1,0mm² 300V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20°C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications where improved fire behaviour is requested.

MSR-2X(St)H

Number of pairs	Insulation thickness min. mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
1	0,26	0,8	5,6	40
2	0,26	0,9	8,3	76
4	0,26	0,9	9,4	101
8	0,26	1,0	12,5	171
12	0,26	1,1	14,7	239
16	0,26	1,1	16,2	306
24	0,26	1,2	20,0	434
Cross section 0,75 mm² / 7				
1	0,26	0,8	6,0	47
2	0,26	0,9	8,9	91
4	0,26	1,0	10,4	132
8	0,26	1,1	13,9	226
12	0,26	1,1	16,1	312
16	0,26	1,2	18,0	413
24	0,26	1,3	22,0	563
Cross section 1,0 mm² / 7				
1	0,26	0,8	6,4	55
2	0,26	0,9	9,6	106
4	0,26	1,0	11,2	161
8	0,26	1,1	15,0	279
12	0,26	1,2	17,6	398
16	0,26	1,2	19,5	516
24	0,26	1,3	24,0	714
Cross section 1,3 mm² / 7				
1	0,26	0,9	7,0	66
2	0,26	1,0	10,4	132
4	0,26	1,0	12,0	192
8	0,26	1,1	16,1	337
12	0,26	1,2	19,0	484
16	0,26	1,3	21,1	623
24	0,26	1,4	26,1	889

All information given is indicative only and not binding and can be subject to change without notice.

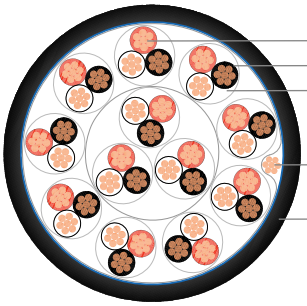
MSR-2X(St)H

Number of pairs	Insulation thickness min. mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 1,5 mm² / 7				
1	0,35	0,9	7,6	76
2	0,35	1,0	11,4	156
4	0,35	1,1	13,4	229
8	0,35	1,2	18,0	404
12	0,35	1,3	21,0	560
16	0,35	1,4	23,6	748
24	0,35	1,5	29,3	1067
Cross section 2,5 mm² / 7				
1	0,35	0,9	8,4	98
4	0,35	1,1	15,0	318
12	0,35	1,4	24,0	814

MSR-2X(St)H

Reference standard: EN 50288-7
XLPE insulated, triple twisted, overall screened, unarmoured, halogen-free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triple(s)
   colour identification: BLACK/WHITE/RED, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30mm)
5. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)H 12x3x1,3mm² 300V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20°C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications where improved fire behaviour is requested.

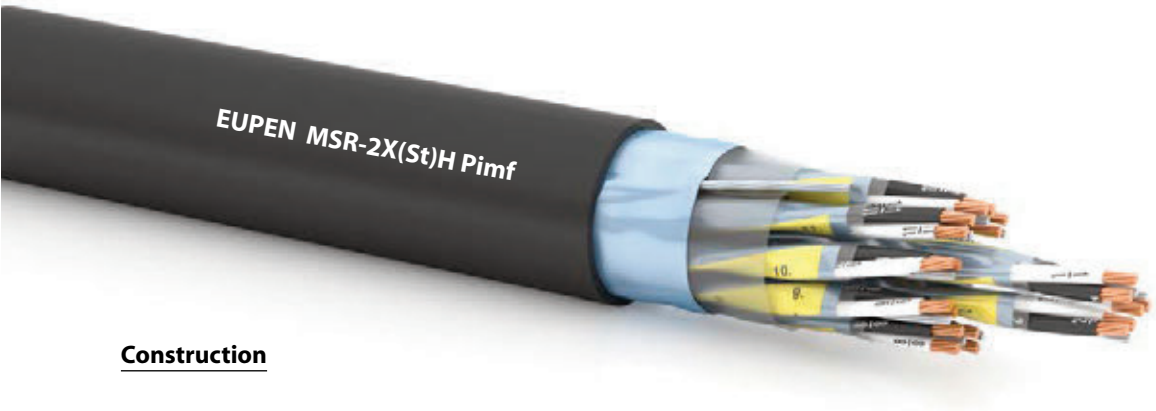
MSR-2X(St)H

Number of triples	Insulation thickness min. mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² /7				
1	0,26	0,8	5,9	48
2	0,26	0,9	9,1	92
4	0,26	1,0	10,6	138
8	0,26	1,1	14,1	236
12	0,26	1,1	16,4	325
16	0,26	1,2	18,4	430
24	0,26	1,3	22,5	592
Cross section 0,75 mm² /7				
1	0,26	0,8	6,3	57
2	0,26	0,9	9,8	114
4	0,26	1,0	11,4	176
8	0,26	1,1	15,3	308
12	0,26	1,2	18,1	440
16	0,26	1,3	20,2	578
24	0,26	1,4	24,8	806
Cross section 1,3 mm² /7				
1	0,26	0,9	7,4	83
2	0,26	1,0	11,6	175
4	0,26	1,0	13,3	259
8	0,26	1,2	18,2	478
12	0,26	1,3	21,3	670
16	0,26	1,4	23,9	889
24	0,26	1,5	29,7	1286

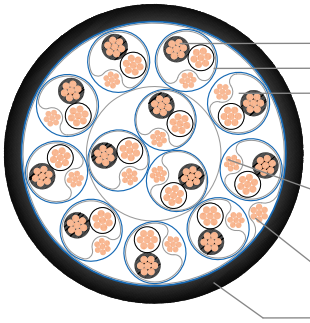
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)H Pimf

Reference standard: EN 50288-7
XLPE insulated, pair twisted, individual & overall screened, unarmoured, halogen-free instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: - insulation: BLACK/WHITE, each core numbered
   - additional black numbered yellow tape above each individual screened pair
4. Individual screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30mm)
6. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)H Pimf 12x2x1,0mm² 300V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm2)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications where improved fire behaviour is requested.

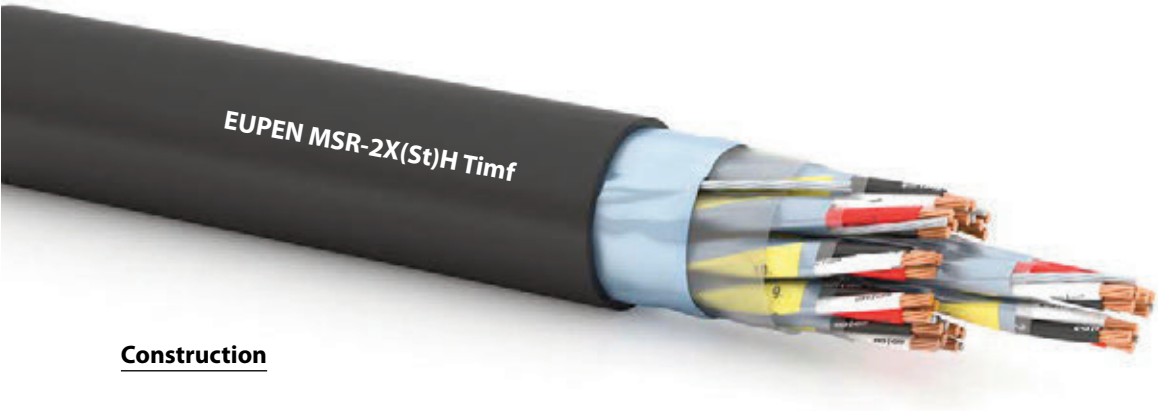
MSR-2X(St)H Pimf

Number of pairs	Insulation thickness min. mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7				
2	0,26	0,9	9,3	95
4	0,26	1,0	10,8	143
8	0,26	1,1	14,4	247
12	0,26	1,2	17,0	349
16	0,26	1,2	18,8	448
24	0,26	1,4	23,2	631
Cross section 0,75 mm² / 7				
2	0,26	1,0	10,2	117
4	0,26	1,0	11,7	171
8	0,26	1,1	15,7	298
12	0,26	1,2	18,5	425
16	0,26	1,3	20,7	550
24	0,26	1,4	25,4	776
Cross section 1,0 mm² / 7				
2	0,26	1,0	10,9	138
4	0,26	1,0	12,5	199
8	0,26	1,2	17,1	361
12	0,26	1,3	20,1	516
16	0,26	1,3	22,1	650
24	0,26	1,5	27,7	944
Cross section 1,3 mm² / 7				
2	0,26	1,0	11,6	161
4	0,26	1,1	13,6	237
8	0,26	1,2	18,3	422
12	0,26	1,3	21,4	585
16	0,26	1,4	24,0	775
24	0,26	1,6	30,0	1128
Cross section 1,5 mm² / 7				
2	0,35	1,0	12,7	180
4	0,35	1,1	14,9	275
8	0,35	1,3	20,4	498
12	0,35	1,4	23,8	690
16	0,35	1,5	26,7	916
24	0,35	1,7	33,4	1328
Cross section 2,5 mm² / 7				
2	0,35	1,1	14,3	240

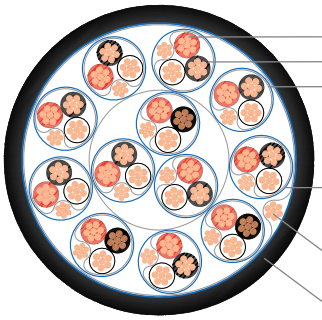
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)H Timf

Reference standard: EN 50288-7
XLPE insulated, triple twisted, individual & overall screened, unarmoured, halogen-free instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triples
   colour identification: - insulation: BLACK/WHITE/RED, each core numbered
   - additional black numbered yellow tape above each individual screened triple
4. Individual screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30mm)
6. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)H Timf 12x3x1,3mm² 300V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications where improved fire behaviour is requested.

MSR-2X(St)H Timf

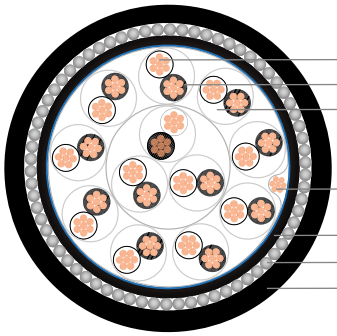
Number of triples	Insulation thickness min. mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² /7				
2	0,26	1,0	10,4	121
4	0,26	1,0	12,0	176
8	0,26	1,1	16,1	308
12	0,26	1,2	18,9	441
16	0,26	1,3	21,0	562
24	0,26	1,5	26,2	816
Cross section 0,75 mm² /7				
2	0,26	1,0	11,2	146
4	0,26	1,1	13,1	223
8	0,26	1,2	17,6	390
12	0,26	1,3	20,7	548
16	0,26	1,4	23,0	713
24	0,26	1,6	28,7	1041
Cross section 1,3mm² /7				
2	0,26	1,0	12,9	199
4	0,26	1,1	15,1	313
8	0,26	1,3	20,7	562
12	0,26	1,4	24,2	801
16	0,26	1,5	27,1	1063
24	0,26	1,7	34,0	1550

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)HRH

Reference standard: EN 50288-7
XLPE insulated, pair twisted, overall screened, armoured, halogen-free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pair(s)
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: halogen-free, fire-retardant polymer compound
6. Armoring: one layer of galvanized steel wires
7. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)HRH 12x2x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

Transmission of analog and digital signals for indoor and outdoor, (in suitable cable trays) applications.
With improved fire behaviour and suitable for strong mechanical requirements.

MSR-2X(St)HRH

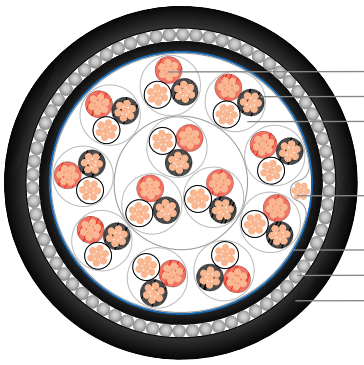
Number of pairs	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
1	0,26	0,8	5,3	0,9	1,3	9,7	193
2	0,26	0,8	7,9	0,9	1,3	12,3	286
4	0,26	0,8	9,0	0,9	1,4	13,6	339
8	0,26	0,8	11,9	0,9	1,4	16,5	473
12	0,26	1,0	14,3	0,9	1,5	19,1	611
16	0,26	1,0	15,8	0,9	1,5	20,6	714
24	0,26	1,0	19,4	1,25	1,6	25,1	1080
Cross section 0,75 mm² / 7							
1	0,26	0,8	5,7	0,9	1,3	10,1	206
2	0,26	0,8	8,5	0,9	1,3	12,9	316
4	0,26	0,8	9,8	0,9	1,4	14,4	385
8	0,26	1,0	13,5	0,9	1,5	18,3	576
12	0,26	1,0	15,7	0,9	1,5	20,5	718
16	0,26	1,0	17,4	0,9	1,5	22,2	849
24	0,26	1,0	21,4	1,25	1,7	28,1	1312
Cross section 1,0 mm² / 7							
1	0,26	0,8	6,1	0,9	1,3	10,5	227
2	0,26	0,8	9,2	0,9	1,4	13,8	351
4	0,26	0,8	10,6	0,9	1,4	15,2	436
8	0,26	1,0	14,6	0,9	1,5	19,4	658
12	0,26	1,0	17,0	0,9	1,5	21,8	824
16	0,26	1,0	18,9	1,25	1,6	24,6	1148
24	0,26	1,0	23,4	1,25	1,7	30,1	1527
Cross section 1,3 mm² / 7							
1	0,26	0,8	6,5	0,9	1,3	10,9	242
2	0,26	0,8	9,8	0,9	1,4	14,4	386
4	0,26	0,8	11,4	0,9	1,4	16,0	481
8	0,26	1,0	15,7	0,9	1,5	20,5	744
12	0,26	1,0	18,4	1,25	1,6	24,1	1104
16	0,26	1,0	20,5	1,25	1,6	27,0	1331
24	0,26	1,1	25,5	1,25	1,7	32,2	1771
Cross section 1,5 mm² / 7							
1	0,35	0,8	7,1	0,9	1,3	11,5	264
2	0,35	0,8	10,8	0,9	1,4	15,4	430
4	0,35	1,0	13,0	0,9	1,5	17,8	572
8	0,35	1,0	17,4	0,9	1,6	22,4	848
12	0,35	1,0	20,4	1,25	1,6	26,9	1259
16	0,35	1,0	22,8	1,25	1,7	29,5	1527
24	0,35	1,1	28,5	1,25	1,8	35,4	2045

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)HRH

Reference standard: EN 50288-7
XLPE insulated, triple twisted, overall screened, armoured, halogen-free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triple(s)
   colour identification: BLACK/WHITE/RED, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: halogen-free, fire-retardant polymer compound
6. Armoring: one layer of galvanized steel wires
7. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)HRH 12x3x1,3 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**300 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

MSR-2X(St)HRH

Number of triples	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² /7							
1	0,26	0,8	5,6	0,9	1,3	10,0	206
2	0,26	0,8	8,7	0,9	1,3	13,1	317
4	0,26	0,8	10,0	0,9	1,4	14,6	397
8	0,26	1,0	13,7	0,9	1,5	18,5	593
12	0,26	1,0	16,0	0,9	1,5	20,8	740
16	0,26	1,0	17,8	1,25	1,6	23,5	1026
24	0,26	1,0	21,9	1,25	1,7	28,6	1353
Cross section 0,75 mm² /7							
1	0,26	0,8	6,0	0,9	1,3	10,4	224
2	0,26	0,8	9,4	0,9	1,4	14,0	366
4	0,26	0,8	10,8	0,9	1,4	15,4	452
8	0,26	1,0	14,9	0,9	1,5	19,7	692
12	0,26	1,0	17,5	0,9	1,6	22,5	890
16	0,26	1,0	19,4	1,25	1,6	25,1	1218
24	0,26	1,0	24,0	1,25	1,7	30,7	1625
Cross section 1,3 mm² /7							
1	0,26	0,8	6,9	0,9	1,3	11,3	267
2	0,26	0,8	11,0	0,9	1,4	15,6	455
4	0,26	1,0	13,1	0,9	1,4	17,7	601
8	0,26	1,0	17,6	0,9	1,5	22,4	918
12	0,26	1,0	20,7	1,25	1,6	27,2	1381
16	0,26	1,0	23,1	1,25	1,7	29,8	1681
24	0,26	1,1	28,9	1,25	1,8	35,8	2277

Application

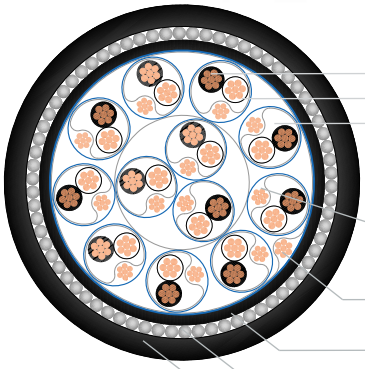
Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications.
With improved fire behaviour and suitable for strong mechanical requirements.

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)HRH Pimf

Reference standard: EN 50288-7
XLPE insulated, pair twisted, individual & overall screened, armoured, halogen-free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: - insulation: BLACK/WHITE, each core numbered
   - additional black numbered yellow tape above each individual screened pair
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Inner sheath: halogen-free, fire-retardant polymer compound
7. Armoring: one layer of galvanized steel wires
8. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)HRH Pimf 12x2x1,0 mm² 300 V + year + meter-marking or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between pairs	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications.
With improved fire behaviour and suitable for strong mechanical requirements.

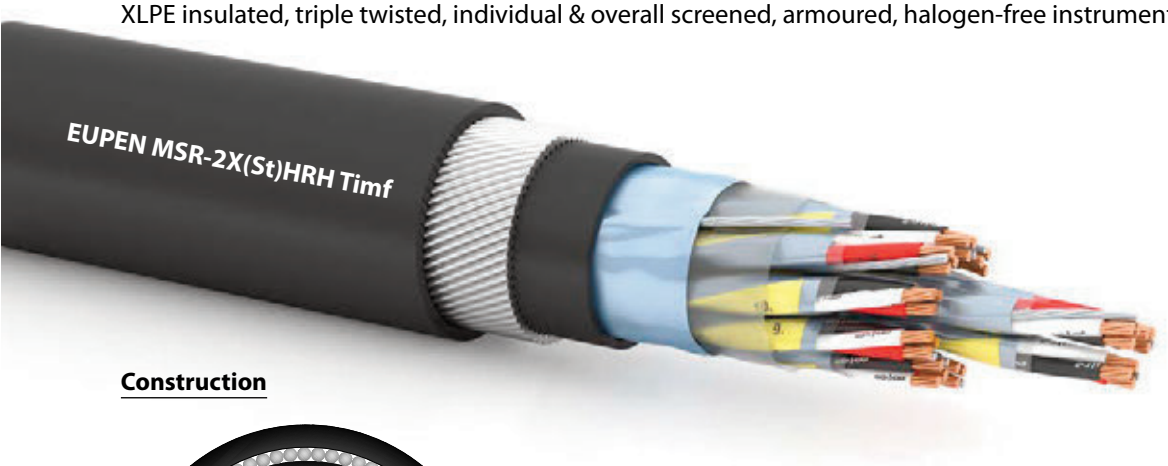
MSR-2X(St)HRH Pimf

Number of pairs	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² / 7							
2	0,26	0,8	8,9	0,9	1,4	13,5	334
4	0,26	0,8	10,2	0,9	1,4	14,8	404
8	0,26	1,0	14,0	0,9	1,5	18,8	609
12	0,26	1,0	16,4	0,9	1,5	21,2	759
16	0,26	1,0	18,2	1,25	1,6	23,9	1054
24	0,26	1,0	22,4	1,25	1,7	29,1	1392
Cross section 0,75 mm² / 7							
2	0,26	0,8	9,6	0,9	1,4	14,2	364
4	0,26	0,8	11,1	0,9	1,4	15,7	452
8	0,26	1,0	15,3	0,9	1,5	20,1	688
12	0,26	1,0	17,9	1,25	1,6	23,6	1018
16	0,26	1,0	19,9	1,25	1,6	26,4	1222
24	0,26	1,1	24,8	1,25	1,8	31,7	1640
Cross section 1,0 mm² / 7							
2	0,26	0,8	10,3	0,9	1,4	14,9	404
4	0,26	1,0	12,3	0,9	1,4	16,9	519
8	0,26	1,0	16,5	0,9	1,5	21,3	771
12	0,26	1,0	19,3	1,25	1,6	25,0	1150
16	0,26	1,0	21,5	1,25	1,7	28,2	1394
24	0,26	1,1	26,9	1,25	1,8	33,8	1863
Cross section 1,3 mm² / 7							
2	0,26	0,8	11,0	0,9	1,4	15,6	441
4	0,26	1,0	13,2	0,9	1,5	18,0	579
8	0,26	1,0	17,7	1,25	1,6	23,4	1014
12	0,26	1,0	20,8	1,25	1,7	27,5	1304
16	0,26	1,0	23,2	1,25	1,7	29,9	1561
24	0,26	1,1	29,0	1,25	1,8	35,9	2100
Cross section 1,5 mm² / 7							
2	0,35	1,0	12,5	0,9	1,5	17,3	514
4	0,35	1,0	14,5	0,9	1,5	19,3	651
8	0,35	1,0	19,6	1,25	1,6	26,1	1148
12	0,35	1,0	23,0	1,25	1,7	29,7	1474
16	0,35	1,1	25,9	1,25	1,8	32,8	1797
24	0,35	1,2	32,4	1,6	2,0	40,4	2688

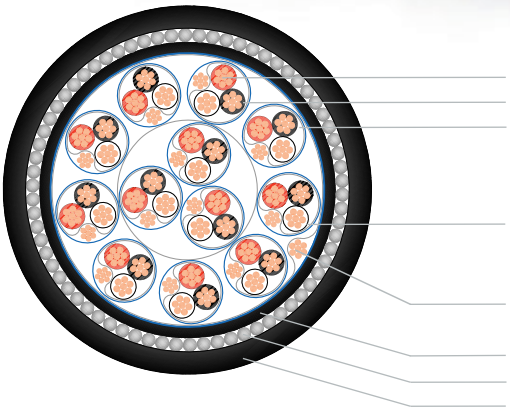
All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)HRH Timf

Reference standard: EN 50288-7
XLPE insulated, triple twisted, individual & overall screened, armoured, halogen-free instrumentation cable



Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: triples
   colour identification: - insulation: BLACK/WHITE/RED, each core numbered
   - additional black numbered yellow tape above each individual screened triple
4. Individual screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
   Cabling elements assembled in concentric layers
5. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
6. Inner sheath: halogen-free, fire-retardant polymer compound
7. Armoring: one layer of galvanized steel wires
8. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)HRH Timf 12x3x1,3 mm² 300 V + year + meter-marking or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Capacitance unbalance between triples	< 500pF / 500m					
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

MSR-2X(St)HRH Timf

Number of triples	Insulation thickness min. mm	Inner sheath thickness nominal mm	Diameter over inner sheath approx. mm	Steal wire armour diameter nominal mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 0,5 mm² /7							
2	0,26	0,8	9,8	0,9	1,4	14,4	374
4	0,26	0,8	11,4	0,9	1,4	16,0	464
8	0,26	1,0	15,7	0,9	1,5	20,5	713
12	0,26	1,0	18,3	1,25	1,6	24,0	1047
16	0,26	1,0	20,4	1,25	1,6	26,9	1257
24	0,26	1,1	25,4	1,25	1,8	32,3	1683
Cross section 0,75 mm² /7							
2	0,26	0,8	10,6	0,9	1,4	15,2	419
4	0,26	1,0	12,7	0,9	1,5	17,5	556
8	0,26	1,0	17,0	0,9	1,6	22,0	824
12	0,26	1,0	19,9	1,25	1,6	26,4	1220
16	0,26	1,0	22,2	1,25	1,7	28,9	1473
24	0,26	1,1	27,7	1,25	1,8	34,6	1974
Cross section 1,3 mm² /7							
2	0,26	1,0	12,7	0,9	1,4	17,3	532
4	0,26	1,0	14,7	0,9	1,5	19,5	690
8	0,26	1,0	19,9	1,25	1,6	26,4	1233
12	0,26	1,0	23,4	1,25	1,7	30,1	1600
16	0,26	1,1	26,3	1,25	1,8	33,2	1957
24	0,26	1,2	33,0	1,6	1,9	40,8	2912

Application

Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications.
With improved fire behaviour and suitable for strong mechanical requirements.

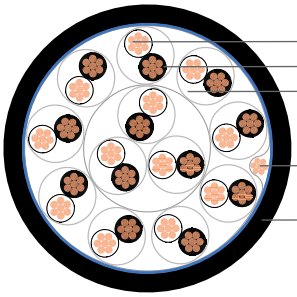
All information given is indicative only and not binding and can be subject to change without notice.

Cables with circuit integrity 300V - 500V

MSR-HX(St)H

Reference standard: EN 50288-7
Fire resistant, ceramic insulated, pair twisted, overall screened, unarmoured, halogen-free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked halogen-free ceramic forming polymer compound
3. Cabling elements: pairs
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-HX(St)H 12x2x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<250	<250	<250	<250	<250	<250
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>300					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-3 Cat. C (Cat. A on request)
Fire resistance	IEC 60331-21/IEC 60331-1/IEC 60331-2 (EN 50200)
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

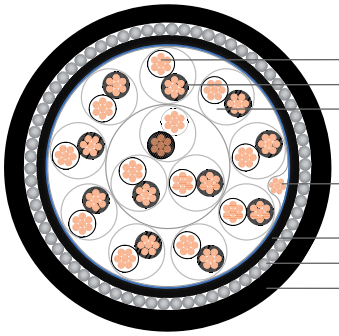
Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications where improved fire behaviour is requested.

All information given is indicative only and not binding and can be subject to change without notice.

MSR-HX(St)HRH

Reference standard: EN 50288-7
Fire resistant, ceramic insulated, pair twisted, overall screened, armoured, halogen-free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked halogen-free ceramic forming polymer compound
3. Cabling elements: paires
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: halogen-free, fire-retardant polymer compound
6. Armoring: one layer of galvanized steel wires
7. Outer sheath: halogen-free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-HX(St)HRH 12x2x1,0 mm² 300 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	300 V					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<250	<250	<250	<250	<250	<250
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>300					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-3 Cat. C (Cat. A on request)
Fire resistance	IEC 60331-21/IEC 60331-1/IEC 60331-2 (EN 50200)
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

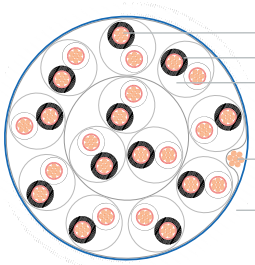
Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications.
With improved fire behaviour and suitable for strong mechanical requirements.

All information given is indicative only and not binding and can be subject to change without notice.

MSR-m2X(St)H

Reference standard: EN 50288-7
Fire resistant, XLPE insulated, pair twisted, overall screened, unarmoured, halogen free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: Mica tape (fire barrier) + cross-linked PE (XLPE)
3. Cabling elements: pairs
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Outer sheath: halogen free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-m2X(St)H 16x2x1,0 mm² 500 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**500 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-3 Cat. C (Cat. A on request)
Fire resistance	IEC 60331-21
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

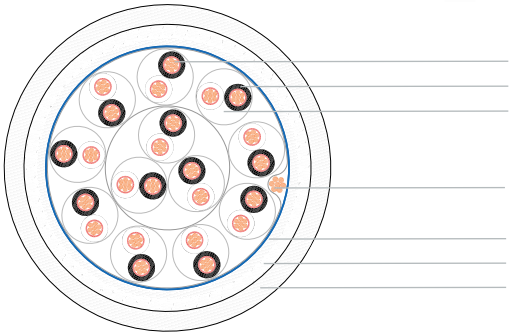
Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications where improved fire behaviour is requested.

All information given is indicative only and not binding and can be subject to change without notice.

MSR-m2X(St)HRH

Reference standard: EN 50288-7
Fire resistant, XLPE insulated, pair twisted, overall screened, armoured, halogen free instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: Mica tape (fire barrier) + cross-linked PE (XLPE)
3. Cabling elements: paires
   colour identification: BLACK/WHITE, each core numbered
   Cabling elements assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: halogen free, fire-retardant polymer compound
6. Armoring: one layer of galvanized steel wires
7. Outer sheath: halogen free, fire-retardant polymer compound
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-m2X(St)HRH 12x2x1,0 mm² 500 V + year + meter-marking or according to customer specification

Electrical Properties

Voltage rating (V)	**500 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36,7	≤25,0	≤18,5	≤14,2	≤12,3	≤7,56
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Test voltage core/core (V_{ac})	1000					
Test voltage core/screen (V_{ac})	1000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-3 Cat. C (Cat. A on request)
Fire resistance	IEC 60331-21
Smoke density	IEC 61034-1+2
Corrosivity of combustion gas	IEC 60754-2
Toxicity of combustion gas	NF X 70-100

Application

Transmission of analog and digital signals for indoor and outdoor (in suitable cable trays) applications.
With improved fire behaviour and suitable for strong mechanical requirements.

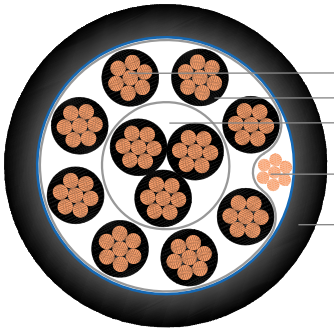
All information given is indicative only and not binding and can be subject to change without notice.

Cables with twisted cores 500V

MSR-2X(St)Y

Reference standard: EN 50288-7
XLPE insulated, twisted, overall screened, unarmoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: twisted cores
   identification: BLACK, each core numbered
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)Y 5x1,5 mm² 500 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**500 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36	≤24,5	≤18,1	≤13,9	≤12,1	≤7,41
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Test voltage core/core (V_{ac})	2000					
Test voltage core/screen (V_{ac})	2000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

Application

Transmission of analog and digital signals for indoor and outdoor applications

MSR-2X(St)Y

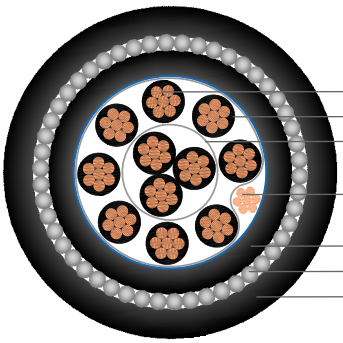
Number of cores	Insulation thickness min. mm	Outer sheath thickness nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 1,5 mm² / 7				
5	0,44	1,0	10,5	154
7	0,44	1,0	11,3	192
12	0,44	1,1	14,7	311
16	0,44	1,2	16,5	407
19	0,44	1,2	17,3	465
24	0,44	1,3	20,3	587
27	0,44	1,3	20,7	646
33	0,44	1,3	22,0	764
37	0,44	1,4	23,0	851
Cross section 2,5 mm² / 7				
5	0,53	1,0	12,1	218
7	0,53	1,1	13,3	283
12	0,53	1,2	17,4	461
16	0,53	1,3	19,5	609
19	0,53	1,3	20,5	697
24	0,53	1,4	23,8	866
27	0,53	1,4	24,3	959
33	0,53	1,5	26,4	1168
37	0,53	1,5	27,4	1286

All information given is indicative only and not binding and can be subject to change without notice.

MSR-2X(St)YRY

Reference standard: EN 50288-7
XLPE insulated, twisted, overall screened, armoured, PVC sheathed instrumentation cable

Construction



1. Conductor: bare stranded copper
2. Insulation: cross-linked PE (XLPE)
3. Cabling elements: twisted cores
   identification: BLACK, each core numbered
4. Overall screening: laminated Alu/PET tape (9 µm Alu/12 µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,30 mm)
5. Inner sheath: flame-retardant PVC
6. Armoring: one layer of galvanized steel wires
7. Outer sheath: flame-retardant PVC
   Outer sheath color: black or blue or according to customer specification
   Outer sheath marking: EUPEN MSR-2X(St)YRY 5x1,5 mm² 500 V
   + year + meter-marking
   or according to customer specification

Electrical Properties

Voltage rating (V)	**500 V**					
Conductor cross-section (mm²)	**0,5**	**0,75**	**1,0**	**1,3**	**1,5**	**2,5**
Conductor resistance @ 20 °C (Ω/km)	≤36	≤24,5	≤18,1	≤13,9	≤12,1	≤7,41
Mutual capacitance (nF/km)	<150	<150	<150	<150	<150	<150
L/R ratio (µH/Ω)	<25	<25	<25	<40	<40	<60
Test voltage core/core (V_{ac})	2000					
Test voltage core/screen (V_{ac})	2000					
Insulation resistance @ 20 °C (MΩ*km)	>5000					

Laying conditions

Operating temperature	-30 °C to +90 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	10 x outer diameter
Oil resistance	ICEA S-82-552

Fire behaviour

Fire propagation	IEC 60332-1
	IEC 60332-3-22 Cat. A
	IEC 60332-3-24 Cat. C

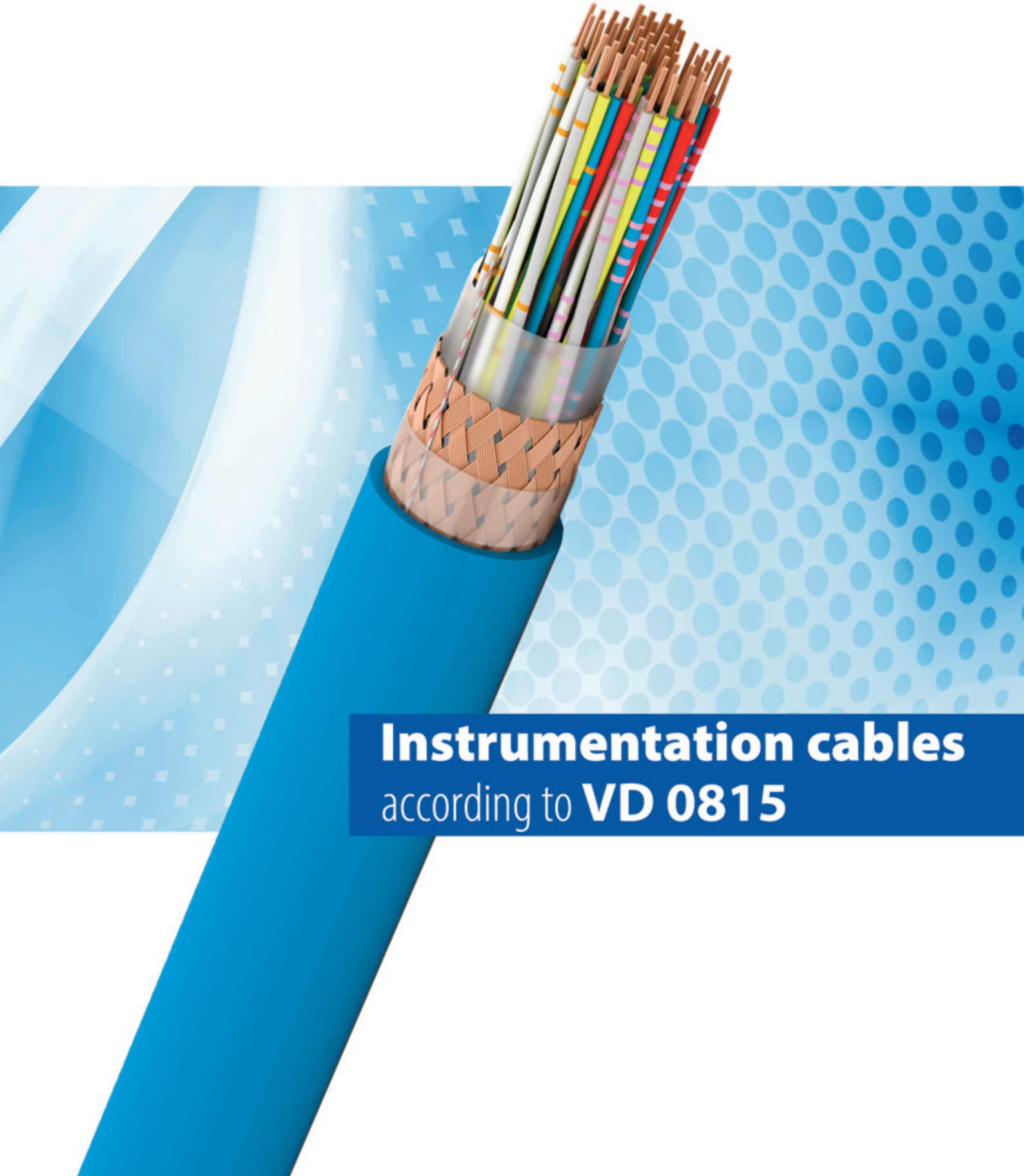
Application

Transmission of analog and digital signals for indoor and outdoor applications and suitable for strong mechanical requirements

MSR-2X(St)YRY

Number of cores	Insulation thickness Minimum mm	Outer sheath thickness Nominal mm	Outer diameter approx. mm	Weight approx. kg/km
Cross section 1,5 mm² / 7				
5	0,44	1,4	14,5	413
7	0,44	1,4	15,3	471
12	0,44	1,5	19,1	687
16	0,44	1,5	20,7	813
19	0,44	1,5	21,5	893
24	0,44	1,6	25,2	1234
27	0,44	1,6	25,6	1305
33	0,44	1,7	27,4	1498
37	0,44	1,7	28,2	1600
Cross section 2,5 mm² / 7				
5	0,53	1,4	16,5	537
7	0,53	1,5	17,7	625
12	0,53	1,6	21,8	897
16	0,53	1,6	24,4	1230
19	0,53	1,6	25,4	1354
24	0,53	1,7	29,0	1640
27	0,53	1,7	29,7	1758
33	0,53	1,8	31,8	2034
37	0,53	1,8	32,8	2179

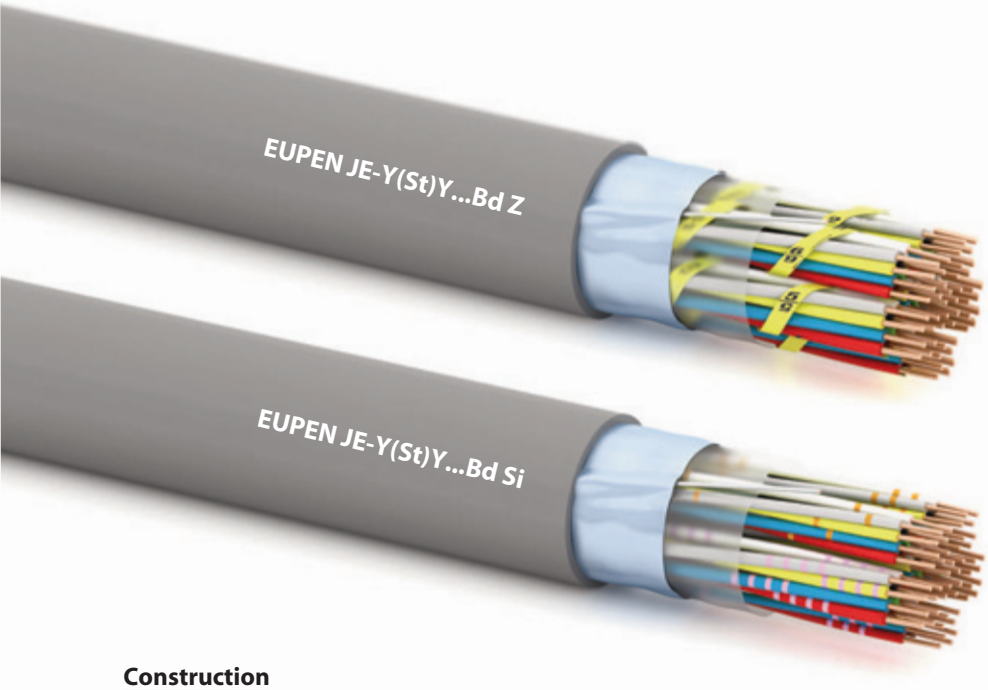
All information given is indicative only and not binding and can be subject to change without notice.



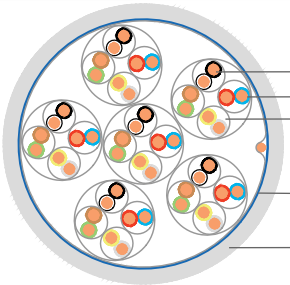
Instrumentation cables
according to **VD 0815**

JE-Y(St)Y…Bd

PVC insulated, overall screened, unarmoured, PVC sheathed control cable acc. to VDE 0815



Construction



1. Conductors: bare solid copper
2. Insulation: PVC
3. Cabling elements: pairs, color coding see pair identification
   Cabling elements assembled in bundles of 4 pairs (Bd)
   Bundles assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,8 mm²
5. Outer sheath: PVC
   Outer sheath color: Grey or blue or according to customer specification

Pair identification

Pair 1:
Pair 2:
Pair 3:
Pair 4:

Electrical Properties

Voltage rating (V)	225	
Conductor cross section (mm²)	0,8	
Conductor resistance in loop @ 20 °C (Ω/km)	73,2	
Capacitance core/core (nF/km)	≤100	(+20% for cables up to 4 pairs)
Capacitance unbalance between pairs @ 800 Hz. (pF/100m)	≤200	(20% for measured values or min. one value may be <400)
Test voltage core/core (V_{ac})	500	
Test voltage core/screen (V_{ac})	2000	
Insulation resistance @ 20 °C (MΩ*km)	≥100	

All information given is indicative only and not binding and can be subject to change without notice.

JE-Y(St)Y…Bd

Application conditions

Operating temperature	-30 °C to +70 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1

Application

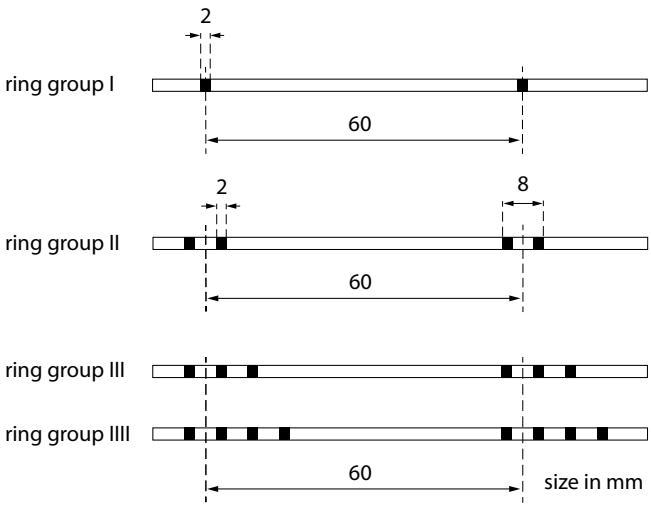
Transmission of analog and digital signals for indoor and outdoor applications.
Also avaible in halogen-free version JE-H(St)H.

Number of pairs and size mm	Thickness of the outer sheath mm	Overall diameter approx. mm	Weight of cable approx. kg/km
1 x 4 x 0,8	1,0	6,0	50
4 x 2 x 0,8	1,0	8,5	90
8 x 2 x 0,8	1,0	12,0	200
12 x 2 x 0,8	1,2	12,5	270
20 x 2 x 0,8	1,2	15,5	400
32 x 2 x 0,8	1,4	19,0	610
40 x 2 x 0,8	1,4	20,5	740

Possible identification of individual bundles:

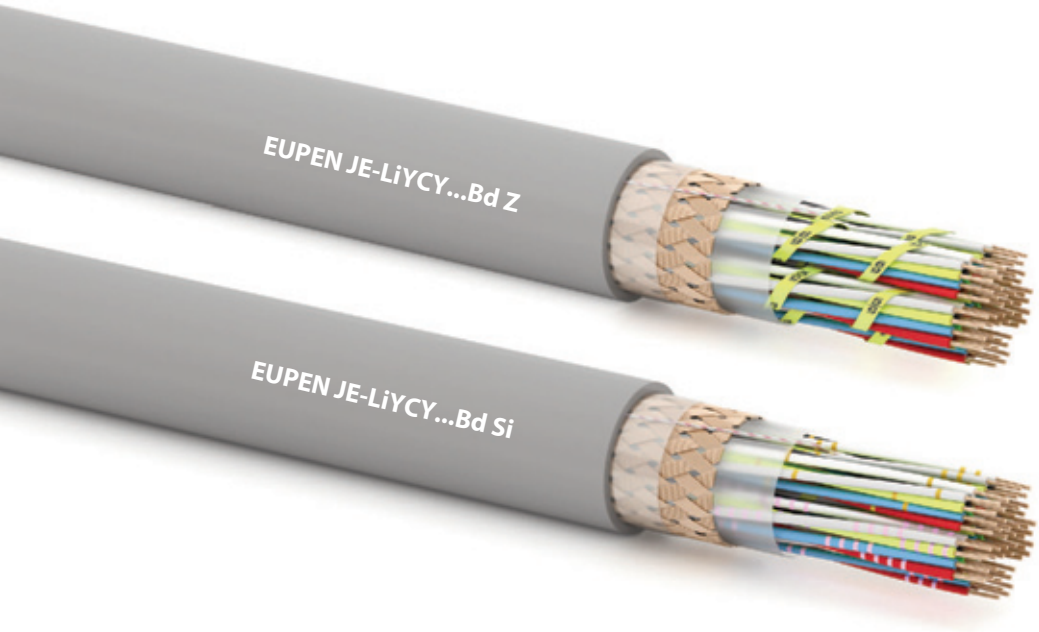
1. **Bd Z**: each bundle is wrapped with a numbered yellow tape
2. **Bd Si "SIMATIC"**: the cores must be indelibly marked with colored rings (see hereafter)

bundle number	ring color	ring group	wrapped tape color
1	pink	I	-
2		II	
3		III	
4		IIII	
5	orange	I	-
6		II	
7		III	
8		IIII	
9	violet	I	-
10		II	
11		III	
12		IIII	
13	pink	I	blue
14		II	
15		III	
16		IIII	
17	orange	I	red
18		II	
19		III	
20		IIII	

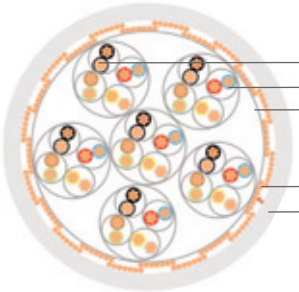


JE-LiYCY…Bd

PVC insulated, tinned or bare copper braid screened, unarmoured, PVC sheathed instrumentation cable acc. to VDE 0815



Construction



1. Conductors: bare stranded copper
2. Insulation: PVC
3. Cabling elements: pairs, color coding see pair identification
   Cabling elements assembled in bundles of 4 pairs (Bd)
   Bundles assembled in concentric layers
4. Overall screening: tinned or bare copper wire braid
5. Outer sheath: PVC
   Outer sheath color: Grey or blue or according to customer specification

Pair identification

Pair 1: 🔵🔴
Pair 2: ⚪🟡
Pair 3: 🟢🟤
Pair 4: ⚪⚫

Electrical Properties

Voltage rating (V)	225
Conductor cross section (mm²)	0,5
Conductor resistance in loop @ 20 °C (Ω/km)	78,4
Capacitance core/core (nF/km)	≤100 (+20% for cables up to 4 pairs)
Capacitance unbalance between pairs @ 800 Hz. (pF/100m)	≤200 (20% of measured values or min. one value may be <400)
Test voltage core/core (V_{ac})	500
Test voltage core/screen (V_{ac})	2000
Insulation resistance @ 20 °C (MΩ*km)	≥100

All information given is indicative only and not binding and can be subject to change without notice.

JE-LiYCY…Bd

Application conditions

Operating temperature	-30 °C to +70 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

Fire behaviour

Fire propagation	IEC 60332-1

Application

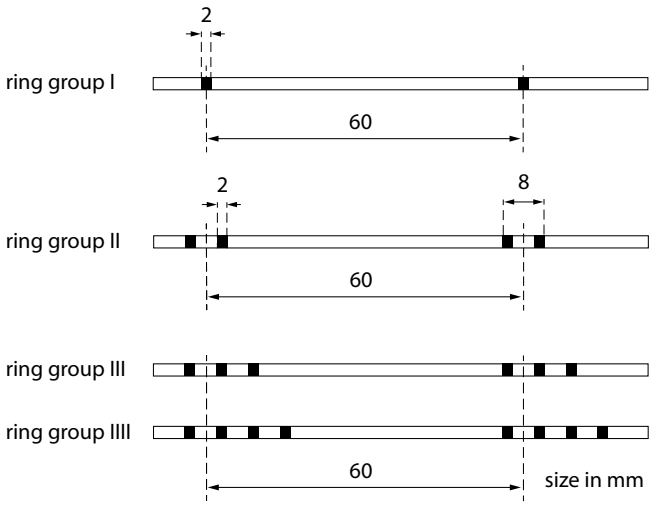
Transmission of analog and digital signals for indoor and outdoor applications.
Also available in halogen-free version JE-LiHCH.

Number of pairs and size mm²	Thickness of the outer sheath mm	Overall diameter approx. mm	Weight of cable approx. kg/km
1 x 4 x 0,5	1,0	7,5	80
4 x 2 x 0,5	1,0	10,5	130
8 x 2 x 0,5	1,0	12,0	200
12 x 2 x 0,5	1,2	14,0	285
16 x 2 x 0,5	1,2	15,5	350
20 x 2 x 0,5	1,2	17,0	435
24 x 2 x 0,5	1,4	19,5	490
32 x 2 x 0,5	1,4	21,0	615
40 x 2 x 0,5	1,4	23,0	795

Possible identification of individual bundles:

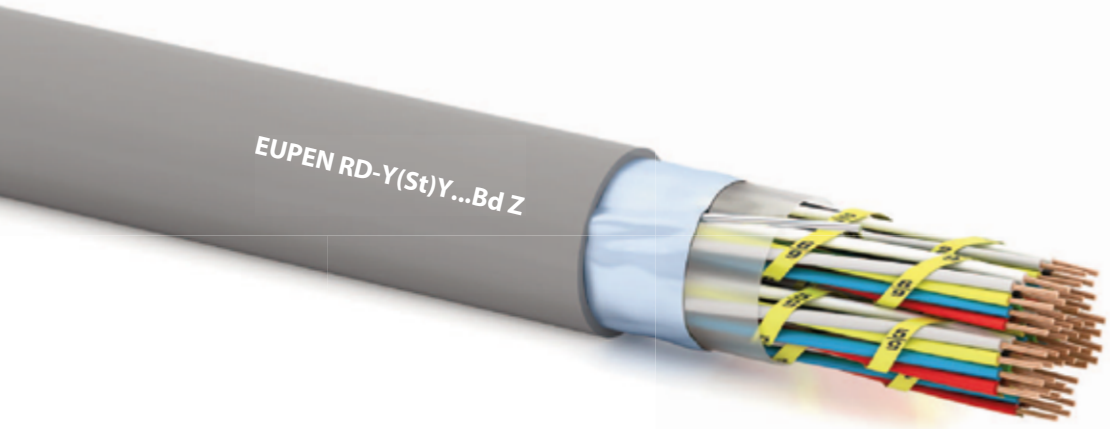
1. **Bd Z**: each bundle is wrapped with a numbered yellow tape
2. **Bd Si "SIMATIC"**: the cores must be indelibly marked with colored rings (see hereafter)

bundle number	ring color	ring group	wrapped tape color
1	pink	I	-
2		II	
3		III	
4		IIII	
5	orange	I	-
6		II	
7		III	
8		IIII	
9	violet	I	-
10		II	
11		III	
12		IIII	
13	pink	I	blue
14		II	
15		III	
16		IIII	
17	orange	I	red
18		II	
19		III	
20		IIII	

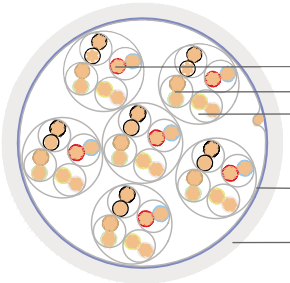


RD-Y(St)Y...Bd Z

PVC insulated, overall screened, unarmoured, PVC sheathed control cable adapted to VDE 0815



Construction



1. Conductors: bare stranded copper
2. Insulation: PVC
3. Cabling elements: pairs, color coding see pair identification
   Cabling elements assembled in bundles of 4 pairs (Bd)
   Bundles assembled in concentric layers
4. Overall screening: laminated Alu/PET tape (9µm Alu/12µm PET) in contact with a tinned copper drain wire 0,5 mm² (7x0,3mm)
5. Outer sheath: PVC
   Outer sheath color: Grey or blue or according to customer specification

Pair identification

Pair 1:
Pair 2:
Pair 3:
Pair 4:

Electrical Properties

Voltage rating (V)	600	
Conductor cross section (mm²)	0,5	
Conductor resistance in loop @ 20 °C (Ω/km)	73,6	
Capacitance core/core (nF/km)	≤100	(+20% for cables up to 4 pairs)
Capacitance unbalance between pairs @ 800 Hz. (pF/100m)	≤200	(20% for measured values or min. one value may be <400)
Test voltage core/core (V_{ac})	2000	
Test voltage core/screen (V_{ac})	2000	
Insulation resistance @ 20 °C (MΩ*km)	≥100	
Line attenuation @ 1 kHz (dB/km)	1,2	
@ 10 kHz (dB/km)	3,0	
Crosstalk attenuation @ 10 kHz/500m (dB)	≤ 60	
Characteristic impedance @ 1 kHz (Ω)	≅ 370	
@ 10 kHz (Ω)	≅ 130	

Application conditions

Operating temperature	-30 °C to +70 °C
Laying temperature	-5 °C to +50 °C
Min. bending radius	7,5 x outer diameter

All information given is indicative only and not binding and can be subject to change without notice.

RD-Y(St)Y…Bd Z

Fire behaviour

Fire propagation	IEC 60332-1

Application

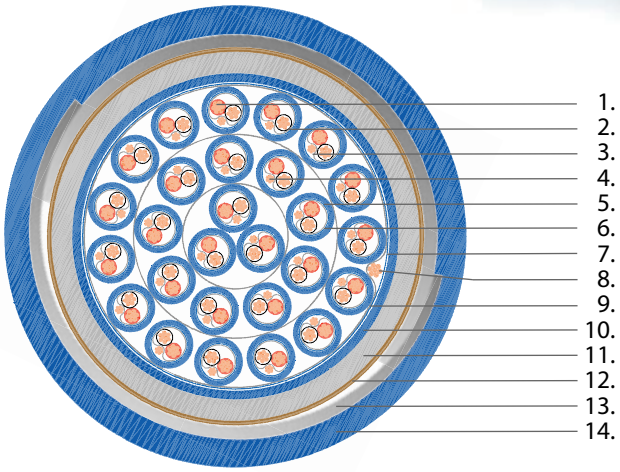
Transmission of analog and digital signals up to 10 kHz for indoor and outdoor applications.
Suitable for maxi termi point connection. Also available in **halogen-free version : RD-H(St)H.**

Number of pairs and size mm²	Thickness of the outer sheath mm	Overall diameter approx. mm	Weight of cable approx. kg/km
1 x 4 x 0,5	1,0	6,5	65
4 x 2 x 0,5	1,0	9,0	105
8 x 2 x 0,5	1,0	11,5	180
12 x 2 x 0,5	1,0	13,5	250
16 x 2 x 0,5	1,2	15,5	310
20 x 2 x 0,5	1,2	16,1	385
24 x 2 x 0,5	1,2	19,0	450
32 x 2 x 0,5	1,4	21,0	560
48 x 2 x 0,5	1,6	25,5	810
96 x 2 x 0,5	1,8	34,0	1570

Instrumentation cables
according to
AFNOR NF M 87-202 250V

AFNOR NF M 87-202 250 V

Construction



1. **âme:** cuivre nu de section 0,50 mm² (1 x 0,80 mm) ou 0,90 mm² (7 x 0,40 mm)
2. **enveloppe isolante:** polychlorure de vinyle (P.V.C.)
   Repérage - paires : naturel, rouge, numéroté
   Repérage - tierces : naturel, rouge, bleu, numéroté
   Repérage - quartes : naturel, rouge, bleu, jaune, numéroté
3. **ruban isolant*:** polyester en hélice
4. **fil de continuité*:** cuivre étamé, câblé, de section 0,22 mm² (7 x 0,20 mm)
5. **écran individuel (EI)*:** ruban aluminium contrecollé plastique en hélice
6. **gaine*:** polychlorure de vinyle (P.V.C.) de couleur bleu clair, numéroté
7. **ruban isolant:** polyester en hélice
8. **fil de continuité:** cuivre étamé, câblé, de section 0,22 mm² (7 x 0,20 mm)
9. **écran général (EG):** ruban aluminium contrecollé plastique en hélice
10. **gaine d'étanchéité**:** polychlorure de vinyle (P.V.C.), de couleur bleu clair, et de qualité spéciale résistant aux hydrocarbures aliphatiques
11. **gaine de plomb (PF) (optionnelle)**
12. **matelas**:** papier crêpé plastifié
13. **double feuillard (FA)**:** acier d'épaisseur 0,2 mm
14. **gaine de protection:** polychlorure de vinyle (P.V.C.), de couleur bleu clair, et de qualité spéciale résistant aux hydrocarbures aliphatiques

*** Eléments constructifs optionnels pour câbles avec écran individuel.**

**** Eléments constructifs optionnels pour câbles armés**

Données techniques

Série	Tension max. d'utilisation	Tension d'essai cond. / cond.	Résistance linéïque max à 20 °C Ω/km	Capacité linéïque entre cond. nF/km
09	250 V	1500 V_{ac} -1 min	21,4	≤ 160
05	250 V	1500 V_{ac} -1 min	37,5	≤ 145
15	250 V	1500 V_{ac} -1 min	12,3*	≤ 200

* conforme à la norme EN 50288-7

Toutes les informations fournies sont données à titre indicatif et ne sont pas contractuelles et peuvent être sujettes à des modifications sans préavis.

AFNOR NF M 87-202 250 V

Type de câble et section	SF non armé		FA armé		PF sous plomb et armé	
	Diam. ext. approx.	Poids approx.	Diam. ext. approx.	Poids approx.	Diam. ext. approx.	Poids approx.
	mm	kg/km	mm	kg/km	mm	kg/km
01 - IP - 09 - EG	7,2	55	10,1	160	13,3	515
01 - IT - 09 - EG	7,6	70	10,5	180	13,7	550
01 - IQ - 09 - EG	8,1	80	10,9	200	14,2	590
03 - IP - 05 - EG	8,9	80	11,7	205	14,9	620
07 - IP - 05 - EG	11,2	150	14,2	305	17,6	850
12 - IP - 05 - EG	14,6	235	17,8	435	21,4	1195
19 - IP - 05 - EG	17,1	355	20,5	590	23,9	1460
27 - IP - 05 - EG	20,5	495	23,9	770	27,7	1890
07 - IT - 05 - EG	12,3	200	15,5	380	18,7	960
12 - IT - 05 - EG	16,3	335	19,6	560	23,1	1390
03 - IP - 05 - EI	13,8	165	17,0	360	-	-
07 - IP - 05 - EI	18,1	320	21,5	570	25,3	1570
12 - IP - 05 - EI	23,9	525	27,5	860	31,5	2245
19 - IP - 05 - EI	28,3	785	32,1	1190	36,5	3050
27 - IP - 05 - EI	34,3	1110	38,3	1610	42,9	3975
07 - IT - 05 - EI	19,0	385	22,4	645	26,2	1690
12 - IT - 05 - EI	25,4	640	29,2	1005	33,2	2565
01 - IP - 15 - EG	8,4	75	11,3	195	14,5	595
01 - IT - 15 - EG	8,8	100	11,7	220	14,9	640
03 - IP - 09 - EG	11,0	125	14,0	280	17,4	830
07 - IP - 09 - EG	14,3	245	17,5	435	21,1	1185
12 - IP - 09 - EG	18,8	400	22,2	660	26,0	1695
19 - IP - 09 - EG	22,1	605	25,7	910	29,7	2200
27 - IP - 09 - EG	26,6	840	30,4	1220	34,6	2865
07 - IT - 09 - EG	16,3	345	19,7	570	-	-
12 - IT - 09 - EG	21,4	575	25,0	875	29,0	2120
03 - IP - 09 - EI	16,6	230	20,0	460	23,4	1305
07 - IP - 09 - EI	21,9	460	25,5	765	29,5	2055
12 - IP - 09 - EI	29,3	765	33,1	1190	37,5	3100
19 - IP - 09 - EI	34,7	1155	38,7	1660	43,3	4045
27 - IP - 09 - EI	41,9	1600	46,3	2250	51,1	5410
07 - IT - 09 - EI	23,1	565	26,7	885	30,7	2230
12 - IT - 09 - EI	31,0	945	35,0	1400	39,4	3420

www.eupen.com

Kabelwerk EUPEN AG

20
23

Malmedyer Str. 9 - 4700 EUPEN - BELGIUM

Tel.: +32(0)87 59 70 00
http://www.eupen.com e-mail:major_projects@eupen.com ISO Certified Company

MSR Instrumentation 04/2023