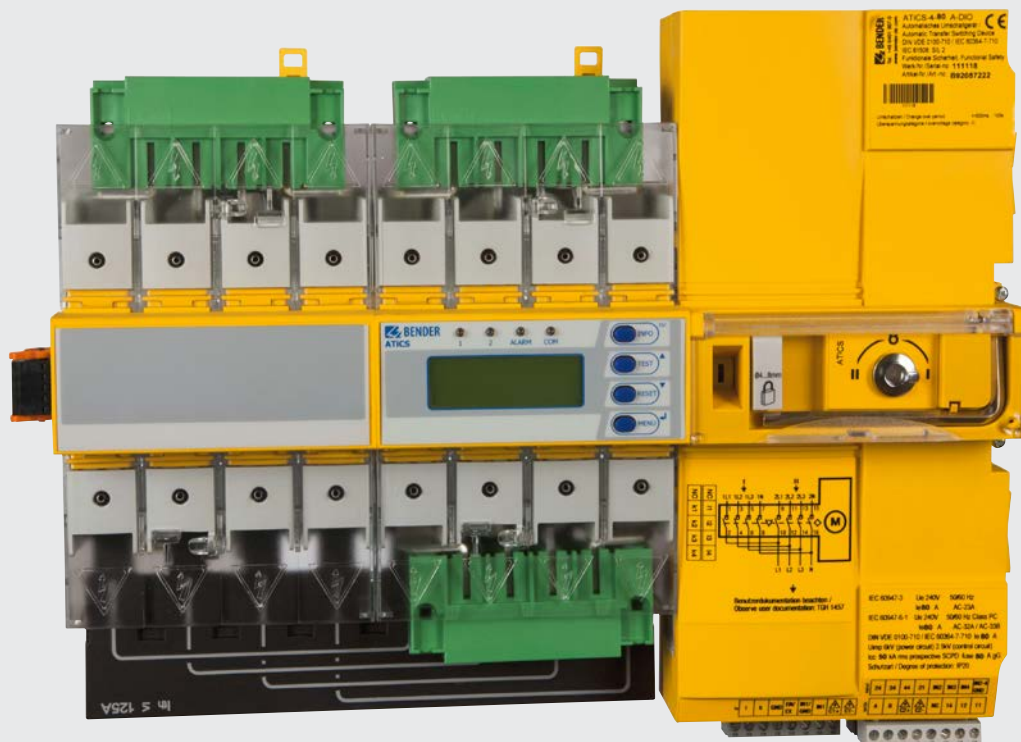


Changeover and monitoring module UMA710-4-xx-DIO, ...-BP



Changeover and monitoring module

UMA710-4-xx-DIO, ...-BP

for safety-relevant environments



ATICS® monitoring device
of the UMA710-4-xx-DIO

Device features

- Automatic transfer switching device ATICS® which monitors in particular:
 - voltage of the incoming supplies
 - output voltage
 - correct switch position
 - switching times
 - load current
 - functional safety acc. to IEC 61508 (SIL2)
- All-in-one: Integration of switch disconnect and control
- Robust switch disconnecter contacts
- Mechanical locking
- Manual operation directly at the device
- Uninterrupted testing and replacement when a bypass switch is included (UMA710-4-80-DIO-BP only) (bypass is recommended)
- Variable changeover period $t \leq 0.5 \dots 15 \text{ s}$
- Information exchange and parameter setting via bus technology
- Connection for alarm indicator and operator panels TM800/MK800/MK2430
- Short delivery times
- Screwless connection system
- Standard-compliant design
- Optional TÜV (Technical Inspection Association) test of the ATICS® transfer switching device

Application

Sensitive installations, e. g. like those in group 2 medical locations, in industry or computer centres, require a power supply that functions safe and reliably, also in case of malfunction. A main contribution to reliable power supply is achieved by redundant supply lines.

The ATICS®-...-DIO 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 (SIL 2).

Connectors at all connecting wires in combination with the optional bypass switch allow the ATICS® to be tested without interruption. In case of need for service, it is possible to replace the device without voltage interruption. In this way, ATICS® enhances the safety level particularly 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
- Freely programmable assignment of the preferred/redundant line

Messages

- Status indication of operating, warning and alarm messages via integrated graphic display and external indication at 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
- 4 programmable output relays and 4 programmable digital inputs

Other safety-enhancing measures

- Continuous monitoring of all essential internal components and connecting wires for proper functioning
- Monitoring for short circuits at the output of the transfer switching device with defined switching behaviour
- Maximum reliability when switching with:
 - Patented switching system with mechanical and electrical interlocking
 - Weld-resistant contacts with the mechanics of a circuit breaker
 - Insensitive to voltage fluctuations and vibrations due to stable switching position and permanent contact pressure
- Preventive safety due to an automatic reminder of mandatory testing procedures, service times, number of switching operations
- Bypass switch for uninterrupted testing/maintenance (recommended) (UMA710-4-80-DIO-BP only)
- Optional TÜV (Technical Inspection Association) test of the ATICS® transfer switching device
- Tested functional safety acc. to IEC 61508 (SIL2) of the ATICS® switch (provide notification in at least two places)

Functional description changeover

The changeover is controlled by the ATICS® device. If the preferred supply fails, the ATICS® ensures that the power supply is changed over safely. The switch contacts are offset on a rotating shaft. This design prevents simultaneous switching on of line 1 and line 2.

The switch has three positions:

- I – Line 1 is switched on
- 0 – Both lines are switched off
- II – Line 2 is switched on.

In the normal condition (fault-free operation) the preferred supply is connected.

The ATICS® will switch to the redundant line if:

- The preferred line fails
- The "TEST" button is pressed and the test function is executed via the menu
- A digital input is configured to "TEST" and this input is enabled
- The setting "Preferred line" is reconfigured to the other line

The ATICS® switches from the redundant line back to the preferred line if:

- The voltage on the preferred line is restored, when:
 - the return transfer delay time $T(2 \rightarrow 1)$ has elapsed and no switching back interlocking function is active
 - after pressing the "RESET" button and the switching back interlocking function has been deleted via the menu
 - when the redundant line fails (even when the switching back interlocking function is enabled)
- The setting "Preferred line" is reconfigured to the other line
- The digital input is configured to "TEST" and this input is reset
- A transfer switching device test is enabled and the test time has expired

Only when an ATICS-ES energy storage is included, the device switches to position "0" and remains there when the following conditions are met simultaneously:

- Line 1 and line 2 failed
- Automatic operation is selected
- There is no short-circuit downstream of the transfer switching device
- The setting "Load separation" "on" has been selected
- The external ATICS-ES energy storage has been connected

The factory settings guarantee a changeover period of $t \leq 0.5$ seconds and switching back within 10 seconds when voltage is restored on the preferred supply. Therefore, the ATICS® can be used in IT systems with a requirement for a changeover period $t \leq 0.5$ s (IT systems with operating theatre lights, endoscopic field illumination in operating theatres or other essential sources of light, etc.).

When there is a short circuit downstream of the transfer switching device, the switching device must not continually change back and forth between the two lines. This can occur when the short-circuit current is small and the transfer switching device switches faster than the short-circuit breaker trips. The ATICS® monitors the load current downstream of the automatic transfer switching device in order to detect a possible short circuit. If the preferred line fails and a short-circuit current is detected at the same time, the ATICS® does not switch over immediately but only once the circuit breaker has tripped.

If the ATICS® detects a supply failure or a fault, a message will appear on the LCD, the "ALARM" LED lights up, the alarm relay trips (if set) and this alarm is forwarded to other Bender devices, (such as an alarm indicator and test combination) via the BMS.

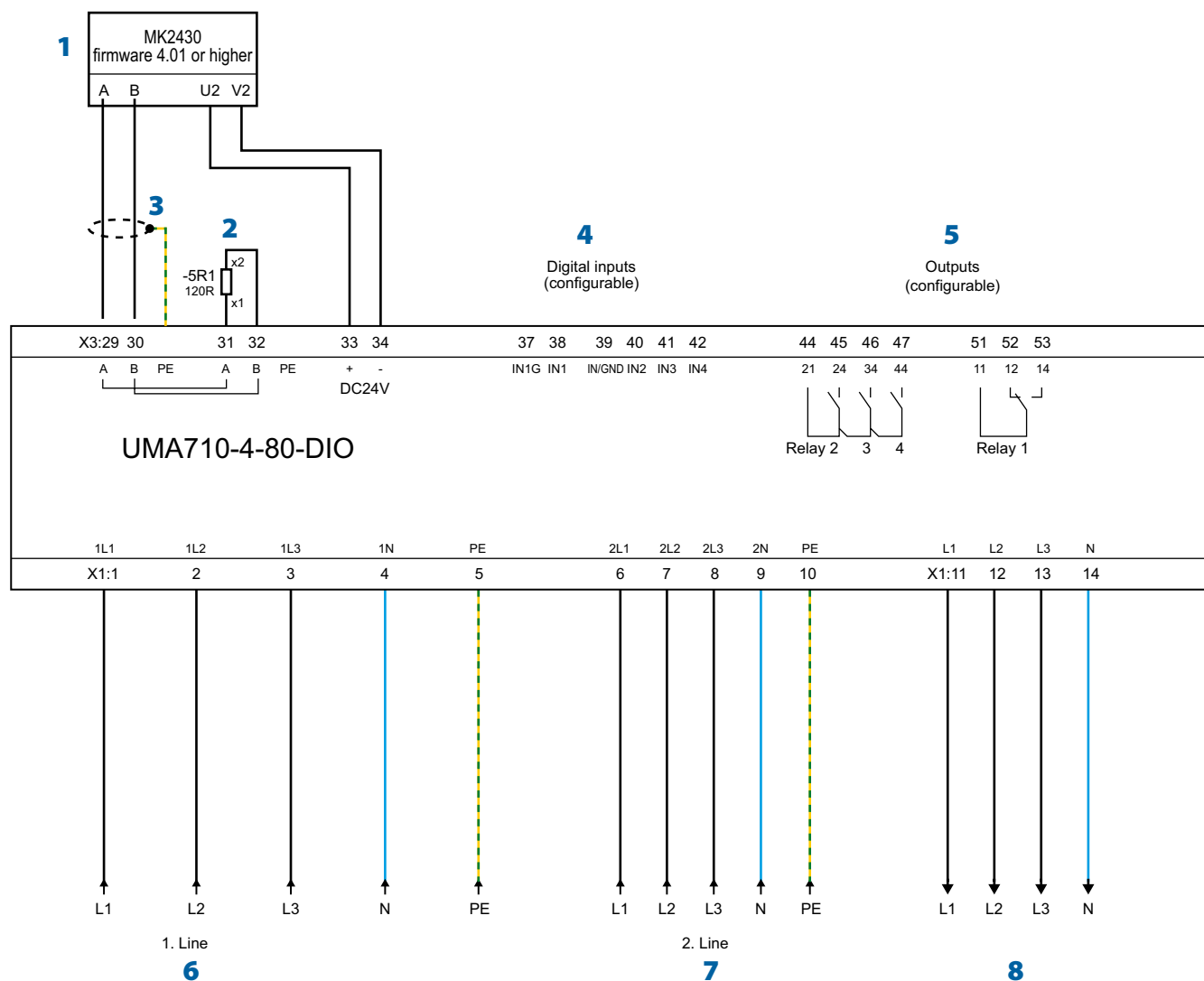
Bypass switch

On the UMA710-4-80-DIO-BP changeover and monitoring module (up to 80 A) uninterrupted testing or replacement of the ATICS® transfer switching and monitoring device can be carried out by means of the bypass switch. Please read the instructions for operation of the bypass switch in the manual.

Clear text display of messages

Operating, warning and fault messages are indicated in clear text display format. The required alarm indicator and test combination MK2430, MK800 or the remote alarm indicator and operator panel TM800 must be installed in a place in the medical location where they are permanently supervised by the medical staff. The module and the alarm and indicator units are connected via a two-wire bus cable.

Wiring diagram UMA710-4-80-DIO (example illustration)



1 - Alarm indicator and test combination MK... (firmware 4.01 or higher)

2 - Remove terminating resistor if other bus devices are to be connected here

3 - Shielded cable 2x2x0.8mm, (for A/B, U2/V2), the shield must be connected to earth at one end

4 - Dig. inputs

5 - Potential-free outputs, 1x changeover contact, 3x N/O contacts

6 - Preferred line (line 1) 3N/AC 400/230 V, 50 Hz

7 - Redundant line (line 2) 3N/AC 400/230 V 50 Hz

8 - Outgoing line (line 3) 3N/AC 400/230 V, 50 Hz

The image shows an example of a typical wiring diagram (black box).

Please observe the individual, job-related or project-related documentation provided.

Technical data

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

Overvoltage category	III
Rated operational voltage U_e	AC 230 V (160...276 V)
Supply voltage U_s	from the system being monitored

Power section/switching elements

Nominal system voltage U_n	3N/AC 400/230 V
Frequency range f_n	48...62 Hz

Displays and data memory

Display (languages DE, EN, FR)	graphic display
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

Inputs

Digital inputs	4
Function adjustable:	refer to device manual TGH1457

Outputs

Switching element	potential-free, 1x changeover contact/3x N/O contacts
Setting	N/O or N/C operation
Function adjustable	refer to device manual TGH1457

BMS interface

Interface/protocol	RS-485/BMS
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Environment/EMC

EMC immunity acc. to	EN 61000-6-2
EMC emission acc. to	EN 61000-6-4
Operating temperature	-10 °C...+55 °C

Classification of climatic conditions acc. to IEC 60721

Stationary use	3K5
Transport	2K3
Long-term storage	1K4

Classification of mechanical conditions acc. to IEC 60721

Stationary use	3M4
Transport	2M1
Long-term storage	1M3

Connection

Control section

Connection type	cage-clamp spring terminals
Connection properties	
rigid/flexible/conductor sizes	0.08...2.5 mm ²

Power section

Connection type	cage-clamp spring terminals
Connection properties	
Up to 125 A rigid/flexible/conductor sizes max.	35/25 mm ²
Up to 160 A rigid/flexible/conductor sizes max.	70/50 mm ²

Miscellaneous

Operating mode	continuous operation
Mounting	vertical
Elevation illustration/circuit diagram	

The documents are project-specifically made to suit the specific needs of each customer

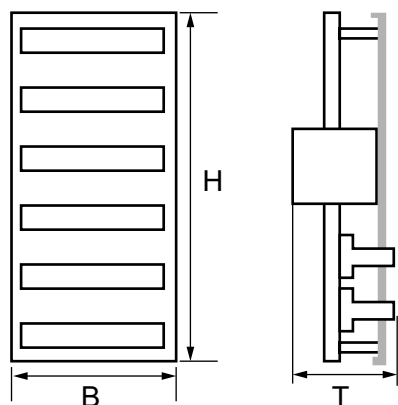
Weight/power consumption	see ordering information
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Ordering information

Nominal current (AC-3) of the transfer switching device	Max. permissible current acc. to DIN VDE 0100-710	Max. permissible back-up fuse	Power consumption approx.	Type	Art. No.
80 A	80 A	80 A, gG	39 W	UMA710-4-80-DIO-HA	B22040184
				UMA710-4-80-DIO-BP-HA	B22040185
125 A	125 A	125 A, gG	87 W	UMA710-4-125-DIO-HA	B22040186
				UMA710-4-125-DIO-BP-HA	B22040187
160 A	160 A	160 A, gG	119 W	UMA710-4-160-DIO-HA	B22040188
				UMA710-4-160-DIO-BP-HA	B22040189

Please observe the individual, job-related or project-related documentation provided.

Dimensions and weights



Type	Sections/ rows	Dimensions in mm			Recommended cabinet depth	Weight approx.
	Quantity	Width (W)	Height (H)	Depth (D)		
UMA710-4-80-DIO-HA	2/6	500	900	190	300	12
UMA710-4-80-DIO-BP-HA	2/6	500	900	190	300	13
UMA710-4-125-DIO-HA	2/6	500	900	190	300	12
UMA710-4-125-DIO-BP-HA	2/6	500	900	190	300	12
UMA710-4-160-DIO-HA	2/6	500	900	190	300	12
UMA710-4-160-DIO-BP-HA	2/6	500	900	190	300	12

One row has a height of 150 mm. One section has a width of 250 mm.
Provision of the equipment rack.



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