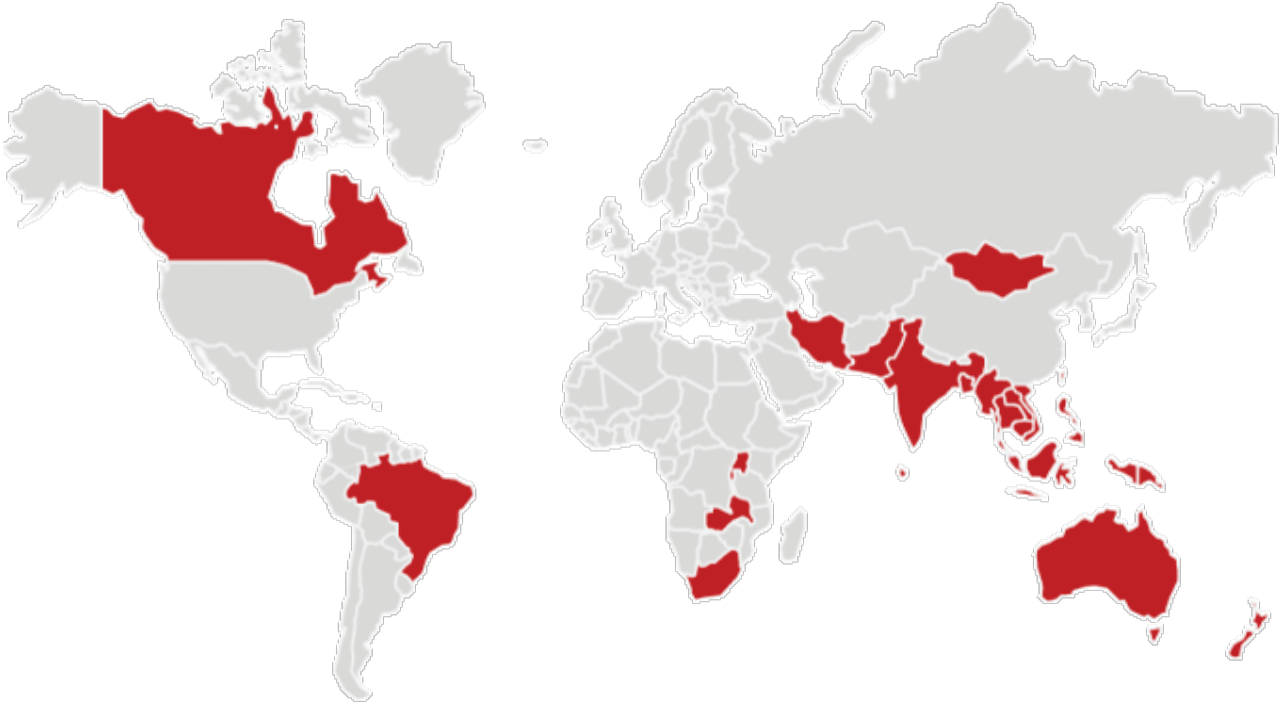


DELIVERING ENERGY >>



# Smart City Cables

# Keystone Cable is a Leading Singapore-based Cable Manufacturer and Supplier.



● Keystone Cable Market Reach



Established since 1990, Keystone Cable has an unwavering commitment to producing and supplying cables of the highest quality. Keystone Cable has obtained all the necessary international third party certifications for our products. In addition, we are ISO 9001, 14001 and OHSAS 18001 accredited for our Quality, Environment and Safety Management Systems.

With our emphasis on stringent quality control processes, we provide our customers with a guarantee of product excellence and reliability.

**CERTIFICATIONS**

ISO 9001:2008    ISO 14001:2004    OHSAS 18001:2007

The certifications section features a red header with the word 'CERTIFICATIONS' in white. Below the header, there are six logos arranged horizontally. From left to right: three EQAIMS logos (each with a star and 'EQUIS ACCREDITED' text), a bizSAFE logo (with 'S T R' below it), a DVE logo (a triangle with 'DVE' inside), a TÜVRheinland logo (a blue triangle with 'TÜVRheinland' below it), a UL logo (a circle with 'UL' inside), and a PSB TEST logo (a blue checkmark with 'PSB TEST' below it). Below the logos, the text 'ISO 9001:2008', 'ISO 14001:2004', and 'OHSAS 18001:2007' is displayed.

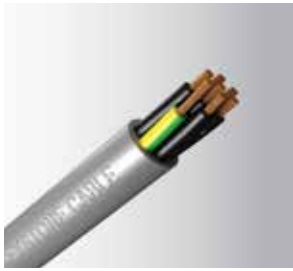
# Keystone Cable Business Solutions



This catalogue showcases our range of cables used in the Smart City. These cables are designed, manufactured and tested in accordance to international standards.

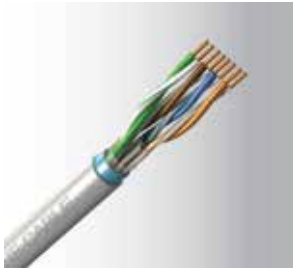
For more information on our offerings in other industries, please visit our website: [www.keystone-cable.com](http://www.keystone-cable.com)

## Cable Properties



### Control Cables

Flexible control cables are used for surveillance and control of static or mobile devices for industrial needs. These cables are light weight, relatively thin, and resistant to medium mechanical loads.



### LAN Cables

LAN cables are used to transmit data in structured cabling solutions.



### Signal Cables

Signal Cables are used to interconnect electric equipment. Most of such signal cables are screened to avoid loss of signal transmissions.



### Coaxial Cables

Coaxial Cables allow distortion-free and low-attenuation transmission of signals with high bandwidth and frequencies. It is widely used in applications related to commercial radio-frequency technologies and electronics.



### Solar Cables

Solar Cables are designed to be UV resistant and weather resistant, suitable for photovoltaic power generation.



### Fire Alarm Fire Resistant Cables

LSZH Fire Alarm Cables are used in fire extinguishing systems, smoke detection and sprinklers, control panels, and exit lights in high-rise buildings, hotels, hospitals, sub-ways, and public facilities.

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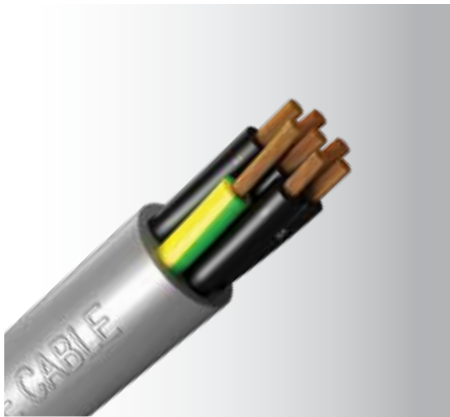
## Control Cables

1	Conductor	Plain Annealed Copper Wire
2	Insulation	PVC, LSZH
3	Binder Tape	Polyester Tape
4	Braided Screen	Tinned Copper Wire
5	Oversheath	PVC

\* LSZH: Low Smoke Zero Halogen

## Control Cables

300/500V, Multi-Core YSLY  
 PVC Insulated, PVC Sheathed Flexible Cable  
 Description: CU/PVC/PVC  
 Model Code: S05VV5-F (Oil Resistant) or S05VV-F



Application :	This cable is intended for the interconnection of manufacturing machines. It can be used in dry, humid and moist environments subject to moderate mechanical loads
Construction :	Plain annealed copper wire (Class 5 to BS EN 60228), PVC insulated (TI 2 to EN 50363-3), PVC (oil resistant TM5 to BS EN 50363-4-1) sheathed or PVC (TM2 to BS EN50363-4-1) sheathed
Insulation colour :	Black Core With White No. or Black Core With White No. + Green/Yellow
Sheath colour :	Grey
Operating Temperature :	-20°C ~ 70°C
Specification :	BS EN 50525-2-51, IEC60332-1-2
Certification :	VDE, CE, RoHS for oil resistant type

Part No.		No. of Cores x Cross Sect.	Approx. Overall Diam.	Approx. Weight
S05VV-F	S05VV5-F	(n x mm <sup>2</sup> )	(mm)	(kg/km)
04023811	04023801	2 x 0.5	5.0	37
04033811	04033801	3 x 0.5	5.2	44
04033812	04033802	3G 0.5	5.2	44
04043811	04043801	4 x 0.5	5.7	53
04043812	04043802	4G 0.5	5.7	53
04053811	04053801	5 x 0.5	6.2	62
04053812	04053802	5G 0.5	6.2	62
04063811	04063801	6 x 0.5	6.9	75
04063812	04063802	6G 0.5	6.9	75
04073811	04073801	7 x 0.5	6.9	82
04073812	04073802	7G 0.5	6.9	82
04103811	04103801	10 x 0.5	8.8	120
04103812	04103802	10G 0.5	8.8	120
04123812	04123802	12G 0.5	9.1	135
04143812	04143802	14G 0.5	9.7	157
04163812	04163802	16G 0.5	10.2	174
04183812	04183802	18G 0.5	10.8	192
04213812	04213802	21G 0.5	11.5	223
04253812	04253812	25G 0.5	12.9	270
05023811	05023801	2 x 0.75	5.3	46
05033812	05033802	3G 0.75	5.7	55
05043811	05043801	4 x 0.75	6.4	71

# Control Cables

300/500V, Multi-Core YSLY  
 PVC Insulated, PVC Sheathed Flexible Cable  
 Description: CU/PVC/PVC  
 Model Code: S05VV5-F (Oil Resistant) or S05VV-F



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Part No.		No. of Cores x Cross Sect.	Approx. Overall Diam.	Approx. Weight
S05VV-F	S05VV5-F	(n x mm <sup>2</sup> )	(mm)	(kg/km)
05043812	05043802	4G 0.75	6.4	71
05053811	05053801	5 x 0.75	6.9	84
05053812	05053802	5G 0.75	6.9	84
05063811	05063801	6 x 0.75	7.5	97
05063812	05063802	6G 0.75	7.5	97
05073811	05073801	7 x 0.75	7.5	107
05073812	05073802	7G 0.75	7.5	107
05103811	05103801	10 x 0.75	9.9	161
05103812	05103802	10G 0.75	9.9	161
05123812	05123802	12G 0.75	10.2	182
05143812	05143802	14G 0.75	10.7	205
05163812	05163802	16G 0.75	11.4	235
05183812	05183802	18G 0.75	12.0	259
05213812	05213802	21G 0.75	12.9	300
05253812	05253802	25G 0.75	14.4	363
06023811	06023801	2 x 1	5.7	54
06033811	06033801	3 x 1	6.0	66
06033812	06033802	3G 1	6.0	66
06043811	06043801	4 x 1	6.8	84
06043812	06043802	4G 1	6.8	84
06053811	06053801	5 x 1	7.4	100
06053812	06053802	5G 1	7.4	100
06063811	06063801	6 x 1	8.2	119
06063812	06063802	6G 1	8.2	119
06073811	06073801	7 x 1	8.2	157
06073812	06073802	7G 1	8.2	157
06093811	06093801	9 x 1	10.1	173
06093812	06093802	9G 1	10.1	173
06103811	06103801	10 x 1	10.5	192
06103812	06103802	10G 1	10.5	192
06123812	06123802	12G 1	10.9	218
06143812	06143802	14G 1	11.6	253
06163812	06163802	16G 1	12.2	282
06183812	06183802	18G 1	13.1	318
06213812	06213802	21G 1	13.8	362
06253812	06253802	25G 1	15.4	453

## Control Cables

300/500V, Multi-Core YSLY  
 PVC Insulated, PVC Sheathed Flexible Cable  
 Description: CU/PVC/PVC  
 Model Code: S05VV5-F (Oil Resistant) or S05VV-F

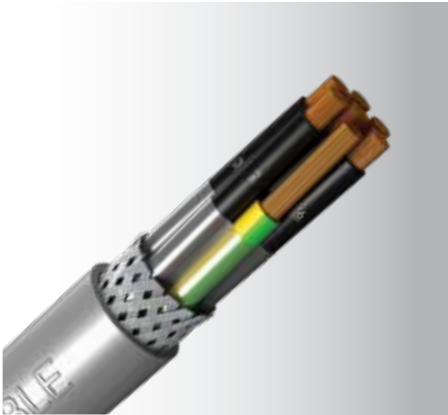


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Part No.		No. of Cores x Cross Sect.	Approx. Overall Diam.	Approx. Weight
S05VV-F	S05VV5-F	(n x mm <sup>2</sup> )	(mm)	(kg/km)
07023811	07023801	2 x 1.5	6.4	73
07033811	07033801	3 x 1.5	6.8	90
07033812	07033802	3G 1.5	6.8	90
07043811	07043801	4 x 1.5	7.4	110
07043812	07043802	4G 1.5	7.4	110
07053811	07053801	5 X 1.5	8.3	135
07053812	07053802	5G 1.5	8.3	135
07063811	07063801	6 x 1.5	9.0	157
07063812	07063802	6G 1.5	9.0	157
07073811	07073801	7 x 1.5	9.0	176
07073812	07073802	7G 1.5	9.0	176
07093811	07093801	9 x 1.5	11.4	235
07093812	07093802	9G 1.5	11.4	235
07103811	07103801	10 x 1.5	11.8	261
07103812	07103802	10G 1.5	11.8	261
07123812	07123802	12G 1.5	12.2	298
07143812	07143802	14G 1.5	13.0	344
07163812	07163802	16G 1.5	13.7	385
07183812	07183802	18G 1.5	14.6	434
07213812	07213802	21G 1.5	15.4	495
07253812	07253802	25G 1.5	17.4	604
08023811	08023801	2 x 2.5	7.8	110
08033811	08033801	3 x 2.5	8.5	142
08033812	08033802	3G 2.5	8.5	142
08043811	08043801	4 x 2.5	9.3	175
08043812	08043802	4G 2.5	9.3	175
08053811	08053801	5 x 2.5	10.4	215
08053812	08053802	5G 2.5	10.4	215
08073811	08073801	7 x 2.5	11.5	287
08073812	08073802	7G 2.5	11.5	287
08123811	08123801	12 x 2.5	15.5	482
08123812	08123802	12G 2.5	15.5	482

## Control Cables

300/500V, Multi-Core YSLCY  
 PVC Insulated, Braided Screen, PVC Sheathed Flexible Cable  
 Description: CU/PVC/TCWB/PVC  
 Model Code: S05VC4V5-K (Oil Resistant) or S05VC4V-K



Application :	This cable is intended for the interconnection of manufacturing machines. It can be used in dry, humid and moist environments subject to moderate mechanical loads
Construction :	Plain annealed copper wire (Class 5 to BS EN 60228), PVC insulated (TI 2 to EN 50363-3), polyester tape wrapping, tinned copper wire braid, PVC (oil resistant TM5 to BS EN 50363-4-1) sheathed or PVC (TM2 to BS EN 50363-4-1) sheathed
Insulation Colour :	Black Core With White No. or Black Core With White No. + Green/Yellow
Sheath Colour :	Grey
Operating Temperature :	-20°C ~ 70°C
Specification :	BS EN 50525-2-51, IEC60332-1-2
Certification :	VDE, CE, RoHS for oil resistant type

Part No.		No. of Cores x Cross Sect.	Approx. Overall Diam.	Approx. Weight
S05VC4V-K	S05VC4V5-K	(n x mm <sup>2</sup> )	(mm)	(kg/km)
04023861	04023821	2 x 0.5	5.6	54
04033862	04033822	3G 0.5	5.9	62
04043862	04043822	4G 0.5	5.9	62
04053862	04053822	5G 0.5	7.0	88
04073862	04073822	7G 0.5	7.6	107
04123862	04123822	12G 0.5	10.0	173
04183862	04183822	18G 0.5	11.7	237
05023861	05023821	2 x 0.75	6.2	68
05033862	05033822	3G 0.75	6.6	79
05043862	05043822	4G 0.75	7.1	94
05053862	05053822	5G 0.75	7.8	112
05073862	05073822	7G 0.75	8.4	138
05103861	05103821	10 x 0.75	10.5	196
05103862	05103822	10G 0.75	10.5	196
05123862	05123822	12G 0.75	11.1	224
05183862	05183822	18G 0.75	12.9	308
06023861	06023821	2 x 1	6.6	78
06033861	06033821	3 x 1	6.9	91
06033862	06033822	3G 1	6.9	91
06043861	06043821	4 x 1	7.5	108
06043862	06043822	4G 1	7.5	108
06053862	06053822	5G 1	8.3	130

## Control Cables

300/500V, Multi-Core YSLCY  
 PVC Insulated, Braided Screen, PVC Sheathed Flexible Cable  
 Description: CU/PVC/TCWB/PVC  
 Model Code: S05VC4V5-K (Oil Resistant) or S05VC4V-K



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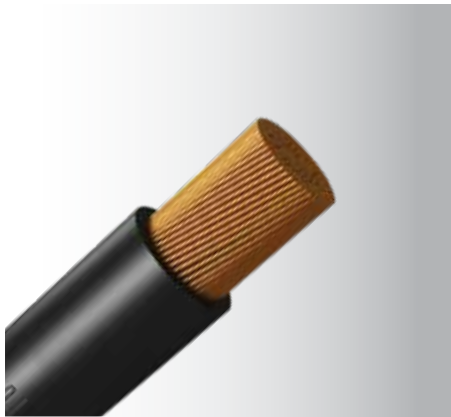
Part No.		No. of Cores x Cross Sect.	Approx. Overall Diam.	Approx. Weight
S05VC4V-K	S05VC4V5-K	(n x mm <sup>2</sup> )	(mm)	(kg/km)
06073862	06073822	7G 1	8.9	162
06123862	06123822	12G 1	12.0	270
06183862	06183822	18G 1	14.1	375
06253862	06253822	25G 1	16.5	510
07023861	07023821	2 x 1.5	7.1	96
07033861	07033821	3 x 1.5	7.5	114
07043861	07043821	4 x 1.5	8.3	141
07043862	07043822	4G 1.5	8.3	141
07053862	07053822	5G 1.5	9.0	165
07073862	07073822	7G 1.5	9.9	213
07123862	07123822	12G 1.5	13.1	348
07183862	07183822	18G 1.5	15.7	511
08023861	08023821	2 x 2.5	8.7	143
08033861	08033821	3 x 2.5	9.2	173
08033862	08033822	3G 2.5	9.2	173
08043862	08043822	4G 2.5	10.2	214
08053862	08053822	5G 2.5	11.2	258
08073862	08073822	7G 2.5	12.2	328
08123862	08123822	12G 2.5	16.5	564
09023861	09023821	2 x 4	10.0	196
09033861	09033821	3 x 4	10.6	240
09043862	09043822	4G 4	11.7	299
09053862	09053822	5G 4	12.9	361
09073862	09073822	7G 4	14.4	486
10023861	10023821	2 x 6	11.8	276
10043862	10043822	4G 6	13.8	425
10053862	10053822	5G 6	15.5	531
11043862	11043822	4G 10	18.4	746
12043862	12043822	4G 16	21.5	1059
13043862	13043822	4G 25	26.0	1579
14043862	14043822	4G 35	30.0	2102

# Control Panel Wire

300/500V & 450/750V PVC or LSZH Insulated, Non-Sheathed Flexible Cable

Description: CU/PVC or CU/LSZH

Model Code: H05V2-K, H07V2-K / 07V2-K, H05Z-K, H07Z-K



Application :	This cable is used for the internal wiring of electric motors and transformers. This cable is suitable for laying in pipes, surface wiring and conduit installations. The LSZH version is generally used in public areas where smoke and toxic fumes may cause a threat to life and equipment.
Construction :	Bare or tinned copper conductor according to BSEN 60228 and IEC 60228 Class 5, EI5 or T13 insulated
Insulation Colour :	Black, Light Blue, Brown, Grey, Red, White, Green/Yellow (other colour upon request)
Operating Temperature:	90°C - H05V2-K & H07V2-K/07V2-K (HR-PVC-TI3) 90°C - H05Z-K & H07Z-K (Thermosetting LSZH-EI 5)
Specification :	BS EN 50525-2-31, BS EN 50525-3-41
LSZH :	IEC60332-1-2, IEC60754, IEC61034-2
Certification :	VDE, CE, RoHS

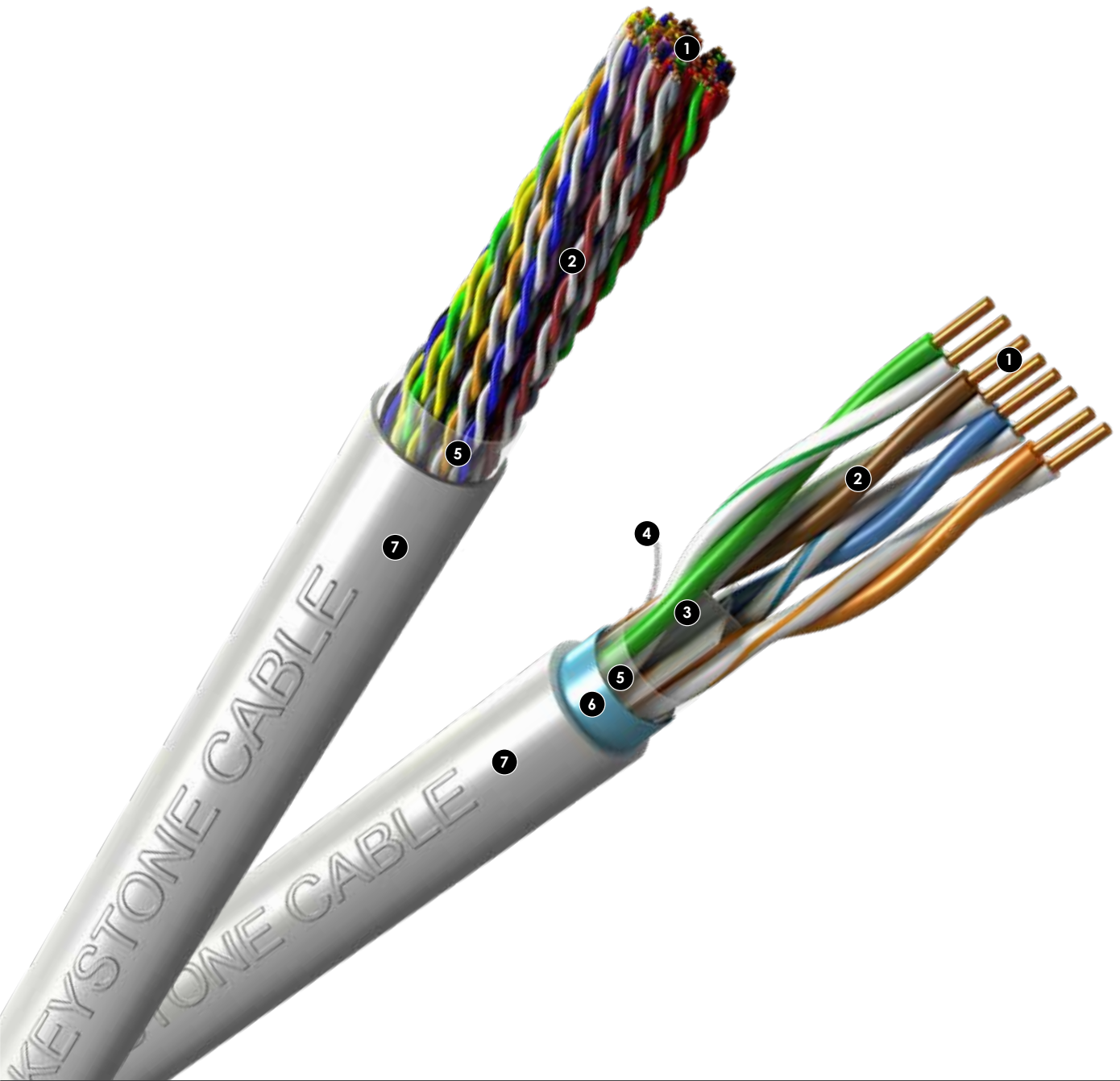
## H05Z-K & H05V2-K

Part No.		No. of Core	Conductor			Insulation	Approx. Overall Diam.	Approx. Weight	Current Rating at 30°C (Method 3)
H05Z-K	H05V2-K		Nominal Area	Approx. Diam.	Maximum Conductor Resistance at 20°C	Thickness			
			(mm <sup>2</sup> )	(mm)	(Ω/km)	(mm)			
0401**50	0401**34	Single-Core	0.5	0.77	39.0	0.6	2.3	7	3
0501**50	0501**34		0.75	0.95	26.0	0.6	2.4	10	6
0601**50	0601**34		1	1.30	19.5	0.6	2.6	12	10

## H07Z-K & H07V2-K / 07V2-K

Part No.		No. of Core	Conductor			Insulation	Approx. Overall Diam.	Approx. Weight	Current Rating at 30°C (Method 3)
H07Z-K	H07V2-K 07V2-K		Nominal Area	Approx. Diam.	Maximum Conductor Resistance at 20°C	Thickness			
			(mm <sup>2</sup> )	(mm)	(Ω/km)	(mm)			
0701**50	0701**34	Single-Core	1.5	1.6	13.3	0.7	3.1	21	16
0801**50	0801**34		2.5	2.0	7.98	0.8	3.8	33	20
0901**50	0901**34		4	2.6	4.95	0.8	4.4	48	25
1001**50	1001**34		6	3.4	3.30	0.8	4.9	66	48
1101**50	1101**34		10	4.4	1.91	1.0	6.4	112	66
1201**50	1201**34		16	5.7	1.21	1.0	7.4	167	88
1301**50	1301**34		25	6.9	0.780	1.2	9.1	254	117
1401**50	1401**34		35	8.1	0.554	1.2	10.4	340	144
1501**50	1501**34		50	9.8	0.386	1.4	12.4	485	175
1601**50	1601**34		70	11.6	0.272	1.4	13.6	674	222
1701**50	1701**34		95	13.3	0.206	1.6	15.8	894	268
1801**50	1801**34		120	15.1	0.161	1.6	17.4	1110	312
1901**50	1901**34		150	16.8	0.129	1.8	19.8	1400	342
2001**50	2001**34		185	18.8	0.106	2.0	21.6	1700	384
2101**50	2101**34		240	21.4	0.0801	2.2	24.6	2230	450

\*\*Stands for colour code: ■ Brown (01) ■ Black (02) ■ Grey (03) ■ Blue (04) ■ Green/Yellow (05)  
For current rating and voltage drop please refer to Tables 7 (Page 44)



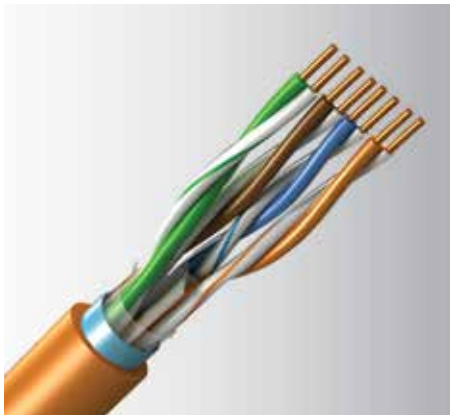
## LAN Cables

1	Conductor	Solid Bare Copper
2	Insulation	PE, Foamed PE
3	Cross-web filler	HDPE
4	Drain Wire	Tinned Copper Wire
5	Binder	Polyester Tape
6	Screen	Aluminium/Polyester Tape
7	Oversheath	RoHS Compliant PVC, LSZH, HDPE

# 4 Pair LAN Cable

Category 6A

Model Code: F/UTP



Application :	<ul style="list-style-type: none"> <li>• High Speed Horizontal Cabling (500 MHz)</li> <li>• 10 / 100/ 1000 Base-T</li> <li>• 100 Mbps Fast Ethernet; 155 / 622 Mbps ATM; Gigabit Ethernet</li> </ul>
Construction :	Solid bare copper, foam PE insulated, cross-web filler, polyester tape, aluminium/polyester tape with drain wire, RoSH compliant PVC, LSZH or HDPE sheathed
Insulation colour :	<ul style="list-style-type: none"> <li>• Blue &amp; White/ Blue</li> <li>• Orange &amp; White/ Orange</li> <li>• Green &amp; White/ Green</li> <li>• Brown &amp; White/Brown</li> </ul>
Sheath colour :	Grey or Blue (RoHS compliant PVC), Orange (LSZH), Black (HDPE) or as per order
Specifications :	ANSI/TIA-568-C.2, ISO/IEC11801, IEC61156-5
Flame Test :	UL1581 (CMX), UL1685 (CM), UL1666 (CMR), IEC60332-1-2
LSZH Test :	IEC60754, IEC61034-2

Part No.	Conductor	Pair	Nominal Outer Diam.	Standard Length	Approx. Weight	Packaging
			(mm)	(m)	(kg/500m)	
<b>444P***6A</b>	Solid Bare Copper (23 AWG)	4	7.2	500	27.5	Plywood Drum

### Electrical Properties @ 20°C

Conductor Resistance	≤ 9.38 Ω / 100m
Resistance Unbalance	≤ 5%
Mutual Capacitance	≤ 5.6nF / 100m
Capacitance Unbalance	≤ 330pF / 100m
Characteristics Impedance	100 ± 15 Ω

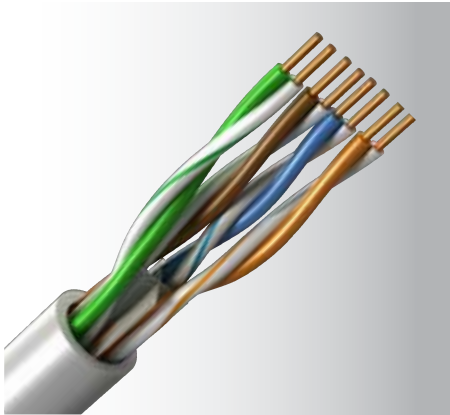
### Electrical Data @ 20°C

Frequency	ATTENUATION Max	NEXT Min	PSNEXT	ELFEXT Min	PSELFEXT Min	RL Min
(MHz)	(dB/100m)	(dB)	(dB)	(dB/100m)	(dB/100m)	(dB)
1	2.1	75.3	72.3	68.0	65.0	20.0
4	3.8	66.3	63.3	56.0	53.0	23.0
10	5.9	60.3	57.3	48.0	45.0	25.0
16	7.5	57.2	54.2	43.9	40.9	25.0
20	8.4	55.8	52.8	42.0	39.0	25.0
31.25	10.5	52.9	49.9	38.1	35.1	23.6
62.5	15.0	48.4	45.4	32.1	29.1	21.5
100	19.1	45.3	42.3	28.0	25.0	20.1
200	27.6	40.8	37.8	22.0	19.0	18.0
300	34.3	38.1	35.1	18.5	15.5	17.3
400	40.1	36.3	33.3	16.0	13.0	17.3
500	45.3	34.8	31.8	14.0	11.0	17.3

# 4 Pair LAN Cable

Category 6

Model Code: U/UTP



Application :	<ul style="list-style-type: none"> <li>• High Speed Horizontal Cabling (250 MHz)</li> <li>• 10 / 100 /1000 Base-T</li> <li>• 100 Mbps Fast Ethernet; 155 / 622 Mbps ATM; Gigabit Ethernet</li> </ul>
Construction :	Solid bare copper, HDPE insulated, cross-web filler, RoSH compliant PVC, LSZH or HDPE sheathed
Insulation colour :	<ul style="list-style-type: none"> <li>• Blue &amp; White/ Blue</li> <li>• Orange &amp; White/ Orange</li> <li>• Green &amp; White/ Green</li> <li>• Brown &amp; White/Brown</li> </ul>
Sheath colour :	Grey or Blue (RoHS compliant PVC), Orange (LSZH), Black (HDPE) or as per order
Specification :	ANSI/TIA-568-C.2, ISO/IEC 11801, IEC61156-5
FlameTest :	UL1581 (CMX); UL1685 (CM); UL1666 (CMR), IEC60332-1-2
LSZH Test :	IEC60754, IEC61034-2

Part No.	Conductor	Pair	Nominal Outer Diam.	Standard Length	Approx. Weight	Packaging
			(mm)	(m)	(kg/305m)	
<b>434P***06</b>	Solid Bare Copper (24 AWG)	4	6.2	305	12	Reel in Box
<b>444P***06</b>	Solid Bare Copper (23 AWG)		6.3		12.2	

### Electrical Properties @ 20°C

Conductor Resistance	≤ 9.38 Ω / 100m
Resistance Unbalance	≤ 5%
Mutual Capacitance	≤ 5.6nF / 100m
Capacitance Unbalance	≤ 330pF / 100m
Characteristics Impedance	100 ± 15 Ω

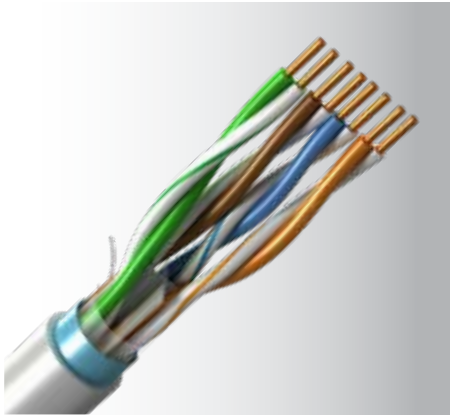
### Electrical Data @ 20°C

Frequency	ATTENUATION Max	NEXT Min	PSNEXT Min	ELFEXT Min	PSELFEXT Min	RL Min	DELAY Max	SKEW Max
(MHz)	(dB/100m)	(dB)	(dB)	(dB/100m)	(dB/100m)	(dB)	(ns/100m)	(ns/100m)
0.772	1.8	76.0	74.0	70.0	67.0	-	-	-
1	2.0	74.3	72.3	67.8	64.8	20.0	570	45
4	3.8	65.3	63.3	55.8	52.8	23.0	-	-
8	5.3	60.8	58.8	49.7	46.7	24.5	-	-
10	6.0	59.3	57.3	47.8	44.8	25.0	545	45
16	7.6	56.2	54.2	43.7	40.7	25.0	-	-
20	8.5	54.8	52.8	41.8	38.8	25.0	-	-
25	9.5	53.3	51.3	39.8	36.8	24.3	-	-
31.25	10.7	51.9	49.9	37.9	34.9	23.6	-	-
62.5	15.4	47.4	45.4	31.9	28.9	21.5	-	-
100	19.8	44.3	42.3	27.8	24.8	20.1	-	-
200	29.0	39.8	37.8	21.8	18.8	18.0	-	-
250	32.8	38.3	36.3	19.8	16.8	17.3	536	45

# 4 Pair LAN Cable

Category 6

Model Code: F/UTP



Application :	<ul style="list-style-type: none"> <li>• High Speed Horizontal Cabling (250 MHz)</li> <li>• 10 / 100 /1000 Base-T</li> <li>• 100 Mbps Fast Ethernet; 155 / 622 Mbps ATM; Gigabit Ethernet</li> <li>• EMI Proof</li> </ul>
Construction :	Solid bare copper, HDPE insulated, polyester tape, aluminium/polyester tape with drain wire, RoSH compliant PVC, LSZH or HDPE sheathed
Insulation colour :	<ul style="list-style-type: none"> <li>• Blue &amp; White/ Blue</li> <li>• Orange &amp; White/ Orange</li> <li>• Green &amp; White/ Green</li> <li>• Brown &amp; White/Brown</li> </ul>
Sheath colour :	Grey or Blue (RoHS compliant PVC), Orange (LSZH), Black (HDPE) or as per order
Specifications :	ANSI/TIA-568-C.2, ISO/IEC11801, IEC61156-5
Flame Test :	UL1581 (CMX); UL1685 (CM); UL1666 (CMR), IEC60332-1-2
LSZH Test :	IEC60754, IEC61034-2

Part No.	Conductor	Pair	Nominal Outer Diam. (mm)	Standard Length (m)	Approx. Weight (kg/305m)	Packaging
<b>434P***06</b>	Solid Bare Copper (24 AWG)	4	7.5	305	16	Reel in Box

### Electrical Properties @ 20°C

Conductor Resistance	≤ 9.38 Ω / 100m
Resistance Unbalance	≤ 5%
Mutual Capacitance	≤ 5.6nF / 100m
Capacitance Unbalance	≤ 330pF / 100m
Characteristics Impedance	100 ± 15 Ω

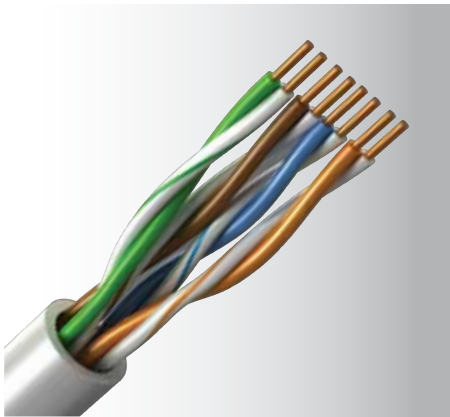
### Electrical Data @ 20°C

Frequency (MHz)	ATTENUATION Max (dB/100m)	Next Min (dB)	PSNEXT Min (dB)	ELFEXT Min (dB/100m)	PSELFEXT Min (dB/100m)	RL MIN (dB)	DELAY Max (ns/100m)	SKEW Max (ns/100m)
0.772	1.8	76.0	74.0	70.0	67.0	-	-	-
1	2.0	74.3	72.3	67.8	64.8	20.0	570	45
4	3.8	65.3	63.3	55.8	52.8	23.0	-	-
8	5.3	60.8	58.8	49.7	46.7	24.5	-	-
10	6.0	59.3	57.3	47.8	44.8	25.0	545	45
16	7.6	56.2	54.2	43.7	40.7	25.0	-	-
20	8.5	54.8	52.8	41.8	38.8	25.0	-	-
25	9.5	53.3	51.3	39.8	36.8	24.3	-	-
31.25	10.7	51.9	49.9	37.9	34.9	23.6	-	-
62.5	15.4	47.4	45.4	31.9	28.9	21.5	-	-
100	19.8	44.3	42.3	27.8	24.8	20.1	-	-
200	29.0	39.8	37.8	21.8	18.8	18.0	-	-
250	32.8	38.3	36.3	19.8	16.8	17.3	536	45

# 4 Pair LAN Cable

Category 5e

Model Code: U/UTP



Application :	<ul style="list-style-type: none"> <li>• High Speed Horizontal Cabling (100 MHz)</li> <li>• 10 / 100 Base-T</li> <li>• 100 Mbps Fast Ethernet; 155 Mbps ATM</li> </ul>
Construction :	Solid bare copper, HDPE insulated, RoHS compliant PVC, LSZH or HDPE sheathed
Insulation colour :	<ul style="list-style-type: none"> <li>• Blue &amp; White/ Blue</li> <li>• Orange &amp; White/ Orange</li> <li>• Green &amp; White/ Green</li> <li>• Brown &amp; White/Brown</li> </ul>
Sheath colour :	Grey or Blue (RoHS compliant PVC), Orange (LSZH), Black (HDPE) or as per order
Specification :	ANSI/TIA-568-C.2, ISO/IEC11801, IEC61156-5
Flame Test :	UL1581 (CMX); UL1685 (CM); UL1666 (CMR), IEC60332-1-2
LSZH Test :	IEC60754, IEC61034-2

Part No.	Conductor	Pair	Nominal Outer Diam.	Standard Length	Approx. Weight	Packaging
			(mm)	(m)	(kg/305m)	
<b>434P***5E</b>	Solid Bare Copper (24 AWG)	4	5.1	305	9	Reel in Box

### Electrical Properties @ 20°C

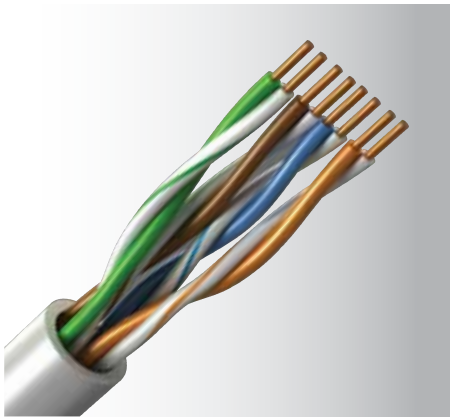
Conductor Resistance	≤ 9.38 Ω / 100m
Resistance Unbalance	≤ 5%
Mutual Capacitance	≤ 5.6nF / 100m
Capacitance Unbalance	≤ 330pF / 100m
Characteristics Impedance	100 ± 15 Ω

### Electrical Data @ 20°C

Frequency (MHz)	ATTENUATION Max (dB/100m)	Next Min (dB)	PSNEXT Min (dB)	ELFEXT Min (dB/100m)	PSELFEXT Min (dB/100m)	RL MIN (dB)	DELAY Max (ns/100m)	SKEW Max (ns/100m)
0.772	1.8	67.0	64.0	66.0	63.0	-	-	-
1	2.0	65.3	62.3	63.8	60.8	20.0	570	45
4	4.1	56.3	53.3	51.7	48.7	23.0	-	-
8	5.8	51.8	48.8	45.7	42.7	24.5	-	-
10	6.5	50.3	47.3	43.8	40.8	25.0	545	45
16	8.2	47.3	44.3	39.7	36.7	25.0	-	-
20	9.3	45.8	42.8	37.7	34.7	25.0	-	-
25	10.4	44.3	41.3	35.8	32.8	24.3	-	-
31.25	11.7	42.9	39.9	33.9	30.9	23.6	-	-
62.5	17.0	38.4	35.4	27.8	24.8	21.5	-	-
100	22.0	35.3	32.3	23.8	20.8	20.3	538	45

# 4 Pair LAN Cable

Enhanced Category 5e  
Model Code: U/UTP



Application :	<ul style="list-style-type: none"> <li>• High Speed Horizontal Cabling (350 MHz)</li> <li>• 10 / 100 Base-T</li> <li>• 100 Mbps Fast Ethernet; 155 Mbps ATM</li> </ul>
Construction :	Solid bare copper, HDPE insulated, RoHS compliant PVC, LSZH or HDPE sheathed
Insulation colour :	<ul style="list-style-type: none"> <li>• Blue &amp; White/ Blue</li> <li>• Orange &amp; White/ Orange</li> <li>• Green &amp; White/ Green</li> <li>• Brown &amp; White/Brown</li> </ul>
Sheath colour :	Grey or Blue (RoHS compliant PVC), Orange (LSZH), Black (HDPE) or as per order
Specifications :	ANSI/TIA-568-C.2, ISO/IEC11801, IEC61156-5
Flame Test :	UL1581 (CMX); UL1685 (CM); UL1666 (CMR), IEC60332-1-2
LSZH Test :	IEC60754, IEC61034-2

Part No.	Conductor	Pair	Nominal Outer Diam.	Standard Length	Approx. Weight	Packaging
			(mm)	(m)	(kg/305m)	
<b>434P***5E</b>	Solid Bare Copper (24 AWG)	4	5.1	305	9	Reel in Box

### Electrical Properties @ 20°C

Conductor Resistance	≤ 9.38 Ω / 100m
Resistance Unbalance	≤ 5%
Mutual Capacitance	≤ 5.6nF / 100m
Capacitance Unbalance	≤ 330pF / 100m
Characteristics Impedance	100 ± 15 Ω

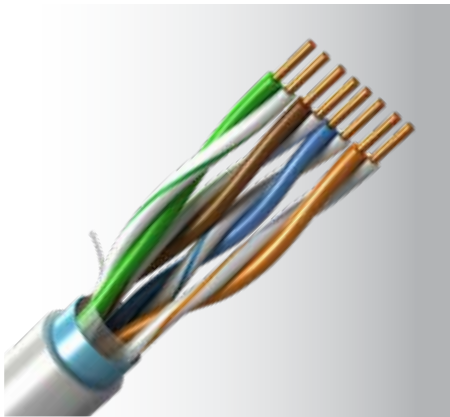
### Electrical Data @ 20°C

Frequency (MHz)	ATTENUATION Max (dB/100m)	Next Min (dB)	PSNEXT Min (dB)	ELFEXT Min (dB/100m)	PSELFEXT Min (dB/100m)	RL MIN (dB)	DELAY Max (ns/100m)	SKEW Max (ns/100m)
0.772	1.8	70.0	67.0	68.2	65.2	-	-	-
1	2.0	68.3	65.3	66.0	63.0	22.0	570	45
4	2.1	59.3	56.3	54.0	51.0	25.0	-	-
8	5.8	54.8	51.8	47.9	44.9	26.5	-	-
10	6.5	53.3	50.3	46.0	43.0	27.0	545	45
16	8.2	50.3	47.3	41.9	38.9	27.0	-	-
20	9.3	48.8	45.8	40.0	37.0	27.0	-	-
25	10.4	47.3	44.3	38.0	35.0	26.3	-	-
31.25	11.7	45.9	42.9	36.1	33.1	25.6	-	-
62.5	17.0	41.4	38.4	30.1	27.1	23.5	-	-
100	22.0	38.3	35.3	26.0	23.0	22.1	-	-
200	32.4	33.8	30.8	20.0	17.0	20.0	-	-
250	36.8	32.3	29.3	18.0	15.0	19.3	-	-
300	40.9	31.1	28.1	16.5	13.5	18.7	-	-
350	44.8	30.1	27.1	15.1	12.1	18.3	536	45

# 4 Pair LAN Cable

Category 5e

Model Code: F/UTP



Application :	<ul style="list-style-type: none"> <li>• High Speed Horizontal Cabling (100 MHz)</li> <li>• 10 / 100 Base-T</li> <li>• 100 Mbps Fast Ethernet; 155 Mbps ATM</li> <li>• EMI Proof</li> </ul>
Construction :	Solid bare copper, HDPE insulated, polyester tape, aluminium/polyester tape with drain wire, RoSH compliant PVC, LSZH or HDPE sheathed
Insulation colour :	<ul style="list-style-type: none"> <li>• Blue &amp; White/ Blue</li> <li>• Orange &amp; White/ Orange</li> <li>• Green &amp; White/ Green</li> <li>• Brown &amp; White/Brown</li> </ul>
Sheath colour :	Grey or Blue (RoHS compliant PVC), Orange (LSZH), Black (HDPE) or as per order
Specification :	ANSI/TIA-568-C.2, ISO/IEC11801, IEC61156-5
Flame Test :	UL1581 (CMX); UL1685 (CM); UL1666 (CMR), IEC60332-1-2
LSZH Test :	IEC60754, IEC61034-2

Part No.	Conductor	Pair	Nominal Outer Diam. (mm)	Standard Length (m)	Approx. Weight (kg/305m)	Packaging
<b>434P***5E</b>	Solid Bare Copper (24 AWG)	4	6.4	305	13	Reel in Box

### Electrical Properties @ 20°C

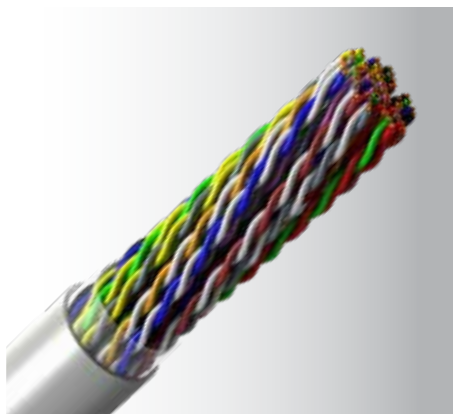
Conductor Resistance	≤ 9.38 Ω / 100m
Resistance Unbalance	≤ 5%
Mutual Capacitance	≤ 5.6nF / 100m
Capacitance Unbalance	≤ 330pF / 100m
Characteristics Impedance	100 ± 15 Ω

### Electrical Data @ 20°C

Frequency (MHz)	ATTENUATION Max (dB/100m)	Next Min (dB)	PSNEXT Min (dB)	ELFEXT Min (dB/100m)	PSELFEXT Min (dB/100m)	RL MIN (dB)	DELAY Max (ns/100m)	SKEW Max (ns/100m)
0.772	1.8	67.0	64.0	66.0	63.0	-	-	-
1	2.0	65.3	62.3	63.8	60.8	20.0	570	45
4	4.1	56.3	53.3	51.7	48.7	23.0	-	-
8	5.8	51.8	48.8	45.7	42.7	24.5	-	-
10	6.5	50.3	47.3	43.8	40.8	25.0	545	45
16	8.2	47.3	44.3	39.7	36.7	25.0	-	-
20	9.3	45.8	42.8	37.7	34.7	25.0	-	-
25	10.4	44.3	41.3	35.8	32.8	24.3	-	-
31.25	11.7	42.9	39.9	33.9	30.9	23.6	-	-
62.5	17.0	38.4	35.4	27.8	24.8	21.5	-	-
100	22.0	35.3	32.3	23.8	20.8	20.1	538	45

# Multi Pair LAN Cable

Category 5e  
Model Code: U/UTP



Application :	<ul style="list-style-type: none"> <li>• High Speed Horizontal Cabling (100 MHz)</li> <li>• 10 / 100 Base-T</li> <li>• 100 Mbps Fast Ethernet; 155 Mbps ATM</li> </ul>
Construction :	Solid bare copper, HDPE insulated, polyester tape, RoHS compliant PVC, LSZH or HDPE sheathed
Insulation colour :	According to standard
Sheath colour :	Grey or Blue (RoHS compliant PVC), Orange (LSZH), Black (HDPE) or as per order
Specifications :	ANSI/TIA-568-C.2, ISO/IEC11801, IEC61156-5
Flame Test :	UL1581 (CMX); UL1685 (CM); UL1666 (CMR), IEC60332-1-2
LSZH Test :	IEC60754, IEC61034-2

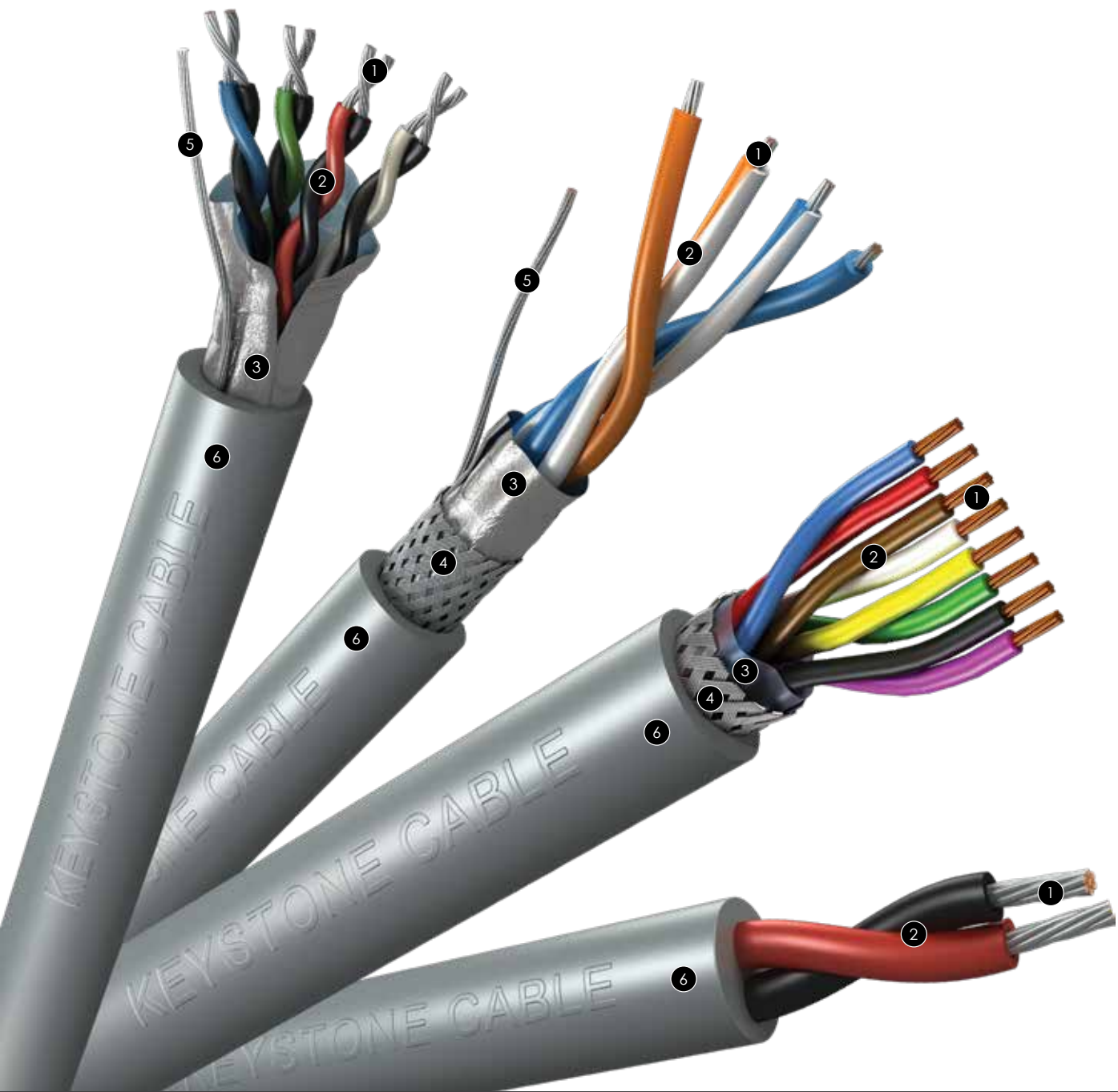
Part No.	Conductor	Pair	Nominal Outer Diam.	Standard Length	Approx. Weight	Packaging
			(mm)	(m)	(kg/km)	
<b>43PE***5E</b>	Solid Bare Copper (24 AWG)	25	13.3	1000	193	Wooden Reel

### Electrical Properties @ 20°C

Conductor Resistance	≤ 9.38 Ω / 100m
Resistance Unbalance	≤ 5%
Mutual Capacitance	≤ 5.6nF / 100m
Capacitance Unbalance	≤ 330pF / 100m
Characteristics Impedance	100 ± 15 Ω

### Electrical Data @ 20°C

Frequency	ATTENUATION Max	NEXT Min	ACR Min	PSACR Min	ELFEXT Min	PSELFEXT Min	RL Min	DELAY Max	SKEW Max
(MHz)	(dB/100m)	(dB)	(dB)	(dB)	(dB/100m)	(dB/100m)	(dB)	(ns/100m)	(ns/100m)
1	3.0	60.0	57.0	54.0	57.4	54.4	17.0	555	50
4	4.5	53.5	49.1	46.1	45.4	42.4	17.0		
8	6.3	48.6	42.3	39.3	39.3	36.3	17.0		
10	7.1	47.0	39.9	36.9	37.4	34.4	17.0		
16	9.1	43.6	34.5	31.5	33.3	30.3	17.0		
20	10.2	42.0	31.8	28.8	31.4	28.4	17.0		
25	11.4	40.3	28.9	25.9	29.4	26.4	16.0		
31.25	12.9	38.7	25.9	22.9	27.5	24.5	15.1		
62.5	18.6	33.6	15.0	12.0	21.5	18.5	12.0		
100	24.0	30.1	6.1	3.1	17.4	14.4	10.0		



## Signal Cables

1	Conductor	Plain or Tinned Annealed Copper Wire
2	Insulation	PVC or PE
3	Overall Screen	Aluminium/Polyester Tape
4	Braided Screen	Tinned Copper Wire Braided
5	Drain Wire	Tinned Copper Wire
6	Oversheath	PVC

## Signal Cables

### Multi-core PVC Insulated, PVC Sheathed Flexible Cable

Description: CU/PVC/PVC

Model Code: LiYY



Application :	For control and signal cable in electronics of computer system, electronic control equipment, office machine and measurement devices
Construction :	Fine-stranded bare copper wire, PVC (T12) insulated, PVC (TM2) sheathed
Core Colour :	According to DIN 47100
Sheath Colour :	Grey
Operating Temperature :	Static: -30°C ~ 70°C Flexing: -5°C ~ 70°C
Insulation Resistance :	200 MΩ·km
Operating Voltage :	0.14 to 0.25mm <sup>2</sup> - 250V 0.34 to 0.5mm <sup>2</sup> - 300/500V
Specification :	VDE 0812, IEC60332-1-2

Part No.	No. of Core (no)	Conductor			Insulation Norminal Thickness (mm)	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)			
00023825	2	0.14	18/0.10	0.49	0.3	3.2	13
00033825	3	0.14	18/0.10	0.49	0.3	3.3	16
00043825	4	0.14	18/0.10	0.49	0.3	3.5	19
00053825	5	0.14	18/0.10	0.49	0.3	4.0	22
00063825	6	0.14	18/0.10	0.49	0.3	4.3	25
00073825	7	0.14	18/0.10	0.49	0.3	4.3	28
00083825	8	0.14	18/0.10	0.49	0.3	4.7	35
00103825	10	0.14	18/0.10	0.49	0.3	5.3	41
00123825	12	0.14	18/0.10	0.49	0.3	5.6	48
00143825	14	0.14	18/0.10	0.49	0.3	5.9	53
00163825	16	0.14	18/0.10	0.49	0.3	6.2	59
00183825	18	0.14	18/0.10	0.49	0.3	6.5	65
00203825	20	0.14	18/0.10	0.49	0.3	6.6	70
00243825	24	0.14	18/0.10	0.49	0.3	7.6	87
00253825	25	0.14	18/0.10	0.49	0.3	7.7	91
00303825	30	0.14	18/0.10	0.49	0.3	8.0	108
01023825	2	0.25	14/0.15	0.65	0.3	3.8	18
01033825	3	0.25	14/0.15	0.65	0.3	3.9	22
01043825	4	0.25	14/0.15	0.65	0.3	4.3	26
01053825	5	0.25	14/0.15	0.65	0.3	4.8	30
01063825	6	0.25	14/0.15	0.65	0.3	5.2	36
01073825	7	0.25	14/0.15	0.65	0.3	5.2	42
01083825	8	0.25	14/0.15	0.65	0.3	5.7	49
01103825	10	0.25	14/0.15	0.65	0.3	6.4	57
01123825	12	0.25	14/0.15	0.65	0.3	6.7	66
01143825	14	0.25	14/0.15	0.65	0.3	7.1	75
01163825	16	0.25	14/0.15	0.65	0.3	7.5	84
01183825	18	0.25	14/0.15	0.65	0.3	7.9	92
01203825	20	0.25	14/0.15	0.65	0.3	9.1	101
01243825	24	0.25	14/0.15	0.65	0.3	9.8	120
01253825	25	0.25	14/0.15	0.65	0.3	9.9	132
01303825	30	0.25	14/0.15	0.65	0.3	10.3	156

## Multi-core PVC Insulated, PVC Sheathed Flexible Cable

Description: CU/PVC/PVC

Model Code: LiYY

Part No.	No. of Core (no)	Conductor			Insulation Nominal Thickness (mm)	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)			
02023863	2	0.34	7/0.25	0.75	0.4	4.2	22
02033863	3	0.34	7/0.25	0.75	0.4	4.4	30
02043863	4	0.34	7/0.25	0.75	0.4	4.9	43
02053863	5	0.34	7/0.25	0.75	0.4	5.3	54
02063863	6	0.34	7/0.25	0.75	0.4	5.9	58
02073863	7	0.34	7/0.25	0.75	0.4	5.9	61
02083863	8	0.34	7/0.25	0.75	0.4	6.3	73
02103863	10	0.34	7/0.25	0.75	0.4	7.2	82
02123863	12	0.34	7/0.25	0.75	0.4	7.6	102
02143863	14	0.34	7/0.25	0.75	0.4	8.0	108
02163863	16	0.34	7/0.25	0.75	0.4	8.4	126
02183863	18	0.34	7/0.25	0.75	0.4	8.9	143
02203863	20	0.34	7/0.25	0.75	0.4	9.8	160
02243863	24	0.34	7/0.25	0.75	0.4	11.0	186
02253863	25	0.34	7/0.25	0.75	0.4	11.2	192
02303863	30	0.34	7/0.25	0.75	0.4	11.6	226
04023863	2	0.5	16/0.20	0.92	0.4	4.8	40
04033863	3	0.5	16/0.20	0.92	0.4	5.1	46
04043863	4	0.5	16/0.20	0.92	0.4	5.7	55
04053863	5	0.5	16/0.20	0.92	0.4	6.2	64
04063863	6	0.5	16/0.20	0.92	0.4	7.4	74
04073863	7	0.5	16/0.20	0.92	0.4	7.4	81
04083863	8	0.5	16/0.20	0.92	0.4	8.0	97
04103863	10	0.5	16/0.20	0.92	0.4	8.8	116
04123863	12	0.5	16/0.20	0.92	0.4	9.1	135
04143863	14	0.5	16/0.20	0.92	0.4	9.5	151
04163863	16	0.5	16/0.20	0.92	0.4	10.0	168
04183863	18	0.5	16/0.20	0.92	0.4	10.6	182
04203863	20	0.5	16/0.20	0.92	0.4	11.2	213
04243863	24	0.5	16/0.20	0.92	0.4	12.3	241
04253863	25	0.5	16/0.20	0.92	0.4	12.5	249
04303863	30	0.5	16/0.20	0.92	0.4	13.5	303

## Signal Cables

### Multi-Pair PVC Insulated, PVC Sheathed Flexible Cable

Description: CU/PVC/PVC

Model Code: LiYY-TP



Application :	For control and signal cable in electronics of computer system, electronic control equipment, office machine and measurement devices
Construction :	Fine-stranded bare copper wire, PVC (T12) insulated, twisted pairs, polyester tape over cable assembly, polyester tape and PVC (TM2) sheathed
Core Colour :	According to DIN 47100
Sheath Colour :	Grey
Operating Temperature :	Static: -30°C ~ 70°C Flexing: -5°C ~ 70°C
Insulation Resistance :	200 MΩ·km
Operating Voltage :	0.14 to 0.25mm <sup>2</sup> - 250V 0.34 to 0.5mm <sup>2</sup> - 300/500V
Specification :	VDE 0812, IEC60332-1-2

Part No.	No. of Pair (no)	Conductor			Insulation Nominal Thickness (mm)	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)			
002P3826	2	0.14	18/0.10	0.49	0.3	4.9	25
003P3826	3	0.14	18/0.10	0.49	0.3	5.0	32
004P3826	4	0.14	18/0.10	0.49	0.3	5.5	39
005P3826	5	0.14	18/0.10	0.49	0.3	6.2	46
006P3826	6	0.14	18/0.10	0.49	0.3	6.4	51
008P3826	8	0.14	18/0.10	0.49	0.3	7.0	59
000P3826	10	0.14	18/0.10	0.49	0.3	8.1	78
00BP3826	12	0.14	18/0.10	0.49	0.3	8.9	95
00DP3826	14	0.14	18/0.10	0.49	0.3	9.4	106
00FP3826	16	0.14	18/0.10	0.49	0.3	9.7	111
00HP3826	18	0.14	18/0.10	0.49	0.3	10.2	120
00KP3826	20	0.14	18/0.10	0.49	0.3	10.8	125
00PE3826	25	0.14	18/0.10	0.49	0.3	11.7	181
012P3826	2	0.25	14/0.15	0.65	0.3	6.1	30
013P3826	3	0.25	14/0.15	0.65	0.3	6.3	38
014P3826	4	0.25	14/0.15	0.65	0.3	6.6	49
015P3826	5	0.25	14/0.15	0.65	0.3	7.2	58
016P3826	6	0.25	14/0.15	0.65	0.3	7.8	66
018P3826	8	0.25	14/0.15	0.65	0.3	8.4	85
010P3826	10	0.25	14/0.15	0.65	0.3	9.8	108
01BP3826	12	0.25	14/0.15	0.65	0.3	10.2	125
01DP3826	14	0.25	14/0.15	0.65	0.3	11.0	142

Multi-Pair PVC Insulated, PVC Sheathed Flexible Cable

Description: CU/PVC/PVC

Model Code: LiYY-TP

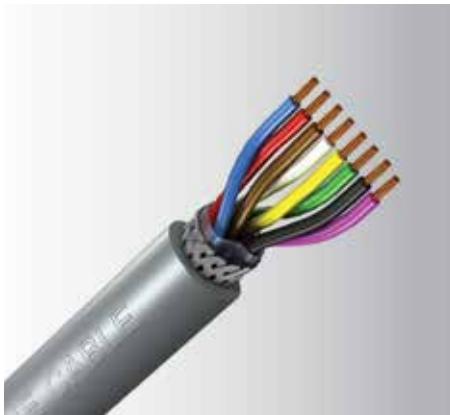
Part No.	No. of Pair (no)	Conductor			Insulation	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)	Norminal Thickness (mm)		
<b>022P3864</b>	2	0.34	7/0.25	0.75	0.4	6.6	40
<b>023P3864</b>	3	0.34	7/0.25	0.75	0.4	7.0	53
<b>024P3864</b>	4	0.34	7/0.25	0.75	0.4	7.8	66
<b>025P3864</b>	5	0.34	7/0.25	0.75	0.4	8.7	79
<b>026P3864</b>	6	0.34	7/0.25	0.75	0.4	9.6	98
<b>028P3864</b>	8	0.34	7/0.25	0.75	0.4	10.2	119
<b>020P3864</b>	10	0.34	7/0.25	0.75	0.4	11.6	150
<b>028P3864</b>	12	0.34	7/0.25	0.75	0.4	12.4	175
<b>02DP3864</b>	14	0.34	7/0.25	0.75	0.4	13.5	201
<b>042P3864</b>	2	0.5	16/0.20	0.92	0.4	7	48
<b>043P3864</b>	3	0.5	16/0.20	0.92	0.4	7.5	64
<b>044P3864</b>	4	0.5	16/0.20	0.92	0.4	8.4	87
<b>045P3864</b>	5	0.5	16/0.20	0.92	0.4	9.2	105
<b>046P3864</b>	6	0.5	16/0.20	0.92	0.4	10.2	120
<b>048P3864</b>	8	0.5	16/0.20	0.92	0.4	11.0	150
<b>040P3864</b>	10	0.5	16/0.20	0.92	0.4	12.4	184
<b>048P3864</b>	12	0.5	16/0.20	0.92	0.4	13.4	221
<b>04DP3864</b>	14	0.5	16/0.20	0.92	0.4	14.6	259

## Signal Cables

Multi-core PVC Insulated, Braided Screen, PVC Sheathed Flexible Cable

Description: CU/PVC/TCWB/PVC

Model Code: LiYCY



Application :	For computer, data transmission, office equipment process control and instrumentation usage where EMI protection is required
Construction :	Fine-stranded bare copper wire, PVC(T12) insulated, polyester tape over cable assembly, tinned copper wire braided screen, PVC(TM2) sheathed
Core Colour :	According to DIN 47100
Sheath Colour :	Grey
Operating Temperature :	Static: -30°C ~ 70°C Flexing: -5°C ~ 70°C
Insulation Resistance :	200 MΩ·km
Operating Voltage :	0.14 to 0.25mm <sup>2</sup> - 250V 0.34 to 0.5mm <sup>2</sup> - 300/500V
Specification :	VDE 0812, IEC60332-1-2

Part No.	No. of Core (no)	Conductor			Insulation Nominal Thickness (mm)	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)			
00023827	2	0.14	18/0.10	0.49	0.3	3.9	20
00033827	3	0.14	18/0.10	0.49	0.3	4.1	28
00043827	4	0.14	18/0.10	0.49	0.3	4.3	33
00053827	5	0.14	18/0.10	0.49	0.3	4.6	38
00063827	6	0.14	18/0.10	0.49	0.3	4.9	38
00073827	7	0.14	18/0.10	0.49	0.3	4.9	49
00083827	8	0.14	18/0.10	0.49	0.3	5.8	56
00103827	10	0.14	18/0.10	0.49	0.3	6.1	66
00123827	12	0.14	18/0.10	0.49	0.3	6.3	78
00143827	14	0.14	18/0.10	0.49	0.3	6.7	80
00163827	16	0.14	18/0.10	0.49	0.3	7.0	90
00183827	18	0.14	18/0.10	0.49	0.3	7.3	104
00203827	20	0.14	18/0.10	0.49	0.3	7.7	116
00253827	25	0.14	18/0.10	0.49	0.3	8.6	149
00303827	30	0.14	18/0.10	0.49	0.3	8.9	158
01023827	2	0.25	14/0.15	0.65	0.3	4.5	32
01033827	3	0.25	14/0.15	0.65	0.3	4.7	37
01043827	4	0.25	14/0.15	0.65	0.3	5.0	41
01053827	5	0.25	14/0.15	0.65	0.3	5.6	51
01063827	6	0.25	14/0.15	0.65	0.3	6.0	58
01073827	7	0.25	14/0.15	0.65	0.3	6.0	65
01083827	8	0.25	14/0.15	0.65	0.3	7.1	73
01103827	10	0.25	14/0.15	0.65	0.3	7.5	82
01123827	12	0.25	14/0.15	0.65	0.3	7.7	98
01143827	14	0.25	14/0.15	0.65	0.3	8.0	99
01163827	16	0.25	14/0.15	0.65	0.3	8.4	124
01183827	18	0.25	14/0.15	0.65	0.3	8.8	143
01203827	20	0.25	14/0.15	0.65	0.3	9.3	152
01253827	25	0.25	14/0.15	0.65	0.3	10.7	172
01303827	30	0.25	14/0.15	0.65	0.3	11.0	189

## Signal Cables

Multi-core PVC Insulated, Braided Screen, PVC Sheathed Flexible Cable

Description: CU/PVC/TCWB/PVC

Model Code: LiYCY

Part No.	No. of Core (no)	Conductor			Insulation Nominal Thickness (mm)	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)			
02023865	2	0.34	7/0.25	0.75	0.4	4.9	37
02033865	3	0.34	7/0.25	0.75	0.4	5.1	49
02043865	4	0.34	7/0.25	0.75	0.4	5.7	59
02053865	5	0.34	7/0.25	0.75	0.4	6.2	66
02063865	6	0.34	7/0.25	0.75	0.4	6.8	79
02073865	7	0.34	7/0.25	0.75	0.4	6.8	83
02083865	8	0.34	7/0.25	0.75	0.4	7.8	94
02103865	10	0.34	7/0.25	0.75	0.4	8.3	129
02123865	12	0.34	7/0.25	0.75	0.4	8.5	142
02143865	14	0.34	7/0.25	0.75	0.4	8.9	154
02163865	16	0.34	7/0.25	0.75	0.4	9.4	160
02183865	18	0.34	7/0.25	0.75	0.4	10.2	173
02203865	20	0.34	7/0.25	0.75	0.4	10.7	192
02253865	25	0.34	7/0.25	0.75	0.4	12.0	260
02303865	30	0.34	7/0.25	0.75	0.4	12.5	292
04023865	2	0.5	16/0.20	0.92	0.4	5.6	54
04033865	3	0.5	16/0.20	0.92	0.4	5.9	67
04043865	4	0.5	16/0.20	0.92	0.4	6.5	77
04053865	5	0.5	16/0.20	0.92	0.4	7.0	90
04063865	6	0.5	16/0.20	0.92	0.4	7.8	104
04073865	7	0.5	16/0.20	0.92	0.4	7.8	112
04083865	8	0.5	16/0.20	0.92	0.4	8.7	135
04103865	10	0.5	16/0.20	0.92	0.4	9.5	160
04123865	12	0.5	16/0.20	0.92	0.4	9.8	177
04183865	18	0.5	16/0.20	0.92	0.4	11.8	239
04203865	20	0.5	16/0.20	0.92	0.4	12.2	276
04253865	25	0.5	16/0.20	0.92	0.4	14.0	352
04303865	30	0.5	16/0.20	0.92	0.4	14.8	399

## Signal Cables

Multi-Pair PVC Insulated, Braided Screen, PVC Sheathed Flexible Cable

Description: CU/PVC/TCWB/PVC

Model Code: LiYCY-TP



Application :	For computer, data transmission, office equipment process control and instrumentation usage where EMI protection is required
Construction :	Fine-stranded bare copper wire, PVC(T12) insulated, twisted pairs, polyester tape over cable assembly, tinned copper wire braided screen, PVC(TM2) sheathed
Core Colour:	According to DIN 47100
Sheath Colour :	Grey
Operating Temperature :	Static: -30°C ~ 70°C Flexing: -5°C ~ 70°C
Insulation Resistance :	200 MΩ·km
Operating Voltage :	0.14 to 0.25mm <sup>2</sup> - 250V 0.34 to 0.5mm <sup>2</sup> - 300/500V
Specification :	VDE 0812, IEC60332-1-2

Part No.	No. of Pair (no)	Conductor			Insulation Norminal Thickness (mm)	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)			
002P3828	2	0.14	18/0.10	0.49	0.3	5.6	40
003P3828	3	0.14	18/0.10	0.49	0.3	5.8	49
004P3828	4	0.14	18/0.10	0.49	0.3	6.2	54
005P3828	5	0.14	18/0.10	0.49	0.3	6.5	66
006P3828	6	0.14	18/0.10	0.49	0.3	7.3	85
008P3828	8	0.14	18/0.10	0.49	0.3	8.2	97
000P3828	10	0.14	18/0.10	0.49	0.3	8.7	110
00BP3828	12	0.14	18/0.10	0.49	0.3	9.3	142
00DP3828	14	0.14	18/0.10	0.49	0.3	10.0	148
00FP3828	16	0.14	18/0.10	0.49	0.3	10.7	155
00HP3828	18	0.14	18/0.10	0.49	0.3	11.0	171
00KP3828	20	0.14	18/0.10	0.49	0.3	11.3	184
00PE3828	25	0.14	18/0.10	0.49	0.3	12.5	238
012P3828	2	0.25	14/0.15	0.65	0.3	7.0	54
013P3828	3	0.25	14/0.15	0.65	0.3	7.1	68
014P3828	4	0.25	14/0.15	0.65	0.3	7.6	81
015P3828	5	0.25	14/0.15	0.65	0.3	8.1	102
016P3828	6	0.25	14/0.15	0.65	0.3	8.3	115
018P3828	8	0.25	14/0.15	0.65	0.3	10.3	130
010P3828	10	0.25	14/0.15	0.65	0.3	11.0	158
01BP3828	12	0.25	14/0.15	0.65	0.3	11.6	190
01DP3828	14	0.25	14/0.15	0.65	0.3	12.0	213
01FP3828	16	0.25	14/0.15	0.65	0.3	13.0	238
01HP3828	18	0.25	14/0.15	0.65	0.3	13.2	248
01KP3828	20	0.25	14/0.15	0.65	0.3	13.7	275
01PE3828	25	0.25	14/0.15	0.65	0.3	16.1	344

# Signal Cables



tel (65) 6367 0107 fax (65) 6365 2963  
www.keystone-cable.com

Multi-Pair PVC Insulated, Braided Screen, PVC Sheathed Flexible Cable

Description: CU/PVC/TCWB/PVC

Model Code: LiYCY-TP

Part No.	No. of Pair (no)	Conductor			Insulation Norminal Thickness (mm)	Approx. OD (mm)	Approx. Weight (kg/km)
		Area (mm <sup>2</sup> )	No. of Wire & Diam. (no/mm)	Stranded Diam. (mm)			
022P3866	2	0.34	7/0.25	0.75	0.4	7.3	65
023P3866	3	0.34	7/0.25	0.75	0.4	7.5	78
024P3866	4	0.34	7/0.25	0.75	0.4	8.0	90
025P3866	5	0.34	7/0.25	0.75	0.4	8.9	111
026P3866	6	0.34	7/0.25	0.75	0.4	10.5	130
028P3866	8	0.34	7/0.25	0.75	0.4	10.9	150
020P3866	10	0.34	7/0.25	0.75	0.4	12.0	190
02BP3866	12	0.34	7/0.25	0.75	0.4	13.2	220
02DP3866	14	0.34	7/0.25	0.75	0.4	13.6	245
02FP3866	16	0.34	7/0.25	0.75	0.4	15.1	250
02HP3866	18	0.34	7/0.25	0.75	0.4	15.5	275
02KP3866	20	0.34	7/0.25	0.75	0.4	16.2	288
02PE3866	25	0.34	7/0.25	0.75	0.4	17.9	400
042P3866	2	0.5	16/0.20	0.92	0.4	7.8	93
043P3866	3	0.5	16/0.20	0.92	0.4	8.8	109
044P3866	4	0.5	16/0.20	0.92	0.4	9.4	136
045P3866	5	0.5	16/0.20	0.92	0.4	10.5	152
046P3866	6	0.5	16/0.20	0.92	0.4	11.4	198
048P3866	8	0.5	16/0.20	0.92	0.4	12.5	259
040P3866	10	0.5	16/0.20	0.92	0.4	13.5	320
04BP3866	12	0.5	16/0.20	0.92	0.4	14.2	354
04DP3866	14	0.5	16/0.20	0.92	0.4	15.3	401
04FP3866	16	0.5	16/0.20	0.92	0.4	16.2	459
04HP3866	18	0.5	16/0.20	0.92	0.4	17.5	522
04KP3866	20	0.5	16/0.20	0.92	0.4	19.5	580
04PE3866	25	0.5	16/0.20	0.92	0.4	22.5	740

## Signal Cables

### Single Pair PVC Insulated, PVC Sheathed UL 2464 Cable

Description: TC/PVC/PVC



Application :	Internal wiring or external interconnection of electrical equipment, remote control circuit and PA system
Voltage Rating :	300V
Construction :	Stranded tinned copper wire, PVC insulated, cores twisted together in pair, PVC sheathed
Insulation Colour :	Red & Black
Sheath Colour :	Grey
Specification :	UL 758, UL 1581, UL style 2464, IEC60332-1-2
Operating Temperature :	80°C

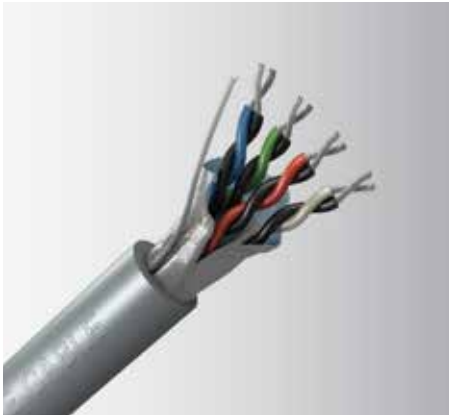
Part No.	Conductor				Insulation		Approx Overall Diam.	Approx Weight	Conductor Resistance @ 20°C	Mutual Capacitance Nom.
	Nos pair & Cross-sectional		Nos & Strand	Stranded Diam.	Thickness Nom.	Core Diam.				
	(nos)	(AWG)	(nos/mm)	(mm)	(mm)	(mm)				
<b>451P1022</b>	1	22	7/0.254	0.75	0.4	1.6	4.8	30	59.4	80
<b>461P1022</b>	1	20	7/0.32	0.93	0.4	1.7	5.2	39	36.7	80
<b>471P1022</b>	1	18	16/0.254	1.17	0.4	2.0	5.8	49	23.5	85
<b>481P1022</b>	1	16	19/0.287	1.44	0.5	2.4	6.6	68	14.6	100

## Signal Cables

Multi-Pair PVC Insulated, Overall Foil Screen, PVC Sheathed UL2464 Cable

tel (65) 6367 0107 fax (65) 6365 2963  
www.keystone-cable.com

Description: TC/PVC/OS/PVC



Application :	For internal and external wiring of electronic equipment
Voltage Rating :	300V
Construction :	Stranded tinned copper wire, PVC insulated, twisted pairs, aluminium/polyester tape with tinned copper drain wire, PVC sheathed
Insulation Colour :	UL 2464 colour coded (page 28)
Sheath Colour :	Grey
Specification :	UL 758, UL 1581, UL style 2464, IEC60332-1-2
Operating Temperature :	80°C

Part No.	Conductor			Insulation		Screen	Approx. Overall Diam.	Approx. Weight	Max Conductor Resistance @ 20°C	
	Nos pair & Cross-sectional		Nos & Strand	Stranded Diam.	Thickness Nom.	Core Diam.				Type
	(nos)	(AWG)	(nos/mm)	(mm)	(mm)	(mm)				(-)
<b>451P1002</b>	1P	22	7/0.254	0.75	0.4	1.7	5.1	37	59.4	
<b>452P1002</b>	2P	22	7/0.254	0.75	0.4	1.7	7.0	65		
<b>453P1002</b>	3P	22	7/0.254	0.75	0.4	1.7	7.5	84		
<b>454P1002</b>	4P	22	7/0.254	0.75	0.4	1.7	8.2	95		
<b>455P1002</b>	5P	22	7/0.254	0.75	0.4	1.7	9.1	105		
<b>456P1002</b>	6P	22	7/0.254	0.75	0.4	1.7	9.8	124		
<b>458P1002</b>	8P	22	7/0.254	0.75	0.4	1.7	11.0	152		
<b>450P1002</b>	10P	22	7/0.254	0.75	0.4	1.7	12.5	188		
<b>461P1002</b>	1P	20	7/0.32	0.96	0.4	1.8	5.8	47	36.7	
<b>462P1002</b>	2P	20	7/0.32	0.96	0.4	1.8	7.8	80		
<b>463P1002</b>	3P	20	7/0.32	0.96	0.4	1.8	8.2	104		
<b>464P1002</b>	4P	20	7/0.32	0.96	0.4	1.8	9.2	125		
<b>465P1002</b>	5P	20	7/0.32	0.96	0.4	1.8	10.2	136		
<b>466P1002</b>	6P	20	7/0.32	0.96	0.4	1.8	11.2	162		

Multi-Pair PVC Insulated, Overall Foil Screen, PVC Sheathed UL2464 Cable

Description: TC/PVC/OS/PVC

Part No.	Conductor				Insulation		Screen	Approx. Overall Diam.	Approx. Weight	Max Conductor Resistance @ 20°C
	Nos pair & Cross-sectional		Nos & Strand	Stranded Diam.	Thickness Nom.	Core Diam.	Type			
	(nos)	(AWG)	(nos/mm)	(mm)	(mm)	(mm)	(-)			
<b>471P1002</b>	1P	18	16/0.254	1.17	0.4	2.0	Aluminium Foil	8.1	52	23.5
<b>472P1002</b>	2P	18	16/0.254	1.17	0.4	2.0		9.1	103	
<b>473P1002</b>	3P	18	16/0.254	1.17	0.4	2.0		9.8	139	
<b>474P1002</b>	4P	18	16/0.254	1.17	0.4	2.0		10.6	163	
<b>475P1002</b>	5P	18	16/0.254	1.17	0.4	2.0		11.5	181	
<b>476P1002</b>	6P	18	16/0.254	1.17	0.4	2.0		12.6	208	
<b>481P1002</b>	1P	16	19/0.287	1.44	0.5	2.4	Aluminium Foil	6.7	69	14.6
<b>482P1002</b>	2P	16	19/0.287	1.44	0.5	2.4		10.6	134	
<b>483P1002</b>	3P	16	19/0.287	1.44	0.5	2.4		11.4	182	
<b>484P1002</b>	4P	16	19/0.287	1.44	0.5	2.4		12.6	215	
<b>485P1002</b>	5P	16	19/0.287	1.44	0.5	2.4		14.0	264	
<b>486P1002</b>	6P	16	19/0.287	1.44	0.5	2.4		15.2	306	

### UL2464 Color Code for Multipair & Multicore

Multipair						Multicore #1		Multicore #2			
Pair no	Core A	Core B	Pair no	Core A	Core B	Core	Color	Core	Color	Core	Color
1	Black	Red	16	Green	Yellow	1	Black	1	Black	11	Blue-black
2	Black	White	17	Green	Brown	2	White	2	White	12	Black-white
3	Black	Green	18	Green	Orange	3	Red	3	Red	13	Red-white
4	Black	Blue	19	White	Blue	4	Green	4	Green	14	Green-white
5	Black	Yellow	20	White	Yellow	5	Brown	5	Orange	15	Blue-white
6	Black	Brown	21	White	Brown	6	Blue	6	Blue	16	Black-red
7	Black	Orange	22	White	Orange	7	Orange	7	White-black	17	White-red
8	Red	White	23	Blue	Yellow	8	Yellow	8	Red-black	18	Orange-red
9	Red	Green	24	Blue	Brown	9	Purple	9	Green-black	19	Blue-red
10	Red	Blue	25	Blue	Orange	10	Grey	10	Orange-black	20	Red-green
11	Red	Yellow				11	Pink				
12	Red	Brown				12	Tan				
13	Red	Orange									
14	Green	White									
15	Green	Blue									

## Signal Cables

Single Pair PE Insulated, Overall Foil Screen, PVC Sheathed UL 2092 Cable

Description: TC/PE/OS/PVC

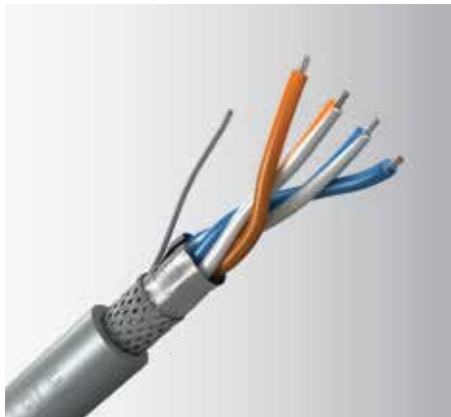


Application :	Internal or external interconnection of electronic equipment
Voltage Rating :	300V
Construction :	Stranded tinned copper wire, PE insulated, cores twisted together in pair, aluminium/ polyester tape with tinned copper drain wire, PVC sheathed
Insulation Colour :	Clear & Black
Sheath Colour :	Grey
Specification :	UL758, UL 1581, UL style 2092, IEC60332-1-2
Operating Temperature :	80°C

Part No.	Conductor				Insulation		Screen	Approx Overall Diam.	Approx Weight	Conductor Resistance @ 20°C	Mutual Capacitance Nom.
	Nos pair & Cross-sectional		Nos & Strand	Stranded Diam.	Thickness Nom.	Core Diam.	Type				
	(nos)	(AWG)	(nos/mm)	(mm)	(mm)	(mm)	(-)				
<b>451P1004</b>	1	22	7/0.254	0.75	0.4	1.6	Aluminium Foil	4.4	24	59.4	65
<b>461P1004</b>	1	20	7/0.32	0.96	0.4	1.7	Aluminium Foil	5.2	31	36.7	75
<b>471P1004</b>	1	18	16/0.254	1.17	0.4	2.0	Aluminium Foil	5.6	37	23.5	80

## PE Insulated, Double Overall Screen, PVC Sheathed RS 485 Cable

Description: TC/PE/OS/OBS/PVC



Application :	For use in communication interface in data acquisition and control application in computer and automation system. In building automation - Interconnect security control panels and device such as access control card readers. In industrial application where higher speed and longer distance are needed
Voltage Rating :	300V
Construction :	Stranded tinned copper wire, PE insulated, double overall screen, twisted pairs, aluminium/polyester tape (metallic side out) with tinned copper drain wire, plus a overall braid of tinned copper wire, PVC insulated
Insulation Colour :	See colour code table 24
Sheath Colour :	Grey
Specification :	EIA-485, UL2919, IEC60332-1-2
Operating Temperature :	-25°C to 75°C

Part No.	Conductor		Insulation		Overall Screen		Overall Approx. Diam.	Approx. Weight
	No. of Pair	Size	Material	Nominal Diam.	Type	Braided Coverage		
	(no)	(AWG)	(-)	(mm)	(-)	(%)		
431P1008	1	24	PE	1.7	Aluminium foil + braid	90	5.9	54
432P1008	2	24	PE	1.7		90	8.7	81
433P1008	3	24	PE	1.7		90	9.2	93
434P1008	4	24	PE	1.7		90	9.9	122
451P1008	1	22	PE	1.95		90	7.2	65
452P1008	2	22	PE	1.85		90	9.2	106
453P1008	3	22	PE	1.85		90	9.8	136
454P1008	4	22	PE	1.85		90	10.3	160
461P1008	1	20	PE	2.1		90	7.2	73
462P1008	2	20	PE	2.1		90	9.7	115
463P1008	3	20	PE	2.1		90	10.3	152
464P1008	4	20	PE	2.1		90	11.4	180
471P1008	1	18	PE	3.2		90	9.1	110
472P1008	2	18	PE	3.1		90	11.7	214
473P1008	3	18	PE	3.1		90	14.4	269
474P1008	4	18	PE	3.1		90	15.8	323



## Coaxial Cables

1	Conductor	Bare Solid Copper or Copper Clad Steel
2	Insulation	Foam PE (FPE) or Polyethylene (PE)
3	Shield-1	Bonded Aluminium/Polyester Tape
4	Shield-2	Aluminium Wire or Bare Copper Wire Braid
5	Oversheath	PVC

Model Code: RG 6/U



Application :	For high frequency transmission For low-power video and RF signal connections and for use at baseband video frequencies, such as composite video
Construction :	Solid copper clad steel conductor, foam PE, bonded aluminium/polyester plus braid of aluminium wire, PVC sheathed
Insulation Colour :	White
Sheath colour :	Black
Operating Temperature :	-40°C to +80°C
Specification :	MIL-C-17, IEC60332-1-2

Part No.	Conductor		Insulation Diam. (mm)	Shields		Approx. Overall Diam. (mm)	Approx. weight (kg/km)	Maximum pulling tension (N)	Minimum bending radius (mm)
	Size	No./Diam.		Inner shield	Outer shield				
	(AWG)	(no./mm)		Type/Coverage					
4701R002	18	1/1.02	4.6	Bonded Aluminium/ Polyester	AL wire braided (90%)	6.8	42	68	720

### Electrical Data

Conductor Type	Copper-Clad Steel (CCS)
Max conductor resistance, DC @ 20°C	91.5 (Ohm/km)
Capacitance at 1kHz	55 (pF/m)
Characteristic impedance at 5~1000 MHz	75 ± 3 (Ohm)
Nominal Inductance	0.32 (µH/m)

### Max Attenuation @ 20°C

Frequency (MHz)	Attenuation (dB/100m)	Frequency (MHz)	Attenuation (dB/100m)
5	2.20	400	13.12
55	5.25	450	14.00
211	9.42	550	15.50
270	10.63	750	18.34
300	11.25	870	19.70
350	12.21	1000	21.50

### Return Loss

Frequency (MHz)	Return Loss dB
1~1000	20

Model Code: RG11/U



Application :	For high frequency transmission, CATV, HDTV, TV antenna and video distribution. For long-length, it is an ideal entry point feeder system that runs through a commercial or residential building into each floor and room. It is also suitable for improved audio and video performance in home theatre applications
Construction :	Solid copper clad steel conductor, foam PE, bonded aluminium/polyester plus braid of aluminium wire, PVC sheathed
Insulation Colour :	White
Sheath Colour:	Black
Operating Temperature:	-40°C to +80°C
Specification :	MIL-C-17, IEC60332-1-2

Part No.	Conductor		Insulation Diam. (mm)	Shields		Approx. Overall Diam. (mm)	Approx. weight (kg/km)	Maximum pulling tension (N)	Minimum bending radius (mm)
	Size	No./Diam.		Inner shield	Outer shield				
	(AWG)	(no./mm)		Type/Coverage					
<b>4901R003</b>	14	1/1.63	7.11	Bonded Aluminium/ Polyester	AL wire braided (60%)	10	85	1156	100

### Electrical Data

Max conductor resistance, DC @ 20°C	36.1 (Ohm/km)
Capacitance at 1kHz	53 (pF/m)
Characteristic impedance at 5~1000 MHz	75 ± 3 (Ohm)
Nominal Inductance	0.32 (µH/m)

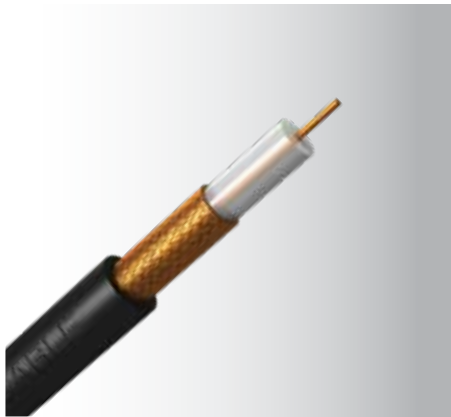
### Max, Attenuation @ 20°C

Frequency (MHz)	Attenuation (dB/100m)	Frequency (MHz)	Attenuation (dB/100m)
5	1.25	400	8.60
55	3.15	450	9.00
211	6.23	500	9.52
250	6.73	550	10.00
270	7.00	600	10.50
300	7.40	750	12.00
330	7.70	870	13.32
350	7.94	1000	14.30

### Return Loss

Frequency (MHz)	Return Loss dB
1~1000	20

Model Code: RG59/U



Application :	For high frequency transmission. For low-power video and RF signal connections and for use at baseband video frequencies, such as composite video. This cable is a perfect fit when digital cables are not required
Construction :	Bare solid copper conductor, PE insulated, copper wire braid, PVC sheathed
Insulation Colour :	Natural
Sheath Colour :	Black
Operating Temperature :	-40°C to +75°C
Specification :	MIL-C-17, IEC60332-1-2

Part No.	Conductor			Insulation Diam.	Shields	Approx. Overall Diam.	Approx. weight	Maximum pulling tension	Minimum bending radius
	Size	Type/No/Diam of Strand							
	(AWG)	Type	(no./mm)						
4401R004	23	CU	1/0.59	3.7	Copper wire braid - 95%	6.2	59	275	62

### Electrical Data

Max conductor resistance, DC @ 20°C	66.93 (Ohm/km)
Capacitance at 1kHz	67 (pF/m)
Characteristic impedance at 5~1000 MHz	75 ± 3 (Ohm)
Nominal Inductance	0.43 (µH/m)

### Max, Attenuation @ 20°C

Frequency (MHz)	Attenuation (dB/100m)	Frequency (MHz)	Attenuation (dB/100m)
1	1.31	400	23.00
10	3.61	700	31.80
50	7.90	900	36.42
100	11.20	1000	39.40
200	16.10		

### Return Loss

Frequency (MHz)	Return Loss (dB)
1~1000	20



## Solar Cables

1	Conductor	Stranded Tinned Copper Wire
2	Insulation	Cross-linked Polyolefin
3	Oversheath	Cross-linked Polyolefin

## 0.6/1kV Cross-linked Polyolefin Insulated and Sheathed Cable

Description: TC/XLPO/XLPO

Model Code: PV1-F



Application :	This cable intended for use in photovoltaic power supply system. It is suitable for fixed installations indoor and outdoor, and within conduits or systems
Construction :	Flexible stranded tinned copper class 5 conductor, cross-linked polyolefin insulated and sheathed cable
Insulation Colour :	Single core: White 2 core: Black and Red
Sheath Colour :	Black
Rated Voltage :	AC $U_0/U$ : 0.6/1kV; Max. DC: 1.8kV
Operating Temperature :	-40°C to +90°C, 2000h at 120°C
Specification :	2Pfg 1169/08.2007, IEC60332-1-2, IEC60754, IEC61034-2

\*Other colours (insulation or sheath) available upon request

Part No.	Conductor		Max. Conductor Resistance, DC @ 20°C	Nominal Insulation Thickness	Approx. Overall Diam.	Approx. Weight	Current Carrying Capacity @ 60°C
	Nominal Area	Stranded Diam.					
	(mm <sup>2</sup> )	(mm)					
<b>07019687</b>	1x1.5	1.57	13.7	0.7	4.6	38	30
<b>08019687</b>	1x2.5	2.04	8.21	0.7	5.1	45	41
<b>09019687</b>	1x4	2.6	5.09	0.7	5.6	60	55
<b>10019687</b>	1x6	3.16	3.39	0.7	6.2	90	70
<b>11019687</b>	1x10	4.3	1.95	0.7	7.2	131	98
<b>12019687</b>	1x16	5.5	1.24	0.8	8.8	187	132
<b>13019687</b>	1x25	6.6	0.795	0.9	11.0	276	176
<b>14019687</b>	1x35	7.6	0.565	0.9	12.0	368	218
<b>09021029</b>	2x4	2.6	5.09	0.7	6.0 x 10.8	125	55
<b>10021029</b>	2x6	3.16	3.39	0.7	6.4 x 11.8	167	70

## 1.0/1.0kV Cross-linked Polyolefin Insulated and Sheathed Cable

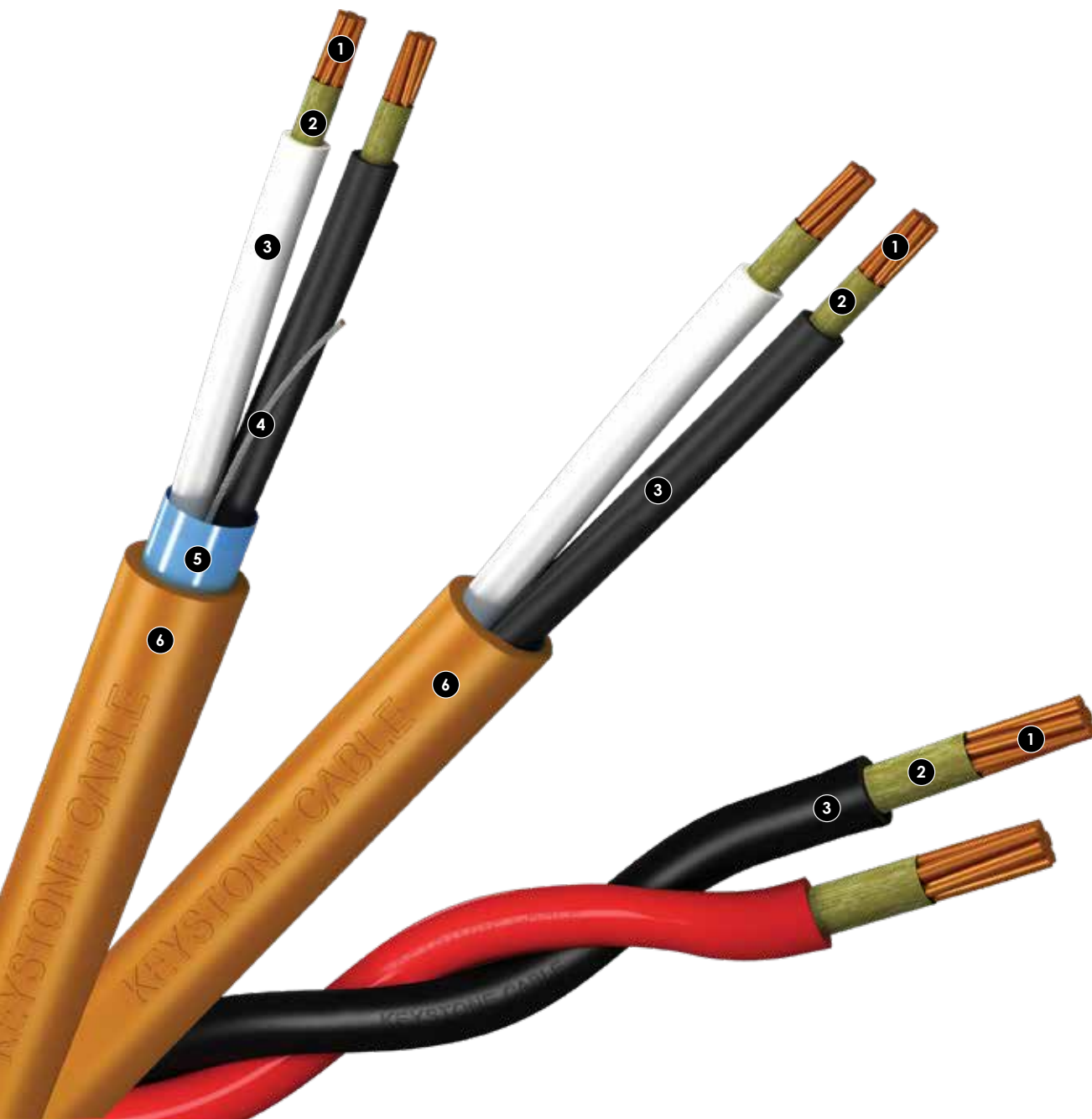
Description: TC/XLPO/XLPO

Model Code: H1Z2Z2-K



Application :	This cable intended for use in photovoltaic power supply system. It is suitable for fixed installations indoor and outdoor, and within conduits or systems
Construction :	Flexible stranded tinned copper class 5 conductor, cross-linked polyolefin insulated and sheathed cable
Insulation Colour :	White
Sheath Colour :	Black
Rated Voltage :	AC $U_0/U$ : 1.0/1.0kV; Max. DC: 1.5kV
Operating Temperature :	-40°C to +90°C, 2000h at 120°C
Specification :	EN50618, IEC60332-1-2, IEC60754, IEC61034-2

Part No.	Conductor		Nominal Insulation Thickness	Nominal Sheath Thickness	Approx. Overall Diam.	Approx. Weight	Minimum Insulation		Max. Conductor Resistance, DC @ 20 °C	Short Circuit Current 1 Second
	Nominal Area	Approx. Diam.					@ 20 °C	@ 90°C		
	(mm <sup>2</sup> )	(mm)					(MΩ·km)	(MΩ·km)		
<b>07019688</b>	1x1.5	1.57	0.7	0.8	4.7	38	860	0.86	13.7	0.215
<b>08019688</b>	1x2.5	2.04	0.7	0.8	5.2	45	690	0.69	8.21	0.358
<b>09019688</b>	1x4	2.6	0.7	0.8	5.7	60	580	0.58	5.09	0.572
<b>10019688</b>	1x6	3.16	0.7	0.8	6.3	90	500	0.50	3.39	0.585
<b>11019688</b>	1x10	4.5	0.7	0.8	7.6	131	420	0.42	1.95	1.430
<b>12019688</b>	1x16	5.7	0.7	0.9	9.1	187	340	0.34	1.24	2.288
<b>13019688</b>	1x25	7.2	0.9	1.0	11.2	276	340	0.34	0.795	3.575
<b>14019688</b>	1x35	8.5	0.9	1.1	12.7	368	290	0.29	0.565	5.005
<b>15019688</b>	1x50	9.4	1.0	1.2	14.5	560	270	0.27	0.393	7.150
<b>16019688</b>	1x70	11.1	1.1	1.2	16.5	756	250	0.25	0.277	10.010
<b>17019688</b>	1x95	13.1	1.1	1.3	18.7	1036	220	0.22	0.210	13.585
<b>18019688</b>	1x120	14.8	1.2	1.3	20.4	1309	210	0.21	0.164	17.160
<b>19019688</b>	1x150	16.5	1.4	1.4	22.7	1636	210	0.21	0.132	21.450
<b>20019688</b>	1x185	18.3	1.6	1.6	25.2	2000	200	0.20	0.108	26.455
<b>20019688</b>	1x240	21.0	1.7	1.7	28.5	2607	200	0.20	0.0817	34.320



## Fire Alarm Fire Resistant Cables

1	Conductor	Plain Annealed Copper Wire
2	Fire Barrier	Mica Tape
3	Insulation	XLPE/LSZH*
4	Drain Wire	Tinned Copper Wire
5	Overall Screen	Aluminium/polyester tape
6	Oversheath	LSZH*

\* LSZH: Low Smoke Zero Halogen

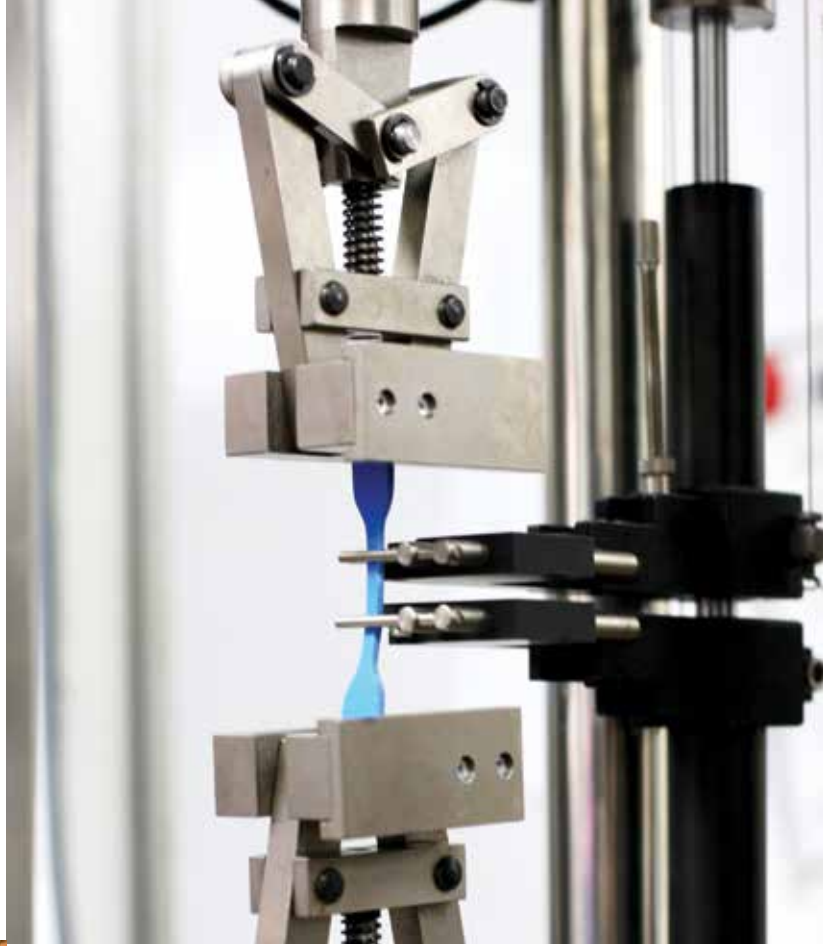
## Fire Alarm Fire Resistant Cables

300/500V, Mica Tape, XLPE Insulated, LSZH Sheathed  
500V, Mica Tape, XLPE Insulated, Overall Foil Screen, LSZH Sheathed  
0.6/1kV, Mica Tape, LSZH Insulated, Twin Twisted Non-sheathed  
Description: CU/MT/XLPE/LSZH-AT or CU/MT/XLPE/OS/LSZH-AT or CU/MT/LSZH-AT  
Model Code: MXL-AT or MXOL-AT or ML-AT



Application :	These cables are used in critical security systems such as smoke detectors, emergency lightings, exit sign and fire command centre
Voltage rating :	300/500V or 500V or 0.6/1kV
Construction :	Plain annealed copper, mica tape barrier, XLPE (or XLEVA) insulated, core twisted together in pair (aluminium/polyester tape with tinned copper drain wire), LSZH sheathed or non-sheathed
Insulation colour :	Black, White; Red, Black for twin twisted non-sheathed cable
Sheath colour :	Orange
Specification :	SS299, BS6387, IEC60331-21, IEC60332-1-2, IEC60332-3, IEC60754, IEC61034-2
Operating Temperature:	90°C

Part No.	No. of Core/Pair (No.)	Conductor		Insulation	Approx. Overall Diam. (mm)	Approx. Weight (kg/km)
		Nominal Area (mm <sup>2</sup> )	No./Diam. of Strand (No./mm)	Norminal Thickness (mm)		
300/500V MXL-AT						
071P4076	1P	1.5	7/0.53	0.6	8.7	107
081P4076	1P	2.5	7/0.67	0.7	9.2	125
500V MXOL-AT						
071P4649	1P	1.5	7/0.53	0.6	10.0	105
081P4649	1P	2.5	7/0.67	0.7	11.5	142
0.6/1kV ML-AT						
07024082	2C	1.5	7/0.53	0.7	7.8	60
08024082	2C	2.5	7/0.67	0.8	9.0	84



## Technical Information

# Current Rating and Voltage Drop



PVC Insulated Cables  
Single-Core, Unarmoured

tel (65) 6367 0107 fax (65) 6365 2963  
www.keystone-cable.com

Single-Core Cables with PVC Insulation, Unarmoured, with or without Sheath 450/750V or 0.6/1kV

**Table 1 : Current-Carrying Capacities (Amp) [CU/PVC or CU/PVC/PVC Cables]**

Conductor Operating Temperature : 70°C  
Ambient Temperature : 30°C

BS EN 50525-2-31 (BS 6004)  
IEC 60502 (BS 6346)  
SS 358

Conductor cross-sectional area	Reference Method 4 (enclosed in conduit in thermally insulating wall etc.)		Reference Method 3 (enclosed in conduit on a wall or in trunking etc.)		Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated cable tray horizontal or vertical)		Reference Method 12 (free air)		
	2 cables, single-phase a.c. or d.c.	3 or 4 cables, three phase a.c.	2 cables, single-phase a.c. or d.c.	3 or 4 cables, three-phase a.c.	2 cables, single-phase a.c. or d.c. flat and touching	3 or 4 cables, three-phase a.c. flat and touching or trefoil	2 cables, single-phase a.c. or d.c. flat and touching	3 or 4 cable three-phase a.c. flat and touching or trefoil	Horizontal flat spaced	Vertical flat spaced	Trefoil
									single-phase a.c. or d.c. three-phase a.c.	single-phase a.c. or d.c. three phase a.c.	3 cables, trefoil three phase a.c.
1	2	3	4	5	6	7	8	9	10	11	12
mm <sup>2</sup>	A	A	A	A	A	A	A	A	A	A	A
<b>BS 6004</b>											
1	11	10.5	13.5	12	15.5	14	-	-	-	-	-
1.5	14.5	13.5	17.5	15.5	20	18	-	-	-	-	-
2.5	19.5	18	24	21	27	25	-	-	-	-	-
4	26	24	32	28	37	33	-	-	-	-	-
6	34	31	41	36	47	43	-	-	-	-	-
10	46	42	57	50	65	59	-	-	-	-	-
16	61	56	76	68	87	79	-	-	-	-	-
25	80	73	101	89	114	104	126	112	146	130	110
35	99	89	125	110	141	129	156	141	181	162	137
<b>BS 6346</b>											
50	119	108	151	134	182	167	191	172	219	197	167
70	151	136	192	171	234	214	246	223	281	254	216
95	182	164	232	207	284	261	300	273	341	311	264
120	210	188	269	239	330	303	349	318	396	362	308
150	240	216	300	262	381	349	404	369	456	419	356
185	273	245	341	296	436	400	463	424	521	480	409
240	320	286	400	346	515	472	549	504	615	569	485
300	367	328	458	394	594	545	635	584	709	659	561
400	-	-	546	467	694	634	732	679	852	795	656
500	-	-	626	533	792	723	835	778	982	920	749
630	-	-	720	611	904	826	953	892	1138	1070	855
800	-	-	-	-	1030	943	1086	1020	1265	1188	971
1000	-	-	-	-	1154	1058	1216	1149	1420	1337	1079

Note : For rating factors of ambient temperature other than 30°C please refer to Table 25

**Table 2 : Voltage Drop (Per Amp, Per Meter) [CU/PVC or CU/PVC/PVC Cables]**

Conductor Operating Temperature : 70°C  
Ambient Temperature : 30°C

BS EN 50525-2-31 (BS 6004)  
IEC 60502-1 (BS 6346)  
SS 358

Conductor cross-sectional area	2 cables d.c.	2 cables single-phase a.c.						3 or 4 cables three-phase a.c.														
		Reference Methods 3 & 4 (enclosed in conduit etc, in or on a wall)		Reference Methods 1 & 11 (clipped direct or on trays, touching)		Reference Method 12 (space)	Reference Methods 3 & 4 (enclosed in conduit etc, in or on a wall)			Reference Methods 1, 11 & 12 (in trefoil)			Reference Methods 1 & 11 (flat touching)			Reference Method 12 (flat spaced)						
		3	4	5	6	7	8	9														
1	2	3	4	5	6	7	8	9														
mm <sup>2</sup>	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m														
1	44	44	44	44	44	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	
1.5	29	29	29	29	29	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
2.5	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	
4	11	11	11	11	11	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	
6	7.3	7.3	7.3	7.3	7.3	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
10	4.4	4.4	4.4	4.4	4.4	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	
16	2.8	2.8	2.8	2.8	2.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	
25	r	x	z	r	x	z	r	x	z	r	x	z	r	x	z	r	x	z	r	x	z	
35	1.75	1.80	0.33	1.80	1.75	0.20	1.75	0.29	1.80	1.50	0.29	1.55	1.50	0.175	1.50	1.50	0.25	1.55	1.50	0.32	1.55	
50	0.93	0.95	0.30	1.00	0.93	0.190	0.95	0.93	0.28	0.97	0.81	0.26	0.85	0.80	0.165	0.82	0.80	0.24	0.84	0.80	0.32	0.86
70	0.63	0.65	0.29	0.72	0.63	0.185	0.66	0.63	0.27	0.69	0.56	0.25	0.61	0.55	0.160	0.57	0.55	0.24	0.60	0.55	0.31	0.63
95	0.46	0.49	0.28	0.56	0.47	0.180	0.50	0.47	0.27	0.54	0.42	0.24	0.48	0.41	0.155	0.43	0.41	0.23	0.47	0.40	0.31	0.51
120	0.36	0.39	0.27	0.47	0.37	0.175	0.41	0.37	0.26	0.45	0.33	0.23	0.41	0.32	0.150	0.36	0.32	0.23	0.40	0.32	0.30	0.44
150	0.29	0.31	0.27	0.41	0.30	0.175	0.34	0.29	0.26	0.39	0.27	0.23	0.36	0.26	0.150	0.30	0.26	0.23	0.34	0.26	0.30	0.40
185	0.23	0.25	0.27	0.37	0.24	0.170	0.29	0.24	0.26	0.35	0.22	0.23	0.32	0.21	0.145	0.26	0.21	0.22	0.31	0.21	0.30	0.36
240	0.180	0.195	0.26	0.33	0.185	0.165	0.25	0.185	0.25	0.31	0.17	0.23	0.29	0.160	0.145	0.22	0.160	0.22	0.27	0.160	0.29	0.34
300	0.145	0.160	0.26	0.31	0.150	0.165	0.22	0.150	0.25	0.29	0.14	0.23	0.27	0.130	0.140	0.190	0.130	0.22	0.25	0.130	0.29	0.32
400	0.105	0.130	0.26	0.29	0.120	0.160	0.20	0.115	0.25	0.27	0.12	0.22	0.25	0.105	0.140	0.175	0.105	0.21	0.24	0.100	0.29	0.31
500	0.086	0.110	0.26	0.28	0.098	0.155	0.185	0.093	0.24	0.26	0.10	0.22	0.25	0.086	0.135	0.160	0.086	0.21	0.23	0.081	0.29	0.30
630	0.068	0.094	0.25	0.27	0.081	0.155	0.175	0.076	0.24	0.25	0.08	0.22	0.24	0.072	0.135	0.150	0.072	0.21	0.22	0.066	0.28	0.29
800	0.053	-	-	-	0.068	0.150	0.165	0.061	0.24	0.25	-	-	-	0.060	0.130	0.145	0.060	0.21	0.22	0.053	0.28	0.29
1000	0.042	-	-	-	0.059	0.150	0.160	0.050	0.24	0.24	-	-	-	0.052	0.130	0.140	0.052	0.20	0.21	0.044	0.28	0.28

Note : r = conductor resistance at operating temperature, x = reactance, z = impedance

# Current Rating and Voltage Drop

PVC Insulated Cables  
Multi-Core, Unarmoured



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www.keystone-cable.com

Multi-Core Cables with PVC Insulation, Unarmoured, PVC Outsheath 0.6/1kV

**Table 3 : Current-Carrying Capacities (Amp) [CU/PVC/PVC Cables]**

Conductor Operating Temperature : 70°C  
Ambient Temperature : 30°C

BS EN 50525-2-31 (BS 6004)  
IEC 60502-1 (BS 6346)

Conductor cross-sectional area	Reference Method 4 (enclosed in an insulated wall etc)		Reference Method 3 (enclosed in conduit on a wall or ceiling, or in trunking)		Reference Method 1 (clipped direct)		Reference Method 11 (on perforated cable tray), or Reference Method 13 (free air)	
	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.
1	2	3	4	5	6	7	8	9
mm <sup>2</sup>	A	A	A	A	A	A	A	A
1	11	10	13	11.5	15	13.5	17	14.5
1.5	14	13	16.5	15	19.5	17.5	22	18.5
2.5	18.5	17.5	23	20	27	24	30	25
4	25	23	30	27	36	32	40	34
6	32	29	38	34	46	41	51	43
10	43	39	52	46	63	57	70	60
16	57	52	69	62	85	76	94	80
25	75	68	90	80	112	96	119	101
35	92	83	111	99	138	119	148	126
50	110	99	133	118	168	144	180	153
70	139	125	168	149	213	184	232	196
95	167	150	201	179	258	223	282	238
120	192	172	232	206	299	259	328	276
150	219	196	258	225	344	299	379	319
185	248	223	294	255	392	341	434	364
240	291	261	344	297	461	403	514	430
300	334	298	394	339	530	464	593	497
400	-	-	470	402	634	557	715	597

\* With or without protective conductor  
Note : For rating factors of ambient temperature other than 30°C please refer to Table 25

**Table 4 : Voltage Drop (Per Amp Per Meter) [CU/PVC/PVC Cables]**

Conductor Operating Temperature : 70°C  
Ambient Temperature : 30°C

Conductor cross-sectional	2-core cable a.c.	2-core cable single-phase a.c.			3-core or 4-core cable 3-phase a.c.		
	2	3			4		
mm <sup>2</sup>	mV/A/m	mV/A/m			mV/A/m		
1	44	44			38		
1.5	29	29			25		
2.5	18	18			15		
4	11	11			9.5		
6	7.3	7.3			6.4		
10	4.4	4.4			3.8		
16	2.8	2.8			2.4		
		r	x	z	r	x	z
25	1.75	1.75	0.170	1.75	1.50	0.145	1.50
35	1.25	1.25	0.165	1.25	1.10	0.145	1.10
50	0.93	0.93	0.165	0.94	0.80	0.140	0.81
70	0.63	0.63	0.160	0.65	0.55	0.140	0.57
95	0.46	0.47	0.155	0.50	0.41	0.135	0.43
120	0.36	0.38	0.155	0.41	0.33	0.135	0.35
150	0.29	0.30	0.155	0.34	0.26	0.130	0.29
185	0.23	0.25	0.150	0.29	0.21	0.130	0.25
240	0.180	0.190	0.150	0.24	0.165	0.130	0.21
300	0.145	0.155	0.145	0.21	0.135	0.130	0.185
400	0.105	0.115	0.145	0.185	0.100	0.125	0.160

Note : r = conductor resistance at operating temperature, x = reactance, z = impedance

# Current Rating and Voltage Drop



LSZH Insulated Cables  
Single-Core, Unarmoured

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Single-Core Cables with LSZH Insulation, with or without PVC (or LSZH) Outsheath 450/750V or 0.6/1kV

**Table 5 : Current-Carrying Capacities (Amp)**  
**[CU/LSZH]**

Conductor Operating Temperature : 90°C  
Ambient Temperature : 30°C

BS EN 50525-3-41 (BS 7211)

Conductor cross-sectional area	Reference Method 4 (enclosed in conduit in thermally insulating wall etc)		Reference Method 3 (enclosed in conduit on a wall or in trunking etc)		Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated cable tray, horizontal or vertical)		Reference Method 12 (free air)		
	2 cables, single-phase a.c. or d.c.	3 or 4 cables, 3-phase a.c.	2 cables, single-phase a.c. or d.c.	3 or 4 cables, 3-phase a.c.	2 cables, single-phase a.c. or d.c. flat and touching	3 or 4 cables, 3-phase a.c. flat and touching or trefoil	2 cables, single-phase a.c. or d.c. or flat and touching	3 or 4 cables, 3-phase a.c. flat and touching or trefoil	Horizontal flat spaced 2 cables, single-phase a.c. or d.c. or 3 cables three phase	Vertical flat spaced 2 cables, single-phase a.c. or d.c. or 3 cables three phase	Trefoil 3 cables, trefoil 3-phase a.c.
1	2	3	4	5	6	7	8	9	10	11	12
mm <sup>2</sup>	A	A	A	A	A	A	A	A	A	A	A
1.5	18	17	22	19	25	23	-	-	-	-	-
2.5	24	23	30	26	34	31	-	-	-	-	-
4	33	30	40	35	46	41	-	-	-	-	-
6	43	39	51	45	59	54	-	-	-	-	-
10	58	53	71	63	81	74	-	-	-	-	-
16	76	70	95	85	109	99	-	-	-	-	-
25	100	91	126	111	143	130	158	140	183	163	138
35	125	111	156	138	176	161	195	176	226	203	171
50	149	135	189	168	228	209	239	215	274	246	209
70	189	170	240	214	293	268	308	279	351	318	270
95	228	205	290	259	355	326	375	341	426	389	330
120	263	235	336	299	413	379	436	398	495	453	385
150	300	270	375	328	476	436	505	461	570	524	445
185	341	306	426	370	545	500	579	530	651	600	511
240	400	358	500	433	644	590	686	630	769	711	606
300	459	410	573	493	743	681	794	730	886	824	701
400	-	-	684	584	868	793	915	849	1065	994	820
500	-	-	783	666	990	904	1044	973	1228	1150	936
630	-	-	900	764	1130	1033	1191	1115	1423	1338	1069
800	-	-	-	-	1288	1179	1358	1275	1580	1485	1214
1000	-	-	-	-	1443	1323	1520	1436	1775	1671	1349

Note : For rating factors of ambient temperature other than 30°C please refer to Table 27  
For rating factors of ground temperature other than 15°C please refer to Table 30

**Table 6 : Voltage Drop (Per Amp Per Meter)**  
**[CU/LSZH]**

Conductor Operating Temperature : 90°C  
Ambient Temperature : 30°C

BS EN 50525-3-41 (BS 7211)

Size of Conductor	2 cables d.c.	2 cables, single-phase a.c.				3 or 4 cables, 3-phase a.c.											
		Reference Methods 3 and 4 (enclosed in conduit etc, in or on a wall)		Reference Methods 1 and 11 (clipped direct or on trays touching)		Reference Methods 3 and 4 (enclosed in conduit etc, in or on a wall)			Reference Methods 1, 11 and 12 (in trefoil)		Reference Methods 1 and 11 (flat and touching)						
1	2	3		4		5			6		7						
mm <sup>2</sup>	mV/A/m	mV/A/m		mV/A/m		mV/A/m			mV/A/m		mV/A/m						
1.5	31	31		27		27			27		27						
2.5	19	19		16		16			16		16						
4	12	12		10		10			10		10						
6	7.8	7.9		6.8		6.8			6.8		6.8						
10	4.7	4.7		4.7		4.0			4		4						
16	2.9	2.9		2.9		2.5			2.5		2.5						
25	1.85	r	x	z	r	x	z	r	x	z	r	x	z				
35	1.35	1.85	0.31	1.90	1.85	0.190	1.85	1.60	0.27	1.65	1.600	0.165	1.600	1.600	0.190	1.600	
50	0.99	1.35	0.29	1.35	1.35	0.180	1.35	1.15	0.25	1.15	1.150	0.155	1.150	1.150	0.180	1.150	
70	0.68	1.00	0.29	1.05	0.99	0.180	1.00	0.87	0.25	0.90	0.860	0.155	0.870	0.860	0.180	0.870	
95	0.49	0.68	0.70	0.28	0.75	0.68	0.175	0.71	0.60	0.24	0.65	0.590	0.150	0.610	0.590	0.175	0.620
120	0.39	0.49	0.51	0.27	0.58	0.49	0.170	0.52	0.44	0.23	0.50	0.430	0.145	0.450	0.430	0.170	0.460
150	0.32	0.39	0.41	0.26	0.48	0.39	0.165	0.43	0.35	0.23	0.42	0.340	0.140	0.370	0.340	0.165	0.380
185	0.25	0.32	0.33	0.26	0.43	0.32	0.165	0.36	0.29	0.23	0.37	0.280	0.140	0.310	0.280	0.165	0.320
240	0.19	0.25	0.27	0.26	0.37	0.26	0.165	0.30	0.23	0.23	0.32	0.220	0.140	0.260	0.220	0.165	0.280
300	0.155	0.19	0.21	0.26	0.33	0.20	0.160	0.25	0.185	0.22	0.29	0.170	0.140	0.220	0.170	0.165	0.240
400	0.12	0.155	0.175	0.25	0.31	0.16	0.160	0.22	0.150	0.22	0.27	0.140	0.140	0.195	0.135	0.160	0.210
500	0.093	0.12	0.140	0.25	0.29	0.13	0.155	0.20	0.125	0.22	0.25	0.110	0.135	0.175	0.110	0.160	0.195
630	0.072	0.093	0.120	0.25	0.28	0.105	0.155	0.185	0.10	0.22	0.24	0.090	0.135	0.160	0.088	0.160	0.180
800	0.056	0.072	0.100	0.25	0.27	0.086	0.155	0.175	0.088	0.21	0.23	0.074	0.135	0.150	0.071	0.160	0.170
1000	0.045	0.056	-	-	-	0.072	0.150	0.170	-	-	-	0.062	0.130	0.145	0.059	0.155	0.165
		0.045	-	-	-	0.063	0.150	0.165	-	-	-	0.055	0.130	0.140	0.050	0.155	0.165

Note : r = conductor resistance at operating temperature, x = reactance, z = impedance

# Current Rating and Voltage Drop

Flexible Cables



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Flexible Cables with PVC Insulation, or PVC Insulation & PVC Outersheath.

**Table 7 : Technical Data Flexible Cord, Metrics Sizes (CU/PVC or CU/PVC/PVC Cables)**

Conductor Operating Temperature : 70°C  
Ambient Temperature : 30°C

BS 6500

Conductor		Current Rating	Voltage Drop		Maximum Weight supportable by twin flexible cord
Nominal Area	Construction	1 or 3 phase a.c. or d.c.	d.c. or 1 phase a.c.	3 phase a.c.	
1	2	3	4	5	6
mm <sup>2</sup>	No. / mm	Amp	mV/m	mV/m	Kg
0.5	16 / 0.2	3	83	72	2
0.75	24 / 0.2	6	56	48	3
1	32 / 0.2	10	43	37	5
1.25	40 / 0.2	13	35	29	5
1.5	30 / 0.25	16	31	26	5
2.5	50 / 0.25	25	18	16	5
4	56 / 0.3	32	11	10	5

Note : For rating factor of ambient temperature other than 30°C please refer to Table 25

300/500V Multicore Flexible Control Cable, S05VV5-F and S05VC4V5-K

**Table 8 : Current Carrying- Capacities (Amp)**

Conductor Operating Temperature : 70°C  
Ambient Temperature : 30°C

BS EN 50525-2-51

Conductor Cross-section area	Single core in free air	2C and 3C upon or on surface Method 1
mm <sup>2</sup>	A	A
0.14	3	2
0.25	5	4
0.34	8	6
0.5	12	9
0.75	15	12
1	19	15
1.5	24	18
2.5	32	26
4	42	34
6	54	44
10	73	61
16	98	82
25	129	108
35	158	135

# Current Rating and Voltage Drop

Solar Cables



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**Table 9: Current Carrying Capacity of PV Cables (EN 50618)**

Max. Conductor Operating Temperature: 120°C  
Ambient Temperature: 60°C

Nominal Cross Sectional Area	Current Carrying Capacity		
	Single Cable		Two Loaded Cables
	Free in air	On a surface	Touching, on a surface
mm <sup>2</sup>	A	A	A
1.5	30	29	24
2.5	41	39	33
4	55	52	44
6	70	67	57
10	98	93	79
16	132	125	107
25	176	167	142
35	218	207	176
50	276	262	221
70	347	330	278
95	416	395	333
120	488	464	390
150	566	538	453
185	644	612	515
240	775	736	620

Note : The expected period of use at max. conductor temperature of 120°C and at a max. ambient temperature of 90°C is limited to 20000 hrs.

**Table 10: Current Rating Conversion Factors for Other Ambient Temperature (EN 50618)**

Max. Conductor Operating Temperature: 120°C  
Ambient Temperature: 60°C

Ambient Temperature	Conversion Factor
60	1.00
70	0.92
80	0.84
90	0.75

**Table 11 : Correction factor for cables with more than 4 loaded cores**

Conductor Operating Temperature : 70°C  
Ambient Temperature : 30°C

BS EN 50525-2-51

Number of loaded cores	5	6	7	10	12	14	19
Correction factor	0.72	0.67	0.63	0.56	0.53	0.51	0.45
Number of loaded cores	24	27	30	37	44	46	48
Correction factor	0.42	0.4	0.39	0.36	0.34	0.33	0.33

Note :

- The current-carrying capacity for a cable in the size range 1.5 to 4 mm<sup>2</sup>, having more than 4 loaded cores, is obtained by multiplying the current-carrying capacity of a 2-core, having the same insulation type, by the factor selected from this table. The current-carrying capacity for the 2-core cable is that for the installation condition to be used for the multicore cable.
- If, due to known operating conditions, a core is expected to carry not more than 30% of its current-carrying capacity in the multicore cable it may be ignored for the purpose of determining the number of cores in the cable.
- If, due to known operating conditions, a core is expected to carry not more than 30% of its rating after applying the rating factor for the total number of current-carrying cores, it may be ignored for the purpose of obtaining the rating factor for the number of loaded cores.

For example, the current-carrying capacity of a cable having N loaded cores would normally be obtained by multiplying the current-carrying capacity of a 2-core, having the same insulation type, by the factor selected from this table for N cores. That is  $I_{zlc} = I_{2c} \times C_{gN}$

where:

- $I_{zlc}$  is the current-carrying capacity of the multicore cable after applying the rating factor for the total number of current-carrying cores.
- $I_{2c}$  is the tabulated current-carrying capacity of a 2-core cable, having the same insulation type as the multi-core cable.
- $C_{gN}$  is the rating factor for the total number of current-carrying cores.

However, if M cores in the cable carry loads which are not greater than  $0.3 \times I_{2c} \times C_{gN}$ , the current-carrying capacity can be obtained by using the rating factor corresponding to (N-M) cores. The "not greater than  $0.3 \times I_{2c} \times C_{gN}$ " calculation should be applied before the adjacent multicore cable grouping factor, if applicable. The 30% rule should not be further applied to any adjacent cable grouping factor calculations.  $I_{zlc}$  should be greater than or equal to  $I_n$  or  $I_b$  as appropriate, divided by the relevant rating factor(s) C, that is  $I_{zlc} \geq I_n$  or  $I_b/C$

**Table 12 : Correction factors for Ambient Temperature & Group Installation**

Correction for groups of more than one circuit of single-core cables, or more than one multi-core cable

Reference Methods of Installation	Correction Factor (C <sub>g</sub> )													
	Number of Circuits or Multi-Core Cables													
	2	3	4	5	6	7	8	9	10	12	14	16	18	20
Enclosed (Method 3 or 4) or bunched and clipped to a non-metallic surface (Method 1)	0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.48	0.45	0.43	0.41	0.39	0.38
Single layer clipped to a non-metallic surface (Method 1)	Touching	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.70	-	-	-	-	-
	Spaced *	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Single layer multi-core on a perforated metal cable tray, vertical or horizontal (Method 11)	Touching	0.86	0.81	0.77	0.75	0.74	0.73	0.73	0.72	0.71	0.70	-	-	-
	Spaced *	0.91	0.89	0.88	0.87	0.87	-	-	-	-	-	-	-	-
Single layer single-core on a perforated metal cable tray, touching (Method 11)	Horizontal	0.90	0.85	-	-	-	-	-	-	-	-	-	-	-
	Vertical	0.85	-	-	-	-	-	-	-	-	-	-	-	-
Single layer multi-core touching on ladder supports	0.86	0.82	0.80	0.79	0.78	0.78	0.78	0.77	-	-	-	-	-	-

\* Space means a clearance between adjacent surfaces of at least one cable Diam. (D<sub>c</sub>). Where the horizontal clearance between adjacent cables exceeds 2 D<sub>c</sub>, no correction factor need be applied

Note : 1 The factors in the table are applicable to a group of cables all of the same sizes. The value of the current derived from application of the appropriate factors is the maximum continuous current to be carried by any of the cables in the group.

2 If, due to known operating conditions, a cable is expected to carry not more than 30% of its grouped rating, it may be ignored for the purpose of obtaining the rating factor for the rest of the group.

For example, a group of N loaded cables would normally require a group reduction factor of C<sub>g</sub> applied to the tabulated I<sub>t</sub>. However, if M cables in the group carry loads which are not greater than 0.3C<sub>g</sub> I<sub>t</sub> amperes, the other cables can be sized by using the group rating factor corresponding to (N-M) cables.

**Table 13 : Reduction factors for one circuit or one multi-core cable or for a group of more than one circuit or more than one multi-core cable**

Item	Arrangement (cables touching)	Number of circuits or multi-core cables											
		1	2	3	4	5	6	7	8	9	12	16	20
1	Bunched in air, on a surface, embedded or enclosed	1.00	0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.45	0.41	0.38
2	Single layer on wall, floor or unperforated cable tray system	1.00	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.70	No further reduction factor for more than 9 circuits or multi-core cables		
3	Single layer fixed directly under a wooded ceiling	0.95	0.81	0.72	0.68	0.66	0.64	0.63	0.62	0.61			
4	Single layer on a perforated horizontal or vertical cable tray	1.00	0.88	0.82	0.77	0.75	0.73	0.73	0.72	0.72			
5	Single Layer on cable ladder system or cleats etc.	1.00	0.87	0.82	0.80	0.80	0.79	0.79	0.78	0.78			

Note : For rating factor of ambient temperature other than 30°C please refer to Table 25

# Correction Factors For Other Temperature Conditions

**Table 14 : Correction factor for ambient air temperature other than 30°C to be applied to the current-carrying capacities for cables in the air**

Ambient temperature °C	Insulation				
	PVC	XLPE	HT-PVC	Rubber	Rubber
	(70°C)	(90°C)	(90°C)	(85°C)	(60°C)
10	1.22	1.15	-	-	-
15	1.17	1.12	-	-	-
20	1.12	1.08	-	-	-
25	1.06	1.04	1.03	1.02	-
30	1.00	1.00	1.00	1.00	1.00
35	0.94	0.96	0.97	0.95	0.91
40	0.87	0.91	0.94	0.90	0.82
45	0.79	0.87	0.91	0.85	0.71
50	0.71	0.82	0.87	0.80	0.58
55	0.61	0.76	0.84	0.74	0.41
60	0.50	0.71	0.80	0.67	-
65	0.35	0.65	0.76	0.60	-
70	-	0.58	0.71	0.52	-
75	-	0.50	0.61	0.43	-
80	-	0.41	0.50	0.30	-
85	-	0.29	0.35	-	-

**Table 15 : Correction factor for ambient ground temperature other than 15°C to be applied to the current-carrying capacities for cables in duct in ground**

Ambient temperature °C	Insulation	
	PVC	XLPE
	(70°C)	(90°C)
10	1.04	1.03
15	1.00	1.00
20	0.95	0.97
25	0.90	0.93
30	0.85	0.89
35	0.80	0.86
40	0.74	0.82
45	0.67	0.77
50	0.60	0.73
55	-	0.68
60	-	0.63
65	-	0.58

**Table 16 : Maximum conductor resistance D.C at 20°C**

Nominal Cross-sectional Area	Maximum conductor resistance DC at 20 °C					
	Class 1		Class 2		Class 5	
	Bare	Tinned	Bare	Tinned	Bare	Tinned
mm <sup>2</sup>	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km
0.5	36.0	36.7	36.0	36.7	39.0	40.1
0.75	24.5	24.8	24.5	24.8	26.0	26.7
1	18.1	18.2	18.1	18.2	19.5	20.0
1.5	12.1	12.2	12.1	12.2	13.3	13.7
2.5	7.41	7.56	7.41	7.56	7.98	8.21
4	4.61	4.70	4.61	4.70	4.95	5.09
6	3.08	3.11	3.08	3.11	3.30	3.39
10	-	-	1.83	1.84	1.91	1.95
16	-	-	1.15	1.16	1.21	1.24
25	-	-	0.727	0.734	0.780	0.795
35	-	-	0.524	0.529	0.554	0.565
50	-	-	0.387	0.391	0.386	0.393
70	-	-	0.268	0.270	0.272	0.277
95	-	-	0.193	0.195	0.206	0.210
120	-	-	0.153	0.154	0.161	0.164
150	-	-	0.124	0.126	0.129	0.132
185	-	-	0.0991	0.100	0.106	0.108
240	-	-	0.0754	0.0762	0.0801	0.0817
300	-	-	0.0601	0.0607	0.0641	0.0654
400	-	-	0.0470	0.0475	0.0486	0.0495
500	-	-	0.0366	0.0369	0.0384	0.0391
630	-	-	0.0283	0.0286	0.0287	0.0292
800	-	-	0.0211	0.0224	-	-
1000	-	-	0.0176	0.0177	-	-

**Table 17 : Conductor resistance temperature other than 20°C**

Temperature (°C)	Factor	Temperature(°C)	Factor
10	0.961	26	1.02
11	0.965	30	1.039
12	0.969	35	1.059
13	0.972	40	1.079
14	0.976	45	1.098
15	0.980	50	1.118
16	0.984	55	1.138
17	0.988	60	1.157
18	0.922	65	1.177
19	0.996	70	1.196
20	1.000	75	1.216
21	1.004	80	1.236
22	1.008	85	1.255
23	1.012	90	1.275
24	1.016		

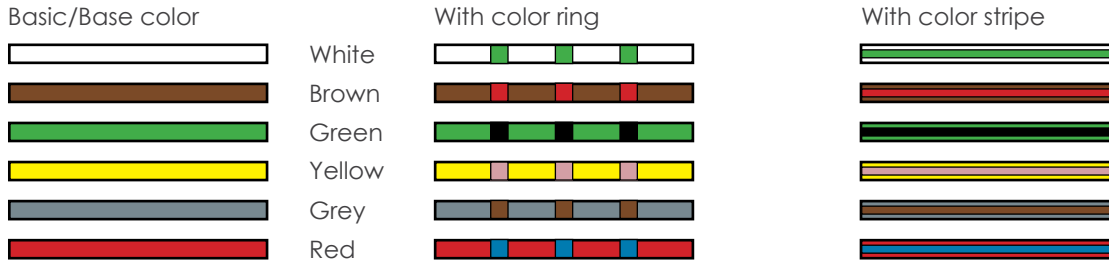
# Electrical Characteristics and Color Code For Multi-core Cable (DIN VDE 0812)

Electronic, control and data: stranded copper conductor

Multi-colored code identification for core or pair are combined with a basic colour and a color in form of rings or stripe.

In reference to Table 18, Color A is the base color, and Color B is the secondary color in the form of rings, printed on top of Color A. Each ring separation is 2-3mm. The cores are counted in one direction from the outer layer in.

Example of color code identification



**Table 18: DIN 47100 with color repetition for multi-core control cables**

Number	Color A	Number	Color A	Color B	Number	Color A	Color B	Number	Color A	Color B
1	white	11	grey-pink		28	yellow-grey		45	white	
2	brown	12	red-blue		29	pink-green		46	brown	
3	green	13	white-green		30	yellow-pink		47	green	
4	yellow	14	brown-green		31	green-blue		48	yellow	
5	grey	15	white-yellow		32	yellow-blue		49	grey	
6	pink	16	yellow-brown		33	green-red		50	pink	
7	blue	17	white-grey		34	yellow-red		51	blue	
8	red	18	grey-brown		35	green-black		52	red	
9	black	19	white-pink		36	yellow-black		53	black	
10	violet	20	pink-brown		37	grey-blue		54	violet	
		21	white-blue		38	pink-blue		55	grey-pink	
		22	brown-blue		39	grey-pink		56	red-blue	
		23	white-red		40	pink-red		57	white-green	
		24	brown-red		41	grey-black		58	brown-green	
		25	white-black		42	pink-black		59	white-yellow	
		26	brown-black		43	blue-black		60	yellow-brown	
		27	grey-green		44	red-black		61	white-grey	

# Electrical Characteristics and Color Code For Multi-pair Cable (DIN VDE 0812)

**Table 19: DIN 47100 with color repetition for multi-pair cables, pairs are repeated after the 22th pair, then repeated after 44pairs again**

Pair	a wire	b wire	Pair	a wire	b wire
1	white	brown	12	white/red	brown/red
2	green	yellow	13	white/black	brown/black
3	grey	pink	14	grey/green	yellow/grey
4	blue	red	15	pink/green	yellow/pink
5	black	violet	16	green/blue	yellow/blue
6	grey/pink	red/blue	17	green/red	yellow/red
7	white/green	brown/green	18	green/black	yellow/black
8	white/yellow	yellow/brown	19	grey/blue	pink/blue
9	white/grey	grey/brown	20	grey/red	pink/red
10	white/pink	pink/brown	21	grey/black	pink/black
11	white/blue	brown/blue	22	blue/black	red/black

**Table 20: For LiYY, LiYCY (1 to 4 core cable)**

Cross-section Area	No./Diam. of Strand	Max. Conductor Resistance @ 20°C	Capacitance @ 800Hz, 20°C		Mutual Capatiance @ 800 Hz, 20°C		Minimum Insulation Resistance	Voltage Test (50Hz) 1min	Current Rating @ 30°C
			Core to core	Core to core	Pair to pair	Pair to screen			
(mm <sup>2</sup> )	(no./diam.)	(Ω/km)	(nF/km)	(nF/km)	nF/km	nF/km	M Ω-km	Volt	(A)
0.14	18/0.10	148	80					1200	1.5
0.25	14/0.15	79.9	100						2.5
0.34	7/0.25	58.0	100						4
0.5	16/0.20	39.0	110		120	160	200	2500	7
0.75	24/0.20	26.0	110						12
1	32/0.20	19.5	120						15
1.5	30/0.25	13.3	120						18

**Table 21: Conversion factors for 5 or more cores**

No. of core	Factor
(nos)	(f)
5	0.75
7	0.65
10	0.55
14	0.50
19	0.45
24	0.40
40	0.35
61	0.30

**Table 22: UL 1581, Conductor configuration and D.C resistance (Stranded Plain/Tinned Copper Conductor)**

Conductor Size	Class (UL)	Configuration		Stranded Diam.	Max. DC Resistance @ 20°C	
					Plain	Tinned
AWG	-	AWG	mm	mm	ohm/km	ohm/km
24	B	7 x 32	7 x 0.203	0.579	87.6	94.2
22	B	7 x 30	7 x 0.254	0.729	55.4	59.4
20	B	7 x 28	7 x 0.320	0.919	34.6	36.7
18	B	7 x 26	7 x 0.404	1.16	21.8	23.2
16	C	19 x 29	19 x 0.287	1.49	13.7	14.9
14	C	19 x 27	19 x 0.361	1.87	8.62	9.32
12	C	19 x 25	19 x 0.450	2.35	5.43	5.88

**Table 23: UL 1581, Single/solid wire Diam.**

Conductor Size	Nominal Diam.	Minimum Diam.	Conductor Size	Nominal Diam.	Minimum Diam.	Conductor Size	Nominal Diam.	Minimum Diam.
AWG	mm	mm	AWG	mm	mm	AWG	mm	mm
40	0.079	0.077	28	0.320	0.312	16	1.29	1.26
39	0.089	0.087	27	0.361	0.353	15	1.45	1.42
38	0.102	0.100	26	0.404	0.396	14	1.63	1.60
37	0.114	0.112	25	0.455	0.444	13	1.83	1.79
36	0.127	0.125	24	0.511	0.500	12	2.05	2.01
35	0.142	0.139	23	0.574	0.561	11	2.30	2.26
34	0.160	0.157	22	0.643	0.630	10	2.588	2.537
33	0.180	0.177	21	0.724	0.709	9	2.906	2.847
32	0.203	0.199	20	0.813	0.798	8	3.264	3.198
31	0.226	0.222	19	0.912	0.894	7	3.665	3.592
30	0.254	0.249	18	1.020	1.000	6	4.115	4.034
29	0.287	0.282	17	1.150	1.130	5	4.620	4.529

**Table 24: Color code for RS 485**

Pair no	Core A	Core B
1	White-blue stripe	Blue-white stripe
2	White-orange stripe	Orange-white stripe
3	White-green stripe	Green-white stripe
4	White-brown stripe	Brown-white stripe
5	White-gray stripe	Gray-white stripe

# Cable Installation Minimum Bending Radius

**Table 25: Minimum Bending Radius**

Type of Cable	Description	Voltage	During Installation	Fixed	Occasional Flexing
Fixed Wiring (PVC, XLPE or Elastomer)	Single & Multicore Unarmoured	up to 0.6/1kV	6D	4D	-
	OD ≤25mm		10D	6D	-
	OD ≥ 25mm	0.6/1kV	18D	12D	-
	Multicore SWA or Metal tape (CTS,DSTA)		12D	8D	-
	Solid Aluminium, Stranded or Sector		18D	12D	-
	Lead alloy sheathed		30Dn	20Dn	-
Polyamide jacketed	-	-	-	-	
Flexible(PVC, Elastomer)	Single & Multicore	300/500V & 450/750V	8D	4D	-
	Multicore		8D	4D	12D
	Twisted Pairs		8D	4D	12D
	Multicore & twisted Pair screened		10D	6D	15D
Signal flexible control cable	Multicore (LiYY)	250V & 300/500V	8D	6D	15D
	Twisted Pairs (LIYY-TP)		8D	6D	15D
	Multicore (LiYCY)		8D	6D	15D
	Multicore & Twisted Pairs (LiYCY-TP)		8D	6D	15D
Instrument Cable	Overall or Individual & Overall Unarmoured	500V	10D	6D	-
	Overall or Individual & Overall Armoured	500V	10D	8D	-
Thermocouple	Unarmoured (*Solid conductor)	500V	10D/15D*	6D/12D*	-
	Armoured (*Solid conductor)	500V	12D/20D*	8D/15D*	-
Bus Cable	Unarmoured	500V	10D	8D	-
	Armoured	500V	12D	10D	-
Welding	Elastomer	0.6/1kV	-	6D	-
HDPE sheath	All type	-	25D	15D	-
Solar Cable (PV1-F & H1Z2Z2-K)	XLPO	0.6/1kV & 1.0/1.0kV	8D	OD<12mm: 4D OD>12mm: 6D	-

Note : D is the cable overall Diam.  
Dn is the Diam. over the Polyamide layer  
It is recommend, the lowest temperature for cable installation shall be higher than its minimum operating temperature by 10 to 20 °C

# Wire Gauge Conversion Table



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**Table 26 : Wire Gauge Conversion Table**

AWG	Conductor Diam.	Converted Area	Nearest Conductor Area	Conductor Resistance @ 20°C
-	(mm)	(mm <sup>2</sup> )	(mm <sup>2</sup> )	(ohm/km)
26	0.405	0.128	0.14	146.00
24	0.511	0.205	0.20	89.20
23	0.573	0.259	0.25	70.10
22	0.644	0.324	0.34	54.80
20	0.812	0.519	0.50	34.50
18	1.024	0.823	0.75	23.00
17	1.150	1.040	1.00	17.80
16	1.290	1.310	1.50	14.70
14	1.630	2.080	2.50	8.79
12	2.050	3.310	4.00	5.41
10	2.590	5.260	6.00	3.64
8	3.260	8.340	10.00	2.36
6	4.110	13.300	16.00	1.44
4	5.190	21.200	25.00	0.91
2	6.540	33.600	35.00	0.57
1	7.350	42.400	50.00	0.47
1/0	8.250	53.400	50.00	0.37
2/0	9.270	67.400	70.00	0.29
3/0	10.400	85.000	95.00	0.23
4/0	11.600	107.200	120.00	0.18





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