

QSO switchboards and devices for medical locations

2CSC004020B0201



ABB

Protection by electrical separation as laid down by IEC standard 60364-7-710 (user electrical systems 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 a failure in the main insulation of the circuit.

By using insulating transformers, this protection against indirect contacts can be guaranteed without having to shut off the circuit automatically at the first earthing fault. Insulating transformers are therefore suitable for use in plants in which the sudden and automatic shutoff of the service could

have serious implications: examples of these applications are plants for medical and surgery rooms (in accordance with IEC standard 60364-7-710) in which specific electromedical devices perform patient 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 insulating transformer and an ISOLTESTER for detecting and signalling the first earthing fault. QSO switchboards represent the ideal solution for all medical locations classified by the

IEC standard 60364-7-710 as group 2 rooms (rooms for anaesthesia, surgery, pre-operative preparation, surgical plaster application, post-operative waking, heart catheter application, 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 other kinds of medical locations

and in any other room in which the service has not to be interrupted automatically at the first fault: industrial laboratories, workshops of jewellers and other craftsmen, test laboratories, school laboratories, research institutes and other rooms with similar problems.

QSO switchboards are equipped with pre-cabled outputs and free modules and are designed, built and tested in accordance with the provisions laid down by the IEC standard 60601-1-1 (AS and ANS type low-voltage panels), IEC 60364-7-710, (requirements for special installations or locations, medical locations); each panel comes with a conformity declaration, which guarantees that it conforms to the reference standards.

The metal structure of the QSO switchboards is made using the modular framework of the ArTu distribution cabinets, which guarantee safety





The Advantages

- Easier installation: time saving of up to 20 hours
- Safety: certified insulating transformer, no type approval required
- Flexibility: available in various expandable versions for all kinds of applications
- Reliability: the quality of ABB technology in every component
- Compact size: limited overall dimensions
- Completeness: 24 V line control, built-in PT100 probes
- Effectiveness: complete network monitoring



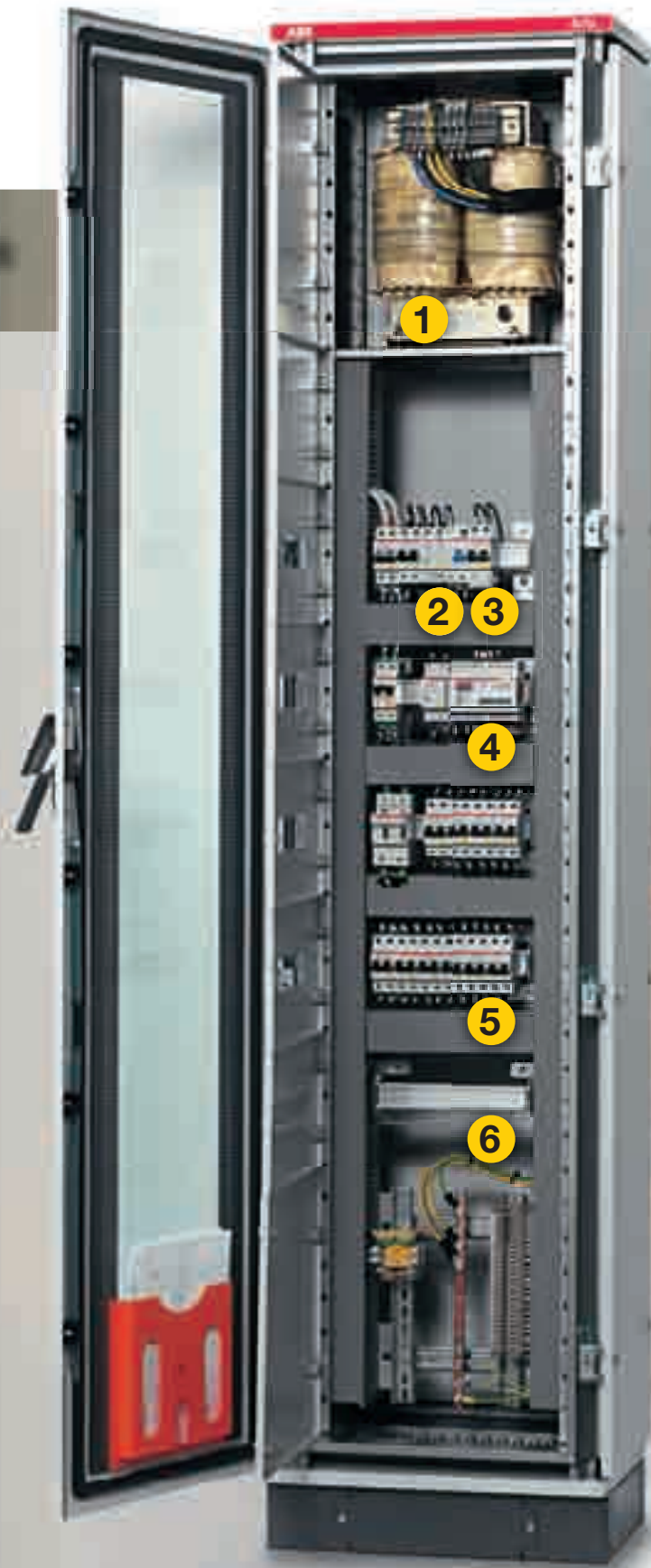
and reliability due to the characteristics of its standardized elements. The colour is RAL 7032. The QSO switchboards are available in wall-mounted and floor-standing versions having power values of 3 kVA, 5 kVA, 7.5 kVA and 10 kVA. Some versions have insulating transformers with internal probes for measuring the temperature. All components used to build QSO switchboards can also be ordered separately.



Preassembled and Certified QSO Switchboards

QSO Switchboards composition

- 1** Insulating transformer
- 2** Surge protection device
- 3** RCBO circuit breaker
- 4** ISOLTESTER-DIG-RZ
- 5** Miniature circuit breakers
- 6** Free modules



- 7** Fuse holder
- 8** Free modules
- 9** Miniature circuit breaker
- 10** ISOLTESTER-DIG-RZ
- 11** Terminal bar
- 12** Insulating transformer



Preassembled and Certified QSO Switchboards

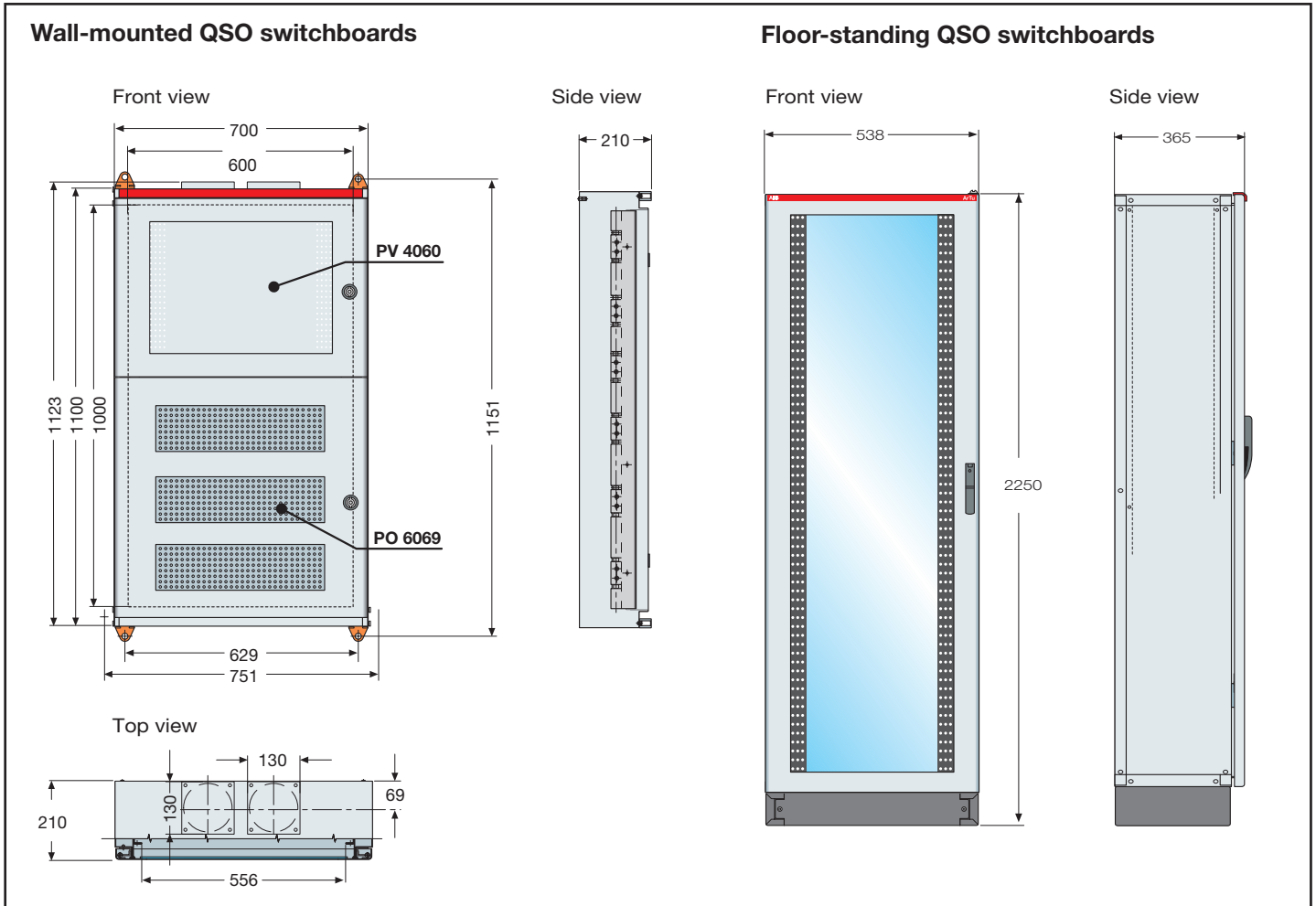
Order codes

Description	Type	ABB code
Wall-mounted 3 kVA QSO switchboards	QSO 3kVA	2CSM110000R1551
Wall-mounted 5 kVA QSO switchboards	QSO 5kVA	2CSM120000R1551
Wall-mounted 7,5 kVA QSO switchboards	QSO 7,5kVA	2CSM130000R1551
Wall-mounted 3 kVA QSO switchboards with probes	QSO 3kVA-S	2CSM210000R1551
Wall-mounted 5 kVA QSO switchboards with probes	QSO 5kVA-S	2CSM220000R1551
Wall-mounted 7,5 kVA QSO switchboards with probes	QSO 7,5kVA-S	2CSM230000R1551
Floor-standing 3 kVA QSO switchboards with probes	QSO 3kVA-S-PV	2CSM310000R1551
Floor-standing 5 kVA QSO switchboards with probes	QSO 5kVA-S-PV	2CSM320000R1551
Floor-standing 7,5 kVA QSO switchboards with probes	QSO 7,5kVA-S-PV	2CSM330000R1551
Floor-standing 10 kVA QSO switchboards with probes	QSO 10kVA-S-PV	2CSM340000R1551
Floor-standing 3 kVA QSO switchboards with probes and 24 V a.c. line	QSO 3kVA-S-PV+24V a.c.	2CSM410000R1551
Floor-standing 5 kVA QSO switchboards with probes and 24 V a.c. line	QSO 5kVA-S-PV+24V a.c.	2CSM420000R1551
Floor-standing 7,5 kVA QSO switchboards with probes and 24 V a.c. line	QSO 7,5kVA-S-PV+24V a.c.	2CSM430000R1551
Floor-standing 10 kVA QSO switchboards with probes and 24 V a.c. line	QSO 10kVA-S-PV+24V a.c.	2CSM440000R1551

Technical features

Power			3 kVA	5 kVA	7,5 kVA	10 kVA
Wall-mounted QSO switchboards	Rated operating voltage	V a.c.	230/230	230/230	230/230	-
	Rated current	A	13,63	22,72	34,09	-
	Dimensions: W x H x D	mm	700x1150x210	700x1150x210	700x1150x210	-
Wall-mounted QSO switchboards with temperature measuring control unit	Rated operating voltage	V a.c.	230/230	230/230	230/230	-
	Rated current	A	13,63	22,72	34,09	-
	Dimensions: W x H x D	mm	700x1150x210	700x1150x210	700x1150x210	-
Floor-standing QSO switchboards with temperature measuring control unit	Rated operating voltage	V a.c.	230/230	230/230	230/230	230/230
	Rated current	A	13,63	22,72	34,09	45,45
	Dimensions: W x H x D	mm	538x2250x365	538x2250x365	538x2250x365	538x2250x365
Floor-standing QSO switchboards with temperature measuring control unit and 24 V a.c. line	Rated operating voltage	V a.c.	230/230	230/230	230/230	230/230
	Rated current	A	13,63	22,72	34,09	45,45
	Dimensions: W x H x D	mm	538x2250x365	538x2250x365	538x2250x365	538x2250x365

Overall Dimensions



Preassembled and Certified QSO Switchboards

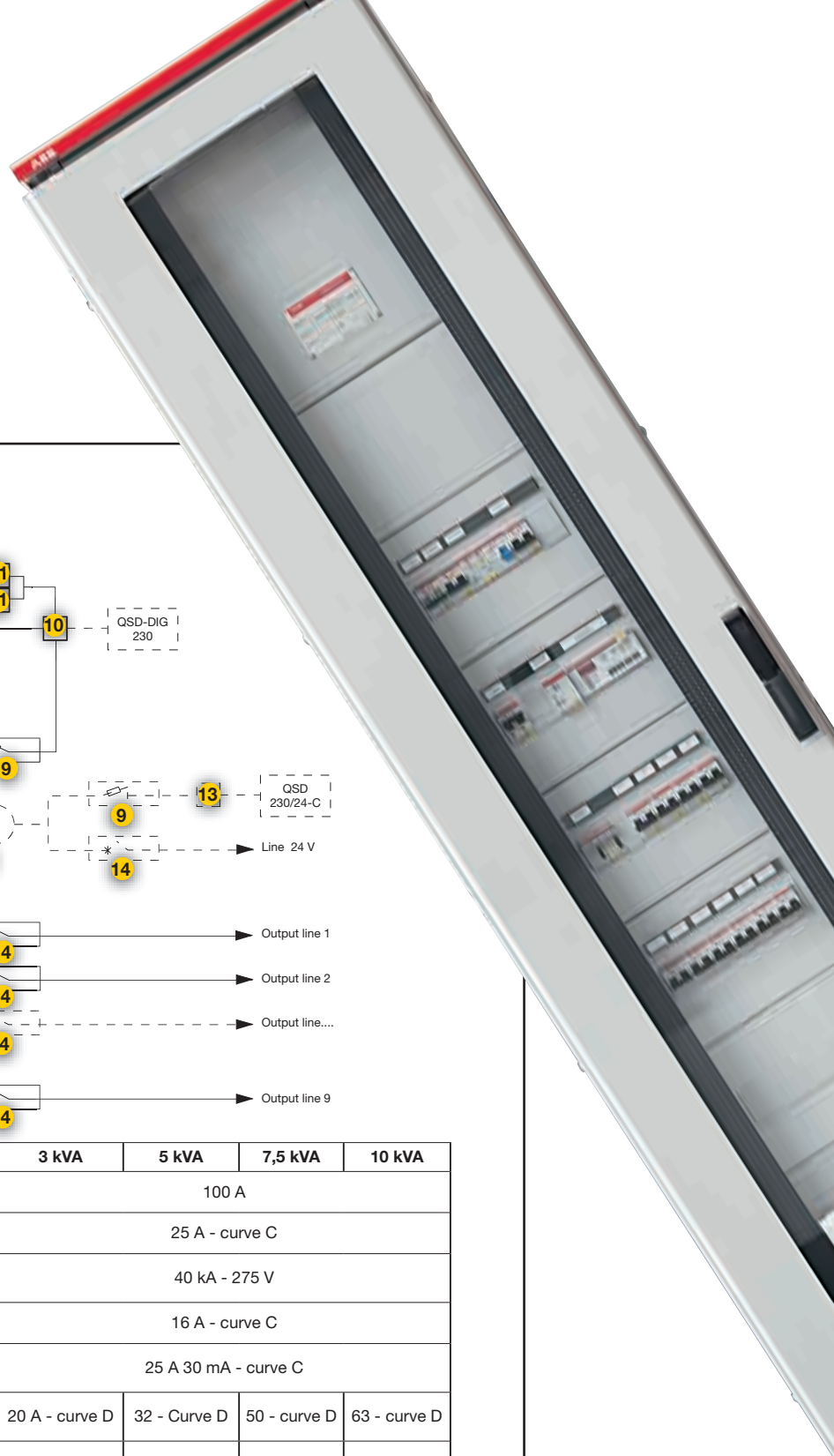
Logical Operating Diagrams

Wall-mounted QSO switchboards

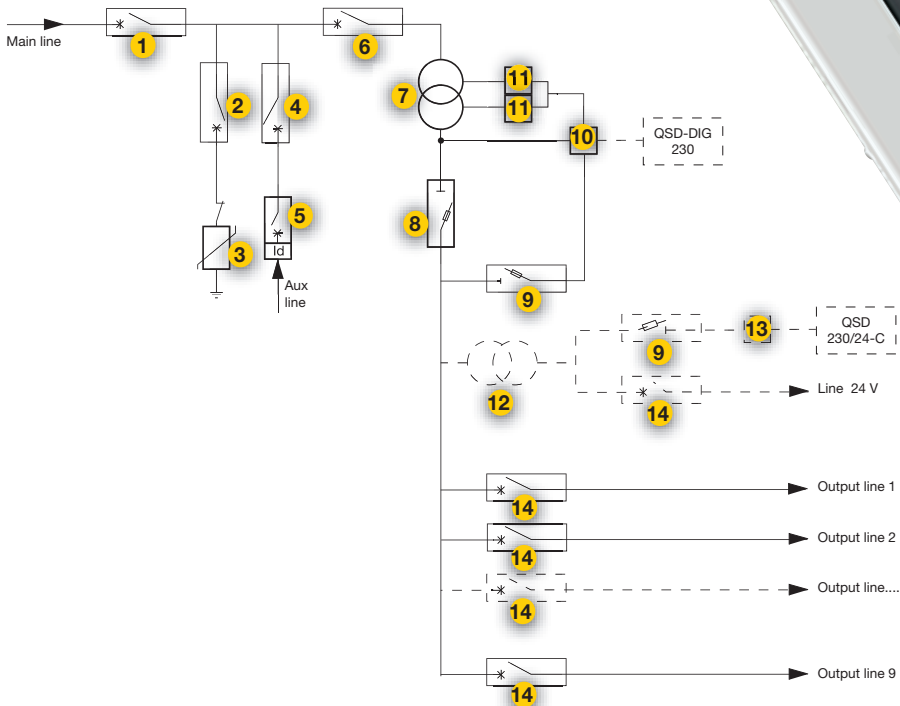
Description	3 kVA	5 kVA	7,5 kVA
1 Fuse holder E932/50	25 A gL	32 A gL	40 A gL
2 Insulating transformer	3 kVA	5 kVA	7,5 kVA
3 Miniature circuit breaker S202 L	16 A	25 A	40 A
4 Fuse holder E931 N/32	2 A gL	2 A gL	2 A gL
5 ISOLTESTER-DIG-RZ	yes		
6 Temperature probe PT100	S version	S version	S version



Logical Operating Diagrams



Floor-standing QSO switchboards



Description	3 kVA	5 kVA	7,5 kVA	10 kVA
1 Disconnector, E202 100 A	100 A			
2 Miniature circuit breaker, S202 25 A - curve C	25 A - curve C			
3 Surge protection device, OVR T2 1N 40 275s P 40 kA - 275 V	40 kA - 275 V			
4 Miniature circuit breaker, S202 L 16 A - curve C	16 A - curve C			
5 RCBO circuit breaker, DS202 25 A 30 mA Type AC- Curve C	25 A 30 mA - curve C			
6 Miniature circuit breaker S202 20 A - curve D 32 - Curve D 50 - curve 2D 63 - curve D	20 A - curve D	32 - Curve D	50 - curve D	63 - curve D
7 Insulating transformer IT ...(S) 3 kVA 5 kVA 7.5 kVA 10 kVA	3 kVA	5 kVA	7,5 kVA	10 kVA
8 Fuse holder, E932/50 50 A gL	50 A gL			
9 Fuse holder, E932/32 32 A gL 32 A gL 32 A gL 32 GL	32 A gL	32 A gL	32 A gL	32 GL
10 ISOLTESTER-DIG-RZ	yes			
11 Temperature probe, PT100	yes			
12 Transformer, 220/24 1 kVA, 24 V version	version 24 V			
13 Selvtester-24	version 24 V			
14 Miniature circuit breaker, S202 16 A - curve C	16 A - curve C			

ISOLTESTER-DIG-RZ



ISOLTESTER-DIG-RZ is an insulation monitoring device for IT-M isolated neutral networks specially designed for medical locations. ISOLTESTER DIG-RZ checks that the power network is isolated from earth as laid down by the installation standards for medical locations. Furthermore ISOLTESTER-DIG-RZ tests the thermal and electric overload of the insulating transformer.

Insulation resistance is measured by applying a direct current signal between the isolated line and earth: the level of insulation can be determined by measuring the leakage current to earth.

ISOLTESTER-DIG-RZ ensures an effective measurement of the insulation resistance even in the presence of strong interference and high harmonic or direct-current components, due to its sophisticated digital filter.

The device offers broad programming possibilities through its user-friendly digital display menu and the four selection keys. The thermal and electric overload of the medical transformer can also be tested by connecting up to two PT100 or PTC probes (DIN 44081) and a current transformer and setting appropriate alarm thresholds. The alarms can be controlled remotely by connecting up to four QSD signalling panels.

ISOLTESTER-DIG-RZ conforms to the EN 61557-8 / IEC 60364-7-710 / CEI 64.8/7-710 V2 / UNE 20615 standards.

Technical features

Power supply voltage	110 - 230 V/50-60 Hz
Network voltage to be tested	24÷230 V a.c.
Maximum voltage measurement	24 V
Maximum current measurement	1 mA
Insulation voltage	2,5 kV/60 sec.
Type of direct-current	Component test signal with digital filter
Measurements made	<p>Insulation measuring range 0-999 kohm/HIGH - resolution 1 kohm</p> <p>Temperature measurement by 2 or 3-wire Rd PT100 temperature probe - 0÷250°C, precision 2%</p> <p>C.T. current measurement, external with 5 A secondary, 2% precision (C.T. ratio value selectable in 1÷200 range)</p> <p>Impedance measurement 0÷999 kohm/ HIGH - resolution 1 kohm (2500 Hz test signal)</p>
Activation thresholds	<p>Low insulation 50÷500 kohm, precision 5%, hysteresis 5%</p> <p>Overtemperature 0÷200 °C, 2% precision</p> <p>Current overload 1÷999 A, precision 2%</p> <p>Low impedance (can be disabled)</p> <p>Device not connected to line (link fail)</p>
Available outputs	<p>Up to 4 QSD panels for remote signalling</p> <p>NO-C-NC, 5 A, 250 V a.c. programmable auxiliary relay output</p>
Displays	<p>Insulation resistance value with signalling of value off scale and earthing fault</p> <p>Temperature value measured 0÷200 °C for channel 1</p> <p>Temperature value measured 0÷200 °C for channel 2</p> <p>Current value measured 0÷999 A</p> <p>Insulation impedance value</p> <p>Programming parameters</p> <p>No connection between device and the line (link fail)</p> <p>Relay output status</p>
Connections	Maximum connectable cross section 2.5 mm ²
Operating temperature	-10...60 °C
Storage temperature	-25...70 °C, humidity < 90%
Size	6 DIN modules
Weight	0,5 kg
Casing	Self-extinguishing plastic case for assembly on a 35 mm DIN section, with a lead-sealable transparent protective front cover
Degree of protection	IP20
Consumption	5 VA
Reference standards	IEC 60364-7-710, EN 61557-8, EN 60255-6, UNE 20615

Order codes

Type	ABB code
ISOLTESTER-DIG-RZ	2CSM244000R1501



The Advantages

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

Frontal operators functioning

Led indicating internal fault alarm, no link to the line to be tested or temperature probe failure

Led indicating the auxiliary relay output status

Led indicating parameter out of range alarm

Led indicating tool programming status

Display for viewing the value of the parameters tested and the settings

Led indicating insulation resistance parameter display (kW), blinks when parameter is out of range

Led indicating transformer temperature parameter display, blinks when parameter is out of range

Led indicating insulation impedance and line capacity display, blinks when parameter is out of range

Led indicating display of 2nd sensor temperature parameter, blinks when parameter is out of range

Led indicating display of line current parameter, blinks when parameter is out of range

Buttons for selecting parameter to be viewed and changing tool settings

Buttons for accessing tool programming mode and confirming settings

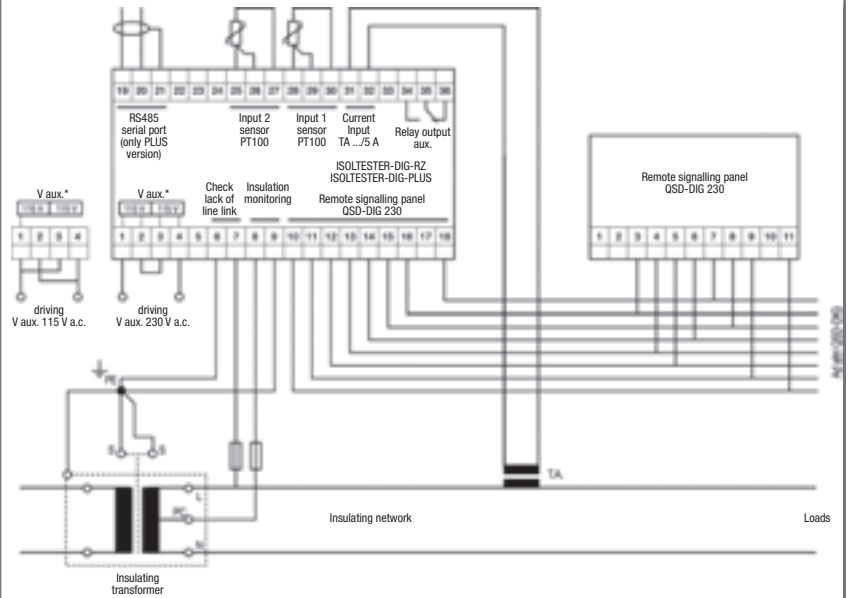
Button for testing the tool and the remote signalling panels and for clearing the settings



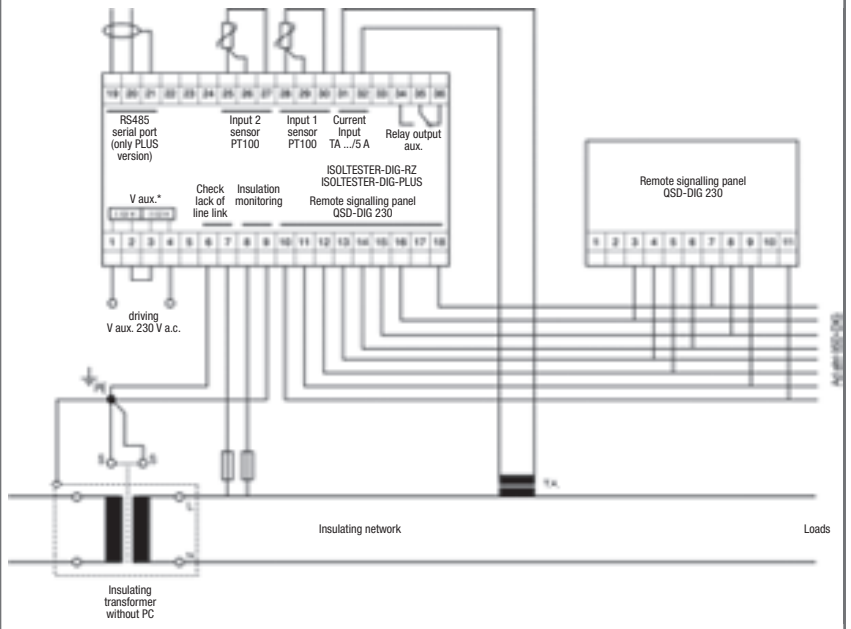
ISOLTESTER-DIG-RZ

Wiring diagrams

With transformer with central socket (pc)



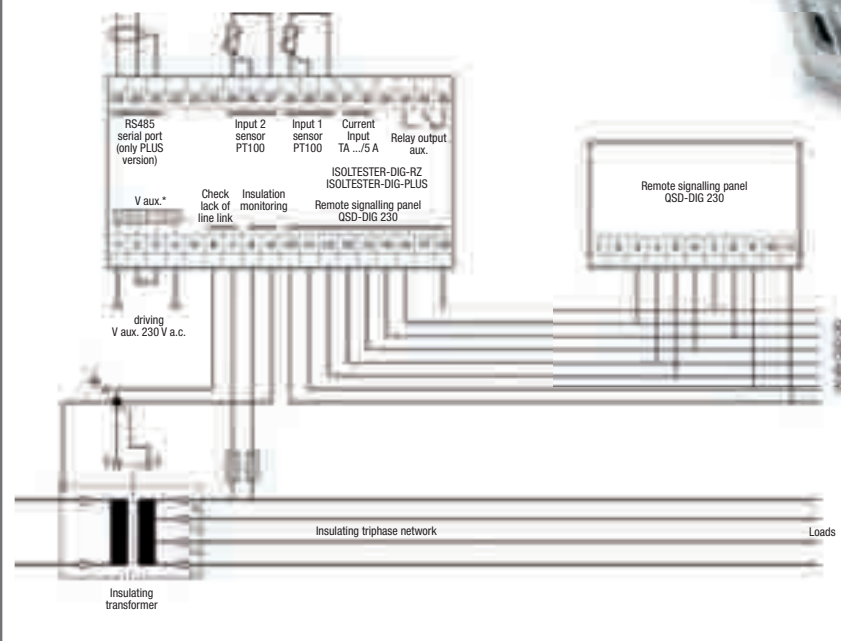
With transformer without central socket (pc)



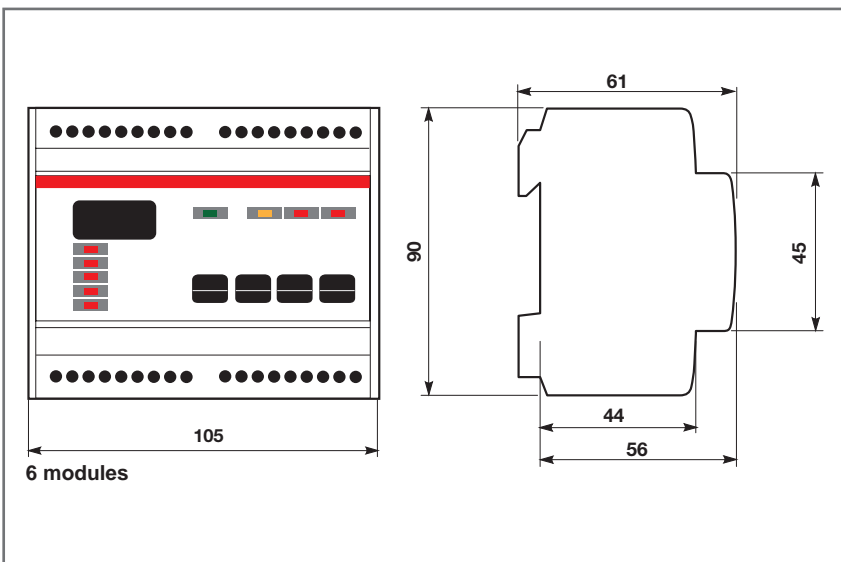


Wiring diagrams

With three-phase transformer



Overall Dimensions



Selvtester



SELVTESTER-24 tests the earth insulation of 24 V a.c./d.c. SELV circuits and is particularly suitable for medical locations (IT-M systems) in which both 24 V and 230 V lines are present;

in these environments, it is important to have a systematic and continuous control of the low-voltage line as, in the event of a fault or short-circuit, this line could transfer a potential of over 250 V with consequent damage to equipment and bodily injury. SELVTESTER-24 measures the variation in potential of the two network polarities with reference to earth so as to signal when insulation drops below a preset value, identifying the faulty pole in direct current. The output signal can be connected to the remote-control signalling panels QSD-230/24-C and QSD-DIG 230/24, to be installed in the rooms powered by the controlled line.

On the front of the device there is a test button, a status indication and two low insulation alarm LEDs. The activation threshold can be adjusted using microswitches.



The Advantages

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

Order codes

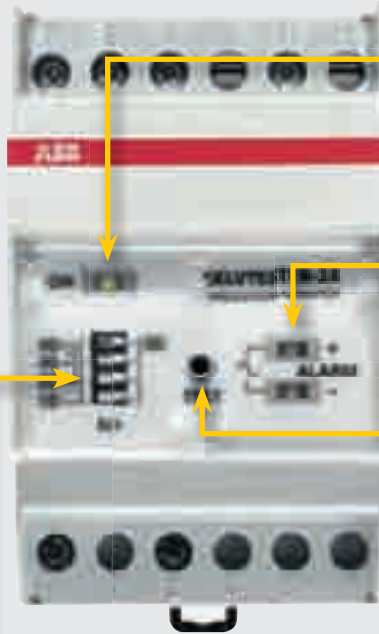
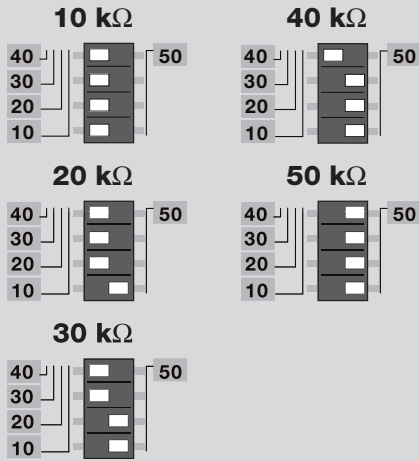
Type	ABB code
SELVTESTER-24	2CSM211000R1511

Technical features

Network voltage and auxiliary power supply	24 V 50-60 Hz/d.c. ± 20%
Max loss	3 VA – 3 W
Max measuring current	max. 0,5 mA
Internal impedance	50 kohm
Activation threshold setting	programmable to 10 ÷ 50 kohm (4 levels using microswitches)
Activation delay	about 1 second
Signals	led ON, led ALARM +, led ALARM -
Output	for up to 2 QSD-230/24-C, max. 24 V 1 A remote panels
Operating / storage temperature	-10 ÷ 60 °C / -20 ÷ 70 °C
Relative humidity	≤ 95%
Insulation test	2,5 kV 60 sec. / 4 kV imp. 1,2/50µs
Terminal cross section	4 mm ²
Front degree of protection	IP40 with cover / IP20 container
Modules	3
Weight	about 200 g
Reference standards for safety:	IEC 60364-7-710 EN 61326-1 EN 61010-1

Microswitches

The front microswitches can be used to set the activation threshold in the range between 10 and 50 kΩ, as shown in the diagram.



Green ON LED

Indicates that the tool is on

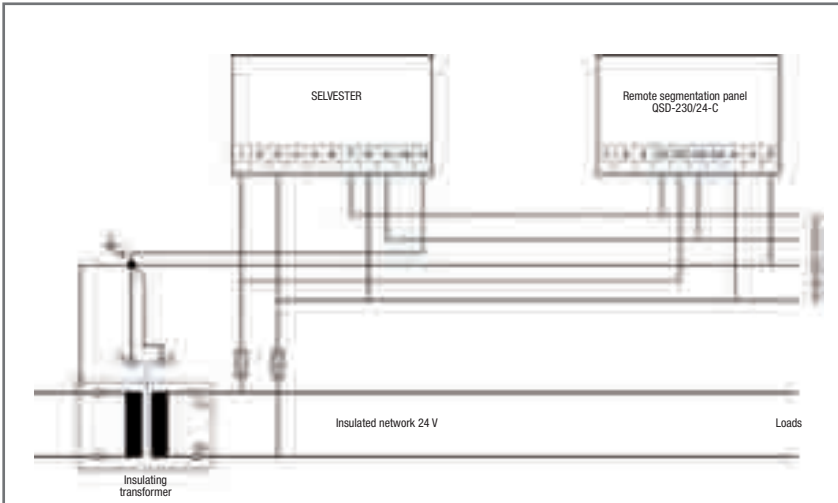
Yellow ALARM LEDs

Signals a low isolation alarm; if the line to be tested receives alternating current, the two LEDs light up while, with direct current, only the LED with the polarity below the activation threshold lights up.

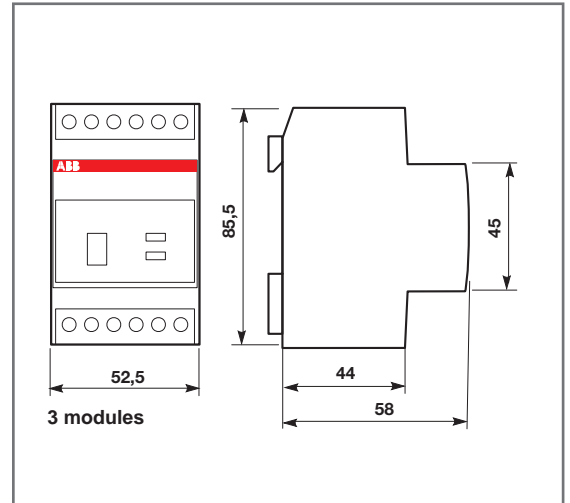
Test button

Executes a functional test on the tool

Wiring diagrams



Overall dimensions



QSD remote signalling panels



The QSD remote signalling panels enable the alarm signals from the insulation monitoring devices to be transmitted to all rooms supplied by the panel, as laid down by the reference standards. The QSD panels generate an acoustic and luminous signal for a low insulation alarm or a thermal and electric overload. In addition, they have a TEST button for periodically checking their operating status and a key for turning off the acoustic signal. They are assembled in universal 3-module flush-mounted boxes.

Order codes

Type	ABB code	For ISOLTESTER	For SELVTESTER
QSD-DIG 230/24	2CSM273063R1521	yes	yes



The Advantages

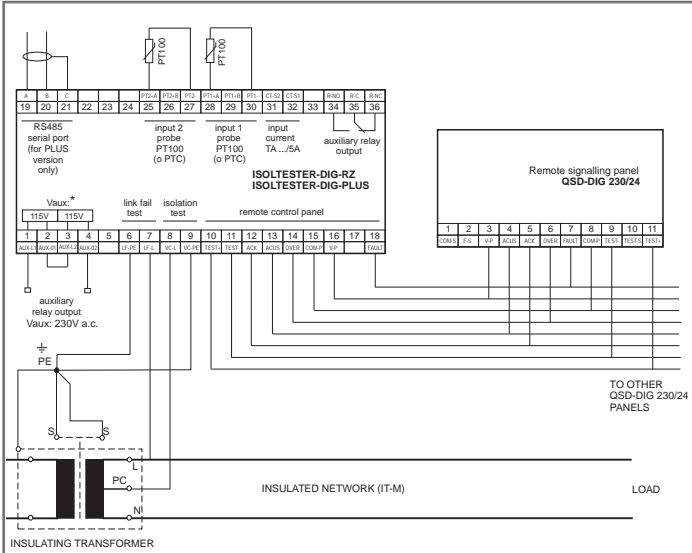
- Universality: installation in a common 3-module flush-mounted box
- Efficiency: acoustic and luminous signalling

Technical features

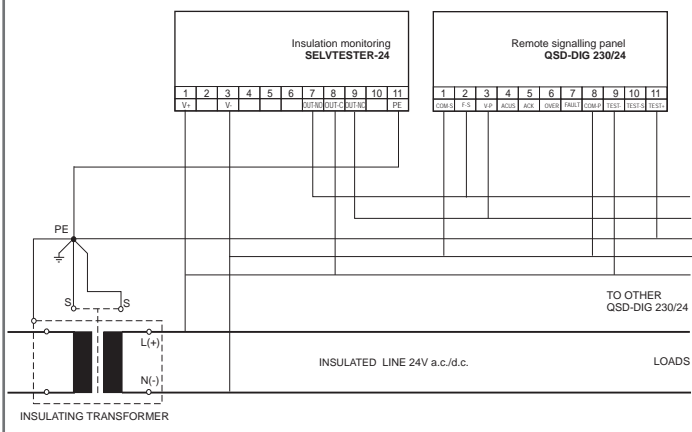
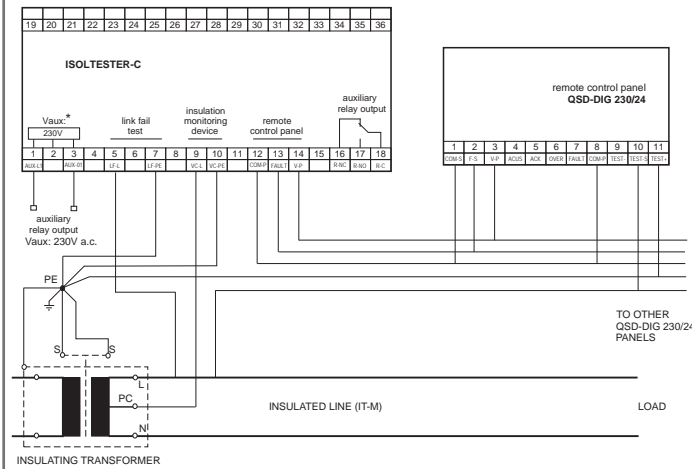
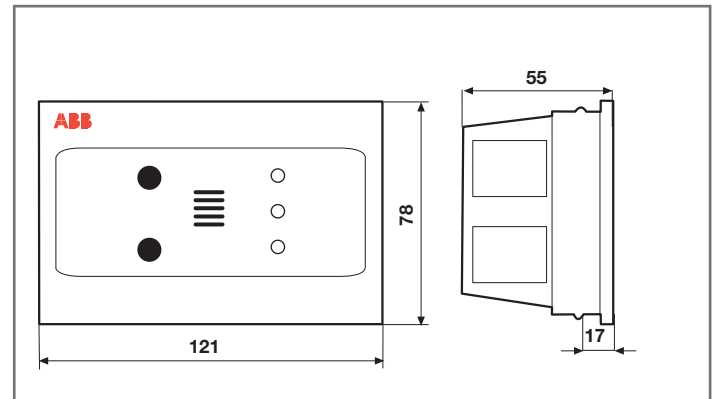
Signals	green led NETWORK, red led overload ALARM, yellow led low insulation FAULT ALARM, acoustic signaller, emission 2400 Hz intermittence 2 Hz dB
Buttons	TEST and MUTE buttons
Terminal cross section	2,5 mm ²
Degree of protection	IP30
Installation	in E503 universal flush-mounted box
Weight	200 g
Operating temperature	-10 ÷ 60 °C, max. humidity 95%
Storage temperature	-25 ÷ +80 °C
Insulation	2500 Vrms 50 Hz per 60 sec
Reference standards	safety CEI EN 61010-1 product CEI EN 61557-8 / CEI 64.8/7-710 V2/ IEC 60364-7-710 / UNE 20615 electromagnetic compatibility CEI EN 61326-1



Wiring diagrams



Overall dimensions



Insulating Transformers



Permanently connected to an IT power supply system, the single-phase insulating transformers for medical use provide galvanic separation between the distribution network and the user load in accordance with the IEC standards EN 61558-1 and IEC EN 61558-2-15 for the power supply of medical locations belonging to group 2.

Main characteristics

- Air cooling
- Output power from 3 kVA to 10 kVA
- Short-circuit voltage drop of less than 3%
- Primary no-load current less than 3% of rated current
- In-rush current (peak value) less than 12 times the rated current I_n (effective value)
- Leakage current to earth of the secondary winding and leakage current of the casing, measured with no load, less than 0.5 mA
- Secondary voltage less than 250 V



The Advantages

- Specialization: designed specially for medical use
- Compact size: the insulating transformers installed in the ABB QSO switchboards are the most compact on the market
- Quality: the insulation of the windings designed with exclusive vacuum-pressure technology, guarantees maximum heat dissipation
- Accessories: versions available with PT100 probes for all capacities
- Double or strengthened isolation between the windings and between the windings and earth
- Between the two windings there is a metal screen that must be connected to earth



Order codes

Description	ABB Code
Insulating transformer 3 kVA	2CSM110000R1541
Insulating transformer 5 kVA	2CSM120000R1541
Insulating transformer 7,5 kVA	2CSM130000R1541
Insulating transformer 10 kVA	2CSM140000R1541
Insulating transformer 3 kVA with probe	2CSM210000R1541
Insulating transformer 5 kVA with probe	2CSM220000R1541
Insulating transformer 7,5 kVA with probe	2CSM230000R1541
Insulating transformer 10 kVA with probe	2CSM240000R1541
Antibuzzing shock-absorbers for transformers	2CSM900000R1541

Technical features

Power		3 kVA	5 kVA	7,5 kVA	10 kVA
Electric protection class		1	1	1	1
Thermal insulation class		B 130 °C	B 130 °C	F 155 °C	F 155 °C
Max. ambient temperature		40 °C	40 °C	40 °C	40 °C
Rated voltage	V	230	230	230	230
Secondary voltage	V	230	230	230	230
Secondary current	A	13	21,7	32,6	43,5
Delayed fuse current external secondary	A	T 12,5	T 20	T 32	T 40
Frequency	Hz	50 - 60	50 - 60	50 - 60	50 - 60
Reference standards		IEC 61558-1 IEC 61558-2-15 IEC 62041			
Dimensions WxHxD	mm	205x340x150	240x380x150	240x380x160	277x380x260
Weight	kg	29,5	44	50,5	73



ABB SACE

A division of ABB S.p.A.

Line Protection Devices

Viale dell'Industria, 18

20010 Vittuone (MI)

Tel.: +39 02.9034.1 - Telefax: +39 02.3034.7609

<http://www.abb.com>

Due to possible developments of standards as well as of materials, the characteristics and dimensions specified in the present catalogue may only be considered binding after confirmation by ABB SACE.

2CSC004020E0201 06/'08
Printed in Italy
2.000 - CAL

