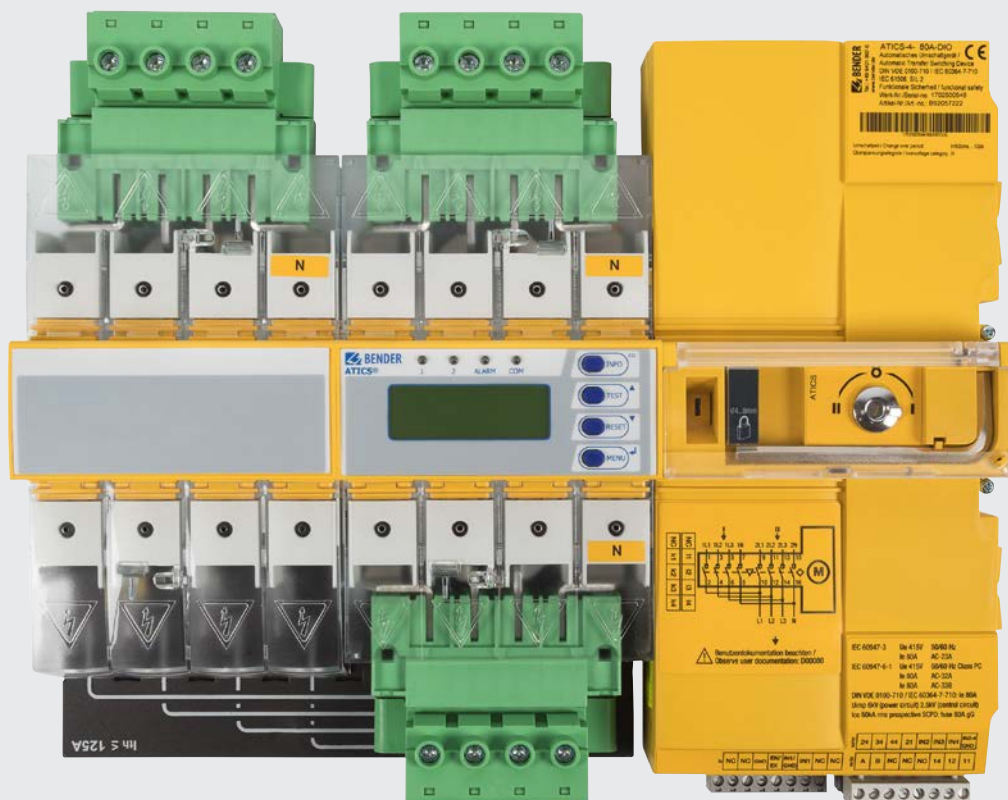
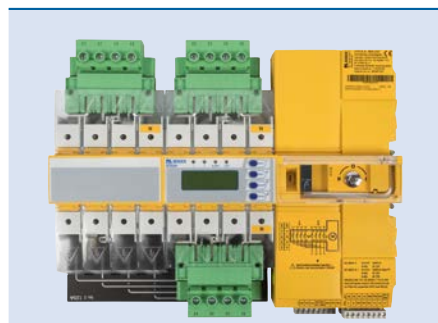


ATICS®-...-DIO

Automatic switching device for safety power supplies





ATICS®-...-DIO

Device features

Perfectly suitable for space-saving installation/retrofitting

- Compact device for designing safety power supplies with functional safety more easily, in accordance with DIN VDE 61508 (SIL 2), in computing centres, industry, or in group 2 medical locations in accordance with DIN VDE 0100-710 (VDE 0100-710)/ IEC 60364-7-710
- All-in-one: Integration of switch disconnect and control electronics
- Compact design
- Solutions for any application

Convenient installation and commissioning

- Saves time and money

Safe operation

- Switch disconnecter contacts of robust design
- 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

Certifications



Task

Where sensitive electrical installations are involved, e.g. in medical locations of Group 2, industry or computing centre, safe and reliable power supply must be ensured, also in the event of malfunctions.

Redundant supply lines significantly contribute to achieve safe and secure power supply.

Product description

The ATICS® transfer switching devices provide all functions for changeover between two independent 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® was designed in strict accordance with the guidelines for functional safety.

Connectors at all connecting wires in combination with bypass switches enable ATICS® to be tested during ongoing operation. In case of need for service, it is possible to repair or replace the device without interrupting the power supply. ATICS® considerably enhances the safety level in industry and other sensitive environments like hospitals.

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, optionally locked with a padlock

Messages

- Status indication of operating, warning and alarm messages via integrated graphic display and external indication at MK2430/CP9xx 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
- 4 programmable relay outputs (alarm relays)
- 4 programmable digital inputs

Standards

The transfer switching device conforms to the following standards:

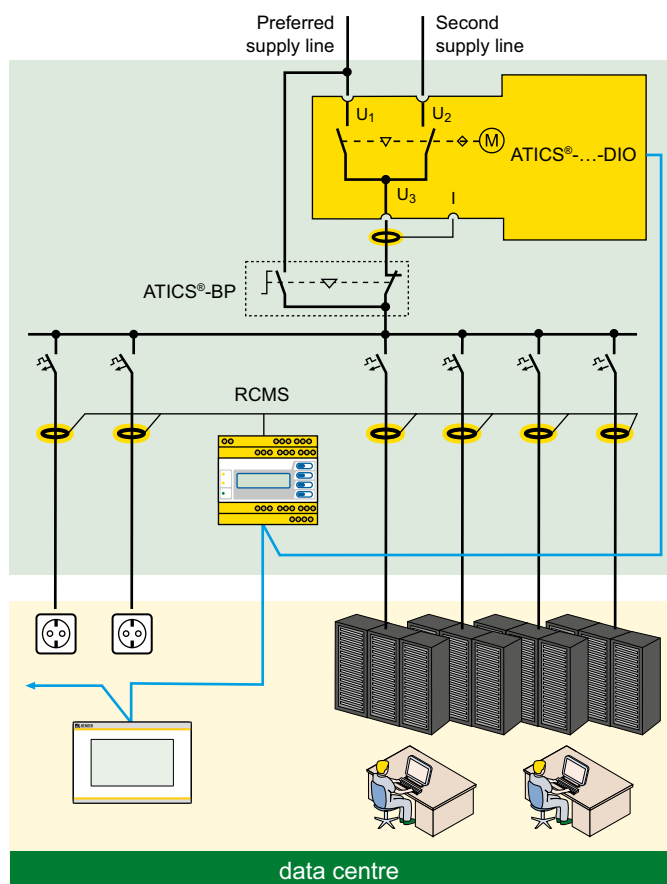
- DIN VDE 0100-710 (VDE 0100 Part 710):2002-11*
- DIN VDE 0100-710 (VDE 0100 Part 710):2012-10*
- DIN VDE 0100-710 (VDE 0100 Part 710) supplement 1:2014-06
- DIN VDE 0100-718 (VDE 0100-718):2014-06
- ÖVE/ÖNORM E 8007:2007-12-01
- IEC 60364-7-710:2002-11*
- IEC 60364-7-710:2021-05
- DIN EN 61508-1 (VDE 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/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.

Application example



Example application computing centre

- ATICS®-...-DIO: Changeover between the preferred and the redundant line
- MK2430/CP9xx: Alarm at at least two points for functional safety

Technical data

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

Rated operational voltage U_e	230 V 50/60 Hz
Supply voltage U_s	from monitored system
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 the changeover process	17 A/< 30 ms

Power section/switching elements

Nominal system voltage U_n (operating range) ATICS-2-DIO/ATICS-4-DIO	AC 230 V/3NAC 400 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 %
Change over period	$t < 500$ ms...100 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 ATICS-DIO	
(versions 63 A and 80 A) with STW3	130 A
(versions 125 A and 160 A) with STW4	250 A
Crest factor	min. 2
Hysteresis for short-circuit alarm	5 %

Cable length:

Single wire ≥ 0.75 mm ²	0...1 m
Single wire, twisted ≥ 0.75 mm ²	1...10 m
Shielded cable	10...40 m
Cable: twisted pairs, shield to terminal I at one end, must not be earthed	
recommended: J-Y(St)Y min. n x 2 x 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 data logger	100 data records
Service logger	100 data records

Input

Digital inputs	4
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 function	switching back interlocking function, manual/automatic mode, bypass mode, functional test, changeover to the preferred line, alarm input for operating theatre lights, alarm input for other devices

Relay output 1

Switching element	1 potential-free changeover contact
Mode of operation adjustable	N/O or N/C operation
Adjustable function	see "Settings menu 4: Relay" in manual
Electrical endurance under rated operating conditions, number of cycles	10,000

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

Relay outputs 2...4

Switching element	1 potential-free N/O contact
Mode of operation adjustable	N/O or N/C operation
Adjustable function	see "Settings menu 4: Relay" in manual
Electrical endurance under rated operating conditions, number of cycles	80,000

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	CAT6/CAT7 min. AWG23*
* alternatively	twisted pair, one end of shield connected to PE J-Y(St)Y min. 2x0.8
Terminating resistor	120 Ω (0.25 W)
Device address, BMS bus	2...90

Environment/EMC

EMC	EN 61326 (see CE declaration)
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Classification of climatic conditions according to IEC 60721:

Stationary use (IEC 60721-3-3)	3K24 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K22
Operating temperature	-25...+55 °C

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

Technical data

Terminals

Power section

Connection directly on ATICS®, for plug connections and connection of 160 A version

	screw-type terminals
rigid (flexible)/conductor sizes	10...95 mm ² (6...70 mm ²)/8 (10)...000 (00) AWG
Stripping length	15 mm
Tightening torque (hexagon socket 4 mm)	5 Nm
Connection type (up to 125 A)	pluggable screw terminals
Conductor cross section, rigid min./max	1.5/35 mm ²
Conductor cross section, flexible min./max.	1.5/25 mm ²
Conductor cross section AWG/min./max	16/2
Stripping length (without ferrules)	20 mm
Tightening torque (Torx® screwdriver T20 or slotted screwdriver 6.5 x 1.2 mm)	2.5 Nm (≤ 25 mm ²) 4.5 Nm (≥ 25 mm ²)

Torque setting for manual operation (Allen 5 mm) approx. 6 Nm

Electronics

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

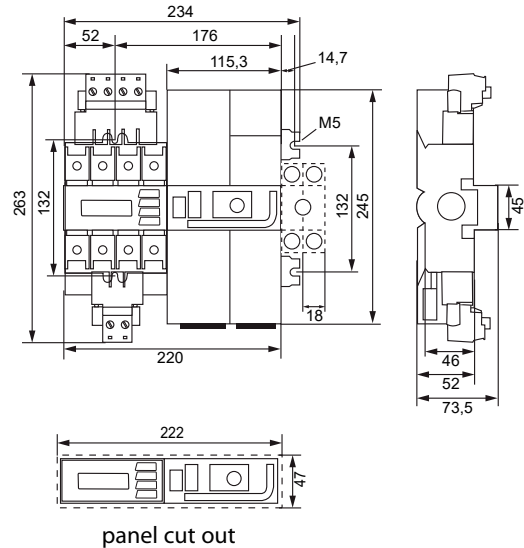
Other

Operating mode	continuous operation
Mounting	display-oriented
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	UL94V-0
Mounting	DIN rail acc. to IEC 60715
Screw mounting	4 x M5
Dimensions incl. terminals (W x H x D)	234 x 270 x 73
Documentation number	D00080
Weight	
ATICS-2-DIO	approx. 3400 g
ATICS-4-DIO	approx. 4800 g

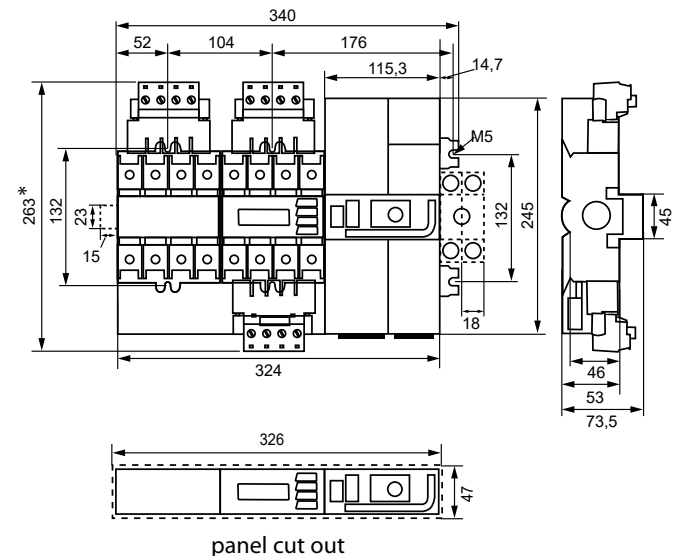
Dimension diagram

Dimensions in mm

2-pole



4-pole



* Version 80 A/125 A. Version 160 A without connectors.

Ordering information ATICS®...-DIO 2-pole

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

Ordering information ATICS®...-DIO 4-pole

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

Accessories

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



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