

Guardian CP™ Digital Pump Control



Model DC2

Your DC2 DIGITAL CONTROL has been carefully assembled and factory tested. To enjoy the full service this unit can provide, you should read and follow all of the instructions in this manual. When all installation steps have been completed, make sure you also follow the enclosed post-installation and startup checklists before using your AMTROL® product. You should also read carefully the sections describing proper product maintenance and follow the required procedures as you use your DC2 DIGITAL CONTROL. Keep this manual with the product. This manual may become out-of-date by later amendments. Check our web site, www.amtrol.com or ask your AMTROL® supplier for any updates relating to your product.



THIS IS THE SAFETY ALERT SYMBOL. IT IS USED TO ALERT YOU TO POTENTIAL PERSONAL INJURY AND OTHER HAZARDS. OBEY ALL SAFETY MESSAGES THAT FOLLOW THIS SYMBOL TO REDUCE THE RISK OF POSSIBLE INJURY AS WELL AS PROPERTY DAMAGE.

INSTALLER: LEAVE THIS MANUAL WITH THE OWNER

Patent Pending

INSTALLATION INSTRUCTIONS

Unit Must be Installed by a Qualified Professional

PLUMBING CONNECTION

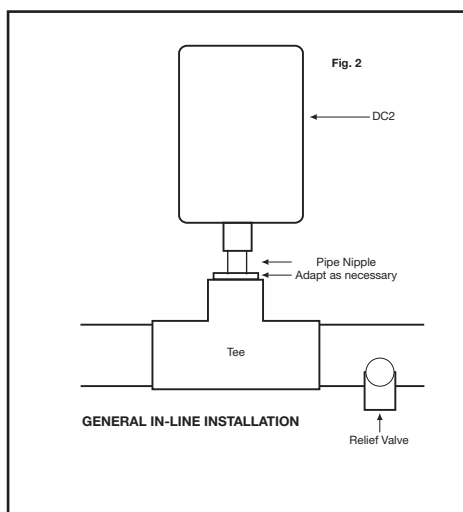
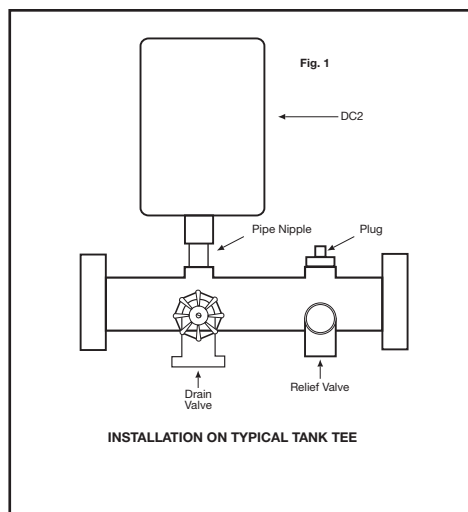
1. Select a location for the DC2. The DC2 should be mounted near the pressure tank or pump, depending upon the installation

⚠ WARNING LOCATE THE DC2 FOLLOWING ALL LOCAL CODES. DO NOT LOCATE THE UNIT WHERE IT CAN BE AFFECTED BY FLOODING.

2. You may assemble the DC2 to a “Tank Tee” or “Tank Cross” (Figure 1) or adapt the unit to an in-line pipe fitting (Figure 2). Use Teflon sealing tape or pipe sealant. Tighten the DC2 using the wrench flats provided on the bottom connection. DO NOT EXCEED 15LB./FT. of torque.

Note: Do not allow pipe sealant or other contaminants to enter the small port in the DC2 connection.

Note: A mechanical pressure gauge is not required. Use the appropriate plug to block any unused ports.



ELECTRICAL CONNECTION

⚠ DANGER ELECTROCUTION HAZARD. FIRST DISCONNECT ALL ELECTRICAL POWER BEFORE SERVICING.

⚠ DANGER ELECTROCUTION HAZARD. THE DC2 MUST BE ELECTRICALLY GROUNDED.

NOTE: The DC2 will operate on 115 VAC & 230 VAC systems. Its ambient air temperature rating is 122°F / 50°C.

1. Disconnect power and verify with a volt meter.
2. Determine the pump electrical requirements. If unknown, contact the pump manufacturer.
3. Select the appropriate wire gauge per local codes and the pump manufacturer's recommendation.

- Loosen the screw on the cover of the controller and remove the plastic cover, exposing the wiring pigtails. (When reassembling cover, do not over-tighten screw.)
- The wire conduit hub is to be connected to the conduit before the hub is connected to the enclosure. The maximum hub diameter cannot exceed 1.15". Larger hub will interfere with cover closure.
- The opening of the enclosure shall be closed with hubs rated 3, 3S, 3SX, 3X, 4, 4X, 6 or 6P.

NOTE: Steps 5 and 6 are required for outdoor installations only.

- Following all electrical codes, wire the DC2 using the wiring diagram below (Figure 3).

NOTE: The DC2 has openings to accept standard conduit terminations. Outdoor installations must use watertight connections.

⚠ WARNING UNIT MUST NOT BE SUPPORTED SOLELY BY THE ELECTRICAL CONDUIT.

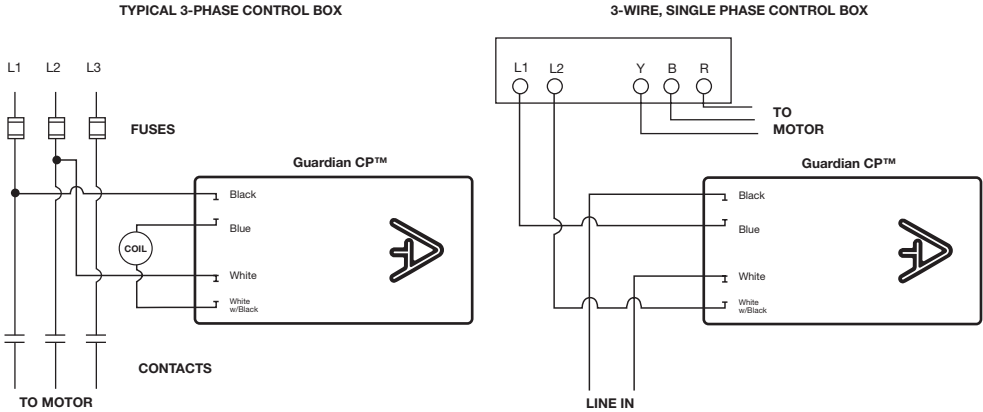
⚠ CAUTION WATERTIGHT CONDUIT CONNECTIONS MUST BE USED WHEN EXPOSED TO DIRECT WEATHER, MOISTURE OR HIGH HUMIDITY.

⚠ CAUTION ELECTRICAL BONDING BETWEEN CONDUIT CONNECTIONS IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION. BONDING KIT, PART #146-2350 CAN BE ORDERED SEPERATELY.

Fig. 3
Guardian CP™



BASIC WIRING



START UP



WARNING BEFORE CONTINUING, CHECK FOR OPEN DRAIN VALVES OR OTHER SOURCES OF FLOODING BEFORE STARTING UNIT.

1. Prime pump if necessary and adjust tank precharge to manufacturer's recommendation for intended pressure range. The factory DC2 setting is 40 psi cut-in and 60 psi cut-out.
2. Turn on power and ensure DC2 display illuminates, "88" will appear, then code revision number, then "00". Display will blank momentarily and the pump will start. If not, check installation.
3. The display will now read the current line pressure.
4. Allow the pump to reach the factory cut-off setting of 60 psi. IF THE PUMP CANNOT REACH THIS SETTING, DISCONNECT POWER AND SEE THE TROUBLESHOOTING SECTION ON PAGE 5.
5. Check for leaks and repair as necessary before proceeding.
6. Proceed to the ADJUSTMENT section.

NOTE: During the first 30 seconds after start up, the pump can be made to operate manually by depressing the ▲ arrow for 6 seconds. This is useful for priming jet pumps.

DEVICE ADJUSTMENT (Entering Programming Mode)

NOTE: Differential pressure cannot exceed 55 psi or be less than 10 psi. If display will not change, alter cut-in or cut-out to within 55 psi.

1. Press and hold ■. When "LO" appears, release. This will determine the pressure at which the pump activates.
2. When number appears, tap ▲ or ▼ to change cut-in setting.
3. Press ■ again. When "HI" appears, tap ▲ or ▼ to change cut-out setting. This will determine the pressure at which the pump shuts off.

NOTE: Depressing ■ a third time will display the last Error Code in memory (see Error Code table in Troubleshooting section). If no errors have occurred, the display will show "- -"

4. After approx. 10 seconds "Pr" will appear, indicating the settings are programmed. Display will then revert to line pressure.

NOTE: The settings will now be stored until changed manually, even in the event of power failure.

NOTE: If pump cannot reach cut-out setting within 5 minutes with no water running, lower the pressure settings to fall within the pump's pressure capabilities.

NOTE: Pressing ▲ ▼ together for 3 seconds will rotate the screen 180 degrees. This is useful if the control is mounted in an inverted position.

OPERATION

The DC2 incorporates an accurate pressure sensing system capable of maintaining the set pressure range without the need for regular service or adjustment. The DC2 controls the on/off cycling of the pump within the selected pressure range (see ADJUSTMENT section).

The DC2 also incorporates built-in diagnostic functions to protect the system and alert the user or installer to potential problems. If a fault is found, an error code will be displayed, indicating that service may be necessary. Error codes are listed in the TROUBLESHOOTING section.

TROUBLESHOOTING

Problem	Cause	Solution
Display will not illuminate	No power Improper wiring Improper voltage	Check circuit breaker and wiring connection Check polarity and wiring Ensure voltage is 115V or 230V
HI or LO setting will not change	Differential attempted is below 10 psi or above 55 psi Minimum cut-in reached Maximum cutout reached	Differential cannot be less than 10 psi or greater than 55 psi LO cannot be set below 10 psi HI cannot be set above 80 psi
Pump will not reach cut-off (HI)	HI setting greater than pump rating Insufficient prime (above ground pumps) No water to pump Pump or line blockage Fixture open or leak in plumbing	Reduce HI setting to within pump capability Prime pump as directed by manufacturer - use manual operation mode Check shutoff valves Remove obstructions Determine cause of flow and remedy
Pump rapid cycles	Pressure tank too small Differential too narrow Waterlogged pressure tank Improper tank air charge Improper wiring	Size tank per manufacturer's literature Spread range via HI or LO setting Replace tank Charge as instructed by manufacturer Check proper wiring to "line in", L1 & L2
Pump will not activate	No power DC2 error encountered Faulty pump Improper wiring (DC2 or pump)	Check circuit breaker and wiring connections See error chart below Contact pump manufacturer Check wiring per manufacturer's instructions
Water flow stops before cut-in	Tank precharge too high	Adjust precharge per manufacturer's instruction
Display reads upside-down	Mounting position may vary	Press ▲ ▼ together for 3 seconds and screen will rotate 180 degrees

MODEL DC2 ERROR CODES

Error Code	Reason	Action	Solution
E1	Rapid cycle Excessive amp draw	Switch continues to operate	See "Pump Rapid Cycle" above Have pump checked for proper operation
E2	Low-suction shutoff (running pressure) below 10 PSI	Shutoff. Auto restart after 60 min.	(A) Determine cause of low-suction (B) Check Wiring (C) Inspect pump
E3	Improper voltage	Shutoff after 2 min.*	Restore voltage to proper range

To reset switch at any time: Press ▲ ■ ▼ buttons simultaneously for 5 seconds.

*Unit will monitor voltage until voltage condition returns to normal. Pump will restart automatically.

UNIT CONTAINS NO SERVICEABLE PARTS. REMOVAL OF MAIN CIRCUIT BOARD COVER WILL VOID WARRANTY.

GENERAL SAFETY INFORMATION

WARNING: REVIEW ALL GENERAL SAFETY INFORMATION PRIOR TO INSTALLATION.

⚠ WARNING READ CAREFULLY THE PRODUCT INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS. FAILURE TO FOLLOW THE INSTRUCTIONS AND WARNINGS IN THE MANUAL MAY RESULT IN SERIOUS OR FATAL INJURY AND/OR PROPERTY DAMAGE, AND WILL VOID THE PRODUCT WARRANTY. THIS PRODUCT MUST BE INSTALLED BY A QUALIFIED PROFESSIONAL. FOLLOW ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS, IN THE ABSENCE OF SUCH CODES, FOLLOW THE CURRENT EDITIONS OF THE NATIONAL PLUMBING CODE AND NATIONAL ELECTRIC CODE, AS APPLICABLE.

⚠ WARNING This product is used in conjunction with a system containing a tank under pressure, which may over time corrode, weaken and burst or explode, causing serious or fatal personal injury, leaking or flooding and/or property damage. To minimize risk, a licensed professional must install and periodically inspect and service the product and system. A drip pan connected to an adequate drain must be installed if leaking or flooding could cause property damage. Do not locate system in an area where leaking could cause property damage.

⚠ WARNING **EXPLOSION OR RUPTURE HAZARD.** A relief valve must be installed to prevent system pressure in excess of local code requirement or maximum working pressure designated in the Product Manual, whichever is less. Do not expose system to freezing temperatures or temperatures in excess of 120 degrees. Failure to properly size the system or follow instructions in the Manual may result in excessive strain on the system and may lead to product failure, leakage, flooding and/or property damage.

⚠ WARNING This control is capable of running pumps to pressures that may exceed the limitations of system components. Never set the operating pressure higher than that of the safe system capacity.

⚠ WARNING This control can be adjusted to a narrow pressure differential. This can cause the pump to cycle rapidly with an improperly sized tank, leading to pump damage. This may require a larger pressure tank than is normally used.

⚠ DANGER **ELECTROCUTION HAZARD.** Must be installed by qualified professional. First disconnect all electrical power before attempting service. For your safety, the information in this Manual must be followed to minimize the risk of electric shock, property damage or personal injury.

⚠ WARNING A water test must be taken before installation of any water treatment equipment. The water quality can significantly influence the life of your system. You should test for corrosive elements, acidity, total solids and other relevant contaminants, including chlorine and treat your water appropriately to insure satisfactory performance and prevent premature failure.

⚠ WARNING Use only lead-free solder and flux for all sweat-solder connections, as required by state and federal codes.



DANGER! EXPLOSION HAZARD. When the well tank has been in service and a change to a higher pre-charge pressure is necessary due to a required change in the pressure switch setting, failure to follow instructions below can cause a rupture or explosion, possibly causing serious or fatal personal injury and/or property damage.

- Do not adjust or add pressure if there has been a loss of air.
- Do not adjust the pre-charge pressure if there is visible exterior corrosion.
- Do not adjust the pre-charge pressure if there has been a reduction of the pump cycle time or the pre-charge pressure compared to its initial setting. This is because reduction in pump cycle time can result from loss of tank air pressure which in turn can mean there may be internal corrosion and any re-pressurization or additional pressure could result in rupture or explosion.
- Do not install with components that are incompatible with the DC2.

NOTE: Inspect for shipping damage and notify freight carrier or store where purchased immediately if damage is present. To avoid risk of personal injury and property damage, if the product appears to be malfunctioning or shows signs of corrosion, call a qualified professional. Please read the entire owner's manual and installation instructions before installing our new AMTROL® product. Save all documents and manuals for future reference. Current copies of the Product manual can be viewed at www.amtrol.com. Use proper safety equipment when installing. You must comply with all plumbing and electrical codes.

AMTROL INC. 2-YEAR LIMITED PRODUCT WARRANTY

Products covered: all Products manufactured by AMTROL Inc. ("AMTROL").

This warranty cannot be transferred – it is extended only to the original Purchaser or First User of the Product. By accepting and keeping this Product you agree to all of the warranty terms and limitations of liability described below.

IMPORTANT WARNING – READ CAREFULLY THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS MANUAL ("MANUAL") to avoid serious personal injury and/or property damage and to ensure safe use and proper care of this product. Proof of Purchase Will Be Required for All Warranty Claims.

Who Receives AMTROL's Product Warranty?

All purchasers or first users of the new Product. The Warranty is non-transferable.

What is covered by this Warranty?

AMTROL warrants to the purchaser or first user of the new Product that at the time of manufacture, the Product is free from defects in material and workmanship. Any warranty claim must be made within **two (2) years** unless another time period is set forth in the Manual, measured from the time the Product was purchased.

What AMTROL Will Do If You Have a Covered Warranty Claim?

In the event of a breach of the foregoing warranty, AMTROL will at its option either make repairs to correct any defect in material or workmanship or supply and ship either new or used replacement parts or products. AMTROL will not accept any claims for labor or other costs.

What This Warranty Does Not Cover — Exclusions and Limitations?

This Warranty does not cover any failure or problem unless it was caused by a defect in material or workmanship. In addition, this Warranty shall not apply:

- if the Product is not correctly installed, operated, repaired or maintained as described in the Manual provided with the Product;
- to any failure or malfunction resulting from abuse (including freezing); improper or negligent: handling, shipping (by anyone other than AMTROL), storage, use, operation, accident; or alteration, lightning, flood or any other environmental condition;
- to any failure or problem resulting from the use of the Product for any purpose other than those specified in the accompanying Manual or alteration of any part of the product;
- this Warranty does not cover labor costs, shipping charges, service charges, delivery expenses, administrative fees or any costs incurred in removing or reinstalling the Product;
- this Warranty does not cover any claims submitted to AMTROL or an AMTROL-authorized distributor or retailer more than 30 days after expiration of the applicable warranty time period described in this Warranty;
- this Warranty also does not cover repair or replacement costs not authorized in advance by AMTROL.

Additional Warranty Limitations

ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY DISCLAIMED.

Limitations of Remedies

THE REMEDIES CONTAINED IN THIS WARRANTY ARE THE PURCHASER'S OR FIRST USER'S EXCLUSIVE REMEDIES. IN NO CIRCUMSTANCES WILL AMTROL BE LIABLE FOR MORE THAN, AND PURCHASER-FIRST USER'S REMEDIES SHALL NOT EXCEED, THE PRICE PAID FOR THE PRODUCT. IN NO CASE SHALL AMTROL BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM NON-DELIVERY OR FROM THE USE, MISUSE, OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT OR FROM AMTROL'S OWN NEGLIGENCE OR OTHER TORT. This exclusion applies regardless of whether such damages are sought for breach of warranty, breach of contract, negligence, strict liability, in tort or under any other legal theory. Such damages include, but are not limited to, inconvenience, loss or damage to property, mold, loss of profits, loss of savings or revenue, loss of use of the Products or any associated equipment, facilities, buildings or services, downtime, and the claims of third parties including customers.

What To Do If You Have a Problem Covered By This Warranty?

Any covered Warranty service must be authorized by AMTROL. Contact the person from whom you purchased the Product, who must receive authorization from an AMTROL distributor or AMTROL. If you do not receive a prompt response, call AMTROL directly at 877-517-9673 or visit our website at www.amtrol.com. Notice of a Warranty claim should be submitted by the authorized distributor to AMTROL at the following address:

AMTROL Inc., Warranty Claim Dept., 1400 Division Rd., West Warwick, RI 02893

Before AMTROL determines to provide any replacement part or Product, it may as a pre-condition to making such a determination require that the warranty claimant ship the Product, postage prepaid to an authorized AMTROL distributor, or to AMTROL and provide proof of purchase evidenced by the original sales receipt or Product registration.

Replacement Product Warranty

In case of replacement of a Product or any component part, AMTROL reserves the right to make changes in the design, construction, or material of the substitute components or products, which shall be subject to all of the terms and limitations of this Warranty, except that the applicable warranty periods shall be reduced by the amount of time the warranty claimant owned the product prior to submitting notification of the warranty claim.