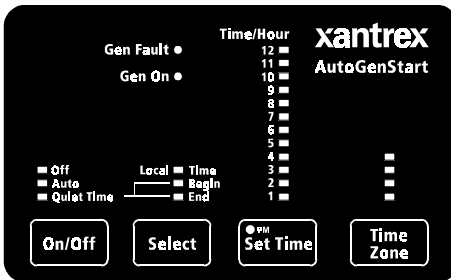


Smart choice for power

xantrex



AGS

Owner's Manual

**Xantrex
Automatic Generator
Start Control System**

www.xantrex.com

TABLE OF CONTENTS

INTRODUCTION	3
Main Features	3
Safety Summary	3
THINGS YOU SHOULD KNOW	4
THEORY OF OPERATION	5
System	5
OPERATION	6
GEN ON Light	6
GEN FAULT Light	6
ON/OFF MODE Switch	6
SET TIME Switch	7
TIME ZONE Switch	7
SELECT Switch	7
Programming LOCAL TIME and QUIET TIME (Setup)	7
INSTALLATION	8
AGS Remote Panel	8
AGS Controller	8
INSTALLATION DIAGRAM	10
COMMON QUESTIONS	12
PARAMETER VALUES	12
TROUBLESHOOTING	13
GLOSSARY	14
WARRANTY	15
SPECIFICATIONS	19

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INTRODUCTION

Thank you for purchasing a Xantrex Automatic Generator Start Control System. Xantrex Technology Inc. takes pride in manufacturing quality products specifically designed to meet your needs.

Main Features

The Automatic Generator Start Control System (AGS) automatically controls and monitors an auxiliary generator. It will automatically start a generator as required to charge a battery bank or as heating or cooling systems require. You can also set allowable generator run times, so that the AGS does not turn on the generator at inconvenient times.

SAFETY SUMMARY

General safety information for installation and operation is contained throughout this manual where it applies and is not completely included in this summary.

Definitions

Warning statements identify conditions or practices which could result in personal injury, loss of life, damage to equipment or other property.

Fuse Replacement

For continued protection against the possibility of fire, replace the fuse only with a fuse of the specified voltage, current and type ratings.

Power Source

To avoid damage, operate the equipment only within the specified AC (line) and DC (battery) voltages.

Servicing

There are no user serviceable parts inside. Refer all service to qualified personnel.

THINGS YOU SHOULD KNOW

The Automatic Generator Start Control System (AGS) has the following features:

Starts the generator automatically in response to a low battery. The AGS continuously monitors the house battery and will start the generator automatically if the battery is low.

Starts the generator automatically in response to air conditioning/heating requests. The AGS continually monitors the air conditioning system and starts the generator, as required by the air conditioning system.

Setting of QUIET TIME. QUIET TIME periods of one hour or more can be entered to prevent automatic operation of the generator during inappropriate times.

Easy changing of time setting. A TIME ZONE indicator is provided for easy changing of local time when travelling.

Displays generator status. The Remote Panel indicates if the generator is on (GEN ON) and if the generator has a problem (GEN FAULT).

This system...

- allows the user to have confidence that the battery will not be completely discharged and the DC systems will be operational. The AGS is not dependent on shorepower and will maintain the system even if small appliances and general lighting are on.
- provides generator power to operate the heating or cooling systems. This will allow you (and your pets) to be comfortable.

The system is not intended...

- to be left unattended.
- to keep batteries fully charged. The charge period is normally two to four hours.
- to maintain area temperature at a specific temperature.
- for use with all air conditioners, heaters, heat pumps and generators.

THEORY OF OPERATION

System

The AGS system, when in AUTO or AUTO QUIET TIME mode, continuously monitors the house battery and two air conditioning/heater thermostats.

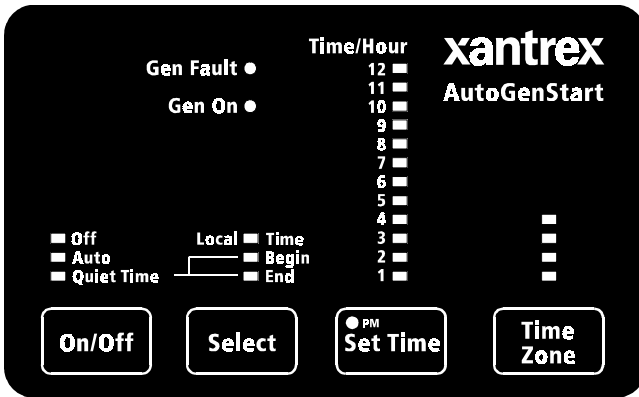
If the LOCAL TIME of day is not within the AUTO QUIET TIME window, it will start the generator to charge the battery or to cool or heat as required.

The AGS system is invisible to the normal operation of the auxiliary generator manual start and stop controls with the following exceptions:

1. If the generator is started by the AGS, which is in AUTO or AUTO QUIET TIME mode, the selection of OFF at the AGS Remote Panel will stop the auxiliary generator.
2. If the AGS system commands the generator to start and it does, the AGS system will stop the generator at the appropriate time. If the generator stops for some other reason, even if it is turned Off by a manual switch other than the AGS, the AGS system will assume that there is a FAULT. It will turn itself OFF and turn on the GEN FAULT light. At this point, the AGS system must be turned on to the AUTO mode or AUTO QUIET TIME mode for it to resume control of the generator.

Once started by the AGS system, the generator will run for a minimum of two hours. This will ensure that there is a good charge in the battery, although it may not be fully charged at the end of the cycle. If the battery voltage does not reach 13.5 volts during the two-hour period, the generator will continue to run for an additional two hours. If at the end of the second two-hour period the battery voltage is still not up to 13.5 volts, then the AGS systems assumes that there is a problem and turns the generator OFF. It must be restarted manually.

OPERATION



GEN ON Light

The GEN ON light is on whenever the generator is running. This includes when the auxiliary generator is run manually.

DEFAULT: Light OFF

GEN FAULT Light

The generator has failed to start or has stopped during AGS control. This will happen if the generator is manually stopped by a generator start/stop switch that is independent of the AGS. Cycling the ON/OFF switch will clear the fault. Check generator for normal operation.

DEFAULT: OFF

On/Off

ON/OFF MODE Switch

Pressing the ON/OFF switch changes the status of the AGS from OFF to AUTO to AUTO QUIET mode. When it is off, the OFF light is illuminated.

DEFAULT: OFF mode.

AUTO Mode

In AUTO mode, the Control Module will respond to requests for generator start from a low battery condition or from an air conditioning demand.

AUTO QUIET Mode

In AUTO QUIET mode (both lights on at the same time) the Control Module will respond to requests from low battery or air conditioning because the time is outside of the user-set Quiet Time. In AUTO QUIET mode (AUTO light on and QUIET light blinking) the AGS will not respond to requests for low battery or thermostats starting because the Local Time is within the Quiet Time window.

●PM
Set Time

Sets the LOCAL TIME, QUIET TIME “BEGIN” or QUIET TIME “END” according to the selection made by the SELECT switch. To set a time parameter, select the hour by repeatedly pressing the SET TIME button until the correct hour light is on.

DEFAULT: LOCAL TIME

Time Zone

Pressing the TIME ZONE button changes the LOCAL TIME by cycling through the available time zones. EST (Eastern Standard Time), CST (Central Standard Time), MST (Mountain Standard Time), or PST (Pacific Standard Time) are possible. Only one can be on at a time. Light is on.

DEFAULT: PST

Local ■ Time
 ■ Begin
 ■ End

Select

SELECT changes the time displayed by the AGS Remote and is used to set the TIME/HOUR. In LOCAL TIME mode the user can set the “Time/Hour” display to the local hour. (Minutes are preset at the factory and do not require user adjustment).
DEFAULT: LOCAL TIME

To Program Local Time (USUALLY NOT REQUIRED):

Use the SELECT switch to select LOCAL TIME. Press the TIME ZONE switch to select the time zone. Press the SET TIME switch to set the local time hour.

Quiet Time BEGIN (REQUIRED SETTING):

Use the SELECT switch and press it until the BEGIN light is on. Use the SET TIME switch to select the time in hours Quiet Time is to begin.

Quiet Time END (REQUIRED SETTING):

Use the SELECT switch and press it until the END light is on. Use the SET TIME switch to select the time in hours Quiet Time is to end.

INSTALLATION

The Automatic Generator Start Control System (AGS) consists of two modules, the Remote Panel and the Controller.

Service Precaution Labels

Install service precaution labels on or near the generator and near the AGS Remote.

AGS Remote Panel

This AGS Remote Panel provides information and control of the Control Module. Power for this Remote Panel comes from the Control Module. The Remote Panel comes on automatically when power is applied to the AGS Control Module.

The AGS Remote Panel measures 5.75" (W) X 3.75" (H) X 0.65" (D). Use the supplied template to cut the proper size hole. Mount the Remote Panel unit using the screws supplied.

Route the control cable from the AGS Remote Panel to the Control Module. Connect the control cable to the AGS Remote Panel and Control Module using the data connectors on the supplied cable.

Power Up Indications

When power is first applied to the AGS Remote, the AGS Remote establishes communications with the Controller. It can take up to four seconds to establish communications.

AGS Controller

The AGS Controller may be mounted in any convenient location. Mount the AGS Controller using the screws supplied. The AGS Controller may be mounted up to 250 feet from the AGS Remote.

#18 AWG wire should be used. The in-line connector for the Controller has the following DC connections.

NO. DESCRIPTION

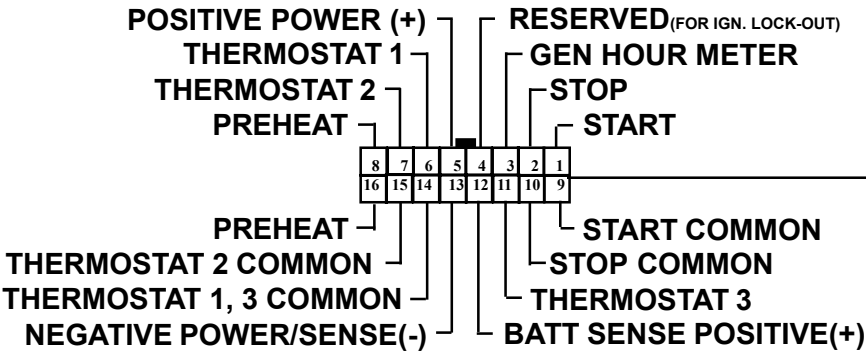
- 1 START: Generator start signal contact.
- 2 STOP: Generator stop signal contact.
- 3 GENERATOR DC HOUR METER.
- 4 RESERVED (Future ignition lock-out).
- 5 POWER POSITIVE: Connect to house battery positive. 2-amp fuse required. See INSTALLATION NOTE page 10.
- 6 THERMOSTAT 1: Connected to positive signal from thermostat/heating-cooling system, 12 VDC = ON.
- 7 THERMOSTAT 2: Connect to positive signal from thermostat/heat-cooling system, 12 VDC = ON.
- 8 PREHEAT: Contact for generator preheat signal.
- 9 START COMMON: Generator Start signal contact. Typically connect to generator ground.
- 10 STOP COMMON: Generator Stop signal contact. Typically connect to generator ground.
- 11 THERMOSTAT 3: Connected to positive signal from thermostat/heating-cooling system, 12 VDC = ON. This is only available on units over S/N 150.
- 12 BATT SENSE POSITIVE: Connect to house battery positive. 2-amp fuse required.
- 13 POWER/SENSE NEGATIVE: Connect directly to house battery negative.
- 14 THERMOSTAT 1,3 COMMON: Contact for thermostat 1 and 3. Connected to ground.
- 15 THERMOSTAT 2 COMMON: Contact for thermostat 2. Connected to ground.
- 16 PREHEAT COMMON: Contact for Preheat signal. Typically connected to generator ground.

INSTALLATION DIAGRAM

INSTALLATION NOTE:
It is advised to interlock the AGS system so that the AGS unit is turned off when the coach is in motion. This may be done by removing power from the AGS Controller. To accomplish this the AGS Controller should be interlocked with the ignition switch to control the POSITIVE POWER (#5) or with the parking brake to disconnect POWER/SENSE NEGATIVE (#13).

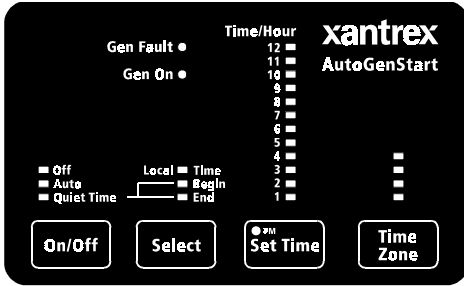
DC CONNECTIONS

16 pin Connector

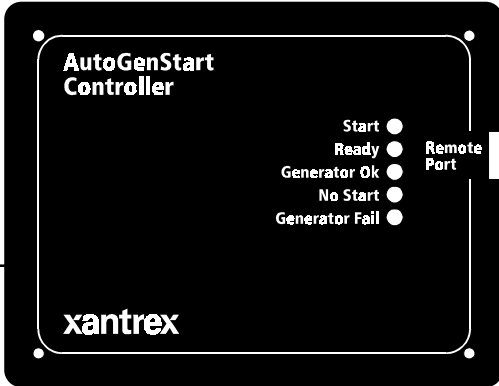


Connector view is looking into the AGS CONTROLLER.
All wires should be #18 AWG
MATING CONNECTORS:
Xantrex P/N 76-0090-01 (mating connector and harness) is recommended for easy installation.
Note: Connector below matches both AMP and MOLEX connectors, but pin numbers only match AMP connector.
AMP: 770583-1, PINS 770988-1

AGS REMOTE PANEL



AGS CONTROLLER



DATA CABLE
4 CONDUCTOR
SUPPLIED

COMMON QUESTIONS

Why is the display blank except for the mode lights?

If buttons are not pressed within five seconds, the Remote Panel goes into a sleep mode to conserve energy.

Why is action not immediate?

The Remote Panel waits 15 seconds to determine if any more changes are to be made. At the end of this period, the display goes to sleep and actions previously entered take effect.

When the On/OFF is moved to OFF position, the generator does not stop immediately.

The action from the buttons on the Remote Panel is delayed to ensure that action is required.

How long is the delay from request for thermostat request to generator start?

The time delay is 60 seconds.

What is the low battery set point and how long does the battery voltage have to stay there to initiate a generator start?

The Low Battery set point is around 11.5 VDC. The battery voltage must stay at or below 11.5 volts for approximately 15 seconds before the AGS will start the generator.

PARAMETER VALUES

Low battery voltage set point	11.5 VDC
Run time for generator	2 hours
Maximum generator run time	4 hours
Number of generator start tries	3 times

TROUBLESHOOTING GUIDE

The following is a list of troubleshooting items. Please see page #8 for the installation diagram. A qualified service technician should be contacted to service your system. Refer to the installation diagram for more information.

PROBLEM

No lights on the AGS
Remote are on

SOLUTION

Check data cable connected to AGS Remote Panel and AGS Control Module. Check for 12 VDC at AGS Controller (wires #5 and #13).

Generator automatically comes on but does not stay on.

Verify that the Generator Hour Meter Signal (wire #3) is connected to the AGS Control Module.

Generator turns on when batteries are charged and air conditioner/heaters are off.

Verify Battery Sense Positive (wire #12) connection.

Generator does not automatically turn on when AGS control attempts to turn on.

Check the preheat, if required (wires #8 and #16) and start signal connections (wires #1 and #9).

Generator does not automatically turn OFF after the AGS system runs the generator for two hours.

If the battery voltage did not rise above 13.5 VDC, this is normal operations. Otherwise check the stop signal connections (wire #2 and #10).

AGS System starts generator at too high of a DC voltage.

Verify quality of Power/Sense negative connection (wire #13).

GLOSSARY

AGS (Automatic Generator Start Control System) A control system to automatically start the auxiliary generator in response to a low battery and/or cooling/heating demand.

AGS Controller The part of the AGS Control System that connects to the wiring of the coach. It contains a micro-controller and a real-time clock.

AGS Remote Panel The user interface part of the Automatic Generator Start Control System. It connects to the Control Module through the data cable.

AUTO MODE In this mode the AGS will automatically start the generator as required by a low battery or a requirement for heating/cooling.

AUTO QUIET MODE In this mode is the same as AUTO mode, except the AGS will not start the generator during quiet hours.

Battery Sense This is the input to the AGS control module used to determine if the battery is low. This battery sense voltage may or may not be the same battery supplying the power to the AGS control module.

Data cable A six-pin telephone-style cable used to carry power and data between the Remote and the Control Module.

Ground The reference potential of a circuit. In automotive use, the result of attaching one battery cable to the body or frame which is used as a path for completing a circuit in lieu of a direct wire from a component.

Negative Designating or pertaining to a lower electrical potential.

Positive Designating or pertaining to electrical potential; opposite of negative. The positive battery terminal.

QUIET TIME The period of time that the AGS is prohibited from starting the auxiliary generator regardless of battery condition or demands for heating/cooling. The AGS is in this mode when the QUIET TIME light is blinking.

Thermostat The heat/cooling thermostat.

Volt Short for voltage, the unit of measure for electric potential.

VDC Direct current voltage.

LIMITED WARRANTY

What does this warranty cover?

This Limited Warranty is provided by Xantrex Technology, Inc. ("Xantrex") and covers defects in workmanship and materials in the Automatic Generator Start Control System. This warranty lasts for a Warranty Period of 12 months from the date of purchase at point of sale to you, the original end user customer.

This Limited Warranty is transferable to subsequent owners but only for the unexpired portion of the Warranty Period.

What will Xantrex do?

Xantrex will, at its option, repair or replace the defective product free of charge, provided that you notify Xantrex of the product defect within the Warranty Period, and provided that Xantrex through inspection establishes the existence of such a defect and that it is covered by this Limited Warranty.

Xantrex will, at its option, use new and/or reconditioned parts in performing warranty repair and building replacement products. Xantrex reserves the right to use parts or products of original or improved design in the repair or replacement. If Xantrex repairs or replaces a product, its warranty continues for the remaining portion of the original Warranty Period or 90 days from the date of the return shipment to the customer, whichever is greater. All replaced products and all parts removed from repaired products become the property of Xantrex.

Xantrex covers both parts and labor necessary to repair the product, and return shipment to the customer via a Xantrex-selected non-expedited surface freight within the contiguous United States and Canada. Alaska and Hawaii are excluded. Contact Xantrex Customer Service for details on freight policy for return shipments outside of the contiguous United States and Canada.

How do you get service?

If your product requires troubleshooting or warranty service, contact your merchant. If you are unable to contact your merchant, or the merchant is unable to provide service, contact Xantrex directly at:

Phone: 1-800-670-0707 (toll free in North America), 1-604-422-2777 (direct)

Fax: 1-604-420-2145

Email: CustomerService@xantrex.com

Direct returns may be performed according to the Xantrex Return Material Authorization Policy described in your product manual. For some products, Xantrex maintains a network of regional Authorized Service Centers. Call Xantrex or check our Web site to see if your product can be repaired at one of these facilities.

In any warranty claim, dated proof of purchase must accompany the product, and the product must not have been disassembled or modified without prior written authorization from Xantrex.

Proof of purchase may be in any one of the following forms:

- The dated purchase receipt from the original purchase of the product at point of sale to the end user, or
- The dated dealer invoice or purchase receipt showing original equipment manufacturer (OEM) status, or
- The dated invoice or purchase receipt showing the product exchanged under warranty

LIMITED WARRANTY

What does this warranty not cover?

This Limited Warranty does not cover normal wear and tear of the product or costs related to the removal, installation, or troubleshooting of the customer's electrical systems. This warranty does not apply to and Xantrex will not be responsible for any defect in or damage to:

- a) the product if it has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment;
- b) the product if it has been subjected to fire, water, generalized corrosion, biological infestations, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the Xantrex product specifications including high input voltage from generators and lightning strikes;
- c) the product if repairs have been done to it other than by Xantrex or its authorized service centers (hereafter "ASCs");
- d) the product if it is used as a component part of a product expressly warranted by another manufacturer;
- e) the product if its original identification (trademark, serial number) markings have been defaced, altered, or removed.

Disclaimer

Product

THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY XANTREX IN CONNECTION WITH YOUR XANTREX PRODUCT AND IS, WHERE PERMITTED BY LAW, IN LIEU OF ALL OTHER WARRANTIES, CONDITIONS, GUARANTEES, REPRESENTATIONS, OBLIGATIONS AND LIABILITIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE IN CONNECTION WITH THE PRODUCT, HOWEVER ARISING (WHETHER BY CONTRACT, TORT, NEGLIGENCE, PRINCIPLES OF MANUFACTURER'S LIABILITY, OPERATION OF LAW, CONDUCT, STATEMENT OR OTHERWISE), INCLUDING WITHOUT RESTRICTION ANY IMPLIED WARRANTY OR CONDITION OF QUALITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE TO THE EXTENT REQUIRED UNDER APPLICABLE LAW TO APPLY TO THE PRODUCT SHALL BE LIMITED IN DURATION TO THE PERIOD STIPULATED UNDER THIS LIMITED WARRANTY.

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Exclusions

If this product is a consumer product, federal law does not allow an exclusion of implied warranties. To the extent you are entitled to implied warranties under federal law, to the extent permitted by applicable law they are limited to the duration of this Limited Warranty.

LIMITED WARRANTY

Some states and provinces do not allow limitations or exclusions on implied warranties or on the duration of an implied warranty or on the limitation or exclusion of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you. This Limited Warranty gives you specific legal rights. You may have other rights which may vary from state to state or province to province.

Warning: Limitations On Use

Please refer to your product user manual for limitations on uses of the product. Specifically, please note that the Automatic Generator Start Control System (AGS) is not intended for use in connection with life support systems, and Xantrex makes no warranty or representation in connection with any use of the product for such purposes.

Return Material Authorization Policy

Before returning a product directly to Xantrex you must obtain a Return Material Authorization (RMA) number and the correct factory "Ship To" address. Products must also be shipped prepaid. Product shipments will be refused and returned at your expense if they are unauthorized, returned without an RMA number clearly marked on the outside of the shipping box, if they are shipped collect, or if they are shipped to the wrong location.

When you contact Xantrex to obtain service, please have your instruction manual ready for reference and be prepared to supply:

- The serial number of your product
- Information about the installation and use of the unit
- Information about the failure and/or reason for the return
- A copy of your dated proof of purchase

LIMITED WARRANTY

Return Procedure

1. Package the unit safely, preferably using the original box and packing materials. Please ensure that your product is shipped fully insured in the original packaging or equivalent. This warranty will not apply where the product is damaged due to improper packaging.
2. Include the following:
 - The RMA number supplied by Xantrex Technology Inc clearly marked on the outside of the box.
 - A return address where the unit can be shipped. Post office boxes are not acceptable.
 - A contact telephone number where you can be reached during work hours
 - A brief description of the problem
3. Ship the unit prepaid to the address provided by your Xantrex customer service representative.

If you are returning a product from outside of the USA or Canada

In addition to the above, you **MUST** include return freight funds and are fully responsible for all documents, duties, tariffs, and deposits.

If you are returning a product to a Xantrex Authorized Service Center (ASC)

A Xantrex return material authorization (RMA) number is not required. However, you must contact the ASC prior to returning the product or presenting the unit to verify any return procedures that may apply to that particular facility.

SPECIFICATIONS

XANTREX PART NUMBERS

AGS System **84-2064-00**
includes Remote Panel, Controller, and 50' data cable (4/6 conductor)

INSTALLATION

Mating Connector **AMP 770583-1**
Mating Pins (16) **AMP 770988-1**
Crimping Tool **AMP 90759-1**
The Xantrex AGS Harness (P/N 76-0090-01) includes these three items.

MECHANICAL

Controller Size: 6.57" (W) X 4.25" (H) X 1.875" (D)
Remote Panel Size: 5.75" (W) X 3.75" (H) X 0.93" (D)
Remote Panel Cutout size: 4.875" (W) X 2.875" (H)
Weight: Controller 1 lb. 12 oz.
Remote Panel 3 oz.

ELECTRICAL

Inputs:

Supply voltage **9–15.5 VDC**
Supply current **125 mA DC**
2 Thermostats DC
Battery sense **9–15.5 VDC**

Control Module Outputs:

2 wire Preheat/ Start/ Stop Lines
Remote Port Data cable (proprietary data)

ENVIRONMENTAL

Operating temperature range **0–70 °C**
AGS Remote **Splash proof**

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