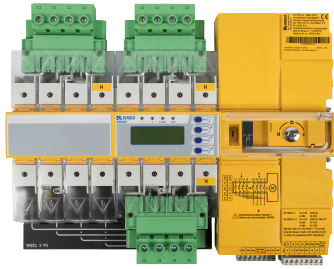


ATICS-2-...-DIO, ATICS-4-...-DIO

Automatic transfer switching devices
for safety power supplies





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) for computing centres, industry, or group 2 medical locations in compliance with DIN VDE 0100-710 (VDE 0100-710)/IEC 60364-7-710
- All-in-one: Integration of switch disconnector and control electronics
- Compact design
- 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

Uninterrupted maintenance

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

Product description

The ATICS-DIO automatic transfer switching devices provide all functions for changeover between two independent power supplies and for monitoring unearthed power supplies. The integration of both the electronic system and the switching elements in one flat, compact device reduces space requirements in the switchgear cabinet, minimises the amount of wiring, and reduces the fault probability. For maximum reliability, ATICS-DIO was designed in strict accordance with the guidelines for functional safety.

Connectors at all connecting wires, in combination with the optional bypass switch, enable the ATICS-DIO to be tested or replaced during service works without interruption of the power supply. ATICS-DIO 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 or at the distribution board downstream of the transfer switching device avoids damaging switching operations
- Manual operation, with optional locking by means of a padlock

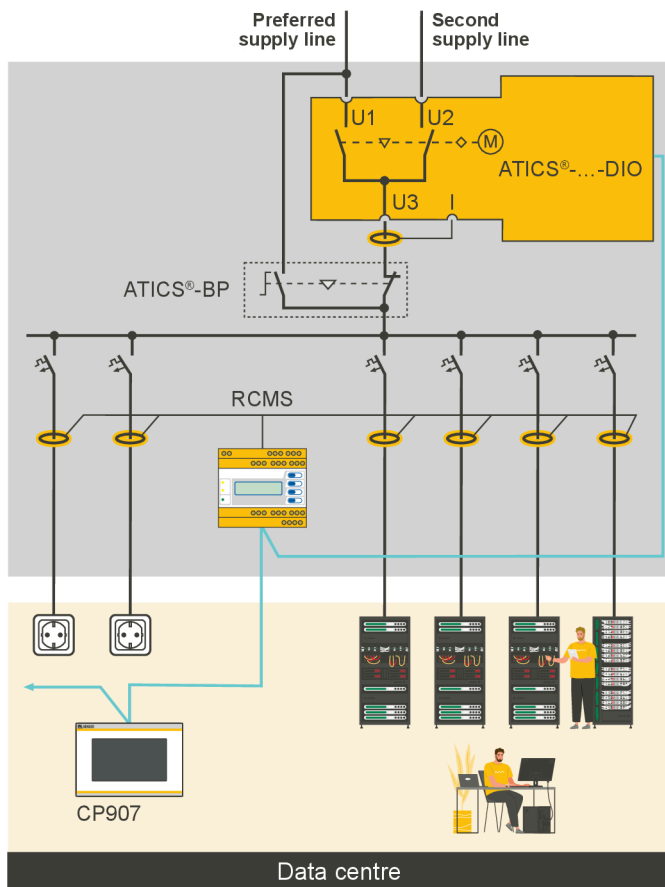
Messages

- Status indication of operating, warning and alarm messages via
 - integrated graphic display and
 - external indication on MK.../TM.../CP...
- 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

Other 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

Application example



- **ATICS-2-63A-DIO**
Changeover between preferred and redundant line
- **MK.../CP...**
Alarm at at least two points with independent power supplies for functional safety
- **RCMS**
RCMS460 or RCMS490 residual current monitors for localising residual and operating currents in TT and TN-S systems

Technical data ATICS-DIO

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

Overvoltage category	III
Pollution degree outside, inside	2
Rated insulation voltage ATICS-2-DIO/ATICS-4-DIO	250 V / 400 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

Supply voltage U_s	230 V (50/60 Hz)
Power consumption ATICS-2-63A-DIO	≤ 16 W
Power consumption ATICS-2-80A-DIO	≤ 23 W
Power consumption ATICS-4-80A-DIO	≤ 39 W
Power consumption ATICS-4-125A-DIO	≤ 87 W
Power consumption ATICS-4-160A-DIO	≤ 119 W
Current during changeover process	17 A / < 30 ms

Power section / switching elements

Rated operational voltage U_c ATICS-2-DIO / ATICS-4-DIO	AC 240 V / 3NAC 415 V
Frequency range f_n	48...62 Hz
Crest factor	≤ 1.2
Number of switching cycles (mechanical)	≥ 8000
Short-circuit currents	see table "Short-circuit currents" in manual
Short-circuit current I_{cc} and fuses	refer to table "Utilisation category acc. to DIN EN 60947" in manual

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 ATICS-2-DIO	20...276 V
Display range measured value ATICS-4-DIO	20...520 V
Operating uncertainty	±1 %
Changeover period	$t < 500 \text{ ms} \dots 100 \text{ s}$

Current monitoring (output current)

Measuring current transformers	STW3, STW4
Measuring range I_n (TRMS)	STW3: 0... > 150 A, STW4: 0... > 260 A
Response value for short-circuit detection (versions 63 A and 80 A) with STW3	130 A
Response value for short-circuit detection (versions 125 A and 160 A) with STW3	250 A
Crest factor	min. 2
Hysteresis for short-circuit alarm	5 %

Cable length

Single wire $\geq 0.75 \text{ mm}^2$	0...1 m
Single wire, twisted $\geq 0.75 \text{ mm}^2$	1...10 m
Shielded cable	10...40 m
Cable: twisted pairs, shield connected to terminal I on one side, must not be earthed	recommended: J-Y(St)Y min. $n \times 2 \times 0.8$

Displays and data memory

Display: graphic display	languages DE, EN, FR, PL
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

Input

Digital inputs	4
Galvanic separation	yes
Control	via potential-free contacts
Operating mode	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 function	switch-back lock manual/automatic mode bypass mode functional test changeover to preferred line alarm input for operating theatre lights alarm input for other devices

Relay output 1

Switching element	1 potential-free changeover contact
Operating mode adjustable	n/o or n/c operation
Adjustable function	see "Settings menu 4: Relay" in manual
Electrical endurance under rated operating conditions	10,000 cycles

Contact data according to IEC 61810

Rated operational current AC (resistive load, $\cos \varphi = 1$)	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

Relaisausgang 2...4

Switching element	1 potential-free changeover contact
Operating mode adjustable	n/o or n/c operation
Adjustable function	see "Settings menu 4: Relay" in manual
Electrical endurance under rated operating conditions	80,000 cycles

Contact data according to IEC 61810

Rated operational current AC (resistive load, $\cos \varphi = 1$)	5 A / AC 150 V
Rated operational current DC	5 A / DC 30 V
Overvoltage category	III
Minimum switching capacity	120 mW

BMS interface

Interface / protocol	RS-485 / BMS
Baud rate	9.6 kbit/s
Cable length	≤ 1200 m
Cable: shielded, one end of shield connected to PE	recommended: CAT6/CAT7 min. AWG23
alternative:	twisted pair, one end of shield connected to PE J-Y(St)Y min. 2 × 0.8
Terminating resistor	120 Ω (0.25 W)
Device address, BMS bus	2...90

Environment/EMC

EMC	EN 61326 (see CE declaration)
Operating temperature	-25...+55 °C

Classification of climatic conditions acc. to IEC 60721

Stationary use (IEC 60721-3-3)	3K22
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K22

Classification of mechanical conditions acc. to IEC 60721

Stationary use (IEC 60721-3-3)	3M11
Transport (IEC 60721-3-2)	2M4
Long-term storage (IEC 60721-3-1)	1M12

Terminals

Power section

Connection directly to ATICS®, for plug connections and the 160 A version	screw-type terminals
rigid (flexible)/conductor sizes	10...95 mm ² (6...70 mm ²) / AWG 8 (10)...000 (00)
Stripping length	15 mm
Tightening torque (hexagon socket 4 mm)	5 Nm
Connection for plug connectors (125 A)	pluggable screw-type terminals
Conductor cross section, rigid min./max	1.5 mm ² / 35 mm ²
Conductor cross section, flexible min./max.	1.5 mm ² / 25 mm ²
Conductor cross section AWG min./max	16 / 2
Stripping length (do not use ferrules)	20 mm
Tightening torque (Torx® screwdriver T20 or slotted screwdriver 6.5 × 1.2 mm)	2.5 Nm (≤ 25 mm ²) 4.5 Nm (> 25 mm ²)
Torque setting for manual operation (hexagon socket 5 mm)	approx. 6 Nm

Electronics

Connection	pluggable screw-type terminals
rigid/flexible/conductor sizes	0.14...1.5 mm ² / AWG 28...16
Stripping length	7 mm
Tightening torque (slotted screws, screwdriver 2.5 × 0.4 mm)	0.22...0.25 Nm

Other

Operating mode	continuous operation
Mounting	display-oriented
For use at altitudes up to	2000 m AMSL
Protection class	Class I
Protection class LCD under foil (DIN EN 60529)	IP40
Enclosure material	polycarbonate
Flammability class	UL 94 V-0
DIN rail mounting	acc. to IEC 60715
Screw mounting	4 × M5
Dimensions incl. terminals (W × H × D)	234 × 270 × 73
Weight ATICS-2-DIO	approx. 3400 g
Weight ATICS-4-DIO	approx. 4800 g

Standards and certifications

The transfer switching and monitoring device conforms to the following standards:

- DIN VDE 0100-710 (VDE 0100-710):2002-11*
- DIN VDE 0100-710 (VDE 0100-710):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*
- IEC 60364-7-710:2021-05
- 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

Standard-compliant isolating transformer monitoring according to:

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

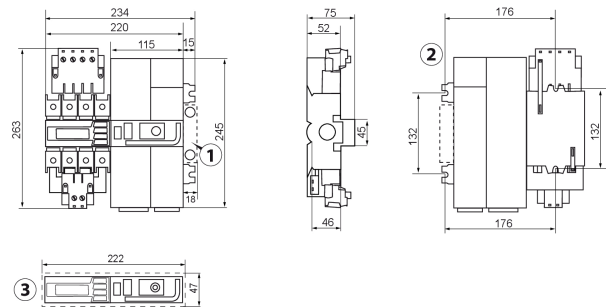
The standards marked with * were part of the test conducted by TÜV Süd.



The EU Declaration of Conformity is available at the following Internet address:

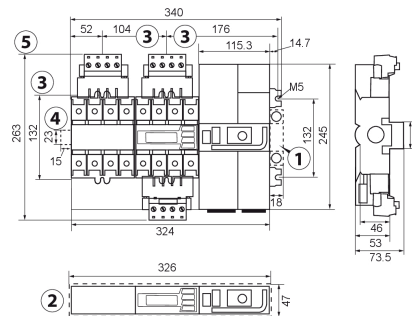
bender.de/fileadmin/content/Products/CE/CEKO_Atics.pdf

Dimension diagram ATICS-2-...-DIO



- 1 Additional space required for auxiliary contact when using the bypass switch
- 2 Rear view (dimensions for screw mounting on mounting plate)
- 3 Cutout for terminal cover

Dimension diagram ATICS-4-...-DIO



- 1 Additional space required for auxiliary contact when using the bypass switch
- 2 Cutout to the terminal cover
- 3 Dimensions for screw mounting on plate
- 4 Additional space required for the connector plug of the measuring current transformer
- 5 80 A / 125 A version; 160 A version without plug connector

Ordering information
ATICS®-...-DIO Variants

ATICS®-...-DIO 2-pole

Type	Version	Rated operational current I_e	Scope of delivery	Art. No.
ATICS-2-63A-DIO	2-pole	AC 63 A	1 x STW3, bridge, connectors, terminal cover	B92057212
ATICS-2-80A-DIO	2-pole	AC 80 A	1 x STW3, bridge, connectors, terminal cover	B92057213
ATICS-BP-2-63A-SET	Bypass switch set	AC 63 A	Bridge, terminal cover, auxiliary contacts, LEDs green/red	B92057252
ATICS-BP-2-80A-SET	Bypass switch set	AC 80 A	Bridge, terminal cover, auxiliary contacts, LEDs green/red	B92057253

ATICS®-...-DIO 4-pole

Type	Version	Rated operational current I_e	Scope of delivery	Art. No.
ATICS-4-80A-DIO	4-pole	AC 80 A	4 x STW3, bridge, connectors, terminal cover	B92057222
ATICS-4-125A-DIO	4-pole	AC 125 A	4 x STW3, bridge, connectors, terminal cover	B92057223
ATICS-4-160A-DIO	4-pole	AC 160 A	4 x STW4, bridge, terminal cover	B92057224
ATICS-BP-2-80A-SET	Bypass switch set	AC 80 A	Bridge, terminal cover, auxiliary contacts, LEDs green/red	B92057260
ATICS-BP-4-125A-SET	Bypass switch set	AC 125 A	Bridge, terminal cover, auxiliary contacts, LEDs green/red	B92057262
ATICS-BP-4-160A-SET	Bypass switch set	AC 160 A	Bridge, terminal cover, auxiliary contacts, LEDs green/red	B92057264

Optional Accessories

Type	Description	Art. No.
STW3	Measuring current transformer (short-circuit monitoring) for ATICS® < 100 A	B98021000
STW4	Measuring current transformer (short-circuit monitoring) for ATICS® < 100 A	B98021001



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Subject to change!
The specified standards take into account the
edition valid until 04.2025 unless otherwise
indicated.