Change-over and monitoring unit
For medical locations acc. to
DIN VDE 0100 Part 710

Operator manual

Information on the manual

Please read this manual, before using the change-over unit. Retain these manual. When the devices are passed to others, the manual has to be forwarded also. This device and its components may only be used for the applications intended.

Disregarding the safety instructions can cause injuries to persons or other damages. If damages arise which are caused by not complying with the operating instructions, no liability or claim shall be accepted.

Equipment may be commissioned and operated only by qualified personnel. Qualified personnel within the meaning of the safety notices in this manual are persons who are authorized to commission, ground and identify equipment, systems and circuits in accordance with safety engineering standards.

The directives guidelines and standards have to be considered

All reasonable endeavours have been made to ensure the accuracy of the content of this operator manual.

Errors, misinterpretations or omissions can not be ruled out.

1 General

1.1 Legend

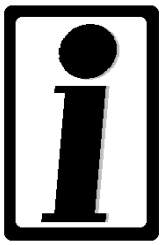
The following section provides a description of the symbols used in this manual

Caution!

This symbol draws attention to information where compliance is essential. Failure to comply with such information may lead to injury or damage to persons or property.

Danger!

Indicates that death, serious injury or substantial property damage will result if proper precautions are not taken.



Note!

Indicates important information regarding the product, the handling of the product or a specific section of the documentation, which should be given special attention.

1.2 Standards and specifications

General standards and specifications

IEC 60439-1 and EN 60439-1
(DIN VDE 0660 Part 500), DIN VDE 0106 Part 100,
IEC 1641 and VDE 0660 Part 500, supplement sheet 2

Clearances in air and creepage distances

DIN VDE 0110 Isolation Group C for 1000 V,
40 to 60 Hz, degree of protection acc. to IEC 529, EN 60529,
IP 20

Additional standards and specifications for medical premises of Application Group 2

DIN VDE 0100 Part 710
IEC 60364-7-710

Test report, certification and markings

Testing is performed by TÜV Rheinland / Berlin-Brandenburg.
Type test report no. 074013

2 Notes on safety

The 7LQ3 361 / 362 change-over unit has been built and tested according to safety specifications. The changeover unit may only be used in perfect technical condition and for its intended purpose.
However, even if this is the case, the unit may still pose a hazard to users, third parties and/or property during use.

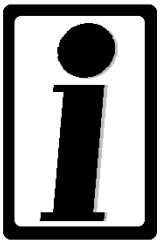
Any faults that could impair the correct operation of the changeover unit should therefore be remedied without delay. Furthermore, no modifications may be made to the changeover unit. Only original spare parts should be used during repair work.

All operation and maintenance of the changeover unit may only be carried out by suitably qualified personnel (who have read and understood all the safety information contained in this operating manual).

Always ensure compliance with the correct ratings (voltage, fusing) for the respective changeover unit. Prior to start-up, always carry out a function test to check that all connections are correct.

Prior to start-up, carry out a visual inspection to ensure that there are no obvious signs of damage, any damaged components must be replaced immediately.

The insulation monitor must be disconnected from the power supply prior to checking the insulation and voltage.



When selecting a changeover unit, it is essential to ensure that the switchgear dimensioning is proper for the facility.

3 Technical description

3.1 Use

The 7LQ3 361 / 362 changeover unit is intended exclusively for switching between two redundant feeder lines.

It serves solely to supply the IT systems of Group 2 medical locations acc. to DIN VDE 0100 – 710 and IEC 60364-7-710

Any other use is not permissible and constitutes an improper use. Siemens AG shall accept no liability whatsoever for any injury or damages resulting from such improper use.

3.2 Model versions

Depending on the power of the IT system transformer, the following changeover units with monitoring are available for IT systems.

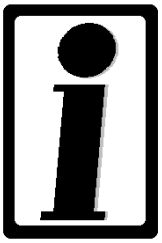
Type	Pole	Rated current (*)	Suitable IT transformer
7LQ3 361	2	80 A (36 A)	Up to 8 kVA
7LQ3 362	4	80 A (25 A)	Up to 8 kVA

(*) Rated current acc. to DIN VDE 0100-710:2002-11 Section 710.537-6

The change-over units are made for mounting in Distribution Boards ALPHA 630 and ALPHA AS with a depth at least of 320 mm.

3.3 Functional description

The 7LQ3 361/362 change-over unit serves the redundant power supply of rooms that meet the requirements of and comply with Group 2 as defined in DIN VDE 0100 710 or IEC 60364-7-710.

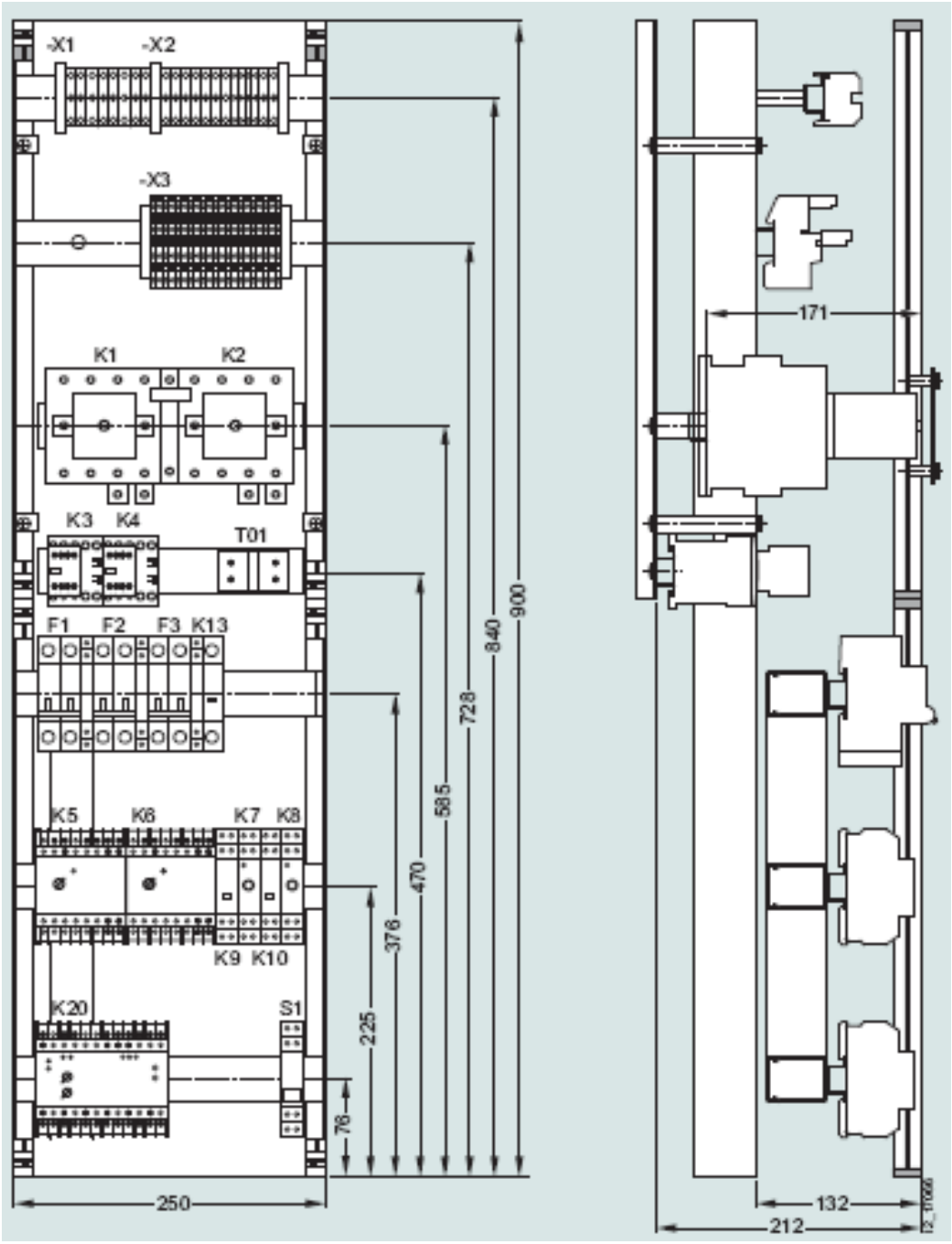


Because the power supply of Group 2 rooms must be implemented as an IT system, the supply must be provided from the building's main distribution board over two separate lines.

Functions of the 7LQ3 361/362 change-over unit:

- Monitoring and safeguarding the power supply of Group 2 rooms
- Change-over time of the change-over module t < 0.5 s
- Monitoring of line 1 (preferred line)
- Monitoring of line 2 (redundant line)
- Change-over to line 2 (if available) if line 1 fails
- Change back to line 1 (as soon as it is available again)
- Insulation monitoring of IT system
- Monitoring of the temperature of the IT system transformer
- Monitoring of the load of the IT system transformer

The 7LQ3 361/362 changeover unit is suitable for the changeover of two redundant IT system transformers.


-X1
-X2
-X3
K1
K2
K3
K4
T01
F1
F2
F3
K13
K5
K6
K7
K8
K9
K10
K20
S1
76
225
376
470
585
728
840
900
250
171
132
212

The change-over unit includes the following components for monitoring and measuring:

- Voltage relay Type: 5TT3 411 for 2-pole changeover
  (type: 5TT3 412 for 4-pole changeover)
- Insulation monitoring device (IMD)
  Type: 7LQ3 354

The voltage relays permanently monitor the voltage of both redundant lines.

The IMD measures the insulation in the ungrounded AC system of the IT system.

- Fixed alarm value for ground fault R(AL) 50 kΩ
- With line breakage monitoring in the measuring circuit

The IT line monitor also monitors the load and temperature of the IT system transformer.

- Measuring range of the load from 5 … 50 A (with external 7LQ3 358 transformer, 50/5 A), adjustable 0.1 … 1 I_n)
- Detection of temperature overshoots and wire breaks in the sensor circuit (supports connection of up to 6 thermistors)

All status and fault indications are floating and output twice.

The changeover unit is powered over two redundant lines according to DIN VDE 0100 710:

Changeover of two-pole 7LQ3 361
- Line 1 (preferred infeed) connection terminal –X1:1 and 2
- Line 2 (redundant infeed) connection terminal –X1:4 and 5

The outfeed to the IT system transformer is implemented over terminal –X1:7 and 8

Changeover of four-pole 7LQ3 362
- Line 1 (preferred infeed) connection terminal –X1:1 to 4
- Line 2 (redundant infeed) connection terminal –X1:6 to 9

The outfeed to the IT system transformer is implemented over terminal –X1:11 to 14

The infeed and outfeed terminals are designed for a conductor cross-section of 4 – 16 mm².

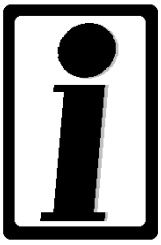
Monitoring module

Infeed of IT system transformers Connection to terminal –X2: 1 and 2
The sensor connection of the IT system transformer
Connection to terminal –X2:10 and 11 (7LQ3 361)
Connection to terminal –X2:12 and 13 (7LQ3 362)
Outfeed to IT system Connection to terminal –X2: 3 and 5

Signalling and test equipment/GLT

Connection over terminal –X3
(Exact data can be found in the circuit diagram for signalling to panel and signalling to GLT)

The backup fuses must be designed so that they ensure short-circuit protection of the transformer and selectivity for the downstream overcurrent protective devices of the IT systems.



If every single control voltage fails, it is also possible to switch the automatic 7LQ3 361/362 change-over unit manually (the cover must be removed first). This ensures enhanced service security of the IT system.

4 Installation, commissioning and maintenance

The connections have to be tested before initiation of the change-over unit.

The current security and accident prevention regulations have to be considered

On receipt of delivery, please check the packaging for damage and the contents of the delivery against the delivery note(s). Please inform immediately if any damage has been incurred during transit.

All assembly, commissioning and maintenance work may only be carried out by qualified experts or suitably trained personnel.

Prior to assembly, a further visual inspection should be carried out in order to ensure there is no damage to equipment.

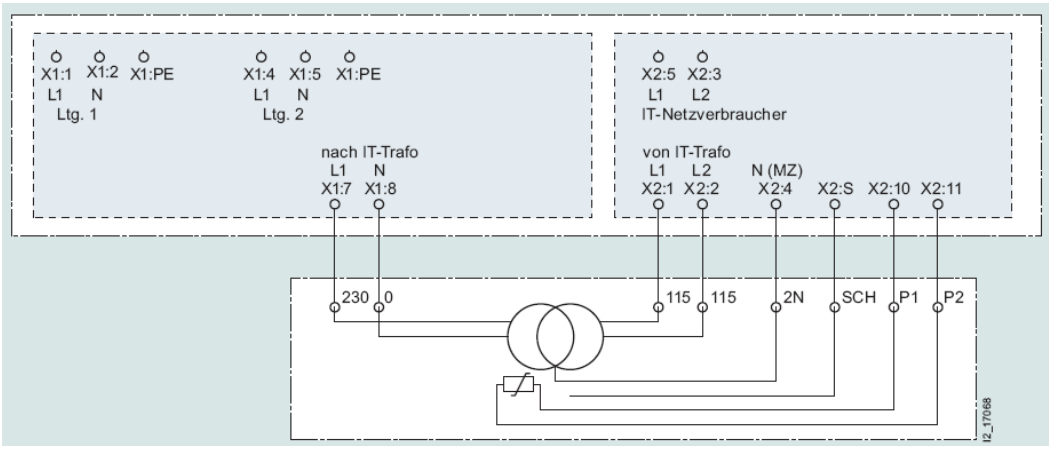
Never try to operate a changeover unit if it is damaged!

Check that all screw and terminal connections are securely fitted.

When applying voltage to both infeeds, the changeover unit will automatically go to the preferred position.

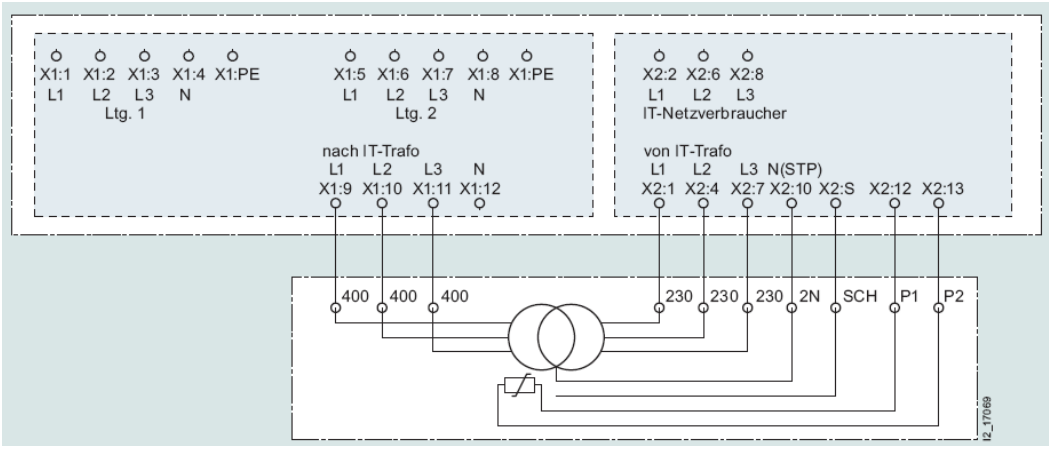
Remove all Screws from the transporter unit before mounting. To ease the mounting, the change-over unit can be fixe with the 4 lower screws and fasten with the remaining 4 screws. To ensure a safe and proper usage, it is necessary to tighten all 8 screws.

7LQ3 361



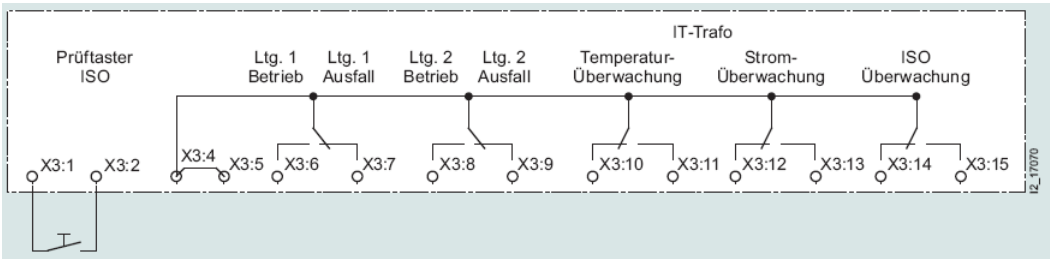
Terminals X1+X2: Power section
If there is no center tap, the terminals X2:3 and X2:4 have to be bridged.

7LQ3 362

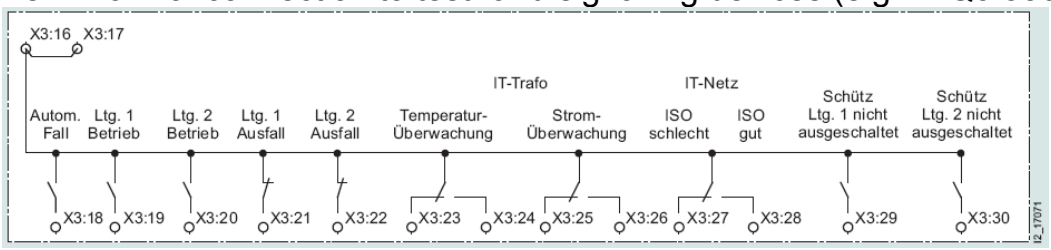


Terminals X1+X2: Power section

7LQ3 361 and 7LQ3 362



Terminal X3: connection to test- and signalling devices (e.g. 7LQ3 356 or 7LQ3 357)



Terminal X3: connection to Building Management Systems

The following set values apply for the measuring circuits:

- **Voltage monitoring** **Response value 0.9 U_N**

  5TT3 411
  5TT3 412

- **IMD** **7LQ3 354**

- Insulation monitoring	non-adjustable	50 kΩ
- Temperature monitoring	response value	3.2 – 3.8 kΩ
- Load monitoring of IT transformer	3.15 kVA	14 A
	4.00 kVA	18 A
	5.00 kVA	22 A
	6.30 kVA	28 A
	8.00 kVA	35 A
	Response delay	t = 2 s

The response value of the load current can be set

7LQ3 361 Terminal –X2: 12 (l) and 13 (k)
7LQ3 362 Terminal –X2: 14 (l) and 15 (k)

These terminals are only for the setting of the load current response value.
It is not allowed to use these terminals for any other case. Maximum current is 10 A, because of the conversion rate 1:5.
The terminals for setting the load stay unlinked and shall not be bridged.

Setting the response value for load current monitoring:

1. Separation of the IT transformer by switching off the MCB F3.
2. Setting the response value of the current monitor and the delay time of the IMD (K20) to minimum.
3. Injecting an alternating current (50HZ) according to table below into Terminals - X2:12 (l) and 13 (k) (7LQ3361) or –X2:14 (l) und 15 (k) (7LQ3362):

Rated power of the IT-transformer	Rated current of the IT-transformer	adjustment value for injection
3,15 kVA	14 A	2,8 A
4,00 kVA	18 A	3,6 A
5,00 kVA	22 A	4,4 A
6,30 kVA	28 A	5,6 A
8,00 kVA	35 A	7,0 A

4. Increasing the response value until the indication LED for the overcurrent extinguishes
5. Disconnect the current supply from the change-over unit
6. Adjust the value for the delay time
7. Close the MCB F3 and activate the facility.

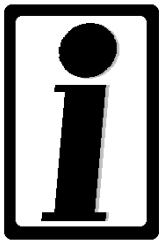
Attention!!

-- only for 2-pole change over units –

If there is no center tap, or for change over of two IT-systems, the terminals X2:3 and X2:4 have to be bridged.

Caution!

The changeover unit should be tested monthly!



If the control fails, please inform/discuss with Siemens AG in order to remedy the fault

- **Test insulation monitoring**
  Activation of the test pushbutton

  -K20 (7LQ3 354)
  Insulation fault
  Indication output
  No changeover

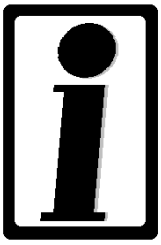
- **Test undervoltage relay line 1**
  Activation of the test pushbutton

  - K5 (5TT3 411/5TT3 412)
  Voltage reduction under 0.9 U_N
  Changeover is actuated
  from line 1 to line 2
  This is followed by a time-delayed change back.

- **Test temperature monitoring**
  Activation of the test pushbutton

  - S1
  Overtemperature transformer
  Indication output

The fault indications are signalled both visually and acoustically at the connected test and signalling units over the function control.



The components in the 7LQ3 361/362 change-over unit are not subject to mandatory maintenance.

The circuit diagrams of the ordered changeover unit are included in the manual.

1

5 Warranty and liability

Siemens AG shall provide no warranty and accept no liability whatsoever for injury or damages if due to the following:

- ➔ Improper handling (assembly, commissioning, operation and maintenance)
- ➔ Unauthorized modification of the changeover unit
- ➔ Improper use of the changeover unit
- ➔ Repairs carried out by unqualified/unauthorized persons and/or use of non-original spare parts and accessories
- ➔ Events due to force majeure and/or ingress of foreign bodies

6 General information

- All rights reserved.
- This publication may only be reproduced or transmitted with the express agreement of the publisher.
- Subject to technical changes without notice!
- Please send any defective units to the relevant Siemens AG branch.

- If you have any further queries regarding the product, please contact our Technical Support team:

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