Introduction to the installations world

The world of electrical installations is not always straightforward. Working on an international project electrical engineers are often bewildered by the extensive amount of electrical standards and wiring regulations which determines their decisions.

Rely on the world’s leading specialist
As one of the world leading specialists in wiring accessories, Legrand actively participate to the elaboration of the installation standards at international (IEC), regional (NEC) and local levels. Thus, the technical expertise of the Legrand people makes it possible to propose installation products suitable for each specific local market.

Detailed knowledge of the wiring rules
The purpose of this document is to clearly present the most frequently encountered sets of wiring rules, showing the main technical characteristics of each set of installation and main accessories standards. Obviously, on any given project, it is essential that the design engineer’s work should be based on a detailed knowledge of the wiring regulations and standards which are applicable in the specific country. This document compares the basic framework of the standards. Therefore, it is essential for the design engineer to obtain more detailed information by contacting the appropriate standards and building regulations organisations.

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130 000 catalogue items!
For you, the wealth of the Legrand Group’s catalogue offer is the guarantee that you will find the products and solutions best suited to your specific requirements in terms of electrical installations and communication networks.

Continuous innovation
No less than 1 800 people are dedicated full-time to research and development. On average, Legrand invests 5% of its sales each year in R&D.

Sustainable Development: a priority
For many years, the Legrand Group has drawn strength from its values to ensure profitable, sustainable and responsible growth in its business.

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<tr>
<td>Zimbabwe</td>
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</table>
Overview of standards for socket outlets worldwide

The map gives an overview of which local standard a country belongs to.

This map is for guidance only. Legrand as a company cannot be held responsible or liable for errors nor for changes that occur constantly with local standards.
IEC | British standard

Typical residential wiring diagram issued from BS 7671 requirements for electrical installations.

I Consumer units and Din-Rail equipment by Legrand Group 10-11
II Wiring accessories by Legrand Group 12-13

N.B.: Conductors cross section is calculated according to various parameters for each circuit. See regulations for details of alternative options using combinations of RCD and MCB.
Overview of the installation and related wiring accessories standard

**SUPPLY**
Since 1 January 1995 nominal voltage in UK is 230 V +10% / - 6% a.c. at 50 Hz. Earth is normally supplied but may be local.

**HOUSE SERVICE CUT-OUT**
The Electricity Boards protective device, usually a 80 A or a 100 A HRC Fuse. It is sealed in a special housing to prevent tampering.

**METER**
Usually a dual meter for normal and off-peak energy consumption, sealed to prevent tampering.

**CONSUMER UNIT**
It houses the main switch which isolates the total installation and the individual circuit protection devices. The consumer unit should comply with BS EN 60439-3. Circuit protection is normally provided by miniature circuit breakers to BS EN 60898 (older installation may have fuse protection). The consumer unit may also contain one or more residual current devices providing additional protection in all or part of the installation (older installations may not have RCD protection provided).

**POWER CIRCUITS**
Appliances having heavy current consumption (cookers, water-heaters, etc.) should each be supplied on a specific circuit of the appropriate rating.

In general, a double pole switch controls and isolates the appliance when necessary and the connection of the appliance can be made either directly to the switch or via a flexible cable outlet. Switches should conform to BS EN 60669 and Cooker Control unit to BS 4177.

**SOCKET OUTLET CIRCUITS**
Socket outlets should comply with BS 1363-2 and are usually of the switched type. They are usually supplied via a ring final circuit which is a circuit running from the protection device to each outlet and then returning to the protection device. Permanent connections to a ring final circuit and branches off the ring are made via fused connection units to BS 1363-4.

Socket outlets to BS 546 are no longer used in domestic installations in the UK but are still widely used in some other countries.

**PLUGS**
Plugs of domestic appliances should conform to BS 1363-1. They contain a fuse link to BS 1362 of a rating appropriate to the flexible cord of the appliance (max =13 A). Domestic appliances sold in UK must be fitted with a BS 1363-1 plug, further the UK plug and socket safety regulations require mandatory third party certification of plugs.

**LIGHTING CIRCUITS**
Usually a circuit supplies several lighting points in turn. A lighting point usually consists of a ceiling rose in which incoming, outgoing and switch connections are made and a pendant flexible cord supplying an attached lampholder or may be a complete luminaire. Light switches should meet BS EN 60669-1. Dimmers should meet BS EN 60669-2-1.
### BATHROOMS

The wiring regulations are very strict. Every switch or other means of electrical control or adjustment shall be so situated as to be normally inaccessible in the bathroom. The required Ingress protection is managed through a series of defined zones progressively from the bath or shower. Pull cord switches are allowed, shaver sockets with isolating transformers are also allowed but should conform to BS EN 61558-2-5.

![Diagram of bathroom zones](image)

**Note:** For showers without basins (e.g. wet-room) zone 1 is extended to 120 cm from the centre point of the water outlet.

### OUTDOORS

Any socket outlet provided outdoors or intended to supply outdoor equipment (e.g. electric lawn-mowers should have a 30 mA RCD protection).

### EARTHING

Socket outlets to BS1363-2 have provision for earthing. A protective conductor (which could also be steel conduit) is generally required for all low voltage circuits (1000 V a.c. between conductors) and its continuity must be proved. All main incoming services, for example, water and gas pipes and metallic parts of the building structure, etc. must be bonded and connected to the main earthing terminal of the installation. In addition it may be necessary to supplementary bond water and waste pipes, sinks and other metallic items such as central heating radiators. However in rooms with a fixed bath or shower, supplementary bonding must be applied to simultaneously accessible metal parts unless RCD protection of all circuits in the bathroom is provided.

### POLARITY

The polarity is conserved and marked throughout the installation:

**Live:**
Terminals marked L are for brown coloured insulated conductors, both solid conductors and flexible conductors are coloured brown.

**Neutral:**
Terminals marked N are for blue coloured insulated conductors, both solid conductors and flexible conductors are coloured blue.

**Earth:**
Terminals marked E or are for green/yellow coloured insulated earth conductors, both solid conductors and flexible conductors are either coloured green or yellow or sleeved as such.

### CABLING

Most domestic wiring is done in flat p.v.c. insulated and sheathed 3 core cable (flat twin and earth). Maximum use is made of floor and internal wall voids to run cables. Surface installations are run in conduit or trunking, these can be plastic or metal. Various British standards govern the design and construction of conduits, trunking and cable. Wiring accessories may be installed in plastic or (more often) metal flush boxes to BS 4662. Surface installations are made in appropriate proprietary boxes.

Typically:

- 16 mm plaster depth box
- 25 mm socket box

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BS 7671, “Requirements for Electrical Installations” is published by the Institution of Engineering and Technology and BSI, it governs all domestic electrical installations (and many other types). Copies are available from:

THE INSTITUTION OF ENGINEERING AND TECHNOLOGY

MICHAEL FARADAY HOUSE

SIX HILLS WAY,

STEVENAGE, SG1 2AY UK

BS 7671 is also available from BSI. The various British standards governing the construction of electrical equipment are also available at the BSI shop on their website: www.bsigroup.com BSI also maintains a database available for enquiries covering all British standards.
Consumer units and Din-Rail equipment by Legrand Group

The Legrand range of insulated and metal consumer units offers flexible and easy installation for a wide range of configurations from full Lexic RCBO protection to mixes of Lexic RCBs, MCBs and RCBOs.

Ekinoxe consumer units have been designed to provide a new dimension of protection in homes, offices and industries. With a stylish colour, elegant curves and distinctive finish, Ekinoxe blends in perfectly with any interior decor.

Legrand Lexic modular circuit breakers offer an extensive range of characteristics and can be used to organise distribution in rows as required, up to 125 A. It is the ideal universal solution for all commercial and residential installations.

SPECIFIC TO UK MARKET

**Consumer units**

INSULATED DUAL WITH RCD INCOMER
8 modules unit

INSULATED DUAL RCD SPLIT LOAD
16 modules unit

METAL DUAL RCD SPLIT LOAD
16 modules unit

**Din-Rail equipment**

ISOLATING SWITCH

I RCCB – DX

I RCBO

I MCB – DX

I TIME SWITCH

SURGE PROTECTION DEVICE

I CONTACTOR
SPECIFIC TO INDIAN MARKET (see p. 46-47 for standards organization)

Consumer units

- **EKINOXE DBs**
  - 8 ways
- **EKINOXE DBs**
  - 12 ways
- **EKINOXE DBs**
  - IP 43 with acrylic door

Din-Rail equipment

- **I MCB**
- **I ISOLATOR SWITCH**
- **I MCB FOR D.C**
- **I RCBO**
Wiring accessories by Legrand Group

All the expertise of the Legrand Group has been brought into play to offer markets governed by the British Standard a unique selection of wiring accessory ranges, in terms of both finish and function, and thus cover all requirements in all sectors of the residential and commercial markets.

Arteor, the Legrand Group’s new international range complies with all international standards and offers the very best in terms of innovation, design and technology.
Axolute by Bticino

- White Limoges Switch
- Red China Switch
- Brushed Bronze Switch
- Black Glass Socket
- Liquid White Switch
- Matt Gold Switch
- Cherry Wood Switch
- Shiny Inox Alessi Steel Switch

Living, Light, Light Tech by Bticino

- Living - Native Switch
- Living - Solid Red Switch
- Light - Satin Gold Switch
- Light Tech - Alu Tech Switch
IEC | German standard

Typical residential wiring diagram issued from VDE 0100 requirements for electrical installations.

- Consumer units and Din-Rail equipment by Legrand Group 18-19
- Wiring accessories by Legrand Group 20-21

N.B.: Conductors cross section is calculated according to various parameters for each circuit.
Overview of the installation and related wiring accessories standard

**SUPPLY**
May be single phase (230 V-50 Hz) or - in the majority of cases - 3 phases (400 / 230 V-50 Hz).
Max. Tolerance (voltage): + 6% / -10%. TN- and TT- systems are in use. TT- systems are the most common in domestic installations. There is usually one meter. Facilities are provided with a second meter for special tariffs, etc. A fuse isolator unit allows all phases to be cut-off, isolating the whole domestic installation.

**DISTRIBUTION BOARD**
The distribution board usually contains pre-fuses (for example 3 x 32 A), RCBO 30 mA for household applications (1 or 3 poles). Transformer(s) as for entry door systems, MCB (16 A for general circuits up to 32 A [3 poles] for [water] heating systems). Time lag switches in dwellings. These devices are all mounted on a DIN-Rail.

**POWER CIRCUITS**
Single phase up to 3 WA, 7.3 KVA: 3 phases.
Electrical appliances having a high power consumption (cookers, washing machines, etc.) are supplied via a specific circuit and connected either to 16 A socket-outlet or cable outlet or to a specific socket Perilexi or CEE 17.

It is not uncommon to find 3 phases appliances. Protection rating and cable size of each circuit are calculated according to the appliance (min section 1.5 mm² Cu 16 A).

**GENERAL CIRCUITS**
These circuits supply both lighting points and socket outlets. The rating of the protective device is usually 16 A. There is no limitation of the number of outlets on a circuit. This limit is calculated according to expected/probable use of the circuit. Socket outlets are generally of the 2P+E type “German”. These plugs are non-polarized. All German socket outlets are earthed. In general, the protective conductor is distributed throughout all circuits. For class II devices < 2.5 A, the Euro-plug is used. The wire cross-section of the fixed installed cables is normally 1.5mm² (protected by a 16 A Circuit Breaker).

**DAMP & OUTDOOR INSTALLATIONS**
Special rules apply, in particular for IP rating of accessories and equipment and RCD Protection.

**EARTHING**
Earthing is local, usually through a foundation earthing arrangement. All metallic services shall be bonded (gas and water pipe, heating, waste systems, etc.) with a 10 mm². In bathrooms the local equipotential bonding could have a cross sectional area of 4 mm². Neutral is re-earthed in the control panel. A protective conductor is distributed to all socket outlets.

**INSTALLATION RULES**
The installation must comply with the requirements of VDE 0100 and the “TAB” (TAB = technische Anschlussbedingungen = special requirements of the energy supplier, for example EON, RWE, EnBw or Wattenfall). Installations may only be erected by registered and qualified electricians.
**BATHROOMS**

Special rules apply to bathrooms. The room is divided into different zones:

**Zone "Bereich 0":** Electrical equipment are not allowed. Only special SELV-devices, max. 12V AC or max. 30V DC are allowed. The power supply for these SELV-circuits is not allowed in "Bereich 0" and in "Bereich 1".

**Zone "Bereich 1":** Only fixed installed electrical equipment for hot water production and SELV- or PELV –devices (max. 25V AC or max. 60V DC) are allowed. The power supply for the SELV- or PELV -circuits has to be installed outside "Bereich 0" and in "Bereich 1".

**Zone "Bereich 2":** Only Electrical equipment supplied by SELV- or PELV (max. 25V AC or max. 60V DC) are allowed. Only shaver sockets according to DIN EN 61558-2-5 are allowed.

In bathrooms, an additional equipotential bonding and RCDs (30 mA) protection for socket outlets are mandatory (Details in the DIN VDE 0100-701).

**HOME AND BUILDING CONTROL**

KNX (EIB) ISO/IEC14543, EN50090 is common in big and luxury installations.

**ACCESSORIES**

They shall comply to the appropriate VDE standards. Flush accessories are fitted in boxes. Claw-mounting and screw-mounting are used.

**ENERGY SAVING & REGENERATIVE POWER GENERATION**

Single-room heating control and time-controlled hot water supply is mandatory due to the EnEV (energy saving directive). Airproof installations are common in low energy-buildings. More and more roofs are equipped with photovoltaic cells.
Consumer units and Din-Rail equipment by Legrand Group

Surface-mounting or flush-mounting Nedbox is a 63 A low voltage consumer unit for easy and clever cabling. The consumer unit is especially suited to housing and small commercial applications in Central Europe (Germany, Austria, Poland, Sweden, Hungary...).

Lexic range is Legrand’s insurance of high performance, providing safety, simplicity and freedom of installation. For easier installation in residential applications, Lexic range offers a large choice of functions such as MCBs, RCDs, voltage surge protector, auxiliaries, Stop and Go automatic resetting.
Din-Rail equipment

- RCD - DX
- Voltage surge protector
- Time-lag switch
- RCD - DX
- MCB - DX

- RCD - DX
- RCD - DX
- MCB - DX-E
- MCB - DX-E
- Pulse operated latching relay
Wiring accessories by Legrand Group

The Legrand Group offers the most comprehensive ranges on the market to meet all your requirements. It is constantly adding new functions to make these ranges even better in terms of sustainable development, accessibility and comfort.

With an unrivalled choice of shapes and finishes, you can be certain of being able to incorporate these functions stylishly in all your projects.

With the Legrand Group you can enhance electrical installations in the eyes of your customers, offering them solutions that meet their requirements for high quality, ease of use and attractive appearance.

Céliane by Legrand

- MICA Switch
- COBALT Switch
- NICKEL VELVET Switch
- CORIAN® NOCTURNE Switch
- MAHOGANY Switch with lever
- PORCELAIN Touch control switch
- KAOLIN GLASS Silent switch
- CAMEL LEATHER Touch-sensitive switch

Valena by Legrand

- WHITE Switch
- IVORY Socket
- ALUMINIUM Switch
- IVORY - TERRA Switch
Axolute by Bticino

- Liquid White Switch
- Shiny Inox Alessi Steel Switch
- Red China Switch
- Black Glass Switch

Living, Light, Light Tech by Bticino

- Living – Native Switch
- Living – Solid Red Switch
- Light – Satin Gold Switch
- Light Tech – Alu Tech Socket

Màtix by Bticino

- Màtix-White Switch
- Màtix-Ivory Switch
- Màtix-Silver Switch
- Màtix-Titanium Switch

Home automation
See page 64 to 67

Axolute by Bticino

- Liquid White Switch
- Shiny Inox Alessi Steel Switch
- Red China Switch
- Black Glass Switch

Living, Light, Light Tech by Bticino

- Living – Native Switch
- Living – Solid Red Switch
- Light – Satin Gold Switch
- Light Tech – Alu Tech Socket

Màtix by Bticino

- Màtix-White Switch
- Màtix-Ivory Switch
- Màtix-Silver Switch
- Màtix-Titanium Switch

Home automation
See page 64 to 67
IEC | French standard

Typical residential wiring diagram issued from NFC 15-100 requirements for electrical installations.

| Consumer units and Din-Rail equipment by Legrand Group | 26-27 |
| Wiring accessories by Legrand Group | 28-29 |

For more details on countries
See maps page 02 to 05
Overview of the installation and related wiring accessories standard

**SUPPLY**
Usually single phase (230 V / 50 Hz). Earth is usually local (TT system). The protective conductor is mandatory in every circuit. An AD fuse is installed on the phase in conjunction with the main circuit breaker.

**METER**
A single kW/h meter is supplied. If an optional off-peak power fare is subscribed, a 2-fares meter with pilot-line switching is installed.

**MAIN CIRCUIT-BREAKER**
This device has 3 functions:
- Acts as the main switch of the installation
- Limits the current consumption to a pre-settled level of the contract with electricity supplier
- Provides protection against indirect contact through a residual current protection (type S, 500 mA).

**LIGHTNING PROTECTION**
The installations supplied by an overhead electric line and located in high risk lightning areas have to be protected by a Surge Protective Device (SPD) installed downstream of the main residual current circuit breaker. The Surge Protective Device has to be connected to the main earth terminal of the consumer unit.

**CONSUMERS DISTRIBUTION BOARD**
All the protection and control functions of the electrical installation are located in the main household trunking (called GTL). The power distribution panel board and the communication panel board are located in the GTL.

**POWER DISTRIBUTION PANEL BOARD**
This panel board concentrates all the control and protection functions of the electrical installation. The protection against overcurrent (short circuit and overload) is provided by circuit-breakers or fuses. All the circuits have to be protected by a 30 mA RCD in order to provide the complementary protection against the direct contacts. Other devices could be located in the panel board as:
- Time switches and time delay relays
- Bell transformer
- Power relays (heating, etc)
- Latching relays for lighting
- Signalling lamps
- Daylight/dusk switches
- Dimmers
- Land-shedding relays
- Off-peak power relays
- Buzzer or bell.

**CIRCUIT PROTECTION AGAINST OVERCURRENT**
Each circuit has to be protected against overcurrent at its origin. The overcurrent protection device shall ensure the simultaneous breaking of both phase and neutral conductors. The protection device should be a miniature circuit breakers or a fuse cartridge.

**SPECIALIZED CIRCUITS**
Some appliances (e.g. washing machine, freezer, dishwasher, etc) should be supplied by a dedicated circuit having the appropriate cross sectional area and overcurrent and RCD protection. They will be connected either via a socket or via a cable outlet box (e.g. oven, cooking plate, water-heater).

**SOCKET OUTLETS**
The socket outlet circuits are installed in a star configuration. The maximum number of socket-outlets is 8 on a 2.5 mm² circuit and 5 on a 1.5 mm² circuit. Socket outlets are of the earthed type 2P+E. Shutters are mandatory for all type of socket-outlets up to 32 A.

**PLUGS**
They can be 2P or 2P+E type. The flat bodied 2P type should have sleeved pins. Specific 20 A
**LIGHTING POINTS**

The lighting circuits are installed in a star configuration. A maximum of 8 points per circuit is allowed, each controlled by switches or dimmers. Multiple-point control of lighting is usually achieved by latching relays and push-buttons. The use of time-lag switches for the light control in public areas is also recommended.

**EARTHING**

The earthing terminal is usually provided by a closed loop foundation earth electrode. Supplementary bonding of metal fittings in bathroom, kitchens, etc., is mandatory.

**CABLING**

Most domestic wiring is run either in plastic surface mounted trunking or in plastic flushed-in conduit systems. Generally PVC insulated solid copper conductors are used in fixed wiring. Concerning the surface-mounted trunking systems, the protection against the external influences has to be ensured throughout the entire length of the circuit.

**ELECTRICAL ACCESSORY INSTALLATION**

Switches, sockets, etc., should be installed in a flush or surface mounted box or in an especially designed trunking system. All the accessories have to be screw fitted.

**OUTDOOR CIRCUITS**

The use of a 30 mA RCD protection is mandatory for the protection of the domestic outdoor circuits. Outdoor sockets should be at least IP 44.

**BATHROOMS**

Specific rules apply for circuits in bathrooms.

**COMMUNICATION BOARD**

In the domestic installation a communication board is installed in the main household trunking (GTL). It is the central part of the communication network of the dwelling. Each room of the dwelling is supplied by a twisted pair cable originating from the communication board and terminating with an RJ 45 socket. This communication network is able to provide different services such as telephone, Ethernet and TV.

---

All the low voltage electrical installation shall comply with the French standard NF C 15100. This standard provides detailed rules concerning all the aspects of the wiring and designing of the installation. Copies of the standards, as well as other French electrical standards are available from:

From:
- UTE
- ute@ute.asso.fr
- http://www.ute-fr.com

Helpful practical guides are available from:
- Promotelec
- http://www.promotelec.com

and 32 A plugs are also available for high power circuits.
Consumer units and Din-Rail equipment by Legrand Group

The enclosures for the French residential system fit perfectly into all indoor, outdoor or design projects. The modular products protect people and property, as well as the most sensitive equipment: including protection against voltage surges and protection with a high level of immunity.

The Stop&Go increases continuity of service on circuits that require special monitoring (aquarium, refrigerator, freezer) and management products, combining ease of use and energy saving.
Din-Rail equipment

- RCD - DX
- Automatic terminals
- VOLTAGE SURGE PROTECTOR
- I E.L.C.B.
- MCB - DNX 4500
- STOP&GO
- Automatic resetting
- PULSE OPERATED LATCHING RELAY

Power protection
See page 56 to 57

FRENCH STANDARD

I RCD - DX
I RCD - DX
I RCD - DX
- Automatic terminals

See page 56 to 57
Wiring accessories by Legrand Group

A new generation of wiring accessories for all your lighting, energy distribution, data and audio-video content, blind management, climate control and safety requirements.

Offers to suit all your sites, with a unique range of designs and user interfaces.

All with the high quality mechanisms and modular design that have made the Legrand Group the world standard for wiring accessories.

Céliane by Legrand

Valena by Legrand
Axolute by Bticino

WHITE LIMOGES Switch
RED CHINA Switch
BRUSHED BRONZE Switch
BLACK GLASS Switch
LIQUID WHITE Switch
MATT GOLD Switch
CHERRY WOOD Switch
SHINY INOX ALESSI STEEL Switch

Living, Light, Light Tech by Bticino

LIVING – NATIVE Switch
LIVING – SOLID RED Switch
LIGHT – SATIN GOLD Switch
LIGHT TECH – ALU TECH Socket
IEC | Italian standard

Typical residential wiring diagram issued from IEC EN 64-8 requirements for electrical installations.

- Consumer units and Din-Rail equipment by Legrand Group
- Wiring accessories by Legrand Group

For more details on countries
See maps page 02 to 05

CONSUMER UNIT
Consumer units, Din-Rail equipment...

The consumer unit range includes resin flush-mounted cabinet E215, 2 and 3 rows IP40, for residential applications, and wall-mounted cabinet Idroboard IP65 for industrial and service sector applications.

Btdin is a complete range of thermal magnetic circuit breakers and earth leakage devices, and is completed by a full range of auxiliary items: insulating switches, control devices and the new automatic resetting Stop&Go for domestic RCD.
... wiring accessories by Legrand Group

Axolute, the luxury range offering a wide choice of materials and prestigious finishes coupled with the performance of the latest digital technologies.

Light and Light Tech, two ranges offering harmonious and rational geometry

Living, tender and rounded forms hosting elegant grey devices.

Màtix, a perfect solution for residential projects and building contractors.

Axolute by Bticino

Axolute by Bticino

Living, Light, Light Tech by Bticino

Living, Light, Light Tech by Bticino

Màtix by Bticino

Màtix by Bticino

Home automation
See page 64 to 67
IEC | Brazil standard

Typical residential wiring diagram issued from ABNT NBR 5410 requirements for electrical installations.

Consumer units and Din-Rail equipment by Legrand Group 38-39

Wiring accessories by Legrand Group 40-41

The nominal cross-sectional area of conductors and the rated currents of MCB’s, RCBO’s and RCCB’s should be dimensioned as prescribed in the ABNT NBR 5410 - Electrical Installation of buildings low voltage standard.
COLOUR CODE OF SOLID STRANDED FLEXIBLE CONDUCTORS

<table>
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<tr>
<td>2.5 mm²</td>
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</tbody>
</table>

- **Switches**
- **Socket outlets**
- **Dish-washer**
- **Lamp**
- **Fluorescent lamp**
- **Socket outlets**
- **Cooker**
- **Socket outlets**
- **Micro-wave**
- **Fast water-heater**

**MCB**: Miniature circuit breaker

**RCBO**: Residual current operated circuit breaker with integral overcurrent protection

**RCCB**: Residual current circuit breaker
Overview of the installation and related wiring accessories standard

**SUPPLY**
Usually single phase (127 V-60 Hz) and two phase (220 V-60 Hz) loads. Phases and neutral are supplied. Earth is usually local. A circuit-breaker should be installed on the phases. Fuses are still common in old residences.

**METER**
As single kWh meter is supplied. The most common domestic type of electricity meter is the electro-mechanical induction watt-hour meter sealed in a special housing to prevent tampering.

**MAIN CIRCUIT-BREAKER**
This unit has 3 functions:
- Acts as main isolator for the installation
- Limits consumption of current to a pre-set level determined by contract with electricity supply organisation
- Provides “blanker” residual current protection at 300 mA.

**COMPULSORY PROTECTION AGAINST LIGHTNING**
Installation supplied by overhead electric line and located in areas where thunder is heard more than 25 days per year must be protected by a Surge Protective Device immediately placed after the main residual current circuit breaker (300 mA and recommended Type S). The Surge Protective Device must be connected to the earth terminal block of the distribution board.

**CONSUMERS DISTRIBUTION BOARD**
It contains distribution of power to subcircuits and circuit protection (overload and short circuit). Additionally it may contain other functions:
- Residual current protection of sub-circuits
- Time switches or time delay relays
- Bell transformer
- Power relays (heating, etc)
- Latching relays for lighting
- Indicator lamps
- Daylight/dusk switches
- Dimmers
- Land-shedding relays
- Off-peak power relays
- Buzzer or bell
- Home automation.
The unit is usually site-assembled and “soft” wired (no busbars).

**CIRCUIT PROTECTION**
Each circuit must have a suitable protection device on its source. This device shall insure the breaking of phases conductors in one operation. Rewireable fuses are not required by Brazilian electrical installation of building standard, the NBR 5410.

**POWER CIRCUITS**
All appliances having a relatively high consumption of current should be supplied on a specific circuit with appropriate protection and cabling. They will be connected either via a special plug and socket-outlet or via cable outlet box (e.g. cooker, dishwasher, washing machine, water-heater, air-conditioning, etc). Individual circuits must be used for lighting points and socket outlets points.

**SOCKET OUTLETS**
Are supplied on radial circuits provided with earth (maximum of 8 socket outlets per circuit in 220 V and 5 socket outlets in 127 V). It is recommended all circuits of socket outlets are protected by 30mA Residual Current Devices. Socket outlets are of the earthed type (2P+E) up to 20 A and should comply with the ABNT NBR 14136 (Brazilian dimensional standard). Shutter is not mandatory. There are two versions of socket outlets: 10 A and 20 A. A 10 A socket outlet should not allow the insert of a 20 A plug.

**PLUGS**
Plugs can be 2P or 2P+E type up to 20 A and should comply with the ABNT NBR 14136 (Brazilian dimensional standard). Sleeved pins are not mandatory. There are two versions of plugs:
- For equipment with rated current up to 10 A.
- For equipment with rated current above 10 A up to 20 A.

**LIGHTING POINTS**
Lighting points are supplied radial circuits provided with earth (max 8 points per lighting circuit) and
controlled by switches or dimmers. **Note:** multiple-point control of lighting is usually achieved using latching relays and push-buttons. The use of time switches to control lights in public areas is commonly used.

**EARTHING**
All circuits distribute a protective conductor. All services should be bonded to earth. Supplementary bonding of metal fittings in bathrooms, kitchens, etc., is also necessary.

**CABLING**
Most domestic wiring is run either in plastic surface trunking or in flushed in conduit systems. Some rules govern the choice of the type of conduit to be used. Generally solid copper conductors (usually PVC insulated) are used for fixed wiring. Attention must be paid to the various rules governing cable section, voltage drop, etc. For plastic surface trunking, protection against external influences must be ensured continuously throughout the length of conduit runs, especially at angles and entries into wiring devices.

**ELECTRICAL ACCESSORY INSTALLATION**
Switches, sockets, etc., should be installed in a flush or surface box or in a purpose made equipment trunking. Accessories may be either screw-fitted or provided with expanding claws which grip the walls of a circular flush box.

**OUTDOORS**
The use of 30 mA RCD protection is recommended. Outdoor socket outlets should be at least IP 44.

**BATHROOMS**
Special rules apply to bathrooms which are divided into 4 zones.

### INSTALLATION RULES
All electrical installations should comply with Brazilian standard ABNT NBR 5410. This document lays down detailed rules governing all aspects of wiring and designing on installation.
Consumer units and Din-Rail equipment by Legrand Group

Legrand load centers, circuit breakers, time switches, residual current and surge protection devices are designed to satisfy individual requirements as far as design, integration, energy saving and protection of people and property are concerned.

Unic, Lexic and Ekinoxe systems comply with Brazilian Standards ABNT NBR and International Standards IEC offering the flexibility to install both protection: Bolt-on type and Din-Rail type.
Lexic Din-Rail equipment

Unic Din-Rail equipment

Power protection
See page 56 to 57
Wiring accessories by Legrand Group

Legrand, the leading supplier of electrical wiring accessories in Brazil for 30 years, offers a comprehensive range for every market segment. Driven by the ongoing pursuit of excellence, the Legrand Group delivers solutions that provide customers with ever greater comfort, safety, connectivity and energy efficiency. The Axolute and Living&Light ranges from Bticino for the luxury segment. The Pialplus and Vela from Legrand for the standard and premium segments.

Axolute by Bticino

- WHITE LIMOGES Switch
- RED CHINA Switch
- BRUSHED BRONZE Switch
- BLACK GLASS Switch
- LIQUID WHITE Switch
- MATT GOLD Switch
- CHERRY WOOD Switch
- SHINY INOX ALESSI STEEL Switch

Living, Light, Light Tech by Bticino

- LIVING - CHERRY WOOD Switch
- LIVING - SOLID RED Switch
- LIGHT - SATIN COPPER Switch
- LIGHT TECH - BRIGHT CHROME Switch
Vela by Legrand

- SATIN WHITE: Switch and socket
- METALLIZED PEARL: Switch
- METALLIZED TITANIUM: Switch
- METALLIZED SILVER: Switch
- ANTHRACITE: Switch

PialPlus by Legrand

- GLOSS WHITE: Switch
- GLOSS WHITE: 3 + 3 module switch
- SATIN WHITE: Switch
- SATIN WHITE: Switch and socket

Home automation
See page 64 to 67
IEC | Chinese standard

Typical residential wiring diagram issued from GB 50054 requirements for electrical installations.

Wiring accessories by Legrand Group 44-45

For more details on countries See maps page 02 to 05
Wiring accessories by Legrand Group

In China, Legrand stand-out offering comes in a wide spectrum of combinations and colours, including market-leading white. With its modular mechanisms as well as flexible installation options, the functional possibilities are endless.

Arteor by legrand

- TATOO - EDITION 1
  Switch
- GRAPHIC - FORMAL
  Switch
- BRUSHED METAL - STAINLESS STEEL
  Switch
- WOOD - WENGE STYLE
  Switch

- MIRROR BLACK
  Micropush switch
- MIRROR WHITE
  Shutter control
- GALUCHAT
  Sensitive switch
- SIGNATURE
  Universal dimmer

Major by legrand

- DARK SILVER - PEARL
  Switch
- SILVER - BLACK
  Switch
- SILVER - BRONZE
  Switch
- PEARL - COPPER
  Switch
A6 by TCL/Legrand

WHITE Switch
WHITE Switch
WHITE Socket
WHITE Computer-TV socket

A8 by TCL/Legrand

SILVER Switch
BROWN Switch
ROSE-GOLD Switch
EGGPLANT Computer socket

Living, Light by Bticino

LIVING NATIVE Switch
LIVING SOLID RED Switch
LIGHT SATIN GOLD Switch
LIGHT SATIN TITANIUM Switch

Home automation
See page 64 to 67
Other IEC based Installation rules

**AUSTRALIA**

Installation reference code:

Standards organization:
Standards Australia International Ltd (SAI)
286 Sussex Street AU-Sydney,
NSW 2000 GPO Box 5420
Sydney NSW 2001
Tel: + 61 2 82 06 60 00
Fax: + 61 2 82 06 60 01
Email: intsect@standards.org.au
Web: www.standards.com.au

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**SOUTH AFRICA**

Installation reference code:
The wiring of premises.
Part 1: Low-voltage installations.

Standards organization:
South African Bureau of Standards (SABS)
1 Dr Lategan Rd, Groenkloof
Private Bag X191
ZA-Pretoria 0001
Tel: + 27 12 428 79 11
Fax: + 27 12 344 15 68
Email: info@sabs.co.za
Web: www.sabs.co.za

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**INDIA**

Installation reference code:

Standards organization:
Bureau of Indian Standards (BIS)
Manak Bhavan
9 Bahadur Shah Zafar Marg
IN-New Delhi 110002
Tel: + 91 11 23 23 79 91
Fax: + 91 11 23 23 93 99
Email: hisird@vsnl.net
Web: www.bis.org.in
**SAUDI ARABIA**

**Installation reference code:**
National Saudi Code (under preparation).

**Standards organization:**
Saudi Arabian Standards Organization (SASO)
Imam Saud Bin Abdul-Aziz Bin Mohammed Road (West End)
P0 Box 3437 Riyadh 11471
Tel: + 966 1 452 00 00
Fax: + 966 1 452 00 86
Email: saso@saso.org.sa
Web: www.saso.org.sa

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**BRITISH STANDARD**
Plug diagram + Plug type

- 3.90 min
- 4.05 max
- 22.10 min
- 22.36 max
- 5.22 min
- 5.48 max
- 7.80 min
- 8.05 max
- 3.90 min
- 8.05 max
- 9.2 max insulated collar
- 17.20 min
- 18.20 max

**EUROPEAN PLUG**
Plug diagram + Plug type

- 17.0 to 18.0 at pin ends
- 18.0 to 19.2 at plug face
- 15.3.5 dia max
- 19.0
- Insulating collar
- 1.70 to 18.0 at pin ends
- 19.0 to 19.2 at plug face
- 15.3.5 dia max
- 19.0
- Insulating collar
- 1.70 to 18.0 at pin ends
- 19.0 to 19.2 at plug face

**GERMAN**
Plug diagram + Plug type

- 36.5 dia nom
- 4.8 dia
- 19.0 Location ridge
- 19.0 Earth contact
- 4.8 dia
- 19.0
- Insulating collar
- 1.70 to 18.0 at pin ends
- 19.0 to 19.2 at plug face
- 15.3.5 dia max
- 19.0
- Insulating collar
- 1.70 to 18.0 at pin ends
- 19.0 to 19.2 at plug face
- 15.3.5 dia max
- 19.0
- Insulating collar
- 1.70 to 18.0 at pin ends
- 19.0 to 19.2 at plug face
- 15.3.5 dia max
NEC | American standard

Typical residential wiring diagram issued from NEC (2008) requirements for electrical installations.

- Consumer units and Plug-in type equipment by Legrand Group 52-53
- Wiring accessories by Legrand Group 54-55

For more details on countries See maps page 02 to 05
Overview of the installation and related wiring accessories standard

**SUPPLY**
Domestic supply is usually 2 phases (120 V/240 V - 60 Hz). 2 phases + neutral are supplied. Neutral is re-earthed at entry. Earth is local.

**METER**
Usually a weatherproof unit outside the house.

**SERVICE PANEL**
Ratings of 60 A, 100 A, 150 A and 200 A exist. The Service Panel (or Service Entrance Panel) usually contains a Main Disconnect device and the necessary protective devices for the sub-circuits.

**POWER CIRCUITS**
Appliances having heavy power consumption (ranges, water-heaters, etc.) are supplied on a specific circuit, often 120/240 V. Various socket outlets of appropriate ratings are available, these are not interchangeable, thus 2 Phase + Neutral + Earth plug cannot be fitted to a 2 Phase + Earth socket, etc.

**GENERAL PURPOSE CIRCUITS**
These are 120 V-15 A and supply socket outlets [IP+N+G]. These circuits supply bedrooms, etc. where the use of a large number of appliances is unlikely. Note that all general purpose socket outlets must be of the grounding type.

**APPLIANCE CIRCUITS**
The 120 V-20 A circuits supply areas such as kitchens, dining-rooms, etc., when there is a likelihood of more intensive use of appliances. The NEC [National Electrical Code] requires at least two appliance circuits for a domestic installation. Only socket outlets may be supplied on an appliance circuit.

All domestic use NEMA 5-15R and 5-20R receptacles must be tamper resistant.

**AMERICAN WIRE GAUGE**
AWG (approximate equivalence)

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<tr>
<th>AWG</th>
<th>Area (mm²)</th>
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<tbody>
<tr>
<td>20</td>
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<td>85.0</td>
</tr>
<tr>
<td>4/0</td>
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</tr>
</tbody>
</table>

**PLUGS**
Various types of plugs exist to match the various configurations of socket outlets.

**OUTDOORS**
Outdoor socket outlets must have 6 mA GFCI protection and be housed in a weatherproof enclosure.
**INSTALLATION RULES**

The "National Electrical Code" gives rules governing all types of electrical installation.

Copies are available from:
NATIONAL FIRE PROTECTION ASSOCIATION
1, Battery March Park
QUINCY, MA 02269 U.S.A.

Standards governing the construction of accessories are published by various organisations, the most important being:

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA).
1300 North 17TH Street Suite 1752
ROSSLYN, VIRGINIA 2009 USA

UNDERWRITERS LABORATORIES INC (UL)
333 Pfingsten Road
NORTHBROOK, IL 60062-2096 USA

Note that local building regulations are very important in the U.S.A. Common practices in one area can be prohibited in another even though the NEC prescribes the method. It is wise to gain local knowledge.

**GROUND-FAULT CIRCUIT-INTERRUPTERS (GFCI)**

All domestic use 125 V - 15 A and 20 A socket outlets in the following locations must be protected by GFCI having a trip level sensitivity of 6 mA:
- Bathrooms
- Garages
- Kitchens
- Basements
- Outdoors
- Laundry and utility sinks (when socket outlets is within 6 feet).

**ARC-FAULT CIRCUIT-INTERRUPTERS (AFCI)**

All domestic use 120 V - 15 A and 20 A branch circuits supplying outlets in living rooms, dining rooms, family rooms, bedrooms and similar areas must be AFCI protected.

**TAMPER RESISTANT (SHUTTERED) SOCKET OUTLETS**

All domestic use 125 V - 15 A and 20 A socket outlets must be Tamper Resistant (shuttered).

All conductive non-current carrying parts of the electrical system should be effectively bonded to earth.

**Polarity:**

Polarity is conserved throughout the installation.

**Live (hot):**

Terminal screws brass colour;
conductors insulated in black

**Neutral:**

Terminal screws silver or marked white or W; conductor insulated in white.

**Ground:**

Terminals green colour or marked G; conductors insulated in green or wire is left bare.

**Cabling:**

Various types of cables are used in domestic installations, the most frequent are:
NM. Non-metallic sheathed;
AC, Metal-clad cable.

Similarly various types of conduits are also encountered:
- Rigid steel conduit
- Intermediate metal conduit
- Thinwall metal conduit
- Flexible metal conduit
- Rigid non-metallic conduit
- Surface raceway.

**EARTHING (GROUNDING)**

The use of ungrounded (2P) sockets in domestic installations is no longer allowed by the NEC. Earth can be distributed in the installation in one or two ways:
- By a specific earth conductor distributed along with live + neutral
- By using metallic boxes, conduit and sheathed cables and using this metallic system as earth.

**ELECTRICAL ACCESSORY INSTALLATION**

Accessories are fitted in standard boxes, either metal or plastic, the most common sizes being 2 inches by 4 inches and 4 inches by 4 inches.
Consumer units and Din-Rail* equipment by Legrand Group

Our systems comply with different rules of installation in America and the Caribbean. In this way, a broad portfolio of protection and distribution products allows us to provide solutions in residential buildings following local adaptations, including among others NEC in USA, NMX in Mexico, COVENIN in Venezuela, NTC in Colombia,...

*or Plug-in or Bolt-on types
**Din-Rail equipment**

- **MCB - BT PLUG**
  - Plug-in type 3/4"
- **MCB - BT PLUG**
  - Plug-in type 3/4"
- **MCB - TIVEN**
  - Plug-in type 1"
- **MCB - DSE**
  - Plug-in type 1"
- **MCB - TIBRA**
  - Bolt-on type 1"
- **MCB - DSA**
  - Bolt-on type 1"
Wiring accessories by Legrand Group

The Studio Collection from Legrand seamlessly blends innovative function with elegant design. The Studio wall plates are offered in 17 contemporary color options in a design and form-factor never before available to homeowners. The design, a sculptural flow of curves featuring titanium edging and a screwless finish, offers customers a new way to integrate Home Systems products with personal style and taste throughout the entire home.
Axolute by Bticino (a Legrand Group brand) is the best choice for prestigious environments. The richness of the aesthetic options and the technology within the devices will enhance your electric system like never before. Combinations of materials, finishes and shapes let you match every space with the most appropriate solution. An innovative modular system that offers a complete UL product range.
ENERGY DISTRIBUTION

To ensure the best possible performance of production tools, buildings need to benefit from high-performance, lasting solutions which provide an optimum quality of service.
A COMPLETE OFFER UP TO 4 000 A
From XL³ distribution enclosures to cabinets, from standard or optimised busbar distribution through to terminals, the Legrand Group offers a complete offer of solutions for energy distribution up to 4 000 A.
DMX, DPX and DX protection devices ensure optimum selectivity with a very high breaking capacity to protect the installation effectively. Remote installation supervision equipment is also available for greater security.

A SET OF RELATED SERVICES
Technical guides, design software, product training, technical and commercial support and indeed on-site assistance – are provided to help you day by day in the achievement of your project.

**DMX**
Air circuit-breaker: a headline device for protection and control of low voltage installations up to 4 000 A

**DPX**
A range of MCCBs that ensure optimum dynamic or logical selectivity to protect the installation

**DX**
Designed to protect devices up to 125 A

**STOP & GO**
Motorized control to restore the power supply in the event of unwanted tripping
PUTTING A STOP TO ENERGY WASTE

It’s the vision of Legrand with its new range of lighting management products & systems. Energy-efficient lighting managements ensure just the right amount of light when and where you need it. They are reliable and easy to use, provide safety and security, reduce expenses and are code compliant, sustainable and environmentally friendly. Legrand has everything you need to make your lighting management project a success, from a comprehensive range of products to informative tools and services.
ENERGY EFFICIENCY

Lighting is a significant consumer of energy in commercial buildings:
- 20% of total site energy is consumed by lighting in commercial buildings.
- Lighting is the first electricity end-user in a commercial building with up to 40% electricity consumed.

NB: Energy end-use distribution greatly varies depending on the activity of the building and across geographical and climate regions (sources: Department of Energy Buildings and Energy Information Administration, USA).

With heating and air-conditioning, lighting accounts for the greatest energy consumption and costs of a building.

These significant costs can be managed more effectively through the use of lighting management.

Each year, more organizations implement lighting management because they recognize the wide range of benefits:
- Energy savings, Economic savings, Code compliance, Sustainability building practice...

2 types of solutions

Switch sensors for automatic management

BUS/SCS system for local and centralised management

THE RIGHT PRODUCT FOR EACH APPLICATION

Because of different types of spaces, most projects require multiple solutions to maximize energy savings and occupant’s satisfaction.

By installing lighting management and other automated controls, energy waste is totally avoided and the building only consumes the necessary amount of energy when needed.

Legrand commits to providing customers with complete and transparent information on actual savings for its lighting management solutions. Please contact us for more information.

Solution and application in large conference rooms

Up to 55% energy saving based on EN 15193 standard (with occupancy sensors + manual switch + daylighting sensor)*

The Legrand lighting management offer can be associated with all wiring accessories international ranges: Arteor, Mosaic, Céliane, Axolute...

*The level of savings that can be achieved with sensors depends on the type of building and the type of area (activity).
Legrand offers complete solutions from technical rooms to workstations with the latest technologies:
Cat. 6A, Wi-Fi and fibre optic
- Copper patch panels, fibre optic drawers, 19” cable management accessories, enclosures
- Cable distribution and cable management
- Connection to information (Voice, Data, Images) via dedicated sockets, Wi-Fi access points, multi-outlets extensions, desk modules, columns... plus a wide selection of complete ranges of wiring accessories such as Mosaic, Arteor, Céliane by Legrand and Mâtix, Living, Light, Axolute by Bticino.

FROM TECHNICAL ROOMS TO WORKSTATIONS
LCS² 19” PANELS
In the LCS² panels, running and organising cables is easy. There is plenty of room for fixing cables on their cable guides, and the plinth and linking interface provide a large space for running cables under the panel. The LCS² panels are very easy to assemble and dismantle: saving a considerable amount of on-site time, and providing full accessibility with their removable sides and rear panels and structure that can be totally dismantled.

SOLUFLEX FLOOR SYSTEM AND LCS² ZONE DISTRIBUTION BOXES
In the Soluflex cable floor system, all power cables, data and telecommunication are conveniently organized, completely out of sight, accessible at any moment. The LCS² zone distribution boxes used with Mosaic feedthrough sockets also provide total flexibility. LCS² ensures perfect performance.
- Takes two 6-connector units, for connecting up to 12 RJ 45 sockets
- Fibre optic/RJ 45 can be used together
- Fibre optic coiling rack.

CABLE MANAGEMENT SYSTEMS FOR ALL INSTALLATION HABITS
Metal or wire mesh cable trays, light or heavy duty cable ladders: the Legrand cable management catalogue covers all market requirements from small tertiary to heavy industrial, offering the world’s largest solutions panel and the world’s most certified products.

CONNECTION TO INFORMATION
A wide selection of equipment to connect information to workstations.
RESIDENTIAL MULTIMEDIA NETWORKS

The worldwide consumer IP traffic is increasing dramatically and will represent more than half of the world total IP flow, because of the growing demand from the households for the entertainment purpose, including internet surfing, music enjoyment, and video watching. More leisure time is spent on the multimedia, more digital content is available, more consumer electronic equipment are networkable: we are entering an era of digital multimedia explosion.

A HOME STRUCTURED CABLEING SYSTEM

Legrand offers a sustainable infrastructure, with mobility based on the wireless technology, to enhance the inhome multiconnection experience. Legrand adapts its technology to:

Copper
Based on copper cable, known for years for its reliability and high performance, it is the sustainable way to share and distribute multimedia content in the home:
- Create network for video streaming
- Multiple internet access
- Distribute phone lines (e.g. home office)
- Multi-room audio diffusion.

Fibre optic
The large band optic fibers transmission will allow to handle a great amount of digital data in living spaces.

Coaxial cable
The traditional way today to connect a TV to your favourite programmes.
COMPLIANCE TO INTERNATIONAL AND AMERICAN STANDARDS
Legrand Group ranges are compliant to ISO/IEC 15018 (residential premises) and EN 50173-4 and to the North-American standards TIA/EIA-570 (residential cabling).

International offer based on IEC standard

Offer based on American standard

MULTIMEDIA DISTRIBUTION BOARD

HOME NETWORKS STRUCTURED WIRING

HOME NETWORKS TELEPHONE MODULE

MULTI-ROOM AUDIO DEVICE

Studio collection
LEGRAND AND BTICINO, the perfect duo: Technology and Aesthetics.
The Group, the world n°1 in the electrical wiring accessories, is the unique provider
to propose not only the technology, but also
a wide range of user interfaces in the harmonized aesthetics.
The Home Automation devices are integrated
into its international electrical wiring accessories ranges, made for specific geographic zones with respect to the local standard, covering the full home applications.
SUSTAINABILITY AND FULL APPLICATION
Based on Legrand Group 2-wire BUS technology, it is an unique offer in the market to perform a perfect interoperation between: lighting, shutters, security, climate, door entry system, and multi-room audio / video diffusion.
Mood setting, event sequence scenarios enhance the home comfort and efficiency. It is an ideal solution for the one looking for an auto-managing home.
Thanks to its full solution on the same technology, the whole-home control becomes possible from any place inside the home, or from distance by mobile or internet.

FLEXIBILITY AND FUTURE EXTENSION
Based on its ZigBee® Radio and Power Line Carrier technology, the system communication protocol is transported on the electrical cables or by wireless in a frequency of 2.4 Ghz, internationally accepted.
It is an ideal solution for renovation by taking the existing electrical networks, or any home owners who want to start the first experience with a partial installation with a possibility of future extension.
It only needs to replace a traditional lighting or shutter switch by the intelligence embedded control device, to transform a traditional electrical installation to a smart home.

Zigbee® Certified product - Manufacturer Specific Profile.

HOME AUTOMATION devices integrated into international ranges either by Legrand or Bticino

3.5" TOUCH SCREEN
Arteor Mirror | by Legrand

TOUCH PLATE DIMMER
Arteor Mirror | by Legrand

VIDEO DISPLAY
Axolute Kristal | by Bticino

LIGHTING CONTROL
Céliane | by Legrand
HOME AUTOMATION PRESTIGE

Synonym with luxury and unprecedented comfort, destined to the prestige residential project, Legrand completes its offering with Vantage, the specialist in the high-end tailor-made home, through system integrators.
ENDLESS POSSIBILITIES OF SOPHISTICATION
The Infusion technology by Vantage is empowered by its sophisticated however easy for us software, allowing endless possibilities in the customization to reply to the prestige home owner’s specific demand.

NUMEROUS APPLICATIONS
Powerful integration platform for numerous applications: lighting, heating, audio, video, bathroom, swimming pool, etc. The keypad in a sheer simplicity style is made to simplify the whole-house control on one finger despite the innovative technology behind.

SUPERVISION AND COMMAND
Colour Touch Screen, flush-mounted in the wall, or portable, is certainly the modern user interface to supervise and command the whole home installation.

VANTAGE HOME
Each project, is a unique master piece

HOME CINEMA
Controlled by Vantage
In a context of accelerated globalisation and increasingly complex projects, the support of a reliable and competent partner is absolutely essential, a real key to the success of your company. Our comprehensive and reliable solutions and services enable you to fully express your vision worldwide.
**Sustainable development: a priority**

By signing up to the Global Compact* in 2006, this approach has been given a wider dimension. The Group’s environmental commitment is centred on 3 guiding lines: taking on board environmental management in the running of its industrial sites, reducing the environmental impact of its products by eco-design, providing environmentally friendly solutions that contribute to energy savings.

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**A VERY BROAD RANGE OF APPLICATIONS**

Beyond the examples of products and solutions we have just shown you, the Legrand Group boasts expert know-how in a large number of other applications. Our consistent research efforts and the complementarity of our offers and brands allow us to respond to the needs of countless different projects. Infrastructure: railway stations, harbours, tunnels, naval installations...

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*Sustainable development: a priority*

*www.unglobalcompact.org*
### Electrical symbols in the world

This table is for guidance only. Symbols other than those given are frequently encountered.

The information in this document is published for guidance only. The company cannot be held responsible or liable for errors existing in the document, nor for errors arising from the use of the information given.

<table>
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<tr>
<th>AMERICAN</th>
<th>ARABIC</th>
<th>CHINESE</th>
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</thead>
<tbody>
<tr>
<td>Wire gauge</td>
<td>AWG</td>
<td>مقطع</td>
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<tr>
<td>Power</td>
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<td>Current</td>
<td>A</td>
<td>شدة التيار</td>
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<td>Voltage</td>
<td>V</td>
<td>ف</td>
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<tr>
<td>Frequency</td>
<td>Hz</td>
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<td>Service entrance panel (or fuse box)</td>
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<td>لوحة توزيع</td>
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<td>فتحة قنبلة</td>
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<td>Ground fault circuit interruptor</td>
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<td>مفاعل تسبب أرضي</td>
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<td>Neutral wire</td>
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<td>موصول مستقيم (أرضي)</td>
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<td>كابل أحادي (مربوط أرضي)</td>
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<td>Single grounded receptacle</td>
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<td>Switched grounded receptacle</td>
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<td>Duplex receptacle</td>
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<td>Cross-section</td>
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<tr>
<td>mm²</td>
<td>mm²</td>
<td>A [mm²]</td>
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<tr>
<td>Power output</td>
<td>Puissance</td>
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<tr>
<td>kW</td>
<td>kW</td>
<td>P [kW]</td>
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<td>Current rating</td>
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<td>Spannung</td>
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<td>Fréquence</td>
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<tr>
<td>Hz</td>
<td>Hz</td>
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<td>Tableau d’abonné</td>
<td>Verteiler Schrank</td>
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<tr>
<td>Cabinet or enclosure</td>
<td>Armoire</td>
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<tr>
<td>Fuse</td>
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<td>Sicherung</td>
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<td>Circuit breaker</td>
<td>Disjoncteur</td>
<td>Schutzschalter</td>
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<td>Residual current device</td>
<td>Interrupteur différentiel</td>
<td>FI-Schutzschalter</td>
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<td>Isolator switch</td>
<td>Interrupteur sectionneur</td>
<td>Trennschalter Trenner</td>
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<tr>
<td>Phase conductor</td>
<td>Conducteur de phase (PH)</td>
<td>Aussenleiter Phase</td>
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<tr>
<td>Neutral conductor</td>
<td>Conducteur de neutre (N)</td>
<td>Neutralleiter Phase</td>
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<tr>
<td>Protective conductor (earth)</td>
<td>Conducteur de protection (T)</td>
<td>Schutzleiter PE</td>
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<tr>
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<td></td>
<td></td>
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<tr>
<td>Single phase + N + E cable</td>
<td>Câble PH + N + T</td>
<td>Leitung 1/N/PE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 phase + N + E cable</td>
<td>Câble 3 PH + N + T</td>
<td>Leitung 3/N/PE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One way switch</td>
<td>Interrupteur</td>
<td>Schalter Ausschalter</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two way switch, single pole</td>
<td>Va-et-vient</td>
<td>Wechselschalter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Push button</td>
<td>Bouton poussoir</td>
<td>Taster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socket outlet</td>
<td>Prise de courant (PC)</td>
<td>Steckdose</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
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