

Model C100M Pump Controller Installation & Operation Manual

P/N 95230 Rev 4-25-13

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General Warnings

Some QED pumping devices are designed to pump floating hydrocarbons from groundwater recovery wells. The recovered product is frequently flammable and vapors may be explosive if exposed to heat, flame, or sparks. ***When any of the pneumatic pumping systems are used care should be taken to ensure that any venting of pump drive air, potentially mixed with the explosive vapors within the pump, is located in a well ventilated area away from sources of open flame, sparks and extreme heat. As in all situations failure to take adequate precautions may result in catastrophic injury or death.*** Protection for eyes, hands, and person should be worn when working with the pumps to avoid injury from contact with hazardous fluids. Tubing used with these systems should be routed in a manner that prevents damage due to chaffing, cutting, or crushing.

Do not apply compressed drive air to the system unless all safety precautions are followed.

C100M Controller Warnings

The C100M is a solar powered timer and valve that has an onboard battery pack for operation during the night and on days with marginal sunlight. The C100M is CSA approved intrinsically safe for Class 1, Group C and D use. The general warning for venting of pump drive air needs to be followed with the C100M as it will vent potentially explosive pump drive air during operation (venting at, or near the C100M is not a problem). The C100M is also NEMA4 rated for use in environments or in situations where the device might be exposed to rain or water spray. The C100M includes an optional AC adapter to allow use inside where there is insufficient light for charging. ***When the controller is used with the AC adapter, the unit is not intrinsically safe.*** Use of the AC charger will require that the controller be mounted ***at least*** 3 feet above the ground and ***at least*** 25 feet horizontally from sources of combustible vapors and liquids (i.e. exhaust valve).

If the rechargeable batteries need to be replaced, they should be replaced only with batteries supplied by QED. ***If replacement batteries other than QED batteries are used in the C100M, the “intrinsically safe” certification will be voided.***

If the C100M should shut down due to a low power situation, (low battery voltage, low sunlight) once sufficient power is available (either by plugging the AC adapter, increase in sunlight, new batteries or other power supply) the C100M will resume cycling automatically. ***The default setting for the controller is to be enabled once adequate power is supplied.*** When servicing any equipment controlled by the C100M, at a minimum, disconnect the air source from the controller to prevent unintentional cycling.

C100M Terminology

Refill Time: This is the time that the pump is venting and fluid is entering the pump.
No pressure is being applied to the pump at this time.

Discharge Time: This is the time that pressure is being applied to the pump to
discharge the fluid from the pump.

On Time: This is the time that the system is on: the system is "AWAKE" and is cycling according to
the settings of the Refill and Discharge times.

Off Time: This is the time that the system is off: the system is "SLEEPING" and not cycling.

System Enabled: This turns the system on and enables the timing sequences to start.

System Disabled: This turns the system off and disengages the timing sequences.

Default Times

Default times are maintained even when the unit is low power disabled. The C100 unit
comes with the following default times:

Refill: 5 minutes

Discharge: 30 seconds

OnTime: 4 hours

Off Time: 1 second

Controller settings

The C100M has three basic controls available that affect pump operation:

Refill time setting:

The refill time settings determines how long the pump will fill. This time needs to be longer when there is less pump submergence (fluid level above the pump). The refill time is settable from 1 second to 99 hours, 59 minutes and 59 seconds.

Discharge time setting:

The discharge time setting determines how long the pump will discharge. This time needs to be longer when the pump is deeper, when the pump is pumping against a higher back-pressure (a pressure header or pumping uphill), and when the fluid has a high viscosity and flows slowly. The discharge time is settable from 1 second to 99 hours, 59 minutes, and 59 seconds.

Pump supply pressure setting:

The filter-regulator attached to the controller is used to raise or lower the air pressure applied to the pump during a discharge cycle. For most applications this is set at the fully clock-wise position to deliver full compressor supply pressure to the pump. If the pump discharge is too high for your particular application, this pressure may be decreased to slow the flow from the pump during a discharge cycle. However, if the pressure is decreased it often becomes necessary to increase the discharge time slightly to offset the decrease in flow and to help maintain full pump discharge.

The C100M Controller features an additional control option to set an awake or sleep mode. This option can be used to schedule the system operation over a one or more day period. For example, the controller can be set to cycle for one hour and "sleep" or stop cycling for 6 hours, which would then repeat. This feature is useful in cases when there is a slow recharge rate in the well.

Function Keys

The "**TIME**" button displays and allows the setting of the following times:

First push: This displays and allows the setting of the Refill time.

Second push: This displays and allows the setting of the Discharge time.

Third push: This displays and allows the setting of the System On time.

Fourth push: This displays and allows the setting of the System Off time.

To adjust the time settings use the     keys.
(A minimum time setting of 1 second is required for all of these times, ie 00:00:01)

The time on the display reads hours, minutes, and seconds. The time display will look like this: 00:00:00


Hours **Minutes** **Seconds**

Pressing the   key moves the cursor to the desired hour, minute, or second.

Pressing the  key increases the number.

Pressing the  key decreases the number.

If changing the Refill or Discharge times, pressing the "**GO TO**" key will start a new time cycle starting with the Refill time. The next time cycle automatically uses the new time. For example, if after changing the Refill time, pressing the "**GO TO**" key will start the new time cycle starting with the new Refill time.

If changing the System On or System Off times, pressing the "**GO TO**" key will start a new time cycle starting with the System Off time. The next cycle automatically uses the new time. For example, if after changing the System Off time, pressing the "**GO TO**" key will start the new time cycle starting with the new System Off time.

C100M Battery

Prior to initial installation, remove the paper tab between the battery and the battery terminal

WARNING: The batteries will be drained and possibly damaged if the C100M is stored in this "enabled" mode for an extended period of time

While the unit will charge itself to self-start under full sunlight charging conditions, it is recommended that the unit be charged overnight (**or least 12 hours**) before being placed into field service for the first time.

When the C100M's battery gage reads LOW, the C100M goes to OFF cycle (or SLEEP) and keeps the unit in the OFF cycle until the battery gage reads OK.

Whenever the C100M has been stored in a discharged or DEAD battery state for an extended period of time (more than 2 weeks) jump-starting charging may be required for operation.

Battery operation time is affected by the following items:

- Initial charge, a minimum of 12 hours is recommended.
- Time of year (there is less daylight in the winter)
- Weather (cloudy days vs sunny days) the time of day (when the sun is low on the horizon it has less energy to charge the battery), and temperature (colder reduces battery capacity).
- Valve cycle frequency (as the valve cycles more, it drains more energy from the battery)

A C100M controller used in a typical hydrocarbon skimming application, where cycle times are long (greater than 30 seconds each) will have no problem maintaining the battery charge with the built in solar panel. As cycle times become shorter (as is typical with Alpha style pumps), it may be necessary to use an external solar panel or the AC adapter to maintain the battery's charge. The following is a general guide line for cycle times and battery life:

Cycle per Minutes	Cycle Length in Seconds	Run Days*	Recommendations
6	5 refill, 5 discharge	2.6	Use AC Adapter
3	10 refill, 10 discharge	4.3	Use AC Adapter or External Solar Panel
1.5	20 refill, 20 discharge	6.3	Use Built In or External Solar Panel
1	30 refill, 30 discharge	7.3	Use Built in Solar Panel
Default	300 refill, 30 discharge	12	Use Built in Solar Panel

*With a completely charged battery and no charging going to the battery.

Rechargeable Batteries

It is recommended that replacement batteries are fully charged using commercially available chargers for these batteries before installing them on the C100M unit. This is to ensure that the two battery cells are matched in terms of cell voltage and charge status so they will function properly in the series cell pack configuration of the C100M unit.

CAUTION: DO NOT use any primary, non rechargeable battery in the C100M unit. If charged, these batteries will swell and rupture causing damage and possible injury to equipment operators. Also, **DO NOT** use Lithium or Lithium Ion type batteries in the C100M unit. The Lithium batteries have a higher voltage (3 Vdc per cell) and use different charging methods than used in the C100M unit.

Tank Full Shutoff

This feature is designed to be used with QED's Tank High Level Shutoff Kit, QED Model CTRTFO. The Tank Full Shutoff uses a normally closed float switch installed at a high tank position in your tank. It is designed to stop pump and controller operation when the level in the collection tank exceeds the upper limit defined by the float switch location. When high levels are detected, the C100M controller will discontinue pump operation and Disable the controller, and will remain in a **"Tank Full"** and **"System Disable"** mode until both are reset. The **"Tank Full"** condition will be shown on the display of the controller as a **"T"** in the upper right hand corner of the display. When this condition is detected, the tank level must be lowered enough to deactivate the switch and the controller must be reset to resume normal operation. First the **"Tank Full"** switch has to be reset by pushing the ◀ ▶ key. Then the controller needs to be enabled. Pressing the **"GO TO"** key three times will take you to the Disable/Enable screen. Once the QED Model CTRTFO is installed, any disconnection or breaks in the switch cable will also cause a **"Tank Full"** and **"System Disable"** response.

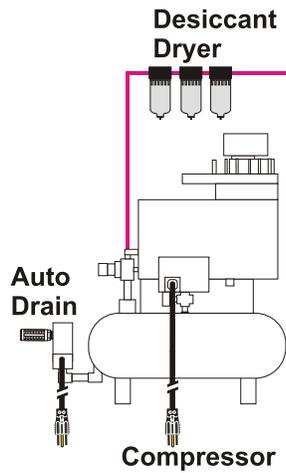
If the QED Model CTRTFO is not being used, then there is a jumper wire in place inside the controller, which disables this feature.

On/Off Level Control

This feature is designed to be used with QED's On/Off Level Control Kit, Model CTRLSW. The On/Off Level Control switch uses a normally closed float switch which is designed to stop pump operation when the level of the liquid being pumped falls below the limit defined by the float switch location and resume pumping automatically when the liquid level rises again and activates the float switch. A "Level Off" condition will be shown as a **"L"** in the lower right hand corner of the display.

Air Supply

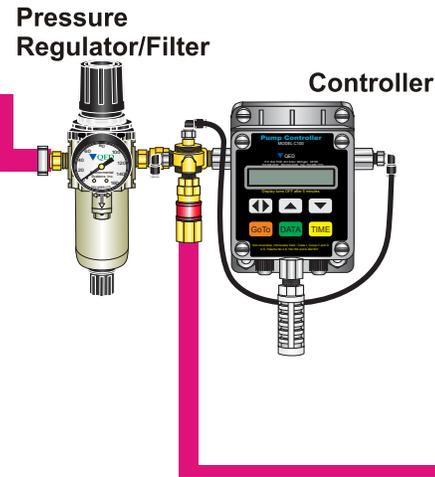
(See Air Supply Overview sheet for more details)



CAUTION: Standard compressors not rated for use near explosive or flammable liquids or vapors.

Controller

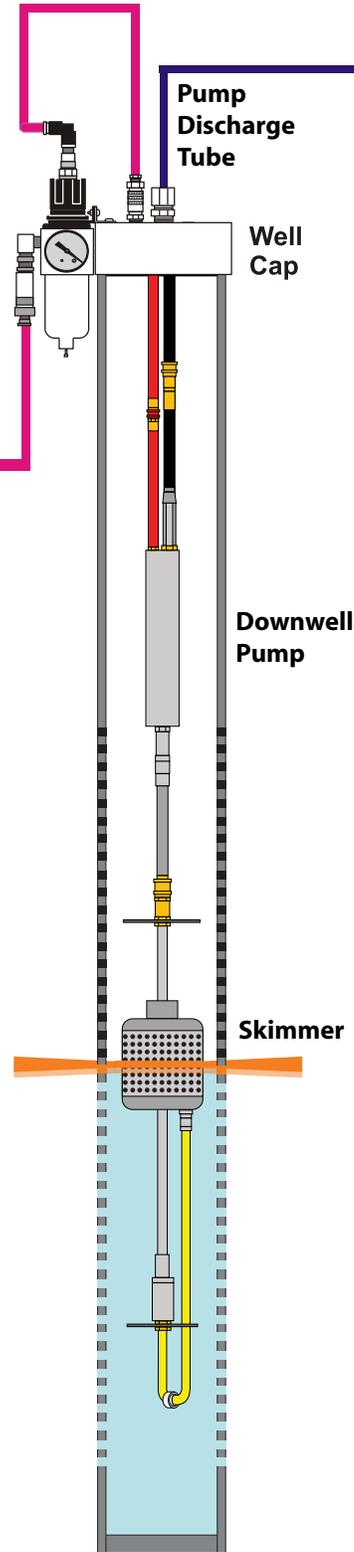
(See Controller Overview sheet for more details)



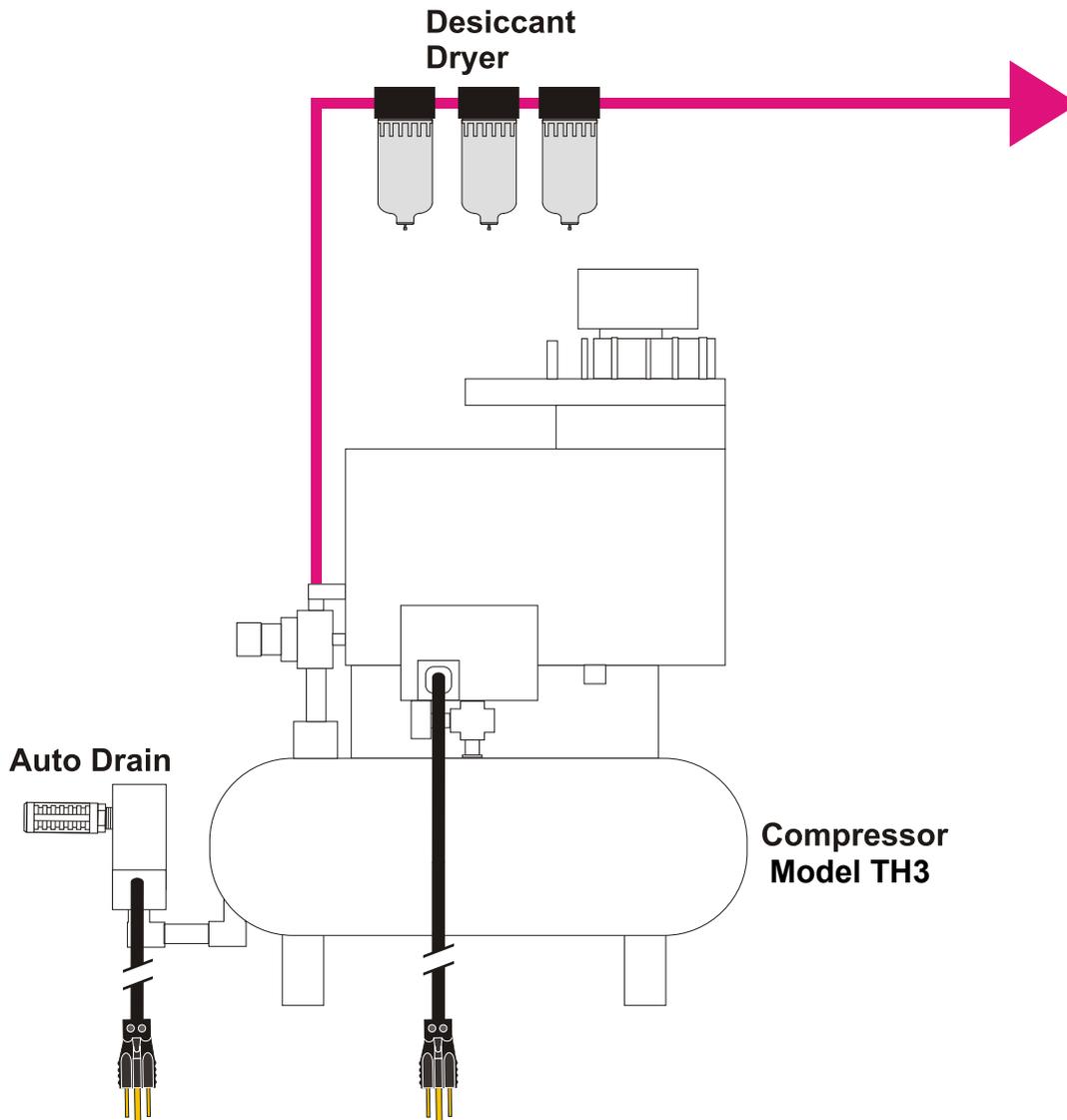
CAUTION: The C100M controller in Solar Powered mode is rated for use near explosive or flammable liquids or vapors. All externally powered controllers must be located in a safe area according to local codes

Well

(See Well Overview sheet for more details)



Air Supply Overview



Installation guidelines - refer to individual equipment manuals for detailed information

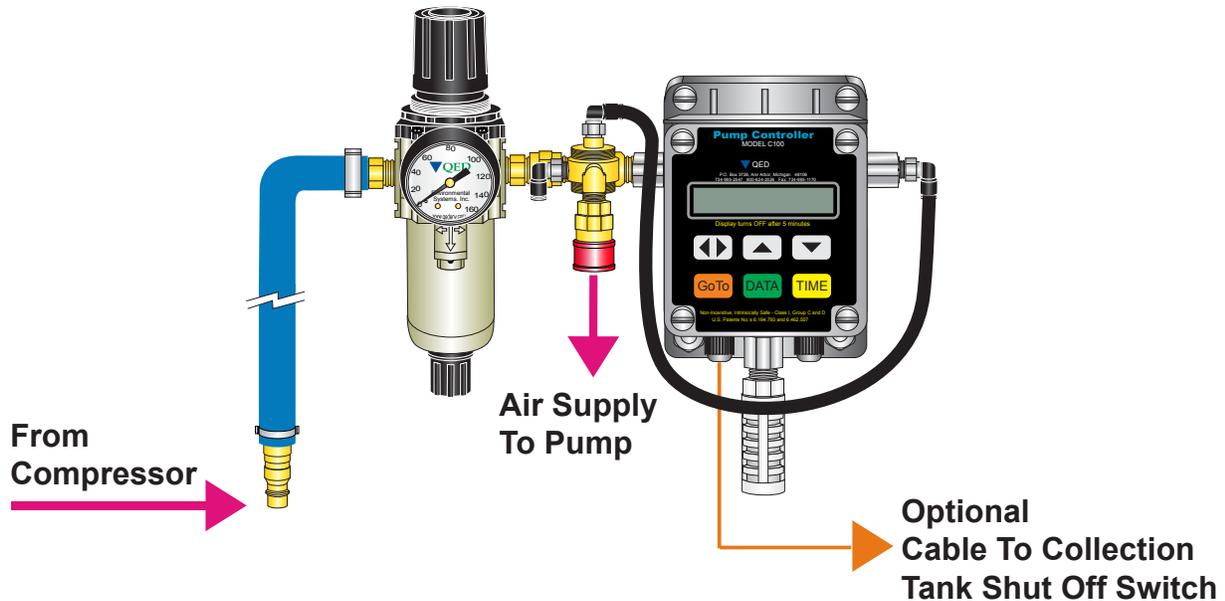
1. Choose compressor location which is away from potential sources of flammable or explosive liquids or vapors.
2. Model TH3 compressor is equipped with a 3 prong grounded power plug and requires a 115 V AC, 15 A, 60 Hz power supply. The auto drain unit has a separate 3 prong grounded power plug and requires a 120 V AC, .08 A, 60 Hz power supply.
3. Install auto drain onto compressor tank, fasten desiccant dryer to nearby wall or other vertical surface, and connect compressor output to desiccant dryer with supplied black nylon tubing.

Controller Overview

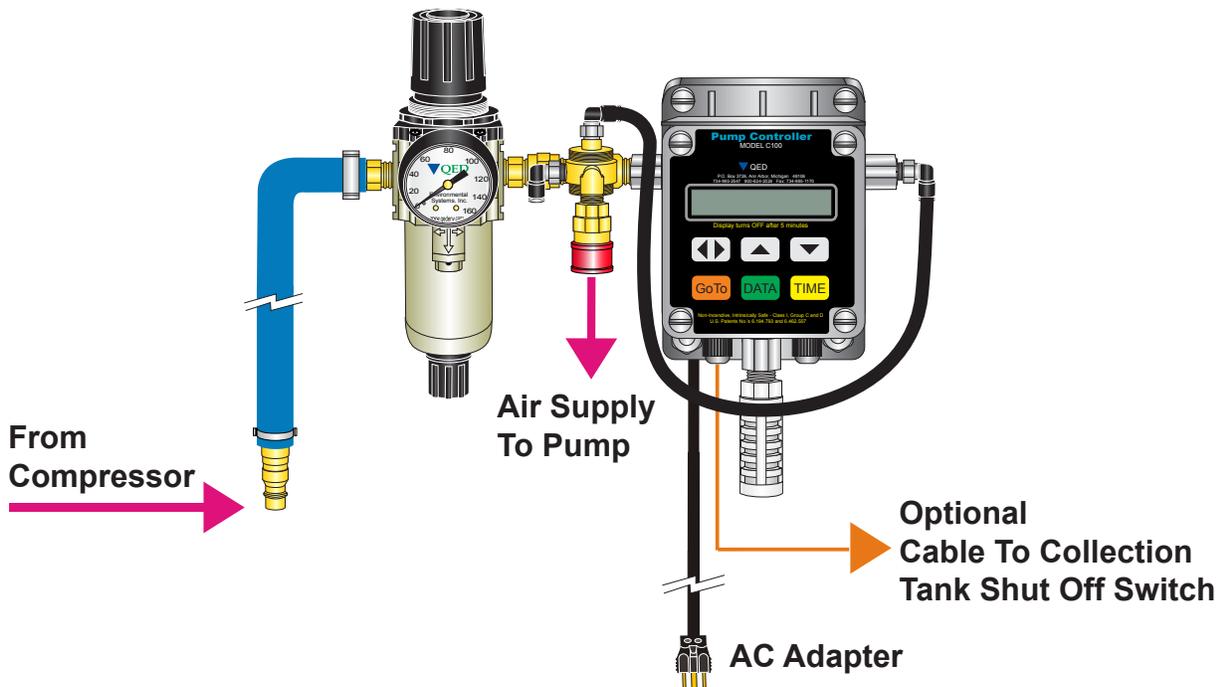
Installation guidelines - refer to individual equipment manuals for detailed information

Controller Options:

Model C100M - Solar powered mode, Requires that solar power panel on controller top be exposed to unobstructed sunlight



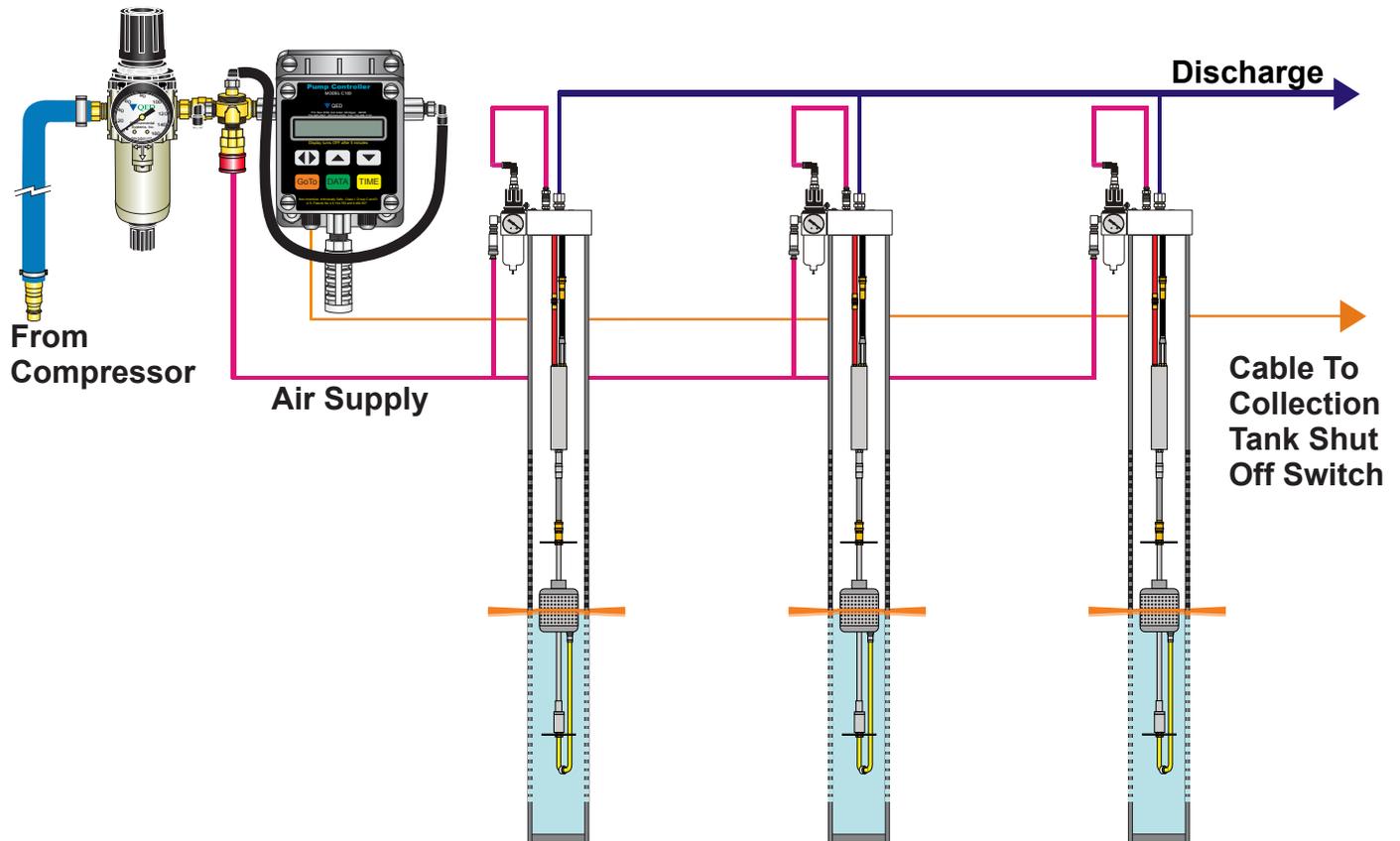
Model C100M - Powered by external power adapter, 110V AC input (Not rated for use near explosive or flammable liquids or vapors), VDC output.



Controller Overview

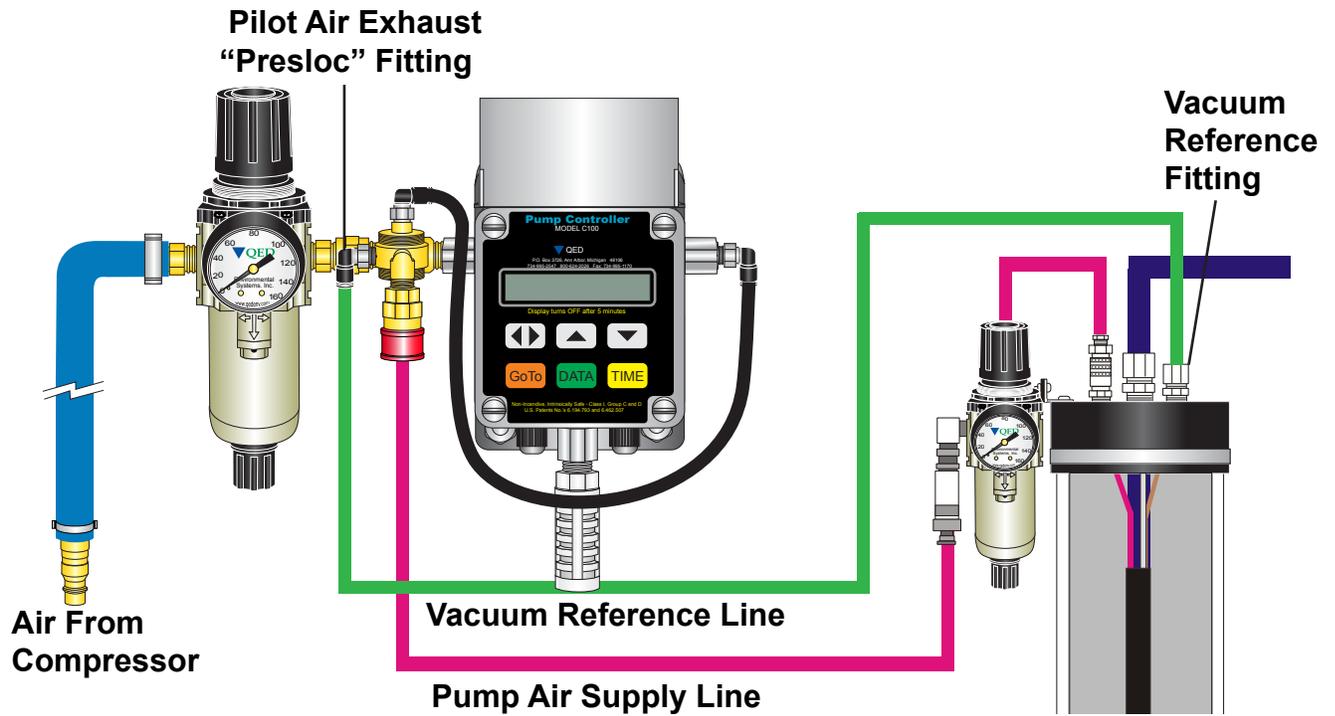
Installation guidelines - refer to individual equipment manuals for detailed information

C100M Controller Operating Multiple Pumps



C100M Controller Vacuum Well Installation

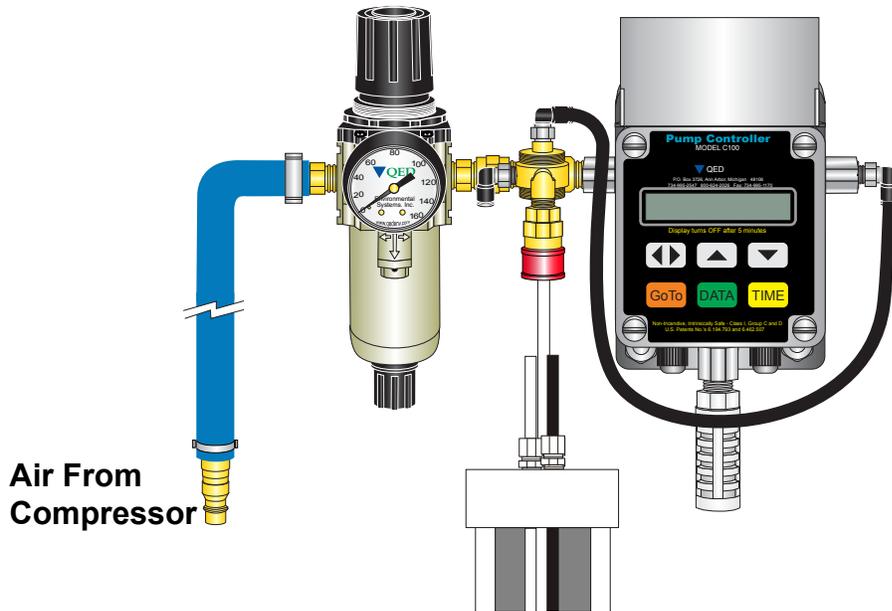
When using the C100M to control a pump in a well that is under vacuum, the pilot air exhaust needs to be referenced to the well cap/flange. Referencing is accomplished by connecting 1/4" O.D. tubing between the pilot air exhaust "presloc" fitting and the vacuum reference fitting on the well cap/flange.



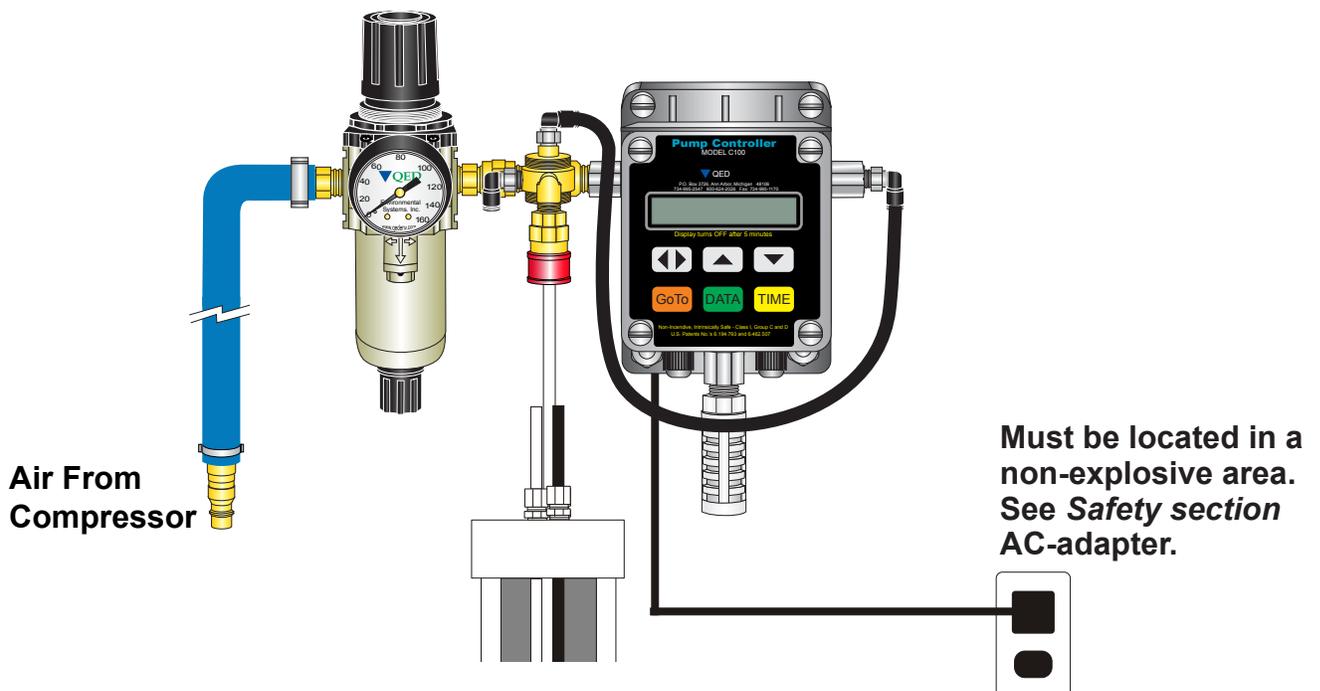
C100M Controller Installation

The top diagram (below) shows the C100M in outdoor use mode. The C100M is located near or at the recovery well in an area that receives sunlight. The bottom diagram (below) shows optional AC adapter use with the C100M. Use of the AC adapter makes the C100M unsafe for use in explosive environments. See the *Safety Section* in this manual for more information.

C100M in Solar Charge Mode

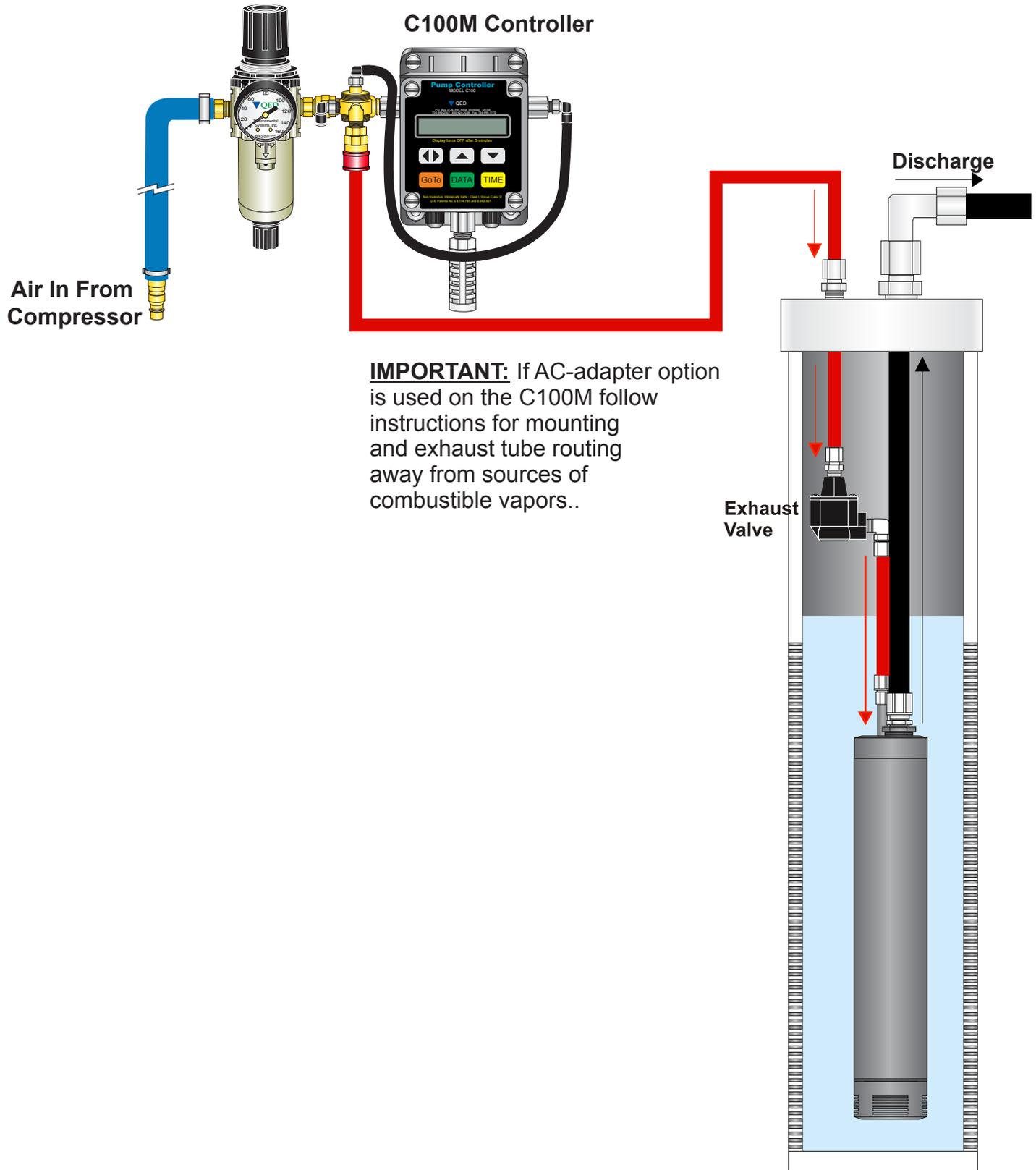


C100M When Used W/ Optional AC Adapter



Single Pump Installation

The drawing below shows a single pump being controlled by a single controller. The drawing shows C100M controller use.



IMPORTANT: If AC-adaptor option is used on the C100M follow instructions for mounting and exhaust tube routing away from sources of combustible vapors..

Troubleshooting

Use the following troubleshooting table to assist in troubleshooting the C100M:

Symptom	Possible Cause	Action/Fix
Won't turn on.	Bad batteries or failed faceplate.	Make sure all wires are securely connected
		If in Solar mode, with direct sunlight or 60 watt light, remove batteries. Does it turn on? If yes, batteries are bad. If no, replace faceplate.
		If using in AC mode, remove batteries. Does it turn on? If yes, replace batteries. If no, check voltage of outlet and AC adapter. If no voltage, replace/repair as needed. If voltage is good, replace faceplate.
Valve not cycling.	Low or dead batteries.	See above.
	Controller not enabled.	Enable.
	Cold Weather - Freezing.	Warm the valve.
	Valve is stuck / Panel not sending proper signal to switch valve.	Make sure valve connector is securely connected to panel. If available, switch faceplates with a known working C100M to determine whether valve or panel issue.
Continuous air to pump.	Valve is stuck in discharge.	Disconnect the 5/32" tubing on the C100M - If air cycles on/off with controller replace the 3-way valve, if air doesn't cycle, valve is not cycling, see above.
3-way valve constantly exhausting air.	3-way valve has failed.	Replace 3-way valve

WARNING: This equipment is designed to be used only with the QED Model C100M Controller and in accordance with the following installation and operation instructions. Serious personal injury, fire or explosion could result from misuse of this product!

Equipment Description

The Level Control Switch option is designed to stop pump operation when the level in the pumped well or sump drops below the limit defined by the float switch location and resume pumping automatically when the liquid level rises again and activates the float switch. When low levels are detected, the C100M will discontinue pump operation and will enter a "Level Off" condition.

This system is designed for safe use with flammable liquids, when used in accordance with these instructions. Alteration, misuse, connection to other pump controllers or equipment, or introduction of other electrical power sources could cause serious personal injury, fire, or explosion when used with or near flammable liquids.

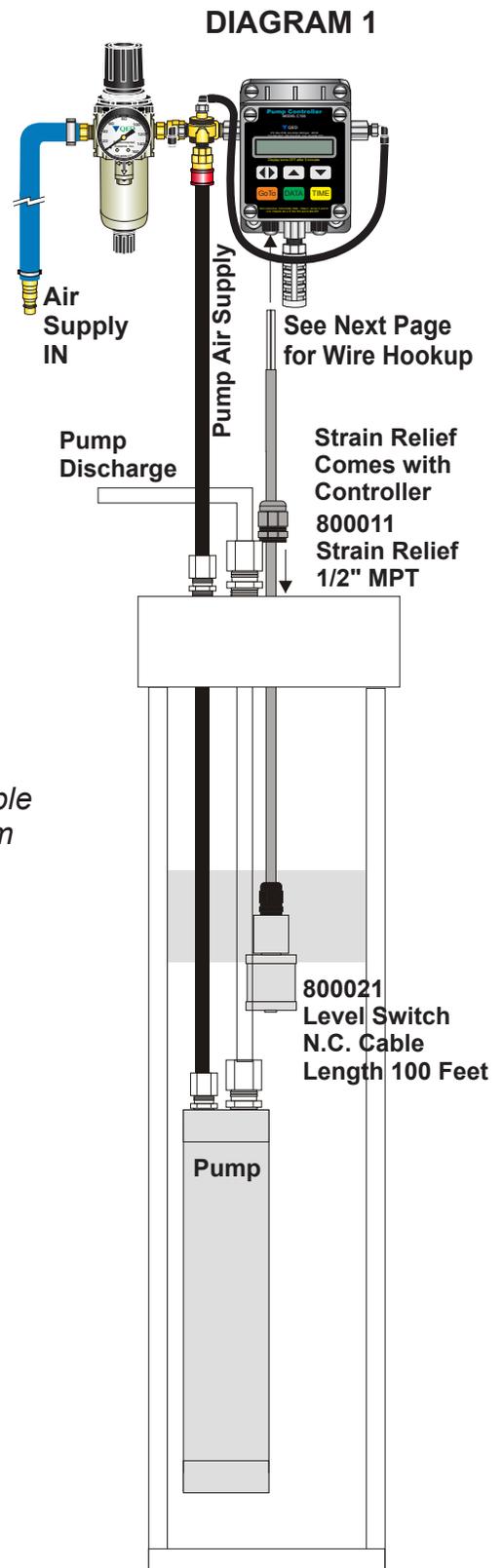
Part No. Description

800021	Level Switch, normally closed, w/100' cable
800011	Strain relief for switch cable at tank, 1/2" MPT

SAFETY WARNING: This switch should only be used with the QED Model C100M Controller and connected as shown. The cable should be protected from abrasion and damage and isolated from other sources of electrical power. Failure to do so may cause personal injury, fire, or explosion.

Installation Procedure

1. Locate well or sump to be pumped and the mounting location of the C100M controller, and identify the intended cable path between them, and ensure that the cable will be protected and be of sufficient length.
2. Install the Level Control Switch in the well using the 800011 Strain Relief (1/2" MPT), in the wellhead or cap. Lower the switch to the desired liquid control level in the well, then tighten the 800021 Strain Relief nut.
3. Route the cable from the switch to the C100M controller, including through all conduits, connectors and restraint devices.



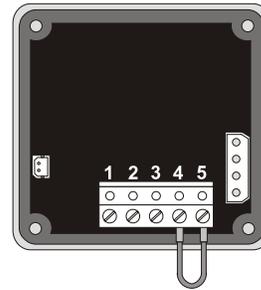
Installation Procedure Continued...

4. Unscrew the four knurled screws on the front cover of the C100M panel. Remove the front panel and disconnect the two electrical plug connectors joining the front panel to the base of the C100M, observing their orientation for reconnecting later. (The terminal orientation inside the front panel will be as shown in Diagram 1).
5. Remove the cable strain relief connector nut from the bottom, right side of the C100M Controller, and pass the cable end up through the connector and through the bottom of the C100M, leaving approximately 1 ft. of cable to allow ease of completion of connections. Loosely install the connector nut.
6. Separate the two conductors for approximately 2", stripping the cable insulation back 3/8-1/2".
7. Connect the cable wires to the C100M by sliding them into the terminal screws marked 1 and 2, then tightening the screws. It does not matter which wire is connected to terminal 1 or 2- no polarity orientation is required (shown in diagram 2).

NOTE: The jumper wire between terminals 4 and 5 should remain in place, unless the "Tank Full Shutoff Kit" is also installed. If so, follow all instructions for the Tank Full Shutoff Kit.

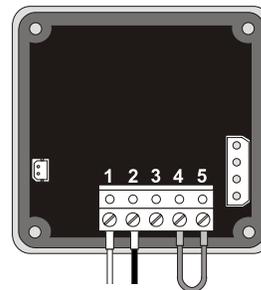
8. Reconnect the C100M front panel electrical connectors to the matching plugs inside the C100M housing, and reinstall the C100M front panel by threading in the 4 knurled corner screws.
9. Tighten the cable strain relief nut on the bottom of the C100M housing.
10. Verify successful installation and system function. Manually raise the float above the liquid level and observe that the C100M responds with a "Level Off" condition.

DIAGRAM 1
C100M with no switches as shipped



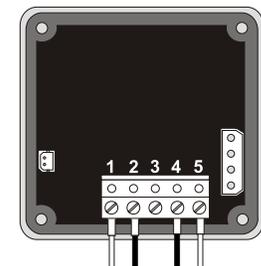
When connecting, breaking 4 & 5 will disable

DIAGRAM 2
ON/OFF Level Shutoff

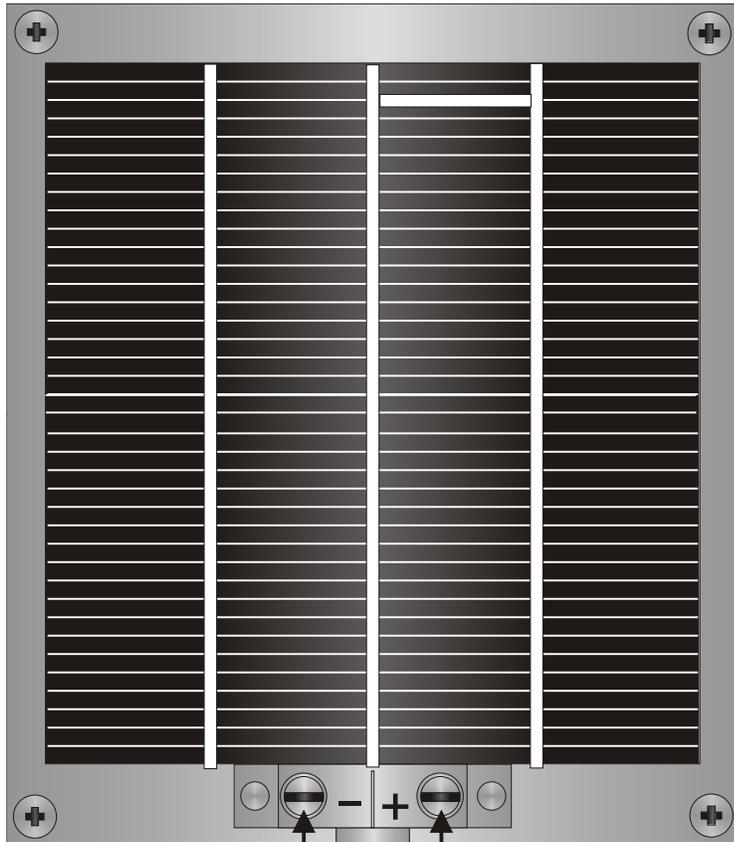


1. Connect leads from level switch to terminals #1 and #2.
 2. Jumper remains connected between #4 and #5.
- No polarity so wires can be connected to either terminal.

DIAGRAM 3
Tank High Level Shutoff Installation With ON/OFF Level Switch

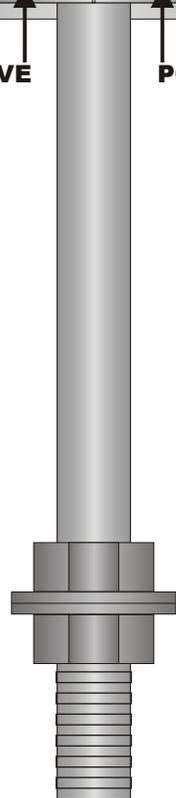


1. Remove jumper wire from terminals #4 and #5.
 2. Connect tank switch leads to terminals #4 and #5.
 3. Connect level switch leads to terminals #1 and #2.
- No polarity so wires can be connected to either terminal.



NEGATIVE

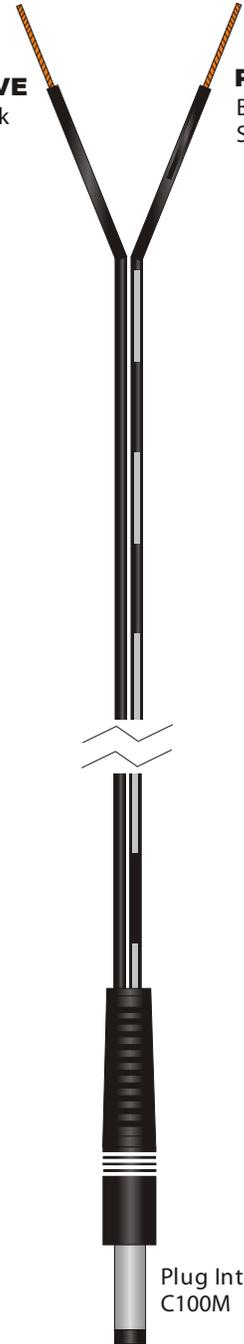
POSITIVE



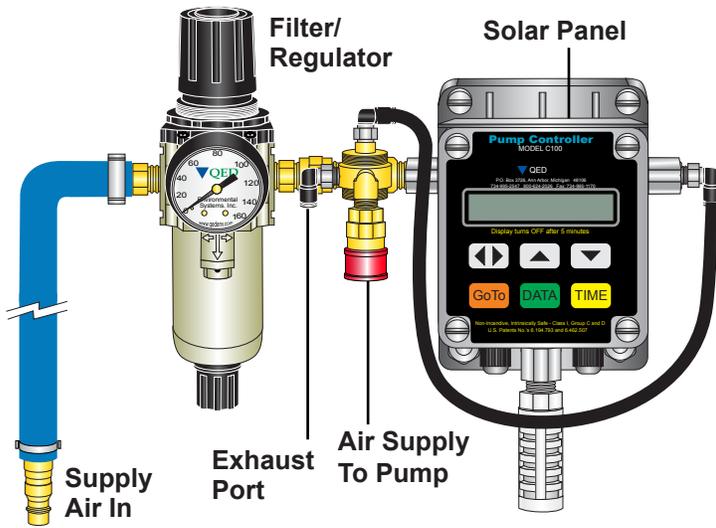
Mount Solar Panel
With Bracket In
Desired Location

NEGATIVE
Solid Black
Wire

POSITIVE
Black & Gray
Striped Wire



Plug Into
C100M



Controller Type:

Solar/Electrical/Pneumatic

Enclosure:

Dimensions - 3.5" (8.9 cm) **W** x 3.65" (9.3 cm) **H** x 3.5" (8.9 cm) **D**

Weight - 6 LBS. (6.4 kg)

Type - Fiber reinforced thermoplastic NEMA 4X & UL 508

Power:

Solar - Shatterproof solar panel on enclosure top, with backup battery pack with. CSA compliance, intrinsically safe, class 1, division 1, group C & D

C100M is CSA rated intrinsically safe when used in solar mode

110 VAC - Power converter plugs in to standard 110 VAC outlet and supplies 3 VDC,(300 milli-amp) to connector plug in enclosure bottom.3-24 VDC external power supply (C100 batteries must be removed and polarity must be correct.



C100M is not rated intrinsically safe when used with 110 VAC power converter or external DC source.

Temperature:

Operating - 14°F to 122°F (-10°C to 50°C)

Display:

Type - LCD display, 16 character alphanumeric w/ temperature compensated contrast and power off control

Window - Non-glare, double hardened optical acrylic

Pneumatic Control:

Type - Latching solenoid w/ dual port manifold

Pressure - 100 P.S.I. (690 kPa) maximum

Control Keys:

GoTo Allows manual toggling of valve and system ON & OFF cycles. Also allows enabling & disabling of system.

DATA Multi screen key to sequentially display well status, battery status, solar panel voltage, ON/OFF and system valve.

TIME Allows system counts and time sums, and valve time settings.

Set Keys:

 Left/right cursor key

 Up or add key.

 Down or subtract key.

NOTE:

Display turns off after five minutes of non activity. Press any key to turn display

Introduction- The C100M electronic/pneumatic controller provides basic refill/discharge air valve cycling to operate QED pneumatic pumps and an ON/OFF timer to allow pump scheduling. Two independent timers maximize system operation flexibility. A built-in solar charging system maintains 24 hour-365 day operation for most sites. CSA approved for intrinsically safe operation near hydrocarbon vapors. Intuitive keypad makes for easy system setup and operation.

Go To Key (orange)- Key press runs through 3 status/option screens (◀▶ Key Used).

Dis/Ref ToGo- Shows current valve status (pump discharge or refill) and the time left in that mode. pressing the ◀▶ key causes the valve to immediately go to the next mode and begin timing down.

System ON/OFF- Shows if the system is ON (awake) or OFF (in sleep mode) and the time left in that mode. Pressing the ◀▶ key causes the system to immediately go to the next mode and begin timing down.

Timer Disabled- Shows if the system is disabled or enabled. Pressing the ◀▶ key causes the system to immediately go to the next mode. System disabled can be used to override system timers during pump maintenance.

Data Key (green)- Key press runs through 7 status screens (arrow keys not used).

Dis/Ref ToGo- Default screen, shows current valve status and the time left in that mode.

Bat Good/Bad XXXX- Shows battery status as "Good"/ "Bad" and shows a bar-graph of X's indicating battery strength, (less X's shows lower strength).

Sun Charge Good/Bad- indicates if sun charge has been sufficient to maintain battery charge for this system's power use (depends on time settings & valve cycle frequency).

Refill - Shows count of refill cycles and total system refill time (sum of all refill times).

Discharge - Shows count of discharge cycles and total system discharge time (sum of all discharge times).

Sys ON - Shows count of system ON cycles and total system ON time.

Sys OFF - Shows count of system OFF cycles and total system OFF time.

Time Key (yellow) - Key press through 4 option screens (◀▶,▲,▼, keys used).

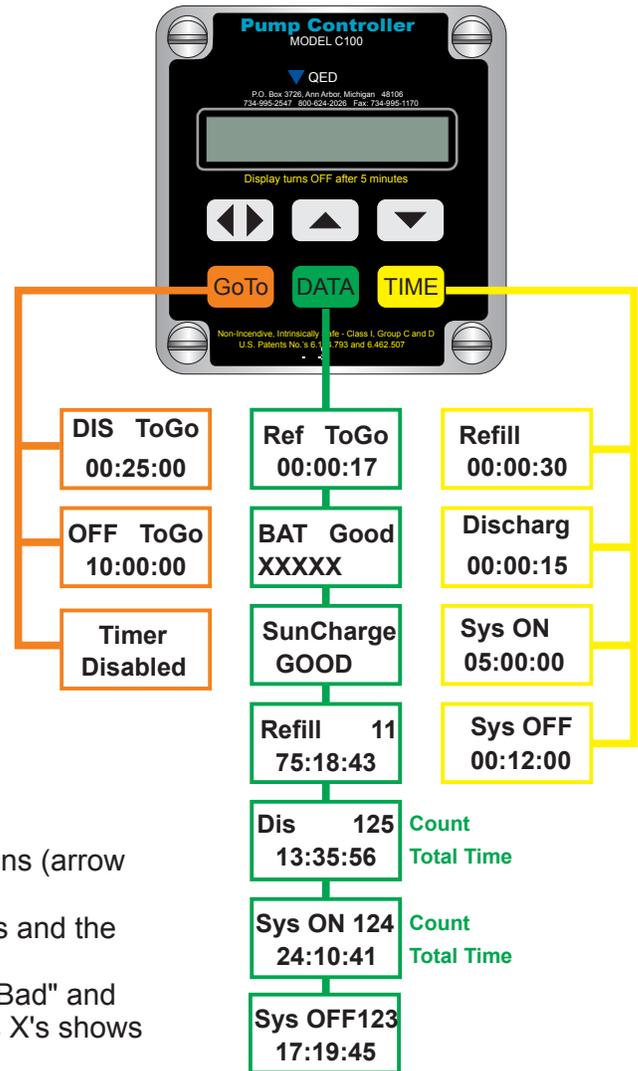
Refill - Sets refill time, ◀▶ moves to hours, minutes, seconds position and ▲▼ keys increase or decrease time settings. Range: 0 seconds to 99 Hours: 59 Minutes: 59 Seconds.

Discharge - Sets discharge time, ◀▶ moves to hours, minutes, seconds position and ▲▼ keys increase or decrease time settings. Range: 0 seconds to 59 Hours: 59 Minutes: 59 Seconds.

System ON - Sets system ON, or awake time, ◀▶ moves to hours, minutes, seconds position and ▲▼ keys increase or decrease time settings. Range: 0 seconds to 99 Hours: 59 Minutes: 59 Seconds.

System OFF - Sets system Off, or sleep mode time, ◀▶ moves to hours, minutes, seconds position and ▲▼ keys increase or decrease time settings. Range: 0 seconds to 99 Hours: 59 Minutes: 59 Seconds.

Key Menu Sequences:



QED Environmental Systems, Inc. (QED) warrants to the original purchaser of its products that, subject to the limitations and conditions provided below, the products, materials and/or workmanship shall reasonably conform to descriptions of the products and shall be free of defects in materials and workmanship. Any failure of the products to conform to this warranty will be remedied by QED in the manner provided herein.

This warranty shall be limited to the duration and the conditions set forth below. All warranty durations are calculated from the original date of purchase.

1. Liquid contacting equipment (including pumps), tubing, liquid contacting supplies and flow totalization equipment are warranted for 1 year.
2. Control devices, control device mounting, and surface air supply hose are warranted for 1 year.
3. Separately sold parts and spare parts kits are warranted for ninety (90) days.
4. Repairs performed by QED are warranted for ninety (90) days from date of repair or for the full term of the original warranty, whichever is longer.

Buyer's exclusive remedy for breach of said warranty shall be as follows: if, and only if, QED is notified in writing within the applicable warranty period of the existence of any such defects in the said products, and QED upon examination of any such defects, shall find the same to be within the term of and covered by the warranty running from QED to buyer, QED will, at its option, as soon as reasonably possible, replace or repair any such product, without charge to the buyer. If QED for any reason, cannot repair a product covered hereby within four (4) weeks after receipt of the original Purchaser's/Buyer's notification of a warranty claim, then QED's sole responsibility shall be, at its option, either replace the defective product with a comparable new unit at no charge to the buyer, or to refund the full purchase price.

In no event shall such allegedly defective products be returned to QED without its consent, and QED's obligations of repair, replacement or refund are conditioned upon the Buyer's return of the defective product to QED.

IN NO EVENT SHALL QED ENVIRONMENTAL SYSTEMS, INC. BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF SAID WARRANTY.

The foregoing warranty does not apply to major subassemblies and other equipment, accessories, and other parts manufactured by others, and such other parts, accessories, and equipment are subject only to the warranties, if any, supplied by their respective manufacturers. QED makes no warranty concerning products or accessory, QED will give reasonable assistance to Buyer in obtaining from the respective manufacturer whatever adjustment is reasonable in light of the manufacturer's own warranty.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY (INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE), WHICH OTHER WARRANTIES ARE EXPRESSLY EXCLUDED HEREBY, and of any other obligations or liabilities on the part of QED, and QED neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with said products, materials and/or workmanship.

It is understood and agreed that QED shall in no event be liable for incidental or consequential damages resulting from its breach of any of the terms of this agreement, nor for special damages, nor for improper selection of any product described or referred to for a particular application.

This warranty will be void in the event of unauthorized disassembly of component assemblies. Defects in any equipment that result from abuse, operation in any manner

outside the recommended procedures, use and applications other than for intended use, or exposure to chemical or physical environment beyond the designated limits of materials and construction will also void this warranty.

Chemical attack to liquid contacting equipment and supplies shall not be covered by this warranty. A range of materials is available from QED and it is the Buyer's responsibility to select materials to fit the Buyer's application. QED will only warrant that the supplied liquid contacting materials will conform to published QED specifications and generally accepted standards for that particular material.

QED shall be released from all obligations under all warranties if any product covered hereby is repaired or modified by persons other than QED's service personnel unless such repair by others is made with the written consent of QED. If any product covered hereby is actually defective within the terms of this warranty, Purchaser must contact QED for determination of warranty coverage. If the return of a component is determined to be necessary, QED will authorize the return of the component, at owner's expense. If the product proves not to be defective within the terms of this warranty, then all costs and expenses in connection with the processing of the Purchaser's claim and all costs for repair, parts and labor as authorized by owner hereunder shall be borne by the Purchaser.

The original Purchaser's sole responsibility in the instance of a warranty claim shall be to notify QED of the defect, malfunction, or other manner in which the terms of this warranty are believed to be violated. You may secure performance of obligations hereunder by contacting the Customer Service Department of QED and:

1. Identifying the product involved (by model or serial number or other sufficient description that will allow QED to determine which product is defective).
2. Specifying where, when, and from whom the product was purchased.
3. Describing the nature of the defect or malfunction covered by this warranty.
4. Sending the malfunctioning component, after authorization by QED to:

QED Environmental Systems Inc.
2355 Bishop Circle West
Dexter, MI 48130

Telephone: 1-734-995-2547
1-800-624-2026



P.O. Box 3726
Ann Arbor, MI 48106-3726

Tel: 734-995-2547 / 800-624-2026
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