OPERATING MANUAL

ATS-16 A

Automatic Transfer Switch
230 VAC

PREPARED		STATUS	SECURITY LEVEL		
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Safety symbols and warnings

The following symbols are used in this manual, the list below explains each symbol.

This symbol in conjunction with the signal word “**DANGER**” indicates an imminent electrical hazard.

Failure to observe the related safety note may cause injury, death or equipment damage.

This symbol in conjunction with the signal word “**WARNING**” indicates a potentially dangerous situation.

Failure to observe may cause injury, death or equipment damage.

This symbol indicates a safety note: “ATTENTION! Hazardous voltage!”

Installation by a certified service engineer only.

This symbol in conjunction with the signal word “**NOTE**” indicates operator tips or particularly useful or important information for the use of the product.

This symbol and wording does not indicate a dangerous situation.

This symbol indicates that reading the instruction manual/booklet before starting work or before operating equipment or machinery is compulsory.

Contents

1. Important safety instructions

BEFORE READING THE OPERATING MANUAL, PLEASE CAREFULLY READ THIS CHAPTER ON IMPORTANT SAFETY INSTRUCTIONS

1.1. Save these instructions

This manual contains important instructions for model ATS 16A (Automatic Transfer Switch) that should be followed during installation and maintenance.

It also provides guidelines to check delivery and is intended for people who plan the installation and use of the product. The reader is expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

READ ALL SAFETY AND OPERATING INSTRUCTIONS BEFORE OPERATING THE ATS 16A (AUTOMATIC TRANSFER SWITCH) SYSTEM. OBSERVE TO ALL WARNINGS ON THE UNIT AND IN THIS MANUAL

BY NOT FULFILLING THIS OBLIGATION, THE PRODUCT MAY LOSE ITS WARRANTY

INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES

WARNING

1.2. Safety rules

- RISK OF ELECTRIC SHOCK - DISCONNECTION OF AC SOURCE(S) (AND THE DC SOURCE) IS REQUIRED TO DE-ENERGIZE THIS UNIT BEFORE SERVICING
- THERE IS DANGER OF AN ELECTRICAL IMPACT.

DANGER

Follow all operating and user instructions.

WARNING

READ THE INFORMATION, IN ORDER TO AVOID DAMAGE TO EQUIPMENT.

The user must follow the precautions and only perform the operations described. Also, in these measures the operator of the ATS 16A (AUTOMATIC TRANSFER SWITCH) system must observe the instructions in this manual. Any deviations from the instructions could be dangerous to the user or cause accidental load loss.

THE MANUFACTURER WILL NOT BE HELD RESPONSIBLE FOR DAMAGES CAUSED THROUGH INCORRECT MANIPULATION OF THE UPS SYSTEM.

DANGER

IT IS PROHIBITED TO REMOVE ANY PARTS FROM THE ATS 16A (AUTOMATIC TRANSFER SWITCH) SYSTEM OR FROM ANY OPTIONAL PART.

THERE IS A DANGER OF ELECTRICAL SHOCK!

DANGER

HIGH FAULT CURRENTS (LEAKAGE CURRENTS):

BEFORE CONNECTING THE MAINS YOU MUST ENSURE THAT THERE IS A PROPER EARTH CONNECTION!

2. Installation

2.1. Receipt and visual inspection

NOTE

ON RECEIPT, CHECK THE PACKAGING AND ENSURE THAT THE CONTENTS ARE UNDAMAGED. ANY DAMAGED OR MISSING PARTS MUST BE REPORTED TO THE SUPPLIER AS SOON AS POSSIBLE.

2.2. Unpacking list

The ATS-16 A is available voltage level 220/230/240VAC. Nominal current: 16 A.

- ATS-16 A module
- 2 pluggable input power cables (p/n: 108-00140-xx)
- Bracket kits (for rack mounting and vertical mounting)

NOTE:

1. An approved power cord greater or equal to H05VV-F, 3G, 0.75mm^2 must be used.

2.3. Storage

Storage temperature: -25–70 °C

Storage humidity: 10%–90%

2.4. Handling

WARNING

THE EQUIPMENT MUST BE HANDLED WITH CARE; DAMAGE MAY BE CAUSED IF DROPPED OR SUBJECTED TO SEVERE IMPACT.

2.5. Environmental conditions

NOTE

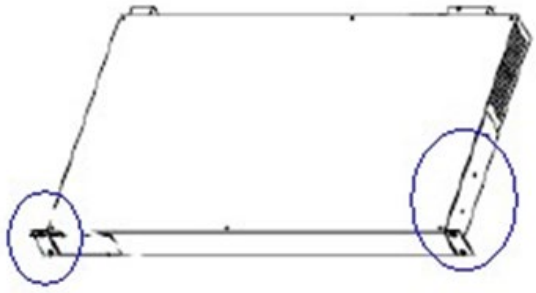
THE ATS-16 A MUST BE EITHER RACK MOUNTED OR INSTALLED ON A LEVEL AND EVEN SURFACE IN AN AREA PROTECTED FROM EXTREMES OF TEMPERATURE, WATER, AND HUMIDITY, AND FROM THE PRESENCE OF CONDUCTIVE POWDER OR DUST

WARNING

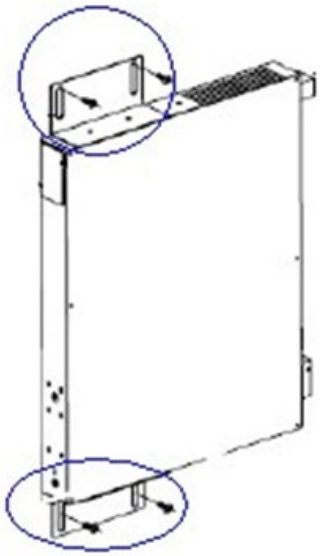
DO NOT STACK UNITS AND DO NOT PLACE ANY OBJECTS ON TOP OF THE UNIT.

2.6. Rack Mounting

When mounting the ATS-16 A in a cabinet, please ensure that the chosen cabinet is capable of supporting the unit with the corresponding rails or brackets. The ATS-16 A scope of supply contains two brackets for fixing the ATS-16 A into a 19-inch rack or into a cabinet with 19-inch inner design. Vertical mounting is also possible with the ATS-16 A.



Rack Mounting



Vertical Mounting

2.7. Dimensions of area

NOTE

IT IS NECESSARY TO LEAVE A MINIMUM SPACE OF A FEW CENTIMETERS ON THE RIGHT, LEFT AND REAR TO ALLOW THE FLOW OF AIR AND TO PROVIDE ACCESS TO THE INTERFACE

3. Installation

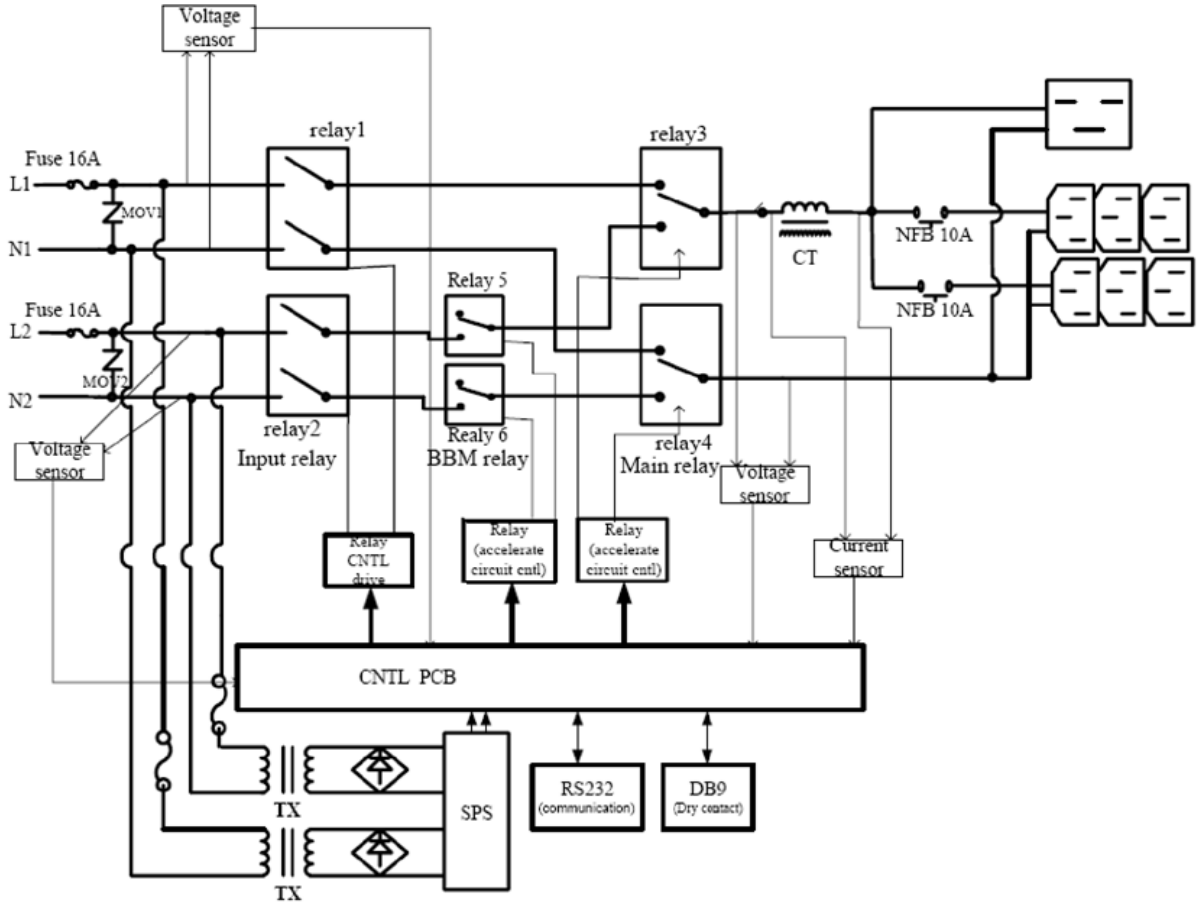
3.1. Configuration of the ATS-16 A system

The ATS-16 A provides high reliability supply by switching the load to one of two possible power supplies.

Primarily, these two supplies are UPS devices with sinusoidal output only. These UPS devices must operate on the double conversion principle.

3.2. Technical Data

3.2.1. Block Diagram



3.2.2. ATS-16 A Technical Data

Input features:

Item	Specification	Remark
Nominal input voltages	230 V (220/230/240 selectable)	Default: 230VAC
Working range	160 ~ 290VAC	
Input voltage acceptance window	Nominal voltage +/- 12% ~ +/- 20%	Adjustable (Default: +/- 12%)
Input voltage low comeback	Input voltage low loss volts +10 V	
Input voltage high comeback	Input voltage high loss volts -10 V	
Nominal current	16 A	
Nominal frequency	50/60 Hz selectable	
Input frequency range	Nominal frequency +/- 15%.	

Output features:

Items	Specifications	Remark
Output voltage	Same as input voltage	
Output frequency	Same as input (50 /60 Hz)	
Output current	16 A	
Max. transfer time	15 ms	
Overload capability	105–125% (20 A): 45 sec 126–150% (24 A): 27 sec 151–210% (33.6 A): 5 sec 211–300% (48) A): 2 sec	

Interface:

Items	Specifications	Remark
Inlet	IEC 320-C20x 2	Power Cord: p/n 108-00140-xx
Outlet	IEC 320-C19 x 1 IEC 320-C13-3 x2	
EPO active	Output NOT supplied.	

Communications:

a) RS232 (DB-9, pin type)

PIN No.	Definition
PIN 2	RX
PIN 3	TX
PIN 5	GND

b) Dry Contact (DB-9, pin type)

PIN No.	Description	Open State	Close State
PIN 1	Over temperature signal	Normal	Over Temperature
PIN 2	Not used		
PIN 3	Not used		
PIN 4	Source 1 status signal	Source 1 is fail	Source 1 is ok
PIN 5	Common		
PIN 6	Not used		
PIN 7	Overload signal	Normal	Over load
PIN 8	Source 2 status signal	Source 2 failed	Source 2 OK
PIN 9	Summary alarm signal	Normal	Alarm occurred

Mechanical Features:

Items	Specification	Remark
Dimensions	W = 430 mm D = 315 mm H = 44 mm (1U)	
Weight	Approx. 8 kg	
Packaging sizes	W = 585 mm D = 425 mm H = 184 mm	
Color	Silver	RAL 9006
Material	Metallic Case	
Structure	Rack Mount Unit (1U) Vertical mount (0U)	

Environment:

Items	Specifications	Comments
Operating temperature	0 to 40 °C	
Storage temperature	-25 °C to 70 °C Continuous	
Storage humidity	10% to 90%	
Operation humidity	20% to 85% No condensation	
Operation Altitude	max. 1000 m	
Audible noise	25dBA (max.)	Buzzer OFF
Cooling	Natural Cooling	
IP Protection	IP 30	

Safety Standards

Meets IEC60950-1.

EMC Standard:

EMI	IEC62310-2, C1
EMS	IEC61000-4-2 level 3
	IEC61000-4-3 level 2 (Lab.)
	IEC61000-4-4 level 2
	IEC61000-4-5 level 3
	IEC 61000-2-2 LF Immunity
	IEC61000-4-6 level 2 (Lab.)
	IEC61000-3-2 Harmonic (Lab.)
	IEC61000-3-3 Flickers

3.3. External Protection and Isolation Devices

External devices for the protection of cables and for isolating the ATS-16 A and UPS must be installed upstream and downstream of the equipment. Select and configure the isolating device upstream in accordance with the ATS-16 A input 16 A breakers.

Disconnecting devices must be provided in building installations and other locations.

All protection devices (circuit breakers and fuses) placed upstream of the ATS-16 A input and downstream to ATS-16 A output line have to be installed for the protection of both the cables and the equipment and in coordination with both ATS-16 A input protection (fuses) and ATS-16 A overload capacities.

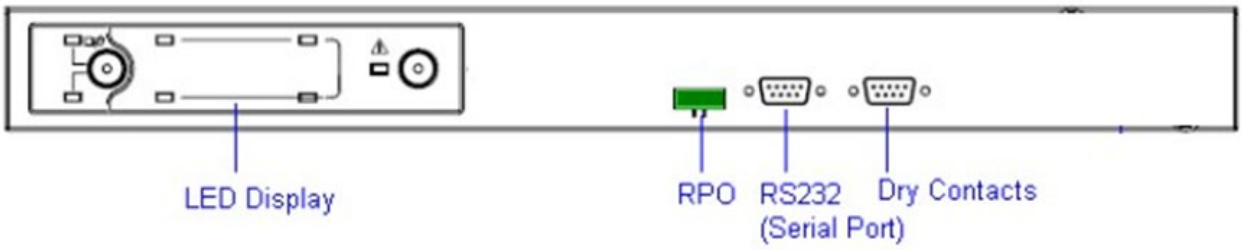
WARNING

IF THE ATS-16 A'S OVERLOAD CAPACITIES ARE EXCEEDED, THE UNIT WILL CUT-OFF THE OUTPUT LOAD.

DEPENDING ON THE OVERLOAD CHARACTERISTICS, THE ATS-16 A WILL EITHER TRIP THE INPUT FUSES OR DRIVE THE INTERNAL POWER RELAYS INTO THE OPEN POSITION.

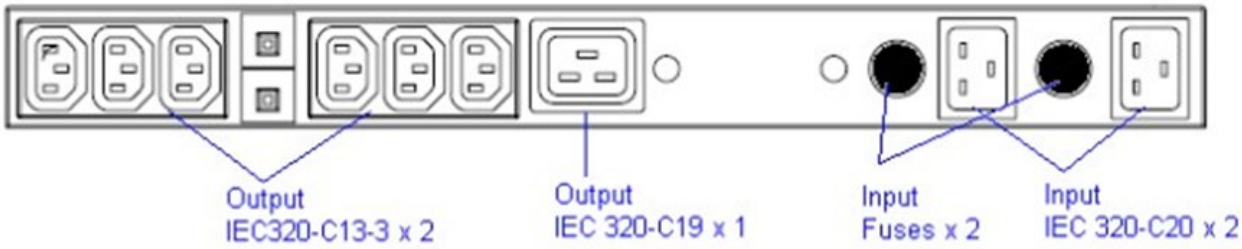
3.4. Front panel

The following figure shows the front of the ATS-16 A with its LED display and interfaces.



3.5. Rear Panel

The following figure shows the back of the ATS-16 A with its connectors, terminals, and interfaces.



3.6. Operating Panel

In the following figure you can see the front panel of the ATS-16 A. Most of the functions of the ATS-16 A are driven by an internal control. From the operating panel, mains electricity can be set as the preferred source of power. The state of the relay group is displayed with several LEDs. Please see the following table for more detailed operating information.

LEDs and Push Buttons of the Operating Panel	
LED PS1 (Preferred Source Indication)	LED PS1 ON (GREEN): Input source 1 is selected as the preferred source (LED PS2 will be OFF when PS1 is selected
LED PS2 (Preferred Source Indication)	LED PS2 ON (GREEN): Input source 2 is selected as the preferred source (LED PS1 will be OFF when PS2 is selected
PUSH BUTTON – BP2 (Selection button for Preferred Source)	(Default) PS1 is the default input source. Each 3-second push will change the preferred source selection. 1. In normal operation, output power is always supplied from the selected preferred source. 2. If the preferred source is abnormal, ATS will automatically transfer to the other source of voltage 3. If both sources are abnormal, no voltage is transferred to the output.
LED S1 (Source S1, Line status LED)	LED GREEN: Input source 1 is OK LED FLASH: Input source 1 voltage / frequency is out of range. LED OFF: Input source 1 failure (no power from source)
LED S2 (Source S2, Line status LED)	LED GREEN: Input source 2 is OK LED FLASH: Input source 2 voltage / frequency is out of range. LED OFF: Input source 2 failure (no power from source)
LED SW1 (Output power state LED)	LED SW1 ON (GREEN): load is powered by input source 1. LED SW1 OFF: load is not powered by input source 1.
LED SW2 (Output power state LED)	LED SW1 ON (GREEN): load is powered by input source 2. LED SW1 OFF: load is not powered by input source 2.
LED F1 (Fault LED)	LED F1 ON (RED): Fault detected. • Overload fault • Output short circuit • Input Source relay fault • EPO active LED F1 OFF: normal operation (no fault).
PUSH BUTTON BP1 (Buzzer ON/OFF)	Each 1-second push will turn the Buzzer ON or OFF.
PUSH BUTTON – BPY WITH BP2 (Fault release)	Each 3-second push on BP1 and BP2 together will release a fault (you must clear the fault conditions first).

3.7. Description of the system

The 2-pole ATS-16 A is a two-way, single phase automatic switch powered by two independent synchronous or asynchronous AC power supply sources.

The ATS-16 A makes a rapid switch from one source to the other in the event of a fault to the power supply used to power the load.

One of the two sources can be designated as the preferred power supply, to which the ATS-16 A will transfer the load. It remains there until different designations or faults require it to be switched to the other source.

The ATS-16 A is fitted with a block diagram with LED indicators, capable of providing all the information concerning equipment operation status, together with the power source priority selection button BP2 needed to enable trained operators to make full use of the apparatus.

Features:

- Break Before Make transfer mode.
- Back feed protection (according EN62310-1).
- Complete overload and short-circuit protection. (With FUSE Holder Accessible).
- Redundant power supply. (From input Source 1 and Source 2).
- AC source detection (voltage and current detection).
- Output detection (current detection).
- LED display.
- Integrated EPO contact
- Different setting to adjust the voltage failure sensing level (+/- 12% ~ +/- 20%). (Default setting: Nominal voltage +/- 12%).
- Protection: IP30.
- ON/OFF for Buzzer
- Selectable Nominal Frequency
- RPO active (open): output not supplied.

4. Manual Switch ON Procedures

4.1. First Switch on from Source A

- Check that all switches are OFF and check the EPO status.
- Connect the mains for source A.
- Wait for several seconds until the logic is enabled and the LEDs on the display are switched ON.
    - Priority LED PS1 or PS2 depending on the default setting.
    - LED S1
    - LED SW1
- Connect the mains for source B.
- The following LEDs are illuminated:
    - Priority LED PS1 or PS2 depending on the default setting.
    - LED S1
    - LED S2
    - LED SW1 or SW2 according to the primary source

4.2. First Switch on from Source B

- Check that all switches are OFF and check the EPO status.
- Input the mains for source B.
- Wait for several seconds until the logic is enabled and the LEDs on the display are switched ON.
    - Priority LED PS1 or PS2 depending on the default setting.
    - LED S2
    - LED SW2
- Connect the mains for source A.
- The following LEDs are illuminated:
    - Priority LED PS1 or PS2 depending on the default setting.
    - LED S1
    - LED S2
    - LED SW1 or SW2 according to the primary source

4.3. Switch OFF

WARNING

WHEN THIS PROCEDURE IS CARRIED OUT THE LOAD IS NO LONGER SUPPLIED BY THE ATS-16 A.

5. Troubleshooting

If problems should occur, please check the following points before contacting the appropriate customer service representative:

- Is the mains voltage present at the ATS-16 A input?
- Has one of the two input fuses tripped or open?

When contacting the ABB customer service representative, please have the following information ready:

- Device information (model name and serial number)
- An exact description of the problem (what loads are being operated, does the problem occur regularly or sporadically, etc.)

5.1. Fault identification and rectification

Problem	Possible Cause	Measure
No display, no alarm.	Mains or feeding UPS units switched off.	Switch on the mains or feeding UPS units.
	No mains voltage present.	Have the mains inspected by a qualified electrician
	Input fuses tripped.	Check and make sure the load capacity is within the specification, then replace with new fuse. If the problem persists, contact the appropriate customer service representative.
Both mains indicator S1 and S2 do not illuminate, when mains voltage present.	Both input fuses tripped.	Check and make sure the load capacity is within the specification, then replace with a new fuse. If the problem persists, contact the appropriate customer service representative.
Alarm indicator F1 illuminates, acoustic alarm activates with a 0.5 second sequence.	ATS-16 A Fault.	Contact the appropriate customer service representative.
	EPO	Check all loads and solve (clear) the problem that caused the EPO.
	Overheating	Check and make sure the load capacity is within the specification or decrease ambient temperature (has to be less than 40 °C).