Power Series Transfer Switch

ATC-900

Automatic Transfer Switch Controller

GENERAC | **INDUSTRIAL POWER**

- Automatic Transfer Switch Controller
- Up to 600 VAC, 50/60 Hz
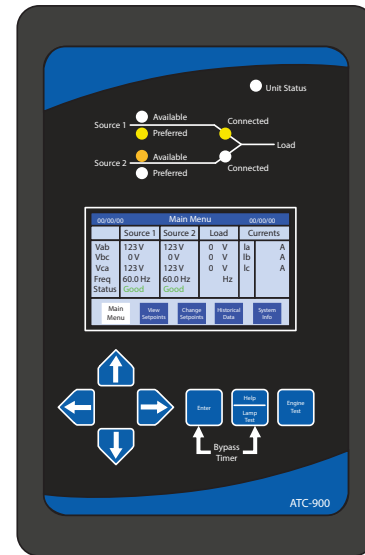- Single and Three Phase
- UL Recognized Component

Image used for illustration purposes only

Codes and Standards

UL recognized component, complies with UL1008 and UL991

NFPA 37, 70, 99, 110 (complies)

Applicable for use in NEC 700, 701, 702, 708

ISO 3046, 7637, 8528, 9001, Pluses #2b, 4

ANSI C62.41

Seismic IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012) Certified in ATS assemblies

IEC 61000-4-2, 3, 4, 5, 6, 11 EMC Testing and Measuring (complies)

FCC Part 15, Class A (complies)

CISPR 11, Class A

Description

The ATC-900 is designed, tested, and listed for the most rigorous mission critical applications. One standard model provides extensive monitoring and control features. The ease of use, adaptability, supervisory, and programming capabilities are ideal for health care, wastewater, data center and other industrial applications. The ATC-900 controller is compatible with Generac's Power Series Transfer Switch Product offering including; contactor, breaker, and power frame transfer switches. System parameters monitored include all of the voltage, frequency, control and timing functions. Data is displayed real-time on a color 4.3 inch screen with a separate mimic diagram providing at-a-glance indication of connection. The controller has selective, automatic load shedding for non priority loads ensuring power transfer sequences align with application needs.

The supervisory controller provides a powerful, yet simple to use interface. Operators have enhanced visibility of system details via 450 time-stamped events and remote event analysis capabilities. Sampling speed, four programmable inputs and 4 programmable outputs aid in diagnosing power anomalies quicker, saving time and money. For the most demanding applications the input and output functions are expandable to 20 parameters and metering options are available.

During installation, start-up costs are reduced with flash drive set point programming. The controller has positive feedback membrane and minimizes use of abbreviations further creating a simple, yet powerful user interface. Data from the controller easily integrates into building management systems.

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STANDARD FEATURES

LOAD MANAGEMENT

The ATC-900 includes several features to enhance the user's ability to manage load while on the alternate source.

- **Integrated Load Metering:** Provides metering data that allows the user to monitor energy utilization and manage system loading.
- **Selective Load Shedding:** Selectively drop non-essential loads when a user-defined kW level is reached. The transfer switch remains on generator.
- **Load Shed to Neutral (Where ATS Construction Allows):** Provides the ability to load shed to a neutral position from a generator source.
- **Pre/Post Transfer Signals:** Provides the ability to stop select loads during the transfer process.
- **Load Bank Disable Output:** Disengages a load bank if utility power is lost during an engine test.

CONTROL INPUTS (4 Standard)*

- Monitor Mode
- Bypass Timers
- Lockout
- Manual Retransfer On/Off
- Manual Retransfer
- Slave In
- Remote Engine Test
- Preferred Source Selection
- Go to Emergency
- Emergency Inhibit
- ATS on Bypass
- Go to Neutral

CONTROL OUTPUTS (4 Standard)*

- Load Sequence
- Selective Load Shed
- Load Bank Control
- Pre/Post-transfer
- Pre-transfer
- User Remote Control
- Source 1 Available (Standard)
- Source 2 Available (Standard)
- Source 1 Connected
- Source 2 Connected
- ATS Not In Automatic
- General Alarm
- ATS In Test
- Engine Test Aborted
- Cooldown In Process
- Engine Start Contact Status
- Generator 1 Start Status
- Generator 2 Start Status
- Emergency Inhibit On
- ATS On Bypass

* Up to 20 available with expandable Input/output Modules.

LED Mimic Diagram:
Source 1 and Source 2 color-coded LEDs provide Available and Connected status indication.

Status Screen:
Displays transfer switch status, Source 1, Source 2, load-metering data, and any active alarms.

Arrow Key Navigation:
Right and Left Arrow Keys are used to navigate menu options. Up and Down Arrow Keys are used to select and change set point values.

Bypass Time Delays:
Pressing Enter and Help simultaniously reduces the active programmed time delay to zero to simplify test procedures.
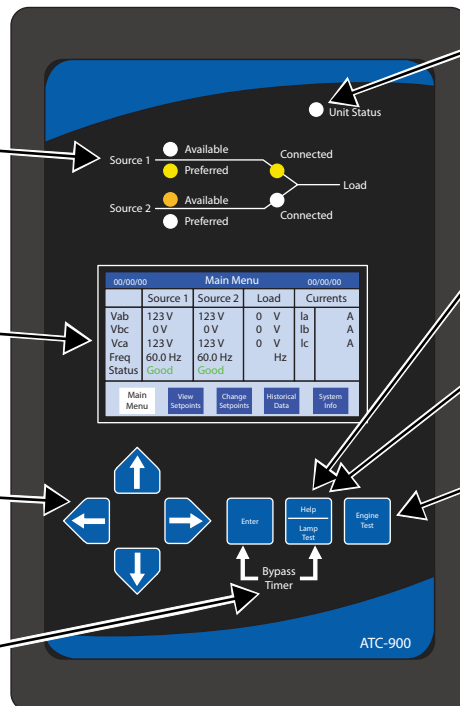
Unit Status Light:
LED blinks green when the ATC-900 Controller is functioning normally. If LED is off, or continuously lit, a problem may be indicated.

Help:
Displays controller firmware version and user tips.

Lamp Test:
Illuminates all LEDs and then displays ATC-900 Controller information.
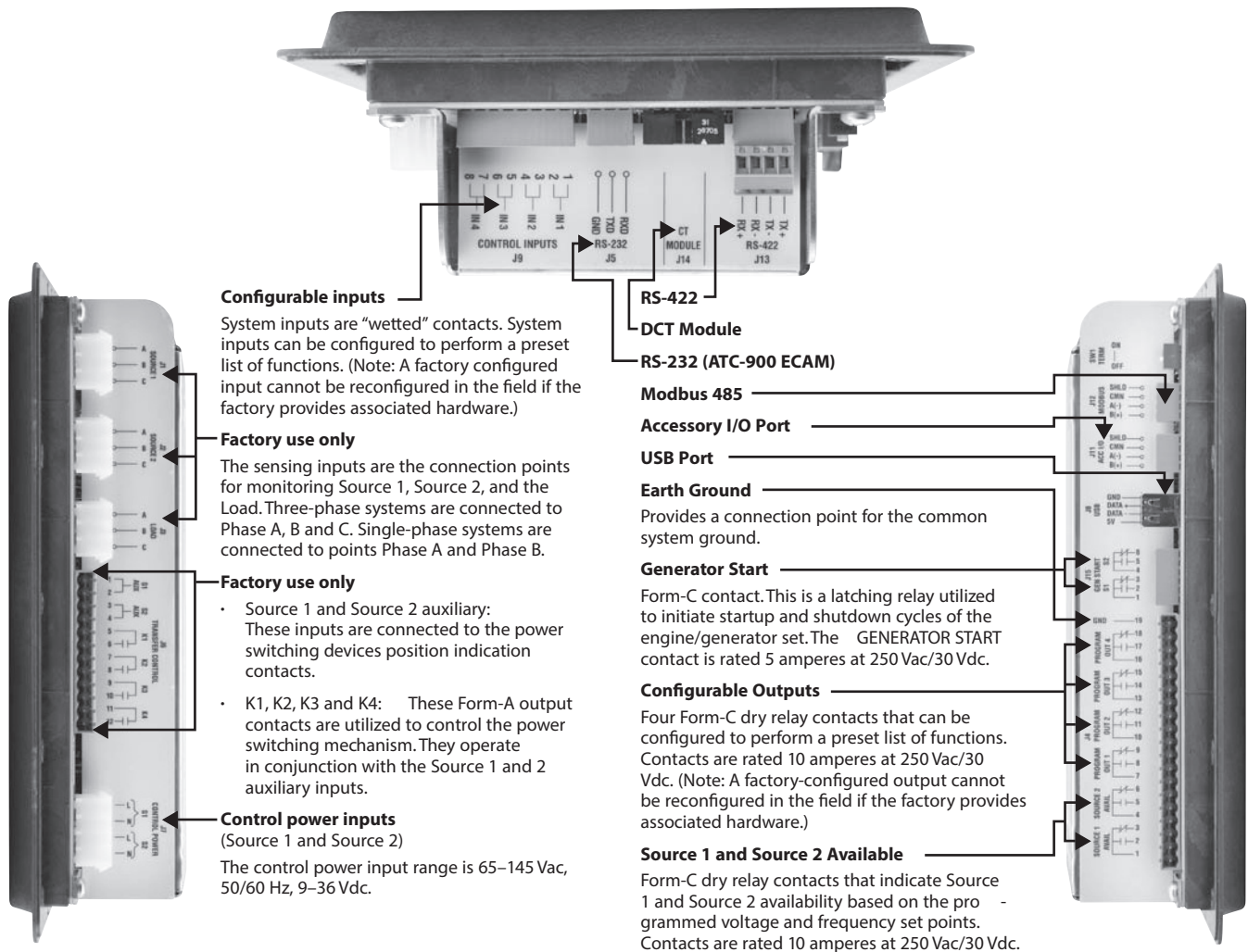
Engine Test:
Performs an engine test using the programmed engine run and cooldown times. This is a password protected feature.

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STANDARD FEATURES

Configurable inputs

System inputs are "wetted" contacts. System inputs can be configured to perform a preset list of functions. (Note: A factory configured input cannot be reconfigured in the field if the factory provides associated hardware.)

Factory use only

The sensing inputs are the connection points for monitoring Source 1, Source 2, and the Load. Three-phase systems are connected to Phase A, B and C. Single-phase systems are connected to points Phase A and Phase B.

Factory use only

- Source 1 and Source 2 auxiliary: These inputs are connected to the power switching devices position indication contacts.

- K1, K2, K3 and K4: These Form-A output contacts are utilized to control the power switching mechanism. They operate in conjunction with the Source 1 and 2 auxiliary inputs.

Control power inputs
(Source 1 and Source 2)

The control power input range is 65–145 Vac, 50/60 Hz, 9–36 Vdc.

RS-422

DCT Module

RS-232 (ATC-900 ECAM)

Modbus 485

Accessory I/O Port

USB Port

Earth Ground

Provides a connection point for the common system ground.

Generator Start

Form-C contact. This is a latching relay utilized to initiate startup and shutdown cycles of the engine/generator set. The GENERATOR START contact is rated 5 amperes at 250 Vac/30 Vdc.

Configurable Outputs

Four Form-C dry relay contacts that can be configured to perform a preset list of functions. Contacts are rated 10 amperes at 250 Vac/30 Vdc. (Note: A factory-configured output cannot be reconfigured in the field if the factory provides associated hardware.)

Source 1 and Source 2 Available

Form-C dry relay contacts that indicate Source 1 and Source 2 availability based on the programmed voltage and frequency set points. Contacts are rated 10 amperes at 250 Vac/30 Vdc.

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SPECIFICATIONS AND PROGRAMMABLE SETPOINTS

SPECIFICATIONS

System Application Voltage	Up to 600 VAC RMS	50/60 Hz
Input Control Voltage	65 to 160 VAC	50/60 Hz
Voltage Measurements of	Utility VAB	Generator VAB
	Utility VBC	Generator VBC
	Utility VCA	Generator VCA
Voltage Measurement Range	0 to 700 VAC RMS	50/60 Hz
Voltage Measurement Accuracy	± 1% of Reading	
Frequency Measurements of	Utility and Generator (Source 1 and Source 2)	
Frequency Measurement Range	40 Hz to 80 Hz	
Frequency Measurement Accuracy	± 0.1 Hz Over the Measurement Range	
Operating Temperature Range	-4 to +158 °F (-20 to +70 °C)	
Operating Humidity	0 to 95% Relative Humidity (Non-condensing)	
Operating Environment	Resistant to Ammonia, Methane, Nitrogen, Hydrogen, and Hydrocarbons	
Generator Start Relay	5 A, 1/6 HP @ 250 VAC 5 A @ 30 VDC with a 150 W Maximum Load	
K1, K2 Relays	10 A, 1-3 HP @ 250 VAC	
	10 A @ 30 VDC	

PROGRAMMABLE SETPOINTS

Undervoltage Dropout Range	50% to 97% of the Nominal System Voltage
Undervoltage Pickup Range	(Dropout +2%) to 99% of the Nominal System Voltage
Overvoltage Dropout Range	105% to 120% of the Nominal System Voltage
Overvoltage Pickup Range	103% to (Dropout -2%) of the Nominal System Voltage
Underfrequency Dropout Range	90% to 97% of the Nominal System Frequency
Underfrequency Pickup Range	(Dropout +1Hz) to 99% of the Nominal System Frequency
Overfrequency Dropout Range	103% to 110% of the Nominal System Frequency
Overfrequency Pickup Range	101% to (Dropout -1Hz) of the Nominal System Frequency

SPECIFICATIONS AND PROGRAMMABLE SETPOINTS

ADDITIONAL PROGRAMMABLE SETPOINTS

Time Delay Nml to Emr	0 to 9,999 seconds
Time Delay Emr to Nml	0 to 9,999 seconds
Time Delay Engine Cool	0 to 9,999 seconds
Time Delay Engine Start	0 to 120 seconds
Time Delay Neutral[1]	0 to 120 seconds
Time Delay Source 2 Fail	0 to 6 seconds
Time Delay Volt Unbal	10 to 30 seconds
Volt Unbal 3-Phase	0 or 1 (1 = Enable)
% of Unbal Volt Dropout (Source 1 and 2)	5% to 20% (DO)
	Dropout -2% to 3% (PU)
Nominal Voltage	120 to 600 Volts
Nominal Frequency	50 or 60Hz
Baud Rate	9,600
Phase Reversal 3-Phase	OFF, ABC, or CBA
In-Phase[2]	0 or 1 (1 = Enable)
Pre-Transfer Signal	1 to 120 seconds
Manual/Retransfer	0 or 1 (1 = Enable)
Plant Exerciser	Off, Daily, 7-Day, 14-Day, 28-Day, Calendar date (up to 12 user-specified dates)
	No Load or Load, with runtime 0-600 minutes
Daylight Svgs Time Adj	0 or 1 (1 = Enable)
System Selection	Utility/Generator Dual Utility, or Generator/Generator
Modbus Address	1 to 247
Communications	Modbus® RTU
	Ethernet and/or Remote Annunciator (Optional)
Applicable Testing	UL Recognized Component
	UL 1008, UL 991 Environmental
	IEC 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-11
	CISPR 11, Class A
	FCC Part 15, Class A
Enclosure Compatibility	NEMA 1, NEMA 3R, NEMA 4X, and NEMA 12
	UV Resistant ATC-900 Faceplate

1. Not available on open transition with inphase only switches
2. Not available on molded case type switches

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DIAGNOSTICS AND TROUBLESHOOTING

Diagnostics and troubleshooting

In a mission-critical application, a failure to transfer to the backup power system requires quick and decisive action. The ATC-900 controller provides users with the data required to quickly identify the root cause of a backup power system failure and minimize system downtime. This data allows the user to identify a specific event and obtain the detailed event information including a step by step breakdown of the transfer sequence.

Historical data

Figure 4.   Historical data display

The historical data display indicates historical and cumulative counter values as follows:

· Source 1 available
· Source 1 connected
· Source 1 engine run
· Source 2 available
· Source 2 connected
· Source 2 engine run
· Tier IV timer
· Load energized
· Number of transfers

Historical counter resets are date and time stamped events that are captured in the event log.

Event summary

Figure 5.   Event summary display

The ATC-900 controller stores 100 transfer summaries, 350 transfer details, 100 alarms, and 20 time adjustments.

Events include:

· Actions of the transfer sequence
· Alarms
· Changes to the set points
· Changes to the time/date
· Resetting a historical counter
· Engine run test

Time-stamping resolution of 1 second.

Event details

Figure 6.   Event details display

Each transfer event can be exploded to view a step by step, time stamped, sequence of operation for a transfer event. All metered values are also logged for each event and can be viewed on the event data screen.

Time stamping resolution of 0.1 seconds.

Hi-speed capture

Figure 7.   High speed capture display, pre and post event

The ATC-900 stores metered data updated on a continuous 20 millisecond basis for specific events. The data is captured 2 seconds before and 2 seconds after the event (except for a power failure, which is 4 seconds before). Oscillographic data for 10 events is stored in the controller and may be downloaded over USB or displayed graphically.

Events Include:

1. Source unavailability actions that initiate a transfer sequence (undervoltage, overvoltage, etc.)
2. Successful transfers (at the point of breaker/contactor closure)
3. Unsuccessful transfers (at the point of breaker/contactor failure to close or open)