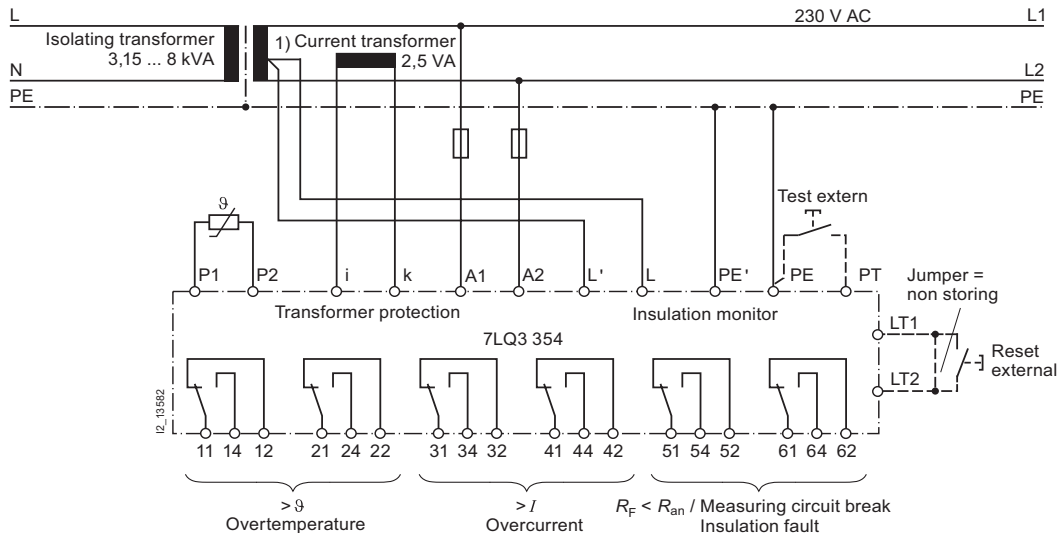


More information

Connection example

7LQ3 354 insulation monitors



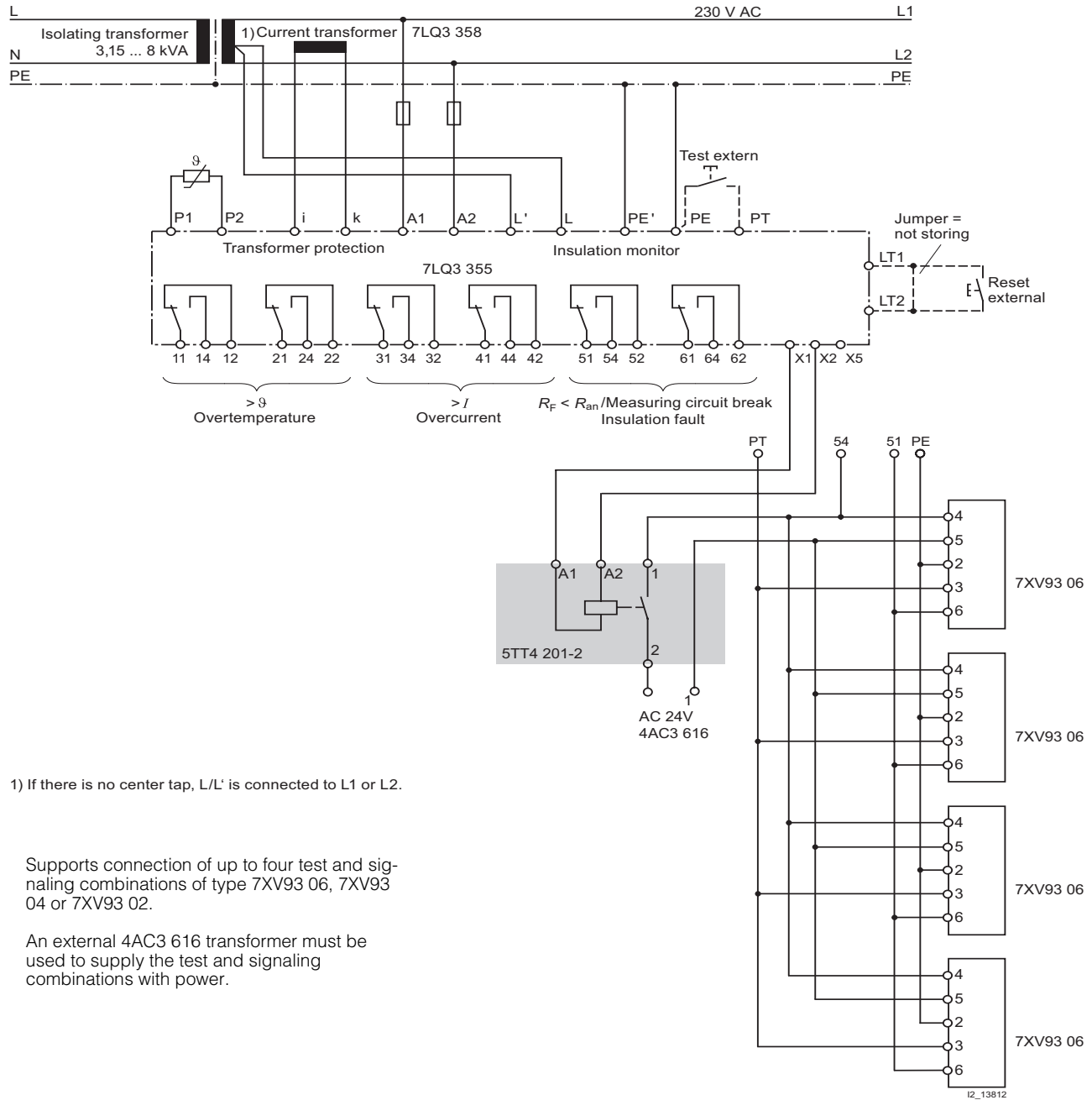
1) If there is no center tap, L/L' is connected to L1 or L2.

BETA Monitoring

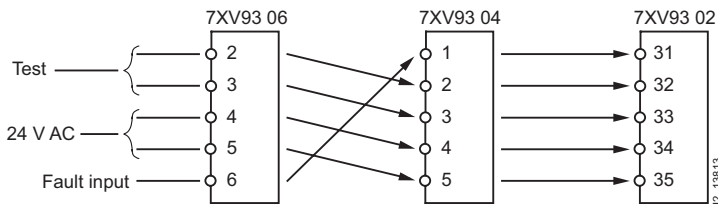
Monitoring of Electrical Values

Insulation monitors for medical premises

7LQ3 355 insulation monitors



Comparison of the contact assignment of the no longer available test and signaling combinations; 7XV9 306, 7XV9 304 and 7XV9 302



Monitoring of medical premises

Medical premises are all rooms used for the examination or treatment of persons or animals. This includes treatment rooms for hydrotherapy and physiotherapy and massage rooms.

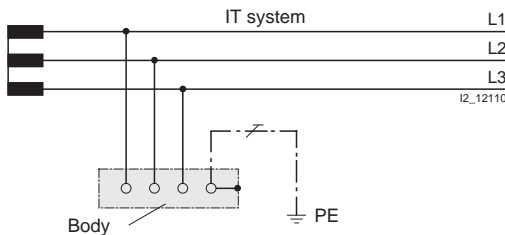
TÜV approved and safety-tested changeover and monitoring units ensure the reliable power supply of such rooms. Any insulation monitors and voltage relays installed in these changeover and monitoring units must meet the requirements of DIN VDE 0100-710 and IEC/EN 60364-7-710.

The changeover and monitoring units serve to safeguard the power supply of non-grounded IT systems on medical premises. In the event of a voltage drop, they switch from the preferred power supply to a second power supply.

IT system

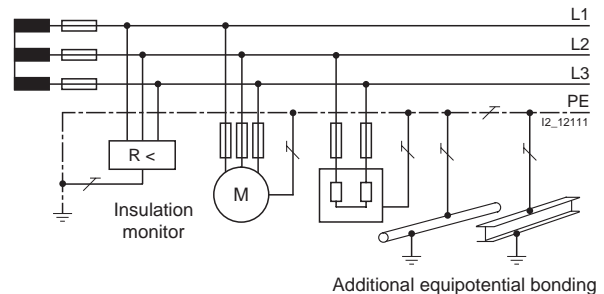
In the IT system designation, the first letter describes the grounding conditions of the power source. I stands for isolation of all live parts from the ground or the linking of a point to the ground over an impedance. The second letter designates the grounding conditions of the body of the electrical plant.

T means that the body is directly grounded, independent of any existing grounding of a point of the power source.



IT system to DIN VDE 0100-300 and IEC/EN 60364-3

The IT system is powered over an isolating transformer or an independent power source (e.g. a battery). The special feature here is the fact that no active conductor is directly linked to the ground in this system. This has the advantage that only a small residual current can flow in the event of an insulation fault. This is largely due to the system leakage capacitance. The upstream fuse does not respond so that the power supply, and therefore operation, is maintained, even in the event of a single-pole ground fault. The high reliability of an IT system is ensured by continuous insulation monitoring. The insulation monitor detects insulation faults as they develop and signals in good time if a value falls below a limit value, before any further insulation faults can lead to an unexpected shutdown.



Typical configuration of an IT system with additional equipotential bonding and insulation monitoring

Insulation monitoring

The 7LQ3 354 and 7LQ3 355 insulation monitors are used for monitoring the insulation resistance of non-grounded IT systems on medical premises, such as hospitals, doctors' surgeries and outpatient treatment centers. They also simultaneously monitor the load current and the temperature of the IT isolating transformer. The device can monitor both three-phase and AC systems.

Load current measurement: The load current is detected over the 7LQ3 358 current transformers.

Temperature measurement: The temperature in the transformer development is recorded over PTC thermistor or NC contacts.

Evaluation: If one of the values is outside the limit values, an alarm is triggered. The LED for the relevant fault lights up and the alarm relay switches. The information is made available over CO contacts.

As well as an adjustable response value of 50 ... 500 kΩ, the 7LQ3 355 insulation monitor also has a 1-step LED chain for displaying the current insulation resistance of the system. A range of different colored LEDs indicate the insulation resistance within a range of 20 kΩ ... 1 MΩ. This allows insulation deteriorations to be detected even before an alarm is triggered. The device is also equipped with an additional relay for connection of a test and signaling combination. This supports connection of the no longer available test and signaling combinations, 7XV9 306, 7XV9 304 and 7XV9 302, to the 7LQ3 355 insulation monitor (see connection example: 7LQ3 355 insulation monitor).

Load current sensing: The 7LQ3 358 measuring current transformer senses the load current of a phase for the incoming supply of medical premises. Evaluation is carried out over insulation monitors, such as the 7LQ3 354 and 7LQ3 355 insulation monitors.

BETA Monitoring

Monitoring of Electrical Values

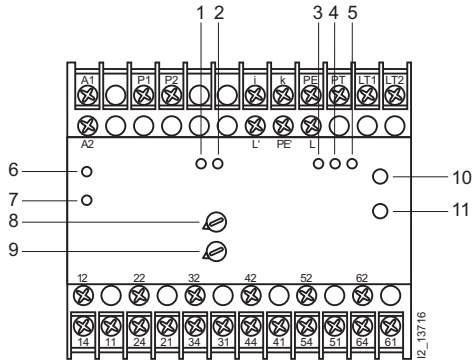
Insulation monitors for medical premises

Voltage monitoring

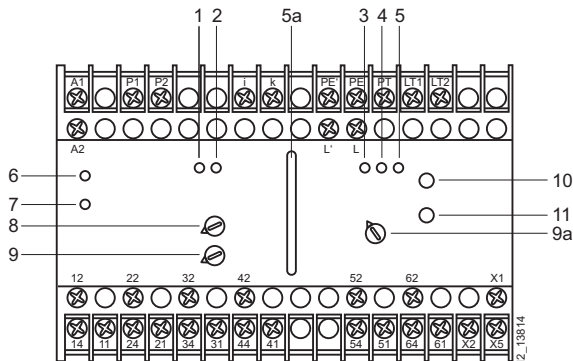
In the case of undervoltage, there is no guarantee that medical equipment will continue to function. Because of the risk this presents to patients, e.g. during operations, it is essential that a changeover unit switches to a second power supply in the event of an undervoltage in the preferred power supply.

Control elements for insulation monitors

7LQ3 354



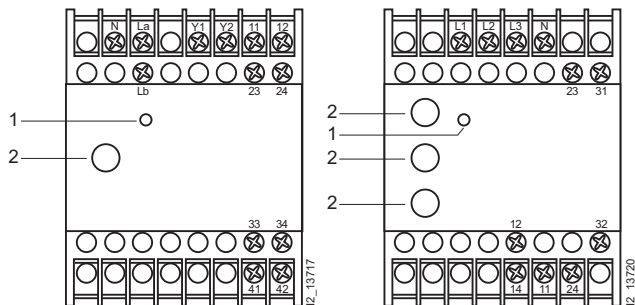
7LQ3 355



Control elements of voltage relay

5TT3 411

5TT3 412



The voltage relays switch when the voltage falls below 90 % of the rated voltage. The 5TT3 411 relays serve to monitor a 1-phase infeed. 3-phase infeeds can be monitored using 5TT3 412 relays. These relays also offer asymmetry, reverse voltage and phase failure detection.

LED	Meaning
1	Current monitoring (green) Lights up if the current is correct (Go-state)
2	Current monitoring ">I" (red) Lights up in the case of overcurrent
3	Insulation monitoring "ON" (green) Lights up when the power supply is switched on (ready to run)
4	Insulation monitoring "MK" (red) Lights up if a line of the measuring circuit is interrupted (L, L', PE, PE')
5	Insulation monitoring "AL" (red) Lights up in the case of an insulation fault, $R_F < R_{on}$ (value has fallen below the response value)
5a	Insulation monitoring "RF" (red, yellow, green) 11-step LED chain to display the current resistance
6	Temperature monitoring (green) Lights up when the power supply is switched on
7	Temperature monitoring (red) Lights up in the event of overtemperature or an interruption in the sensor circuit

Pushbutton/rotary regulator	Meaning
8	Rotary regulator response value ">I" Setting of the response value for current monitoring
9	Rotary regulator delay time Setting of delay time after which the CO contacts return to their normal position if the current value exceeds the set response value.
9a	Rotary regulator response value " $R_{on} k\Omega$ " Setting of the response value for line insulation monitoring.
10	"Test" pushbutton Pressing the test button simulates an insulation deterioration in the measuring circuit (R_F approx. 40 k), thus checking that the line insulation monitor is fully functional.
11	"Reset" pushbutton Deletion of fault if the fault storage is activated

LED/pushbutton	Meaning
1	5TT3 411: yellow LED 5TT3 412: green LED The LED lights up if the system is fault-free
2	Test button Pressing the test button simulates an undervoltage. The 3-phase 5TT3 412 voltage relay has a test button for each phase.