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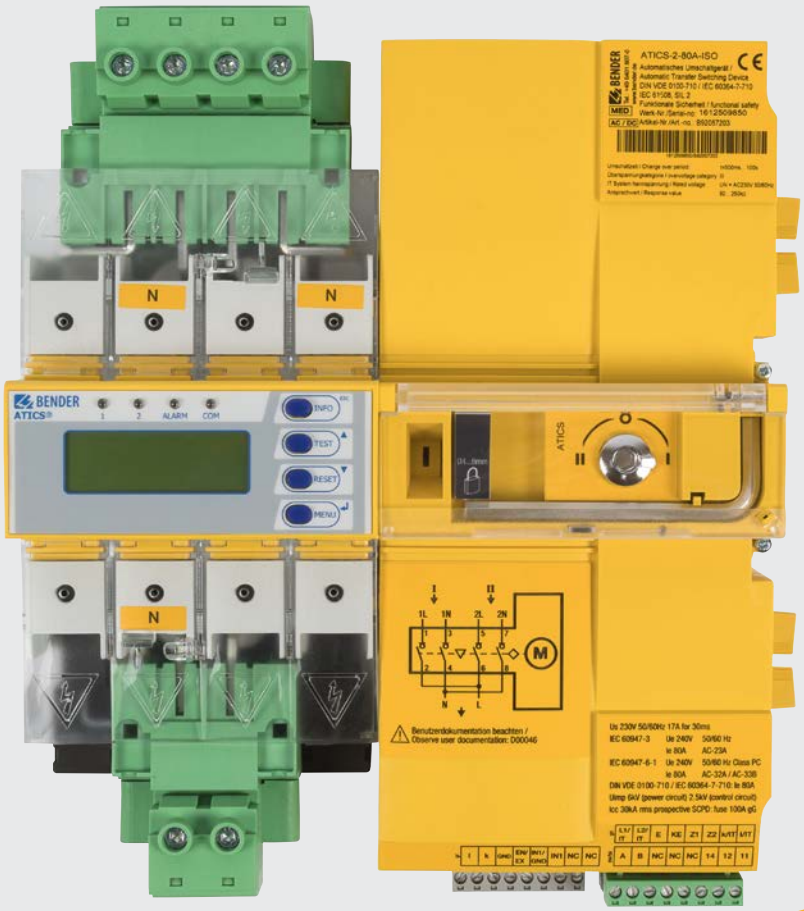
ATICS®-2-63A-ISO
ATICS®-2-80A-ISO

Automatic transfer switching devices with monitoring functions for unearthed safety power supplies



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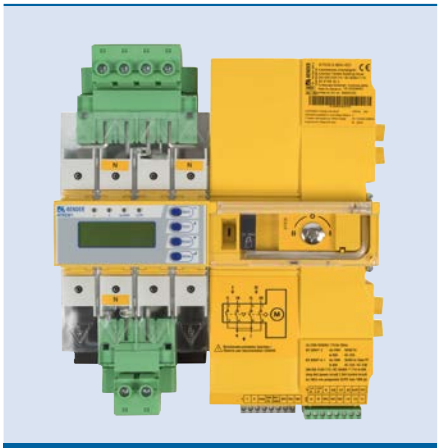


ATICS®-...-ISO

Device features

Perfectly suitable for space-saving installation/retrofitting

- Compact device for easy setup of safety power supplies with functional safety in accordance with DIN EN 61508 (SIL 2) e.g. for group 2 medical locations in compliance with DIN VDE 0100-710 (VDE 0100-710)/IEC 60364-7-710
- Increased safety and availability by integrating changeover and IT system monitoring in one compact device
- All-in-one: Integration of switch disconnector, control and monitoring electronics for unearthed safety power supplies
- Solutions for any application

Convenient installation and commissioning

- Saves time and money

Safe operation

- Robust switch disconnector contacts
- Mechanical locking
- Manual operation directly on the device
- Functional safety SIL 2
- Certification by TÜV SÜD in accordance with EN 61508 (VDE 0803) SIL 2 and DIN VDE 0100-710 (VDE 0100-710)

Uninterrupted maintenance

- Plug connectors and optional bypass switch
- Excellent communication and parameterisation options

Approvals and certifications

CE

Task

Power supplies for sensitive equipment used in group 2 medical locations, for example, must function safely and reliably even in the event of malfunctions.

A major contribution to achieve this are redundant supply lines and the design of an unearthed power supply system (IT system).

Product description

ATICS® transfer switching devices provide all functions for changeover between two independent power supplies and for monitoring unearthed power supplies. The power section and the electronic system integrated in one flat, compact enclosure allow space-saving installation into the respective control cabinet, simplifies wiring and reduces fault potential. To ensure maximum availability, ATICS® has been designed in strict accordance with the guidelines for functional safety.

Connectors at all connecting wires in combination with optional bypass switch allow ATICS® to be tested without interruption of the power supply. During service works, it is possible to repair or replace the device without interrupting the power supply. ATICS® considerably enhances the safety level particularly in intensive care units and in operating theatres.

Changeover

- Automatic changeover to the second (redundant) line on loss of the preferred supply or when the values are outside the permissible voltage range
- Voltage monitoring line 1/2 (input) and line 3 (output)
- Automatic return to the preferred line on voltage recovery
- Monitoring for short circuits at the output of the switching device or at the distribution board downstream of the transfer switching device avoids damaging switching operations
- Manual operation, optionally locked with a padlock

IT system (unearthed power supply)

- Insulation monitoring
- Load and temperature monitoring IT system/transformer
- Optional insulation fault location system

Messages

- Status indication of operating, warning and alarm messages via integrated graphic display and external indication on MK2430/MK800/TM800 alarm indicator and operator panels
- Automatic reminder for prescribed tests and service intervals
- History memory for events, messages, tests and parameter changes
- Exchange of information with alarm indicator and operator panels via BMS bus

Additional functions

- Automatic monitoring of all programme and data storage as well as essential internal components and connecting wires for proper functioning
- Programmable relay output (alarm relay)
- Programmable digital input

Staggered restarting

If line and line 2 fail simultaneously, the energy storage ATICS®-ES supplies the energy required for switching the ATICS®-2-xxA-ISO-ES to position “0”. This has the following advantages:

- When the voltage is restored, the ATICS® switching device selectively switches the power supply on.
- A generator can switch on without a load being immediately present. If there are several ATICS® transfer switching devices, they can be switched on one after the other in staggered order.

Standards

The transfer switching device conforms to the following standards:

- DIN VDE 0100-710 (VDE 0100 Part 710):2002-11*
- DIN VDE 0100-710 (VDE 0100 Part 710):2012-10*
- DIN VDE 0100-710 (VDE 0100-710) Supplement 1:2014-06
- DIN VDE 0100-718 (VDE 0100-718):2014-06
- ÖVE/ÖNORM E 8007:2007-12-01
- IEC 60364-7-710:2002-11*
- DIN EN 61508-1 (VDE 0803-1):2011-02*
- IEC 61508-1 (2010-04) Ed. 2.0*
- DIN EN 61508-2 (VDE 0803-2):2011-02*
- IEC 61508-2 (2010-04) Ed. 2.0*
- DIN EN 61508-3 (VDE 0803-3):2011-02*
- IEC 61508-3 (2010-04) Ed. 2.0*
- DIN EN 60947-6-1 (VDE 0660-114):2014-09
- IEC 60947-6-1 (2013-12) Ed. 2.1
- DIN EN 61557-8 (VDE 0413-8):2015-12

Standard-compliant isolating transformer monitoring according to:

- DIN EN 61558-1 (VDE 0570-1):2006-07
- DIN EN 61558-1/Amendment 1 (VDE 0570-1/Amendment 1):2008-11
- DIN EN 61558-1/Amendment 2 (VDE 0570-1/Amendment 2):2008-12
- DIN EN 61558-1/A1 (VDE 0570-1/A1):2009-11

The standards marked with * were part of the test conducted by TÜV Süd.

Ordering details

Rated operational voltage U_e	Nominal system voltage U_n	Rated operational current I_e	Type	Art. No.
AC	AC	AC		
230 V	230 V	63 A	ATICS-2-63A-ISO	B92057202
		80 A	ATICS-2-80A-ISO	B92057203
	400 V	63 A	ATICS-2-63A-ISO-400	B92057204
		80 A	ATICS-2-80A-ISO-400	B92057205
	230 V	63 A	ATICS-2-63A-ISO-ES	B92057206
		80 A	ATICS-2-80A-ISO-ES	B92057207

Accessories

Description	Rated operational current I_e	Type	Art. No.
	AC		
Bypass switch kit	63 A	ATICS-BP-2-63A-SET	B92057252
	80 A	ATICS-BP-2-80A-SET	B92057253
Energy storage for ATICS®	–	ATICS-ES*	B92057255

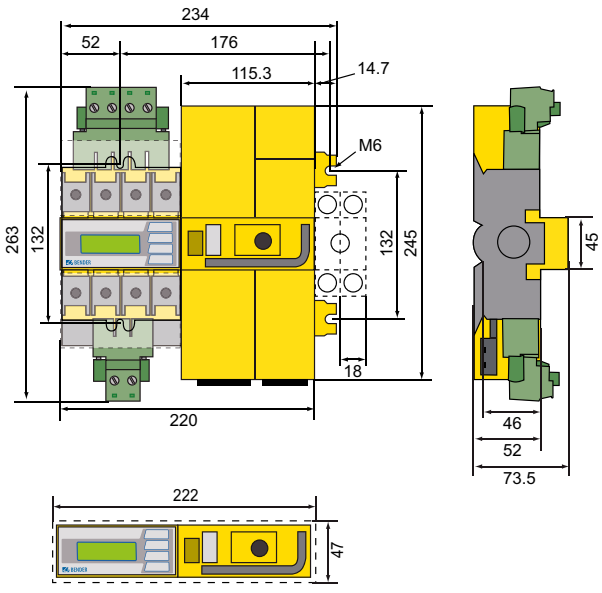
* ATICS-ES may only be used in combination with the following ATICS® transfer switching devices: B92057206, B92057207.

Suitable system components

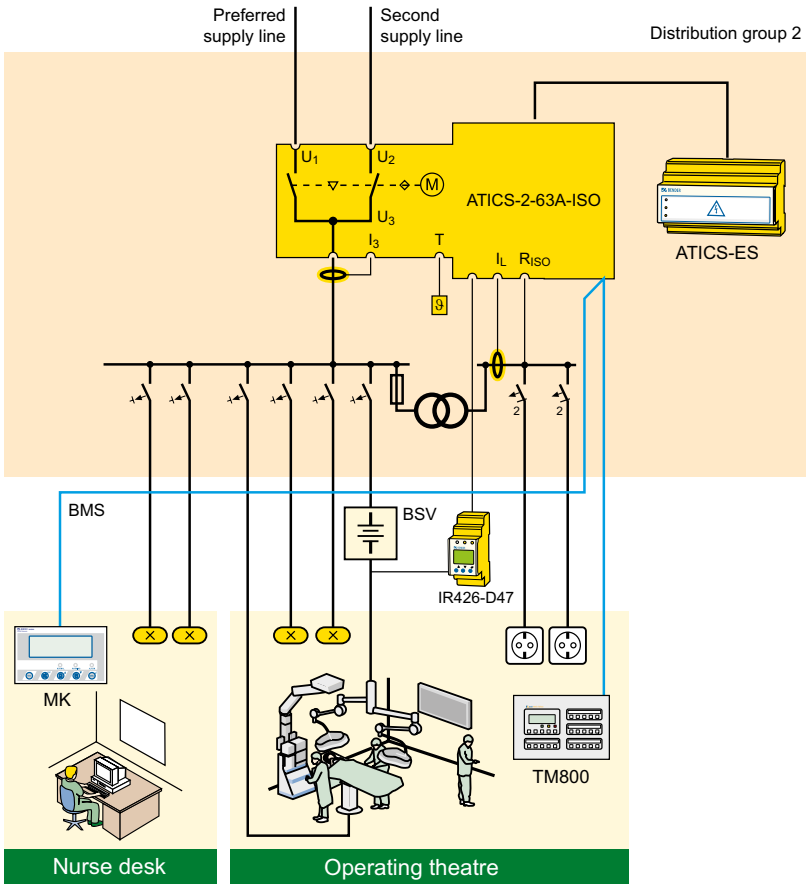
Description	Type	Art. No.
Insulation fault locator	EDS151	B91080101

Dimension diagram

Dimensions in mm

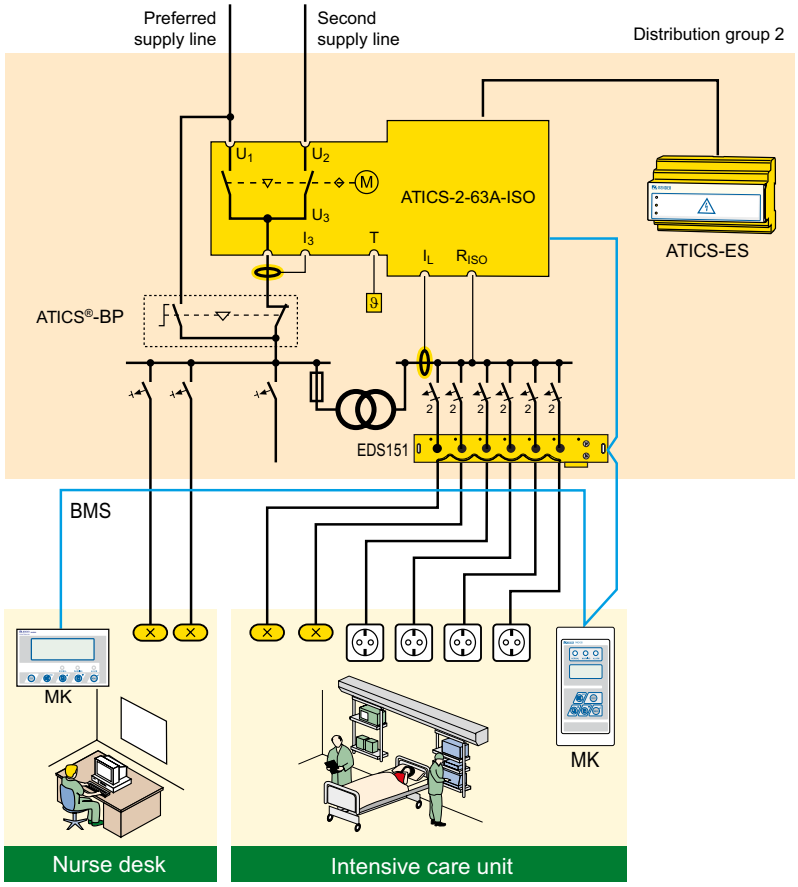


Application examples



Application example operating theatre

- ATICS®-2-63A-ISO: Changeover between the preferred and the redundant line while monitoring the medical IT system with transformer load and temperature monitoring
- IR426-D47: Monitoring of the operating theatre light IT system (optional)
- MK2430/MK800/TM800: Alarm at at least two points with independent power supplies for functional safety
- ATICS-ES: Energy storage (B92057206, B92057207 only)



Example intensive care unit

- ATICS®-2-63A-ISO: Changeover between the preferred and the redundant line while monitoring the medical IT system with transformer load and temperature monitoring
- EDS151: Insulation fault locator or fast insulation fault localisation (recommended)
- ATICS®-BP: Bypass switch for uninterrupted test/ maintenance (recommended)
- MK: Alarm at at least two points with independent power supplies for functional safety
- ATICS-ES: Energy storage (B92057206, B92057207 only)

Technical data

Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Overvoltage category	III
Pollution degree outside, inside	2
Rated insulation voltage	250 V
Protective separation between	line 1 – line 2; line 1, 2, 3 – RS-485 line 1, 2, 3 – digital inputs; line 1, 2, 3 – relay outputs
Voltage test according to IEC 61010-1 (basic insulation/protective separation)	2.21 kV/3.54 kV

Supply voltage

Rated operational voltage U_e	AC 50…60 Hz, 230 V
Supply voltage U_S	see ordering details
Power consumption at 63 A	≤ 16 W
Power consumption at 80 A	≤ 28 W
Current during changeover process	17 A/< 30 ms

Power section/switching elements

Nominal system voltage U_n	refer to ordering details
Frequency range f_n	48…62 Hz
Crest factor	≤ 1.2
Number of switching cycles (mechanical)	≥ 8000
Short circuit current I_{cc} and fuses	refer to the manual, table “Utilisation category acc. to DIN EN 60947”

Voltage monitoring/changeover

Frequency range f_n	40…70 Hz
Undervoltage response value (Alarm 1)	160…207 V (1-V steps)
Overvoltage response value (Alarm 2)	240…275 V (1-V steps)
Response delay t_{on}	50 ms…100 s (resolution of setting starting 50 ms)
Delay on release t_{off}	200 ms…100 s (resolution of setting starting 50 ms)
Hysteresis	2…10 % (1-% steps)
Frequency measurement	40…70 Hz (resolution 0.1 Hz)
Display range measured value	20…300 V
Operating uncertainty	±1 %

Current monitoring (output current)

Measuring current transformers	STW3, STW4
Measuring range In (TRMS)	STW3: 0…> 150 A, STW4: 0…> 260 A
Response value for short-circuit detection ATICS-ISO (versions 63 A and 80 A) with STW3	130 A
Crest factor	min. 2
Hysteresis for short-circuit alarm	5 %
Cable length:	
Single wire ≥ 0.75 mm²	0…1 m
Single wire, twisted ≥ 0.75 mm²	1…10 m
Shielded cable	10…40 m
Cable: twisted pairs, shield to terminal 1 at one end, must not be earthed	recommended: J-Y(St)Y min. n x 2 x 0.8

IT system monitoring

Insulation monitoring

Nominal system voltage (operating range)	80…275 V
Measuring range	10 kΩ…1 MΩ
Measurement method	AMP (adaptive measuring pulse)
Response value R_{an1} (ALARM 1)	50…250 kΩ
Relative uncertainty	±15 %
Hysteresis	≤ 25 %
Response time t_{an} at $R_F = 0.5$ x R_{an} and $C_e = 1$ µF	≤ 5 s
Measuring voltage U_m	DC 12 V
Measuring current I_m (at $R_F = 0$ Ω)	≤ 53 µA
Internal resistance R_i	≥ 240 kΩ
Impedance Z_i	≥ 220 kΩ
Internal resistance/impedance during test	≥ 100 kΩ
Permissible extraneous DC voltage U_{fg}	≤ DC 370 V
Permissible system leakage capacitance C_e	≤ 5 µF
Automatic self test	every hour
Response time for loss of earth connection as well as loss of network connection	maximum 1 hour

Load current monitoring (IT system transformer)

Measuring current transformers	STW2, STW3, SWL-100 A
Measuring range IL (TRMS)	10…110 % of the response value
Adjustable response value (STW2, STW3, SWL-100A)	5…(50) 100 A (1-A steps)
Relative uncertainty	±5 %
Crest factor	≤ 2
Response time	< 1 s
Response delay ton	0…100 s (step-by-step in 1-s steps)
Delay on release toff	0…100 s (step-by-step in 1-s steps)
Hysteresis	5…30 %
Response time CT connection monitoring	approx. 1 h (or immediately in case of “TEST Isometer”)
Cable length:	
Single wire ≥ 0.75 mm²	0…1 m
Single wire, twisted ≥ 0.75 mm²	1…10 m
Shielded cable 0.5 mm²	10…40 m
Cable: twisted pairs, shield to terminal 1 at one end, must not be earthed	recommended: J-Y(St)Y min. n x 2 x 0.8

Temperature monitoring (IT system transformer)

Response value	4 kΩ
Relative uncertainty	±10 %
Release value	1.6 kΩ
Response time (overtemperature or open-circuit temperature sensor)	≤ 2 s
PTC resistors acc. to DIN 44081	max. 6 in series

Insulation fault location

Test current I_T	< 1 mA
Test cycle/pause	2/4 s

Displays and data memory

Display: graphic display	languages DE, EN, FR
Alarm LEDs	line 1, line 2, alarm, com
History memory	500 data records
Data logger	500 data records/channel
Config. logger	300 data records
Test logger	100 data records
Service logger	100 data records

Technical data (continuation)

Input

Digital inputs	1
Galvanic separation	yes
Control	via potential-free contacts
Mode of operation	active at 0 V (low) or 24 V (high), adjustable
Voltage range high/low	AC/DC 10…30 V/AC/DC 0…0.5 V
Adjustable functions	switching back interlocking function, manual/automatic mode, bypass operation, function test, changeover of the preferred line, alarm input for operating theatre lights, alarm input for other devices

Output

Switching element	1 potential-free changeover contact
Mode of operation adjustable	N/O or N/C operation
Adjustable function	refer to the manual, settings menu 5: "Relay"
Electrical endurance under rated operating conditions, number of cycles	10 000

Contact data according to IEC 61810

Rated operational current AC (resistive load, cos φ=1)	5 A/AC 250 V
Rated operational current DC	5 A/DC 30 V
Overvoltage category	III
Minimum contact rating	10 mA at DC > 5 V

BMS interface

Interface/protocol	RS-485/BMS
Baud rate	9.6 kbit/s
Cable length	≤ 1200 m
Cable (twisted pairs, shielded, shield connected to PE on one side)	recommended: J-Y(St)Y min. n x 2 x 0.8
Terminating resistor	120 Ω (0.25 W)
Device address, BMS bus	2…90

Environment/EMC

EMC	EN 61326 (see CE declaration)

Classification of climatic conditions acc. to IEC 60721:

Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3
Long-term storage (IEC 60721-3-1)	1K4
Operating temperature	-25…+55 °C

Classification of mechanical conditions acc. to IEC 60721:

Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-term storage (IEC 60721-3-1)	1M3

Terminals

Power section

Connection directly on ATICS®, for plug connections	screw-type terminals
rigid (flexible)/conductor sizes	10…70 mm² (6…50 mm²)/8 (10)…0 AWG
Stripping length	15 mm
Tightening torque (hexagon socket 4 mm)	5 Nm
Connection type	pluggable screw-type terminals
Conductor cross section, rigid min/max	1.5/35 mm²
Conductor cross section, flexible min/max	1.5 mm²/25 mm²
Conductor cross section AWG/min/max	20/2
Stripping length (do not use ferrules)	20 mm
Tightening torque (Torx® screwdriver T20 or slotted screwdriver 6.5 x 1.2 mm)	2.5 Nm (≤ 25 mm²) 4.5 Nm (≥ 25 mm²)
Torque setting for manual operation (Allen 5 mm)	approx. 6 Nm

Electronics

Connection	screw-type terminals
rigid/flexible/conductor sizes	0.14…1.5 mm²/28…16 AWG
Stripping length	7 mm
Tightening torque (slotted screws, screwdriver 2.5 x 0.4 mm)	0.22…0.25 Nm

Other

Operating mode	continuous operation
Mounting	display-oriented
Operating altitude up to a maximum of	2000 m AMSL
Protection class	Class I
Protection class LCD under foil (DIN EN 60529)	IP40
Enclosure material	polycarbonate
Flammability class	UL94V-0
DIN rail mounting	acc. to IEC 60715
Screw mounting	4 x M5
Dimensions incl. terminals (W x H x D)	234 x 270 x 73
Weight	approx. 3400 g

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