

AIRIUS[®]

AIRFLOW REINVENTED

DELTA T AC FAN CONTROL INSTALLATION, OPERATION & MAINTENANCE



CONTENTS

- » **Introduction**
- » **Safety Precautions**
- » **Pre-Installation**
- » **Installation**
- » **Operation**
- » **Maintenance**
- » **Troubleshooting**
- » **Warranty**

Airius, LLC

811 South Sherman St.
Longmont, Colorado 80501 - USA
Toll free: 1-888-247-7327
Telephone: 303-772-2633
Fax: 303-772-8276
Email: info@airiusfans.com
Web: www.airiusfans.com

May be covered by one or more of the following United States Patents: 7,381,129 B2; D514688 and other patents pending

AIRIUS®, AIR PEAR®, AIRIUS PUREAIR®, PEARLINK®, and THE THERMAL EQUALIZER® are trademarks of Airius, LLC, registered in the U.S. and in some countries abroad. Other trademarks pending in the U.S. and abroad.

NOTE: Carefully check fans/controls for shipping damage. Report any damage to the carrier immediately. Do not attempt to operate if visible damage is evident to either the circuit or to the electronic components. All information contained in this manual is intended to be correct, however information and data in this manual are subject to change without notice. Airius makes no warranty of any kind with regard to this information or data. Further, Airius is not responsible for any omissions or errors or consequential damage caused by the user of the product. Airius reserves the right to make manufacturing changes that may not be included in this manual.

Delta T AC Control Installation Guide: V1.1
©2023 Airius, LLC.

Introduction

Congratulations on the purchase of an Airius' fan system. Our patented, American-made, air-mixing system will ensure better thermal comfort in both the summer and winter while driving down expensive energy bills. We are here to support you and if you have any questions or comments, we can be contacted through our website, airiusfans.com, or give us a call: 1-888-247-7327.

About the Airius Delta-T AC Control

Airius Delta-T AC controls allow for 5 modes of operation: 24 hr timer, automatic Delta T Control, thermostat control, humidistat control and manual mode. Automatically take control of stratification in your space using the supplied ceiling/floor temperature sensors. The variable voltage output makes this control compatible with all Airius AC motor options (shaded pole and PSC motors).

Operating Temperature: 15 to 150°F

Humidity Range: 10 to 99% RH (non-condensing)

Power Input: 120VAC, 230VAC or 277VAC (input depends on model selection)

Power Output: 8 Step voltage output 0 to 115V, 0 to 230V, or 0 to 277V (output depends on model selection)

Low Capacitance Wire: 4 conductor 22-24AWG

Interface Display Type: LCD

Units: Fahrenheit or Celsius

High Sensor: Air Temperature and humidity

Low Sensor: Air Temperature and humidity

Limitations: Max distance of 82ft between interface and sensors.

What's In the Box

Each Delta T Control package includes:

- 115V, 230V, or 277V AC auto-transformer
- Wall mounted control interface
- (2) temperature sensors

What You Will Need

- Transformer mounting screws/anchors
- Phillips screwdriver
- 2x4 job box for wall mounted control
- 2x4 job box for each temperature sensor
- Conduit for wire runs
- Twisted pair, low capacitance,
- communication cable (4 conductors)



Safety Precautions - Read & Save



WARNING - TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS: Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards.

CAUTION: The installation of the Airius Delta T Control must be in accordance with the requirements specified in this installation manual and with any additional requirements set forth by the national electric code (NEC), ANSI/NFPA 70-1999, and all local codes.

If you are unfamiliar with wiring, use a qualified electrician.

ONLY USE THIS PRODUCT INDOORS

WARNING: To prevent electrical shock and/or injury disconnect controller from power source before you move or service the controller.

WARNING: To reduce the risk of fire, electric shock, and injury to persons, this controller should only be installed with Airius Fans that use a shaded pole or PSC motor. Not suitable for use with other motors.

CAUTION: When service or replacement of a component in the controller requires the removal or disconnection of a safety device, the safety device is to be reinstalled or remounted as previously installed.

WARNING: Risk of fire, electric shock, or injury to persons during maintenance. Disconnect the controller from the power supply before servicing.

WARNING - TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

- a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
- b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnect to prevent power from being switched on accidentally. When the service disconnect cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

Pre-Installation

Electrical

ELECTRICAL WORK MUST BE PERFORMED BY A QUALIFIED PERSON(S) IN ACCORDANCE WITH ALL NATIONAL AND LOCAL CODES/STANDARDS.

Airius recommends installing a dedicated circuit only to be used with the Delta T Control and Airius fans. DO NOT install any other devices onto the fan circuit. The voltage fluctuates with the Delta T Control and may interfere with the operation of other devices.

CAUTION – Make sure the input fan voltage matches the transformer voltage (120V fans used with the 120V transformer package). Connecting the transformer to the wrong voltage will void warranty.

Mechanical

A ladder, scissor lift or other suitable means of reaching the ceiling sensor installation point will be required.

Installation

Component Mounting

The wall control and floor sensor should both be located approximately 48" AFF and each mounted within a standard 2x4 job box.

The ceiling sensor should be wall mounted within a 2x4 job box at the same elevation as the fans.

Mount the transformer enclosure to the wall utilizing hardware of your choice.

Component Mounting Note

The sensors need to be located in an area where they will not be influenced by local factors. DO NOT MOUNT in an area that sees direct sun light, next to high heat/cold sources, near HVAC discharge vents, near radiant heating panels, etc...

Ideally, the sensors will be centrally located in the space to best represent the average temperature and humidity.

If you have questions please contact the factory.

Power Requirements

Depending on the control package ordered, the input power to the transformer will be 120V, 230V or 277VAC.

Number of Fans

The total fan amperage should not exceed the controller amperage rating. 10A for 120V, 5A for 230V and 5A for 277V. Only suitable for use with Airius shaded pole or PSC motors. The model part number will contain SP, P4 or P2. Do not use this control with EC motors.

Circuit Protection

The Airius Delta T Control includes built in fuses. The branch circuit must have a dedicated circuit breaker or similar device. National and local safety standards and electrical codes may determine additional requirements for installation.

Input and Output Power Wiring

If you are unfamiliar with wiring, use a qualified electrician.

WARNING: To prevent electrical shock and/or injury cut power at the circuit breaker from the feeding power panel.

Remove the panel from the Airius transformer using a philips screwdriver. Connect the AC input power to the following terminal connections:

ACL = AC Live (Black)
ACN = AC Neutral (White)
EARTH = GROUND (Green)

Output power circuit going to the fans is labeled:

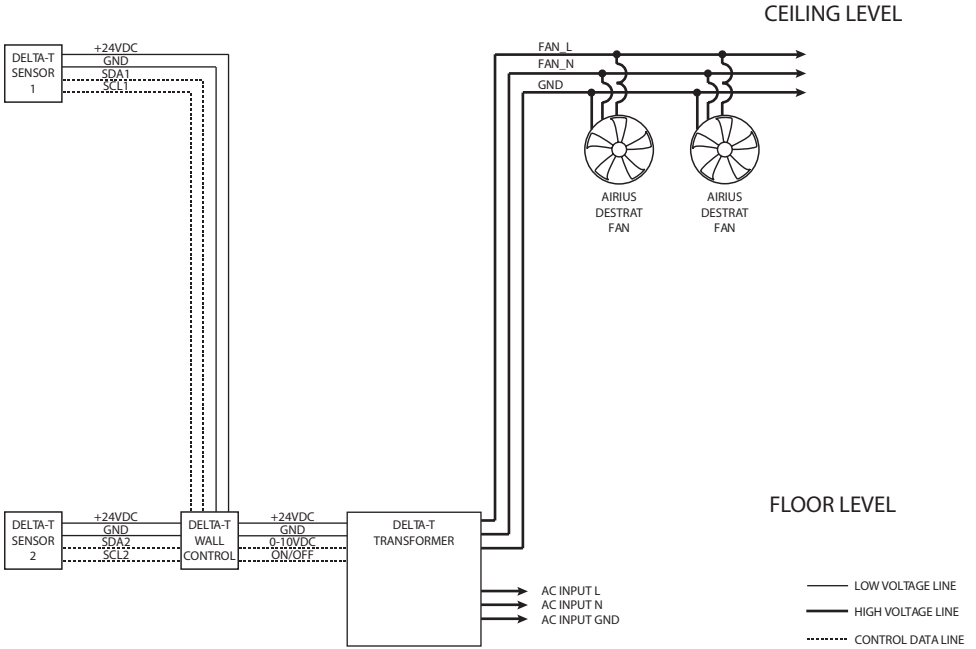
FAN L = FAN Live (Black)
FAN N = FAN Neutral (White)
EARTH = GROUND (Green)

Using the 4 conductor 22-24AWG communication wire, make the terminal connections from the transformer circuit board to the wall mounted controller. The **transformer to controller distance should not exceed 82 feet (25m)** of wire length.

+24VDC
GND
0-10V
ON/OFF

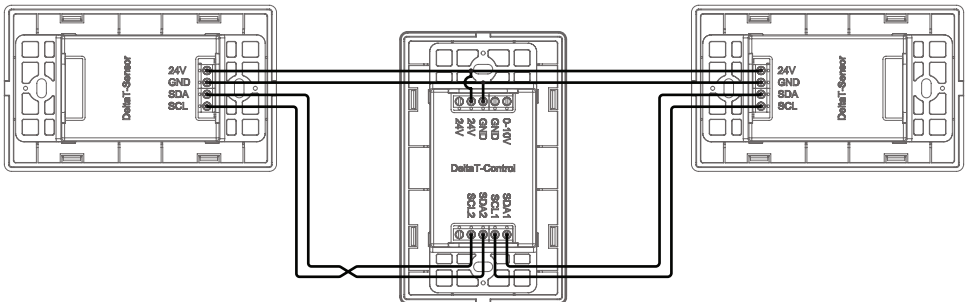
Installation

Overall System Wiring Diagram



Sensor Wiring

Wire the wall control and sensors using twisted pair cables. The sensor to controller distance should not exceed 82 feet (25m) of wire length.



Control Via 0-10VDC

If you wish to control the fans via a 0-10VDC signal, do not wire the controller or sensors. Only the transformer is needed.

Make all the same input and output power connections as described on the input & output power wiring page and connect your 0-10VDC signal cable to the terminal connections labeled:

GND (-)
0-10V (+)

The transformer will vary the fan speed through eight steps. Use the voltage chart below to select each speed step:

Signal Input Range	Recommended Signal Voltage	Step Setting
9.8-10.5V	10V	Speed 8 (high)
8.9-9.7V	9V	Speed 7
8-8.6V	8.5V	Speed 6
7.4-7.9V	7.5V	Speed 5
6.9-7.3V	7V	Speed 4
6.2-6.8V	6.5V	Speed 3
5.2-6.1V	5.5V	Speed 2
3.4-5.1V	4V	Speed 1 (low)
0V	0V	Speed 0 (off)

Operation

The controller operates in 5 different modes: 24 hr automatic timer, Delta T control, thermostat control or humidistat control, and manual mode. Below are instructions on modifying the settings and operating the various modes.

NOTE: AUTO Mode

The default AUTO mode is Delta T control. The other modes will run when the set of conditions are met under their settings. If you wish for a particular function to not run, set the parameters outside of possible conditions in the space or in the case of the timer, do not set any on/off times.

Reading the LCD Interface

AUTOMATIC MODE
Blank when in Manual mode



24 HR TIME

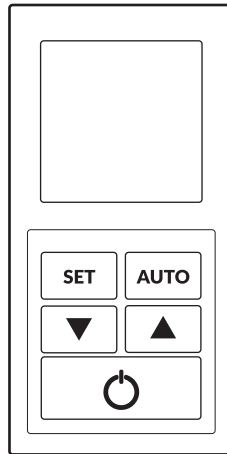
**FLOOR SENSOR
TEMPERATURE or HUMIDITY**

SPEED SETTING
0 is OFF, 8 is MAX

Keypad Operation

SET
Press to set auto control
Hold down to set time

DOWN
Press to decrease
Hold 3 seconds to rapidly decrease



AUTO
Press to switch modes
Press to switch Auto/Manual mode
Holding down to switch between temp./humidity control

UP
Press to increase,
Hold 3 seconds to rapidly increase

ON/OFF
Holding down switches
between degrees F or C

Set Units in Degrees F ° or C °

The controller defaults to Fahrenheit. If you wish to change the units, PRESS & HOLD the ON/OFF button for 3 seconds

Set System Time

HOLD SET for 3 seconds. Press AUTO to select hours or minutes. Use the UP and DOWN arrows to increase/decrease the time setting. Press SET to exit time settings.

Set 24 HR Timer Mode

The timer mode will run the fans at a fixed speed between two set times (ex: business hours 8:00-16:00). There is a 'time on' setting, a 'time off' setting, and 'speed step' setting.

Press SET. Press AUTO to select: timer on hour, timer on minutes, timer OFF hour, timer OFF minutes, and speed setting. Under each selection use the UP/DOWN arrows to increase or decrease the selected value. Press SET four times to exit.

Set Delta T Mode

The delta-T control mode continuously measures the difference in temperature between the high and low temperature sensors and automatically adjusts fan speed. As the delta-T increases, the fan speed increases. Here is a list of the default delta T values and associated speed setting:

- 0 degrees F = Speed 4
- 2 degrees F = Speed 4
- 4 degrees F = Speed 5
- 6 degrees F = Speed 6
- 8 degrees F = Speed 7
- 10 degrees F = Speed 8
- 12 degrees F = Speed 8
- 14 degrees F = Speed 8
- 16 degrees F = Speed 8

Press SET twice. Press AUTO to select the delta-T value then press UP/DOWN to set the speed step for the given delta T. Some adjustments might be needed depending on sound constraints, building height, severity of stratification, etc...

Set Thermostat Mode

The thermostat control mode monitors the floor sensor temperature and will energize the fans to the speed setting once the temperature is met. The default value is 120 degrees F with a speed setting of 0. Use this mode when using the fans for cooling. As an example, set the temperature to 75 degree F and the speed to setting 8 (MAX). Once the temperature in the space reaches and exceeds 75 degrees F, the fan will run at full speed.

Press SET 3 times. Press AUTO to select the thermostat threshold or the speed setting. Use the UP/DOWN arrows to adjust the selected value.

Set Humidity Control Mode

The humidity control mode monitors the floor sensor humidity and will energize the fans to the speed setting once the relative humidity percentage is met. The default value is 65% with a speed setting of 5. This mode would commonly be used in grocery applications to prevent fogging on case doors.

Press SET 4 times. Press AUTO to select the relative humidity threshold or the speed setting. Use the UP/DOWN arrows to adjust the selected value.

The thermostat and humidistat control modes can not be operated at the same time. To select one or the other, hold down the AUTO button for 3 seconds. If humidistat control mode is selected, the screen will show the percent relative humidity of the floor sensor. If the thermostat control mode is selected, the screen will show the floor sensor temperature value.

Manual Control

Pressing the UP/DOWN arrows will allow you to manually adjust the speed setting. The controller will stay in manual mode until it is switched back to AUTO. To go back to AUTO mode, press AUTO once.

Maintenance

Follow these easy steps to prevent any excess dirt buildup and preserve the life of the product:

Cleaning:

Power off the control

You may clean the controller and sensor faceplate with a damp cloth, using mild household detergent only.

DO NOT use petroleum products, thinners, solvents, ammonia, alcohols or other chemicals to clean any part of the Delta-T Controller.

Troubleshooting

The Airius products are tested before they leave the factory, resulting in an extremely low rate of returns. However, mechanical and electrical devices do fail, and we recommend that you identify the problem and try the simple suggestions below.

The screen shows 'E1' or 'E2':

- a) Check sensor/control wiring.
- d) Contact manufacturer for additional help: 1-888-247-7327 or support@airiusfans.com

Fan airflow is too fast/slow:

- a) Adjust speed control settings to produce desired flow.

Control will not power on:

- a) Check that the power supply is providing 24VDC power to the control.
- b) Contact manufacturer for additional help: 1-888-247-7327 or support@airiusfans.com

Airius Warranty Policy

This warranty is limited to products purchased directly from Airius, LLC ("Airius") or one of its authorized resellers. To determine whether a reseller is authorized, please contact Airius at the contact information below. Airius warrants products listed below will operate properly and be free of defects in materials and workmanship according to the following terms:

Products Warranty Period

Speed Controllers 1 Year (All Parts/Components)

These include new units or units rebuilt under Airius' factory refurbish program. Airius will repair or replace such units, at Airius' sole discretion, if there is any defect in their materials or workmanship caused by Airius during the warranty period. With respect to replacement or repair rendered, Airius warrants that the parts replaced or repaired will operate properly and be free from defects in materials and workmanship for the remainder of the original warranty period.

Definitions:

1. The "warranty period" shall begin on the shipping date from the Airius factory to the customer (end user) .
2. "Operate properly" applies to mechanical, electrical and structural functions only. No guarantee is made regarding the quantity of air movement or the appropriateness or the effectiveness or merchantability of any product for its intended purpose or for the customer's particular application.

Exclusions:

Any of the following actions will constitute a breach of and will void all warranties:

1. Improper delivery, installation, or maintenance, including, but not limited to:
 - a. Failure to follow the required installation procedures specified in the Airius "Installation Guide" and in all other documentation supplied with the fans and related equipment, including documentation provided by the manufacturers of the individual fan and control components;
 - b. Failure to follow all applicable codes and ordinances, including, but not limited to the National Electric Code and state and local building codes;
 - c. Failure to follow electrical engineering industry standards regarding the approved method of installing electrical equipment having the characteristics of the fans, the fan controls, and their related components, even if such standards are not explicitly referenced in any literature supplied by Airius or provided by the manufacturers of the fan and control components.
2. Any modification or alteration of, or adjustment to the fans, fan controls, and/or any disassembly of the components of the fans and fan controls for any purpose whatsoever, including any attempt to diagnose and/or repair any problem, without prior written authorization from Airius. Such disassembly includes, but is not limited to, separation of the motor from the housing assembly and/or removal of any electrical component from the fan controller unit.
3. Installation of fans into a detrimental environment with airborne oils / cutting fluids / solvents that may attack the base resin or motor, unless:
 - a. Airius has provided written authorization prior to installation.
4. Misuse, abuse, accidents, unreasonable use or Acts of God.
5. Incorrect electric current, voltage or supply.
6. Failure to use fan controls supplied by Airius, unless:
 - a. Airius has provided written authorization prior to installation; and
 - b. The fan controls are built, operated and maintained according to specifications provided to and approved by Airius.
7. Failure to perform periodic maintenance as detailed in the Airius "Installation Guide."

- Consequential or incidental damages sustained by any person or entity as a result of any breach of these warranties are also excluded, except where such damages may not be excluded by law.

Acquiring Warranty Service

Do not return any item without first being assigned a Return Material Authorization (RMA) tag number. Customer must obtain a RMA# from Airius (888-AIR-PEAR or info@airiusfans.com) before returning the faulty unit. RMA number must appear on the return-shipping label and be associated with any correspondence. Customer is responsible for all return shipping costs to:

Airius Warranty - RMA# ____
711 South Lincoln Street
Longmont, Colorado 80501

Airius will return the unit(s) freight prepaid. Airius may elect to repair the same unit at customer site or offer replacement parts to facilitate repair and reduce customer down time and expense. Airius is not responsible for misuse of their product.

Freight claims are the responsibility of the customer and all products are shipped FOB Longmont, Colorado, USA.

Remedy and Limit of Liability

The exclusive remedy of the purchaser, and the limit of liability for Airius, for any and all losses in connection with this product shall be repair or replacement of the warranted product or the affected components, as provided above.

Airius reserves the right to make the final determination, based on its own assessment, as to (1) whether the problem in question is the result of a defect in design, workmanship or materials, and not the result of error, misuse or abuse on the part of the customer, as set forth under the exclusions detailed above; (2) whether the problem or defect is material and requires action under this warranty; and (3) whether the remedy of repair or replacement is appropriate.

With regard to electrical and electronic components provided by Airius that comprise part of the products, including motors, Airius relies on the determination by the original manufacturer as to whether the failure of such component was the result of a defect. If the manufacturer of such component determines that there was no defect and therefore refuses to cover it under warranty, Airius likewise will not warranty such item.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY, REPRESENTATION OR CONDITION OF MERCHANTABILITY OR THAT THE PRODUCTS ARE FIT FOR ANY PARTICULAR PURPOSE OR USE, AND SPECIFICALLY IN LIEU OF ALL SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. REPAIR OR REPLACEMENT SHALL BE THE SOLE REMEDY OF THE CUSTOMER AND THERE SHALL BE NO LIABILITY ON THE PART OF AIRIUS FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED, TO ANY LOSS OF BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE.

Any and all disputes related to this warranty or any other matter related to Airius must be submitted to binding arbitration within 45 radial miles of Longmont, Colorado. The arbitrator will follow the Colorado Uniform Arbitration Act and the Rules of the American Arbitration Association. Under Colorado law, punitive damages are not recoverable by any party subject to arbitration. Moreover, jury trials are not available in arbitration. The arbitration decision or award is legally binding and enforceable. To the extent that a court rules that this paragraph is not enforceable, the parties agree to resolve any and all disputes in the Boulder District Court in Boulder, Colorado.

Customer Service: 888-AIR-PEAR (888-247-7327) or info@airiusfans.com

