ZARSIM

Instrumentation Cables

Where do you want to go today?


Success is a choice


A leap ahead


You can count on us

Where vision gets built

Zarsim History

شرکت زرسیم در سال ۱۳۶۲ تاسیس و در سال ۱۳۶۳ عملیات تولید را آغاز کرد.
ماموریت این شرکت، بقاء ضمن حفظ کیفیت است. ما معتقدیم که ارتقاء کمی و کیفی، پویایی و سرمایه گزاری مناسب در نیروی انسانی و ماشین آلات از الزامات و نیازمندی های تحقق این ماموریت است. شرکت زرسیم در پرتو چنین نگرشی موفق به اخذ پروانه های استاندارد ایران در زمانی کوتاه پس از شروع تولید گردید.
با بدست آوردن گواهینامه ISO 9002 در سال ۱۳۸۰ و گواهینامه های ISO 14001، ISO 9001 و OHSAS 18001 در سال ۱۳۸۴، شرکت زرسیم بعنوان اولین دارنده گواهینامه IMS در صنعت سیم و کابل کشور شناخته می شود. به منظور گسترش فعالیت در بازار و صادرات، شرکت زرسیم در سال ۱۳۸۶ گواهینامه های CE و BS را برای کابل های ولتاژ پایین دریافت نمود و همچنین در سال ۱۳۹۱ موفق به اخذ گواهینامه های ISO 17025 و ISO TS 16949 (with Design) گردید.
شرکت زرسیم دارای فضای تولید ۸۰۰۰ متر مربع و حداقل ظرفیت تولید ماهانه ۵۰ میلیون متر انواع سیم و کابل شامل کابل های ولتاژ پایین، کابل های کنترل، کابل های ابزار دقیق، کابل های مخابراتی، کابل های کوآکسیال، کابل های صوتی و کابل های خاص می باشد. همچنین شرکت زرسیم بعنوان بزرگترین تولید کننده کابل های مورد مصرف در صنعت خودرو شناخته می شود.
به منظور تامین نیازهای گسترده مشتریان و تنوع بخشیدن به محصولات خود، شرکت زرسیم بصورت مستمر از ماشین آلات روز دنیا استفاده کرده است.
در طول ده سال گذشته شرکت زرسیم پیوسته چشم اندازهای کاری خود را با آموزش کارکنان، ارتقاء ماشین آلات و فن آوری توسعه داده است.
امروز شرکت زرسیم، سازمان بین المللی مبتکر و پویایی است که توسط مدیریت حرفه ای با ساختار مدیریتی نوین اداره می شود.

Zarsim Co. was established in 1983 and started its operation in 1984.
Zarsim's mission is survival while maintaining quality. We believe that qualitative and quantitative improvement, dynamism and proper investment in manpower and machinery are the requisites of such a mission. It was with such an attitude that Zarsim Company managed to receive the certificates of Iranian standard within a short time from the start of production.
Having acquired ISO 9002 certificate in 2001, and later ISO 9001, ISO 14001, and OHSAS 18001 in 2005, Zarsim is recognised as the first holder of Integrated Management System (IMS) certificate in wire and cable industry in Iran. We were awarded CE and BS certificates for low voltage cables in 2007 in order to extend our activities in market development and export sales. ISO 17025 and ISO TS 16949 (with Design) were also achieved in 2012.
The 8000 square meter facility with a minimum monthly production capacity of fifty million meters of different cables, Zarsim produces various types including low voltage power cables, control cables, instrumentation cables, telecommunication cables, coaxial cables, audio cables and specialty cables. Zarsim is also considered the topmost manufacturer of cables used in automotive industry.
In order to meet the extended needs of customers and to introduce various choices to its production line, Zarsim has been using modern machinery. In the last ten years, Zarsim has continuously developed its operational outlook by providing employee training, modernizing its machinery, and improving its core technology.
Today, Zarsim is a dynamic and enterprising international corporation truly run by professional management with a modern management structure.

Zarsim Certificates

پروانه کاربرد علامت استاندارد اجباری

براساس قانون اصلاح قوانین و مقررات سازمان ملی استاندارد ایران

مصوب یکهزار و صد و هشتاد و یک و در اجرای مصوبات شورای عالی استاندارد:

به موجب این پروانه اجازه داده می شود: شرکت زرسیم

با رعایت قوانین و مقررات مربوط و استاندارد ملی شماره ۵۰۷۰۵ از علامت

استاندارد ملی ایران برای محصول: تجهیزات حفاظتی برای ولتاژهای اسمی ۱۰۰۰ ولت و کمتر

با نام و یا علامت تجاری: استاندارد نیلد

مدت اعتبار این پروانه از تاریخ صدور تمدید سه سال است

پروانه کاربرد علامت استاندارد اجباری

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به موجب این پروانه اجازه داده می شود: شرکت زرسیم

با رعایت قوانین و مقررات مربوط و استاندارد ملی شماره ۶۰۷۰۲ از علامت

استاندارد ملی ایران برای محصول: سیم با عایق پلی وینیل کلراید با ولتاژ اسمی ۴۵۰/۷۵۰ ولت گروه هادی ۵ و ۵

با نام و یا علامت تجاری: حروف Z5 به شکل هندسی به رنگ نقره ای طبق نمونه استاندارد نیلد

مدت اعتبار این پروانه از تاریخ صدور تمدید سه سال است

پروانه کاربرد علامت استاندارد اجباری

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به موجب این پروانه اجازه داده می شود: شرکت زرسیم

با رعایت قوانین و مقررات مربوط و استاندارد ملی شماره ۶۰۷۰۲ از علامت

استاندارد ملی ایران برای محصول: کابل های شرکت چندرشته گرد با عایق الاستومری شده و تجهیزات جانبی آن با ولتاژهای اسمی ۱۰۰۰ ولت و کمتر

با نام و یا علامت تجاری: استاندارد نیلد

مدت اعتبار این پروانه از تاریخ صدور تمدید سه سال است

پروانه کاربرد علامت استاندارد اجباری

براساس قانون اصلاح قوانین و مقررات سازمان ملی استاندارد ایران

مصوب یکهزار و صد و هشتاد و یک و در اجرای مصوبات شورای عالی استاندارد:

به موجب این پروانه اجازه داده می شود: شرکت زرسیم

با رعایت قوانین و مقررات مربوط و استاندارد ملی شماره ۶۰۷۰۲ از علامت

استاندارد ملی ایران برای محصول: کابل غیر فلزی انعطاف (گروه هادی ۱)

با نام و یا علامت تجاری: استاندارد نیلد

مدت اعتبار این پروانه از تاریخ صدور تمدید سه سال است

پروانه کاربرد علامت استاندارد اجباری

براساس قانون اصلاح قوانین و مقررات سازمان ملی استاندارد ایران

مصوب یکهزار و صد و هشتاد و یک و در اجرای مصوبات شورای عالی استاندارد:

به موجب این پروانه اجازه داده می شود: شرکت زرسیم

با رعایت قوانین و مقررات مربوط و استاندارد ملی شماره ۶۰۷۰۵ از علامت

استاندارد ملی ایران برای محصول: کابل ها و بندهای قابل انعطاف

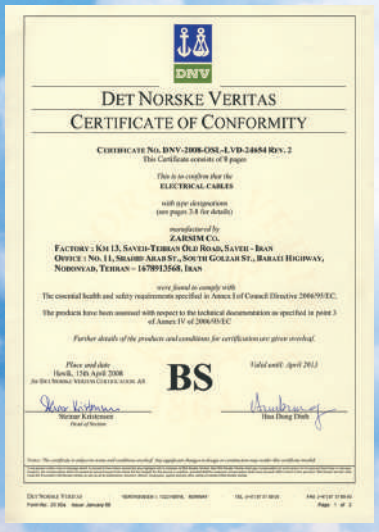
با نام و یا علامت تجاری: حروف Z5 به شکل هندسی به رنگ نقره ای طبق نمونه استاندارد نیلد

مدت اعتبار این پروانه از تاریخ صدور تمدید سه سال است

شرکت مدیریت تولید، توزیع و انتقال نیروی برق ایران

امور تعیین شده قبض برق و امور توزیع شرکت توانیر

شرکت توانیر



DNV

DET NORSKE VERITAS

CERTIFICATE OF CONFORMITY

CERTIFICATE No. DNV-2008-OSL-LVD-24654 REV. 2

This Certificate consists of 8 pages

This is to confirm that the

ELECTRICAL CABLES

with type designations

(see pages 3-8 for details)

manufactured by

ZARSIM CO.

FACTORY : KM 13, SAVEH-TEHRAN OLD ROAD, SAVEH - IRAN

OFFICE : NO. 11, SHAHID ARAB ST., SOUTH GOLZAR ST., BAHAEI HIGHWAY, NORDNVAD, TEHRAN – 1678913568, IRAN

were found to comply with

The essential health and safety requirements specified in Annex I of Council Directive 2006/95/EC.

The products have been assessed with respect to the technical documentation as specified in point 3 of Annex IV of 2006/95/EC

Further details of the products and conditions for certification are given overleaf.

Place and date: Høvik, 15th April 2008

Valid until: April 2013

BS

Steinar Kristensen

Head of Section

Hua Dong Dinh

DNV

DET NORSKE VERITAS

CERTIFICATE OF CONFORMITY

CERTIFICATE No. DNV-2006-OSL-LVD-0059

This Certificate consists of 2 pages

This is to confirm that the

ELECTRICAL CABLES

with type designations

(see page 2 for details)

manufactured by

ZARSIM CO.

FACTORY : KM 13, SAVEH-TEHRAN OLD ROAD, SAVEH - IRAN

OFFICE : UNIT 18, 3RD FLOOR, BUILDING #1, 9TH BAHABESTAN ST., PASDARAN AVE., TEHRAN-IRAN

were found to comply with

The essential health and safety requirements specified in Annex I of Council Directive 73/23/EEC.

The products have been assessed with respect to the technical documentation as specified in point 3 of Annex IV of 73/23/EEC.

Further details of the products and conditions for certification are given overleaf.

Place and date: Høvik, 20th February 2007

Valid until: February 2012

CE

Line Gangsøe

Head of Section

Hua Dong Dinh

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List of Contents

Shoud you have any questions, including inquiries about detailed prouduct specifications or performance, please ask our sales department.

We are happy to prepare cable in addition to those introduced here to meet specific customer needs. Please contact us for details.

In the interest of quality improvement, specifications are subject to change without notice.

Foreword

This is not just a catalogue. It is what you have always looked for - a selection guide to choose the construction you need for your project, your plant, your application ....

... CREATED TO PROVIDE YOUR CABLE SOLUTION

The European Standard BS EN 50288-7 is the first Standard for Instrumentation and Control Cables which addresses the whole range of requirements and needs of general and specific industrial cable applications.

Contrary to already existing official regulations and specifications, the new standard covers a huge variety of cable constructions as used today in the international scene for global business. A meaningful, comprehensive - but still standardised - offering on different material and construction variations allows you to select cable constructions, which are part of the Standard but still are covering the necessity of the application.

The new standard will be complemented by European Standards for Material and Test. As yet these standards do not exist, so reference is made either to IEC Standards or national standards.

Based on many years of experience, being project oriented or based on customer site requirements, using the new European standard as a solid base, we have defined a very wide product range with the intention to cover your field driven product requirements.

We selected and designed a product programme with the goal in mind to cover all usual applications. Environmental, electrical, mechanical, laying and safety requirements result in a substantial product family offering. This first section covers all product family related information. Specific type information will be provided on request or through other media.

A very systematic organisation of this product family guide, allows you to select your product according to your application and needs in a very efficient manner.

Introduction of Standard and Product Programme

1. The Standard BS EN 50288-7

The product programme "Zarsim Instrumentation Cable" covers products which are based on the European standard BS EN 50288 -7. Since the BS 5308-1 & 2: 1986 covered only a small fraction of the constructional and performance of the international market, they were withdrawn on 31.07.2008 and superseded by the BS EN 50288-7: 2005 standard.

This product programme gives extensive coverage to the requirements of the different Installation and Safety Regulations which are applied for measurement, control and monitoring systems in industrial plants. As a result, the user has a product programme at his disposal for applications world wide.

The world-wide market for instrumentation cables is largely characterised by an immense number of different products – with a further rising tendency. This problem, and it's really a problem for all involved people, was mainly caused by a normative gap: a missing recognised standards for design, materials and tests.

Today the scene is dominated by a multitude of specifications with different rules and regulations and often uncoordinated references to standards to be applied.

In this way the 'instrumentation cables' are invented again and again with all corresponding consequences of loss of economic viability, clearness, rapidity, in summary of loss of efficiency in handling. The few existing national standards for instrumentation cables (eg, UK, France) are not suited as specification basis for the international scene. Tailor made to its national market demands, they cover only a small fraction of the constructional and performance requirements of the international market.

The new European Standard BS EN 50288-7 for instrumentation cables, erected by the European Standardisation Organisation CENELEC and published in September 2005, is suited to solve this problem.

It describes: "Single and multi-element cables with copper conductors … They may be individually and/or overall screened and optionally may incorporate armouring and/or moisture or environmental protection layers".

The constructional design options cover more or less the complete range of products worldwide completed by well-coordinated material and test standards.

The structure of this standard does not contain finished products, but it specifies the single cable elements with its permitted constructional variants as well as the respective characteristics demands.

The application of this standard offers many chances to users, engineers and consultants such as manufacturers. Key improvements are:

- cost reduction
- clarity
- conclusiveness
- comparability
- rapidity

Thus, a conclusive, quality assured standardised work, closed unit is now available.
Wherever Zarsim had the opportunity to present the new standard senior engineers and purchasing managers recognised the advantages of the new standard for their own work. They started to revise the existing specifications or took the opportunity for creating a new conclusive instrumentation cable: specification based on BS EN 50288-7 standard.

2. The Product Programme

In the BS EN 50288-7 Standard, no finished products are specified; the standard describes "only" the individual cable elements, the constructional possibilities, specify materials, dimensions and test requirements with normative references.
Supported by experiences of many years in the project business, Zarsim defined its product programme covering two parts:

"Standard Types" and **"Customised Types"**

2.1 "Standard Types"

The part "Standard Types" contains a comprehensive product offer suited to the usual market demands. It describes thousands of products in detail and appeals particularly to those users who are responsible for product specifications for world wide applications.

2.2 "Customised Types"

The part "Customised Types" gives an overview of the alternatives and possibilities in designs that is allowed by the standard.

Appropriate products can be offered on request.

Presentation of the Product Programme

1. Introduction

This catalogue has been created to be used as a product guide.

Systematically structured, put into condensed form, more than ten thousand different products are described on the following pages (Standard Types).

This product programme is completed by listing the design alternatives and solutions for special requirements (Customised Types).

So, this catalogue

supports ⇒ an easy to read overview of the listed product-programme
offers ⇒ product information with all relevant data
allows ⇒ a fast and best possible selection of the product to use

In this way this catalogue combines

⇒ clarity
⇒ completeness and
⇒ information demand

2. Way of presentation

The description of the product programme is divided into two main groups :

Group 1
Group 2

The BS EN are arranged into 2 main product groups:

Group 1	■ Instrumentation Cables	Cabling elements: pair, triple and quad
Group 2	■ (Instrumentation) Control Cables	Cabling element: core

Pairs, triples and quads may be with or without individual screen.

2.1 Sub Groups

For cables following the BS EN 50288-7 each of the above mentioned main groups is divided into the subsquent sub-groups:

- Common Types (PVC-sheathed)
- Halogen-free, flame retardant Types (LSZH-sheathed)
- Fire-resisting, flame retardant Types (LSZH-sheathed)

Each sub-group describes different product-families, each containing unarmoured and armoured products, additionally armoured versions with chemical protection (multi layer sheath) for the group “Common Types”. Product-family stands for a specific insulation material which offers choices for optimising electrical, thermic or other relevant product properties.

2.2 Presentation of Product Data

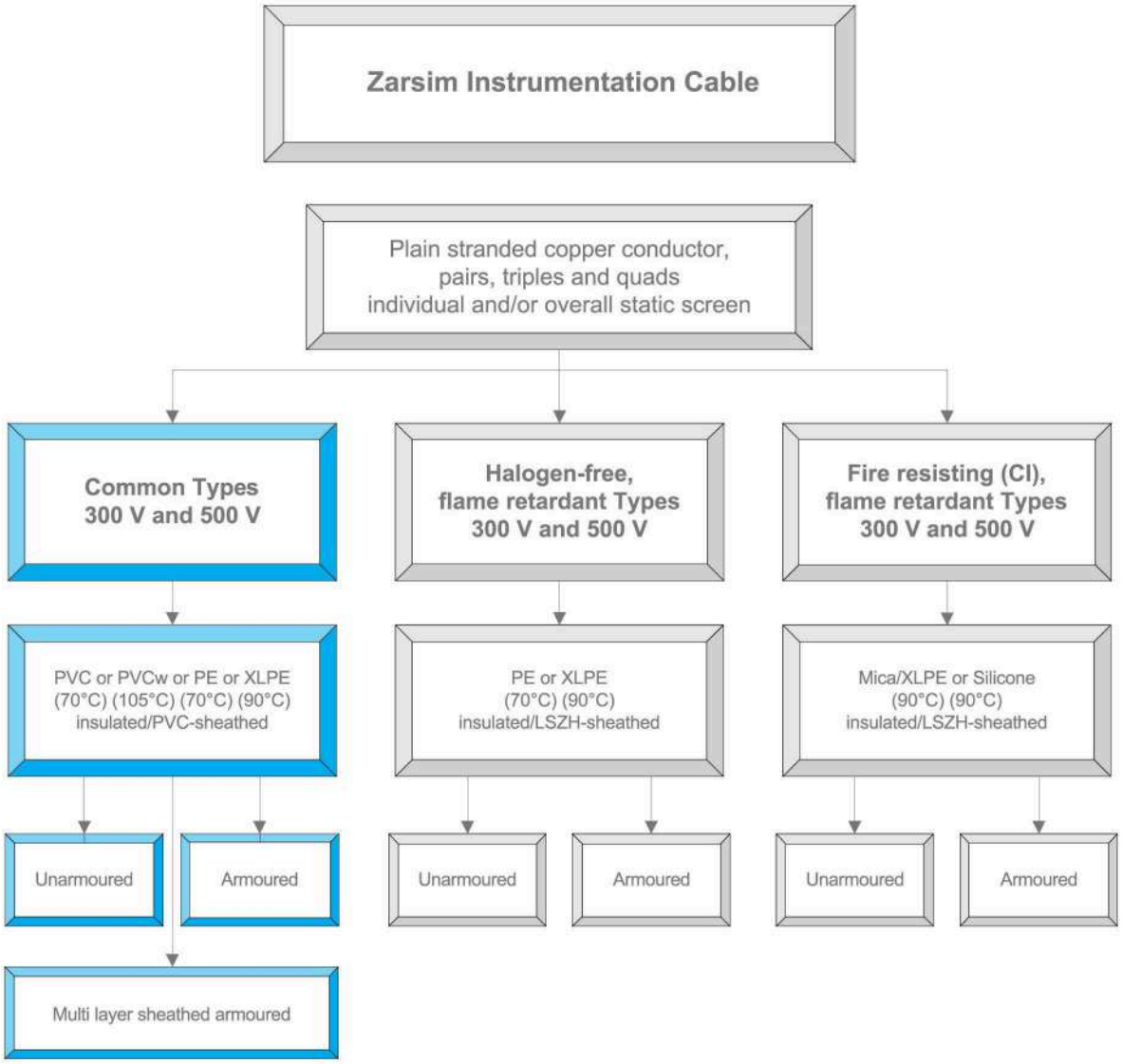
The product data are presented in three or more sections:

■ Technical data	consist of information on application range, laying, bending radius, temperature limitation range, laying, bending specific properties of outer sheath
■ Construction	describes the design of the cables
■ Electrical data	contains information on electrical properties of the described products
■ Geometrical data	contains information on dimension and weight of most demanded products

Group 1
Instrumentation Cable
acc. to BS EN 50288-7

Group 1
Instrumentation Cable
acc. to BS EN 50288-7

Common Types
300 V and 500 V


Zarsim Instrumentation Cable
Plain stranded copper conductor, pairs, triples and quads individual and/or overall static screen
Common Types 300 V and 500 V
Halogen-free, flame retardant Types 300 V and 500 V
Fire resisting (CI), flame retardant Types 300 V and 500 V
PVC or PVCw or PE or XLPE (70°C) (105°C) (70°C) (90°C) insulated/PVC-sheathed
PE or XLPE (70°C) (90°C) insulated/LSZH-sheathed
Mica/XLPE or Silicone (90°C) (90°C) insulated/LSZH-sheathed
Unarmoured
Armoured
Unarmoured
Armoured
Unarmoured
Armoured
Multi layer sheathed armoured

Common Types / 300 V and 500 V

Single, multipair and multitriple, individual and/or collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Technical Data

Type of insulation/ sheath	**PVC/PVC**	**PVCw/PVCw**	**PE/PVC**	**XLPE/PVC**
Type of cabling elements	Pair, Triple, PiMF, TiMF, Quad			
No. of cabling elements	1, 2, 4, 5, 6, 8, 10, 12, 16, 20, 24			
Conductor sizes	0.5 mm², 0.75 mm, 1.0 mm², 1.3 mm², 1.5 mm², 2.5 mm²			
1. Unarmoured types	RE-Y(St)Y-fl	RE-Yw(St)Yw-fl	RE-2Y(St)Y-fl [1]	RE-2X (St)Y-fl
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations			
■ Bending radius	7.5 x cable ∅			
2. Armoured types	RE-Y(St)YSWAY [2]	RE-Yw(St)YwSWAYw [2]	RE-2Y(St)YSWAY [2]	RE-2X(St)YSWAY [2]
■ Laying	Recommended for outdoor installation, on racks, trays, in conduits, in dry and wet locations, for direct burial			
■ Bending radius	10 x cable ∅			
3. Armoured types with chemical protection Multi layer sheathed	—	—	—	RE-2X(L)2Y4YSWAY [3),4)]
■ Laying	Recommended for direct burial, especially in presence of oil and aggressive chemical substances			
■ Bending radius	15 x cable ∅			
Temperature range				
■ During operation	-30°C up to 70°C	-30°C up to 105°C	-30°C up to 70°C	-30°C up to 90°C
■ During installation	-5°C up to 50°C	-5°C up to 50°C	-5°C up to 50°C	-5°C up to 50°C
Reaction to fire				
■ **Flame propagation**				
a) Test on single cable	IEC 60332-1			
b) Test on bunched cables	IEC 60332-3 part 24 (Cat. C), (excluded types with Multi layer sheath)			
Sunlight resistance (Optional)	UL 1581 Section 1200			
Oil resistance (Optional)	ICEA S-82-552			
Application	For transmission of analogue and digital signals in instrument and control systems; allowed for use in zone 1 and zone 2, group II, classified areas (IEC 60079-14), not allowed for direct connection to low impedance sources, e.g. public mains electricity supply			

1) Also with increased thickness of outer sheath (Yv)
2) Also with SWB or GSTA
3) Also with HDPE outer sheath; in this case Tests "Reaction to Fire" are not passed.
4) Max. operating temperature 80°C

ZARSIM Instrumentation Cable

acc. to BS EN 50288-7

Common Types / 300 V and 500 V

Single, multipair and multitriple, individual and/or collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Construction

Product Type	Unarmoured Types					Armoured Types
Conductor	Plain annealed copper; 7 stranded acc. to HD 383, Class 2					
Cross-section mm²	0.5	0.75	1.0	1.3	1.5	
Conductor design mm	7 x 0.3	7 x 0.37	7 x 0.43	7 x 0.49	7 x 0.53	
Insulation materials	■ Cross linked Polyethylene XLPE or ■ Polyethylene PE or ■ Polyvinylchloride PVC or ■ Polyvinylchloride heat resistant PVCw					
Cabling element [1]						
Without ind. screen	Pair, Triple, Quad					
With ind. screen	PiMF, TiMF, QiMF					
Individual screen	Aluminium/Plastic tape over solid tinned copper drain wire, 0.6 mm plastic tape under and above screen					
Wrapping	At least one plastic tape above cable core					
Overall screen	Aluminium/Plastic tape over tinned copper drain wire 0.5 mm²/ 7 x 0.3 mm					
Inner sheath	—					PVC and PVCw resp. , black
Armouring	—					Galvanized steel wire armouring; wire ∅ depending on cable-∅ under armouring, at least 0.9 mm
Outer sheath [2] **Colour**	PVC and PVCw resp. Black or blue for intrinsically safe systems					
Marking	ZARSIM Instrumentation Cable . Standard . Rated voltage . RP [3] . Length marking					

1) Colour code of cabling elements: see Appendix I
2) Also with increased thickness of outer sheath (Yv) for PE insulated, unarmoured types
3) RP = Reduced flame progation

Common Types / 300 V and 500 V

Single, multipair and multitriple, individual and/or collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Construction

Product Type	Multi layer sheathed, armoured Types				
Conductor	Plain annealed copper acc. to HD 383, Class 2				
Cross-section mm²	0.5	0.75	1.0	1.3	1.5
Conductor design mm	7 x 0.30	7 x 0.37	7 x 0.43	7 x 0.49	7 x 0.53
Insulation materials	XLPE				
Cabling element [1]					
Without ind. screen	Pair, Triple, Quad				
With ind. screen	PiMF, TiMF, QiMF				
Individual screen	Aluminium/Plastic tape over tinned copper drain wire, 0.6 mm, plastic tape under and above screen				
Wrapping	At least one plastic tape above cable core				
Overall screen	Longitudinal one side plastic coated aluminium foil over tinned copper drain wire, 7x0.3 mm, high density Polyethylene sheath with an additional Polyamide covering. The aluminium foil is bonding within the overlapping and with the inner surface of the Polyethylene sheath				
Armouring	Galvanized steel wire; wire∅ depending on cable-∅ under armouring, at least 0.9 mm				
Outer sheath	PVC or PE (high density)				
Colour	Black				
Marking	ZARSIM Instrumentation Cable . Standard . Rated voltage . RP [2] . Length marking				

1) Colour code of cabling elements: see Appendix I
2) RP = Reduced flame propagation, excluded types with multi layer sheath

Common Types / 300 V

Single, multipair and multitriple, individual and/or collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Electrical Data at 20°C 300 V

Properties	Character	Unit	Values				
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5
Conductor resistance	max.	Ω/km	36.7	25.0	18.5	14.2	12.3
Insulation resistance							
■ PVC / PVCw insulation	min.	MΩxkm			100		
■ PE / XLPE insulation	min.	MΩxkm			5000		
L/R Ratio	max.	µH/Ω		25		40	
Inductance	max.	mH/km			1		
Mutual capacitance							
■ PVC / PVCw insulation							
Pair, Triple [1), 2)]	max.	nF/km		150		160	
PiMF, TiMF	max.	nF/km		190		200	
■ PE / XLPE insulation							
Pair, Triple [1), 2)]	max.	nF/km		75		85	
PiMF, TiMF	max.	nF/km		115		115	
Capacitance unbalance [3)]							
■ Pair	max.	pF/500m			500		
Test voltage							
■ Core/core (U_{rms})		V			1500		
■ Core/screen (U_{rms})		V			1500		
Operating voltage (U_{rms})	max.	V			300		

1) Values for cables with 1 element correspond to those for PiMF and TiMF resp.
2) Values for cables with 2 up to 4 elements + 20%
3) To apply only for PE/XLPE insulated types

Common Types / 500 V

Single, multipair and multitriple, individual and/or collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Electrical Data at 20°C	500 V								
Properties	**Character**	**Unit**	**Values**						
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5		
Conductor resistance	max.	Ω/km	36.7	25.0	18.5	14.2	12.3		
Insulation resistance									
■ **PVC / PVCw insulation**	min.	MΩxkm			100				
■ **PE / XLPE insulation**	min.	MΩxkm			5000				
L/R Ratio	max.	µH/Ω		25			40		
Inductance	max.	mH/km			1				
Mutual capacitance									
■ **PVC / PVCw insulation**									
Pair, Triple [1), 2)]	max.	nF/km			120		130		
PiMF, TiMF	max.	nF/km			160		170		
■ **PE / XLPE insulation**									
Pair, Triple [1), 2)]	max.	nF/km			65		75		
PiMF, TiMF	max.	nF/km			100		100		
Capacitance unbalance [3)]									
■ **Pair**	max.	pF/500m			500				
Test voltage									
■ **Core/core** (U_{rms})		V			2000				
■ **Core/screen** (U_{rms})		V			2000				
Operating voltage (U_{rms})	max.	V			500				

1) Values for cables with 1 element correspond to those for PiMF and TiMF resp.
2) Values for cables with 2 up to 4 elements + 20%
3) To apply only for PE/XLPE insulated types

Common Types / 70°C / 300 V

Single, multipair, PVC insulation, individval & collective screen, PVC sheath

Unarmoured RE-Y(St)Y			Armoured RE-Y(St)YSWAY		
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
0.5 mm²/7 , RE-Y(St)Y			**0.5 mm²/7 , RE-Y(St)YSWAY**		
1 x 2 x 0.5	6.3	38	6.3	9.6	178
2 x 2 x 0.5	8.2	74	8.2	12.2	265
4 x 2 x 0.5	9.0	98	9.0	13.6	330
5 x 2 x 0.5	9.8	119	9.8	14.4	370
12 x 2 x 0.5	13.7	245	13.7	18.5	589
24 x 2 x 0.5	18.5	448	18.5	24.4	1,056
0.75 mm²/7 , RE-Y(St)Y			**0.75 mm²/7 , RE-Y(St)YSWAY**		
1 x 2 x 0.75	6.7	48	6.7	10.2	208
2 x 2 x 0.75	9.1	86	9.1	13.3	329
4 x 2 x 0.75	10.0	123	10.0	14.6	388
5 x 2 x 0.75	11.1	155	11.1	15.9	455
12 x 2 x 0.75	15.3	313	15.3	21.0	841
24 x 2 x 0.75	21.0	588	21.0	27.1	1,322
1 mm²/7 , RE-Y(St)Y			**1 mm²/7 , RE-Y(St)YSWAY**		
1 x 2 x 1	7.2	58	7.2	10.7	222
2 x 2 x 1	9.8	102	9.8	14.0	341
4 x 2 x 1	11.1	159	11.1	15.9	458
5 x 2 x 1	12.1	193	12.1	16.9	506
12 x 2 x 1	17.0	415	17.0	22.9	970
24 x 2 x 1	23.3	766	23.3	29.4	1,571
1.3 mm²/7 , RE-Y(St)Y			**1.3 mm²/7 , RE-Y(St)YSWAY**		
1 x 2 x 1.3	7.7	66	7.7	11.2	245
2 x 2 x 1.3	11.0	125	11.0	15.0	402
4 x 2 x 1.3	12.2	198	12.2	17.0	525
5 x 2 x 1.3	13.6	244	13.6	18.4	613
12 x 2 x 1.3	19.1	528	19.1	25.0	1,185
24 x 2 x 1.3	26.2	1,001	26.2	33.2	2,130
1.5 mm²/7 , RE-Y(St)Y			**1.5 mm²/7 , RE-Y(St)YSWAY**		
1 x 2 x 1.5	8.2	73	8.2	11.7	261
2 x 2 x 1.5	11.4	138	11.4	15.8	424
4 x 2 x 1.5	12.7	212	12.7	17.5	538
5 x 2 x 1.5	14.2	268	14.2	19.2	655
12 x 2 x 1.5	19.9	568	19.9	25.8	1,251
24 x 2 x 1.5	27.6	1,092	27.6	34.8	2,293

Common Types / 70°C / 300 V

Single, multipair, PVC insulation, individval & collective screen, PVC sheath

	Unarmoured RE-Y(St)Y, PiMF		Armoured RE-Y(St)YSWAY, PiMF		
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
0.5 mm²/7 , RE-Y(St)Y, PiMF			**0.5 mm²/7 , RE-Y(St)YSWAY, PiMF**		
2 x 2 x 0.5	9.3	83	9.3	13.5	334
4 x 2 x 0.5	10.2	120	10.2	14.8	379
5 x 2 x 0.5	11.4	152	11.4	16.2	458
12 x 2 x 0.5	15.8	304	15.8	21.5	818
24 x 2 x 0.5	21.8	584	21.8	27.9	1,297
0.75 mm²/7 , RE-Y(St)Y, PiMF			**0.75 mm²/7 , RE-Y(St)YSWAY, PiMF**		
2 x 2 x 0.75	10.1	103	10.1	14.3	345
4 x 2 x 0.75	11.4	151	11.4	16.2	445
5 x 2 x 0.75	12.5	183	12.5	17.3	518
12 x 2 x 0.75	17.6	381	17.6	23.5	960
24 x 2 x 0.75	24.4	734	24.4	30.7	1,551
1 mm²/7 , RE-Y(St)Y, PiMF			**1 mm²/7 , RE-Y(St)YSWAY, PiMF**		
2 x 2 x 1	11.0	125	11.0	15.0	382
4 x 2 x 1	12.3	182	12.3	17.1	496
5 x 2 x 1	13.7	231	13.7	18.5	577
12 x 2 x 1	19.3	480	19.3	25.2	1,108
24 x 2 x 1	26.5	913	26.5	33.5	1,953
1.3 mm²/7 , RE-Y(St)Y, PiMF			**1.3 mm²/7 , RE-Y(St)YSWAY, PiMF**		
2 x 2 x 1.3	12.0	160	12.0	16.9	460
4 x 2 x 1.3	13.7	222	13.7	18.5	591
5 x 2 x 1.3	15.0	280	15.0	20.0	683
12 x 2 x 1.3	21.2	594	21.2	27.3	1,295
24 x 2 x 1.3	29.3	1,171	29.3	36.5	2,439
1.5 mm²/7 , RE-Y(St)Y, PiMF			**1.5 mm²/7 , RE-Y(St)YSWAY, PiMF**		
2 x 2 x 1.5	12.4	157	12.4	17.3	506
4 x 2 x 1.5	14.2	243	14.2	19.2	624
5 x 2 x 1.5	15.5	299	15.5	21.2	805
12 x 2 x 1.5	22.2	646	22.2	28.3	1,375
24 x 2 x 1.5	30.7	1,264	30.7	38.1	2,476

Common Types / 70°C / 300 V

Single, multipair, XLPE insulation, individval & collective screen, PVC sheath

Unarmoured RE-2X(St)Y			Armoured RE-2X(St)YSWAY		
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
0.5 mm²/7 , RE-2X(St)Y			**0.5 mm²/7 , RE-2X(St)YSWAY**		
1 x 2 x 0.5	6.3	38	6.3	9.6	183
2 x 2 x 0.5	8.3	71	8.3	12.2	280
4 x 2 x 0.5	9.0	94	9.0	13.6	336
5 x 2 x 0.5	9.8	113	9.8	14.4	376
12 x 2 x 0.5	13.7	230	13.7	18.5	593
24 x 2 x 0.5	18.5	418	18.5	24.4	1,060
0.75 mm²/7 , RE-2X(St)Y			**0.75 mm²/7 , RE-2X(St)YSWAY**		
1 x 2 x 0.75	6.7	48	6.7	10.2	200
2 x 2 x 0.75	9.2	91	9.2	13.3	319
4 x 2 x 0.75	10.0	119	10.0	14.6	383
5 x 2 x 0.75	11.1	149	11.1	15.9	449
12 x 2 x 0.75	15.3	299	15.3	21.0	827
24 x 2 x 0.75	21.0	560	21.0	27.1	1,294
1 mm²/7 , RE-2X(St)Y			**1 mm²/7 , RE-2X(St)YSWAY**		
1 x 2 x 1	7.2	56	7.2	10.7	220
2 x 2 x 1	9.9	107	9.9	14.0	358
4 x 2 x 1	11.1	151	11.1	15.9	450
5 x 2 x 1	12.1	183	12.1	16.9	510
12 x 2 x 1	17.0	383	17.0	22.9	974
24 x 2 x 1	23.3	721	23.3	29.4	1,523
1.3 mm²/7 , RE-2X(St)Y			**1.3 mm²/7 , RE-2X(St)YSWAY**		
1 x 2 x 1.3	7.7	63	7.7	11.2	242
2 x 2 x 1.3	11.1	129	11.1	15.0	383
4 x 2 x 1.3	12.2	184	12.2	17.0	512
5 x 2 x 1.3	13.6	227	13.6	18.4	596
12 x 2 x 1.3	19.1	487	19.1	25.0	1,115
24 x 2 x 1.3	26.2	920	26.2	33.2	2,049
1.5 mm²/7 , RE-2X(St)Y			**1.5 mm²/7 , RE-2X(St)YSWAY**		
1 x 2 x 1.5	8.2	71	8.2	11.7	260
2 x 2 x 1.5	11.5	150	11.5	15.8	420
4 x 2 x 1.5	12.7	209	12.7	17.5	531
5 x 2 x 1.5	14.2	259	14.2	19.2	646
12 x 2 x 1.5	19.9	547	19.9	25.8	1,230
24 x 2 x 1.5	27.6	1,050	27.6	34.8	2,251

Common Types / 70°C / 300 V

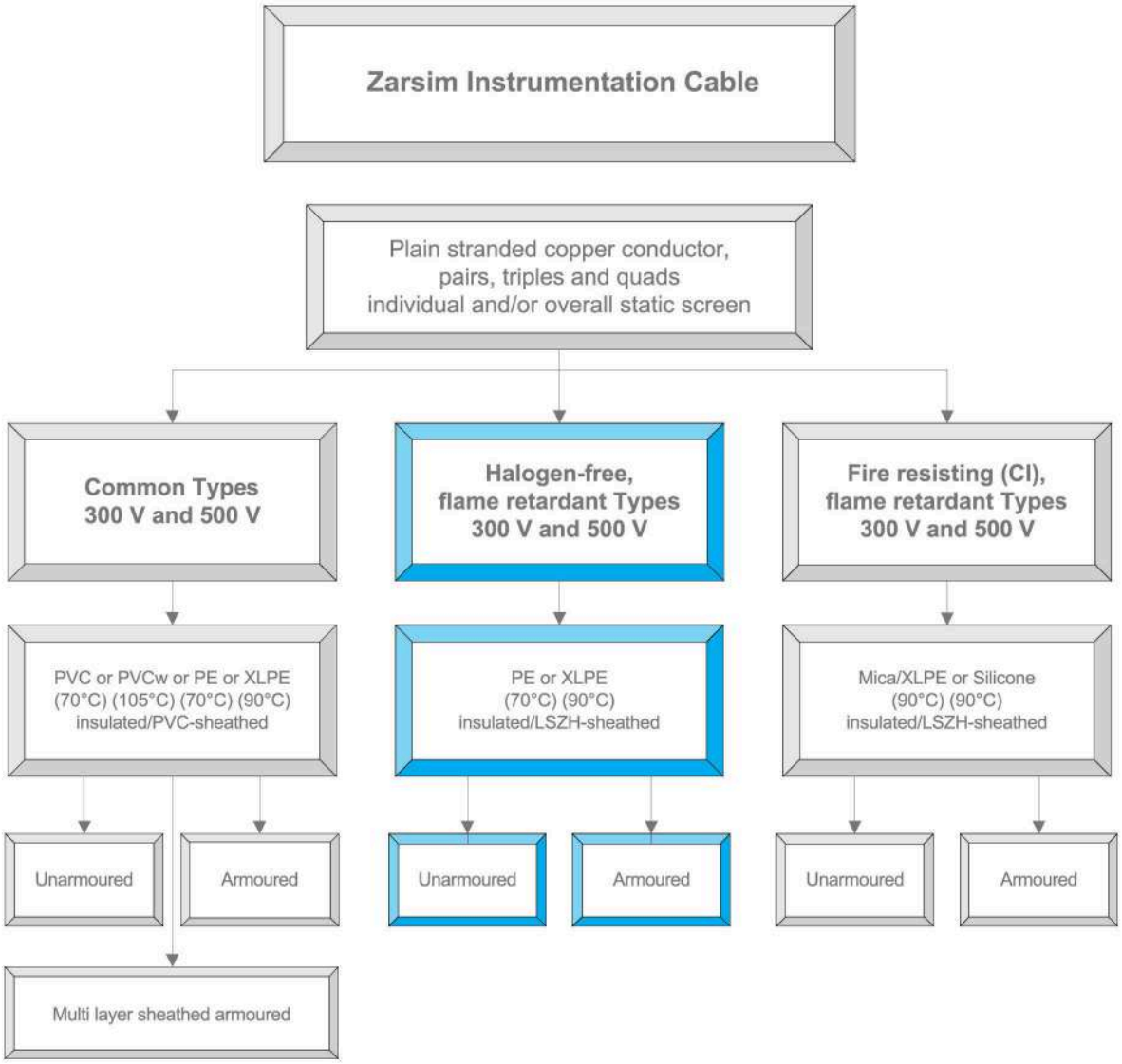
Single, multipair, XLPE insulation, individval & collective screen, PVC sheath

Unarmoured RE-2X(St)Y, PiMF			Armoured RE-2X(St)YSWAY, PiMF		
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
0.5 mm²/7 , RE-2X(St)Y, PiMF			**0.5 mm²/7 , RE-2X(St)YSWAY, PiMF**		
2 x 2 x 0.5	9.4	90	9.4	13.5	332
4 x 2 x 0.5	10.2	116	10.2	14.8	387
5 x 2 x 0.5	11.4	145	11.4	16.2	452
12 x 2 x 0.5	15.8	289	15.8	21.5	830
24 x 2 x 0.5	21.8	554	21.8	27.9	1,314
0.75 mm²/7 , RE-2X(St)Y, PiMF			**0.75 mm²/7 , RE-2X(St)YSWAY, PiMF**		
2 x 2 x 0.75	10.2	106	10.2	14.3	353
4 x 2 x 0.75	11.4	146	11.4	16.2	453
5 x 2 x 0.75	12.5	177	12.5	17.3	512
12 x 2 x 0.75	17.6	367	17.6	23.5	972
24 x 2 x 0.75	24.4	706	24.4	30.7	1,534
1 mm²/7 , RE-2X(St)Y, PiMF			**1 mm²/7 , RE-2X(St)YSWAY, PiMF**		
2 x 2 x 1	11.1	121	11.1	15.0	398
4 x 2 x 1	12.3	174	12.3	17.1	503
5 x 2 x 1	13.7	221	13.7	18.5	584
12 x 2 x 1	19.3	456	19.3	25.2	1,113
24 x 2 x 1	26.5	866	26.5	33.5	1,997
1.3 mm²/7 , RE-2X(St)Y, PiMF			**1.3 mm²/7 , RE-2X(St)YSWAY, PiMF**		
2 x 2 x 1.3	12.1	154	12.1	16.9	483
4 x 2 x 1.3	13.7	209	13.7	18.5	578
5 x 2 x 1.3	15.0	264	15.0	20.0	666
12 x 2 x 1.3	21.2	554	21.2	27.3	1,254
24 x 2 x 1.3	29.3	1,090	29.3	36.5	2,358
1.5 mm²/7 , RE-2X(St)Y, PiMF			**1.5 mm²/7 , RE-2X(St)YSWAY, PiMF**		
2 x 2 x 1.5	12.5	159	12.5	17.3	503
4 x 2 x 1.5	14.2	236	14.2	19.2	617
5 x 2 x 1.5	15.5	290	15.5	21.2	797
12 x 2 x 1.5	22.2	625	22.2	28.3	1,388
24 x 2 x 1.5	30.7	1,222	30.7	38.1	2,546

Creator of Links, Pioneer in Services

Group 1
Instrumentation Cable
acc. to BS EN 50288-7

Halogen-free, Flame Retardant Types 300 V and 500 V


Zarsim Instrumentation Cable
Plain stranded copper conductor, pairs, triples and quads individual and/or overall static screen
Common Types 300 V and 500 V
Halogen-free, flame retardant Types 300 V and 500 V
Fire resisting (CI), flame retardant Types 300 V and 500 V
PVC or PVCw or PE or XLPE (70°C) (105°C) (70°C) (90°C) insulated/PVC-sheathed
PE or XLPE (70°C) (90°C) insulated/LSZH-sheathed
Mica/XLPE or Silicone (90°C) (90°C) insulated/LSZH-sheathed
Unarmoured
Armoured
Unarmoured
Armoured
Unarmoured
Armoured
Multi layer sheathed armoured

ZARSIM Instrumentation Cable

acc. to BS EN 50288-7

Halogen-free, Flame Retardant Types / 300 V and 500 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Technical Data

Type of insulation/sheath	**PE/LSZH**	**XLPE/LSZH**
Types of cabling elements	Pair, Triple, PiMF, TiMF	
No. of cabling elements	1, 2, 4, 5, 6, 8, 10, 12, 16, 20, 24	
Conductor sizes	0.5 mm² , 0.75 mm² , 1.0 mm² , 1.3 mm² , 1.5 mm²	
1. Unarmoured types	RE-2Y(St)H	RE-2X(St)H
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations	
■ Bending radius	7.5 x cable ∅	
2. Armoured types	RE-2Y(St)HSWAH [1]	RE-2X(St)HSWAH [1]
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations, for direct burial	
■ Bending radius	10 x cable ∅	
Temperature range		
■ During operation	-30°C up to 70°C	-30°C up to 90°C
■ During installation	-5°C up to 50°C	-5°C up to 50°C
Reaction to fire		
■ **Flame propagation**		
a) Test on single cable	IEC 60332-1	
b) Test on bunched cables	IEC 60332-3 part 24 (Cat. C)	
■ **Test on gases evolved during combustion:**		
a) Amount of halogen acid gas	IEC 60754-1 (0%)	
b) Degree of acidity of gases	IEC 60754-2 (pH > 4.3, c < 10µS/mm)	
■ **Measurement of smoke density**	IEC 61034-2 (L.T. [2] > 60%)	
Oil resistance (Optional)	ICEA S-82-552	
Application	For transmission of analogue and digital signals in instrument and control systems; allowed for use in zone 1 and zone 2, group II, classified areas (IEC 60079-14), not allowed for direct connection to low impedance sources, e.g. public mains electricity supply. Recommended for use as fire protection measure for people and important material assets.	

1) Also with SWB or GSTA
2) L.T. = Light Transmission

ZARSIM Instrumentation Cable

acc. to BS EN 50288-7

Halogen-free, Flame Retardant Types / 300 V and 500 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Construction

Product Type	Unarmoured Types				Armoured Types
Conductor	Plain annealed copper; 7 stranded acc. to HD 383, Class 2				
■ **Cross-section mm²**	0.5	0.75	1.0	1.3	1.5
■ **Conductor design mm**	7 x 0.30	7 x 0.37	7 x 0.43	7 x 0.49	7 x 0.53
Insulation materials	■ Polyethylene PE or ■ Cross linked Polyethylene XLPE				
Cabling element [1)] ■ **Without ind. screen** ■ **With ind. screen**	Pair, Triple, Quad PiMF, TiMF, QiMF				
Individual screen	Aluminium/Plastic tape over solid tinned copper drain wire, 0.6 mm plastic tape under and above screen				
Wrapping	At least one plastic tape above cable core				
Overall screen	Aluminium/Plastic tape over tinned copper drain wire 0.5 mm²/ 7 x 0.3 mm				
Inner sheath	—				LSZH , black
Armouring	—				Galvanized steel wire; wire ∅ depending on cable -∅ under armouring, at least 0.9 mm
Outer sheath	LSZH				
Colour	Black or blue for intrinsically safe systems				
Marking	ZARSIM Instrumentation Cable . Standard . Rated voltage . LSZH . Length marking				

1) Colour code of cabling elements: see Appendix I

Halogen-free, Flame Retardant Types / 300 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Electrical Data at 20°C	300 V								
Properties	**Character**	**Unit**	**Values**						
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5		
Conductor resistance	max.	Ω/km	36.7	25.0	18.5	14.2	12.3		
Insulation resistance ■ **PE / XLPE insulation**	min.	MΩxkm			5000				
L/R Ratio	max.	µH/Ω		25		40			
Inductance	max.	mH/km			1				
Mutual capacitance ■ **PVC / PVCw insulation**									
Pair, Triple [1), 2)]	max.	nF/km		75		85			
PiMF, TiMF	max.	nF/km		115		115			
Capacitance unbalance ■ **Pair**	max.	pF/500m			500				
Test voltage									
■ **Core/core** (U_{rms})		V			1500				
■ **Core/screen** (U_{rms})		V			500				
Operating voltage (U_{rms})	max.	V			300				

1) Values for cables with 1 element correspond to those for PiMF and TiMF resp.
2) Values for cables with 2 up to 4 elements + 20%

Halogen-free, Flame Retardant Types / 500 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Electrical Data at 20°C 500 V

Properties	Character	Unit	Values				
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5
Conductor resistance	max.	Ω/km	36.7	25.0	18.5	14.2	12.3
Insulation resistance							
■ **PE / XLPE insulation**	min.	MΩxkm			5000		
L/R Ratio	max.	µH/Ω		25		40	
Inductance	max.	mH/km			1		
Mutual capacitance							
■ **PVC / PVCw insulation**							
Pair, Triple [1), 2)]	max.	nF/km		65		75	
PiMF, TiMF	max.	nF/km		100		100	
Capacitance unbalance							
■ **Pair**	max.	pF/500m			500		
Test voltage							
■ **Core/core** (U_{rms})		V			2000		
■ **Core/screen** (U_{rms})		V			2000		
Operating voltage (U_{rms})	max.	V			500		

1) Values for cables with 1 element correspond to those for PiMF and TiMF resp.
2) Values for cables with 2 up to 4 elements + 20%

Halogen-free, Flame Retardant Types / 90°C / 300 V

Single, multipair, XLPE insulation, individval & collective screen, LSZH sheath

Unarmoured RE-2X(St)H			Armoured RE-2X(St)HSWAH		
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
0.5 mm²/7 , RE-2X(St)H			**0.5 mm²/7 , RE-2X(St)HSWAH**		
1 x 2 x 0.5	6.3	38	6.3	9.6	177
2 x 2 x 0.5	8.3	63	8.3	12.2	279
4 x 2 x 0.5	9.0	94	9.0	13.6	336
5 x 2 x 0.5	9.8	112	9.8	14.4	375
12 x 2 x 0.5	13.7	226	13.7	18.5	592
24 x 2 x 0.5	18.5	417	18.5	24.4	1,058
0.75 mm²/7 , RE-2X(St)H			**0.75 mm²/7 , RE-2X(St)HSWAH**		
1 x 2 x 0.75	6.7	48	6.7	10.2	199
2 x 2 x 0.75	9.2	126	9.2	13.3	307
4 x 2 x 0.75	10.0	118	10.0	14.6	382
5 x 2 x 0.75	11.1	149	11.1	15.9	435
12 x 2 x 0.75	15.3	298	15.3	21.0	825
24 x 2 x 0.75	21.0	559	21.0	27.1	1,291
1 mm²/7 , RE-2X(St)H			**1 mm²/7 , RE-2X(St)HSWAH**		
1 x 2 x 1	7.2	58	7.2	10.7	219
2 x 2 x 1	9.9	107	9.9	14.0	357
4 x 2 x 1	11.1	150	11.1	15.9	449
5 x 2 x 1	12.1	182	12.1	16.9	508
12 x 2 x 1	17.0	382	17.0	22.9	972
24 x 2 x 1	23.3	719	23.3	29.4	1,520
1.3 mm²/7 , RE-2X(St)H			**1.3 mm²/7 , RE-2X(St)HSWAH**		
1 x 2 x 1.3	7.7	65	7.7	11.2	241
2 x 2 x 1.3	11.1	128	11.1	15.0	382
4 x 2 x 1.3	12.2	184	12.2	17.0	510
5 x 2 x 1.3	13.6	226	13.6	18.4	595
12 x 2 x 1.3	19.1	486	19.1	25.0	1,110
24 x 2 x 1.3	26.2	918	26.2	33.2	1,960
1.5 mm²/7 , RE-2X(St)H			**1.5 mm²/7 , RE-2X(St)HSWAH**		
1 x 2 x 1.5	8.2	68	8.2	11.7	259
2 x 2 x 1.5	11.5	134	11.5	15.8	448
4 x 2 x 1.5	12.7	208	12.7	17.5	544
5 x 2 x 1.5	14.2	259	14.2	19.2	644
12 x 2 x 1.5	19.9	545	19.9	25.8	1,227
24 x 2 x 1.5	27.6	1,047	27.6	34.8	2,247

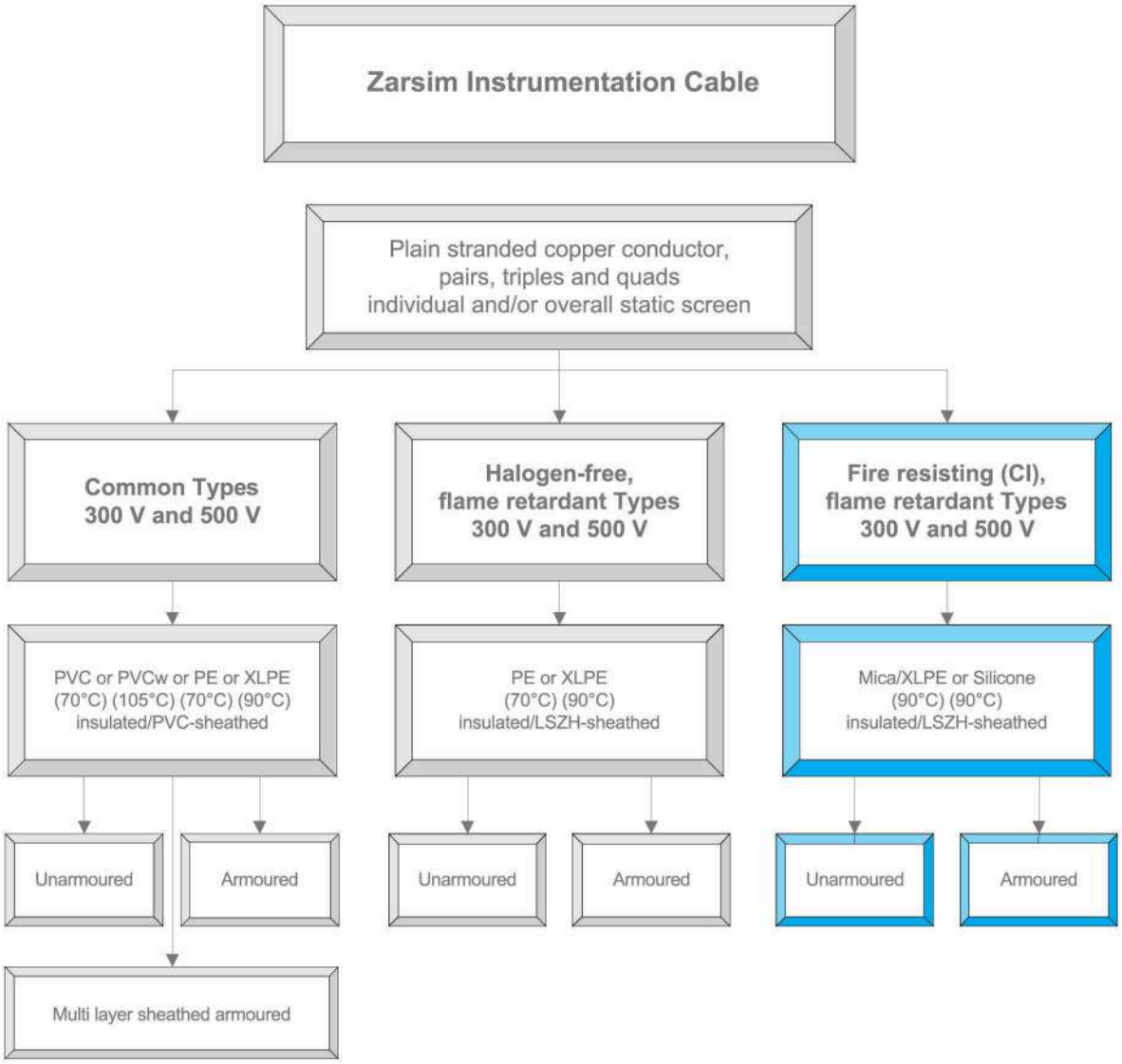
Halogen-free, Flame Retardant Types / 90°C / 300 V

Single, multipair, XLPE insulation, individval & collective screen, LSZH sheath

Unarmoured RE-2X(St)H, PiMF			Armoured RE-2X(St)HSWAH, PiMF		
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
0.5 mm²/7 , RE-2X(St)H, PiMF			**0.5 mm²/7 , RE-2X(St)HSWAH, PiMF**		
2 x 2 x 0.5	9.4	89	9.4	13.5	311
4 x 2 x 0.5	10.2	115	10.2	14.8	373
5 x 2 x 0.5	11.4	145	11.4	16.2	451
12 x 2 x 0.5	15.8	286	15.8	21.5	801
24 x 2 x 0.5	21.8	551	21.8	27.9	1,264
0.75 mm²/7 , RE-2X(St)H, PiMF			**0.75 mm²/7 , RE-2X(St)HSWAH, PiMF**		
2 x 2 x 0.75	10.2	95	10.2	14.3	341
4 x 2 x 0.75	11.4	145	11.4	16.2	451
5 x 2 x 0.75	12.5	176	12.5	17.3	511
12 x 2 x 0.75	17.6	366	17.6	23.5	970
24 x 2 x 0.75	24.4	704	24.4	30.7	1,531
1 mm²/7 , RE-2X(St)H, PiMF			**1 mm²/7 , RE-2X(St)HSWAH, PiMF**		
2 x 2 x 1	11.1	112	11.1	15.0	389
4 x 2 x 1	12.3	174	12.3	17.1	501
5 x 2 x 1	13.7	220	13.7	18.5	583
12 x 2 x 1	19.3	454	19.3	25.2	1,081
24 x 2 x 1	26.5	871	26.5	33.5	1,902
1.3 mm²/7 , RE-2X(St)H, PiMF			**1.3 mm²/7 , RE-2X(St)HSWAH, PiMF**		
2 x 2 x 1.3	12.1	153	12.1	16.9	482
4 x 2 x 1.3	13.7	208	13.7	18.5	576
5 x 2 x 1.3	15.0	263	15.0	20.0	664
12 x 2 x 1.3	21.2	552	21.2	27.3	1,286
24 x 2 x 1.3	29.3	1,067	29.3	36.5	2,353
1.5 mm²/7 , RE-2X(St)H, PiMF			**1.5 mm²/7 , RE-2X(St)HSWAH, PiMF**		
2 x 2 x 1.5	12.5	164	12.5	17.3	474
4 x 2 x 1.5	14.2	235	14.2	19.2	615
5 x 2 x 1.5	15.5	289	15.5	21.2	818
12 x 2 x 1.5	22.2	623	22.2	28.3	1,385
24 x 2 x 1.5	30.7	1,219	30.7	38.1	2,541

Group 1
Instrumentation Cable
acc. to BS EN 50288-7

Fire Resisting (CI), Flame Retardant Types 300 V and 500 V


Zarsim Instrumentation Cable
Plain stranded copper conductor, pairs, triples and quads individual and/or overall static screen
Common Types 300 V and 500 V
Halogen-free, flame retardant Types 300 V and 500 V
Fire resisting (CI), flame retardant Types 300 V and 500 V
PVC or PVCw or PE or XLPE (70°C) (105°C) (70°C) (90°C) insulated/PVC-sheathed
PE or XLPE (70°C) (90°C) insulated/LSZH-sheathed
Mica/XLPE or Silicone (90°C) (90°C) insulated/LSZH-sheathed
Unarmoured
Armoured
Unarmoured
Armoured
Unarmoured
Armoured
Multi layer sheathed armoured

Fire Resisting (CI), Flame Retardant Types / 300 V and 500 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Technical Data

Type of insulation/sheath	**Mica tape + XLPE/LSZH**	**Silicone/LSZH**
Types of cabling elements	Pair, Triple, PiMF, TiMF	
No. of cabling elements	1, 2, 4, 5, 6, 8, 10, 12, 16, 20, 24	
Conductor sizes	0.5 mm² , 0.75 mm² , 1.0 mm² , 1.3 mm² , 1.5 mm²	
1. Unarmoured types	RE-2X(St)H...CI	RE-2G(St)H...CI
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations	
■ Bending radius	7.5 x cable ∅	
2. Armoured types	RE-2X(St)HSWAH...CI [1), 2)]	RE-2G(St)HSWAH...CI [1), 2)]
■ Laying	Recommended for outdoor installation, on racks, trays, in conduits, in dry and wet locations, for direct burial	
■ Bending radius	10 x cable ∅	
Temperature range		
■ During operation	-30°C up to 90°C	-30°C up to 90°C
■ During installation	-5°C up to 50°C	-5°C up to 50°C
Resistance to fire		
■ Circuit Integrity	a) IEC 60331-21,	b) BS 6387 Cat. C, W, Z
Reaction to fire		
■ **Flame propagation** a) Test on single cable b) Test on bunched cables	IEC 60332-1 IEC 60332-3 part 24 (Cat. C)	
■ **Test on gases evolved during combustion** a) Amount of halogen acid gas	IEC 60754-1 (0%)	
b) Degree of acidity of gases	IEC 60754-2 (pH > 4.3, c < 10µS/mm)	
■ **Measurement of smoke density**	IEC 61034-2 (L.T. [3)] > 60%)	
Oil resistance (Optional)	ICEA S-82-552	
Application	For transmission of analogue and digital signals in instrument and control systems, where maintenance of circuit integrity in case of fire is required; allowed for use in zone 1 and zone 2, group II, classified areas (IEC 60079-14); not allowed for direct connection to low impedance sources, e.g. public mains electricity supply	

1) Also with SWB or GSTA
2) Alternative with outer sheath PVC; in this case tests "Test on gases evolved during combistion" and "Measurement of smoke density" are not applicable.
3) L.T. = Light Transmission

ZARSIM Instrumentation Cable

gen. to BS EN 50288-7

Fire Resisting (CI), Flame Retardant Types / 300 V and 500 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Construction

Product Type	Unarmoured Types					Armoured Types
Conductor	Plain annealed copper; 7 stranded acc. to HD 383, Class 2					
■ **Cross-section mm²**	0.5	0.75	1.0	1.3	1.5	
■ **Conductor design mm**	7 x 0.30	7 x 0.37	7 x 0.43	7 x 0.49	7 x 0.53	
Insulation materials	Mica tape + cross linked Polyethylene XLPE or Silicone					
Cabling element [1]						
■ **Without ind. screen**	Pair, Triple, Quad					
■ **With ind. screen**	PiMF, TiMF, QiMF					
Individual screen	Aluminium/Plastic tape over tinned copper drain wire, 0.6 mm plastic tape under and above screen					
Wrapping	At least one plastic tape above cable core					
Overall screen	Aluminium/Plastic tape over tinned copper drain wire 0.5 mm²/ 7 x 0.3 mm					
Inner sheath	—					LSZH , black
Armouring	—					Galvanized steel wire; wire ∅ depending on cable-∅ under armouring, at least 0.9 mm
Outer sheath	LSZH [2]					
Colour	Black or blue for intrinsically safe systems					
Marking	ZARSIM Instrumentation Cable . Standard . Rated voltage . LSZH [2] . Length marking					

1) For armoured types also with outer sheath of PVC
2) The sign "LSZH" is not applicable, if an outer sheath of PVC is applied.

Fire Resisting (CI), Flame Retardant Types / 300 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Electrical Data at 20°C 300 V

Properties	Character	Unit	Values				
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5
Conductor resistance	max.	Ω/km	36.7	25.0	18.5	14.2	12.3
Insulation resistance							
■ **PE / XLPE insulation**	min.	MΩxkm			5000		
L/R Ratio	max.	µH/Ω		25		40	
Inductance	max.	mH/km			1		
Mutual capacitance							
■ **PVC / PVCw insulation**							
Pair, Triple [1), 2)]	max.	nF/km		75		85	
PiMF, TiMF	max.	nF/km		115		115	
Capacitance unbalance							
■ **Pair**	max.	pF/500m			500		
Test voltage							
■ **Core/core** (U_{rms})		V			1500		
■ **Core/screen** (U_{rms})		V			1500		
Operating voltage (U_{rms})	max.	V			300		

1) Values for cables with 1 element correspond to those for PiMF and TiMF resp.
2) Values for cables with 2 up to 4 elements + 20%

Fire Resisting (CI), Flame Retardant Types / 500 V

Single, multipair and multitriple, individual and/or collective screen, LSZH sheath

- unarmoured
- armoured

Electrical Data at 20°C 500 V

Properties	Character	Unit	Values				
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5
Conductor resistance	max.	Ω/km	36.7	25.0	18.5	14.2	12.3
Insulation resistance							
■ Mica tape + XLPE Insulation	min.	MΩxkm			5000		
■ Silicone	max.	µH/Ω			300		
L/R Ratio	max.	mH/km		25		40	
Inductance					1		
Mutual capacitance							
■ Mica tape + XLPE Insulation							
Pair, Triple [1), 2)]	max.	nF/km		65		75	
PiMF, TiMF	max.	nF/km		100		100	
■ Silicone							
Pair, Triple [1), 2)]	max.	nF/km	110			110	
PiMF, TiMF	max.	nF/km	150			150	
Test voltage							
■ Core/core (U_{rms})		V			2000		
■ Core/screen (U_{rms})		V			2000		
Operating voltage (U_{rms})	max.	V			500		

1) Values for cables with 1 element correspond to those for PiMF and TiMF resp.
2) Values for cables with 2 up to 4 elements + 20%

Fire Resisting (CI), Flame Retardant Types / 90°C / 500 V

Single, multipair, mica tape+XLPE insulation, individval & collective screen, LSZH sheath

Unarmoured RE-2X(St)H...CI		
Cross section (mm²)	Outer diameter (mm)	Weight (kg/km)
0.75 mm²/7, RE-2X(St)H...CI		
1 x 2 x 0.75	7.8	64
2 x 2 x 0.75	10.7	118
5 x 2 x 0.75	14.8	218
10 x 2 x 0.75	20.1	380
15 x 2 x 0.75	24.9	535
20 x 2 x 0.75	28.2	680
1 mm²/7, RE-2X(St)H...CI		
1 x 2 x 1	8.4	73
2 x 2 x 1	11.5	136
5 x 2 x 1	15.7	266
10 x 2 x 1	21.3	455
15 x 2 x 1	26.5	646
20 x 2 x 1	30.2	839
1.5 mm²/7, RE-2X(St)H...CI		
1 x 2 x 1.5	9.3	87
2 x 2 x 1.5	13.0	165
5 x 2 x 1.5	18.1	342
10 x 2 x 1.5	24.8	606
15 x 2 x 1.5	30.8	862
20 x 2 x 1.5	34.9	1,121

Armoured RE-2X(St)HSWAH...CI		
Diameter under armour (mm²)	Outer diameter (mm)	Weight (kg/km)
0.75 mm²/7, RE-2X(St)HSWAH...CI		
7.8	12.3	292
10.7	15.5	504
14.8	22.2	703
20.1	25.8	1,005
24.9	31.0	1,434
28.2	34.6	1,715
1 mm²/7, RE-2X(St)HSWAH...CI		
8.4	12.7	316
11.5	18.3	549
15.7	23.7	798
21.3	28.8	1,279
26.5	32.9	1,622
30.2	36.9	1,971
1.5 mm²/7, RE-2X(St)HSWAH...CI		
9.3	13.7	346
13.0	19.6	622
18.1	25.5	927
24.8	31.3	1,535
30.8	35.8	1,954
34.9	40.8	2,631

Fire Resisting (CI), Flame Retardant Types / 90°C / 500 V

Single, multipair, Silicone insulation, individval & collective screen, LSZH sheath

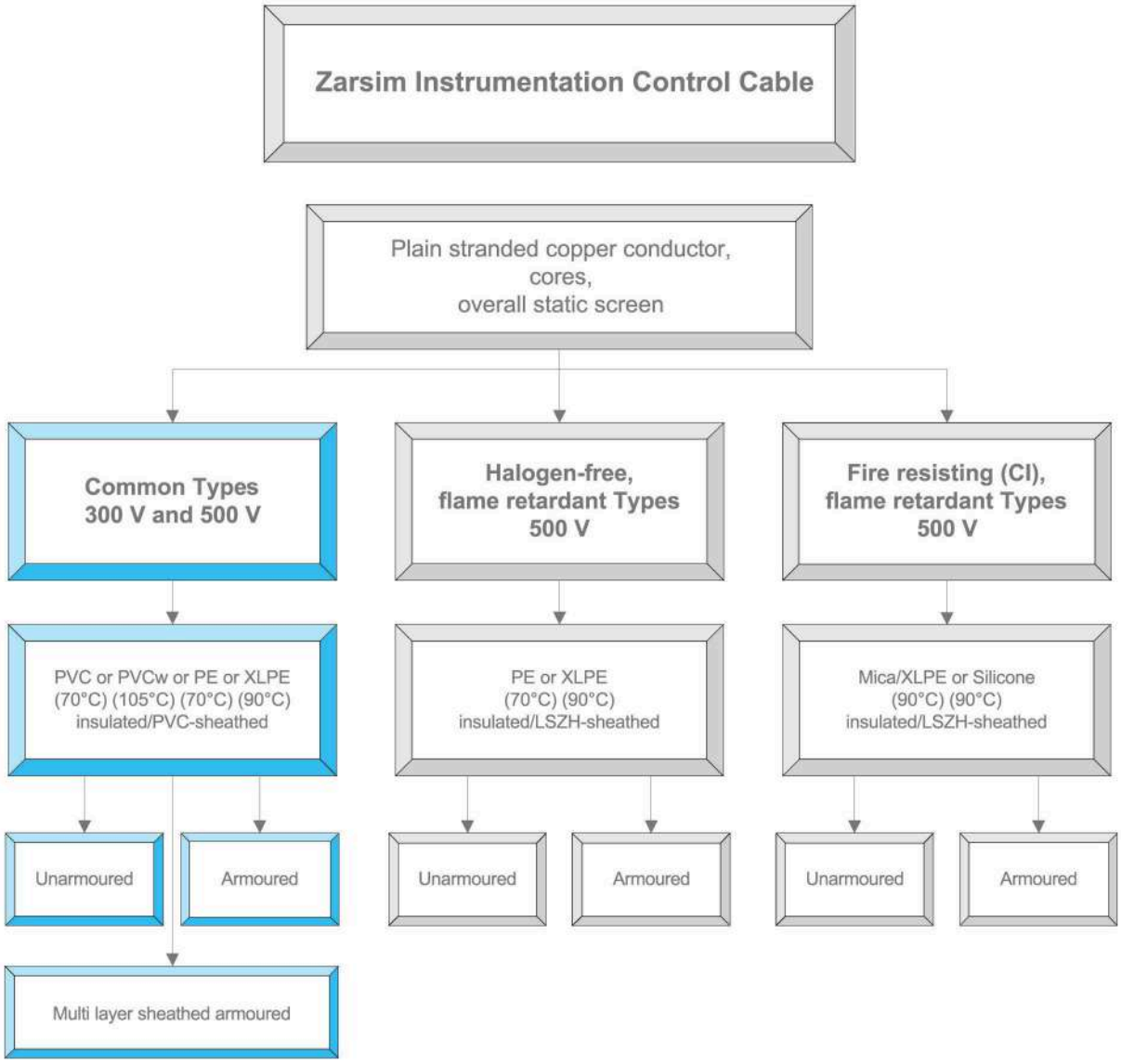
Unarmoured RE-2G(St)H...CI		
Cross section (mm²)	Outer diameter (mm)	Weight (kg/km)
0.5 mm²/Solid, RE-2G(St)H...CI		
1 x 2 x 0.5	6.5	56
2 x 2 x 0.5	9.5	94
3 x 2 x 0.5	10.5	118
5 x 2 x 0.5	12.0	167
6 x 2 x 0.5	13.0	197
10 x 2 x 0.5	16.5	273
15 x 2 x 0.5	20.5	410
20 x 2 x 0.5	22.6	520
1 mm²/7, RE-2G(St)H...CI		
1 x 2 x 1	7.4	77
2 x 2 x 1	10.6	130
3 x 2 x 1	11.2	196
5 x 2 x 1	13.7	245
6 x 2 x 1	14.8	300
10 x 2 x 1	18.9	378
15 x 2 x 1	23.2	567
20 x 2 x 1	26.2	831
1.5 mm²/7, RE-2G(St)H...CI		
1 x 2 x 1.5	8.7	100
2 x 2 x 1.5	10.2	188
3 x 2 x 1.5	12.9	223
5 x 2 x 1.5	16.7	346
6 x 2 x 1.5	17.5	426
10 x 2 x 1.5	23.4	541
15 x 2 x 1.5	28.9	892
20 x 2 x 1.5	32.5	1,182

Armoured RE-2G(St)HSWAH...CI		
Diameter under armour (mm²)	Outer diameter (mm)	Weight (kg/km)
0.5 mm²/Solid, RE-2G(St)HSWAH...CI		
6.5	10.7	235
9.5	14.5	381
10.5	15.2	472
12.0	18.4	550
13.0	18.5	574
16.5	22.3	760
20.5	24.2	941
22.6	27.1	1,146
1 mm²/7, RE-2G(St)HSWAH...CI		
7.4	11.3	265
10.6	15.9	452
11.2	16.2	528
13.7	20.1	665
14.8	20.3	695
18.9	23.8	937
23.2	27.8	1,368
26.2	30.9	1,650
1.5 mm²/7, RE-2G(St)HSWAH...CI		
8.7	12.1	305
10.2	15.0	525
12.9	17.2	614
16.7	22.1	794
17.5	22.3	845
23.4	27.0	1,315
28.9	30.7	1,691
32.5	34.4	2,075

Group 2
Instrumentation Control Cable
acc. to BS EN 50288-7

Group 2
Instrumentation Control Cable
acc. to BS EN 50288-7

Common Types
300 V and 500 V


Zarsim Instrumentation Control Cable
Plain stranded copper conductor,
cores,
overall static screen
Common Types
300 V and 500 V
Halogen-free,
flame retardant Types
500 V
Fire resisting (CI),
flame retardant Types
500 V
PVC or PVCw or PE or XLPE
(70°C) (105°C) (70°C) (90°C)
insulated/PVC-sheathed
PE or XLPE
(70°C) (90°C)
insulated/LSZH-sheathed
Mica/XLPE or Silicone
(90°C) (90°C)
insulated/LSZH-sheathed
Unarmoured
Armoured
Unarmoured
Armoured
Unarmoured
Armoured
Multi layer sheathed armoured

Common Types / 300 V and 500 V

Multicore, collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Technical Data

Type of insulation/sheath	**PVC/PVC**	**PVCw/PVCw**	**PE/PVC**	**XLPE/PVC**
Type of cabling elements	Core			
No. of cabling elements	2, 4, 5, 6, 8, 10, 12, 16, 20, 24, 36, 40			
Conductor sizes	0.5 mm², 0.75 mm², 1.0 mm², 1.3 mm², 1.5 mm², 2.5 mm²			
1. Unarmoured types	RE-Y(St)Y-fl	RE-Yw(St)Yw-fl	RE-2Y(St)Y-fl [1]	RE-2X(St)Y-fl
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations			
■ Bending radius	7.5 x cable ∅			
2. Armoured types	RE-Y(St)YSWAY-fl [2]	RE-Yw(St)YwSWAYw-fl [2]	RE-2Y(St)YSWAY-fl [2]	RE-2X(St)YSWAY-fl [2]
■ Laying	Recommended for outdoor installation, on racks, trays, in conduits, in dry and wet locations, for direct burial			
■ Bending radius	10 x cable ∅			
3. Armoured types with chemical protection Multi layer sheathed	—	—	—	RE-2X(L)2Y4YSWAY [3], [4]
■ Laying	Recommended for direct burial, especially in presence of oil and aggressive chemical substances			
■ Bending radius	15 x cable ∅			
Temperature range				
■ During operation	-30°C up to 70°C	-30°C up to 105°C	-30°C up to 70°C	-30°C up to 90°C
■ During installation	-5°C up to 50°C	-5°C up to 50°C	-5°C up to 50°C	-5°C up to 50°C
Reaction to fire				
■ **Flame propagation**				
a) Test on single cable	IEC 60332-1			
b) Test on bunched cables	IEC 60332-3 part 24 (Cat. C), (excluded types with Multi layer sheath)			
Sunlight resistance (Optional)	UL 1581 Section 1200			
Oil resistance (Optional)	ICEA S-82-552			
Application	For control purposes, e.g controlling of valves or engines; allowed for use in zone 1 and zone 2, group II, classified areas (IEC 60079-14); not allowed for direct connection to low impedance sources, e.g. public mains electricity supply			

1) Also with increased thickness of outer sheath
2) Also with SWB or GSTA
3) Also with HDPE outer sheath; in this case Test "Reaction to Fire" are not passed.
4) Max. operating temperature 80°C

Common Types / 300 V and 500 V

Multicore, collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Construction

Product Type	Unarmoured Types				Armoured Types	
Conductor	Plain annealed copper; 7 stranded acc. to HD 383, Class 2					
Cross-section mm² / **Conductor design mm**	0.5 / 7 x 0.30	0.75 / 7 x 0.37	1.0 / 7 x 0.43	1.3 / 7 x 0.49	1.5 / 7 x 0.53	2.5 / 7 x 0.67
Insulation materials	■ Cross linked Polyethylene XLPE or ■ Polyethylene PE or ■ Polyvinylchloride PVC or ■ Polyvinylchloride heat resistant PVCw					
Cabling element [1]	Core					
Wrapping	At least one plastic tape above cable core					
Overall screen	Aluminium/Plastic tape over tinned copper drain wire 0.5 mm²/ 7 x 0.3 mm					
Inner sheath	—				PVC and PVCw resp. , black	
Armouring	—				Galvanized steel wire armouring; wire∅ depending on cable-∅ under armouring, at least 0.9 mm	
Outer sheath [1] **Colour**	PVC and PVCw resp. Depending on the used conductor material or blue for intrinsically safe systems					
Marking	ZARSIM Instrumentation Control Cable. Standard. Rated voltage. RP [2]. Length marking					

1) Colour code of cabling elements: see Appendix I
2) RP = Reduced flame progation, excluded types with multi layer sheath

Common Types / 300 V and 500 V

Multicore, collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Construction

Product Type	Multi layer sheathed, armoured Types
Conductor	Plain annealed copper; 7 stranded acc. to HD 383, Class 2
Cross-section mm²	0.5 | 0.75 | 1.0 | 1.3 | 1.5 | 2.5
Conductor design mm	7 x 0.30 | 7 x 0.37 | 7 x 0.43 | 7 x 0.49 | 7 x 0.53 | 7 x 0.67
Insulation materials	XLPE
Cabling element [1]	Core
Wrapping	At least one plastic tape above cable core
Overall screen	Longitudinal one side plastic coated aluminium foil over tinned copper drain wire, 7x0.3 mm, high density Polyethylene sheath with an additional Polyamide covering. The aluminium foil is bonding within the overlapping and with the inner surface of the Polyethylene sheath.
Armouring	Galvanized steel wire; wire ∅ depending on cable-∅ under armouring, at least 0.9 mm
Outer sheath	PVC or PE (high density)
Colour	Black
Marking	ZARSIM Instrumentation Control Cable . Standard . Rated voltage . RP [2] . Length marking

1) Colour code of cabling elements: see Appendix I
2) RP = Reduced flame propagation, excluded types with multi layer sheath

Common Types / 300 V

Multicore, collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Electrical Data at 20°C 300 V									
Properties	**Character**	**Unit**	**Values**						
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5	2.5	
Conductor resistance	max.	Ω/km	36.0	24.5	18.1	13.9	12.1	7.41	
Insulation resistance									
■ **PVC / PVCw insulation**	min.	MΩxkm	100						
■ **PE / XLPE insulation**	min.	MΩxkm	5000						
L/R Ratio	max.	µH/Ω	25		40		60		
Inductance	max.	mH/km	1						
Mutual capacitance									
■ **PVC / PVCw insulation**	max.	nF/km	200						
■ **PE / XLPE insulation**	max.	nF/km	130						
Test voltage									
■ **Core/core** (U_{rms})		V	1500						
■ **Core/screen** (U_{rms})		V	1500						
Operating voltage (U_{rms})	max.	V	300						

Common Types / 500 V

Multicore, collective screen, PVC sheath

- unarmoured
- armoured
- with or without chemical protection, armoured

Electrical Data at 20°C	500 V							
Properties	**Character**	**Unit**	**Values**					
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5	2.5
Conductor resistance	max.	Ω/km	36.0	24.5	18.1	13.9	12.1	7.41
Insulation resistance								
■ **PVC / PVCw insulation**	min.	MΩxkm	100					
■ **PE / XLPE insulation**	min.	MΩxkm	5000					
L/R Ratio	max.	µH/Ω	25		40		60	
Inductance	max.	mH/km	1					
Mutual capacitance								
■ **PVC / PVCw insulation**	max.	nF/km	170					
■ **PE / XLPE insulation**	max.	nF/km	115					
Test voltage								
■ **Core/core** (U_{rms})		V	2000					
■ **Core/screen** (U_{rms})		V	2000					
Operating voltage (U_{rms})	max.	V	500					

Common Types / 70°C / 300 V

Single & multicore, PVC insulation, collective screen, PVC sheath

	Unarmoured RE-Y(St)Y			Armoured RE-Y(St)YSWAY	
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
0.5 mm²/7 , RE-Y(St)Y			**0.5 mm²/7 , RE-Y(St)YSWAY**		
2 x 2 x 0.5	6.2	50	6.2	10.6	215
4 x 2 x 0.5	7.0	70	7.0	11.4	250
5 x 2 x 0.5	7.6	80	7.6	12.0	280
12 x 2 x 0.5	10.7	160	10.7	15.3	445
24 x 2 x 0.5	14.7	290	14.7	19.5	670
30 x 2 x 0.5	15.7	355	15.7	20.5	860
0.75 mm²/7 , RE-Y(St)Y			**0.75 mm²/7 , RE-Y(St)YSWAY**		
2 x 2 x 0.75	6.5	55	6.5	10.9	225
4 x 2 x 0.75	7.4	80	7.4	11.8	275
5 x 2 x 0.75	8.1	105	8.1	12.7	320
12 x 2 x 0.75	11.5	200	11.5	16.1	495
24 x 2 x 0.75	16.0	365	16.0	20.8	880
30 x 2 x 0.75	16.9	440	16.9	21.9	1,000
1 mm²/7 , RE-Y(St)Y			**1 mm²/7 , RE-Y(St)YSWAY**		
2 x 2 x 1	6.9	65	6.9	11.3	240
4 x 2 x 1	7.9	95	7.9	12.5	295
5 x 2 x 1	8.6	120	8.6	13.2	337
12 x 2 x 1	12.2	240	12.2	17.0	550
24 x 2 x 1	17.0	450	17.0	22.0	1,010
30 x 2 x 1	18.0	540	18.0	23.7	1,130

Common Types / 70°C / 300 V

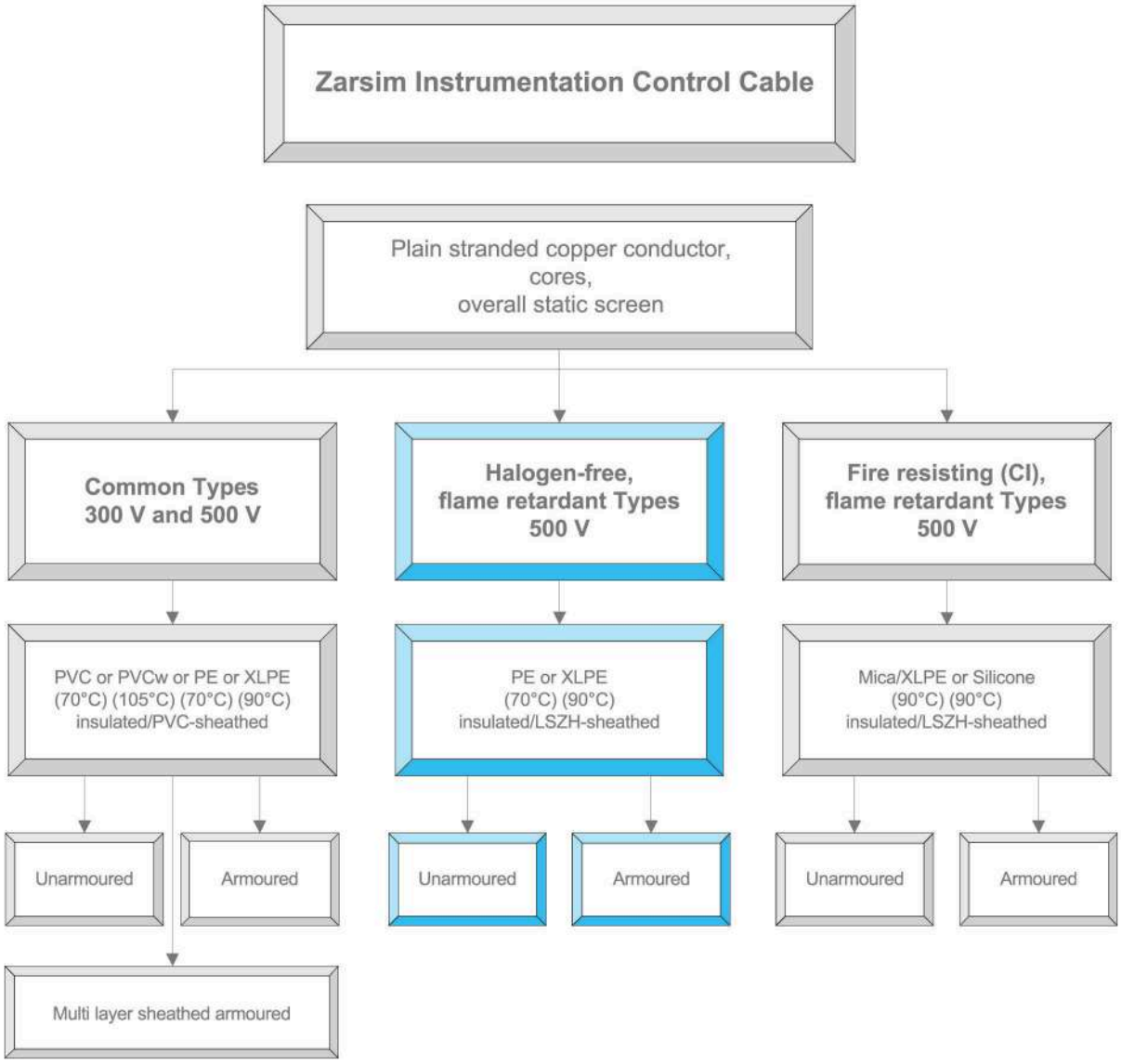
Single & multicore, PVC insulation, collective screen, PVC sheath

	Unarmoured RE-Y(St)Y		Armoured RE-Y(St)YSWAY		
Cross section	Outer diameter	Weight	Diameter under armour	Outer diameter	Weight
(mm²)	(mm)	(kg/km)	(mm²)	(mm)	(kg/km)
1.3 mm²/7 , RE-Y(St)Y			**1.3 mm²/7 , RE-Y(St)YSWAY**		
2 x 2 x 1.3	7.4	75	7.4	11.9	270
4 x 2 x 1.3	8.5	115	8.5	13.1	335
5 x 2 x 1.3	9.5	145	9.5	14.1	380
12 x 2 x 1.3	13.6	290	13.6	18.4	635
24 x 2 x 1.3	18.7	550	18.7	24.4	1,170
30 x 2 x 1.3	20.0	665	20.0	25.7	1,310
1.5 mm²/7 , RE-Y(St)Y			**1.5 mm²/7 , RE-Y(St)YSWAY**		
2 x 2 x 1.5	7.7	82	7.7	12.1	285
4 x 2 x 1.5	8.8	130	8.8	13.4	345
5 x 2 x 1.5	9.8	155	9.8	14.4	400
12 x 2 x 1.5	14.1	325	14.1	18.9	685
24 x 2 x 1.5	19.6	610	19.6	25.3	1,255
30 x 2 x 1.5	20.8	740	20.8	26.7	1,430
2.5 mm²/7 , RE-Y(St)Y			**2.5 mm²/7 , RE-Y(St)YSWAY**		
2 x 2 x 2.5	8.9	115	8.9	13.5	370
4 x 2 x 2.5	10.5	180	10.5	15.1	440
5 x 2 x 2.5	11.5	215	11.5	16.1	540
12 x 2 x 2.5	16.9	480	16.9	21.9	1,040
24 x 2 x 2.5	23.6	925	23.6	29.5	1,690
30 x 2 x 2.5	25.2	1,130	25.2	31.3	2,140


We create the links

Group 2
Instrumentation Control Cable
acc. to BS EN 50288-7

Halogen-free, Flame Retardant Types 500 V


Zarsim Instrumentation Control Cable
Plain stranded copper conductor,
cores,
overall static screen
Common Types
300 V and 500 V
Halogen-free,
flame retardant Types
500 V
Fire resisting (CI),
flame retardant Types
500 V
PVC or PVCw or PE or XLPE
(70°C) (105°C) (70°C) (90°C)
insulated/PVC-sheathed
PE or XLPE
(70°C) (90°C)
insulated/LSZH-sheathed
Mica/XLPE or Silicone
(90°C) (90°C)
insulated/LSZH-sheathed
Unarmoured
Armoured
Unarmoured
Armoured
Unarmoured
Armoured
Multi layer sheathed armoured

Halogen-free, Flame Retardant Types / 500 V

Multicore, collective screen, LSZH sheath

- unarmoured
- armoured

Technical Data

Type of insulation/sheath	**PE/LSZH**	**XLPE/LSZH**
Types of cabling elements	Core	
No. of cabling elements	2, 4, 5, 6, 8, 10, 12, 16, 20, 24, 36, 40	
Conductor sizes	0.5 mm² , 0.75 mm² , 1.0 mm² , 1.3 mm² , 1.5 mm², 2.5 mm²	
1. Unarmoured types	RE-2Y(St)H	RE-2X(St)H
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations	
■ Bending radius	7.5 x cable ∅	
2. Armoured types	RE-2Y(St)HSWAH [1]	RE-2X(St)HSWAH [1]
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations, for direct burial	
■ Bending radius	10 x cable ∅	
Temperature range		
■ During operation	-30°C up to 70°C	-30°C up to 90°C
■ During installation	-5°C up to 50°C	-5°C up to 50°C
Reaction to fire		
■ **Flame propagation**		
a) Test on single cable b) Test on bunched cables	IEC 60332-1 IEC 60332-3 part 24 (Cat. C)	
■ **Test on gases evolved during combustion:**		
a) Amount of halogen acid gas	IEC 60754-1 (0%)	
b) Degree of acidity of gases	IEC 60754-2 (pH > 4.3, c < 10µS/mm)	
■ **Measurement of smoke density**	IEC 61034-2 (L.T. [2] > 60%)	
Oil resistance (Optional)	ICEA S-82-552	
Application	For control purposes, e.g controlling of valves or engines; allowed for use in zone 1 and zone 2, group II, classified areas (IEC 60079-14); not allowed for direct connection to low impedance sources, e.g. public mains electricity supply. Recommended for use as fire protection measure for people and for important material assets	

1) Also with SWB or GSTA
2) L.T. = Light Transmission

Halogen-free, Flame Retardant Types / 500 V

Multicore, collective screen, LSZH sheath

- unarmoured
- armoured

Construction

Product Type	Unarmoured Types				Armoured Types	
Conductor	Plain annealed copper; 7 stranded acc. to HD 383, Class 2					
Cross-section mm²	0.5	0.75	1.0	1.3	1.5	2.5
Conductor design mm	7 x 0.30	7 x 0.37	7 x 0.43	7 x 0.49	7 x 0.53	7 x 0.67
Insulation materials	Polyethylene PE or cross linked Polyethylene XLPE					
Cabling element	Core					
Wrapping	At least one plastic tape above cable core					
Overall screen	Aluminium/Plastic tape over tinned copper drain wire 0.5 mm²/ 7 x 0.3 mm					
Inner sheath	—				LSZH , black	
Armouring	—				Galvanized steel wire; wire ∅ depending on cable-∅ under armouring, at least 0.9 mm	
Outer sheath [1]	LSZH					
Colour	Depending on the used conductor material or blue for intrinsically safe systems					
Marking	ZARSIM Instrumentation Control Cable . Standard . Rated voltage . LSZH . Length marking					

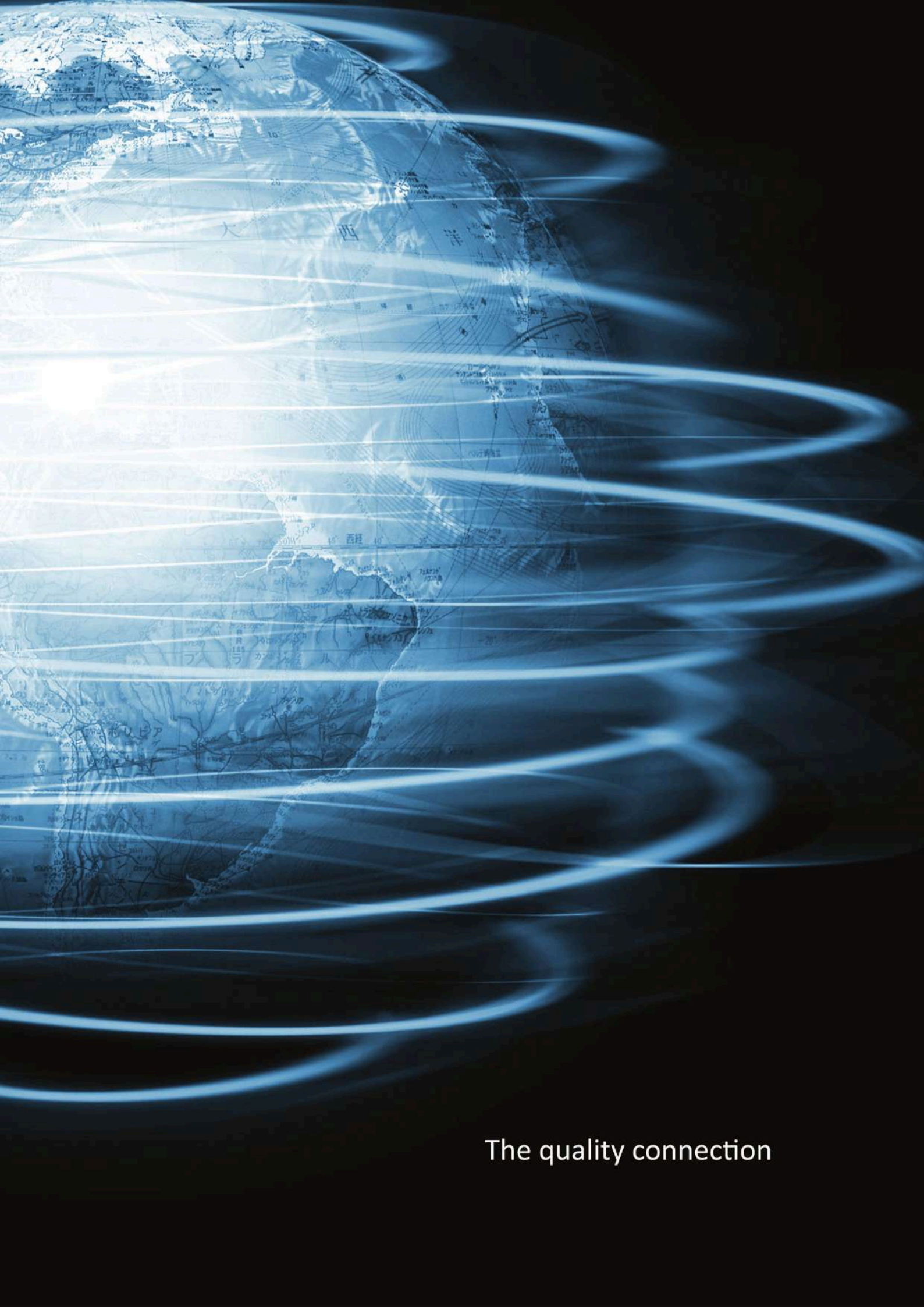
1) Colour code of cabling elements: see Appendix I

Halogen-free, Flame Retardant Types / 500 V

Multicore, collective screen, LSZH sheath

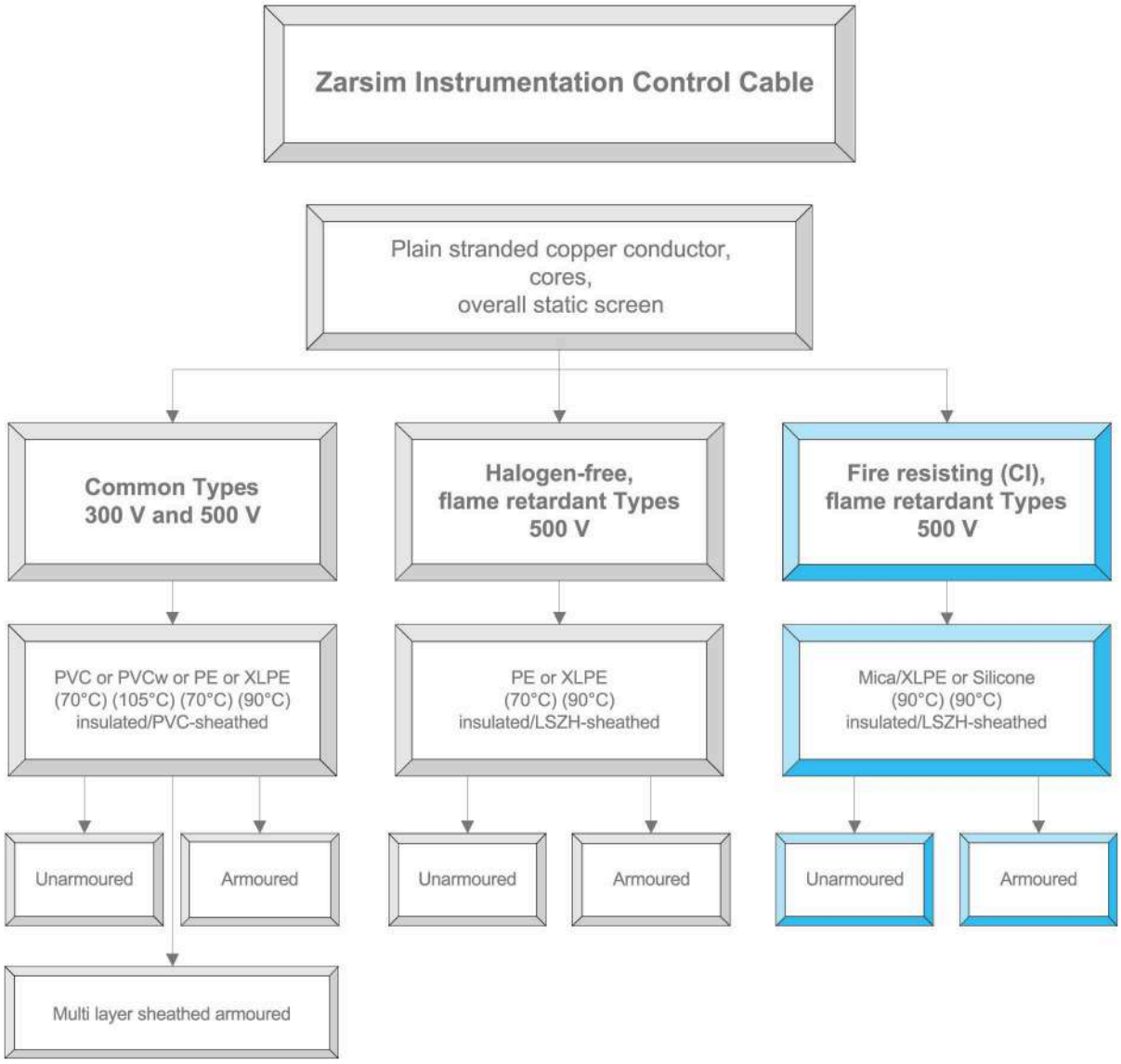
- unarmoured
- armoured

Electrical Data at 20°C 500 V									
Properties	**Character**	**Unit**	**Values**						
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5	2.5	
Conductor resistance	max.	Ω/km	36.0	24.5	18.1	13.9	12.1	7.41	
Insulation resistance									
■ PE-XLPE insulation	min.	MΩxkm	5000						
L/R Ratio	max.	µH/Ω	25			40		60	
Inductance	max.	mH/km	1						
Mutual capacitance	max.	nF/km	115						
Test voltage									
Core/core (U_{rms})		V	2000						
Core/screen (U_{rms})		V	2000						
Operating voltage (U_{rms})	max.	V	500						


The quality connection

Group 2
Instrumentation Control Cable
acc. to BS EN 50288-7

Fire Resisting (CI), Flame Retardant Types 500 V


Zarsim Instrumentation Control Cable
Plain stranded copper conductor,
cores,
overall static screen
Common Types
300 V and 500 V
Halogen-free,
flame retardant Types
500 V
Fire resisting (CI),
flame retardant Types
500 V
PVC or PVCw or PE or XLPE
(70°C) (105°C) (70°C) (90°C)
insulated/PVC-sheathed
PE or XLPE
(70°C) (90°C)
insulated/LSZH-sheathed
Mica/XLPE or Silicone
(90°C) (90°C)
insulated/LSZH-sheathed
Unarmoured
Armoured
Unarmoured
Armoured
Unarmoured
Armoured
Multi layer sheathed armoured

Fire Resisting (CI), Flame Retardant Types / 500 V

Multicore, collective screen, LSZH sheath

- unarmoured
- armoured

Technical Data

Type of insulation/sheath	**Mica tape + XLPE/LSZH**	**Silicone/LSZH**
Types of cabling elements	Core	
No. of cabling elements	2, 4, 5, 6, 8, 10, 12, 16, 20, 24, 36, 40	
Conductor sizes	0.5 mm² , 0.75 mm² , 1.0 mm² , 1.3 mm² , 1.5 mm², 2.5 mm²	
1. Unarmoured types	RE-2X(St)H...CI	RE-2G(St)H...CI
■ Laying	Recommended for indoor and outdoor installation, on racks, trays, in conduits, in dry and wet locations	
■ Bending radius	7.5 x cable ∅	
2. Armoured types	RE-2X(St)HSWAH [1), 2)]...CI	RE-2G(St)HSWAH [1), 2)]...CI
■ Laying	Recommended for outdoor installation, on racks, trays, in conduits, in dry and wet locations, for direct burial	
■ Bending radius	10 x cable ∅	
Temperature range		
■ During operation	-30°C up to 70°C	-30°C up to 90°C
■ During installation	-5°C up to 50°C	-5°C up to 50°C
Reaction to fire ■ **Circuit Integrity**	a) IEC 60331-21, b) BS 6387 Cat. C, W, Z	
Reaction to fire ■ **Flame propagation** a) Test on single cable b) Test on bunched cables	IEC 60332-1 IEC 60332-3 part 24 (Cat. C)	
■ **Test on gases evolved during combustion:** a) Amount of halogen acid gas	IEC 60754-1 (0%)	
b) Degree of acidity of gases	IEC 60754-2 (pH > 4.3, c < 10µS/mm)	
■ **Measurement of smoke density**	IEC 61034-2 (L.T. [3)] > 60%)	
Oil resistance (Optional)	ICEA S-82-552	
Application	For control purposes, e.g. controlling of valves or engines where maintenance of circuit integrity in case of fire is required; allowed for use in zone 1 and zone 2, group II, classified areas (IEC 60079-14); not allowed for direct connection to low impedance sources, e.g. public mains electricity supply	

1) Also with SWB or GSTA
2) Alternative with outer sheath PVC; in this case tests "Test on gases evolved during combistion" and "Measurement of smoke density" are not applicable.
3) L.T. = Light Transmission

Fire Resisting (CI), Flame Retardant Types / 500 V

Multicore, collective screen, LSZH sheath

- unarmoured
- armoured

Construction

Product Type	Unarmoured Types				Armoured Types	
Conductor	Plain annealed copper; 7 stranded acc. to HD 383, Class 2					
Cross-section mm²	0.5	0.75	1.0	1.3	1.5	2.5
Conductor design mm	7 x 0.30	7 x 0.37	7 x 0.43	7 x 0.49	7 x 0.53	7 x 0.67
Insulation materials	Mica tape + Cross linked Polyethylene XLPE or Silicone					
Cabling element [1]	Core					
Wrapping	At least one plastic tape above cable core					
Overall screen	Aluminium/Plastic tape over tinned copper drain wire 0.5 mm²/ 7 x 0.3 mm					
Inner sheath	—				LSZH , black	
Armouring	—				Galvanized steel wire armouring; wire ∅ depending on cable-∅ under armouring, at least 0.9 mm	
Outer sheath [1] **Colour**	LSZH Black or blue for intrinsically safe systems					
Marking	ZARSIM Instrumentation Control Cable . Standard . Rated voltage . LSZH . CI . Length marking					

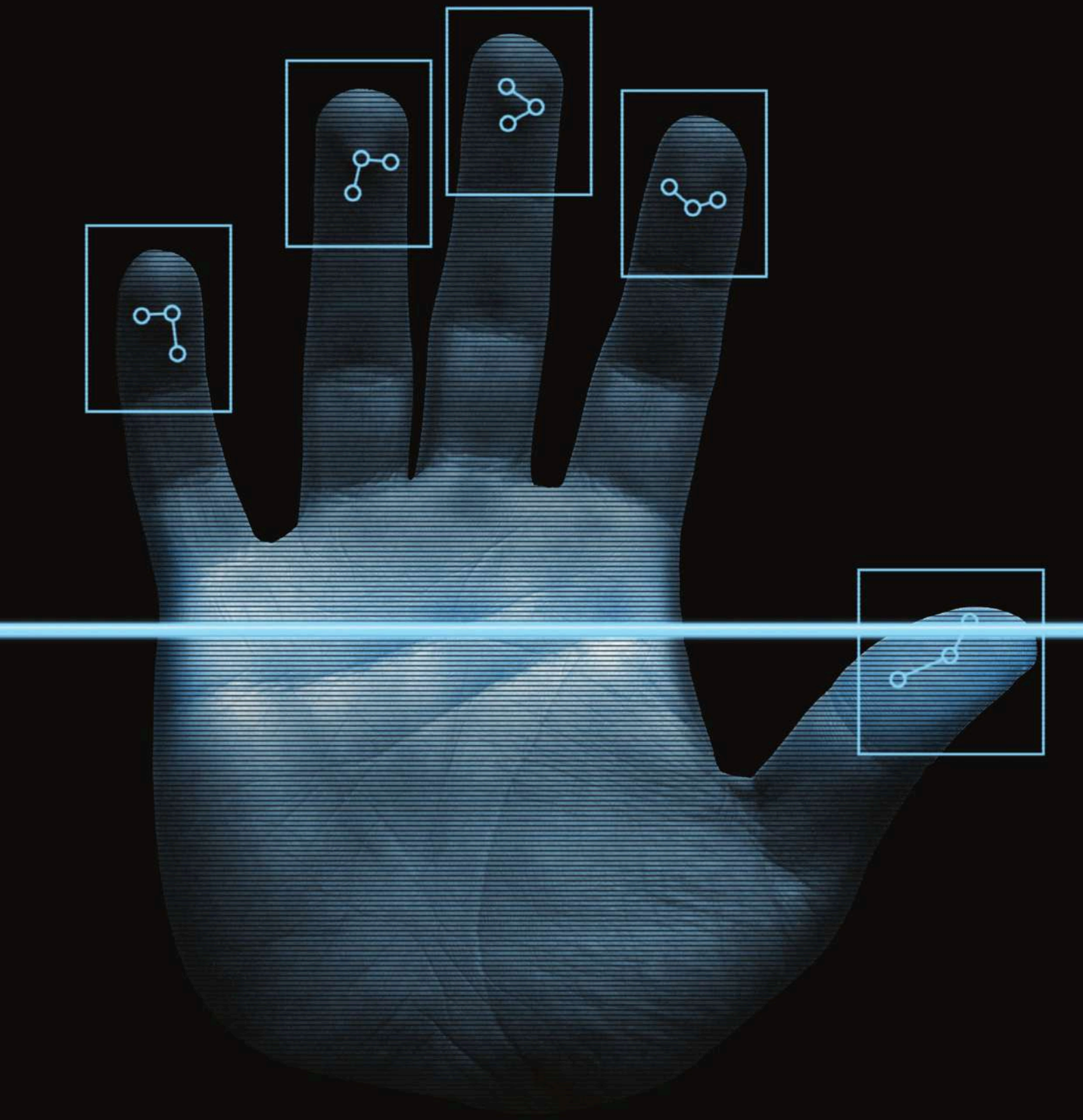
1) Colour code of cabling elements: see Appendix I

Fire Resisting (CI), Flame Retardant Types / 500 V

Multicore, collective screen, PVC sheath

- unarmoured
- armoured

Electrical Data at 20°C 500 V									
Properties	**Character**	**Unit**	**Values**						
Conductor sizes	nom.	mm²	0.5	0.75	1.0	1.3	1.5	2.5	
Conductor resistance	max.	Ω/km	36.0	24.5	18.1	13.9	12.1	7.41	
Insulation resistance									
■ **Mica Tape + XLPE insulation**	min.	MΩxkm	5000						
■ **Silicone**	min.	MΩxkm	150						
L/R Ratio	max.	µH/Ω	25			40		60	
Inductance	max.	mH/km	1						
Mutual capacitance									
■ **Mica Tape + XLPE insulation**	max.	nF/km	100						
■ **Silicone**	max.	nF/km	150						
Test voltage									
■ **Core/core** (U_{rms})		V	2000						
■ **Core/screen** (U_{rms})		V	2000						
Operating voltage (U_{rms})	max.	V	500						



Our quality is your security

The Customised Types

Customised Products

The above listed product programme covers in a large extent the most popular instrumentation cables which are nowadays used especially in the petrochemical industry.

But, nevertheless, depending on many reasons sometimes cables of alternative construction and dimesions, cables with special properties, are requested.

Therefore, below an overview of the given construction possibilities, which can be offered. Resulting products are either fully in accordance with the European standard.

Cable elements	Constructions possibilities
■ Conductor	Plain or metal coated solid, stranded or flexible (Class 1, 2 or 5) 0.5 mm² upto 4 mm²
■ Insulation	Polyethylene (low, medium and high density), flame-proof Polyethylene, cross-linked Polyethylene, low smoke, zero halogen compounds, Polypropylene, PVC, cold and heat-resistant PVC
■ Cabling elements	Core, pair, triple, quad, bundle
■ Screen	Foils, metal tape, copper braids
■ Inner and outer sheath	Polyethylene (low, medium and high density), flame-proof Polyethylene cross-linked Polyethylene, low smoke, zero halogen compounds, special oil-resistant PVC, cold and heat-resistant PVC
■ Chemical protection	Multi layer sheath
■ Armour	Galvanized round steel wires with or without metallic counter helix Flat steel wires with metallic counter helix Double layer of galvanized steel or brass tapes Braid of galvanized round steel wires
■ Moisture barrier	Laminated sheath, water swellable tapes and/or powder, filling compound

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Appendix

Appendix I: Colour Codes

Colour Code of Instrumentation and Instrumentation Control Cables

1. Colour Code of Standardised Product Programme

Cabling element / Rated voltage	Core [1]	Pair [2]	Triple [2]
300 V	–	Black/white	Black/white/red
		Continuously numbered on white core 1, 2, 3.. for multi-element cables, starting with 1 in the centre	
500 V	Black	Black/blue	Black/blue/red
	Continuously numbered 1, 2, 3 .. for multi-core cables, starting with 1 in the centre	Continuously numbered on blue core 1, 2, 3.. for multi-element cables, starting with 1 in the centre	

2. Other colour codes on request

1) If specified green-yellow core principially applied as last element in the outer layer
2) Identification scheme for elements with and without individual screen

Appendix II: Common Test Methods for Cables under Fire Conditions

Reaction to Fire - IEC and corresponding European Standards

IEC Standard		CENELEC Standard	
No.	**Title**	**No.**	**Title**
IEC 60332	Tests on electric and optical cables under fire conditions	EN 50265	Test for resistance to vertical flame propagation for a single insulated conductor or cable
-1-1 [1]	Test on a single vertical insulated wire or cable - Apparatus	-1	Apparatus
-1-2 [2]	Test on a single vertical insulated wire or cable - Procedure	-2-1 [1]	Procedures - 1 kW pre-mixed flame
-1-3	Test on a single vertical insulated wire or cable - Procedure for determination of flaming droplets / particles	-2-2	Procedures - Diffusion flame
IEC 60332	Tests on electric cables under fire conditions		
-2-1	Test on a single vertical insulated wire or cable - Apparatus		
-2-2	Test on a single vertical insulated wire or cable - Procedure		
IEC 60332 -3 [2]	Tests on bunched wires or cables	EN 50266 [2]	Test f. vertical flame spread of vertically mounted bunched wires o.cables
-10	Apparatus	-1	Apparatus
-21	Procedures - Category A F/R	-2-1	Procedures - Category A F/R
-22	Procedures - Category A	-2-2	Procedures - Category A
-23	Procedures - Category B	-2-3	Procedures - Category B
-24	Procedures - Category C	-2-4	Procedures - Category C
-25	Procedures - Category D	-2-5	Procedures - Category D
IEC 60754 [3]	Tests on gases evolved during combustion of materials from cables	EN 50267 [3]	Tests on gases evolved during combustion of materials from cables
-1	Determination of amount of halogen acid gas	-1	Apparatus
-2	Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	-2-1	Procedures - Determination of the amount of halogen acid gas
		-2-2	Procedures - Determination of degree of acidity of gases for materials by measuring pH and conductivity
		-2.3	Procedures - Determination of degree of acidity of gases for cables by determination of the weighted average of pH and conductivity
IEC 61034 [2]	Measurement of smoke density of cables burning u. defined conditions	EN 50268 [2]	Measurement of smoke density of cables burning u. defined conditions
-1	Test apparatus	-1	Apparatus
-2	Test procedure and requirements	-2	Procedure

Resistance to Fire (IEC 60331)

IEC 60331	Tests for electric cables under fire conditions – Circuit Integrity	(under consideration)	(under consideration)
-11	Apparatus – Fire alone at temperature of at least 750°C		
-21	Procedures and requirements – Cables of rated voltage up to and including 0.6/1 kV		
-22	Procedures and requirements – Cables of rated voltage greater than 1 kV (under consideration)		
-23	Proc. and requirements – Electric data cables		
-25	Proc. and requirements – Optical fibres cables		

1) Tests almost identical
2) Tests identical
3) The formal structure of the standards differs in some points, but procedure and requirements of tests are identical.

Appendix III: Identification of Instrumentation Cable

1 Indication

Type Designations of ZARSIM'S Instrumentation Cable reads as follows:

- Type abbreviation code
- No. of cabling elements
- Type of cabling element
- Conductor size in mm² (stranded conductors) or conductor diameter in mm (solid conductors)

followed by (where and when applicable):

- Abbreviation sign for cables with Circuit Integrity Properties
- Individual screening of pairs and triples resp.
- Rated Voltage
- Standard

2 Abbreviation Code

- Cable Type

RE-	Instrumentation and Instrumentation Control Cable resp.

- Metal cladding of conductor

-v	Copper conductor, tinned

- Insulation and/or sheath materials

Y	Insulation, inner or outer sheath of Polyvinylchloride (PVC)
Yw	Insulation, inner or outer sheath of heat resistant Polyvinylchloride (PVCw)
Yv	Outer sheath of Polyvinylchloride of increased thickness
2Y	Insulation, inner or outer sheath of Polyethylene (PE)
2X	Insulation of crosslinked Polyethylene (XLPE)
H	Inner or outer sheath of halogen-free, flame retardant compound (LSZH)
2G	Insulation of Silicone (SiR)
4Y	Covering of Polyamide (Nylon)

- Screening

(St)	Static screen of Aluminium laminated plastic tape
(L)	Longitudinally applied Aluminium foil, one or both sides plastic coated
C	Braid of tinned or untinned copper wires over cable core
K	Wrapping of copper foils
PiMF	Pair in Metal Foil
TiMF	Triple in Metal Foil
QiMF	Quad in Metal Foil
(C)	Braid of tinned or untinned copper wires over single cabling element

- Armour

SWA	Galvanized round steel wires (Steel Wire Armour)
RG	Galvanized round steel wires with counter helix of galvanized steel tape
FG	Galvanized flat steel wires with counter helix of galvanized steel tape
GSTA	Double layer of galvanized steel tapes (Galvanized Steel Tape Armour)
SWB	Braid of galvanized round steel wires (Steel Wire Braid)

- Other properties

CI	Circuit Integrity (Fire resistant)
-fl	Increased flame retardancy; requirements for IEC 60332-3-24 (cat.C) fulfilled [1)]
F	Cable core petrojelly filled

1) This property will be indicated on the outer sheath of PVC-sheathed cables with the marking RP.

Appendix III: Identification of Instrumentation Cable

3 Type of Cabling Elements

The type of cabling elements are indicated by figures resp. by figures with an additional information for individual screened cabling elements

	no	figure
■ Core		
■ Pair		
■ Triple	2	
■ Quad	3	
■ Individual screened pair	4	
■ Individual screened triple	2	PiMF
■ Individual screened quad	3	TiMF
	4	QiMF

4 Indication Examples:

■ Instrumentation cable RE-, 24 triples 3, conductor size 1.5 mm², insulation of PE 2Y, individual TiMF and overall screen (St), inner sheath of PVC Y, steel wire armour SWA, outer sheath of PVC Y-fl, rated voltage 300 V, standard BS EN 50288-7

RE-2Y(St)YSWAY-fl 24 x 3 x 1.5 mm² TiMF 300 V BS EN 50288-7

■ Instrumentation control cable RE-, halogen-free with Circuit Integrity CI, 8 cores, conductor size 2.5 mm², insulation of XLPE 2X, overall screen (St), outer sheath of halogen-free, flame retardant compound H, rated voltage 500 V, standard BS EN 50288-7

RE-2X(St)H 8 x 2.5 mm² CI 500 V BS EN 50288-7

■ Instrumentation cable RE-, 12 pairs 2, conductor size 1.5 mm², insulation of XLPE 2X, individual screen PiMF, Multi layer sheath (L)2Y, steel wire armour SWA, outer sheath of PE 2Y, rated voltage 300 V, standard BS EN 50288-7

RE-2X(L)2Y4YSWA2Y 12 x 2 x 1.5 mm² PiMF 300 V BS EN 50288-7

Zarsim Co.

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