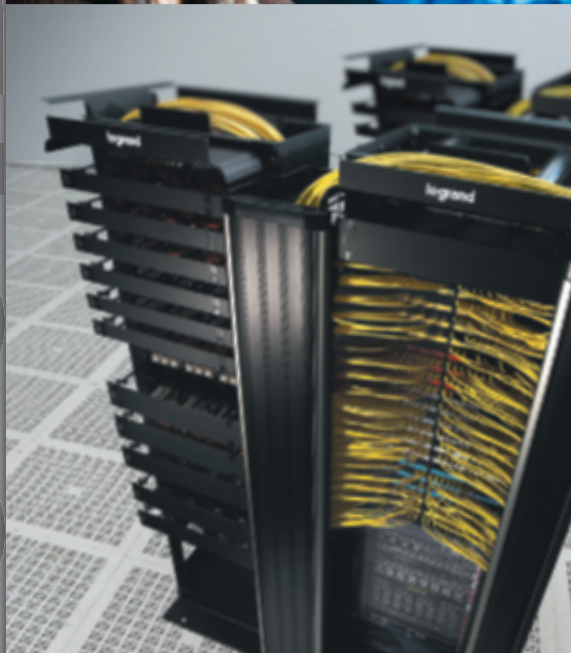# GUIDE

BUILDINGS DIGITAL INFRASTRUCTURES
COMMUNICATION NETWORK

→ CATALOGUE PAGES INSIDE

THE GLOBAL SPECIALIST IN ELECTRICAL AND
DIGITAL BUILDING INFRASTRUCTURES

L1 legrand®

**COMMUNICATION
NETWORK**
BUILDINGS DIGITAL
INFRASTRUCTURES

A COMPLETE GLOBAL SOLUTION
Legrand provides complete ranges, to meet three requirements:
• Network performance
• Network protection
• Accessibility of the infrastructures inherent to the communication networks of service sector buildings (offices, hotels, shopping centres, university campuses, healthcare establishments, etc.).

This guide has been designed to provide you with technical answers and the product-based solutions to your problems.

Table of contents

Legrand
a global player

Legrand is the global specialist in electrical and digital building infrastructures. The Group offers a comprehensive range of solutions and services tailored to residential, commercial and industrial markets. The scope of its offering and its leading positions make Legrand a worldwide benchmark.

4 KEY AREAS OF EXPERTISE

From control and connection interfaces to cable management, energy distribution and voice-data-image (VDI) distribution systems, Legrand provides a host of solutions designed to manage lighting, energy, networks and building access.

CONTROL AND COMMAND

User interfaces

Building systems

Home systems

Energy efficiency solutions

CABLE MANAGEMENT

Ducts

Columns

Trunking

Floor boxes

![legrand]
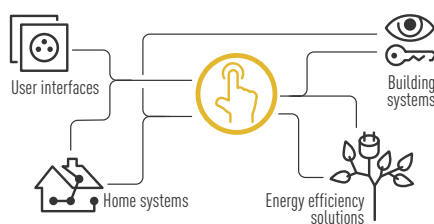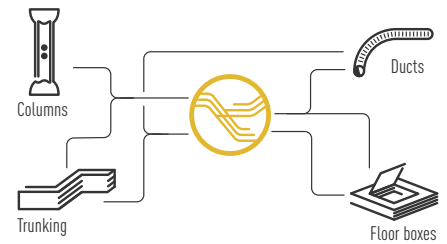
AN ACTIVE INTERNATIONAL PRESENCE

ESTABLISHED IN OVER 80 COUNTRIES

SALES IN CLOSE TO 180 COUNTRIES

OVER 36.000 EMPLOYEES IN 2015

INNOVATION IN 2015

4,5% OF SALES INVESTED IN R&D

A WIDE CHOICE BY ANY MEASURE

OVER 215.000 CATALOGUE ITEMS

80 PRODUCT FAMILIES

ENERGY DISTRIBUTION

Circuit breakers

Low-loss transformers

Distribution panels

UPS

DIGITAL INFRASTRUCTURE

Enclosures & cabinets

Audio Video Systems

VDI

Copper and optical fiber patch panels

RJ45 and optical fiber sockets
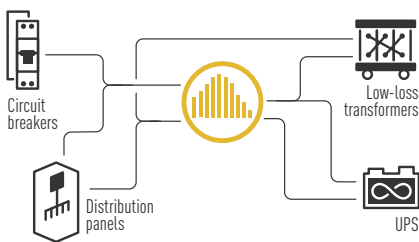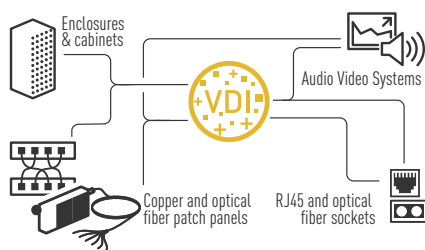
Legrand group
a leading company for all your IT networks

The Legrand group is a world leader in communication networks for data transmission. Its investment in the development and design of structured cabling systems and solutions has enabled it to develop its offer and achieve the highest perfomance level. These solutions are ideal for today's multimedia networks, technologies and applications.

ELECTRORACK
Design, manufacture and deliver quality, market-leading cabinets, power and cooling.

LEGRAND DATACOM US
In the US, complete global solutions for network infrastructure solutions.

A PORTFOLIO OF FLAGSHIP BRANDS

Legrand • Legrand datacom US • C2G • Electrorack • Estap • Middle Atlantic • Minkels • Quicktron • Raritan • SJ Manufacturing • Valrack

![legrand logo]

GLOBAL PLAYERS
DATACOM IT

RARITAN
Raritan - Proven innovator of award-winning intelligent PDUs, transfer switches, rack sensors, serial consoles

MINKELS
Complete datacenter solutions for Corporate and SME-environments and Commercial datacenter infrastructures. Cold corridor modular solutions.

LEGRAND
Complete global solutions for network infrastructure solutions. Worldwide presence (outside US).

VALRACK
An Indian player specialized in racks, Voice-Data-Image cabinets and related products.

....

SJ MANUFACTURING
A Singaporean frontrunner in racks, Voice-Data-Image cabinets and related products for data centers - 3 plants (Singapore, Malaysia, Vietnam).

Our digital infrastructure expertise

Legrand's complete global solutions for data communication perfectly address the key challenges for digital networks: network performance and protection and accessibility of every infrastructure.

DATA CENTER
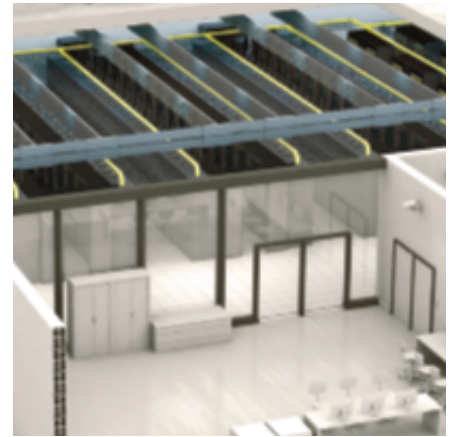
COMPLETE SOLUTIONS FOR STRUCTURED CABLING IN SERVER ROOMS
- **Housing solutions**
  (Server cabinets, cooling units and cold corridor, open racks, PDU...)
- **Intelligent patching**
  (Pre-terminated...)
- **Fibre solutions**
  (Pre-terminated, intelligent patching, high density fibre optic solutions...)

![legrand logo]

■ LOCAL AREA NETWORKS

COMPLETE SOLUTIONS FOR STRUCTURED CABLING
- **Housing solutions**
  (19" freestanding and wallmounting cabinets, open racks, PDU...)
- **Intelligent patching**
  (New Plug, controlled access panel, controlled access RJ45...)
- **Fibre solutions**
  (Connectors, equipped & modular panels, bend insensitive cables...)

■ HOME NETWORK SYSTEM

A COMPLETE RANGE OF ESSENTIAL PRODUCTS AND COMPONENTS FOR OPTIMUM COMMUNICATION
- **Base** (Din cabinets with rail...)
- **Components**
  (RJ 45 Modular DIN patch panel, RJ 45 connectors, Analog phone, Fibre Optic telecommunications outlet, patch cords...)
- **Additional products**
  (RJ 45 port switch, double play switch + power supply, cords, accessories, sockets ...)

■ AUDIO VIDEO SYSTEM

A WIDE RANGE OF TECHNOLOGIES TO SUIT THE LOCATION AND THE USER EQUIPMENTS
- **Racks and enclosures**
- **Preterminated audio/video sockets** (HDMI, display port, HD15, USB, RCA, JACK...)
- **Cords and adaptors**

NETWORK
PERFORMANCE

LCS² complete systems with a 25-year guarantee

LCS² cat. 6_A (up to 500 MHz), cat. 6 (up to 250 MHz) and cat. 5e (up to 100 MHz) systems have been designed as coherent entities to optimise their performance from the technical room to the workstation.

These systems are suitable for fibre optic cables as well as copper cables. Measurements of LCS² components and links are validated by independent laboratories 3P Third Party Testing and ETL.

LCS² category 6_A designed to exceed all application requirements

With LCS² category 6_A, Legrand guarantees installed channel performance exceeding all category 6_A crosstalk requirements by **5dB /TIA*** or **3dB /ISO*** and exceeding all category 6_A return loss requirements by **3dB /ISO-TIA*** for configurations and installations conforming to standards, as well as on-site testing conducted by verified testing agents.

Guaranteed applications

10Base-T	155 Mbps ATM
100Base-TX	270 Mbps digital video
1000Base –T	Broadband video
1000Base-TX	1.2 Gbps (CBIG) ATM
10GBase-T	10 Gigabit Ethernet

Compliance with standards
ANSI/TIA/EIA 568-C2
ISO/IEC – 11801 (second edition) class E_A amendment 2

LCS² Cat. 6_A channel components
- LCS² category 6_A F/UTP cables Cat.No 0 327 78
- LCS² category 6_A RJ 45 sockets
- LCS² category 6_A patch panels
- LCS² category 6_A patch cords

100 metre horizontal channel
The LCS² category 6_A channel is designed to offer flexibility. Legrand LCS² solutions have been designed to optimise application performance by using all standardised channel lengths and configurations.

With Legrand LCS² category 6_A solutions, it is no longer necessary to determine specific installation specifications or particular patch cable width limits.

WIRING PRINCIPLE

LCS² cat.6_A patch panels

D LCS² cat.6_A patch cords

A LCS² cat.6_A F/UTP cable

LCS² cat.6_A zone distribution boxes

C

LCS² cat.6_A patch cords LCS² cat.6_A patch panels

B LCS² cat.6_A patch cords

E

LCS² cat.6_A patch cords LCS² cat.6_A modular jacks/sockets

A+B = 90 m
C+D+E = 10 m
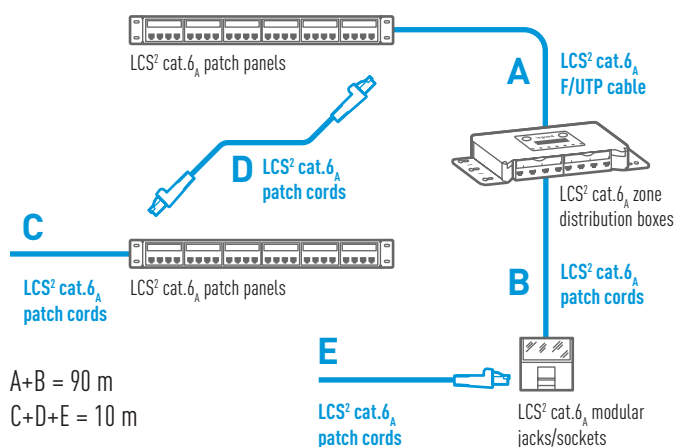
* Depending on the degree of accuracy offered by the tester at the test point.

8

LCS² category 6$_A$ performance

The results of independent trials shown below allow comparison of worst performance obtained from a 100-metre LCS² channel with 4 connectors conforming with ISO standard category 6$_A$ specifications.
The significant margins shown for each measured parameter demonstrate the technical superiority of the LCS² category 6$_A$ solution.
These performance margins are consistent across the ISO/TIA standard tested frequency range and even beyond.

NEXT

RETURN LOSS

ACR-N

PS NEXT

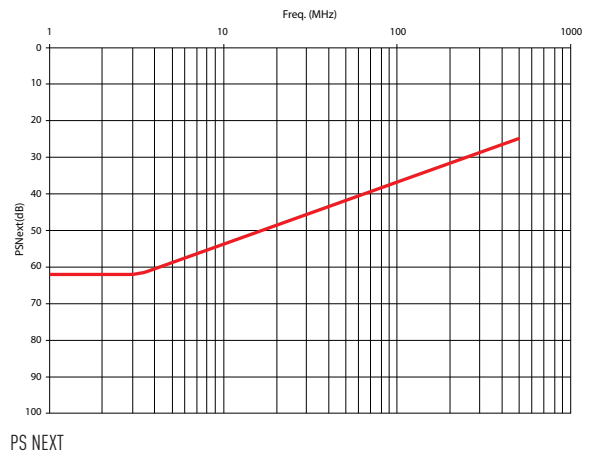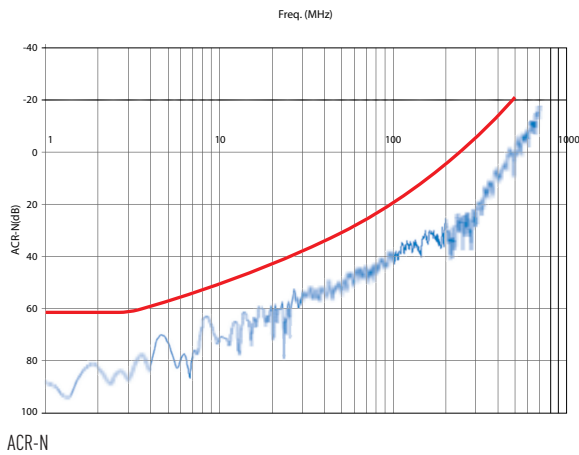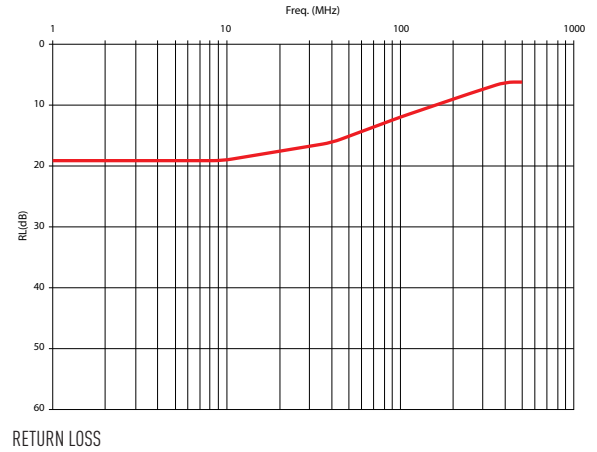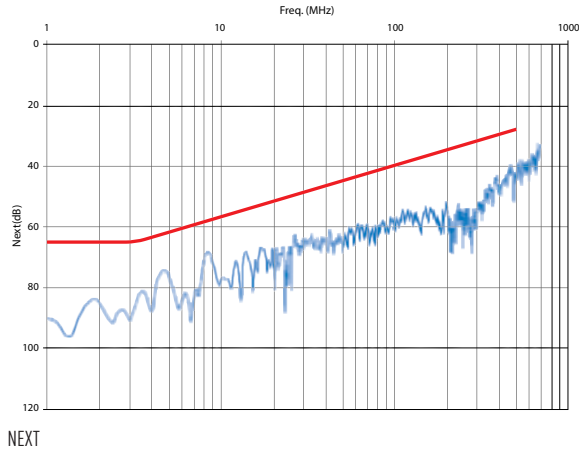| Frequency (MHz)	NEXT (dB) ISO11801 Channel Class E$_A$	NEXT (dB) LCS² Channel Class E$_A$	ACR-N (dB) ISO11801 Channel Class E$_A$	ACR-N (dB) LCS² Channel Class E$_A$	RL (dB) ISO11801 Channel Class E$_A$	RL (dB) LCS² Channel Class E$_A$	PS NEXT (dB) ISO11801 Channel Class E$_A$	PS NEXT (dB) LCS² Channel Class E$_A$	PS ACR-N (dB) ISO11801 Channel Class E$_A$	PS ACR-N (dB) LCS² Channel Class E$_A$	ACR-F (dB) ISO11801 Channel Class E$_A$	ACR-F (dB) LCS² Channel Class E$_A$	PS ACR-F (dB) ISO11801 Channel Class E$_A$	PS ACR-F (dB) LCS² Channel Class E$_A$
1	65	68	61	64	19	22	62	65	58	61	63.3	66.3	60.3	63.3
4	63	66	58.9	61.9	19	22	60.5	63.5	56.4	59.4	51.2	54.2	48.2	51.2
10	56.6	59.6	50.1	53.1	19	22	54	57	47.5	50.5	43.3	46.3	40.3	43.3
20	51.6	54.6	42.5	45.5	17.5	20.5	49	52	39.8	42.8	37.2	40.2	34.2	37.2
31.25	48.4	51.4	36.9	39.9	16.5	19.5	45.7	48.7	34.2	37.2	33.4	36.4	30.4	33.4
62.5	43.4	46.4	27	30	14	17	40.6	43.6	24.2	27.2	27.3	30.3	24.3	27.3
100	39.9	42.9	19	22	12	15	37.1	40.1	16.2	19.2	23.3	26.3	20.3	23.3
200	34.8	37.8	4.7	7.7	9	12	31.9	34.9	1.8	4.8	17.2	20.2	14.2	17.2
250	33.1	36.1	-0.8	2.2	8	11	30.2	33.2	-3.7	-0.7	15.3	18.3	12.3	15.3
300	31.7	34.7	-5.6	-2.6	7.2	10.2	28.8	31.8	-8.6	-5.6	13.7	16.7	10.7	13.7
400	29.6	32.6	-14.1	-11.1	6	9	26.6	29.6	-17.1	-14.1	11.2	14.2	8.2	11.2
500	27.9	30.9	-21.4	-18.4	6	9	24.8	27.8	-24.5	-21.5	9.3	12.3	6.3	9.3

LCS² fibre optic high density system

LCS² high density fibre optic drawers are easy to install and maintain, offering complete accessibility and built-in coiling accessories.

A flexible and easy to install system
A ready made system compared to traditional installation: fully populated modules and preterminated trunks. Installation is cut to a minimum: one single connection connects 12/24 fibres instantly. (MTP/MPO interfaces)

- Easy installation of 24-fibre modules (12-fibre modules available on request)
- Fixed mid-module position for easy patch cord installation and port access: no need for extraction tool
- Open chassis for front and rear module access
- Front and rear cable management
- A or C polarity (B available on request)
- Compatible with 1 U - 5 modules chassis (up to 120 LC ports) and with 2 U - 12 modules chassis (up to 288 LC ports)

Custom solutions available on request
- Preterminated MTP/MPO trunks
- Factory preterminated module
- Terminated end (MTP, LC, breakout module, etc.)
- Splice module
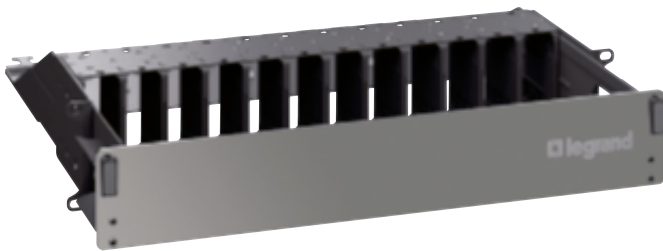
19''- Fibre optic drawer with front and rear cable management, 2U (p. 136)

19'' high density fibre optic drawer and cassettes (p. 110)

Varicon-L server cabinets and Cold Corridor® high performance cooling system

Choosing suitable cooling equipment is a major consideration to ensure efficient data center operation and optimum payback.

- ◾ Energy efficient and reliable system: Cold Corridor®
- Airflow segregation: 85% efficiency on cold air containment
- Constant air conditions for servers thanks to homogeneous temperature distribution, which increases equipment lifetime
- ◾ Scalable and compact solutions: Varicondition H_2O row based cooling units
- Possible to spread investment during growth process by adding cooling units in a row or Cold Corridor®
- Raised floor is not required. Heat load and cooling capacity are brought very closed to one other, reducing the airflow path and consequently energy consumption
- ◾ Terminated end (MTP, LC, breakout module, etc.)
- ◾ Splice module

Varicon-L server cabinets (p. 128)

Varicon-L server cabinets (p. 130) and airflow optimisation for data center applications

NETWORK
PROTECTION

UPS
The guarantee of optimum "continuity of service"

Legrand offers a range of solutions to ensure maximum protection for electrical and data systems, people and property.
Legrand's UPS range is divided into 3 different families ensuring the offer is suitable for all applications with solutions providing the best performance levels in terms of power and backup time. Legrand UPS are ideal for all your requirements.

Incorporating an environmentally-friendly approach to technological development and to address a constantly changing market, Legrand is now offering its new range of UPS and additional functions to ensure maximum continuity of service for all installations.

■ **High efficiency**
The innovative design and high quality of the components used enable our UPS to achieve up to 96% efficiency, leading to significant energy savings.

■ **Advanced technology**
The On-line Double Conversion technology ensures provision of a top quality power supply and maximum energy efficiency.

■ **Environmentally responsible approach**
Our UPS are built with the greatest care with a view to sustainable development. Moreover, Legrand has developed an innovative testing system which reduces the energy consumed for each device manufactured.

■ **Reliable electronics**
The optimum sizing of the power stages and thorough testing of each unit ensure excellent reliability.

■ **Latest generation components**
A careful search for the best electronic components on the market, together with the most up-to-date manufacturing methods, ensure that Legrand UPS use leading-edge technology and provide optimum reliability.

■ **High performance batteries**
The batteries used in Legrand UPS are the best on the market. The innovative charging system significantly extends battery life by up to 50%.

Modular
UPS up to 120 kVA providing maximum safety (power and control), for applications requiring easy expansion and fast maintenance.

Conventional
UPS providing a safe, reliable power supply up to 10 kVA.

Line Interactive
UPS up to 3 kVA. Ideal protection for individual workstations, telephone switchboards or home automation applications and even for small service sector companies.

Legrand enclosures
the first layer
of protection

When you consider the devastating impact that downtime or data loss can have on a business, the network protection appears obvious. Enclosures are the first physical layer of protection for a network.

Enclosures protect networks and live equipment against **accidental external damage or contact:**
- IP 20 (conforming to IEC/EN 60529) provides protection against solid objects and liquids
- IK 08 (conforming to IEC/EN 60062) provides protection against mechanical shock.

Enclosures also protect against **unauthorised access**. All cabinets are lockable to prevent malicious acts or unintended operation by unauthorised personnel.

More importantly, enclosures must **ensure the safety of people**. As they house the AC power for active equipment (switches, servers, PABX, etc.), cabinets must protect people against electrical shock in the event of a fault.
That's why Legrand implements strict controls in terms of enclosure design and manufacture. All metal parts in enclosures are linked together to guarantee earthing.

Accessories automatically integrate this function to prevent accidents

Quick-fixing system provides automatic earthing on patch panels and shelves.
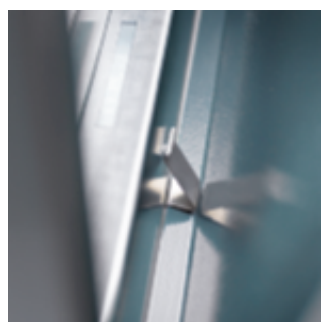
Automatic earthing clip earths the side and rear panels.

NETWORK
ACCESSIBILITY

Legrand offers a comprehensive range of products from cable management to workstation products for cable distribution and network accessibility solutions in buildings.

Cablofil® a full cable management solution

Cablofil is the most versatile cable tray. Made from welded steel wires, Cablofil meets the strictest safety standards and satisfies the customer's need for reliability and fast, economical installation.
Available in a large choice of surface treatments, it is also possible to obtain the entire range of RAL colours in applying a resin-based paint.

Data cabling - In order to manage data installations and master their complexity, it is necessary to have a high performance cabling system which has the capacity to evolve. With the relevant standards in mind, CABLOFIL® helps design, organise and arrange a variety of cabling systems, whilst also ensuring system safety.
First and foremost, a cable tray must act as an effective, resistant and durable support for cables. The mechanical performance of all products and accessories is tested against the very demanding requirements imposed by the international standard IEC 61537 and can ensure large spans and support big loads. The open structure maximises ventilation and therefore reduces installation and operational costs.

P31 OFT cable management solutions for fibre optic cables

Specially designed to meet the requirements of data center, the P31 OFT range provides excellent technical performance levels and can be used for building complex installations using both fibre optic and copper. The rails and accessories provide a high degree of strength and excellent withstand to heavy loads.

The integration of the P31 OFT provides a high degree of uniformity for all cable routing with its metal construction and metric lengths.
This range, with its specific dimensions and dedicated accessories, ensures compliance with the fibre optic bending radius right up to where the cables are routed down to the VDI patch cabinets.
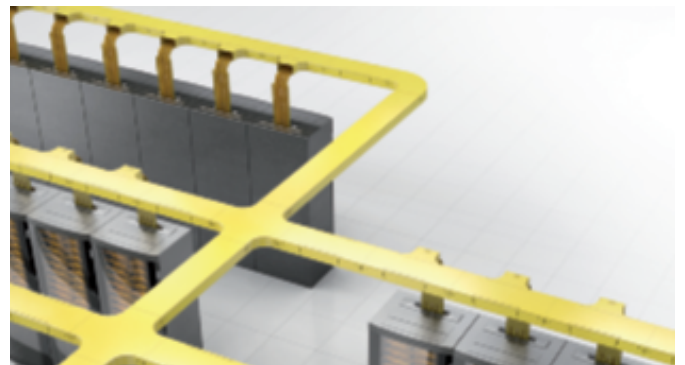
Cover for reinforced mechanical protection

Smooth, flat base

Strong metal body for excellent load withstand

Smooth, rounded edges
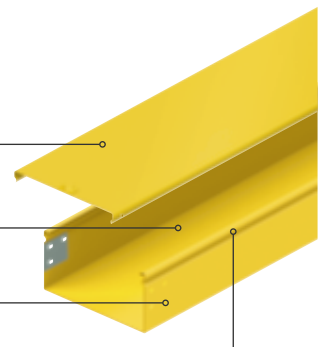
LCS² Cabinets ensure evolution and maintenance

A network is a living organism. Cabinets must offer features and solutions which will allow for expansion and maintenance.

LCS² cabinets facilitate network access and scalability

Total accessibility: thanks to the removable side panels.

Dedicated space for cable management with easy access via door to cabling unit.

Easy access at the rear: pivoting body on wall-mounting cabinets.

NOTE:

In the case of crowded freestanding cabinets, cabinet capacity can be increased using vertical extensions. For example, in a 42 U 800 mm wide cabinet, a set of 2 vertical trim plates can be used to increase the capacity by 12 U.

DATA CENTER

Performance and reliability at the heart of the **data center**

▶ Legrand's global solution also includes: cable management, security systems, power equipment...

Varicondition Cold Corridor® (p. 130)   Metered PDU (p. 124)
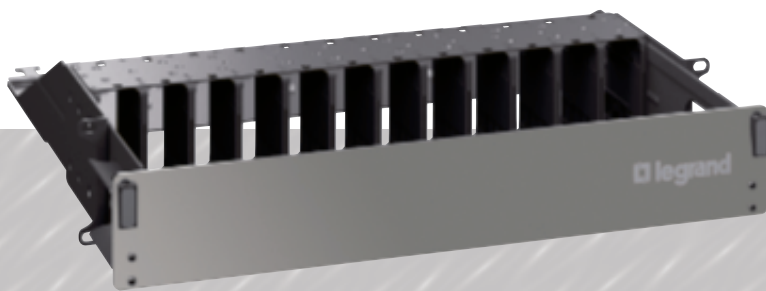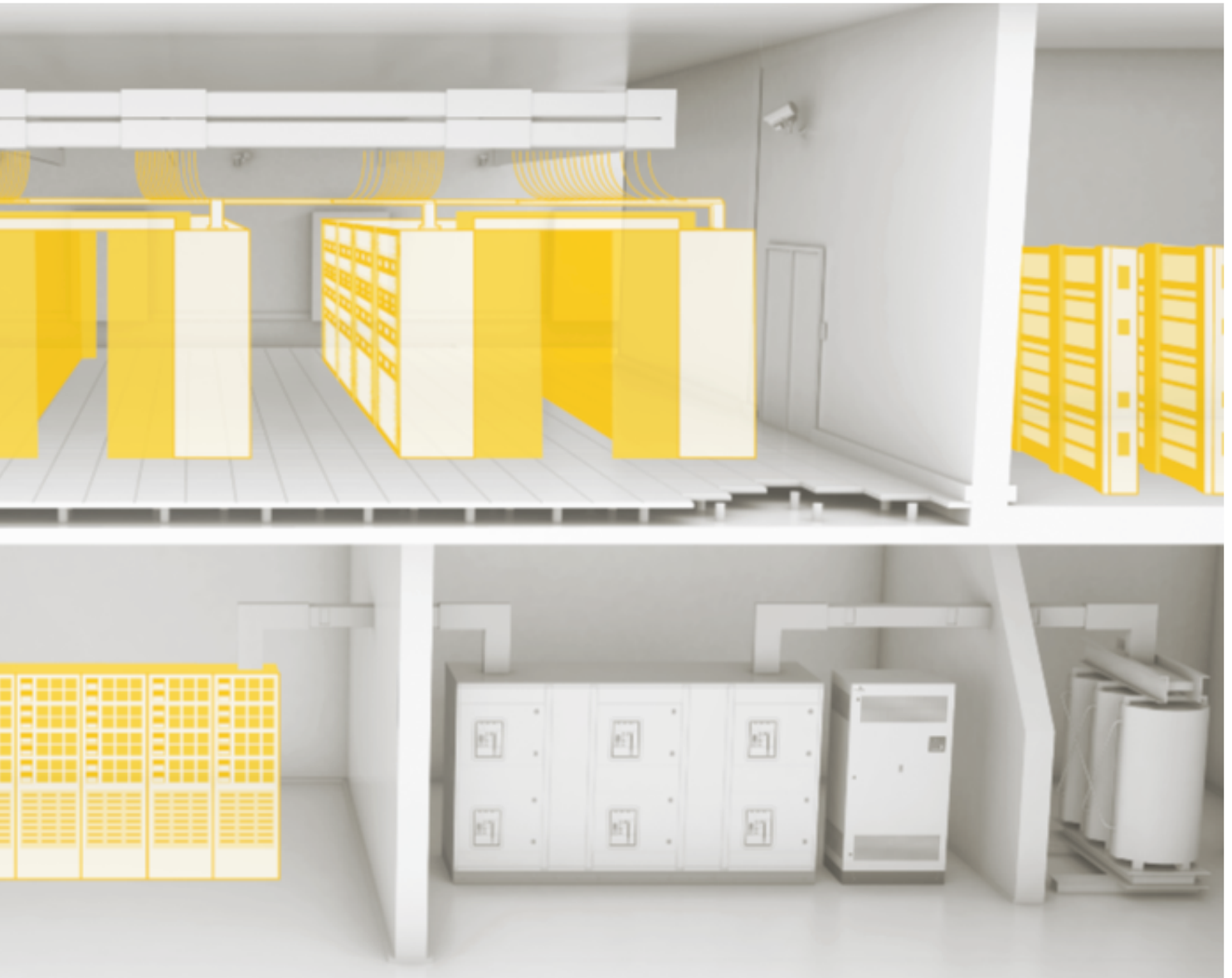
19" high density fibre optic drawer (p. 136)
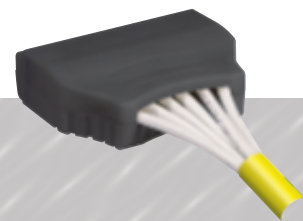
Predeterminated cassettes (p. 135)

OFFICE

Flexible
cabling systems
Minimise
upgrade costs

▶ Legrand's global solution
also includes: UPS, CCTV,
cable management, power
equipment...

Patch panel (p. 90)

RJ 45 socket (p. 93)

LCS² cabinet (p. 128)

HYPERMARKET

Safety
of property,
people and
well-being of
customers

▶ Legrand's global solution
also includes: UPS, cable
management, power
equipment...

Cablofil wire mesh

Fibre optic socket (p. 111)

10" cabinet (p. 122)

Ethernet switch (p. 103)

Security
of people and
their data

▶ Legrand's global solution
also includes: UPS, emergency
lighting, power equipment,
security systems...

Antimicrobial RJ 45 socket

Singlemode fibre units (p. 109)
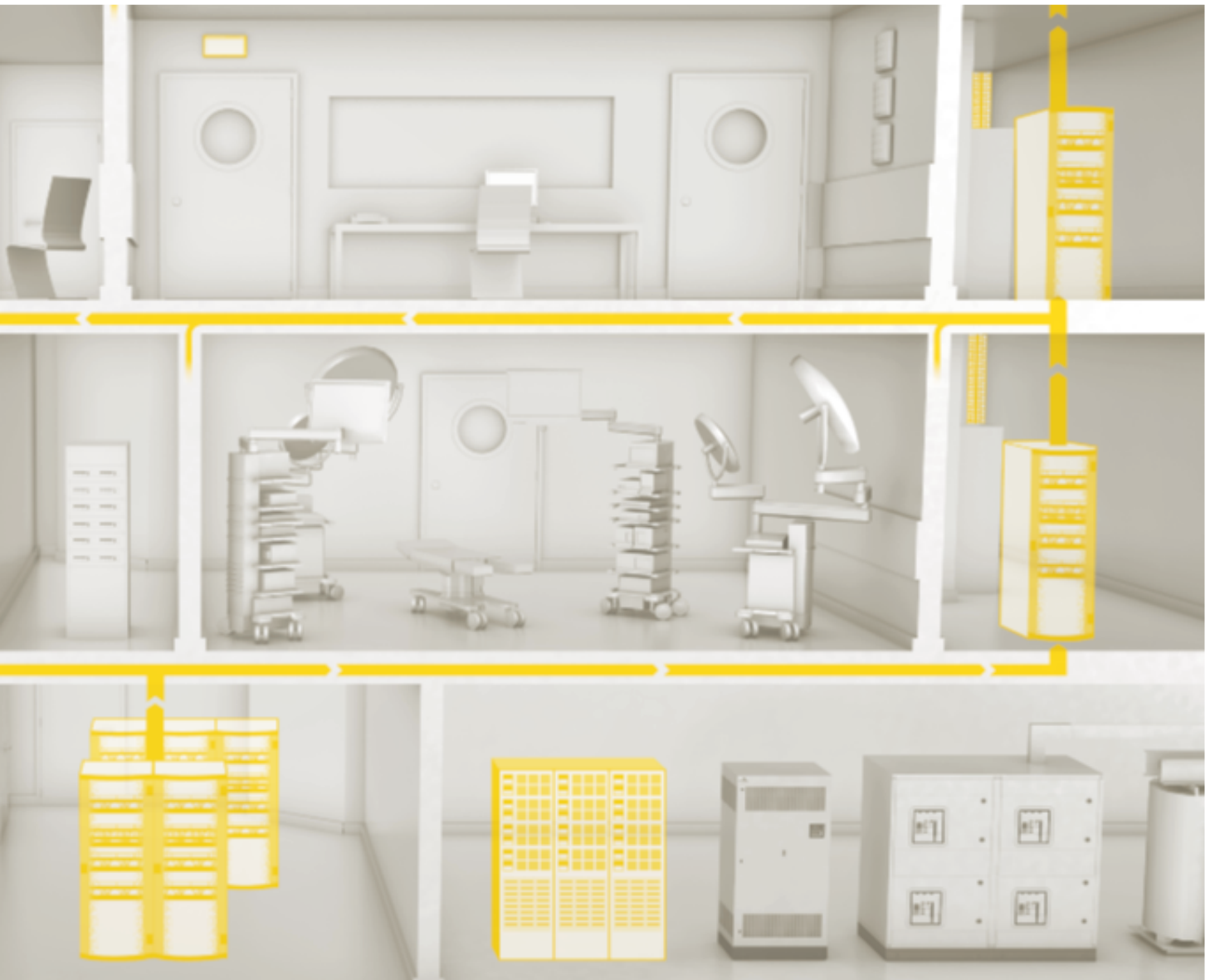
Access control

Analyser for RFID patch panels (p. 133)

www.legrand.xxx

CAMPUS

Simplicity
and **safety**
when providing
information

▶ Legrand's global solution
also includes: power
equipment, security systems...

AVS socket (p. 140)   DLP trunking system

RJ 45 socket Cat. 6A (p. 93)

Wi-Fi access point (p. 106)

HOTEL

Availability
and efficiency
for the **best
service**
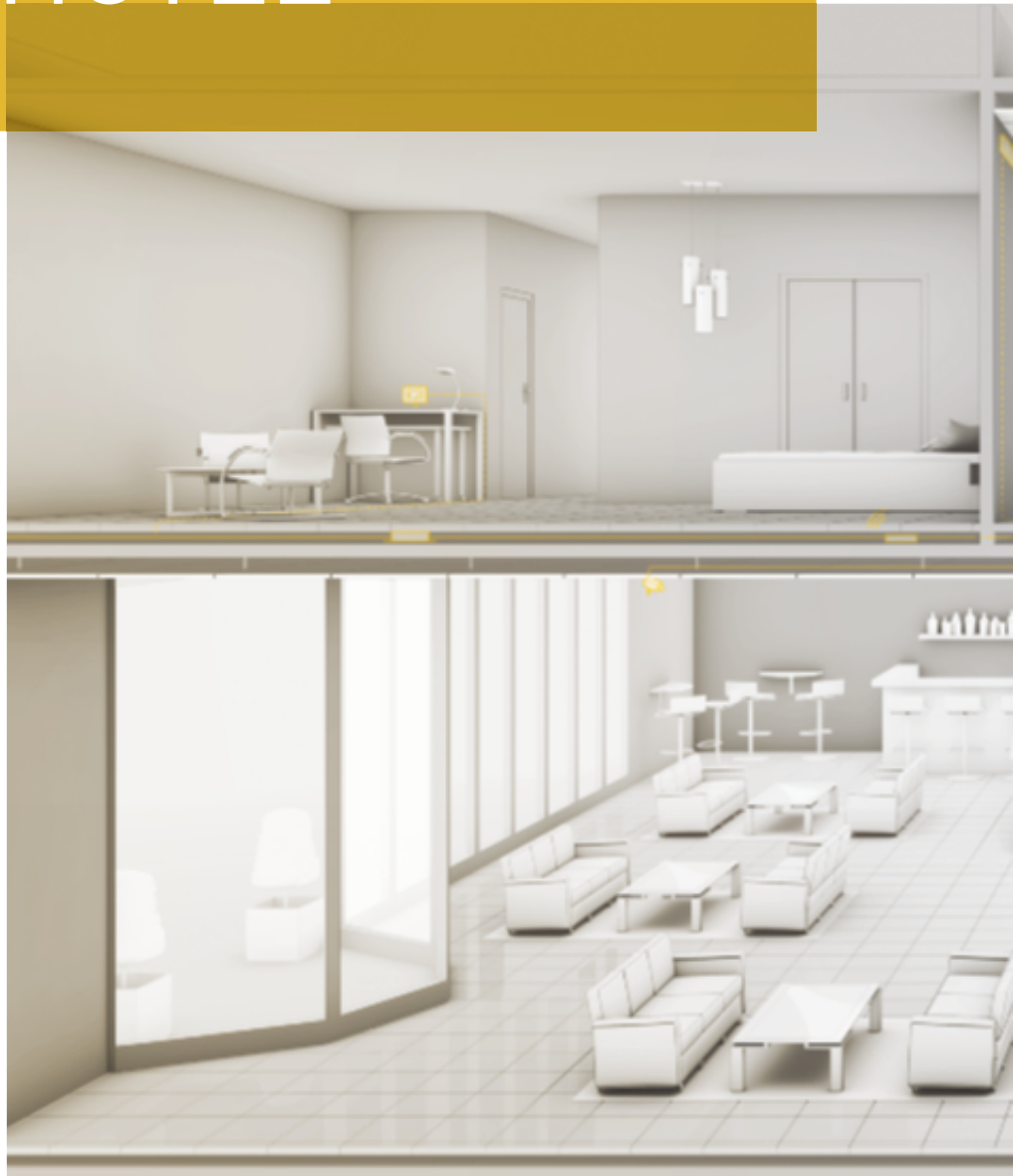
▶ Legrand's global solution
also includes: wiring device,
power equipment,
cable management...

RJ 45 sockets 45°

19" wall-mounting
cabinet (p. 121)

Retractable RJ 45 socket (p. 102)

Patch cord (p. 113)

1. STRUCTURED CABLING

1.1 - INTRODUCTION AND LOGIC OF STRUCTURED CABLING

IT and Telecommunications are at the heart of all activities. They require structures capable of carrying various signals (telephony, data, etc.) **flexibly, reliably and quickly.** Structured cabling is the response to these requirements. It has two key objectives: to group together companies' connection systems and to provide flexible management of the installations for distributing communication services, including telephony and

data. A structured cabling installation reduces the costs of any modifications for the entire lifetime of the system, enabling **quick reconfiguration** of the transmission network, without having to work directly on the support infrastructure.

1.2 - WIRING STRUCTURE

1.2.1 - Network topology

The term wiring implies the infrastructure (generally passive) at the origin of the network which is used to interconnect users and resources. There are numerous wiring configurations (loop, bus, star, etc.), each with its own advantages and disadvantages, both in terms of technology and scalability.

The only connection structure used for structured cabling systems is the hierarchical star, which provides a great deal of flexibility both in the installation phase and in extension and/or modification phases.

The physical connection structure is that actually used for the cables linking the nodes.

The logical structure refers to the method used by the nodes to communicate with one another. It is determined by the active network devices and the protocols used. The physical and logical structures are quite likely to be different.
The structure is referred to as a **hierarchical star**, as the wiring system may have several interconnection levels, depending on its complexity.

There are generally three levels, as follows:
- **Floor wiring** (horizontal wiring)
- **Building wiring** (vertical wiring)
- **Campus wiring**

EXAMPLE OF THE STRUCTURE OF A WIRING SYSTEM
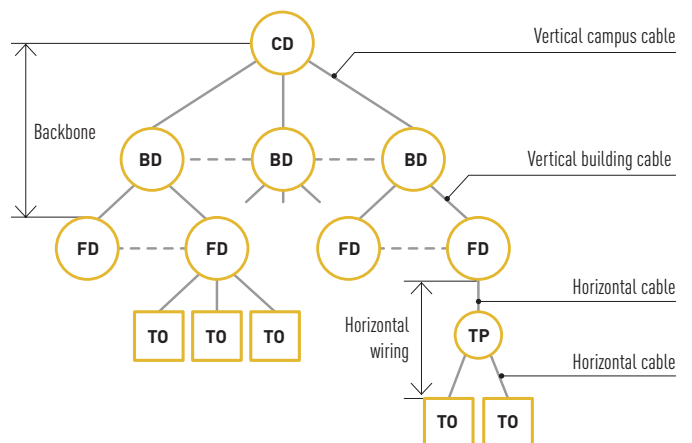
1.2.2 – Patching

Each hierarchical level in the wiring system is therefore a series of cables converging towards a neutral point. The horizontal wiring is all the cables which run to the floor distributor from each telecommunications outlet. The vertical wiring consists of the cables which converge towards the building distributor (BD) from the floor distributors (FD), etc. Each branch of the wiring ends at an active device which connects the users to the network.

Extension and/or modernisation of the network, reconfiguration of the layout of the areas, reorganisation, replacement of devices, etc., are modifications which generally require a change of (user)/logical port cable connections. To meet this requirement, the principle of **patching** has been introduced.

The patch cord physically links a given user (identified by a port on the patch panel) to the network itself (identified by a port on the network device) and provides a high degree of flexibility in terms of reconfiguration. If, for example, a single user has to be moved from the workstation he/she usually occupies, it is very easy to reassign all the network services to the new workstation.

The type of structure just described is also called **simple patching**, as all the cords link the cable identification panel directly to the active device. It is also possible to create a slightly more complex structure, called **double patching**, in which the active device itself is also linked permanently to the ports on a panel identical to that which terminates the cables from the installation. In this case, the network connections are configured between two panels, i.e. between the "cable side" panel and the "device side" panel. The choice of this more complex, and more costly, structure (which requires twice the number of panels) is primarily associated with the need to protect the active devices. Frequently moving the network connections may damage the connectors involved.

If the damaged connector is in a patch panel, the damage is limited and can be repaired quickly (the connector can be replaced quickly). Conversely, if the damaged connector is on an active device, it is then necessary to send the whole device to the support centre, which involves much higher costs and has a much greater impact on the operation of the network. With double patching, which is also called "Cross Connection", the ports on the device are no longer directly involved in the patching operations.

This principle applies to all the neutral points in the structure (FD, BD and CD) and is independent of the cable technology (copper or fibre optic).

INTERCONNECTION AND CROSS-CONNECTION METHODS

INTERCONNECTION METHOD

Active device

DEVICE CABLE

Horizontal wiring

Workstation

CROSS-CONNECTION METHOD

Active device

DEVICE CABLE

Patch cord

Horizontal wiring

Workstation
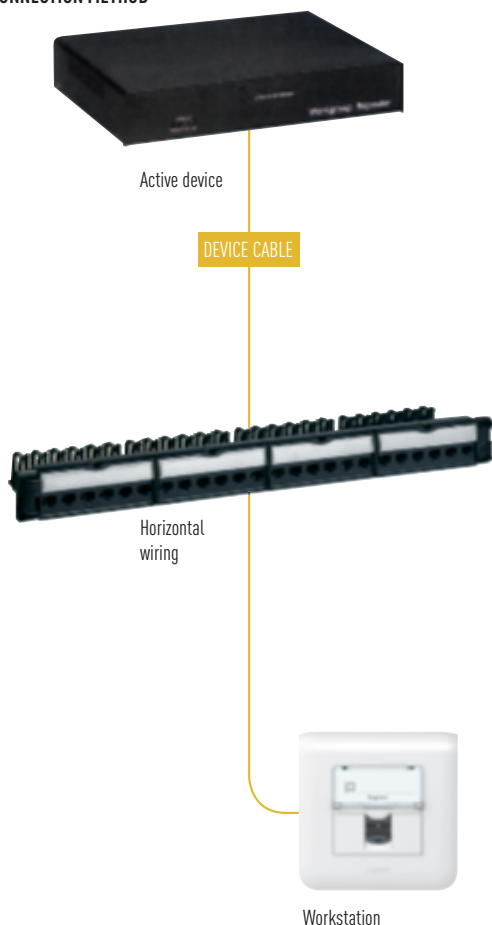
1.2.3 - Working area

From a structural point of view, the working area consists of all the components required to link the user's device to the horizontal wiring: depending on the different installation architectures, the working area can include telecommunications outlets (TO), multi user telecommunications outlet assemblies (MUTOA), the consolidation point (CP), the transition point (TP) and the connection cord of the device. All these components help to improve the wiring of an area that is generally problematic as it is subject to numerous structural, environmental and topological constraints, and also potentially subject to change, being moved, reorganisation of the areas, etc. The working area wiring must be freely adaptable to suit different and changing situations. Components such as the multi user telecommunications outlet assembly (MUTOA) and the consolidation point have been introduced to deal with just such requirements. A MUTOA device brings together several users' data sockets in a single point. These users can position themselves anywhere within a relatively large radius, the only limit being that of the maximum length of the device's cord, which is 20 m.

The introduction of the CP (consolidation point) is another technique which provides some freedom for reconfiguring the area. The floor wiring is subdivided into two main parts: the fixed (or permanent) wiring which runs from the technical room to a predefined location in the area to be served and is not modified over time, and a reconfigurable part from the CP which links the telecommunications outlets (TO). If the layout of 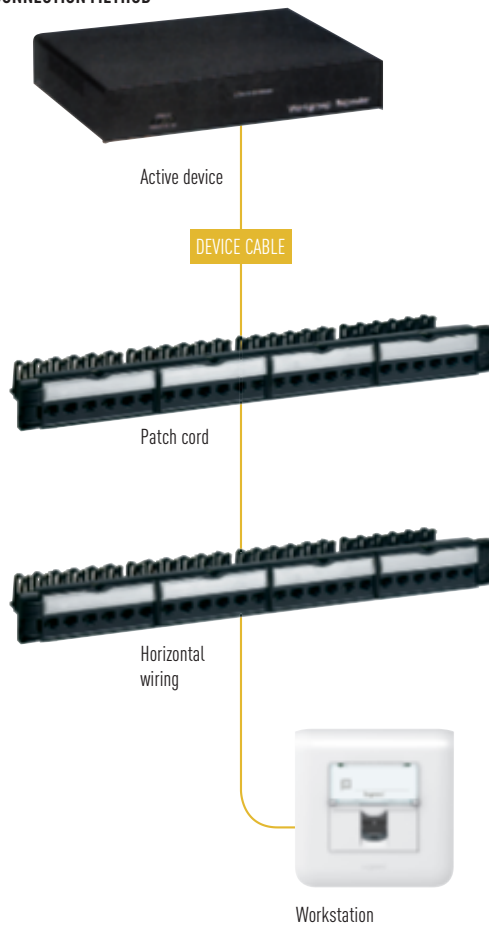the office is changed, all that needs to be changed is the last portion of the wiring without having to to anything to the whole of the section, which would require work that would doubtless be more complex and more costly.

> **NOTES**:
>
> Various definitions used in this document are listed below.
> - WA - Working Area. This is the area in which the work is carried out and where the user interacts with the data and telephone systems, computers, printers, faxes, etc.
> - TO - Telecommunications Outlet. This is the telephone socket in each working area. The user can plug his/her devices into this in order to access services.
> - MUTOA - Multi User Telecommunications Outlet Assembly. This is a multiple data socket which can serve several users.
> - TR - Telecommunications Room. This is the technical room containing the enclosures with the panels and devices for the floor wiring.
> - FD - Floor Distributor. This is the floor enclosure located in the TR. It is the neutral point of the horizontal wiring where all the cables from the user workstations converge and from which the connections for the vertical wiring depart.
> - ER - Equipment Room. This is the building's technical room in which the central network devices and the enclosures for the building's (vertical) wiring are located.
> - BD - Building Distributor. This is the building enclosure located in the ER. It is the neutral point of the vertical wiring where all the cables from the various FD (floor distributors) converge and from which the connections for the campus wiring (if there are any) depart.
> - CD - Campus Distributor. This is the campus enclosure, located in the main ER. It is the neutral point of the campus wiring where all the cables from the various BD (building distributors) converge.
> - CP - Consolidation Point. This is a zone box which links the floor distributor (FD) to the telecommunications outlet (TO).

1.2.4 - Horizontal wiring

Horizontal wiring comprises all the components used to transport information from the user's IT structures to the floor distributor contained in the TR for this wiring branch. The working area wiring is therefore part of the horizontal wiring, which comprises:
- The device cords
- The telecommunications outlet
- The cable
- A possible CP (consolidation point) or the TP
- The patching systems which make up the floor distributor (FD)
- The patch cords
- The device cables

The horizontal wiring is the most critical part of the whole structured cabling system. Firstly, it is structurally complex and includes a large number of cables which must reach various distributed points in a more or less uniform way over quite large areas. Secondly, it is the part of the wiring that is most subject to modification and being moved over time. The technological choices made and the attention given to the infrastructure project supporting this part of the installation will be very important in terms of performance levels and overall cost of the system.

1.2.5 - Vertical wiring

The vertical wiring represents the upper levels of the hierarchical structure described in section 1.2.1. The system which links the floor distributors (FD) on the various floors to the building distributor (BD) is generally referred to as the building backbone. Likewise the campus backbone links the various BDs to the CD (campus distributor). This backbone is generally made up of structures for transporting cables between isolated buildings within complexes that are sometimes huge.

These descriptions refer in all cases to typical situations: in reality, each application can differ, often quite considerably, from this general description.

Vertical wiring presents very different installation problems from those of horizontal wiring.

The topology is simpler, and the wiring runs to and from different points. It is easier to create the service spaces in the structure through which to run the cables. The cable runs are not affected by expansion of the network and any updates, modifications, extensions,etc. However the installation of backbones requires the application of special techniques, for both copper and fibre optic cables, whether indoor vertical wiring or campus vertical wiring running outside buildings is involved. In addition, the reliability of the work carried out is particularly critical as each cable is not just associated with a single user but with all the users on a floor, in the wing of a building, in a whole building or even a group of buildings, depending on the hierarchical level of the network structure in question.

1.2.6 – Technical rooms

The telecommunications rooms (TR) and equipment rooms (ER) are technical rooms, i.e. areas designed to contain structured cabling equipment and devices. The difference between TR and ER is essentially connected with their hierarchical positions in the wiring structure. A telecommunications room (TR) is the point at which all the cables from the floor wiring converge and from which the vertical wiring cables depart. It contains the hardware structures for patching (panels, patch cords, etc.), the floor distributor (FD), the active network devices and those

required for telecommunications. The equipment room (ER) is intended to serve an entire building or group of buildings: it is therefore the room in which all the interconnections are made in the hierarchical layout of the vertical wiring. It contains the hardware structures for termination and patching (BD and CD) and the active devices. In view of the "hierarchical" position of the equipment room (ER) and the complexity, costs and critical nature of all the devices it contains, an ER project must meet very stringent requirements and comply with very strict rules.

1.3 - PERFORMANCE OF THE WIRING SYSTEM: CLASSES AND CATEGORIES

Now let's take a look at the problem of performance levels, i.e. technological compliance with the intended function of the wiring. The task of each wiring structure is to transport data encoded according to a given protocol.

The need to exchange data ever more quickly necessitates upgrading of the protocols.

If we just look at Ethernet protocols (the most widely used), it will be seen that whereas the transmission speed of the first wiring systems was 10 Mbps, today's network performance is now a thousand times faster, at around 40 Gbps. In the following sections we will describe the essential parameters for defining performance levels.

1.3.1 - Bandwidth

When describing the performance of a wiring system, irrespective of the technology used for the transport medium, whether it is copper or a wireless system, reference is always made to its bandwidth, expressed in Hertz (its multiples, MHz and GHz). The bandwidth represents the frequency range within which the system operates. A series of electrical parameters is defined within this range, with specific limits given in the reference standards (eg: EN 50173 series).

The performance of a wiring system can be expressed according to a division into classes (according to the ISO/IEC, CENELEC and CEI standards) or categories (TIA/EIA standard).

The category is a parameter which identifies the characteristics of each component in the wiring system. The class identifies the expected performance levels of the system, once all the components have been cabled. The class is checked by means of tests using instruments. These tests must be carried out:
- On the link: fixed horizontal part of the wiring system. The portion from the patch panel to the connector at the workstation
- On the channel: portion which, as well as the link, also includes the patch cords (between patch panels) and the connection to the peripheral at the workstation.

ACTIVE DEVICE
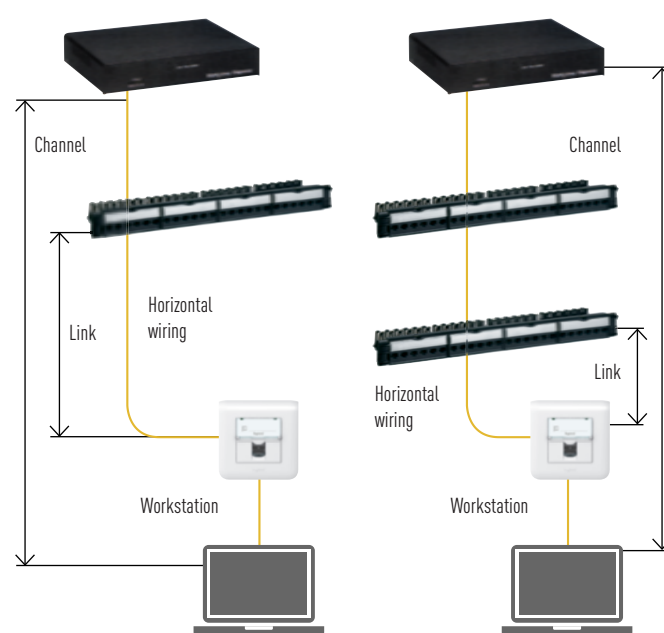
Class	Category	Speed	Bandwidth	Applications
A	1		100 KHz	no longer used
B	2		1 MHz	no longer used
	3		10 MHz	no longer used
C	3		16 MHz	no longer used
D	5	1 Gbps	100 MHz	data
E	6	1 Gbps	250 MHz	broadband data
EA	6$_A$	10 Gbps	500 MHz	broadband data
F	7	10 Gbps	600 MHz	broadband data
FA	7$_A$	10 Gbps	1000 MHz	broadband data
Optical		≥ 40 Gbps	2 GHz	broadband data

1.4 - TOPOLOGY AND DEFINITION OF THE SPECIFICATION

1.4.1 Topology of structured cabling

A structured cabling system is created for a LAN (Local Area Network) using a star-shaped topology, in which the centre of the star is made up of one or more patch panels. In the star-shaped topology, the cables converge towards a main concentration point with normally corresponds to the location of the equipment to be connected.

Central point of the star

Workstation

1.4.2 Definition of the specifications

To ensure the integrity of a project, the requirements must be defined, in terms of description, installation diagrams and request for quotation and also in terms of specifications. A typical wiring structure must include the following points:
- Introduction (purpose of the document, timescales, contractual aspects)
- Reference regulations and standards
- Description of the operation (area to be wired, requirements in terms of applications and integration between installations)
- Description of the installation architecture
- Description of the performance levels
- Technical specifications
- Construction
- Tests and checks to be carried out
- Documentation to be provided.

Breaks in communications or poor quality of the service provided, due to the use of inappropriate components or an installation error, may have serious consequences. The wiring defined by standard IEC EN 50173 applies to a wide range of services, including telephony, data, image and video.

These standards and those in the EN 50173 series define:
- The structure and minimum configuration of the generic wiring
- The design requirements
- The operating requirements for the links
- The conformity requirements
- The testing procedures.

1.5 - FUNCTIONAL COMPONENTS OF A WIRING STRUCTURE

The generic wiring system is a star-shaped hierarchical structure. The functional components of a generic wiring system are as follows:
- Campus distributor (CD)
- Vertical campus cable
- Building distributor (BD)
- Vertical building cable
- Floor distributor (FD)
- Horizontal cable
- Consolidation point (CP)
- Telecommunications outlet (TO).

EXAMPLE OF THE STRUCTURE OF A WIRING SYSTEM
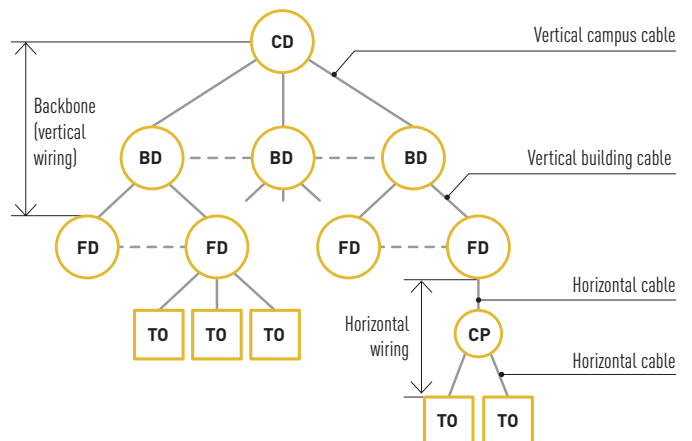
1.6 - WIRING SUBSYSTEMS

The number and type of subsystems defined for a wiring system depend on the geographical characteristics, the size of the campus or the building and the user's requirements. In the case of a single building, the main concentration point is the building equipment room. There is no need for a vertical campus wiring system. However, a large building can be treated like a campus, using a vertical campus wiring subsystem and several equipment rooms. The cables must be installed between the adjacent levels in the structure, to form a hierarchical star-shaped structure which provides the high degree of flexibility necessary for the various applications.

The generic wiring contains three subsystems which are connected together:
- Campus backbone
- Building backbone
- Horizontal wiring.

1.7 - DESIGN RULES

The structured wiring system is an infrastructure which must be taken into account at the building design stage. The standards (TIA/EIA 568, ISO/IEC - 11801 and EN 50173) give extremely simple design and installation specifications whose application enables structured cabling systems to be designed and created without taking the future applications into consideration. The principle of these standards is based on the relationship between the provision of the services and the space.

The connections depend on the surface areas, independently of how these areas will be used at different times. One workstation every 10 m^2 will make it possible to reconfigure the spaces without having to contact the installation company to install new lines. The use of open plan areas has played a major role in the establishment of structured cabling systems, with the main advantage being the provision of sufficient equipment, irrespective of how the wired areas are used.

For installations larger than 5000 m^2, created with full IP, or those in building structures which have various restrictions (eg: weight limits on ageing raised access floors, saturation of the cable ducts, protected historic buildings, etc.), the infrastructure can be created using FTTO (Fibre To The Office).

This recommends the use of fibre optic vertically and horizontally from the building distributor right up to the usage areas, and including the floor distributor. This enables the outgoing fibres to be distributed via 4 to 6 fibre cables to the manageable area switches.

Fibre optic is used for the vertical and horizontal wiring up to the connection of the SFP ports on the switches which can be in the false ceiling, raised access floor, wall-mounted or in trunking. These switches convert the optical signal to a copper signal, provide PoE/PoE+ with their associated power supply, and are fully manageable.

This architecture thus reduces the cost of the technical rooms item.

FD

Vertical wiring

BD

Equipment room

CD

Vertical campus cable

BD

Horizontal wiring

KEY

CD = campus distributor	
BD = building distributor	
FD = floor distributor	
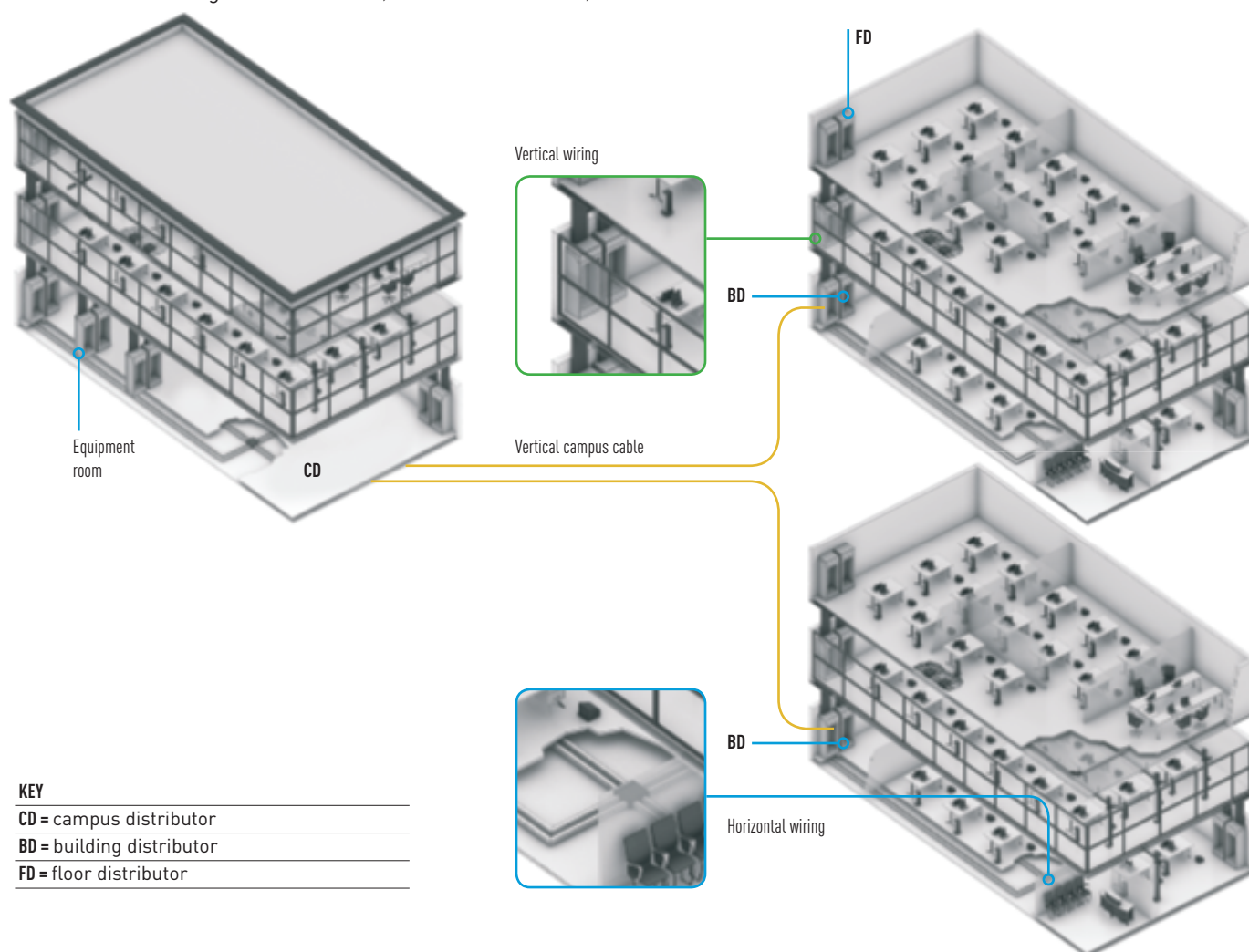
1.8 - MAIN COMPONENTS OF STRUCTURED CABLING

A structured cabling system is subdivided into subsystems in which the active and passive components are installed. The main subsystems which make up the structured cabling are:

- A - Workstation: this includes the components between the telecommunications outlet and the terminal equipment. The data terminal (PC, printer, etc.), the connection cable and any adaptors are also part of the workstation
- B - Horizontal wiring: this runs from the telecommunications outlet to the floor distributor. It includes the horizontal wiring, the multimedia socket, the cable terminations and the interconnection or patch panel
- C - Floor distributor: the floor distributor is the area of the building housing the terminations and patch panels of the backbone and the horizontal wiring

- D - Building backbone: this connects the floor distributors, the equipment room/entry area. It includes the vertical cables, the main and secondary patching points and the cables between the equipment room and entry area in the building
- E - Equipment room: this is the room housing all the main network equipment serving the wiring
- Entry area: this is the area of the building where the connection is made between the part of the wiring outside the building and that inside the building normally the backbone).

- Fibre optic system
- Patch panels
- Active equipment
- Power supply

(D) Building backbone

(A) Workstation

(B) Horizontal wiring

(C) Floor distributor

(E) Equipment room/entry area

(F) External entry line
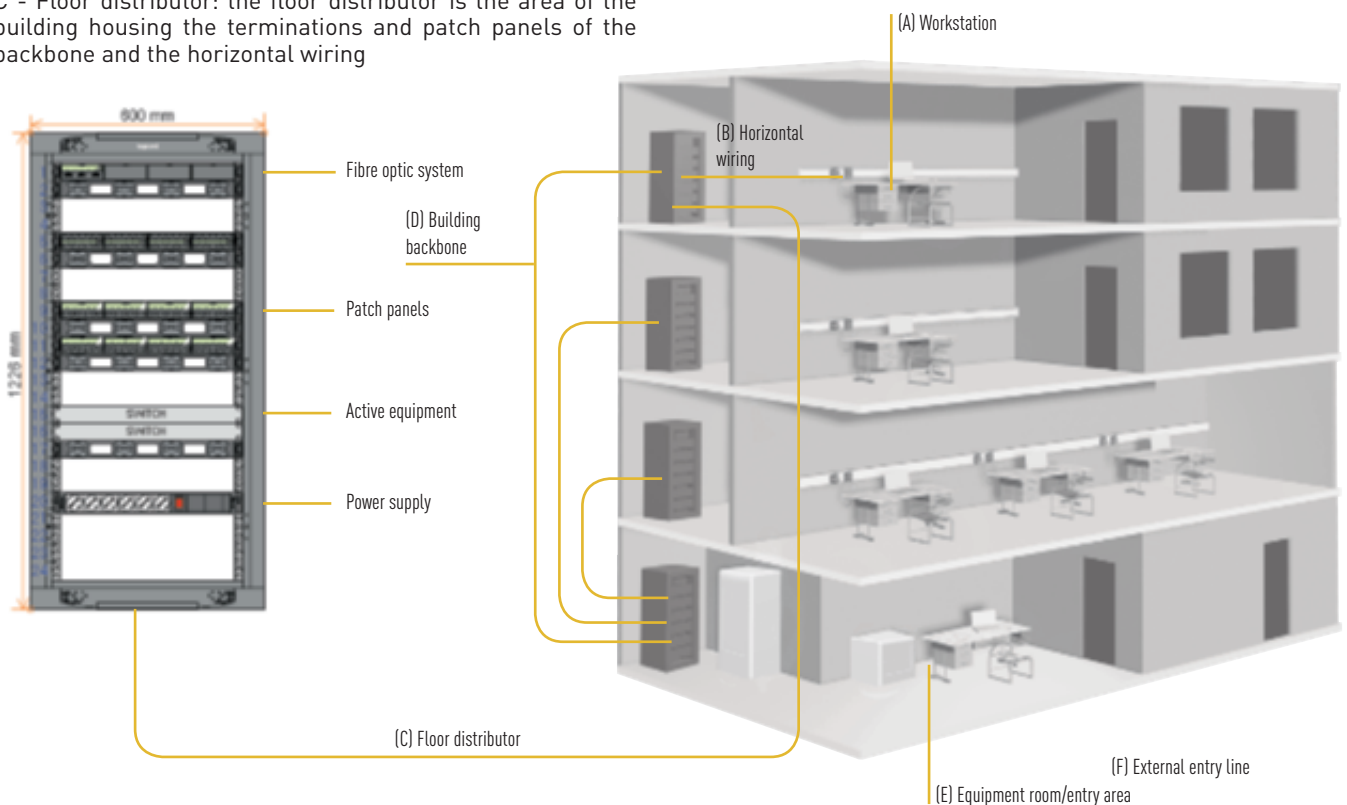
Fibre To The Office: digital infrastructure

Example of a configuration for fibre optic distribution in false ceilings or raised access floors

The individual desk is equipped with a zone distribution box that can be installed in a false ceiling or raised access floor. The optical signal is converted to a copper signal by the active zone box. The active zone box distributes five RJ 45 Gigabit outlets, including four PoE/PoE+ ports (max. 120 W).

Active zone distribution box

Fibre Optic floor distribution cabinet

Copper cords for zone connections

Mosaic column

Wi-Fi terminal

Access control

Fibre Optic cable for vertical distribution

Copper cords to the workstation

Mosaic RJ 45 outlet with copper crosspiece
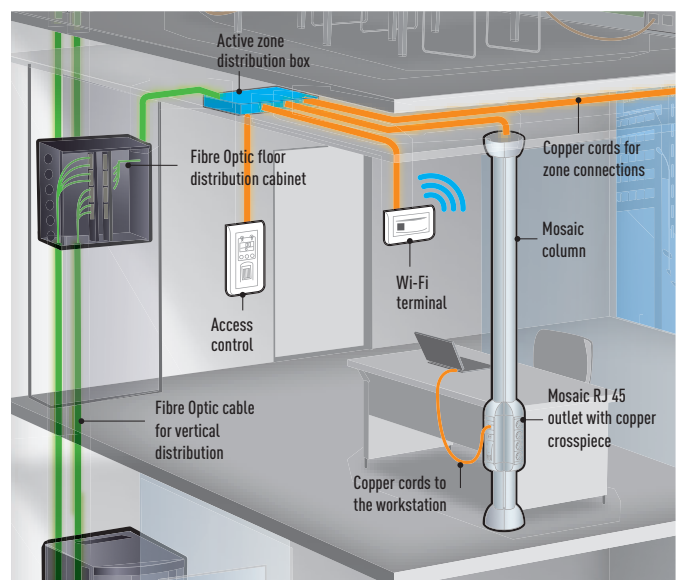
1.8.1 - Workstation

Telecommunications outlet

The telecommunications outlet distributes the various services to the workstation. The workstation can have a minimum of two connection points (one for telephony, the other for data). Telecommunications outlets must be positioned in areas that are easy to access. A high density of telecommunications outlets increases the flexibility of the wiring. It is advisable to provide at least two telecommunications outlets per working area measuring at least 10 m^2, each connected to a connection cable. The outlets must have a permanent label that is visible to the user. Any possible adaptors such as baluns and impedance converters must be outside the outlet.
There are two types of telecommunications outlet:

Copper

Two 8-pin connectors for connecting the 4-pair 100 ohm symmetrical copper cable.
Legrand offers the following connector solutions:
■ Type 110 with insulation displacement by Impact Tool or Tool kit
■ TOOLLESS which does not require any tools to connect the cable.
All connectors are available in the various wiring accessory ranges. The various services can be provided at two workstations, using finishing plates that can contain up to four RJ 45 connectors. In this case, a mixture of connectors are used without plates that match the Legrand wiring accessory ranges.

Fibre optic

This type of solution is called FTTD (Fibre To The Desk: interconnection principle using fibre optic) and is used in installations in which data is transmitted entirely via fibre optic. This type of installation must provide devices for converting the optical signal. A feedthrough socket for 50/125 μm or 9/125 μm fibre optic is installed as the telecommunications outlet. Legrand offers the following solutions for optical sockets and coupling connectors:
■ SC duplex
■ ST duplex
■ LC.
All feedthrough sockets and coupling connectors are available in the various Legrand wiring accessory ranges.
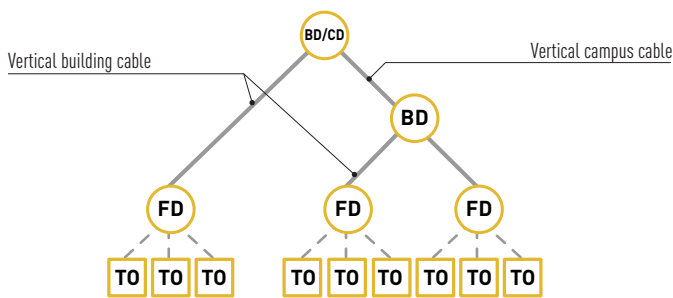
1.8.2 - Horizontal wiring

Horizontal wiring includes the horizontal cables, the mechanical terminations of the horizontal cables, the telecommunications outlets and the cross-connections in the telecommunications room.
The following main rules must be complied with when creating horizontal wiring:
■ The horizontal cables must be continuous, from the telecommunications room to the telecommunications outlet
■ If necessary use a consolidation point between a floor distributor (FD) and any telecommunications outlet (TO)
■ Comply with the maximum connection lengths given in the table (in accordance with IEC EN 50173-1).

MAXIMUM LENGTHS OF CONNECTIONS

Length (m)	Type of connection
90	Horizontal wiring (between FD and TO)
5	Patch cord between the telecommunications outlet (TO) and the equipment
5	Connection jumpers inside the telecommunications room

Consolidation point

The regulations stipulate that there must be no breaks or joins in the lines linking the floor distributors to the sockets at the workstations. A consolidation point may however be installed between the floor distributor (FD) and the telecommunications outlet (TO), using zone boxes. The use of a consolidation point to create area wiring is helpful in open plan areas which require a high degree of flexibility in terms of reconfiguration of the working areas. Only one consolidation point is permitted, and it must only contain passive connections. The following points must also be remembered:
■ The consolidation point can serve a maximum of twelve working areas
■ The consolidation point must be placed in an area that is accessible to staff
■ A consolidation point must comply with the labelling and documentation specifications and must be included in the wiring management system
■ The consolidation point can only contain passive connection hardware.

EXAMPLE OF INSTALLATION OF A CONSOLIDATION POINT

Patch panel

Consolidation point

Telecommunications outlets

Horizontal wiring, max. 90 m (permanent link)

Workstation
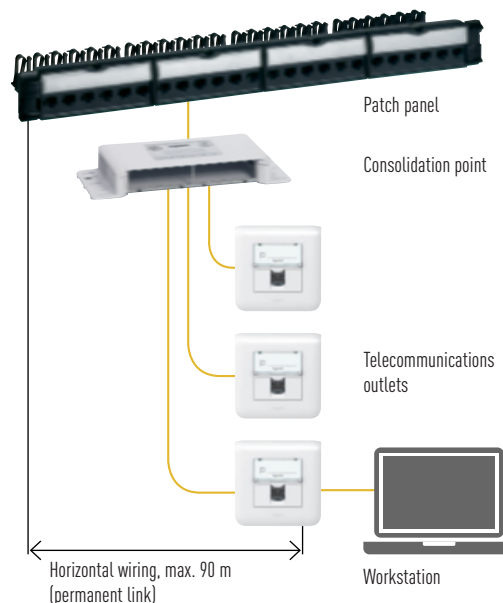
Main characteristics of the Consolidation Point (CP)

Possibility of installing 2 units of 6 RJ 45 connectors (for up to 12 sockets) for each unit

Maximum flexibility of use due to the ability to install the same number of fibre optic and copper connectors in the same unit

Accessories for fibre optic management

Patch cord, 5, 8 or 20 m

Spare lines

1.8.3 - Building backbone

Building backbone (from BD to FD)

This runs from the equipment room to the telecommunications room. The subsystem includes the vertical cables of the building, the mechanical terminations at both ends of the cables and the cross-connections in the equipment room. The following main rules must be complied with when creating a building backbone:

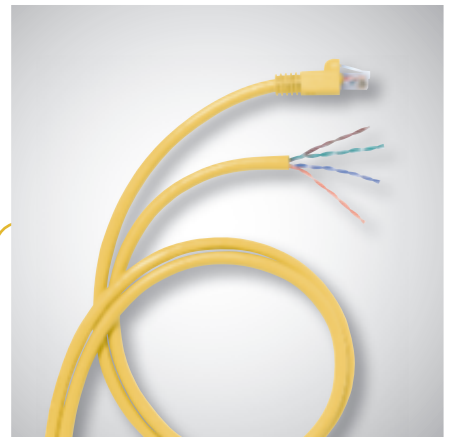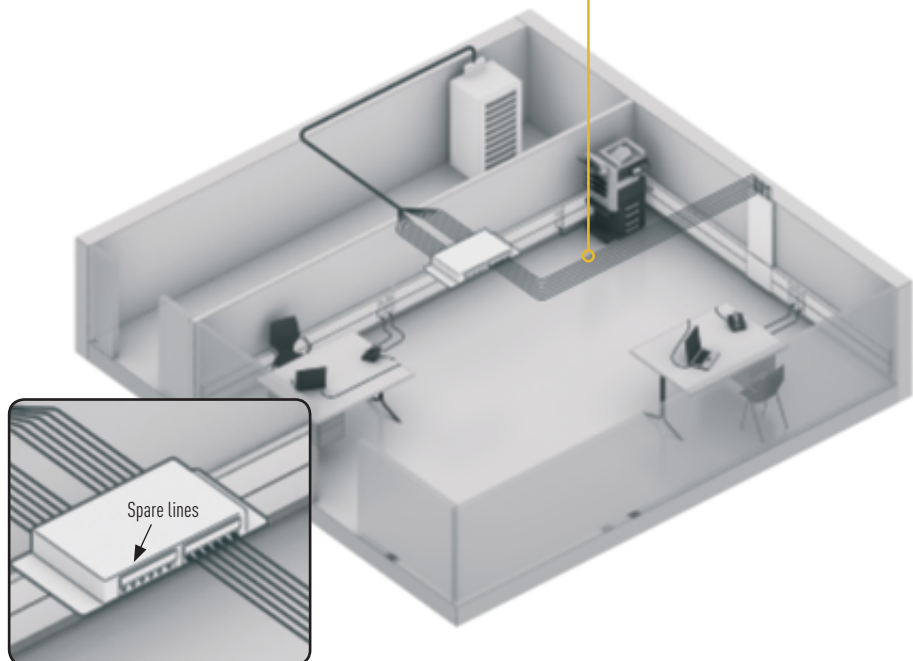■ The vertical cables of the building must not contain any transition points

■ The vertical copper cables must not contains any joints.

Campus backbone (from CD to BD)

This runs from the campus distributor to the building distributor which is generally located in a separate building. The campus distributor includes the vertical cables, the mechanical termination of the cables (both in the campus equipment room and the building technical room) and the cross-connections in the campus equipment room. The following main rules must be complied with when creating a campus backbone:

■ There must be no more than two hierarchical patching levels in the vertical wiring, in order to limit impairment of the signal for passive systems and to simplify the management of the cables and connections

■ No more than one patch cord may be crossed to reach the campus equipment room when departing from a floor distributor (FD).

BUILDING BACKBONE PRINCIPLE

KEY
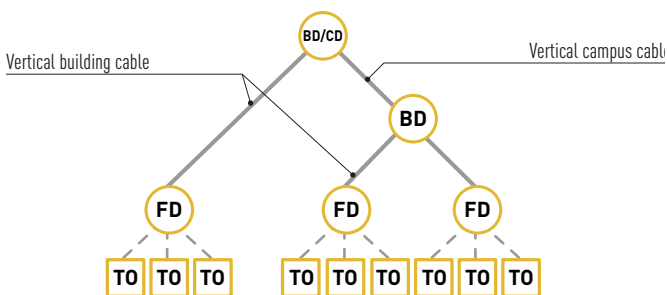
CD = campus distributor
BD = building distributor
FD = floor distributor
TO = telecommunications outlet

Sizing the technical rooms

Each 1000 m^2 area for offices requires at least one telecommunications room. If possible, create a telecommunications room for each floor in the structure. If a floor is not used very much, this floor can be "served" from the telecommunications room on an adjacent floor.

■ Vertical wiring distances
The following can be used to create backbones:
- 62.5/125 µm or 50/125 µm multimode fibre optic cables (recommended for creating backbones), or as an alternative, singlemode fibre optic cables
- Cat. 5e, 6, 6$_A$ 100 ohm, multipair symmetrical copper cables. The maximum distance of the vertical wiring between the campus distributor (CD) and the associated distributor in the cabinet must not exceed the distance limits given below.

■ Telecommunication enclosures
Each telecommunication enclosure must have direct access to the backbone. When selecting the type of cabinet or enclosure, it is advisable to establish the minimum dimensions, calculating the rack units occupied by the passive and active equipment already defined at project stage

Second factor to be taken into account: the possibility of future extensions.

It is not possible to have more than 2 hierarchical patching levels

Maximum lengths of vertical connections in accordance with standard IEC EN 50173-1 (06/2003)

Maximum lengths (m)	Type of connection
2000	Campus backbone + building backbone + horizontal wiring
1500	Campus backbone + building backbone
500	Equipment room + telecommunications room
20	Patch cord in the building and campus equipment rooms

Recommended vertical wiring methods

Subsystem	Type of medium	Recommended use
Campus backbone	Symmetrical cables	According to requirements*
	Fibre optic	Resolution of problems due to differences in earthing potential and other sources of interference
Building backbone	Symmetrical cables	Low to medium speed telephony and data
	Fibre optic	Medium to high speed data

* Symmetrical cables can be used in the campus vertical wiring subsystem if the bandwidth of fibre optics is not required.
Eg: telephone lines

1.8.4 - Data backbones (vertical wiring)

Although for telephony the project and the components used in the vertical wiring are relatively standardised, for vertical data wiring the dependence on the type of application is much more obvious. This dependence do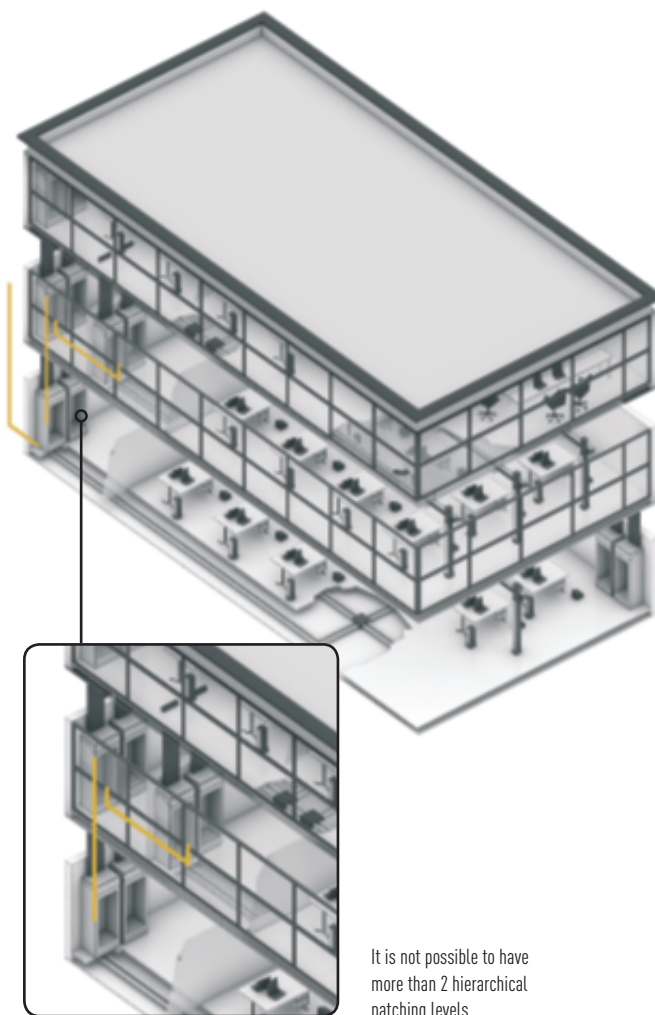es not involve loss of flexibility of the installation: the horizontal wiring, in terms of which the installation is qualified, is not affected as a result of the creation or modification of the backbone. The connections can still be used at the performance levels indicated by the reference category or class. In addition it should be noted that the modification or replacement of a backbone is not generally a difficult operation in terms installation and that the inherent transfer of the applications only requires limited downtime of the network. It is advisable to allow for future extensions (during the project stage), both in terms of users and of bandwidth, to avoid too many modifications of the vertical wiring. Modification or replacement of a backbone does not require the wiring system to be re-certified.
Vertical data wiring can be carried out in 2 ways:
■ Using a multimode fibre optic (recommended)
■ Using a twisted pair copper cable, impedance 100 ohms or category 5e (applications up to 100 MHz) or 6 (applications up to 250 MHz) or 6_A (up to 500 MHz).

Backbones for Ethernet applications
To date, applications refer to standards with connection via cable and fibre optic. To choose the correct reference standard for vertical connections, the maximum distances that can be covered and the maximum permitted speed must be taken into account, assessing the costs and advantages of each option.

Vertical wiring

Components for telephone system installation
Type 110 connection blocks, which manage the pairs individually, are normally used for connection in the main cabinet. A type 110 block can take up to 100 pairs, i.e. 100 telephone lines in the case of traditional 2-wire analogue telephones. The connection cross-section capacity must be at least equal to the number of internal telephone lines. However the possibility of increasing the number of pairs that can be connected should be provided. Many telephone switchboards are extendable and this possibility must be taken into account at the project stage. RJ 45 panels can however be used to replace the type 110 blocks. Using RJ 45 patch panels involves partial use of the pairs available on the RJ 45 panel. For patching, 110-RJ 45 patch cables must be used to transmit the signal to the horizontal distribution (if this has been done using RJ 45 panels), and type 110-110 patch cables if the horizontal wiring is done using type 110 blocks, or RJ 45-RJ 45 patch cords if the whole installation is built using RJ 45 patch panels. On the switchboard side, the use of patch cords will be identical depending on whether the internal lines have been connected on RJ 45 panels or type 110 blocks. An RJ 45 panel is often used for horizontal distribution and a type 110 block for connecting the internal lines on the switchboard side and for the vertical cables.

1.8.5 – Technical rooms

The technical rooms constitute the centre of the wired infrastructure star. They are dedicated areas from which the building backbones or the campus connections and the horizontal distribution cables depart or where they terminate.
The data, voice, multimedia, automation, control and security services must be managed in the technical rooms and distributed from them to the groups of users in a specific building. There are two different technical rooms:
■ Floor technical rooms
■ Building technical rooms.

Floor technical room TR (telecommunications room)

Telecommunications rooms are the management location where the vertical wiring of the building is interfaced with the horizontal distribution, transporting the services from the main vertical trunking to the working areas.
Each building should have one or more telecommunications rooms. If the infrastructures are shared by several companies, any cohabitation of devices and services intended for different owners must be avoided. If it is not possible to have a telecommunications room for each company, it is essential to separate and identify each owner's areas, distribution blocks and devices.
At the TR project stage, it is important to take into account not only the normal requirements of the traditional telephony and data transmission services, but also all the services that may be used in the future if the functions of the infrastructure are extended: IP CCTV, access control, automation, energy management, alarms and sound systems.
It is therefore very important to calculate the space needed for the network devices, the other active equipment and any future extensions in the cabinets. As a result, no problems in terms of slots in the racks or problems of physical space in the telecommunications room will be encountered.

The telecommunications room must contain the following equipment and devices: rack cabinets comprising:
■ Active equipment for the data networks, floor distributors, backbone terminations, telephony management devices and the safety, control and automation services
■ Infrastructures for horizontal cable distribution
■ Air conditioning systems to maintain the temperature between 18 and 24°C and 30 to 55% ambient humidity
■ Fire protection and safety systems
■ Electrical safety systems, ensuring that all the metal parts of the infrastructure are connected to the equipotential bonding system in accordance with the standards.

Building technical room ER (equipment room)

The equipment room is where the whole infrastructure is managed and where all the functions of the structured cabling system are managed.
In buildings where there are fewer than 100 working areas, the equipment room corresponds to the telecommunications room, in that they can be managed using a single central point in the star network.
In large buildings, with more than 100 working areas, the main, and also possibly secondary, vertical connections depart from the equipment room and run to all the telecommunications rooms.
The equipment room must be designed and positioned so that it can house all the active and passive equipment for the operational management of the services and also the management systems for the air conditioning and uninterruptible power supplies.
All the IT services (room containing the EDP central computer, servers and data storage devices) must be located in the equipment room or in the immediate vicinity.

1.9 – CONSIDERATIONS FOR WIRELESS NETWORK PROJECTS

Wireless networks require very specific project and layout rules and procedures.
To be sure of creating a compliant structure, it is important to know the user's requirements and the constraints of buildings, which may be:
■ Structural requirements, i.e. the type of area to be covered (closed or open plan offices, function rooms with or without obstacles, open spaces, type and material of inner walls, etc.)
■ Requirements in terms of performance, which consist of defining the minimum useful band to ensure signal coverage in each room
■ Requirements in terms of density, i.e. how many users are anticipated in each area
■ Requirements in terms of safety
■ Requirements in terms of mobility, to ensure connection even when moving.
Once the user's requirements have been defined, a project can be built and the number and type of access points to be installed (802.11a/b/g/n) in each space can be established.
Next phase: the analysis (visual and using instruments) of the areas in which the wireless network is to be installed. This analysis establishes the basic characteristics of the areas, to assess the presence of obstacles that may cause attenuation of the signal, such as fire doors, metal cabinets, walls, etc.

Given the possibility of varying the transmission medium according to the installation area (people, topology, equipment, compatibility, etc.), it is advisable to carry out a site study before installation in order to check that the project has been designed correctly.
Because of the different types of attenuation to which the signal is subjected, due to the structures of walls it has to pass through and to interference, as well as the bandwidth being shared between the different users connected to the Wi-Fi access point, it is especially difficult to calculate the size of the coverage cell for each one and therefore to determine the total number of Wi-Fi access points in the wireless network.
Key points to be checked to ensure coverage of each access point (AP) in the installation:
■ Determining the attenuation linked to the presence of walls
■ Determining the attenuation linked to how far away users are (cell usage limit)
■ Determining the maximum number of users for each AP (bandwidth sharing)
■ Determining internal and external interference
■ Establishing a frequency plan for the internal APs and those in neighbouring buildings
Once all this information has been analysed, it is then possible to determine the number of access points, their positioning and also the choice of channel and signal strength. The spread in the choice of Wi-Fi AP channels over the frequency band should be validated on a functional installation that reflects current usage as closely as possible. In some cases, the positioning or even the number of Wi-Fi APs needs to be altered in order to reflect actual usage when the building is occupied.

2. STANDARDS

2.1 - GENERAL

The reference standards for structured cabling include the design and installation of the overall system and the technical characteristics of each component. The standards are structured differently for each continent, but they all cover all the important topics.

The standards include requirements in terms of:
■ Performance
■ Safety
■ Conformity of the installation

The main reference standards for wiring mainly contain performance requirements and are listed below:
■ United States: TIA 568[1]
■ Europe: EN 50173 (project), EN 50174 (planning and installation)
■ Rest of the world: ISO/IEC 11801 (project) and other standards on specific topics (see 2.4)

Other important standards:

Safety:
■ United States: NEC - National Electrical Code
■ Europe: HD 60364 series
■ Rest of the world: IEC 60634 series
■ Italy CEI 64-8.
Fire resistance (properties of the materials used for cable sheaths):
■ IEC 60332-1, 2: flame propagation (single cable)
■ IEC 60332-3: fire propagation (cable bundle)
■ IEC 60331: integrity of the service under fire conditions (single cable).

All these standards impose various levels of tests in terms of severity and specifications for the cable type (copper, fibre optic, etc.).
Smoke emission (LS), and irritant and corrosive substances (ZH):
■ IEC 61304-1, 2
■ CEI 20-38.
Properties of the sheaths of fibre optic cables, with regard to its installation:
■ Indoor (liquid tight, IEC 60974-2)
■ Outdoor (cables not attached, IEC 60974-3).

TIA 568[1]   ISO/IEC 11801   IEC EN 50173

1) The TIA 568 series replaces the previous TIA 568-A and 568-B series.

2.2 - ISO/IEC, IEC (REST OF THE WORLD)

2.2.1 - ISO/IEC standards for structured cabling in general

11801: International standard ISO/IEC 11801 defines the specific requirements for the design of the structured cabling system in each of the installation areas listed in the European standards.

In future, it is planned to have a subdivision in the international standards similar to that in the European standards.

International standard ISO/IEC 14763-2 defines the installation, planning, management and maintenance rules for wiring.

ISO/IEC 14763-3: Testing of fibre optic cabling.

2.2.2 - IEC standards for cabling components

Copper cables for horizontal wiring:

Wiring class	Cable category	Maximum frequency (MHz)	Standard	Type of cable
D	5	100	IEC 61156-5	Shielded
D	5	100	IEC 61156-5	Unshielded
E	6	250	IEC 61156-5	Shielded
E	6	250	IEC 61156-5	Unshielded
E_A	6_A	500	IEC 61156-5	Shielded
E_A	6_A	500	IEC 61156-5	Unshielded
F	7	600	IEC 61156-5	Shielded*
F_A	7_A	1000	IEC 61156-5	Shielded*

* Categories 7 and 7_A shielded cable only, with pairs shielded individually

Copper cords:

Wiring class	Cable category	Maximum frequency (MHz)	Standard	Type of cable
D	5	100	IEC 61156-6	Shielded
E	6	250	IEC 61156-6	Shielded
E	6	250	IEC 61156-6	Unshielded
E_A	6_A	500	IEC 61156-6	Shielded
E_A	6_A	500	IEC 61156-6	Unshielded
F	7	600	IEC 61156-6	Shielded*
F_A	7_A	1000	IEC 61156-6	Shielded*

* Categories 7 and 7_A shielded cable only, with pairs shielded individually

FIBRE OPTIC CABLES: CONFORMING TO THE EUROPEAN STANDARD

FIBRE OPTIC CORDS: CONFORMING TO THE EUROPEAN STANDARD

COPPER CONNECTORS: CONFORMING TO THE EUROPEAN STANDARD (IEC 60603-7 SERIES + IEC 61076-3-104)

FIBRE OPTIC CONNECTORS: CONFORMING TO THE EUROPEAN STANDARD

2.3 - TIA (UNITED STATES)

The American standards are, in the strict sense, national standards and are therefore applicable to a given area. In the specific field of structured cabling, they are the latest standards, and thus often the only reference in existence for the most innovative solutions, or are quoted in all cases as a reminder.

The ISO/IEC and EN standards often inherit their content at a later stage and do not always correspond with them 100%.

The TIA 568-C series specifies the minimum requirements for wiring in individual commercial buildings or in complexes. It specifies the physical, electrical and transmission requirements, the maximum possible lengths and the characteristics of the components. The wiring systems described cover a maximum distance of 3000 m and areas of approximately 1,000,000 m², with connection of up to 50,000 users.

The TIA 568-C series supersedes the previous TIA 568-B series, adopting its content and incorporating it in that of class E_A which is designated category 6_A in American territory (different notation: capital "A" and same term as that used for the requirements for conduits, links and components). To be more precise, the requirements relating to class E_A/category 6_A are not completely equivalent: those in the TIA series are less restrictive.

2.3.1 - TIA standards for structured cabling in general

Project
TIA 568-C.0: Structured cabling, general principles.
TIA 568-C.1: Requirements specific to wiring in commercial premises and offices.
TIA 570-B: Requirements specific to wiring in residential environments.
TIA 942-A: Infrastructure requirements for data centers.
TIA 1005: Infrastructure requirements for industrial premises.
TIA 1179: Structured cabling for hospital environments
Planning and installation.
TIA 569-C: Cable pathways and spaces.
TIA 606-A: Cable routing.
TIA 607/B: Requirements specific to earthing.

2.3.2 - TIA standards for wiring components

TIA 568-C.2: Components for copper wiring.
TIA 568-C.3: Components for fibre optic wiring.

2.4 - CENELEC (EUROPE)

2.4.1 - Cenelec standards for structured cabling in general

The Cenelec standards define the requirements for the structured cabling system, in particular:
- Class (D, Ex, Fx - copper; OF-l - fibre optic): transmission requirements for a channel or a permanent link
- Category (5e, 6x, 7x - copper; Oxy - fibre optic): transmission requirements for components (cables, connectors and cords)

The standards define "reference layouts" with correspondence between the class of the channel and the component category. For example: a reference layout for a class E channel can certainly be created using category 6 components. The same channel can, however, be created differently: using higher category components, and also lower category components (by reducing the length).

The standards specifically relating to wiring are then subdivided into design, installation, planning and component standards, as specified below.

EN 50173

The EN 50173 series defines the design requirements for copper and fibre optic structured cabling systems in various different installation areas.
EN 50173-1: Definitions and general characteristics
EN 50173-2: Specific requirements for offices and commercial sites
EN 50173-3: Specific requirements for industrial environments
EN 50173-4: Specific requirements for residential environments
EN 50173-5: Specific requirements for data centers
EN 50173-6: Specific to Building distributed services

EN 50174

The EN 50174 series contains the practical installation requirements for copper and fibre optic structured cabling systems, in particular:
EN 50174-1: Planning, management and maintenance
EN 50174-2: Installation inside standard buildings and specific information for commercial, residential, industrial and data center buildings: backbones and horizontal wiring
EN 50174-3: Installation outside buildings.

EN 50310

Standard EN 50310 defines the specific requirements for earthing a structured cabling system.

EN 50346

Standard EN 50346 contains the requirements in terms of methods and instruments for testing both copper and fibre optic structured cabling.

2.4.2 - Cenelec standards for the wiring components

The European standards on wiring components are included in the system standards (inherent in section 2.3.1) and define the transmission requirements that must be met by each device in order to constitute transmission channels that comply with them.

Copper cables for horizontal wiring

Wiring class	Cable category	Maximum frequency (MHz)	Cable standard	Type of cable
D	5	100	EN 50288-2-1	Shielded
D	5	100	EN 50288-3-1	Unshielded
E	6	250	EN 50288-5-1	Shielded
E	6	250	EN 50288-6-1	Unshielded
E_A	6_A	500	(TIA 568-C.2); EN 50288-10-1	Shielded
E_A	6_A	500	(TIA 568-C.2); EN 50288-11-1	Unshielded
F	7	600	EN 50288-4-1	Shielded*
F_A	7_A	1000	EN 50288-9-1	Shielded*

* Categories 7 and 7_A shielded cable only, with pairs shielded individually

Copper cords

Wiring class	Cable category	Maximum frequency (MHz)	Cable standard	Type of cable
D	5	100	EN 50288-2-2	Shielded
D	5	100	EN 50288-3-2	Unshielded
E	6	250	EN 50288-5-2	Shielded
E	6	250	EN 50288-6-2	Unshielded
E_A	6_A	500	(TIA 568-C.2); EN 50288-10-2	Shielded
E_A	6_A	500	(TIA 568-C.2); EN50288-11-2	Unshielded
F	7	600	EN 50288-4-2	Shielded*
F_A	7_A	1000	EN 50288-9-2	Shielded*

* Categories 7 and 7_A shielded cable only, with pairs shielded individually

Fibre optic cables for horizontal wiring: type of fibre + location of the cable (indoor or outdoor)

Channel class	Mode/window (nm)	Type of fibre (equiv. category)	Reference standard
OF-25	M/650;	OP1	EN 60793-2-40 (A4a.2)
OF-50	M/650; M/850; M/1300	OP1; OP2	EN 60793-2-40 (A4a.2; A4g)
OF-100	M/650; M/850; M/1300	OP1; OP2	EN 60793-2-40 (A4a.2; A4g)
OF-100	M/850	OH1	EN 50793-2-30 (A3c)
OF-100	M/850; M/1300	OM1	EN 60793-2-10 (A1a) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-100	M/850; M/1300	OM2	EN 60793-2-10 (A1b) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-100	M/850; M/1300	OM3	EN 60793-2-10 (A1a.2) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-100	M/850; M/1300	OM4	EN 60793-2-10 (A1a.3) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-200	M/650; M/850; M/1300	OP2	EN 60793-2-40 (A4f)
OF-200	M/850	OM1	EN 50793-2-30 (A3c)
OF-300	M/850; M/1300; S/1310; S/1550	OM1	EN 60793-2-10 (A1a) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-300	M/850; M/1300; S/1310; S/1550	OM2	EN 60793-2-10 (A1b) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-300	M/850; M/1300; S/1310; S/1550	OM3	EN 60793-2-10 (A1a.2) + EN 60794-2 (ind.), EN 60794-3 (out.)

Fibre optic cables for horizontal wiring: type of fibre + location of the cable (indoor or outdoor) (continued)

Channel class	Mode/window (nm)	Type of fibre (equiv. category)	Reference standard
OF-300	M/850; M/1300; S/1310; S/1550	OM4	EN 60793-2-10 (A1a.3) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-300	M/850; M/1300; S/1310; S/1550	OS1	EN 50793-2-50 (B1.3, B6.a) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-300	M/850; M/1300; S/1310; S/1550	OS2	EN 50793-2-50 (B1.3, B6.a) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-2000	M/850; M/1300; S/1310; S/1550	OM1	EN 60793-2-10 (A1a) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-2000	M/850; M/1300; S/1310; S/1550	OM2	EN 60793-2-10 (A1b) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-2000	M/850; M/1300; S/1310; S/1550	OM3	EN 60793-2-10 (A1a.2) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-2000	M/850; M/1300; S/1310; S/1550	OM4	EN 60793-2-10 (A1a.3) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-2000	M/850; M/1300; S/1310; S/1550	OS1	EN 50793-2-50 (B1.3, B6.a) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-2000	M/850; M/1300; S/1310; S/1550	OS2	EN 50793-2-50 (B1.3, B.6a) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-5000	S/1310; S/1550	OS2	EN 50793-2-50 (B1.3) + EN 60794-2 (ind.), EN 60794-3 (out.)
OF-10000	S/1310; S/1550	OS2	EN 50793-2-50 (B1.3) + EN 60794-2 (ind.), EN 60794-3 (out.)

P: Plastic; M: Multimode "100% silica"; S: Singlemode "100% silica"; H: Hybrid singlemode (plastic sheath + glass core)

Fibre optic cords:
- 100% silica: General specifications EN 60794-1-1 + EN 60794-1-2 + specific requirements for the cable + standards for the connectors used
- Plastic: standards under consideration
- Hybrid: standards under consideration

Copper connectors:

Category	Standard
5/unshielded	EN 60603-7-2
5/shielded	EN 60603-7-3
6/unshielded	EN 60603-7-4
6/shielded	EN 60603-7-5
6_A/unshielded	EN 60603-7-41
6_A/shielded	EN 60603-7-51
7 (shielded only)	EN 60603-7-7; EN 61076-3-104
7_A (shielded only)	EN 60603-7-71; EN 61076-3-104

Fibre optic connectors:
There are different types of fibre optic connector according to the type of fibre (100% silica, hybrid, plastic, step index, graded index, etc.) and the mechanical connection (by switch, PC) or angled connection (APC).
All types of connector must comply with the:
- Safety requirements in standard EN 60825-1
- Colour codes in standard EN 60794-2, to prevent any connection errors with different mode cables
Comply with the physical requirements listed in the following table (source EN 50173-1).

SC PC Multimode

No.	Characteristics		Specification	Reference
a)	Characteristics in terms of optical performance			
	Maximum attenuation	Connectors	0.5 dB for 95% of the connections 0.75 dB for 100% of the connections	EN 61300-3-4
		Splice	0.2 dB	EN 61300-3-4
	Minimum return loss	Multimode	20 dB	EN 61300-3-6
b)	Physical characteristics			
	Compatibility of the termination with the cable			
	Nominal diameter of the sheath (µm)		125	EN 60793-1-20
	Nominal diameter of the secondary coating (µm)		-	EN 60794-1-1
	Outer diameter of the cable (µm)		-	EN 60794-1-1
c)	Mechanical characteristics			
	Resistance to wear (duration) cycles		≥ 500 (see NOTE 1)	EN 61300-2-2
	Strength of the coupling mechanism		68.6 N	EN 61300-2-6
	Tension on the cable		90 N	EN 61300-2-4
d)	Environmental specifications			
	Cold		-10°C 96 h (see NOTE 1)	EN 61300-2-17
	Dry heat		60°C 96 h (see NOTE 1)	EN 61300-2-18
	Damp heat		40°C, 93% RH 96 h (see NOTE 1)	EN 61300-2-19
	Impact		1 m 5 times (see NOTE 1)	EN 61300-2-12
	Vibration		10 Hz to 55 Hz 0.75 mm 30 min in each of the 3 directions (see NOTE 1)	EN 61300-2-1
	Change of temperature test		+60°C/-10°C at a rate of 1°C/min 30 min at extremities 5 cycles (see NOTE 1)	EN 61300-2-22

NOTE 1 Maximum variation during the test < 0.2 dB, initial and final attenuation < 0.75 dB
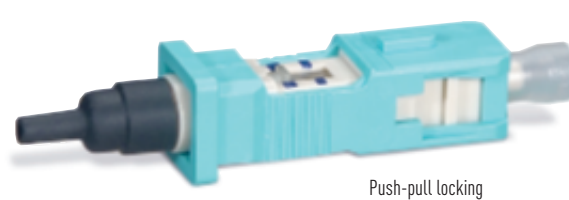**NOTE 2** Initial and final attenuation < 0.75 dB
NOTE 3 Maximum variation during the test < 0.5 dB, initial and final attenuation < 0.75 dB

The most common mechanical types are:

LC	SC

Clip locking

Push-pull locking

LC Duplex

SC Duplex

There are then connectors with 12 or 24 fibres (MPO) for the most advanced applications (10GbaseT, and the 40Gbase-ER4 and 100Gbase-SR4).

3. COPPER TRANSMISSION MEDIUM

3.1 - CABLE

The cable is one of the most critical components in horizontal wiring for the performance of the whole link, in terms of both quality of the product and conformity of the installation.
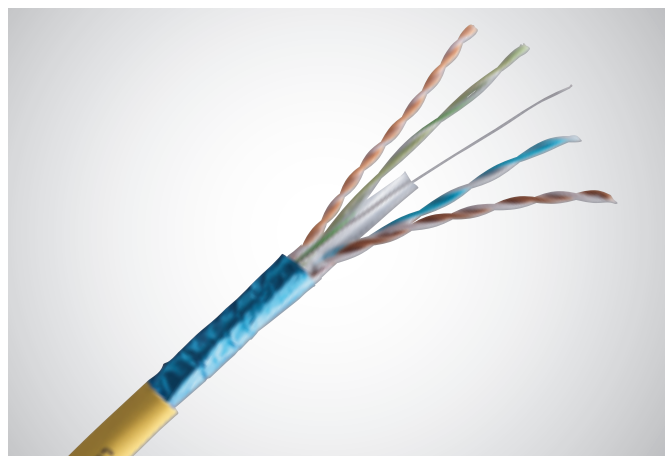
Any cable installation error will seriously compromise the performance of the installation.

For structured cabling systems, the standard requires the use of category 5e, 6 and 6_A (100 MHz, 250 MHz et 500 MHz respectively) twisted, symmetrical 4-pair cables with an impedance of 100 Ω 1).
The cable can be of the following type:
- Unshielded U/UTP (Unshielded Twisted Pairs)
- Shielded F/UTP (Foiled Twisted Pairs)
- Double shielding SF/UTP or S/FTP.

NOTE 1): To date, category 7 is not very widely used, even though it is standardised and can offer high performance levels. It is used for reasons of form factor, cost and where there are installation difficulties.

Legrand cable solutions

	Sheath	Marking	Storage/installation temperature	Operating temperature
Cat. 6$_A$ F/UTP 100 Ω	LSZH (zero halogen cables) conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 2.1 - Ø 7.8 mm - Colour: RAL 1018 yellow	LEGRAND 32778 4 pairs 24 AWG F/UTP 100 ohms LSZH cat. 6a 500 MHz - CHECKED AGAINST ISO 11801 IEC 332-1 EN 50173 - TIA 568B - VPN/NVP .....% Batch no. + length in metres	0 to +50°C	–20 to +60°C
Cat. 6 U/UTP 100 Ω	PVC or LSZH cables conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 2.1 - Ø 6.4 mm - Colour: RAL 5015 blue	LEGRAND (4 pairs or 2x4 pairs) 24 AWG UTP 100 ohms 250 MHz (PVC or LSZH) cat. 6 250 MHz - CE CHECKED AGAINST ISO 11801 IEC 332-1 EN 50173-1 TIA 568A Batch no. + length in metres	0 to +50°C	–20 to +60°C
Cat. 6 F/UTP 100 Ω	PVC or LSZH cables conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 water-repellent synthetic tape - Ø 7 mm - Colour: RAL 5015 blue	LEGRAND (4 pairs or 2x4 pairs) 24 AWG FTP 100 ohms 250 MHz (PVC or LSZH) cat. 6 250 MHz - CE CHECKED AGAINST ISO 11801 IEC 332-1 EN 50173-1 TIA 568A Batch no. + length in metres	0 to +50°C	–20 to +60°C
Cat. 5e U/UTP 100 Ω	PVC or LSZH cables conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 2.1 - Ø 5.2 mm - Colour: RAL 7035 light grey	Cat. No. LEGRAND (4 pairs or 2x4 pairs) 24 AWG UTP 100 ohms (PVC or LSZH) cat. 5e CE CHECKED AGAINST ISO 11801, IEC 332-1, EN 50173-1, TIA 568A Batch no. + length in metres	–15 to +70°C	+5 to +40°C

NOTE: for all other types of cable, please contact the Legrand sales network
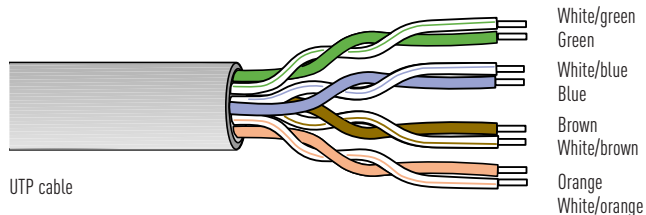
Data transmission cables are made up of four pairs arranged inside a sheath according to a specific layout, which is necessary to reduce attenuation and crosstalk problems. This layout consists of twisting the pairs of conductors individually. These pairs are identified using standard colours. Each of the pairs has a different pitch, and is in turn twisted differently inside the outer sheath. The conductor size permitted by the standards is between 22 and 26 AWG: 24 AWG is the most commonly used in all cases. The acronym AWG (American Wire Gauge) corresponds to the unit of measurement used by the American standards to measure the cross-sections of cables. As it is a ratio, the smallest cross-sections correspond to the largest AWG sizes. The appropriateness of using cables with different types of sheath must be assessed according to the area in which the wiring system is installed. The most commonly used cable sheath is PVC or LSZH (low smoke zero halogen).
According to the IEC and CEI specifications, cables with LSZH sheath must be used:
- In public areas
- In very busy areas
- Installations subject to a final test by public or safety bodies, such as local health authorities and fire services. If there is a fire, cables with this type of sheath emit very little smoke and do not release any toxic gases.

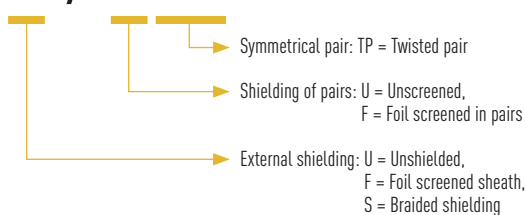| New ref.	Old ref.	Description
U/UTP	UTP	Unshielded twisted multipair cable
F/UTP	FTP	Twisted multipair cable (external foil screen)
U/FTP	FTP PIMF	Shielded twisted multipair cable (foil screened in pairs)
F/FTP	FFTP	Shielded twisted multipair cable (foil screened in pairs and outer general shielding)
S/FTP	SFTP	Twisted multipair cable (foil screened in pairs and outer braid)

X / XXX

Symmetrical pair: TP = Twisted pair

Shielding of pairs: U = Unscreened,
F = Foil screened in pairs

External shielding: U = Unshielded,
F = Foil screened sheath,
S = Braided shielding

UTP CABLE

White/green
Green
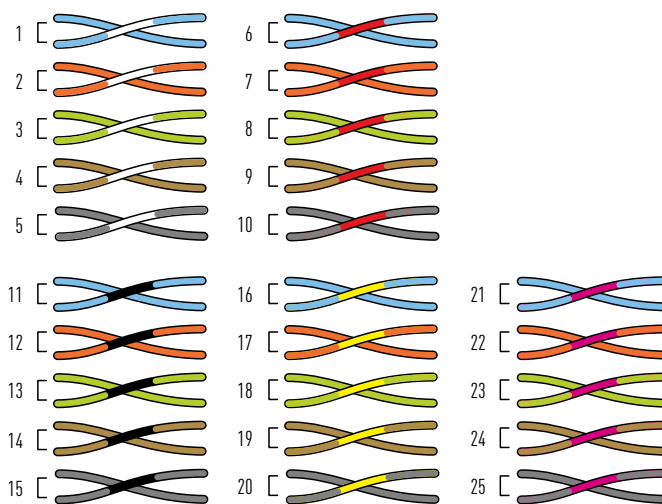White/blue
Blue
Brown
White/brown
Orange
White/orange

UTP cable

3.1.1 – Multipair cable

Multipair cables for telecommunications are mainly used to transmit telephone services to the workstation. The cables used are generally made up of 50 and 100 pairs. Cables with larger numbers of pairs should not generally be used. There are also Category 5 multipair cables, generally with 25 and 50 pairs. These cables are normally used for specific solutions, specified by the design office when the project is drawn up. The pairs inside multipair cables are standard colours. The specifications and colour code must be followed when installing 25-pair cables.

AWG cable conversion table

AWG	Ø (mm)	Cross-section (mm)	AWG	Ø (mm)	Cross-section (mm)
1	7.250	42.400	**16**	1.290	1.3100
2	6.540	33.600	**17**	1.150	1.0400
3	5.190	21.200	**18**	1.024	0.8230
4	5.190	21.200	**19**	0.912	0.6530
5	4.620	16.800	**20**	0.812	0.5190
6	4.110	13.300	**21**	0.723	0.4120
7	3.670	10.600	**22**	0.644	0.3250
8	3.260	8.350	**23**	0.573	0.2590
9	2.910	6.620	**24**	0.511	0.2050
10	2.590	5.270	**25**	0.455	0.1630
11	2.300	4.150	**26**	0.405	0.1280
12	2.050	3.310	**27**	0.361	0.1020
13	1.830	2.630	**28**	0.321	0.0804
14	1.630	2.080	**29**	0.286	0.0646
15	1.450	1.650	**30**	0.255	0.0503

COLOUR CODES OF MULTIPAIR CABLES

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3.2 - CONNECTORS FOR WORKSTATIONS

The connectors have the colour codes defined in the standards, according to which a structured cabling system can be installed. These colours are the same as those on 4-pair cables.
A standard installation, which uses 4-pair copper cables, must always be wired with the same sequence of colour codes, irrespective of the application and the type of service for which they are to be used (telephony or data transmission).
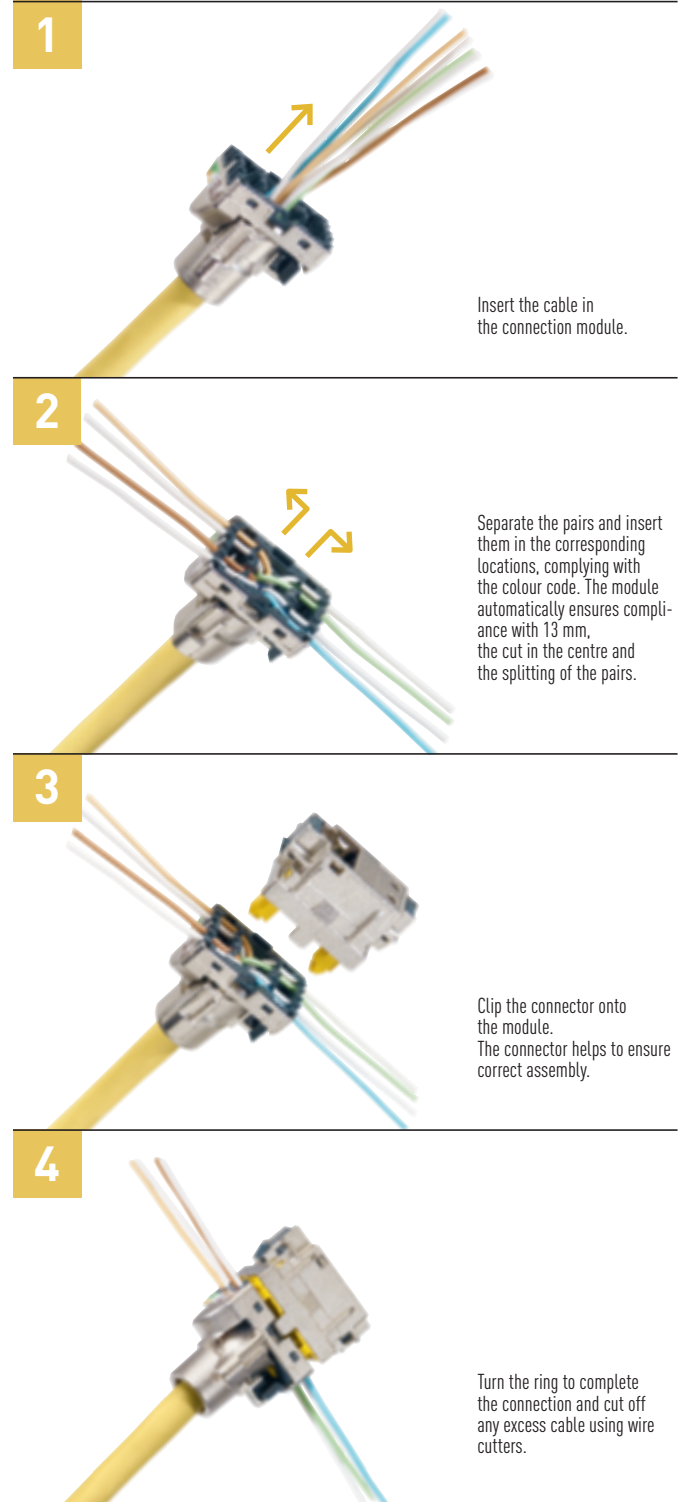Legrand offers two types of connector:
■ TOOLLESS connectors (do not require a connection tool)
■ Type 110 connectors (require a connection tool)
The connectors are available in cat. 5e UTP and FTP, 6 UTP, FTP and STP, 6_A UTP and STP, in all wiring device ranges.

3.2.1 - Toolless connection
The new TOOLLESS connector is at the heart of the performance of the LCS^2 system. A perfect connection can be obtained in just a few seconds, giving a link providing excellent performance levels, from the patch panel through to the workstation.

ASSEMBLY

1

Insert the cable in the connection module.

2

Separate the pairs and insert them in the corresponding locations, complying with the colour code. The module automatically ensures compliance with 13 mm, the cut in the centre and the splitting of the pairs.

3

Clip the connector onto the module. The connector helps to ensure correct assembly.

4

Turn the ring to complete the connection and cut off any excess cable using wire cutters.

The new TOOLLESS connector for quick, tool-free connection is available in all categories for installation on patch panels and on workstations.

TOOLLESS connectors are coloured so that their category can be easily and safely identified: yellow cat. 6_A, blue cat. 6, grey cat. 5e.

No tool

6$_A$

6

6

5e

TWO TYPES OF CONNECTOR

Different TOOLLESS connectors are used for the patch panel and the terminal socket: the connection ring on the panel connector is larger to make it easier to use and for repeated installation. The ring is smaller on the module connector so that it is easier to install in a flush-mounting box. The two connectors are not interchangeable.
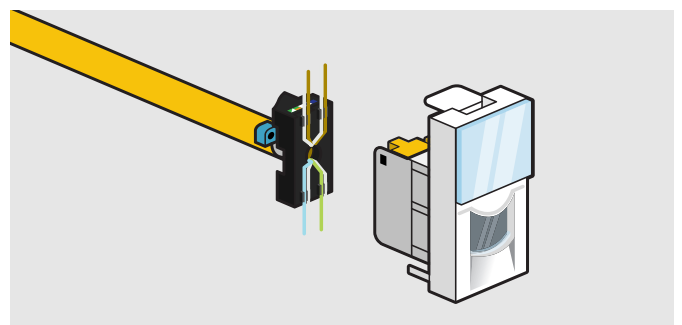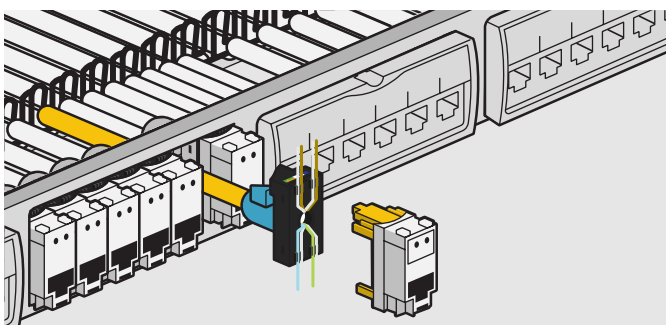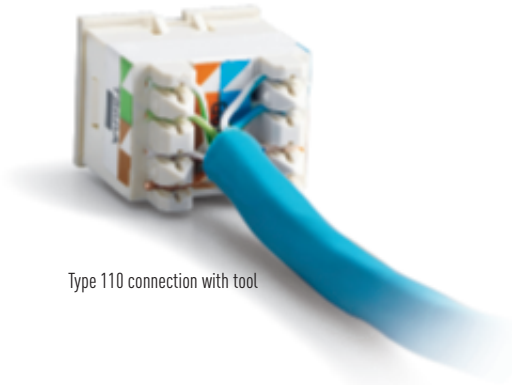
3.2.2 – Type 110 connection

The type 110 solution is wired using a tool and has been updated with a new range of connectors.

6

5e
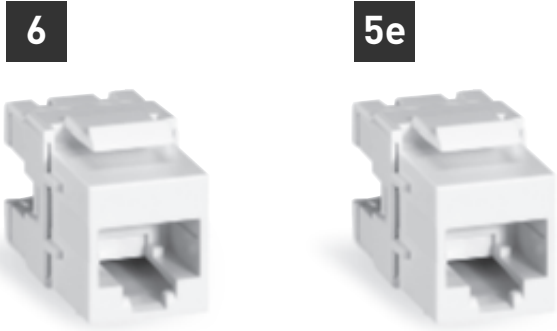
RJ 45 Keystone socket, cat. 6 UTP and 5e UTP

Type 110 connection with tool

With tool

3.2.3 – Connection methods

T568A and T568B: the standards specify two connection types, governed respectively by the following recommendations: T568A and T568B in ANSI/TIA 568-C.
These two methods are identical in terms of performance and applications supported. The only difference is the reversal of pair 2 and pair 3. It is easy to see that, due to the reversal of the pairs, both methods cannot be present in the same wiring system at the same time. The network applications would not operate correctly. The prevailing trend is to build installations using the T568B connection method. It is however possible to come across existing installations built using the T568A method.

Pin connection by application type

RJ 45 application	Pin no.							
	1	2	3	4	5	6	7	8
Telephony (analogue and digital)				■	■			
ISDN			■	■	■	■		
10/100/1000 Ethernet Mbps	■	■	■			■		
Token Ring			■	■	■	■		
Ethernet 1 Gbps/10 Gbps	■	■	■	■	■	■	■	■

Note: this table shows that pins 7 and 8 are not used. There are however specific applications which also use these two pins.

T568A AND T568B PIN CONFIGURATIONS
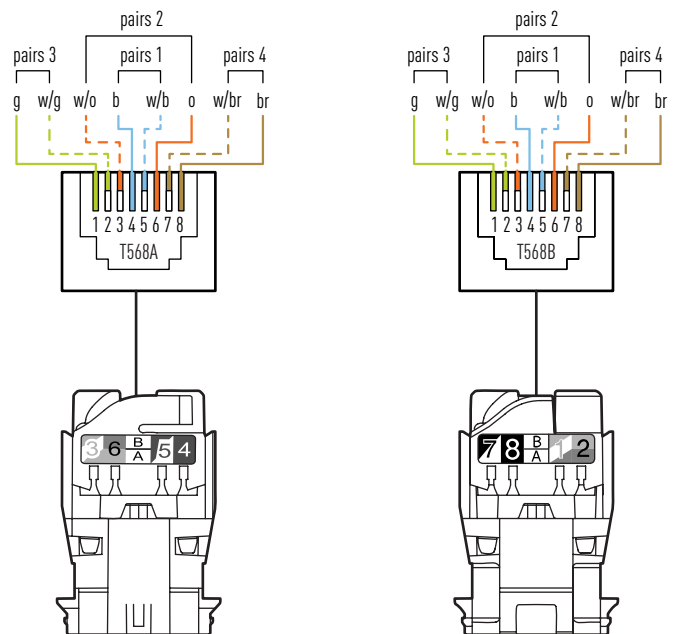
g = green
w/g = white/green
o = orange
w/o = white/orange

b = blue
w/b = white/blue
br = brown
w/br = brown/white

3.3 - PATCH PANELS

Patch panels are used to make wiring tidier and reconfigurable. Legrand offers two types of panel:
■ Toolless patch panel
■ Type 110 patch panel.

The new patch panels have been designed to optimise installation and maintenance: each connector connects individually to a front panel installation. Cable management is also made easier by a cable guide.

The panels are available in their complete versions in cat. 6_A STP, cat. 6 UTP, FTP and STP and cat. 5e UTP and FTP, and modular versions with units of six RJ 45 connectors.
The new QUICK-FIX system reduces installation times as no screws are required.

Patch panels with V screw-free attachment. Full interoperability with other commercially available products.
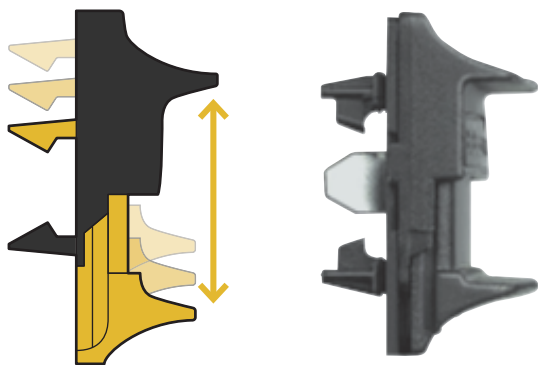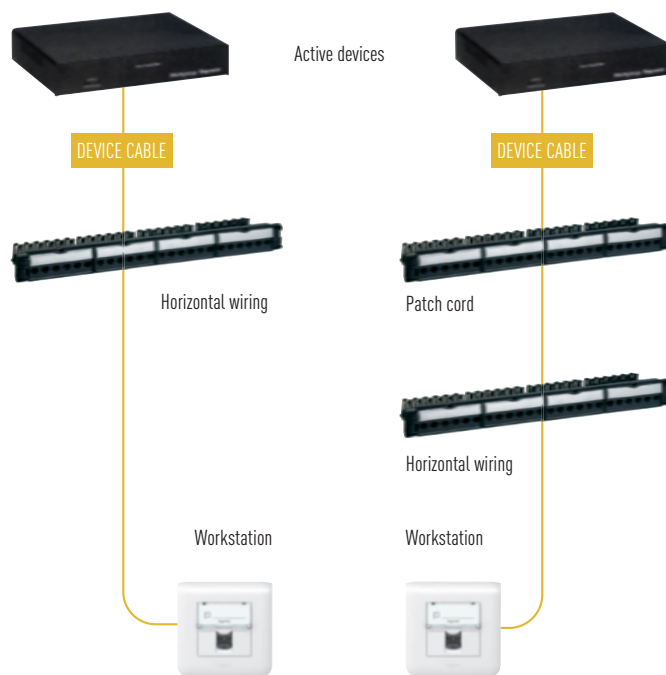

Detail of the mechanical spring for fixing to the upright, with stabiliser

3.3.1 - Patching methods

There are two methods for patching in racks: the first, referred to as interconnection, is used for small to medium sized installations, as the active device is reached directly from the patch panel via the corresponding cable. The second method is called cross-connection. Here, patching is not carried out directly on the active device, but between patch panels. The type of patching must be chosen at the project stage.
The panels must be chosen according to the number of distributed ports, and it it standard practice not to saturate them totally. Leave at least 10% free space on the total number of modules connected, to allow for any future extension.

INTERCONNECTION AND CROSS CONNECTION METHODS

Active devices

DEVICE CABLE

DEVICE CABLE

Horizontal wiring

Patch cord

Horizontal wiring

Workstation
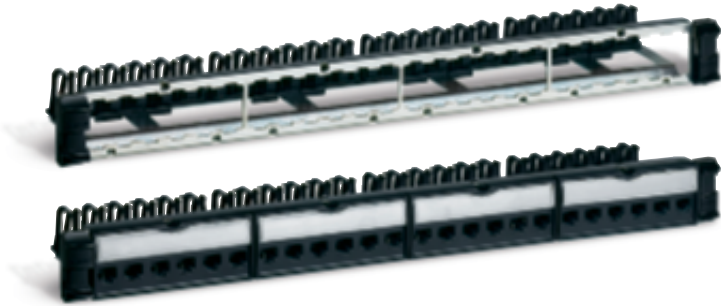
Workstation

www.legrand.xxx

3.3.2 - TOOLLESS patch panels

TOOLLESS patch panels use the same connection method as TOOLLESS connectors. The connectors do not require any tools for connecting the cable.
For this solution, Legrand offers a complete range of patch panels:
■ Modular patch panels with 24 ports
■ Complete patch panels with 24 ports.

3.3.3 - Type 110 patch panels

Type 110 patch panels use the same connection method as the 110 connector. The special tool is required to wire each connector. Legrand offers complete 24 port patch panels.

3.3.4 - Telephone patch panels

The use of patch panels can make it easier to interconnect the different panels. There is a choice of two types of patch panel:
■ Type 110 telephone panel
■ TOOLLESS telephone panel.
The type 110 telephone panel is available with 50 cat. 3 RJ 45 connectors in a rack unit. As with all 110 connectors, the telephone connectors also require a connection tool for their wiring. The TOOLLESS telephone panel is available with 48 cat. 3 RJ 45 TOOLLESS connectors in a rack unit, with the Quick-Fix system. This type of solution does not require a connection tool for wiring the connectors.

3.4 - PATCH CORDS

The patch cords must be excellent quality, and the male and female connectors must be electrically and mechanically compatible.
For this reason, compliance with the following recommendations is necessary:
■ Only use factory-assembled patch cords
■ Do not use horizontal cables to make patch cords yourself
■ Test patch cords individually to check their performance, as this is not possible with generally available conventional instruments.
Legrand patch cords are available in various lengths, in categories 5e UTP and FTP, 6 UTP, FTP and STP, and 6_A UTP and STP.

Measurement of LCS^2 components and links are validated by independent laboratories 3P Third Party Testing and ETL.

4.1 - CABLE

The fibre optic is a transmission medium that enables a larger bandwidth to be used than copper cables. With fibre optic cables, transmission is based on the propagation of light pulses, generated by an LED or a laser source in the infrared band, along a glass fibre. Inside an fibre optic, the signal can either be propagated in a straight line, or be reflected many times. Straight line propagation mode is said to be zero order. Singlemode fibres only use one mode to propagate light. The diameter of their cores is between 8 and 10 µm. Multimode fibres allow several propagation modes, and the diameter of their cores is 50 µm or 62.5 µm (the latter is now hardly ever used).

The diameter of the cladding is generally 125 µm. Multimode fibres are used in indoor installations and enable more economical devices to be used. They are however subject to the phenomenon of modal distortion, when the different modes propagate at slightly different speeds, which limits the maximum distance at which the signal can be received correctly. Singlemode fibres are used in outdoor installations as they can cover much longer distances and reach much higher speeds.

Multimode fibres are divided into two categories: step index and graded index fibres.
Legrand supplies the following fibre optic cable solutions:
- Multimode cables (50/125 microns, 6 to 24 fibres), available in 2000 m reels
- Singlemode cables (9/125 microns, 6 to 24 fibres), available in 2000 m reels

The various types of cable are also available with different types of coating:
- LSZH and/or flame retardant
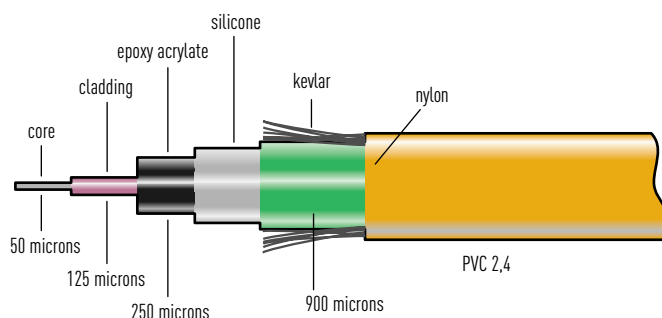- Armoured
- Armoured, anti-rodent

4.1.1 - Advantages

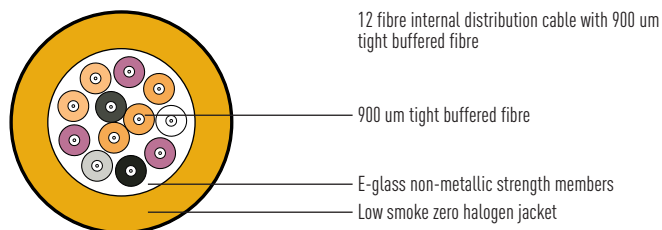Fibre optic have the following major advantages in relation to copper cables:
- Total immunity to electromagnetic interference
- High transmission capacity
- Low attenuation
- Very compact

The use of fibre optic is recommended for vertical wiring. In some situations, it is even possible to run the fibre optic right up to the office (FTTO - Section 7) or to the workstation (FTTD). The presence of fibre optic necessitates the use of devices with optical interfaces.
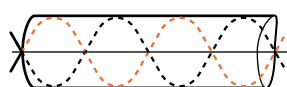
DIAGRAM OF A SINGLE FIBRE CABLE

core
cladding
epoxy acrylate
silicone
kevlar
nylon
50 microns
125 microns
250 microns
900 microns
PVC 2,4

EXPLODED VIEW OF A MULTIFIBRE CABLE CONTAINING 6 SINGLE FIBRES

12 fibre internal distribution cable with 900 um tight buffered fibre

900 um tight buffered fibre

E-glass non-metallic strength members
Low smoke zero halogen jacket

Multimode fibre optic

Diameter of the core: 50-62.5 µm
Diameter of the cladding: 125 µm

Singlemode fibre optic
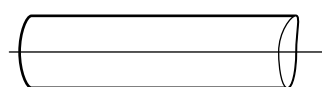
Diameter of the core: 8 to 10 µm
Diameter of the cladding: 125 µm

4.1.2 - Characteristics

The fibre optic is made of an internal part, called the core, and an external part, called the cladding. The light ray injected at one end of the fibre remains confined between the two layers of material and is guided along the length of the fibre due to the differences in the refraction indexes of the materials from which the core and the cladding are made.

The fibres, which are mechanically very fragile, are covered in the cladding and placed in the fibre optic cables using the most diverse technologies to meet the requirements of different applications.

Fibres are normally identified by the abbreviation 50/125 μm (or 9/125 μm), which indicates that the core is 50 μm and the cladding 125 μm.

4.1.3 - Fibre optic backbones

If the application is an Ethernet network, it is advisable to install a cable with at least 6 fibres, two of which will be used for Ethernet transmission, while the other 4 will be for future uses or simply as a back-up. It must be remembered that attaching connectors is one of the most costly elements. This does not not necessarily have to be done at the same time as the fibre is installed for all optical conductors. It is possible to postpone this operation, leaving the fibres free inside the specific unit. Likewise, ascending fibres must be interfaced at an active neutral point (hub or switch) which has optical connections. Inside racks, fibres are connected in a fibre optic drawer with feedthroughs.

This operation requires the same number of feedthroughs as there are fibres.

The fibre optic drawer generally has appropriate protective devices and accessories to prevent the connected fibre being subjected to any mechanical stresses.

The connection is made using small coupling tubes called "splice protection" tubes.

4.1.4 - Installing the fibre optic

The fibre optic is installed in different ways depending on the location, the type of fibre and the level of safety required by the end user. The fibre optic must be run in the support infrastructures. As this structure is mainly used for vertical wiring applications which concern two levels, two main connections can be identified.

First level: between the buildings on a campus, and thus in the infrastructures linking the buildings.

Second level: between the floors in a building. The only infrastructure is therefore the cable. They must therefore be pulled in the conduits using the specially inserted Kevlar layer. In installations requiring a high degree of safety, it is recommended that the fibre optic cables are protected by steel conduits.

4.2 - Fibre optic connectors

Connectors are attached to the fibre optic by mechanically coupling the two fibres. Passing the light ray from one fibre to the other requires the core to be coupled at both ends of the fibre.

In view of the dimensions of the areas to be coupled, it is clear that the devices for the interconnection must have specific characteristics in terms of quality and precision.

Fibre optic connectors consist of one part called the ferrule, and a support body.

The ferrule is generally made of ceramic or a composite material. It has a hole drilled in its centre and takes the terminal part of the fibre. This terminal part is connected to the ferrule using different technologies (mechanical couplers, heat-cured epoxy resins, infrared sensitive resins, 2-component adhesives, etc.). The head of the ferrule, which contains the termination of the fibre, must therefore be polished until a totally flat surface is obtained. ST (round bayonet connector) and SC (square clip-on connector) connectors are generally used. There are also various new types of connector, for example LC connectors. These are the latest generation, high density connectors which are very compact in comparison with the traditional SC connectors.

LCS[2] fast-connection fibre optic connectors are easy to connect, reliable and robust, and can be re-used up to 5 times. A microswitch is used to make a mechanical connection to lock the fibre inside the connector. There is an illuminated indicator in the connector to check for any connection errors at the end of the process. These connectors do not require any type of adhesive or special tool.

For installing connectors on loose fibre cables (250 μm), use connection kits Cat. Nos. 0 330 48 and 0 330 49.

Tool case for fibre optic connection

4.3 - Tool case for fibre optic connection

The kit Cat. No. 0 326 90 contains all the tools needed for connecting SC, ST and LC connectors.
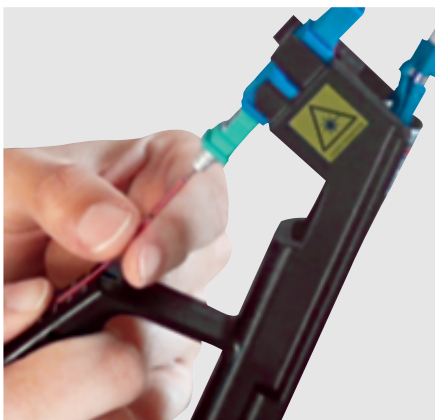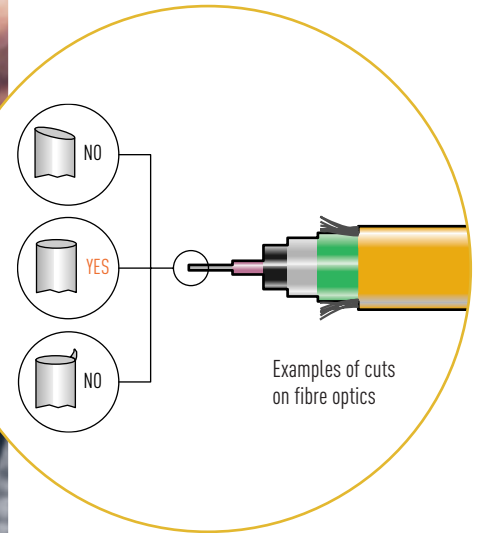A connection takes less than 3 minutes with this kit.

Remove the sheath from the fibre
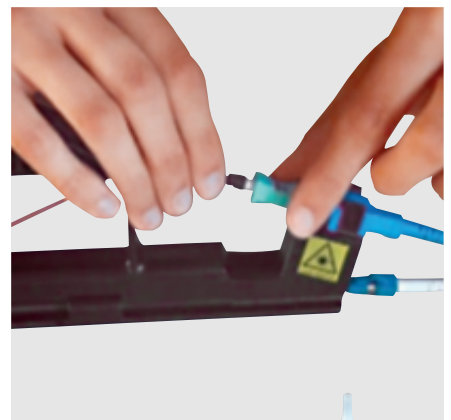

Cut the fibre

Check that the cut is correct

NO

YES

NO

Examples of cuts on fibre optics

Insert the fibre in the connector

Slide the microswitch on the connector to make the connection

Slide the dust cover into the connector

4.4 - Fibre optic feedthrough sockets (connectors)

To make fibre optic connections directly at the workstation (Fibre To The Desk connections), there are ST and SC duplex fibre optic feedthrough sockets and LC fibre optic connectors for workstations in all Legrand wiring accessory ranges.


0 786 16   0 786 17   0 786 18
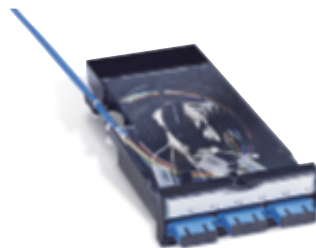
4.5 - Fibre optic drawers

The fibre optic drawer is the equivalent of the patch panel for copper cables. Its function is to house all the connectors connected to the fibre optic cable, thus enabling connection to the active devices on the network.
The LCS^2 range offers:
■ A fibre optic patch drawer Cat. No. 0 355 09 to contain 4 fibre optic units with ST, SC or LC connectors, for a total of 48 fibres
■ Fibre optic units for 6 and 12 fibres for mounting on 19" fibre optic drawer Cat. No. 0 355 10
There must be the necessary space for the connected fibres, and occasionally a support to maintain the correct bending radius to ensure insertion of the fibre in the feedthrough socket. This modular solution meets all connection requirements without adversely affecting the performance of the system
■ A range of high density fibre optic drawers Cat. Nos. 0 326 40/41/42 which take OM4 and OS1/OS2 cassettes with prefitted connectors with an MTP high density connector and 24 LC or 12 SC outlets at the rear Cat. Nos. 0 325 45/46/47/48.
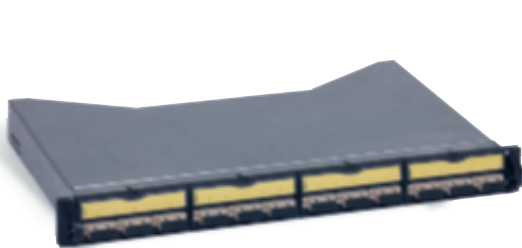
19" high density fibre optic drawer - 24 OF

High density fibre optic cassette and unit - 6 OF

Fibre optic floor cabinet

Fibre optic units

Installation recommendations

The fibre optic drawer has accessories for managing the fibre optic, to avoid any excessive mechanical stress. The drawer is supplied with optional accessories to ensure correct management the bending radiuses of pigtails and to protect splices.

4.6 - Patch cords

Fibre optic patch cords perform the same function as copper cords. They are both used to connect fibre optic drawers together, for patching between active devices and fibre optic drawers and for patching at workstations (Fibre To The Desk) with terminals which have inputs for fibre optic.

Legrand offers fibre optic patch cord solutions, both multimode OM2, OM3 and OM4 50/125 µm and singlemode OS1/OS2 9/125 µm, with combinations of SC, ST and LC connectors.

Multimode patch cord OM2 50/125 µm

4.7 - Connection kit

This is essential for connecting loose structure cables with individual fibres covered by a 250 µm diameter sheath to connectors.

Core + cladding (125 µm)   Coating (250 µm)   Buffer (900 µm)   Loose tube type construction
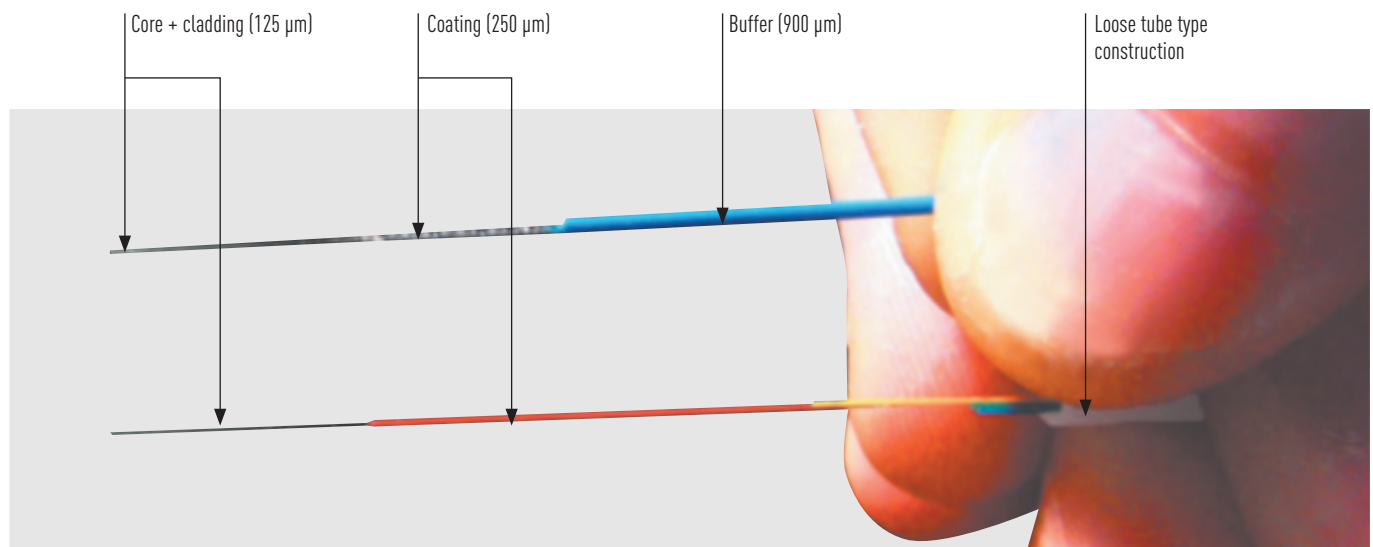
5. WI-FI TRANSMISSION MEDIUM

The wireless network is one in which the signal is transmitted by radio waves. No connection cables are necessary for users. This gives wireless technology:
- A great deal of flexibility in terms of the positioning of the access point
- A high degree of mobility

Provides users with a wireless network connection for the purposes of mobility in addition to the wired structure.

Users can connect to a wireless network by hooking up their equipment to a Wi-Fi access point (Wi-Fi AP) which is connected wirelessly to the building LAN.

This access point provides access to one or more "clients" devices located in the coverage area of the radio signal transmit by the access point.
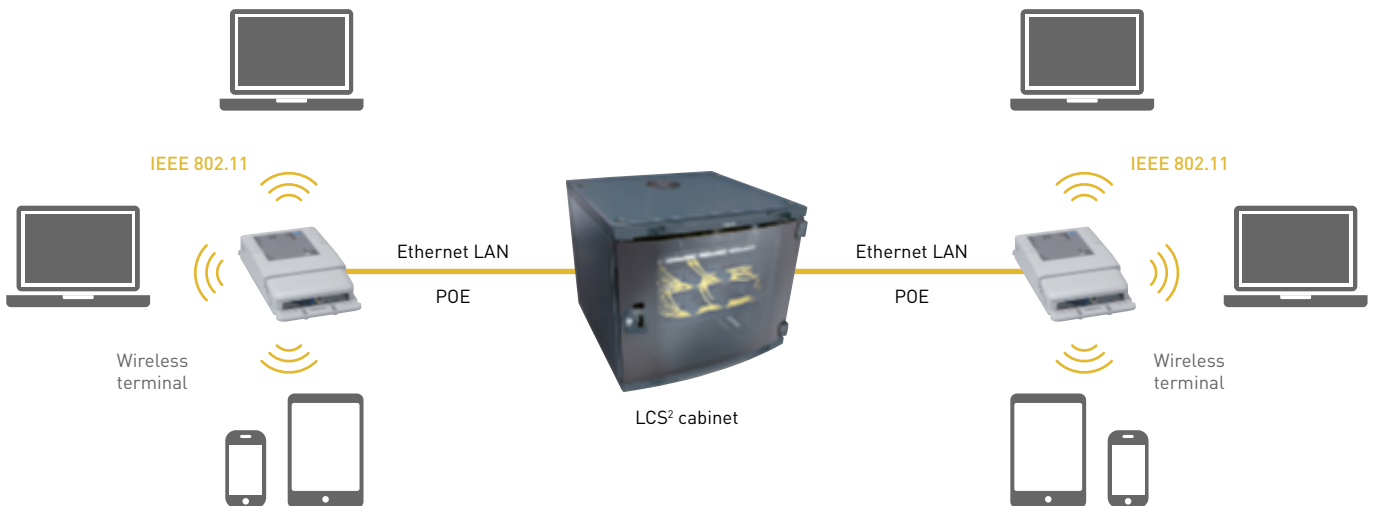
5.1 - Wireless transmission standard

The body responsible for the standardisation of wireless local area networks is the IEEE (Institute of Electrical and Electronics Engineers) Working Group for wireless LAN, called IEEE 802.11. The following standards have been established by IEEE 802.11:
- IEEE 802.11 - The initial 2 Mbps, 2.4 GHz standard
- IEEE 802.11a - 54 Mbps, 5 GHz standard (1999, approved in 2001)
- IEEE 802.11b - Enhancement of standard 802.11, supporting 5.5 and 11 Mbps (1999)
- IEEE 802.11e - Enhancement: Quality of service
- IEEE 802.11g - 54 Mbps, 2.4 GHz standard (compatible with 802.11b) (2003)
- IEEE 802.11i (ratified 24 June 2004) - Enhanced security
- IEEE 802.11n ratified 2009 - Enhanced range and bandwidth available due to MIMO technology (up to 300 Mbps with 2 antennae and choice of 20 or 40 MHz channel width).

WIRELESS LOCAL AREA NETWORKS

IEEE 802.11

Ethernet LAN

POE

LCS^2 cabinet

Ethernet LAN

POE

IEEE 802.11

Wireless terminal

Wireless terminal

5.2 - Components for wireless networks

Access point. This is the device that enables a mobile device user to connect to a wireless network. The access point is wired connected to the LAN. It realizes, among other things, transmissions to users, managing connection permissions and encryption of datas...

It communicate to each device connected, one by one and in only one sens. Data rate decrease by the number of users, their distance, the attenuation due by the walls, by other access points, the radio perturbation in same frequencies...

No Mosaic RJ45 socket to add, the cable enters directly into Legrand LCS² Wi-Fi access points connecting directly with a RJ 45 connector witch still allowing the test of the link.

Power over Ethernet (PoE) devices. Devices which deliver the power supply via the structured cabling. The DC power supply is provided to an access point directly via the network cable. The delivery of power to the access point is made after reconization of its compatibility with the 802.3 af/at standards. In this case, the data cable performs the dual function of transmitting data and supplying the power. Therefore, it isn't necessary to provide a power supply near the access point.

The power can be supplied by the network switch. A Legrand LCS² PoE injector can also be added to a wiring system to powering access points.

Centralised management software
For centralised management of Legrand Wi-Fi access points. Recommended for installations over 8 or 10 access points

PoE INJECTOR
Each PoE unit can manage up to 4 Wi-Fi access points. Can be installed in the patch panel.

Wi-Fi access points installed in false ceilings or wall-mounted, and controlled remotely (802.11n)
Dual radio 2.4 or 5 GHz access point. Can be installed in the false ceiling or on the wall.
Provides a maximum theoretical speed of 300 Mbps. The network administrator can manage access point remotely. Security ensured using encryption methods such as WPA 2. Conforms to the 802.11a/b/g/n and 802.3 af/at standards (and more). No RJ 45 socket to add, the cable come directly into Legrand LCS² Wi-Fi access points. A RJ 45 connector permit the test of the link. This enables the network to be extended up to 600 m² free space (depending on environment).

Wi-Fi 802.11a/b/g access points which can be trunking-mounted in Legrand range of wiring accessories
Dual radio 2.4 and 5 GHz simultaneously. To be installed in trunk or frame. The network administrator can manage access point remotely. Conforms to the 802.11a/b/g, 802.3 af/at, 802.1x standards (and more)
No RJ 45 socket to add, the cable come directly into Legrand LCS² Wi-Fi access points. A RJ 45 connector permit the test of the link. This enables the network to be extended up to 100 m² free space (depending on environment) ideal for small working areas.

Connections
In false ceiling for managed Wi-Fi access points. On the ground for wall-mounted and wired access points and RJ 45 sockets.

RJ 45 connectors
For access to the wired distribution system. Available in cat. 6_A, cat. 6 and cat. 5e.

The LCS² offer (copper and fibre optic)
This comprises:
- Cabinets and panels
- Devices (patching and reels, etc.)
- Sockets: cat. 6_A, cat. 6 and cat. 5e
- Cables and cords: U/UTP, F/UTP, SF/UTP

6. AUDIO VIDEO SYSTEM

6.1 - General

Legrand offers a wire range of technologies for audio video system to suit the location and the user requierements in workstations, meeting rooms, classrooms, av signage, entertainment...

- Audio sockets provides the stereo link for microphone, amplifier, mixing console, loudspeakers.
- Audio/Video sockets are used to transmit audio/video strems between a source (computer, DVD) and a receiver (videoprojector, TV).
- Multi-participant presentation system allows the different participants to broadcast a presentation.

Preterminated Audio/Video sockets are equipped with cord length 15 cm and female connector :
- Quick installation
- Easy connection
- Optimum performance

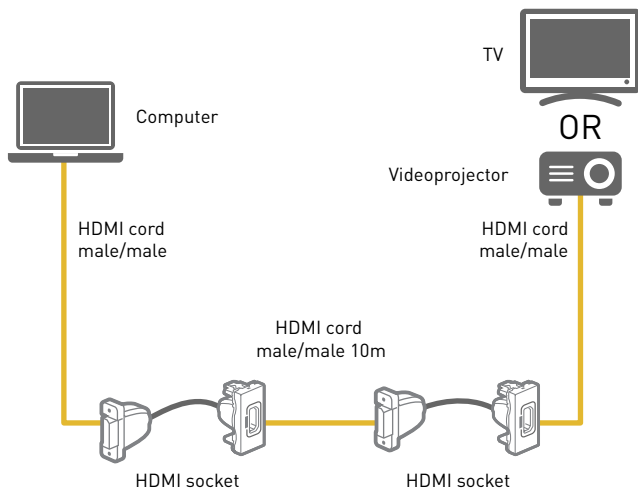Preterminated HDMI 1.4   USB Data extender
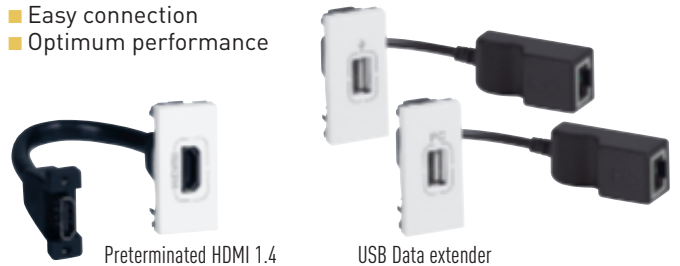
Media Hub   Multiparticipant Transmitter HD15 + Jack

6.2 - Technologies examples

6.2.1 - HDMI preterminated socket

Example of installation with preterminated sockets in meeting room or training room.

TV

Computer

OR

Videoprojector

HDMI cord male/male

HDMI cord male/male

HDMI cord male/male 10m

HDMI socket   HDMI socket

6.2.2 - USB Data extender

For connecting USB devices closer to the user in case of large distances (digital school board, interactive whiteboard...) located more than 5m (30m max) away from a source (computer...).
- The kit includes a transmitter and a receiver.
- The link between the transmitter and the receiver is made via a RJ 45 / RJ 45 cord.

Computer   Interactive whiteboard

USB cord male type A/male type A   USB cord type A/male type A

RJ 45/RJ 45 cord U/UTP or F/UTP Cat. 5e or 6
L < 30 m

Transmitter   Receiver
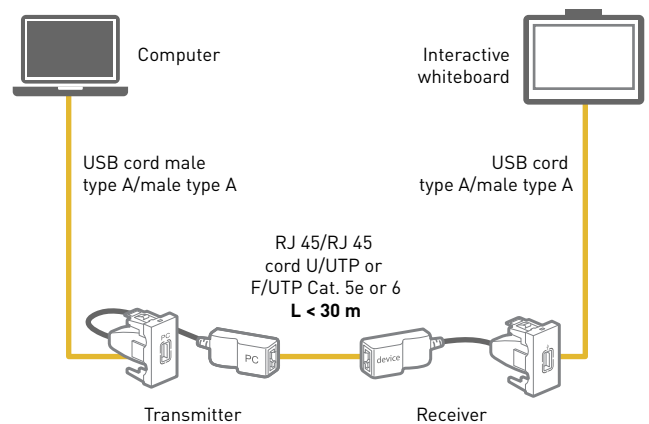
### 6.2.3 - Videoprojector switch Infrared ON/ STANDBY control

Universal remote switch for turning a video projector ON or setting it to STANDBY mode. Works with all video projectors or TVs through IR learning process. Installed close to the room's light switches, it replaces the manufacturer's remote and is used to switch the video projector ON and OFF, therefore reducing energy consumption and extending the bulb's lifetime.

Push button   Videoprojector
                switch

6.2.6 - Media Hub

Used to connect several kinds of audio/video devices (computer, camera, video recorder, mp3 player, smartphone, etc) to a specific product and to display and/or listen to these media files on the TV screen.
Connection via one HDMI cable to a TV. Particularly suitable for remote TV connection when it is wall-mounted.
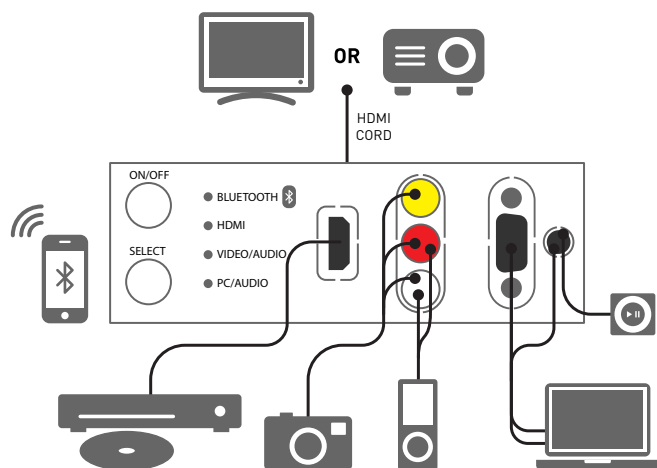
6.2.5 - Multi-participant system

This transmitter-receiver unit enables the various participants of the meeting room to show a presentation from their PC by pressing the control button and without disconnecting the projector cable. The video link is established using a HD15 connector and the audio link uses a 3.5 mm Jack.
The connections between receiver and transmitters using a RJ45/RJ45 cable (not supplied). It is possible to add additional transmitters. Maximum distance between the receiver (TV, projector) and the last transmitter is 70 m with an F/UTP cable or 50 m with a U/UTP cable.

Transmitter HD15 + Jack
Allows the different participants in a meeting room to broadcast a presentation on their PC by pressing the shutter button control without disconnecting the cable from the projector.
Can be installed in pop-up, desktop multi-outlet extensions and DLP trunking.
HD15+3.5 mm Jack cord length 2 m included
for connection to a PC.

Receiver HD15 + Jack
Receives commands from the audio/video
multi-participant transmitter.
Can be installed in pop-up, desktop multi-outlet extensions and DLP trunking.
HD15 + 3.5mm Jack cord length 2 m included for connection to a video projector.

RJ 45 patch cord (not included) U/UTP or F/UTP Cat.5e or 6

Possibility of adding additional transmitters (10 max)

HD15+Jack cord 2m

Transmitter HD15+Jack   Transmitter HD15+Jack   Receiver HD15+Jack and power supply 230 VAC
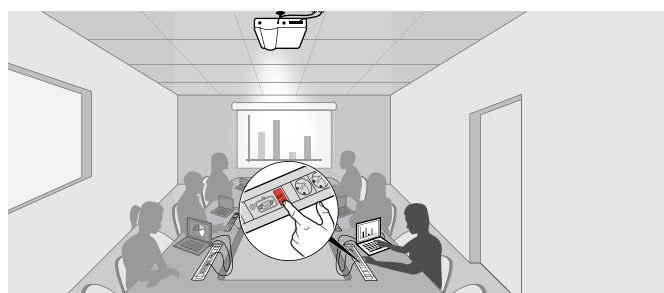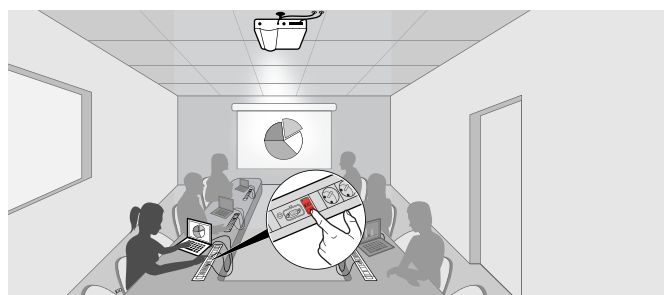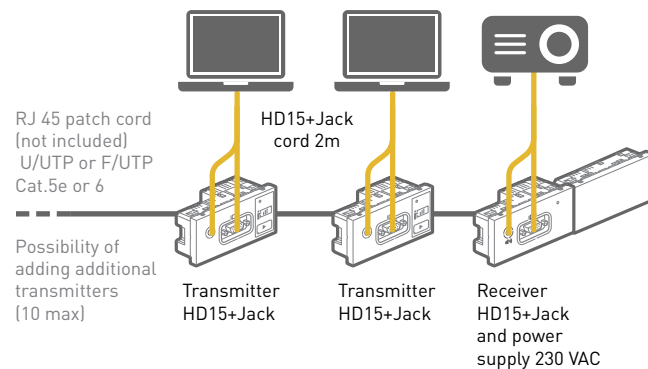
7. HOUSING REQUIREMENTS

Legrand offers a series of solutions for cabinets for structured cabling in commercial buildings, ranging from the main distributor to the floor distributor.

All products comply with the following standards:

IEC 60297-3-100 **DIN 41414-7**	(NF C 20-150, NF C 20-151). Dimensions of mechanical structures of the 482.6 mm (19 in) series
EIA-310-E	Cabinets, racks, panels and associated equipment (ANSI/EIA/-310-E-2005)
IEC 60950-1 **EN 60950-1** **C 77-210-1**	Safety of information technology equipment
IEC 60529	(NF C 20-010) Degrees of protection provided by enclosures (IP code)
IEC 62262 **EN 62262**	(EN 50102, NF C 20-015). Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)

LCS² cabinets can be integrated in installations complying with the following standards:

ISO IEC 11801	Information technology - Generic cabling for customer premises
EN 50173-1	Information technology - Generic cabling systems
EN 50174-1 and 2 C 90-480-1 and 2	Information technology - Cabling installation
IEC 60364-4-41	Low voltage electrical installations - Protection for safety - Protection against electric shock
NF C 15-100 **Part 4-41**	Low voltage electrical installations - Recommendations
UTE C90-483	Residential cabling for communication networks

7.1 - LAN requirements

7.1.1 - Freestanding cabling cabinets

General characteristics

LCS² 19'' freestanding cabinets have been designed to answer to esthetic, easy installation and efficient maintenance needs.

They have a single color finish, Anthracite Grey RAL 7016.

Metallic freestanding cabinets (textured polyester coating) provide excellent resistance to corrosion and scratching.

LCS² 19'' freestanding cabinets have a reversible curved front door (single or double) made of screen-printed safety glass.

The cabinets can be joined together with baying kits and can be completed with a cabling unit.

All the different cabinet versions have common features and equipment:
- Equipped with 4 x 19'' depth-adjustable uprights
- Removable panels
- Automatic equipotential connection
- Levelling feet adjustable from the inside
- Protection index (weatherproof) against solid objects and liquids: IP 20 conforming to IEC/EN 605 29
- Protection index against mechanical impact:
  IK 08 conforming to IEC/EN 60062.

The structure can be completely dismantled in case of difficult room access.

The freestanding cabinets can be equipped with a PDU (Power Distribution Unit p. 123) for providing electric power.
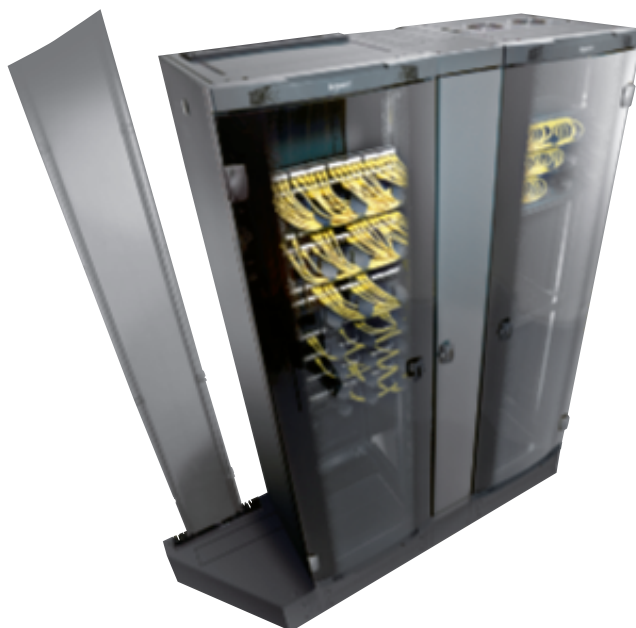
Optimised cable and patch cord management

LCS² freestanding cabinets are designed to ensure **easy cable and patch cord management**: dedicated unit for cords, cable entries at the top and bottom of cabinets, new management panels for perfect organisation and circulation of patch cords.

Optimised cable management
The cabinets offer lots of space beside the 19'' uprights to guide and fix large quantities of cables.

Cable entries: top and bottom 19'' cut-outs receive 19'' plates with brushes and 19'' fan plates. Cabling units have a cut-out for direct cable trunking entry.

Management panels: with rings to guide and protect the patch cords.

Linking interface: protects the cables and guarantees the bending radius between the cabinet and the cable trunking.

Simplified assembly

LCS² freestanding cabinets are easy to equip.
They offer considerable time savings on site and allow full accessibility with their removable side and rear panels and a structure that can be entirely dismantled.

Removable side panels for full accessibility

Automatic earthing clip for earthing the side and rear panels

Dual marking of 19" uprights for easy installation

Several combinations are possible to meet various needs: combination of 2 cabinets with baying kit, side by side or with cabling unit. The use of a cabling unit saves floor space.
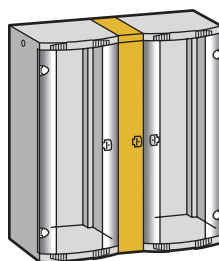
COMBINATIONS TO SUIT VARIOUS NEEDS

← 1450 mm →

Two 600 mm wide cabinets with a cabling unit

← 1600 mm →
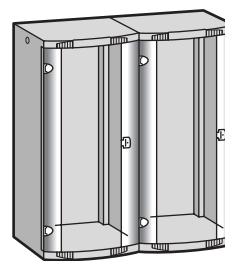
Two 800 mm wide cabinets side by side

Quick-fixing principle

For easier and faster installation of shelves and cable management accessories, screw-free mounting equipment is available (no tool required).

EXAMPLE FOR FIXED SHELVES
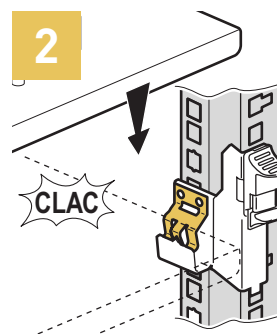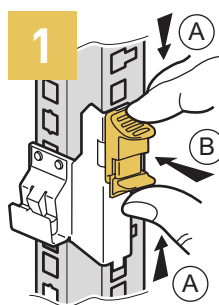
7.1.2 - Server cabinets

General characteristics

LCS² server cabinets have been designed to meet the main need of the user: full accessibility
Similar design to the other cabinets in the range:
■ Anthracite grey RAL 7016 finish
■ Reversible front and rear microperforated (80%) metal door.

A cabinet for server requirements:
■ Load capacity: 630 kgs
■ Equipped with 4 x 19¨ depth-adjustable uprights
■ Removable side panels
■ Top and bottom cable entries
■ Levelling feet adjustable from the inside
■ Metallic cabinets (textured polyester coating) provide excellent resistance to corrosion and scratching
- protection index (weatherproof) against solid objects and liquids: IP 20 conforming to IEC/EN 605 29
- protection index against mechanical impact: IK 08 conforming to IEC/EN 60062.

Full accessibility

LCS² server cabinets are designed to be fully accessible:
■ Reversible rear and front doors
■ Choice of locking system: without key, front door can be fitted with a European DIN cylinder (with option to complete with a handle), rear door can be fitted with a key cylinder
■ Removable panels
■ Cable entries: open bottom, top cable entries in 19¨ pre-cut format, capable of taking 19¨ plates with brushes, fans, etc,
■ Can be equipped with screwless tray fixing for cable trays (Cablofil).

The server cabinets can be completely dismantled where access is difficult.

Top and bottom cable entries

	Top	Bottom
Width 600		
Width 800		

Front door with handle

Keyless locking system
(view of rear door)

Cable trays
Support with screwless tray fixing - Cablofil

7.1.3 - Racks

General characteristics

LCS² 19'' HD (high density) racks with 45 U capacity are available in 2 versions with different depths of upright: 267 mm or 413 mm. Uprights are designed with U marking and tapped holes for fixing 19'' equipment.

They can receive:
- 19'' metal management panels
- 19'' Power Distribution Units
- DIN rail kit.

Designed in light stainless steel aluminium, with black powder finish, resistant to marks and scratches.

The structure can be equipped with:
- Cord management grid for creating a space (63 mm or 165 mm) between 2 joined racks or an isolated rack for running cables and cords to the front and rear. A version is available with a door which opens in both directions
- Cable tray support to be fitted the full depth of the rack to support a high cable tray
- Lower finishing plate for finishing the lower part of the rack and providing protection against dust.

Advanced cable management

LCS² racks offer full cable management for optimising network performance and are particularly suitable for high-density cabling (e.g. data centers, SANs, main distributors, etc.).
Type of equipment for optimised cable management:
- Channel type 19'' uprights for guiding and fixing cables
- Integrated upper trunking for right-left cord routing that complies with the bending radiuses
- Straps with hook and loop type closure
- Innovative cord management grid creates a space between 2 joined racks for running cables and cords to front and rear. Maintain side cord channels every 1 U

In addition to the support strength, LCS² cable management systems provide flexibility from the system design stage through to any future extensions.
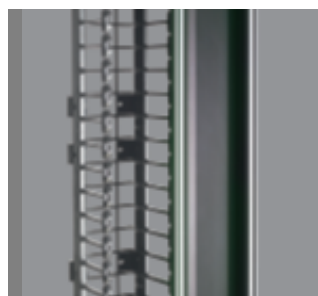
Innovative cord management grids
With individual conduit for each rack unit and door which opens in both directions.

Cord management panels with cover
With conduits for vertical and horizontal cord organization.
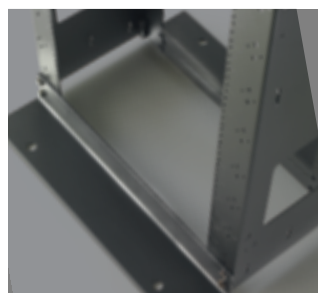
Light stainless steel aluminium construction
With black powder finish, resistant to marks and scratches.

Integrated upper trunking
For compliance with the bending radius and organised running of cords.

FITTING CABLE TRAY SUPPORTS TO THE RACKS
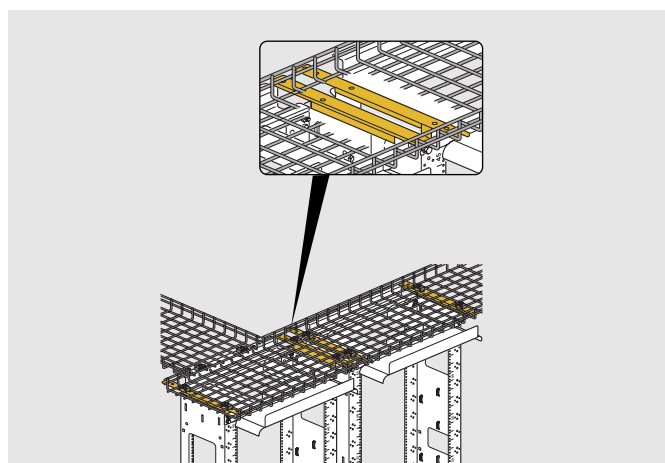
7.1.4 - Wall-mounting cabinets

General characteristics

Wall-mounting cabinets are available in 2 versions: 19'' or compact 10''.

The 10'' cabinets are suitable for small business applications up to 36 RJ 45 sockets.

The 19'' cabinets are available in 2 versions: fixed or pivoting, allowing free access to the rear of the cabinet to facilitate installation and maintenance.

These 2 cabinets have the **same design**:
- A single color finish: Anthracite grey RAL 7016
- Reversible curved screen-printed door made of safety glass.

All the cabinets have **common features and equipment**:
- 2 x 19" depth-adjustable uprights
- Removable side panels
- Rear pre-cut cable entries
- Top and bottom perforations for natural ventilation
- Protection index (weatherproof) against solid objects and liquids: IP 20 conforming to IEC/EN 605 29
- Protection index against mechanical impact: IK 08 conforming to IEC/EN 60062.

Easy access, high-quality finish

LCS² wall-mounting cabinets ensure easy access for quick installation and easy maintenance thanks to the removable side panels and flexible cable entries (in the fixed cabinets).
Installation anywhere can be possible with these new wall-mounting cabinets where maintaining aesthetic quality is very important.
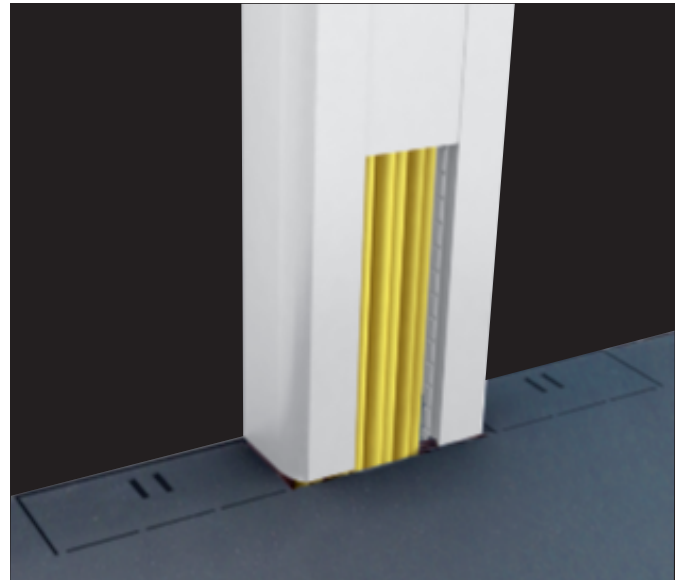
Flexible cable entries. DLP format cable entries at the top and bottom, bandable, with ability to attach cables using cable ties
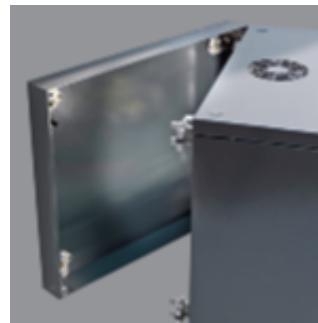
Full accessibility for cable management and maintenance
Removable side panels on all LCS² cabinets
19'' cabinets also available with pivoting body to enable easy access at the back
Ability to fix cable management ring on structural uprights of 19'' fixed cabinets
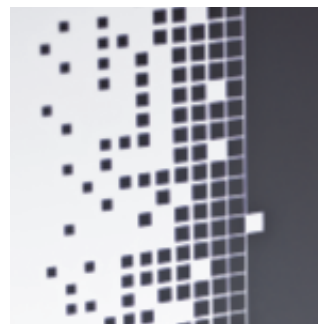
High-quality finish. A unique design: curved door, screen-printed glass.

7.1.5 - PDU - Power Distribution Units

General characteristics

The PDU is a unit which provides electric power for IT equipment.

Available in 2 versions:
- 19''
- Vertical for mounting at the rear of LCS² cabinets (cabling and server) and Varicon-L server cabinets.

The cases are aluminium for total rigidity.
The sockets outlets are adapted to the relevant country's electrical standard:
- Local standards: German, BS, French etc.
- International standards: C13 and C19 with cord locking system
- Single phase or three-phase.

The PDU integrate features such as MCB and over voltage protection and can also be metered.

Metered PDU

Measures consumption to provide better installation management: balancing circuits, displaying available capacity, preventing overloads and power failures. The information is read locally.

Main characteristics of these PDUs:
- Measurement of the total PDU current
- Measurement from 0 to 32 A
- 3-digit display.
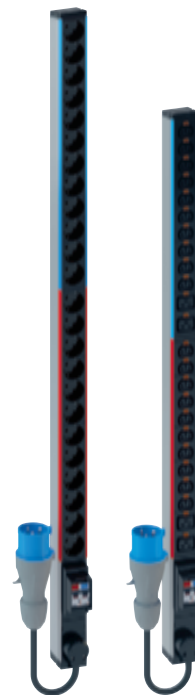
Vertical PDU

Vertical PDU with energy metering system
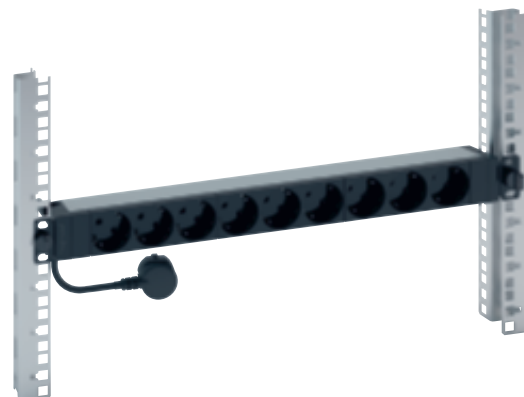
19'' PDU

7.2 - Data center requirements

Data centers increasingly opt to apply energy-efficient cooling techniques, such as Free Cooling and Fresh Air Cooling.

The first step in implementing such techniques is to segregate hot and cold air using Cold Corridors®. The next is airflow optimisation in the rack. The latter, however, is often not adequately addressed unfortunately, despite the fact that airflow optimisation is certainly the next stage in the process of rendering data centers more energy efficient.
Furthermore, airflow optimisation is not only essential to the favourable operation of server, network and storage equipment, but also to the temperature control and general stability of a data center.
Legrand offers a solution from server cabinet to Cold Corridor® and row-based cooling system to provide cooling as close to the servers as possible.

7.2.1 - Varicon-L

Varicon-L server cabinets have been designed to house the heart of the data center: the servers.
They provide a means of support, protection, cooling, power and connection.

A simple design helps you build your own data center cabinets:
- Color finish black RAL 9011
- Front and rear microperforated (80%) metal door
- 41 U or 46 U capacity.

The server cabinets can be joined to extension cabinets with baying kits.

These servers cabinets can be equipped with:
- PDU (Power Distribution Unit) p. 123
- Cable management accessories
- Equipment mounting brackets
- Airflow management equipment.

Main characteristics:
- Load capacity: 1000 kgs
- Equipped with 4 x 19˝ depth-adjustable uprights with U marking
- Lockable and reversible doors with 2 point locking handle. Locked with 2233 key
- Removable side panels
- Top and bottom cable entries
- Levelling feet adjustable from the inside
- Protection index against mechanical impact: IK 08 conforming to IEC/EN 60062.

Interior
- 19-inch profiles with U marking
- Support spacer for 800 mm wide cabinet

Top
- Cable entries

Frame
- Aluminium
- 1000 kg loading capacity

Cable management
- Vertical cable managers
- Cable guide rings
- Cable guides
- 19˝ management panels

Airflow optimisation
- 19˝ blanking panels
- Side skirts for 800 mm wide cabinet

Accessories
- Fixing crosspieces
- Mounting brackets
- Shelves

Side
- Removable side panels
- Locked with 2233 key

Base
- Adjustable levelling feet
- Open base

Front and rear
- 80% microperforated doors
- Reversible
- Swivel handle
- Locked with 2233 key

7.2.2 - Cold Corridor®

The Cold Corridor® basic principle is the segregation of hot and cold airflows at row level.

Airflow segregation is a vital step towards the achievement of integrated energy saving throughout data centers. However, the two main benefits to be gained by installing a Cold Corridor® are:
- Constant air conditions for your IT equipment
- Considerable energy saving potential.

Constant air conditions around server equipment also substantially reduce the risk of hotspots. The levels of predictability and reliability increase for your valuable IT equipment.
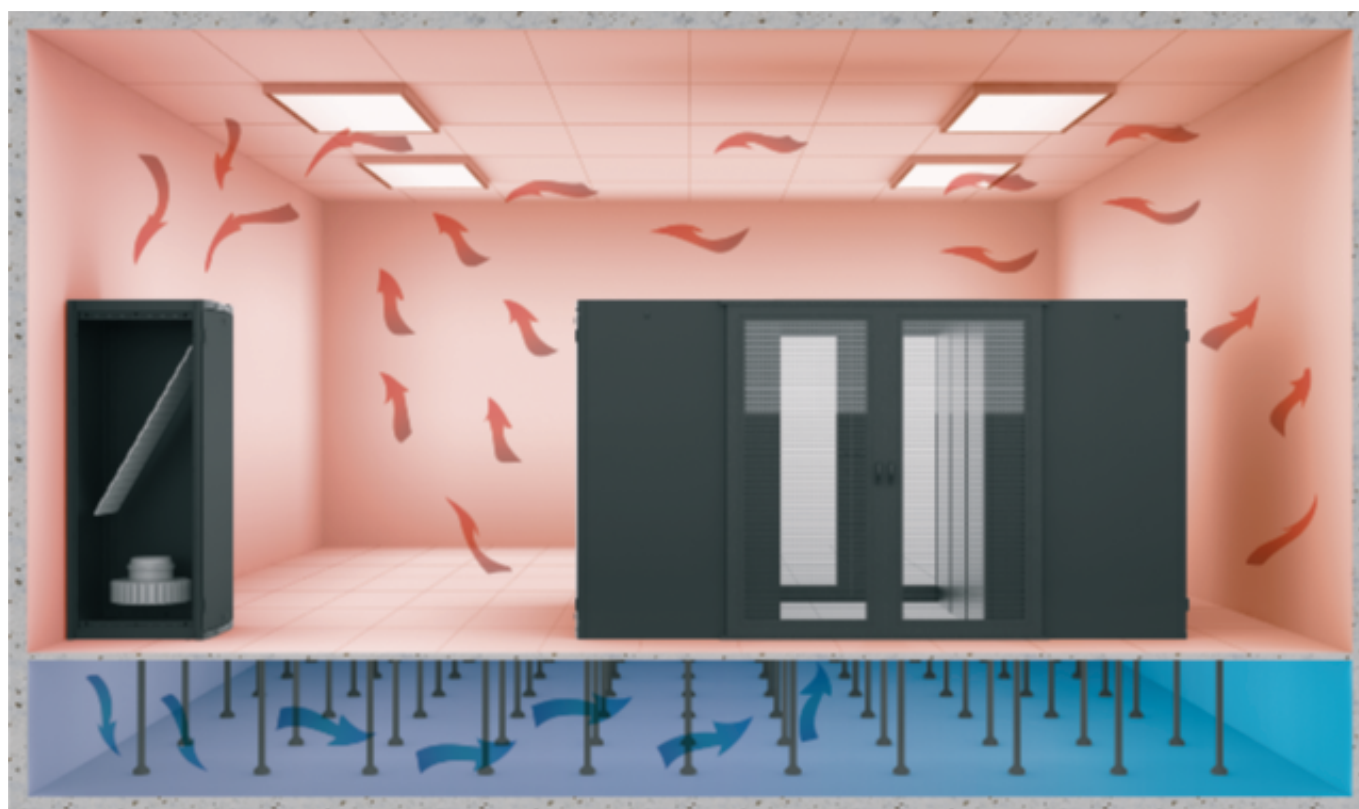
The basic Cold Corridor® system comprises the following:
- Manual sliding double doors with window made of safety glass. Position a double door at each end of the corridor
- Roof modules: cover the 1200 mm wide corridor
- 3 available widths 100, 200 or 600 mm
- The 100 and 200 mm modules are solid metal. The 600 mm module consists of a metal frame with a glass window
- Match the number and sizes of the modules to the length of the rows of cabinets
- Provide one 100 or 200 mm solid module at each end of the corridor and between each 600 mm module
- Roof profile: takes the roof modules
- Is positioned on the roofs of the cabinets. Enables the cabinets to be moved without having to dismantle the corridor roof.
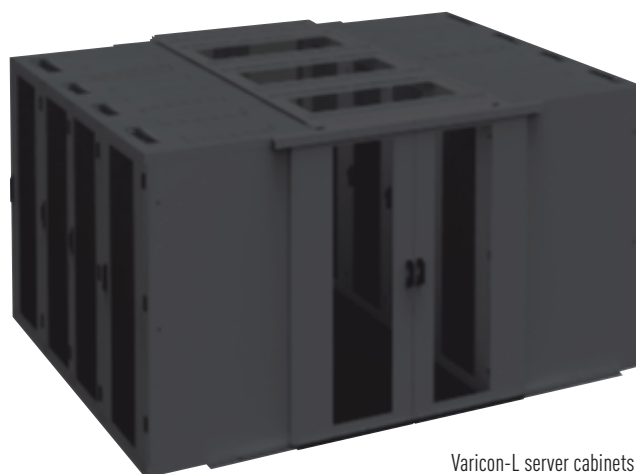
Varicon-L server cabinets organized in Cold Corridor®

7.2.3 - Row-based cooling

The row-based cooling principle is the integration of active cooling in the Cold Corridor®.

This row-based cooling system moves the cooling much closer to the heat source and reduces the distance between the cooling and IT equipment. Benefits include cooling accuracy and efficiency and a reduced airflow path.
This solution is perfectly suitable for rooms with a low ceiling or no raised floor.

Row-based cooling is specially adapted to the construction of high density clusters, even in existing circumstances. Furthermore, the fact that there is no need to install a (high) raised floor in this case enables a further reduction in the amount of investment required.

The main characteristics of the row-based cooling system are:
■ Water cooling technology
■ 24 kW cooling capacity per unit
■ Hot swappable components.

Varicondition H_2O row-based cooling unit

STUDY OF INTEGRATING AIR CONDITIONING UNITS IN ROWS
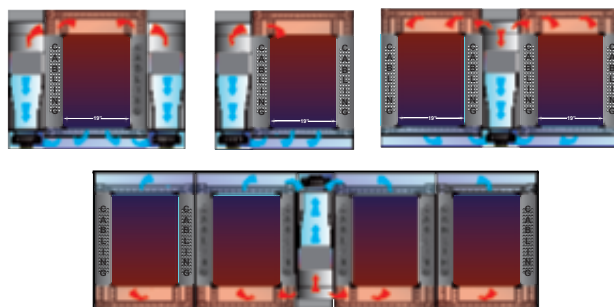
Closed loop
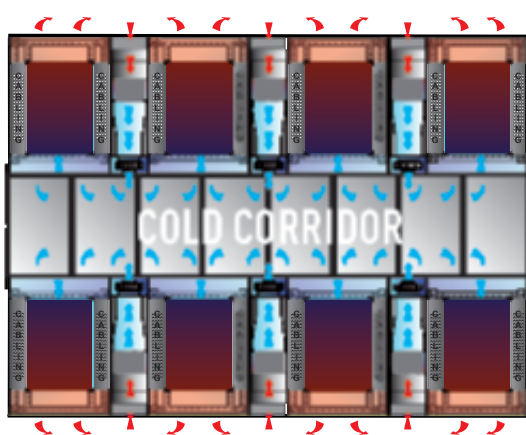
Open loop
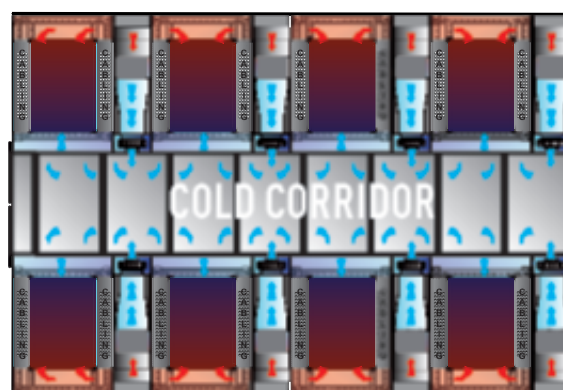
Hybrid loop

7.2.4 - Metered, Smart PDU and Environmental Monitoring system

Metered PDU are used to measure the consumption for better management of the installation: balancing circuits, displaying available capacity, preventing overloads and power failures. The information is read locally.

Main characteristics of these PDU:
- Measurement of the total PDU current
- Measurement from 0 to 32 A
- 3-digit display.

Smart PDU provide local and remote power monitoring and environmental monitoring via IP. Use a network interface via web browser to:
- View power (Volt, Amps, VA, kWh) with less than 1% deviation
- View temperature and humidity levels
- Receive alerts if conditions exceed defined thresholds
- Switch outlets on or off individually (managed PDU version)
Power measurement is at PDU level for monitored PDU and at outlet level for managed PDU.

Environmental Monitoring System gives informations about the environment in which active products run. You have remotely all the data (temperature, humidity and door cabinet status for example) to guarantee their operation and lifetime. You can get alarms in case of incident (e.g. unnormal temperature elevation). EMS functions can be either integrated in smart PDU or sold separately.

Vertical PDU with energy metering system

8. CHECKING
THE INSTALLATION

8.1 - GENERAL

Testing the transmission performance is the phase which, once the installation has been completed, is designed to demonstrate its compliance with the wiring regulations (EN 50173 series, ISO/IEC 11801, TIA/EIA 568C, see section 2). In practice it consists of measuring a whole series of transmission parameters in a certain frequency range, and checking compliance with the limit values over the whole measurement range (eg: Class E_A 1...500 MHz).

Although selecting of compliant components is a necessary requirement, this is not sufficient to ensure that the nominal transmission performance levels are complied with in the actual installation.

The wiring must be installed in accordance with good practice. In this respect it is advisable to follow the instructions in the specific standard (EN 50174-2, ISO/IEC 14763-2, etc. see section 2). These two requirements are the prelude to a positive test.

Some errors may nevertheless have been made during installation. The final test will establish whether errors have been made and it they have compromised compliance. If the test is negative, the cause must be found and corrected. This is not always easy, especially in large-scale installations. For this reason it is important to carry out the initial phases rigorously. The guidelines for doing so are given in this section.

Standard IEC 61935-1 specifies the testing methods for each transmission parameter for copper wiring, and the requirements for the measurement instrument.

The testing of structured cabling systems is governed by standard EN 50346.

The standard indicates how to conduct the test. It also gives references to the original testing methods, for both copper and fibre optic, but does not provide any information on how to resolve any non-compliance problems.

The regulations for structured cabling are voluntary. There are no legal provisions making it compulsory for the installer to provide a declaration of conformity, as is the case for electrical installations.

The value of the test report is not the same as the declaration of conformity of the electrical installation.

However, in practice, the customer generally requests the test report as proof of the positive completion of the work.

To summarise, a test report makes it easy to:
- Prove that the installation complies with the required nominal performance
- Fulfil a contractual obligation (customers often require a final test as a condition of acceptance of the work)
- Guarantee the installation supplied for a certain period (according to the contractual guarantee terms)

The verification takes the form of a process stipulating checks and tests:
- Visual
- Static electrical
- Of the transmission parameters.

These phases are generally sequential. For example, a negative static electrical test makes testing the transmission parameters meaningless before the cause of this negative outcome has been eliminated.

But this is not a set rule: the decision on how to proceed can be made according to the type of result of each preliminary phase. The testing of optical systems is similar. It is described in section 7.5 and stipulates the following checks and tests:
- Visual
- Conformity of the connectivity
- The transmission parameters.

8.2 - COPPER WIRING

8.2.1 - Copper wiring: visual check

This phase is simple and immediate, and involves:
- Checking the catalogue numbers of the components installed
- Checking there are no excessive mechanical stresses on the cables (eg: identification of points characterised by visibly incorrect bending radiuses)
- Checking that the cable ties do not tighten the bundles too much; and checking the sheaths are not distorted
- Checking the wiring of the sockets and patch panels, and that all conductors are connected correctly
- Checking that all functional earth connections are present (cable shielding, connectors, etc.)
- Checking that the cords are compatible with the nominal class of the link.

8.2.2 - Copper wiring: static electrical test

The static electrical test is used to verify:
- The complete connection of each link, i.e. the electrical continuity
- The correspondence with the topological diagram
- Compliance with the polarity, if required
- That there are no accidental short circuits between each conductor
- The isolation between conductors and to earth
- The correspondence between the installation diagram and the installation itself
- The continuity of the foil screen, if present (FTP, STP, S/FTP).

This test may not be included on some models of certification instruments.

Some certification instruments stop the test procedure if there are static electrical errors. On other models, it is possible to force the continuation of the test. However, it is not necessarily worthwhile continuing the test on the transmission parameters. This possibility must be assessed according to the types of error found when carrying out the static electrical test. A few suggestions on the most frequent causes of failure of the static electrical test are given below.
Mapping errors:

Open:
- Conductors broken due to stresses, generally on the connection points
- One of the two connectors used for the test is not connected (another one has been inadvertently connected in its place)
- Damaged connector
- Cuts or breaks inside the cable
- Conductors connected to the wrong pins
- Cables for specific applications (eg: Ethernet, wiring of single conductors 1-2, 3-6).

Short-circuit:
- Incorrect termination
- Damaged connector
- Presence of conductive dirt between the pins of the connectors (the shape of the RJ 45 encourages dust and fluff deposits)
- Cables for specific applications (eg: control systems)
- Inverted pairs: conductors connected to the wrong pins on at least one of the two terminations.

Twisted pairs:
- Conductors connected to the wrong pins on at least one of the two terminations
- Mixture of 568 A and 568 B connections
- Crossed cables (pairs 1-2 and 3-6 cross).

Pairs separated:
Conductors connected to the wrong pins on at least one of the two terminations.

8.2.3 - Copper wiring: testing the transmission parameters

Testing the transmission parameters is the fundamental phase of all the processes and enables the installation to be declared compliant. If they are carried out meticulously, the visual check and static electrical test will provide the best preparation for this phase.

The instrument used to carry out this testing, the certification instrument, consists of a transmitting unit and a receiving unit which, when connected to the ends of the connection to be tested, exchange test signals enabling processing of all the transmission parameters which the system standards (EN 50173, ISO/IEC 11801, TIA/EIA 568C) require to be checked. A resident software program launches an automatic measurement routine, which carries out all the necessary measurements in the frequency range concerned (eg: 1...500 MHz for class E_A) and compares them with the corresponding limits.

The instrument must be configured by selecting the limits to be applied, which vary according to the regulations (there are currently slight differences between EN, ISO/IEC and TIA/EIA) and the type of measurement to be performed (channel or permanent link).

The difference between a channel and a permanent link is whether the connection cords on the part to be measured are included (channel) or omitted (permanent link).

The maximum length of the permanent link is 90 m, while that of the channel is 100 m (90 m link + 2 x 5 m cords) if two fixed sockets only are present at the ends. If there are intermediate patch panels or transition points, the standards provide formulae to proportionally reduce the maximum lengths. As a guide: 1 m/patch panel. The actual length of the link can be calculated in detail by taking into account the formulae given in standard EN 50173-1. For example, for a class E_A link:
B = 105 - 3 - F . X
Where:
B: actual length of the link
F: Number of patch panels
X: Relationship between the attenuation of the cord and the attenuation of the cable, in dB/m.
Before starting the certification, the propagation velocity of the light in the cable being tested must be configured, in accordance with the instructions of the manufacturer (NVP), and the instrument for measuring the channel or the permanent link must be provided.
The provisions for carrying out the test procedure correctly are in standard EN 50346.

GENERAL DIAGRAM FOR CHECKING THE TRANSMISSION PARAMETERS

Patch panel   Consolidation point   Telecommunications outlet

Beginning of the permanent link   Permanent link adaptors   End of the permanent link
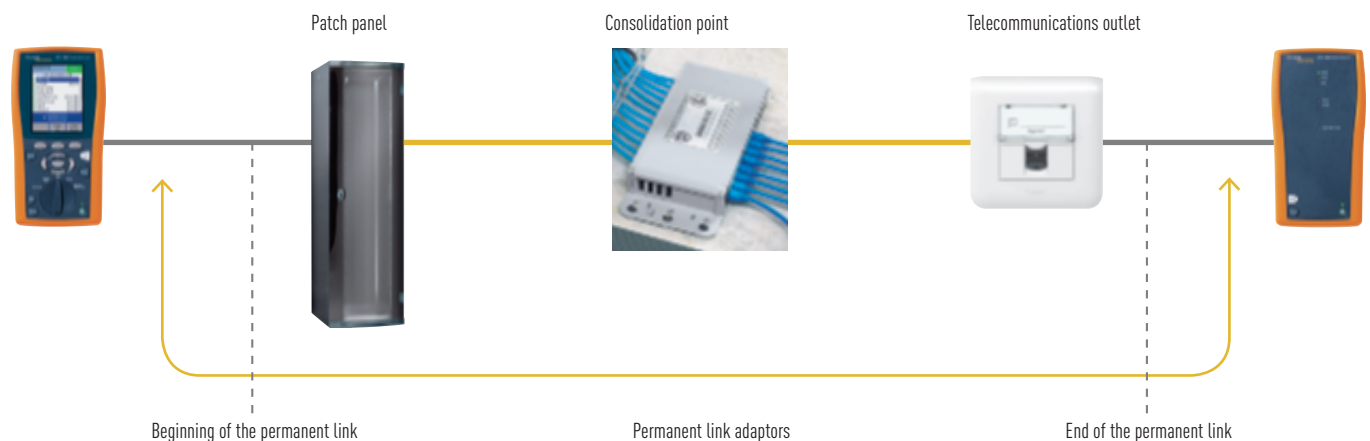
General diagram for testing the transmission parameters (source: Fluke Networks documentation)

The final result of the test is a frequency distribution of a series of curves, the number of which varies according to the parameter.

All these curves must comply with a regulatory limit.

Example of the result of a transmission parameter test (NEXT, near end crosstalk)

The above figure shows an example of a NEXT (near end crosstalk) test. The red curves represents the regulatory limit according to the frequency (eg: 1...500 MHz, class E_A). The different coloured curves represent the attenuation measurement carried out by injecting a test signal on the pair AA terminated on its impedance, and measured on one of the three adjacent pairs (terminated on both sides on the characteristic impedance) on the same side as that of the injection (near end). Switching over the measurements on the four pairs, taking the measurement on each of the three adjacent pairs and taking the measurements on both sides of the link, the following is obtained:

3*4*2 = 24 curves. To obtain a positive result, all these curves must remain below the limit, while the minimum value of the difference in dB between the limit curve and all the points on the curves measured constitutes the margin of compliance.

Similar considerations can be applied for all the other parameters: attenuation, return loss, PSNEXT, ACR, ANEXT, PSANEXT, AACR, PSAACR, LCL, propagation delay, propagation time difference, etc.

The software which controls the operation of the certification instruments is constantly being updated in line with changes to the standards.

The installer must therefore check that the most recent version is being used.

The software versions may differ according to the type of parameter to be measured, the limit values and their definition and/or calculation algorithm.

The manufacturers of certification instruments generally supply software updates free of charge on their websites.

The instrument must be calibrated at regular intervals by a specialist laboratory or by the manufacturer, to ensure its measurement accuracy.

This operation must not be confused with self-calibration, which must be carried out before each measurement, and which is simply a measurement cord compensation procedure, the purpose of which is to provide the exact reference for the measurements to be carried out.

If the test is positive, the installation can then be declared as conforming to the selected standard (EN50173, ISO/IEC 11801, TIA/EIA 568) and the final report can be drawn up.

If the result is negative, the cause of this failure must be found and eliminated.

A few suggestions on the most frequent causes of errors are given below.

General errors:

- Has the class/category been selected correctly?
- Has the software of the certification instrument been updated?
- Have the correct measurement heads been used?
- Is a channel or a permanent link being tested?
- Has an appropriate propagation velocity (NVP) been entered?
- Although the limit values can be accepted temporarily, they require an additional examination, according to the parameters, as specified below.

Errors on the length of the wiring:

- Measured length longer than the authorised limits:
- The cable is too long. Assess the possibility of reducing the cable coils at the connections or follow other installation routes.
- The propagation velocity (NVP) has not been set correctly
- Measured length obviously shorter than that installed:
- Intermediate break on the cable
- One or more pairs are much too short:
- Cable damaged
- Connection error.
- Propagation delay/propagation time difference (above the limits):
- Cable too long (propagation delay)
- The cable uses different insulating materials for the pairs of which it is made up (if this is the case, replace it).
- Attenuation:
- Too long
- Poor quality cords
- High impedance in the connections (a specific measurement must then be carried out)
- Incorrect use of lower category components (eg: 5e cord in a class E link).
- Incorrect execution of the self-calibration routine on the certification instrument
- NEXT and PSNEXT ("fail"):
- The connectors/sockets have not been connected in line with the "unwinding" rules for each pair (poor twisting)
- Poor impedance matching between connectors and sockets (most probably as a result of mixing components from different manufacturers for category 6 and higher)
- Use of an incorrect measurement head on the certification instrument
- Poor quality cords, connectors, sockets or cables
- Cable ties too tight in cable bundles
- Presence of elements creating interference near the link
- See return loss errors: NEXT errors can be a result of return loss, due to the large width of the reflected signal.
- NEXT and PSNEXT ("pass" when there is an error - masked "fail", which could appear in the future):
- A good quality cable can withstand minor knots and kinks
- Incorrect test procedure selected: a "poor" class E link may pass the class D test which has been configured in error (also test the frequency range).
- "Fail" at low frequencies and "pass" at high frequencies: in reality, the problem concerns the whole frequency range and may be due to one of the above causes

■ Return loss ("fail"):
- Characteristic impedance of the cords incorrect (other than 100 Ω)
- Damaged cords have lost the characteristic impedance value
- Loss of the "twisting" pitch during installation
- Too many cables in the boxes containing the telecommunications outlets
- Poor quality connectors/sockets
- Poor quality cable: characteristic impedance not uniform along the whole length
- Poor impedance matching between connectors and sockets (most probably as a result of mixing components from different manufacturers for category 6 and higher)
- Erroneous use of a cable with 120 Ω characteristic impedance (previous generation components)
- Too much stock of cables in the cabinets
- Instrument self-calibration error and/or inappropriate selection of measurement cables and heads.

■ Return loss ("pass" when there is an error - masked "fail", which could appear in the future):
- A good quality cable can withstand minor knots and kinks
- Incorrect selection of lower limits
- "Fail" at low frequencies and "pass" at high frequencies: in reality, the problem concerns the whole frequency range and may be due to one of the above causes.
■ ELFEXT and PSELFEXT:
- See NEXT
- Too much cable in coils that are too tight.
■ Resistance:
- Cable too long
- Oxidised contacts
- Conductors incorrectly connected in connectors or sockets
- Cable with abnormally thin conductors (check the nominal AWG) or poor quality cord.

8.3 - FIBRE OPTIC WIRING

8.3.1 - Fibre optic wiring: visual check

This phase is simple and immediate, and involves:
■ Checking the catalogue numbers of the components installed
■ Checking there are no excessive mechanical stresses on the cables (eg: identification of points characterised by obviously incorrect bending radiuses)
■ Checking that the cable ties are not too tight on the bundles; and checking the sheaths are not distorted
■ Checking the wiring of sockets and patch panels, i.e. that all conductors are connected correctly
■ Checking the cleanliness of the interface surfaces of the components
■ Checking that the cords are compatible with the type of fibre optic in the link (eg: 50/125 μm).

Devices to assist with visual checking and cleaning the surfaces of the connectors are commercially available.

Example of microscope for visually checking the surfaces of the connectors and connector cleaning kit

8.3.2 - Testing the connectivity

As for copper wiring, this phase involves establishing whether the connections have been made correctly.

A device called a visual fault locator injects visible light into the termination of a link and checks that it exits at the other end. This system can also be used to identify breaks, excessive folds and macroscopic connection errors on connectors. Less serious errors of this type may not be detected during the connectivity test, but can be identified using the more accurate reflectometry test.

Examples of commercially available visual fault locator devices

8.3.3 - Testing the transmission parameters

The following transmission parameters must be tested for optical links:
- Attenuation (dB)
- Polarities
- Length (m)
- Return loss (dB)
- Propagation time (ns), optional.

The transmission parameters for fibre optic wiring are tested using the following methods:
- Photometry
- Reflectometry.

Photometry tests: these are based on measuring the attenuation of a light pulse, of the nominal wavelength for the type of link, applied between the two ends by a certification instrument.

The certification instruments must record the following wavelengths (in accordance with standard EN 50346):
- Multimode fibres:
- 850 nm ± 30 nm
- 1300 nm ± 20 nm.
- Singlemode fibres:
- 1310 nm ± 10 nm
- 1550 nm ± 20 nm.

As for the tests on copper cables, the certification instrument consists of a transmitting unit and a receiving unit which exchange signals. Measurement of the optical attenuation of the signal is adequate to certify a link. However, if there are problems, it is necessary to perform additional reflectometry measurements in order to find the causes of the failures.

Examples of photometric certification instruments

Reflectometry tests: these are based on measuring the time taken by a light pulse to travel the distance of the link forwards and backwards (after reflection). A specific instrument called an OTDR is used for this.
There are two types of reflected signal: "strong" and "weak". The former, generated by Fresnel reflection, indicate the presence of microcracks in the fibre. Weak reflections are caused by back-scattering of the light and are used to measure the attenuation.
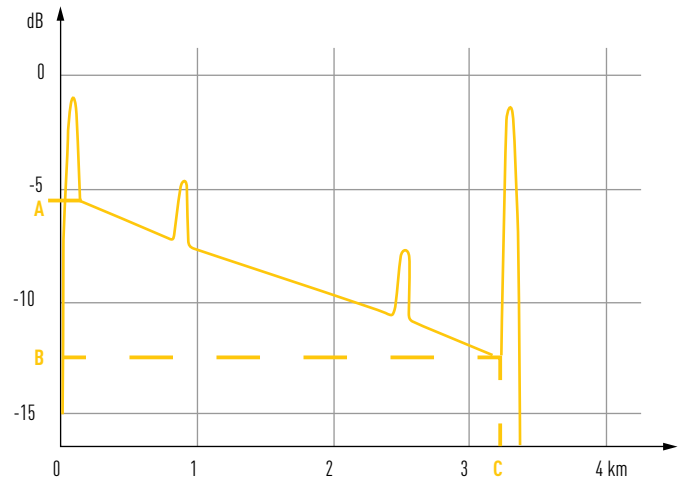
Example of reflectometry measurement: the decreasing trend is used to measure the attenuation (AB). The peaks correspond to Fresnel reflection situations, located at specific points where there are discontinuities inside the fibre, due to connections.
At C, the attenuation after the peak falls to - ∞, a clear sign of a break.

Example of an OTDR

Reflectometry measurements must be carried out using the "launch fibre", i.e. a piece of cable that is in addition to the link to be checked, which is used to resolve the issue of the "dead zone" of the instrument and thus analyse the entire length of the link. The first few metres of cable would not be visible without the launch fibre.
Putting together all the above information, the most effective method for testing fibre optic wiring can be summarised in five points:
1) Visual check of the cable on the reel: preliminary check of the type of cable, and to ensure there is no macroscopic damage
2) Reflectometry measurement of the bare fibre before installation: check to ensure there is no micro-damage on the cable
3) Reflectometry measurement of the bare fibre after installation: check to ensure there is no micro-damage on the cable, which has occurred during installation
4) Visual check + cleaning of the connectors
5) Final test on the installed fibre fitted with connectors: using photometry and/or reflectometry method.

9. SUPPORT

9.1 - PROJECT PERFORMANCE GUARANTEE

The performance of an installation must stand the test of time. This is why Legrand offers the installer the opportunity to guarantee the long-term continuity of performance of a cat. 6_A, 6, 5e or OM1, OM2, OM3, OM4, OS1 or OS2 LCS² cabling system. Two guarantees ensure the durability of your installations:

The 25-year performance guarantee:

Legrand offers the installer the guarantee of continuity of performance levels of an LCS² cabling system on link or channel over time.

3-year extended guarantee on additional products:

By taking out the Performance guarantee opposite, the usual 2-year Legrand guarantee is extended to 5 years for the following products:
- Enclosures
- Cabinets
- Patching accessories (feedthroughs, shelves, etc.).

9.1.1 - 25-year link or channel performance guarantee

The link guarantee relates to an assembly consisting of the following components:
- Patch panel
- Copper or fibre optic cable
- Terminal socket
- Zone distribution box
- Fibre optic cassette and/or fibre optic drawer with feedthrough
- Pigtail.

Performance is measured over a maximum length of 90 m for copper links. For fibreoptic links see the contract.


Sockets   Patch panel   Cables and cords

A channel is defined by the standards as being an assembly consisting of the following components:
- Patch cord or jumper
- Patch panel
- Copper or fibre optic cable
- RJ 45 socket
- User cord
- Zone distribution box
- Fiber optic cassette and/or fiber optic drawer with feedthrough.

Performance is measured over a maximum length of 100 m for a copper channel. For a fibre optic channel respect the maximum length associated with each performance level (refer to the contract).

Patch panel   Sockets   Computer   Cables
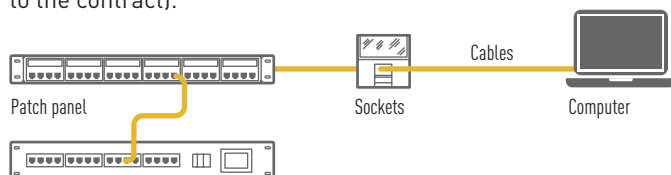
Active product

9.1.2 - 3-year guarantee extension

The guarantee extension means a period in addition to the initial guarantee delivered by Legrand in the frame of its general sales conditions, and a three (3) year extension of the guarantee covering correct operation on products referred to as ADDITIONAL PRODUCTS, excluding all other products and equipment:
- Enclosures
- Cabinets
- Patching accessories (feedthroughs, shelves, etc.).

9.1.3 - Conditions of the 25-year guarantee

The Guarantee only applies to the installation carried out at the worksite for which the details are given in the Installation Identity Document.
The INSTALLER can only benefit from the Extended Guarantee if all the following conditions have been met:
- The installer has stored the components used in the installation under conditions that are appropriate to their nature
- The installer has carried out the installation in strict compliance with good practice and in accordance with the following combination of conditions:
- All the components used in the cabling system must be Category 5e, 6 or 6_A or OM2, OM3, OM4, OS or OS2 components of LEGRAND LCS² cabling systems, listed in the Installation Identity Document, or failing that, products recommended and approved by LEGRAND
- The installation must be carried out in accordance with the rules defined in installation standards EN 50174, EN 55022 and ISO 11801 or EN 50173, which are in force on the date the Guarantee is granted
- For a CHANNEL Performance Guarantee, all the patch cords and user cords must be original LEGRAND components. The length of a patch cord is limited to 5 meters.
- As well as the signed agreement, the Installer has delivered to LEGRAND the Installation Identity Document, consisting of:
- The completed Worksite Details
- List of VDI PRODUCTS and ADDITIONAL PRODUCTS with their quantities
- The «Key Points» document completed, checked and signed to indicate that the INSTALLER has complied with these points
- A copy of the installed equipment layout plan bearing the installer's company stamp
- Documentation on the installation acceptance test carried out in accordance with current standards.
- The INSTALLER must ensure that the data for the installation acceptance test conform to the values specified in the performance standards
- Any subsequent modifications must comply with the conditions listed above. Any ˝new phase of work˝ type extension to the installation must form the subject of a new agreement.

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9.2 - LCS PRO² SOFTWARE: ALL THE PRODUCTS YOU NEED FOR AN LCS PROJECT

The new LCS Pro² software lets you select your products quickly and easily, view your cabinets and much more...
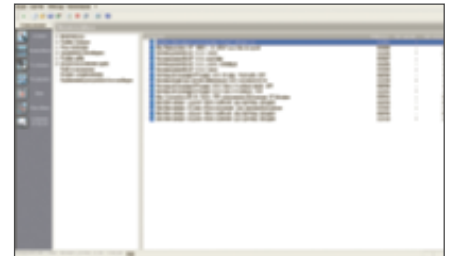
Automatic determination of catalogue numbers by selecting the features and options

Easy project management
Technical records, purchase orders, document printing

Visual display of the enclosure layout with option to make changes

Discover the new features:
- Create the block diagram of your installation
- Find Cat. Nos automatically by selecting characteristics and options
- Display the cabinet installation and amend it if required
- Manage your projects: technical summaries, purchase orders, document printing.

9.3 - TOP-LEVEL TRAINING AT INNOVAL

Being in close contact with engineers at the cutting edge of technological advances, Legrand trainers offer you practical classes in workshops. Discover the aesthetic, technical and innovative potential of Legrand products and systems in a real-life situation.

Take the opportunity to meet experienced people who understand your business and speak your language. We offer you very useful and practical classes.

Innoval Centre, Limoges[1]

This is the training nerve centre for the Legrand Group, offering an overall view of the solutions designed by the whole of the Legrand Group for the residential, commercial and industrial markets.

Its 15 training rooms have been designed and equipped with individual computers and workshop areas to promote the practical acquisition of new skills and allow participants to handle actual products.

Innoval Centre, Bagnolet[1]

Showcasing Legrand's specialist solutions for the commercial and industrial sectors, the Bagnolet Innoval centre offers the expertise and ideal tools for you to develop your knowledge in the fields of VDI, power/high voltage, lighting management and security systems.

The two training rooms at the Innoval Centre in Bagnolet have interactive panels for the lively communication of theoretical knowledge, as well as workshop areas for the immediate practical application of acquired skills.

Comprehensive classes
- Copper installation: essential for commercial sites
- Fibre optic: use and testing of an installation
- Copper: use and testing of an installation.

Classes to understand different methods
For example using a fibre optic backbone and connecting and testing the fibre optic links, as per the standards in force.

Classes to convert the telephone and computer network needs of your clients into complete and upgradeable solutions, and cabling them as per the standards in force.
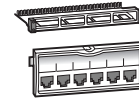

(1) To adapt for your country

DIGITAL INFRASTRUCTURES
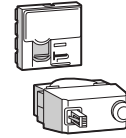SYSTEMS FOR
COMMUNICATIONS
NETWORKS IN
COMMERCIAL BUILDINGS
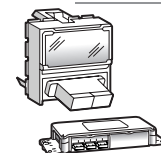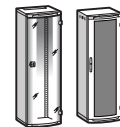
P. 91
LCS^2, cat. 6$_A$
cables, cords and
zone distribution boxes
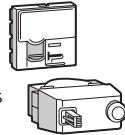
P. 93
LCS^2 cat. 6$_A$
RJ 45 sockets
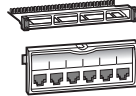
P. 94
LCS^2, cat. 6 patch
panels and
connector units
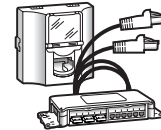
P. 95
LCS^2, cat. 6 cables,
cords, zone distribution
boxes and cooper
feedthroughs
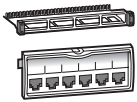
P. 100
LCS^2, cat. 5e
patch panels
and connector units
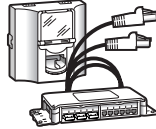
P. 100
LCS^2, cat. 5e cables,
cords, zone distribution
boxes and cooper
feedthroughs

P. 102
LCS^2, cat. 5e
RJ 45 sockets
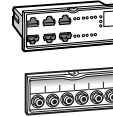
P. 103
LCS^2: panels, connector
units, switches, PoE, etc.

P. 104
LCS^2, system
installation
accessories

P. 105
Telephone,
panels units, cables
and data sockets
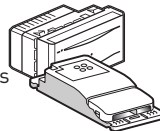
P. 106
Switches and Wi-Fi
access points
Mosaic and Arteor

P. 108
LCS^2, Tool case
fibre optic connectors
and pigtails
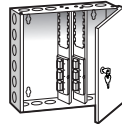
P. 109
LCS^2, 19" fibre optic
drawers

P. 109
LCS^2, fibre optic
drawers, converters
and cassettes

P. 110
LCS^2, 19" high density
fibre optic drawer
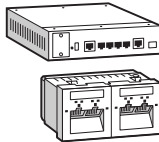
P. 112
LCS^2, fibre optic
FTTO

P. 113
LCS^2,
fibre optic
patch
cords
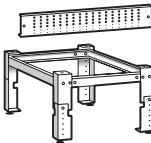
P. 117
Plinths, adjustable
height plinths
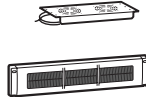
P. 118
LCS^2, cable entries,
thermal management
and wiring
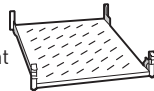
P. 119
LCS^2,
19" equipment

P. 120
19" racks

P. 122
LCS^2,
10" wall-mounting
cabinets
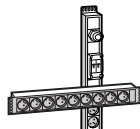
P. 123
Power Distribution
Units and DIN rail
kit
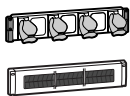
P. 129
Equipment for
Varicon-L, 19"
server cabinets
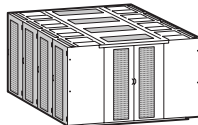
P. 130
Varicondition Cold
Corridor® and
Varicondition H$_2$0

P. 132
Smart PDU

P. 135
Copper and fibre
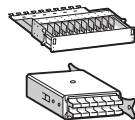
P. 136
LCS^2, 19" high density
fibre optic drawer

P. 138
Cables and cords OM4
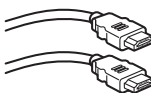
P. 142
Audio/video
Cords and cables

P. 142
Audio/video
Patch pannel

P. 143
Audio/video
Kits

Selection chart for equipment and cabinets

configure your LCS² system

LCS² PANELS AND CONNECTOR UNITS (p. 90, 94 and 100)

			LCS² cat. 6A	LCS² cat. 6	LCS² cat.5e
Patch panels 1U Fitted with 24 connectors		STP	Quick-fixing 0 335 73	Quick-fixing 0 335 63	-
		FTP	-	Quick-fixing 0 335 62	Quick-fixing 0 335 52
High density patch panels		STP	Quick-fixing 0 335 86	-	-
		FTP	-	Quick-fixing 0 335 68	-
		UTP	-	Quick-fixing 0 335 67	-
Units of 6 x RJ 45 connectors		STP	0 335 76	0 335 66	-
		FTP	-	0 335 65	0 335 55
Blanking plate			0 335 91	0 335 91	0 335 91
Patch panel 1 U To be fitted with 4 units			Quick-fixing 0 335 90	Quick-fixing 0 335 90	0 335 90

ADDITIONAL LCS² PANELS AND UNITS (p. 103)

		LCS²
Telephone panels 1 U Fitted with 4 units of 12 ports	3-6/4-5 contacts (digital)	0 335 31
	4-5/7-8 contacts (analogue)	Quick-fixing 0 335 30
Telephone units Fitted with 12 ports	3-6/4-5 contacts (digital)	0 335 33
	4-5/7-8 contacts (analogue)	0 335 32
Doubler units	Ethernet/Ethernet	0 335 39
	Telephone/Ethernet	0 335 37
	Telephone/telephone	0 335 35
Video streaming unit	6 x "F" connectors	0 335 34
Switch units	7 x RJ 45 ports	0 335 02
	6 x RJ 45 ports + 1 LC type optic port	0 335 05
Power over Ethernet (PoE) injector	4 ports	0 335 01
Controlled access units		0 334 71/72/73/74/75

LCS² 19" FEEDTHROUGH PANELS AND BLANKING PLATES (p. 119)

		LCS²
Metal, 2 axes	1 U	Quick-fixing 0 465 22
	2 U	0 465 23
Plastic with brushes, snap on	1 U	0 465 28
	2 U	0 465 29
Metal with brushes	1 U	Quick-fixing 0 465 30
	2 U	0 465 31
Plastic blanking plate, snap on	1 U	0 465 32
	2 U	0 465 33
Metal blanking plate	1 U	Quick-fixing 0 465 38
	2 U	0 465 39
	3 U	0 465 40

LCS² 19" AREA DISTRIBUTION BOXES (p. 90, 92, 96, 100)

			LCS² cat. 6A	LCS² cat. 6	LCS² cat.5e
Area distribution box equipped with 12 x RJ 45 connectors		STP	0 335 49	0 335 46	-
		FTP	-	0 335 45	-
		UTP	-	0 335 44	-
Units of 6 x RJ 45 connectors		STP	-	0 335 66	-
		FTP	-	0 335 65	0 335 55
		UTP	0 335 77	0 335 64	0 335 54
Fibre optic accessory			-	0 335 20	0 335 20
Area distribution box - To be fitted with 4 units			-	0 335 40	0 335 40

Cords specifically for area distribution boxes
p. 100-101
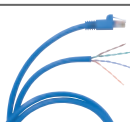
Selection chart for equipment and cabinets

configure your LCS² system (continued)

PLAIN MOSAIC RJ 45 SOCKETS (p. 93, 98 and 102)				LCS² cat. 6$_A$	LCS² cat. 6	LCS² cat.5e
	1 module	STP		0 765 73	0 765 63	-
		FTP		-	0 765 62	-
		UTP		0 765 71	0 765 61	0 765 51
	2 modules	STP		0 765 76	0 765 66	-
		FTP		-	0 765 65	-
		UTP		0 765 74	0 765 64	0 765 54
	2 x 45° modules	STP		0 765 08	0 765 07	-
		FTP		-	0 765 05	-
		UTP		0 765 09	0 765 03	0 765 01
	90° sockets	STP		-	0 765 93	-
		FTP		-	0 765 92	-
		UTP		-	0 765 91	-
	Antimicrobial	STP		0 765 84	0 765 83	-
		FTP		-	0 765 82	-
		UTP		-	0 765 81	-
	With controlled access	STP		0 765 99	0 765 96	-
		FTP		-	0 765 95	-
		UTP		0 765 90	0 765 94	0 765 97
	Green shutter	STP		0 765 24	-	-
		FTP		-	0 765 22	-
	Orange shutter	STP		0 765 25	-	-
		FTP		-	0 765 23	-
	2 x RJ 45 sockets	FTP		-	0 765 46	-
		UTP		-	0 765 44	0 765 41
	Copper feedthroughs	STP		0 786 28	-	-
		FTP		-	0 786 23	-
		UTP		-	0 786 22	0 786 20
	Doubler sockets	Ethernet/Ethernet	FTP	0 765 39	0 765 39	-
			UTP	0 765 38	0 765 38	0 765 38
		Telephone/Ethernet	FTP	0 765 37	0 765 37	-
			UTP	0 765 36	0 765 36	0 765 36
		Telephone/telephone		0 765 35	0 765 35	0 765 35

WI-FI ACCESS POINTS (p. 106)			
	Wall-mounted manageable Wi-Fi access points	Dual-band and dual-radio	0 779 13
	Manageable Wi-Fi access point (false ceiling)		0 335 21
	Manageable Wi-Fi access point (surface-mounted)		0 335 22
	Centralised configuration software		0 335 24
	PoE injector	4 inputs/4 outputs	0 335 01
		1 input/1 output	0 327 37

FIBRE OPTIC EQUIPMENT (p. 109)		Monomode	Multimode
	LC units	For 6 fibres	0 335 13	0 335 18
		High density - For 12 fibres	-	0 335 19
	SC units	For 6 fibres	0 335 12	0 335 17
	ST unit	For 6 fibres	-	0 335 16
	SC/APC units	For 4 fibres	0 327 86	-
		For 6 fibres	0 335 14	-
	Copper/fibre optic converters	10/100 base T to 10/100 base SX	-	0 335 06
		1000 base T to 1000 base SX/LX	-	0 335 07
	Switch units	6 x RJ 45 ports + 1 LC type optic port	0 335 05	
	Fibre optic racks 1 U - For 4 fibre optic units		0 335 10	
	Fibre optic cassettes for patch panel		0 335 11	
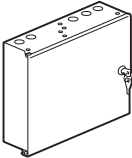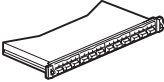
Selection chart for equipment and cabinets

configure your LCS² system (continued)

RJ 45 PATCH CORDS AND USER CORDS (p. 91, 95 and 100)					LCS² cat. 6A	LCS² cat. 6	LCS² cat. 5e
	PVC	S/FTP	Impedance 100 ohms	0.5 m	0 518 16	-	-
				1 m	0 517 80	0 517 52	-
				2 m	0 517 81	0 517 53	-
				3 m	0 517 82	0 517 54	-
				5 m	0 517 83	0 517 55	-
		F/UTP	Impedance 100 ohms	0.5 m	-	0 518 15	0 518 14
				1 m	-	0 517 62	0 516 40
				2 m	-	0 517 63	0 516 41
				3 m	-	0 517 64	0 516 42
				5 m	-	0 517 65	0 516 43
		U/UTP	Impedance 100 ohms	0.5 m	-	0 518 18	0 518 17
				1 m	0 518 82	0 517 72	0 516 36
				2 m	0 518 83	0 517 73	0 516 37
				3 m	0 518 84	0 517 74	0 516 38
				5 m	0 518 85	0 517 75	0 516 39
	LSOH	S/FTP	Impedance 100 ohms	1 m RAL 3020	0 518 70	-	-
				1 m RAL 6026	0 518 66	-	-
				2 m RAL 3020	0 518 71	-	-
				2 m RAL 6026	0 518 67	-	-
				3 m RAL 3020	0 518 72	-	-
				3 m RAL 6026	0 518 68	-	-
				5 m RAL 3020	0 518 73	-	-
				5 m RAL 6026	0 518 69	-	-
		F/UTP	Impedance 100 ohms	1 m RAL 3020	-	0 518 54	-
				1 m RAL 6026	-	0 518 50	-
				2 m RAL 3020	-	0 518 55	-
				2 m RAL 6026	-	0 518 51	-
				3 m RAL 3020	-	0 518 56	-
				3 m RAL 6026	-	0 518 52	-
				5 m RAL 3020	-	0 518 57	-
				5 m RAL 6026	-	0 518 53	-
		U/UTP	Impedance 100 ohms	1 m RAL 3020	0 518 78	0 518 62	-
				1 m RAL 6026	0 518 74	0 518 58	-
				2 m RAL 3020	0 518 79	0 518 63	-
				2 m RAL 6026	0 518 75	0 518 59	-
				3 m RAL 3020	0 518 80	0 518 64	-
				3 m RAL 6026	0 518 76	0 518 60	-
				5 m RAL 3020	0 518 81	0 518 65	-
				5 m RAL 6026	0 518 77	0 518 61	-

COPPER CABLES (305 OR 500 M REELS) (p. 91, 95 and 100)				LCS² cat. 6A	LCS² cat. 6	LCS² cat. 5e
	S/FTP	4 pairs	500 m	0 327 77	-	-
	SF/UTP	4 pairs	500 m	-	0 327 57	-
	F/UTP	4 pairs	305 m	-	0 328 56	0 327 52
		4 pairs	500 m	0 327 78	0 327 56	0 328 50
		2 x 4 pairs	500 m	0 328 78	0 327 76	0 327 74
	U/UTP	4 pairs	305 m	-	0 327 54	0 327 50
		4 pairs	500 m	0 327 87	0 328 61	0 328 53
		2 x 4 pairs	500 m	-	0 328 63	0 327 73

FIBRE OPTIC PATCH CORDS (p. 113)			OS1/OS2 (UPC) singlemode 9/125 μm	OM4 multimode 50/125 μm	OM3 multimode 50/125 μm
	SC/SC duplex cords	1 m	0 326 00	0 326 30	0 326 09
		2 m	0 326 01	0 326 31	0 326 10
		3 m	0 326 02	0 326 32	0 326 11
	SC/LC duplex cords	1 m	0 326 03	-	0 326 12
		2 m	0 326 04	-	0 326 13
		3 m	0 326 05	-	0 326 14
	LC/LC duplex cords	0.5 m	0 326 28	0 326 33	-
		1 m	0 326 06	0 326 34	0 326 15
		2 m	0 326 07	0 326 35	0 326 16
		3 m	0 326 08	0 326 36	0 326 17
		5 m	0 326 29	0 326 37	-

OPTICAL CABLES (REEL) (p. 107 and 138)				OS1/OS2 (UPC) singlemode 9/125 μm	OM4 multimode 50/125 μm	OM3 multimode 50/125 μm
	Indoor/Outdoor	6 fibres		0 325 12	0 326 65/66	0 325 10
		12 fibres	Loose tube	0 325 14	-	-
			Tight buffer	0 325 50	0 326 67	0 325 11
		24 fibres	Loose tube	0 325 51	-	0 325 53
			Tight buffer	-	0 326 68	0 325 52
	Outdoor, reinforced steel, anti-rodent	6 fibres		0 325 13	-	-
		12 fibres		0 325 15	-	-
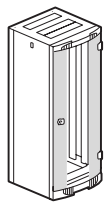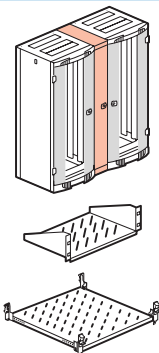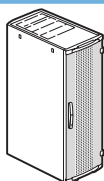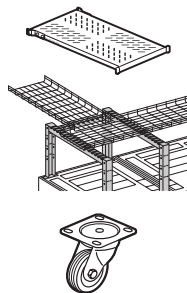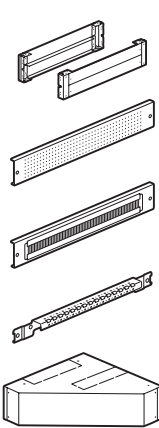
Selection chart for equipment and cabinets

for FTTO infrastructure

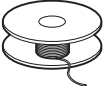|	EQUIPMENT FOR INDIVIDUAL WORKSTATIONS			EQUIPMENT FOR SHARED WORKSTATIONS		
	RJ 45 socket, cat. 6 - FTP - 2 modules		0 765 65	OM3 multimode optical cord 50/125 μm - SC/LC	3 m	0 326 14
	Cat. 6 cords - RJ 45/stripped - F/UTP	Length 8 m	0 517 96		SC/LC > 3 m	consult our customized offer
		Length 15 m	0 517 97	Ready-assembled area distribution box		0 335 43
AREA BOX <-> FLOOR DISTRIBUTOR LINK						
	Fast-connection connector 50 μm OM3/OM4 900 μm - LC/UPC		0 326 58	Fast-connection connector 50 μm OM3/OM4 900 μm - SC/UPC		0 326 57
	Pigtail 10 Giga - OM3 - 50/125 μm - LC		0 326 23	Pigtail 10 Gb - OM3 - 50/125 μm - SC		0 326 22
	OM3 multimode fibre optic cable 50/125 μm - 6 fibres					0 325 10
EQUIPMENT FOR FLOOR DISTRIBUTOR						
	Modular cabinet					0 462 90
	Fibre optic floor distributor cabinet - ready-assembled					0 462 91
	Fast-connection connector - 50 μm OM3/OM4 900 μm - SC/UPC					0 326 57 x 2
	Pigtail 10 Gb - OM3 - 50/125 μm - SC					0 326 22 x 2
FLOOR DISTRIBUTOR <-> BUILDING DISTRIBUTOR LINK						
	Pigtail 10 Gb - SC (for input) - OM3 - 50/125 μm - SC (incoming)					0 326 22
	OM3 multimode fibre optic cable 50/125 μm - 24 fibres					0 325 52
	Pigtail 10 Gb - SC (for output) - OM3 - 50/125 μm - SC (outgoing)					0 326 22
EQUIPMENT IN THE GENERAL BUILDING DISTRIBUTOR						
	19'' fibre optic drawer - equipped with SC units					0 335 09
	Fast-connection connector - 50 μm OM3/OM4 900 μm - SC/UPC					0 326 57
	Pigtail 10 Gb - OM3 - 50/125 μm - SC					0 326 22

legrand

Selection chart for equipment and cabinets

configure your LCS² system
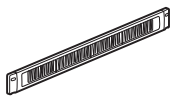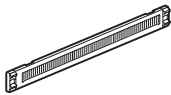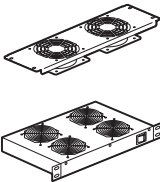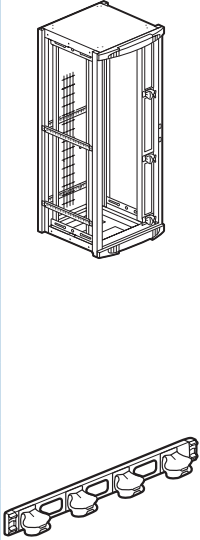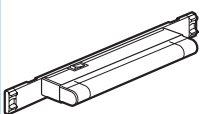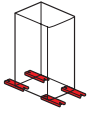
LCS² 19" CABINETS (p. 115)

			Depth 600 mm	Depth 800 mm	Depth 1000 mm
Single front door	24 U	Width 600 mm	0 463 00	-	-
	29 U	Width 600 mm	0 463 06	-	-
	33 U	Width 600 mm	0 463 12	-	-
	42 U	Width 600 mm	0 463 18	0 463 19	-
		Width 800 mm	0 463 21	0 463 22	0 463 23
	42 U extension[1]	Width 600 mm	0 463 30	-	-
		Width 800 mm	-	0 463 33	-
	47 U	Width 800 mm	-	0 463 28	0 463 29
Double front door	42 U	Width 800 mm	0 463 41	0 463 42	0 463 43

EQUIPMENT FOR LCS² 19" CABINETS (p. 115-119)

		For cabinet depth 600 mm	For cabinet depth 800 mm	For cabinet depth 1000 mm
Cabling unit for 42 U cabinet		0 463 34	0 463 35	-
Direct baying kit		0 463 37	0 463 38	0 463 39
Fixed shelf Projecting fixing on 2 x 19" uprights, 2 U	Depth 115 mm	0 465 00	0 465 00	0 465 00
	Depth 200 mm	0 465 01	0 465 01	0 465 01
	Depth 360 mm	0 465 02	0 465 02	0 465 02
Fixed shelf Fixing on 4 x 19" uprights	50 kg max., 1 U	0 465 05	0 465 06	0 465 07
	100 kg max., 1 U	-	-	0 465 17
Telescopic shelf, fixing on 4 x 19" uprights, 1 U		0 465 08	0 465 09	0 465 10
Set of 2 fixed sliders		0 465 11	0 465 12	0 465 13

LCS² 19" SERVER CABINETS (p. 115)

		Depth 1000 mm
42 U	Width 600 mm	0 463 85
	Width 800 mm	0 463 86

EQUIPMENT FOR LCS² 19" SERVER CABINETS (p. 115-119)

		For cabinet depth 1000 mm
Baying kit		0 463 39
Fixed shelf Projecting fixing on 2 x 19" uprights, 2 U	Depth 115 mm	0 465 00
	Depth 200 mm	0 465 01
	Depth 360 mm	0 465 02
Fixed shelf Fixing on 4 x 19" uprights	50 kg max., 1 U	0 465 07
	100 kg max., 1 U	0 465 17
Telescopic shelf Fixing on 4 x 19" uprights	50 kg max., 1 U	0 465 10
	100 kg max., 2 U	0 465 18
Set of 2 fixed slidders		0 465 13
Cable guide support		0 464 79 (+ 0 464 78)
Set of 4 casters, 500 kg max.		0 464 82

PLINTH FOR LCS² 19" CABINETS AND SERVER CABINETS (p. 117)

Plinth kit, height 100 mm	For cabinet width 600 mm	0 464 50
	For cabinet width 800 mm	0 464 51
Plinth kit, height 200 mm	For cabinet width 600 mm	0 464 52
	For cabinet width 800 mm	0 464 53
Set of 2 solid side traps	For cabinet depth 600 mm	0 464 54[2]
	For cabinet depth 800 mm	0 464 56[2]
	For cabinet depth 1000 mm	0 464 58[2]
Ventilated trap, height 100 mm	For cabinet width/depth 600 mm	0 464 60
	For cabinet width/depth 800 mm	0 464 61
Trap with brushes, height 100 mm	For cabinet width/depth 600 mm	0 464 62
	For cabinet width/depth 800 mm	0 464 63
Cross bar	For cabinet depth 600 mm	0 476 93
	For cabinet depth 800 mm	0 476 94
	For cabinet depth 1000 mm	0 476 95
Linking interface	For cabinet depth 600 mm	0 464 66
Plinth for cabling unit, trap height 100 mm		0 464 64[2]

1: Cabinets with no side panels supplied with baying kit - 2: Double the number of traps for a height of 200 mm

Selection chart for equipment and cabinets

configure your LCS² system (continued)

CABLE ENTRIES FOR LCS² 19" CABINETS AND SERVER CABINETS (p. 118)

	Plastic plate with brushes, snap on	1 U	0 465 28
		2 U	0 465 29
	Metal plate with brushes	1 U	0 465 30
		2 U	0 465 31

THERMAL MANAGEMENT FOR LCS² 19" CABINETS AND SERVER CABINETS (p. 118)

	19" 3 U plate with 230 V ~ fans	2 fans	0 464 87
		3 fans	0 464 88
	1 U ventilation drawer	2 fans, depth 150 mm	0 464 89
		4 fans, depth 300 mm	0 464 90
	Thermostat	Adjustable from 5 to 60°C	0 348 48

CABLE MANAGEMENT FOR LCS² 19" CABINETS AND SERVER CABINETS (p. 118)

	Set of 3 cable management supports	For cabinet width/depth 600 mm	0 464 72
		For cabinet width/depth 800 mm	0 464 73
		For cabinet depth 1000 mm	0 464 74
	Flat cable guide	For 33 U cabinet	0 464 76
		For 42 U cabinet	0 464 77
	U-shaped cable guide, 3 m	Width 200 mm	0 464 69
		Width 400 mm	0 464 70
	Vertical cable management grille	For 42 U cabinet, width 800 mm	0 331 35
	Vertical cable manager	For 42 U cabinet, width 800 mm	0 464 80
	Patch extension	For 42 U cabinet, width 800 mm	0 464 81
	19" management panels, 2 axes	1 U	0 465 22
		2 U	0 465 23

ACCESSORIES FOR LCS² 19" CABINETS AND SERVER CABINETS (p. 119)

	Accessories	230 V ∿ lighting kit, 1 U	0 464 85
		Anti-tilt kit	0 464 84
		Floor fixing kit	0 464 86
		Set of 4 casters - 380 kg max.	0 464 83
	Vertical PDU supports	For 42 U cabinets	0 465 75
		For 47 U cabinets	0 465 76

LCS² 19" WALL-MOUNTING CABINETS AND EQUIPMENT (p. 121)			FIXED		PIVOTING
			Depth 400 mm	Depth 580 mm	Depth 600 mm
	6 U	Height 350 mm x width 600 mm	0 462 00	-	-
	9 U	Height 500 mm x width 600 mm	0 462 01	0 462 06	0 462 11
	12 U	Height 600 mm x width 600 mm	0 462 02	0 462 07	0 462 12
	16 U	Height 800 mm x width 600 mm	0 462 03	0 462 08	0 462 13
	21 U	Height 1000 mm x width 600 mm	-	0 462 09	0 462 14
	Fixed shelves	Depth 115 mm	0 465 00	0 465 00	0 465 00
		Depth 200 mm	0 465 01	0 465 01	0 465 01
		Depth 360 mm	-	0 465 02	0 465 02
	Equipment	Cable entry plate with brush	-	-	0 462 55
		Cable management ring	0 465 41[1]	0 465 41/42	-
		230 V ~ fan	0 462 60	0 462 60	0 462 60
		Thermostat	0 348 48	0 348 48	0 348 48
		Set of 4 casters	-	-	0 462 64

1U 19" POWER DISTRIBUTION UNITS (p. 123-124)			
	PDU standard	6 outlets	German standard	6 468 06
			French standard	6 468 05
			C19 (IEC 60320 standard)	6 468 07
		8 outlets	British standard	6 468 13
			6 C13 + 2 C19 (IEC 60320 standard)	6 468 09
		9 outlets	German standard	6 468 12
			French standard	6 468 10
			Tamperproof French standard	6 468 11
		12 outlets	C13 (IEC 60320 standard)	6 468 15
	PDU with power indicator	9 outlets	German standard	6 468 21
			French standard	6 468 20
	PDU with luminous switch	6 outlets	British standard	6 468 24
		8 outlets	German standard	6 468 23
			French standard	6 468 22
	PDU with 16 A MCB	6 outlets	German standard	6 468 31
			French standard	6 468 30
	PDU with 16 A 30 mA RCBO	6 outlets	French standard	6 468 33
	PDU with surge protection	6 outlets	German standard	6 468 36
			French standard	6 468 35
	PDU with ammeter	6 outlets	German standard	6 468 41
			French standard	6 468 40
			C13 (IEC 60320 standard)	6 468 43
			C19 (IEC 60320 standard)	6 468 44

ZERO-U POWER DISTRIBUTION UNITS (p. 124)			
SINGLE-PHASE			
	PDU standard	24 outlets	German standard	6 468 52
			British standard	6 468 54
			French standard	6 468 50
			C13 (IEC 60320 standard)	6 468 56
			20 C13 + 4 C19 (IEC 60320 standard)	6 468 60
	PDU with ammeter	24 outlets	20 C13 + 4 C19 (IEC 60320 standard)	6 468 65
THREE-PHASE			
	PDU standard	24 outlets	18 C13 + 6 C19 (IEC 60320 standard)	6 468 70
	PDU with ammeter	24 outlets	18 C13 + 6 C19 (IEC 60320 standard)	6 468 75

MULTI-APPLICATION 19" DIN RAIL (p. 125)		
	19" DIN rail Kit	DIN Rail with front cover	0 465 46
		Rear cover	0 465 47

1: Except for 6 U cabinet

Selection chart for panels and cords for audio/video applications

ASSEMBLED PANELS, AUDIO/VIDEO APPLICATIONS (p. 142)			
	19" panel equipped with HDMI units		0 335 97
	19" panel equipped with HD 15 units		0 335 98
	19" panel equipped with XLR units		0 335 96
	19" panel equipped with 9-way SUB-D units		0 335 99

CORDS AND ADAPTORS FOR AUDIO/VIDEO AND DATA APPLICATIONS (p. 142)				
	HDMI 1.4 cords		1 m	0 517 32
			2 m	0 517 33
			3 m	0 517 34
			5 m	0 517 27
			7 m	0 517 35
			10 m	0 517 20
			15 m	0 517 36
	DisplayPort cord		2 m	0 514 00
	HD 15 cords		2 m	0 517 29
			5 m	0 517 30
			10 m	0 517 23
			15 m	0 517 31
	HD 15 cord + Jack 3.5 mm		2 m	0 517 22
	RCA male / male audio stereo cords		2 m	0 514 03
			5 m	0 514 04
	Jack 3.5 mm male / 2 RCA Y male audio/stereo cords		2 m	0 514 05
			5 m	0 514 06
	Jack 3.5 mm male / male audio/stereo cord		2 m	0 514 07
			5 m	0 514 08
	XLR cord		10 m	0 517 24
	USB Data cords	USB 3.0 A male / A male cord	2 m	0 514 01
		USB 3.0 A male / B male cord	2 m	0 514 02
		USB 3.1 C male / C male cord	1 m	0 514 10 JANUARY 2017
		USB 2.0 C male / A male cord	2 m	0 514 11 JANUARY 2017
	Adaptors	USB 3.1 C male / HDMI female		0 514 12 APRIL 2017
		USB C male / RJ 45 female		0 514 13 APRIL 2017
	9-way SUB-D cord		10 m	0 517 25

CABLES FOR AUDIO/VIDEO APPLICATIONS (p. 142)			
	HDMI cable	20 m	0 327 80
	VGA cable	20 m	0 327 81
	Speaker cable	15 m	0 514 09

Mosaic and Arteor audio/video sockets
p. 140-141

Legrand cabling system LCS² category 6A

patch panels, blocks of connectors

0 335 86
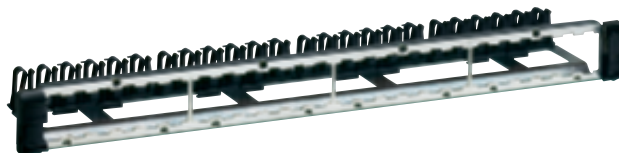
0 335 90

0 335 76

Connector cat. 6A
shielded STP

A SECURE CONTROLLED NETWORK

From the equipment room through to workspaces, and also suitable for highly critical applications, LCS² solutions are used to access (and control access to) the VDI network.

● **Cables**
Fitted with new plugs which are easier to grip.

● **Controlled access in the equipment room**
Controlled access units for fitting on Cat. 6A, Cat. 6 ST P and Cat. 6 UTP units on patch panels.
Mechanical locking with a key.

● **Controlled access in the workspace**
Controlled access RJ 45 socket for restricting access to sensitive data networks.
Available in Cat. 6A, Cat. 6 STP and Cat. 6 UTP versions.
Flap with a key for mechanical locking.

Pack	Cat.Nos	
		Patch panel cat. 6A **24 x RJ 45 connectors**
		Panel supplied with quick-fixing Panel ensures automatic grounding of each connector Fitted with rear cable guide to hold cables during maintenance Fitted with 4 units of 6 LCS² RJ 45 connectors cat. 6A with fast connection thanks to integrated crimping, with wiring schemes T 568 A and T 568 B Supplied with numbered colour labels Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-2 and TIA/EIA 568C 19" panel - 1 U
1	0 335 84	UTP panel - 8 contacts
1	0 335 85	UTP high density panel - 8 contacts
1	0 335 73	STP - Metal shielding 360°
1	0 335 86	STP high density panel - 360° metal shielding
		Modular panel
		Panel supplied with quick-fixing Panel ensures automatic grounding of each connector Fitted with rear cable guide to hold cables during maintenance Modular empty panel for up to 4 units Take the following equipment: - units of 6 x LCS² RJ 45 connectors - telephone inlet units - fibre optic units - PoE injector units - video streaming units - switch units - telephone/Ethernet doubler units - copper/fibre optic converter units - blanking plates
1	0 335 90	19" panel - 1 U
		Units of 6 x RJ 45 connectors cat. 6A
		Fitted with 6 x LCS² RJ 45 connectors cat. 6A with fast connection thanks to integrated crimping, with wiring schemes T 568 A and T 568 B Supplied with colour labels Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-2 and TIA/EIA 568C
2	0 335 77	UTP unit - 8 contacts
2	0 335 76	STP unit - metal shielding 360°
10	0 335 91	Blanking plate for 19" panel - Black

Legrand cabling system LCS² category 6A

cables and cords

New plug
Convenient for gripping

0 327 77

0 517 82
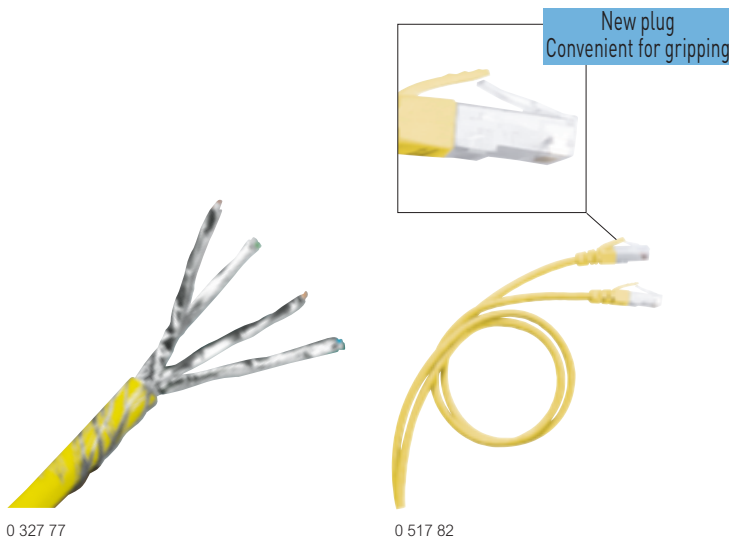
Pack	Cat.Nos	**Cables for local networks cat. 6A**
		Cables 4 pairs or 2 x 4 twisted pairs 100 ohms
		LSZH sleeve: halogen-free
		Yellow RAL 1018
		Colour code TIA/EIA
		Conform to standards ISO/IEC 11801
		Ed. 2.0, EN 50173-1 and TIA/EIA 568C
		Performance 500 MHz
	LSZH	**U/UTP - 4 pairs**
		Performance 500 MHz
500¹	0 327 87	Length 500 m
		Supplied on reel. Weight 25 kg
		F/UTP - 4 pairs
		Performance 500 MHz
500¹	0 327 78	Length 500 m
		Supplied on reel. Weight 25 kg
		F/UTP - 2 x 4 pairs
		Performance 500 MHz
500¹	0 328 78	Length 500 m
		Supplied on reel. Weight 65 kg
		S/FTP - 4 pairs
		Performance 600 MHz
500¹	0 327 77	Length 500 m
		Supplied on reel. Weight 30 kg

1: in metre(s)

Pack	Cat.Nos	**RJ 45 patch cords and user cords cat. 6A**
		RJ 45 - RJ 45 right
		Conform to standards ISO/IEC 11801
	PVC	Ed. 2.0, EN 50173-1 and TIA/EIA 568C
		U/UTP unscreened impedance 100 Ω
1	0 518 82	Length 1 m
1	0 518 83	Length 2 m
1	0 518 84	Length 3 m
1	0 518 85	Length 5 m
	LSZH	
1	0 518 78	Length 1 m
1	0 518 79	Length 2 m
1	0 518 80	Length 3 m
1	0 518 81	Length 5 m
1	0 518 74	Length 1 m
1	0 518 75	Length 2 m
1	0 518 76	Length 3 m
1	0 518 77	Length 5 m
	PVC	**S/FTP shielded impedance 100 Ω**
1	0 518 16	Length 0.5 m
5	0 517 80	Length 1 m
5	0 517 81	Length 2 m
5	0 517 82	Length 3 m
5	0 517 83	Length 5 m
	LSZH	
1	0 518 70	Length 1 m
1	0 518 71	Length 2 m
1	0 518 72	Length 3 m
1	0 518 73	Length 5 m
1	0 518 66	Length 1 m
1	0 518 67	Length 2 m
1	0 518 68	Length 3 m
1	0 518 69	Length 5 m

0 335 49

0 335 40

0 335 40 fitted with SC fibre optic unit, accessory Cat.No 0 335 20 and a 6 x RJ 45 connector unit

RJ 45   RJ 45
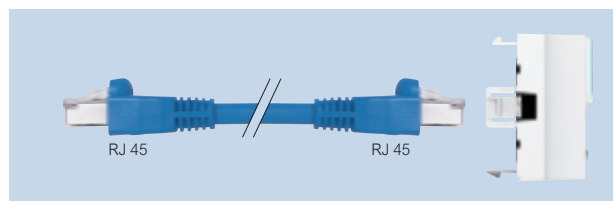
Connection principle
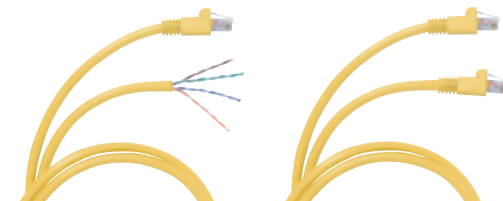
0 517 86

0 515 23

Pack	Cat.Nos	**Area distribution boxes**
		For distribution of low current in a zone fitted with 1 to 12 RJ 45 sockets
		Centralise connections to guarantee flexibility and adaptability of the installation
		Installed on false ceiling or false floor
		Connect to the patch panel or the floor cabinet
		Connection to an RJ 45 socket with stripped cord or to a Mosaic RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord
		IP 21 - IK 07
		Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568
		Colour code TIA/EIA 568 A and C
		Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568
		Technical characteristics:
		- polycarbonate PC hood
		- polypropylene PP base
		- RAL 7035
		- hold connector units in place in the box: 100 N
		- Cables anchored on support using Colring cable ties
		Area distribution boxes cat. 6A
1	0 335 49	STP
		Fitted with 2 x 6 LCS² RJ 45 cat. 6A connector blocks and RJ 45 blanking plates
		Supplied with Colring cable ties
		Self-assembly area distribution box for cat. 6A
1	0 335 40	Used for mounting LCS² RJ 45 connector blocks cat. 6A (p. 90)

Pack	Cat.Nos	**Cords cat. 6A - RJ 45/stripped**
		RJ 45 - straight stripped
		Clip on and off in the area distribution boxes and connection via LCS² connector of an RJ 45 socket by the stripped side
		Cords prepared in factory, "ready for wiring"
		Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568 C2
		Yellow RAL 1018
		S/FTP unscreened impedance 100 Ω
1	0 517 86	Length 8 m
1	0 517 87	Length 15 m
1	0 517 88	Length 20 m

Pack	Cat.Nos	**Cords cat. 6A - RJ 45/RJ 45**
		For direct connection via RJ 45 male plug to the area distribution box and to the RJ 45 socket with copper feedthrough to ensure:
		- safe connection
		- speed and reliability of connection
		Yellow RAL 1018
		S/FTP unscreened impedance 100 Ω
4	0 515 23	Length 8 m
4	0 515 24	Length 15 m
4	0 515 25	Length 20 m

| 0 765 73 | 0 765 76 | 0 794 76 | 0 765 24 | 0 765 25 | 0 765 99 | 6 327 79 |

Can be integrated in all supports (see Legrand general catalog)
Mechanisms to be equipped with support frames (see Legrand general catalog) and plates (see Legrand general catalog)
With LCS² connector with fast connection thanks to integrated crimping take AWG 22 single-core cables up to AWG 26 and AWG multicore cables
Contacts marked with dual colour code and wiring schemes T568 A and T 568 B
Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-1 and TIA/EIA 568 C

Pack	Cat.Nos	**Mosaic Programme RJ 45 sockets cat. 6A**
		STP - 1 module
		360° metal shielding
10	0 765 73	○ White
10	0 765 84	○ White antimicrobial
10	0 794 73	● Aluminium
		STP - 2 modules
		360° metal shielding
10	0 765 76	○ White
10	0 794 76	● Aluminium
10	0 765 24	○ White with green shutter
10	0 765 25	○ White with orange shutter
10	0 765 08	○ White
		STP with controlled access - 2 modules
		360° metal shielding
		Supplied with 2 keys for 5 sockets
5	0 765 99	○ White with red shutter
		UTP - 1 module
10	0 765 71	○ White
10	0 794 71	● Aluminium
10	0 765 26	○ White with green shutter
10	0 765 27	○ White with orange shutter
		UTP - 2 modules
10	0 765 74	○ White
10	0 794 74	● Aluminium
		UTP with controlled access - 2 modules
		Supplied with 2 keys for 5 sockets
5	0 765 90	○ White with red shutter
10	0 765 09	○ White

Pack	Cat.Nos	**Keystone RJ 45 sockets cat. 6A**
10	0 331 54	STP socket - metal shielding 360° with fast connection thanks to integrated crimping
10	0 331 55	UTP socket - with fast connection thanks to integrated crimping
		Surface-mounting 1 or 2 ports box
1	6 327 79	For keystone connectors
		Provides a solution for the integration of a keystone in surface-mounting installations
		Can be fixed on table or in association with mini-trunking

Legrand cabling system LCS² category 6

patch panels, blocks of connectors

0 335 62

0 335 89
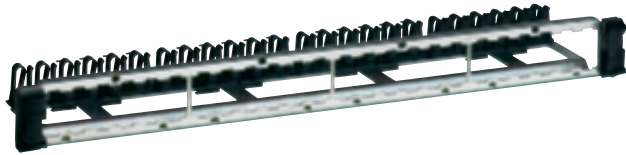
0 335 90

0 335 65

Cat. 6 connector
STP shielded

Pack	Cat.Nos	**Patch panels cat. 6** **24 x RJ 45 quick-fixing connectors**
		Patch panels Panels supplied with quick-fixing Panels ensure automatic grounding of each connector Fitted with rear cable guide to hold cables during maintenance Fitted with 4 units of 6 LCS² RJ 45 connectors cat. 6 with fast connection thanks to integrated crimping, with colour code and wiring schemes T 568 A and T 568 B Supplied with numbered colour labels Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-2 and TIA/EIA 568C 19" panel - 1 U
1	0 335 61	UTP panel - 8 contacts
1	0 335 67	UTP high density panel - 8 contacts
1	0 335 62	FTP panel - 9 contacts
1	0 335 68	FTP high density panel - 9 contacts
1	0 335 63	STP panel - metal shielding 360°
		UTP through panel 24 x RJ 45 connectors
1	0 335 89	UTP through panel

Pack	Cat.Nos	**Modular panels**
		Panels supplied with quick-fixing General all-purpose assembly of all enclosures or cabinets Panels ensure automatic earthing of each connector Fitted with rear cable guide to hold cables during maintenance Empty panels to be fitted with 4 units Take the following equipment: - 6 LCS² RJ 45 connector units - telephone inlet units - fibre optic units - PoE injector units - video streaming units - switch units - telephone/Ethernet doubler units - copper/fibre optic converter units - blanking plates
1	0 335 90	19" panel - 1 U

Pack	Cat.Nos	**Units of 6 x RJ 45 connectors cat. 6**
		Fitted with 6 x LCS² RJ 45 connectors cat. 6 with fast connection thanks to integrated crimping, with colour code and wiring schemes T 568 A and T 568 B Supplied with colour labels Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568
2	0 335 64	UTP unit - 8 contacts
2	0 335 65	FTP unit - 9 contacts
2	0 335 66	STP unit - metal shielding 360°
10	0 335 91	Blanking plate for 19" panel - Black

Legrand cabling system LCS² category 6

cables and cords
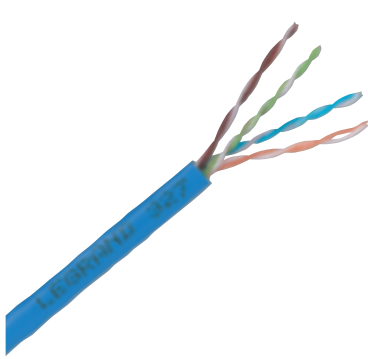
0 327 54

0 517 62

New plug
Convenient for gripping

Cables for local networks cat. 6

Cables 4 pairs or 2 x 4 twisted pairs
100 ohms
Blue RAL 5015
Colour code TIA/EIA
Conform to standards ISO/IEC 11801
Ed. 2.0, EN 50173-1 and TIA/EIA 568C

Pack	Cat.Nos LSZH	Cat.Nos PVC	
			U/UTP - 4 pairs
305¹	0 327 54		Length 305 m Supplied in cardboard box. Weight 16 kg
500¹	0 328 61		Length 500 m Supplied on reel. Weight 18 kg
305¹		0 327 55	Length 305m Supplied in cardboard box. Weight 13 kg
			U/UTP - 2 x 4 pairs
500¹	0 328 63		Length 500 m Supplied in cardboard box. Weight 38 kg
			F/UTP - 4 pairs
305¹	0 328 56		Length 305 m Supplied on reel. Weight 17 kg
500¹	0 327 56		Length 500 m Supplied on reel. Weight 25 kg
			F/UTP - 4 pairs
305¹		0 328 57	Length 305 m Supplied in cardboard box. Weight 17 kg
500¹		0 327 58	Length 500 m Supplied on reel. Weight 25 kg
			F/UTP - 2 x 4 pairs
500¹	0 327 76		Length 500 m Supplied on reel. Weight 48 kg
			SF/UTP - 4 pairs
500¹	0 327 57		Length 500 m Supplied on reel. Weight 29 kg
500¹		0 327 59	Length 500 m Supplied on reel. Weight 30 kg

1: in meter(s)

RJ 45 patch cords and user cords cat. 6

RJ 45 - RJ 45 right

U/UTP unscreened impedance 100 Ω

Pack	Cat.Nos PVC			
1		0 518 18		Length 0.5 m
1		0 517 72		Length 1 m
1		0 517 73		Length 2 m
1		0 517 74		Length 3 m
1		0 517 75		Length 5 m

Pack	Cat.Nos LSZH (red)	LSZH (green)	
1	0 518 62	0 518 58	Length 1 m
1	0 518 63	0 518 59	Length 2 m
1	0 518 64	0 518 60	Length 3 m
1	0 518 65	0 518 61	Length 5 m

F/UTP screened impedance 100 Ω

Pack	Cat.Nos PVC	
1	0 518 15	Length 0.5 m
1	0 517 62	Length 1 m
1	0 517 63	Length 2 m
1	0 517 64	Length 3 m
1	0 517 65	Length 5 m

Pack	Cat.Nos LSZH (red)	LSZH (green)	
1	0 518 54	0 518 50	Length 1 m
1	0 518 55	0 518 51	Length 2 m
1	0 518 56	0 518 52	Length 3 m
1	0 518 57	0 518 53	Length 5 m

SF/UTP shielded impedance 100 Ω

Pack	Cat.Nos PVC	
5	0 517 52	Length 1 m
5	0 517 53	Length 2 m
5	0 517 54	Length 3 m
5	0 517 55	Length 5 m

0 335 40

0 335 40 fitted with SC fibre optic unit, accessory
Cat.No 0 335 20 and a 6 x RJ 45 connector unit

RJ 45   RJ 45
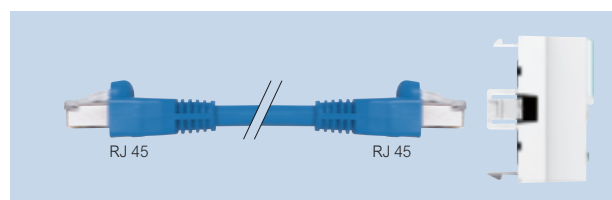
Connection principle
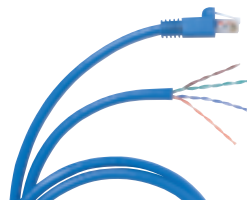
0 517 57

Pack	Cat.Nos	**Area distribution boxes**
		For distribution of low current in a zone fitted with 1 to 12 RJ 45 sockets
		Centralise connections to guarantee flexibility and adaptability of the installation
		Installed on false ceiling or false floor
		Connect to the patch panel or the floor cabinet
		Connection to an RJ 45 socket with stripped cord or to a Mosaic RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord
		IP 21 - IK 07
		Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568
		Colour code TIA/EIA 568 A and C
		Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568
		Technical characteristics:
		- polycarbonate PC hood
		- polypropylene PP base
		- RAL 7035
		- hold connector units in place in the box: 100 N
		- Cables anchored on support using Colring cable ties
		Area distribution boxes cat. 6
		Fitted with 2 x 6 LCS² connector blocks
		RJ 45 cat. 6 and RJ 45 blanking plates
		Supplied with Colring cable ties
1	0 335 44	UTP
1	0 335 45	FTP
1	0 335 46	STP
		Self-assembly area distribution box for cat. 6
1	0 335 40	Used for mounting LCS² RJ 45 connector blocks cat. 6 (p. 94)

Pack	Cat.Nos	**Cords cat. 6 - RJ 45/stripped AWG 24**
		RJ 45 - straight stripped
		Clip on and off in the area distribution boxes and connection via LCS² connector of an RJ 45 socket by the stripped side
		Cords prepared in factory, "ready for wiring"
		Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568
		Blue RAL 5015
		Wiring in T 568 B
		U/UTP unscreened impedance 100 Ω
4	0 517 57	Length 8 m
4	0 517 58	Length 15 m
4	0 517 59	Length 20 m
		F/UTP screened impedance 100 Ω
4	0 517 96	Length 8 m
1	0 517 97	Length 15 m
4	0 517 98	Length 20 m

Pack	Cat.Nos	**Cords cat. 6 - RJ 45/RJ 45**
		For direct connection via RJ 45 male plug to the zone distribution box and to the RJ 45 socket with copper feedthrough to ensure:
		- safe connection
		- speed and reliability of connection
		Blue RAL 5015
		U/UTP unscreened impedance 100 Ω
4	0 515 10	Length 8 m
4	0 515 11	Length 15 m
4	0 515 12	Length 20 m
		F/UTP screened impedance 100 Ω
4	0 515 13	Length 8 m
4	0 515 14	Length 15 m
4	0 515 15	Length 20 m

Legrand cabling system LCS²

feedthrough sockets - Mosaic™ Programme and Arteor

0 786 28   0 786 25

Certified as conforming to standards ISO 11801 ed. 2.0, EN 50173-1 and EIA/TIA 568
Contacts marked with 568 A and B dual colour code and numbers
Connectors with self-stripping terminals
Possibility of re-wiring in the event of error
Multidirectionnal cable entry
For use with area distribution boxes (see opposite), connection to boxes via RJ 45-RJ 45 dedicated cords
Used to create cat. 6A, cat. 6 and cat. 5e links in accordance with standards
2 modules

Pack	Cat.Nos	Sockets with copper feedthrough cat. 6A
		Cat. 6A STP - Mosaic Programme
10	0 786 28	○ White
10	0 786 29	● Aluminium
		Sockets with copper feedthrough cat. 6
		Cat. 6 UTP - Mosaic Programme
10	0 786 22	○ White
10	0 786 26	● Aluminium
		Cat. 6 FTP - Mosaic Programme
10	0 786 23	○ White
10	0 786 27	● Aluminium
		Cat. 6 UTP - Arteor
10	5 723 31	○ White
10	5 728 31	● Magnesium
		Cat. 6 FTP - Arteor
10	5 723 33	○ White
10	5 728 33	● Magnesium
		Sockets with copper feedthrough cat. 5e
		Cat. 5e UTP - Mosaic Programme
10	0 786 20	○ White
10	0 786 24	● Aluminium
		Cat. 5e FTP - Mosaic Programme
10	0 786 21	○ White
10	0 786 25	● Aluminium
		Cat. 5e UTP - Arteor
10	5 723 30	○ White
10	5 728 30	● Magnesium
		Cat. 5e FTP - Arteor
10	5 723 32	○ White
10	5 728 32	● Magnesium

NEW LCS PRO² SOFTWARE

Your
LCS² cabinet
in a few clicks

Select your products and visualise your cabinet simply and quickly with the new LCS Pro2 software...
and complete your study with Chantier Chrono software which integrates trunking, columns, floor and feeder boxes
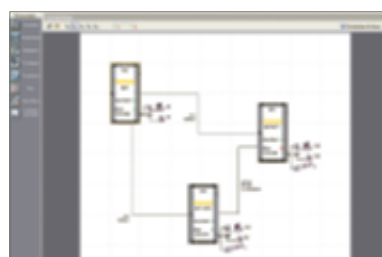
■ LCS Pro² allows you **to automatically find** Cat.Nos by selecting characteristics and options

■ LCS Pro² lets you **visualise the cabinet installation** and amend it if required

■ LCS Pro² allows you to **easily manage your projects:** technical summaries, purchase orders, document printing

In addition to LCS Pro², Chantier Chrono extends the selection to trunking, columns, floor and feeder boxes

Legrand cabling system LCS² category 6

RJ 45 sockets – Mosaic™ Programme

0 765 63 0 765 96 0 794 33

Can be integrated in all supports (see Legrand general catalog)
Mechanisms to be equipped with support frames (see Legrand general catalog) and plates (see Legrand general catalog)
With LCS² connector with fast connection thanks to integrated crimping take AWG 22 single-core cables up to AWG 26 and AWG multicore cables
Contacts marked with dual colour code and wiring schemes T568 A and T 568 B
Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-1 and TIA/EIA 568 C

Pack	Cat.Nos	Mosaic Programme RJ 45 sockets cat. 6
		UTP - 1 module
10	0 765 61	○ White
10	0 794 61	● Aluminium
10	0 765 81	○ White antimicrobial
		UTP - 2 modules
10	0 765 64	○ White
10	0 794 64	● Aluminium
		UTP with controlled access - 2 modules Supplied with 2 keys for 5 sockets
5	0 765 94	○ White with red shutter
		UTP 90° - 2 modules Vertical snap-on socket for column module
10	0 765 91	○ White
		UTP 45° - 2 modules
10	0 765 03	○ White
		UTP 45° - 2 x RJ 45 - 2 modules
5	0 765 04	○ White
		UTP retractable RJ 45 socket - 4 modules With integrated retractable cord (0.9 m) Winds up automatically with a pushbutton
1	0 765 32	○ White
		UTP - 1 module
10	0 794 81	● Black
		UTP 2 x RJ 45 with Soluclip accessory - 3 modules For snap-on mounting on DLP trunking with 45 mm cover
5	0 765 44	○ White
		FTP - 1 module
10	0 765 62	○ White
10	0 794 62	● Aluminium
10	0 765 82	○ White antimicrobial
		FTP - 2 modules
10	0 765 65	○ White
10	0 794 65	● Aluminium
10	0 765 22	○ White with green shutter
10	0 765 23	○ White with orange shutter
		FTP - 2 modules For snap-on mounting on trunking with 45 mm cover
5	0 765 46	○ White
10	0 794 85	● Black

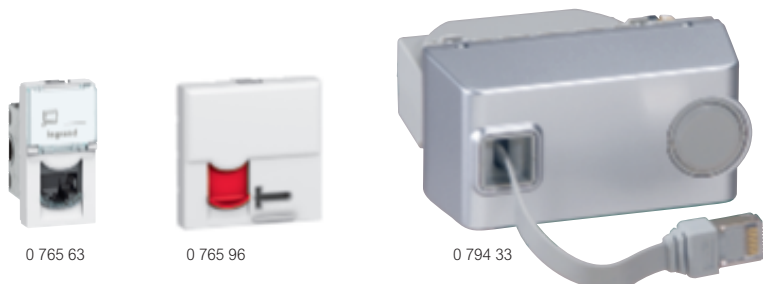| Pack	Cat.Nos	Mosaic Programme RJ 45 sockets cat. 6 (continued)
		FTP with controlled access - 2 modules Supplied with 2 keys for 5 sockets
5	0 765 95	○ White with red shutter
		FTP 45° - 2 modules
10	0 765 05	○ White
		FTP 2 x RJ 45 45° - 2 modules
5	0 765 06	○ White
		FTP retractable RJ 45 sockets - 4 modules With integrated retractable cord (0.9 m) Winds up automatically with a pushbutton
1	0 765 33	○ White
1	0 794 33	● Aluminium
		FTP 90° - 2 modules Vertical snap-on socket for column module
10	0 765 92	○ White
10	0 794 92	● Aluminium
		Shielded STP - 1 module
10	0 765 63	○ White
10	0 765 83	○ White antimicrobial
		Shielded STP - 2 modules
10	0 765 66	○ White
		STP - 2 modules
10	0 794 86	● Black
		Shielded STP with controlled access - 2 modules Supplied with 2 keys for 5 sockets
5	0 765 96	○ White with red shutter
		STP 45° - 2 modules Vertical snap-on socket for column module
10	0 765 07	○ White
		Shielded STP 90° - 2 modules Vertical snap-on socket for column module
10	0 765 93	○ White

Legrand cabling system LCS² category 6

RJ 45 sockets - Arteor, Soliroc and Plexo

5 728 02   5 728 16   6 327 79   0 695 69

Can be integrated in all supports (see Legrand general catalog)
With LCS² connector with fast connection thanks to integrated crimping take AWG 22 single-core cables up to AWG 26 and AWG multicore cables
Contacts marked with dual colour code and wiring schemes T568 A and T 568 B
Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-1 and TIA/EIA 568 C

Pack	Cat.Nos	**Arteor RJ 45 sockets cat. 6**
		Mechanisms supplied with square rocker plates, to be equipped with support frames (see Legrand general catalog) and plates (see Legrand general catalog)
		UTP - 1 module
10	5 723 02	○ White
10	5 728 02	● Magnesium
10	5 723 54	○ White with orange shutter
10	5 728 54	● Magnesium with orange shutter
10	5 723 55	○ White with green shutter
10	5 728 55	● Magnesium with green shutter
		UTP - 2 modules
10	5 723 14	○ White - square version
10	5 728 14	● Magnesium - square version
		UTP with controlled access - 2 modules
		Supplied with 2 keys for 5 sockets
5	5 723 53	○ White with red shutter
5	5 728 53	● Magnesium with red shutter
		UTP retractable RJ 45 sockets - 4 modules
		With integrated retractable cord (0.9 m) Winds up automatically with a pushbutton
1	5 723 39	○ White
1	5 728 39	● Magnesium
		FTP - 1 module
10	5 723 22	○ White
10	5 728 22	● Magnesium
		FTP - 2 modules
10	5 723 16	○ White
10	5 728 16	● Magnesium
		Shielded STP - 1 module
10	5 723 23	○ White
10	5 728 23	● Magnesium
		Shielded STP - 2 modules
10	5 723 17	○ White
10	5 728 17	● Magnesium

Pack	Cat.Nos	**Keystone RJ 45 socket cat. 6**
10	0 331 81	UTP socket with fast connection
		Surface-mounting 1 or 2 ports box
1	6 327 79	For keystone connectors Provides a solution for the integration of a keystone in surface-mounting installations Can be fixed on table or in association with mini-trunking
		Soliroc RJ 45 socket cat. 6 - IK 10
		FTP - 2 modules
1	0 778 91	IP 20 - IK 10 For at-risk areas or areas with no surveillance
		Plexo RJ 45 sockets cat. 6 - IP 55 closed flap IK 07
		RJ 45 sockets
		Protection against water, dust For industrial sites
5	0 695 69	◐ Grey/white FTP socket
1	0 695 61	◐ Grey/white UTP socket
		Adaptor for RJ 45 socket
1	0 695 81	RJ 45 to be ordered separately Weatherproofing ensured (IP 44) plug inserted ◐ Grey/white
		Plexo 66 RJ 45 socket cat. 6 - IP 66 - IK 08
		FTP socket
1	0 904 67	9 contacts Weatherproofing ensured (IP 66) with plug inserted Inclined 90° ● Grey RAL 7016/T029

Arteor and Mosaic Programme
audio/video sockets **p. 140**

Legrand cabling system LCS² category 5e

patch panels, blocks of connectors

Legrand cabling system LCS² category 5e

cables and cords

0 335 52

0 335 90

0 328 50

0 516 40
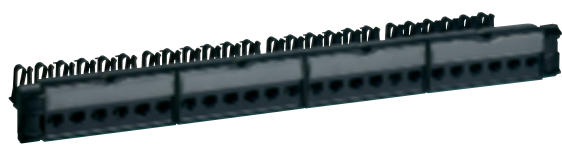
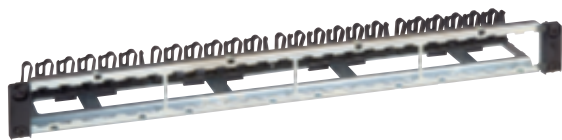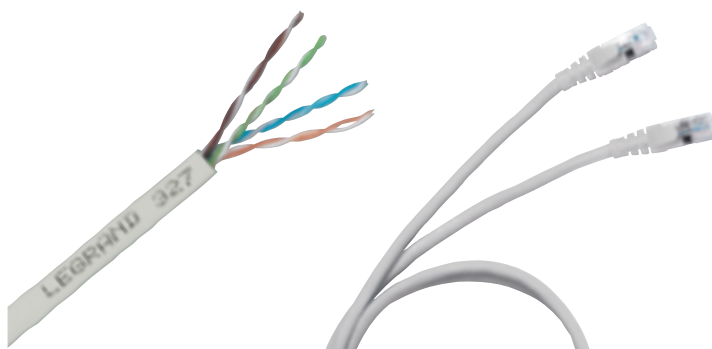| Pack	Cat.Nos	Patch panels cat. 5e 24 x RJ 45 connectors
		Panels supplied with quick-fixing
		Panels ensure automatic grounding of each connector
		Fitted with rear cable guide to hold cables during maintenance
		Fitted with 4 units of 6 LCS² RJ 45 connectors cat 5e with fast connection thanks to integrated crimping, with colour code and wiring schemes T 568 A and T 568 B
		Supplied with colour labels numbered from 1 to 24
		Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568
		19" panel - 1 U
		UTP panel
1	0 335 51	UTP panel - 8 contacts
1	0 335 83	UTP high density panel - 8 contacts - connection with 110 tool
		FTP panel
1	0 335 52	FTP panel - 9 contacts
		UTP through panel
		24 RJ 45 connectors
1	0 335 88	UTP through panel

Pack	Cat.Nos	Modular panels
		Panels supplied with fast assembly
		Panels ensure automatic grounding of each connector
		Fitted with rear cable guide to hold cables during maintenance
		Modular empty panels for up to 4 units
		Takes the following equipment:
		- units of 6 LCS² RJ 45 connectors
		- units for telephone inlets
		- fibre optic units
		- PoE injector units
		- video streaming units
		- switch units
		- telephone/Ethernet doubler units
		- copper/fibre optic converter units
		- blanking plates
1	0 335 90	19" panel - 1 U

Pack	Cat.Nos	Units of 6 x RJ 45 connectors cat. 5e
		Fitted with 6 x LCS² RJ 45 connectors cat. 5e with fast connection thanks to integrated crimping, with colour code and wiring schemes T 568 A and T 568 B
		Supplied with colour labels
		Conforms to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568
2	0 335 54	UTP unit
2	0 335 55	FTP unit
10	0 335 91	Blanking plate for 19" panel - Black

Cables for local networks cat. 5e

4 twisted pair cables 100 ohms
LSZH sleeve: non-halogen
Grey RAL 7035
Colour code TIA/EIA

Pack	LSZH	PVC	
			U/UTP - 4 pairs
305¹	0 327 50		Length 305m Supplied in cardboard box. Weight 10 kg
500¹	0 328 53		Length 500 m Supplied on reel. Weight 15 kg
305¹		0 327 51	Length 305m Supplied in cardboard box. Weight 9 kg
			U/UTP - 2 x 4 pairs
500¹		0 327 73	Length 500 m Supplied on reel
			F/UTP - 4 pairs
305¹	0 327 52		Length 305 m Supplied in cardboard box. Weight 12 kg
500¹	0 328 50		Length 500 m Supplied on reel. Weight 21 kg
305¹		0 327 53	Length 305 m Supplied by box. Weight 11 kg
			F/UTP - 2x4 pairs
500¹	0 327 74		Length 500 m Supplied on reel. Weight 38 kg

RJ 45 patch cords and user cords cat. 5e

RJ 45 - RJ 45 right

U/UTP unscreened impedance 100 Ω

Pack	PVC	Grey
1	0 518 17	Length 0.5 m
1	0 516 36	Length 1 m
1	0 516 37	Length 2 m
1	0 516 38	Length 3 m
1	0 516 39	Length 5 m

F/UTP screened impedance 100 Ω

		Grey
1	0 518 14	Length 0.5 m
1	0 516 40	Length 1 m
1	0 516 41	Length 2 m
1	0 516 42	Length 3 m
1	0 516 43	Length 5 m

Legrand cabling system LCS² category 5e

aera distribution boxes and cords

0 335 40
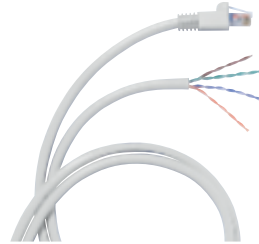
0 517 90

0 515 03

Pack	Cat.Nos	
		Area distribution boxes
		For distribution of low current in a zone fitted with 1 to 12 RJ 45 sockets
		Centralise connections to guarantee flexibility and adaptability of the installation
		Installed on false ceiling or false floor
		Connect to the patch panel or the floor cabinet
		Connection to an RJ 45 socket with stripped cord or to a Mosaic RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord
		IP 21 - IK 07
		Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568
		Colour code TIA/EIA 568 A and C
		Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568
		Technical characteristics:
		- polycarbonate PC hood
		- polypropylene PP base
		- RAL 7035
		- hold connector units in place in the box: 100 N
		- Cables anchored on support using Colring cable ties
		Self-assembly area distribution box for cat. 5e
1	0 335 40	Used for mounting LCS² RJ 45 connector blocks cat. 5e (p. 100)

Pack	Cat.Nos	
		Cords cat. 5e - RJ 45/stripped
		RJ 45 - straight stripped
		Clip on and off in the area distribution boxes and RJ 45 socket connection via LCS² connector via the stripped side.Cords prepared in factory, "ready for wiring". Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568
		Grey RAL 7035. Wiring in T 568 B
		U/UTP unscreened impedance 100 Ω
4	0 517 90	Length 8 m
4	0 517 91	Length 15 m
4	0 517 92	Length 20 m
		F/UTP screened impedance 100 Ω
4	0 517 93	Length 8 m
4	0 517 94	Length 15 m
4	0 517 95	Length 20 m
		Cords cat. 5e - RJ 45/RJ 45
		For direct connection via RJ 45 male plug to the area distribution box and to the RJ 45 socket with copper feedthrough to ensure:
		- safe connection
		- speed and reliability of connection
		Grey RAL 7035
		U/UTP unscreened impedance 100 Ω
4	0 515 00	Length 8 m
4	0 515 01	Length 15 m
4	0 515 02	Length 20 m
		F/UTP unscreened impedance 100 Ω
4	0 515 03	Length 8 m
4	0 515 04	Length 15 m
4	0 515 05	Length 20 m

Legrand cabling system LCS² category 5e

RJ 45 sockets - Mosaic™ Programme, Arteor and Plexo

0 765 52   6 327 79   0 695 57

Can be integrated in all supports (see Legrand general catalog)
With LCS² connector with fast connection thanks to integrated crimping Take AWG 22 single-core cables up to AWG 26 and AWG multicore cables
Contacts marked with dual colour code and wiring schemes T568 A and T 568 B
Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-1 and TIA/EIA 568 C

Pack	Cat.Nos	**Mosaic Programme RJ 45 sockets cat. 5e**
		Mechanisms to be equipped with support frames (see Legrand general catalog) and plates (see Legrand general catalog)
		UTP - 1 module
10	0 765 51	○ White
10	0 794 51	● Aluminium
		UTP - 2 modules
10	0 765 54	○ White
10	0 794 54	● Aluminium
		UTP with controlled access - 2 modules
		Supplied with 2 keys for 5 sockets
5	0 765 97	○ White with red shutter
		UTP - 2 x RJ 45 with Soluclip accessory - 3 modules
		For snap-on mounting on DLP trunking with 45 mm cover
5	0 765 41	○ White
		UTP retractable RJ 45 socket - 4 modules
		With integrated retractable cord (0.9 m) Winds up automatically with a pushbutton
1	0 765 30	○ White
		UTP 45° - 2 modules
10	0 765 01	○ White
		2 x RJ 45 UTP 45° - 2 modules
5	0 765 02	○ White
		FTP - 1 module
10	0 765 52	○ White
10	0 794 52	● Aluminium
		FTP - 2 modules
10	0 765 55	○ White
10	0 794 55	● Aluminium
		FTP with controlled access - 2 modules
		Supplied with 2 keys for 5 sockets
5	0 765 98	○ White with red shutter
		FTP - 2 x RJ 45 with Soluclip accessory - 3 modules
		For snap-on mounting on Mosaic trunking with 45 mm cover
5	0 765 42	○ White

Pack	Cat.Nos	**Arteor RJ 45 sockets cat. 5e**
		Mechanisms supplied with square rocker plates, to be equipped with support frames (see Legrand general catalog) and plates (see Legrand general catalog)
		UTP - 1 module
10	5 723 03	○ White
10	5 728 03	● Aluminium
		UTP - 2 modules
10	5 723 15	○ White
10	5 728 15	● Aluminium
		FTP - 1 module
10	5 723 04	○ White
10	5 728 04	● Aluminium

Pack	Cat.Nos	**Keystone RJ 45 socket cat. 5e**
		UTP socket
10	0 331 80	With fast crimping connection

Pack	Cat.Nos	**Surface-mounting 1 or 2 ports box**
1	6 327 79	For keystone connectors Provides a solution for the integration of a keystone in surface-mounting installations Can be fixed on table or in association with mini-trunking

Pack	Cat.Nos	**Plexo RJ 45 sockets, cat. 5e - IP 55 closed flap IK 07**
		RJ 45 sockets
		Protection against water, dust For industrial sites
1	0 695 57	◐ Grey/White FTP socket
1	0 695 56	◐ Grey/White UTP socket
		Adaptor for RJ 45 socket
1	0 695 81	RJ 45 to be ordered separately Weatherproofing ensured (IP 44) plug inserted ○ Grey/white

Arteor and Mosaic Programme audio/video sockets **p. 140-141**

Legrand cabling system LCS²

LCS² system additional products cat. 6$_A$, LCS² cat. 6, LCS² cat. 5e

0 335 39

0 335 34

0 335 12

0 335 16

0 334 75

0 335 02

0 335 01

Pack	Cat.Nos	Modular panels
		Panels supplied with captive screws and cage nuts or with quick fixing. Universal mounting for all freestanding or wall-mounted cabinets. Panels ensure automatic earthing of each connector. Fitted with rear cable guide to hold cables in place during maintenance
		Modular empty panels for up to 4 units
		Take the following equipment:
		- units of 6 x LCS² RJ 45 connectors
		- telephone inlet units
		- fibre optic units
		- PoE injector units
		- video streaming units
		- switch units
		- telephone/Ethernet doubler units
		- copper/fibre optic converter units
		- blanking plates
1	0 335 90	19" panel - 1 U

Pack	Cat.Nos	Doubler units
		Units of 6 x LCS² RJ 45 doubler connectors for fast tool-free connection. Used with doubler sockets (p. 104)
2	0 335 54	UTP unit
2	0 335 55	FTP unit
10	0 335 91	Blanking plate for 19" panel - Black
		Ethernet/Ethernet doublers 100 base T
1	0 335 39	FTP - 9 contacts
1	0 335 38	UTP - 8 contacts
		Telephone/Ethernet doublers 100 base T
1	0 335 37	FTP - 9 contacts
1	0 335 36	UTP - 8 contacts
		Telephone/telephone doubler
1	0 335 35	45 contacts

Pack	Cat.Nos	Video streaming unit
1	0 335 34	Unit of 6 "F" connectors for video circuits

Pack	Cat.Nos	Copper/fibre optic converter units
		Simply and quickly permit copper to fibre conversion and vice versa
		Clip directly onto the patch panels
		Fitted with an SC type fibre optic connector
1	0 335 06	10/100 base T to 10/100 base FX type SC
1	0 335 07	1000 base T to 1000 base SX type SC

Pack	Cat.Nos	Fibre optic units
		Clip directly onto fibre optic enclosure Cat.No 0 335 10 (p. 109), on the patch panels with fibre optic cassette Cat.No 0 335 11 (p. 109) or in the zone distribution boxes with fibre optic accessory Cat.No 0 335 20 (p. 111)
		Singlemode fibre units (9/125 µm)
1	0 335 13	LC unit for 6 singlemode fibres
1	0 335 12	SC unit for 6 singlemode fibres
		Multimode fibre units (62.5 and 50/125 µm)
1	0 335 16	ST unit for 6 multimode fibres
1	0 335 17	SC unit for 6 multimode fibres
1	0 335 18	LC unit for 6 multimode fibres
1	0 335 19	High-density LC unit for 12 multimode fibres

Pack	Cat.Nos	Controlled access units
		Solution for making an RJ 45 passive connection on sensitive networks secure. A cord can be locked/ unlocked using the unlocking tool. Suitable for all 19" patch panels in the LCS² Legrand cabling system range, cat. 5e, cat. 6 and cat. 6$_A$ Compatible with the cords in the LCS² Legrand cabling system range, cat. 5e, cat. 6 and cat. 6$_A$
		Controlled access units
		Unlocking tool not supplied
2	0 334 71	Black shutter
2	0 334 72	Blue shutter
2	0 334 73	Red shutter
2	0 334 74	Orange shutter
2	0 334 75	Green shutter
		Unlocking tool for controlled access units
5	0 334 70	Unlocking tool

Pack	Cat.Nos	Blanking plates
		Set of 12 blanking plugs for RJ 45 LCS² connector
10	0 517 40	White
10	0 517 41	Black
		Blanking plate for 19" panel
10	0 335 91	Black

Pack	Cat.Nos	Ethernet switches 100 Mbps
		Mounted in the patch panel
		Conform with standards IEEE 802-3, EN 500 81-1 and EN 500 82-1 (Conformity with EMC requirements)
		Switch units for patch panel
		Clip directly onto the patch panels
1	0 335 02	7 RJ 45 ports at the front, 1 of which is a cascade port
		Power supply with transformer provided
1	0 335 05	6 RJ 45 ports + 1 LC type optic port with front-mounted cascade 100 base FX type LC
		Power supply via transformer provided
		PoE switch
		For distribution over 4 RJ 45 outputs of data and PoE (65 W) for devices (Wi-Fi access points, IP cameras, etc.)
		Supplied with power supply and DIN rail fixing accessory
		Dim. : 135 x 27 x 86 mm
1	0 335 08	Gigabit 5-port PoE switch
1	0 335 03	10/100Mbps 5-port PoE switch

Pack	Cat.Nos	Midspan Power over Ethernet (PoE) injectors
1	0 335 01	4 inlets/outlets
		Used for supplying 4 Wi-Fi access points
		Clips directly onto a patch panel
1	0 327 37	1 inlet/outlet
		Used for supplying a Wi-Fi access point
		Direct connection to the patch panel

JANUARY 2017

0 539 49 | 0 533 00 in position (no cord supplied) | 0 533 01 | 0 327 60 | 0 517 09

Reinforced protection

RJ 45 doubler sockets

Pack	Cat.Nos	
	Mosaic	**Ethernet/Ethernet**
10	0 765 39	FTP - 9 contacts
10	0 765 38	UTP - 8 contacts
	Mosaic	**Telephone/Ethernet**
10	0 765 37	FTP - 9 contacts
	Arteor	
10	5 723 36	FTP - 9 contacts ○ White
10	5 728 36	FTP - 9 contacts ● Magnesium
	Mosaic	
10	0 765 36	UTP - 8 contacts
	Arteor	
10	5 723 35	UTP - 8 contacts ○ White
10	5 728 35	UTP - 8 contacts ● Magnesium
	Mosaic	**Telephone/telephone**
10	0 765 35	45 contacts

Mobile doublers

Pack	Cat.Nos	
		Clip into RJ 45 sockets to double applications
10	0 327 83	TV/computer network or telephone double connector
10	0 327 47	Telephone/telephone doubler
10	0 327 45	Computer network/telephone doubler
10	0 327 46	L1/L2 telephone doubler
10	0 327 48	Computer network/computer network double connector

Weatherproof adaptors

Pack	Cat.Nos	
		IP 55 - IK 07 Allow all functions to be adapted 2 Mosaic modules IP 55 operation
	Grey/White	
10	0 695 80	Adaptor with smoked flap
1	0 695 79	Adaptor with smoked flap lockable by special tool
1	0 695 81	Adaptor for RJ socket ensuring IP 44 waterproofness cable already connected
1	0 919 45	Locking tool (used for changing vandal-proof screws)
		Soliroc adaptor Used for adapting all functions 2 Mosaic modules IK 10 - IP 55
1	0 778 80	Adaptor with flap
1	0 778 81	Adaptor without flap
		Hypra adaptor
5	0 539 49	IP 55 adaptor base

Cable protection accessories

Pack	Cat.Nos	
		Plastic material IP 66/67 guaranteed connection with the pair Cat.No 0 533 02 IP 55 with no connection for base with shutter Protection for RJ 45 shielded or unshielded cables ensuring a link of category 5 Conform to standards of the IEC 60603-7 series and to standard IEC 61076-3-106 (version 5) Compatible with products on the market conforming to the standards listed
3	0 533 00	**Plug** Integrated PE with sealing ring and clamping blades Tool-free assembly Ability to protect cables of category 5e
3	0 533 01	**Flush-mounting base** Locking base Supplied with RJ 45 female/female coupler cat. 5e
3	0 533 02	**Kit** Flush-mounting base + plug
3	0 533 03	**Protective flap** Fits on base Cat.No 0 533 01

RJ plugs for round cables

Pack	Cat.Nos	
		Gold-coated contacts 1.2 µm
50	0 517 01	**RJ 11** 4 contacts, width 9.65 mm
50	0 517 02	**RJ 12** 6 contacts, width 9.65 mm
		RJ 45 cat. 5e
50	0 517 03	8 contacts, width 11.70 mm
50	0 517 04	9 contacts, width 11.70 mm
		RJ 45 sleeves
50	0 517 06	Black
50	0 517 07	White

Stripping tool

Pack	Cat.Nos	
		Slits the sheath and releases the conductors by rotation For twisted pair cables Does not damage the conductors
1	0 332 62	**Stripper** For twisted pair and fibre optic cable
1	0 327 60	**Cutting pliers** Cut wires cleanly without damaging the copper

Crimping tool for RJ 45 plugs

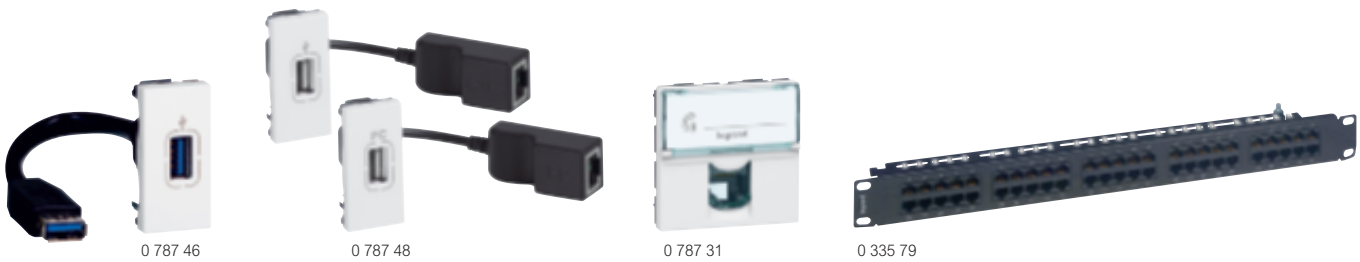| Pack	Cat.Nos	
1	0 517 09	Used for crimping plugs RJ 4/6/8/9 contacts Ratchet control of crimping mechanism Able to cut and strip cables Tool with 3 crimping points High resistance steel material

110 tool

Pack	Cat.Nos	
1	0 332 60	110 tool
1	0 332 61	Replacement blade

Legrand cabling system LCS²

data and telephone sockets, patch panels, cables

| 0 787 46 | 0 787 48 | 0 787 31 | 0 335 79 |

SUB D socket - 2 modules

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 65	-

9 contacts - Screw terminals connection to link type RS 232 series

Female USB DATA sockets - for data transfer

Used to bring connections closer to the user
For connecting USB devices (scanner-printer, external hard disk). Max. cable length: 5 m. Recommended cable: USB A
1 module

Preterminated
USB 3.0. Equipped with a 15 cm cord

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 46	5 720 94	○ White - square version
1	-	5 725 94	● Magnesium - square version

Connection via screw terminals
USB 2.0. Cross section - 1 mm²

Pack	Mosaic	Arteor	
1	0 787 61	5 722 75	○ White
1	0 792 84	-	○ Aluminium
1	-	5 727 75	● Magnesium

Female USB DATA amplifier - for data transfer

Used to bring connections closer to the user in case of large distances
For connecting USB devices (digital school board / interactive whiteboard…) located more than 5 m away (up to 30 m) from a source (computer…)
The kit includes a transmitter (1 module) and a receiver (1 module)
The link between the transmitter and the receiver is made via a RJ 45 / RJ 45 cord (not provided)
○ White

Pack	Mosaic	Arteor
1	0 787 48	5 720 23

Telephone sockets

RJ 11 and RJ 12 sockets
Equipped with a modular Jack connector with 1/4 turn terminal for fast connection
Tap-off possible

Pack	Mosaic	Arteor	
10	0 787 30	5 723 00	○ White - RJ 11, 4 contacts 1 module
10	0 792 31	-	○ Aluminium - RJ 11, 4 contacts - 1 module
10	-	5 728 00	● Magnesium - RJ 11, 4 contacts - 1 module
10	0 787 31	5 723 13	○ White - RJ 11, 4 contacts - 2 modules
10	-	5 728 13	● Magnesium - RJ 11, 4 contacts - 2 modules
10	0 787 32	5 723 12	○ White - RJ 12, 6 contacts - 2 modules
10	-	5 728 12	● Magnesium - RJ 12, 6 contacts - 2 modules

ISDN socket
Self-stripping 1/4 turn terminals for fast connection. Tap-off possible

Pack	Mosaic	Arteor	
10	0 787 34	-	○ White - 8 contacts, 2.5 mm² earth terminal

Telephone sockets (continued)

Single master - 2 modules
With IDC connection
Conform to British Telecom

Pack	Cat.Nos		
	Mosaic	Arteor	
10	-	5 723 10	○ White
10	-	5 728 10	● Magnesium

Single secondary - 1 module
With IDC connection
Conform to British Telecom

Pack	Mosaic	Arteor	
5	-	5 723 01	○ White
5	-	5 728 01	● Magnesium

Patch panel telephone 50 ports 110 connect

Pack	Cat.Nos
1	0 335 79

19" panel - 1 U

Cables for telephone networks cat. 3

PVC sleeve
Colour white
Colour code TIA/EIA

U/UTP - 50 pairs
Length 500 m
Supplied on reel

Pack	Cat.Nos
1	0 328 91

U/UTP - 100 pairs
Length 500 m
Supplied on reel

Pack	Cat.Nos
1	0 328 88

Panels and units for incoming telephone

Panels assembled - 1 U
Fitted with 4 LCS² RJ 45 units of 12 ports with fast tool-free connection

Pack	Cat.Nos	
1	0 335 31	3-6/4-5 contacts for digital telephone
1	0 335 30	4-5/7-8 contacts for analogue telephone

Incoming telephone units for self-assembly panels
Fitted with 12 LCS² RJ 45 ports with quick tool-free connection

Pack	Cat.Nos	
2	0 335 33	3-6/4-5 contacts for digital telephone
2	0 335 32	4-5/7-8 contacts for analogue telephone

L1 legrand

Legrand cabling system LCS² Wi-Fi access points

0 335 22   0 335 21

Pack	Cat.Nos	
		Manageable Wi-Fi access points 802.11n
		Dual band 2.4 GHz or 5 GHz Conforms with standard 802.11 a, b, g, n Gross speed: 300 Mbps max. MIMO 2x2, supports up to 4 SSIDS PoE power supply (Power over Ethernet - standard IEEE 802.3 af). Tool-less network connection via LCS² RJ 45 connector The installation must include at least: - a Wi-Fi access point (false ceiling) - a PoE injector conforming with 802.3 af (see opposite Legrand PoE injector LCS² unit format) Can be configured via configuration software or individually The management function allows the network administrator to manage Wi-Fi access points remotely via a web https interface Security via WEP, WPA and WPA2 (802.11i) encryption and 802.1x authentication QOS WMM compatible and supports SNMP management Guest access: allows visitors specific access to the Internet (special SSID given access to internet only, not to local network) Energy saving with standby management
1	0 335 22	Wi-Fi surface-mounted access point 802.11n
1	0 335 21	Wi-Fi ceiling-mounted access point 802.11n
		Manageable Wi-Fi access points 802.11a & b/g
		Dual-band and dual-radio Conform with standards 802.11a and 802.11b/g Gross speed: 54 Mbps max. simultaneously on each frequency 2.4 GHz and 5 GHz (802.11a and 802.11g) Can be installed in addition to a new or existing LCS/LCS² structured wiring system to meet mobile working requirements. Can be integrated into all compatible supports with minimum 40 mm depth Tool-less network connection via RJ 45 connector The installation must include at least: - a Wi-Fi access point - a PoE injector conforming with 802.3 af (see opposite Legrand PoE injector LCS² unit format) The management function allows the network administrator to manage Wi-Fi access points remotely via a web interface. Security via WPA/WPA2 encryption (802.11i) and 802.1x authentication Guest access: allows visitors specific access to the Internet (special SSID given access to internet only, not to local network). 4 modules - 40 mm depth
1	Mosaic 0 779 13	Without RJ 45 socket outlet ○ White
1	Arteor 5 723 77	With no RJ 45 socket ○ White

➕ Access point manager. Allows the installation of a secure Wi-Fi network with centralised management of the Wi-Fi access points
The installation must include at least:
- a Wi-Fi access point
- a PoE injector conforming with 802.3 af
(see opposite Legrand PoE injector LCS2 unit format)

## Legrand cabling system LCS² switches and PoE injectors

0 779 00

0 332 80

Pack	Cat.Nos	
		Flush-mounting Ethernet 10/100 base T switches
		For networking computer peripherals without a patch panel: computers, printers, servers, etc. Possibility of extending an existing network by simply replacing an RJ 45 socket Tool-free connection Conform with standards IEEE 802.3 (Ethernet) and EN 500 81/82-2 (EMC requirements) Installation in all supports with minimum 40 mm depth 6 ports at the front + 1 side RJ 45 connector for cabling and carrying out link tests Port status display integrated into the RJ 45 connectors Labelling of each port from 1 to 6 and marker holder for switch identification 6 modules
		Non manageable 230 V supply - Mosaic Programme
1	0 779 00	○ White
		Non manageable PoE supply (802-3 af) supply - Mosaic Programme
1	0 779 01	○ White
		Non manageable 230 V supply - Arteor
1	5 720 83	○ White
		Non manageable PoE supply (802-3 af) supply - Arteor
1	5 728 84	● Magnesium
		Power over Ethernet (PoE) injectors Midspan
1	0 335 01	4 inputs/outputs Supply 4 Wi-Fi access points Attach directly to the patch panel conform with standard IEEE 802.3 af
1	0 327 37	1 input/1 output
		Mosaic VDI distribution block without connectors
1	0 332 80	16 modules Dimensions: 135 x 223 x 57 mm For small patch panel For mounting a Mosaic switch Cat.Nos 0 779 00/01/20

➕ PoE switch p. 103

🖥 Centralized configuration software
(free download)
www.legrand.com

Legrand cabling system LCS² fibre optic

fibre cables

0 325 15

0 325 10

0 325 08

0 325 06
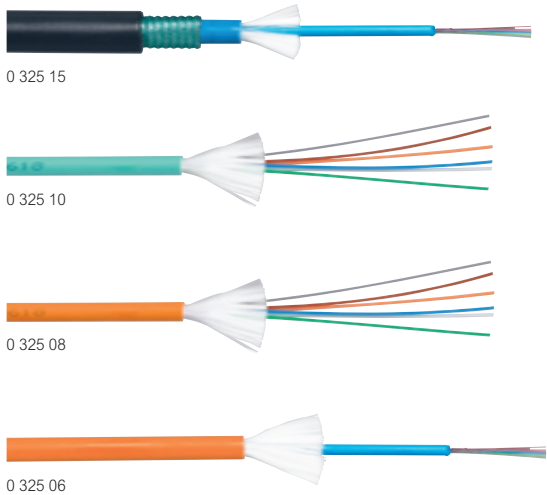
LSZH sheath (except Cat.Nos 0 325 13/15)
Fibre colour code: FOTAG
Standard: EN 50173-2, ISO IEC 11801

Pack	Cat.Nos		

OS1/OS2 singlemode optical cables (9/125 µm)

Pack	Loose tube	900 µm Tight buffer	
			For 9/125 µm singlemode installations (OS1) Yellow jacket or black for outdoor, corrugated
2000[1]	0 325 12		Indoor/outdoor (universal) 6 fibres
2000[1]	0 325 13		Outdoor, corrugated steel tape 6 fibres
2000[1]	0 325 14	0 325 50	Indoor/outdoor (universal) 12 fibres
2000[1]	0 325 15		Outdoor, corrugated steel tape 12 fibres
2000[1]	0 325 51		Indoor/outdoor (universal) 24 fibres

OM 4 multimode optical cables (50/125 µm)

Pack	900 µm Tight buffer	
		For 50/125 µm multimode installations (OM 4) Aqua jacket Compatible with 10 Giga Ethernet network
500[1]	0 326 65	Indoor/outdoor (universal) 6 fibres
1000[1]	0 326 66	Indoor/outdoor (universal) 6 fibres
1000[1]	0 326 67	Indoor/outdoor (universal) 12 fibres
1000[1]	0 326 68	Indoor/outdoor (universal) 24 fibres

OM 3 multimode optical cables (50/125 µm)

Pack	Loose tube	900 µm Tight buffer	
			For 50/125 µm multimode installations (OM 3) Aqua jacket
2000[1]		0 325 10	Indoor/outdoor (universal) 6 fibres
2000[1]		0 325 11	Indoor/outdoor (universal) 12 fibres
2000[1]	0 325 53	0 325 52	Indoor/outdoor (universal) 24 fibres

OM 2 multimode optical cables (50/125 µm)

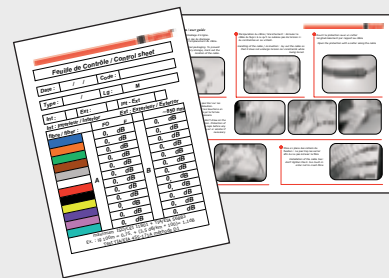| Pack	Loose tube	900 µm Tight buffer	
			For 50/125 µm multimode installations (OM 2) Orange jacket or black for outdoor, corrugated
2000[1]		0 325 55	Indoor/outdoor (universal) 4 fibres
2000[1]	0 325 04	0 325 08	Indoor/outdoor (universal) 6 fibres
2000[1]	0 325 05		Outdoor, corrugated steel tape 6 fibres
2000[1]	0 325 06	0 325 09	Indoor/outdoor (universal) 12 fibres
2000[1]	0 325 07		Outdoor, corrugated steel tape 12 fibres

1: in meter(s)

Customized fibre optic links

↓ FIBRES PRE-FITTED WITH CONNECTORS

Length of link
(from connector to connector in metres)
Link supplied with protective sleeve and compression gland pull system to facilitate entry into the fibre optic enclosures

Connectors:
LC
SC
ST
MTP

Number of fibres:
2, 4, 6, 8, 12, 24 (LC, SC, ST)
6, 12, 24, 48 (MTP)

Fibre type

Multimode: 62.5/125 µm
Conforms with category OM1

Multimode: 50/12550/125 µm
(ensured speed 1 Gbps)
Conforms with category OM2

Multimode: 50/125 µm
(ensured speed 10 Gbps over 300 m)
Conforms with category OM3

Multimode: 50/125 µm
Conforms with category OM4
(ensured speed 10 Gbps over 550 m)

Singlemode: 9/125 µm
(ensured speed 10 Gbps)
Conforms with category OS1/OS2

Type of sheath:
Tight buffer
Loose tube
Loose tube corrugated steel tape
Microcable for MTP

↓ DOCUMENTS

Each link is supplied with a test report (fibre by fibre) and illustrated operating instructions

↓ PACKAGING

According to length of link:
- packed
  on a reel
- packed
  on a ring
Connector protection by tube

Reel

0 326 57

0 326 58

0 326 53

0 331 27

0 331 00

0 326 90

0 330 49

Pack	Cat.Nos	**Tool case for preparing optic fibres for optic connectors**
1	0 326 90	Provides the tools required for preparing optic cables, for carrying out initial tests of the connection of fibres to connectors and the accessories for easy connection in all situations Comprises: - Installation instructions and video - Stripping tool (for fibres and cables) - Cleaving tool - Microscope for checking the quality of the cut - Visual fault locator with cord - Accessories (ultra-strong scissors, marker, protective glasses, etc.)

Pack	Cat.Nos	**Update kit for case Cat.No 0 331 93**
1	0 326 91	Comprises: - Visual fault locator with cord - Adaptors for connectors - Connector support for easier connection - Fibre positioning label to be affixed to the cleaver in case Cat.No 0 331 93

Fast-connection connectors

Quick to connect, reliable and can be reused up to 5 times
Microswitch for locking the fibre inside the connector and illuminated indicator for checking for faults at the end of the process
These connectors do not require any glue, polishing or special tools
For installation on tight jacketed fibre (diam. 900 µm)
For loose jacketed fibre (diam. 250 µm), use a spreader Cat.No 0 330 48 or 0 330 49

Pack	Cat.Nos	**Multimode connectors**
10	0 326 57	SC/UPC connector 50 µm OM3/OM4 900 µm
10	0 326 58	LC/UPC connector 50 µm OM3/OM4 900 µm
10	0 326 56	ST/UPC connector 50 µm OM3/OM4 900 µm
10	0 326 62	SC connector 62.5 µm OM1 900 µm
10	0 326 61	ST connector 62.5 µm OM1 900 µm
		Singlemode connectors
10	0 326 52	SC/UPC connector 9 µm OS1/OS2 900 µm
10	0 326 53	LC/UPC connector 9 µm OS1/OS2 900 µm
10	0 326 54	SC/APC connector 9 µm OS1/OS2 900 µm

Pack	Cat.Nos	**Pigtails**
		Supplied with 900 µm sleeve, 1 m
		10 Gb - 50/125 µm OM4
10	0 326 70	LC connector
1	0 326 71	Kit of 12 LC-connector pigtails
		10 Gb - 50/125 µm OM3
6	0 326 22	SC connector
6	0 326 23	LC connector
1	0 326 27	6 x LC-PC connectors
1	0 326 26	12 x LC-PC connectors
		9/125 µm OS1/OS2
4	0 326 19	SC/APC connector
6	0 326 20	SC connector
6	0 326 21	LC connector
1	0 326 25	6 x LC-UPC connectors
1	0 326 24	12 x LC-UPC connectors
		Thermoretractable sleeve for pigtails
1	0 327 44	40 mm - pack of 50 sleeves

Pack	Cat.Nos	**Glue-on connectors 50/125 and 62.5/125 µm**
		Supplied with sleeve 900 µm Connectors with ceramic ferrule Typical attenuation: 0.3 dB
10	0 331 27	ST connector
10	0 331 47	SC connector
10	0 331 00	LC connector

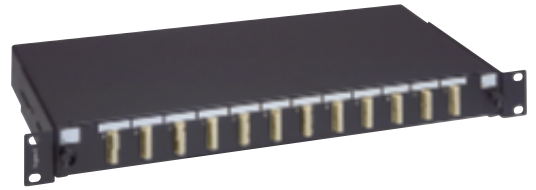| Pack	Cat.Nos	**Breakout kits**
		For 900 µm of optical fibres Take 250 µm fibre diameters
1	0 330 48	6 fibre breakout kit
1	0 330 49	12 fibre breakout kit

Legrand cabling system LCS² fibre optic

19" fibre optic drawers and fibre sockets
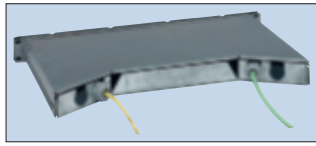
"Tail-coat" enclosure rear for easier cable entry
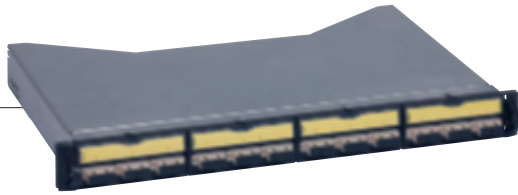
0 335 09 fitted with fibre optic units

0 325 20

0 335 13

0 335 12

0 335 11 fitted with fibre optic unit 0 335 17

0 786 17

0 786 18

Pack	Cat.Nos	**19" slide-in modular optic drawers**
1	0 335 10	Limit switch stop with 45° slope Depth 220 mm, height 1 U Maximum capacity: - 24 x ST and SC connectors ST - 48 x LC connectors Supplied with screws and wiring accessories Takes up to 4 fibre optic units (see below)
1	0 335 09	Supplied with 24 SC connectors
		19'' Linkeo optic drawers
1	0 325 20	Fastening kit of 4 cage nuts Depth 200 mm, width 483 mm, height 1 U Incoming cable area at the bottom 1 cable seal for cable from 6 to 12 mm 1 fibre management kit 1 splice bridge (12 splices) Maximum capacity: 24 SC connectors (loaded adaptors)
1	0 325 22	Maximum capacity: 48 LC connectors (loaded adaptors)
		Fibre optic units
		Clip directly onto the fibre optic drawer Cat.No 0 335 10 or on the patch panels with fibre optic cassette Cat.No 0 335 11
	N	**Singlemode fibre units (9/125 µm)**
1	0 335 13	LC unit for 6 singlemode fibres
1	0 335 12	SC unit for 6 singlemode fibres
1	0 327 86	SC/APC unit for 4 singlemode fibres
1	0 335 14	SC/APC unit for 6 singlemode fibres
		Multimode fibre units (62.5 and 50/125 µm)
1	0 335 16	ST unit for 6 multimode fibres
1	0 335 17	SC unit for 6 multimode fibres
1	0 335 18	LC unit for 6 multimode fibres
1	0 335 19	High-density LC unit for 12 multimode fibres
		Switch/fibre optic unit
1	0 335 05	Power supply via transformer provided 6 x RJ 45 ports + 1 cascade LC type optic port at the front. Clips directly onto the patch panels
		Copper/fibre optic converter units
		For simple and fast copper to fibre conversion and vice versa Clip directly onto the patch panels Fitted with an SC type fibre optic connector
1	0 335 06	10/100 base T to 10/100 base FX type SC
1	0 335 07	1000 base T to 1000 base SX type SC
		Fibre optic cassette for patch panel
1	0 335 11	Ensures fibre coiling (from 2 to 12 fibres) Takes a fibre optic unit Cat.Nos 0 335 12/13/16/17/18/19 Used for linking copper and fibre optic blocks on the same LCS² patch panel

Pack	Cat.Nos	**Blanking plate for 19" panel**
10	0 335 91	Black
		Cassette for pigtails
1	0 329 07	12-fibre capacity
1	0 326 72	24-fibre capacity
		Sockets with fibre optic feedthrough
		Fitted with duplex feedthrough 2 inlets/2 outlets Used for connecting 2 fibres (fitted with their connector) Supplied with protective caps Fitted with transparent marker holder 2 modules
		Socket with fibre optic feedthrough 2 x ST Bayonet connection (STII compatible)
1	0 786 16	○ White
		Socket with fibre optic feedthrough 2 x SC Push-pull connection
1	0 786 17	○ White
		Socket with fibre optic feedthrough 2 x LC Push-pull connection
1	0 786 18	○ White
		Socket with fibre optic feedthrough 2 x SC/APC Push-pull connection With shutters
1	0 786 14	○ White

0 325 69 (not equipped)

0 462 91

Pack	Cat.Nos	**19" high density fibre optic drawer**
1	0 325 69	Modular fibre optic drawer Slide-in and modular drawer Maximum capacity: - 36 ST and SC connectors - 72 LC connectors Depth 220 mm, height 1 U Supplied with screws and wiring accessories Receives up to 3 fibre optic units below
		Fibre optic units
		Clip directly onto the optic drawer Cat.No 0 325 69
		Singlemode fibre units (9/125 µm)
3	0 325 73	LC duplex unit for 12 singlemode fibres - blue
3	0 325 74	LC quadriplex unit for 24 singlemode fibres - blue
3	0 325 70	ST duplex unit for 12 singlemode fibres - blue
3	0 325 71	SC duplex unit for 12 singlemode fibres - blue
3	0 325 72	MPO unit type A for 6 x 12 singlemode fibres - blue
		Multimode fibre units (62.5 and 50/125 µm)
3	0 325 78	LC duplex unit for 12 multimode fibres - beige
3	0 325 79	LC quadriplex unit for 24 multimode fibres - beige
3	0 325 75	ST duplex unit for 12 multimode fibres - beige
3	0 325 76	SC duplex unit for 12 multimode fibres - beige
3	0 325 77	MPO unit type A for 6 x 12 multimode fibres - beige
		Accessory
10	0 335 93	Blanking plate
		Accessories common to 2 fibre optic drawers
		Cassette for pigtails
1	0 329 07	12-fibre capacity
1	0 326 72	24-fibre capacity
		Bend limiting clip
10	0 335 94	Fibre management bend limiting clip
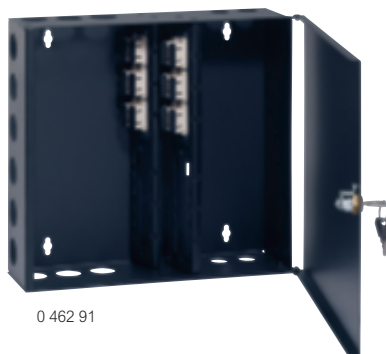
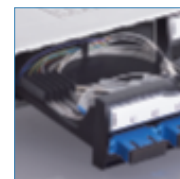| Pack	Cat.Nos	**19'' fibre optic drawer equipped with SC units**
1	0 335 09	Fibre optic drawer equipped with 4 SC fibre optic units for 6 multimode fibres Modular sliding drawer End stop, tilted at 45° Depth 220 mm, height 1 U Supplied with screws and wiring accessories
		OM 3 multimode optical cords (50/125 µm)
		Suitable for 10 Gb Ethernet network Max. optical losses: 0.3 dB For 50/125 µm multimode installations, type OM 3 Purple sheaths
		SC/SC duplex cords
3	0 326 09	Length: 1 m
3	0 326 10	Length: 2 m
3	0 326 11	Length: 3 m
		SC/LC duplex cords
3	0 326 12	Length: 1 m
3	0 326 13	Length: 2 m
3	0 326 14	Length: 3 m
		OM 3 multimode fibre optic cables (50/125 µm)
	Tight jacketed 900 µm	For 50/125 µm multimode installations, type OM 3 Green sheaths Suitable for 10 Gb Ethernet network
2000	0 325 10	Internal/external (glass sheath) 6 fibres
2000	0 325 52	Internal/external (glass sheath) 24 fibres
		Fibre optic floor distribution cabinets
		Reversible metal cabinets with key-operated lock IP 20 - IK 08 Maximum capacity: - 24 fibres with ST connectors - 48 fibres with SC connectors - 96 fibres with LC connectors Up to 4 fibre optic units can be fitted Cat.Nos 0 325 71/72/73/74/76/77/78/79, 0 335 12/13/16/17/18/19 4 cable entries (2 at the top and 2 at the bottom) 12 outlets, 22 mm diameter (3 at the top, 3 at the bottom and 6 at the sides) Supplied with 1 black ISO 20 cable gland to hold the incoming cable and 15 feedthrough covers The outgoing cables can be clamped using a clamp at the back of the cabinet Can take 2 cassettes for pigtails Cat.No 0 329 07 (incoming and outgoing) 292 x 323 x 92 mm Black RAL 9005
1	0 462 91	Cabinet equipped with 2 SC fibre optic units for 12 multimode fibres
1	0 462 90	Modular cabinet

0 335 40

0 335 40 fitted with SC fibre optic unit, accessory
Cat.No 0 335 20 and a 6 x RJ 45 connector unit

0 335 20 fibre optic accessory

0 786 16

0 786 17

0 786 18

Pack	Cat.Nos	**Area distribution box**
		For distribution of low current in an area fitted with 1 to 12 RJ 45 sockets
		Centralise connections to guarantee flexibility and adaptability of the installation
		Installed on false ceiling or false floor
		Connect to the patch panel or the floor cabinet
		Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568
		Colour code and wiring schemes T 568 A and T 568 B
		Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568
		Technical characteristics:
		- polycarbonate PC hood
		- polypropylene PP base
		- RAL 7035
		- hold connector units in place in the box: 100 N
		- Cables anchored on support using Colring cable ties
		Self-assembly area distribution box
1	0 335 40	Used for fitting fibre optic accessory units
		Fibre optic accessory
1	0 335 20	Used for fitting fibre optic units (p. 110) and the fibre coil in the area distribution box

Pack	Cat.Nos	**Sockets with fibre optic feedthrough**
		Fitted with duplex feedthrough 2 inlets/2 outlets
		Used for connecting 2 fibres (fitted with their connector)
		Supplied with protective caps
		Fitted with transparent marker holder
		2 modules
		Socket with fibre optic feedthrough 2 x ST
		Bayonet connection (STII compatible)
1	0 786 16	○ White
		Socket with fibre optic feedthrough 2 x SC
		Push-pull connection
1	0 786 17	○ White
		Socket with fibre optic feedthrough 2 x LC
		Push-pull connection
1	0 786 18	○ White
		Socket with fibre optic feedthrough 2 x SC/APC
		Push-pull connection
		With shutters
1	0 786 14	○ White

0 325 10

0 335 43

Pack	Cat.Nos	**OM 3 multimode fibre optic cables (50/125 µm)**
	Tight jacketed 900 µm	For 50/125 µm multimode installations, type OM 3 Green sheaths Suitable for 10 Gb Ethernet network
2000[1]	0 325 10	Internal/external (glass sheath) 6 fibres
2000[1]	0 325 52	Internal/external (glass sheath) 24 fibres

1: in meters

Pack	Cat.Nos	**Ready-assembled area distribution box**
		For extra low voltage distribution Centralises connections to guarantee flexibility and adaptability of the installation Installed in a false ceiling or raised access floor Connects to the floor distribution cabinet Connection to a Mosaic socket with copper feedthrough with an RJ 45/RJ 45 cord IP 21 - IK 07 Conforming to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, IEC 60950, ISO/IEC 11801 ed. 2.0, EN 50173-2 and IEA/TIA 568 Colour code EIA/TIA 568 A and B Cords and cables: ISO 11801 id.2.0, EN 50173-1, EIA/TIA 568 Technical characteristics: - polycarbonate PC hood - polypropylene PP base - RAL 7035 - Resistance of connector units on the box: 100 N - Cables anchored on support using Colring cable ties
1	0 335 43	Ready-assembled area box with: - a fibre optic accessory for mounting fibre optic modules and coiling the fibre - an SC fibre optic unit for 6 multimode fibres

Legrand cabling system LCS² fibre optic

Patch cords

0 326 01

0 326 07

0 326 13

0 326 16

0 330 70

0 330 65
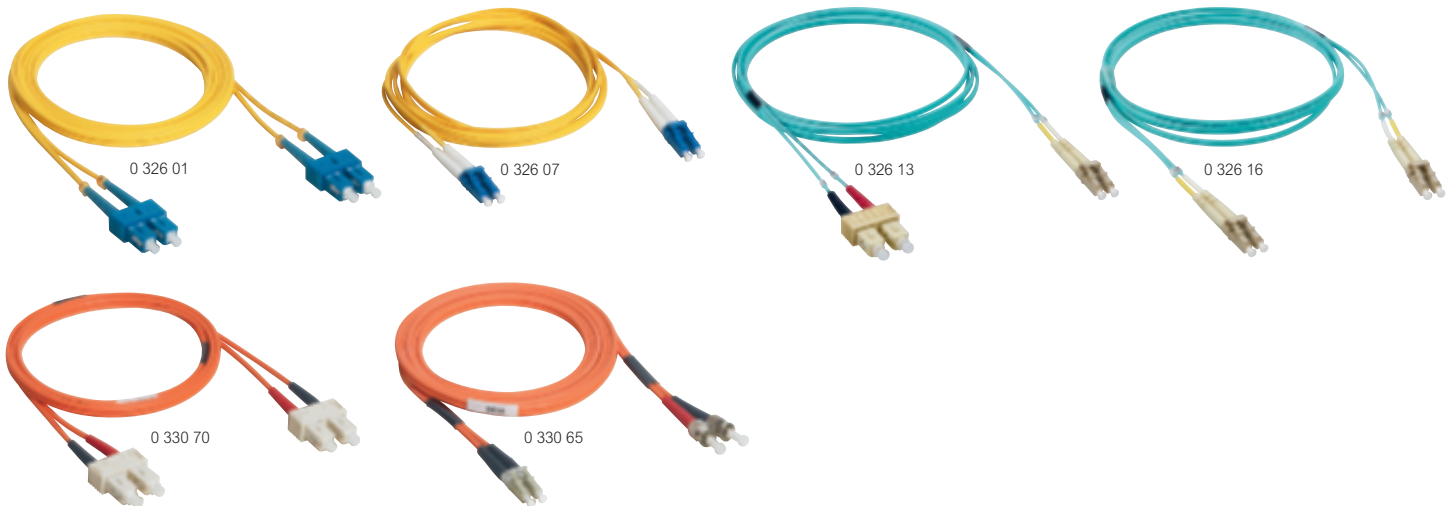
Technical characteristics **p. 145**

Fitted with 2 connectors with ceramic ferrule at either end
Packed and tested individually (report supplied)
Zipcord LSZH sleeve

Pack	Cat.Nos	**OS1/OS2 (UPC) singlemode optical cords**
		Max. optical losses: 0.3 dB For OS1 9/125 µm singlemode installations, OS1 type For OS1/OS2 9/125 µm singlemode installations, OS1/OS2 type Yellow sheaths
		SC/SC duplex cords
3	0 326 00	Length: 1 m
3	0 326 01	Length: 2 m
3	0 326 02	Length: 3 m
		SC/LC duplex cords
3	0 326 03	Length: 1 m
3	0 326 04	Length: 2 m
3	0 326 05	Length: 3 m
		LC/LC duplex cords
3	0 326 28	Length: 0.5 m
3	0 326 06	Length: 1 m
3	0 326 07	Length: 2 m
3	0 326 08	Length: 3 m
3	0 326 29	Length: 5 m

Pack	Cat.Nos	**OM 4 multimode optical cords (50/125 µm)**
		Suitable for 10 Gb Ethernet network Max. optical losses: 0.3 dB For 50/125 µm multimode installations, OM 4 type Aqua sheaths
		SC/SC duplex cords
3	0 326 30	Length: 1 m
3	0 326 31	Length: 2 m
3	0 326 32	Length: 3 m
		LC/LC duplex cords
3	0 326 33	Length: 0.5 m
3	0 326 34	Length: 1 m
3	0 326 35	Length: 2 m
3	0 326 36	Length: 3 m
3	0 326 37	Length: 5 m

Pack	Cat.Nos	**OM 3 (PC) multimode optical cords (50/125 µm)**
		Suitable for 10 Gb Ethernet network Max. optical losses: 0.3 dB For 50/125 µm multimode installations, OM 3 type Aqua sheaths
		SC/SC duplex cords
3	0 326 09	Length: 1 m
3	0 326 10	Length: 2 m
3	0 326 11	Length: 3 m
		SC/LC duplex cords
3	0 326 12	Length: 1 m
3	0 326 13	Length: 2 m
3	0 326 14	Length: 3 m
		LC/LC duplex cords
3	0 326 15	Length: 1 m
3	0 326 16	Length: 2 m
3	0 326 17	Length: 3 m

Pack	Cat.Nos	**OM 2 (UPC) multimode optical cords (50/125 µm)**
		Max. optical losses: 0.3 dB For 50/125 µm multimode installations, OM 2 type Orange sheaths
		ST/ST duplex cords
3	0 330 80	Length: 1 m
3	0 330 81	Length: 2 m
3	0 330 82	Length: 3 m
		SC/SC duplex cords
3	0 330 69	Length: 1 m
3	0 330 70	Length: 2 m
3	0 330 71	Length: 3 m
		ST/SC duplex cords
3	0 330 72	Length: 2 m
3	0 330 73	Length: 3 m
		LC/LC duplex cord
3	0 330 61	Length: 2 m
		SC/LC duplex cords
3	0 330 75	Length: 1 m
3	0 330 63	Length: 2 m
3	0 330 76	Length: 3 m
		LC/ST duplex cord
3	0 330 65	Length: 2 m

↓ FIBRES PRETERMINATED WITH CONNECTORS

Length of link
(from connector to connector in metres)
Link supplied with protective sleeve
and compression gland pull system to
facilitate entry into the fibre optic units

Connectors:

LC

SC

ST

Number of fibres:
2, 4, 6, 8, 12, 24

Fibre type

Multimode: 62.5/125 μm
Conforms with category OM1

Multimode: 50/125 μm
(ensured speed 1 Gbps)
Conforms with category OM2
Multimode: 50/125 μm

(ensured speed 10 Gbps over 300 m)
Conforms with category OM3
Singlemode: 9/125 μm

(ensured speed 10 Gbps over 550 m)
Conforms with category OM4
Singlemode: 50/125 μm

Structure:
- tight buffer
- loose tube
- loose tube corrugated
  steel tape

↓ DOCUMENTS

Each link is supplied with a test report (fibre by fibre) and illustrated
operating instructions

↓ PACKAGING

According to length of link:
- packed on a reel
- packed on a ring
Connector protection by tube

Reel

↓ FIBRES PRETERMINATED WITH CONNECTORS

Length of link
(from connector to connector,
in metres)

**Link supplied with
sleeve on request**

Connectors:

MTP

**Number of
fibres:**
6, 12, 24, 48

Performance:
- OM4
- OM3
- OS1/OS2

Fibre type

Free or microcable structure

Type of sheath: LSZH
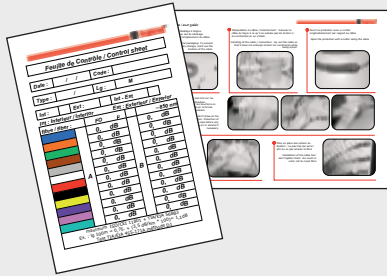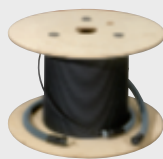
OUR COMMITMENT
Request a quotation from our technical team

Legrand cabling system LCS² cabinets

LCS² 19" cabling freestanding cabinets

0 463 41

0 463 34 + 1 cabinet 0 463 18
+ 1 extension cabinet 0 463 30

Technical characteristics **p. 148 to 150**

IP 20 - IK 08 baying cabinets with single or double curved front door made of screen-printed safety glass. Side and rear removable panels Panels with automatic equipotential connection. Lock with 2433 A key for locking of the 4 sides. Top and bottom cable entries (19" cut-out format) receive 19" plates with brushes, fans, etc
Equipped with 4 x 19" uprights with U marking and depth adjusting aid Option of cable and patch cord management in cabling unit Cat.Nos 0 463 34/35. Cabinets can be dismantled completely where access is difficult Levelling feet adjustable from the inside. Loading capacity: 420 Kg. Anthracite grey RAL 7016

LCS² 19" cabling cabinets

Single front door
Reversible door

Pack	Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)
1	0 463 00	24 U	1226	600	600
1	0 463 06	29 U	1448	600	600
1	0 463 12	33 U	1626	600	600
1	0 463 18	42 U	2026	600	600
1	0 463 19	42 U	2026	600	800
1	0 463 21	42 U	2026	800	600
1	0 463 22	42 U	2026	800	800
1	0 463 23	42 U	2026	800	1000
1	0 463 28	47 U	2248	800	800
1	0 463 29	47 U	2248	800	1000

Double front door
Door opening suitable for small spaces

Pack	Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)
1	0 463 41	42 U	2026	800	600
1	0 463 42	42 U	2026	800	800
1	0 463 43	42 U	2026	800	1000

LCS² 19" extension cabinets

Single front door. No side panels
Supplied with baying kit

Pack	Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)
1	0 463 30	42 U	2026	600	600
1	0 463 33	42 U	2026	800	800

LCS² baying kits

For direct linking of 2 LCS² cabinets
For cabinet depth (mm):

Pack	Cat.Nos	
1	0 463 37	600
1	0 463 38	800
1	0 463 39	1000

LCS² cabling units

Can be attached between 2 LCS² 42 U cabinets
Easier cable and patch cord management
Width 250 mm
Supplied with earthing kit
Anthracite grey RAL 7016
For cabinet depth (mm):

Pack	Cat.Nos	
1	0 463 34	600
1	0 463 35	800

Legrand cabling system LCS² cabinets

LCS² 19" freestanding server cabinets and equipment

0 463 85
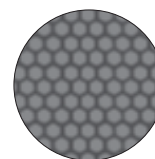
Technical characteristics **p. 148 to 150**

IP 20 - IK 08
Baying cabinets with front and rear metal microperforated door (80%), reversibles, can be opened without key
Front door can be fitted with a European DIN cylinder (30 + 10 mm), with option of fitting a handle Cat.No 0 347 71/72 (see Legrand general catalogue)
Rear door can be fitted with a key cylinder Cat.Nos 0 368 22/23/24/25/26/27 (see Legrand general catalogue)
Removable side panels
Top cable entries in 19" cut-out format, capable of taking 19" plates with brushes, fans, etc
Open bottom cable entries
Equipped with 4 x 19" uprights with depth adjusting aid
Levelling feet adjustable from the inside
Cabinets can be dismantled completely where access is difficult
Supplied with earthing kit
Loading capacity: 630 Kg
Anthracite grey RAL 7016

LCS² 19" server cabinets

Pack	Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)
1	0 463 85	42 U	2026	600	1000
1	0 463 86	42 U	2026	800	1000

LCS² baying kit

For direct linking 2 LCS² cabinets
For cabinets depth (mm):

Pack	Cat.Nos	
1	0 463 39	1000

Accessories for LCS² 19" server cabinets

Set of 4 caster wheels
Set of 4 pivoting casters, 2 of which have brakes
Load on the 4 wheels: 500 kg

	Cat.No	
1	0 464 82	

Cable guides support
Fast screw-free assembly of cable guides (p. 118)
For width 600/800 mm
Fitted between 2 supports
Cat.No 0 464 79
For depth 1000 mm
Pre-cut every 100 mm for height 500 to 200 mm

	Cat.No
1	0 464 78
1	0 464 79
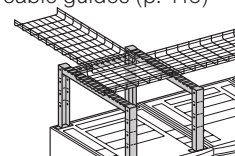
Plinths, cable entry plates, thermal management, cable management and other accessories,
p. 117-118

LCS² 19" equipment
p. 119

1200 mm deep LCS² server cabinet
please consult us

LCS² 19" FREESTANDING CABINETS

40 SIZES

Capacity	24 U	29 U	33 U	42 U	47 U
Width	600 or 800 mm				
Depth	600, 800, 1000 or 1200 mm				

CABINET DEFINITION

Thermal management: plate with 230 V fans, thermostat

Lighting kit[1]

Rear door

Other key codes

Cabling or server cabinet

No panels

Plinth, ventilation/ brush trap, raised floor plinth[1]

19" cable entries: metal or plastic

Earthing wire/braid

Anti-tilt kit[1] or ground fixing kit[1]

Wiring management: vertical brush panels, patch extension, supports, guards
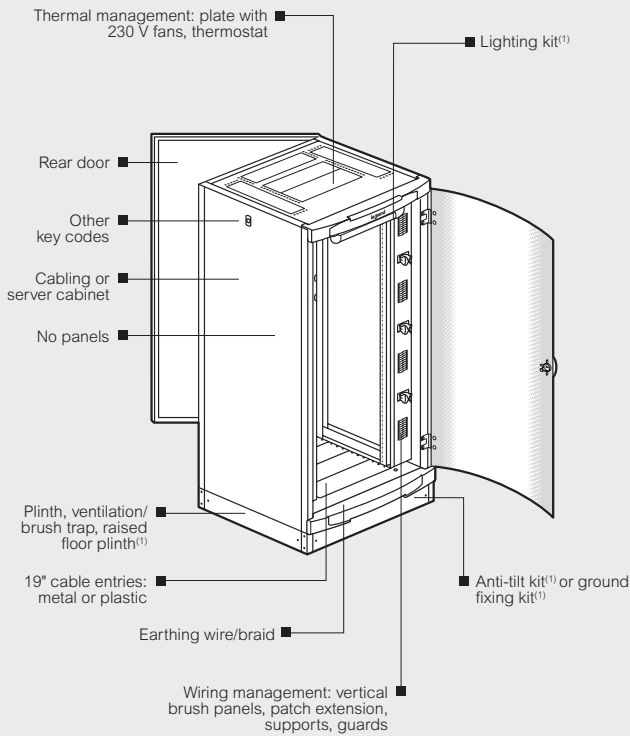
1: Supplied ready for assembly

Option of solid or microperforated metal doors, screen-printed glass doors, double doors or no doors
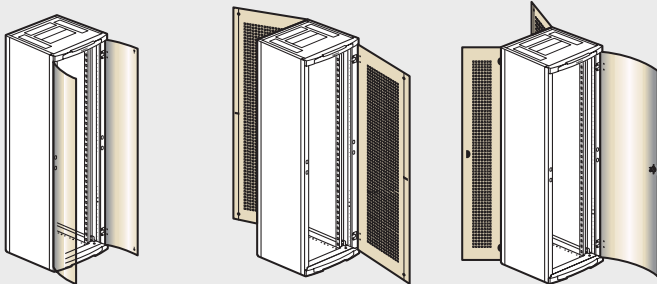
Cabinet fitted with screen-printed glass double door at the front (42 U/47 U; width 800 mm)

Cabinet fitted with microperforated metal doors at the front and rear (opening to the left)

Cabinet fitted with microperforated metal double rear door and screen-printed glass front door

19" EQUIPMENT ASSEMBLY

Patch panel, 1 U, equipped or to be equipped with: copper and for fiber bloc units, fiber cassettes and active products

Feedthrough panels, metal or plastic

Fibre optic drawer, equipped or to be equipped with: bloc units, pigtails/ cassettes

Ventilation drawer

Set of 2 L-shaped fixed sliders

PDU

Rail kit DIN

Blanking plates, metal or plastic

Shelves:
- fixed
- telescopic
- keyboard support

COLOURS

180 RAL colours available. Optional touch-up brush in the selected RAL

OUR COMMITMENT

Request a quotation from our technical team

Kit 0 464 52 comprising 4 corner blocks and solid traps at front/rear

0 464 61

0 464 63
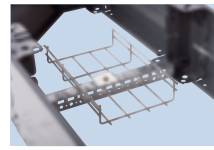
Cross Bar 0 476 93 with cable guide
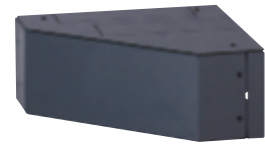
0 464 66

For raised access floor

0 464 32

Technical characteristics **p. 149-150**

Plinths for cabinets

Metal. Open on 4 sides
Anthracite grey RAL 7016

Plinth kits
Consisting of 4 corner blocks and solid front/rear traps height 100 mm
Side traps to be ordered separately
For cabinet width (mm):

Pack	Cat.Nos		
	Height 100	Height 200	
1	0 464 50	0 464 52	600
1	0 464 51	0 464 53	800

Sets of 2 solid side traps
Trap height 100 mm
Order 2 sets for a plinth height of 200 mm (Cat.No 0 464 52/53)
For cabinet depth (mm):

Pack	Cat.Nos	
1	0 464 54	600
1	0 464 56	800
1	0 464 58	1000

Ventilated traps
1 trap height 100 mm
For cabinet width/depth (mm):

1	0 464 60	600
1	0 464 61	800

Traps with brushes
1 trap height 100 mm
For cabinet width/depth (mm):

1	0 464 62	600
1	0 464 63	800

Plinth for cabling units

1	0 464 64	For mounting between the plinths of the associated cabinets Trap height 100 mm Double the number of traps for a height of 200 mm Anthracite grey RAL 7016

Cross bars

Fixed between 2 cabinet plinth corner blocks
For clamping cables between associated cabinets and fixing a cable guide (p. 118)
For cabinet depth (mm):

1	0 476 93	600
1	0 476 94	800
1	0 476 95	1000

Linking interface

Pack	Cat.Nos	
		Make junction between cabinet plinth and cable tray to protect cables Supplied with weatherproof brush Reversible cover with cut-outs providing a high-quality finish Height 200 mm. Anthracite grey RAL 7016
1	0 464 66	For cabinet depth 600 mm

Adjustable height plinths for raised access floors

Transfer the load of the cabinet directly to the ground
Height adjustable from 200 to 350 mm in 25 mm steps to adapt to different floor heights
Levelling feet for fine adjustment
For floor tiles 30 or 38 mm thick
Permissible load: 1000 kg

Adjustable height plinths
Front and rear floor tile supports included
For cabinet width/depth (mm):

1	0 464 30	600 x 600
1	0 464 31	600 x 800
1	0 464 32	600 x 1000
1	0 464 34	800 x 600
1	0 464 35	800 x 800
1	0 464 36	800 x 1000

Set of 2 tile support brackets
Fix onto adjustable height plinths to support the side tiles
For plinths depth (mm):

1	0 464 38	600
1	0 464 39	800
1	0 464 40	1000

Adjustable height plinth, depth 1200 mm
please consult us

0 465 29

0 465 31

0 464 87

0 465 75

0 331 35

0 464 80

0 464 81

Technical characteristics **p. 150-151**

Technical characteristics **p. 150-151**

19" cable entry plates

Pack	Cat.Nos	
		Black RAL 9005
		Plastic plates with brushes, snap on
1	0 465 28	1 U
1	0 465 29	2 U
		Metal plates with brush
1	0 465 30	1 U
1	0 465 31	2 U

Thermal management

Pack	Cat.Nos	
		Plates with fans 3 U
		Fix onto the 19" cable entries
		2.5 m power supply cable. 230 V∿
		Anthracite grey RAL 7016
1	0 464 87	2 fans
1	0 464 88	3 fans
		1 U ventilation drawers
		For internal air circulation. Fix on 2 x 19" uprights
		ON/OFF switch. Supplied with power supply cord
		230 V∿. Black RAL 9005
1	0 464 89	Drawer with 2 fans
		Depth 150 mm
1	0 464 90	Drawer with 4 fans
		Depth 300 mm
		Thermostat
1	0 348 48	Adjustable from 5 to 60°C, 230 V∿, 50/60 Hz
		NC contact (5 A) and NO contact (10 A)
		Magnetic mounting

PDU supports

Pack	Cat.Nos	
		Vertical support for fixing to the rear of 19" LCS²
		cabinets and server cabinets (see p. 151). For
		mounting 19" PDU vertically and vertical PDU
1	0 465 75	For 42 U cabinets
1	0 465 76	For 47 U cabinets

Accessories

Pack	Cat.Nos	
		Anti-tilt kit
1	0 464 84	Stabilises a cabinet when heavy items
		installed on telescopic equipment are
		being removed
		Floor fixing kit
1	0 464 86	Used for permanently fixing
		a cabinet to the ground by locking the
		levelling feet
		Casters
1	0 464 83	Set of 4 pivoting casters
		Total permissible load on the 4 casters: 380 kg

Cable and cord management

Pack	Cat.Nos	
		Set of 3 cable management supports
		Fix on structure
		Quick, screw-free mounting of cable guides
1	0 464 72	For cabinets width/depth 600 mm
1	0 464 73	For cabinets width/depth 800 mm
1	0 464 74	For cabinets depth 1000 mm
		Flat cable guides
		Quick, screw-free mounting on cable
		management supports
		Width 250 mm
1	0 464 76	For 33 U cabinet
1	0 464 77	For 42 U cabinets
		U-shaped cable guides
		For creating a cable tray
		Used with cross bars
		Cat. No 0 476 93/94/95 in a 200 mm high plinth on
		associated cabinets, and 0 464 78/79
		supports on server cabinets
		Height 54 mm - Length 3 m
1	0 464 69	Width 200 mm
1	0 464 70	Width 400 mm
		Vertical cable management grille
		For 42 U cabinets - width 800 mm
		Fixes onto 19" uprights
1	0 331 35	Grille with articulated bolts
		1560 x 100 x 150 mm
		Vertical cable manager
		For 42 U cabinets - width 800 mm
		Fixes onto 19" uprights
1	0 464 80	Set of 2 vertical panels with brush feedthroughs
		Supplied with 10 cable guide rings Cat.No 0 465 42,
		3 cable ties Cat.No 0 331 94, 3 cable ties
		Cat.No 0 331 95 and 3 cable ties Cat.No 0 331 96
		Black RAL 9005

Patch extension

Pack	Cat.Nos	
		For 42 U cabinets - width 800 mm
		Fixes onto 19" uprights
1	0 464 81	Set of 2 uprights for increasing the capacity of
		the cabinet by 12 U, for mounting 19" equipment
		vertically (feedthrough panels, 19" PDU, etc.)
		Supplied with 8 cable guide rings Cat.No 0 465 42
		Black RAL 9005

Cable ties, document holders
p. 125

Legrand cabling system

LCS² 19" equipment

0 465 01

0 465 22

0 465 23

0 465 06

465 29

0 465 32

📷 Technical characteristics **p. 150**

Pack	Cat.Nos	Fixed shelves
		For cabinets and server cabinets Quick, screw-free mounting. Black RAL 9005
		Projecting mounting on 2 x 19" uprights Height 2 U. Max. load: 15 kg
1	0 465 00	Depth 115 mm
1	0 465 01	Depth 200 mm
1	0 465 02	Depth 360 mm
		Fixing on 4 x 19" uprights Height 1 U. Max. load: 50 kg
1	0 465 05	Shelf depth 425 mm For 600 mm
1	0 465 06	Shelf depth 625 mm For depth 800 mm
1	0 465 07	Shelf depth 825 mm For depth 1000 mm

Pack	Cat.Nos	Telescopic shelves
		For cabinets and server cabinets Quick fixing on 4 x 19" uprights Height 1 U. Max. load: 50 kg. Black RAL 9005
1	0 465 08	Shelf depth 425 mm For 600 mm
1	0 465 09	Shelf depth 625 mm For depth 800 mm
1	0 465 10	Shelf depth 625 mm For depth 1000 mm

Pack	Cat.Nos	Shelves for heavy items
		Max. load: 100 kg For cabinets depth 1000 mm (server cabinet only for telescopic shelf) Screw fixing on 4 x 19" uprights. Black RAL 9005
1	0 465 17	Fixed shelf depth 820 mm, 1 U
1	0 465 18	Telescopic shelf depth 820 mm, 2 U

Pack	Cat.Nos	Keyboard support shelf
		For cabinets and server cabinets For depth 800 mm and 1000 mm Screw fixing on 4 x 19" uprights Max. load: 50 kg. Black RAL 9005 Can take: - a computer screen - a keyboard on the retractable support - a mouse on a sliding shelf with integrated mat Area for mouse or CD
1	0 465 19	

Pack	Cat.Nos	Sets of 2 fixed sliders
		For cabinets and server cabinets Fixing on 4 x 19" uprights Max. load: 50 kg
1	0 465 11	For depth 600 mm
1	0 465 12	For depth 800 mm
1	0 465 13	For depth ≥ 1000 mm

Pack	Cat.Nos	19" management panels
		For organisation and circulation of patch cords Black RAL 9005
		Metal 2 axes, quick-fixing Horizontal and through run. Fitted with plastic cable guide rings radiating out for optimum protection of the cords (compliance with the bending radius) Quick, screw-free fixing
1	0 465 22[1]	1 U
1	0 465 23[1]	2 U
		Plastic with brushes, snap on
1	0 465 28[2]	1 U
1	0 465 29[2]	2 U
		Metal with brushes, quick-fixing Quick, screw-free fixing
1	0 465 30[1]	1 U
1	0 465 31[1]	2 U

Pack	Cat.Nos	19" blanking plates
		Black RAL 9005
		Plastic, snap on
1	0 465 32[2]	1 U
1	0 465 33[2]	2 U
		Metal, quick-fixing Quick, screw-free fixing
1	0 465 38[1]	1 U
1	0 465 39[1]	2 U
1	0 465 40[1]	3 U

Pack	Cat.Nos	19" lighting kit
		19" metal panel with a lighting kit with switch Quick, screw-free fixing Supplied with 230 V∿ - 8 W fluorescent tube
1	0 464 85[1]	1 U

Pack	Cat.Nos	Fixing screws
		Set of 50 cage nuts, 50 plastic washers and 50 x M6 screws
1	0 364 53	With 8.5 mm cage nuts
1	0 364 54	With 9.5 mm cage nuts

1: Can be mounted on 19" racks with screws Cat.No 0 464 23 (p. 120)
2: Not for mounting on 19" racks

19'' screw fixing in tapped holes

0 464 06   0 464 25   0 464 27
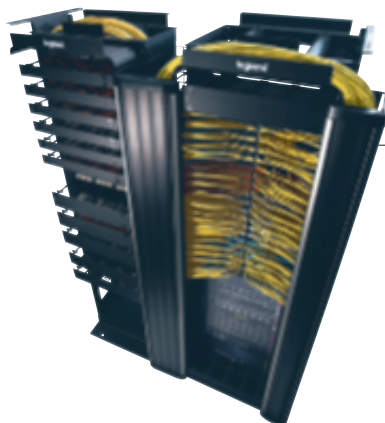
0 464 06 + 0 464 27 + 0 464 26 + 0 464 18 + 0 465 70
with LCS² patch panels and cords

Technical characteristics **p. 151-152**

Pack	Cat.Nos	**19" racks**
		Racks for high-density cabling (e.g. data centers, SANs, main distributors, etc)
		Channel type 19" uprights for guiding and fixing cables, with U marking and tapped holes for fixing 19" equipment
		Roofing for right-left cord routing that complies with the bending radiuses
		Receive 19" LCS² metal management panels, 19" power distribution units and the LCS² 19" DIN rail kit fastened by screws Cat.No 0 464 23 (1 set of 50 supplied with the rack)
		Supplied with straps with hook and loop type closure
		Aluminium structure to be assembled
		Racks joined using grids Cat.Nos 0 464 25/26/27
		Black

Pack	Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)	Permissible load (kg)	Depth of uprights (mm)
1	0 464 06	45 U	2185	604	521	675	267
1	0 464 07	45 U	2185	604	667	675	413

Pack	Cat.Nos	**Cord management grids**
		To be mounted between 2 joined racks or on an isolated rack
		The grid creates a 63 mm space between 2 joined racks for running cables and cords to the front and rear
		Capacity: 200 cat. 6 cords
		Black
1	0 464 25	Grid with hinged closing latches
		1965 mm x 153 mm x 156 mm

Pack	Cat.Nos	**Cord management grids with door**
		Easily removable door that opens in both directions
		To be mounted between 2 joined racks or on an isolated rack (Cat.No 0 464 26 only)
		The grids create a space between 2 joined racks (63 mm for Cat.No 0 464 26, 165 mm for Cat.No 0 464 27) for running of cables and cords to the front and rear
		Side cord channels every 1 U
		Capacity: 200 cat. 6 cords for Cat.No 0 464 26, 580 cords for Cat.No 0 464 27
		Supplied with 12 bend limiting clips and 4 coiling supports
		Black
1	0 464 26	1970 mm x 165 mm x 204 mm
1	0 464 27	1970 mm x 267 mm x 331 mm

Pack	Cat.Nos	**Cable tray supports**
		To be fitted in the depth of the rack to support a high cable tray (Cat.No 0 464 69/70 p. 118)
1	0 464 18	For rack Cat.No 0 464 06
1	0 464 19	For rack Cat.No 0 464 07
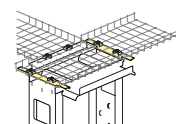
Pack	Cat.Nos	**Lower finishing plates**
		Metal plates provide the finishing of the lower part of the rack and protection against dust
		The sides of the plates can be folded easily for direct insertion of cables in the 19" upright channel
1	0 464 15	For rack Cat.No 0 464 06
1	0 464 16	For rack Cat.No 0 464 07

Pack	Cat.Nos	**19" cord management panels**
		1 axis closed panels with pivoting cover
		Depth 172 mm
		Black
1	0 465 70	1 U
1	0 465 71	2 U
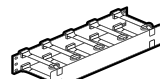
Pack	Cat.Nos	**19" equipment screws**
1	0 464 23	Set of 50 special screws for 19" racks and 25 earthing claws

Legrand cabling system LCS² cabinets

LCS² 19" wall-mounting cabinets and accessories

0 462 01
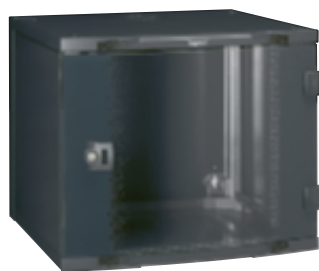
0 462 11
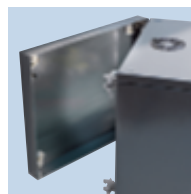
Pivoting cabiinet 0 462 11

0 465 01

Technical characteristics **p. 153-154**

IP 20 - IK 08
With reversible curved print screen glass safety door
Pivoting side panels, tool-free removal from inside
Lock closure with key 2433 A
Equipped with 2 x 19" uprights with depth adjusting aid
Supplied with earthing kit
Top and bottom grilles for natural ventilation, capable of taking a fan in the top part
Anthracite grey RAL 7016

Fixed LCS² 19" cabinets

Easier cable management: ability to fix cable guide connecting rings Cat.Nos 0 465 41/42 and cable ties (p. 125)
DLP format cable entries at the top and bottom, bendable, with ability to attach cables using cable ties
Rear pre-cut cable entries

Cabinet depth 400 mm

Pack	Cat.Nos	Capacity	Width (mm)	Height (mm)	Load capacity (kg)
1	0 462 00	6 U	600	350	18
1	0 462 01	9 U	600	500	27
1	0 462 02	12 U	600	600	36
1	0 462 03	16 U	600	800	48

Cabinet depth 580 mm

Pack	Cat.Nos	Capacity	Width (mm)	Height (mm)	Load capacity (kg)
1	0 462 06	9 U	600	500	27
1	0 462 07	12 U	600	600	36
1	0 462 08	16 U	600	800	48
1	0 462 09	21 U	600	1000	63

Pivoting LCS² 19" cabinets

Cabinets composed of:
- base (wall-fixing)
- pivoting body allowing free access to the rear of the cabinet to facilitate installation and maintenance
Reversible pivoting direction
Full cable entry plate at top and bottom, a brush plate can be fitted Cat.No 0 462 55

Cabinet depth 600 mm

Pack	Cat.Nos	Capacity	Width (mm)	Height (mm)	Load capacity (kg)
1	0 462 11	9 U	600	500	27
1	0 462 12	12 U	600	600	36
1	0 462 13	16 U	600	800	48
1	0 462 14	21 U	600	1000	63

Fixed shelves

Quick fixing without screws
Height 2 U
Max. load 15 kg
Black RAL 9005

Quick fixing on 2 x 19" uprights

Pack	Cat.Nos	
1	0 465 00	Depth 115 mm. For cabinets depth 400, 580 and 600 mm
1	0 465 01	Depth 200 mm. For cabinets depth 400, 580 and 600 mm
1	0 465 02	Depth 360 mm. For cabinets depth 580 and 600 mm

Thermal management

Fan
2.5 m power supply cable

Pack	Cat.Nos	
1	0 462 60	230 V∿ fan
1	0 348 48	**Thermostat** Adjustable from 5 to 60°C, 230 V∿, 50/60 Hz NO contact (10A) and NC contact (5 A) Fixed by magnet

Cable entry

Pack	Cat.Nos	
1	0 462 55	Cable entry plate with brush For pivoting cabinets

Cable management rings

Direct clipping onto front structural uprights of 9 U to 21 U fixed cabinets (Cat.No 0 465 41 only) and on central upright of 580 mm depth cabinets

Pack	Cat.Nos	
4	0 465 41	1 U, plastic Usable section 1890 mm²
4	0 465 42	2 U, plastic Usable section 4070 mm²

Accessories

Pack	Cat.Nos	
1	0 462 64	Set of 4 caster wheels for assembly on pivoting cabinets Total load permissible on the 4 casters: 120 kg

Legrand cabling system LCS² cabinets

LCS² 10" wall-mounting cabinet for small businesses

Customized solutions

LCS² 19" wall-mounting cabinets

0 335 92

0 462 23

6 468 01

0 462 20

Technical characteristics p. 153-154

Pack	Cat.Nos	
		LCS² 10" cabinet
		300 mm depth cabinet Compact cabinet suitable for small business applications up to 36 RJ 45 sockets IP 20 – IK 08 Equipped with: -1 reversible door made of safety glass -2 side panels removable from inside -key locking No 2433A -2 depth-adjustable uprights -top and bottom cable entries to DLP trunking system format -pre-cut back cable entry -top and bottom perforations for natural ventilation Anthracite grey RAL 7016

		Capacity	Width (mm)	Height (mm)	Load capacity (kg)
1	0 462 20	6 U	314	352	12

Pack	Cat.Nos	
		10" equipment
		Supplied with screws and cage nuts
1	0 335 92	**Modular empty panel** 10" panel - 1 U For up to 2 connector units or 2 fibre optic units (p. 109)
1	0 462 23	**Fixed shelf 1 U** Depth 120 mm Max. load. 10 kg Black RAL 9005
		10" Power Distribution Units (PDU)
		230 V - 50/60 Hz power supply 1U aluminium profile End cap with metallic brackets and cable holder shape Quick fixing (no screws) on 19" uprights with shutters and inclined at 55°
1	**N** 6 468 01	**4 x 2P+E outlets Black** German standard 1 m power supply cord with 16 A 2P+E French/German plug
1	**N** 6 468 00	French standard 1 m power supply cord with 16 A 2P+E French/German plug
1	**N** 6 468 98	To be equipped with Mosaic wiring device modules Capacity: 8 Mosaic modules

LCS² 19" WALL-MOUNTING CABINETS

Cable entry plate with brushes[1]

Thermal management (fan, thermostat)

Other colour, 180 RAL

Solid metal door, opening to the left, no door

No side panels

Fixed or pivoting

Earthing wire

Other key codes

Fixed shelves, modular patch panel 1 U and feedthrough, blanking plates, DIN rail kit, fibre optic drawer

Power supply unit

1: Pivoting cabinets

OUR COMMITMENT

Request a quotation from our technical team

Energy Distribution

LCS² 1U 19" Power Distribution Units (PDU)

N

6 468 12

Quick fixing

End cap with cable holder shape

6 468 24

6 468 36
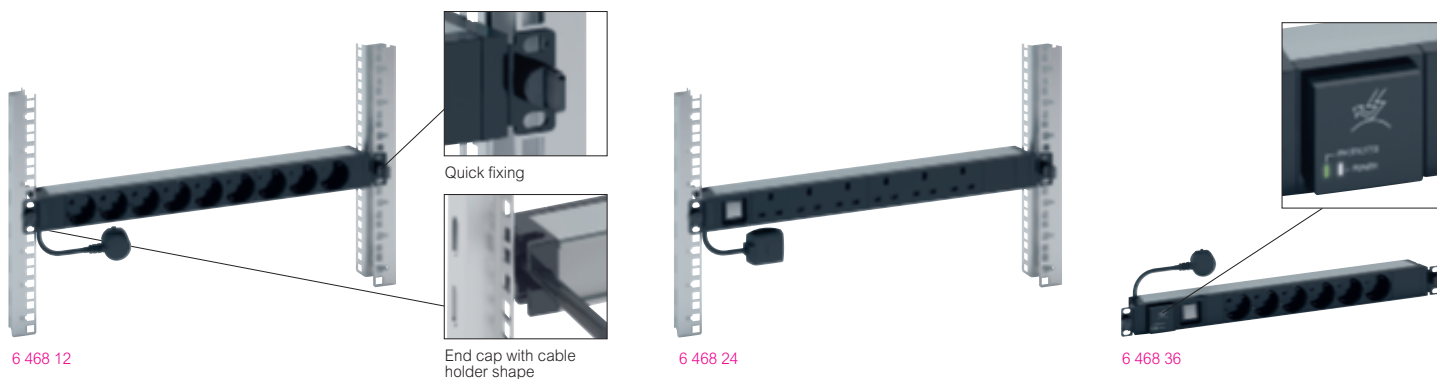
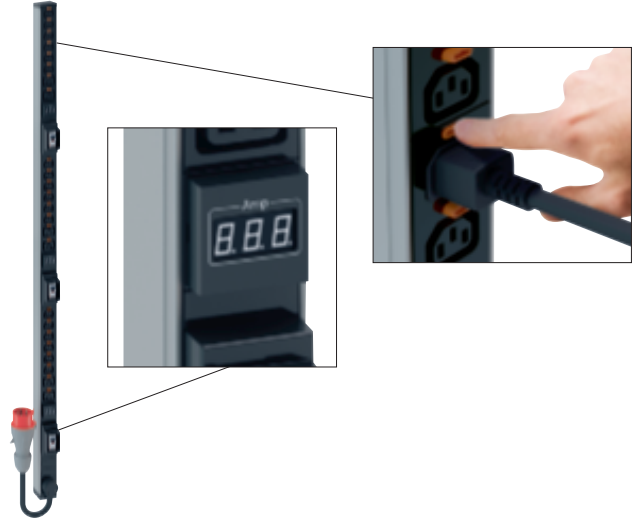**Technical characteristics p. 155**

To provide ∿ electric power for IT equipments in 19" enclosures. 230 V - 50/60 Hz power supply. 1U and 19" aluminium profile. End cap with metallic brackets and cable holder shape. Quick fixing (no screws) on 19" fixing centres[1]. Can also be installed vertically by reverting the brackets (no screws) 2P+E outlets:
- C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19)
- French, German and British standard outlets are equipped with shutters
- French and German standard outlets are inclined at 55°
Black modules (outlets and functions)

Pack	Cat.Nos	**Standard**
		German standard
		3 m power supply cord with 16 A 2P+E French/German plug
1	6 468 06	6 outlets
1	6 468 12	9 outlets
		British standard
		3 m power supply cord with 13 A 2P+E British plug
1	6 468 13	8 outlets
		French standard
		3 m power supply cord with 16 A 2P+E French/German plug
1	6 468 05	6 outlets
1	6 468 10	9 outlets
1	6 468 11	9 tamperproof red outlets
	CORD LOCKING SYSTEM	**IEC 60320 standard**
		Connection on terminal block (except Cat.No 6 468 15)
1	6 468 14	10 C13 outlets with cord locking system
1	6 468 15	12 C13 outlets with cord locking system
		3 m power supply cord with 16 A IEC 60309 2P+E
1	6 468 09	6 C13 outlets + 2 C19 outlets with cord locking system
1	6 468 07	6 C19 outlets with cord locking system

Pack	Cat.Nos	**With power indicator or luminous switch**
		LED indicator gives information whether the PDU is supplied with power or not
		LED indicator switch powers on/off the total PDU
		German standard
		3 m power supply cord with 16 A 2P+E French/German plug
1	6 468 21	9 outlets and 1 power indicator
1	6 468 23	8 outlets and 1 luminous switch
		British standard
		3 m power supply cord with 13 A 2P+E British plug
1	6 468 24	6 outlets and 1 luminous switch
		French standard
		3 m power supply cord with 16 A 2P+E French/German plug
1	6 468 20	9 outlets and 1 power indicator
1	6 468 22	8 outlets and 1 luminous switch

Pack	Cat.Nos	**With protection devices**
		MCB and RCBO support with projecting edges to avoid accidental breakdown
		3 m power supply cord with 16 A 2P+E French/German plug
		German standard
1	6 468 31	6 outlets and a 16 A single pole Micro Circuit Breaker
		French standard
1	6 468 30	6 outlets and a 16 A single pole Micro Circuit Breaker
1	6 468 33	6 outlets and a 16 A 30 mA Residual-current Circuit Breaker with Overcurrent protection

Pack	Cat.Nos	**With surge protection**
		Protect against mains overvoltages while keeping outlets energised
		With light indicators:
		- one LED (white) gives information whether the PDU is supplied with power or not
		- one LED (green) indicates when surge protection module is efficient or must be replaced
		Hotswappable surge protection module Cat.No 6 468 97 (replacement keeping the PDU and its outlets powered on)
		With switch
		3 m power supply cord with 16 A 2P+E French/German plug
1	6 468 36	6 outlets - German standard
1	6 468 35	6 outlets - French standard

Pack	Cat.Nos	**With ammeter**
		Measure consumption to provide better installation management:
		balancing circuits, displaying available capacity, preventing overloads and power failures
		Measure total PDU current
		Rotating display to ensure a perfect reading whatever the PDU mounting direction is (horizontal, vertical with top or bottom power supply input)
		German standard
		3 m power supply cord with 16 A 2P+E French/German plug
1	6 468 41	6 outlets
		French standard
		3 m power supply cord with 2P+E French/German plug
1	6 468 40	6 outlets
	CORD LOCKING SYSTEM	**IEC 60320 standard**
		With integrated universal plug locking system Connection on terminal block
1	6 468 43	6 C13 outlets with cord locking system
1	6 468 45	6 C13 outlets + 1 C19 outlet with cord locking system
1	6 468 44	6 C19 outlets with cord locking system

1: For 19" racks, it's necessary to use screws Cat.No 0 464 23 (p. 120)

Energy Distribution

LCS² single phase Zero-U Power Distribution Units (PDU)
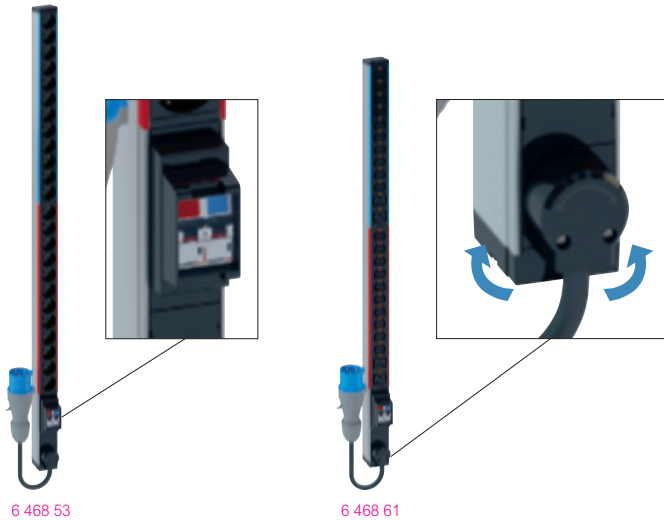
N

6 468 53   6 468 61

Technical characteristics **p. 155-157**

To provide ∿ electric power for IT equipments in 19" enclosures
Single phase 230 V - 50/60 Hz power supply
Zero-U PDU for vertical mounting in the cabinet (see p. 156-157 for dimensions)
PDU with 2 circuits protected by 16 A uni+neutral MCB in a support with projecting edges to avoid accidental breakdown
Each circuit is identified by color coding
The total number of outlets is distributed equally between the 2 circuits
330° rotating cable input for a perfect orientation of the cable and no interference in the cabinet
2P+E outlets:
- C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19)
- French, German and British standard outlets are equipped with shutters
- French and German standard outlets are inclined at 55°
Delivered with 2 sets of metallic mounting brackets
(see details p. 156-157):
- Button brackets. For quick fixing and variable pitch
- Standard brackets. For screw fixing
Black modules (outlets and functions). Aluminium profile

Pack	Cat.Nos	**Standard**
		German standard
1	6 468 52	24 outlets. Connection on terminal block up to 6 mm²
1	6 468 53	24 outlets. 3 m power supply cord with IEC 60309 32 A 2P+E plug
		British standard
1	6 468 54	24 outlets. Connection on terminal block up to 6 mm²
		French standard
1	6 468 50	24 outlets. Connection on terminal block up to 6 mm²
1	6 468 51	24 outlets. 3 m power supply cord with IEC 60309 32 A 2P+E plug
		IEC 60320 standard
1	6 468 56	24 C13 outlets with cord locking system. Connection on terminal block up to 6 mm²
1	6 468 57	24 C13 outlets with cord locking system. 3 m power supply cord with IEC 60309 32 A 2P+E plug
1	6 468 60	20 C13 outlets + 4 C19 outlets with cord locking system. Connection on terminal block up to 6 mm²
1	6 468 61	20 C13 outlets + 4 C19 outlets with cord locking system. 3 m power supply cord with IEC 60309 32 A 2P+E plug
		With ammeter
		Measure consumption to provide better installation management: balancing circuits, displaying available capacity, preventing overloads and power failures. 1 ammeter per circuit. Rotating display to ensure a perfect reading whatever the PDU mounting direction is (horizontal, vertical with top or bottom power supply input)
		IEC 60320 standard
1	6 468 65	20 C13 outlets + 4 C19 outlets with cord locking system. Connection on terminal block up to 6 mm²

Energy Distribution - LCS² three

phase Zero-U Power Distribution Units (PDU)

N

6 468 75

Technical characteristics **p. 155-157**

To provide ∿ electric power for IT equipments in 19" enclosures
Three phase 380 V - 50/60 Hz power supply
Zero-U PDU for vertical mounting in the cabinet (see p. 156-157 for dimensions)
Each circuit is protected by 16 A single pole MCB in a support with projecting edges to avoid accidental breakdown
1 circuit per phase, each with 6 IEC 60320 C13 outlets and 2 IEC 60320 C19 outlets
330° rotating cable input for a perfect orientation of the cable and no interference in the cabinet
C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19)
Delivered with 2 sets of metallic mounting brackets:
- Button brackets. For quick fixing and variable pitch
- Standard brackets. For screw fixing
Black modules (outlets and functions)
Aluminium profile

Pack	Cat.Nos	**Standard**
		IEC 60320 standard
1	6 468 70	18 C13 outlets + 6 C19 outlets with cord locking system. 3 m power supply cord with IEC 60309 32 A 3P+N+E plug
		With ammeter
		Measure consumption to provide better installation management: balancing circuits, displaying available capacity, preventing overloads and power failures. 1 ammeter per circuit. Rotating display to ensure a perfect reading whatever the PDU mounting direction is (horizontal, vertical with top or bottom power supply input)
		IEC 60320 standard
1	6 468 75	18 C13 outlets + 6 C19 outlets with cord locking system. 3 m power supply cord with IEC 60309 32 A 3P+N+E plug

Cord locking system **p. 155**

Energy Distribution - Power Distribution
Units (PDU) accessories and multi-application DIN rail **N**

Cable ties and document holders

6 468 90

0 465 46 + 0 465 47

0 331 94

0 331 95

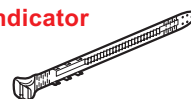0 331 96

0 331 85

0 331 87

0 320 68

Technical characteristics p. 155 - 157

For grouping together and organising audio, computer, VDI, etc, cables
Re-usable (cables can be added)
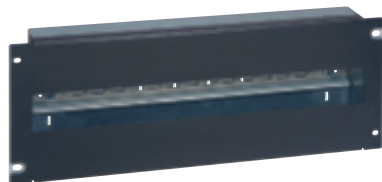
Pack	Cat.Nos	**PDU to be equipped**
		For self assembly with Mosaic wiring device modules
		Quick fixing (no screws) on 19" uprights[1]
		Aluminium profile
1	6 468 99	PDU 19"
		Capacity: 16 Mosaic modules
1	6 468 98	PDU 10"
		Capacity: 8 Mosaic modules
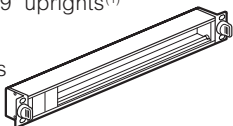
		PDU accessories
		Locking caps
		To block the use of an outlet. A key is necessary to remove the cap and free the access
		Light grey
1	6 468 90	Set of 6 locking caps for French and German standard outlet + 1 key
1	6 468 92	Set of 6 locking caps for British standard outlet + 1 key
1	6 468 94	Set of 6 locking caps for C13 standard outlet + 1 key
1	6 468 95	Set of 6 locking caps for C19 standard outlet + 1 key
		Surge protection module
		To replace used module on PDU
		With light indicators:
		- one LED (white) gives information whether the PDU is supplied with power or not
		- one LED (green) indicates when surge protection module is efficient or must be replaced
		Hotswappable: replacement keeping the PDU and its outlets powered on
1	6 468 97	Surge protection replacement module

		Multi-applications DIN rail
		For mounting modular devices (circuit breakers, Legrand multimedia network components, etc)
		Capacity: 24 modules
		Height 4 U
		Screw fixing on 19" uprights[1]
1	0 465 46	DIN profile rail with front panel
		Supplied with blanking plates
		24 modules
		Black RAL 9005
1	0 465 47	Rear cover
		To be used for high current applications (greater than 50 V)
		Used with Cat.No 0 465 46
		Ensures IP XXB
		Supplied with terminal block (8 + 1 connections)
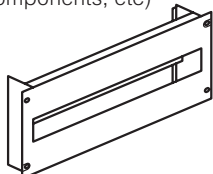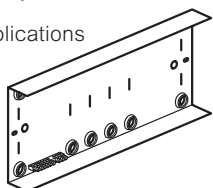
1 : For 19" racks, it's necessary to use screws
Cat.No 0 464 23 (p. 120)

Cable ties with tightening indicator

Wide cable ties with patented warning system to prevent overtightening cables
Release by pinching the head of the cable tie
Strap held in place after tightening

Pack	Cat.Nos	Width (mm)	Length (mm)	Tightening Ø max.	Tightening Ø min.
50	0 331 94	15	180	35	15
50	0 331 95	15	225	50	35
50	0 331 96	15	320	80	50

Self-locking cable ties

Repositionable cable ties
Double-sided textile with "loops" on one side and "hooks" on the other
Do not damage cables

Pack	Cat.Nos	Colour	Width (mm)	Length (mm)	Tightening Ø max. (mm)
10	0 331 84	Black	16	150	35
10	0 331 85	Red	16	150	35
10	0 331 86	Green	16	150	35
10	0 331 87	Black	16	300	80
10	0 331 88	Red	16	300	80
10	0 331 89	Green	16	300	80

Self adhesive base

Pack	Cat.Nos	
50	0 320 68	For cable ties max. width 20 mm
		Black - 38 x 38 x 9.4 mm
		Possible central fixing with screw Ø4 mm

Self-adhesive document holders

Open - RAL 7035

Pack	Cat.Nos	Ext. dimensions Height (mm)	Ext. dimensions Width (mm)	Int. dimensions Height (mm)	Int. dimensions Width (mm)	Depth (mm)
20	0 365 80	235	340	200	310	18
20	0 365 81	165	260	130	230	18
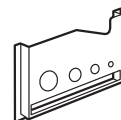
Closed - RAL 7035

1	0 365 82	Rigid plastic - IP 50
		Int. dimensions: 324 x 120 x 18 mm

Transparent

10	0 097 99	Soft plastic, A4 - 305 x 220 mm

Performance
and reliability
at the heart
of the server room

Legrand provides a comprehensive range of
products and solutions dedicated to server
room applications

Smart patching for fibre and copper
p. 133

LCS² cat. 6$_A$ cables, patch cords and patch panels
p. 138

Smart PDU
p. 132

LCS² fibre optic cables and patch cords
p. 138

Varicondition Cold Corridor®
p. 130
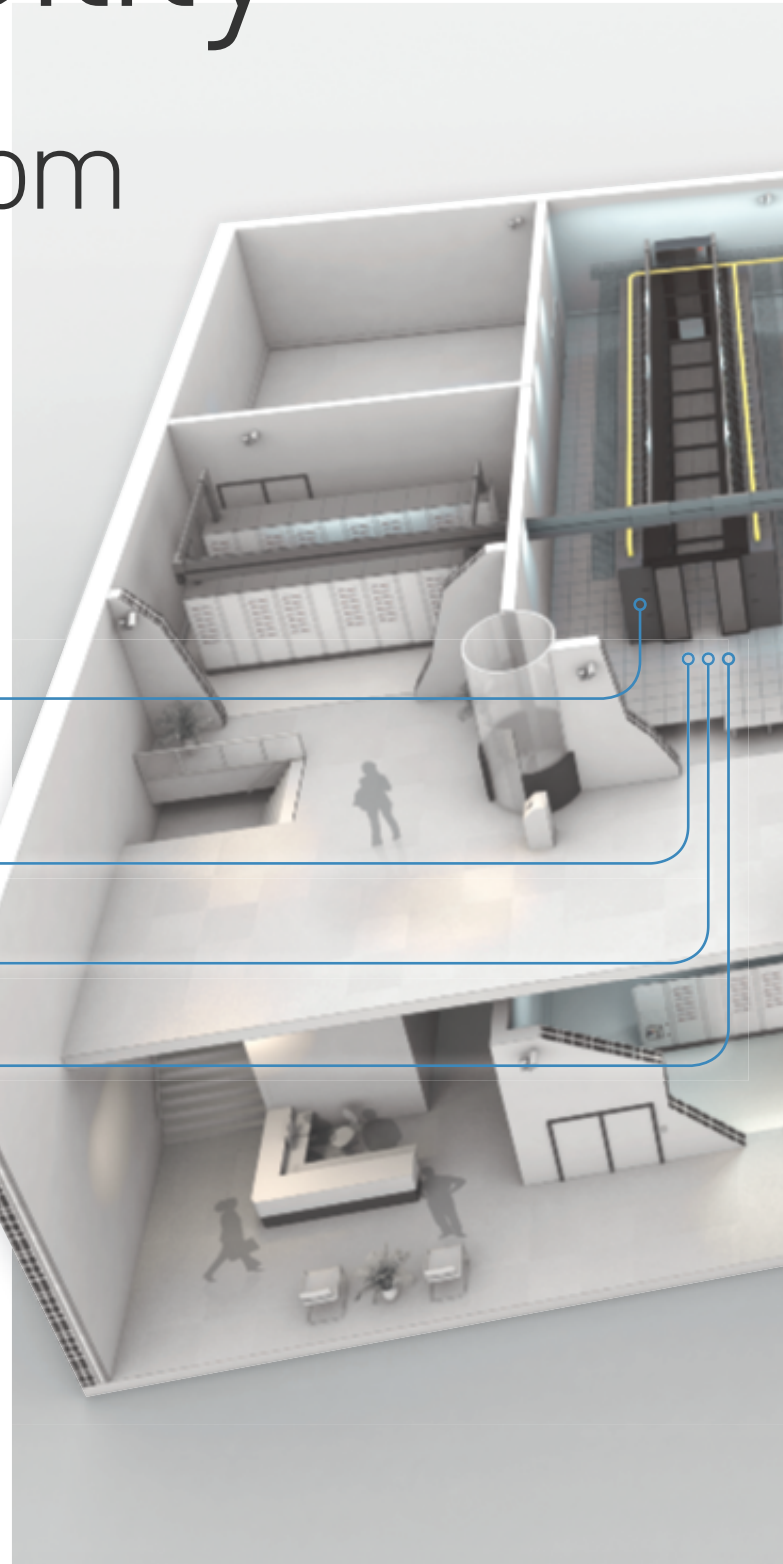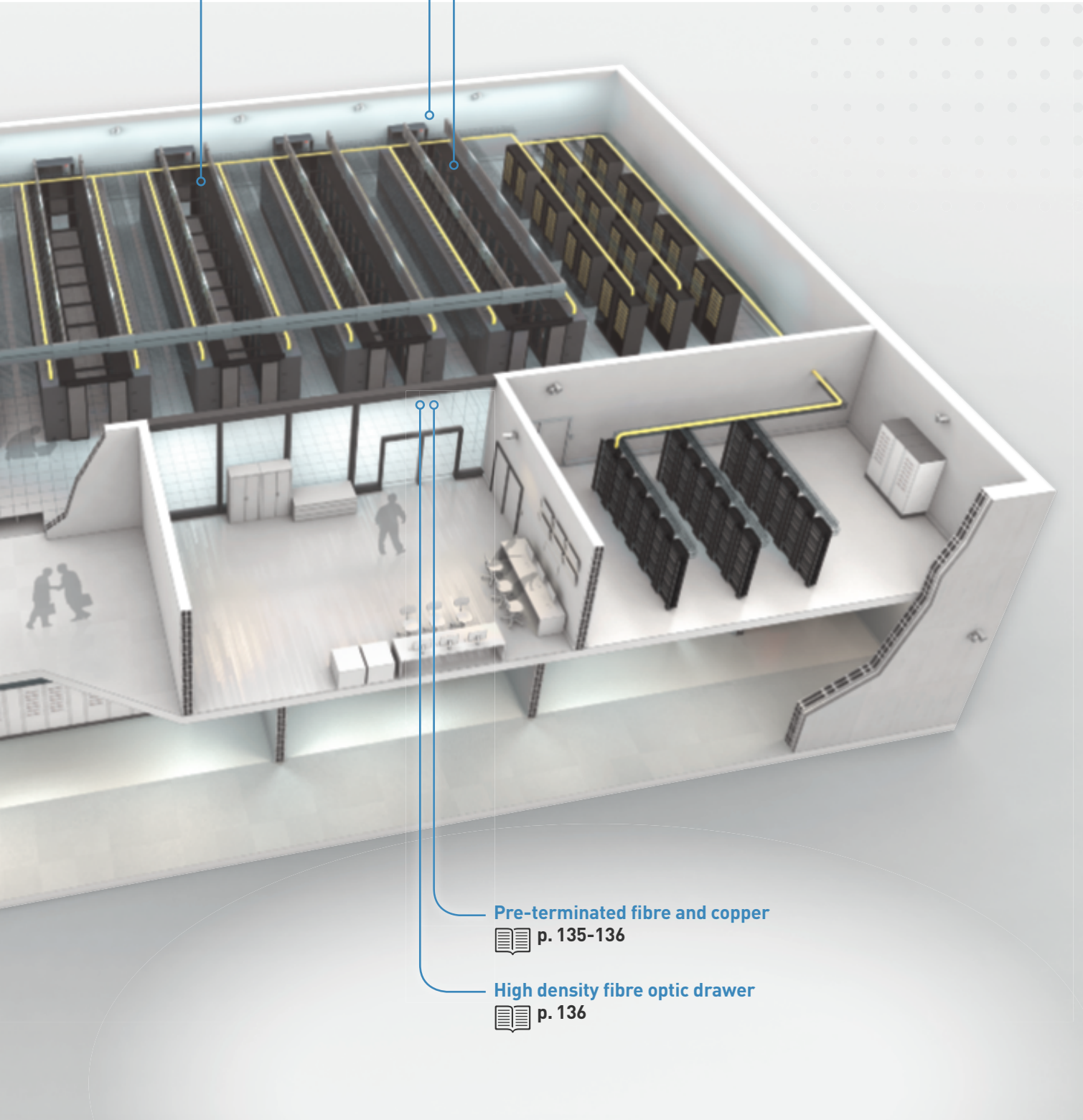
Varicondition H₂O
p. 130

Varicon-L 19" server cabinets
p. 128

Pre-terminated fibre and copper
p. 135-136

High density fibre optic drawer
p. 136

| 6 466 21 | 6 466 68 | 6 466 69 | 6 466 61 |

Technical characteristics **p. 158-159**

Varicon-L 19" server cabinets

Pack	Cat.Nos	
		Baying server cabinets, IK08

Permissible load 1000 kg
Front and rear reversible microperforated metal doors (80%), with 2-point locking handles
Removable side panels
4 sides locked with 2233 key lock
Cable entries at the top: 1 rear entry with brushes and 2 entries fitted with solid plates (3 when width 800 mm)
Open cable entry at the bottom
Equipped with 4 x 19" uprights with U marking and adjustable in depth
Levelling feet adjustable from the inside
Supplied with earthing kit
Cabinets depth 1200 mm take LCS^2 shelves for depth 1000 mm
Black RAL 9011

Cabinets

Pack	Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)
1	6 466 10	41 U	2000	600	1000
1	6 466 12	41 U	2000	600	1200
1	6 466 13	41 U	2000	800	1000
1	6 466 15	41 U	2000	800	1200
1	6 466 16	46 U	2200	600	1000
1	6 466 18	46 U	2200	600	1200
1	6 466 19	46 U	2200	800	1000
1	6 466 21	46 U	2200	800	1200

Extension cabinets
Without side panels
Supplied with joining kit

Pack	Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)
1	6 466 30	41 U	2000	600	1000
1	6 466 32	41 U	2000	600	1200
1	6 466 33	41 U	2000	800	1000
1	6 466 35	41 U	2000	800	1200
1	6 466 36	46 U	2200	600	1000
1	6 466 38	46 U	2200	600	1200
1	6 466 39	46 U	2200	800	1000
1	6 466 41	46 U	2200	800	1200

Cable management

Pack	Cat.Nos	
		Vertical cable managers

Fix on 19" uprights to manage copper or fibre optic cords (see technical page, p. 159)
Supplied with 10 plastic cable guides that can be positioned without any tools over the whole height
Supplied with screws

Pack	Cat.Nos	
1	6 466 65	Vertical cable manager for 41 U cabinet
1	6 466 66	Vertical cable manager for 46 U cabinet

Cable guide rings
Fix on structural uprights and 19" uprights
Metal
Supplied with screws

| 1 | 6 466 68 | Ring for vertical management. 35 x 65 mm |
| 1 | 6 466 69 | Ring for horizontal management. 30 x 85 mm |

Cable guides
For holding cables in the cabinet
Direct rear or side fixing on the structure
Width 300 mm
Supplied with screws

| 1 | 6 466 61 | Cable guide for 41 U cabinet |
| 1 | 6 466 62 | Cable guide for 46 U cabinet |

Cable entry with brushes
For mounting on the top cable entry

| 1 | 6 466 85 | Set of brushes |

| 6 466 81 | 0 465 32 | | 0 465 29 | | 0 465 23 | | 0 465 29 |

Technical characteristics **p. 158-159**

Pack	Cat.Nos	**Equipment supports**
		Fixing crosspieces
		For fixing equipment depthwise in cabinets
		Fix on structural uprights in 25 mm steps over the whole height of the cabinet
		Supplied without screws
1	6 466 55	Crosspiece for cabinet depth 1000 mm
1	6 466 57	Crosspiece for cabinet depth 1200 mm
		Set of 4 universal fixing brackets
		For fixing equipment. Numerous attachment points (see technical page, p. 159)
		Fix on structural uprights and 19" uprights
		Supplied with screws
1	6 466 59	Set of 4 universal fixing brackets

Pack	Cat.Nos	**Air flow management**
		Front vertical covers
		For cabinet width 800 mm. Keep the cold air at the front of the servers. Fix on the 19" uprights and cover the space on the front between the structure and the 19" uprights. Each cover has three 2 U cut-outs to be fitted with 19" LCS² blanking plates or plastic plates with brushes
		Black RAL 9011
1	6 466 81	Set of 2 front covers for 41 U cabinets
1	6 466 82	Set of 2 front covers for 46 U cabinets
		Side vertical covers
		For cabinet width 800 mm. Used with front vertical covers. Cover the sides of the space between the structure and the front covers. Depth 270 mm
		Black RAL 9011
1	6 466 88	Set of 2 side covers for 41 U cabinets
1	6 466 89	Set of 2 side covers for 46 U cabinets
		19" LCS² blanking plates
		Plastic, snap on, black
1	0 465 32	1 U
1	0 465 33	2 U
		19" LCS² feedthrough panels
		Plastic with brushes, snap on, black
1	0 465 28	1 U
1	0 465 29	2 U

Pack	Cat.Nos	**Shelves for heavy items**
		Max. load: 100 kg
		For cabinets depth 1000 and 1200 mm
		Screw fixing on 4 x 19" uprights (max. fixing centre: 825 mm)
		Black RAL 9005
1	0 465 17	Fixed shelf, depth 820 mm, 1 U
1	0 465 18	Telescopic shelf, depth 820 mm, 2 U

Pack	Cat.Nos	**Keyboard support shelves**
		For cabinets depth 1000 and 1200 mm
		Screw fixing on 4 x 19" uprights (max. fixing centre: 825 mm)
		Max. load: 50 kg
		Black RAL 9005
		Can take:
		- a computer screen
		- a keyboard on the retractable support
		- a mouse on a sliding shelf with integrated mat
1	0 465 19	Area for mouse or CD

Pack	Cat.Nos	**Sets of 2 fixed sliders**
		For cabinets depth 1000 and 1200 mm
		Fixing on 4 x 19" uprights (fixing centre: 740 mm)
		Max. load: 50 kg
1	0 465 13	For depth ≥ 1000 mm

Pack	Cat.Nos	**19" management panels**
		For organisation and circulation of patch cords
		Black RAL 9005
		Metal 2 axes, quick-fixing
		Horizontal and through run. Fitted with plastic cable guide rings radiating out for optimum protection of the cords (compliance with the bending radius)
		Quick, screw-free fixing
1	0 465 22	1 U
1	0 465 23	2 U
		Plastic with brushes, snap on
1	0 465 28	1 U
1	0 465 29	2 U

Pack	Cat.Nos	**19" lighting kit**
		19" metal panel with a lighting kit with switch
		Quick, screw-free fixing
		Supplied with 230 V∼
		8 W fluorescent tube
1	0 464 85	1 U

Other equipment and accessories
Customized solutions, p. 131

For other shelves and management panels
p. 119-121
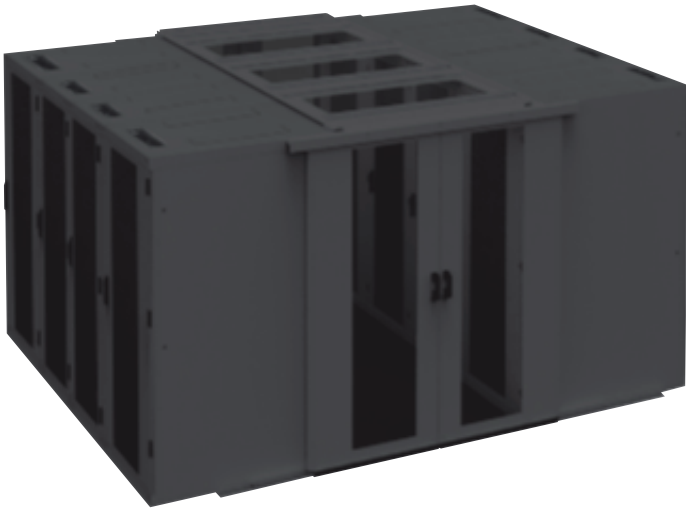
6 466 12 + 6 467 10 + 6 467 28 + 6 467 20 + 6 467 22 + 6 467 24

6 467 40

Technical characteristics **p. 158-159**

Pack	Cat.Nos	**Varicondition Cold Corridor®**
		Solution to contain the cold air in the corridor formed by 2 rows of cabinets Minimises the cold air production needed for cooling the servers
		Double sliding doors To close off a 1200 mm wide corridor Sliding doors with window made of safety glass Opened and closed manually Supplied with the necessary fixing accessories (attachment to the cabinets and to the ground) Provide a double door at each end of the corridor Black RAL 9011
1	6 467 10	For corridor consisting of cabinets height 41 U
1	6 467 12	For corridor consisting of cabinets height 46 U
		Roof modules To cover a 1200 mm wide corridor The roof modules are placed on the rail Cat.No 6 467 28 600 mm wide module consisting of a metal frame and a glass window 100 and 200 mm wide modules solid metal Match the number and sizes of the modules to the length of the rows of cabinets Always place a 100 or 200 mm solid module at each end of the corridor and between each 600 mm module Black RAL 9011
1	6 467 20	Module, width 600 mm
1	6 467 22	Module, width 200 mm
1	6 467 24	Module, width 100 mm
		Roof profile Takes the roof modules Positioned on the roofs of the cabinets Enables the cabinets to be moved without having to dismantle the corridor roof
1	6 467 28	Rail, length 2 m

Pack	Cat.Nos	**Varicondition - H₂0**
		Cooling unit for integration in the rows of cabinets for precise air conditioning as close as possible to the servers Deals with hot spots
		Water-based cooling unit for connection to a chiller Cooling capacity up to 24 kW Cold air production controlled by the control unit: - control of the water inlet valve - control of the speed of the 6 fans distributed in 3 areas Control screen on the front Front and rear panels 80% microperforated for open loop operation: air drawn in at the rear of the unit and discharged at the front into the corridor after being cooled The control unit and fans can be maintained without stopping the cooling unit
		For use with 19" Varicon-L server cabinets 41 U depth 1200 mm Height 2000 mm Width 300 mm Depth 1200 mm Black RAL 9011
1	6 467 40	Cooling unit 24 kW

Customized solutions

19" Varicon-L server cabinets, Varicondition Cold Corridor® and H$_2$0

Data Center

↓ 19" VARICON-L SERVER CABINETS

Up to 384 possible combinations to meet all your configuration requirements

Height	Width	Depth	Front door	Rear door	Side panels
41 U	600 mm	1000 mm	single, microperforated	single, microperforated	without
46 U	800 mm	1200 mm	single, glazed	single, glazed	with
			double, microperforated	single, solid metal	
			double, glazed	double, microperforated	
				double, glazed	
				double, solid metal	

Secure access to sensitive equipment:
- Locked with key
- Locked using a code
- Locked using a card reader

- Plinth
- Casters
- Floor fixing kit
- Cable entry plate
- Ventilation
- Etc.

Optimisation of the energy use and servers cooling by appropriate organisation of the rows of cabinets:

Cold Corridor® (width 1200 mm) with raised access floor

Specific corridor widths

Motorised doors
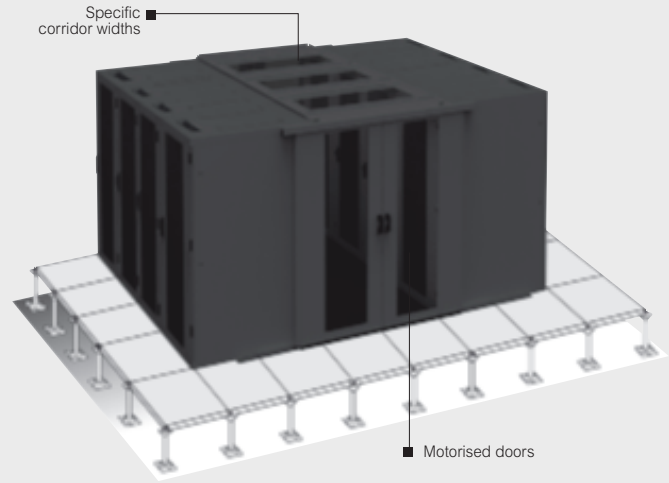
Study of integrating cooling units in the rows

Closed loop

COLD CORRIDOR

COLD CORRIDOR

Open loop

Hybrid loop

> > > |

Customized solutions

smart PDU

Data Center
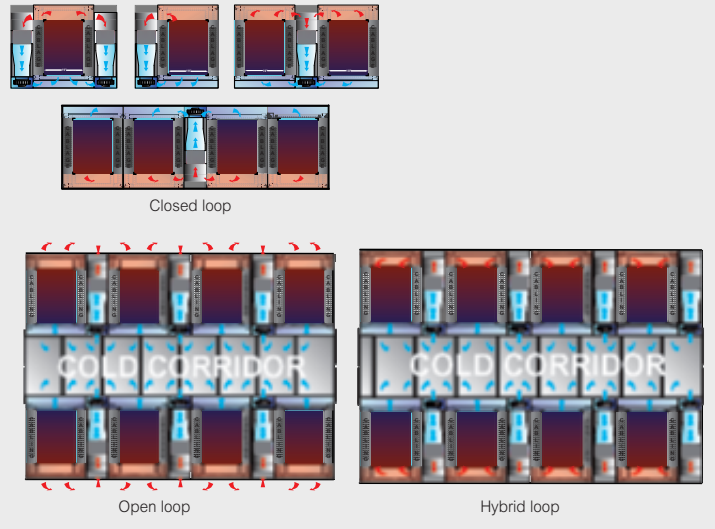
A customized offer
for Smart PDU
and Environmental Monitoring System

Smart PDU and Environmental Monitoring System provide local and remote power monitoring and environmental monitoring via IP in server cabinets
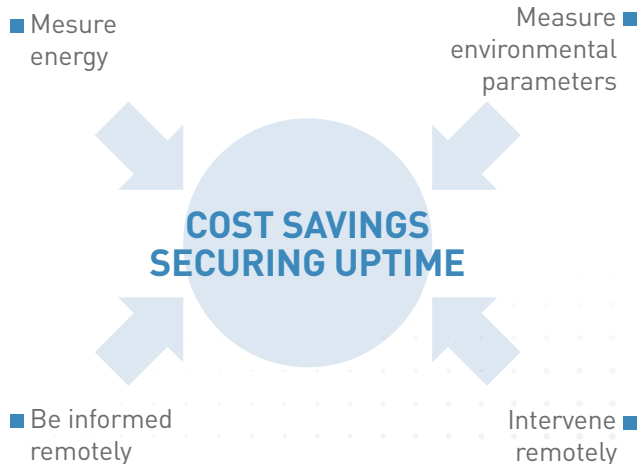
↓ MONITORING LEVELS ON PDU

3-Outlet monitoring and switching
Usage per server
Reboot server/control access

2-Outlet monitoring
Usage per server

1-Inlet monitoring
Total usage per rack
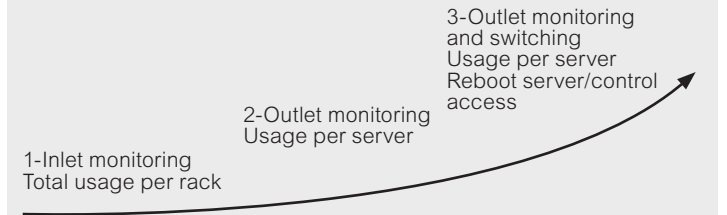
↓ ARCHITECTURE FRAMEWORKS

Integrated "smart module" to the PDU main frame

All in one. Features integrated in the PDU

Web browser

Servers

Data

Power feed

Integrated Smart module in PDU
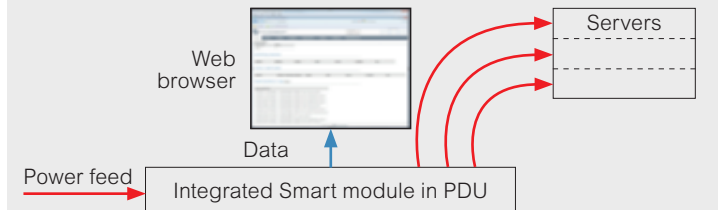
External "smart module" (with or without display) from PDU main frame

For existing installation equipped with basic PDU, upgrade installation by integrating "smart module" on your power feed

Web browser

Servers

Data

Power feed

Smart module
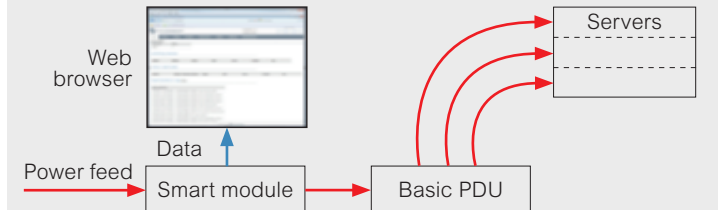
Basic PDU

(The "smart module" will powered the Basic PDU)

Independent "smart module" (with or without display) from PDU main frame

For new project, bring flexibility thanks to smart module in parallel to basic. PDU Service and repair without interrupting, spread or postponed investments

(The "smart module" is powered the Basic PDU)

↓ FEATURES

Energy measured values

Power (kW) and power consumption (kWh), Voltage (V), Current (A), apparent power (VA), power factor
+/- 1% accuracy

Communication

IP connection through Ethernet port. Local display and Web browser interface. SNMP protocol. Possible local configuration with RS232 port

Physical

Power: single or Three phase, 16 or 32 Amps
Inlet: choose your connector type and cord length
Outlet socket types: C13, C19, local standards
Protection: without, with fuse, with circuit breaker
Format: 19" or vertical

Environmental

Temperature. Humidity. Water detection. Door cabinet status

■ Mesure energy

Measure environmental parameters ■

COST SAVINGS SECURING UPTIME

■ Be informed remotely

Intervene remotely ■

OUR COMMITMENT

Request a quotation from our technical team

>>>

Legrand cabling system LCS²

smart patching for fibre and copper

DATA Center

3 343 15

3 343 03

3 343 00

3 343 17

3 343 40

3 343 44

Smart
patching
for fibre
and copper

Provides an intelligent and efficient patch management system for complex networks and data centers

■ **ANALYSER FOR RFID PATCH PANEL**

■ **RFID PATCH CORD** (equipped with a transponder)

■ **RFID FO PATCH CORD** (equipped with a transponder)
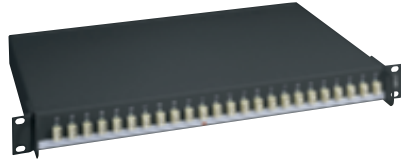
Pack	Cat.Nos	
		Analyser
		The Analyser acts as an intelligent communications interface between the patch panel/FO drawer and the management system
1	3 343 15	Analyser for RFID patch panels 1 for 30 RFID patch panels
		Patch panel
		The patch panel is equipped with a sensor bar which reads the RFID information from patch cords and displays, by means of LEDs, ports involved in changes or jobs
1	3 343 00	RFID patch panel 24 RJ 45 cat. 6$_A$ STP
		Fibre optic drawer
		The drawer is equipped with a sensor bar which reads the RFID information from patch cords and displays, by means of LEDs, ports involved in changes or jobs
1	3 343 40	RFID drawer fibre optic OM4 24 LC to be equipped
		RJ 45-RJ 45 cords
		Patch cords (copper) are fitted with RFID transponders at both ends
1	3 343 03	RFID patch cord cat. 6$_A$ S/FTP LSZH 1 m
1	3 343 04	RFID patch cord cat. 6$_A$ S/FTP LSZH 2 m
1	3 343 05	RFID patch cord cat. 6$_A$ S/FTP LSZH 3 m
1	3 343 06	RFID patch cord cat. 6$_A$ S/FTP LSZH 5 m
1	3 343 17	RFID server patch cord cat. 6$_A$ S/FTP LSZH 1 m
1	3 343 18	RFID server patch cord cat. 6$_A$ S/FTP LSZH 2 m
1	3 343 19	RFID server patch cord cat. 6$_A$ S/FTP LSZH 3 m
		Fibre optic cords
		Patch cords (fibre optic) are fitted with RFID transponders at both ends
1	3 343 44	RFID patch cord fibre optic OM4 LC/LC 1 m
1	3 343 45	RFID patch cord fibre optic OM4 LC/LC 2 m
1	3 343 46	RFID patch cord fibre optic OM4 LC/LC 3 m
1	3 343 47	RFID server patch cord fibre optic OM4 LC/LC 1 m
1	3 343 48	RFID server patch cord fibre optic OM4 LC/LC 2 m
1	3 343 49	RFID server patch cord fibre optic OM4 LC/LC 3 m
		BUS connection accessories
1	3 343 30	BUS cable 25 m
1	3 343 31	BUS connector
1	3 343 32	BUS termination
1	3 343 33	BUS connector crimping tool

Visualisation
Consult us

Legrand cabling system LCS²

smart patching for fibre and copper

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■ Schematic explanation

Hardware

Software

BUS

ETHERNET

Analyser

RFID FO drawer
(equipped with
a sensor bar)

RFID

RFID FO patch cord
(equipped with a transponder)

Visualisation

Hardware

Software

BUS

ETHERNET

Analyser

RFID patch panel
(equipped with a
sensor bar)

RFID

RFID patch cord
(equipped with a transponder)

Visualisation

Legrand cabling system LCS²

solution preterminated copper

0 335 50 fitted with 4 preterminated cassettes

0 328 30

0 328 33

Pack	Cat.Nos	**Modular high density panel**
		Panel specifically for using preterminated cassettes (maximum 4)
		Fitted with:
		- a side cord management accessory (does not require the use of feedthrough panels)
		- soluclip for automatic fixing (no screws) on the cabinet uprights
1	0 335 50	19" panel - 1 U

Pack	Cat.Nos	**Preterminated cassettes**
		Clip directly onto panels Cat.No 0 335 50 Links factory tested with test report provided
		Cassette-cassette termination
		Cat. 6A S/FTP copper band 6 links (trunk)
1	0 328 30	Length 6 m
1	0 328 31	Length 9 m
1	0 328 32	Length 12 m
		Cassette-RJ 45 cord termination
		Cat. 6A S/FTP copper band 6 links (trunk)
1	0 328 33	Length 6 m
1	0 328 34	Length 9 m
1	0 328 35	Length 12 m

Customized solutions

solution preterminated copper

↓ CHOOSING THE TERMINATION AND THE CORD LENGTH

Choose the termination

Cassette-cassette termination

Termination cassette-cassette

Cassette termination

Cassette-RJ 45 cord termination
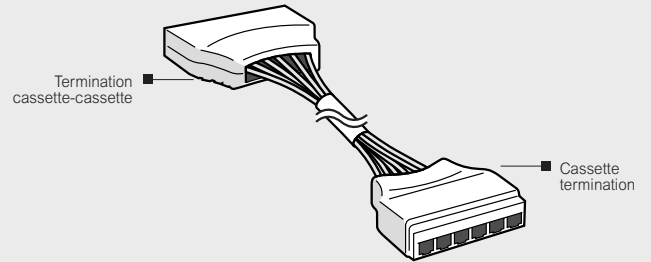
RJ 45 cord termination

Cassette termination
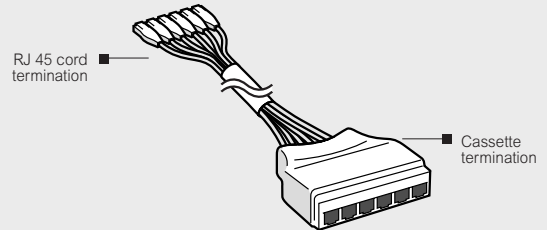
Choose the cord length: 1 to 70 m
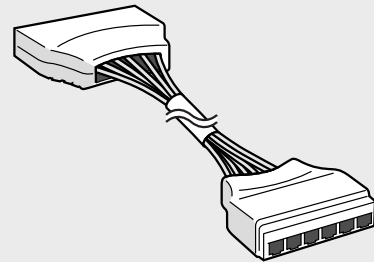
Mount the cassette for the snap on system on the panel

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135

Legrand cabling system LCS² fibre optic - 19" high density fibre optic drawer

Data Center

Legrand cabling system LCS²

solution pre-fitted with fibre optic connectors

N
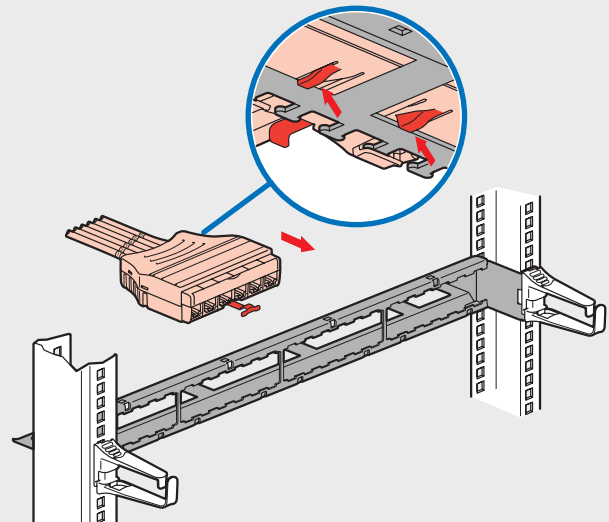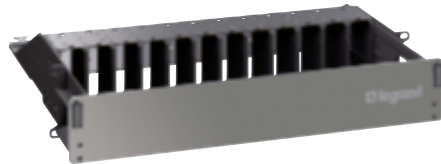
0 326 40

0 326 42

0 326 45

0 326 46

0 324 01

High density, modular fibre optic drawer

Pack	Cat.Nos	
		Fibre optic drawers with cord management at the front and rear
		Modular fibre optic drawer
		Fixed modular frame to take the cassettes below
		Maximum capacity 2 U (takes up to 12 cassettes)
		- 288 LC connectors
		- 144 SC connectors
		Maximum capacity 1 U (takes up to 5 cassettes)
		- 120 LC connectors
		- 60 SC connectors
		Depth: 500 mm
1	0 326 40	1 U
1	0 326 42	2 U
		Fibre optic drawers without cord management
		Modular fibre optic drawer
		Fixed modular frame to take the cassettes below
		Maximum capacity 1 U (takes up to 5 cassettes)
		- 120 LC connectors
		- 60 SC connectors
		Depth: 340 mm
1	0 326 41	1 U

High Density cassettes[1]

Pack	Cat.Nos	
		Clip directly into fibre optic drawers
		Cat.No 0 326 40/41/42
		Cassettes slide into the above frame
		Remove cassettes from the front using the metal tab provided
		MTP Elite® high performance cassettes
		Low insertion loss < 0.35 dB
		A/C polarity
		OM4 multimode cassettes (50/125 µm)
		For 10 Gigabit Ethernet network
		For 50/125 µm multimode installations, OM4 type
1	0 326 45	MTP Elite® cassette (MPO compatible) 24 x LC fibres OM4 Type A/C
1	0 326 46	MTP Elite® cassette (MPO compatible) 12 x SC fibres OM4 Type A/C
		OS1/OS2 cassettes (9/125 µm)
		For 9/125 µm singlemode installations, OS1/OS2 type
1	0 326 47	MTP Elite® cassette (MPO compatible) 24 x LC fibres OS1/OS2 Type A/C
1	0 326 48	MTP Elite® cassette (MPO compatible) 12 x SC fibres OS1/OS2 Type A/C
		Cover
1	0 326 49	Blanking cassette

1: MTP Elite® is a registered trademark of the US Conec Ltd

High density pre-fitted fibre optic links

Pack	Cat. Nos	
		Supplied on a cardboard reel
		For high density fibre optic drawer cassette connections
		Low density microcable
		LSZH sheath, aqua (OM3) and yellow (OS2)
		Supplied with test reports and cable dispensers
		Fan-out - Fan-out: anodised aluminium terminations for optimum resistance
		Low insertion loss for LC connector < 0.15 dB/connector
		MTP-MTP: low insertion loss for MTP connector < 0.35 dB/connector
		Other configurations available on request

OM3 Fan-out - Fan-out microcables
Microcables with fan-out termination, 2 mm output

Pack	Cat. Nos	Description	Length (m)
1	0 324 01	6 LC Duplex - 6 LC Duplex	10
1	0 324 02	6 LC Duplex - 6 LC Duplex	20
1	0 324 03	6 LC Duplex - 6 LC Duplex	30
1	0 324 04	6 LC Duplex - 6 LC Duplex	40
1	0 324 05	6 LC Duplex - 6 LC Duplex	50
1	0 324 11	12 LC Duplex - 12 LC Duplex	10
1	0 324 12	12 LC Duplex - 12 LC Duplex	20
1	0 324 13	12 LC Duplex - 12 LC Duplex	30
1	0 324 14	12 LC Duplex - 12 LC Duplex	40
1	0 324 15	12 LC Duplex - 12 LC Duplex	50

OS2 Fan-out - Fan-out microcables
Microcables with fan-out termination, 2 mm output

Pack	Cat. Nos	Description	Length (m)
1	0 324 21	6 LC Duplex - 6 LC Duplex	10
1	0 324 22	6 LC Duplex - 6 LC Duplex	20
1	0 324 23	6 LC Duplex - 6 LC Duplex	30
1	0 324 24	6 LC Duplex - 6 LC Duplex	40
1	0 324 25	6 LC Duplex - 6 LC Duplex	50
1	0 324 31	12 LC Duplex - 12 LC Duplex	10
1	0 324 32	12 LC Duplex - 12 LC Duplex	20
1	0 324 33	12 LC Duplex - 12 LC Duplex	30
1	0 324 34	12 LC Duplex - 12 LC Duplex	40
1	0 324 35	12 LC Duplex - 12 LC Duplex	50

MTP OM3 microcables

Pack	Cat. Nos	Description	Length (m)
1	0 324 41	12 fibres - MTP-MTP	10
1	0 324 42	12 fibres - MTP-MTP	20
1	0 324 43	12 fibres - MTP-MTP	30
1	0 324 44	12 fibres - MTP-MTP	40
1	0 324 45	12 fibres - MTP-MTP	50

MTP OS2 microcables

Pack	Cat. Nos	Description	Length (m)
1	0 324 51	12 fibres - MTP-MTP	10
1	0 324 52	12 fibres - MTP-MTP	20
1	0 324 53	12 fibres - MTP-MTP	30
1	0 324 54	12 fibres - MTP-MTP	40
1	0 324 55	12 fibres - MTP-MTP	50

Customized solutions
see opposite

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CASSETTE WITH MTP SOLUTION

Cassette with MTP + trunk MTP,
40 Gbit/100 Gbit scalability

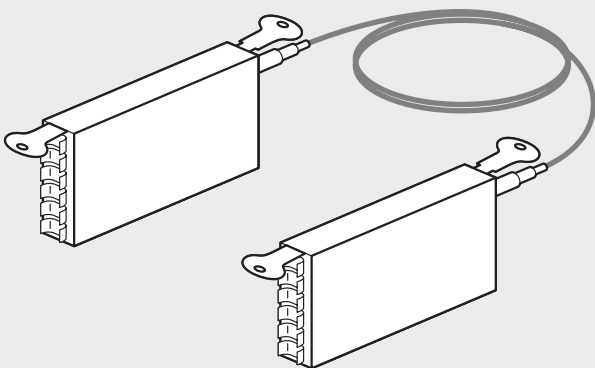MTP: one single connection to
connect 12/24 fibres instantly
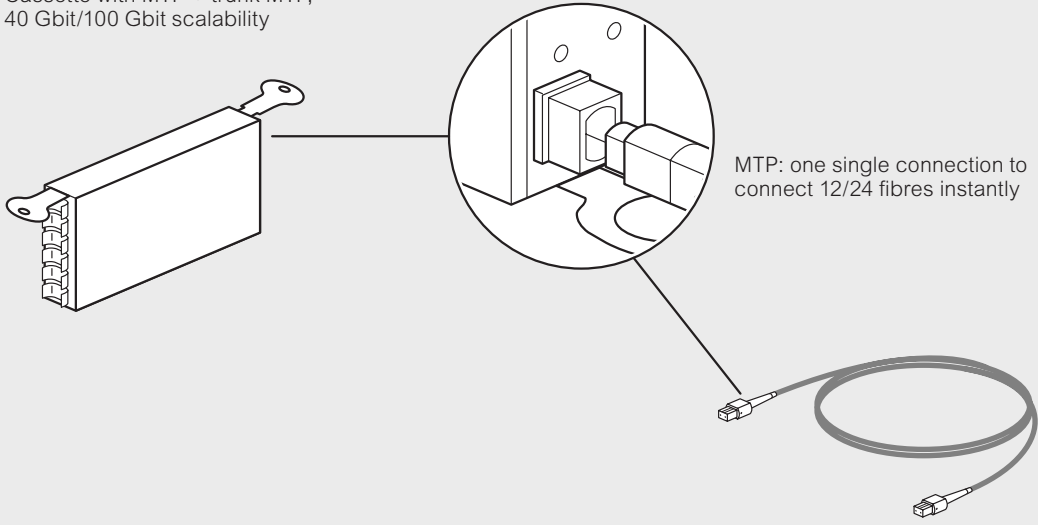
CASSETTE WITHOUT MTP SOLUTION

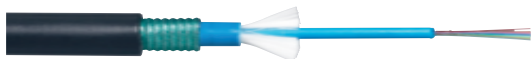Cassette without MTP at the back + Terminated MTP or Fan out
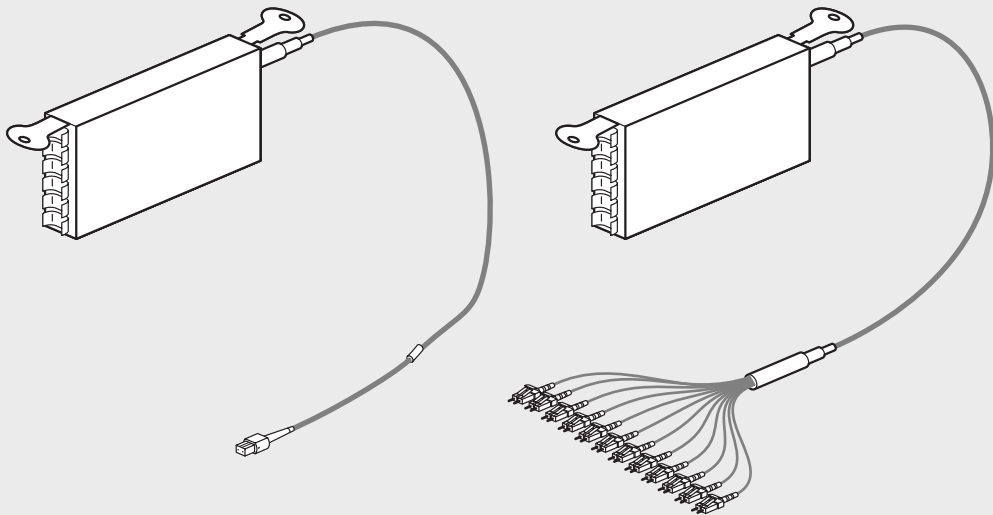
2 CASSETTES WITHOUT MTP SOLUTION
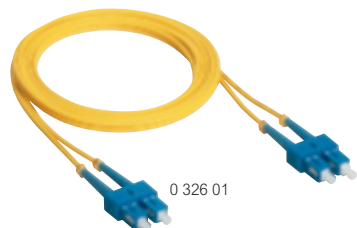
2 cassettes without MTP at the back terminated together

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Legrand cabling system LCS² fibre optic - OM4 cables and cords

Data Center

0 325 15

0 326 01   0 326 07

Pack	Cat.Nos	
	Tight buffer 900 µm	**OM4 multimode fibre optic cables (50/125 µm)**
		For 50/125 µm multimode installations, type OM4. Blue sheaths 10 Gigabit Ethernet compliant
500	0 326 65	Indoor/outdoor (glass strands) 6 fibres - 500 m
1000	0 326 66	Indoor/outdoor (glass strands) 6 fibres - 1000 m
1000	0 326 67	Indoor/outdoor (glass strands) 12 fibres - 1000 m
1000	0 326 68	Indoor/outdoor (glass strands) 24 fibres - 1000 m

Pack	Loose tube	900 µm Tight buffer	**OS1/OS2 singlemode fibre optic cables (9/125 µm)**
			For 9/125 µ m singlemode installations (OS1) Yellow jacket
2000[1]	0 325 12	-	Indoor/outdoor (universal) 6 fibres
2000[1]	0 325 13	-	Outdoor, corrugated steel tape 6 fibres
2000[1]	0 325 14	0 325 50	Indoor/outdoor (universal) 12 fibres
2000[1]	0 325 15	-	Outdoor, corrugated steel tape 12 fibres
2000[1]	0 325 51	-	Indoor/outdoor (universal) 24 fibres

Pack	Cat.Nos	
		OM4 multimode optical cords (50/125 µm)
		10 Gigabit Ethernet compliant Max. optical losses: 0.3 dB For 50/125 µm multimode installations, OM4 type. Blue sheaths
		SC/SC duplex cords
3	0 326 30	Length: 1 m
3	0 326 31	Length: 2 m
3	0 326 32	Length: 3 m
		LC/LC duplex cords
3	0 326 33	Length: 0.5 m
3	0 326 34	Length: 1 m
3	0 326 35	Length: 2 m
3	0 326 36	Length: 3 m
3	0 326 37	Length: 5 m

Pack	Cat.Nos	
		OS1/OS2 (UPC) Singlemode fibre optic cords
		Max. optical losses: 0.3 dB For OS1 9/125 µm singlemode installations, OS2 to OS1 type. Yellow sheaths
		SC/SC duplex cords
3	0 326 00	Length: 1 m
3	0 326 01	Length: 2 m
3	0 326 02	Length: 3 m
		SC/LC duplex cords
3	0 326 03	Length: 1 m
3	0 326 04	Length: 2 m
3	0 326 05	Length: 3 m
		LC/LC duplex cords
3	0 326 28	Length: 0.5 m
3	0 326 06	Length: 1 m
3	0 326 07	Length: 2 m
3	0 326 08	Length: 3 m
3	0 326 29	Length: 5 m

LCS² EQUIPMENT

A/C polarity
for
high density
cassettes

The polarity of Legrand cassettes is compatible with methods A and C defined in standard ANSI/TIA - C.O. - Annex B

ADVANTAGES

- The cassettes are identical at each end of the link

- Can be used with singlemode and multimode

- 1 single type of patch cord for each end of the link (method C polarity)

legrand

>>>|

The right system
to meet
your needs

A wide range of technologies (HDMI, HD15, USB DATA, DISPLAY PORT, RCA, JACK) to suit the location and the user requirements

INSTALLATION EXAMPLE WITH HDMI PRETERMINATED SOCKET AND VIDEO PROJECTOR SWITCH

1 Quick installation

2 Easy connection

3 Optimum performance

1 Infrared ON/STANDBY control for video projector associated with a pushbutton
Cat.No 0 787 99/5 720 89

2 3 Preterminated HDMI sockets
Cat.No 0 787 78/5 720 36

4 10 m male/male HDMI cords
Cat.No 0 517 20

5 3 m male/male HDMI cord
Cat.No 0 517 34

6 1 m male/male HDMI cord
Cat.No 0 517 32

Audio/video system

audio/video sockets

0 787 78   0 517 38   0 787 77   0 787 99

HDMI type A sockets

Used to transmit high-definition digital audio/video streams between a source (computer, Blu-Ray player,...) and a compatible receiver (TV, videoprojector,...)

Preterminated sockets HDMI 1.4 - 1 module
Equipped with cord, length 15 cm

Screw-type sockets HDMI 1.3 - 2 modules

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 78	5 720 96
1	0 793 78	
1		5 725 96
1	0 787 68[1]	5 722 81
1	0 792 75[1]	
1		5 727 81

○ White
● Alu
● Magnesium

○ White
● Alu
● Magnesium

HDMI extender

Pack	Cat.Nos
1	0 517 38

Extends HDMI audio/video signals up to 57 m and up to a 4K resolution using HDBaseT Lite technology Support of IR control allows a device to be remotely controlled
Kit includes :
- 1 transmetter
- 1 receiver
- 2 power adapters
- 2 IR emitter cables
- 2 IR receiver cables
Network cord RJ45/ RJ45 not included for linking between transmitter and receiver Supports 3D video, HDCP, 4K resolution, EDID pass through and IR control, HDBaseT certified

Display port sockets

Used to transmit high-definition digital audio/video streams between a source (laptop, computer, etc) and a compatible receiver (videoprojector, TV,...)

Preterminated socket - 1 module
Equipped with cord, length 15 cm

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 91	5 720 90
1		5 725 90

○ White
● Magnesium

HD15 sockets

Used to transmit analog video streams (VGA, XGA, UXGA depending on graphic card) between a source (computer) and a compatible receiver (video projector, TV,...)

Preterminated sockets - 1 module
Equipped with cord, length 15 cm

**Screw-type female HD15 sockets
2 modules**

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 77	5 720 97
1	0 793 77	
1		5 725 97
1	0 787 57[1]	5 722 82
1	0 792 57[1]	
1		5 727 82

○ White
● Alu
● Magnesium

○ White
● Alu
● Magnesium

1: Can be installed in receptacles for floor sockets
   see Legrand general catalog

HD15 sockets (continued)

**Screw-type female HD15 sockets
2 modules + 3.5 mm Jack**

Pack	Cat.Nos	
1	0 787 74	5 722 88
1		5 727 88

○ White
● Magnesium

**Solder-type female HD15 sockets
1 module**
15 pin

Pack	Cat.Nos	
1	0 787 72	5 722 79
1		5 727 79

○ White
● Magnesium

HD15 + 3.5 mm Jack amplifier

Used to connect audio/video terminals more than 20 m apart up to 100 m
The video link is via an HD15 connector (resolution up to UXGA)
The stereo audio link is via a 3.5 mm Jack
The kit includes:
- One 4-module transmitter equipped with an HD15 connector and a 3.5 mm Jack
- One 4-module receiver equipped with an HD15 connector and a 3.5 mm Jack
- One 4-module power supply to be connected on the mains then linked to the receiver or transmitter
The link between the transmitter and receiver is via a 4 twisted pair cable

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 70	5 723 70

○ White

Videoprojector switch

Universal remote switch allowing to turn ON or place in STANDBY mode a video projector
Works with all videoprojectors or TV through IR learning process
Installed close to the room's lighting switches, it replaces the constructors remote and fosters the ignition and extinction of the video projector therefore reducing energy consumption and extending the bulb's lifetime

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 99	5 720 89

○ White

Audio/video system

audio/video sockets (continued)

| 0 787 79 | 0 787 53 | 0 787 54 | 0 787 55 | 0 787 60 | 0 787 50 | 0 787 76 |

Jack sockets 3.5 mm

3.5 mm Jack connectors can be used to create audio links

Preterminated sockets - 1 module
Equipped with cord, length 15 cm
- ○ White
- ● Alu
- ● Magnesium

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 79	5 720 91
1	0 793 79	
1		5 725 91

4 screw-type female 3.5 mm Jack socket - 1 module
- ○ White
- ● Alu
- ● Magnesium

1	0 787 64	5 722 74
1	0 792 64	
1		5 727 74

Solder-type female 3.5 mm Jack socket - 1 module
- ○ White
- ● Magnesium

| 1 | 0 787 73 | 5 722 78 |
| 1 | | 5 727 78 |

Female 2 RCA sockets

Provide the stereo audio link for any peripheral device such as a DVD drive, camera, video recorder
1 module

Preterminated
Equipped with a 15 cm cord
- ○ White
- ● Magnesium

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 47	5 720 92
1		5 725 92

Connection via screw terminals
- ○ White
- ● Magnesium

| 1 | 0 787 53 | 5 722 72 |
| 1 | | 5 727 72 |

Female 3 RCA sockets

Provide the composite video and stereo audio links for any peripheral device such as a DVD drive, camera, video recorder, videoconferencing, etc
1 module

Connection via screw terminals
- ○ White
- ● Alu
- ● Magnesium

1	0 787 54	5 722 73
1	0 792 54	
1		5 727 73

3-pole XLR sockets

Provide the stereo link for microphone, amplifier, mixing console, etc.
Recommended cable: 1 audio pair 0.14 mm² to 0.5 mm² shielded
Max. cable length: 50 m (without amplifier)
2 modules
- ○ White - Fast screw connection female
- ● Alu - Fast screw connection female
- ● Magnesium - Fast screw connection female
- ○ White - Fast screw connection male
- ● Magnesium - Fast screw connection male

Pack	Cat.Nos	
	Mosaic	Arteor
1	0 787 55	5 722 83
1	0 792 55	
1		5 727 83
1	0 787 56	5 722 77
1		5 727 77

4-pole Speakon

Used to connect power enclosures
Recommended cable: 2 audio pairs 4 mm²
Max. cable length: 50 m (without amplifier)
2 modules
- ○ White

	Mosaic	
1	0 787 60	

Loudspeaker sockets

Terminal 4 mm²
- ○ White - 2 modules
- ● Magnesium - 2 modules
- ○ White - 1 module
- ● Alu - 1 module
- ● Magnesium - 1 module

	Mosaic	Arteor
10	0 787 51	5 722 80
10		5 727 80
10	0 787 50	5 722 70
10	0 792 50	
10		5 727 70

Attenuators

1 00 V-25 W
Allow to adjust power to 25 W from a balanced 100 V loudspeaker line
2 modules
- ○ White
- ● Magnesium

	Mosaic	Arteor
1	0 787 76	5 722 84
1		5 727 84

Female BNC 75 socket - 1 module

Provides the composite video link for any peripheral device such as a DVD drive, camera, video recorder, etc
- ○ White
- ● Magnesium

	Mosaic	Arteor
1	0 787 58	5 722 76
1		5 727 76

Audio/video system

audio/video cords, cables and patch panels

N

0 517 33

0 517 27

0 514 03

0 514 12

0 514 13

0 514 10

0 514 02

0 514 11

0 335 97

Audio/video cords and adaptors

Pack	Cat.Nos	
		HDMI cords
		For connecting an HDMI socket to an audio/video terminal (computer, video projector, TV, Blu-Ray player, home cinema, games console, etc.)
		1.4 HDMI cord
		Supports 1080 P resolution and 3D video
		Gold plated connectors
1	0 517 32	Length 1 m
1	0 517 33	Length 2 m
1	0 517 34	Length 3 m
1	0 517 27	Length 5 m
1	0 517 35	Length 7 m
1	0 517 20	Length 10 m
1	0 517 36	Length 15 m
		HDMI booster
1	0 779 30	Used to extend an HDMI connection
		Consists of 2 female connectors and used as an addition to the HDMI cord
		Does not need external power supply
		HDMI 90° adaptor
1	0 517 37	HDMI male to HDMI female 90° adaptor
		For connection in tight areas
		Display Port cord
1	0 514 00	Length 2 m
		For connecting a Display Port socket to an audio/video terminal (PC, video projector, etc.)
		HD15 male/male cords
		For connecting an HD15 socket to a video terminal (PC, video projector, etc.)
		Supports up to QXGA (2048x1536) resolution
1	0 517 29	Length 2 m
1	0 517 30	Length 5 m
1	0 517 23	Length 10 m
1	0 517 31	Length 15 m
		HD15 cord + 3.5 mm Jack
1	0 517 22	Length 2 m
		For connecting an HD15 video socket and a 3.5 mm audio Jack to a terminal (PC, video projector)

Audio cords

Pack	Cat.Nos	
		RCA male/male audio stereo cords
1	0 514 03	Length 2 m
1	0 514 04	Length 5 m
		Jack 3.5 mm male to 2 RCA male Y cords
1	0 514 05	Length 2 m
1	0 514 06	Length 5 m
		Jack 3.5 mm male/male audio stereo cords
1	0 514 07	Length 2 m
1	0 514 08	Length 5 m
		XLR cord
1	0 517 24	Length 10 m
		For connecting an XLR socket to an audio peripheral (microphone, amplifier, etc.)

Type-C USB adapter

Pack	Cat.Nos	
1	APRIL 2017 0 514 12	**Type-C USB 3.1 male to HDMI female adapter** For connecting type-C USB equipment to the HDMI port of a video-projector or TV for audio/video distribution
1	JANUARY 2017 0 514 13	**Type-C USB to RJ 45 adapter** For connecting type-C USB equipment to the data network

Type-C USB 3.1 cord

Pack	Cat.Nos	
	JANUARY 2017	For charging, data transfer, and audio/video distribution
1	0 514 10	Type-C USB 3.1 male to type-C male cord - length: 1 m

Data cords

Pack	Cat.Nos	
		USB Data cords
		For transfering data from a USB data socket to a terminal (hard drive, printer, scan...)
		Shielded to protect from interference
1	0 514 01	USB 3.0 A male / A male cord - length 2 m
1	0 514 02	USB 3.0 A male / B male cord - length 2 m
1	JANUARY 2017 0 514 11	USB 2.0 Type-C male / USB A male cord - length 2 m
		9-way SUB-D cord
1	0 517 25	Length 10 m
		For RS 232 serial connection (printer, machine screen, etc.)

Cables

Pack	Cat.Nos	
		HDMI cables
1	0 327 81	Length 20 m
		For connecting HDMI sockets over distances of up to 10 m
		VGA cables
1	0 327 80	Length 20 m
		For full pin connection of HD15 sockets over distances of up to 20 m
		Speaker cable
1	0 514 09	Length 15 m
		For connecting speaker to amplifier

19" patch panels

Pack	Cat.Nos	
		Used to distribute the audio/video signal
		Universal mounting in all enclosures
		Equipped with marked connectors
		19" female 1 U metal panels
1	0 335 97	HDMI 19" panel - 16 connectors
1	0 335 98	HD15 19" panel - 12 connectors
1	0 335 96	XLR 19" panel - 16 connectors
1	0 335 99	SUBD9 19" panel - 12 connectors

5 725 68

0 789 09

0 789 10

🔍 Technical information **see e-catalogue**

MediaHub

Pack	Cat.Nos	

For connecting various types of audio/video devices (computer, camera, camcorder, Blu-ray player, MP3 player, games console, smartphone etc.) to a single product, to be played on TV
Inputs : HDMI, 3 RCA, HD15 + 3.5 mm Jack, Bluetooth audio. Output : HDMI
The Bluetooth function enables users to play music from a mobile device (smartphone, tablet etc.) through the TV's louspeakers
Connection to TV via HDMI cord (max length 10 m)
Power supply : via a terminal block 110/220 V~
6 modules

N

Pack	Arteor	
10	5 720 68	⚪ White
10	5 725 68	⚫ Magnesium

HD15 video kit

Up to 15 m
Ideal for classrooms and small meeting rooms
Used to transmit analogue video streams (VGA, XGA, UXGA depending on graphic card) between a source (computer) and a compatible receiver (video projector, TV) over a length of 15 m
The video link is via an HD15 connector.
The kit includes:
- 2 female HD15 preterminated sockets 1 module
- 1 HD15 cord length 15 m
- 1 video projector switch (2 modules) and 1 push-button (2 modules) with supports and plates

Pack	Mosaic	Arteor	
1	0 787 97	5 720 24	⚪ White

Audio/video HD15+3.5 mm Jack amplifier kit

Pack	Cat.Nos	

Up to 100 m
Ideal for large meeting rooms
Used to transmit audio and analogue video streams (VGA, XGA, UXGA depending on graphic card) between a source (computer) and a compatible receiver (video projector, TV) over a length (up to 100 m). The video link is via an HD15 connector and the stereo audio link is via a 3.5 mm Jack
The link between the transmitter and receiver is via a twisted pair cable (not included)
The kit includes:
- 1 transmitter HD15+3.5 mm Jack - 4 modules
- 1 receiver HD15+3.5 mm Jack - 4 modules
- 1 power supply- 4 modules
- 2 HD15+3.5 mm cord length 2 m
- 1 video projector switch (2 modules) and 1 push-button (2 modules) with supports and plates

Pack	Mosaic	Arteor	
1	0 787 98	5 720 25	⚪ White

Audio/video multi-participant transmitter HD15+3.5 mm Jack

Allows the different participants in a meeting room to broadcast a presentation on their PC by pressing the shutter button control without disconnecting the cable from the projector. Must be associated with other transmitters and one receiver
Can be installed in pop-up, desktop multi-outlet extensions and DLP trunking
The video link is via an HD15 connector and the stereo audio link is via a 3.5 mm Jack HD15+3.5 mm Jack cord length 2 m included for connection to a PC
Transmitters are connected by RJ 45 patch cord (not included)

Pack	Mosaic	Arteor	
1	0 789 09	5 720 26	⚪ White - 4 modules

Audio/video multi-participant receiver HD15+3.5 mm Jack

Receives commands from the audio/video multi-participant transmitter. Can be installed in pop-up, desktop multi-outlet extensions and DLP trunking. The video link is via an HD15 connector and the stereo audio link is via 3.5 mm Jack HD15 + 3.5 mm Jack cord length 2 m included for connection to a video projector
Must be associated with the first transmitter by a RJ 45 patch cord (not included)

Pack	Mosaic	Arteor	
1	0 789 10	5 720 27	⚪ White - 2 x 4 modules

Audio/video system

kits

■ **HD15 video kit (Cat.Nos 0 787 97 / 5 720 24)**

HD15 cord
2m

HD15 cord
2m

HD15 cord male/male - 15 m

Female HD15
preconnected socket

Female HD15
preconnected socket

Push-button   Videoprojector
switch

— Video on HD15
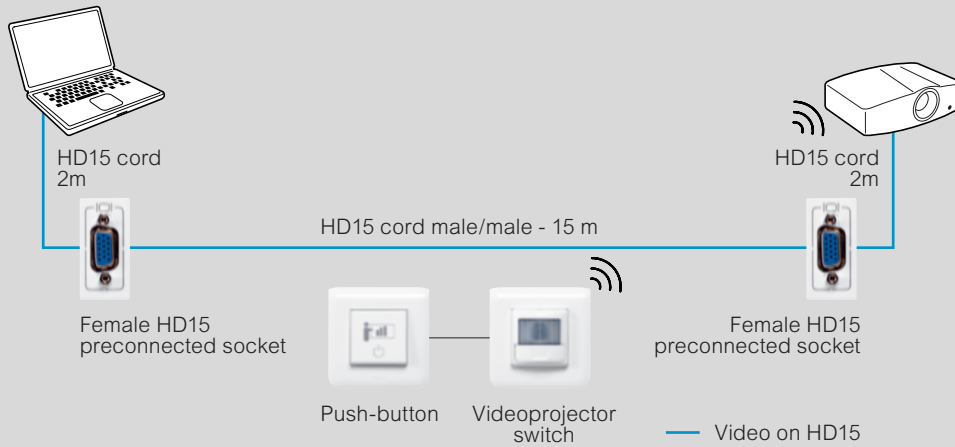
■ **Audio/video HD15+3.5 mm Jack amplifier kit (Cat.Nos 0 787 98 / 5 720 25)**

230 VAC

HD15 + Jack cord
2m

HD15 + Jack cord
2m

RJ 45 patch cord (not included)
U/UTP or F/UTP - Cat. 5e or 6

Transmitter HD15 + Jack

Receiver HD15 + Jack   Power supply

Push-button   Videoprojector
switch

— Audio and video on HD15+Jack
— Audio and video on RJ 45 patch cord
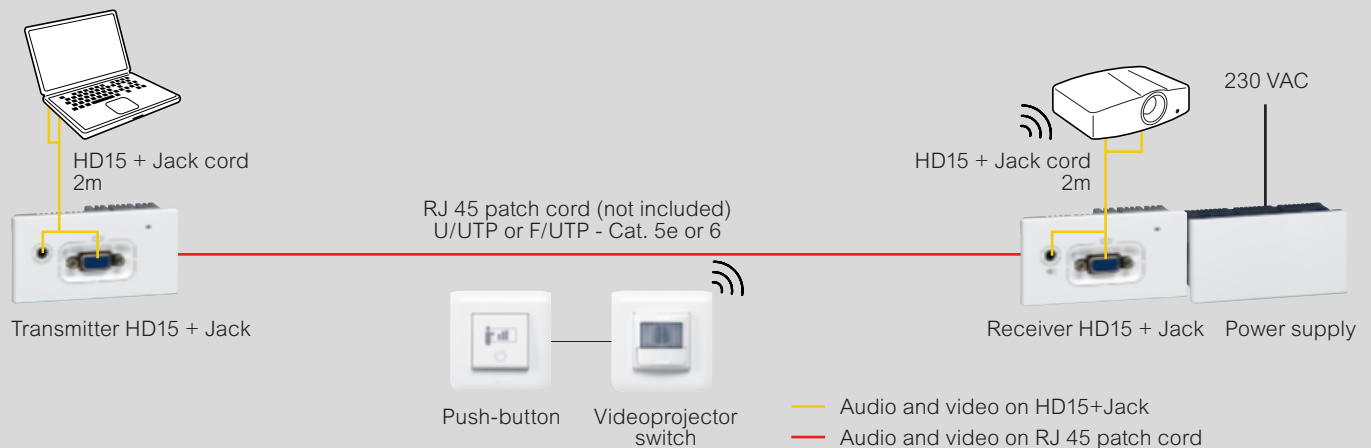
■ **Audio/video HD15+3.5 mm Jack multiparticipant transmitter (Cat.Nos 0 789 09 / 5 72 026)
and receiver (Cat.Nos 0 789 10 / 5 720 27)**

230 VAC

HD15 + Jack cord
2m

RJ 45 patch cord
(not included)
U/UTP or F/UTP
Cat. 5e or 6

Possibility of
adding
additional
transmitters
(unlimited)

Transmitter
HD15 + Jack

Transmitter
HD15 + Jack

Receiver HD15 + Jack   Power supply

Shutter button control

— Audio and video on HD15+Jack
— Audio and video on RJ 45 patch cord

144
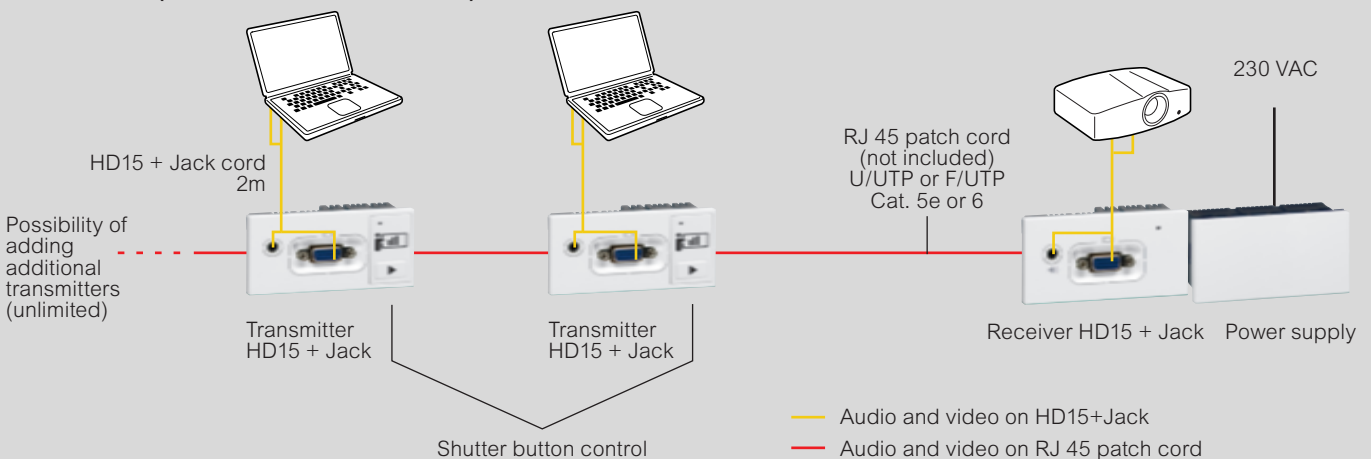
Legrand cabling system LCS²

standards and certification

■ New fibre optic classes ISO 11801 2nd Ed.
Parameters of the fibre optic link (ISO 11801/EN 50173)

Parameter	Multimode		Singlemode	
	850 nm	**1300 nm**	**1310 nm**	**1550 nm**
Fibre attenuation dB/km	3.5 max.	1.5 max.	1.0	1.0
Bandwidth MHz.km	200 min.	500 min.	n/a	n/a
Connector attenuation dB	0.75 max.	0.75 max.	0.75 max.	0.75 max.
Return loss dB	20 min.	20 min.	26 min.	26 min.

■ Typical layout of a fibre optic link between 2 distribution blocks

Table 2
- RJ 45 panel
- ② Copper/optical fibre switch
- Optical fibre drawer

Table 1
- Optical fibre drawer
- ① Copper/optical fibre switch
- RJ 45 panel

RJ 45 sockets
Electrical signal
Copper/optical fibre converter
Optical signal
Copper/optical fibre converter
Electrical signal
RJ 45 sockets

— : Optical link
— : Copper link
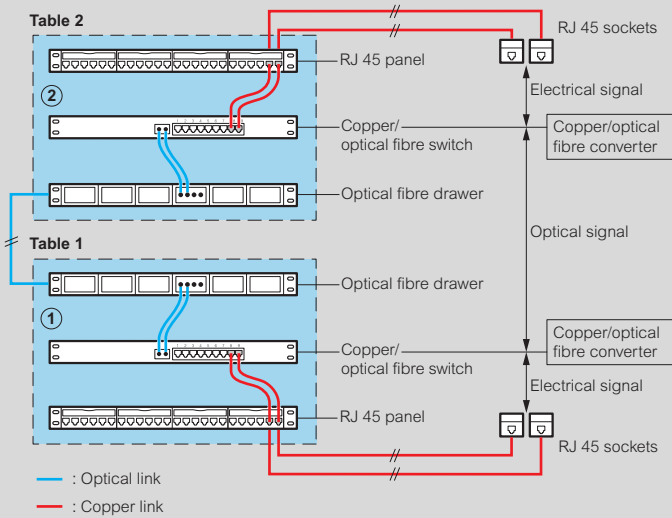
■ Maximal length of channel by fibre optic application

850/1300 nm bandwidth (Mhz x km)

OS1/OS2 — 1 Gigabits max. 2 km
OM4 — 10 Gigabits max. 550 m
OM3 — 10 Gigabits max. 300 m
OM2 — 10 Gigabits max. 82 m

3500 / 5000
1500 / 500
500 / 500
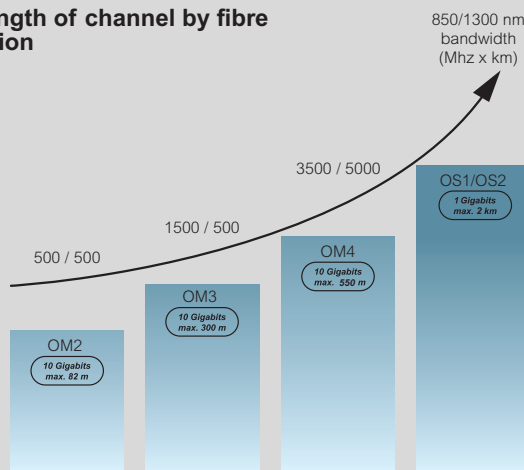
Applications	Multimode			Singlemode
	OM2	OM3	OM4	OS1/OS2
10 Gigabits Ethernet (S/R base)	82 m	300 m	550 m[(1)]	NA
Giga Ethernet (LX base)	550 m	550 m	550 m	2 km
Giga Ethernet (SX base)	550 m	550 m	1100 m	NA

■ TIA 568
☐ IEEE 802.3 applications
1: Engineered solution using a max. cabled fibre attenuation of 3.0 dB/km. If not distance is 400 m

■ Compliance of LCS² systems with standards and certifications

LCS² systems and components (de-embedded) conform to the following standards:
- TIA/EIA 568C
- EN 50173-1 and EN 50173-2
- ISO/IEC 11801 version 2

The LCS² system supports 10GBase-T applications up to 100 m in a transmission channel
Conforms with standards ISO/IEC 24750, TIA TSB 155 and IEEE 802.3
The EA link class of the LCS² system also conforms with amendment 1 (04/2008) of standard ISO 11801 and its components conform with amendment 2
LCS² systems are certified by expert independent laboratory 3P

■ Main characteristics of LCS² systems

	LCS² 6A		LCS² 6		LCS² 5e
Frequency	500 Mhz		250 MHz		100 Mhz
Speed	10 Gbps		1 Gbps		1 Gbps
Wiring	Copper	FO	Copper	FO	Copper
Connectors	RJ 45	SC-LC…	RJ 45	SC-LC…	RJ 45
Max. cable length	100 m	variable	100 m	variable	100 m

■ New names for LAN cables (according to ISO 11801-2)

They correspond to: "type of cable shield"/ "type of twisted pair shield"
TP monitoring (for twisted pairs)

Type of cable		Cable shielding	Twisted pair shielding
old name	**new name**		
SSTP	S/FTP	S: screen made up	F: screen formed a metal braid of an aluminium and polyester ribbon
SFTP	SF/UTP	SF: combination of ribbon + braid	U: no screen
STP	U/FTP	U: no screen	F: screen formed of an aluminium and polyester ribbon
FTP	F/UTP	F: screen formed of an aluminium and polyester ribbon	U: no screen
UTP	U/UTP	U: no screen	U: no screen
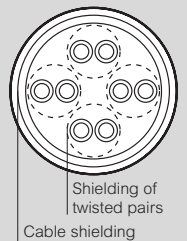
Shielding of twisted pairs
Cable shielding

■ Zone distribution boxes

Compliance with standards:
Zone distribution box: TIA/EIA 568
UTE C 15-900
NF C 15-100 - NF C 20-730
EN 50-174.2
ISO 11801
EN 50173
IEC 60950

Cords and cables: ISO 11801 id.2.0, EN 50173-1, TIA/EIA 568

General characteristics:
- 6 or 12 incoming ports (depending on Cat.No)
RJ 45 wiring
- 4, 8 or 12 outgoing ports (depending on Cat.No) maximum
Connection of mixed cords via RJ 45 connector
(RJ 45/stripped)
- UTP and FTP versions
- Cat. 5e, 6 and 6$_A$
- for computer applications; telephone, access control, etc

Technical characteristics:
- Material: Polycarbonate PC hood
Polypropylene PP base
- Colour: RAL 7035
- Weatherproofing protection index: IP 21
- Mechanical impact protection index: IK 07
- Holding strength of connector units in the box: 100 N
- Cables anchored on support using Colring cable ties

Dimensions
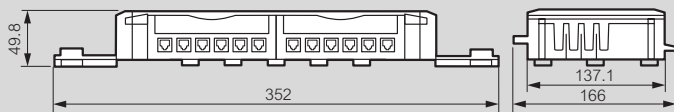
Performance
Maximum recommended lengths of links to ensure high performance of the systems with the use of RJ 45 sockets with copper feedthroughs and/or RJ 45 sockets

	Associated lengths (m)		
	Cords	Cables	Links
Cat. 6$_A$	8 15 20	70 60 55	78 75 75
Cat. 6	8 15 20	70 60 55	78 75 75
Cat. 5e	8 15 20	75 65 60	83 80 80

We recommend selecting the shortest wiring lengths for more flexibility regarding cord length in the event of reconfiguration

Application example
A zone distribution box is installed to connect the RJ 45 sockets and meet the future requirements of the installation
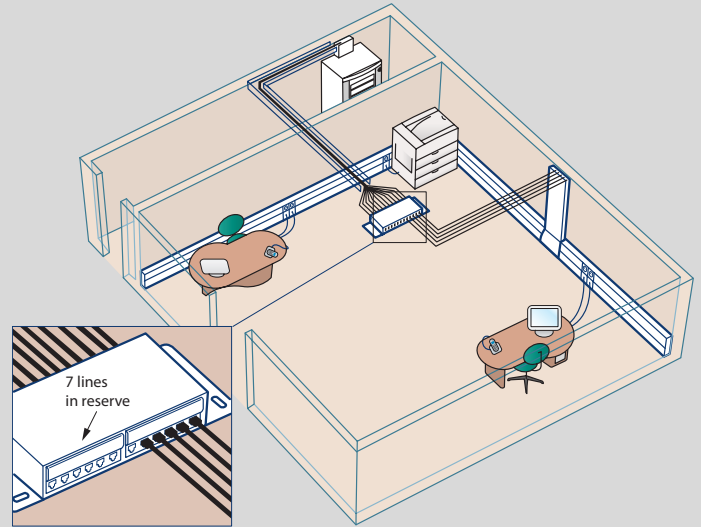
Connection to additional RJ 45 sockets is done by adding RJ 45 - RJ 45 cords between the unit and the RJ 45 sockets with copper feedthrough
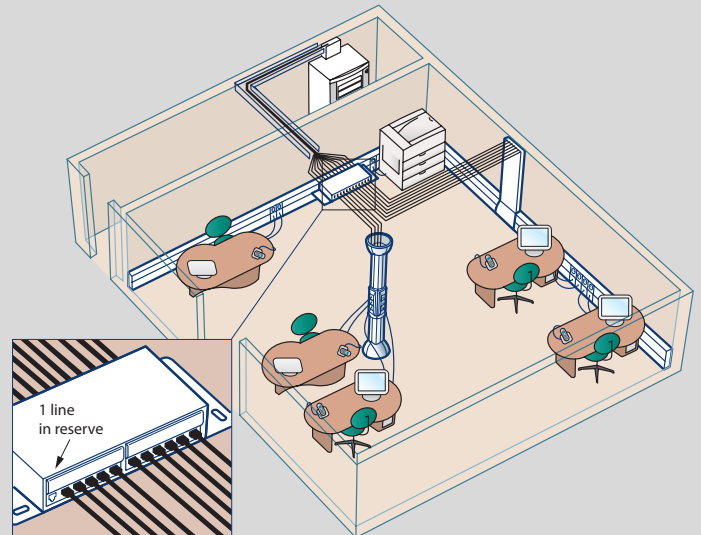
Legrand cabling system LCS²

standards and certification

■ Flush-mounting 10/100 Base-T Ethernet switches

	0 779 00	0 779 01
Power supply	230 V	PoE
Speed	100 Mbps	
Standards	802.3/802.3u	802.3u 802.3 af
Common technical characteristics	• Operating temperature: from 0°C to +40°C • Max. permissible humidity level: 95% • Auto MDI-X (takes crossed and straight cords) • Orange LED: - on: speed of 100 Mbps - off: speed 10 Mbps • Green LED on: traffic	

■ Mosaic Wi-Fi access points

An 802.11 a and b/g/n solution

Radio communication standard	802.11 b/g	802.11 a	802.11 b/g/n or 802.11 a/n
Power supply standard Power over Ethernet	802.3 af		
Frequency band	between 2.40 and 2.48 GHz	5 GHz	2.4 GHz or 5 GHz
Number of available channels	13	8	40 MHz or 20 MHz
Max. gross speed	54 Mbps	54 Mbps	300 Mbps

■ Benefits of a Legrand Wi-Fi access point

- Possibility of simultaneous operation on 2 frequencies, a and b/g
New products: invited access: used to allocate a network dedicated to visitors
Provides a max. gross speed of up to 2 x 54 Mbps in simultaneous mode
- Very high security level: WPA2 encryption (802.11i) and authentication (802.1x)
- Possibility of roaming (moving from one access point to another without breaking the link)
- Quality of service (priority automatically given to voice, then video and finally data)
- Easy to configure and make secure: using the CD supplied with the access point

■ Installation

In all supports able to take a Mosaic mechanism (trunking, columns, flush-mounting boxes, floor boxes, etc)
Do not place access points behind anything that could limit the antenna's range
Access points are connected tool-free via an RJ 45 connector

■ Sizing

- Provide 1 access point for 1 localised requirement (in entrance hall)
- Provide 1 access point per 100 m² for overall coverage and a maximum gross speed
- Provide 1 access point with an RJ 45 socket for a desk used by visitors

■ Installation principle for a Wi-Fi access point with Power over Ethernet

RJ45 Connector

PoE injector

230 V

Switch

230 V
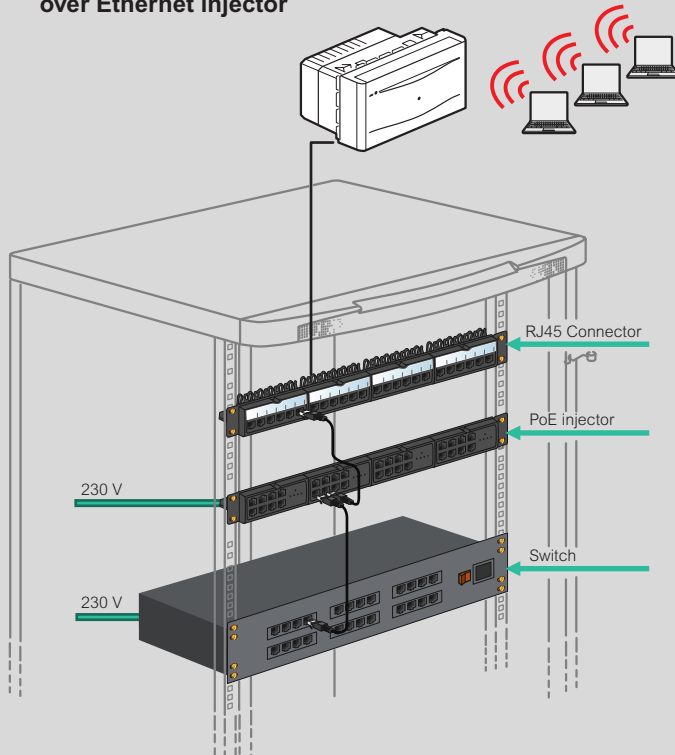
Particular case of the 1 port PoE: Clips directly onto a port on any patch panel A single cord is necessary to connect it to a port on the switch

PoE injector

4 x RJ 45 connector unit
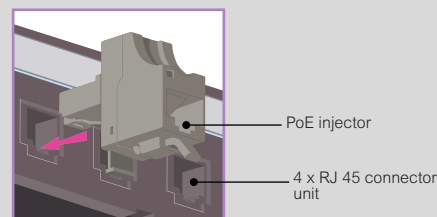
■ Operation of PoE injector

A PoE injector has one input and one output per access point to be supplied

Incoming switch: data

Power supply 48 V

Outgoing cable to patch panel: Data + power supply

: Data
: Power

Pair 2

Pair 3 | Pair 1 | Pair 4

1 2 3 4 5 6 7 8

Twisted pairs cable exiting from the PoE carries power (48 V) to feed the data
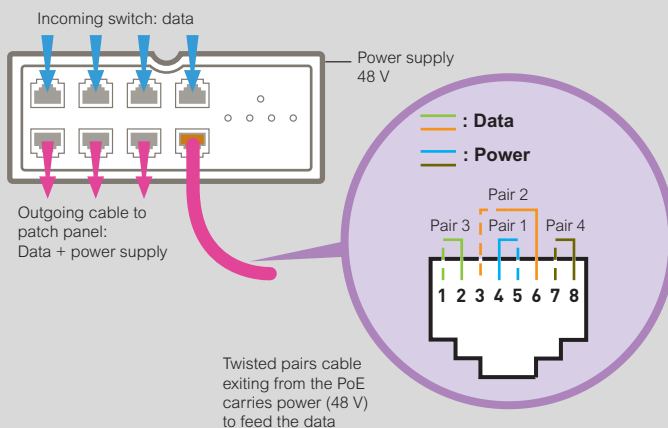
■ Legrand services

The Relations Pro[1] service will work with you and guide you in setting up your VDI sites, offering:
- help with sizing the installation
- on-site assistance for integrating products and making important installations secure
Advisors are also available to answer all your technical questions

1: 0810 48 48 48 (local call rate) Monday to Friday 8am to 6pm

Legrand cabling system LCS²

LCS² 19"cabling and server freestanding cabinets

■ General characteristics

Extendable metallic cabinets. RAL 7016 textured polyester coating providing excellent resistance to corrosion and scratching
Front door made of safety glass, front and rear microperforated metal doors for server cabinets
Protection index (weatherproof) against solid objects and liquids: IP 20.
Protection index against mechanical impact: IK 08
Perforations in 19" uprights: 9.5 x 9.5 mm
Loading capacity: 420 kg for cabling cabinet
630 kg for server cabinet

■ Compliance with standards

LCS² cabinets comply with the following standards:

IEC 60529 **EN 60529**	(NF C 20-010) Degrees of protection provided by enclosures (IP code)
IEC 62262 **EN 62262**	(EN 50102, NF C 20-015) Degree of protection provided by enclosures of electrical equipment against external mechanical impacts (IK code)
IEC 60950-1 **EN 60950-1** **C 77-210-1**	Safety of data processing equipment
EIA-310-E	Cabinets, enclosures, panels and associated equipment (ANSI/EIA/310-E-2005)
IEC 60297-3-100 **DIN 41414-7**	(NF C 20-150, NF C 20-151) Sizes of mechanical structures of the 482.6 mm (19 in) series

LCS² cabinets can be integrated into installations complying with the following standards:

EN 50173-1	Information technology - Generic cabling systems
EN 50174-1 and 2 **C 90-480-1 and 2**	Information technology - Cabling installation
ISO IEC 11801	Information technology - Generic cabling for customer premises
NF C 15-100 **Part 4-41**	Low voltage electrical installations - Recommendations
IEC 60364-4-41	Low voltage electrical installations - Protection for safety - Protection against electric shock

■ Overall dimensions (mm)
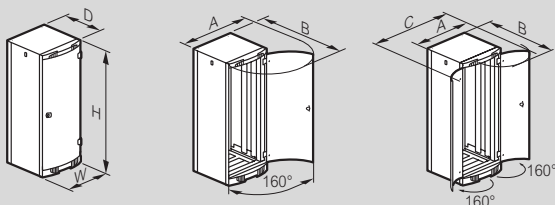
Single front door cabinets

Cat.Nos	Capacity	H(1)	W	D	A	B
0 463 00	24 U	1226				
0 463 06	29 U	1448		659	1138	1208
0 463 12	33 U	1626	610			
0 463 18/30						
0 463 19				859		1408
0 463 21	42 U	2026		657		
0 463 22/33			810	857	1525	1608
0 463 23				1057		1808
0 463 28	47 U	2248		857		1608
0 463 29				1057		1808

Double front door cabinets

Cat.Nos	Capacity	H(1)	W	D	A	B	C
0 463 41				657		815	
0 463 42	42 U	2026	810	857	1165	1015	1535
0 463 43				1057		1215	

Server cabinets

Cat.Nos	Capacity	H(1)	W	D	A	B
0 463 85	42 U	2026	610	1086	1160	1655
0 463 86	42 U	2026	810	1096	1550	1858

1: Without adjustment levelling feet (+ 15 to 45 mm with feet)

■ Usable dimensions
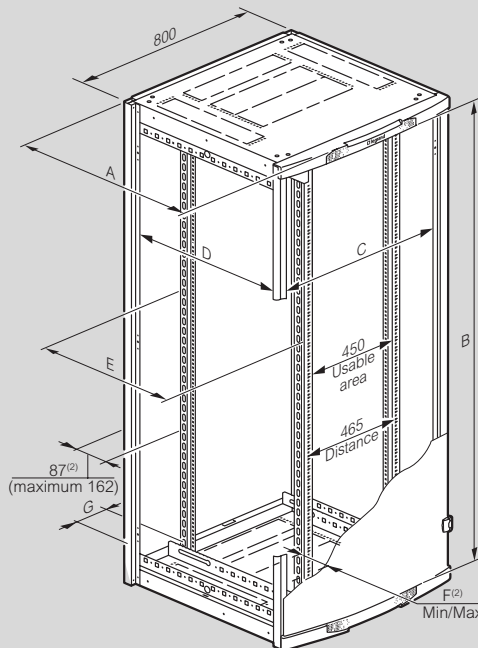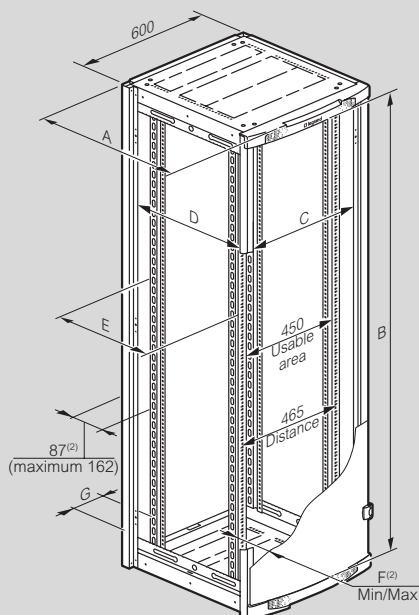
2: Continuous adjustment with adjustments in widths of 12.5 mm

Single front door cabinets

Cat.Nos	Capacity	A	Usable area			E	F(2)		G
			B	C	D		Min.	Max.	
0 463 00	24 U		1086						
0 463 06	29 U	659	1308	490	490	425	118	193	41
0 463 12	33 U		1486						
0 463 18/30									
0 463 19			859			690	625		
0 463 21	42 U		657	1886		490	425		
0 463 22/33			857			690	625	122	197	141
0 463 23			1057		690	890	825		
0 463 28	47 U		857	2108		690	625		
0 463 29			1057			890	825		

Double front door cabinets

Cat.Nos	Capacity	A	Usable area			E	F(2)		G
			B	C	D		Min.	Max.	
0 463 41		657			490	425			
0 463 42	42 U	857	1886	690	690	625	122	197	141
0 463 43		1057			890	825			

Server cabinets

Cat.Nos	Capacity	A	Usable area			E	F(2)		G
			B	C	D		Min.	Max.	
0 463 85	42 U	1086	1886	490	890	825	75	150	41
0 463 86		1096		690					141

Legrand cabling system LCS²

LCS² 19"cabling and server freestanding cabinets and accessories

■ LCS² cabling cabinet cable entries (mm)

Pre-cut at the top and bottom in 19" format (usable area 451 mm)

	Width 600	Width 800
Depth 600	2 U / 3 U / 3 U	2 U / 3 U / 3 U
Depth 800	2 U / 3 U / 3 U	2 U / 3 U / 3 U
Depth 1000	-	2 U / 3 U / 3 U

■ LCS² server cabinet cable entries (mm)

Pre-cut at the top in 19" format (usable area 451 mm)
Bottom central cut (805 x 450 mm)

	Top	Bottom
Width 600	2 U / 3 U / 3 U / 3 U	
Width 800	2 U / 3 U / 3 U / 3 U	

■ Weight of cabling cabinets (kg)

Weights shown correspond to net weight (without packaging)

Cat.Nos	Weight Cabinet	Weight Extension cabinet
0 463 00	69	-
0 463 06	77	-
0 463 12	84	-
0 463 18/30 (ext)	99	72
0 463 19	110	-
0 463 21	114	-
0 463 22/33 (ext)	127	90
0 463 23	151	-
0 463 28	138	-
0 463 29	163	-
0 463 41	114	-
0 463 42	127	-
0 463 43	151	-

■ Weight of server cabinets (kg)

Weights shown correspond to net weight (without packaging)

Cat.Nos	Weight Cabinet
0 463 85	155
0 463 86	166

■ Cabinet plinths (mm)

Base kit + side traps
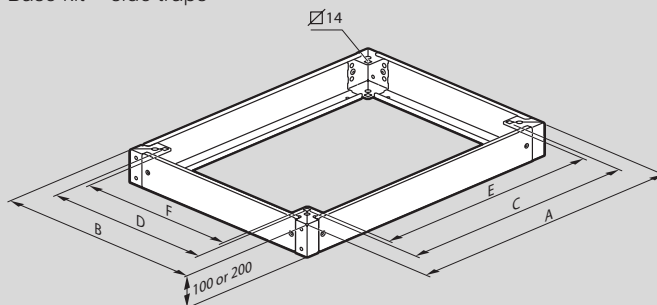
Cabinet dim. Width x Depth	Overall		Mounting		Usable area	
	A	B	C	D	E	F
600 x 600	599	599	478	478	449	449
600 x 800	599	799	478	678	449	649
800 x 600	799	599	678	478	649	449
800 x 800	799	799	678	678	649	649
600 x 1000	599	999	478	878	449	849
800 x 1000	799	999	678	878	649	849

■ Linking interface (mm)

Left or right assembly of a cabinet fitted with a 200 mm high base
Reversible interface cover
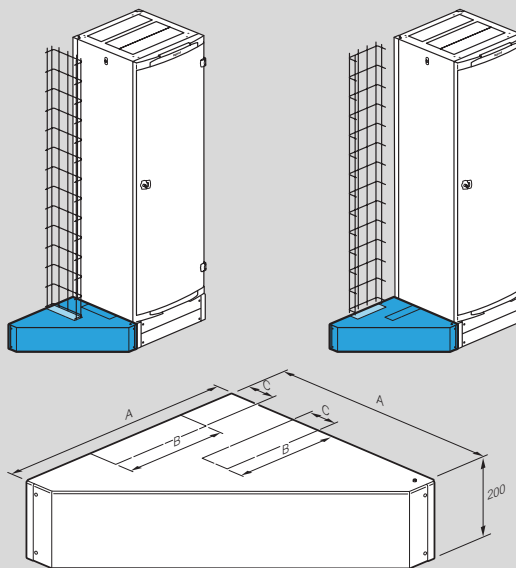
Cabinet dim. Depth	A	B	C
600	595	435	120

Adjustable height plinths
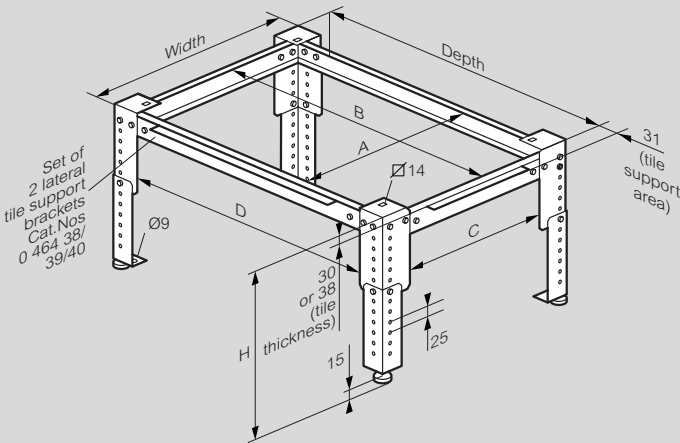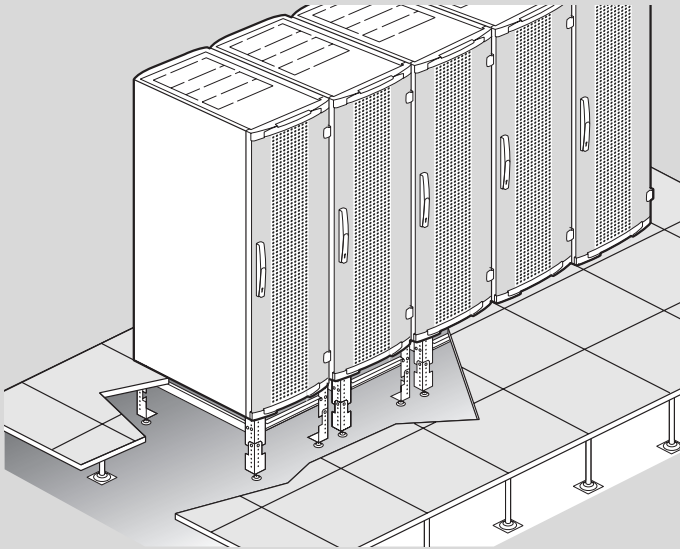
Cat.Nos	Width x Depth	H[1]		Usable area				Distance (width x depth)	
		Min.	Max.	A	B	C	D	With cabinet	To the ground
0 464 30	600 x 600	200	350	530	530	435	435	478 x 478	520 x 520
0 464 31	600 x 800				730		635	478 x 678	520 x 720
0 464 32	600 x 1000				930		835	478 x 878	520 x 920
0 464 33	800 x 600			730	530	635	435	678 x 478	720 x 520
0 464 34	800 x 800				730		635	678 x 678	720 x 720
0 464 35	800 x 1000				930		835	678 x 878	720 x 920

1: Adjustable in steps of 25 mm + fine tuning

Supports for cable guides on server cabinets

Cat.No 0 464 78

Cat.No 0 464 79
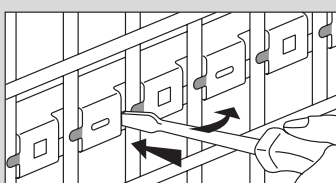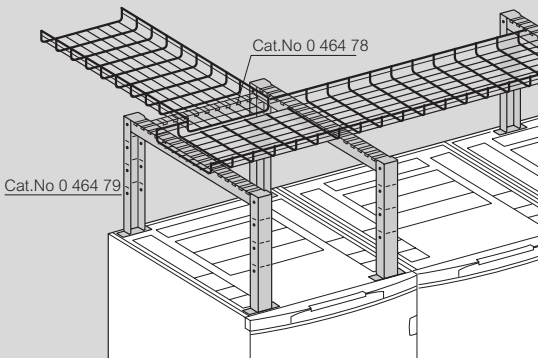
Cable guides can be installed quickly on the supports
Cat.Nos 0 464 72/73/74/78/79

19" plates with fans (mm)
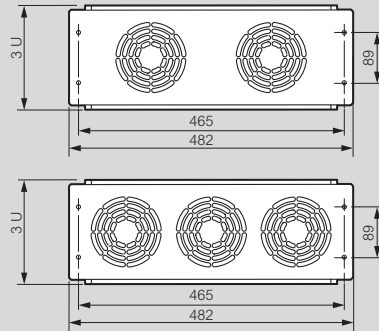
Cat.Nos	Ventilation zone	
	Number of fans	Output (m³/h)
0 464 87	2	180
0 464 88	3	270

Shelves (mm)
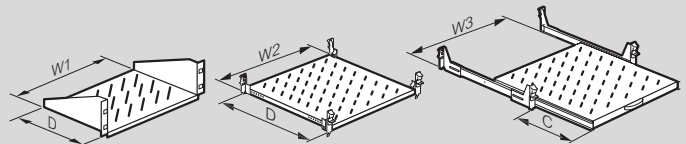
Cat.Nos	D	Usable width			C
		W1	W2	W3	
0 462 23[1]	120	216			
0 465 00	115	435			
0 465 01	200	435			
0 465 02	360	435			
0 465 05	425		440		
0 465 06	625		440		
0 465 07	825		440		
0 465 08	425			425	320
0 465 09	625			425	420
0 465 10	625			425	420
0 465 17	820		425		
0 465 18	820			380	650

1: Fixing centre 236.5 mm

Keyboard support shelf (mm)

■ **PDU support**

73
31.2
20
27 x 7
80.5 x 5.5   74 x 9
105.5 x 5.5   29 x 9
94 x 9
70.5 x 5.5

25

73
31.2
20
27 x 7
80.5 x 5.5   74 x 9
105.5 x 5.5
29 x 9
94 x 9
70.5 x 5.5

1600 (0 465 75)
1822 (0 465 76)
1858 (0 465 75)
2080 (0 465 76)

1827 (0 465 75)
2049 (0 465 76)
1755 MAX (0 465 75)
1986 MAX (0 465 76)

800 (0 465 75)
911 (0 465 76)

105.5

5 x 7 U (0 465 75)
6 x 7 U (0 465 76)

7 U[1]

ø 22[1]
ø 12[1]

1: For PDU with button mounting
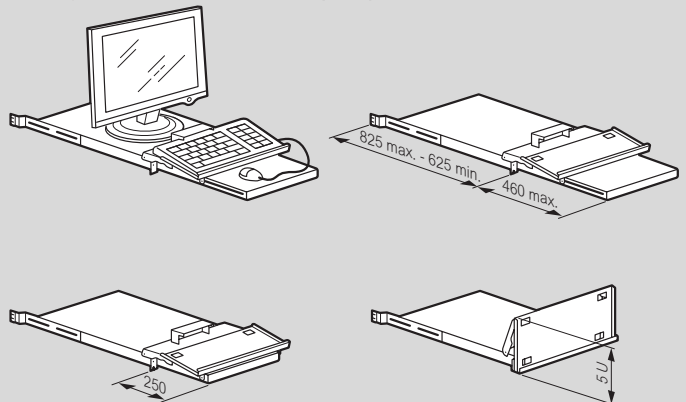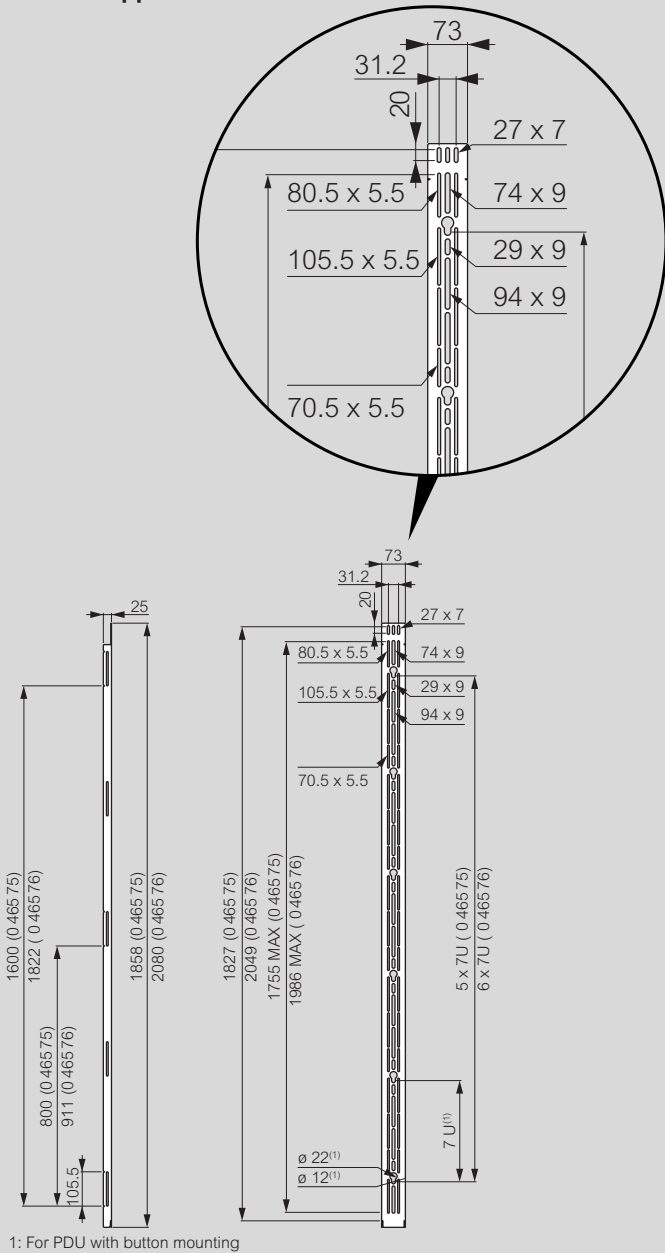
■ **19" Racks**

Permissible load: 15 kg/U

0 464 06   **0 464 07**

510
2185
2135
267
521
604

655
2185
2135
413
667
604
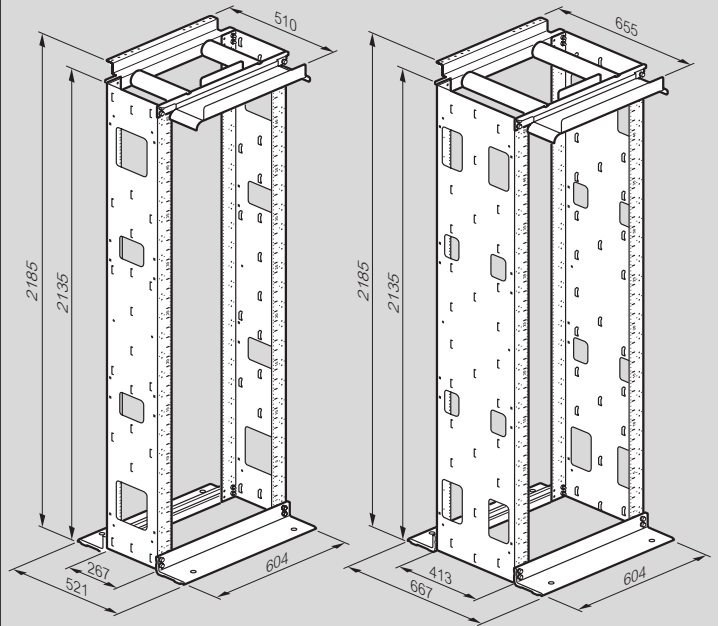
■ **Cord management grids**

0 464 25   **0 464 26**   **0 464 27**

156
153
1965

1U
1970
204   165

165
1U
1970
331   267
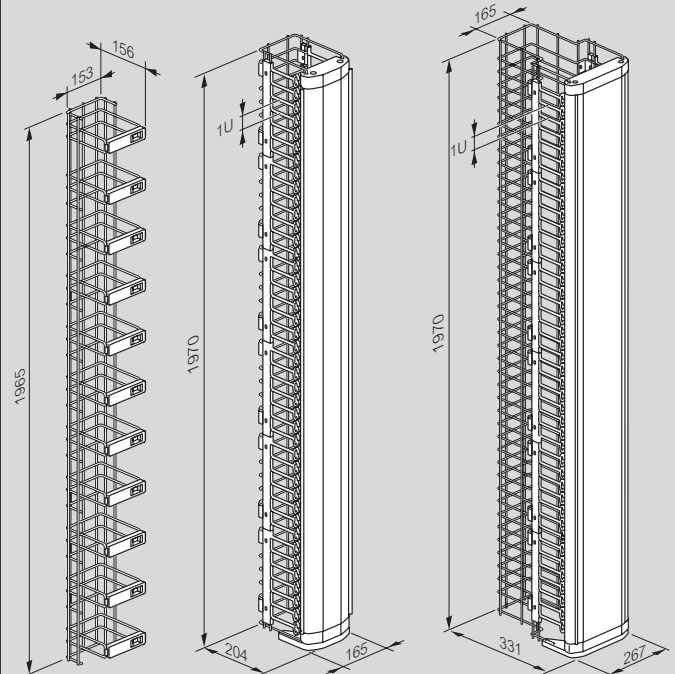
■ 0 464 25

Swing latch replacement installation

Installation can be either right or left hand swing out

■ 0 464 26/27

Bend limiting clips

1U
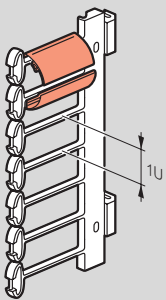
Cord coiling support
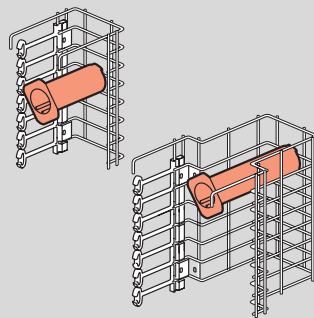
■ Joining racks with grid

0 464 25/26

63 mm

0 464 27

165 mm
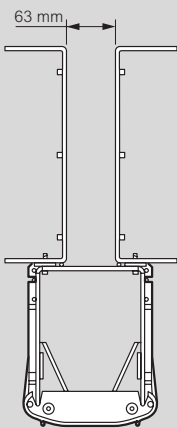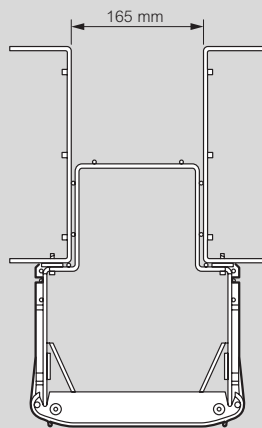
■ Cable tray support

0 464 18/19

45
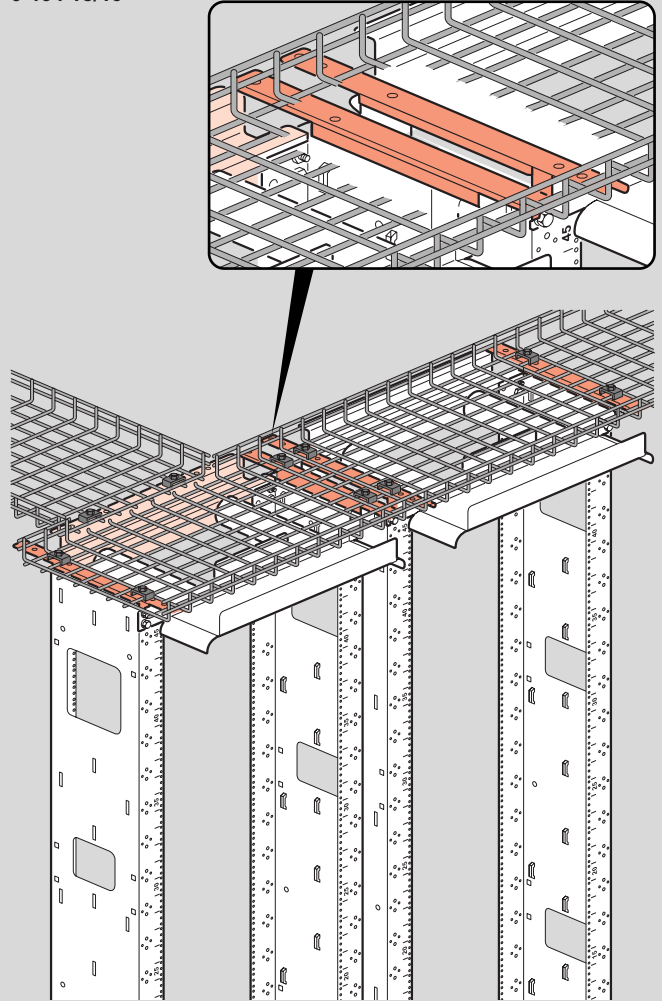
■ 19" cord management panels

0 465 70/71
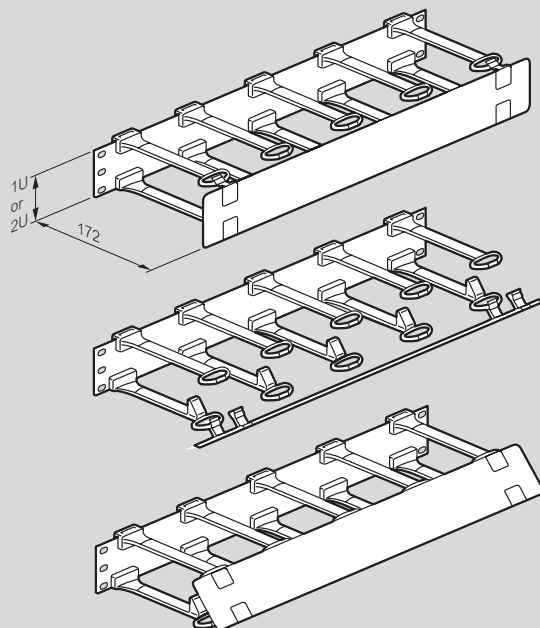
1U
or
2U

172

Legrand cabling system LCS²

19" and 10" LCS² wall-mounting cabinets

■ General characteristics

Metallic wall-mounting cabinets
RAL 7016 textured polyester coating providing excellent resistance to corrosion and scratching
Front door made of safety glass
Protection index (weatherproof) against solid objects and liquids: IP 20
Protection index against mechanical impact: IK 08
Perforations in uprights: 9.5 x 9.5 mm
Permissible load: 3 kg/U (or 48 kg for a 19" cabinet 16 U)
          12 kg for the 10" cabinet 6 U

■ Compliance with standards

LCS² cabinets comply with the following standards:

IEC 60529 **EN 60529**	(NF C 20-010) Degrees of protection provided by enclosures (IP code).
IEC 62262 **EN 62262**	(EN 50102, NF C 20-015) Degrees of protection provided by enclosures of electrical equipment against external mechanical impacts (IK code).
IEC 60950-1 **EN 60950-1** **C 77-210-1**	Safety of data processing equipment.
EIA-310-E	Cabinets, enclosures, panels and associated equipment (ANSI/EIA/310-E-2005).
IEC 60297-3-100 **DIN 41414-7**	(NF C 20-150, NF C 20-151) Sizes of mechanical structures of the 482.6 mm (19 in) series

LCS² cabinets can be integrated into installations complying with the following standards:

EN 50173-1	Information technology - Generic cabling systems.
EN 50174-1 and 2 **C 90-480-1 and 2**	Information technology - Cabling installation.
ISO IEC 11801	Information technology - Generic cabling for customer premises
NF C 15-100 **Part 4-41**	Low voltage electrical installations - Recommendations.
UTE C90-483	Residential cabling for communication networks
IEC 60364-4-41	Low voltage electrical installations - Protection for safety - Protection against electric shock

■ Overall dimensions (mm)
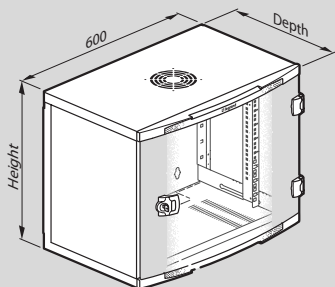
	Cat.Nos	Capacity	Height	Width	Depth
19" fixed cabinets	0 462 00	6 U	350	600	400
	0 462 01	9 U	500		
	0 462 02	12 U	600		
	0 462 03	16 U	800		
	0 462 06	9 U	500		580
	0 462 07	12 U	600		
	0 462 08	16 U	800		
	0 462 09	21 U	1000		
19" pivoting cabinets	0 462 11	9 U	500	600	615
	0 462 12	12 U	600		
	0 462 13	16 U	800		
	0 462 14	21 U	1000		
10" cabinet	0 462 20	6 U	352	314	300

Pivoting bottom opening
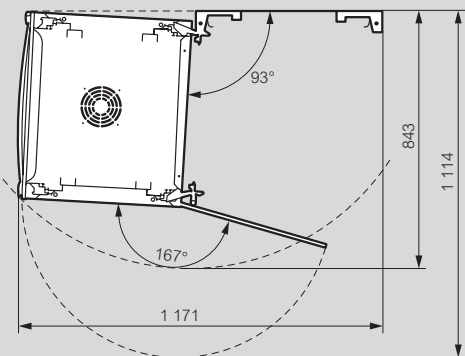
Front door and side panel opening

10" cabinet door opening Cat.No 0 462 20
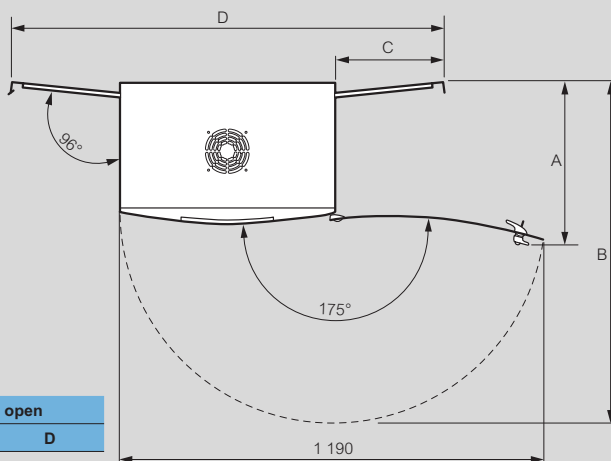
	Cat.Nos	Doors open		Panels open	
		A	**B**	**C**	**D**
19" fixed cabinets	0 462 00	400	962	305	1205
	0 462 01				
	0 462 02				
	0 462 03				
	0 462 06	580	1140	482.5	1565
	0 462 07				
	0 462 08				
	0 462 09				
19" pivoting cabinets	0 462 11	600	1179	482.5	1565
	0 462 12				
	0 462 13				
	0 462 14				
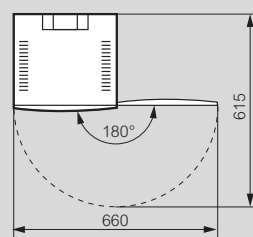
Legrand cabling system LCS²

19" and 10" LCS² wall-mounting cabinets
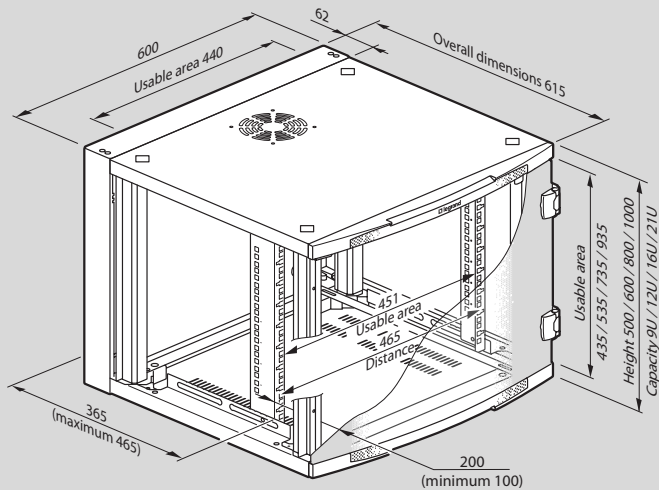

■ Usable dimensions (mm)

19" LCS² fixed cabinets depth 400 mm
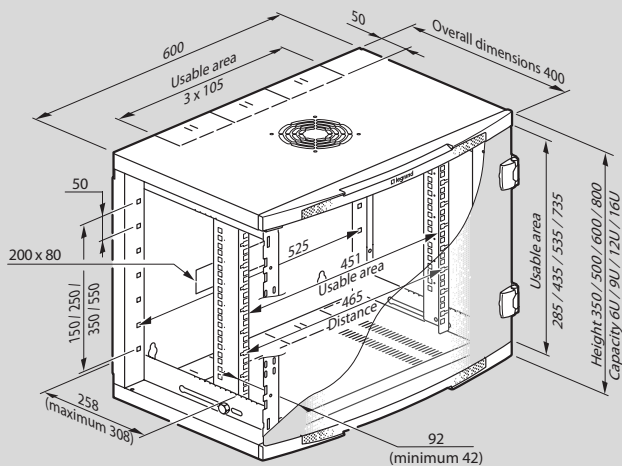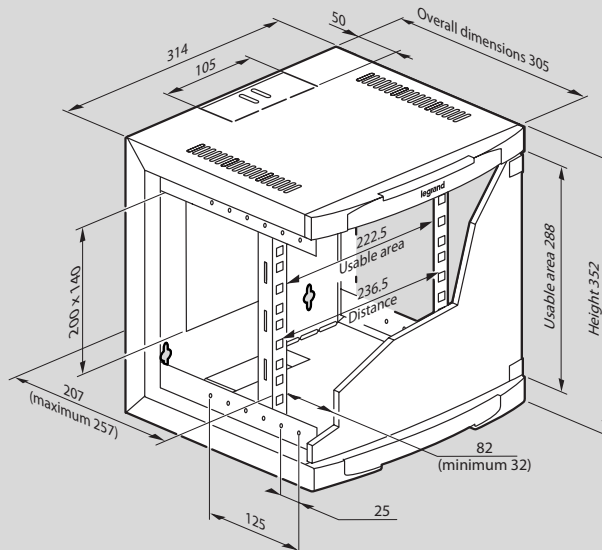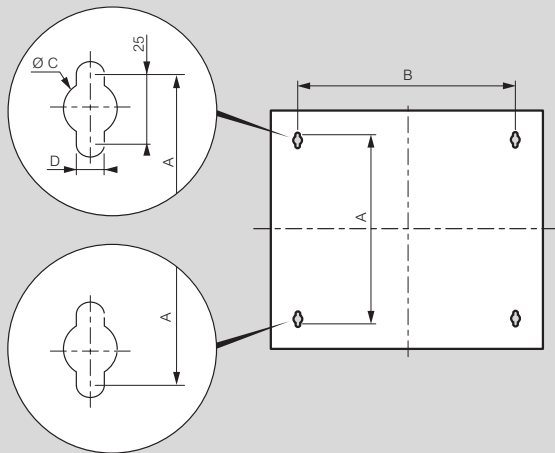

19" LCS² fixed cabinets depth 580 mm
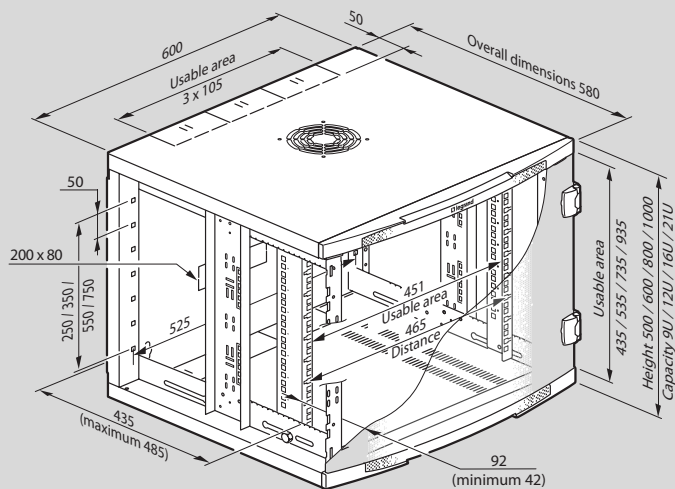
19" LCS² pivoting cabinets depth 600 mm

10" LCS² cabinet depth 300 mm

■ Fixing of cabinets (mm)

	Capacity	A	B	C	D
19" fixed cabinets	6 U	275	408	20	11
	9 U	425			
	12 U	525			
	16 U	725			
	21 U	925			
19" pivoting cabinets	9 U	425	500	18	9
	12 U	525			
	16 U	725			
	21 U	925			
10" cabinets	6 U	275	250	15	6.5

■ Weight (kg)

	Cat.Nos	Weight
19" fixed cabinets	0 462 00	16.7
	0 462 01	20.4
	0 462 02	22.8
	0 462 03	26
	0 462 06	25.7
	0 462 07	32.7
	0 462 08	41.5
	0 462 09	52.5
19" pivoting cabinets	0 462 11	31.8
	0 462 12	40
	0 462 13	47.3
	0 462 14	59
10" cabinet	0 462 20	8

Energy distribution

PDU cord locking system

■ **Cord locking system**

1

2

3

①

②
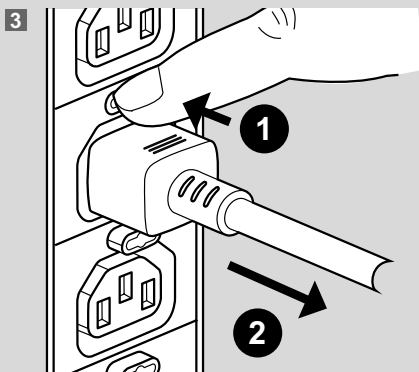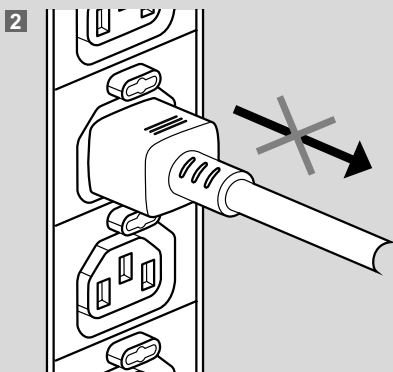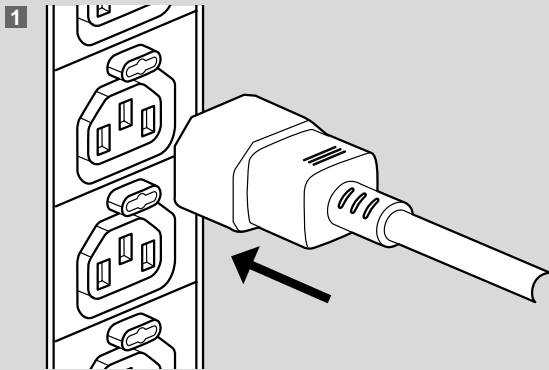
Energy distribution

19" 1U PDU mounting

■ **Horizontal mounting in Legrand 19" cabinets**

Can be mounted in all Legrand 19" cabinets except for 19" HD racks which require the use of equipment screws Cat.No 0 464 23

Quick fixing
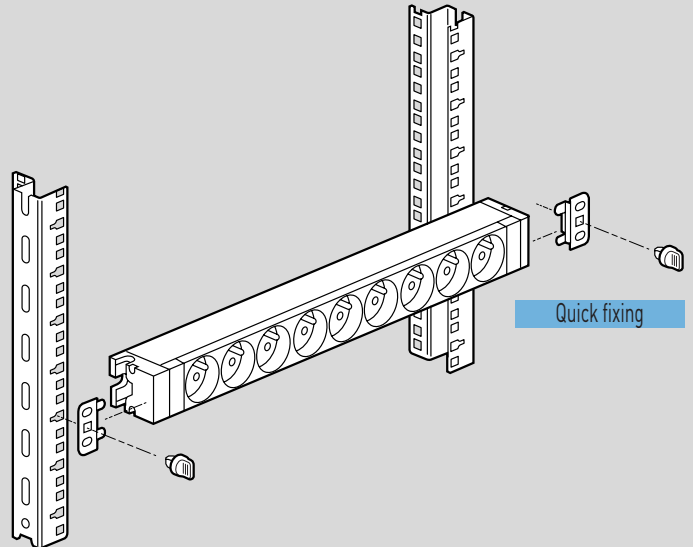
■ **Vertical mounting in LCS² freestanding cabinets with support 0 465 75/76**

■ Zero-U PDU configurations (p. 124)

6 468 50	6 468 51	6 468 52	6 468 53	6 468 54	6 468 56
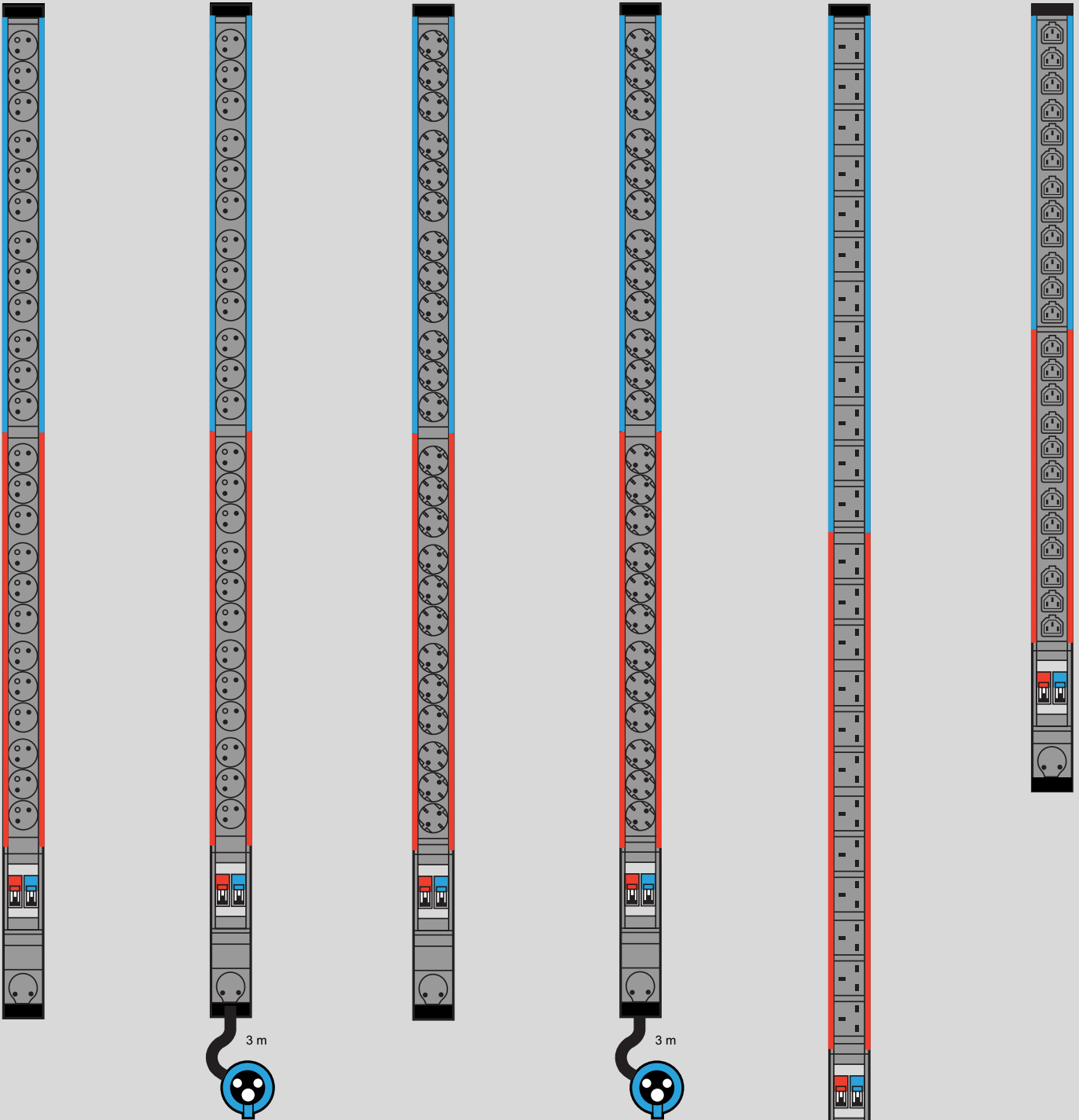
3 m

3 m

■ Zero-U PDU sizes (mm)
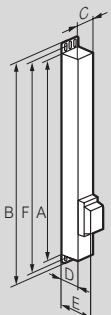
Cat.Nos	Height		Width	Depth		Fixing centres (mini-maxi)
	A	B[1]	C	D	E[2]	F[1]
6 468 50	1250	1294	52	52.5	87	1262-1292
6 468 51	1250	1294	52	52.5	87	1262-1292
6 468 52	1250	1294	52	52.5	87	1262-1292
6 468 53	1250	1294	52	52.5	87	1262-1292
6 468 54	1466	1510	52	52.5	87	1478-1508
6 468 56	1034	1078	52	52.5	87	1046-1076

1 : Overall height with standard brackets (screw fixing)
2 : Overall depth at the circuit breaker slot

6 468 57 6 468 60 6 468 61 6 468 65 6 468 70 6 468 75
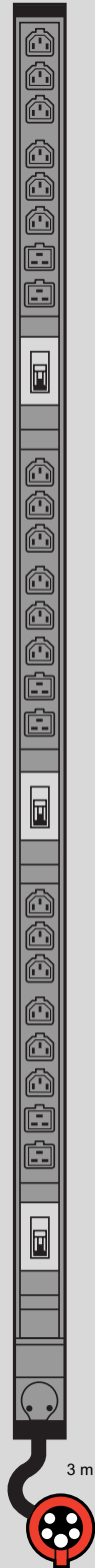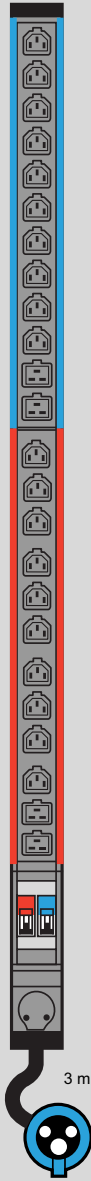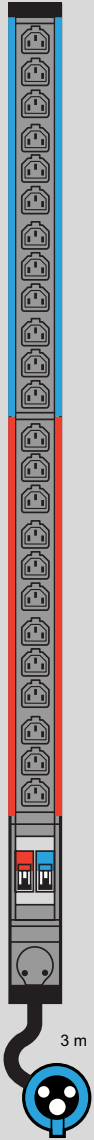
3 m

3 m

3 m

3 m

3 m

■ Zero-U PDU sizes (mm)
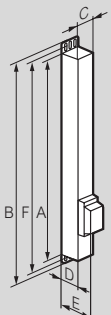
Cat.Nos	Height		Width	Depth		Fixing centres (mini-maxi)
	A	B[1]	C	D	E[2]	F[1]
6 468 57	1034	1078	52	52.5	87	1046-1076
6 468 60	1070	1114	52	52.5	87	1082-1112
6 468 61	1070	1114	52	52.5	87	1082-1112
6 468 65	1160	1204	52	52.5	87	1172-1202
6 468 70	1340	1384	52	52.5	87	1352-1382
6 468 75	1475	1519	52	52.5	87	1487-1517

1 : Overall height with standard brackets (screw fixing)
2 : Overall depth at the circuit breaker slot

Energy distribution

Zero-U PDU mounting in Varicon-L 19" server cabinets

■ Solution with standard brackets

Screw fixing with support 6 466 55/57
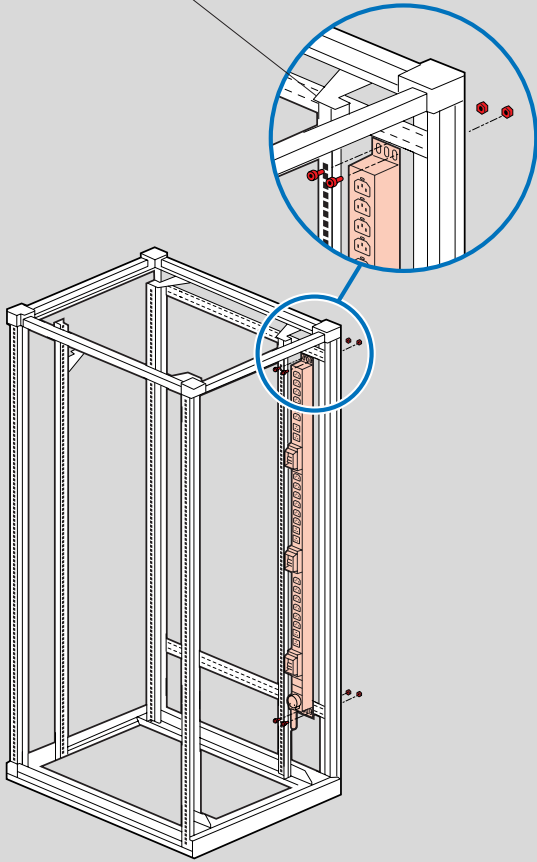
Screw fixing with brackets 6 466 59
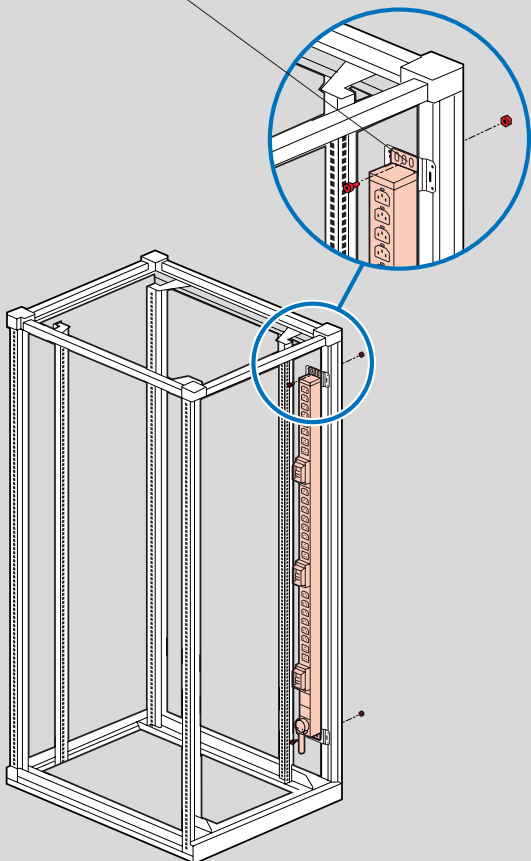
Energy distribution

19" 1U PDU mounting

■ Vertical mounting in Varicon-L 19" server cabinets

Screw fixing with brackets 6 466 59
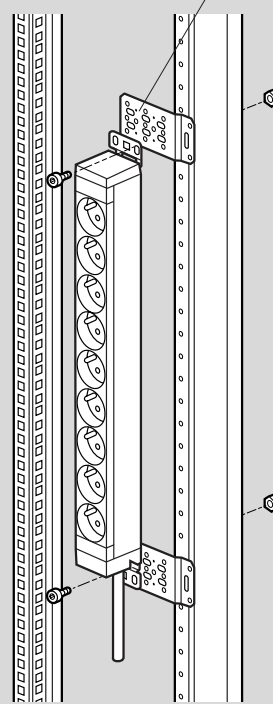
Legrand Server System

## 19" Varicon-L server cabinets and accessories

■ General characteristics

Extendable metallic cabinets. RAL 9011 textured paint providing excellent resistance to corrosion and scratching
Front and rear 80% microperforated metal doors
Protection index against mechanical impact: IK 08
Perforation in 19" uprights: 9.5 x 9.5 mm
Loading capacity: 1000 kg

■ Compliance with standards

Varicon-L 19" server cabinets comply with the following standards:

IEC 62262 EN 62262	(EN 50102, NF C 20-015) Degree of protection provided by enclosures of electrical equipment against external mechanical impacts (IK code)
EIA-310-E	Cabinets, enclosures, panels and associated equipment (ANSI/EIA/310-E-2005)
IEC 60297-3-100 DIN 41414-7	(NF C 20-150, NF C 20-151) Sizes of mechanical structures of the 482.6 mm (19 in) series

■ Dimensions (mm)
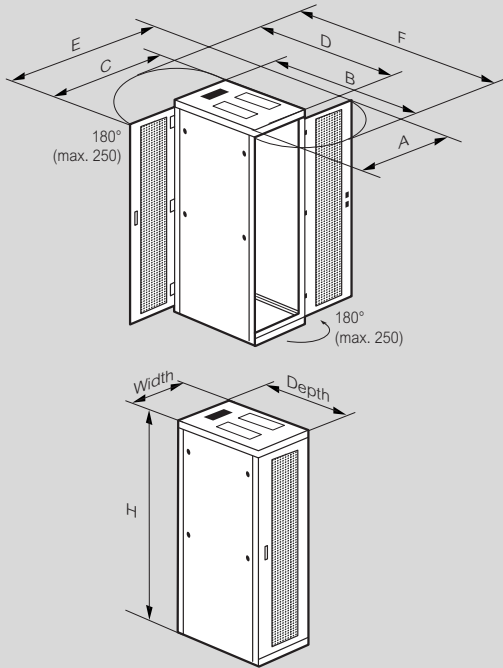
■ Usable dimensions
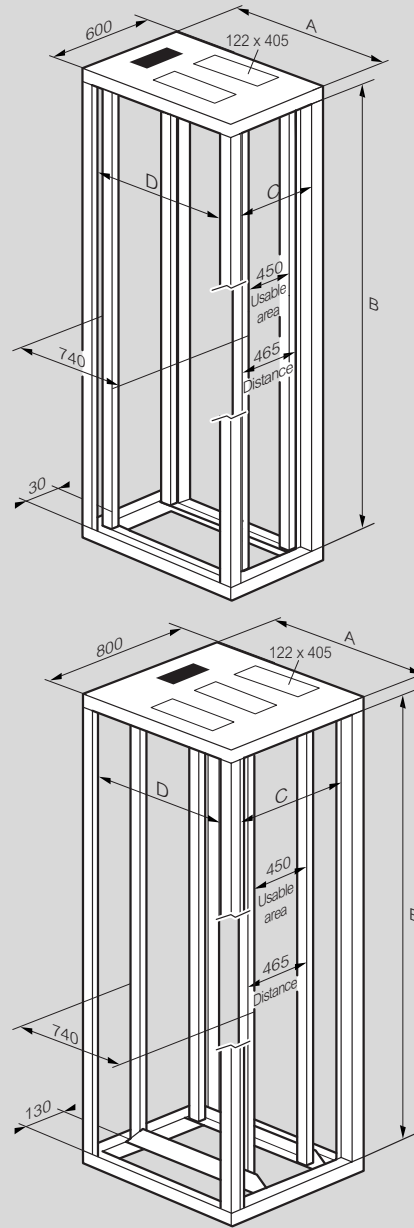
Cat.No	Capacity	H[1]	Width	Depth	Front door open		Rear door open		Front and rear doors open	
					A	B	C	D	E	F
6 466 10/30	41 U	2004	600	1040	1178	1615	1178	1615	1760	2189
6 466 12/32				1240		1815		1815		2389
6 466 13/33			800	1040	1580	1815	1580	1815	2360	2589
6 466 15/35				1240		2015		2015		2789
6 466 16/36	46 U	2204	600	1040	1178	1615	1178	1615	1760	2189
6 466 18/38				1240		1815		1815		2389
6 466 19/39			800	1040	1580	1815	1580	1815	2360	2589
6 466 21/41				1240		2015		2015		2789

1: With levelling feet at min. adjustment (Max. adjustment of feet: + 26 mm)

Cat.No	Capacity	A	Usable space		
			B	C	D
6 466 10/30	41 U	1040	1850	536	835
6 466 12/32		1240			1035
6 466 13/33		1040		736	835
6 466 15/35		1240			1035
6 466 16/36	46 U	1040	2050	536	835
6 466 18/38		1240			1035
6 466 19/39		1040		736	835
6 466 21/41		1240			1035

■ Fixing crosspieces (mm)

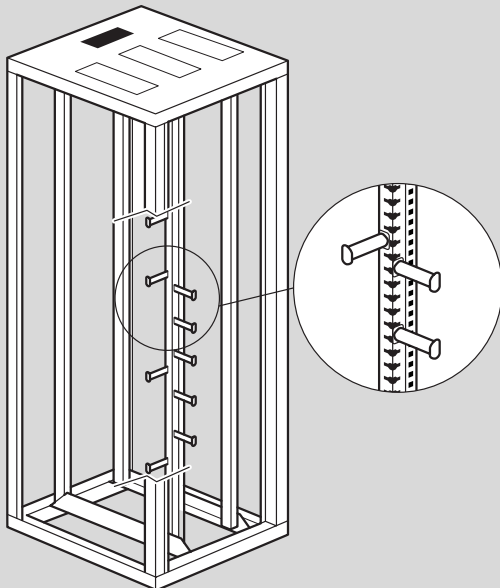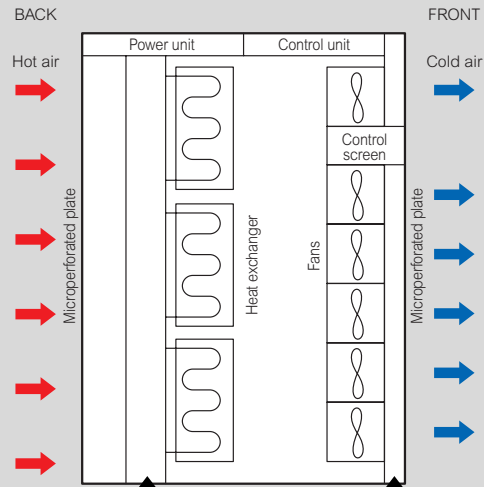| Cat.No.	L	E
6 466 55	865	850
6 466 57	1065	1050

■ Universal fixing bracket (mm)
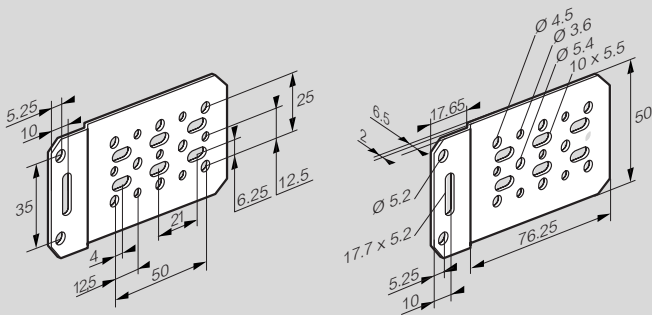
■ Vertical feedthrough

Fixing of the vertical cable managers on 19" upright
Cable guides can be mounted at the front, and at the side (only for 800 mm wide cabinets)
UL94 V0 halogen free cable guide

■ Varicondition H$_2$0 air conditioning unit

Cooling capacity	Electrical connections
24 kW*	230 VAC - 700 Watts - 1.1 kVA

* With a $\triangle$T of 25°C (on the servers)

Max. water flow rate	65 l/min
Recommended water flow rate for 24 kW	54 l/min
Water inlet temperature	8 to 20°C
Maximum working pressure	5 bar
Water hose connection (at bottom)	1 inch DN25, PN30
Condens drain connection (at bottom)	20.32 inches (5/4 inch)
Max. air flow rate	5000 m³/h
Air inlet temperature IT equipment	20 to 25°C**
Max. allowable local humidity	5.5 ADP - 60% RH

* Recommended water temperature for 24 kW, other inlet temperatures possible. Do not hesitate to contact us for advice on your specific situation
** ASHRAE, Class 1, 2

Type of valve	2-channel proportional control valve
Pressure drop valve	27 kPa*
Pressure loss coil assembly	66 kPa*
Water valve Kvs	6.3 m³/h

* At the recommended rate of 54 l/min

Legrand cabling system LCS² fibre optic

fibre optic connectors

■ Technical characteristics

- Connection of connectors on 900 µm fibre
- Maximum attenuation: 0.3 dB
- Ideal for high-speed systems: 10 gigabit Ethernet
- Operating temperature: 0 to 65°C
- Shallow connectors

■ Advantages:

- High quality finish
- Can be reused 5 times
- Shallow connector, depth less than 40 mm
- Connector factory pre-polished and does not require any glue
- No special tools, easy to transport
- Speed of installation: simple connection process, quick training
It takes less than five seconds to fit the connector

■ The basic steps

Preparation of the fibre:

Stripping

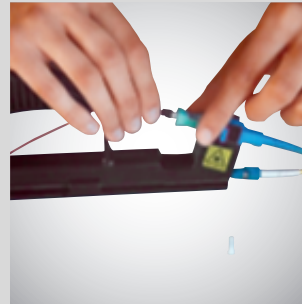Cleaving

Inspection

Connection:

1/ Insert the fibre into the connector

2/ Slide the switch on the connector -
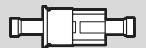the splice is done

3/ Slide the boot onto the connector

Finally, the visual fault locator is used
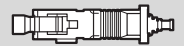to check the connection.

■ Rapid crimping connectors with tool case Cat.No 0 326 90

Types of connector
- ST connector: Helical shape locked
  by "push and turn"
  bayonet type connector

- SC connector: Rectangular shape "push-pull"
  latch type locking
  Suitable for a large number
  of active devices
  Recommended in the generic
  standards ISO/IEC 11801 and EN 50173

- LC connector: Rectangular shape tab locking
  Half the size of a conventional
  connector

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0 097 00		
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0 320 68	125	50
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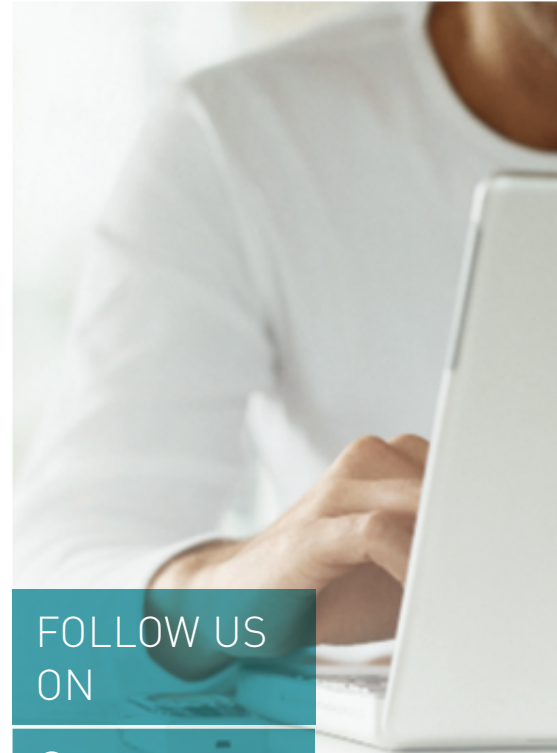
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