CYCLONE 4400

Meter Lubrication System
With Z-100 Controller

Learn More

YZ® SYSTEMS
An Ingersoll Rand Business

Cyclone 4400 Instruction & Operating Manual

Version: 03-2024

YZ SYSTEMS

An Ingersoll Rand Business

4400 MLS Table of Contents

4400 MLS Table of Contents

Section 1: First Things To Know About MLS

Operation Specifications

Injection Pump

Operating Pressure:	15 - 1500 psi.(1.03-103.4 Bar (g))
Actuation Pressure:	15 - 55 psi.(1.03-3.79 Bar (g))
Displacement:	.140 cc (fixed)
Operating System Temperature:	*-4F — +140F(-20C — +60C)

Service Connections:

Actuation Gas Inlet:	1/4” NPT Female
Lubricant Discharge:	1/8” S/ST tube, Ferrule

Oil Reservoir

Material:	Polycarbonate & Anodized Aluminum
Capacity:	6 oz. (175 cc) (1250 injections)
Compatible Lubricants:	Chemlube, Anderol, 5w or equivalent

Controller

Power Supply:	Lithium battery pack
Battery Reserve:	2 years (1 stroke/hr)
Timer Accuracy:	< + 0.01%, deviation from absolute
Display:	LCD, indicating total injections (re-settable)
Flow input:	
Continuous:	20 Hz
Minimum Pulse Width:	20 ms
Pulse Type:	Electronic, 5 — 24VDC Dry, Contact Closure

Operating Mode

Timer Mode, Continuous:	0.10 to 100.0 hours (incrementally adjustable) 0.10 to 100.0 hours in 0.01 hour increments
Remote Inhibit:	Allows remote pausing of the system. See RMT INHIBIT. Refer Page 21
Proportional-to-Flow Mode:	10 to 9900 pulses per injection (incrementally adjustable)

*Note: Operation at extreme temperatures may affect system performance. To enhance the performance of this system, adequate heat should be provided to maintain an operating environment above 30° F (-1º C).

Section 1: First Things To Know About MLS

Theory of Operation

The Cyclone 4400 MLS is a pipeline mounted system which uses the pneumatically operated, positive displacement Cyclone 4400 pump, the Z-100 controller, the YZ filter/regulator and a low power solenoid valve to deliver injections.

The 4400 provides two modes of operation:

A. Time-based injection:
In this mode of operation, the 4400 injects lubricant into the meter at regular time intervals. The volume of injection is preset at .140 cc/stroke. The Z-100 controller operates as a recycling timer, periodically energizing a low power solenoid valve. Energizing the solenoid valve allows actuation gas to stroke the C-44 pump. The rate at which this occurs is a function of operator input. Modes are used to set the off time interval. The number of times the solenoid output is activated is recorded by the onboard LCD stroke indicator.

B. Proportional-to-flow injection:
In this mode of operation, the Z-100 counter operates as a dividing counter. The Z-100 counter periodically energizes a low power solenoid valve. As in the other two modes of operation, this allows actuation gas to stroke the C-44 pump. The rate at which this occurs is a function of operator input as well as the host computer or other device that inputs pulses per volume metered. The cycle time screen from the mode menu on the Z-100 are used to set the number of pulses the counter will count before activating the solenoid output. The number of times the solenoid output is activated is recorded by the onboard display.

In both modes of operation, the Z-100 timer/counter operates using a replaceable internal battery pack. The BATTERY TEST screen will open. The value shown initially will be from the previously run test and not a current reading. In order to get a valid test result, a solenoid must be connected to the system. Press enter to start the test, the solenoid will be actuated one time, the LED will flash and the battery voltage reading will be updated. A new battery will read approximately 11.5V during this test and the LED will flash GREEN.

If the battery voltage is found to be low during the test, the LED will flash RED. A fully charged new battery pack will measure approximately 14.4V if measured with a DMM or voltmeter at the battery leads.

System Accessories

• The **External Power Option** can be used in lieu of the internal battery pack. The External Power Option consists of an AC to DC convertor and intrinsically safe barrier to convert 120 VAC power to 24 VDC to operate the controller without the use of the internal battery pack.

• The **Solar Power Option** can be used in lieu of the internal battery pack. The **Solar Power Option** consists of a 5 watt solar panel with a charger regulator module and internal 12VDC, 5 Amp hour battery pack.

• 1/8” stainless steel Check Valve. These should be installed in every tubing line that attaches a MLS 4400 to a meter. (P/N A3-0228).

A complete line of accessories is available through YZ. Please contact your local representative or YZ Systems, Inc.

Section 1: First Things To Know About MLS

Application

One of the difficulties in maintaining turbine meters in the field is that they require lubricant for the unrestricted movement of the turbine, and for measurement accuracy.

Maintaining the lubricant level in meters is a problem that has existed for a very long time. Today, at YZ Systems, we have the solution in the Cyclone — Meter Lubrication System 4400.

Features & Benefits:

- Provides Systematic Lubrication to the meter for ensured measurement accuracy and durability
- Versatile electronic controller for time-based and proportional-to-flow operation
- Durable NEMA 4X fiberglass reinforced polyester enclosure to protect from the elements
- Flexible dry contact or voltage pulse flow input
- A menu driven display & LED stroke indicator
- Adjustable Filter/Regulator provides actuation gas
- On-board 6 oz. oil reservoir
- Long life potted electronics
- Intrinsically Safe with Global certifications
- Convenient termination block for customer connections.

North America, Class and Division Hazardous Location

Ex ia IIB T4 Ga
II 1 G Ex ia IIB T4 Ga
Class I, Zone 0, AEx ia IIB T4 Ga
Class I Division 1, Groups C-D, T4
-20°C ≤ Ta ≤ +60°C

Certification Standards:
UL 913:2013 Ed.8+R:06Dec2019
UL 600079-0:2019 Ed. 7+R:15Apr2020
UL 600079-11:2013 Ed. 6+R:14Sep2018
CSA C22.2#60079-0:2019 Ed.4
CSA C22.2#60079-11:2014 Ed.2

Section 1: First Things To Know About MLS

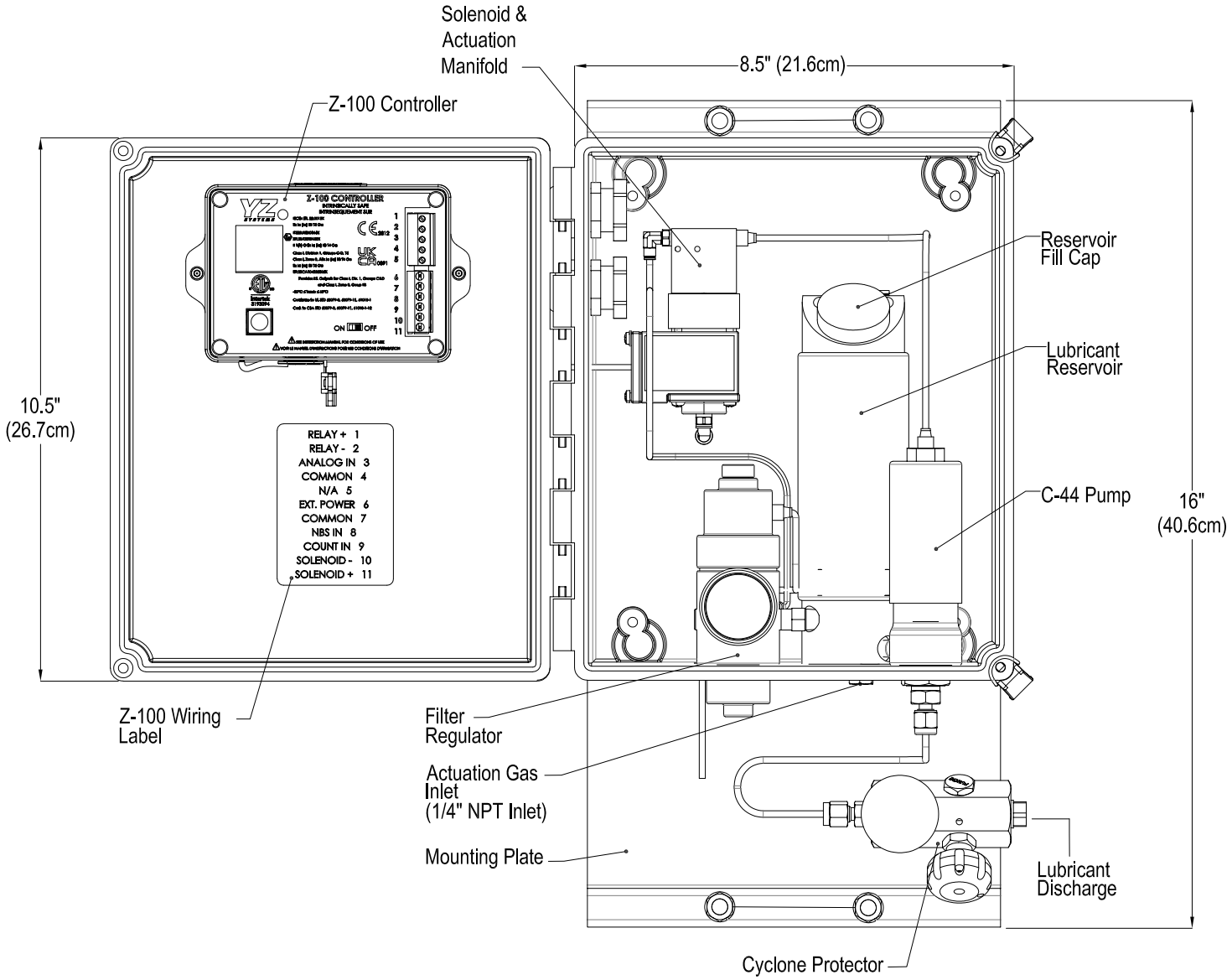
Notes

Section 2: System Installation

System Components

The primary components of the Cyclone 4400 MLS (Meter Lubrication System) are illustrated below:

figure 1



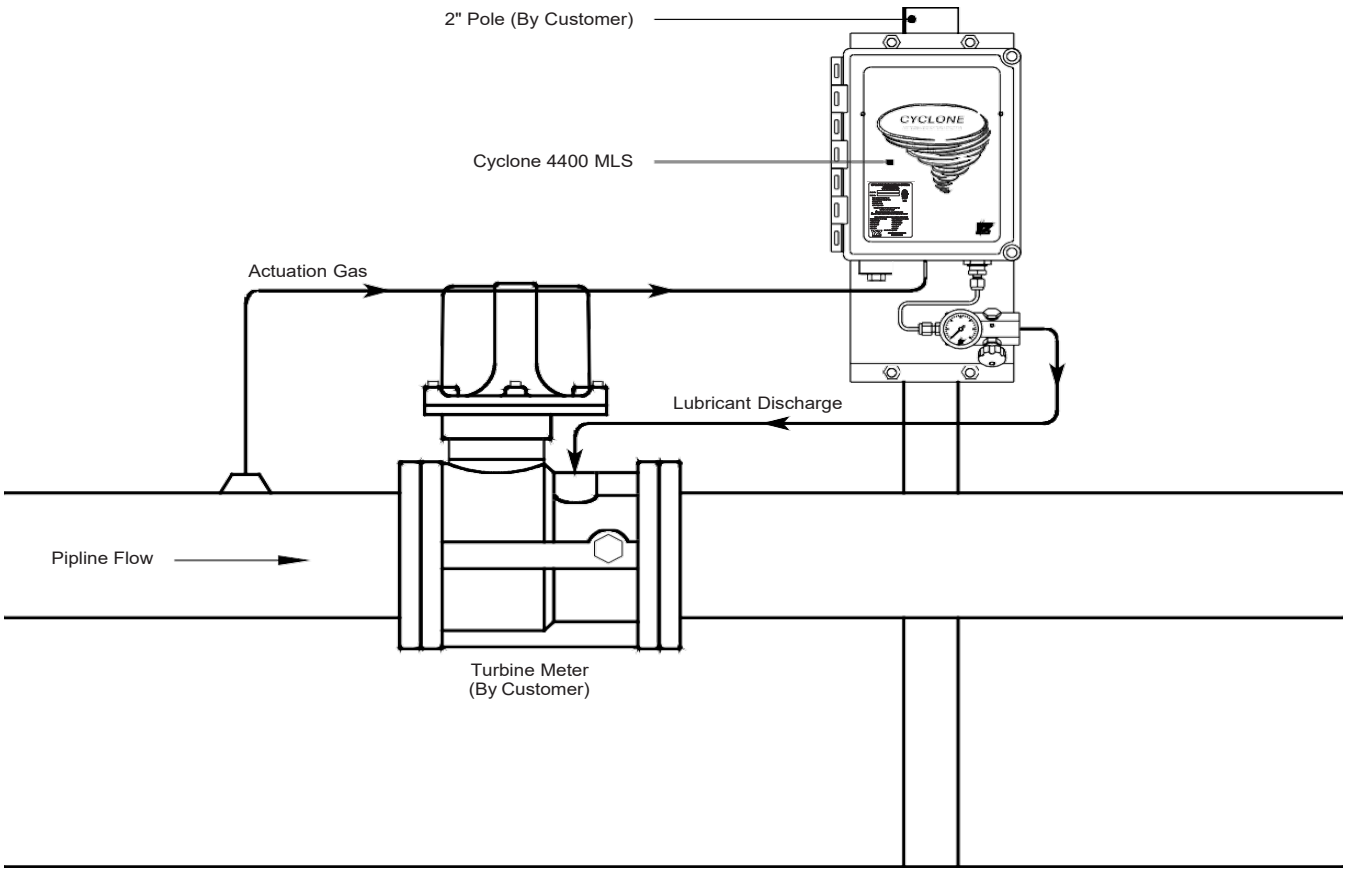
Section 2: System Installation

Injector Location

1. The injector unit should be located as close to meter as possible. In addition, discharge tubing should be kept as short as possible.

2. The injector unit is designed to mount to a 2” pole. The recommend mounting configuration is shown below.

figure 2



Section 2: System Installation

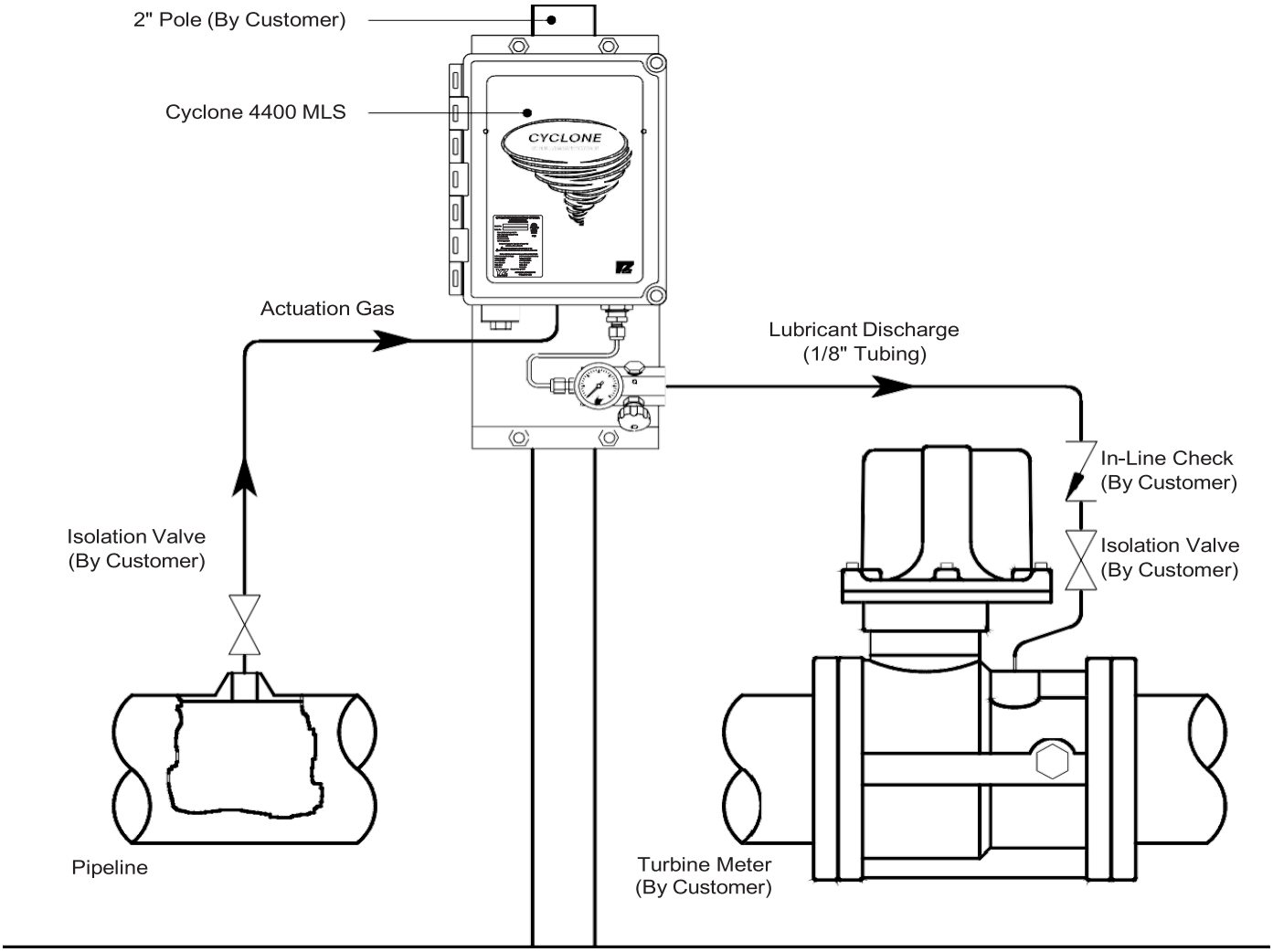
Injector Installation

1. The Cyclone 4400 should be mounted in a vertical position.

2. The Cyclone 4400 requires a 1/4” NPT pipeline gas connection.

3. The 1/8” discharge tubing should connect to the meter injection port. An in-line check valve should be installed at the injection port.

figure 3

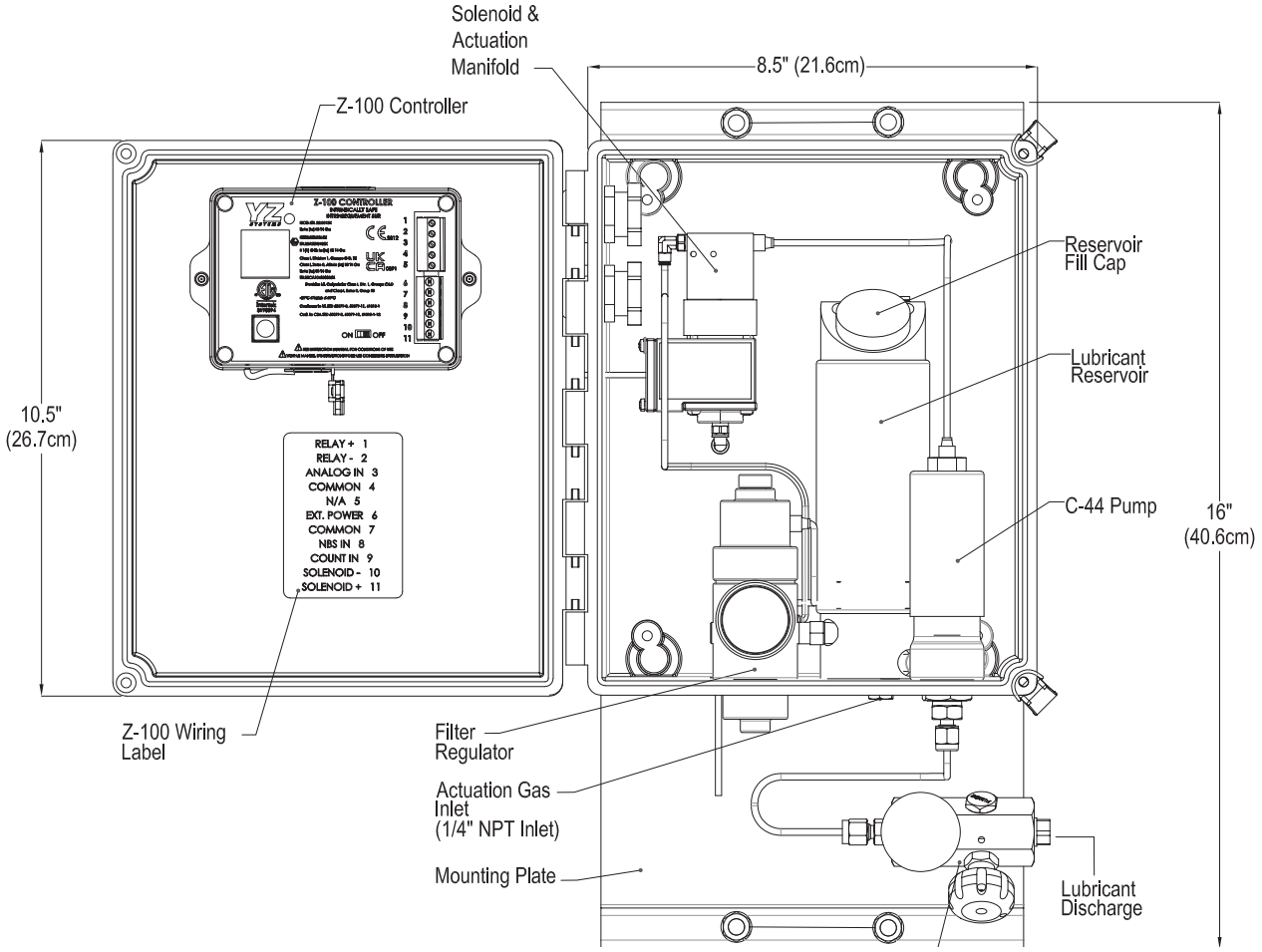


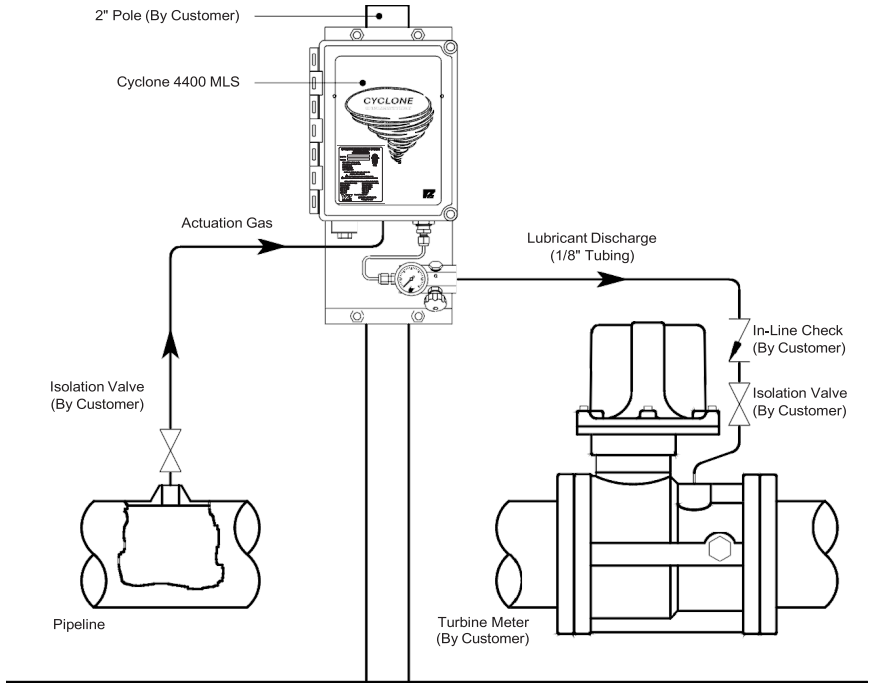
Section 2: System Installation

Notes

Section 3: System Control And Electronics

figure 4



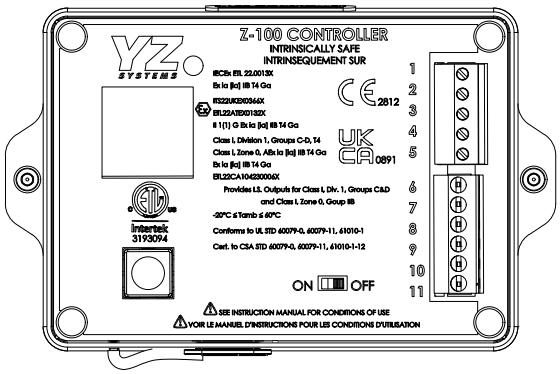


Section 3: System Control And Electronics

Overview

The electronic control package provided with your Cyclone system consists of Z-100 controller powered by an internal battery or external power supply and a low power solenoid. The Z-100 Controller will control the timing of the C-44 Pump based on the controller settings and mode of operation, either proportion to flow or time. When lubricant is required, the controller will energize the solenoid, allowing the actuation gas to activate the C-44 Pump.

figure 5



SAFETY NOTES

Always take the necessary measures to verify whether the area has an explosive atmosphere and obtain necessary work permits are obtained and safety protocols followed. as required by the areas of installation. Use the wiring label in the door of the Cyclone system, also shown to the right, to make your connections to the Z-100 controller. Please note some connections may share a common Ground connection. All wiring connected to the Z-100 controller must be done in accordance with the Wiring Control Document, see Figure 20. The Z-100 is rated for use in Class I, Division 1, Groups C&D and IECEx/ATEX Zone 1 hazardous locations.

WARNING:

- Electrostatic Discharge Hazard – Wipe with a damp cloth only.
- System is top-heavy. Lift cabinet with riggingto support weight and prevent it from tipping.
- The Z-100 controller is in a housing with more than 10% aluminum. Non-sparking tools must be used while servicing the Z-100 controller to avoid an ignition hazard due to impact or friction.
- Customer to ensure inlet actuation supply pressure does not exceed 90 psi (6.2 bar).

Z-100 Controller Approvals:

Ex ia IIB T4 Ga
II 1 G Ex ia IIB T4 Ga
Class I, Zone 0, AEx ia IIB T4 Ga
Class I Division 1, Groups C-D, T4
-20°C ≤ Ta ≤ +60°C

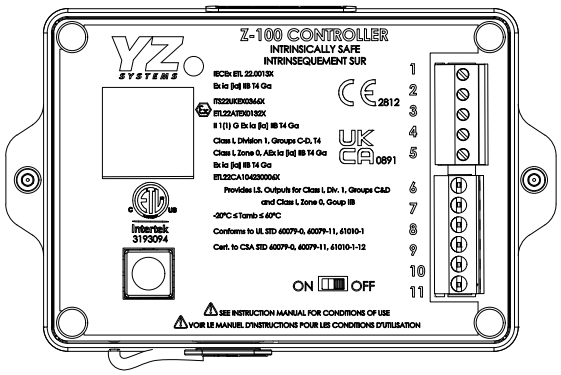
RELAY + 1
RELAY - 2
ANALOG IN 3
COMMON 4
N/A 5
EXT. POWER 6
COMMON 7
NBS IN 8
COUNT IN 9
SOLENOID - 10
SOLENOID + 11

Section 3: System Control And Electronics

Programming Z-100 Controller

Controller Overview

figure 6



To begin initial setup of the Z-100 Controller, move the Power switch, located on the front panel, to the ON position. The YZ logo will be shown while the controller is initializing then the Home Screen will be displayed when ready to operate.

The navigation switch has 5 functions: UP, DOWN, RIGHT, LEFT, and ENTER (center press). Pressing the switch in the appropriate direction to move between menus, and a center key to select sub menus or to modify, select, and save settings.

When moving between screens arrows will be shown on the display indicating what keys are active and their functions. Example illustration: the small down arrow indicates pressing the down key will allow you to scroll to additional Home Screen information. The right arrow next to “Menu” indicates pressing the right arrow will take you to the “Menu” Screen. See detailed navigation switch functionality in Section 05, menu screens.

When the controller starts, the YZ Systems logo will load and the Home Screen will be displayed. The navigation switch will be used to navigate menus, change parameters, enter changes, etc. To navigate the controller, you will press the navigation switch in the direction you would like to move.

To open sub-menus, enter parameters, etc. you will use the navigation like a push button and push by pressing in the center of the switch.

When viewing a screen, note if there is an arrow at the top or bottom of the screen. If a small arrow is shown, it indicates you can scroll down or navigate in that direction. On some screens, additional instructions may be shown in the bottom corners.

Section 3: System Control And Electronics

Programming Z-100 Controller

The Z-100 controller has two main operating modes:

TIMER: In timer mode, the controller actuates the pump at a set time interval. The time interval can be set to 0.1 hr to 100.00 hr. in 0.01hr. increments.

COUNTER: In counter mode, the Z-100 controller functions as a pulse divider. The controller monitors and counts incoming pulses at the count input. When the number of pulses equals the pulse divider setting the controller operates the pump The pulse divider can be set from 1 to 10,000 in increments of 1.

Section 3: System Control And Electronics

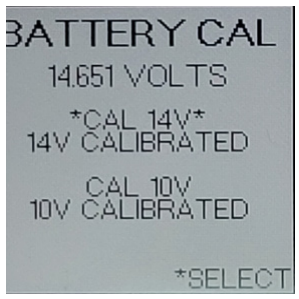
Programming Z-100 Controller

Home Screen

Total signaled count is displayed on the main Home Screen. This screen resets at midnight each day. Where the display shows DAILY TOTALS, this line will alternate between showing DAILY TOTALS and the running mode. It will display TIMER or COUNTER or ANALOG followed by OFF or ON.

Hold UP on joystick starting when logo shows and releasing when the screen changes to go to Z-100 screen.

Hold LEFT on joystick to enter battery cal screen.



Signaled

Signaled is the count of how many times the controller sent a signal to the solenoid to stroke the pump.

Section 3: System Control And Electronics

Programming Z-100 Controller

Totalizer

From the Home Screen, you can navigate to the Totalizer by pressing down on the navigation button. The totalizer is a running total of how much sampling has been pumped. The date the totalizer was started will be displayed at the top, along with the current date and time. The display will show NA for number of strokes. The totalizer can be reset by pressing the navigation button in and holding until the value and date resets.

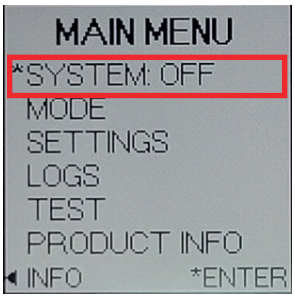
Using the Z-100 Controller

The Z-100 user interface has been designed for easy navigation and setting of parameters. The following sections outline the various screens and the steps needed to change and save settings.

Menu Screens

Modifying Controller Settings: Z-100 Controller settings will either be a value that must be changed, an item selected from a list, or a multiple-choice parameter option.

For items requiring a number to be edited, like the sampling density, each digit will need to be changed individually. Note the arrow underneath the digit that is currently being edited. Press the left or right arrow to change which digit is updated. To change the value, press the navigation switch up or down. Move to the next digit as needed. To cancel the change, navigate to the back button and Press enter on the navigation switch to go back to the previous screen. To save the change, navigate to the Save option and Press enter on the navigation switch to save.



Section 3: System Control And Electronics

Programming Z-100 Controller

For an item that must be selected from a menu, the option that is currently selected will be shown with a dash next to it on the left. To change the selection, use the navigation switch and move up and down to the desired option. The possible selection will be shown with an asterisk to the left. Press the navigation switch to confirm the selected option.

Lastly, for the alarm sources, you can select multiple options to turn on or off each alarm source. The alarms will be shown with a dash next to it to indicate the alarm is active. The activate or deactivate an alarm, press the navigation switch up or down to the desired alarm source, the elected alarm will have an asterisk to the left. Press the navigation switch to enable or disable the alarm, if disabled the dash will be removed.

System ON/OFF

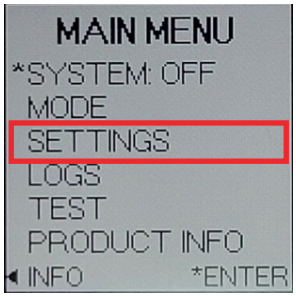
This menu, is used to start and stop the system. Select ON to start pumping as per the settings on the controller. Actuate the pump once immediately after turning the system ON and then begin pumping as per the current operating mode and settings. Settings cannot be modified while the system is ON, If a settings change is attempted while the system is ON, the controller will display a popup notification prompting to STOP the system. Selecting Yes will turn the OFF and display the setting to be modified. Selecting No will leave the system ON and return to the previous menu.

The system must be re-started once settings changes are completed.

Section 3: System Control And Electronics

Programming Z-100 Controller

Go back to Main menu and scroll down to Settings tab and press Enter.

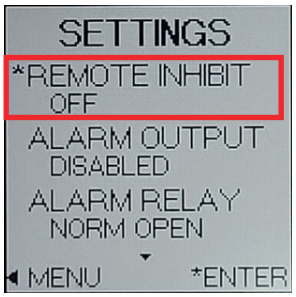


Change Z-100 Settings

In order to run the pump system to the proper sampling rate, the settings must be set within the settings menu. From the Home Screen, open the Main Menu and navigate to the Settings parameter and press the navigation button in to open. To modify each setting, navigate to the setting and press the navigation button in to open. The active setting will be indicated with an asterisk (*) on the left side. Press the left arrow to return to the Main Menu. The small arrow at the bottom or top of the screen indicates there are additional parameters to scroll through.

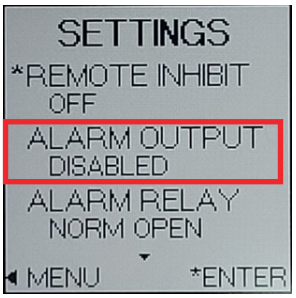
Remote Inhibit

Remote inhibit allows the end user to stop the unit remotely if wired. To use this feature, it must be set to ON in the Remote Inhibit menu. Remote inhibit allows an operator to have a remote signal to stop pumping.



Alarm Output

The Alarm Output screen allows you to test the alarm output is being sent properly to the customer monitoring system. To test, ensure that the alarm output option has been enabled from the settings menu and the relay type selected as normally open or normally closed. Open the Test Alarm Output option by pressing the navigation button in to enter. The Test Alarm Output screen will display whether the alarm output is normally open or normally closed. Press the navigation button in to toggle the alarm. While the alarm is toggled, check your monitoring system to ensure the alarm is being monitored and enables when toggled.



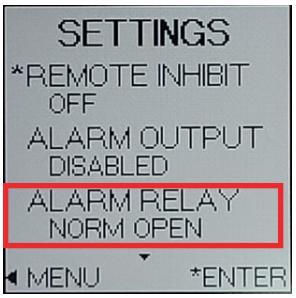
Section 3: System Control And Electronics

Programming Z-100 Controller

Alarm Relay

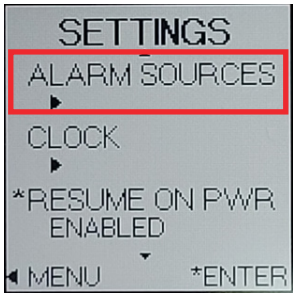
For the alarm output, the user has the option of selecting the relay to be normally open or normally closed. Select which option best suits the monitoring needs.

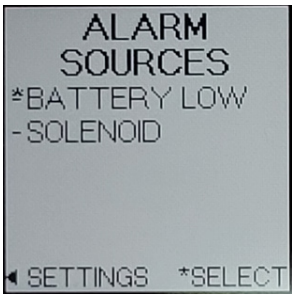
In the Settings menu, scroll down to get more choices.



Alarm Sources

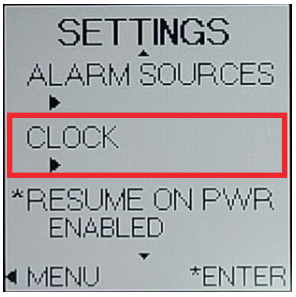
Selecting Alarm Sources will open a sub-menu to select the alarm sources in which to be notified. The three alarm options are Battery Low, Solenoid, and Pump Flow. The selected alarm will be highlighted with an asterisk (*). Navigate to each alarm in the list and press the navigation button in to select or deselect each option. If an alarm source is activated, it will have a single line dash (-) next to the alarm.





Clock Menu

Use the Clock Menu to set the day and time. Keeping the date and time accurate will keep the daily pumped usage total accurate. Before setting the time and date, choose which format you would like for each. The time can be formatted in a 12- or 24-hour clock. The date can be formatted in three ways (YYYY/MM/DD, DD/MM/YYYY, or MM/DD/YYYY). After selecting the formats for each, return to the Set Time option and press the navigation button in to enter. Entering the Set Time submenu allows you to set each individual parameter of the date and time. Use the left and right arrows to navigate to each digit in each parameter. An arrow will be shown under the digit and pointing up indicating which digit is being modified.

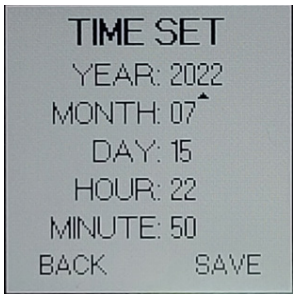


Section 3: System Control And Electronics

Programming Z-100 Controller

Date & Time Set

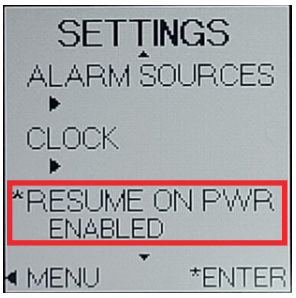
Press the navigation button up or down to adjust the digit and press the navigation button to the right to move to the next digit. Setting the time and date can be cancelled by pressing the navigation button to the right until reaching the Back option highlighted with two asterisks (*). Press the navigation button in to enter and go back without saving. Once the time is set to the current time, navigate to the Save option at the bottom of the screen by pressing the navigation to the right until Save is highlighted with two asterisks (*). Press the navigation button in to enter the time.

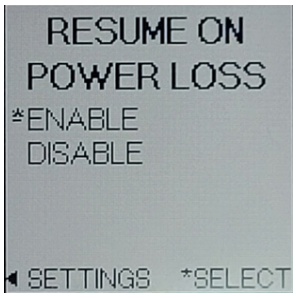


Resume on Power Loss

If the pump system loses power during normal operation, the Resume on Power loss function can be enabled so the system resumes pumping when power is returned. If the unit is not running when it loses power, it will stay not running.
To enable, open the Resume on Power Loss sub-menu. The highlighted option will be indicated with an asterisk (*) to the left of the option. To enable or disable, navigate to the preferred option and press the navigation button in to select.

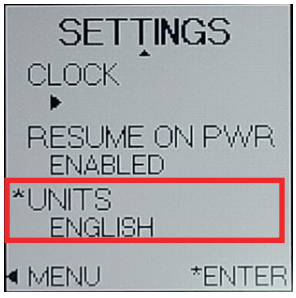
In the Settngs menu, scroll down to get more choices.





Units

The Z-100 can be assigned either English or Metric units. Navigate to the Units submenu and press the navigation button in to enter. The highlighted set of units will be indicated with an asterisk (*) on the left side. The set of units that is selected and active will be indicated with a single line dash (-) on the left side. To change the units, navigate to the set of units that is preferred and press the navigation button in to enter the selection.



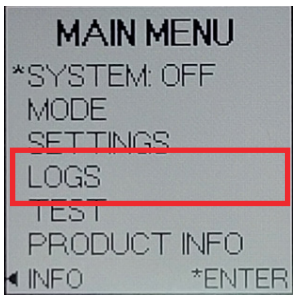
Section 3: System Control And Electronics

Programming Z-100 Controller

Go back to Main menu and scroll down to Logs tab and press Enter.

Logs

The Z-100 logs the daily pumped usage for the pump system and saves to the controller locally. The data can be downloaded with an MM-100 Memory Module or it can be viewed directly on the controller. To view the logged data, open the Main Menu and scroll to the Logs option and press the navigation button in to open.



DOU

The DOU logs are the daily pumped volume logs. Select the DOU option by pressing the navigation button in. This will open the latest DOU log. Note the small arrows displayed on the bottom and/or top of each DOU screen. Scroll up or down to view logs from other days.

Config

The config logs are logs of changes to the system configuration. Changes that are saved include settings that affect the system performance such as a stroke rate change, changing of the operational mode, input signal type change, and alarm changes.

Event Logs

Event logs are saved when an event happens in the Z-100 controller. The events that are recorded are totalizer resets, DOU reset, alarm count reset, device powered on, alarms turning on or clearing of alarms, alarm output turned on or off, and time changes.

Section 3: System Control And Electronics

Programming Z-100 Controller

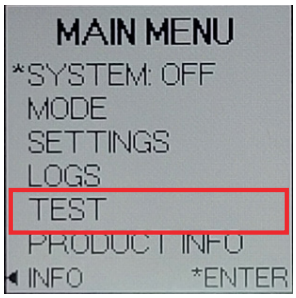
MM100

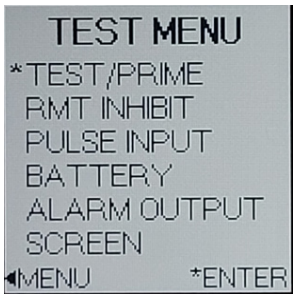
When ready to download the MM-100 Memory Module data, connect the memory module in the opening in the bottom of the enclosure. A rubber plug is provided to protect the opening when not in use. If the MM-100 is not plugged in or not recognized, the MM100 screen will display “Not Found”. If MM-100 is plugged in and recognized, you can download the module from the MM-100 screen.

Go back to Main menu and scroll down to Tests tab and press Enter.

Test Menu

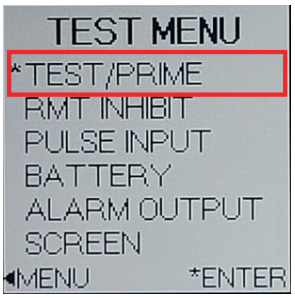
The test screen allows you to test the system functionality after installation or maintenance to ensure it is running as expected. To open the test screen, navigate to the Test option from the Main Menu and select the Test option by pressing the navigation button in to enter.

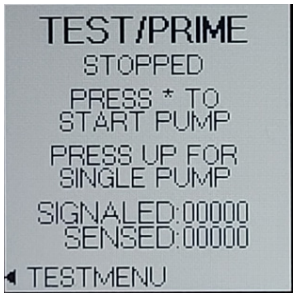




Test/Prime

The Test/Prime screen provides access to two functions. Function 1, press enter on the navigation switch the UP direction for 1 to 2 seconds will actuate the solenoid a single time to stroke the C-44 pump. Function 2, pressing the center button will initiate a prime cycle. The Prime cycle actuates the pump at a 2.5 second cycle time for 60 cycles, or until stopped by pressing the center button. The pump actuations signaled will increment each time the pump is stroked. This allows the system to be primed during installation and maintenance. For Cyclone systems “SENSED” will always show N/A.



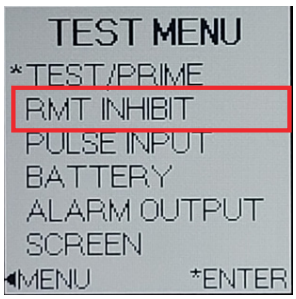


Section 3: System Control And Electronics

Programming Z-100 Controller

RMT Inhibit

The INHIBIT TEST can be used to verify the incoming remote inhibit signal is being properly read by the Z-100 controller at the NBS IN (Remote Inhibit) input terminal.



If the REMOTE INHIBIT input setting is OFF, the test function will be disabled and TEST status NA displayed. Go to the SETTINGS MENU to change the REMOTE INHIBIT input setting.

If the REMOTE INHIBIT input setting is ON or NBS, upon entry, the INHIBIT TEST screen will show the INHIBIT test type (INHIBIT ON, or INHIBIT NBS) with NOT TESTING status. Press enter on the navigation switch to start the test and begin monitoring the NBS IN input.

If an active input signal is not sensed, the red LED will flash and the test status will indicate INPUT INACTIVE. If an active input signal is sensed the GREEN LED flash and the test status will indicate INPUT ACTIVE.

The difference between INHIBIT input types INHIBIT ON and NBS is the "active" voltage level of the incoming signal.

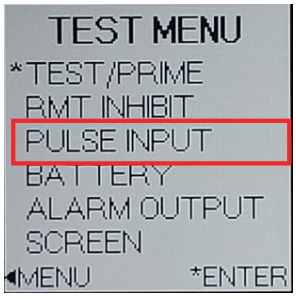
To stop the INHIBIT INPUT test press enter on the navigation switch.

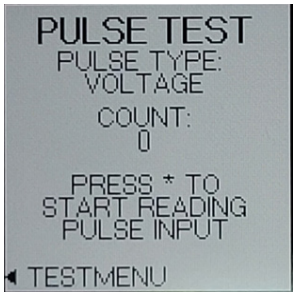
Section 3: System Control And Electronics

Programming Z-100 Controller

Pulse Test

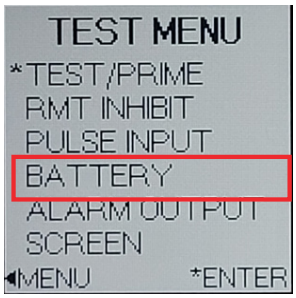
The PULSE TEST can be used to verify the incoming pulsed flow signal is being properly read by the Z-100 controller at the COUNT input. The PULSE TEST signal will be interpreted based on the PULSE TYPE setting for COUNTER mode. To test the pulse signal, ensure the type of pulse is selected from the Mode Menu when the Counter mode is selected. The pulse types are voltage, or dry contact/SSR.
Navigate to the Pulse Input option from the Test Menu screen and press enter on the navigation switch to select. The Pulse Test screen will display what pulse type is selected. Press enter on the navigation switch to enter and start reading the pulse input. Send the pulse signal from the signal generator and confirm the counts on the Z-100 controller. The count will increase and the green LED will flash on every successful pulse reading.

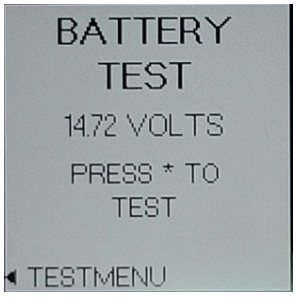




Battery Test

The BATTERY TEST is used to verify the system power supply voltage read by the controller. The test is primarily used when to verify the voltage when the system is powered from the internal battery pack. The test can also be used to verify the voltage reading when the system is supplied by and external power source.
Select BATTERY TEST from the Test Menu and press enter on the navigation switch. The BATTERY TEST screen will open. The value shown initially will be from the previously run test and not a current reading. In order to get a valid test result, a solenoid must be connected to the system. Press enter to start the test, the solenoid will be actuated one time, the LED will flash and the battery voltage reading will be updated. A new battery will read approximately 11.5V during this test and the LED will flash GREEN.
If the battery voltage is found to be low during the test, the LED will flash RED. A fully charged new battery pack will measure approximately 14.4V if measured with a DMM or voltmeter at the battery leads.





Section 3: System Control And Electronics

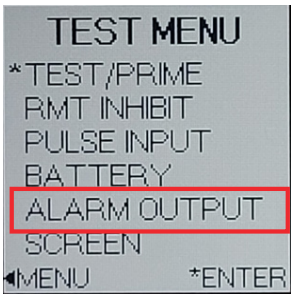
Programming Z-100 Controller

Alarm Output Screen

The RELAY OUTPUT test is used to the RELAY OUTPUT is being properly sensed by the users external SCADA or other control system.

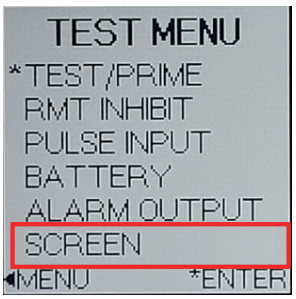
If the RELAY OUTPUT setting is DISABLE, the test screen will indicate RELAY OUTPUT NOT CONFIGURED, CHECK SETUP. Change the RELAY OUTPUT setting to enable the output and test. If RELAY OUTPUT setting is ALARM OUT, the test display will show the relay config as ALARM OUT, the normal contact state, and ALARM OFF. Press enter to toggle the alarm ON or OFF and OPEN or CLOSE the output relay.

If RELAY OUTPUT setting is SAMPLING RATE, the test display will show the relay config as SAMPLING RATE, and normal output state. Press enter to initiate a single 40mS output pulse. The LED will flash GREEN to indicate the pulse was generated.



Screen Test

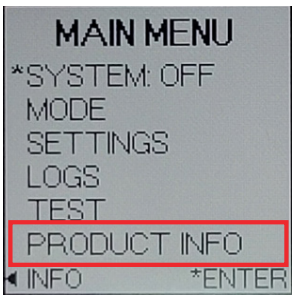
The Screen Test will cycle all pixels on the display on (black), then all off (blank), then back to the Test Screen. This test can help determine if any pixels are malfunctioning on the display.



Z-100 Product Info

Go back to Main menu and scroll down to product info tab and press Enter.

To show the product information.

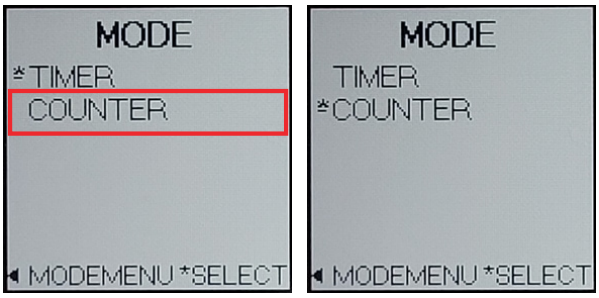


Section 3: System Control And Electronics

Selecting the Z-100 Operational Mode

The Z-100 controller can operate your Cyclone system in timer mode or counter mode. To select the Z-100 mode of operation, navigate to the Main Menu and select Mode. The Mode Menu will open showing the currently selected operating mode and mode specific settings.

Select Mode to access the list of modes available an * indicates the currently selected mode. Once a mode has been selected, press the left key to exit back to the Mode Menu.



Go back to Mode menu and under Mode menu scroll down and select Counter tab and press enter.

Section 3: System Control And Electronics

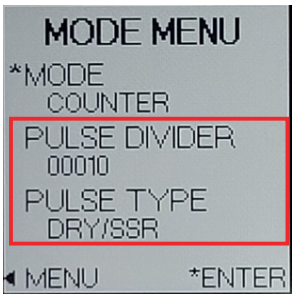
Timer Mode

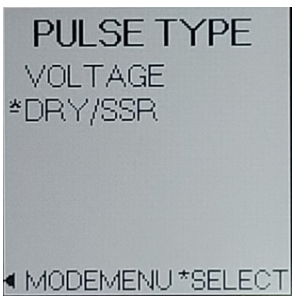
In timer mode, the controller actuates the C-44 pump at a set time interval as per the CYCLE TIME setting. The CYCLE TIME range is 0.1 hr to 100.00 hr in 0.01 hr increments. To modify the CYCLE TIME, move the * to CYCLE TIME and press enter to select. Use the navigation switch to modify the value then navigate to SAVE and press enter.

Counter Mode

In counter mode, the Z-100 controller functions as a pulse divider. The controller monitors and counts a customer provided pulse signal at the COUNT input. When the number of pulses counted equals the PULSE DIVIDER setting the controller actuates the C-44 pump. The PULSE DIVIDER can be set from 1 to 10,000 in increments of 10. When the counter mode is selected, the PULSE DIVIDER setting will determine the pumps injection rate in response to the incoming pulses. For example, a pulse divider of 10 will cause the pump to actuate once each time 10 pulses are counted. The minimum pulse width is 20ms with a maximum input frequency of 25Hz. The pulse types available are Voltage or Dry Contact/SSR. Navigate to the Pulse Type option submenu. Select the pulse type and navigate to the select button and press enter to save.

Pulse Types:
Voltage: Positive voltage pulse (5-24VDC).
Dry/SSR: Voltage free contact closures.





Section 3: System Control And Electronics

Z-100 Set-up Proportional-to-Flow

Calculate the counter setting using the following chart:

1. C-44 pump displacement (.140cc)	=	a. _____
2. Desired injections lubricant per volume of flow (cc/MMCF or cc/MCM)	=	b._____
3. pulses/volume metered (pulses/MMCF or pulses/MCM)	=	c._____
4. Counter setting	=	(a x c) / b

			Example#1 English Gas Flow Units	Example#2 Metric Gas Flow Units
Pump Displacement	(a.)	=	.140cc	.140cc
Injection Rate	(b.)	=	.05cc/MMCF	.05cc/MCM
Pulses per volume metered	(c.)	=	100 pulses/MMCF	100 pulses/MCM

Example #1

Counter Setting = (.140cc X 100 pulses per MMCF) / .05cc per MMC = 280 pulses

Example #2

Counter Setting = (.140cc X 100 pulses per MCM) / .05cc per MCM = 280 pulses

IMPORTANT NOTE:
If the calculated counter setting is less than 10 or greater than 9900, the pulses per volume metered will need to be adjusted. This can be programmed in most flow meters to the desired rate. If the calculated counter setting is less than 10, increase the pulses per volume metered.
If the calculated counter setting is greater than 9900, decrease the pulses per volume metered.

Section 3: System Control And Electronics

Z-100 Set-up Proportional-to-Time

Go back to Mode menu and under Mode menu scroll down and select Timer tab and press enter.

Timer Mode

The Z-100 controller sends a signal to the solenoid to actuate the pump at a set time interval. The cycle time must be selected. The cycle time is 0.10 hr.

Calculate the injection rate using the following 30 day chart.

Counter Range Settings

cc/month	Hours	cc/month	Hours
1	100.8	15	6.7
2	50.4	20	5.0
3	33.6	25	4.0
4	25.2	30	3.4
5	20.2	40	2.5
6	16.8	50	2.0
7	14.4	60	1.7
8	12.6	75	1.3
9	11.2	100	1.0
10	10.1		

Section 3: System Control And Electronics

Operation Check and Leak Testing

1. When all of the tubing connections have been completed, open the gas supply valve to allow pipeline pressure into the injector. Check all connections using a liquid leak detector.

2. Adjust the filter/regulator from the following ranges.

Pipeline, in psi	Actuation, in psi
15-50	(no regulator required)
50-200	35
200-500	40
500-800	45
800-1200	50
1200-1500	55

3. Fill oil reservoir with desired quantity of lubricant (Anderol, Chemlube or 5W equivalent). The reservoir has a 6 oz. capacity.

4. Verify isolation valve on protector is closed.

5. Open purge nut on protector approximately 1 turn.

6. Go to Main Menu, scroll down to Test and push to choose TEST.

7. From the TEST MENU, choose TEXT/ PRIME. Notice it gives status: STOPPED. Press the joystick to start pumping. The controller will signal the solenoid about every three second. You should see the LED flashing and hear the Solenoid stroking.

8. Allow the injector to operate until oil is present at the purge orfice on the protector, then close purge nut.

9. Allow the injector to operate until pressure begins to build on the protector gauge. STOP unit promptly. Do not allow pressure to exceed 1000 psi.

10. Open the Cyclone protector isolation valve.

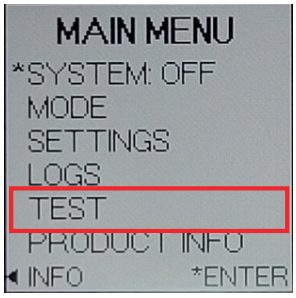
11. Open the meter isolation valve.

12. Allow the injector to operate until pipeline pressure is achieved at the injector discharge.

13. Push joystick to stop pumping.

14. Check all connections from the injector discharge to the connection on the meter for oil leaks.

15. If no leaks are found, the pump and tubing should be considered tested and functional.



Section 3: System Control And Electronics

Notes

Section 4: Injector maintenance

Recommended preventative maintenance schedule

Every injection situation is unique. Below are our recommendations for average conditions. High injection rates will necessitate more frequent pump/filter maintenance.

1. Clean and inspect injector pump biannually.

2. Check the filter element every six months, replacing as necessary.

3. Test the battery every month.

4. Test the system for leaks each time a fitting or connection has been made.

Recommended spare parts for the Cyclone 4400 MLS

Part Number	Description	Qty	Location
C4-0004	Filter Element	1	see diagrams
D3-0156	C-44 pump seal kit	1	see diagrams
D3-0003	YZ filter regulator repair kit	1	see diagrams
D3-0284	Z-100 fuse replacement kit	1	see diagram
E3-2005	Battery pack	1	see diagram
A4-0036	Solenoid	1	see diagram
C7-0009	3mm Tubing	as req'd	see diagram

Section 4: Injector Maintenance

Pump Rebuild - Disassembly

1. “Go to Main Menu, then System, and select OFF.

2. Close isolation valves from pipeline and to meter.

3. Open the Purge Nut on the protector to relieve pressure.

4. Remove discharge tubing.

5. Remove reservoir drain plug, and drain the oil.

6. Disconnect the actuation line from the actuation cylinder.

7. Unscrew the actuation cylinder from the pump body.

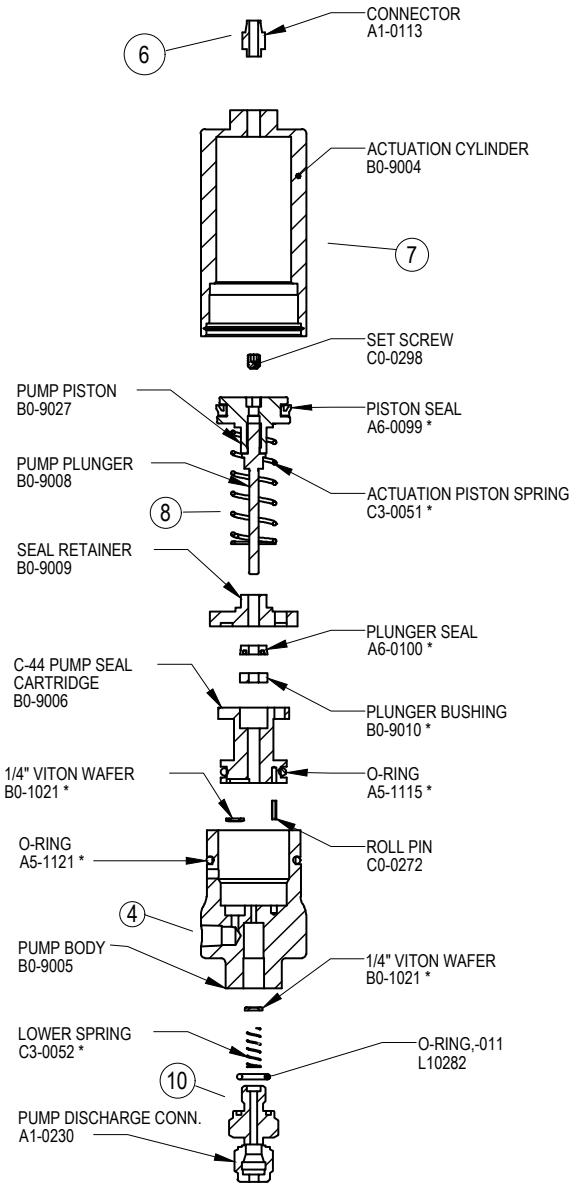
8. Remove plunger and piston from the actuation cylinder.

9. Insert a 8-32 bolt into the threaded hole in the seal cartridge; pull up to remove cartridge. Inlet check valve wafer can now be removed from pump body.

10. Remove discharge tubing fitting from pump body. Discharge wafer / spring can now be removed from pump body.

11. Clean and inspect all components and replace if necessary.

figure 7



* C-44 Pump Seal Kit P/N D3-0156

Section 4: Injector maintenance

Pump Rebuild - Assembly

1. Install ICV wafer into seat pocket in the pump body.

2. Install new seal, bushing and 015 o-ring in seal cartridge.

3. Apply light grease to 015 o-ring on seal cartridge. Orient alignment pin on cartridge with alignment hole in pump body. Install cartridge body.

4. Apply light grease to inside of actuation cylinder.

5. Install piston/plunger into actuation cylinder with spring attached.

6. Apply light coat of grease to top of plunger seal.

7. Place seal retainer on top of seal cartridge.

8. Install actuation cylinder/plunger assembly.

9. Install DCV wafer, spring and fitting.

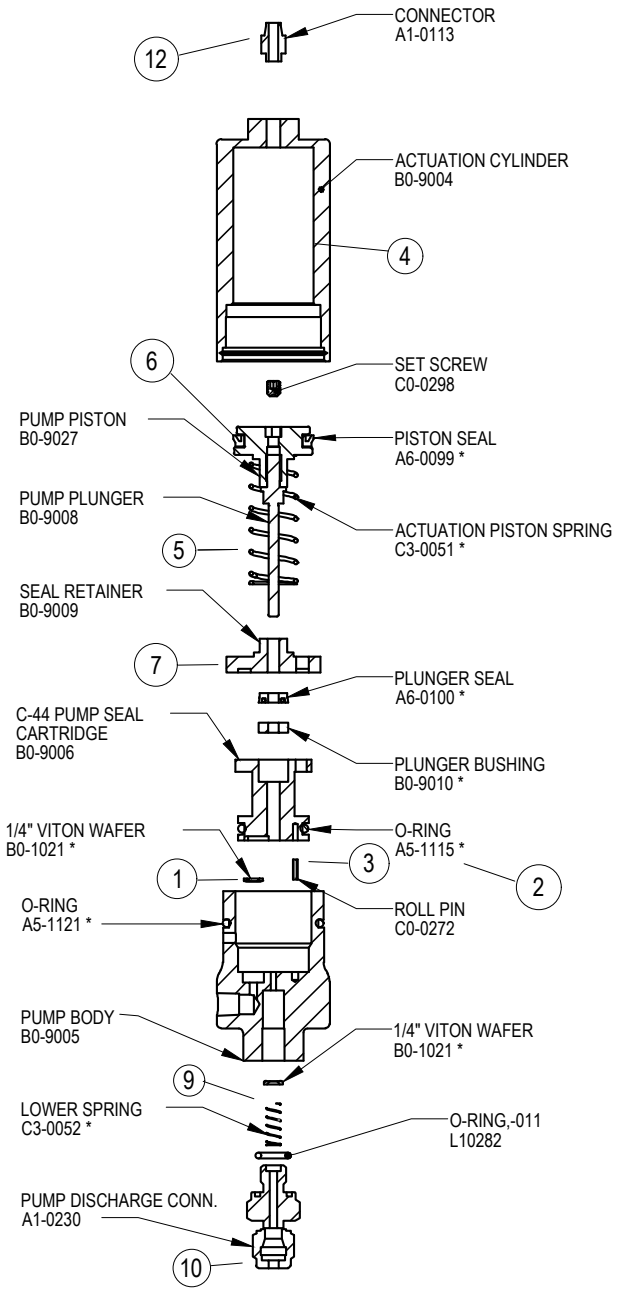
10. Reconnect discharge tubing.

11. Refill reservoir to proper level with lubricant.

12. Reconnect actuation cylinder tubing line.

13. Prime system.

figure 8

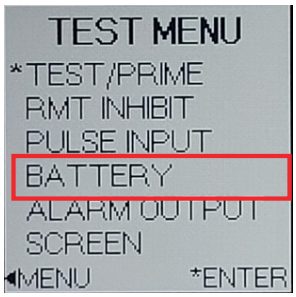


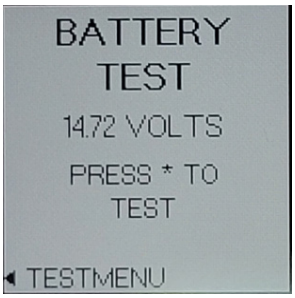
* C-44 Pump Seal Kit P/N D3-0156

Section 4: Injector Maintenance

Battery Test

The BATTERY TEST is used to verify the system power supply voltage read by the controller. The test is primarily used when to verify the voltage when the system is powered from the internal battery pack. The test can also be used to verify the voltage reading when the system is supplied by and external power source.





Select BATTERY TEST from the Test Menu and press enter on the navigation switch. The BATTERY TEST screen will open. The value shown initially will be from the previously run test and not a current reading. In order to get a valid test result, a solenoid must be connected to the system. Press enter to start the test, the solenoid will be actutated one time, the LED will flash and the battery voltage reading will be updated. A new battery will read approximately 11.5V during this test and the LED will flash GREEN.

If the battery voltage is found to be low during the test, the LED will flash RED. A fully charged new battery pack will measure approximately 14.4V if measured with a DMM or voltmeter at the battery leads.

Section 4: Injector maintenance

Replacing a depleted battery

1. Remove the four thumb screws, cover plate and terminal connector.

2. The battery is located in the upper right hand corner of the Z-100 controller assembly.

3. Un-clip the battery plug from the battery receptacle.

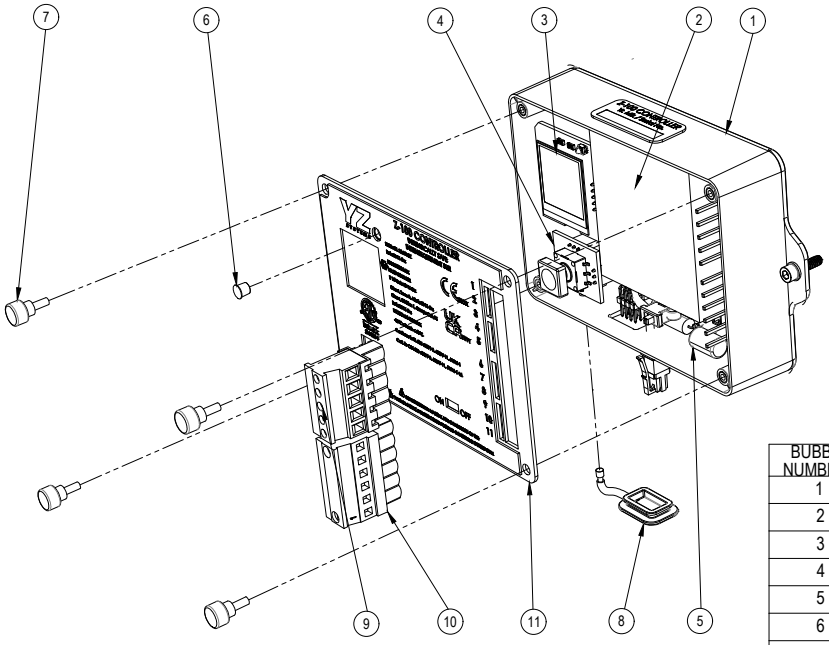
4. Replace the depleted battery with a fresh battery pack (part No. E3-2005).

IMPORTANT NOTE:
Follow the illustration along with steps 1-5 to assure proper battery replacement in the Z-100 enclosure

5. Restart the Z-100 controller.

6. For Technical Support: 1-281-362-6500 and
1-800-NJEX-HELP (1-800-653-9435)
Email: techsupport@yzsystems.com

figure 9



BUBBLE NUMBERS	PART NO.	DESCRIPTION
1	F2-0615	Z-100 Controller Assy
2	E3-2005	Battery Pack
3	G0-0096	Z-100 Display Board
4	G0-0097	Z-100 Navigation Switch
5	D3-0284	Z-100 Fuse Replacement Kit (2 Fuses per kit)
6	C0-1026	Stand Pipe
7	A9-1001	Thumb Screws
8	D5-0322	Z-100 MM Plug Cover
9	H1-0201	Z-100 5 Pin Terminal Block
10	H1-0202	Z-100 6 Pin Terminal Block
11	A9-3141	Z-100 Face Plate

Section 4: Injector Maintenance

Notes

Section 5: Troubleshooting

How to Use This Section

The recommendations contained in this section should be used as a preliminary information resource to remedy operational issues with the Cyclone System. It is important to read all of the definitions and notes prior to initiating work.

Each subsection contains a description of the indicators followed by a step-by-step trouble shooting procedure.

For Additional Help

Any issue that can not be resolved through the use of this reference, please contact YZ:

For Technical Support: 1-281-362-6500 and
1-800-NJEX-HELP (1-800-653-9435)
Email: techsupport@yzsystems.com

SAFETY NOTES

• Always use extreme care when performing maintenance on Sampling Systems. Always take necessary measures to assure that electrical classification in the area is considered, before, and during all repairs, and that necessary steps are taken to maintain proper electrical procedures for the classification of the area.

• Take special care when disconnecting any fitting, to assure that product and/or pressure will not be released when the connection is broken. This system may contain liquid and/or gas high pressures.

Step-by-Step Resolution

Using a step-by-step method to resolve issues on the Sampling System will reduce maintenance time and assist in returning the system to service quicker.

The following represent the recommended chronology to resolve issues:

Resolve issues to the following order:

a. Battery Power, page 36
b. Timer Mode, page 37
c. Counter Mode, page 38
d. Mechanical Assembly, page 39

Section 5: Troubleshooting

Battery Power

The Z-100 controller and the low powered solenoid are normally powered by the Z-100 battery assembly. The battery assembly is not a rechargeable type battery. Under normal conditions this battery may last two years. The Z-100 controller has an alarm that will advise when the battery needs replaced.

Battery Power TroubleShooting Steps

- The battery voltage can be tested with the battery test option under the test menu. Navigate to the battery test menu and press enter on the navigation switch.
- While in the battery test menu, press the navigation switch in to test the battery.

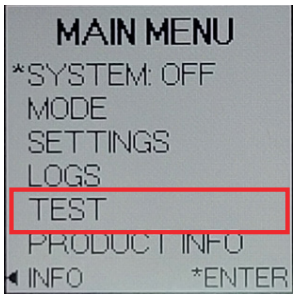
Note: The battery test will send a signal to the solenoid to stroke the pump - the pump will stroke into the discharge line if open. This provides the most accurate load on the battery pack to be representative of the available battery life.

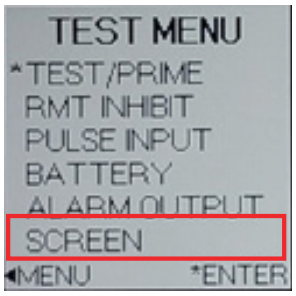
- The battery voltage will be displayed on the screen and the LED will flash green or red, depending if the battery voltage is acceptable or low. It is recommended to replace the battery when it reaches 11.5 volts as shown on the controller in the battery test screen with the solenoid connected.

Section 5: Troubleshooting

Trouble Shooting: Screen

If the display looks like it is missing sections or stray marks, run the screen test.





Screen Test:

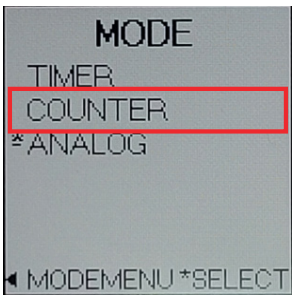
1. Set the mode to Timer.
2. This mode enables the user to increase the solenoid output rate at a set time interval.
3. Go to Main Menu, scroll down to TEST and push to choose TEST.
4. Scroll down to SCREEN. Push to choose that.
5. Press once and the screen should go to all black, then all white. It's fast - you can repeat it to double check. Push left to return to test.

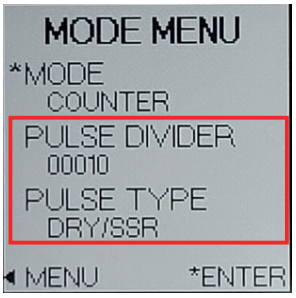
Section 5: Troubleshooting

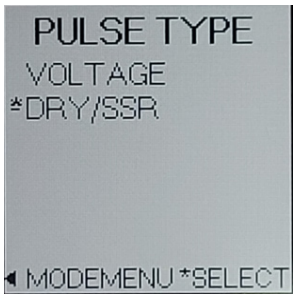
Trouble Shooting: Counter Mode

Go back to Mode menu and under Mode menu scroll down and select Counter tab and press enter.

The Z-100 controller monitors a pulse input signal provided by the customer. In this mode, the Z-100 controller is used as a dividing counter to control the rate at which the solenoid output is activated to stroke to the pump. When the counter mode is selected, the pulse divider must be input to determine how often the pump will stroke in response to the incoming pulses. Navigate to the Pulse Divider option and press the navigation button in to enter the Pulse Divider screen. The arrow at the bottom of the number will indicate which digit is being modified. Press the navigation button up ro down to adjust the digit and then press the right arrow to move to the next digit. Use the right arrow to navigate to the back button and press the button in to cancel, or navigate to save and enter to save. The pulse types that can be selected are Voltage or Dry Contact/SSR. Navigation to the Pulse Type option from the Mode Menu to open the Pulse Type submenu. Select the pulse type and navigate to the select button and press enter to save, or press the navigation button to the left to discard the change.







Fuse Replacement:

1. If the Z-100 display will not power-up, from battery or external power supply, replace F2.
2. If the Z-100 powers up, but the solenoid does not activate, replace F1.

Section 5: Troubleshooting

Mechanical Assembly

1. The basic mechanical components of the Cyclone 4400 MLS are:
   C-44 Pump
   Calibration Oil Reservoir/Actuation Mani fold
   Filter Regulator
   Solenoid and Manifold

2. Should malfunction of the mechanical system be suspected, follow the following procedure:

a. System actuation pressure: absolute minimum requirement is 15 psi. Refer to chart located on page 13 for actuation requirements.

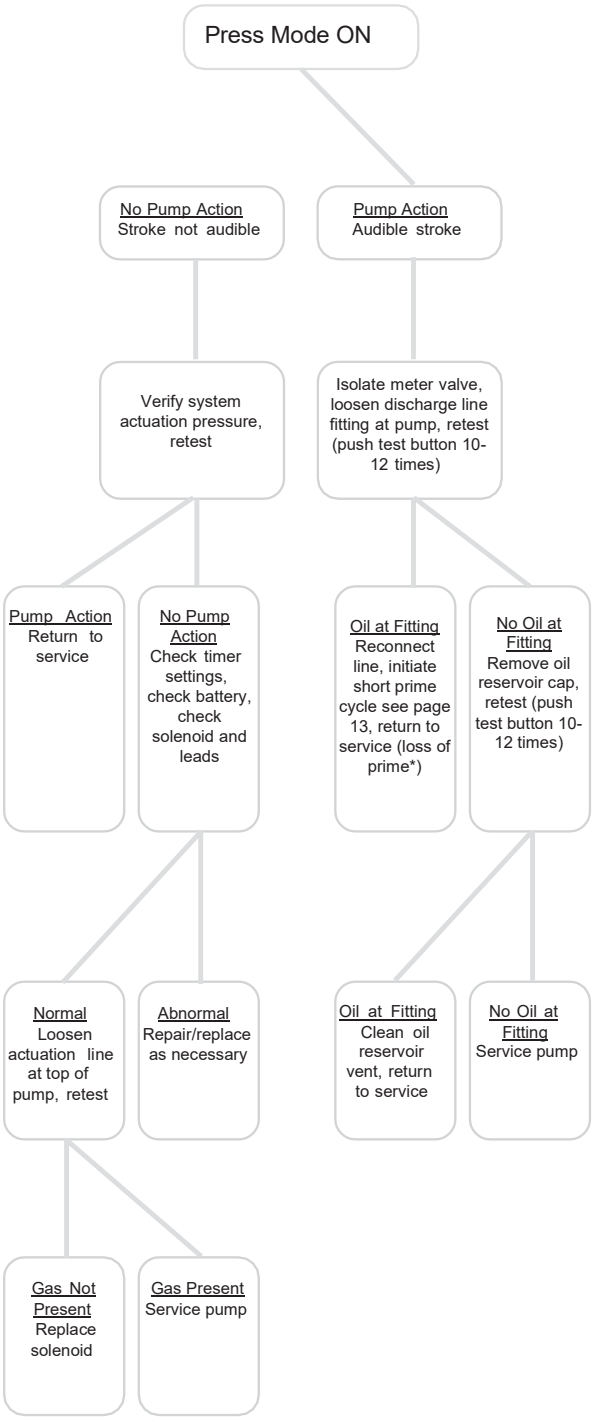
b. Oil level: must be visible in reservoir.

c. Pump action: pump stroke and actuation gas vent should be audible when actuated with test button on Z-100 controller. Follow diagram to test system.

IMPORTANT NOTE:
Follow the illustration to assure proper battery wire placement in the Z-100 enclosure.

---

figure 10



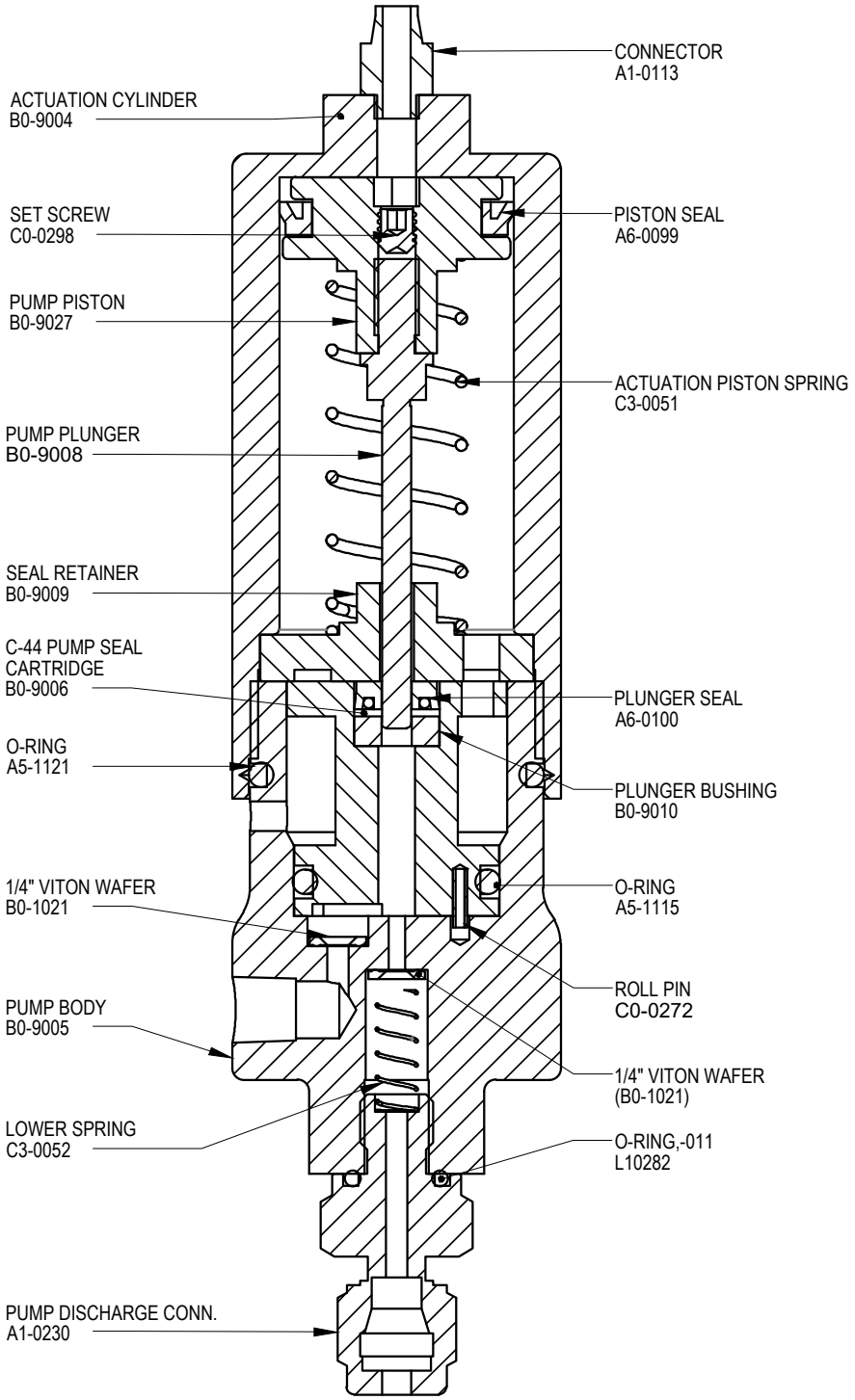
Section 5: Troubleshooting

Notes

Appendix A: Illustrations

C-44 Pump Assembled

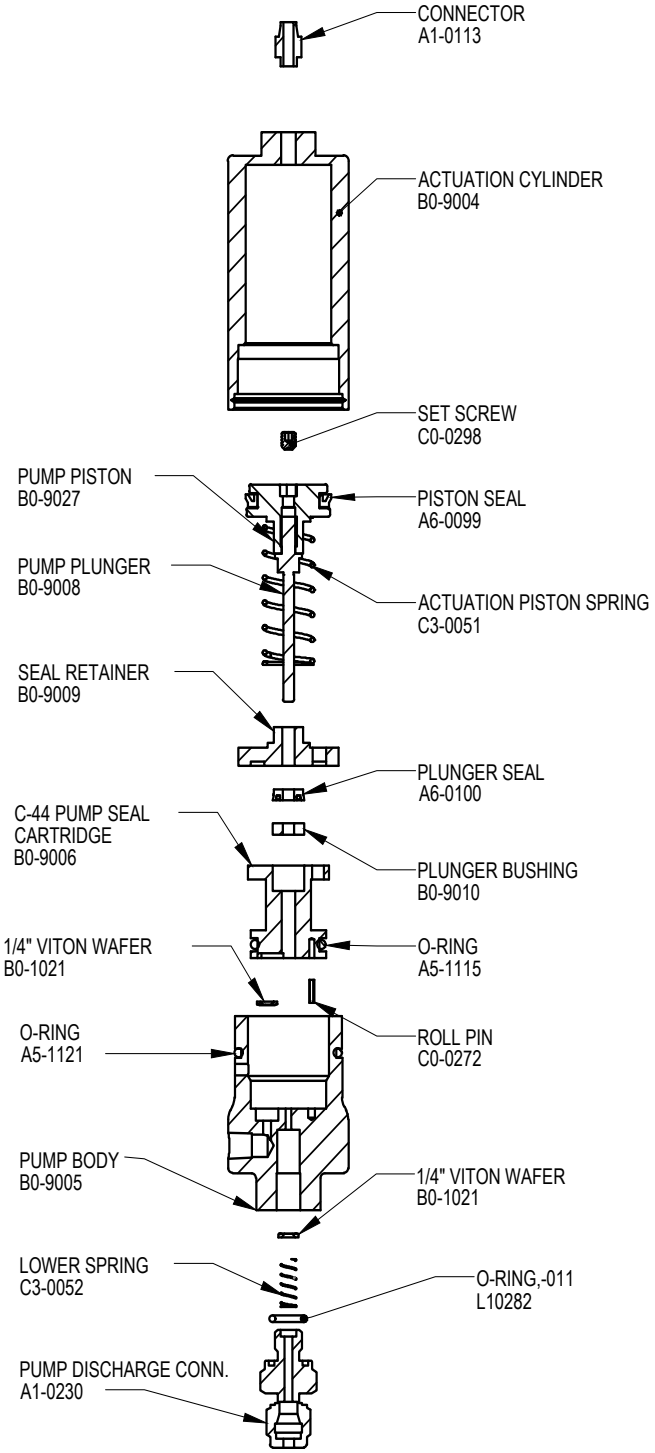
Figure 11



Appendix A: Illustrations

C-44 Pump Exploded

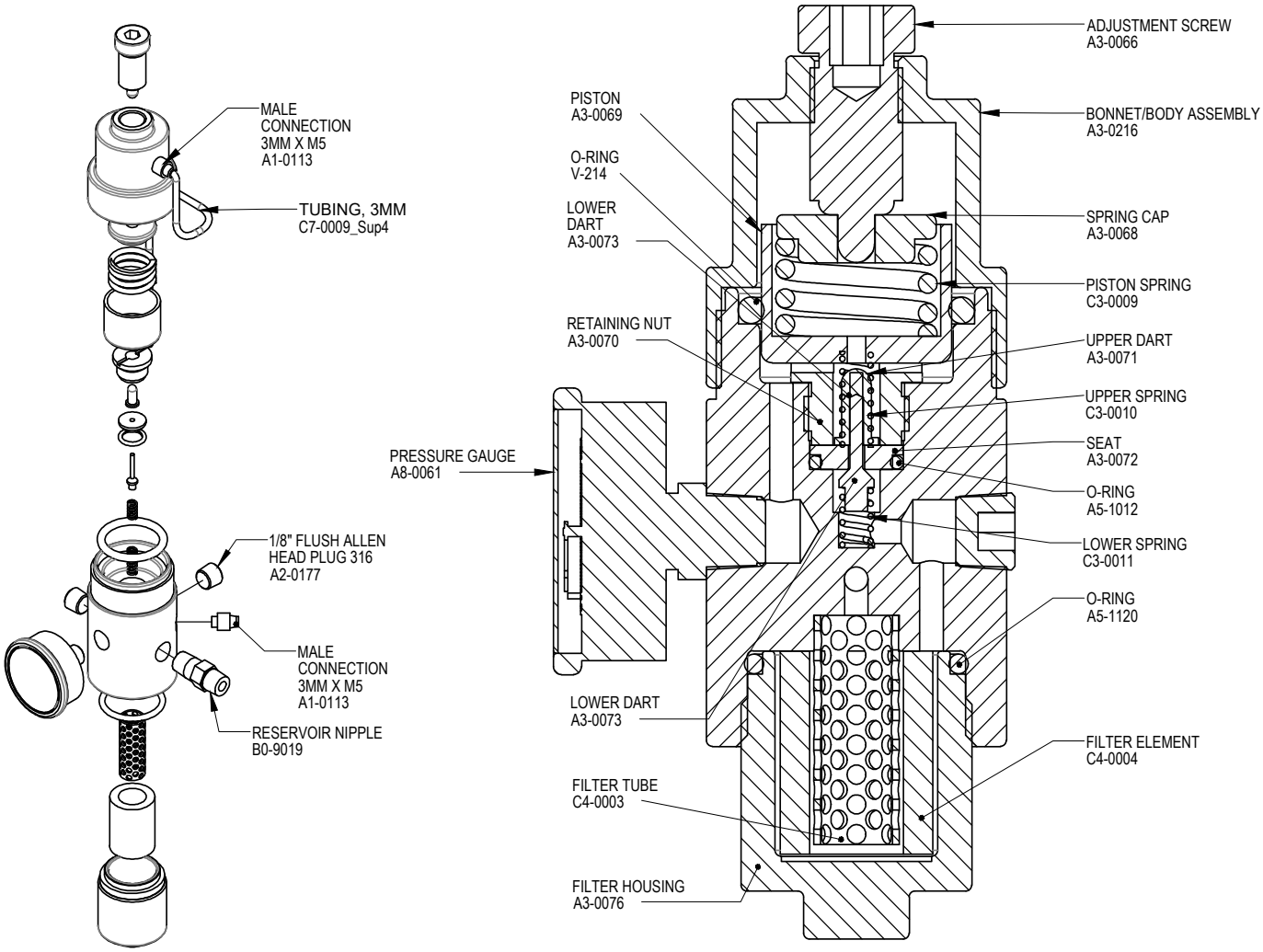
Figure 12



Appendix A: Illustrations

YZ Filter/Regulator Assembled

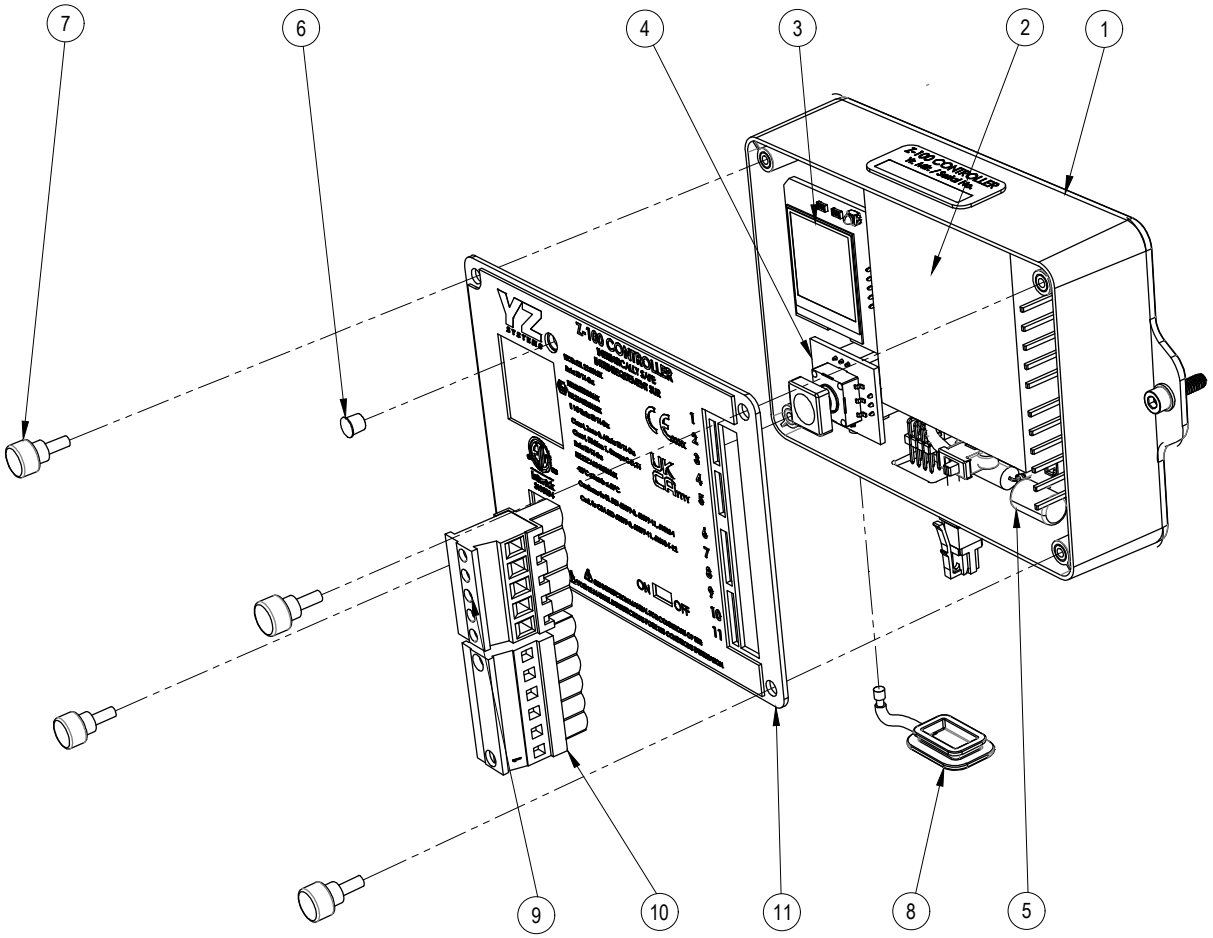
Figure 13



Appendix A: Illustrations

Z-100 Controller

Figure 14



BUBBLE NUMBERS	PART NO.	DESCRIPTION
1	F2-0615	Z-100 Controller Assy
2	E3-2005	Battery Pack
3	G0-0096	Z-100 Display Board
4	G0-0097	Z-100 Navigation Switch
5	D3-0284	Z-100 Fuse Replacement Kit (2 Fuses per kit)
6	C0-1026	Stand Pipe
7	A9-1001	Thumb Screws
8	D5-0322	Z-100 MM Plug Cover
9	H1-0201	Z-100 5 Pin Terminal Block
10	H1-0202	Z-100 6 Pin Terminal Block
11	A9-3141	Z-100 Face Plate

APPENDIX A: ILLUSTRATIONS

Z-100 Installation Drawing

Z-100 ELECTRONIC CONTROLLER
HAZARDOUS AREA INSTALLATION INSTRUCTIONS AND DRAWINGS

The following instructions apply to equipment covered by the following certificate numbers:

IECEx:	IECEx ETL 22.0013X
ATEX:	ETL22ATEX0132X
UKEX:	ITS22UKEX0366X
NORTH AMERICA:	ETL22CA104230006X

APPLICABLE STANDARDS:
Class I, II, and III, Division 1, Hazardous (Classified) Locations
UL 913:2013 Ed.8+R:06 Dec2019
UL 60079-0:2019 ED.7 + R:15 APR 2020, UL 60079-11:2013 ED.6 + R:14 SEP2018
CSA C22.2#60079-0 : 2019 ED.4, CSA C22.2#60079-11 : 2014 ED.2)(R2018)
IEC 60079-0 : 2017 ED.7, IEC 60079-11 : 2011 ED.6
EN 60079-0 : 2018, EN 60079-11 : 2012

The Z-100 controller assembly (F2-0615) is an intrinsically safe electronic controller that can reside in a hazardous area and is used to control and monitor chemical injection or sampling applications. The Z-100 also provides several entity rated intrinsically safe customer inputs and outputs. These include 2 digital inputs, 1 digital output, and 1 analog input for interfacing to suitably certified equipment located inside or outside the hazardous area.

The Z-100 Controller may be used in hazardous area locations with flammable gas and vapors of Class I group IIB Zone 0 or Division 1 Group C-D with a temperature class rating of T4 with an ambient temperature range of -20C to +60C.

Z-100 Intrinsically Safe Controller Assembly F2-0615, shall be housed in a general purpose enclosure with or without factory interconnect wiring and mechanical components. The minimum IP rating of the system enclosure shall be IP54.

For safe operation and installation the information in this document, and the end applications system level instruction and operating manual shall be observed.

The Z-100 Controller shall only be installed and maintained by qualified personnel in accordance with all local laws, national laws, directives, and standards applicable to the country and area of installation.
Factory wiring shall not be modified.

DATE	ECN	DESCRIPTION	UPD BY	APR BY	REV
02/16/2023	28238	PRODUCTION RELEASE	GSS	YZT	00
12/14/2022	26682	PRELIM: UPDATED ENTITIES, ADDED WARNING,	GSS	YZT	C

REVISION HISTORY

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE INCH[mm]
INTERPRET DIM AND TOL PER ASME Y14.5-2009
TOLERANCES:

.X	± .050[1.27]
.XX	± .010[.254]
.XXX	± .005[.127]
∠	± .5°
FRACTIONS	± 1/64[.397]

FINISH: 125 $\sqrt{}$ RMS

THIRD ANGLE PROJECTION

MILTON ROY
www.miltonroy-americas.com MILTON ROY, LLC

TITLE
INSTALLATION DRAWING
YZ SYSTEMS
Z-100 CONTROLLER

DO NOT SCALE DRAWING | SIZE A | DRAWING NO 2E-0042 | REV 00 | SCALE 1 : 1 | SHEET 1 of 4

APPENDIX A: ILLUSTRATIONS

Z-100 Installation Drawing

Z-100 ELECTRONIC CONTROLLER
HAZARDOUS AREA INSTALLATION INSTRUCTIONS AND DRAWINGS

WARNING: Substitution of components may impair intrinsic safety.
AVETISSEMENT: La substitution de composants peut compromettre la sécurité intrinsèque.

WARNING: Explosion Hazard - To prevent ignition of an explosion atmosphere remove power before disconnecting any equipment or wiring unless the area is known to be non-hazardous.
AVERTISSEMENT: **Risque d'explosion -** Pour éviter l'inflammation d'une atmosphère d'explosion, coupez l'alimentation avant de déconnecter tout équipement ou câblage, à moins que la zone ne soit connue pour être non dangereuse.

WARNING: Replace removable fuses with the same type and rating to provide protection against the risk of fire and shock.
AVERTISSEMENT: Remplacez les fusibles amovibles avec le même type et les mêmes caractéristiques pour vous protéger contre les risques d'incendie et de choc.

WARNING: If battery powered, use only YZ Systems replaceable battery pack assembly, Part Number: E3-2005
AVERTISSEMENT: Si alimenté par batterie, utilisez uniquement l'ensemble de batterie remplaçable YZ Systems, numéro de pièce : E3-2005.

WARNING: F2-0615 Z-100 Controller contains lithium primary battery (VBAT1) under encapsulation. Unit may explode if mistreated. Do Not Recharge, Disassemble or Dispose of in fire.
AVERTISSEMENT: Le contrôleur F2-0615 Z-100 contient une batterie primaire au lithium (VBAT1) sous encapsulation. L'appareil peut exploser s'il est maltraité. Ne pas recharger, démonter ou jeter au feu.

WARNING: POTENTIAL STATIC CHARGING HAZARD - To avoid static buildup, use a damp cloth to clean all painted or other non-metallic surfaces.
AVERTISSEMENT: RISQUE DE CHARGE STATIQUE POTENTIEL - Pour éviter l'accumulation d'électricité statique, utilisez un chiffon humide pour nettoyer toutes les surfaces peintes ou non métalliques.

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE INCH[mm]
INTERPRET DIM AND TOL PER ASME Y14.5-2009
TOLERANCES:

.X	± .050[1.27]
.XX	± .010[.254]
.XXX	± .005[.127]
∠	± .5°
FRACTIONS	± 1/64[.397]
FINISH:	125 √RMS

THIRD ANGLE PROJECTION

MILTON ROY
www.miltonroy-americas.com MILTON ROY, LLC

TITLE
INSTALLATION DRAWING
YZ SYSTEMS
Z-100 CONTROLLER

DO NOT SCALE DRAWING	SIZE	DRAWING NO	REV
	A	2E-0042	00
		SCALE 1 : 1	SHEET 2 of 4

APPENDIX A: ILLUSTRATIONS

Z-100 Installation Drawing

HAZARDOUS AREA INSTALLATION INSTRUCTIONS AND DRAWINGS

Conditions for safe use:

The system shall not be connected to any associated apparatus which uses or generates more than 250VRMS.

Installations:

USA- Installations shall be in accordance with the National Electric Code (NEC), NFPA-70, and ANSI/ISA-RPI206.1
Canada - Installation shall be in accordance with Canadian Electrical Code (CEC) Part 1 (CSA22.1).
ATEX/IECEx - Installations shall be in accordance with all applicable local and national electrical codes, EN60079-14, IEC60079-25, and all Essential Health and Safety Regulations of Directive 2014/34/EU.

Z-100 Controller Assembly F2-0615 is rated and shall be marked as follows:

Z-100 Controller
Ex ia IIB T4 Ga
Ex II 1 G Ex ia IIB T4 Ga
Class I, Zone 0, AEx ia IIB T4 Ga
Class I Division 1, Groups C-D, T4

NOTES:

1. INTRINSICALLY SAFE INTERCONNECT WIRING BETWEEN DEVICES SHOWN MAY BE FACTORY INSTALLED.
2. SUBSTITUTION OF COMPONENTS COULD IMPAIR INTRINSIC SAFETY.
3. CABLE(S) X SHALL BE SHIELDED TWISTED PAIR TYPE. CABLE SHIELDS SHALL BE EARTHED PER 60079-14 IN NON-HAZARDOUS AREA.
4. WHEN USING MULTI-CORE TYPE CABLE(S) FOR CABLE X THE CABLE SHALL BE TYPE A OR B PER 60079-25 CLAUSE 9.
5. IF USING DIODE SAFETY BARRIERS, FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS FOR PROPER SAFETY GROUNDING TO PROTECTIVE EARTH.
6. ANALOG FLOW INPUT (TB2) AND COUNT INPUT (TB2) SHALL NOT BE CONNECTED AT THE SAME TIME.
7. INTRINSIC SAFETY BARRIERS OR ISOLATORS SHALL BE COMPLIANT WITH THE SAFETY PARAMETERS LISTED FOR EACH INPUT OR OUTPUT.
8. THE AMBIENT TEMPERATURE RANGE FOR F2-0615 IS -20C TO +60C.
9. F2-0615 INTRINSIC SAFETY PROTECTION LEVEL IS: "ia".
10. EXTERNAL I.S. SUPPLY AND BATTERY PACK E3-2005 SHALL NOT BE CONNECTED AT THE SAME TIME.
11. REPLACEABLE INTRINSICALLY SAFE BATTERY PACK ASSEMBLY, E3-2005, CONTAINS LITHIUM PRIMARY CELLS. DO NOT STORE OR USE IN TEMPERATURES EXCEEDING 85C. DO NOT CHARGE, DISASSEMBLE, OR INCINERATE. DEPLETED BATTERY PACKS SHOULD BE DISPOSED OF PER LOCAL REGULATIONS.
12. ALTHOUGH RECOMMENDED TO VERIFY THE AREA IS SAFE, THE E3-2005 BATTERY PACK MAY BE REPLACED SAFELY IN A HAZARDOUS AREA. REPLACE **ONLY** WITH YZ PN: E3-2005 INTRINSICALLY SAFE BATTERY PACK ONLY, **SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**
13. MM-100 MEMORY MODULE ASSEMBLY F2-0268 IS NOT NORMALLY CONNECTED TO THE CONTROLLER. TO PREVENT POTENTIAL DAMAGE OR SYSTEM RESETS WHEN MEMORY MODULE IS NOT IN USE, COVER THE CONTROLLER CONNECTOR WITH PROVIDED SEAL. SHORT CIRCUITS OR ESD DISCHARGE TO TO THESE CONNECTIONS COULD RESET OR DAMAGE THE CONTROLLER.
14. Z-100 CONTROLLER IS INTENDED FOR FIXED INSTALLATION.
15. Z-100 CONTROLLER F2-0615 SHALL BE MOUNTED IN AN ENCLOSURE WITH A MINIMUM IP54 RATING IN SYSTEM LEVEL OR FINAL INSTALLATION.
16. MATERIAL USED IN Z-100 COVER PLATE IS ALUMINUM WHICH EXCEEDS 10% IN TOTAL. PLEASE SEE APPLICABLE SYSTEM LEVEL USER MANUAL FOR INSTRUCTIONS TO AVOID IGNITION HAZARD DUE TO IMPACT OR FRICTION.
17. **SCHEDULE DRAWING - DO NOT MODIFY WITHOUT AGENCY APPROVAL.** EX

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE INCH[mm]
INTERPRET DIM AND TOL PER ASME Y14.5-2009
TOLERANCES:

.X	± .050[1.27]
.XX	± .010[.254]
.XXX	± .005[.127]
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FRACTIONS	± 1/64[.397]

FINISH: 125 √RMS

THIRD ANGLE PROJECTION

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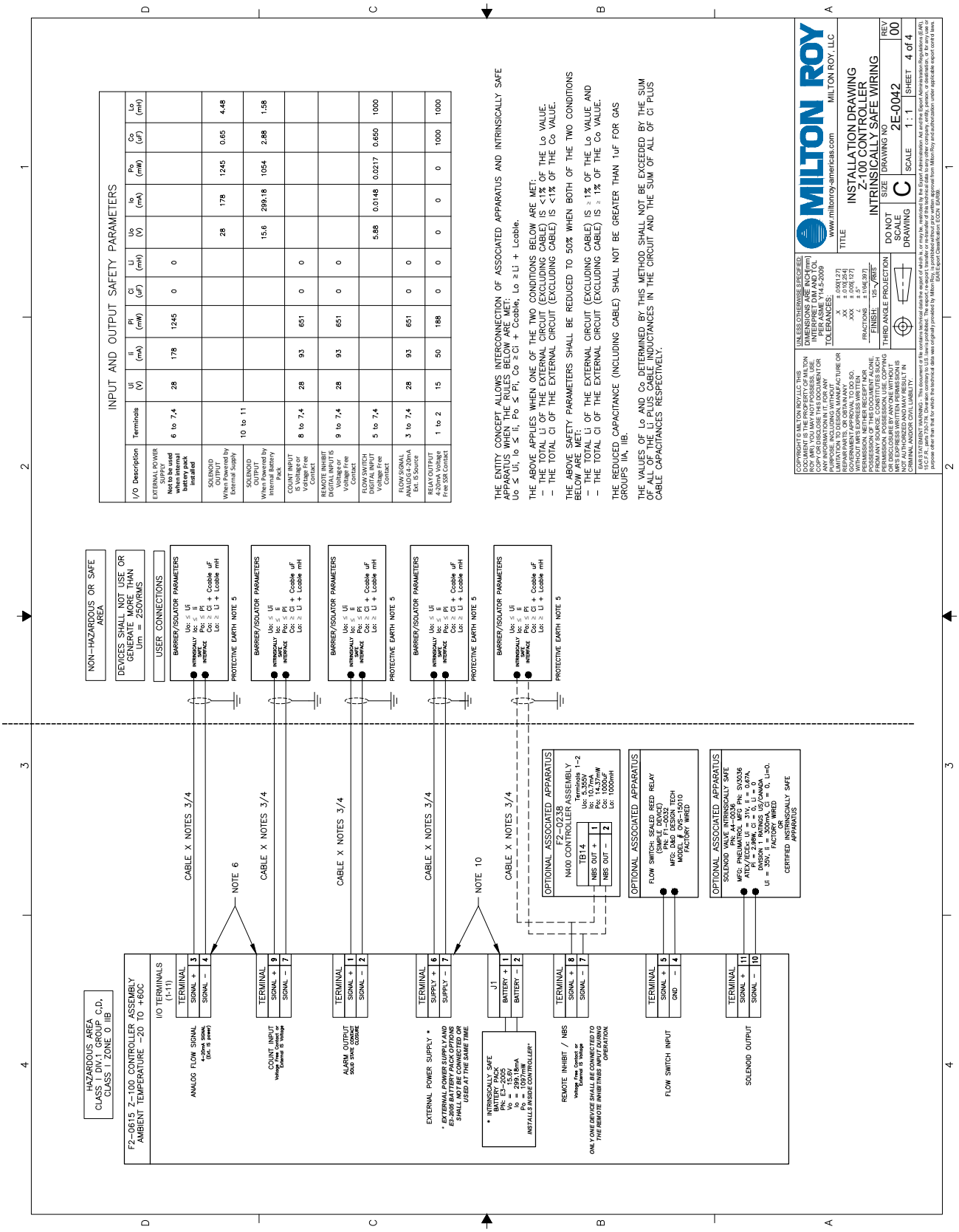
www.miltonroy-americas.com MILTON ROY, LLC

TITLE
INSTALLATION DRAWING
YZ SYSTEMS
Z-100 CONTROLLER

DO NOT SCALE DRAWING	SIZE	DRAWING NO	REV
	A	2E-0042	00
		SCALE 1 : 1	SHEET 3 of 4

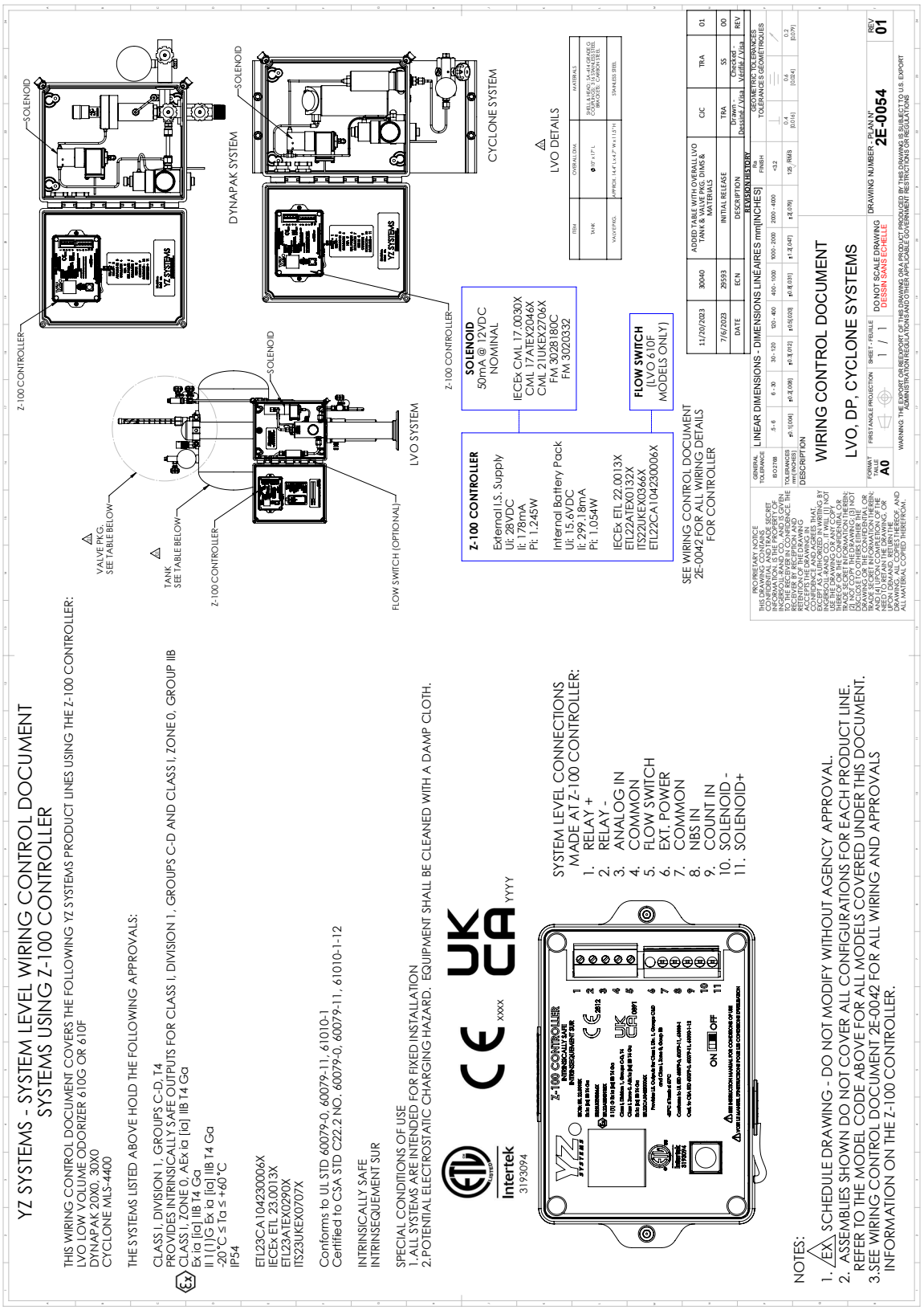
APPENDIX A: ILLUSTRATIONS

Z-100 Installation Drawing



Appendix A: Illustrations

Wiring Control Document



Appendix A: Illustrations

Notes

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(1-800-653-9435)

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