ATS-22AG
Automatic Transfer Switch
And Control PLC
Operator’s Manual

Dedicated Single Phase
Transfer Switch
With Touch Screen Controls
INTRODUCTION

1.1 Preliminary Comments and Safety Precautions
The manual covers installation, operation and maintenance of the ATS-22AG Automatic Transfer Switch and Controller. This manual is for use by authorized and qualified personnel only.

WARNING
High voltages can kill.

1.2 Overview
Transfer switches protect critical electrical loads against loss of power. A standby (emergency) generator backs up the normal grid power. The transfer switch connects either the normal or the generator to the load. When power is lost the switch transfers the load to the generator. Eventually after the grid is restoration, the ATS connects the load back to the grid.

1.3 Product Overview
The ATS-22AG is a programmable automatic transfer switch Controller. It's suitable for single phase systems only, and including all necessary monitoring and protections.

The ATS-22AG features:

- Smart touch screen (touch sensor) design.
- Compact size with user-friendly LED display.
- All programming and operations are done from the front screen interface.
- Monitors grid and emergency for over and under voltage anomalies.
- Monitors grid and emergency for over and under frequency anomalies.
- Programmable exerciser with or without load.
- Exerciser can be set for 1 to 4 weeks scheduled.
- Emergency position contacts for Auto-Dialer
- Simple programming on-site
- Auto-saved settings (memory preserved throughout all power disconnects and resets).
- Front panel display provides source status and fail alarm indications.

1.4 Functions / Features
The primary function of ATS-22AG controller is to monitor grid / normal street power and to provide the necessary intelligence to operate a seamless automatic transfer of load.

1.4.1 Operational Simplicity
Installation, programming and use of the ATS-22AG controller are designed with simplicity in mind. The user-friendly front panel simplifies routine operation, programming and adjustments.
Line 1: Time Delay Emergency to Normal (TDEN)

TDEN delays the transfer from the emergency source back to the grid, permitting the stabilization of the grid before returning. Timing begins when the grid becomes available.
Adjustable TDEN time range: 0.0 to 990 sec

Line 2: Time Delay Normal to Emergency (TDNE)

TDNE delays the transfer from normal to emergency to permit stabilization of the generator before the retransfer is made. Timing begins when the generator becomes available.
Adjustable TDEN time range: 0.0 to 250 sec

Line 3: Time Delay Engine Start (TDES)

This timer prevents nuisance start because of momentary electrical glitches. If power normalizes before the countdown ends, the controller skips the engine start and resets the timer.
Adjustable TDES time range: 0 to 30 sec

Line 4: Time Delay Engine Cool-down (TDEC)

TDEC permits the generator to run unloaded after the ATS return to the grid. Timing begins when the ATS connects back to grid power
Adjustable TDEC range: 0 to 999 sec

Line 5: Time Delay Center OFF Position

This timer temporally stops the switch in the center OFF position (completely cut off) before proceeding to normal. Useful is some computerizes system that need time in OFF to reset.
Adjustable time delay range: 0 to 99 sec

Lines 6, 7, 10, & 11: Over / Under Voltage and Loss of one wire sensing

The controller monitors the voltage from grid and emergency power. The client can program over & under voltage window. (Refer to program table line 6, 7, 10, 11

O/V adjustment range: 110VAC to 300VAC
O/V reset value: -10VAC (Not adjustable)
U/V adjustment range: 80VAC to 240VAC
U/V reset value: +10VAC (Not adjustable)

Programmable exerciser

It can be set to exercise one time per week to one time every 4 weeks on any day and time, with or without load. The length of the exercise is also set. (Refer to program table line 14, 15, 16, 17, 18 & 19)

NOTICE

ATS-22AGAG provides one auxiliary contact for external output signal for Transfer in Emergency position for 60 sec

REPLACEMENT PARTS

Replacement parts are available. When ordering parts provide the Model and Serial Number. From the transfer switch name-Plate. Contact MTS Power in United States call 1-800-541-7677 World Wide call 305-634-1511
Feature 10: Panel LED Test
Touch the OFF button twice, all LEDs must light up.

SECTION 2: OPERATION

2.1 Display Window
The ATS-22AG controller has a 4-digit, 7-segment displayer to monitor all parameters, setting and messages. The screen displays:
- Voltage / frequency
- Current Time HH:MM (In OFF only)
- Time delay countdown
- Program setting parameters

2.3 Operate Touch Buttons
The front panel has 5 sensitive capacitive touch and release buttons.

2.3.1 Increase (▲) Button
When programming (▲) button increases the displayed parameter by one unit. If held, the up (▲) button continues to scroll.

2.3.2 Decrease (▼) Button
When programming every touch of the down (▼) button decreases by one unit. If held, the down (▼) button continues to scroll.

2.3.3 Auto Button
In AUTO, the ATS-22AG runs in automatic mode lighting the corresponding LED to indicate the selection. The controller automatically starts the generator, transfer and retransfers from grid to generator as commanded.

2.3.4 Test Button
Touching the TEST button simulates a power failure and begins a preprogrammed testing sequence. Starting the generator and putting it underload

2.3.5 OFF Button
Touching the OFF again, turns the ATS-22AG OFF engaging a flashing red LED disabling all functions and the screen shows the Time of Day
2.4 Panel LED Outputs

Eight individual red and blue LEDs light bars perform or indicating each function.

Information concerning the LEDs output

- Power available display normal / grid & emergency
- Emergency over voltage
- Emergency under voltage
- Emergency over frequency
- Emergency under frequency
- Normal / grid over voltage
- Normal / grid under voltage
- Normal / grid over frequency
- Normal / grid under frequency
- Normal / grid transfer failure
- Emergency transfer failure

ATS-22AG Automatic Transfer Switch
SECTION 3: OPERATION

3.1 General
The four functions of the ATS-22AG:
- In AUTO
- In OFF
- UNDER TEST mode
- Programming

The practical use of each operation under each category will be explained in this section. It is assumed that prior sections are understood, and the operator has a basic understanding of the hardware.

3.2 IN AUTO
The AUTO mode of the ATS-22AG controller provides automatic engine start, stop, and power transfer and retransfers from source to source as dictated by the values previously programmed.

The ATS-22AG constantly monitors the condition of both the grid and generators providing the intelligence for transfer operations.

In AUTO the ATS starts the generator, using the normally open remote start connection. Next to the remote start is the connections for the Common Alarms which are activated only for 60 sec. when the ATS moves to the Emergency Position.

3.3 IN OFF
In OFF the ATS-22AG disables all the transfers and protection functions with all LED indicators off leaving the display screen only showing the time. User can test the LEDs by touching the OFF button twice. Check and reset the clock every year. The wrong time can affect the schedule exerciser. Without power, the controller can maintain the clock working for up to a week.

However, when programming, the OFF button allows you to move to the next program line and then change the values for that line using down (▼) and up (▲) buttons.

3.4 Manual TEST (TEST)
Touching TEST simulate a loss of normal/grid power. Permitting the controller to start the engine and carry out a power transfer UN load.

To end, touch the AUTO button. If normal power is available, the controller transfer back to normal and the engine follow the program shutdown procedure to stop the generator. However, by touching the OFF button, the transfer switch remains in its current position stopping the engine, and bypassing all time delays.

3.5 Programming Instruction
You program the ATS-22AG from the front faceplate.

To start, set the controller to OFF and touch & hold the OFF button for 4 seconds. The word “Vr1.0” appears on the display for 2 seconds, showing the software version.

You are ready to start the line-by-line programming sequence. Always touch the OFF key to move to the next line, to change the parameters, on each line use the up (▲) and down (▼) arrows. Repeatedly touching the up (▲) or down (▼) key, changes the displayed by one. To change faster, hold the buttons down.

Remember to always touch the “OFF” button to move to the next line or until the “End” appears on the screen. **Note:** To end and exit at any time, hold the “OFF” key down for 4 seconds.

If you make an error or need to return to factory settings, stay or reenter programming and then hold the AUTO keys down for 4 seconds, until the word “Au.Po” appears on the screen verifying that all programming lines are factory reset back like in the manual. (See line-by-line programming table for ATS-22AG factory settings).
## 3.7 Line By Line Programming Table – To Enter Touch the OFF button for 5 sec

<table>
<thead>
<tr>
<th>LINE</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
<th>FACTORY SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TDEN Time Delay Emergency to Normal</td>
<td>00 to 999 sec</td>
<td>10 sec</td>
</tr>
<tr>
<td>2</td>
<td>TDNE Time Delay Normal to Emergency</td>
<td>00 to 250 sec</td>
<td>10 sec</td>
</tr>
<tr>
<td>3</td>
<td>TDES Time Delay Engine Start</td>
<td>00 to 30 sec</td>
<td>5 sec</td>
</tr>
<tr>
<td>4</td>
<td>TDEC Time Delay Engine Cool-down</td>
<td>00 to 999 sec</td>
<td>00 sec</td>
</tr>
<tr>
<td>5</td>
<td>TDN Time Delay in Neutral “OFF” Position</td>
<td>00 to 25 sec</td>
<td>2 sec</td>
</tr>
<tr>
<td>6</td>
<td>Normal over voltage protection setting</td>
<td>11 to 30 (110V to 300V)</td>
<td>27 (270V)</td>
</tr>
<tr>
<td>7</td>
<td>Normal Under voltage protection setting</td>
<td>08 to 24 (80V to 240V)</td>
<td>18 (180V)</td>
</tr>
<tr>
<td>8</td>
<td>Time delay if there is a problem with the normal voltage</td>
<td>00 to 99sec (0 = Disabled voltage monitoring)</td>
<td>10 sec</td>
</tr>
<tr>
<td>9</td>
<td>Time delay if there is a problem with the normal frequency</td>
<td>00 to 99sec (0 = Disabled Hz monitoring)</td>
<td>10 sec</td>
</tr>
<tr>
<td>10</td>
<td>Generator over voltage protection setting</td>
<td>11 to 30 (110V to 300V)</td>
<td>27 (270V)</td>
</tr>
<tr>
<td>11</td>
<td>Generator Under voltage protection setting</td>
<td>8 to 24 (80V to 240V)</td>
<td>18 (180V)</td>
</tr>
<tr>
<td>12</td>
<td>Time delay if there is a problem with generator voltage</td>
<td>00 to 99sec (0 = Function disabled)</td>
<td>10 sec</td>
</tr>
<tr>
<td>13</td>
<td>Time delay if there is a problem with the generator frequency</td>
<td>00 to 99sec (0 = Function disabled)</td>
<td>10 sec</td>
</tr>
<tr>
<td>14</td>
<td>Set today’s day of the week – Day</td>
<td>1 to 7 (Monday to Sunday)</td>
<td>current</td>
</tr>
<tr>
<td>15</td>
<td>Set today’s time – Hour using 24 hr military time</td>
<td>00 to 23</td>
<td>current</td>
</tr>
<tr>
<td>16</td>
<td>Set today’s time – minutes</td>
<td>00 to 59</td>
<td>current</td>
</tr>
<tr>
<td>17</td>
<td>Set day of week to do the engine exercise</td>
<td>1 to 7 (Monday to Sunday)</td>
<td>6</td>
</tr>
<tr>
<td>18</td>
<td>Set the time to start the exercise</td>
<td>00 to 23 (24 Hr Mode)</td>
<td>12</td>
</tr>
<tr>
<td>19</td>
<td>Set Generator automatic exercise cycle</td>
<td>01) 1 week 02) 2 weeks</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>03) 3 weeks 04) 4 weeks</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Exercising duration</td>
<td>00 to 99 min (0 = Do not exercise)</td>
<td>00</td>
</tr>
<tr>
<td>21</td>
<td>Exercise with load or without load</td>
<td>00) Without load 01) With load</td>
<td>00</td>
</tr>
</tbody>
</table>

To EXIT just go to the End and the word “END” shows up on the screen and all changes are saved
3.8 Specification Summary

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Voltage Measurement Range</td>
<td>50 VAC to 300 VAC 50/60 HZ</td>
</tr>
<tr>
<td>Frequency Measurement Range</td>
<td>40HZ to 75HZ</td>
</tr>
<tr>
<td>Remote Start Contact</td>
<td>7A @ 250VAC Max</td>
</tr>
<tr>
<td>Normal ON Contact</td>
<td>7A @ 250VAC Max</td>
</tr>
<tr>
<td>Emergency ON Contact</td>
<td>7A @ 250VAC Max</td>
</tr>
<tr>
<td>Auxiliary Contact Output</td>
<td>7A @ 250VAC Max</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-4F to 160F</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-4F to 160F</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>Maximum 90% relative humidity</td>
</tr>
<tr>
<td>Weight</td>
<td>0.55lbs 2%</td>
</tr>
</tbody>
</table>

SECTION 4: INSTALLATION INSTRUCTIONS

4.1 General

The ATS-22AG is made for front panel mounting.

4.2 Panel Cut-Out (All Dimensions in Inches)
4.3 Unit Dimensions (All Dimensions in MM.)

4.4 Installation Reference
SECTION 5: TYPICAL WIRING AG Unit