

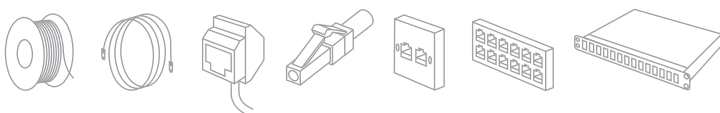
3M Telecommunications
Solutions for Networks



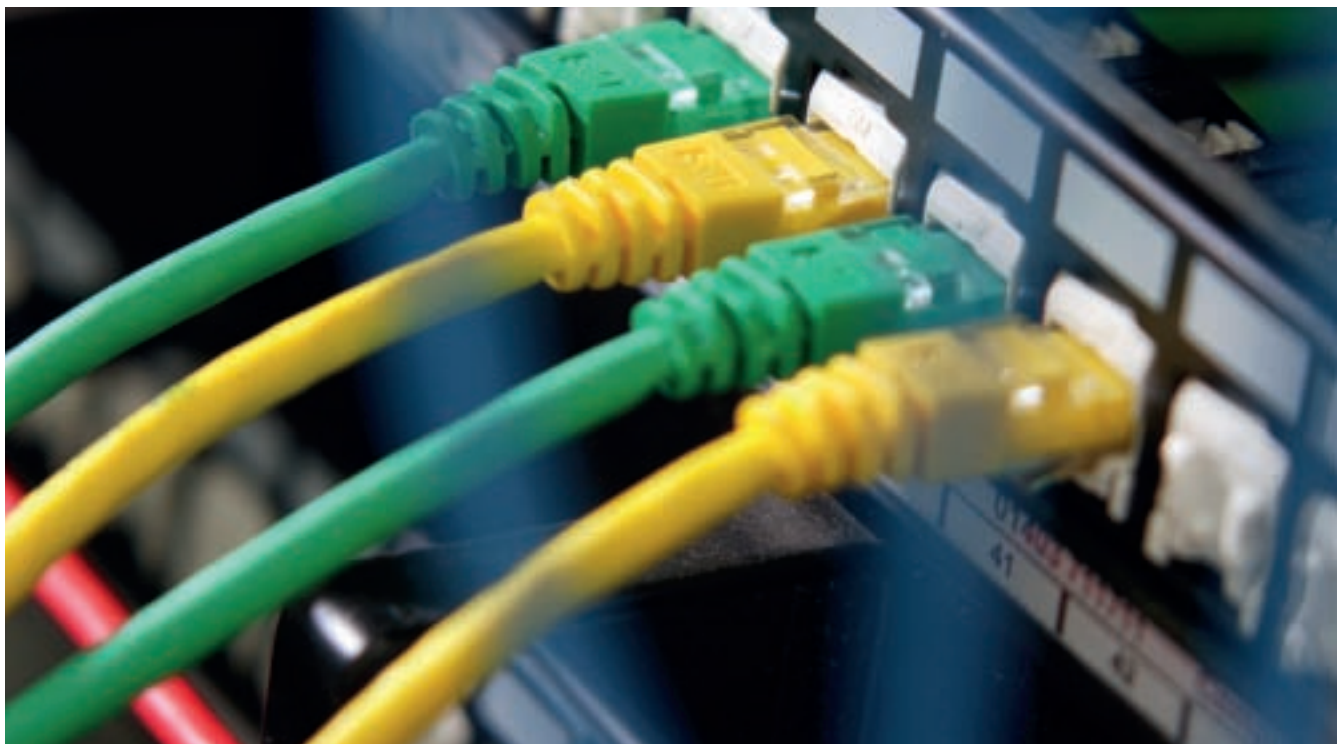
Solutions for Enterprise Networks

Product Catalogue

Technology built for business



3M



Dear Customer,

In response to the increased demands made on the cabling infrastructure, the range of Enterprise Network Solutions products includes passive and active products for copper and fibre optic cabling systems for use in local area networks, data centres and campus networks for both data and telephony.

3M provides a broad range of support options for every stage of a system's life, including network design and project support, on-site assistance, certified installer training and advice on systems upgrades.

The components of 3M's systems feature innovative and high performance designs that offer the strong customer value that you would expect from a company that has more than 40 years experience of network design and product innovation.

Further information to our extensive products program and our achievements are on our Website: www.3MTelecommunications.com

Sincerely,

3M Telecommunications Team

Why Choose 3M?

The company is renowned for its commitment to research and development, so customers and partners can always be sure that 3M is at the leading edge of innovation, as well as the assurance that 3M has a strong focus on environmental issues and adhering to relevant legislation. 3M continues to follow the evolution of information technology and to develop high performance solutions which meet the increasing need for bandwidth. Employing some of the best experts in the industry, 3M has for many years worked closely with the industry associations tasked with creating international cabling standards.



Thanks to its network of branches in 80 countries in the world, 3M is in a position to offer both world class support and the understanding of local markets, including installer training, on site support and advice.

Network Compliance

3M Enterprise Networks Solutions offer a complete range of products to support local area network and data centre applications over copper or fibre cabling., giving performance above the limits set by the standards ISO/IEC 11801, EN 50173 series and ANSI/TIA-568C series.



In addition 3M Volition™ copper components are independently certified by Delta for compliance to the component standards. See www.madebydelta.com/

3M Enterprise Networks Solutions extended 25-year warranty

As such a crucial part of a company's communications system, customers need to be confident that their network will work to specification from commissioning to the end of its lifetime. 3M Telecommunications offers an extended 25-year warranty* for the entire range of passive permanent link components in the Volition and Fibre Interconnect ranges that they will continue to perform to ISO/IEC 11801, EN50173 and TIA/EIA 568 standards in force at the time of installation. The warranty is extended through 3M partner installers and systems integrators who support the warranty in the field, backed by 3M technical support.

*Terms and conditions apply.



3M Telecommunications is a Registered Developer in the Cisco Developer Network



3M Telecommunications is an HP AllianceOne Partner

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Copper Cabling Solutions

Copper Cabling Solutions include state of the art voice and data copper cabling system, including a range of Category 6A, Category 6 and Category 5e systems.

A variety of easy to install and innovative connectivity solutions ensure high performance, reliable systems. The 3M™ RJ45 copper products offer simple termination solutions – jacks snap on without tools – with built-in reliability features and component performance exceeding existing standards. The jacks are complemented by a range of cables, panels, outlets and patchcords to complete the installed link.

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Copper Cabling System - Features and Benefits

Description

Volition™ Copper Cabling System

- The Volition Copper Cabling system offers a complete range of products to support Ethernet applications over twisted pair. The Volition system gives electrical performance above the limits set by the standards ISO/IEC 11801, EN 50173 series and ANSI/TIA-568C series.
The Volition Copper Cabling system offers a complete range of RJ45 jacks and sockets, cables, patch panels, patch cords and accessories. All the Volition components are designed to guarantee optimal performance as a complete system.

Standards

- ISO/IEC 11801
- EN 50173 series
- ANSI/TIA-568-C series

Applications

- IEEE 802.3ab 1000BASE-T
- IEEE 802.3an 10GBASE-T

Volition™ 25-years Warranty

- 3M Telecommunications offers an extended 25-year warranty on the complete range of Volition components.

3M Telecommunications guarantees the electrical performance according to ISO/IEC 11801, EN 50173 series and ANSI/TIA-568-C series.

Advantages of 3M Telecommunications

- 3M is renowned for its commitment to research and development and its sense of innovation. 3M Telecommunications has dedicated more than 40 years of study to designing and improving networks. The Volition™ solution is an innovation from 3M Telecommunications Laboratories. 3M continues to follow the evolution of information technology and to develop high performance

solutions which meet the increasing need for bandwidth. Thanks to its network of branches in 60 countries in the world, 3M is in a position to offer world class service support on three levels: certified installation training, assistance with the design of networks and on-site assistance with installation.

Volition™ RJ45 Keystone Jacks

- The RJ45 Keystone jacks have been specifically developed for Gigabit and 10 Gigabit Ethernet applications, according to ISO/IEC 11801, EN 50173-1, EN 60603-7 series and TIA/EIA 568C. Their patented design allows an easy, tool-less

termination, and makes them leading products in the market.

The keystone format gives compatibility with many standard faceplates and adapters.

Features

- Tool-free assembly
- Built-in dust shutter which closes automatically
- Easily reusable
- Insulation displacement connections compatible with solid and stranded cables
- Cable entry from top or bottom
- Versions: UTP, FTP and STP with 360° shield
- STP version: Total 360° coverage of cable shield by metallic braid

Advantages

- Connection quality is independent of the quality of tools or labour
- Immunity to dust on both patch panels and terminal outlets
- No waste in the case of cabling errors
- Consolidation point assembly with patch cables
- Easier accommodation of cable minimum bend radius
- Compliance with different EMC requirements
- STP version: Excellent transfer of impedance for immunity against electromagnetic disturbances

Copper Cabling System - Features and Benefits

Volition™ RJ45 sockets and faceplates

- Volition faceplates are available in many different formats, according to the most important national standards.



Features

- Available types: France, Germany, Italy, UK, USA
- Built-in dust shutter in the RJ45 jack
- Shallow depth of the jack and choice of cable entry
- Compatibility with UTP, FTP and STP RJ45 jacks

Advantages

- Integration with many standards
- Immunity to dust on terminal outlets
- Compatibility with many types of boxes and frames
- Compliance with different EMC requirements

Volition™ Cables

- Volition™ Cables allow easy termination to the RJ45 jacks. The cables are available in unshielded

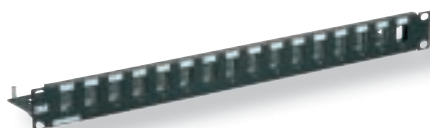
and shielded versions, 4 pairs and 2x4 pairs, with PVC or LSOH (Low Smoke Zero Halogen) jacket.



Volition™ Patch Panels

- Volition patch panels are modular and can accommodate up to 24 RJ45 ports in one unit of rack space (1U). Their modular design makes them easy to install on site in 19" racks.

All Volition patch panels have an earth stud which permits continuity of earth with the FTP or STP RJ45 K series jacks.



Volition™ certificates of compliance

- Certification by an independent laboratory is a proof of the quality and reliability of the Volition™ range.
- 3M is using world-class laboratories for its certification.
- The Category 6_A and Category 6 systems are certified by the external laboratory Delta.
- The 3M certificates are updated annually and can be downloaded from the web site www.delta.dk.

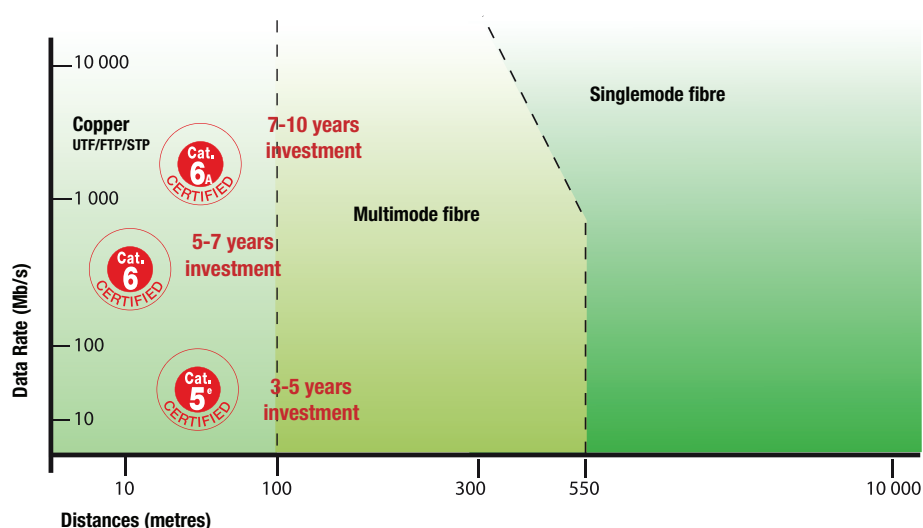


Note: In international and European standards copper components are classified in Categories and links are classified in Classes. In USA standards the term Category is used for both copper components and links.

In international and European standards Category 6_A and Class E_A are written with subscript A whereas in USA standards an uppercase A is used - Category 6A.

Copper Cabling Selection Guide

Version	U/UTP Cat.5e	F/UTP Cat.5e	U/UTP Cat.6	F/UTP Cat.6	F/UTP Cat.6 _A	F/FTP Cat.6 _A	S/FTP Cat.6 _A
EMC	Low	Medium	Low	Medium	Medium	High	High
Cables	U/UTP	F/UTP	U/UTP	F/UTP	F/UTP Cat.6 _A	F/FTP Cat.6 _A	S/FTP Cat.7
Cords	U/UTP	F/UTP	U/UTP	S/FTP	S/FTP	S/FTP	S/FTP
RJ45	UTP	FTP	UTP	FTP or STP	STP	STP	STP
Class	D / 1 Gb/s	D / 1 Gb/s	E / 1 Gb/s	E / 1 Gb/s	E _A / 10 Gb/s	E _A / 10 Gb/s	E _A / 10 Gb/s



Category 5e

- Volition™ Category 5e solution (standard bandwidth up to 100MHz) supports up to 1Gb/s Ethernet for businesses with a short-medium term

investment strategy in the infrastructure and with a limited demand for high-speed voice-video-data applications.

Category 6

- Volition™ Category 6 solution (standard bandwidth up to 250 MHz) offers a larger bandwidth than Category 5e and supports up to

1Gb/s Ethernet with higher efficiency and throughput for those businesses with a medium-term investment strategy in infrastructure.

Category 6_A

- Volition™ Class E_A / Category 6_A solution supports up to 10G Ethernet according to the 10GBASE-T standard. It is ideal for businesses with a long-term investment strategy and with a fast evolution in network application requirements.
- The Volition™ Class E_A / Category 6_A solution offers double the bandwidth (500 MHz) compared with Class E / Category 6 and a unique integral reduction of alien crosstalk (AXT).

- AXT is all the electrical noise created on a cable or an RJ45 jack by neighbouring cables and jacks. The number one noise source in 10GBASE-T is AXT, the effects of which disturb not only the cables, particularly in the cable routes, but also the RJ45 jacks, especially in patching racks where there are many adjacent links.



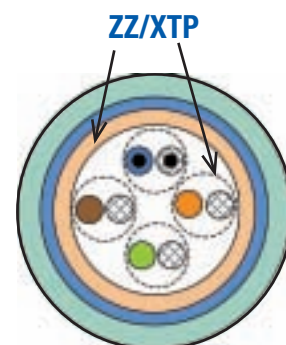
Copper Cabling Selection Guide

LAN Cable Naming Scheme

- The naming conventions of LAN cables are published in Annex E of ISO 11801.
- All the designations have the format: **ZZ/XTP**
- TP** = Twisted Pair

Naming Scheme of 3M LAN cables

3M Name	ISO 11801 Name
UTP	U/UTP
FTP	F/UTP
SFTP	SF/UTP
FFTP	F/FTP
SSTP	S/FTP



ZZ = general protection of the cable
U = Unshielded
F = Foil screen (made from aluminium/polyester foil)
S = Braid screen (made from copper braid)
SF = Braid and foil screen (made from braid + aluminium/polyester foil)

X = protection of the individual pairs
U = Unshielded
F = Foil screened (screen made from aluminium/polyester foil)

Category/Class	Cable			3M Connector	Alternative	
	Structure	No. pairs	3M Reference	Type	Recommended	Version
Cat.5e/ Class D	U/UTP	4	VOL-5EUL4	K5E	VOL OCK5EU	-
		2 x 4	VOL-5EUL8			
	F/UTP	4	VOL-5EFL4		VOL OCK5EF	VOL OCK5ES
		2 x 4	VOL-5EUL8			
Cat.6/ Class E	U/UTP	4	VOL-6UL4	K6	VOL OCK6U	-
		2 x 4	VOL-6UL8			
	F/UTP	4	VOL-6FL4		VOL OCK6F	VOL OCK6S
		2 x 4	VOL-6FL8			
	S/FTP	4	VOL-10SFL4		VOL OCK6S	-
		2 x 4	VOL-10SFL8			
Cat.6A/ Class E_A	F/UTP	4	VOL-6AFL4	K6A	VOL OCK6A	-
		2 x 4	VOL-6AFL8			
	F/FTP	4	VOL-6AFFL4		VOL OCK6A	-
		2 x 4	VOL-6AFFL8			
	S/FTP	4	VOL-10SFL4		VOL OCK6A	-
		2 x 4	VOL-10SFL8			

1.1 Volition™ Class E_A / Category 6A Cabling System

Description - Class E_A /Category 6A cabling system

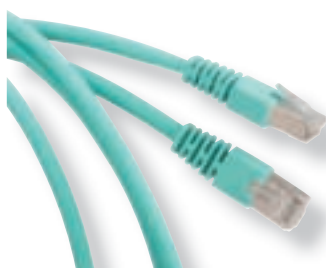
Category 6_A extended to 500 MHz

- In less than 10 years, the speed of local area networks (LAN) has gone from less than 10 Mb/s to several Gigabits per second. Market specialists foresee LAN requirements accelerating and a progression in bandwidth for the horizontal cabling which is traditionally a copper system. The 10 Gb/s Ethernet standard (10GBASE-T) for twisted pair copper cabling is a now a reality. New revisions of international standards on cabling systems ISO/IEC 11801, EN 50173 series and ANSI/TIA-568-C series define Class E_A and Category 6A cabling which both offer a bandwidth of 500 MHz.
- These developments mean that companies are now able to install a high-speed fibre optic backbone and migrate towards higher speed copper cabling in the horizontal. Many LAN administrators plan to install high performance copper cabling systems which make it possible to support both present and future applications. Also Class E_A / Category 6A cabling is increasingly used in data centres where higher speeds are essential.
- Volition Network Solutions from 3M comply fully and economically with the advances in copper cabling standards.

10 Gigabit per second copper cabling technologies

- The IEEE 802.3an group chose a maximum frequency of 500 MHz which doubles the frequency range of the original Class E /Category 6 specified up to 250 MHz. The IEEE group also defined a new electrical parameter for the channel which is "alien cross talk" (AXT). AXT is all the electrical noise created on a cable or an RJ45 jack

by neighbouring cables and jacks. The number one interference in 10GBASE-T is AXT, the effects of which disturb not only the cables, particularly in the cable routes, but also the RJ45 jacks, especially in patching racks where there are many adjacent links.



- Volition Class E_A / Category 6A cabling system is designed in compliance with the most recent ISO/IEC, European and TIA standards for Channel and Permanent Link configurations. The Volition Class E_A / Category 6A Solution is differentiated by the unequalled reduction of the effects of AXT over the

entire channel. The solution comprises a complete range of new RJ45 jacks, new twisted pair copper cables, 19" patch panels and new RJ45 patch cables. The Volition Class E_A / Category 6A solution fully meets the requirements of a 10 Gb/s local area network infrastructure.

RJ45 Volition K6A jack

- The RJ45 Volition K6A jack has been specially developed for Class E_A and Category 6A systems on twisted pair cable in compliance with the standards ISO/IEC 11801, EN 50173 series and ANSI/TIA-568-C for channel and permanent link configurations. With its patented design, it can be connected to Volition Category 6_A cables

without any special tools. The 360° connection to the cable shield, thanks to the metallic braid of the cover, is a unique, method of cabling. The 360° shield acts like a Faraday cage around the RJ45 Volition K6A jack, giving unrivalled immunity against alien cross talk.



- Volition faceplates are available in many different formats, according to national standards.

1.1 Volition™ Class E_A / Category 6A Cabling System

3M™ Volition™ Category 6_A / Category 7 cables



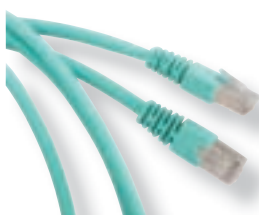
- The Volition Category 6_A and Category 7 cables have been specially developed to ensure excellent immunity against AXT up to 500 MHz (for Category 6_A) and 600 MHz (for Category 7). All cables of Volition design have a general shield and/or screen per pair. Volition cables benefit from unequalled immunity to AXT. The cables have independent performance verification from Delta. Volition cables are easy to install and do not require any special installation precautions. Connection to the Volition K6A RJ45 jack remains simple and familiar. Pulling in the cables is easy, due to the fact that their outer dimensions are very close to the current Volition Category 6 cables. Volition cables have LSOH (Low Smoke Zero Halogen) sheath.
- Comparative studies show that competing Category 6_A UTP cables have outer diameters larger than those of current Category 6 cables or are a non-round shape. Cabling techniques to reduce AXT between 10 Gb/s UTP cables consist of moving the pairs further apart, strengthening the outer sheaths, placing an insulator or separator between the pairs and increasing the twist. The outer diameter of Category 6_A UTP cables is thus increased. Another technique consists of making Category 6_A UTP cables oval to reduce the risk in cable routes of one pair being adjacent to another pair with the same twist. This makes the cables harder to install and the cable bundles larger.

Features

- Category 6_A cable with round design
- General shield and/or screen per pair
- Metric markings on exterior sheath

Advantages

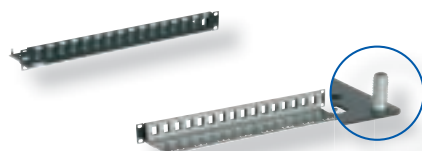
- Easy to terminate with RJ45 Volition K6A jacks
- Unequalled protection against AXT
- Makes it easier to manage the installation



Volition patch cables

- Volition patch cables have been specially designed to give excellent immunity against AXT up to 500 MHz, in particular to reduce the effect of AXT in patching racks where there are many adjacent links. Volition patch cables have a general braid and a screen per pair. Volition patch cables are available with LSOH (Low Smoke Zero Halogen) sheath.

Volition patch panels



- Volition patch panels are modular and can accommodate up to 24 RJ45 ports in one unit of rack space (1U). Their modular design makes them

easy to install on site in 19" racks. All Volition patch panels have an earth stud which permits continuity of earth with the RJ45 K6A jacks.

1.1 Volition™ Class E_A / Category 6A Cabling System



Volition RJ45 Faceplates

- Available in many different formats compatible with Category 6_A RJ45 jacks
- Have automatic dust shutter when fitted with a jack
- Low depth when fitted with a jack



Ordering Information

> France	REF. NO.
	FP4MF1KND
	FP4MF2KND
> USA	
	VOL-0712B
	VOL-0714B
> UK	
	VOL-CHUK-1K
	VOL-CHUK-2K
	VOL-EF-F-1K
	VOL-EF-A-1K
	VOL-EFUK-1K
	VOL-EFUK-2K
	VOL-EFUK-4K
	VOL-EF-BEV-2K
	VOL-EF-BEV-4K
	VOL-LJ6C-F-1K
	VOL-LJ6C-A-1K
	VOL-FPUK-LJ6C-F1K
	VOL-FPUK-LJ6C-F2K
	VOL-FPUK-LJ6C-F4K
> Germany	
	60-516-09200
	60-516-09225
> Italy	
	VOL-BLI-K6
	VOL-BLG-K6
	VOL-BLT-K6
	VOL-BMA-K6
	VOL-BMT-K6
	VOL-BMX-K6
	VOL-BXN-K6
	VOL-BXA-K6
	VOL-GPL-K6
	VOL-GSB-K6
	VOL-GSN-K6
	VOL-VIB-K6
	VOL-VIG-K6
	VOL-VPL-K6

1.1 Volition™ Class EA / Category 6A Cabling System

Ordering Information

Accessories for USA Faceplates

> Coloured identifiers

- For identification of different service (data or telephony)

	Ref. No.
Blue	VOL0790BL
Yellow	VOL0790YL
Red	VOL0790RD
Green	VOL0790GR



Accessories for France Faceplates

> Coloured identifiers

- For identification of different service (data or telephony)

	Ref. No.
Blue	VOL0790BLND
Yellow	VOL0790YLND
Red	VOL0790RDND
Green	VOL0790GRND



Accessories for UK faceplates

> Blanking Plates

	Ref. No.
LJ6C Adaptor Blanking Plate	VOL-LJ6C-F1K BLANK
12.5 x 50 Euro Blanking Plate	VOL-EF-BLANK-12.5*50
25 x 50 Euro Blanking Plate	VOL-EF-BLANK-25*50



1.1 Volition™ Class E_A / Category 6A Cabling System



Volition RJ45 K6A STP keystone jack

- 360° Metallic shielding
- Tool-less termination
- Re-usable jack
- Connector can be terminated with both solid and stranded wires
- Integral shutter
- Separate wire guide indicating the contact number and the wiring codes TIA 568A and TIA 568B

Ordering Information

STP Category 6_A Jack – bag of 8

Ref. No.

VOLCK6ASE

Volition RJ45 19" Patch Panels for K6A STP jacks

- Modular patch panel for RJ45 keystone jacks
- Delivered without connectors
- Can be equipped with Volition RJ45 K6A STP Jacks
- Direct and individual earthing protection upon insertion of jacks
- Delivered with screws and cage nuts

Ordering Information

> 16 ports

19" x 1U x 100 mm, Black aluminium

19" x 1U x 100 mm, Black aluminium with locking system

19" x 1U x 100 mm, Brushed aluminium

19" x 1U x 11 mm, Black aluminium, Eco version

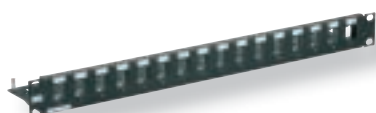
Ref. No.

VOLPPCBF16K

VOLPPCBV16K

VOLPPCAF16K

VOLPPUDF16K



> 24 ports

19" x 1U x 100 mm, Black aluminium

19" x 1U x 100 mm, Black aluminium with locking system

19" x 1U x 100 mm, Brushed aluminium

19" x 1U x 11 mm, Black aluminium, Eco version

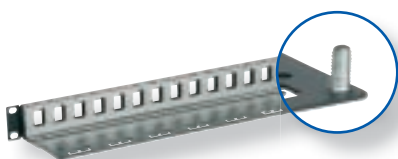
Ref. No.

VOLPPCBF24K

VOLPPCBV24K

VOLPPCAF24K

VOLPPUDF24K



> 32 ports

19" x 2U x 118 mm, Black aluminium

19" x 2U x 118 mm, Brushed aluminium

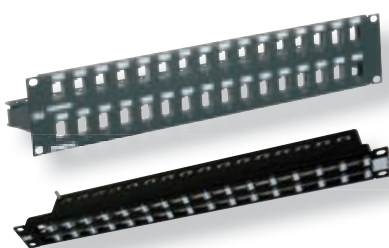
19" x 1U x 118 mm, Black aluminium, high density

Ref. No.

VOLPPCBF32K

VOLPPCAF32K

VOL-PPCBHD-F32K



> 48 ports

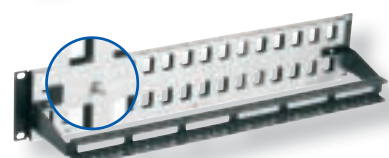
19" x 2U x 118 mm, Black aluminium

19" x 2U x 118 mm, Brushed aluminium

Ref. No.

VOLPPCBF48K

VOLPPCAF48K



1.1 Volition™ Class E_A / Category 6A Cabling System

Accessories for Volition RJ45 19" Patch Panels



> Coloured identifiers

- Cannot be used with RJ45 splitters

	Ref. No.
Blue	VOLPCCB
Yellow	VOLPCCY
Red	VOLPCCR
Green	VOLPCCG



> Coloured identifiers with label holder

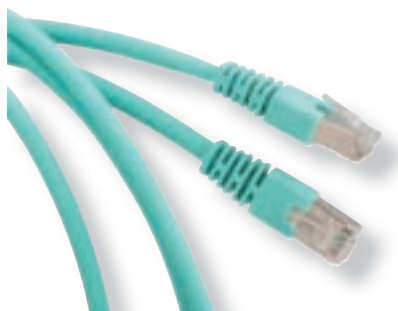
	Ref. No.
Blue	VOLPECB
Yellow	VOLPECY
Red	VOLPECR
Green	VOLPECG



> RJ45 keystone blanking caps

	Ref. No.
Black	VOL0300BK
White	VOL0300

1.1 Volition™ Class EA / Category 6A Cabling System



Volition RJ45 Category 6A patch cords

- These cords allow the implementation of Class EA ISO or EN Channel and Category 6A TIA Channel.
- Round S/FTP cable
- Straight wiring
- LSOH jacket
- Standard colour: turquoise

> Volition S/FTP LSOH turquoise

- Multistranded cable, foil wrapped pair by pair, general braid.

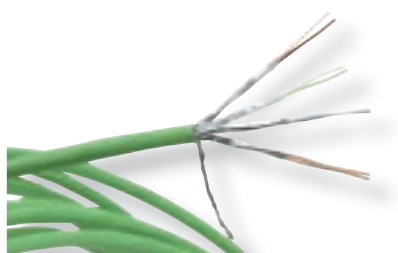
Turquoise	Ref. No.
1,00 m	VOL10SFL1
2,00 m	VOL10SFL2
3,00 m	VOL10SFL3
5,00 m	VOL10SFL5

Volition Category 6A and Category 7 cables

> Copper cable, 4 pairs, Category 7, S/FTP, LSOH

> Available in 1000 m and 500 m drums

	Ref. No.
4 pairs, 500 m drum	VOL10SFL4500
4 pairs, 1000 m drum	VOL10SFL41000
2 x 4 pairs, 1000 m drum	VOL10SFL8500



> Copper cable, 4 pairs, Category 6A, F/FTP, LSOH

	Ref. No.
4 pairs, 1000 m drum	VOL6AFFL41000
2 x 4 pairs, 1000 m drum	VOL6AFFL8500

> Copper cable, 4 pairs, Category 6A, F/UTP, LSOH

	Ref. No.
4 pairs, 500 m drum	VOL6AFL4500
4 pairs, 1000 m drum	VOL6AFL41000
2 x 4 pairs, 1000 m drum	VOL6AFL8500

> Copper cable, 4 pairs, Category 6A, U/FTP, LSOH

	Ref. No.
4 pairs, 500 m drum	VOL6AUFL4500
4 pairs, 1000 m drum	VOL6AUFL41000
2 x 4 pairs, 1000 m drum	VOL6AUFL8500

> Copper Cable, 4 pairs, S/FTP LSOH, Reduced Diameter

	Ref. No.
4 pairs, 500 m drum	VOLDSCFL4500
4 pairs, 1000 m drum	VOLDSCFL41000

1.1 Volition™ Class EA / Category 6A Cabling System

Technical Specifications

Category 7 S/FTP LSOH cable

Cabling standards

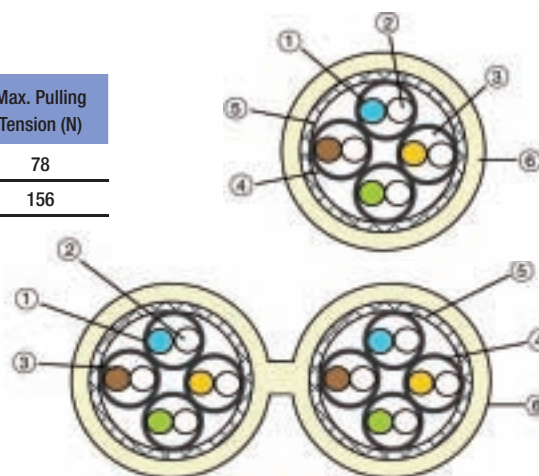
- EN 50173
- ISO/IEC 11801
- EN 50288-4-1
- IEC 61156-5

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emission IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
		mm	kg/km	MJ/Km	
4P	Green	7,70	57	626	78
2x4P	Green	7,90x16,00	116	1 301	156

- 1 – Conductor material: copper wire Ø 0.56 mm (23AWG)
- 2 – Insulation material: Coloured polyethylene Ø 1.45 mm
- 3 - Number of pairs: 4 and 8 (2x4)
- 4 – Individual screen on each pair: Aluminium/Polyester foil
- 5 – General screen: copper braid
- 6 – Jacket material: LSZH



Electrical characteristics at 20°C

- Complete conductor resistance: $\leq 146.4 \Omega / \text{km}$
- Insulation resistance (500V): $\geq 5000 \text{ M}\Omega \cdot \text{km}$
- Dielectric strength at 50 Hz 1 kVdc / 1 min (no breakdown)
- Capacitance unbalance – pair to ground: $\leq 1600 \text{ pF} / \text{km}$
- Propagation velocity (NVP): 78%
- Characteristic Impedance at 100 MHz: $100 \pm 5 \Omega$
- Transfer impedance at
 - 1 MHz $\leq 10 \text{ m}\Omega / \text{m}$
 - at 10 MHz $\leq 10 \text{ m}\Omega / \text{m}$
 - at 30 MHz $\leq 20 \text{ m}\Omega / \text{m}$
 - at 100 MHz $\leq 30 \text{ m}\Omega / \text{m}$

Mechanical installation characteristics

- Minimum bend radius (installation): 60 mm
- Minimum bend radius (installed): 30 mm
- Temperature range (°C)
 - Transport / storage / installation: 0 to +50°C
 - Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	250	500	600
Max. Attenuat. (dB/100m)	Typical value	3.6	5.6	8	14.2	18.1	28.9	41.2	44
	Category 7 (max.)	3.8	5.9	8.4	15	19.1	31.1	45.3	50.1
Next (dB)	Typical value	90	90	90	90	85	77	74	73
	Category 7 (min.)	78	78	78	75	72	66	62	61
PS Next (dB)	Typical value	87	87	87	87	82	74	71	70
	Category 7 (min.)	75	75	75	72	69	63	59	58
ELFEXT (dB/100 m)	Typical value	86	85	82	76	72	60	51	50
	Category 7 (min.)	78	74	68	58	54	46	40	38
PS ELFEXT (dB/100 m)	Typical value	83	82	79	73	69	57	48	47
	Category 7 (min.)	72	71	65	55	51	43	37	35
Return Loss (dB)	Typical value	26	26	26	26	24	19	16.7	16
	Category 7 (min.)	23	25	25	21.5	20.1	17.3	17.3	17.3
PS ANEXT (dB)	Typical value	85	85	85	85	80	75	68	67
	Category 7 (min.)	67	67	67	64.5	62.5	56.5	52	51

1.1 Volition™ Class EA / Category 6A Cabling System

Technical Specifications

Category 6A F/FTP LSZH cable

Cabling standards

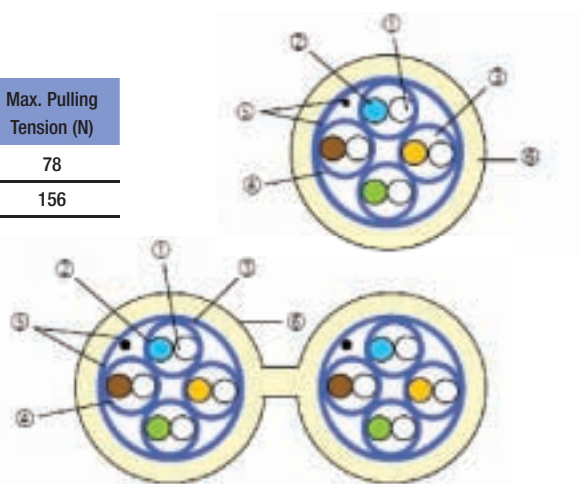
- EN 50173
- ISO/IEC 11801
- ANSI/TIA-568-C
- EN 50288-10
- IEC 61156-5

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emission IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P	Green	7,80	52	550	78
2x4P	Green	7,80x15,80	110	1125	156

- 1 – Conductor material: copper wire Ø 0.56 mm (23AWG)
 2 – Insulation material: Coloured polyethylene Ø 1.45 mm
 3 - Number of pairs: 4 and 8 (2x4)
 4 – Individual screen on each pair: Aluminium/Polyester foil
 5 – General screen: Aluminium foil with copper drain wire
 6 – Jacket material: LSZH



Electrical characteristics at 20°C

- Complete conductor resistance (maxi):
≤ 146.4 Ω / km
- Insulation resistance (500V): ≥ 5000 MΩ.km
- Dielectric strength at 50 Hz 1 kVdc / 1 min
(no breakdown)
- Capacitance unbalance – pair to ground:

≤ 1600 pF / km

- Propagation velocity (NVP): 78%
- Characteristic Impedance at 100 MHz: 100 ± 5 Ω
- Transfer impedance at
 at 1 MHz ≤ 30 mΩ / m
 at 10 MHz ≤ 30 mΩ / m
 at 30 MHz ≤ 50 mΩ / m
 at 100 MHz ≤ 100 mΩ / m

Mechanical installation characteristics

- Minimum bending radius (installation) 70 mm
- Minimum bending radius (installed) 35 mm
- Temperature range (°C)
 - Transport / storage / installation: 0 to +50°C
 - Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	250	500	550*
Max. Attenuat. (dB/100m)	Typical value	3.6	5.6	8	14.2	18.1	28.9	41.2	43.5
	Category 6A (max.)	3.8	5.9	8.4	15	19.1	31.1	45.3	-
Next (dB)	Typical value	90	90	90	90	85	77	74	73
	Category 6A (min.)	65.3	59.3	54.8	47.4	44.3	38.3	33.8	-
PS Next (dB)	Typical value	87	87	87	87	82	74	71	70
	Category 6A (min.)	63.3	57.3	52.8	45.4	42.3	36.3	31.8	-
ELFEXT (dB/100 m)	Typical value	86	85	82	76	72	60	51	50
	Category 6A (min.)	58	50	44	34.1	30	22	16	-
PS ELFEXT (dB/100 m)	Typical value	83	82	79	73	69	57	48	47
	Category 6A (min.)	55	47	41	31.1	27	19	13	-
Return Loss (dB)	Typical value	26	26	26	26	24	19	18	16
	Category 6A (min.)	23	25	25	21.5	20.1	17.3	17.3	-
PS ANEXT (dB)	Typical value	85	85	85	85	80	73	68	67
	Category 6A (min.)	76.5	72.5	69.5	64.5	62.5	56.5	52	-

* For information only

1.1 Volition™ Class EA / Category 6A Cabling System

Technical Specifications

Category 6A F/UTP LSZH cable

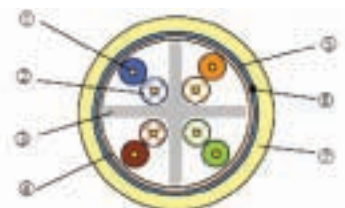
Cabling standards

- EN 50173
- ISO/IEC 11801
- ANSI/TIA-568-C
- EN 50288-10
- IEC 61156-5

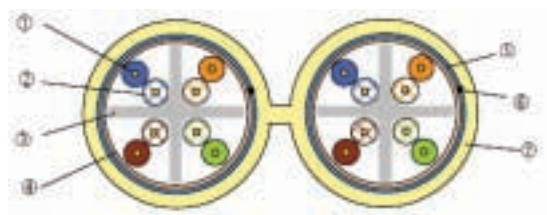
Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emission IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P	Green	6,70	48	710	80
2x4P	Green	6,70x14,10	95	1422	160



- 1 – Conductor material: copper wire Ø 0.510 mm (24AWG)
 2 – Insulation material: Polyethylene Ø 1.10 mm
 3 – Cross separator to optimise NEXT
 4 – Tape – Synthetic
 5 – General screen: Aluminium/Polyester foil
 6 – Copper drain wire
 7 – Jacket material: LSZH



Electrical characteristics at 20°C

- Complete conductor resistance (maxi): $\leq 190 \Omega / \text{km}$
- Insulation resistance (500V): $\geq 5000 \text{ M}\Omega \cdot \text{km}$
- Dielectric strength at 50 Hz 1 kVdc / 1 min (no breakdown)
- Capacitance unbalance – pair to ground: $\leq 1600 \text{ pF} / \text{km}$
- Propagation velocity (NVP): 78%
- Characteristic Impedance at 100 MHz: $100 \pm 5 \Omega$
- Transfer impedance at
 - 1 MHz $\leq 40 \text{ m}\Omega / \text{m}$
 - at 10 MHz $\leq 40 \text{ m}\Omega / \text{m}$
 - at 30 MHz $\leq 50 \text{ m}\Omega / \text{m}$
 - at 100 MHz $\leq 200 \text{ m}\Omega / \text{m}$

Mechanical installation characteristics

- Minimum bending radius (installation) 50 mm
- Minimum bending radius (installed) 25 mm
- Temperature range (°C)
 - Transport / storage / installation: 0 to +50°C
 - Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	250	500	550*
Max. Attenuat. (dB/100m)	Typical value	3.6	5.6	8	14.2	18.1	28.9	41.2	43.5
	Category 6A (max.)	3.8	5.9	8.4	15	19.1	31.1	45.3	-
Next (dB)	Typical value	71	65	61	53	50	44	40	39
	Category 6A (min.)	66.3	60.3	55.8	48.4	45.3	39.3	34.8	-
PS Next (dB)	Typical value	68	62	58	50	47	41	37	36
	Category 6A (min.)	66.3	60.3	55.8	48.4	45.3	39.3	34.8	-
ELFEXT (dB/100 m)	Typical value	73	65	59	49	45	37	31	30
	Category 6A (min.)	58	50	44	34.1	30	22	16	-
PS ELFEXT (dB/100 m)	Typical value	70	62	56	46	42	34	28	27
	Category 6A (min.)	55	47	41	31.1	27	19	13	-
Return Loss (dB)	Typical value	27	27	27	25.8	25	22	18	17
	Category 6A (min.)	23	25	25	21.5	20.1	17.3	17.3	-
PS ANEXT (dB)	Typical value	85	85	80	75	75	75	75	75
	Category 6A (min.)	76.5	72.5	69.5	64.5	62.5	56.5	52	-

* For information only

1.1 Volition™ Class EA / Category 6A Cabling System

Technical Specifications

Category 6_A U/FTP LSZH cable

Cabling standards

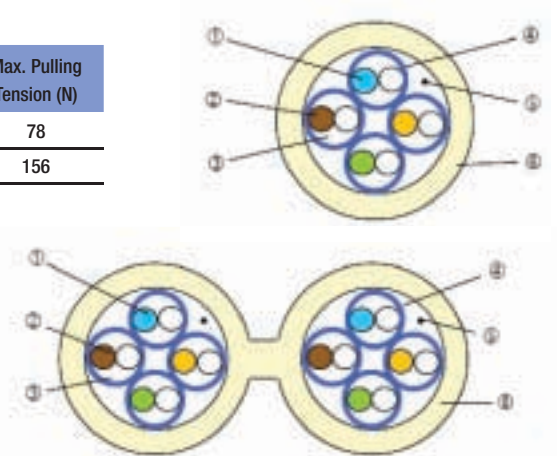
- EN 50173
- ISO/IEC 11801
- ANSI/TIA-568-C
- EN 50288-10
- IEC 61156-5

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emissions IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P	Green	8,0	57	674	78
2x4P	Green	8,0x16,2	116	1380	156

- 1 – Conductor material: copper wire Ø 0,56 mm (23AWG)
 2 – Insulation material: Polyethylene Ø 1,45 mm
 3 – Pairs: 4 AND 8 (2X4)
 4 – Tape – Synthetic
 5 – Copper drain wire
 6 – Jacket material: LSZH



Electrical characteristics at 20°C

- Complete conductor resistance (maxi):
≤ 146,4 Ω / km
- Insulation resistance (500V): ≥ 5000 MΩ.km
- Dielectric strength at 50 Hz 1 kVdc / 1 min
(no breakdown)
- Capacitance unbalance – pair to ground:
≤ 1600 pF / km
- Propagation velocity (NVP): 78%
- Characteristic Impedance at 100 MHz: 100 ± 5 Ω
- Transfer impedance at
 at 1 MHz ≤ 50 mΩ / m
 at 10 MHz ≤ 50 mΩ / m
 at 30 MHz ≤ 70 mΩ / m
 at 100 MHz ≤ 100 mΩ / m

Mechanical installation characteristics

- Minimum bending radius (installation) 70 mm
- Minimum bending radius (installed) 35 mm
- Temperature range (°C)
 - Transport / storage / installation: 0 to +50°C
 - Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	250	500	550*
Max. Attenuat. (dB/100m)	Typical value	3.6	5.6	8	14.2	18.1	28.9	41.2	43.5
	Category 6 _A (max.)	3.8	5.9	8.4	15	19.1	31.1	45.3	-
Next (dB)	Typical value	90	90	82	75	72	65	60	59
	Category 6 _A (min.)	65.3	59.3	54.8	47.4	44.3	38.3	33.8	-
PS Next (dB)	Typical value	87	87	79	72	69	62	57	56
	Category 6 _A (min.)	66.3	57.3	52.8	45.4	42.3	36.3	31.8	-
ELFEXT (dB/100 m)	Typical value	80	80	77	71	67	52	46	45
	Category 6 _A (min.)	58	50	44	34.1	30	22	16	-
PS ELFEXT (dB/100 m)	Typical value	77	77	74	68	64	49	43	42
	Category 6 _A (min.)	55	47	41	31.1	27	19	13	-
Return Loss (dB)	Typical value	25	26	26	23	22	19	18	16
	Category 6 _A (min.)	23	25	25	21.5	20.1	17.3	17.3	-
PS ANEXT (dB)	Typical value	85	85	85	85	80	73	68	67
	Category 6 _A (min.)	76.5	72.5	69.5	64.5	62.5	56.5	52	-

* For information only

1.1 Volition™ Class EA / Category 6A Cabling System

Technical Specifications

S/FTP LS0H reduced diameter cable

- 3M™ Volition™ S/FTP Small Diameter Cable has been specifically designed to provide performances and higher density in data centre applications, as well as offering a low 'Eco-Profile' and cost effectiveness.

VOL-DCSFL4 cable, when associated with 3M K6AS and 3M K6ASE RJ45 Jacks, provides compliance with Category 6A/Class EA performance in permanent link up to 65 m and in channel up to 70m.

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emissions IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P	Green	5,80	38	626	55

- Conductor Diameter: 0,425 mm (AWG 26)
- Insulation Diameter: Pe < 1,00 mm
- Cable assemblies: pairs
- Individual Screen around pairs: Alu/Polyester tape conductor
- Shield: Copper braid
- Sheath material: LS0H
Colour: green



Electrical characteristics at 20°C

- Complete conductor resistance (maxi): $\leq 250 \Omega / \text{km}$
- Insulation resistance (500V): $\geq 5000 \text{ M}\Omega \cdot \text{km}$
- Dielectric strength at 50 Hz 1 kVdc / 1 min (no breakdown)
- Capacitance unbalance – pair to ground: $\leq 1600 \text{ pF} / \text{km}$
- Propagation velocity (NVP): 78%
- Characteristic Impedance at 100 MHz: $100 \pm 5 \text{ Ohm}$
- Transfer impedance at 1 MHz $\leq 10 \text{ mOhm} / \text{m}$
at 30 MHz $\leq 20 \text{ mOhm} / \text{m}$
at 100 MHz $\leq 30 \text{ mOhm} / \text{m}$

Mechanical installation characteristics

- Minimum bending radius (installation) 45 mm
- Minimum bending radius (installed) 25 mm
- Temperature range (°C)
- Transport / storage / installation: 0 to +50°C
- Service: -20 to +60°C

Electrical performance (typical values)

Frequency (MHz)	4	10	100	250	600	900*
Max Attenuation (dB/70m)	3.4	5.7	18.5	29.4	47.8	58.2
Min NEXT (dB)	83	83	77	72	66	63
PS NEXT (dB)	80	80	74	69	63	60
ELFEXT (dB)	84	80	60	52	44	40
PS ELFEXT (dB)	81	77	57	49	41	37
Min ACR (dB)	79.6	77.3	58.5	42.6	18.2	4.8
Return Loss (dB)	25	27	22	20	19.5	19.5

* For information only

1.2 Volition™ Category 6 Cabling System

Volition™ - Category 6/Class E cabling system



- The Volition Copper Cabling system offers a complete range of products to support Gigabit Ethernet applications over twisted pairs, according to Ethernet standard IEEE 802.3 (1GBASE-T). Volition Solutions provide electrical performance above the limits set by the standards ISO/IEC 11801, EN 50173 series and ANSI/TIA-568-C in permanent link, up to 90 m with 4 Volition™ RJ45 K6 jacks and Volition™ Category 6 cable, if installed according to the Volition™ Planning and Installation Guide.
- Volition Copper Cabling system offers a complete range of RJ45 jacks and sockets, cables, patch panels and patch cords. All the components of Volition are designed to guarantee optimal performance as a complete system.
- Volition™ Category 6 solution (standard bandwidth up to 250 MHz) offers a larger bandwidth than Category 5e and supports up to 1G Ethernet with higher efficiency and throughput for those businesses with a medium-term investment strategy in infrastructure.

Selection Guide Volition™

Version	U/UTP Cat.6	F/UTP Cat.6	S/FTP Cat.6
EMC	Low	Medium	High
Cables	U/UTP Cat.6	F/UTP Cat.6	S/FTP Cat.7
Cords	U/UTP	S/FTP	S/FTP
RJ45	UTP	FTP	STP
Class E	1 Gb/s	1 Gb/s	1 Gb/s



Volition™ RJ45 Jacks

- The RJ45 Volition jacks have been specially developed for Ethernet applications up to 1Gb/s, according to ISO/IEC 11801, EN60603-7 series and ANSI/TIA-568-C. With their patented design, they can be connected to Volition cables without any special tools.

1.2 Volition™ Category 6 Cabling System



Volition™ RJ45 sockets and faceplates

- Volition faceplates are available in many different formats, according to the most important national standards (France, Germany, Italy, UK, USA) and are compatible with UTP, FTP and STP RJ45 jacks.



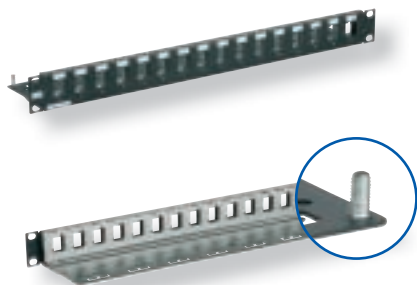
Volition™ Cables

- Volition™ Cables allow easy termination to RJ45 jacks. The Volition™ Category 5e and Category 6 cables are available in U/UTP and F/UTP versions, with PVC and LSZH (Low Smoke Zero Halogen) jacket.



Volition™ Patch Cords

- Volition™ patch cords are designed to ensure electrical performance above ISO/IEC 11801, EN 50173 series and ANSI/TIA-568-C in channel configuration. The Volition™ Category 5e and Category 6 patch cords are available in unshielded and shielded versions, with PVC or LSZH (Low Smoke Zero Halogen) jacket.



Volition™ Patch Panels

- Volition patch panels are modular and can accommodate up to 24 RJ45 ports in one unit of rack space (1U). Their modular design makes them easy to install on site in 19" racks. All Volition patch panels have an earth stud which permits continuity of earth with RJ45 FTP or STP jacks.

1.2 Volition™ Category 6 Cabling System



Volition RJ45 Faceplates

- Available in many different formats compatible with Category 6 RJ45 jacks.
- Have automatic dust shutter when fitted with a jack
- Low depth when fitted with a jack

Ordering Information



> France	Ref. No.
45 x 45 France faceplate, 1 port, white	FP4MF1KND
45 x 45 France faceplate, 2 ports, white	FP4MF2KND
> USA	
Single gang USA faceplate, 2 port, white	VOL-0712B
Single gang USA faceplate, 4 port, white	VOL-0714B
> UK	
Single gang UK faceplate, 1 port, white	VOL-CHUK-1K
Single gang UK faceplate, 2 ports, white	VOL-CHUK-2K
25 x 50 Euro Flat Adapter	VOL-EF-F-1K
25 x 50 Euro Angled Adapter	VOL-EF-A-1K
86 x 86 Euro Flat Faceplate Single Port	VOL-EFUK-1K
86 x 86 Euro Flat Faceplate Dual Port	VOL-EFUK-2K
86 x 172 Euro Flat Faceplate Quad Port	VOL-EFUK-4K
86 x 86 Euro Bevelled Faceplate Single/Dual Port	VOL-EF-BEV-2K
86 x 172 Euro Bevelled Faceplate Single/Dual/Quad Port	VOL-EF-BEV-4K
LJ6C Flat Adapter	VOL-LJ6C-F-1K
LJ6C Angled Adapter	VOL-LJ6C-A-1K
86 x 86 LJ6 Flat Faceplate Single Port	VOL-FPUK-LJ6C-F1K
86 x 86 LJ6 Flat Faceplate Dual Port	VOL-FPUK-LJ6C-F2K
86 x 172 LJ6 Flat Faceplate Quad Port	VOL-FPUK-LJ6C-F4K
> Germany	
50 x 50 Germany faceplate, white, 2 ports	60-516-09200
50 x 50 Germany faceplate, beige, 2 ports	60-516-09225
> Italy	
Faceplate for BTicino Living International, 1 port	VOL-BLI-K6
Faceplate for BTicino Light, 1 port	VOL-BLG-K6
Faceplate for BTicino Light Tech, 1 port	VOL-BLT-K6
Faceplate for BTicino Magic, 1 port	VOL-BMA-K6
Faceplate for BTicino Magic TT, 1 port	VOL-BMT-K6
Faceplate for BTicino Matix, 1 port	VOL-BMX-K6
Faceplate for BTicino Axolute, 1 port, black	VOL-BXN-K6
Faceplate for BTicino Axolute, 1 port, silver	VOL-BXA-K6
Faceplate for Gewiss Playbus, 1 port	VOL-GPL-K6
Faceplate for Gewiss System, 1 port, white	VOL-GSB-K6
Faceplate for Gewiss System, 1 port, black	VOL-GSN-K6
Faceplate for Vimar Idea, 1 port, white	VOL-VIB-K6
Faceplate for Vimar Idea, 1 port, grey	VOL-VIG-K6
Faceplate for Vimar Plana, 1 port	VOL-VPL-K6

1.2 Volition™ Category 6 Cabling System

Ordering Information

Accessories for USA Faceplates

> Coloured identifiers

- For identification of different service (data or telephony)

	Ref. No.
Blue	VOL0790BL
Yellow	VOL0790YL
Red	VOL0790RD
Green	VOL0790GR



Accessories for France Faceplates

> Coloured identifiers

- For identification of different service (data or telephony)

	Ref. No.
Blue	VOL0790BLND
Yellow	VOL0790YLND
Red	VOL0790RDND
Green	VOL0790GRND



Accessories for UK faceplates

> Blanking Plates

	Ref. No.
LJ6C Adaptor Blanking Plate	VOL-LJ6C-F1K BLANK
12.5 x 50 Euro Blanking Plate	VOL-EF-BLANK-12.5*50
25 x 50 Euro Blanking Plate	VOL-EF-BLANK-25*50



1.2 Volition™ Category 6 Cabling System

Volition RJ45 K6 keystone jack

- Tool-less termination
- Re-usable jack
- Connector can be terminated with both solid and stranded wires
- Integral shutter
- Separate wire guide indicating the contact number and the wiring codes TIA 568A and TIA 568B
- IP50
- UTP – coloured jacks available
- Bulk packaging available



Ordering Information

	Ref. No.
> STP	OCK6S8
> FTP	OCK6F8
> UTP	OCK6U8
> UTP Coloured, Blue	VOLOCK6UB
> UTP Coloured, Green	VOLOCK6UG
> UTP Coloured, Red	VOLOCK6UR
> UTP Coloured, Yellow	VOLOCK6UY
> UTP Coloured, Black	VOLOCK6UBK
> UTP Coloured, Orange	VOLOCK6UO
> UTP Coloured, Almond	VOLOCK6UA

1.2 Volition™ Category 6 Cabling System

Volition RJ45 19" Patch Panels for K6 Jacks

- Modular patch panel for RJ45 keystone jacks
- Delivered without connectors
- Can be equipped with Volition RJ45 K6 Jacks
- Direct and individual earthing protection upon insertion of jacks (FTP and STP)
- Delivered with screws and cage nuts
- Compatible with the RJ45 splitter locking system (Type CBV in 16 and 24 ports versions in black)

Ordering Information

> 16 ports

	Ref. No.
19" x 1U x 100 mm, Black aluminium	VOLPPCBF16K
19" x 1U x 100 mm, Black aluminium with locking system	VOLPPCBV16K
19" x 1U x 100 mm, Brushed aluminium	VOLPPCAF16K
19" x 1U x 11 mm, Black aluminium, Eco version	VOLPPUDF16K

> 24 ports

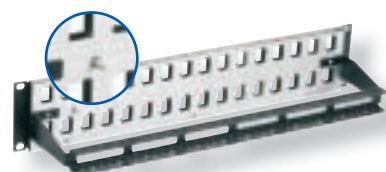
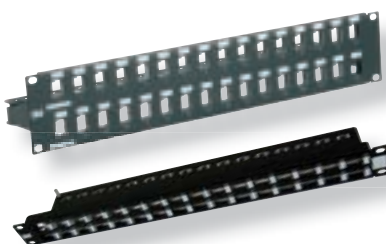
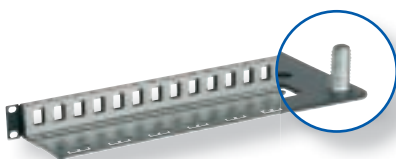
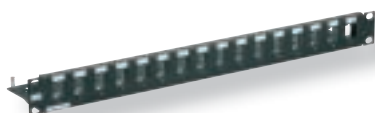
	Ref. No.
19" x 1U x 100 mm, Black aluminium	VOLPPCBF24K
19" x 1U x 100 mm, Black aluminium with locking system	VOLPPCBV24K
19" x 1U x 100 mm, Brushed aluminium	VOLPPCAF24K
19" x 1U x 11 mm, Black aluminium, Eco version	VOLPPUDF24K

> 32 ports

	Ref. No.
19" x 2U x 118 mm, Black aluminium	VOLPPCBF32K
19" x 2U x 118 mm, Brushed aluminium	VOLPPCAF32K
19" x 1U x 118 mm, Black aluminium, high density	VOL-PPCBHD-F32K

> 48 ports

	Ref. No.
19" x 2U x 118 mm, Black aluminium	VOLPPCBF48K
19" x 2U x 118 mm, Brushed aluminium	VOLPPCAF48K



1.2 Volition™ Category 6 Cabling System



> Socket Connector RJ45 / RJ45

- Used to equip feed-through patch panels
- May be used in consolidation point applications as defined by ISO 11801

Category 6, shielded

Ref. No.

VOL78004

Accessories for Volition RJ45 19" Patch Panels



> Coloured identifiers

- Cannot be used with RJ45 splitters

Blue

Ref. No.

VOLPCCB

Yellow

VOLPCCY

Red

VOLPCCR

Green

VOLPCCG



> Coloured identifiers with label holder

Blue

Ref. No.

VOLPECB

Yellow

VOLPECY

Red

VOLPECR

Green

VOLPECG



> RJ45 keystone blanking caps

Black

Ref. No.

VOL0300BK

White

VOL0300

1.2 Volition™ Category 6 Cabling System

Volition RJ45 patch cords

- Compliant with Category 6 hardware performance, certified by Delta
- These cords allow the implementation of Class E ISO/IEC Channel and Category 6 TIA Channels at 250 MHz
- Round cable
- Moulded boot
- Straight wiring
- PVC or LSOH jacket
- Standard colour: turquoise

> Volition S/FTP LSOH turquoise

Turquoise	Ref. No.
1,00 m	VOL6SSLL1
2,00 m	VOL6SSLL2
3,00 m	VOL6SSLL3
5,00 m	VOL6SSLL5

> Volition S/FTP LSOH red

Red	Ref. No.
1,00 m	VOL6SSLL1R
2,00 m	VOL6SSLL2R
3,00 m	VOL6SSLL3R
5,00 m	VOL6SSLL5R

> Volition S/FTP LSOH yellow

Yellow	Ref. No.
1,00 m	VOL6SSLL1Y
2,00 m	VOL6SSLL2Y
3,00 m	VOL6SSLL3Y
5,00 m	VOL6SSLL5Y

> Volition S/FTP LSOH green

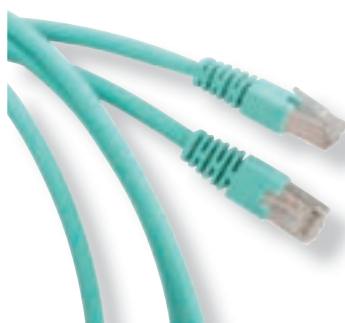
Green	Ref. No.
1,00 m	VOL6SSLL1G
2,00 m	VOL6SSLL2G
3,00 m	VOL6SSLL3G
5,00 m	VOL6SSLL5G

> Volition S/FTP LSOH blue

Blue	Ref. No.
1,00 m	VOL6SSLL1B
2,00 m	VOL6SSLL2B
3,00 m	VOL6SSLL3B
5,00 m	VOL6SSLL5B

> Volition S/FTP LSOH white

White	Ref. No.
1,00 m	VOL6SSLL1W
2,00 m	VOL6SSLL2W
3,00 m	VOL6SSLL3W
5,00 m	VOL6SSLL5W



1.2 Volition™ Category 6 Cabling System



> Volition U/UTP LSOH turquoise

Turquoise	Ref. No.
1,00 m	VOL6ULL1
2,00 m	VOL6ULL2
3,00 m	VOL6ULL3
5,00 m	VOL6ULL5

> Volition U/UTP PVC turquoise

Turquoise	Ref. No.
1,00 m	VOL6UPL1
2,00 m	VOL6UPL2
3,00 m	VOL6UPL3
5,00 m	VOL6UPL5

> Volition U/UTP LSOH red

Red	Ref. No.
1,00 m	VOL6ULL1R
2,00 m	VOL6ULL2R
3,00 m	VOL6ULL3R
5,00 m	VOL6ULL5R

> Volition U/UTP LSOH yellow

Yellow	Ref. No.
1,00 m	VOL6ULL1Y
2,00 m	VOL6ULL2Y
3,00 m	VOL6ULL3Y
5,00 m	VOL6ULL5Y

> Volition U/UTP LSOH green

Green	Ref. No.
1,00 m	VOL6ULL1G
2,00 m	VOL6ULL2G
3,00 m	VOL6ULL3G
5,00 m	VOL6ULL5G

> Volition U/UTP LSOH blue

Blue	Ref. No.
1,00 m	VOL6ULL1B
2,00 m	VOL6ULL2B
3,00 m	VOL6ULL3B
5,00 m	VOL6ULL5B

> Volition U/UTP LSOH white

White	Ref. No.
1,00 m	VOL6ULL1W
2,00 m	VOL6ULL2W
3,00 m	VOL6ULL3W
5,00 m	VOL6ULL5W

1.2 Volition™ Category 6 Cabling System

Volition Category 6 cables

Copper cable, 4 pairs, Category 6, U/UTP, LS0H

	Ref. No.
> 4 pairs, 305 m box	VOL6UL4305
> 4 pairs, 1000 m drum	VOL6UL41000
> 2 x 4 pairs, 500 m drum	VOL6UL8500
> 2 x 4 pairs, 1000 m drum	VOL6UL81000

Copper cable, 4 pairs, Category 6, U/UTP, PVC

	Ref. No.
> 4 pairs, 305 m box	VOL6UP4305
> 4 pairs, 1000 m drum	VOL6UP41000
> 2 x 4 pairs, 1000 m drum	VOL6UP81000

Copper cable, 4 pairs, Category 6, F/UTP, LS0H

	Ref. No.
> 4 pairs, 500 m drum	VOL6FL4 500
> 4 pairs, 1000 m drum	VOL6FL4 1000
> 2 x 4 pairs, 500 m drum	VOL6FL8 500
> 2 x 4 pairs, 1000 m drum	VOL6FL8 1000

Copper cable, 4 pairs, Category 6, F/UTP, PVC

	Ref. No.
> 4 pairs, 1000 m drum	VOL6FP41000
> 2 x 4 pairs, 500 m drum	VOL6FP8500

1.2 Volition™ Category 6 Cabling System

Technical Specifications

Volition Category 6 F/UTP LSZH and PVC cable

Cabling standards

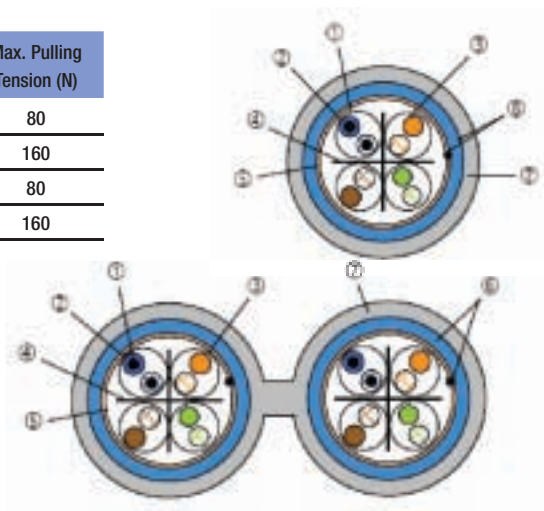
- EN 50173
- ISO/IEC 11801
- TIA/EIA 568
- EN 50288-5-1
- IEC 61156-5

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emissions IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P (LSZH)	Green	6,30	42	538	80
2x4P (LSZH)	Green	6,30x13,30	82	1060	160
4P (PVC)	Green	6,30	42	578	80
2x4P (PVC)	Green	6,30x13,30	79	1126	160

- 1 – Conductor material: copper wire Ø 0,535 mm (24AWG)
 2 – Insulation material: Polyethylene Ø 1,10 mm
 3 – Pairs: 4 and 8 (2X4)
 4 – Cross separator
 5 – Tape – Synthetic
 6 – Alu/polyester tape and copper drain wire
 7 – Jacket material: LSZH or PVC
 Colour: green



Electrical characteristics at 20°C

- Complete conductor resistance (max):
≤ 190 Ohm / km
- Insulation resistance (500V):
≥ 5000 MOhm.km
- Dielectric strength at 50 Hz 1 kVdc / 1 min
(no breakdown)
- Capacitance unbalance – pair to ground:
≤ 1600 pF / km
- Propagation velocity (NVP): 78%
- Characteristic Impedance at 100 MHz: $100 \pm 5 \Omega$
- Transfer impedance at
 at 1 MHz ≤ 40 mΩ / m
 at 10 MHz ≤ 40 mΩ / m
 at 30 MHz ≤ 50 mΩ / m
 at 100 MHz ≤ 200 mΩ / m

Mechanical installation characteristics

- Minimum bend radius (installation): 50 mm
- Minimum bend radius (installed): 25 mm
- Temperature range (°C)
 - Transport / storage / installation: 0 to +50°C
 - Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	250	300**	450**
Max. Attenuat. (dB/100m)	Typical value	3.6	5.7	8.3	14.8	19	31	34	43
	Category 6* (max.)	3.8	6	8.5	15.5	19.9	33	-	-
Min. Next (dB)	Typical value	71	65	61	53	50	44	43	40
	Category 6* (min.)	65.3	59.3	54.8	47.4	44.3	38.3	-	-
Min. ACR (dB)	Typical value	68	62	58	50	47	41	40	37
	Category 6* (min.)	63.3	57.3	52.8	45.4	42.3	36.3	-	-
PS Next (dB)	Typical value	73	65	59	49	45	37	35	32
	Category 6* (min.)	58	50	44	34.1	30	22	-	-
ELFEXT (dB/100 m)	Typical value	70	62	56	46	42	34	32	29
	Category 6* (min.)	55	47	41	31.1	27	19	-	-
PS ELFEXT (dB/100 m)	Typical value	27	27	27	25.8	25	22	22	21
	Category 6* (min.)	23	25	25	21.5	20.1	17.3	-	-
Return Loss (dB)	Typical value	27	27	27	25.8	25	22	22	21
	Category 6* (min.)	23	25	25	21.5	20.1	17.3	-	-

*Category 6 acc. to IEC 61156-5 ** For information only

1.2 Volition™ Category 6 Cabling System

Technical Specifications

Volition Category 6 U/UTP LSZH and PVC cable

Cabling standards

- EN 50173
- ISO/IEC 11801
- TIA/EIA 568
- EN 50288-6-1
- IEC 61156-5

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emissions IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P	Green	6,00	38	468	95
2x4P	Green	6,0x18,1	90	1197	180
4P (PVC)	Green	6,60	37	518	95
2x4P (PVC)	Green	6,0 x 19,6	97	1561	180

1 – Conductor material: copper wire Ø 0,56 mm (23AWG)

2 – Insulation material: Polyethylene Ø 0,98 mm

3 – Pairs: 4 and 8 (2X4)

4 – Cross separator

5 – Jacket material: LSZH or PVC

Colour: green



Electrical characteristics at 20°C

- Complete conductor resistance (max):
≤ 190 Ohm / km
- Insulation resistance (500V):
≥ 5000 MOhm.km
- Dielectric strength at 50 Hz 1 kVdc / 1 min
(no breakdown)
- Capacitance unbalance – pair to ground:
≤ 1600 pF / km
- Propagation velocity (NVP): 66%
- Characteristic Impedance at 100 MHz: 100 ± 5 Ω

Mechanical installation characteristics

- Minimum bend radius (installation): 50 mm
- Minimum bend radius (installed): 25 mm
- Temperature range (°C)
- Transport / storage / installation: 0 to +50°C
- Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	250	300**
Max. Attenuat. (dB/100m)	Typical value	3.6	5.7	8.3	14.8	19	31	34
	Category 6* (max.)	3.8	6	8.5	15.5	19.9	33	-
Min. Next (dB)	Typical value	71	65	61	53	50	44	43
	Category 6* (min.)	65.3	59.3	54.8	47.4	44.3	38.3	-
Min. ACR (dB)	Typical value	67.4	59.3	52.7	38.2	31	13	11
	Category 6* (min.)	61.5	53.3	46.3	31.9	24.4	5.3	-
PS Next (dB)	Typical value	68	62	58	50	47	41	40
	Category 6* (min.)	63.3	57.3	52.8	45.4	42.3	36.3	-
ELFEXT (dB/100 m)	Typical value	73	65	59	49	45	37	35
	Category 6* (min.)	58	50	44	34.1	30	22	-
PS ELFEXT (dB/100 m)	Typical value	70	62	56	46	42	34	32
	Category 6* (min.)	55	47	41	31.1	27	19	-
Return Loss (dB)	Typical value	27	27	27	25.8	25	22	22
	Category 6* (min.)	23	25	25	21.5	20.1	17.3	-

*Category 6 acc. to IEC 61156-5 ** For information only

1.3 Volition™ Category 5e Cabling System



Description - Category 5e/Class D cabling system

- The Volition Copper Cabling system offers a complete range of products to support Gigabit Ethernet applications over twisted pairs, according to Ethernet standard IEEE 802.3 (1GBASE-T). Volition Solutions provide electrical performance above the limits set by the standards ISO/IEC 11801, EN 50173 series and ANSI/TIA-568-C in permanent link, up to 90 m with 4 Volition™ RJ45 K5e jacks and Volition™ Category 5e cable, if installed according to the Volition™ Planning and Installation Guide.
- Volition Copper Cabling system offers a complete range of RJ45 jacks and sockets, cables, patch panels and patch cords. All the components of Volition are designed to guarantee optimal performance as a complete system.
- Volition™ Category 5e solution (standard bandwidth up to 100 MHz) supports 10 MHz, 100MHz and 1G Ethernet for those businesses with a limited need for bandwidth and a short to medium-term investment strategy in infrastructure.

Version	U/UTP Cat.5e	F/UTP Cat.5e
EMC	Low	Medium
Cables	U/UTP Cat.5e	F/UTP Cat.5e
Cords	U/UTP	F/UTP
RJ45	UTP	FTP
Class D	100 Mb/s 1 Gb/s	100 Mb/s 1 Gb/s

Volition RJ45 Faceplates and modules

- Available in many different formats compatible with UTP and FTP Category 5e RJ45 jacks
- Have automatic dust shutter when fitted with a jack
- Low depth when fitted with a jack

Ordering Information

> France	Ref. No.
45 x 45 France faceplate, 1 port, white	FP4MF1KND
45 x 45 France faceplate, 2 ports, white	FP4MF2KND
> USA	
Single gang USA faceplate, 2 port, white	VOL-0712B
Single gang USA faceplate, 4 port, white	VOL-0714B
> UK	
Single gang UK faceplate, 1 port, white	VOL-CHUK-1K
Single gang UK faceplate, 2 ports, white	VOL-CHUK-2K
25 x 50 Euro Flat Adapter	VOL-EF-F-1K
25 x 50 Euro Angled Adapter	VOL-EF-A-1K
86 x 86 Euro Flat Faceplate Single Port	VOL-EFUK-1K
86 x 86 Euro Flat Faceplate Dual Port	VOL-EFUK-2K
86 x 172 Euro Flat Faceplate Quad Port	VOL-EFUK-4K
86 x 86 Euro Bevelled Faceplate Single/Dual Port	VOL-EF-BEV-2K
86 x 172 Euro Bevelled Faceplate Single/Dual/Quad Port	VOL-EF-BEV-4K
LJ6C Flat Adapter	VOL-LJ6C-F-1K
LJ6C Angled Adapter	VOL-LJ6C-A-1K
86 x 86 LJ6 Flat Faceplate Single Port	VOL-FPUK-LJ6C-F1K
86 x 86 LJ6 Flat Faceplate Dual Port	VOL-FPUK-LJ6C-F2K
86 x 172 LJ6 Flat Faceplate Quad Port	VOL-FPUK-LJ6C-F4K

1.3 Volition™ Category 5e Cabling System

Ordering Information

> Germany	Ref. No.
50 x 50 Germany faceplate, white, 2 ports	60-516-09200
50 x 50 Germany faceplate, beige, 2 ports	60-516-09225
> Italy	
Faceplate for BTicino Living International, 1 port	VOL-BLI-K6
Faceplate for BTicino Light, 1 port	VOL-BLG-K6
Faceplate for BTicino Light Tech, 1 port	VOL-BLT-K6
Faceplate for BTicino Magic, 1 port	VOL-BMA-K6
Faceplate for BTicino Magic TT, 1 port	VOL-BMT-K6
Faceplate for BTicino Matix, 1 port	VOL-BMX-K6
Faceplate for BTicino Axolute, 1 port, black	VOL-BXN-K6
Faceplate for BTicino Axolute, 1 port, silver	VOL-BXA-K6
Faceplate for Gewiss Playbus, 1 port	VOL-GPL-K6
Faceplate for Gewiss System, 1 port, white	VOL-GSB-K6
Faceplate for Gewiss System, 1 port, black	VOL-GSN-K6
Faceplate for Vimar Idea, 1 port, white	VOL-VIB-K6
Faceplate for Vimar Idea, 1 port, grey	VOL-VIG-K6
Faceplate for Vimar Plana, 1 port	VOL-VPL-K6

Accessories for USA Faceplates

> Coloured identifiers

- For identification of different service (data or telephony)

	Ref. No.
Blue	VOL0790BL
Yellow	VOL0790YL
Red	VOL0790RD
Green	VOL0790GR



Accessories for France Faceplates

> Coloured identifiers

- For identification of different service (data or telephony)

	Ref. No.
Blue	VOL0790BLND
Yellow	VOL0790YLND
Red	VOL0790RDND
Green	VOL0790GRND



Accessories for UK faceplates

> Blanking Plates

	Ref. No.
LJ6C Adaptor Blanking Plate	VOL-LJ6C-F1K BLANK
12.5 x 50 Euro Blanking Plate	VOL-EF-BLANK-12.5*50
25 x 50 Euro Blanking Plate	VOL-EF-BLANK-25*50



1.3 Volition™ Category 5e Cabling System



Volition RJ45 K5e keystone jack

- Tool-less termination
- Re-usable jack
- Connector can be terminated with both solid and stranded wires
- Integral shutter
- Separate wire guide indicating the contact number and the wiring codes TIA 568A and TIA 568B
- IP50
- UTP – coloured jacks available
- Bulk packaging available

Ordering Information

	Ref. No.
> STP	OCK5ES8
> FTP	OCK5EF8
> UTP	OCK5EU8
> UTP Coloured, Blue	VOLOCK5EUB
> UTP Coloured, Green	VOLOCK5EUG
> UTP Coloured, Red	VOLOCK5EUR
> UTP Coloured, Yellow	VOLOCK5EUY
> UTP Coloured, Black	VOLOCK5EUBK
> UTP Coloured, Orange	VOLOCK5EUO
> UTP Coloured, Almond	VOLOCK5EUA

1.3 Volition™ Category 5e Cabling System

Volition RJ45 19" Patch Panels for K5E Jacks

- Modular patch panel for RJ45 keystone jacks
- Delivered without connectors
- Can be equipped with Volition RJ45 K5E Jacks
- Direct and individual earthing protection upon insertion of jacks (FTP and STP)
- Delivered with screws and cage nuts
- Compatible with the RJ45 splitter locking system (Type CBV in 16 and 24 ports versions in black)

Ordering Information

> 16 ports

	Ref. No.
19" x 1U x 100 mm, Black aluminium	VOLPPCBF16K
19" x 1U x 100 mm, Black aluminium with locking system	VOLPPCBV16K
19" x 1U x 100 mm, Brushed aluminium	VOLPPCAF16K
19" x 1U x 11 mm, Black aluminium, Eco version	VOLPPUDF16K

> 24 ports

	Ref. No.
19" x 1U x 100 mm, Black aluminium	VOLPPCBF24K
19" x 1U x 100 mm, Black aluminium with locking system	VOLPPCBV24K
19" x 1U x 100 mm, Brushed aluminium	VOLPPCAF24K
19" x 1U x 11 mm, Black aluminium, Eco version	VOLPPUDF24K

> 32 ports

	Ref. No.
19" x 2U x 118 mm, Black aluminium	VOLPPCBF32K
19" x 2U x 118 mm, Brushed aluminium	VOLPPCAF32K
19" x 1U x 118 mm, Black aluminium, high density	VOL-PPCBHD-F32K

> 48 ports

	Ref. No.
19" x 2U x 118 mm, Black aluminium	VOLPPCBF48K
19" x 2U x 118 mm, Brushed aluminium	VOLPPCAF48K

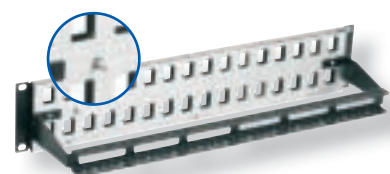
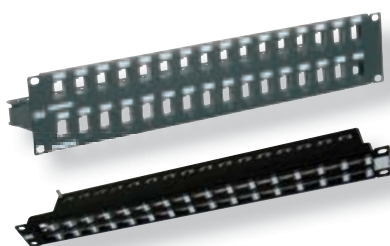
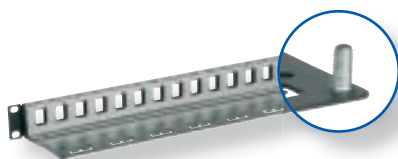
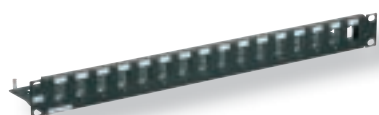
> Socket Connector RJ45 / RJ45

- Used to equip feed-through patch panels
- May be used in consolidation point applications as defined by ISO 11801

Category 5E, shielded

Ref. No.

VOL78005



1.3 Volition™ Category 5e Cabling System

Accessories for Volition RJ45 19" Patch Panels



> Coloured identifiers

- Cannot be used with RJ45 splitters

	Ref. No.
Blue	VOLPCCB
Yellow	VOLPCCY
Red	VOLPCCR
Green	VOLPCCG



> Coloured identifiers with label holder

	Ref. No.
Blue	VOLPECB
Yellow	VOLPECY
Red	VOLPECR
Green	VOLPECG



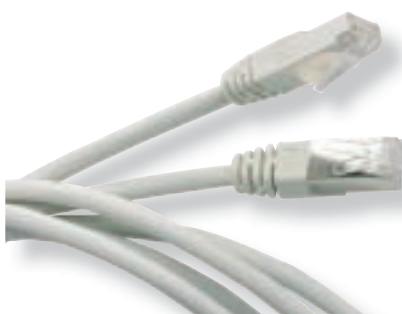
> RJ45 keystone blanking caps

	Ref. No.
Black	VOL0300BK
White	VOL0300

1.3 Volition™ Category 5e Cabling System

Volition RJ45 patch cords

- Compliant to Category 5e hardware performance
- These cords allow the implementation of Class D ISO/IEC Channel and Category 5e TIA Channels at 100 MHz
- Round cable
- Moulded boot
- Straight wiring
- PVC or LSOH jacket
- Standard colour: Grey



> Volition F/UTP LSOH grey

Grey	Ref. No.
1,00 m	VOL5EFLL1
2,00 m	VOL5EFLL2
3,00 m	VOL5EFLL3
5,00 m	VOL5EFLL5

> Volition F/UTP LSOH red

Red	Ref. No.
1,00 m	VOL5EFLL1R
2,00 m	VOL5EFLL2R
3,00 m	VOL5EFLL3R
5,00 m	VOL5EFLL5R

> Volition F/UTP LSOH yellow

Yellow	Ref. No.
1,00 m	VOL5EFLL1Y
2,00 m	VOL5EFLL2Y
3,00 m	VOL5EFLL3Y
5,00 m	VOL5EFLL5Y

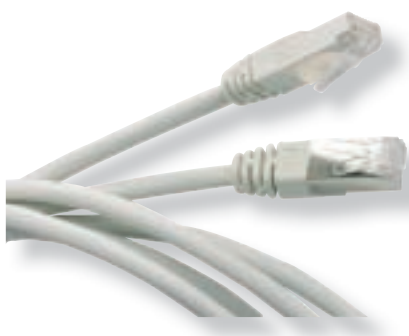
> Volition F/UTP LSOH green

Green	Ref. No.
1,00 m	VOL5EFLL1G
2,00 m	VOL5EFLL2G
3,00 m	VOL5EFLL3G
5,00 m	VOL5EFLL5G

> Volition F/UTP LSOH blue

Blue	Ref. No.
1,00 m	VOL5EFLL1B
2,00 m	VOL5EFLL2B
3,00 m	VOL5EFLL3B
5,00 m	VOL5EFLL5B

1.3 Volition™ Category 5e Cabling System



> Volition U/UTP LS0H grey

Grey	Ref. No.
1,00 m	VOL5EULL1
2,00 m	VOL5EULL2
3,00 m	VOL5EULL3
5,00 m	VOL5EULL5

> Volition U/UTP LS0H red

Red	Ref. No.
1,00 m	VOL5EULL1R
2,00 m	VOL5EULL2R
3,00 m	VOL5EULL3R
5,00 m	VOL5EULL5R

> Volition U/UTP LS0H yellow

Yellow	Ref. No.
1,00 m	VOL5EULL1Y
2,00 m	VOL5EULL2Y
3,00 m	VOL5EULL3Y
5,00 m	VOL5EULL5Y

> Volition U/UTP LS0H green

Green	Ref. No.
1,00 m	VOL5EULL1G
2,00 m	VOL5EULL2G
3,00 m	VOL5EULL3G
5,00 m	VOL5EULL5G

> Volition U/UTP LS0H blue

Blue	Ref. No.
1,00 m	VOL5EULL1B
2,00 m	VOL5EULL2B
3,00 m	VOL5EULL3B
5,00 m	VOL5EULL5B

> Volition U/UTP PVC grey

Grey	Ref. No.
1,00 m	VOL5EUPL1
2,00 m	VOL5EUPL2
3,00 m	VOL5EUPL3
5,00 m	VOL5EUPL5

1.3 Volition™ Category 5e Cabling System

Category 5e Cable

Volition Category 5E cables

- Volition™ Cables allow easy termination to RJ45 jacks. The Volition™ Category 5e cables are available in U/UTP and F/UTP versions, with PVC or LSZH (Low Smoke Zero Halogen) jacket.

Copper cable, 4 pairs, Category 5E, U/UTP, LS0H

	Ref. No.
> 4 pairs, 305 m box	VOL5EUL4 305
> 4 pairs, 1000 m drum	VOL5EUL4 1000
> 2 x 4 pairs, 1000 m drum	VOL5EUL8 1000

Copper cable, 4 pairs, Category 5E, U/UTP, PVC

	Ref. No.
> 4 pairs, 305 m box	VOL5EUP4305
> 4 pairs, 1000 m drum	VOL5EUP41000
> 2 x 4 pairs, 1000 m drum	VOL5EUP81000

Copper cable, 4 pairs, Category 5E, F/UTP, LS0H

	Ref. No.
> 4 pairs, 305 m box	VOL5EFL4 305
> 4 pairs, 500 m drum	VOL5EFL4 500
> 4 pairs, 1000 m drum	VOL5EFL4 1000
> 2 x 4 pairs, 500 m drum	VOL5EFL8 500
> 2 x 4 pairs, 1000 m drum	VOL5EFL8 1000

Copper cable, 4 pairs, Category 5E, F/UTP, PVC

	Ref. No.
> 4 pairs, 305 m box	VOL5EFP4305
> 4 pairs, 1000 m drum	VOL5EFP41000

1.3 Volition™ Category 5e Cabling System

Technical Specifications

Volition Category 5E F/UTP LSZH and PVC cable

Cabling standards

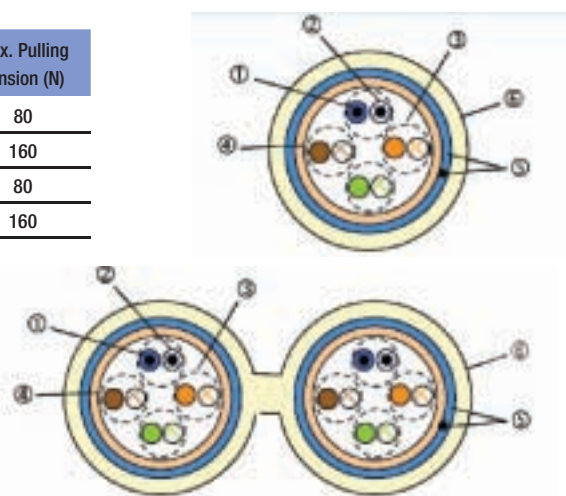
- EN 50173
- ISO/IEC 11801
- TIA/EIA 568
- EN 50288-2-1
- IEC 61156-5

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emissions IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P (LSZH)	Green	5,75	36	371	80
2x4P (LSZH)	Green	6,0x12,5	72	782	160
4P (PVC)	Green	5,75	35	417	80
2x4P (PVC)	Green	6,0 x 12,5	67	825	160

- 1 – Conductor material: copper wire Ø 0,50 mm (23AWG)
 2 – Insulation material: Polyethylene Ø 0,95 mm
 3 – Pairs: 4 and 8 (2X4)
 4 – Synthetic tape
 5 – Alu/polyester tape and copper drain wire
 6 – Jacket material: LSZH or PVC
 Colour: green



Electrical characteristics at 20°C

- Complete conductor resistance (max):
≤ 190 Ohm / km
- Insulation resistance (500V):
≥ 5000 MOhm.km
- Dielectric strength at 50 Hz 1 kVdc / 1 min
(no breakdown)
- Capacitance unbalance – pair to ground:
≤ 1600 pF / km
- Propagation velocity (NVP): 78%
- Characteristic Impedance at 100 MHz: 100 ± 5 Ω
- Transfer impedance
 - at 1 MHz ≤ 40 mΩ / m
 - at 10 MHz ≤ 40 mΩ / m
 - at 30 MHz ≤ 50 mΩ / m
 - at 100 MHz ≤ 200 mΩ / m

Mechanical installation characteristics

- Minimum bending radius (installation) 50 mm
- Minimum bending radius (installed) 25 mm
- Temperature range (°C)
 - Transport / storage / installation: 0 to +50°C
 - Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	155	200**
Max. Attenuat. (dB/100m)	Typical value	3.8	6	8.5	15.2	19.5	25	28
	Category 5* (max.)	4.1	6.5	9.3	17	22	-	-
Min. Next (dB)	Typical value	63	57	52	45	42	39	37
	Category 5* (min.)	56.3	50.3	45.8	38.4	35.3	-	-
Min. ACR (dB)	Typical value	59.2	51	43.5	29.8	22.5	14	9
	Category 5* (min.)	52.2	43.8	36.5	21.4	13.3	-	-
PS Next (dB)	Typical value	60	54	49	42	39	36	34
	Category 5* (min.)	53.3	47.3	42.8	35.4	32.3	-	-
ELFEXT (dB/100 m)	Typical value	63	55	48	39	35	31	29
	Category 5* (min.)	52	44	38	28	24	-	-
PS ELFEXT (dB/100 m)	Typical value	60	52	45	36	32	28	26
	Category 5* (min.)	49	41	35	25	21	-	-
Return Loss (dB)	Typical value	25	25	25	23.8	23	22	21
	Category 5* (min.)	23	25	25	21.5	20.1	-	-

*Category 5e acc. to IEC 61156-5 ** For information only

1.3 Volition™ Category 5e Cabling System

Technical Specifications

Volition Category 5E U/UTP LSZH and PVC cable

Cabling standards

- EN 50173
- ISO/IEC 11801
- TIA/EIA 568
- EN 50288-3-1
- IEC 61156-5

Environmental characteristics (LSZH)

- Flammability performance IEC 60332-1
- Smoke emissions IEC 61034
- Toxicity/acid gas IEC 60754-1/-2

Type	Colour	Max. Diameter	Weight	Fire loading	Max. Pulling Tension (N)
4P (LSZH)	Green	5,1	27	303	80
2x4P (LSZH)	Green	5,1 x 10,5	55	600	160
4P (PVC)	Green	5,1	28	392	80
2x4P (PVC)	Green	5,1 x 10,5	53	658	160

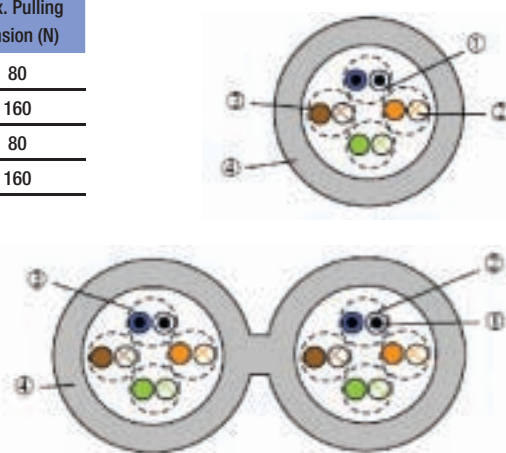
1 – Conductor material: copper wire Ø 0,51 mm (23AWG)

2 – Insulation material: Polyethylene Ø 0,90 mm

3 – Pairs: 4 and 8 (2X4)

4 – Jacket material: LSZH or PVC

Colour: green



Electrical characteristics at 20°C

- Complete conductor resistance (max):
≤ 190 Ohm / km
- Insulation resistance (500V):
≥ 5000 MOhm.km
- Dielectric strength at 50 Hz 1 kVdc / 1 min
(no breakdown)
- Capacitance unbalance – pair to ground:
≤ 1600 pF / km
- Propagation velocity (NVP): 66%
- Characteristic Impedance at 100 MHz: 100 ± 5 Ω

Mechanical installation characteristics

- Minimum bending radius (installation) 40 mm
- Minimum bending radius (installed) 20 mm
- Temperature range (°C)
- Transport / storage / installation: 0 to +50°C
- Service: -20 to +60°C

Electrical performance

Frequency (MHz)		4	10	20	62.5	100	155**	200**
Max. Attenuat. (dB/100m)	Typical value	3.8	6	8.5	15.2	19.5	25	28
	Category 5* (max.)	4.1	6.5	9.3	17	22	-	-
Min. Next (dB)	Typical value	63	57	52	45	42	39	37
	Category 5* (min.)	56.3	50.3	45.8	38.4	35.3	-	-
Min. ACR (dB)	Typical value	59.2	51	43.5	29.8	22.5	14	9
	Category 5* (min.)	52.2	43.8	36.5	21.4	13.3	-	-
PS Next (dB)	Typical value	60	54	49	42	39	36	34
	Category 5* (min.)	53.3	47.3	42.8	35.4	32.3	-	-
ELFEXT (dB/100 m)	Typical value	63	55	48	39	35	31	29
	Category 5* (min.)	52	44	38	28	24	-	-
PS ELFEXT (dB/100 m)	Typical value	60	52	45	36	32	28	26
	Category 5* (min.)	49	41	35	25	21	-	-
Return Loss (dB)	Typical value	25	25	25	23.8	23	22	21
	Category 5* (min.)	23	25	25	21.5	20.1	-	-

*Category 5e acc. to IEC 61156-5 ** For information only

1.4 Industrial RJ45 Connector

Description - Industrial RJ45 Connector



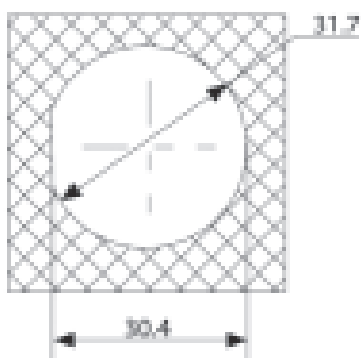
A complete, easy to use IP67 solution for an industrial network based on copper RJ45 connections. The system consists of shells which go over the RJ45 connection giving demountable IP67 protection that is waterproof and dustproof when connected. The system is suitable for use with 3M category 5e, 6 or 6A jacks and with 3M's patchcords, whether watertight or standard. A cap is available for the socket shell to protect the receptacle when it is not in use. The shell for the patchcord plug does not need to be fitted using a tool, so it is easy to move when required.

Features

- IP67 Solution
- Assembly of the shell on a patchcord does not require any tools
- Patchcord shell may be used on most cords in the market
- Installation of the connector and base plate does not require any tools
- Connector is removable from the base plate and reusable
- Cable entry to top or bottom of the 3M jack
- Integrated shutter protection on the jack when the patchcord is demounted
- May be used with solid or stranded wires AWG 26 to 22

Benefits

- Suitable for difficult or industrial environments
- Easily Implemented. Time saving
- Possibility to retrofit IP67 protection to existing systems
- Quality and speed of connection is not dependent on the state of the tools nor on the competence of the installer
- No wasted connectors. No time wasted waiting for a new delivery of product
- Easier to observe the minimum bend radius. Easier to use in boxes with shallow depth
- Sealing increased with dust, particularly during the installation or in dirty environment
- Compatible with many cables on the market



Technical Details

- Locking reversed bayonet
- Sealing IP67: conforms to IEC 60.512-5 test 9a
- Fire/Smoke: UL94 V0

1.4 Industrial RJ45 Connector



Ordering Information

IP67 Plastic shell for patchcords

- Easily fitted to most patchcords
- May be assembled without tools
- Reverse bayonet closing mechanism

IP67 Plastic shell

Ref. No.
I67M



IP 67 Receptacle

IP67 Receptacle

Ref. No.
I67B



Receptacle Cap

- For 6 IP67 receptacles

Cap

Ref. No.
I67C

1.4 Industrial RJ45 Connector



RJ45 Module for DIN Rail Mounting

- Does not include connector

> RJ45 Module for DIN Rail Mounting

Ref. No.

VOL78003



Left and Right Face Covers

- Does not include DIN Rail Module

> Dust protection

Ref. No.

VOL78006



Stainless Steel Faceplate for IP67 Receptacle

- Includes sealing gaskets and 2 M4 fixing screws
- Dimensions: 86 x 86 mm

> Stainless Steel Faceplate for IP67

Ref. No.

I67FP1S

1.5 Splitters

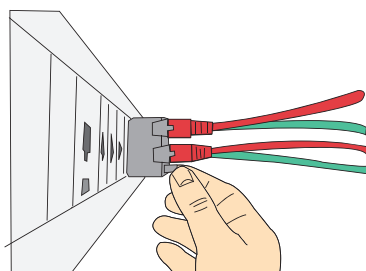
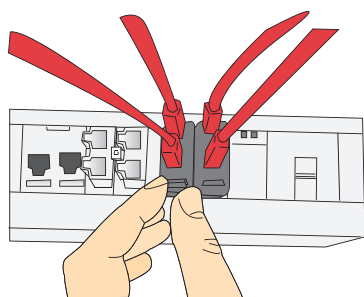


Description - Splitters

New splitters are compatible with older faceplates and panels. Lockable on new keystone panels of 16 and 24 ports. Lockable on all new 3M French style wall outlets. Overall dimension: 50 x 34 x 21 mm

New Splitter

> How to install the splitter in French Style Faceplates



Diagrams of the New Installation Process

Mounting	Locking	Unlocking and Removal
<p>1</p>	<p>1</p>	<p>1</p>
<p>2</p>	<p>2</p>	<p>2</p>
<p>3</p>		<p>3</p>

The new 3M splitter range offers:

- optimal reliability of connection
- locking function to selected patch panels and French style faceplates
- improved mechanical characteristics
- small overall dimensions
- retrofittable to older faceplates and panels, without the locking function

The new design allows:

- improved mechanical hold due to the creation of two zones of support on the splitter
- mechanical locking by expandable fitting
- Easy removal thanks to a pull knob patented by 3M laboratories

Features

- Two zones of support on the splitter
- Mechanical lock with expandable fitting
- Removal by pulling a knob
- Removal knob located in bottom of the splitter
- Improved ergonomics
- Complete range for 4 applications

Benefits

- Stability of the splitter on the faceplate or panel
- Secure fixing of the splitter
- Simple removal using only one hand
- Removal knob easily accessible on panel
- Less space taken up in the workspace
- Applications: Ethernet/Ethernet, Ethernet/Telephony, Ethernet/Numeris ISDN, Telephony/Telephony

1.5 Splitters

UTP and FTP RJ45 Splitters

- Consists of a RJ45 plug and 2 RJ45 sockets RJ45 for sharing pairs
- Adaptable to all RJ45 panels 16, 24, 32 and 48 ports and RJ45 Keystone faceplates
- Polycarbonate/ABS white colour



RJ45	P1	P2
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8

> Parallel Telephony – Lockable

UTP

Ref. No.

P29659AA



RJ45	P1	P2
1	4	N.C.
2	5	N.C.
3	6	N.C.
4	N.C.	4
5	N.C.	5
6	N.C.	6
7	N.C.	7
8	N.C.	8

> Telephone/Telephone – Lockable

UTP

Ref. No.

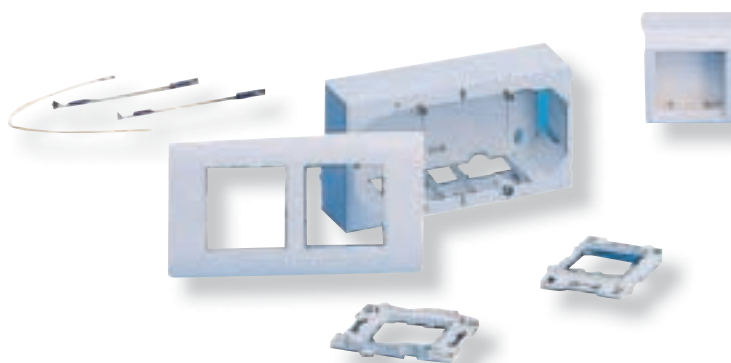
P29643AA



RJ45	P1	P2
1	1	N.C.
2	2	N.C.
3	3	N.C.
4	N.C.	1
5	N.C.	2
6	N.C.	3
7	N.C.	4
8	N.C.	5
9	N.C.	6
10	N.C.	7
11	N.C.	8
12	N.C.	9
13	N.C.	10
14	N.C.	11
15	N.C.	12
16	N.C.	13
17	N.C.	14
18	N.C.	15
19	N.C.	16
20	N.C.	17
21	N.C.	18
22	N.C.	19
23	N.C.	20
24	N.C.	21
25	N.C.	22
26	N.C.	23
27	N.C.	24
28	N.C.	25
29	N.C.	26
30	N.C.	27
31	N.C.	28
32	N.C.	29
33	N.C.	30
34	N.C.	31
35	N.C.	32
36	N.C.	33
37	N.C.	34
38	N.C.	35
39	N.C.	36
40	N.C.	37
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43	N.C.	40
44	N.C.	41
45	N.C.	42
46	N.C.	43
47	N.C.	44
48	N.C.	45
49	N.C.	46
50	N.C.	47
51	N.C.	48
52	N.C.	49
53	N.C.	50
54	N.C.	51
55	N.C.	52
56	N.C.	53
57	N.C.	54
58	N.C.	55
59	N.C.	56
60	N.C.	57
61	N.C.	58
62	N.C.	59
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64	N.C.	61
65	N.C.	62
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72	N.C.	69
73	N.C.	70
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75	N.C.	72
76	N.C.	73
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82	N.C.	79
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87	N.C.	84
88	N.C.	85
89	N.C.	86
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92	N.C.	89
93	N.C.	90
94	N.C.	91
95	N.C.	92
96	N.C.	93
97	N.C.	94
98	N.C.	95
99	N.C.	96
100	N.C.	97
101	N.C.	98
102	N.C.	99
103	N.C.	100
104	N.C.	101
105	N.C.	102
106	N.C.	103
107	N.C.	104
108	N.C.	105
109	N.C.	106
110	N.C.	107
111	N.C.	108
112	N.C.	109
113	N.C.	110
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116	N.C.	113
117	N.C.	114
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133	N.C.	130
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136	N.C.	133
137	N.C.	134
138	N.C.	135
139	N.C.	136
140	N.C.	137
141	N.C.	138
142	N.C.	139
143	N.C.	140
144	N.C.	141
145	N.C.	142
146	N.C.	143
147	N.C.	144
148	N.C.	145
149	N.C.	146
150	N.C.	147
151	N.C.	148
152	N.C.	149
153	N.C.	150
154	N.C.	151
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158	N.C.	155
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160	N.C.	157
161	N.C.	158
162	N.C.	159
163	N.C.	160
164	N.C.	161
165	N.C.	162
166	N.C.	163
167	N.C.	164
168	N.C.	165
169	N.C.	166
170	N.C.	167
171	N.C.	168
172	N.C.	169
173	N.C.	170
174	N.C.	171
175	N.C.	172
176	N.C.	173
177	N.C.	174
178	N.C.	175
179	N.C.	176
180	N.C.	177
181	N.C.	178
182	N.C.	179
183	N.C.	180
184	N.C.	181
185	N.C.	182
186	N.C.	183
187	N.C.	184
188	N.C.	185
189	N.C.	186
190	N.C.	187
191	N.C.	188
192	N.C.	189
193	N.C.	190
194	N.C.	191
195	N.C.	192
196	N.C.	193
197	N.C.	194
198	N.C.	195
199	N.C.	196
200	N.C.	197
201	N.C.	198
202	N.C.	199
203	N.C.	200
204	N.C.	201
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213	N.C.	210
214	N.C.	211
215	N.C.	212
216	N.C.	213
217	N.C.	214
218	N.C.	215
219	N.C.	216
220	N.C.	217
221	N.C.	218
222	N.C.	219
223	N.C.	220
224	N.C.	221
225	N.C.	222
226	N.C.	223
227	N.C.	224
228	N.C.	225
229	N.C.	226
230	N.C.	227
231	N.C.	228
232	N.C.	229
233	N.C.	230
234	N.C.	231
235	N.C.	232
236	N.C.	233
237	N.C.	234
238	N.C.	235
239	N.C.	236
240	N.C.	237
241	N.C.	238
242	N.C.	239
243	N.C.	240
244	N.C.	241
245	N.C.	242
246	N.C.	243
247	N.C.	244
248	N.C.	245
249	N.C.	246
250	N.C.	247
251	N.C.	248
252	N.C.	249
253	N.C.	250
254	N.C.	251
255	N.C.	252
256	N.C.	253
257	N.C.	254
258	N.C.	255
259	N.C.	256
260	N.C.	257
261	N.C.	258
262	N.C.	259
263	N.C.	260
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265	N.C.	262
266	N.C.	263
267	N.C.	264
268	N.C.	265
269	N.C.	266
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290	N.C.	287
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295	N.C.	292
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298	N.C.	295
299	N.C.	296
300	N.C.	297
301	N.C.	298
302	N.C.	299
303	N.C.	300
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305	N.C.	302
306	N.C.	303
307	N.C.	304
308	N.C.	305
309	N.C.	306
310	N.C.	307
311	N.C.	308
312	N.C.	309
313	N.C.	310
314	N.C.	311
315	N.C.	312
316	N.C.	313
317	N.C.	314
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319	N.C.	316
320	N.C.	317
321	N.C.	318
322	N.C.	319
323	N.C.	320
324	N.C.	321
325	N.C.	322
326	N.C.	323
327	N.C.	324
328	N.C.	325
329	N.C.	326
330	N.C.	327
331	N.C.	328
332	N.C.	329
333	N.C.	330
334	N.C.	331
335	N.C.	332
336	N.C.	333
337	N.C.	334
338	N.C.	335
339	N.C.	336
340	N.C.	337
341	N.C.	338
342	N.C.	339
343	N.C.	340
344	N.C.	341
345	N.C.	342
346	N.C.	343
347	N.C.	344
348	N.C.	345
349	N.C.	346
350	N.C.	347
351	N.C.	348
352	N.C.	349
353	N.C.	350
354	N.C.	351
355	N.C.	352
356	N.C.	353
357	N.C.	354
358	N.C.	355
359	N.C.	356
360	N.C.	357
361	N.C.	358
362	N.C.	359
363	N.C.	360
364	N.C.	361
365	N.C.	362
366	N.C.	363
367	N.C.	364
368	N.C.	365
369	N.C.	366
370	N.C.	367
371	N.C.	368
372	N.C.	369
373	N.C.	370
374	N.C.	371
375	N.C.	372
376	N.C.	373
377	N.C.	374
378	N.C.	375
379	N.C.	376
380	N.C.	377
381	N.C.	378
382	N.C.	379
383	N.C.	380
384	N.C.	381
385	N.C.	382
386	N.C.	383
387	N.C.	384
388	N.C.	385
389	N.C.	386
390	N.C.	387
391	N.C.	388
392	N.C.	389
393	N.C.	390
394	N.C.	391
395	N.C.	392
396	N.C.	393
397	N.C.	394
398	N.C.	395
399	N.C.	396
400	N.C.	397
401	N.C.	398
402	N.C.	399
403	N.C.	400
404	N.C.	401
405	N.C.	402
406	N.C.	403
407	N.C.	404
408	N.C.	405
409	N.C.	406
410	N.C.	407
411	N.C.	408
412	N.C.	409
413	N.C.	410
414	N.C.	411
415	N.C.	412
416	N.C.	413
417	N.C.	414
418	N.C.	415
419	N.C.	416
420	N.C.	417

1.6 Boxes for Surface Mounting

Description - Boxes for Surface Mounting



A good choice of models

- For mosaic standard faceplates with the format 22,5 X 45 mm or 45 X 45 mm used for:
 - telephone points (PBI), data points (RJ45)
 - Clip on front plates

Easy to install

- Pre-pierced for cable entry or are provided with push in openings
- Surface mounted boxes in ABS, single or multiple sockets

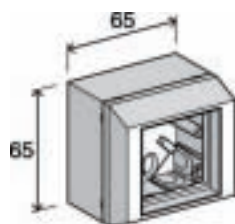
Safe to install

- All the models are equipped with either an insulating partition or distinct compartments

45 x 45 mm Module Supports

Single box in ABS

- PBM1 box for surface mounting 45 x 45 m faceplates
- White (RAL 9011)
- 65 x 65 x 48 mm



> Single box in ABS

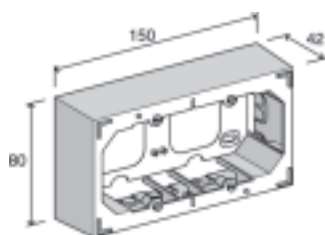
Ref. No.

P28420AA

Wall Mounted Boxes

> PBM2 box for surface mounting 45 x 45 m faceplates

- For two 45 x 45 mm faceplates
- Fits PBM2 Cover (P28691AA)
- White (RAL 9011)
- 150 x 80 x 42 mm



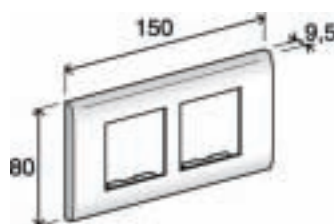
> PBM2 box

Ref. No.

P28690AA

> PBM2 Cover

- For mounting on box PBM2
- Requires two faceplate supports (P28692AA)
- White (RAL 9011)
- 150 x 80 x 9,5 mm

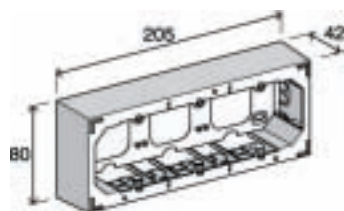


> PBM2 Cover

Ref. No.

P28691AA

1.6 Boxes for Surface Mounting

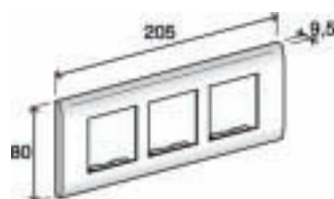


> PBM3 Box for surface mounting 45 x 45 mm faceplates

- For three 45 x 45 mm faceplates
- Fits PBM3 Cover (P28691AA)
- White (RAL 9011)
- 205 x 80 x 42 mm

Ref. No.
P28695AA

> PBM3 box

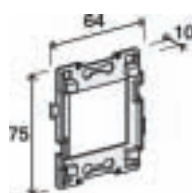


> PBM3 Cover

- For mounting on box PBM3
- Requires three faceplate supports (P28692AA)
- White (RAL 9011)
- 205 x 80 x 9,5 mm

Ref. No.
P28696AA

> PBM3 Cover



> Faceplate Support

- Fits between the box and the cover
- Polycarbonate with 30% fibre glass
- 75 X 64 X 10 mm

Ref. No.
P28692AA