Operational continuity
ABB H+Line safety and reliability, switchboards and devices for medical locations

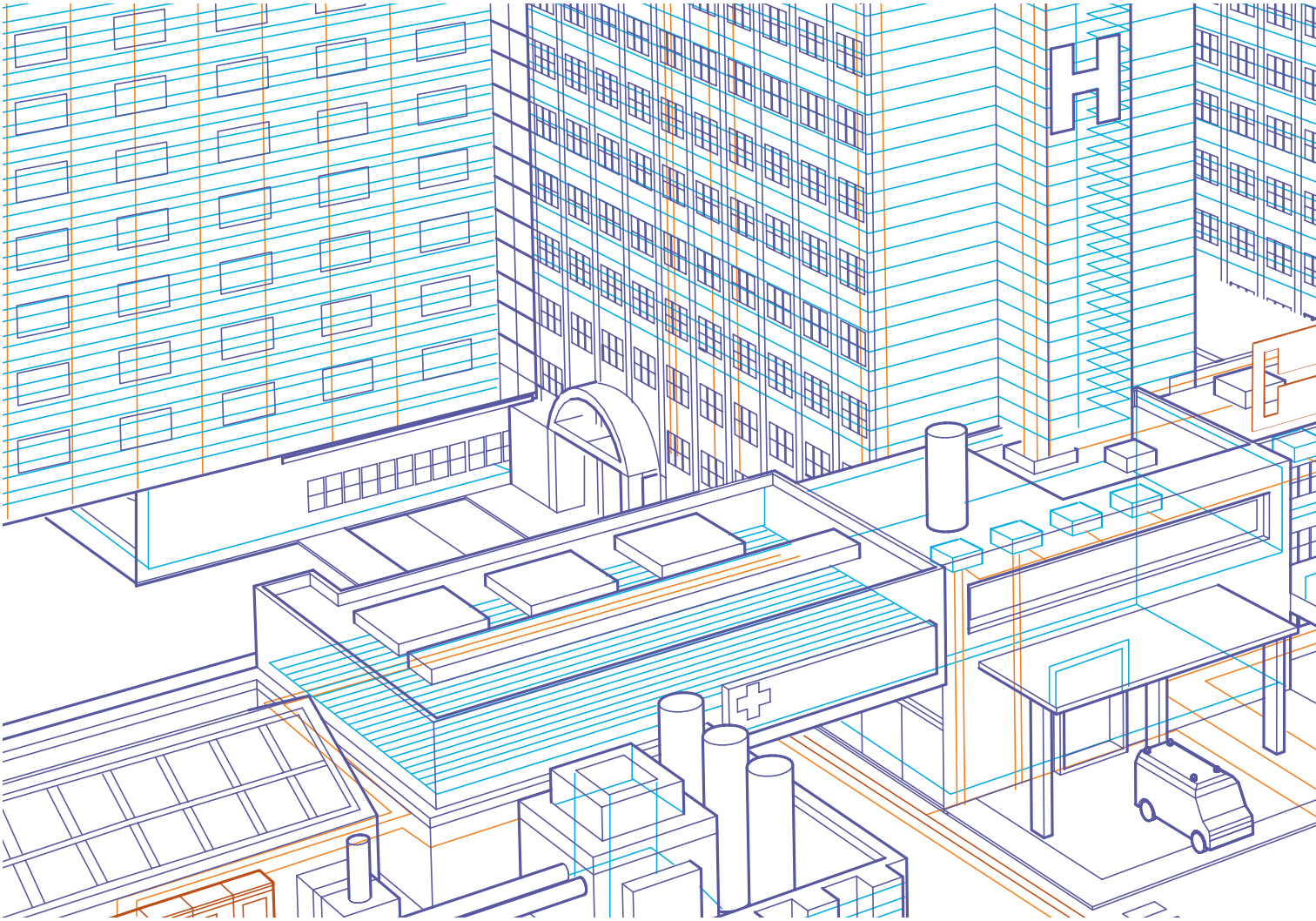
Power and productivity
for a better world™

ABB technology and safety in hospital segment

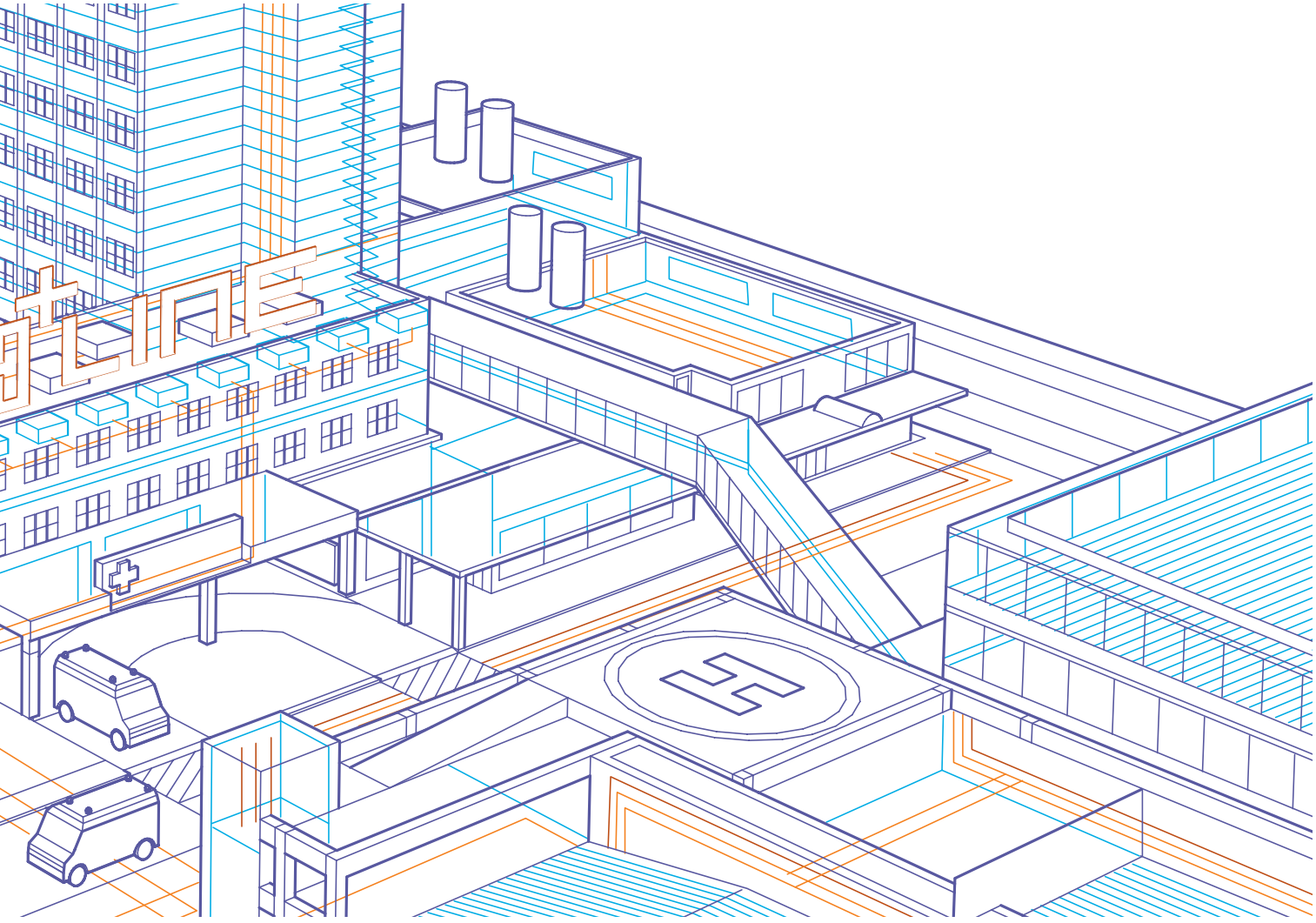
Over ten years' experience, state-of-the-art solutions offered to the most important Italian hospitals, a complete and performing range of products: this is H+Line, an ABB products range specific for group 2 medical locations, where operational continuity and reliability are key requirements for patients' and medical staff's safety and protection

Helpful for designers

What Standards say is explained by everybody. ABB tells what Standards don't say. The "Practical guide for group 2 medical locations" can be a useful daily tool to be consulted for supporting designers and installers in each step of the design and installation process of group 2 medical locations electrical plants.



The document has been developed in a tight collaboration with ABB customers. The aim is to add practical solutions, ideas and plant design suggestions coming from the field to fundamental standards.
Thus the “Practical guide to group 2 medical locations” turns into a real help, full of examples, and a useful tool even for the ones designing hospital plants for the first time ever. In the practical guide, ABB customers will find at their complete disposal all the expertise of a leading company which has always been promoting and sustaining safety.



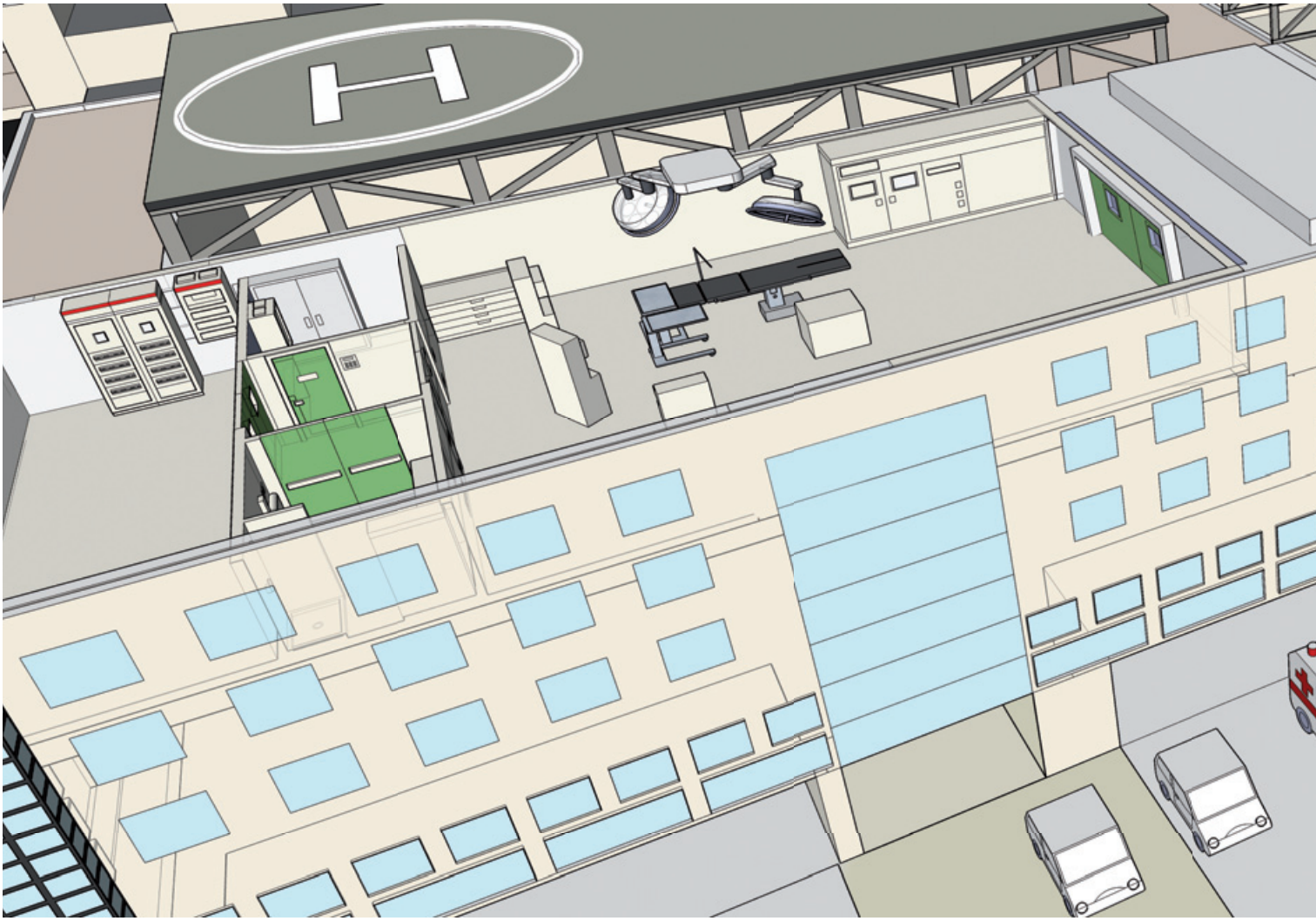
H+LINE

Range overview

A wide range of reliable products assuring patients' and medical staff's safety in intensive care units, operating theatres, first aid and day hospital premises, ambulatories, nursing homes, dentist's and vet's

ISOLTESTER-DIG, insulation monitoring device for 230 V AC IT-M circuits

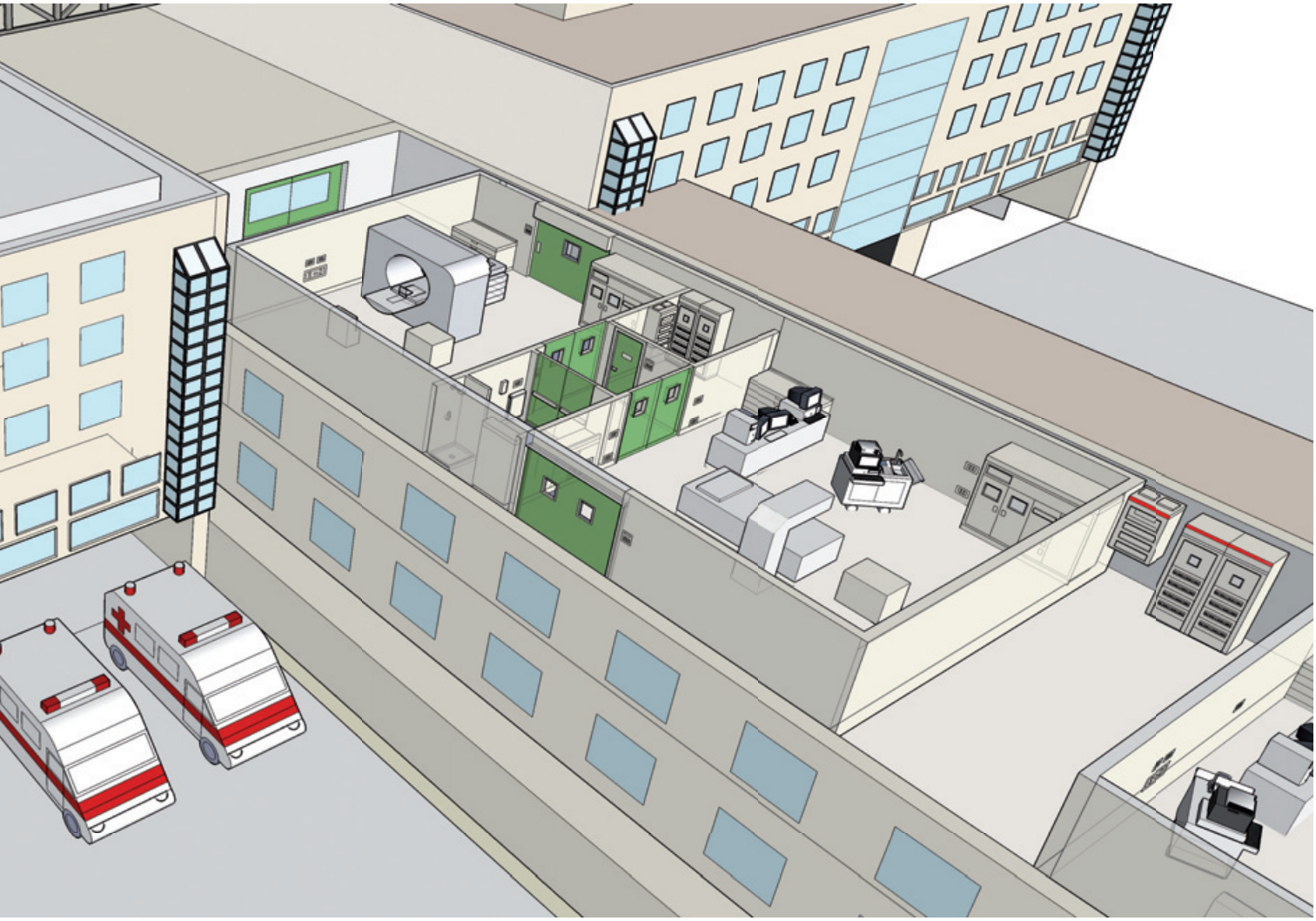
SELVTESTER-24, insulation monitoring device for 24 V AC/DC SELV circuits supplying scialitic lamps



QSD-DIG 230/24, remote signalling panel with luminous and acoustic fault indicators

TI, medical insulating transformers supplying IT-M networks

QSO, wall-mounted and floor standing operating theatres switchboards to supply and protect medical locations



QSO Switchboards - S series
Details which make a difference

In order to satisfy the needs of group 2 medical locations, ABB supplies preassembled wall-mounted and floor standing QSO electrical switchboards, complete with TI-S insulating transformer and ISOLTESTER-DIG-RZ insulation monitoring device to detect and signal promptly the first fault to earth.

Transparent cover panel

A split opening in the cover panel enables to operate on the modular devices without opening the compartment beneath where the transformer and the terminal block are placed.

S700 E miniature circuit-breakers

The S700 main circuit-breaker placed in the upstream IT section of the insulation transformer ensures **total selectivity up to 10 kA** with all downstream circuit-breakers.
They can be equipped with a signalling contact in order to remotely control the status of the lever.

Reduced depth

The narrow depth of the enclosure makes the installation easier even inside cupboards, compartments or recesses, thanks to the ArTu M series single-piece structure.

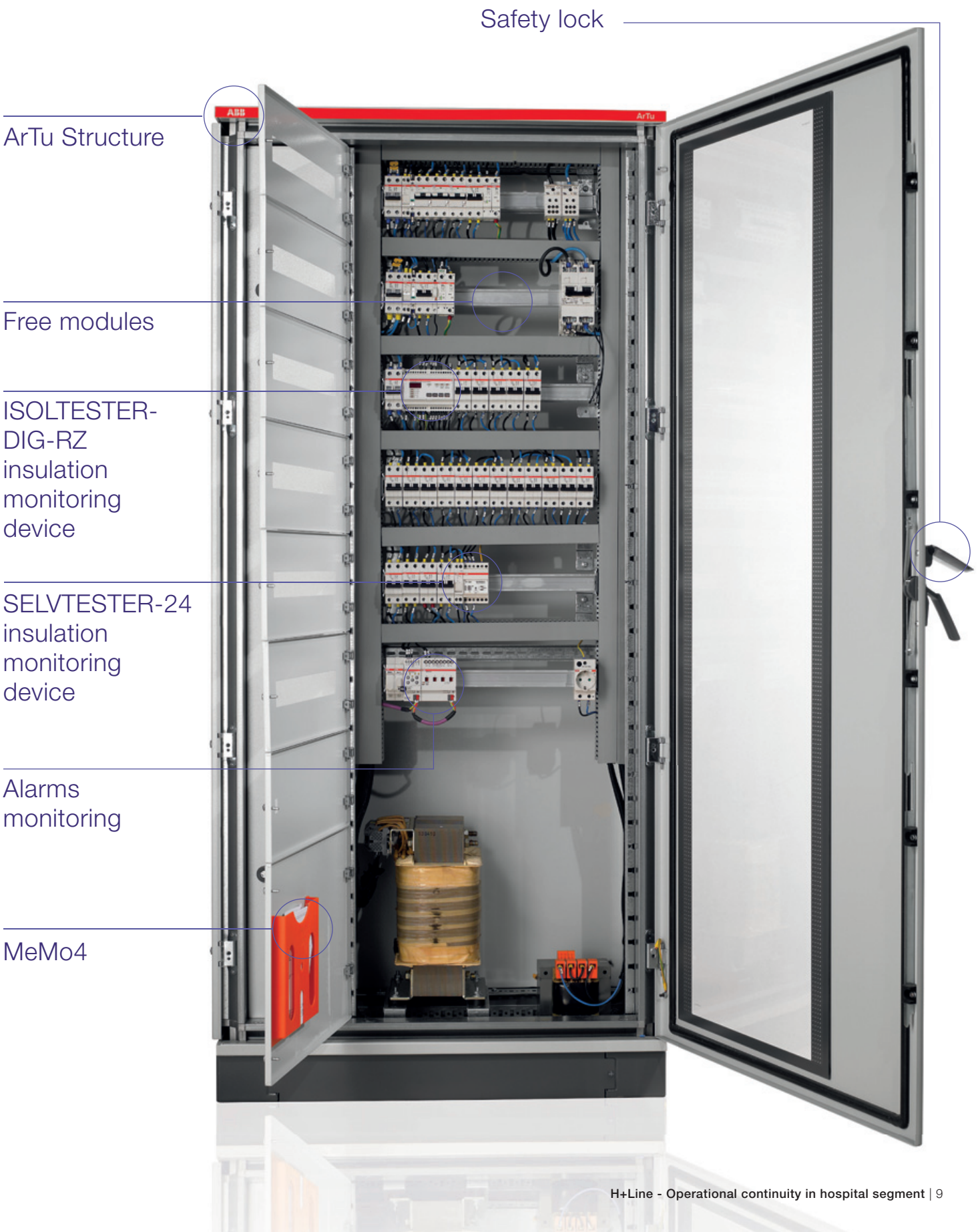
MeMo4

Installation and assembly instructions, electrical layouts and all the business documentation related with the H+Line offer are supplied together with the switchboard. Thanks to its **USB MeMo4 modular memory**, it is possible to file further documents such as testing certificates, declarations of conformity and results of the periodic tests, thus **preventing them from being damaged or lost in time**.

Terminal block

All terminal blocks have been studied in such a way as to guarantee correct connections between all switchboard equipment, **ensuring mechanical separation between the circuits**.

QSO Switchboards - M, L and XL series
Details which make a difference


Safety lock
ArTu Structure
Free modules
ISOLTESTER-DIG-RZ insulation monitoring device
SELVTESTER-24 insulation monitoring device
Alarms monitoring
MeMo4

QSO Switchboards - M, L and XL series
Details which make a difference

S200 miniature circuit-breakers
These protect the downstream circuits of the IT-M section against overloads and short-circuits, assuring reliability and safety during the operations.

OVR surge protection device
It has been designed in order to safeguard the electrical systems and equipment from any transient and impulsive over-voltages.
OVR surge protective devices, installed in both the emergency and safety sections, **are coordinated with suitable back up protection** in order to avoid circuit overloads during the devices useful life. All surge protective devices are equipped with **removable cartridges** and **signalling contacts** in order to optimize maintenance operations, and operational continuity.

S700 E miniature circuit-breakers
The S700 main circuit-breaker placed in the upstream IT section of the insulation transformer **ensures total selectivity up to 10 kA** with all downstream circuit-breakers. Furthermore it protects the insulating transformers from overloads.
They can be equipped with a signalling contact in order to remotely control the status of the lever (see page 51 for the S700 selectivity table).

M1175-FL schuko socket outlet
QSO switchboards are equipped with a socket outlet which is useful to supply measurement devices and tools used during maintenance. This socket is **protected by an integrated fuse and is equipped with an indicator lamp** that allows detecting whenever the auxiliary circuit has been supplied, even in the darkness.

Cable container
Artu K series floor standing switchboards are equipped with a cable container that makes installation and wiring easier, **both for the electrical systems distributed along the false cieling, as under the floor**.
It is possible to reach any terminal block in a comfortable way. Finally, there is a copper equipotential bonding busbar which may lodge up to 20 additional connections, providing grounding connections to all the external masses which are present in the medical premises, and avoiding the creation of further cascade sub-nodes that are not allowed.

TI-S insulating transformer
Specifically designed and assembled **for medical use** according to the IEC EN 61558-2-15, it ensures protection against indirect contacts without the need to interrupt the circuit automatically upon the first grounding fault.
Thanks to its two PT100 temperature probes, on primary and secondary winding, **it is possible to monitor the transformer over temperature** produced by any eventual overload, and therefore anticipating any breakdown.
The transformer is mounted on the base of the switchboard in order to ease handling and installation operations.

DS200 residual current breaker with overcurrent protection
They protect emergency section TN-S terminal circuits from any direct and indirect contacts. These lines feed the **lighting system**, the **radiological** and the **general purpose socket outlets**, mounted outside the patients' environment.

Lifting eyebolts
They allow immediate and safe wall fastening.




MeMo4
Installation and assembly instructions, electrical layouts and all the business documentation related with the H+Line offer are supplied together with the switchboard. Thanks to its **USB MeMo4 modular memory**, it is possible to file further documents such as testing certificates, declarations of conformity and results of the periodic tests, thus **preventing them from being damaged or lost in time**.

ISOLTESTER-DIG-RZ insulation monitoring device
This is an insulation monitoring device for group 2 medical locations **fully compliant with the IEC 60364-7-710** reference standard. It integrates all the performances established by the reference standard, such as overload and overcurrent monitoring, together with traditional IT system earthing insulation measurement.

Safety lock
This is a door with a key lock system in order to avoid undesired interventions by non authorized personnel.

SELVTESTER-24 insulation monitoring device
QSO “Premium” are equipped with 24 V SELV line **supplying the scialitic lamp**.
SELVTESTER-24 monitors extremely low voltage circuits. IEC 60364-7-710 reference standard does not impose monitoring of such circuits, but, it is possible that during regular handling of the lamp some conductors, detaching themselves from the terminals, may enter into contact with the metal housing. Therefore SELVTESTER-24 detects the damage as soon as it happens, and consequently improve operational continuity.

Alarms monitoring
High end configurations are equipped with I/O modules for alarms management. In particular it is possible to control the status of the main circuit-breaker and signalling contacts of the OVR and ISOLTESTER, by means of the KNX bus.

ArTu Structure
Floor standing QSO switchboards are composed of modular ArTu K series enclosures. The switchboards are equipped with venting grooves that guarantee proper natural convection, useful to dissipate the heat produced by the transformer during its normal functioning.

Free modules
Switchboard flexibility is ensured by the possibility of inserting further equipment that may be necessary to **complete the system or for possible future expansions**.

E210 indicator lamp
Thanks to the green LED indicator lamp it is possible to see in a blink whether the switchboard is supplyed or not.



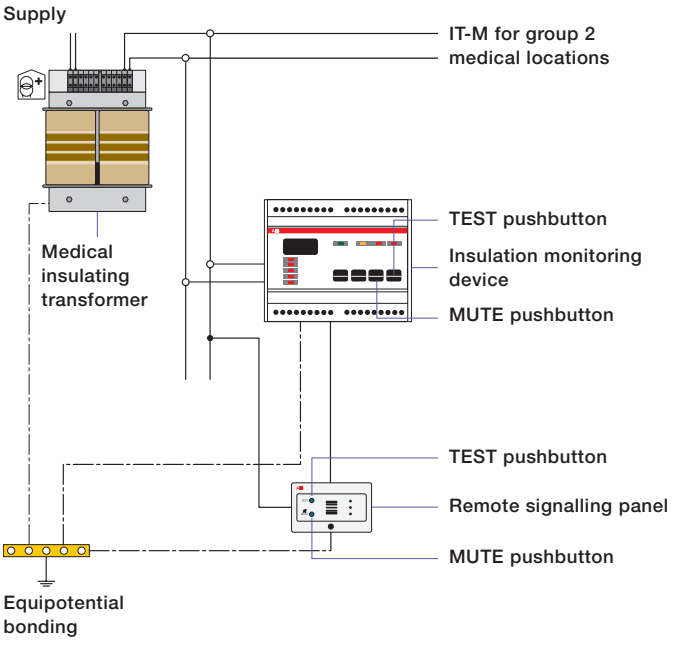

QSO Switchboards and devices for medical locations

Protection by electrical separation as laid down by IEC EN 60364 reference standard (user electrical plants with a rated voltage of no more than 1000 V in alternating current and 1500 V in direct current) prevents the generation of hazardous currents due to contacts with earths under voltage because of a fault in the main insulation of the circuit.

By using insulating transformers, the protection against indirect contacts can be guaranteed without having to automatically break the circuit at the first fault to earth. Insulating transformers are therefore suitable for use in plants where the sudden and automatic breaking of the service may have serious implications: examples of these applications are plants for medical and surgery rooms (in accordance with IEC EN reference standard 60364, Part 7, Section 710) where specific electromedical devices perform patients' monitoring and attending functions. To meet the special needs of these fields of application, ABB supplies preassembled wall-mounted and floor-standing QSO switchboards, complete with an insulation transformer and an ISOLTESTER-DG device for detecting and signalling the first fault to earth.

QSO switchboards represent the ideal solution for all medical locations classified by the IEC EN reference standard 60364-7-710, as group 2 medical locations (anaesthesia, surgery, preoperative preparation, surgical plaster applications, postoperative wakening, heart catheterizations, intensive care, angiography and blood flow tests, premature births) where the use of an IT-M (Medical IT) system is mandatory. In addition, they are suitable for installation in any further medical locations and any other room where the automatic breaking of the service at the first fault to earth is dangerous or inconvenient: industrial laboratories, craft workshops (jewellery' and the like), test laboratories, school laboratories, research institutes and any other room with similar problems.

IT-M system

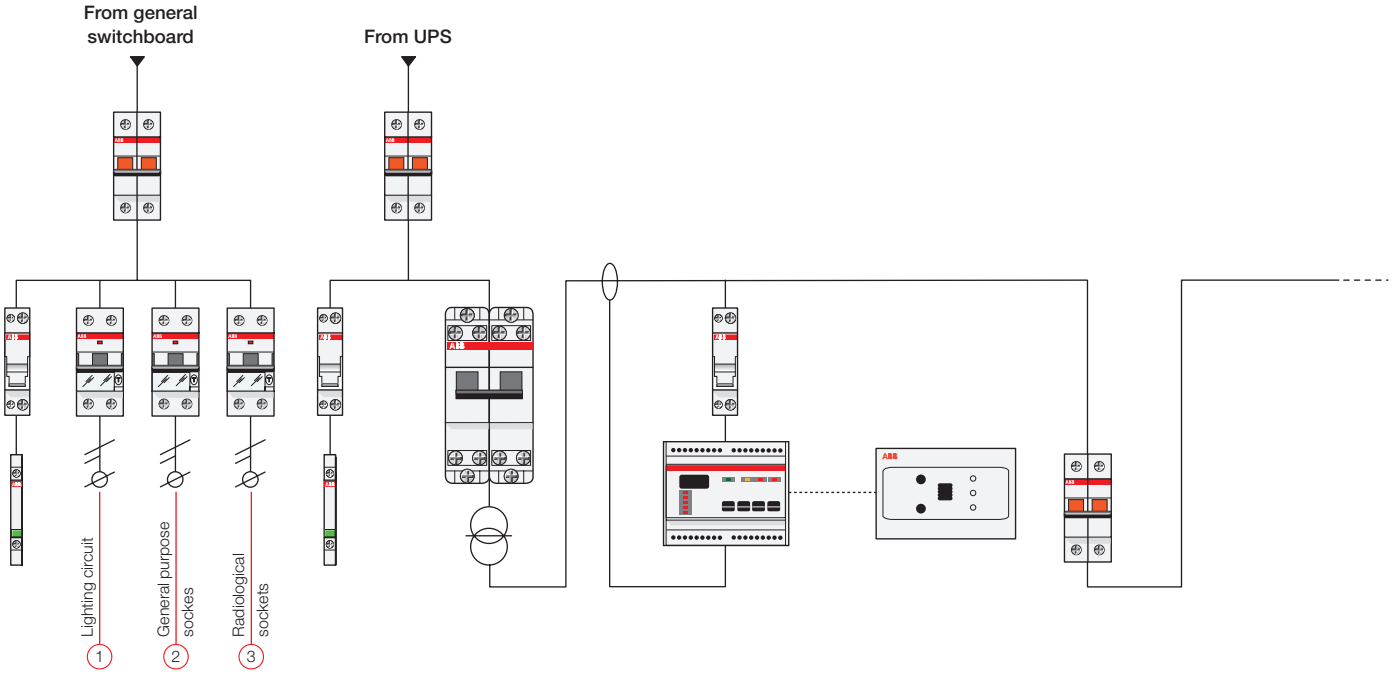


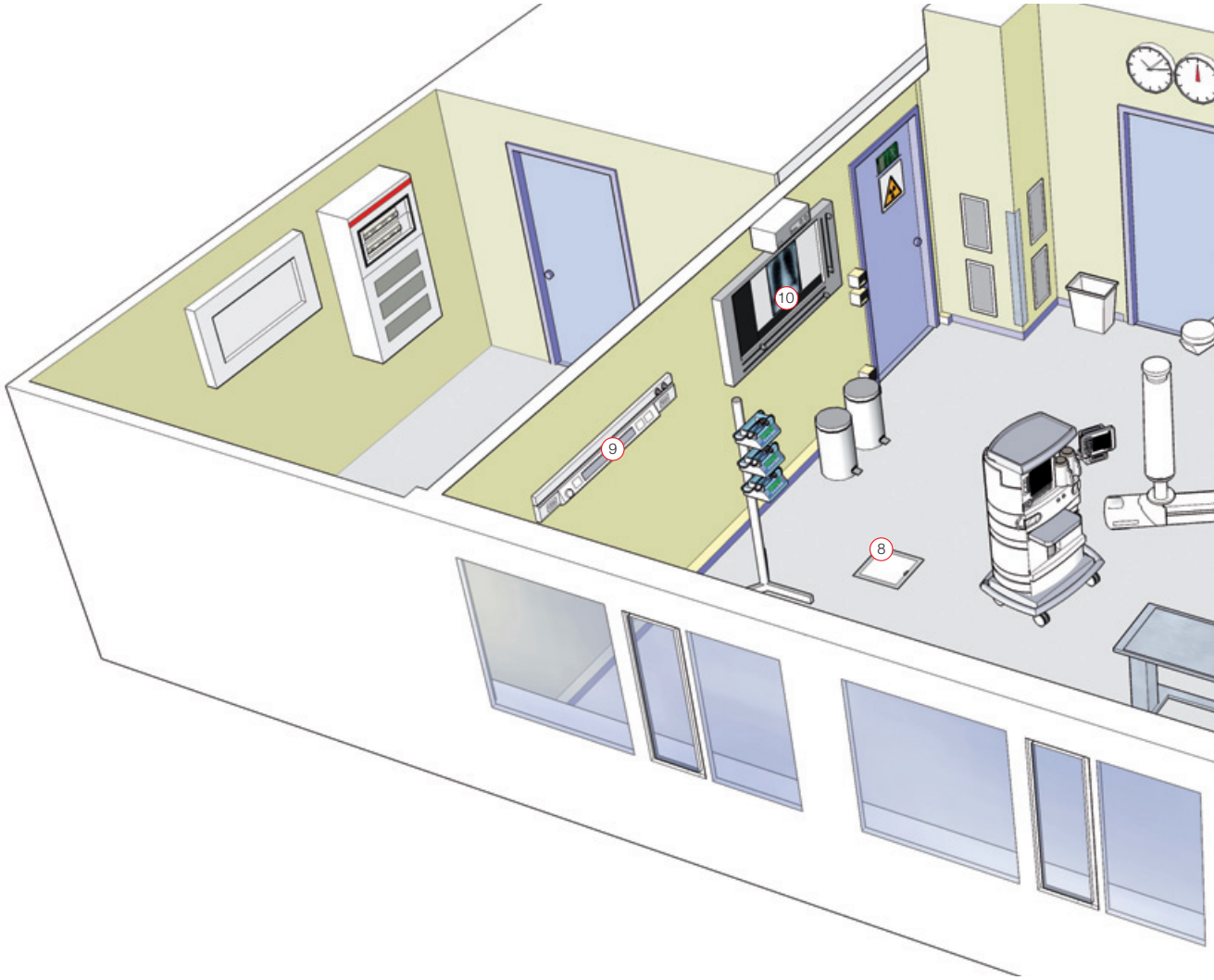
Protection, control and operational continuity

The new QSO operating theatre switchboards are the ideal solution to supply operating theatres and group 2 medical locations according to the IEC 60364-7-710 reference standard. All the switchboards are wired by ABB, and are equipped with the declaration of conformity which is necessary for the system initial start up, guaranteeing the installer full conformity for plant performance.

Compactness, total protection selectivity and maximum ergonomics and simplicity during maintenance operations make QSO range the most suitable product to guarantee service continuity at medical locations.

QSO S


From general switchboard
From UPS
Lighting circuit
1
General purpose sockes
2
Radiological sockets
3


8
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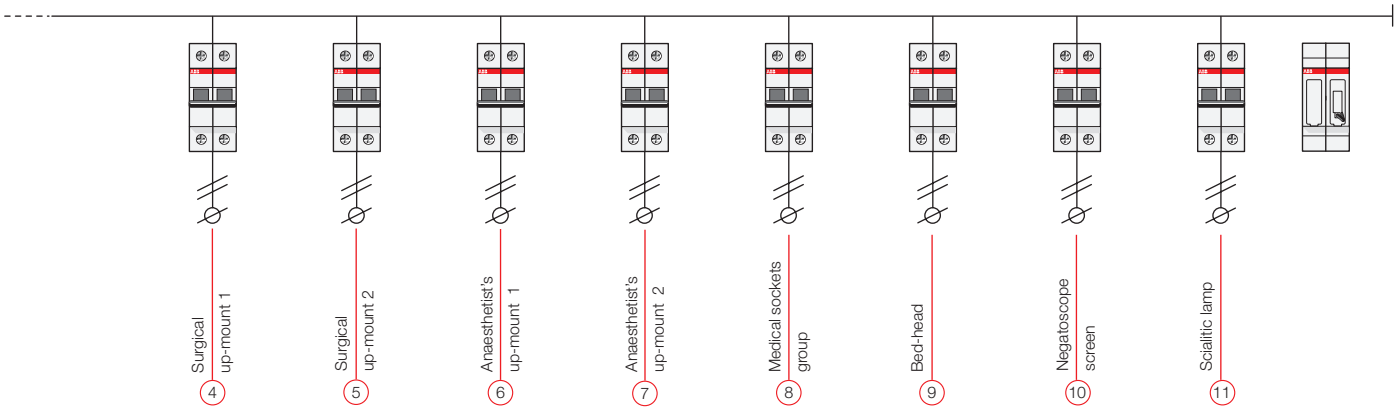
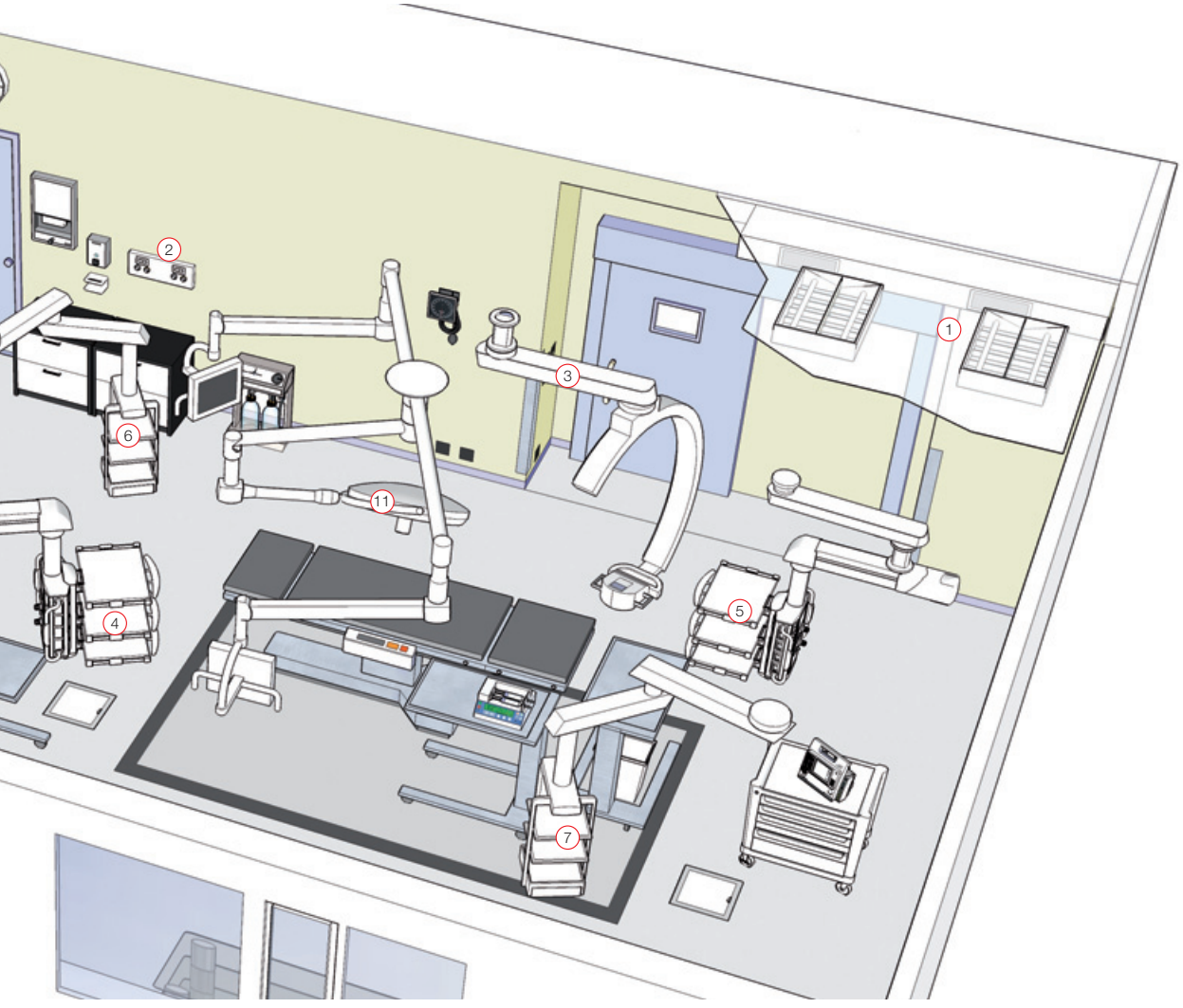
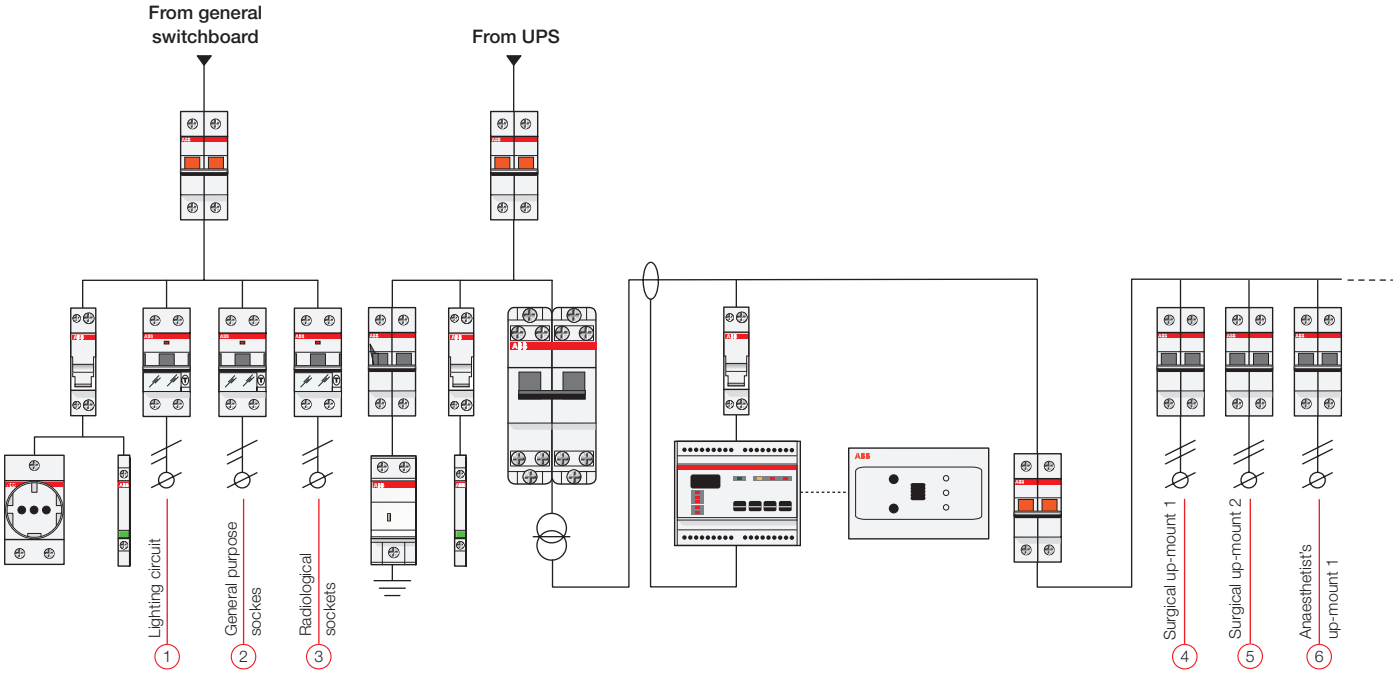
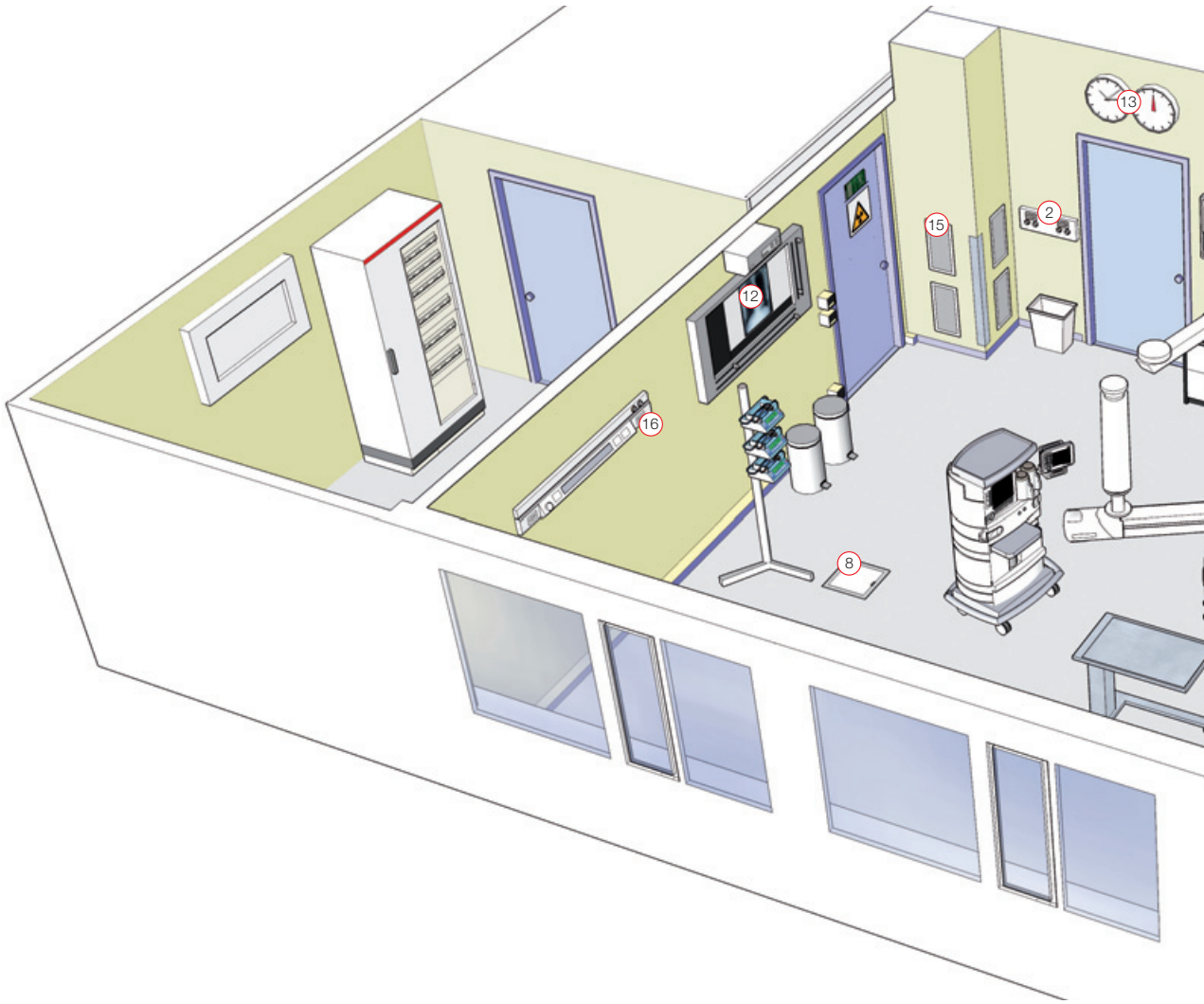
Wall-mounted switchboards of 3 kVA and 5 kVA for applications such as surgery ambulatories, recovery rooms, test laboratories, dentist's and vet's.



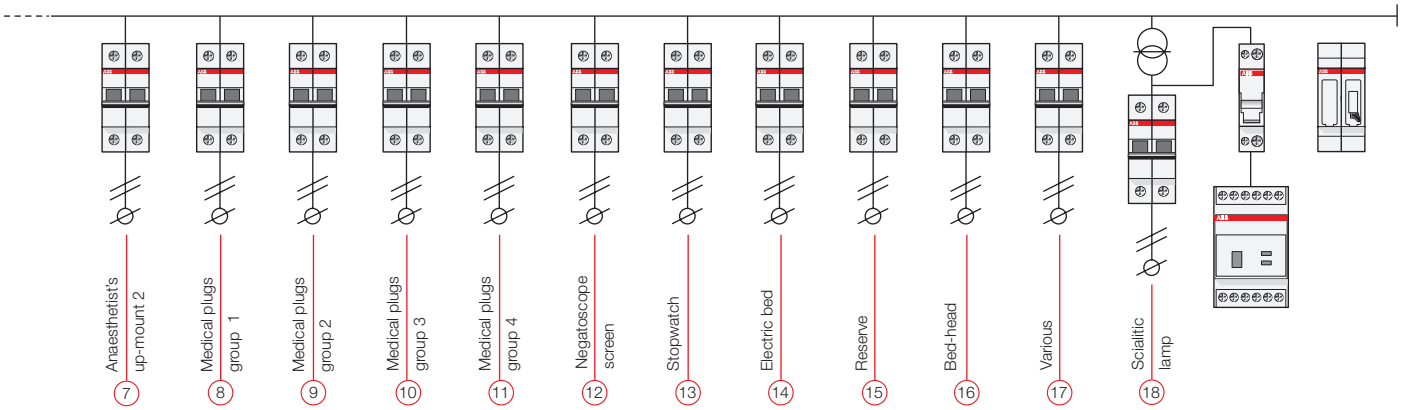


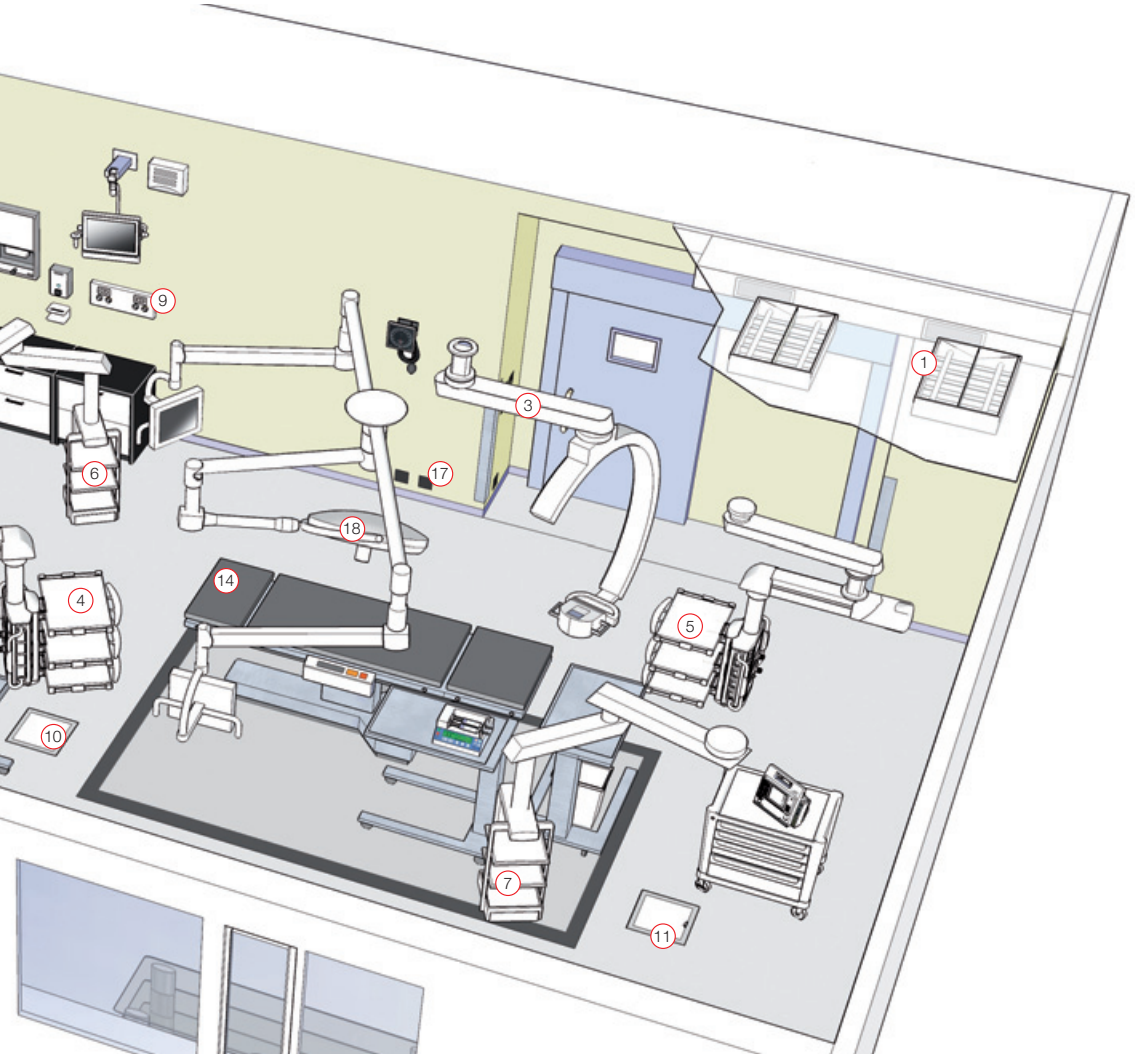
QSO M


From general switchboard
From UPS
Lighting circuit
1
General purpose sockes
2
Radiological sockets
3
Surgical up-mount 1
4
Surgical up-mount 2
5
Anaesthetist's up-mount 1
6

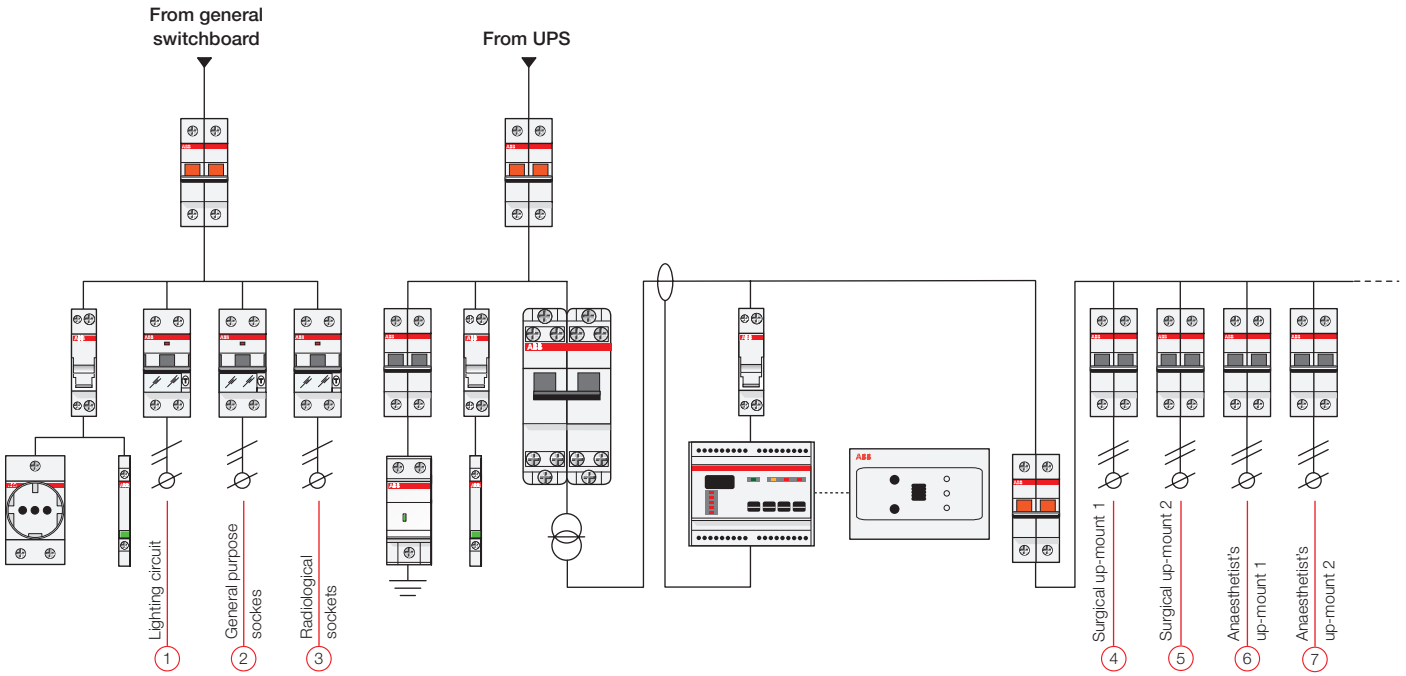

13
2
15
12
16
8

Floor standing switchboards of 3 kVA, 5 kVA and 7,5 kVA, for day hospital premises, medium-size operating theatres, intensive care units.





QSO L


From general switchboard
From UPS
Lighting circuit
General purpose sockes
Radiological sockets
Surgical up-mount 1
Surgical up-mount 2
Anaesthetist's up-mount 1
Anaesthetist's up-mount 2
1
2
3
4
5
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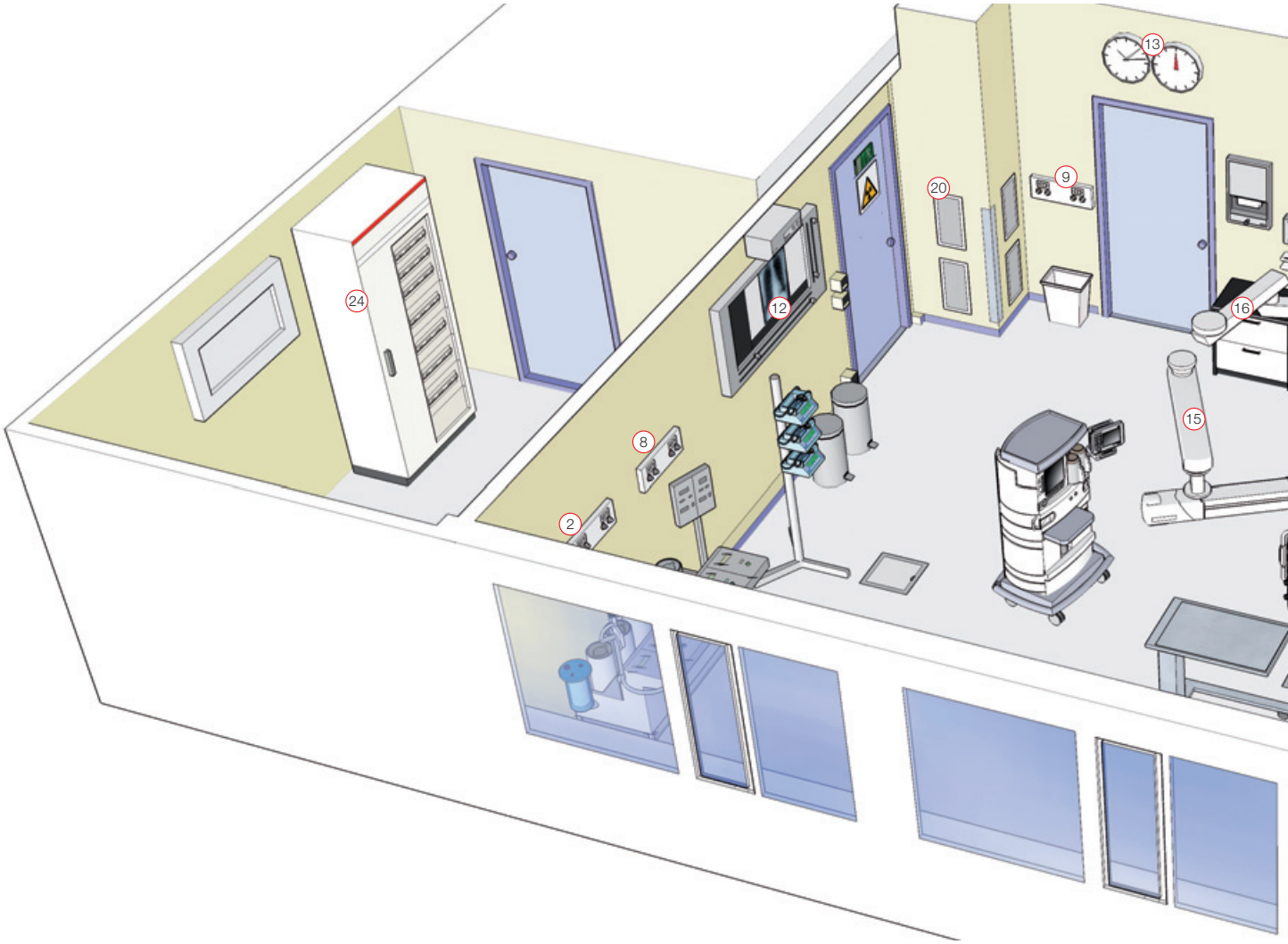
24
12
20
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16
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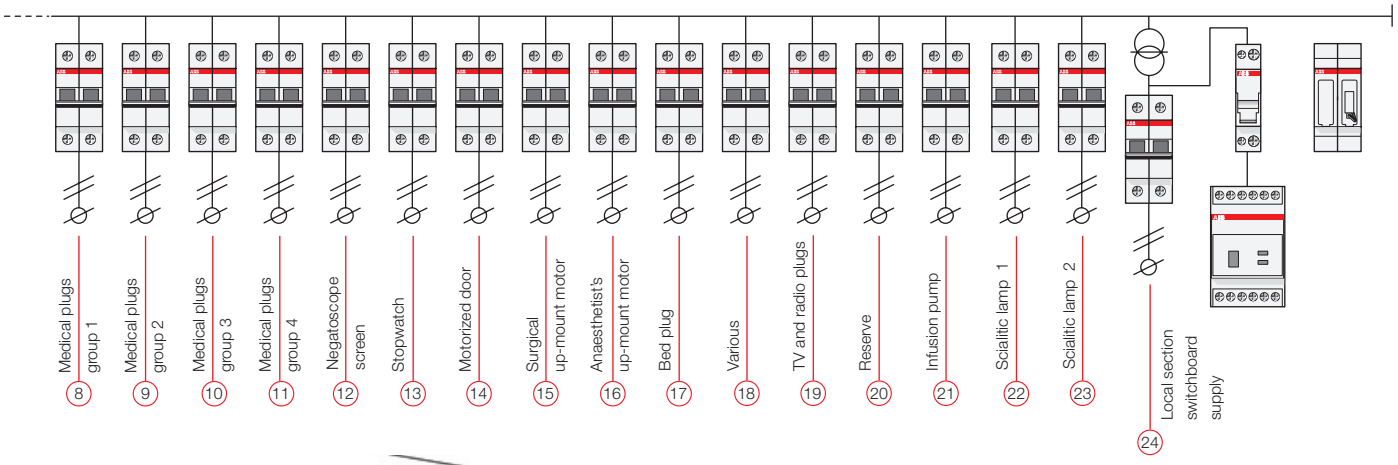
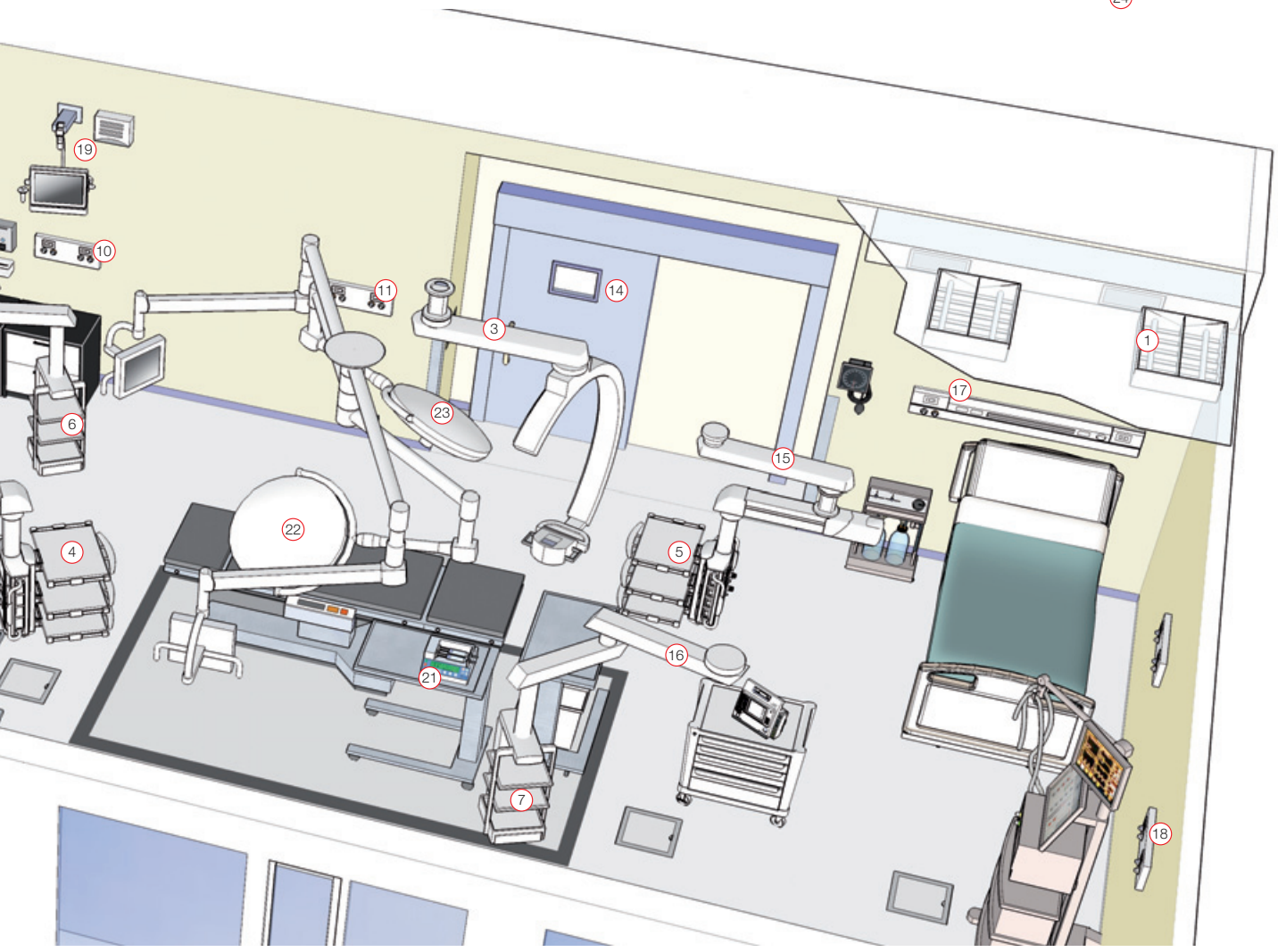
Floor standing switchboards of 7,5 kVA and 10 kVA for operating theatres, intensive care units, cardiac surgeries, long-term hospitalizations.





- Easier to install: time saving up to 25 hours
- Safety: certified insulation transformer; no homologation required
- Flexibility: available in different versions, customizable to meet any need
- Reliability: the quality of ABB technology in every component
- Compact size: limited overall dimensions
- Completeness: 24 V line control, PT100 probes embedded
- Effectiveness: complete electrical network monitoring

Quality for Information Technology and Data Centers

QIT, the new ABB electrical switchboard which is ideal to supply and protect data centres, server farms and data warehouses, is the product of a ten year old experience accrued in critical applications such as medical locations. In these applications, maximum service continuity is required, which may only be guaranteed by means of an insulated neutral IT plant that allows normal functioning even in the presence of a first earth fault.
In addition, QIT includes all ABB most recent devices which guarantee maximum speed and efficiency during fault analysis and any eventual maintenance of its parts. QIT switchboards are RAL 7012 coloured, in total accordance with the array of ABB industrial products.

16 kVA insulating transformer
This is a more neutral three-phase 16 kVA insulating transformer, designed and assembled according to the IEC EN 61558-2-2 and IEC EN 61558-2-4 reference standards. It ensures protection against indirect contacts without the need to interrupt the circuit automatically upon the first ground fault.
Thanks to its two PT100 temperature probes, on the three windings, it is possible to monitor the transformer over temperature produced by any eventual overloads, and therefore anticipating breakdowns.
The transformer is mounted on the base of the switchboard in order to ease handling and installation operations.

Technical specifications:
Power = 16 KVA
Primary = 400V S+N
Frequency = 50/60 Hz
Secondary = 400V S+N
Room temperature = 40°C
Insulation class = F / 155°C
Winding class = H / 200°C
Temperature probes = 3 PT100 with 3 wires
Electrostatic shield with dedicated terminal block
ìReference standards = IEC EN 61558-2-4 and IEC EN 61558-2-2

QIT Switchboards
Details which make a difference

ANR96-230
Network analyzer

TMD-T4/96
temperature
measuring
control unit

ISL-C 600
insulation
monitoring
device

Unifix L fast
wiring system

Alarm
monitoring

ANR96-230 Network analyzer

ANR96-230 is a measuring device with advanced analyzing functions for single-phase and three-phase, low and medium voltage distribution networks. It allows **harmonic analysis up to the 31st order**, visualizing the contribution of each single harmonic both graphically and in numeric values, thanks to its LCD graphic display with **visualization of the current and voltage signals waveform**. ANR96-230 is equipped with RS485 and RS232 serial ports with Modbus-RTU protocol, two totally programmable digital outputs, digital inputs for signal entry, and active, reactive and total energy counts per each phase and for the three-phase system. Finally, it allows memorizing up to 128 kb of historical data within its internal memory.

ISL-C 600 insulation monitoring device

This is an insulation monitoring device for industrial use in complying with the IEC 61557-8 for up to 760 V alternating current IT systems. This device embeds a pre-alarm threshold ALARM and an intervention threshold TRIP: **each alarm may be managed indipendently by the output relay with positive safety**. ISL-C 600 allows to visualize insulation levels by means of an LEDs bar on the front.

Unifix L fast wiring system

Modular equipment is wired by means of the Unifix L fast wiring system which **ensures maximum equipment substitution speed**.

Alarm monitoring

QIT switchboards are equipped with **I/O modules to manage the alarm by means of the KNX protocol**. It is particularly possible to remotely control the status of the main circuit-breaker, the signalling contacts of the OVR surge protective devices as well as the low insulation and over temperature alarms.

TMD-T4/96 temperature measuring control unit

An excessive increase of the insulation transformer temperature indicates overloads or malfunctioning. Detection of critical values allows carrying out a **preventive system diagnosis**, anticipating any eventual damages and expensive inefficient services.
The TMD-T4 temperature measuring control unit allows measuring and controlling of **4 temperature values**, of which typically three are related with the windings and the other one is for the internal temperature of the switchboard, detected with PT100 probes from 0 to 220 °C. **Two alarm levels** may be programmed (alarm-release) for each measuring channel, which activate the output relay switch, usable for remote signalling or in order to disconnect the equipment under control. The presence of a RS485 serial port allows control unit checking and programming and the connection by means of the Modbus-RTU protocol with the acquisition systems (PC, PLC, SCADA, etc.)

S700 E miniature circuit-breakers

The S700 main circuit-breaker placed in the upstream IT section of the insulation transformer **ensures total selectivity up to 10 kA** with respect to all downstream circuit-breakers.
They are equipped with a signalling contact in order to remotely control the lever status.

Multiroom monitoring system

ISOLTESTER MRM BOX

Thanks to its CP415M touch screen and AC500-eCo series PLC PM554-T terminals it is possible to control the status of a group of operating theatres (from 2 to 99) from two different positions. The personnel may verify the status of each operating theatre and any alarm signalling in real time.

ISOLTESTER MRM BOX includes exclusive H+Line software in 5 languages, which allows for very simple system installation: no programming is necessary. It is sufficient to insert the total number of operating theatres to be monitored on the touch screen panel.

The 3.5’ display touch screen allows visualizing:

- General page: it is possible to immediately understand whether the system of each facility is functioning correctly or if, instead, it is suffering anomalies or damages
- Alarm page: summarizes in a single screen the real time, maximum and minimum measures (resistance, impedance, as well as any over temperature of the transformer primary and secondary windings and over current) and the alarms (Error - Link Fail; low insulation; surpassed programmed threshold alarm)
- Language page: it is possible to configure the device language from the 5 established ones with a simple touch: Italian, English, German, Spanish and Portuguese
- Configuration page: it is possible to configure the system to be monitored and to protect any entry to the panel by means of a login password

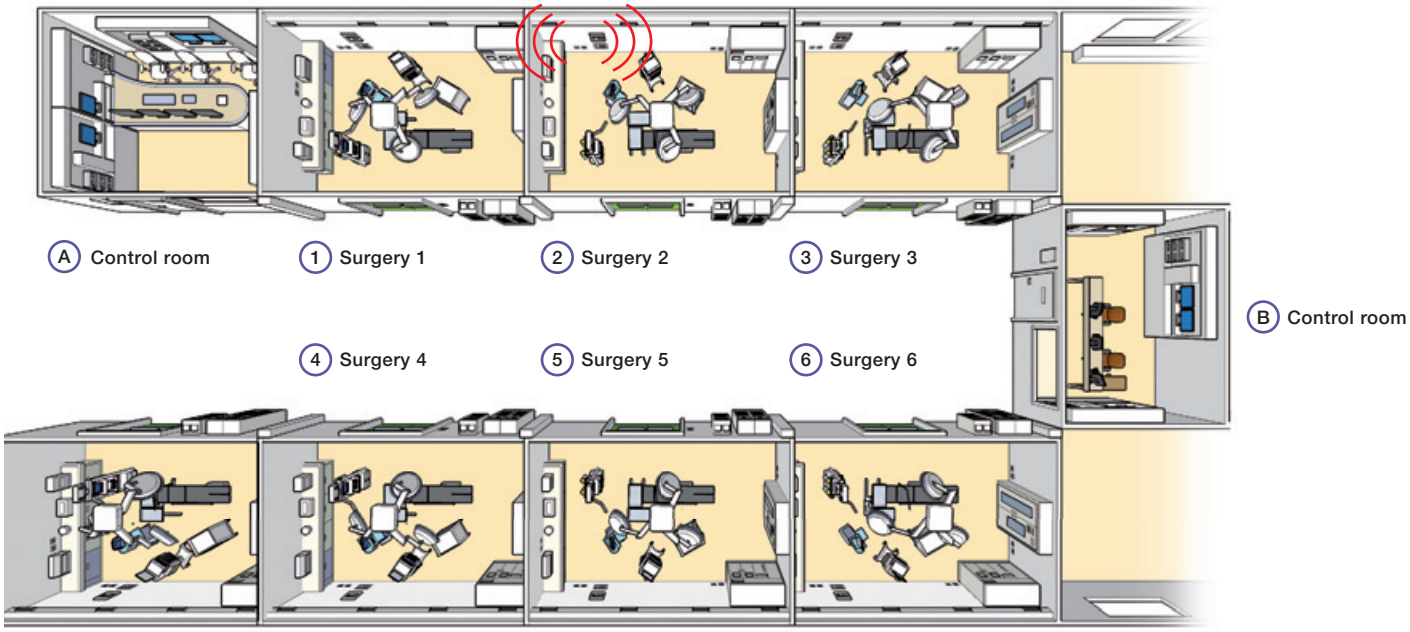
General page

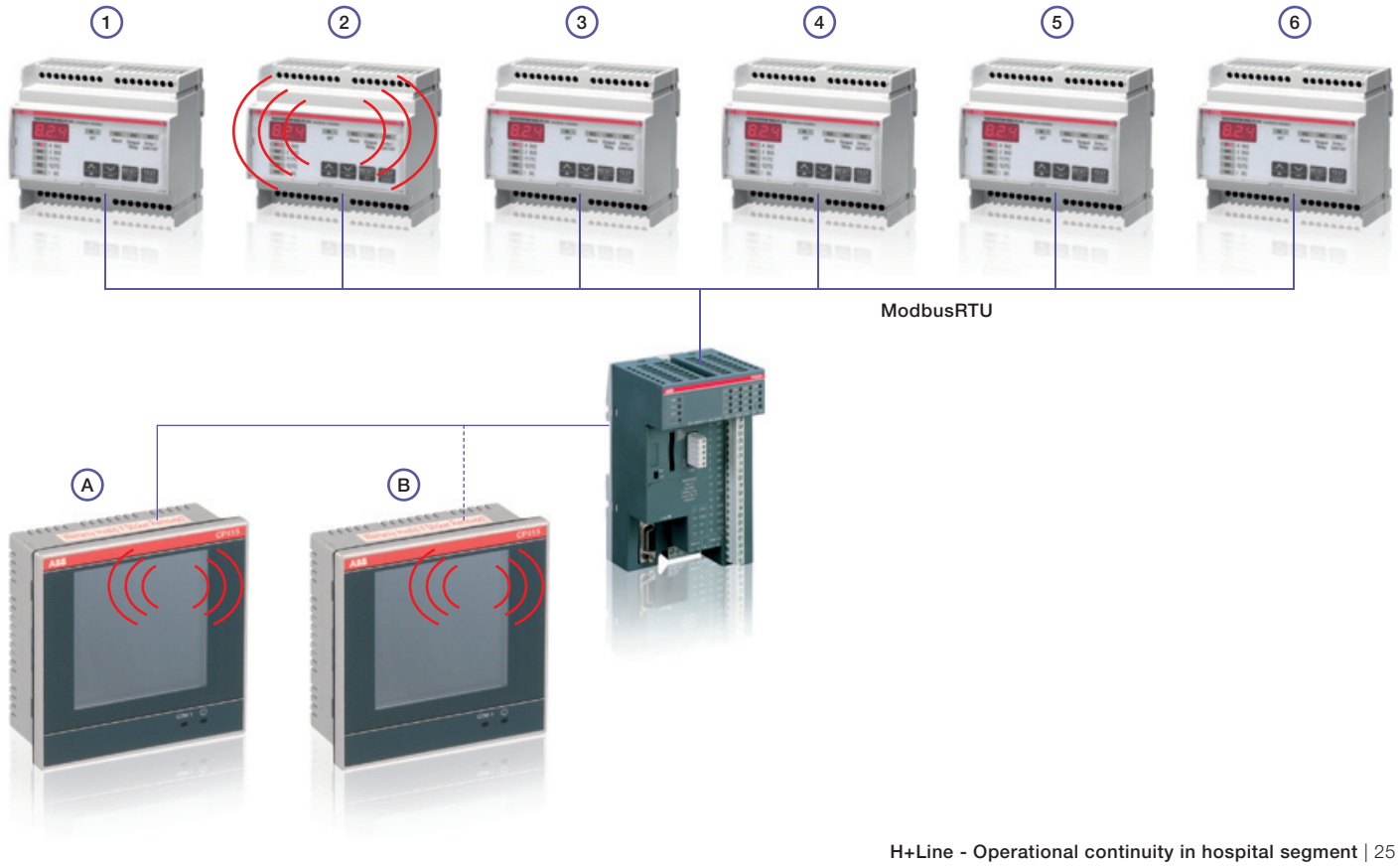
Alarm page

Language page

Configuration page

With ISOLTESTER-DIG-PLUS and ABB automation devices it is possible to keep under control electrical parameters of different medical locations from two different locations, through Modbus-RTU network and CP400 touch screen terminals.

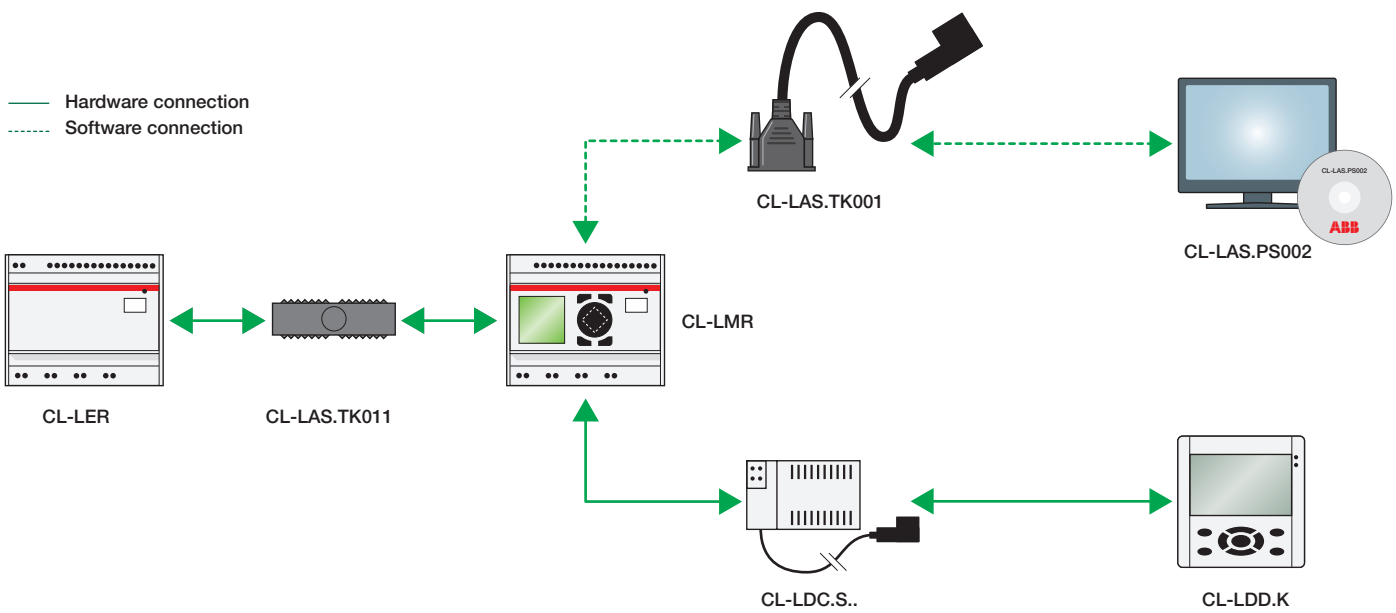




Fault monitoring system

Operational continuity it's a key issue in operating theatres. If a ground fault happens, the surgeon is able to bring to an end the medical treatments thanks to the continuity of supply granted by the IT-M system; but when the surgery is finished the fault has to be located and recovered as soon as possible. Operating theatres have nowadays more and more medical equipments that are supplied by different feeder lines. In case of fault thus, it's not trival to locate quickly which line out of the many is involved.

Thanks to ABB command devices it is possible to automate a fault detection system without any specific infrastructure. The fault detection routine test is managed by a logic relay with graphic display which allows total customization according to the specific needs of each environment.

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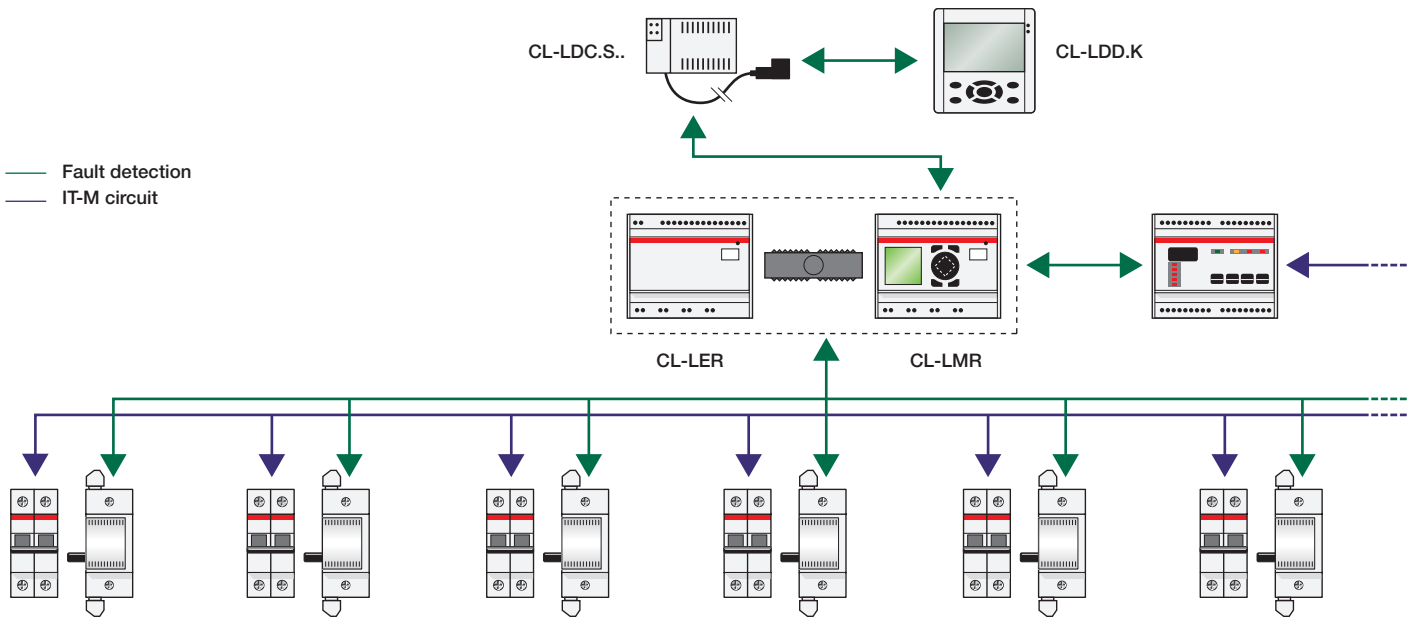
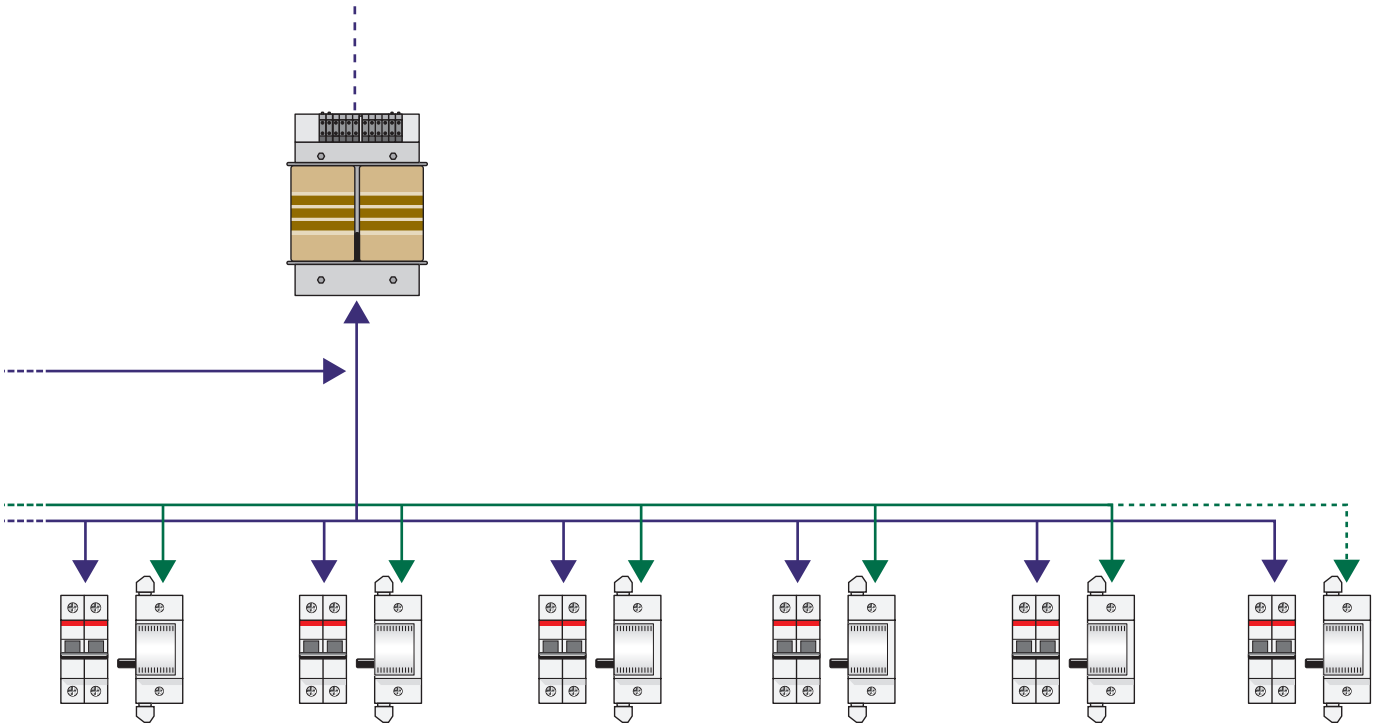
Fault monitoring system

Routine test procedure

1. A leakage to earth is detected by insulation monitoring device ISOLTESTER-DIG.
2. The fault detection is activated by the means of a pushbutton of the logic relay keyboard. This helps preventing unintentional operations.
3. The logic relay makes all the feeder lines opening by the means of motor operator installed beside each S202 breaker.
4. The logic relay makes each motor operator reclose, ony by one. After each reclosing operation. ISOLTESTER-DIG measure the insulation level.
5. As soon as the faulted line is reclosed, ISOLTESTER-DIG detects the leakage to earth.
6. The information of the faulted line is brought to logic relay by the means of the output relay embedded in the insulation monitoring device.
7. Finally the graphic display indicates the faulted line to be maintained.

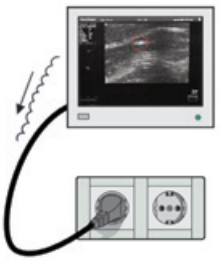


Description	Type	ABB code	Pack unit pieces
Motor operator	S2C-CM2/3	2CSS203997R0013	1
Logic relay, 12 in 6 out	CL-LMR-CX18AC2	1SVR440723R0200	1
Graphic display with keyboard	CLLLD.K	1SVR440843R0000	1
Expansion, 12 in 6 out	CL-LER.18AC2	1SVR440723R0000	1
Connecting plug CL-LINK for connection of logic relay to expansion	CL-LAS.TK011	1SVR440799R5100	1
Software CL-SOFT for Windows	CL-LAS.PS002	1SVR440799R8000	1
Connecting cable with USB interface to connect PC and logic relay	CL-LAS.TK002	1SVR440799r6100	1
Connection between Graphic display and logic relay	CLLDC.SAC2	1SVR440843R0000	1

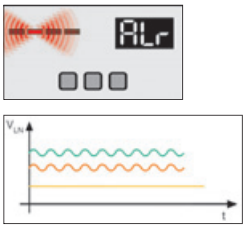


ISOLTESTER-DIG-PLUS
The solution to unwanted alarms

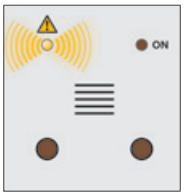
Wherever it is necessary to guarantee safety and operational continuity and prevent power supply interruptions, such as hospitals and other medical locations, insulation transformers and devices detecting and signalling any first fault to earth have to be used.



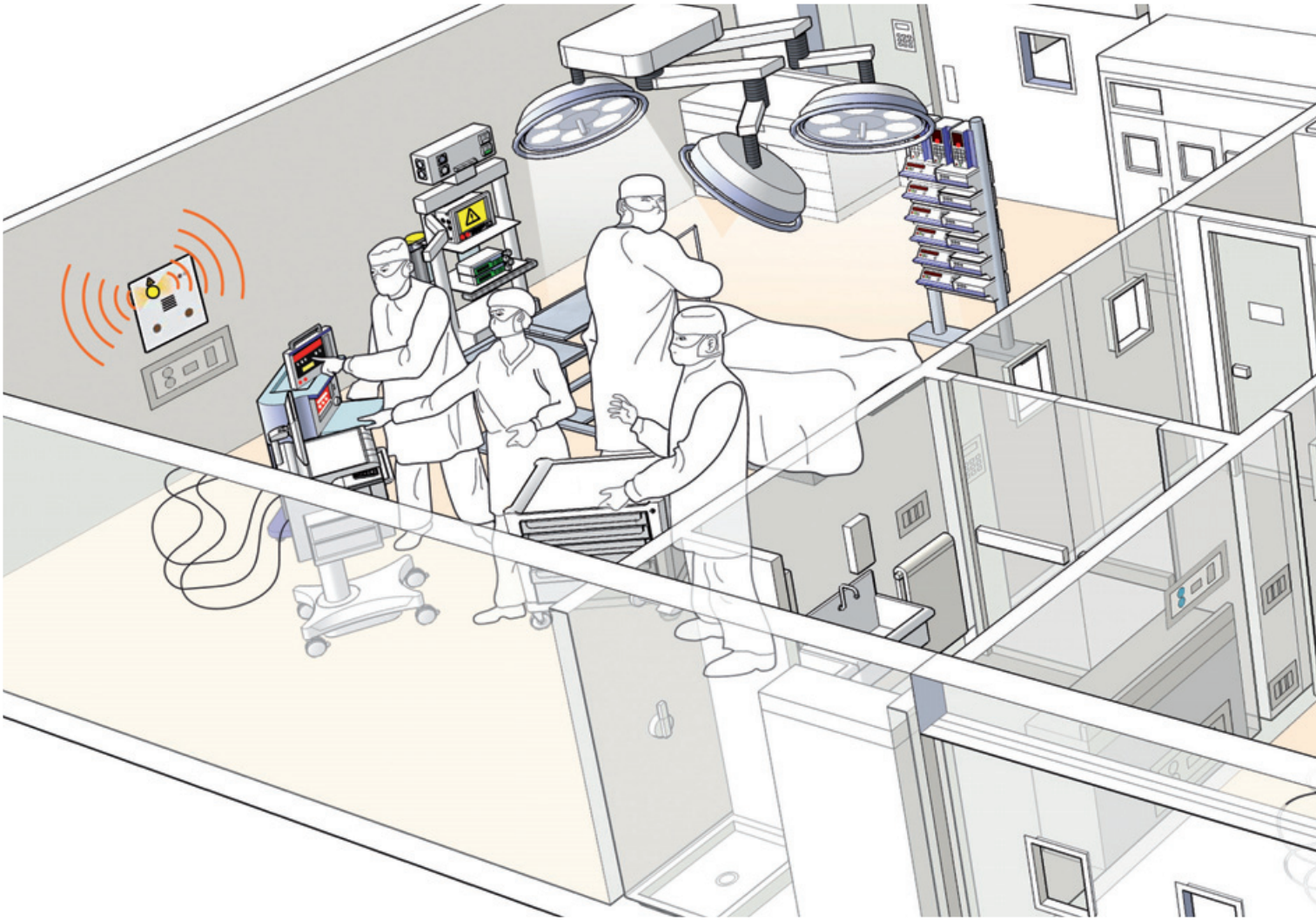
Operating theatres equipment can generate interference within the network



A traditional monitoring device can generate an unwanted alarm in operating theatres

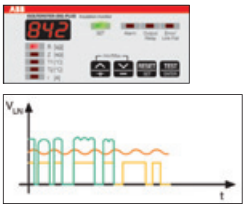


Risks arising from the use of a traditional insulation monitor:
- impossibility to distinguish between interference and real fault
- carelessness of the medical staff
- unjustified intervention of specialized technical staff

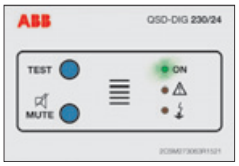


ISOLTESTER-DIG-PLUS is the device for insulation monitoring in IT-M networks. It ensures absolute reliability of measurement by means of a codified signal able to detect interferences generated by common equipment in operating theatres and avoid unwanted alarms signalling.

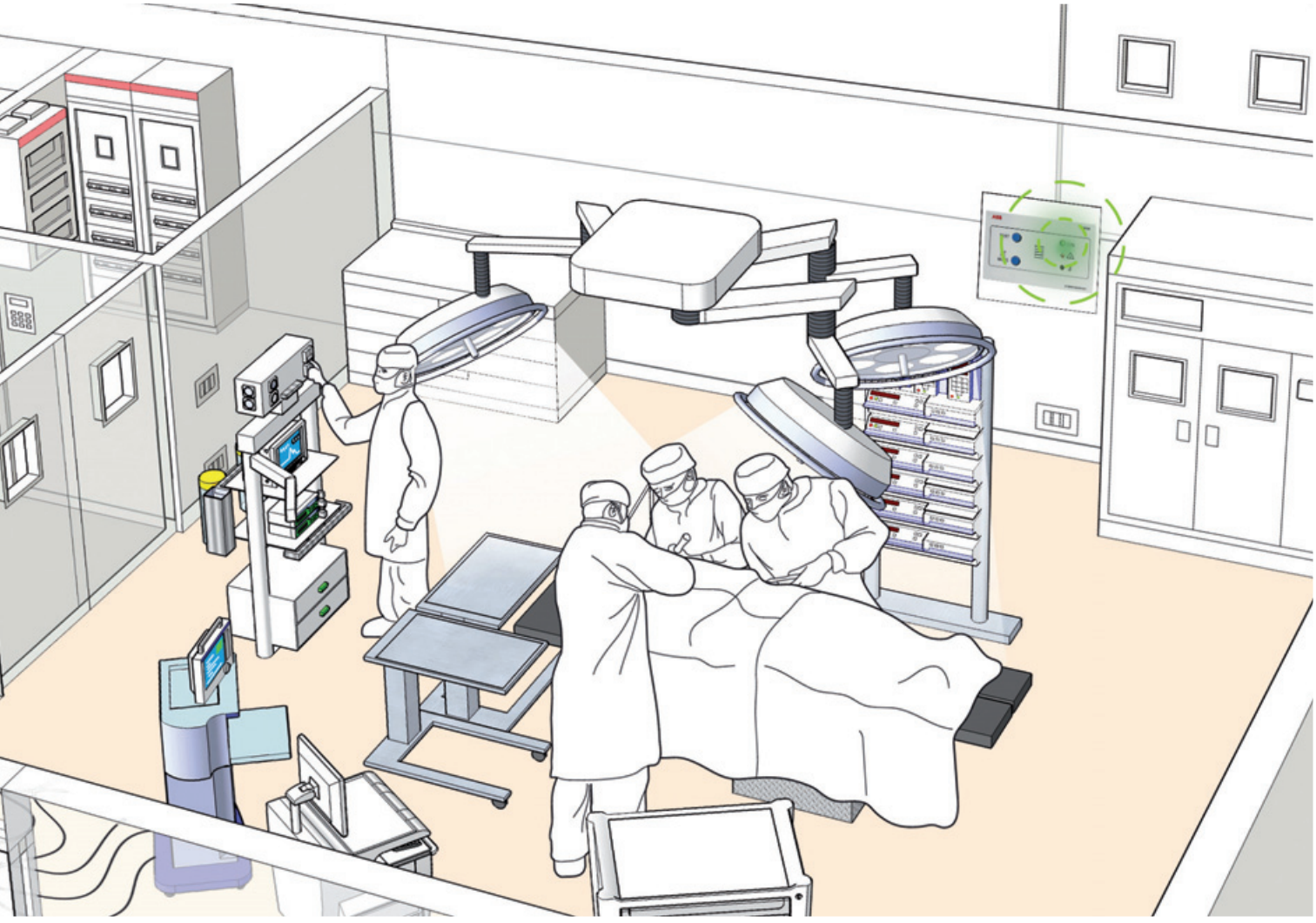
Despite network interferences...



ISOLTESTER-DIG-PLUS avoids unwanted alarms



Advantages of ISOLTESTER-DIG-PLUS:
- monitoring reliability
- integration with supervision systems
- proper fault analysis
- complete control of network parameters



ISOLTESTER-DIG
Medical insulation monitoring devices

ISOLTESTER-DIG-RZ

- Quality: the recognized standard in hospital insulation control
- Specialization: properly designed for hospitals
- Completeness: all electrical and thermal parameters controlled by a single device
- Flexibility: adjustable intervention thresholds according to all the parameters monitored
- Strength: high resistance to network interferences

Functioning principle

Insulation resistance is measured by applying a direct current signal between insulated line and earth and determining the dispersion current generated. Effective measurement is granted thanks to a digital filter integrated in the device even if interferences and harmonic components occur.

Programming

Through its LCD display and four selection keys, the device offers easy programming possibilities by setting intervention thresholds without making any mistakes.

Complete monitoring of all electrical parameters

ISOLTESTER-DIG tests the thermal and electrical overload of the medical insulation transformer, managing two temperature thresholds coming from both PT100 and PTC probes. By controlling temperature, the overload of the transformer can be monitored and the automatic circuit-breaker downstream of the secondary can be avoided. All faulty conditions are remotely controlled thanks to QSD remote signalling panels, granting a proper prompt technical supervision.

Self-testing system

Error-Link Fail system checks device proper functioning and controls wiring presence and properness at the end of the terminal blocks: it prevents the possibility to operate in group 2 medical locations when the insulation monitoring device is disconnected.

For higher safety

Thanks to a codified signal, the new ISOLTESTER-DIG-PLUS IT networks insulation monitoring device grants absolute reliability of measurement in any operational condition, even if high network interferences occur. Furthermore it is fitted with a RS485 serial port through which it can be perfectly integrated with communication systems such as PLC/PC by using ModbusRTU protocol. The measurement of network maximum and minimum values enables a wider monitoring and an easier plant checking in case of any fault.
Finally, the programmable output relay allows to manage any warning condition signalled in a dedicated way.

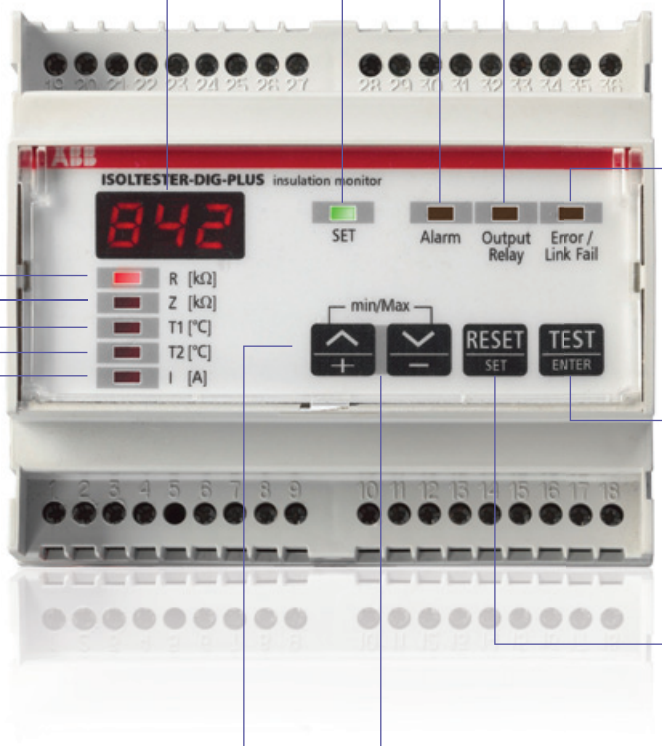
ISOLTESTER-DIG-PLUS

- Reliability: safe monitoring under any operational condition, thanks to the codified signal
- Integration: able to interact with supervising systems through ModbusRTU protocol via RS485 serial port
- Analysis: any fault can be estimated by means of the measurement of maximum and minimum values
- Flexibility: alarms sent up to 4 medical locations attended by medical and healthy staff, thanks to remote signalling panels
- Control: complete control of any alarm signalled thanks to the programmable relay

ISOLTESTER-DIG is the insulation monitoring device specifically designed by ABB for group 2 medical locations. ISOLTESTER-DIG measures the insulation to earth in IT-M network and the thermal and electrical overload of the insulation transformer, in accordance with the international standards: EN 61557-8, IEC EN 64-8/7-710 and UNE 20615.

ISOLTESTER-DIG

Frontal operators functioning



Green LED, SET:
Tool programming status

3 digit display

Red LED, R:
Insulation resistance (kΩ)

Red LED, Z:
Insulation impedance and line capacity (only for ISOLTESTER-DIG-PLUS)

Red LED, T1:
Transformer temperature

Red LED, T2:
2nd sensor temperature

Red LED, I:
Line current

Yellow LED, Alarm:
Parameter out of threshold

Red LED, Output Relay:
Auxiliary relay status

Red LED, Error/Link Fail:
Internal fault alarm, faulty wiring to the line to be controlled, PT100 temperature probe open or under short-circuit

TEST | ENTER:
Device and remote signalling panels testing and SETUP settings confirmation

RESET | SET:
Device programming access, alarm disconnection and memorized values cancellation

+/-:
Selection of the parameter to be displayed, settings adjustment and memorized maximum and minimum values display (only for ISOLTESTER-DIG-PLUS)

Easy programming by four pushbuttons

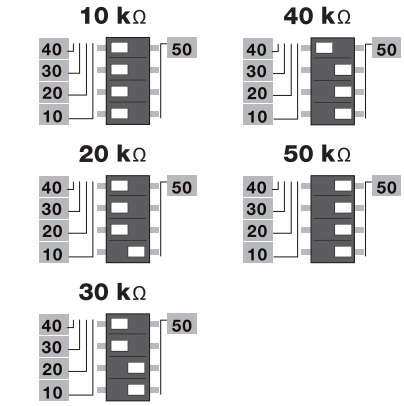
SELVTESTER-24
Medical insulation monitoring device for scialitic lamps

SELVTESTER-24 tests the insulation to earth of 24 V AC/ DC SELV circuits dedicated to scialitic lamps supply. Scialitic lamps insulation is to be monitored in order to prevent detaching from conductors when being moved. The conductors, by contact with the metal structure of the lamp, may transfer a potential of over 250 V, resulting in damage to equipment and people.

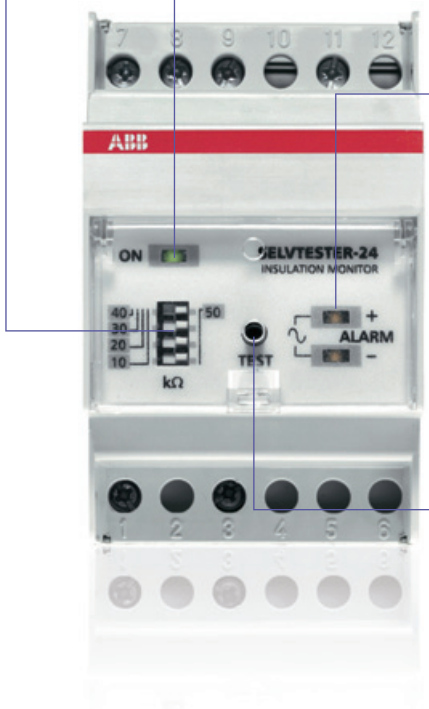
SELVTESTER-24 measures the variation in potential of the two network polarities with reference to earth in order to signal when insulation drops below a set value, through the frontal microbreakers, identifying the faulty pole in direct current. The output signal can be connected to QSD-DIG 230/24 remote signalling panel. The frontal panel of the device carries test pushbutton, status indicator and two LEDs for low insulation signalling.

- Flexibility: programmable alarm threshold
- Intelligence: recognition of faulty pole in direct current
- Compact size: fits into just 3 modules
- Practicality: extremely easy to install and use
- Integration: ideal complement for ISOLTESTER-DIG

Frontal operators functioning



Microbreakers
The frontal microbreakers allow to set the intervention threshold from 10 to 50 kΩ, as shown in the picture.



Green LED ON
Device is working properly

Yellow LED ALARM
Low insulation warning; if line has to be controlled, in AC both LEDs blink whereas in DC only the LED corresponding to the faulty pole blinks.

TEST pushbutton
It tests that the device is working properly

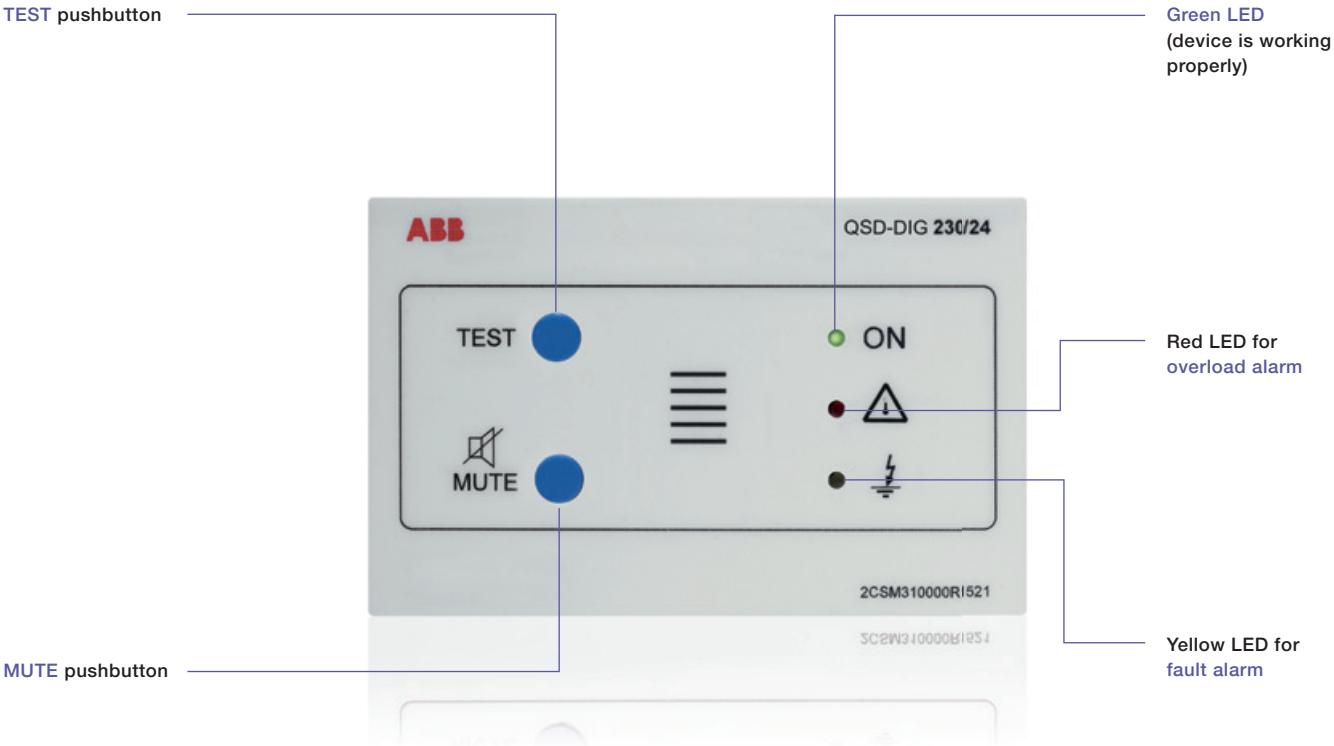
QSD-DIG 230/24
Remote signalling panel

QSD-DIG 230/24 remote signalling panel enables to send alarm signals from the insulation monitoring devices to all the medical locations attended by medical staff, as laid down by reference standards.

QSD-DIG 230/24 panel provides an acoustic and luminous signal in case of low insulation or thermal and electrical overload. Moreover, it is provided with a TEST pushbutton to periodically check its operating status and a pushbutton for disconnecting the acoustic signal. It is assembled in universal 3-module flush-mounted boxes.

- Compact size: limited dimensions
- Easy to install: installation in a universal 3-module flush-mounted box type E503, in horizontal or vertical position
- Reliability: prompt fault recognition
- Comfort: simultaneous disconnection of more signalling panels
- Operational efficiency: both visual and acoustic signalling

Frontal operators functioning

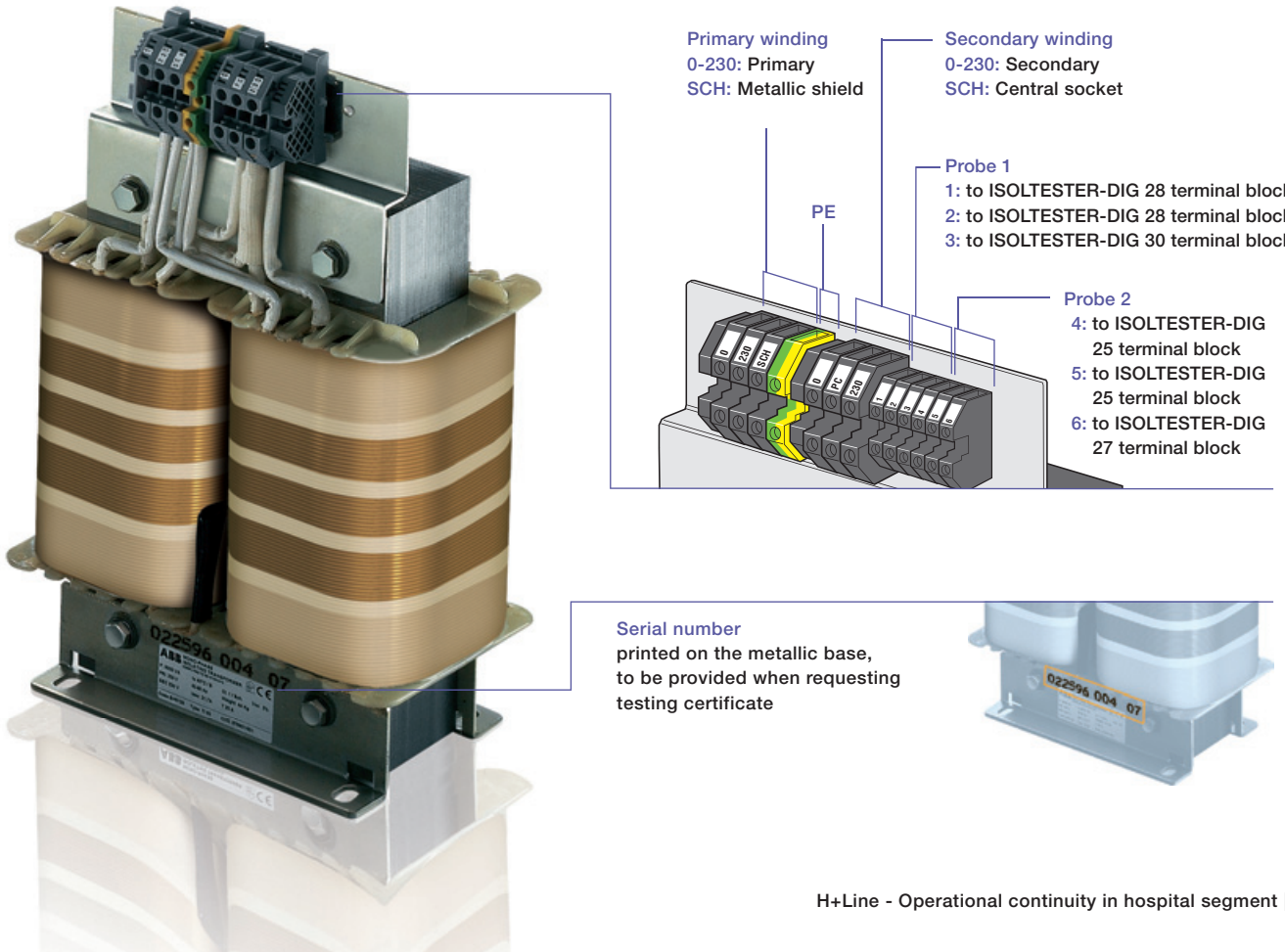


TI
Insulating transformers

Medical single-phase insulating transformers provide galvanic separation between the distribution network and the user load in accordance with the IEC 61558-1 and IEC 61558-2-15 reference standards concerning power supply in group 2 medical locations.

ABB medical insulating transformers combine conformity with reference standards to maximum performance and limited dimensions thanks to which it is thus possible to reduce switchboards costs. The range is made up of transformers with 3, 5, 7,5 and 10 kVA power, available with two PT100 temperature probes, on the primary and the secondary winding, thus enabling continuous and precise temperature monitoring. ABB transformers are provided with a particular impregnation system which allows maximum heat dissipation thanks to the exclusive vacuum-pressure technology. Finally, the insulating transformer has a metallic shield between the two windings allowing to reduce network interferences and harmonic components coming from the supply. Upon communication of the item serial number, ABB will provide the testing certificates of each medical insulation transformer.

- Specialization: especially designed for medical use
- Compact size: the overall dimensions of the insulation transformers installed in ABB QSO switchboards are the most compact on the market
- Quality: the insulation of the windings, realized with the exclusive vacuum-pressure technology, guarantees maximum heat dissipation
- Accessories: versions available with PT100 probes



QSO Switchboards
General technical features

Type	Power [kVA]	Installation	TN-S section feeder lines	IT-M section feeder lines	Net weight [kg]
QSO 3S Classic	3	wall-mounted		2x10A+3x16A	73
QSO 5S Classic	5	wall-mounted		2x10A+3x16A	88
QSO 3S Premium	3	wall-mounted	1X10A+2x16A	2x10A+1x25A+5x16A	75
QSO 5S Premium	5	wall-mounted	1X10A+2x16A	2x10A+1x25A+5x16A	90
QSO 3M Classic	3	floor standing	1x10A	3x10A+7x16A	126
QSO 5M Classic	5	floor standing	1x10A	3x10A+7x16A	141
QSO 7.5M Classic	7.5	floor standing	1x10A	3x10A+7x16A	147.5
QSO 3M Premium	3	floor standing	1X10A+2x16A	6x10A+8x16A+1x25A	127
QSO 5M Premium	5	floor standing	1X10A+2x16A	6x10A+8x16A+1x25A	142
QSO 7.5M Premium	7.5	floor standing	1X10A+2x16A	6x10A+8x16A+1x25A	147.5
QSO 10L Classic	10	floor standing	1X10A+2x16A	6x10A+9x16A	190
QSO 7.5L Premium	7.5	floor standing	1X10A+2x16A	1x32A+2x25A+6x10A+11x16A	168
QSO 10L Premium	10	floor standing	1X10A+2x16A	1x32A+2x25A+6x10A+11x16A	193.5
QSO 7.5XL Premium	7.5+7.5	floor standing	2X10A+4x16A	2x32A+4x25A+12x10A+22x16A	325
QSO 10XL Premium	10+10	floor standing	2X10A+4x16A	2x32A+4x25A+12x10A+22x16A	375

	Wall-mounted QSO		Floor standing QSO	
Operating rated voltage (Ue)	230 V ~ ± 15%			
Network rated frequency	50 - 60 Hz			
Number of phases	1 + N ~/ PE			
Rated voltage of service auxiliary circuits	24 - 230 V ~			
Insulation rated voltage (UI)	300 V - *2500 V			
Grounding power system	TT / TN-S			
Expected maximum short circuit current for input terminals (Icc)	10 kA RMS Sym **			
Maximum height	2000 m a. s. l.			
Pollution level	1 ***			
Impact resistance level (code IK) EN 50102	IK 09 (5kg - 200mm)			
Humidity level related with temperature expressed in ° C	Internal mounting 50% with maximum temperature of +40°C			
Operating room air temperature	-5°C - +55°C			
Transport and storage room air temperature	-25°C - +40°C			
Protection level of the front IP EN 60529	QSO 3S Classic	IP 40	QSO 3M Classic	IP 54
	QSO 5S Classic	IP 40	QSO 5M Classic	IP 54
	QSO 3S Premium	IP 40	QSO 5M Premium	IP 54
	QSO 5S Premium	IP 40	QSO 7.5M Premium	IP 54
			QSO 10L Classic	IP 54
			QSO 7.5L Premium	IP 54
			QSO 10L Premium	IP 54
			QSO 7.5XL Premium	IP 54
			QSO 10XL Premium	IP 54

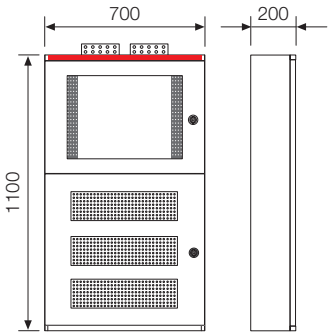
* **Dielectric strength testing voltage.**

** **Value subject to upstream coordination with fuse NH 00 100A gL-gG**

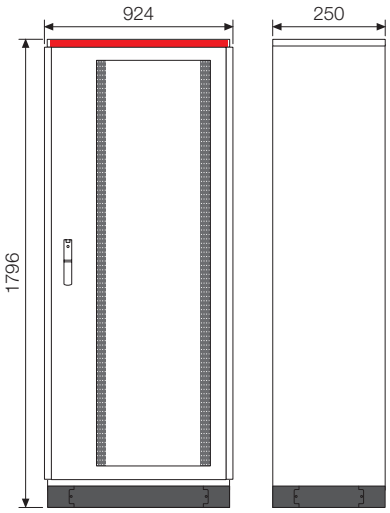
*** **It corresponds to absence of pollution or only to dry pollution and non conducting pollution.**

QSO Switchboards
Overall dimensions

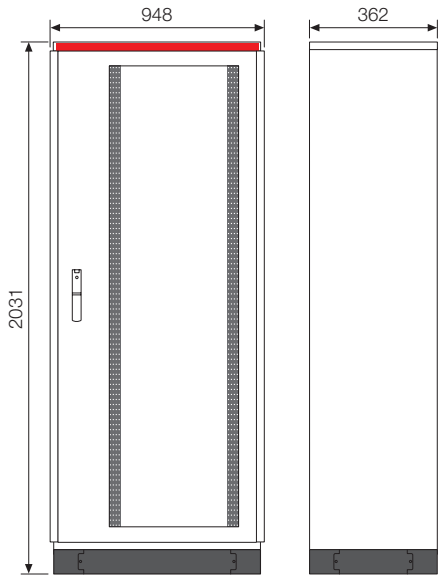
QSO S



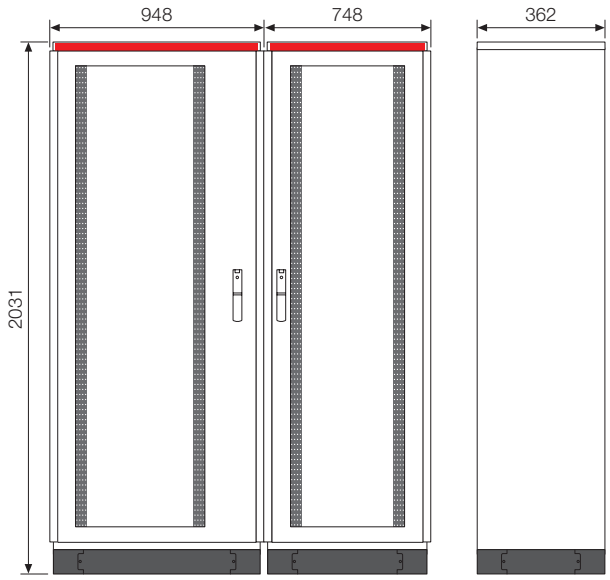
QSO M



QSO L

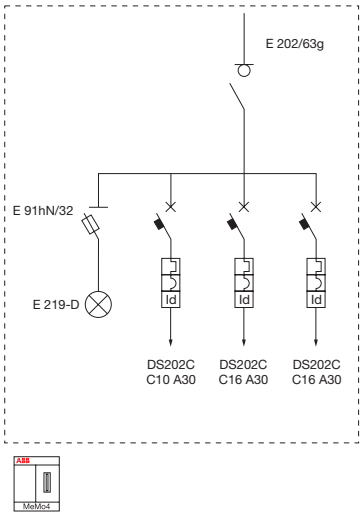


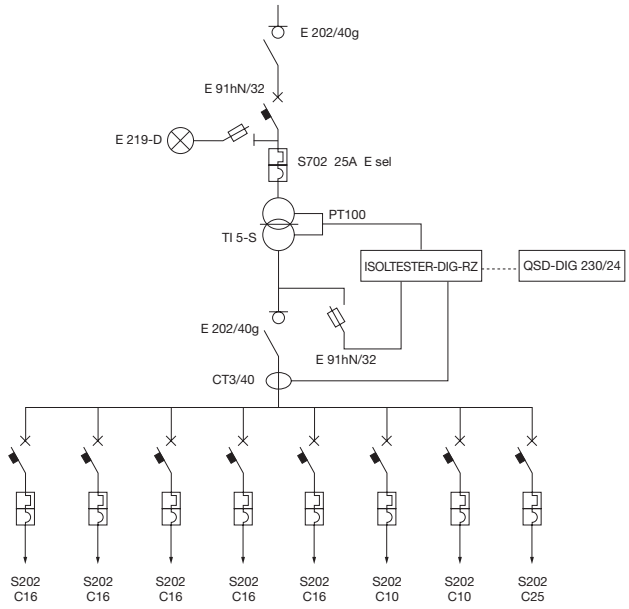
QSO XL



QSO Switchboards
Wiring diagrams

QSO S diagram

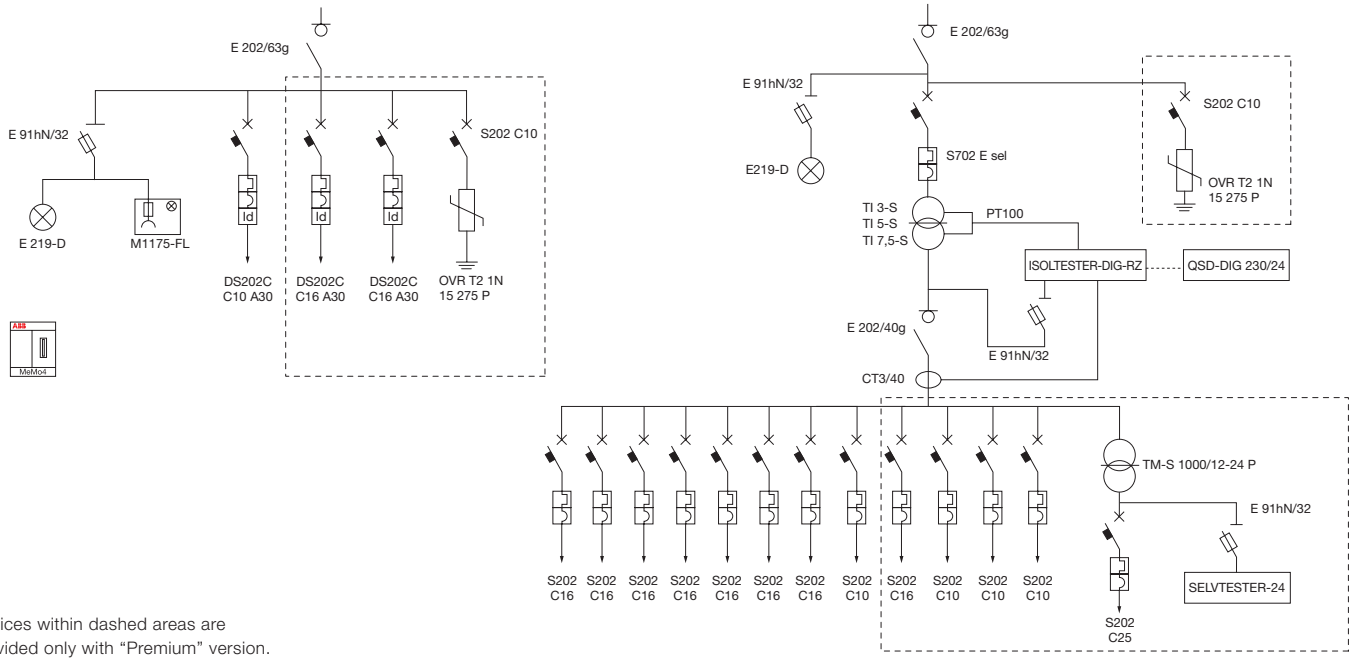




Devices within dashed areas are
provided only with “Premium” version.

Description	QSO 3S Classic	QSO 5S Classic	QSO 3S Premium	QSO 5S Premium
2P 40 A E202/40g disconnector	2	2	2	2
2P 63 A E202/63g disconnector			1	1
E 91hN/32 fuse-holder	2	2	3	3
E219-D green light indicator power supply presence	1	1	2	2
USB2.0 4GB MeMo4 DIN rail memory	1	1	1	1
BE/S 4.20.2.1 4 channel binary input terminal				
ISOLTESTER-DIG-RZ insulation monitoring device	1	1	1	1
6 kA 2P C10 S202 miniature circuit-breaker	2	2	2	2
6 kA 2P C16 S202 miniature circuit-breaker	5	5	5	5
6 kA 2P C25 S202 miniature circuit-breaker	1	1	1	1
25 kA 2P E25 S702 miniature circuit-breaker	1	1	1	1
1N 10 A 0,03 A DS202 C C10 A30 residual current breaker with overcurrent protection			1	1
1N 16 A 0,03 A DS202 C C16 A30 residual current breaker with overcurrent protection			2	2
AMM damper set	4	4	4	4
CT3 40/5 A current transformer	1	1	1	1
Medical insulation transformer with 3000 VA 230/230 V TI 3-S probes	1		1	
Medical insulation transformer with 5000 VA 230/230 V TI 5-S probes		1		1
10 x 38 gG 2A E 9F10 GG2 fuse	4	4	6	6

QSO M diagram

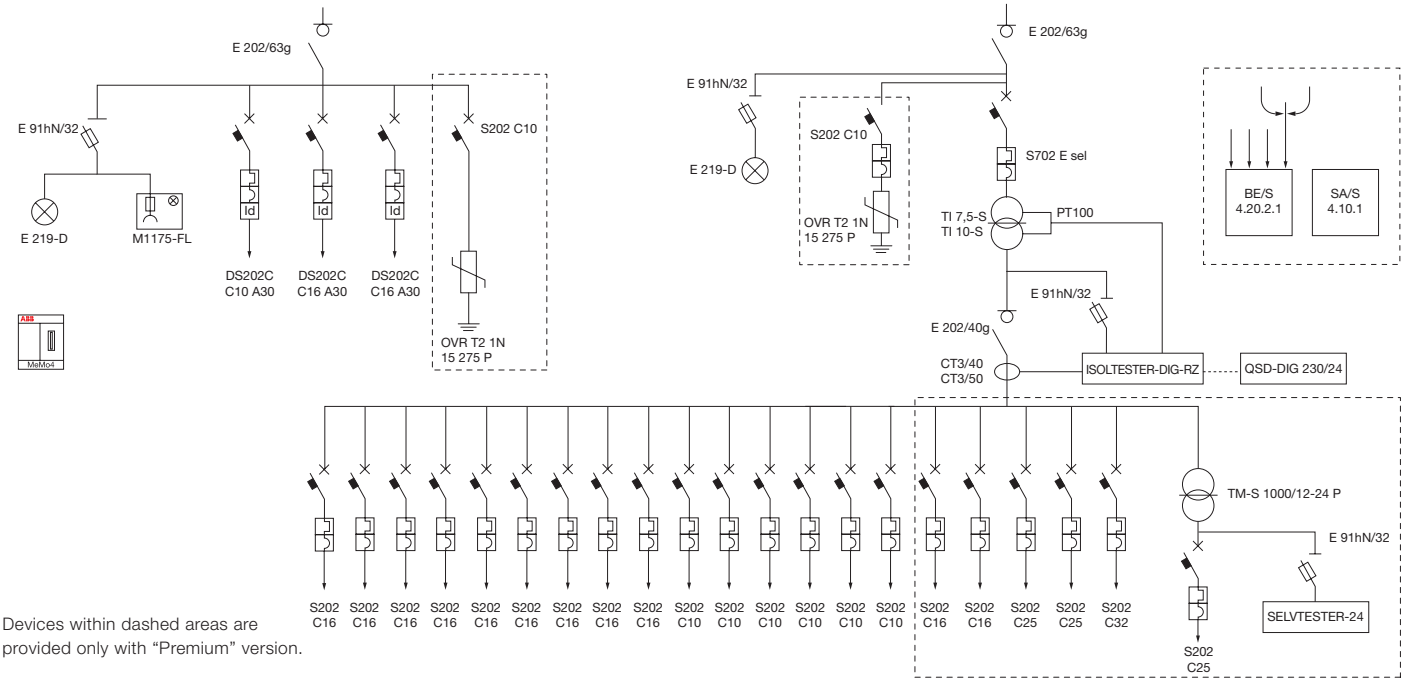


Devices within dashed areas are provided only with “Premium” version.

Description	QSO 3M Classic	QSO 5M Classic	QSO 7,5M Classic	QSO 3M Premium	QSO 5M Premium	QSO 7,5M Premium
2P 63 A E202/63g disconnector	3	3	3	3	3	3
E 91hN/32 fuse-holder	3	3	3	4	4	4
E219-D green light indicator power supply presence	2	2	2	2	2	2
USB2.0 4GB MeMo4 DIN rail memory	1	1	1	1	1	1
ISOLTESTER-DIG-RZ insulation monitoring device	1	1	1	1	1	1
24 V SELVTESTER-24 insulation monitoring device				1	1	1
OVRT2 1N 15 275 surge protective device				2	2	2
6 kA 2P C10 S202 miniature circuit-breaker	3	3	3	8	8	8
6 kA 2P C16 S202 miniature circuit-breaker	7	7	7	8	8	8
6 kA 2P C25 S202 miniature circuit-breaker				1	1	1
M1175-FL 2P+T 16 A schucko socket with indicator lamp and fuse	1	1	1	1	1	1
25 kA 2P E25 S702 miniature circuit-breaker	1	1		1	1	
25 kA 2P E35 S702 miniature circuit-breaker			1			1
1N 10 A 0,03 A DS202 C C10 A30 residual current breaker with overcurrent protection	1	1	1	1	1	1
1N 16 A 0,03 A DS202 C C16 A30 residual current breaker with overcurrent protection				2	2	2
AMM damper set	4	4	4	8	8	8
CT3 40/5 A current transformer	1	1	1	1	1	1
TM-S 1000/12-24 P. 230-400V S. 24V control and safety transformer				1	1	1
Medical insulating transformer with 3000 VA 230/230 V TI 3-S probes	1			1		
Medical insulating transformer with 5000 VA 230/230 V TI 5-S probes		1			1	
Medical insulating transformer with 7500 VA 230/230 V TI 7,5-S probes			1			1
10 x 38 gG 2A E 9F10 GG2 fuse	6	6	6	8	8	8

QSO Switchboards
Wiring diagrams

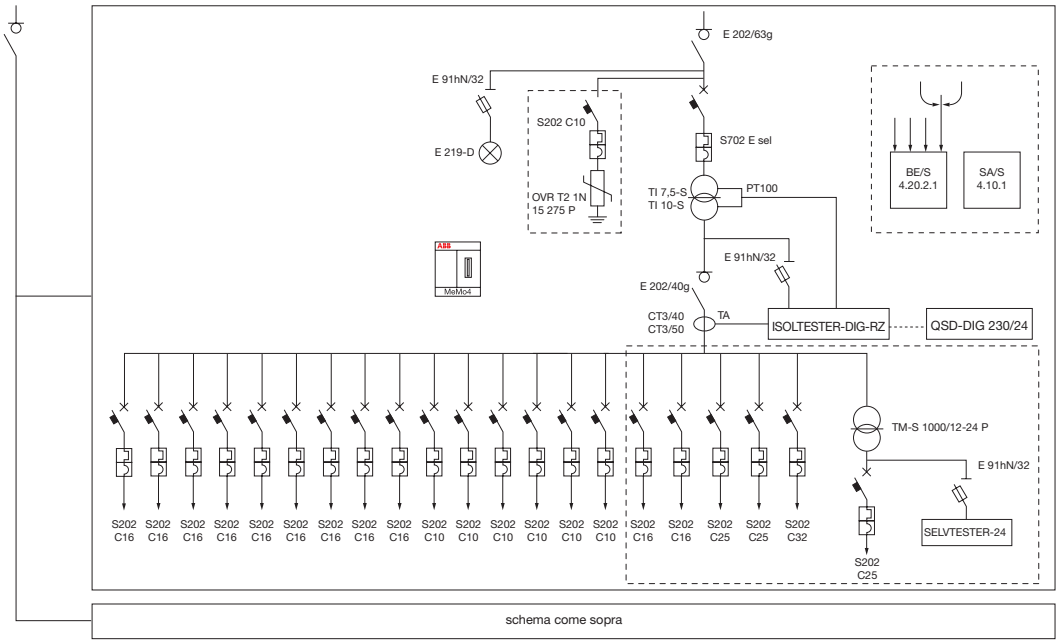
QSO L diagram



Devices within dashed areas are provided only with “Premium” version.

Description	QSO 10L Classic	QSO 7,5L Premium	QSO 10L Premium
2P 63 A E202/63g disconnector	3	3	3
E 91hN/32 fuse-holder	2		4
E219-D green light indicator power supply presence	2	2	2
USB2.0 4GB MeMo4 DIN rail memory	1	1	1
BE/S 4.20.2.1 4 channel binary input terminal			1
ISOLTESTER-DIG-RZ insulation monitoring device	1	1	1
24 V SELVTESTER-24 insulation monitoring device		1	1
10 A SA/S 4.10.1 4 channel output terminal			1
OVRT2 1N 15 275 surge protective device		2	2
S2-CS/H6R auxiliary contact 1 exchange			1
6 kA 2P C10 S202 miniature circuit-breaker	5	7	7
6 kA 2P C16 S202 miniature circuit-breaker	9	11	11
6 kA 2P C25 S202 miniature circuit-breaker		3	3
6 kA 2P C32 S202 miniature circuit-breaker		1	1
M1175-FL 2P+T 16 A schucko socket with indicator lamp and fuse	1	1	1
25 kA 2P E25 S702 miniature circuit-breaker			
25 kA 2P E35 S702 miniature circuit-breaker		1	
25 kA 2P E50 S702 miniature circuit-breaker	1		
25 kA 2P S702-E 50+H2WR miniature circuit-breaker			1
1N 10A 0,03A DS202 C C10 A30 residual current breaker with overcurrent protection	1	1	1
1N 16A 0,03A DS202 C C16 A30 residual current breaker with overcurrent protection	2	2	2
AMM damper set	4	8	8
CT3 40/5 A current transformer		1	
CT3 50/5 A current transformer	1		1
TM-S 1000/12-24 P. 230-400 V S.24 V control and safety transformer		1	1
Medical insulating transformer with 7500 VA 230/230 V TI 7,5-S probes		1	
Medical insulating transformer with 10000 VA 230/230 V TI 10-S probes	1		1
10 x 38 gG 2A E 9F10 GG2 fuse		8	8

QSO XL diagram

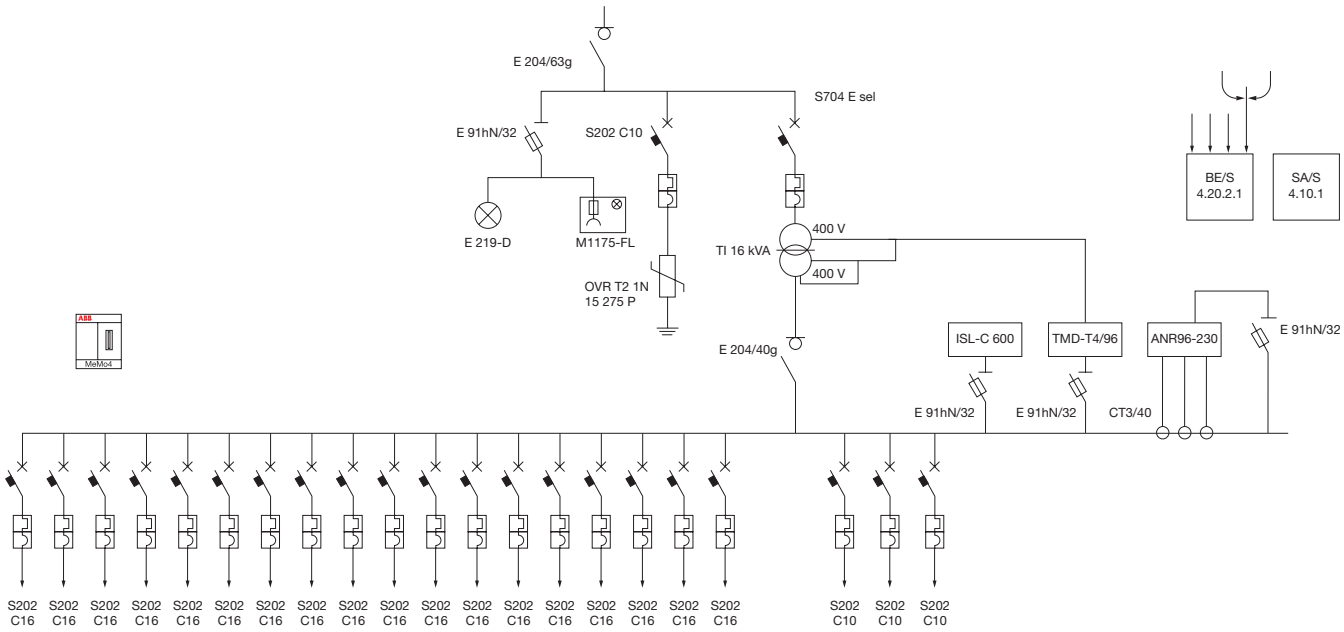


Devices within dashed areas are provided only with “Premium” version.

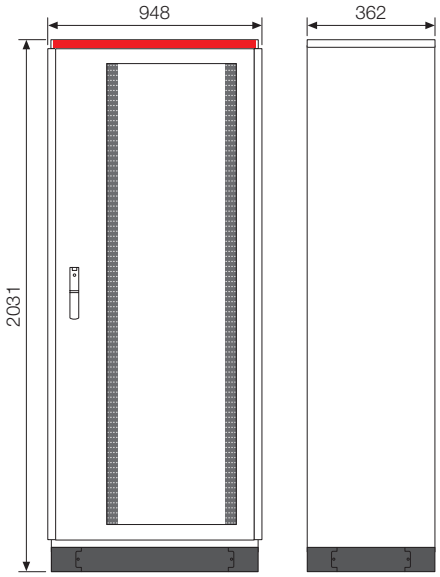
Description	QSO 7,5XL Premium	QSO 10XL Premium
OT80F3C disconnector 3P disconnector 80 A	1	1
2P 63 A E202/63g disconnector	3	3
E 91hN/32 fuse-holder	7	7
E219-D green light indicator power supply presence	3	3
USB2.0 4GB MeMo4 DIN rail memory	1	1
BE/S 4.20.2.1 4 channel binary input terminal	2	2
ISOLTESTER-DIG-RZ insulation monitoring device	2	2
24 V SELVTESTER-24 insulation monitoring device	2	2
10 A SA/S 4.10.1 4 channel output terminal	2	2
OVRT2 1N 15 275 surge protective device	3	3
6 kA 2P C10 S202 miniature circuit-breaker	15	15
6 kA 2P C16 S202 miniature circuit-breaker	23	23
6 kA 2P C25 S202 miniature circuit-breaker	6	6
6 kA 2P C32 S202 miniature circuit-breaker	2	2
M1175-FL 2P+T 16 A schucko socket with indicator lamp and fuse	1	1
25 kA 2P S702-E 35+H2WR miniature circuit-breaker	2	
25 kA 2P S702-E 50+H2WR miniature circuit-breaker		2
1N 10 A 0,03 A DS202 C C10 A30 residual current breaker with overcurrent protection	1	1
1N 16 A 0,03 A DS202 C C16 A30 residual current breaker with overcurrent protection	2	2
AMM damper set	16	16
CT3 40/5A current transformer	2	
CT3 50/5A current transformer		2
TM-S 1000/12-24 P. 230-400V S.24V control and safety transformer	2	2
Medical insulating transformer with 7500 VA 230/230 V TI 7,5-S probes	2	
Medical insulating transformer with 10000 VA 230/230 V TI 10-S probes		2
10 x 38 gG 2A E 9F10 GG2 fuse	14	14
Square shaft section squared 6 mm and 360 mm long for switch	1	1
OHB45J6E011 I-0-II 45mm square safety door block grip	1	1

QIT Switchboards
Wiring diagrams

QIT diagram



Overall dimensions



Technical features

	QIT
Rated Power	16 kVA
Operating rated voltage (Ue)	400 V ~ ± 15%
Network rated frequency	50 - 60 Hz
Number of phases	3 + N ~/PE
Rated voltage of service auxiliary circuits	24 - 230 V ~
Insulation rated voltage (UI)	2500 V *
Grounding power system	TT / TN-S
Expected maximum short circuit current for input terminals (Icc)	10 kA RMS Sym **
Maximum height	2000 m a. s. l.
Pollution level	1 ***
Impact resistance level (code IK) EN 50102	IK 09 (5kg - 200mm)
Humidity level related with temperature expressed in ° C	Internal mounting 50% with maximum temperature of +40°C
Operating room air temperature	-5°C - +55°C
Transport and storage room air temperature	-25°C - +40°C

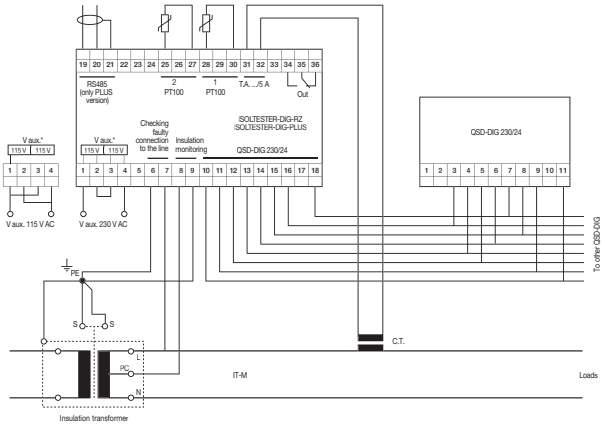
* **Dielectric strength testing voltage.**
** **Value subject to upstream coordination with fuse NH 00 100A gL-gG**
*** **It corresponds to absence of pollution or only to dry pollution and non conducting pollution.**

ISOLTESTER-DIG
Technical features

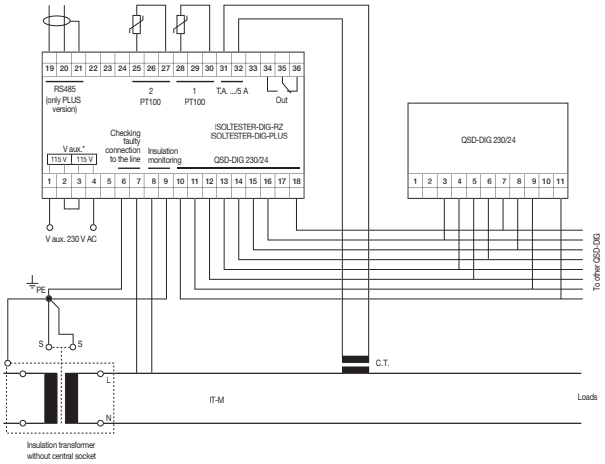
Technical features	ISOLTESTER-DIG-RZ	ISOLTESTER-DIG-PLUS
Supply voltage	110 - 230 V/50-60 Hz	
Network voltage to be controlled	24 ÷ 230 V AC	
Maximum voltage measurement	24 V	
Maximum current measurement	1 mA	
Maximum internal resistance	100 kΩ	
Insulation voltage	2,5 kV/60 seconds	
Control signal type	Continuous component with digital filter	Codified composite signal
Sensed measures	Insulation measurement range 0÷999 kΩ/HIGH – resolution 1 kΩ	
	Temperature measurement by Rd PT100 or 2/3-wire thermal-probe – 0÷250°C, accuracy 2%	
	Current measurement by external CT with secondary 5 A, accuracy 2% (selectable CT ratio 1÷200)	
	Impedance measurement 0÷999 kΩ/HIGH - resolution 1 kΩ (test signal 2500 Hz)	Impedance measurement 0÷999 kΩ/HIGH - resolution 1 kΩ (variable composite signal)
Intervention threshold	Low insulation 50÷500 kΩ, accuracy 5%, hysteresis 5%, settable delay	
	Overtemperature 0 ÷ 200°C, accuracy 2%	
	Current overload 1 ÷ 999 A, accuracy 2%	
	Low impedance (deactivable)	
	Device not connected to the line (Error/Link-Fail)	
Available outputs	Up to maximum 2 QSO panels for remote signalling	Up to maximum 4 QSO panels for remote signalling
	Programmable auxiliary relay output NA-C-NC, 5A, 250 V AC	Programmable auxiliary relay output NA-C-NC, 5A, 250 V AC, RS 485 serial output, standard ModbusRTU protocol
Displays	Insulation resistance value signalling over full scale and fault to earth	
	Measured temperature value 0 ÷ 200°C for channel 1	
	Measured temperature value 0 ÷ 200°C for channel 2	
	Measured current value 0 ÷ 999 A	
	Insulation impedance value	
	Setting parameters	
	Device failing connection to the line (Error/Link-Fail)	
	Relay output status	
	Line-to-earth capacity value	
		Minimum insulation and maximum temperature and current values
Connections	Maximum linkable section 2,5 mm^2	
Operating temperature	-10...60 °C	
Storage temperature	-25...70 °C, humidity < 90%	
Overall dimensions	6 DIN MODULES	
Weight	0,5 kg	
Casing	Self-extinguishing plastic case to be assembled on 35 mm DIN rail, with transparent lead-sealable protective front cover	
Degree of protection	IP20	
Self-consumption	5 VA	
Reference standards	IEC EN 60364-7-710, IEC EN 61557-8, EN 60255-6, UNE 20615	

ISOLTESTER-DIG
Technical features

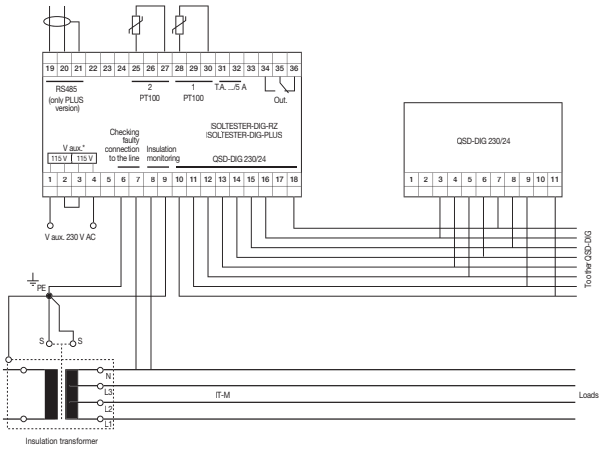
ISOLTESTER-DIG



Transformer with central socket



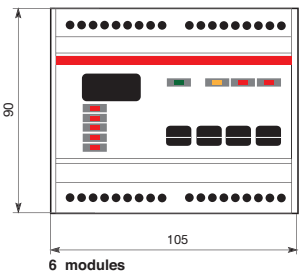
Transformer without central socket



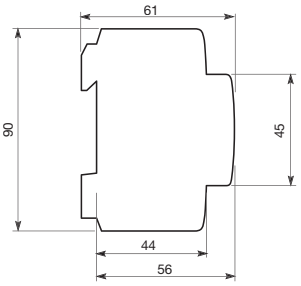
3-phase transformer

* Optional wiring of temperature probes and current transformers

Overall dimensions



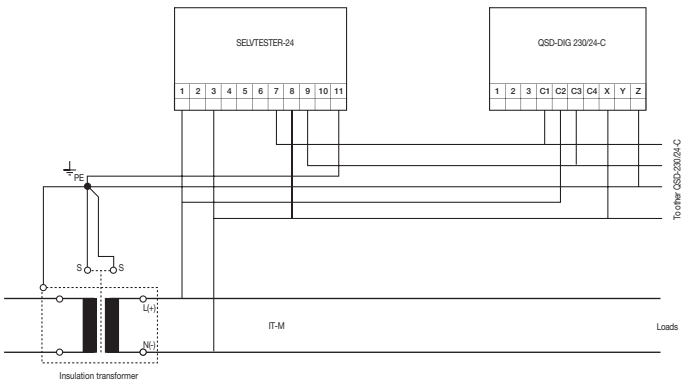
6 modules



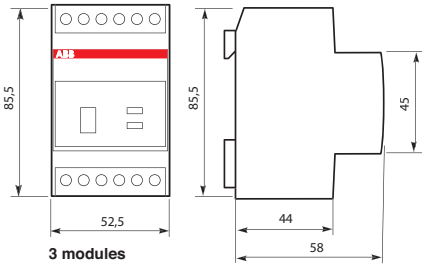
SELVTESTER-24
Technical features

Technical features SELVTESTER-24	
Network voltage and auxiliary supply	24 V AC/DC
Frequency	50-60 Hz
Maximum self-consumption	3 VA
Maximum measurement current	0,5 mA
Internal impedance	50 kΩ
Intervention threshold	10 ÷ 50 kΩ 4 levels
Intervention delay	1 s
Signals	LED ON, LED ALARM +, LED ALARM -
Output	maximum 24 V 1 A
Remote signalling panels	maximum 2 QSD-DIG 230/24
Operating temperature	-10 ÷ 60 °C
Storage temperature	-20 ÷ 70 °C
Relative humidity	≤ 95%
Insulation test	2,5 kV 60 s / 4 kV imp. 1,2/50 µs
Terminal blocks section	4 mm^2
Degree of protection	front IP40 with cover / IP20 case
Modules	3
Weight	200 g
Reference standards	EN 61010-1; IEC EN 60364-7-710; EN 61326-1

Wiring diagrams



Overall dimensions

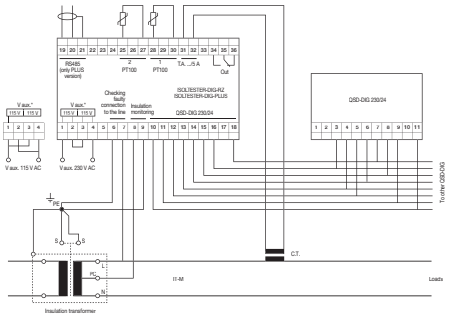


QSD-DIG 230/24
Remote signalling panels
Technical features

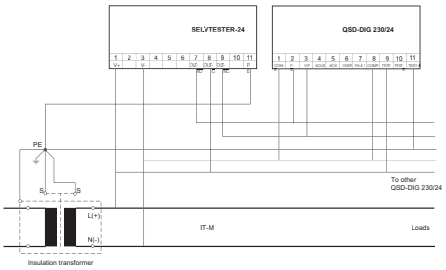
Technical features QSD-DIG 230/24	
Signals	Green LED NETWORK; Red LED overload ALARM; Yellow LED FAULT ALARM; Low insulation; Acoustic signaller; Emission 2400 Hz; Intermittence 2 Hz dB
Pushbuttons	Testing (TEST), acoustic disconnection (MUTE)
Terminal blocks section	2,5 mm^2
Degree of protection	IP30
Installation	E503universal 3-module flush-mounted box
Weight	200 g
Operating temperature	-10 ÷ 60 °C, maximum humidity 95%
Storage temperature	-25 ÷ +80 °C
Insulation	2.500 V rms 50 Hz for 60 s
Connection	UTP cable (recommended)
Cable minimum section	0,35 mm^2 (maximum 300 m)
Reference standards	IEC-EN 61010-1, IEC EN 61557-8, IEC EN 60364-7-710, UNE 20615, IEC EN 61326-1

Wiring diagrams

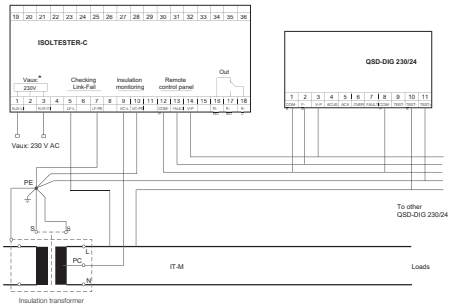
ISOLTESTER-DIG



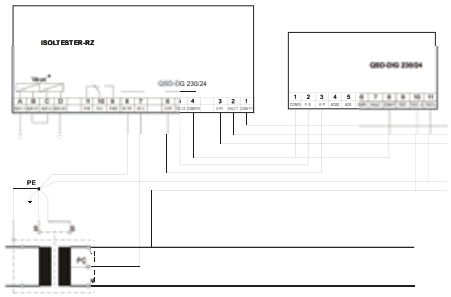
SELVTESTER-24



ISOLTESTER-C

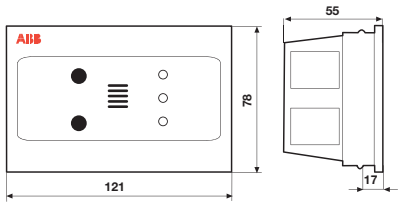


ISOLTESTER-RZ

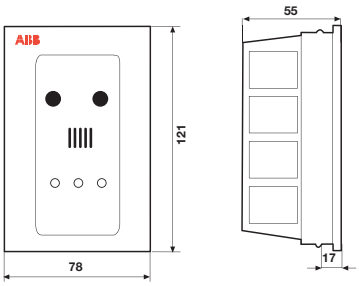


Overall dimensions

QSD-DIG 230/24



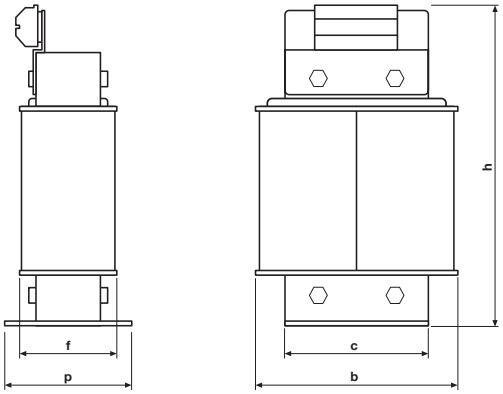
QSD-DIG 230/24 V



Insulating transformers
Technical features

Insulating transformer technical features					
Power		**3 kVA**	**5 kVA**	**7,5 kVA**	**10 kVA**
Electrical protection class			1		
Thermal insulation class	[°C]	B 130	B 130	F 155	F 155
Maximum ambient temperature	[°C]		40		
Primary voltage	[V]		230		
Secondary voltage	[V]		230		
Secondary current	[A]	13	21,7	32,6	43,5
Maximum inrush current	[A]	221	369	553	738
External secondary slow-blow fuse current	[A]	T 12,5	T 20	T 32	T 40
Maximum power dissipation	[W]]	120	150	260	320
Frequency	[Hz]		50 - 60		
Dispersion current to earth of the secondary winding	[mA]		< 0,5		
Dispersion current to earth of the case	[mA]		< 0,5		
Voltage drop in short-circuit			< 3%		
Primary no load current	[In]		< 3%		
Dispersion current between primary and secondary winding	[mA]		< 3,5		
Dimensions (BxHxP)	[mm]	205 x 340 x 150	240 x 380 x 150	240 x 380 x 160	277 x 380 x 260
Weight	[kg]	29,5	44	50,5	73
Reference standards			EN 615588-1, EN 61558-2-15, EN 62041		

Overall dimensions



		3 KVA	5 KVA	7,5 KVA	10 KVA
b	[mm]	205	240	240	277
c	[mm]	170	170	170	176
f	[mm]	115	115	115	173
h	[mm]	340	380	380	380
p	[mm]	150	150	160	203

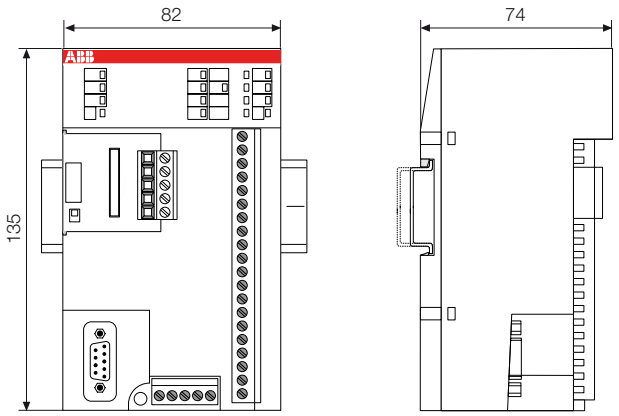
Multiroom monitoring and remote control
Technical features

AC500-eCo CPU Technical features				
Type	Onboard I/O DI/ DO/AI/AO	Digital Onboard I/O Input signal	Output signal	Supply
PM554-T	8 / 6 / - / -	24 V DC	Transistor, 24 V DC, 0.5 A	24 V DC

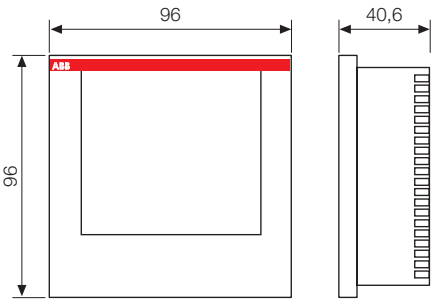
CP415M Technical features	
Display size	3,5”
Resolution (Pixels)	240 x 240
Brightness (cd/m²)	90
Contrast adjustment	through touch panel
Backlighting	LED
Backlighting duration	40.000 hours
Touch screen (number of operations)	> 1 million
Flash prom	4 MB
RTC	yes
Alarm control	yes
Communication user interface	1
Self-consumption	> 330 mA
Dimensions LxHxP (mm)	96 x 96 x 40,6
Weight (kg)	0,23

Overall dimensions

PM554-T



CP415M



S700 vs S200 Selectivity table

Downstream circuit-breaker	Upstream circuit-breaker		S 700							
	Caractheristic		E/K							
		Icu [kA]	25							
			In [A]	16	20	25	35	40	50	63
S 200	C	10	≤ 2	> 15	> 15	> 15	> 15	> 15	> 15	> 15
			3	T	T	T	T	T	T	T
			4	T	T	T	T	T	T	T
	B, C		6	T	T	T	T	T	T	T
	C		8	T	T	T	T	T	T	T
	B, C		10	T	T	T	T	T	T	T
			13	T	T	T	T	T	T	T
			16		T	T	T	T	T	T
			20			T	T	T	T	T
			25				T	T	T	T
			32					T	T	T
			40						T	T
			50/63							

T = total selectivity

Order codes

QSO switchboards order codes			
Type	Power	BbN 8012542 EAN	ABB code
Operating theatre electrical switchboards, series S			
QSO 3S Classic	3	611226	2CSM261122R1551
QSO 5S Classic	5	736929	2CSM273692R1551
QSO 3S Premium	3	736028	2CSM273602R1551
QSO 5S Premium	5	736820	2CSM273682R1551
Operating theatre electrical switchboards, series M			
QSO 3M Classic	3	735922	2CSM273592R1551
QSO 5M Classic	5	736721	2CSM273672R1551
QSO 7,5M Classic	7,5	735823	2CSM273582R1551
QSO 3M Premium	3	736622	2CSM273662R1551
QSO 5M Premium	5	735724	2CSM273572R1551
QSO 7,5M Premium	7,5	736523	2CSM273652R1551
Operating theatre electrical switchboards, series L			
QSO 10L Classic	10	735625	2CSM273562R1551
QSO 7,5L Premium	7,5	736424	2CSM273642R1551
QSO 10L Premium	10	735526	2CSM273552R1551
Operating theatre electrical switchboards, series XL			
QSO 7,5XL Premium	7,5+7,5	736325	2CSM273632R1551
QSO 10XL Premium	10+10	735427	2CSM273542R1551

ISOLTESTER-DIG order codes		
Type	BbN 8012542 EAN	ABB code
ISOLTESTER-DIG-RZ	884507	2CSM244000R1501
ISOLTESTER-DIG-PLUS	884606	2CSM341000R1501

SELVTESTER-24 order codes			
Controlled network	Type	BbN 8012542 EAN	ABB code
IT-M SELV 24 V c.a./c.c.	SELVTESTER-24	884705	2CSM211000R1511

QSD-DIG 230/24 order codes

Installation	Type	BbN 8012542 EAN	ABB code
Horizontal	QSD-DIG 230/24	730637	2CSM273063R1521
Vertical	QSD-DIG 230/24 V	570936	2CSM257093R1521

Medical insulating transformers order codes

Description	Type	PT100 Probes	BbN 8012542 EAN	ABB code
Insulating transformer 3 kVA	TI 3		2896005	2CSM110000R1541
Insulating transformer 5 kVA	TI 5		2896104	2CSM120000R1541
Insulating transformer 7,5 kVA	TI 7.5		2896203	2CSM130000R1541
Insulating transformer 10 kVA	TI 10		2521204	2CSM140000R1541
Insulating transformer 3 kVA	TI 3-S	▪	2521402	2CSM210000R1541
Insulating transformer 5 kVA	TI 5-S	▪	2521501	2CSM220000R1541
Insulating transformer 7,5 kVA	TI 7.5-S	▪	2521600	2CSM230000R1541
Insulating transformer 10 kVA	TI 10-S	▪	2521709	2CSM240000R1541
Anti-jamming dampers for transformers	AMM			2CSM900000R1541

Multiroom monitoring system order codes

Description	Type	BbN 8012542 EAN	ABB code
PLC 8 IN and 6 OUT - HMI touch 3.5” - H+Line sw	ISOLTESTER MRM BOX	736127	2CSM273612R1521
Operator’s terminal touch 3.5 ‘’ - H+Line sw	ISOLTESTER MRM CPU	735229	2CSM273522R1521

QIT switchboards order codes

Description	Type	Power	BbN 8012542 EAN	ABB code
QIT 16L Premium	IT switchboard for data center	16 kVA	735328	2CSM273532R1551

Questions and answers

What does HI_ can be displayed on ISOLTESTER-DIG-RZ insulation monitoring device mean?
It means high insulation. ISOLTESTER-DIG-RZ displays, thanks to its three digit display, the real time insulation measure up to 999 kΩ. HI appears whenever the detected insulation is higher than this value.

What does LF_ which can be displayed on ISOLTESTER-DIG-RZ insulation monitoring device mean?
It means "Link Fail". ISOLTESTER-DIG-RZ display is capable of carrying out an internal self diagnosis to verify whether the measurement of the insulation is correctly performed. If the indication LF appears, it may mean that:

1. The device has not been wired correctly. In this case it is necessary to verify the wiring according to the installation electrical scheme.
2. There are electrical devices that discharge some direct current interference on the PE safety conductor which affects ISOLTESTER-DIG-RZ measuring signal.

In this case it is necessary to verify the dispersion by means of a tester. ABB has developed ISOLTESTER-DIG-PLUS specifically in order to operate also in a strongly interfered context.

Which insulation value shall I set on ISOLTESTER-DIG as insulation threshold?
There are not normative prescription. It all depends on the level of protection you want for the system. The higher the threshold, the higher the protection. On the other hand, the higher the threshold, the higher the possibility to be warned. A useful recomendation may be setting the threshold around 20% below the insulation measured in standard operating conditions.

How do I enter ISOLTESTER-DIG setup menu?
Press "MINUS" and "SET/RESET" pushbutton simultaneously.

How do I access the ISOLTESTER-DIG regulator menu?
Press "SET/RESET" pushbutton.

How many signalling panels can I connect to each insulation monitor?
You can connect up to 4 remote parallel signalling panels, without adding any auxiliary supply.

Is it possible to use the same QSO switchboards to feed two (or more) group 2 medical facilities?
The IEC 60364-7-710 reference standard does not allow this application.
Any medical facility must be supplied by a dedicated medical insulating transformer. "For any group of functionally connected facilities at least an IT-M system is necessary" (article 710.512)

Shall I avoid the protection related with the insulation monitoring device by means of a fuse, in order to avoid the risk of the monitor being disconnected?
The protection of the insulation monitoring device is necessary to protect the device from short circuits, in particular at the end of the equipment useful life. Without a suitable protection, a fire could be produced which should damage seriously the switchboard. For these reasons, in accordance with the IEC 60364 reference standard, the switchboard manufacturer cannot ignore the duty of protection.
It is also true that the insulation monitoring device cannot be accidentally disconnected for several reasons:

1. QSO Switchboards are equipped with a locked door. Only qualified and authorized personnel are expected to open it.
2. The E 91hN/32 fuse holder that protects the insulation monitoring device has no disconnecting performance under load, and therefore, in order to open the handle it is necessary to operate on the circuit upstream, disconnecting this way the operating theatre from the supply.
3. The E 91hN/32 fuse holder is sealed, and it may only be opened intentionally.

How many CP415M Touch Screen displays can I connect to each multiroom supervision system?
Up to two displays may be installed for each system, and consequently for each PLC. In this way, visualization and management of the alarms may be carried out from different points of the building.

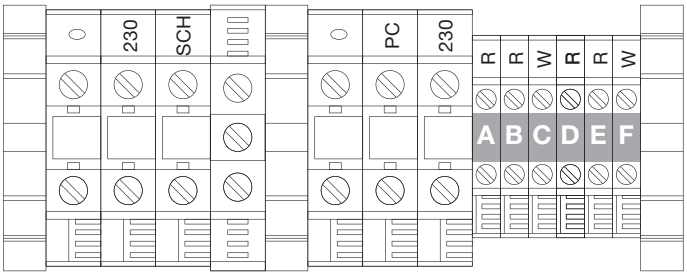
How is it possible to connect 99 ISOLTESTER-DIG-PLUS to a single PLC with only few input channels?
The connection between ISOLTESTER-DIG-PLUS and the PLC is via bus. This mean that no point to point connection is needed and only one PLC input is used.

Does ABB release the QSO declaration of conformity?
Certainly.

Is it possible to receive the test report related to the medical insulating transformer according to the IEC 60364-7-710 reference standard?
Certainly. It is enough to communicate the serial number printed on the metallic base of the transformer, since the test reports on each produced unit are performed at the factory. The serial number is the only eleven digit number, as shown in the picture below.

How shall the PT100 temperature probes of the medical insulating transformer be connected?
The temperature probes shall be connected to ISOLTESTER-DIG insulation monitoring device, as follows:
- Connection of the primary winding temperature probe:

Terminal block	Description	ISOLTESTER terminal block
A-B	Sensor 1	28
C	Sensor 1	30
D-E	Sensor 2	25
F	Sensor 2	27



Can I use any kind of insulating transformer in medical premises?
General purpose insulating transformers are to be used in accordance with the IEC EN 61558-2-4 reference standard “Particular requirements for general insulating transformers”. The range of IT medical insulating transformers is in accordance with the IEC EN 61558-2-15 reference standard “Particular requirements for insulating transformers for the supply of medical locations”.
This regulation prescribes additional requirements in order to safeguard the safety of the medical facilities. It is therefore not possible to use general purpose insulating transformers.

Shall the insulating transformer be protected?
All transformers shall be protected from short circuits and overloads according to the IEC 60364-1 reference standard. The protection shall be assigned by the manufacturer in order to guarantee suitable coordination. ABB indicates the IT protection, which depends on the power, as follows:

TI	[KVA]	**3**	**5**	**7,5**	**10**
Fuse	[A]	T12,5	T20	T32	T40

IEC EN 60364-7-710 reference standard requires that the medical transformer inrush current shall not be higher than 12 times the rated current. Why does the transformer technical specifications table shows a ratio of about 17 times (inrush current divided by rated current)?
The rated current is not a RMS value, and therefore it is necessary to extract the peak value multiplying it a factor root of two. Dividing the inrush current by the rated current RMS, the result shall be a ratio equal to 12.

Contact us

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