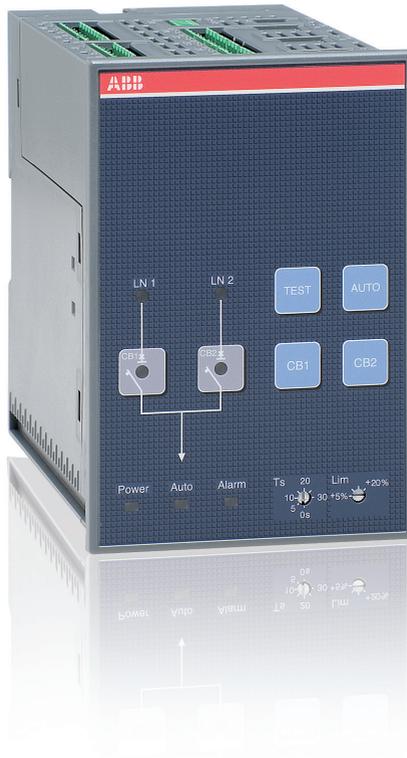


Automatic transfer switch ATS021

Installation and operating instructions



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1. Safety notes



Before using the ATS021 unit, read the following "Safety notes": using the unit without following the indications can lead to malfunctioning and, in some cases, hazardous conditions.

If there are doubts about safe use, the unit must be put out of service.

The automatic transfer switch ATS021 must be prevented from operating the circuit breakers before:

- accessing the circuit breakers
- performing maintenance on circuit breakers or any electrical circuits powered by them
- performing any operation where opening/closing the circuit breaker could be dangerous

During maintenance:

- set the "Manual" mode.
- lock the circuit breaker mechanically in the open position.

Safe use is not guaranteed if:

- the device has been damaged during transport
- the device shows visible signs of damage
- the device does not work
- the device has been stored for a long period

If the device operates on a circuit without warning, it must be excluded from the control circuit even if it seems to be in stand-by

2. Explanation of abbreviations and terms

2.1. General information

ATS:	Automatic Transfer Switch; automatic switching device
ATS021:	ATS of the ATS02x series, version with rotary switch and LEDs.
CB:	Circuit Breaker; low voltage automatic Circuit Breaker.
CB1:	CB on line LN1.
CB2:	CB on line LN2.
LN1:	Power supply line No.1.
LN2:	Power supply line No.2.
Lim:	Rotary switch of automatic/manual mode and voltage limit thresholds
Ts:	Rotary switch for setting Ts (See Chap. 2.2 – Times)
fn:	Rated plant frequency

2.2. Times

NOTE: All the details of the times and switching logics are described in the Chapters concerned.

TS:	<ul style="list-style-type: none">- Opening delay of main line CB, after detection of fault in the mains (generator is not in use)- Generator start delay, after detection of fault in mains (generator in use).
TBS:	Opening delay of emergency line CB, after detection of stabilised voltage on main line
TGOFF:	Generator switching off delay, after closure of normal line CB.
TF:	fixed delay of emergency line CB closure, after detection of stabilised voltage on the same line and fixed delay of normal line CB closure, after opening of emergency line CB.

3. Introduction

3.1 Product overview

The automatic transfer switch ATS021 is used in all installations where switching is required between two lines to ensure the supply of loads in case of a fault on one line.

ATS021 selects the power supply line by acting directly on the CBs provided on the lines: ATS021 can be used with automatic CBs and ABB SACE switch-disconnectors.

The device monitors the voltage of the main line and emergency line and records the following faults:

- Maximum and minimum voltage (up to +/-30%)*
- Maximum and minimum frequency (0.9fn>f>1.1fn)
- Phase balance
- Frequency imbalance**
- Voltage imbalance***

* Max. +20% in case of 480 VAC voltage and min. -20% in case of 208 VAC voltage

** In case of frequency imbalance, the fixed threshold +/- 10% is also applied to the difference between the two frequency values of the phases.

*** In case of imbalance of voltage, the threshold set by means of the Lim selector is also applied to the difference between the voltage values of the phases.

Depending on the settings and the anomalies recorded, the device pilots the CBs on the power supply lines to ensure continuous power supply of the plant.

ATS021 does not require an auxiliary safety power supply since it is powered directly by the line voltages.

ATS021 can be used in manual or automatic mode. In the first case, the circuit breakers can be controlled by means of pushbuttons present on the front of the device, while in automatic mode, the switching logic is controlled directly by the device.

The settings and adjustments can be done by means of dip switches and rotary selectors; the statuses of the lines, the circuit breakers connected and the device itself are visible by means of special LEDs, if the unit is powered.

ATS021 can be used in systems with rated frequency 50Hz, 60Hz which can be set by means of dip switch.

The device can be used in single-phase, three-phase systems with Neutral and three-phase without neutral, the setting can be done by means of dip switch.

If the ATS021 is used in systems without the Neutral, an external voltage transformer must be used

If the ATS021 is used in single-phase systems the Neutral wire must be connected.

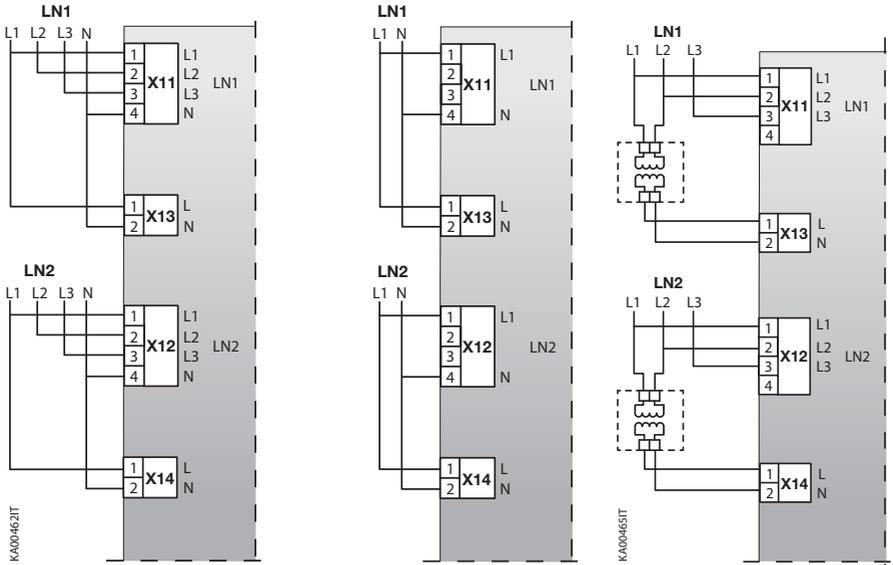


Figure 3.1: Diagram showing ATS021 connection to lines LN1-LN2

3.2 Application scenarios

The ATS021 device may be used in the following applications:

- Main line – Emergency line switching
- Main line – Emergency generator switching

With the Lim rotary switch in the SETUP position, the RESET key can be used to set the following switching logics:

- main line: Line LN1
- no line priority
- automatic mode without inverse procedure

Different combinations of LEDs indicate the setting of the various switching logics. For the details, see Chap. 5.

4. Applications of device ATS021

The ATS021 device controls all the switching sequences by applying the time delays that can be set:

Time delays	Description	Value
TS Delay	Opening delay of main line CB1 after detection of a fault in the mains (Generator is not in use)	0...30s
	Generator start delay after detection of a fault in the mains (Generator in use).	
TBS Delay	Opening delay of emergency line CB2 after detection of power restored on main line.	0...30s or Fixed 300s
TF Delay	Closing delay of emergency line CB2 after detection of voltage on emergency line	Fixed 3.5 sec
	Closing delay of emergency line CB1 after detection of voltage on main line	
TGOFF Delay	Generator switching off delay after closure of main line CB1.	0...30s or Fixed 300s

Table 4.1 Description of time delays

4.1 Main Line – Emergency Line switching

Description

Both the lines are normally present; in case of a fault in the main line, ATS021 switches on the emergency line used as the reserve line.

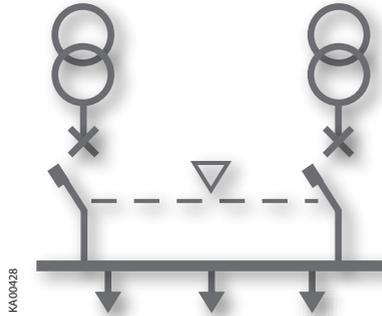


Figure 4.1: Application diagram – generator not in use

Time diagrams

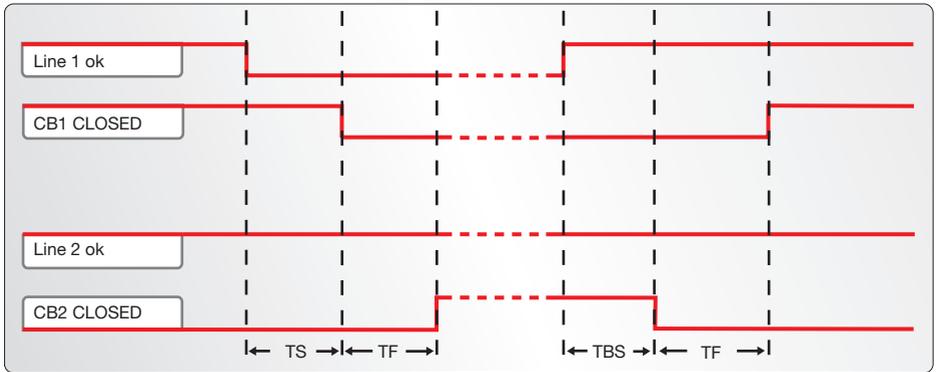


Figure 4.2: Application time diagram - line-line (main line LN1)

4.2 Main Line – Emergency generator Switching

Description

In case of a mains failure the ATS021 automatically starts up an emergency generator and, as soon as power is available on the generator side, ATS021 starts the automatic switching procedure.

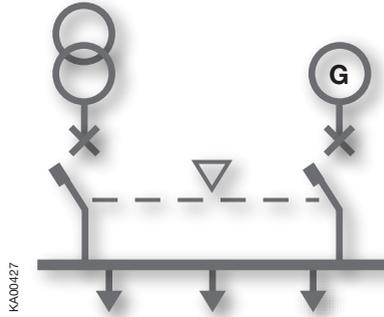


Figure 4.3: Application diagram – generator in use

Time diagrams

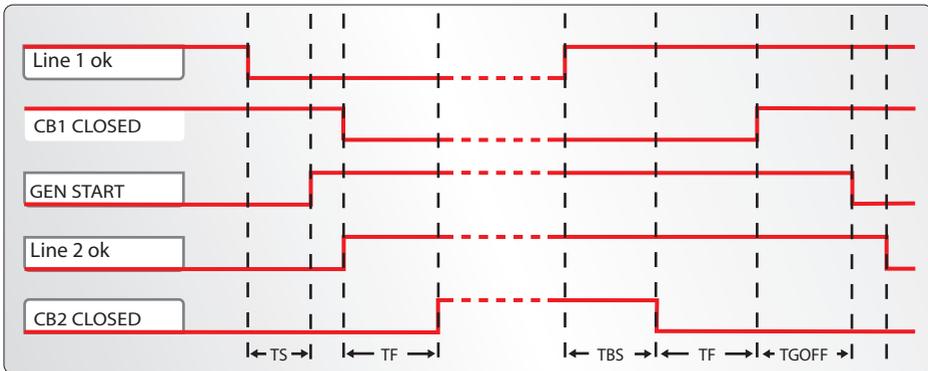


Figure 4.4: Line-generator application time diagram (main line LN1)

4.3 Automatic switching without inverse procedure

Description

Following an anomaly of the main line, ATS021 switches to an emergency line (1). If the mains supply is restored, the inverse switching procedure is not started up (2).

If there is a fault in the reserve line, ATS021 must open the emergency switch (3) and wait for the emergency line to return to reclose (4), without in any case providing for switching on the main line. This operating mode is also applicable if the generator is present: in this case, after time T_s the generator is started up and as soon as the emergency line is available CB1 is opened.

ATTENTION If ATS021 is not powered by any of the two lines the device waits for at least one of the two lines (5) to return before proceeding with the switching procedure (6).

Time diagrams

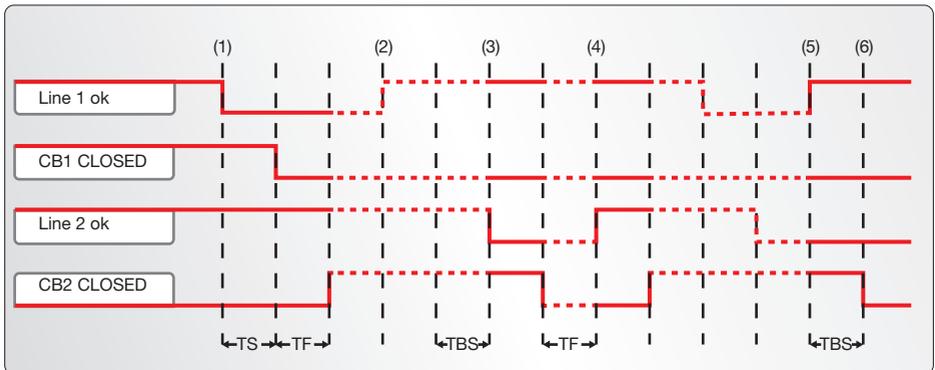


Figure 4.5: Line-line application time diagram without inverse switching procedure

4.4 Line Priority Selection

Description

ATS021 makes it possible to handle the priority of the lines; the following selections are possible:

- main line: Line LN1
- no line priority: ATS021 ensure power to the load from one of the lines considering anyone of them as priority line. So, for example, after the switch to LN2 because of LN1 fails, ATS021 stay on LN2 even if LN1 came back. It is possible to select this mode by means of the RESET key with the Lim rotary switch in the SETUP position. For more the details, see Chap. 5.

Time diagrams

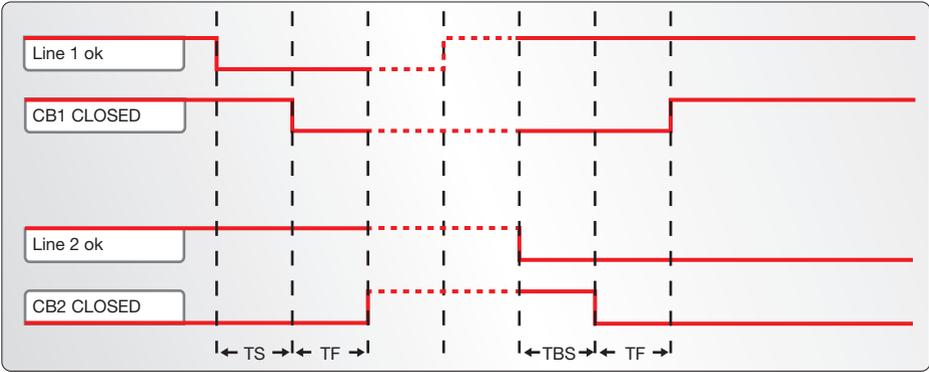


Figure 4.6: Time Diagram no line priority – generator non in use

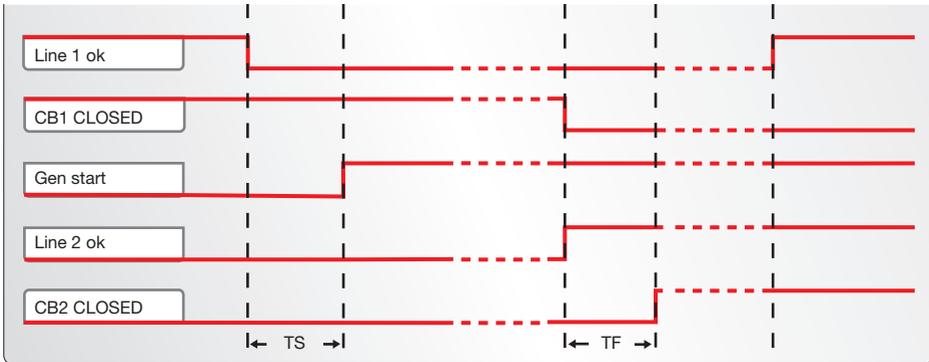


Figure 4.7: Time diagram no line priority – generator in use

5. Using the automatic transfer switch

5.1 Interface

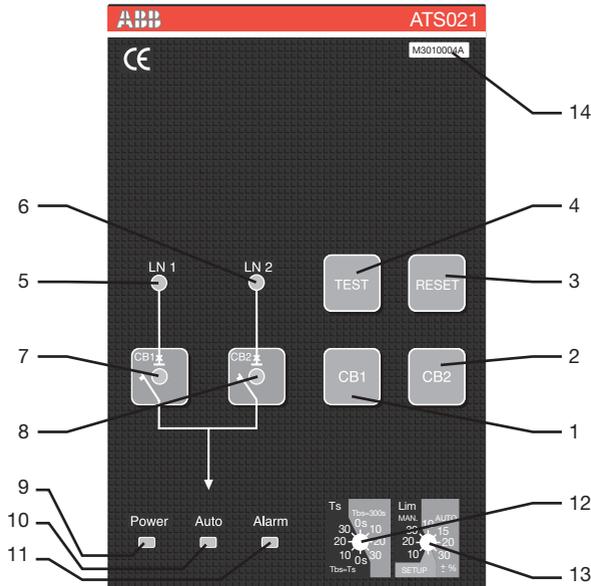


Figure 5.1: Description of ATS021 front panel interface

Ref.	Description
1	CB1: pushbutton for opening/closing circuit breaker CB1
2	CB2: pushbutton for opening/closing circuit breaker CB2
3	RESET: alarms reset button
4	TEST: test mode selection pushbutton
5	LED LN1: line 1 status indicator
6	LED LN2: line 2 status indicator
7	LED CB1: CB1 circuit breaker status indicator
8	LED CB2: CB2 circuit breaker status indicator
9	LED POWER: indicates power supply presence
10	LED AUTO: indicates automatic or manual mode
11	LED ALARM: indicates active alarm
12	Ts: Switching delay times rotary switch
13	Lim: Automatic/manual mode rotary switch and voltage limit thresholds
14	Serial No.

Table 5.1: Description of ATS021 interface

5.2 LED indicators

Alarm

The steady red Alarm LED, see Figure 5.1/11, may indicate one of the following events:

- generic alarm
- logic disabling from input DI3

The alarm LED switches Off indicating that the switching logic is enabled and no alarms are present

Auto

The Auto LED, see Figure 5.1/10, indicates the operating mode:

- manual: LED Off
- automatic: steady green LED
- test: flashing green LED

Power

The Power LED, see Figure 5.1/9, indicates the presence of power supply:

- power supply present: steady green LED indicates power supply from line voltage
- no power supply: LED Off indicates that both lines are not present and that the Powersave condition has ended. The switching logic is in stand-by for return of one of the line voltages
- Powersave: green flashing LED indicates, if both lines are absent, that the device is active and is in stand-by for return of one of the line voltages (maximum duration 1 minute). When the Powersave period ends, the LED switches off and the device awaits a line voltage. The moment the normal or the emergency line is restored, with ATS021 in automatic, the unit analyses the conditions of the lines monitored and the status of the circuit breakers and proceeds with the switching operation in accordance with the situation concerned. If power is absent in both lines, the alarms signalling contact is activated.

LN1 – LN2

The status of lines LN1 and LN2 is signalled by means of the red LEDs LN1 and LN2, see Figure 5.1/5 – 5.1/6; the status of the lines is expressed in the Table shown below.

Line status	LED indication
Power OK	ON
No power	OFF
Maximum voltage	Rapid flashing (5 Hz)
Minimum voltage	Flashing (1 Hz, 50% ON / 50% OFF)
Frequency not valid	Flashing (1 Hz, 90% ON / 10% OFF)
Imbalance	Flashing (1 Hz, 10% ON / 90% OFF)

Table 5.2: Indications of status of lines LN1 - LN2

CB1

The status of circuit breaker CB1 is signalled by red LED CB1, see Figure 5.1/7:

Circuit Breaker Status	CB1 LED Indication
CB1 open	LED CB1 OFF
CB1 closed	LED CB1 ON
CB1 opening movement under way	CB1 LED flashing (1 Hz, 50%ON / 50%OFF)
CB1 closing movement under way	CB1 LED flashing (1 Hz, 50%ON / 50%OFF)
CB1 opening failed	LED CB1 ON - LED Alarm ON
CB1 closure failed	CB1 LED flashing - Alarm LED flashing

Table 5.3: CB1 status indications

CB2

The status of circuit breaker CB2 is signalled by red LED CB2, see Figure 5.1/8:

CB2 circuit breaker status	LED indication
CB2 open	LED CB2 OFF
CB2 closed	LED CB2 ON
CB2 opening movement under way	CB2 LED flashing (1 Hz, 50%ON / 50%OFF)
CB2 closing movement under way	CB2 LED flashing (1 Hz, 50%ON / 50%OFF)
CB2 opening failed	LED CB2 ON - LED Alarm ON
CB2 closing failed	CB2 LED flashing - Alarm LED flashing

Table 5.4: CB2 status indications

5.3 Keypad keys

CB1 key

In manual mode, press the CB1 key, see Figure 5.1/1 for Opening/Closure of circuit breaker CB1.

CB2 key

In manual mode, press the CB2 key, see Figure 5.1/2 for Opening/Closure of circuit breaker CB2.

RESET

In case of alarm, press RESET to reset the alarm.

TEST button

ATS021 must be in the manual position.

Press the TEST key, see Figure 5.1/4, to set the test mode of the direct and inverse switching sequences.

To exit the TEST mode press RESET.

5.4 Rotary selectors

5.4.1 Selector for setting operating mode, voltage limit threshold and operating logic

ATS021 can be set in manual or automatic mode by moving the Lim rotary switch, see Figure 5.1/13 on the front panel in the MAN or AUTO section.

The voltage limit threshold is selected by turning the Lim rotary switch to the position corresponding to the required value.

The following options are available:

- in manual mode: ± 10 , ± 20 , ± 30 %.
- in automatic mode: ± 10 , ± 15 , ± 20 , ± 30 %.
- Operating logic configuration (SETUP).

The operating logic can be configured by turning the Lim rotary switch to the SETUP position and following the procedure described in the “Switching logic Setup” Chapter.

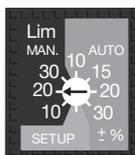


Figure 5.2: Description of Lim rotary selector

Manual mode

ATS021 can be set in manual mode by turning the Lim rotary switch, see Figure 5.1/13 on the front panel in the MAN section.

For example, when the Lim rotary switch is in the MAN area in position 20, ATS021 operates in Manual mode and the voltage threshold is ± 20 %; in manual mode this threshold is used as the reference for the LN1 and LN2 LED signals.

Automatic mode

ATS021 can be set in automatic mode by turning the Lim rotary switch, see Figure 5.1/13 on the front panel in the AUT section.

For example, when the Lim rotary switch is in the AUTO area in position 20, ATS021 operates in Automatic mode and the voltage threshold is ± 20 %; in automatic mode this threshold is used as the reference for the switching procedure start-up and for the LN1 and LN2 LED signals.

Switching logic setup

ATS021 allows the setting of three different operating logics:

- main line: Line LN1
- no line priority
- automatic switching without inverse procedure

To select the different operating logics:

1. turn the Lim rotary switch to the SETUP position
2. press the RESET button to select the switching logic used by ATS021.
3. the selection of a definite operating logic is indicated by a different lighting up of the LEDs according to the table shown below:

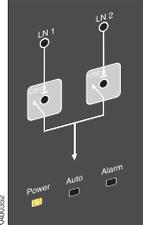
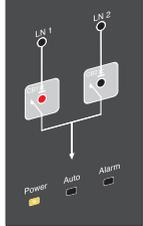
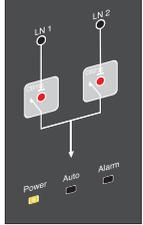
OPERATING LOGIC	LEDs INDICATION	
Main line 1	LED POWER ON	
No line priority	LED POWER ON LED CB1 ON	
Automatic switching without inverse procedure	LED POWER ON LED CB1 ON LED CB2 ON	

Table 5.5: Description of ATS021 operating logic setup

WARNING: after the operating logic setup, the user must make sure the device is not left accidentally in the SETUP position.

5.4.2 Selector for setting delay times T_s and T_{bs}

The delay times can be set by means of rotary switch T_s , see Figure 5.1/12 on the front panel.

The time settings possible are:

Time delays	Description	Value
TS Delay	Opening delay of main line CB1 after detection of a fault in the mains (Generator is not in use)	0...30s
	Generator start delay after detection of a fault in the mains (Generator in use).	
TBS Delay	Opening delay of emergency line CB2 after detection of power restored on main line.	0...30s or Fixed 300s

Table 5.6: Description of ATS021 delay time

Two different sections are available:

- section $T_{bs}=T_s$: select time T_s by turning the rotary switch to one of the possible positions. ATS021 uses a time T_{bs} equal to time T_s selected. The possible selections are 0s, 10s, 20s, 30s.
- section $T_{bs}=300s$: select time T_s by turning the rotary switch to one of the possible positions. ATS021 uses a fixed time T_{bs} of 300sec. The possible selections for T_s are 0s, 10s, 20s, 30s.

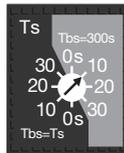


Figure 5.3: Description of T_s rotary selector

5.5 Dip Switches



Figure 5.4: ATS021 lower interface

The parameters which can be modified by means of the dip switches in the lower part of the ATS021 are:

- Un** Rated voltage: can be set by means of DIP switches S23-1...3
- fn** Rated frequency: can be set by means of DIP switch S23-4
- N** Neutral in use, can be set by means of DIP switch S24-1
- Ph** Number of phases: can be set by means of DIP switch S24-2
- Gen** Generator in use: can be set by means of DIP switch S24-3
- Tgoff** Delay in switching off generator: can be set by means of DIP switch S24-4

5.1.1 Setting parameters by means of DIP switches

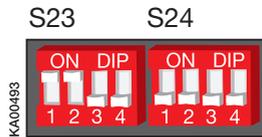


Figure 5.5 Default setting DIP switches ATS021

DIP switches S23

DIP switches S23-1...3 for setting rated voltage of lines monitored

S23-1...3 Positions	UN - main/phase voltage
 OFF, OFF, OFF	Un - 480/227 V
 ON, OFF, OFF	Un - 440/254 V
 OFF, ON, OFF	Un - 415/240 V
 ON, ON OFF	Un - 400/230 V (default)
 OFF, OFF, ON	Un - 380/220 V
 ON, OFF, ON	Un - 230/130 V
 OFF, ON, ON	Un - 220/127 V
 ON, ON, ON	Un - 208/120 V

DIP switch S23-4...3 for setting rated frequency of lines monitored

S23-4	Positions	Rated frequency fn
	OFF	50Hz (default)
	ON	60Hz

Figure 5.6: Description of settings DIP Switches S23 - ATS021

DIP switches S24**DIP switch S24-1 for setting neutral**

S24-1	Positions	Neutral
	OFF	N used (default)
	ON	N not in use

DIP switch S24-2 for setting the phase system

S24-2	Positions	Phase System
	OFF	three-phase (default)
	ON	single-phase

DIP switch S24-3 for setting the unit in use

S24-3	Positions	Generator
	OFF	not in use (default)
	ON	in use

DIP switch S24-4 for setting Tgoff

S24-4	Positions	Tgoff
	OFF	Tgoff = Ts
	ON	Tgoff = 5 minutes

Figure 5.7: Description of settings DIP Switches S22 - ATS021

5.6 Using pushbuttons in manual mode

Opening/Closing circuit breakers CB1, CB2

In manual mode the circuit breakers can be controlled by means of pushbuttons CB1 and CB2. In case of a fault, the alarms are activated by the same methods as those for the automatic switching sequence.

Pressing the CB1 key:

- If CB1 is closed, the opening command is sent to CB1
- If CB1 and CB2 are both open, the closing command is sent to CB1
- If CB1 is open and CB2 is closed, no operation is carried out

Pressing CB2 key:

- If CB2 is closed, the opening command is sent to CB2
- If CB2 and CB1 are both open, the closing command is sent to CB2
- If CB2 is open and CB1 is closed, no operation is carried out

Manual Start/Stop of generator

In manual mode, the combination of the RESET, CB1 and CB2 keys allows Start/Stop of the generator.

- Generator Start: keeping RESET pressed, press CB1
- Generator Stop: keeping RESET pressed, press CB2

5.7 Test Modes

ATS021 makes it possible to select two different test modes:

- test of the entire switching procedure (complete Test)
- generator start/stop test (gen set test)

WARNING: when the test procedure ends, the user must make sure the device is not left accidentally in TEST mode

Complete Test

With ATS021 in manual mode, press TEST: all the LEDs flash twice simultaneously and then the Auto LED flashes every 0.5 sec

Description of complete TEST sequence
<ol style="list-style-type: none"> 1. Press TEST; generator start (not done if generator is NOT in use) 2. Press TEST; CB1 Opening 3. Press TEST; CB2 Closure 4. Press TEST; CB2 Opening 5. Press TEST; CB1 Closure 6. Press TEST; generator stop (not done if generator is NOT in use)

Table 5.7: Description of complete TEST sequence ATS021

At the end of the procedure, press TEST again to resume the sequence.

Alarms, if any, on the protection devices control are activated in the same manner as the automatic and manual operating modes.

The user can stop the TEST sequence by pressing the RESET.

Gen Set Test

This test mode makes it possible to test only the start and stop of the generator with the plant running without in any way operating the circuit breakers on the lines.

With ATS021 in manual mode, keep TEST pressed for at least 3 seconds: when the TEST button is released, all the LEDs flash simultaneously twice and then the Auto LED flashes for 0.5 sec every 2 sec .

The test procedure is as follows:

<ol style="list-style-type: none"> 1. Press TEST; start generator 2. Press TEST; stop generator

Table 5.8: Description of test method GEN SET ATS021

6. Input and output signals

6.1 Output signals

DO1, DO2, DO3, DO4: Circuit breakers opening/closing command

Output signals DO1...DO4 control the opening and closing of circuit breakers CB1 and CB2 connected to ATS021.

The control logic integrated in the device punctually checks the correct operation of the circuit breakers following the command.

If the change in status of the circuit breaker is not received within 5 seconds of sending the command, the device considers the command as failed and operates as below:

- alarm LED lights up.
- DO6 alarm output activation

To reset the alarm press the RESET button.

DO5 Emergency generator start/stop command

Start and stop of the Emergency generator are controlled by means of a bistable relay, making it possible to maintain the generator even when the powersave mode runs out.

- contact DO5 (X23:1 ; X23:2 - NO):
 - stop unit = contact open
 - start unit = contact closed
- contact DO5 (X23:2 ; X23:3 - NC):
 - stop unit = contact closed
 - start unit = contact open

DO6 Alarm signal

When an alarm is generated, the DO6 contact switches; the switching logic is disabled.

To reset the alarm press the RESET button.

If there is no power in both lines the alarm signalling contact DO6 is activated.

- contact DO6 (X24:1 ; X24:2 - NO):
 - Alarm = contact open
 - Normal operation = contact closed
- contact DO6 (X24:2 ; X24:3 - NC):
 - Alarm = contact closed
 - Normal operation= contact open

DO7 Manual mode signalling

Contact DO7 provides the indication of the operating mode of the ATS021 unit (X25:2 - contact closed if the unit is in manual mode and open if in automatic mode)

DO8 Logic enabled indication

Contact DO8 provides the indication of the operating mode of the ATS021 unit (X25:3 – contact open if the unit operates with the logic enabled; contact closed if the unit operates with the logic disabled).

6.2 Input signals

DI1, DI2 Status signals of circuit breakers CB1, CB2

Inputs DI1, DI2 are connected to the normal and emergency lines circuit breakers status auxiliary contacts

- DI1, DI2 open: CB open
- DI1, DI2 closed: CB closed

DI3 Switching Logic Activation/Deactivation

Input DI3 is used for enabling/disabling the switching logic. The function may be used for integrating generic alarms coming from the plant the presence of which leads to disabling of ATS021 automatic switching logic.

- DI3 open: logic disabled
- DI3 closed: logic enabled

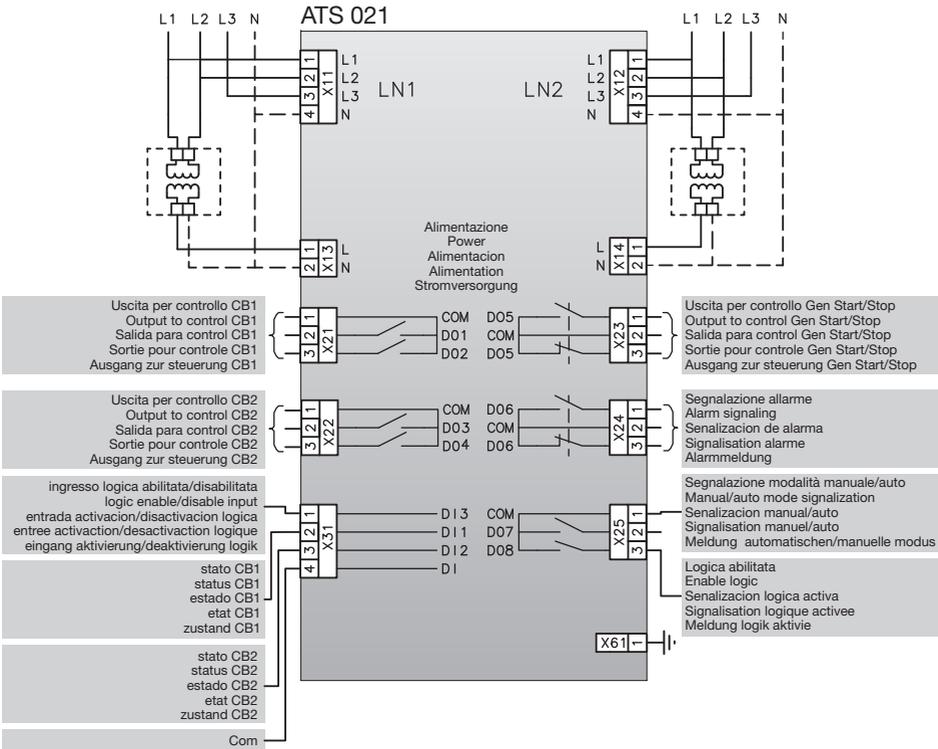


Figure 6.1: Control circuit diagram ATS021

Connectors	Description	DI/DO	Type
X11:1	Normal Line LN1: L1	-	-
X11:2	Normal Line LN1: L2	-	-
X11:3	Normal Line LN1: L3	-	-
X11:4	Normal Line LN1: N	-	-
X12:1	Emergency Line LN2: L1	-	-
X12:2	Emergency Line LN2: L2	-	-
X12:3	Emergency Line LN2: L3	-	-
X12:4	Emergency Line LN2: N	-	-
X13:1	Power supply from Normal Line LN1: L	-	-
X13:2	Power supply from Normal Line LN1: N	-	-
X14:1	Power supply from Normal Line LN2: L	-	-
X14:2	Power supply from Normal Line LN2: N	-	-
X21:1	Com	-	-
X21:2	CB1 opening command	DO1	NO
X21:3	CB1 closure command	DO2	NO
X22:1	Com	-	-
X22:2	CB2 opening command	DO3	NO
X22:3	CB2 closure command	DO4	NO
X23:1	generator start/stop command	DO5	Open =gen stop; Closed = gen start
X23:2	Com	-	-
X23:3	generator start/stop command	DO5	Closed =gen stop; Open = gen start
X24:1	normal operation	DO6	Closed = normal operation; Open = Alarm
X24:2	Com	-	-
X24:3	alarm presence	DO6	Open = normal operation; Closed = Alarm
X25:1	Com	-	-
X25:2	Manual mode indication	DO7	Open = Automatic; Closed = manual
X25:3	Alarm signal	DO8	Open = no alarm/logic Enabled; Closed = alarm/logic disabled
X31:1	logic enabling input	DI3	NC
X31:2	CB1 status input	DI1	Open = CB open; Closed = CB closed
X31:3	CB2 status input	DI2	Open = CB open; Closed = CB closed
X31:4	Com	-	-
X61	Earth connection	-	-

Table 6.1: Description of function and type of connectors ATS021

7. Technical data

ATS021		Value
Three-phase voltage used		
	Connected voltage	208Vac - 480Vac (+/-20%) ⁽¹⁾
	Phase voltage	120Vac - 277Vac (+/-20%) ⁽²⁾
	Frequency	50-60 Hz +/-10%
Single-phase voltage used		
	Phase voltage	120Vac - 277Vac (+/-20%)
	Frequency	50-60 Hz +/-10%
Sensors precision		
	Voltage	5%
	Frequency	1%
Relay utilization category		8 A, AC1, 250 V
Relay/connectors utilization category		6 A, AC1, 250 V
Over voltage category		III, Uimp 6 kV
Power consumption		Max 22W
IP rating		IP20
Device weight		807g
Operating temperature		-20 / +60 °C
Storage temperature		-25 / +80°C
Humidity		r.h=95% T=25...60°C
Altitude		Max. 2000m

Table 7.1: Technical data ATS021

NOTES

1. In the three-phase system without neutral, an external voltage transformer must be used.

The features of the external transformer for power supply only of the ATS021 are:

- transformer from connected voltage to phase voltage
- Isolation transformer
- size 40VA.

2. In the single-phase system the Neutral conductor must be connected.

8. Installation of device ATS021

The automatic transfer switch ATS021 must be mounted on the panel front door or on DIN rail.

8.1. Door-mounted Automatic Transfer Switch ATS021

The Automatic Transfer Switch ATS021 can be mounted on the door as shown in Figure 8.1.

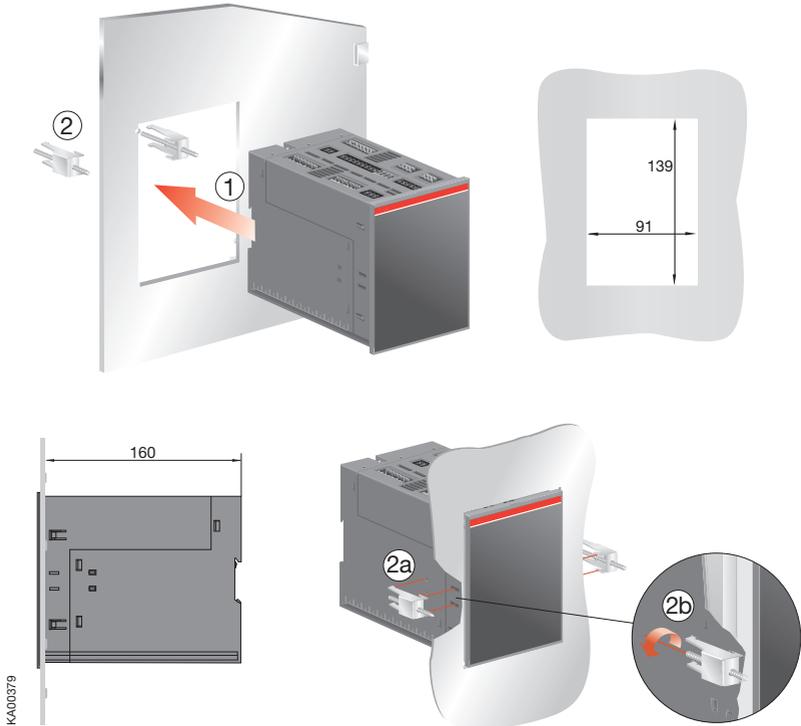


Figure 8.1: Door-mounted ATS021

8.2. DIN rail-mounted Automatic Transfer Switch ATS021

The automatic transfer switch ATS021 can be mounted on a 35mm DIN rail as shown in Figure 8.2.

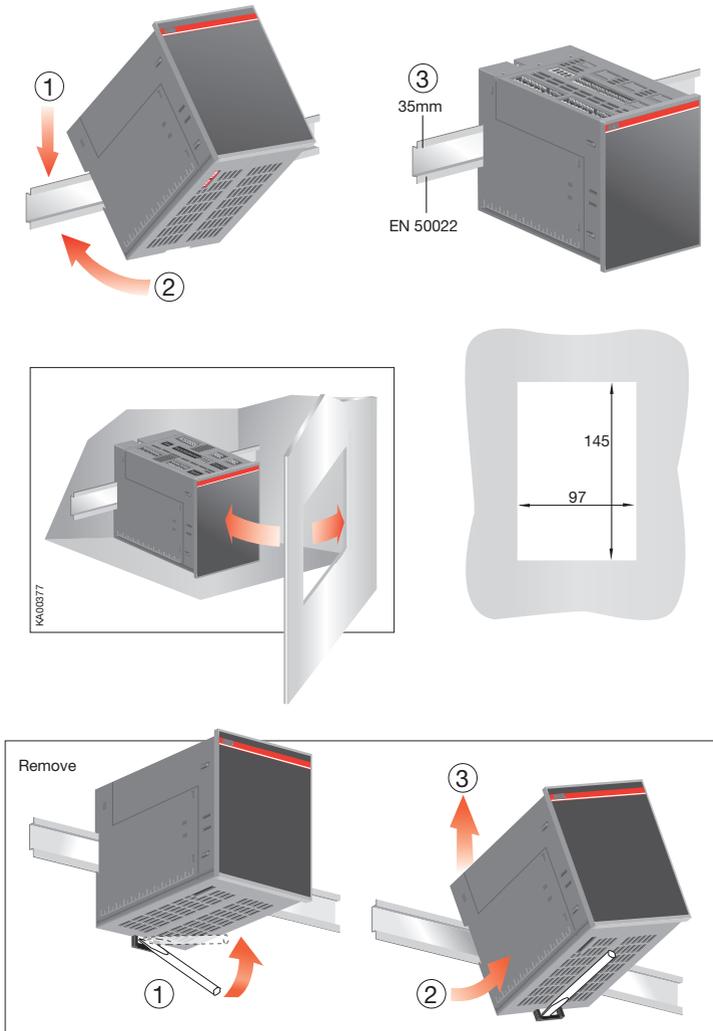


Figure 8.2: DIN rail-mounted ATS021

9. Regulatory standards

ATS021 conforms to the following regulatory standards:

- European Directive 73/23 “LVD – Low Voltage Directive”
- EN 50178 electronic equipment for use in power Installations
- EN-IEC 62103 electronic equipment for use in power Installations
- EN-IEC 60947-5-1 low voltage switchgear and control gear: control circuit devices and switching elements
- Electromagnetic compatibility EN 50081-2, EN 50082-2
- Environmental conditions IEC 68-2-1, IEC 68-2-2, and IEC 68-2-3
- EN-IEC 61000-4-2: Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test Basic
- EMC Publication (IEC 61000-4-2 [8KV air, 4KV cont])
- EN-IEC 61000-4-3, Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 3: Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3 [level 3])
- EN-IEC 61000-4-4, Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 4: Electrical fast transient/burst immunity test Basic EMC Publication (IEC 61000-4-4 [level 2/3])
- EN-IEC 61000-4-5, Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 5: Surge immunity test (IEC 61000-4-5 [level 1/2])
- EN-IEC 61000-4-6: Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques (IEC 61000-4-6 [level 3])
- EN-IEC 61000-4-8: Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques (IEC 61000-4-8 [level 5])
- EN 50093, Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 11: Voltage dips, short interruptions and voltage variations immunity test (IEC 61000-4-11, [100ms/5s] B, C criterion)
- CISPR11 (30MHz...1GHz): Emission (Generic Standard, Industrial) – Radiated o CISPR11 (0.15MHz...30MHz): Emission (Generic Standard, Industrial) – Conducted
- CISPR/CEI 1000-6-3: Part 6: Generic standards – Section 3: Emission standard for residential, commercial and light-industrial environments
- IEC 60068-2-2: Environmental testing. Part 2: Tests. Test B: Dry heat
- IEC 60068-2-6: Environmental testing. Part 2: Tests. Test Fc: vibration (sinusoidal)
- IEC 60068-2-27: Environmental testing. Part 2: Tests. Test Ea and guidance: shock
- IEC 60068-2-30: Environmental testing. Part 2: Tests. Test Db and guidance: Damp heat, cyclic
- IEC 60068-2-1: Environmental testing. Part 2: Tests. Test A: cold (-20 °C ± 3 °C, 16 hours)

10. Troubleshooting

The alarms are indicated by a flashing Alarm LED on the front of the ATS021. The list of possible meanings are shown in the Table below:

Alarm	Fault	Action
Opening 1 Alarm	the protection switch on normal line LN1 does not open. After 5s the alarm LED starts flashing and the CB1 LED lights up.	the alarm can be reset by means of the RESET button. If the alarm is not cleared, there is probably a malfunction in the protection switch.
Opening 2 Alarm	the protection switch on emergency line LN2 does not open. After 5s the alarm LED starts flashing and the CB2 LED lights up.	the alarm can be reset by means of the RESET button. If the alarm is not cleared, there is probably a malfunction in the protection switch.
Closure 1 Alarm	the protection switch on normal line LN1 does not close. After 5s the alarm LED and the CB1 LED start flashing.	the alarm can be reset by means of the RESET button. If the alarm is not cleared, there is probably a malfunction in the protection switch.
Closure 2 Alarm	the protection switch on emergency line LN2 does not close. After 5s the alarm LED and the CB2 LED start flashing.	the alarm can be reset by means of the RESET button. If the alarm is not cleared, there is probably a malfunction in the protection switch.

Table 10.1: Alarms ATS021

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Due to possible development of Standards as well as of materials, the characteristics and dimensions specified in this Installation and operating instructions may be considered as binding only after confirmation by ABB SACE Division.

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