ATICS-2...-ISO checklist

Initial commissioning and recurrent tests on site

Software version: D333 V1.3x, D334 V1.3x, D335 V1.0x, D308 V1.2x

Setting and testing according to the checklist

The factory settings and system-specific settings of the ATICS® devices are documented in the checklist. Please carry out all the work outlined in the list and log each test step.

The column "Ok/Comment" or "Ok/New value" is used to indicate changes. If no changes have been made, no entries are required here. If the initial commissioning or the recurrent test has been carried out by the Bender service, the computer printout replaces manual entry of the set parameters into this checklist.

Keep this checklist and the enclosed documentation near to the device.

Table of contents

1 Identification of the ATICS®

Project number		ATICS® type	
Project name		ATICS® article no.	
Switchgear production		ATICS® serial no.	
Installer		Software D333	
Bender order confirmation no.		Software D334	
Installation location/ Operator		Software D308	

2 Prior to commissioning - visual inspection

No.	Test step	Workshop test		On-site commissioning	
		Ok/Comment	Tested by/Date	Ok/Comment	Tested by/Date
1	Device and accessories checked for obvious damage				
2	Screw and clamping connections checked (correct wiring, torque setting). Repeat this test at regular intervals!				
3	Back-up fuses properly installed and selected				
4	Earth-fault and short-circuit-proof cable routing between ATICS® and transformer and distribution board. Make sure that no ferrules have been used to connect conductors 1, 2 and 3. (Ferrules can be used for 160 A version[2])				
5	Check interface				
5.1	Terminals A and B properly connected (not mixed up)				
5.2	BMS bus properly connected (terminating resistors)				
5.3	Shield connected to PE on one side				
5.4	MK2430 or MK800 alarm indicator and test combinations, and TM... alarm indicator and operator panels that are monitoring each other for device failure must be supplied by at least two independent power supply sources.				
6	For versions with ATICS-BP-… bypass switch: Terminals properly connected. Pay attention to the polarity! Bypass labels have been positioned at a suitable place.				

3 Commissioning - supply voltages and BMS bus

No.	Test step	Workshop test		On-site commissioning	
		Ok/ Comment	Tested by/Date	Ok/ Comment	Tested by/Date
1	For versions with ATICS-BP-… bypass switch, change to position I (normal). Connect existing voltage to line 1 and line 2.				
1.1	ATICS® starts in fault-free operating condition: • The green "L1" and "L2" LEDs light • The orange "ALARM" LED does not light				
1.2	The LCD shows the standard information				
2	Check voltage				
2.1	Line 1 L-N: AC 230 V / _____ V				
2.2	Line 2 L-N: AC 230 V / _____ V				
2.3	Line L-N: AC 230 V / _____ V				
2.4	Only for versions with ATICS-BP-… bypass switch: • The indicator light (next to the bypass switch) may only light up green when line 1 has been switched on at the ATICS®. The bypass switch may be operated. • If the ATICS® is in position "0" or "II", the indicator light (next to the bypass switch) must light up red. The bypass switch must not be operated. • Settings of the digital input must be changed for "Bypass" (refer to "Settings menu 6: Dig. input")				
3	Check the connected components				
3.1	Observe the messages on the TM… alarm indicator and operator panels or MK… alarm indicator and test combinations				
3.2	Check that the address assignment complies with the project planning : • Is the master function assigned to address "1"? • Has each address only been assigned once? • Is there an EDS… insulation fault locator? • Check address assignment (see "Functional test EDS system").				

No.	Test step	Workshop test		On-site commissioning	
		Ok/ Comment	Tested by/Date	Ok/ Comment	Tested by/Date
3.3	Check MK2430 or MK800 alarm indicator and test combinations, and TM… alarm indicator and operator panels (if available): • Assign addresses (master 1, slave 2…150) • Set alarm addresses (address for alarm transmitter) • Set the alarm address so that the MK… and TM… monitor each other and the ATICS® for device failure (functional safety) • Set test addresses for insulation monitoring devices (integrated into ATICS®) • Set date/time				

4 Checking parameter settings

4.1 Settings menu 1: Changeover

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
1	t(start)	0 s				
2	t(0)	160 ms				
3	t(2->1)	10 s				
4	t(test)	5 s				
5	System*	U1-U2				
6	SwitchBackLock	off				
7	Prefer.supply	1				
8	Test interval	12 mo (months)				
9	Reminder	21 d (days)				
10	Serviceinterv.	36 mo (months)				
11	Reminder	40 d (days)				
12	t(Gen.start)	---				
13	t(Gen.Max)	---				
14	t(Gen.off)	---				
15	Load disconnection (only for ATICS® in "ES" version)	on				

*Tab. 4-1 * Adjust settings to system (e.g. SV/AV (safety power supply/normal power supply) or BSV/SV (battery-supported safety power supply/safety power supply) or …) and in compliance with other connected indicator units (e.g. TM800 or MK2430). For more detailed information, refer to the chapter "Settings menu 1: Changeover" menu item "5. System".*

4.2 Settings menu 2: Voltage

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
	Line 1					
1	Undervoltage	184 V (320 V)*				
2	Overvoltage	260 V (450 V)*				
3	t(on)	150 ms (<2 s)**				
4	t(off)	200 ms				
5	Hysteresis	3 %				
	Line 2					
1	Undervoltage	184 V (320 V)*				
2	Overvoltage	260 V (450 V)*				
3	t(on)	150 ms (<2 s)**				
4	t(off)	200 ms				
5	Hysteresis	3 %				

*Tab. 4-2 * Values for ATICS®…400 versions*
*** Values for ATICS® in "ES" version*

For "-ES" version of ATICS®, t(on) must have the same value for line 1 and 2 and be < 2 s! For staggered switch-on of several ATICS®, the values for t(on) must be set differently!

4.3 Settings menu 3: Current

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
1	Function	on				
2	CT	STW3				
3	CT monitor.	on*				

*Tab. 4-3 * Recommendation: set to "off" after successful commissioning.*

4.4 Settings menu 4: IT system

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
1	Insulation	100 kΩ				
2	CT	STW2				
3	CT monitor.	on				
4	Load	5 A				
5	Hysteresis	5 %				
6	t(on)	0 s				
7	t(off)	0 s				
8	Temperature	on				
9	Fault location	off				
10	IT system	230 V				

4.5 Settings menu 5: Relays

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
1	Function*	Alarm				
2	Operating principle	N/C-T				
3	Line 1	on				
4	Line 2	on				
5	Manual mode	on				
6	Device error	on				
7	Test interval	on				
8	Service interval	on				
9	Dig. input	off				
10	Insulation	on				
11	Load	on				
12	Temperature	on				
13	Undervoltage	on				

*Tab. 4-4 * For more detailed information, refer to the chapter "Settings menu 5: Relays"*

4.6 Settings menu 6: Dig. input

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
1	Function	off				
2	Resp. value	24 V				
3	t(on)	100 ms				
4	t(off)	100 ms				

The following must be set for operation with bypass switch:

- 1. Function: Bypass
- 2. Response value: 0 V
- 3. t(on) response delay: 100 ms
- 4. t(off) delay on release: 100 ms

4.7 Settings menu 7: Data logger

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
1.1	1 Line 1: modification	4 %				
1.2	1 Line 1: overwrite	Yes				
2.1	2 Line 2: modification	4%				
2.2	2 Line 2: overwrite	Yes				
3.1	3 Component : modification	0 %				
3.2	3 Component : overwrite	Yes				
4.1	4 I(3): modification	20 %				
4.2	4 I(3): overwrite	Yes				
5.1	5 Insulation: modification	10 %				
5.2	5 Insulation: overwrite	Yes				
6.1	6 Load: modification	20 %				
6.2	6: Load: overwrite	Yes				

4.8 Settings menu 8: Language

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
	Language	German				

4.9 Settings menu 9: Interface

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/New value	Tested by/ Date	Ok/New value	Tested by/ Date
1	Address	3				
2	Change settings via BMS bus	off				
3	Carry out TEST of the changeover device via BMS bus	off				
4	Failure monitoring of the BMS master	on				
5	Profile	Standard				

4.10 Settings menu 10: Clock

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/Comment	Tested by/ Date	Ok/Comment	Tested by/ Date
1	Format	d.m.y				
2	Date*					
3	Time*					

*Tab. 4-5 * These setting options are required when the ATICS® is operated as "Stand-alone" device. If the device is operated in a bus system, these settings are overwritten by the master.*

4.11 Settings menu 11: Password

The device has two separate passwords for the "Settings" menu and the "TEST" menu. Enter a password for each menu. Activate both passwords (status: on).

No.	Parameter	Factory setting	Workshop test		On-site commissioning	
			Ok/Comment	Tested by/ Date	Ok/Comment	Tested by/ Date
1	Settings					
1.1	Password	000				
1.2	Status	off				
2	TEST					
2.1	Password	000				
2.2	Status	off				

4.12 Settings menu 12: Service

This menu is only intended for the Bender service.

5 Functional test

These tests are to be performed during:

- Initial commissioning (workshop test)
- On-site commissioning
- Recurrent test

Warning! During a functional test (recurrent test) without a bypass switch, there is a brief interruption in the power supply. *It is essential to consult the medical staff before performing a functional test!*

		Required test step	Test by chapter:
A	With bypass	☐	5.1, at the end: 5.6
B	With disconnector	☐	5.2 and 5.3 or 5.4
	With energy storage device	☐	additionally 5.5
C	Without disconnector	☐	5.3 or 5.4
	Generator directly controlled by ATICS®	☐	optional: separate generator test without changeover 5.7[1]
	With IT system	☐	5.8
	With EDS	☐	5.9
	Establish readiness for operation	☑	5.10

Tab. 5-6 [1] Changeover test according to B, C triggers generator start (generator runs for test time t(test) or until manual switching back + generator run-on time t(gen.off))

5.1 Functional test enable bypass switch

(Test required [ ])

Caution! The bypass switch may only be operated when the indicator light (next to the bypass switch) is green.

No.	Functional test	Ok	Tested by
1	**Check requirements:** • ATICS® is in switching position "I".		
2	**Enable bypass: Change bypass switch quickly to position "II".** The yellow "ALARM" LED lights up on the ATICS®. The message "Bypass mode" appears on the display.		

No.	Functional test	Ok	Tested by
3	Observe the messages on the ATICS® and on the connected alarm indicator and operator units (TM... , MK..., CP…). Acknowledge acoustic message.		

5.2 Functional test changeover by interrupting the preferred supply

(Test required [ ])

No.	Functional test	Ok	Tested by
1.1	**Switch off first line – activate changeover function**		
1.2	ATICS® indication: the green power on LED line "1" goes out; the yellow "ALARM" LED lights up. The fault message "Failure Line 1" appears on the display. The device switches to the redundant line within a preset time. The inspection window shows the changed switching position of the changeover.		
1.3	Observe the messages on the connected alarm indicator and operator units (TM... , MK..., CP…). Acknowledge acoustic message.		
1.4	**Reconnect the first line – activate switching back function**		
1.5	ATICS® indication: the green power on LED line "1" lights up; the yellow "ALARM" LED goes out. The device switches to the preferred supply within a preset time. Exception: If the switching back interlocking function is activated, the device will not switch back. The message "Switching back interlock" appears on the display. The device does not switch back to the preferred supply until the corresponding RESET function has been carried out (or line 2 has been switched off).		
1.6	Observe the messages on the connected alarm indicator and operator units (TM... , MK..., CP…).		
2.1	**Switch off second line**		
2.2	ATICS® indication: the green power on LED line "2" goes out; the yellow "ALARM" LED lights up. The fault message "Failure Line 2" appears on the display. The device does not switch.		
2.3	Observe the messages on the connected alarm indicator and operator units (TM... , MK..., CP…). Acknowledge acoustic message.		
3.1	**Reconnect second line**		
3.2	ATICS® indication: the green power on LED line "2" lights up; the yellow "ALARM" LED goes out.		
3.3	Observe the messages on the connected alarm indicator and operator units (TM... , MK..., CP…).		

5.3 Functional test changeover by internal test function manual with control of the changeover time

(Test required [ ])

No.	Functional test	Ok	Tested by
1	**Press the"TEST" button for at least one second, then select "Manual changeover".** The device switches to the redundant line within a preset time. Read off and note down the changeover period t(1->2): _____ ms. • ATICS® indicates the modified switching position in the inspection window.		
2	Observe the messages on the connected alarm indicator and operator units (TM... , MK..., CP…). Acknowledge acoustic message.		
3	Activate switching back function: Press the "RESET" button for at least one second. The device switches to the preferred supply within a preset time.		
4	Observe the messages on the connected alarm indicator and operator units (TM... , MK..., CP…).		

5.4 Functional test changeover by internal test function auto with control of the changeover time

(Test required [ ])

No.	Functional test	Ok	Tested by
1	**Press "TEST" button for at least one second, then select "Changeover Auto".** The device switches to the redundant line within a preset time. Read off and note down the changeover time t(1->2): _____ ms.		
2	The device changes back automatically to the preferred supply after the set time t(Test) has elapsed.		
3	Observe the messages on the ATICS® and on the connected alarm indicator and operator units (TM... , MK..., CP…).		

5.5 Functional test changeover with ATICS-ES energy storage device by disconnecting the feeding lines

(Test required [ ])

To test the energy storage device, the supply lines must be disconnected.

Warning! When testing the function of the ATICS-ES energy storage device without a bypass switch or with a circuit breaker upstream of the bypass tap, the power supply is interrupted for as long as the ATICS® is in switching position "0". *It is essential to consult the medical staff before performing a functional test!*

Before each test, observe the LEDs on the ATICS-ES and wait until the energy storage device is fully charged.

No.	Functional test	Ok	Tested by
1	**Check requirements:** • All three LEDs on the ATICS-ES energy storage device light up continuously.		
2	**Disconnect line 2, then disconnect line 1** • ATICS® switches to position "0".		
3	**Connect line 2** • ATICS® switches to position "II". • If available: The indicator light (next to the bypass switch) lights up red. • Wait until the ATICS-ES energy storage device is fully charged. All three LEDs light up continuously.		
4	**Disconnect line 2** • ATICS® switches to position "0"		
5	**Connect line 1, then connect line 2** • Wait until the ATICS-ES energy storage device is fully charged. • All three LEDs light up continuously.		
6	Observe the messages on the connected alarm indicator and operator units (TM... , MK..., CP…). Acknowledge acoustic message.		

5.6 Functional test disable bypass

(Test required [ ])

No.	Functional test	Ok	Tested by
	Disable bypass		
1	**Check requirements:** • ATICS® is in switching position "I". • The indicator light (next to the bypass switch) lights up green.		
2	Observe the messages on the ATICS® and on the connected alarm indicator and operator units (TM... , MK..., CP…).		

5.7 Functional test generator

(Test required [ ])

No.	Functional test	Ok	Tested by
1	**Check requirements:** • ATICS® in normal operation, no alarm message.		
2	**Press the "TEST" button for at least one second, then select "Generator".** • The generator starts. • The green LED "Line 2" lights as soon as the voltage from the generator is available. • No message is shown on the display. **Wait - depending on the required generator operating time**		
3	**Press the "RESET" button.** • The generator stops. • The green LED "Line 2" goes out. • No message is shown on the display.		

5.8 Functional test insulation monitoring

No.	Functional test	Ok	Tested by
1	**Press the "TEST" button:** Press the "TEST" button for at least one second, then select "IT system" (confirm twice).		
1.1	Insulation fault, overload, overtemperature are simulated. The yellow "ALARM" LED lights up. After the test, the device displays for a few seconds the measured values simulated during the test. The messages of this test are stored in the history memory.		
1.2	Observe the messages on the displays of the TM… alarm indicator and operator panels or the MK… alarm indicator and test combinations. Acknowledge acoustic message.		
2	**Generate a genuine insulation fault:** Generate a 42 kΩ or 46 kΩ insulation fault (e.g. via a test plug) in the IT system.		
2.1	The yellow "ALARM" LED lights up. The fault message "Insulation fault" appears on the display.		
2.2	Observe the messages on the TM… alarm indicator and operator panels or MK… alarm indicator and test combinations Acknowledge acoustic message.Eliminate the insulation fault.		
2.3	Eliminate the insulation fault.		
3	**Check the interaction with TM… alarm indicator and operator panels or MK… alarm indicator and test combinations.**		
3.1	Press the test button on TM… alarm indicator and operator panels or the MK… alarm indicator and test combinations. Alarm only on tripping TM... alarm indicator and operator panel or MK… alarm indicator and test combination.		

5.9 Functional test EDS system (if available)

No.	Functional test	Ok	Tested by
1	**Check settings:** Menu > IT system > Fault location must be set to "Auto".		
2	**Generate a genuine insulation fault** Generate a 42 kΩ or 46 kΩ insulation fault (e.g. via a test plug) in the first monitored outgoing circuit of the IT system.		
2.1	Observe the messages on the displays of the TM… alarm indicator and operator panels or the MK… alarm indicator and test combinations: Insulation fault, measured value, address and channel. Acknowledge acoustic message.		
2.2	**The LED of the faulty outgoing circuit/channel lights on the EDS.**		
2.3	ATICS® displays the measured value of the insulation fault and "Ins. fault location".		
2.4	Eliminate the insulation fault.		
3	Perform functional test for all other monitored outgoing circuits of the IT system.		

5.10 Completing the functional test

No.	Functional test	Ok	Tested by
1	**Establish readiness for operation:** Reattach covers, check labelling. Activate fuses according to the guidelines which apply to the site of use, check readiness for operation of ATICS®.		

5.11 Signature

The settings were adjusted to the existing installation.

Initial commissioning (workshop test)

Date/Place	Comments	Tested by

On-site commissioning

Date/Place	Comments	Tested by

Recurrent test

Date/Place	Comments	Tested by
Date/Place	Comments	Tested by
Date/Place	Comments	Tested by
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