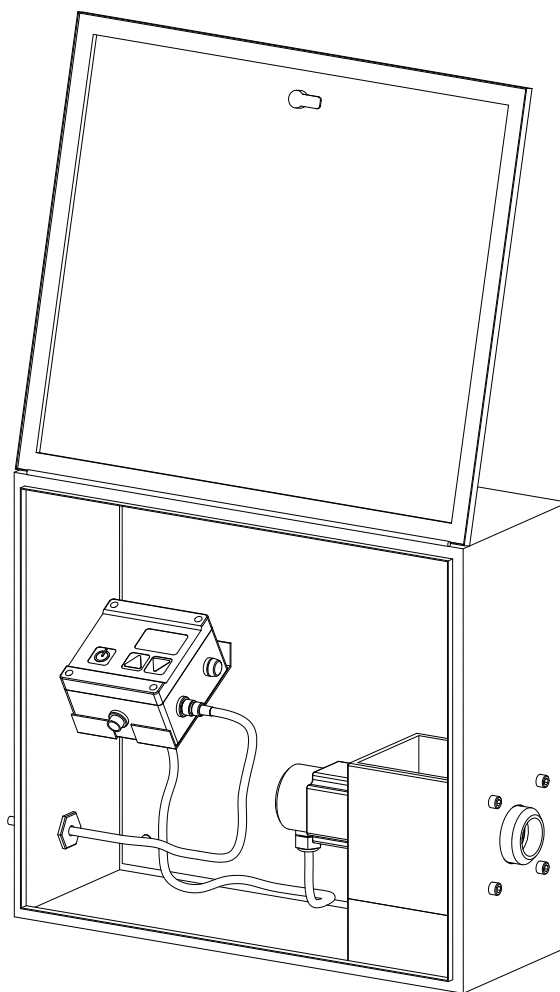




Electric Chemical Injection System Instruction Manual

MODEL 3401



www.mcisolutions.ca

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⚠ DANGER!

Read and understand all instructions. Failure to follow the Dangers, Cautions and Warnings contained in this owners manual may result in electric shock, fire, serious bodily injury or death.

Symbol Usage

⚠ DANGER!

Designates an imminent danger. In case of non-observance of this information, death or severe injuries are an imminent risk

⚠ WARNING!

Designates a possibly dangerous situation. In case of non-observance of this information, death or severe injuries can occur

⚠ CAUTION!

Designates a possibly dangerous situation. In case of non-observance of this information, death or severe injuries can occur



Designates areas where the potential for severe crush injury exists. These crush injuries can result in serious bodily injury



Electrical Shock Hazard Warning indicates a potential injury hazard that can result in serious bodily injury or death.



Designates important user tips and other useful information



Important installation information that if not followed could cause system failure

The electric chemical injection system you have purchased has been subjected to a safety test and quality acceptance inspection. Please ensure all safety instructions are clearly understood. Misuse or incorrect operation of this equipment has the potential for serious injury.

Only properly qualified and trained personnel should be involved in the setting up, putting into service, inspecting, servicing and repairing of this equipment.

NOTICE TO INSTALLER: These instructions must be left with the owner/operator of this equipment. They should be kept for future use

Proper Use

This electric chemical injection system drive uses a reciprocating positive displacement pump. It serves the purpose of conveying and circulating liquids

The electric drive and these operating instructions are intended for commercial use exclusively

WARNING!

Severe skin injury can result from dangerous media used with this equipment. (i.e. Aggressive, toxic and caustic media)

Unsuitable media can damage the pump and then escape into the surrounding area.

If you intend to use dangerous media, the materials used for the pump parts must be designed for this kind of use. Consult fluid end supplier for current trim requirements.

Arbitrary modifications of the pump are prohibited for safety reasons.

CAUTION!

Any form of liability on the part of the manufacturer/supplier shall be excluded for any form of damage caused by arbitrary modifications.

If you intend to carry out any modifications on the electric drive system, please note any modifications must be approved in writing by MCI SOLAR MFG LTD.

When replacing any parts in our system, use only spare parts or standard parts approved by the manufacturer (Please refer to REPLACEMENT PARTS section in this manual for more information)

Sources of Danger

The MCI Electric Chemical injection system complies with all mandatory legal safety requirements.

Although most safety risks have been reduced through suitable construction and design measures, residual risks (explosive atmospheres, electrical, mechanical or thermal) cannot be excluded entirely during either transport, maintenance, and repair work or regular operation.

Authorized Operators

Only persons who have been properly authorized and trained by the owner-operator are allowed to work on this equipment.

The responsibilities for the various activities performed on the pump must be clearly defined and observed. Unclear competencies are a safety risk

The owner operator must:

- Make these operating instructions accessible to the operator
- Make sure that the operator has read and understood all operating instructions in this manual



For extra copies of this manual or for more information please visit us online at:
www.mcisolutions.ca

CAUTION!

Maintenance, upkeep and electrical tasks should only be performed by technically competent, trained and/or qualified personnel

Technically competent, trained and qualified personnel are defined as follows:

- Possessing sufficient knowledge in a specific field based on their specialized training and experience
- Familiar with work safety and accident prevention regulations (lock-out/tag-out safety procedures)

Personal Protective Equipment

WARNING!

Oils, lubricants and cleaning agents can cause skin reactions and irritation. Avoid skin contact with all chemical

Hot Surfaces and/or caustic media can cause severe burns or acid burns.

Wash your hands properly each time after coming into contact with these substances

Wear appropriate protective equipment especially when you are performing any maintenance, inspection and cleaning tasks

In case of Emergency

In case of emergency originating from our equipment or from conditions in the surrounding area, the pump must be switched off immediately.

The pump cannot be put back into operation until the cause of the emergency has been identified and corrected, and corrective actions taken to prevent future occurrence.

In case of fires, use only suitable fire-extinguishing agents.

Read the instructions in this manual carefully before installing or starting the system. MCI SOLAR MFG will accept no liability for damages due to non-observance of this manual.

 CAUTION!

If the instructions in this operating manual are not adhered to or are inadequately adhered to, there shall be no entitlement to services under the warranty and the CSA declaration of conformity shall cease to be valid

Information in this manual is subject to change without notice and does not represent a commitment on the part of MCI SOLAR MFG LTD.

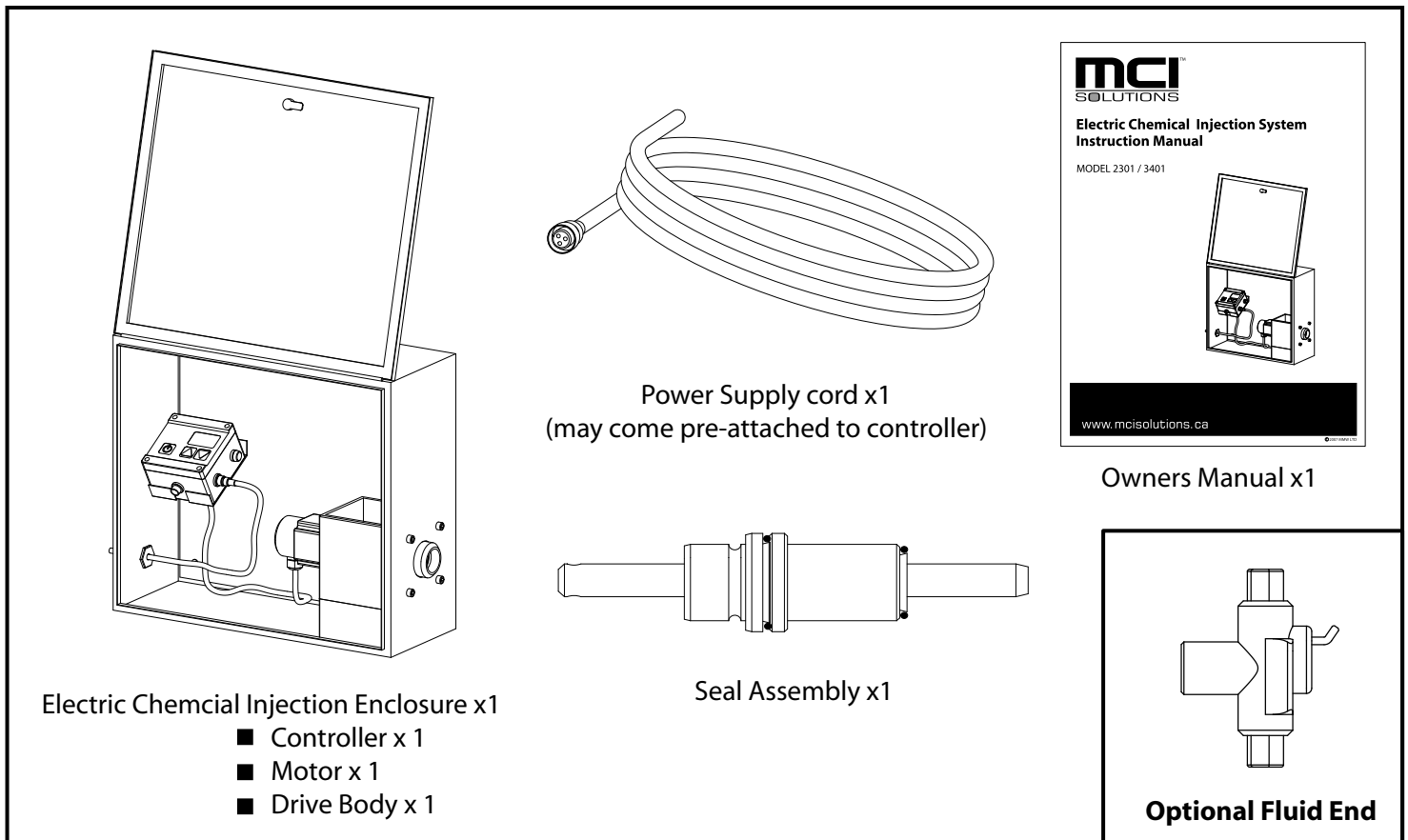


INSTALLATION AND STARTUP PROCEDURES

- MODEL 3401
- 24V DC ELECTRIC CHEMICAL INJECTION SYSTEM

Thank you for purchasing our chemical injection system. Every care possible has been taken with assembly, packaging and shipping of this product. Check that it has arrived in its entirety and in good condition. Any concerns can be directly addressed to MCI Solutions at www.mcisolutions.ca or by calling our office headquarters at +1.250.263.0977.

Standard Package Contents

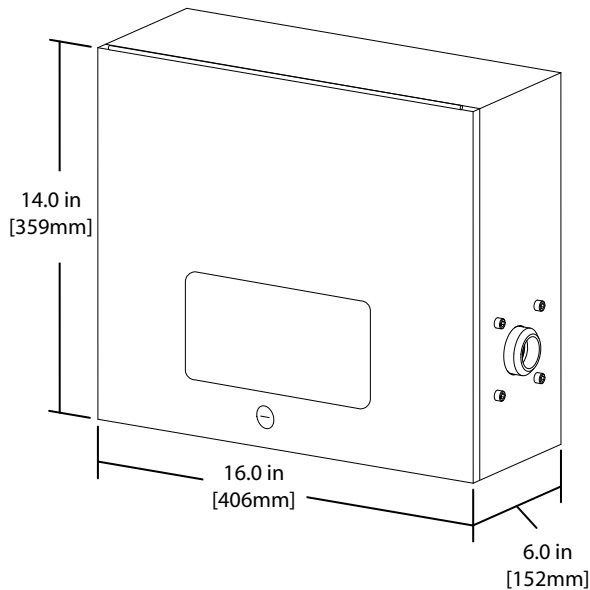


Please ensure you have fully read and understood the general safety section of this manual before proceeding with installation and startup procedures.

Please read all of these instructions before installing, operating or maintaining any of this equipment.

Wherever possible all optional components ordered with this system are packaged within the pump box enclosure.

System Specifications



Electrical Rating: 24V DC 4.0A

Classification: CSA CLASS 1 DIVISION 2

Enclosure Rating: 3R

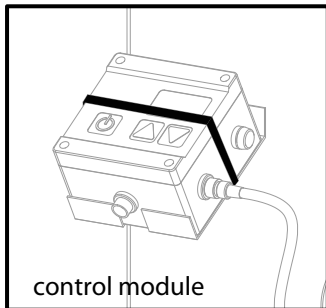
Temperature Code: T4A

OUTPUT - Model 3401

PLUNGER SIZE	MAX. PRESSURE	VOLUME [LITRES PER DAY]
1/4	3000 PSI	0.12 - 17.4
3/8	1500 PSI	0.26 - 39.1
1/2	750 PSI	0.46 - 69.5

All electrical connections must satisfy National, Provincial/State and local electrical codes.

This equipment is CSA approved for use in Class 1 Division 2 areas. It is the responsibility of the owner or owner operator to determine the classification of the area where the equipment is to be installed.



The enclosure has been secured for shipment to the controller bracket inside the enclosure with a tie wrap. This requires removal before operating this system.

We also suggest removing the clear plastic cover found on control interface

This equipment is to be mounted securely in a safe location that satisfies the classification requirements. Location should offer convenient and safe access to 24V DC power supply, chemical supply and injection point.

Ensure 1 - 2 [psi] of suction head pressure is available for efficient operation of the positive displacement fluid end.

Refer to the fluid end manufacturers Installation, Operation and Maintenance instructions for additional information.

To protect the system and components the pump box must be connected to ground.

PUMP BOX ASSEMBLY

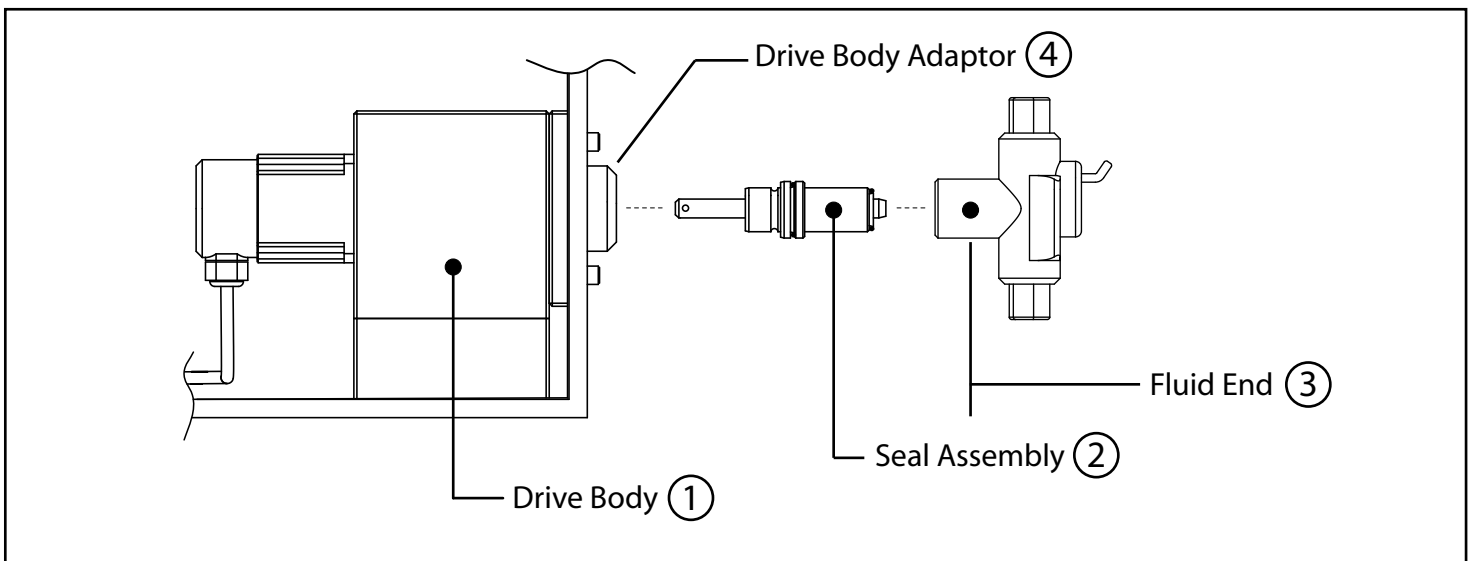
The electric chemical injection system is shipped largely assembled.

There are two main items that require assembly:

- 1- Fluid end and seal assembly installation
- 2- Power cord to power supply wiring

! Please refer to the section regarding cable polarity on the following page before attempting to wire the power supply cable

Attaching Fluid End

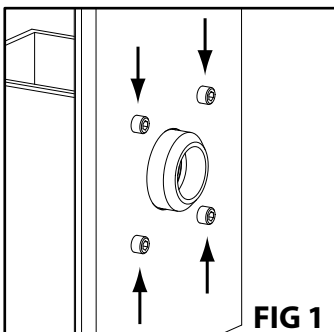


The positive displacement fluid end (3) is an option offered by MCI SOLAR MFG and may not have been included with the pump box

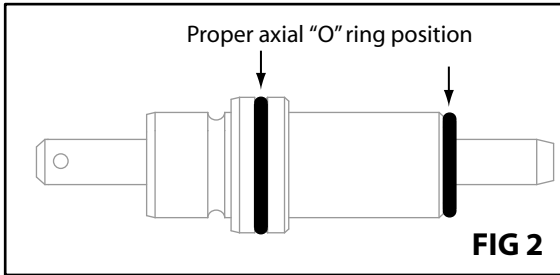
If installing a used fluid end (3) ensure it is in excellent working condition and clean before attempting installation on the electric injection system

Our system does not use packing, if there is packing in the fluid end (3) remove packing completely and ensure packing gland is thoroughly cleaned

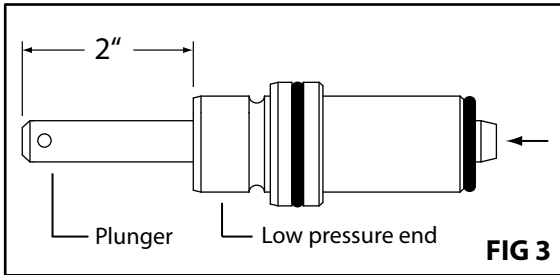
STEP 1



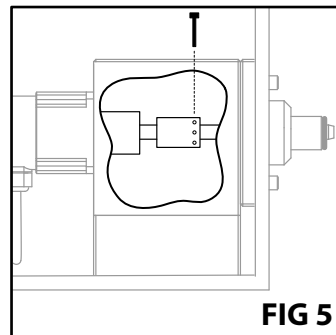
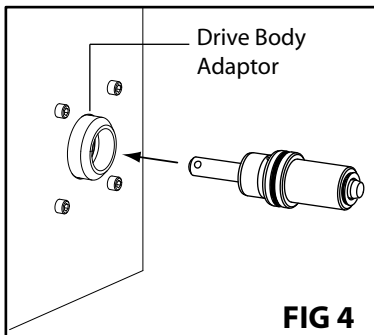
Temporarily tighten the four locking bolts on the Drive Body (1)
AS SHOWN [FIG1]

STEP 2

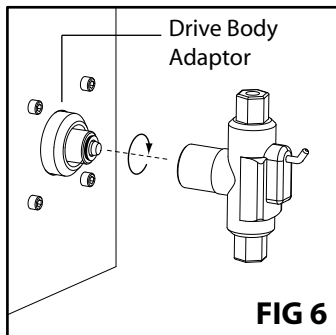
Remove new plunger and seal gland assembly from packaging and inspect for any damages that may have occurred in transit. Ensure the axial "O" ring seals are positioned as per [FIG 2]

STEP 3

Slide the plunger through the seal assembly until 2" of the plunger is protruding past the low pressure end. AS SHOWN [FIG 3] (This allows for easy installation of connector pin)

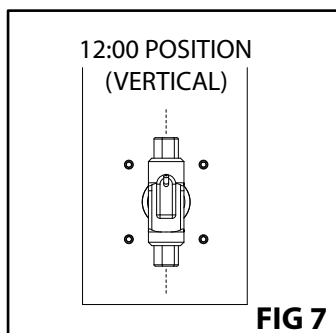
STEP 4

Insert the entire seal assembly into the drive body adaptor(4). AS SHOWN [FIG 4]
Then install the provided connecting pin through the motor connector and plunger. AS SHOWN [FIG 5] (Rotate plunger if necessary to align motor connector with plunger)

STEP 5

Push the seal glands along the plunger until the low pressure seal gland is flush with the inside of the drive body adaptor (4)
Thread fluid end (3) into the Drive body adaptor (4) AND TIGHTEN COMPLETELY AS SHOWN [FIG 6] **At this time do not worry if fluid end is not in vertical position when tightened, this will be corrected in STEP 6**

- !
IMPORTANT: To prevent leaks ensure fluid end is securely tightened into Drive body adaptor (4).
- **Failure to engage seals will result in leaks.**

STEP 6

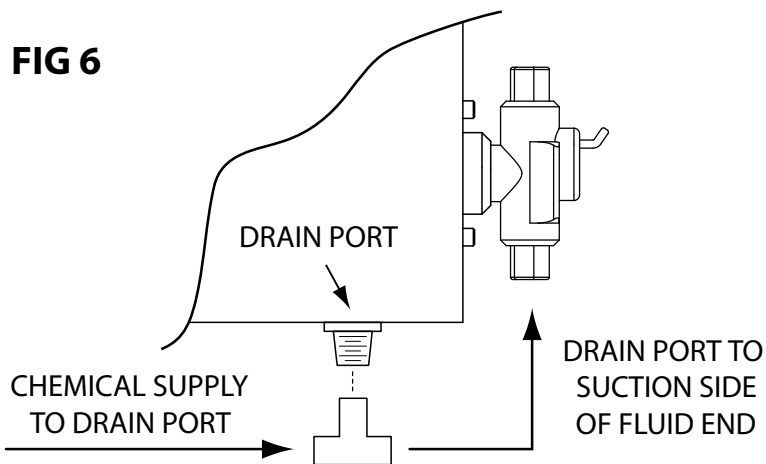
Loosen the four locking bolts that were temporarily tightened in STEP 2. Once loosened rotate fluid end (3) until it is oriented in a 12:00 (vertical) position. AS SHOWN [FIG 5]
When in vertical position re-tighten the four locking bolts to secure fluid end in place.

STEP 7

! WARNING!

Only properly qualified and trained personnel should be involved in the setting up, putting into service, inspecting, servicing and repairing of the plumbing for the fluid end.

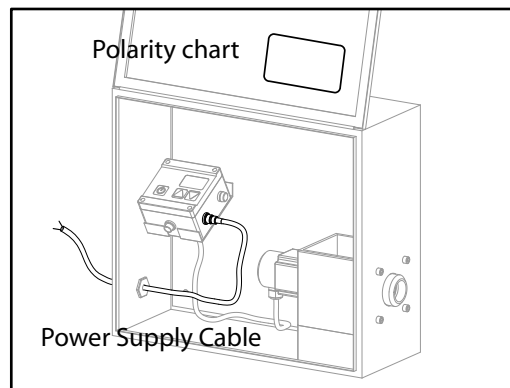
Ensure National, Provincial/State and local codes are followed when plumbing equipment. Failure to follow these laws can result in serious bodily injury even death.



Connect drain port to chemical supply and suction side of pump AS SHOWN [FIG 6]

Refer to fluid end manufacturers installation manual for proper installation of fluid end

WIRING POWER SUPPLY CORD



Polarity chart for the power cable is located inside the access panel of enclosure door

Supply voltage Requirement: 24V DC

DO NOT EXCEED 28V DC POWER SUPPLY OR DAMAGE TO ELECTRICAL COMPONENTS WILL RESULT



When wiring power cord to power supply follow cable orientation as shown on the inside cover of the pump box. Failure to orientate wiring properly will result in destruction of the onboard electronics and could cause serious bodily injury even death.

Before connecting power to the control board ensure that you are clear of all moving parts, serious injuries can occur. MACHINE CAN START AUTOMATICALLY

When attaching/re-attaching the power supply cord to the controller box ensure connections are fully made up and tightened.

LOOSE CONNECTIONS CAUSE ARCING AND EROSION OF THE PINS WHICH DESTROY THE INTEGRITY OF THE CONNECTIONS

When power has been connected a small LED will flash in the Digital display window indicating the system is successfully powered

If the model you have ordered does not have auto start enabled you will have to press the ON/OFF button on the control interface to start the motor

To determine the maximum pressure and injection rate first determine the motor size of your system: The model/motor size can be found on the CSA warning label located on outside of the enclosure access door.

MODEL: 3401 = 34 Motor (large drive motor)

Once the motor size is determined refer to the injection rate label located on the inside cover of the enclosure access door.

WARNING!

To ensure maximum efficiency of this system DO NOT exceed maximum recommended injection pressure





Maximum line pressure and output specifications can also be found in this manual (Beginning of this section) and online at www.mcisolutions.ca

IMPORTANT!

Do not connect or disconnect motor while controller is powered up damage to the controller can result

Refer to the maintenance section of this manual for information regarding installation of replacement parts

PROBLEM	CHECK	SOLUTIONS
<p>Power is connected to the system but the motor is not turning on and there is no blinking light in the bottom left hand corner of the controller</p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> ■ Use extreme caution when testing electrical connections ■ Only qualified/trained personnel should be performing these tasks 	<p>Is there a red LED flashing in the bottom left hand corner of the digital display window? IF NO CHECK THE FOLLOWING</p>	
	<p>A) Check if the fuse is installed, if it is installed ensure it is in working order with a volt meter (VOM)</p>	<p>If fuse is not working replace fuse</p>
	<p>B) Ensure the power supply cordset (3 pin connector located on same side of the controller as the fuse) is securely fastened. If it is securely fastened remove cordset and inspect pins CONNECTIONS MUST BE TIGHT TO PREVENT FAILURE. If there are no visual problems reconnect the power supply cordset</p>	<p>If loose tighten connections, and recheck board for blinking LED If there is damage to the pins on the controller receptacle, the controller and or motor will need to be returned for repair</p>
	<p>C) If running system off BATTERIES check that the batteries are in good condition and fully charged. Check the fuse or circuit interrupter with VOM check that it is functional. System requires a minimum of 5V DC to function and 24V DC to achieve maximum output. NEVER EXCEED 28V DC</p>	<p>If batteries are drained, recharge batteries. Once charged and connected check for blinking LED</p>
	<p>D) Check output of voltage regulator used with system. Some will be equipped with low voltage disconnect and may need to be reset. Check Voltage Regulator Manual</p>	<p>If voltage regulator has reset options try resetting. If after resetting there is still no output replace voltage regulator</p>
	<p>E) If power supply is from 24V DC INVERTER check that the inverter is powered up. Check output with VOM. Refer to manufacturers operating instructions for further information.</p>	<p>If there is no power from inverter after referring to manufacturers operating instructions replace inverter</p>
	<p>F) Check power cord from batteries or inverter</p>	<p>If damaged replace power cord</p>
	<p>G) If there is still no indication of power reaching the controller then replace the controller CAUTION: DISCONNECT POWER SUPPLY TO BOARD BEFORE DISCONNECTING THE MOTOR CABLE</p>	<p>Replace controller, hook up motor cord then power cord and check for blinking LED</p>
<p>H) If after replacing the controller there is still no power reaching the board (NO FLASHING LED) the problem is with the power supply</p>	<p>Replace / repair power supply</p>	
<p>Power is connected to the system but the motor is not turning on and there is a blinking light in the bottom left hand corner of the controller</p>	<p>Is there a red LED flashing in the bottom left hand corner of the digital display window? IF YES CHECK THE FOLLOWING</p>	
	<p>A) If this model does not have an auto start feature then check that the on button has been pressed</p>	<p>Press the "ON" button on the control interface. Motor should begin cycling</p>
	<p>B) Remove fuse from controller and check the pins on the motor cord connection located on the bottom of the controller. DO NOT CONNECT OR DISCONNECT MOTOR WITH POWER SUPPLY CONNECTED</p>	<p>If the pins are damaged on the motor cord the cord needs replacing. If there is no damage ensure cord is tightly threaded onto connection If still not functioning motor may need replacing</p>

PROBLEM	CHECK	SOLUTIONS
Motor will start but does not cycle the full one inch stroke and/or is noisy	Check power supply and confirm system is receiving full 24V DC Anything less than 24V DC will greatly reduce effect motor output	Fully charge system if found to be below 24VDC. If this occurs after fully charging system and the discharge head pressure is within the systems rating the motor may need replacing
	Check that the isolation valves on the suction and discharge side are open	If the valves are found to be closed, and if safe to do so, open valves
	Check the plunger diameter that is installed in fluid end. Then Check the output pressure that this model/plunger size is capable of. If the discharge head pressure is greater than the output pressure that the motor is capable of the motor will stall and will not travel the full one inch stroke. This shortened stroke length due to discharge pressure exceeding motor output does not affect the system components but expected injection rates will not be achieved.	If discharge head pressure is higher than the systems rating try the following: 1) Switch to a smaller diameter plunger that fits the discharge head pressure 2) If using 23 motor upgrade to size 34 motor
<p>Motor cycles as it should but no chemical is being injected</p> <p>! DANGER!</p>  <p>PINCH POINT BE CAREFUL</p> <p>! WARNING!</p> <ul style="list-style-type: none"> Be sure to wear appropriate personal protection equipment as specified in your companies safe work procedures when testing this equipment 	Check that the suction and discharge valves are open	If found closed, open the suction and discharge valves , if safe to do so.
	Check chemical Inventory	If inventory is empty refill supply
	Check that the connector pin is fully engaged connecting the plunger to the motor	If not engaged. Insert pin completely and visually confirm the motor is cycling the fluid end during its stroke. THIS IS A PINCH POINT IN OUR SYSTEM. USE EXTREME CAUTION WHEN WORKING IN THIS AREA
	Check chemical flow of the pump by pressing the OFF button on the drive controller. Open the bleed screw and ensure chemical is flowing freely. USE A CLEAN AND COMPATIBLE CONTAINER TO CONTAIN ANY AND ALL LOST FLUID Restart the pump and fully close the bleed screw as close to the end of the discharge stroke as possible, this will greatly reduce airlocks in the fluid end.	If after checking the fluid end it appears the suction or discharge check valves may not be functioning. Refer to the manufacturers operation/maintenance manuals for further information. Fluid end may require repair and/or replacement.
	Check the calibrated drum/tank gauge for fluid dropping in the sight glass during the suction stroke and rising in the sight glass during the discharge stroke	If the fluid is dropping and rising when checking the drum/tank gauge try the following solutions: 1) Ensure the suction and discharge fluid end check valves are functioning properly. Refer to the manufacturers operation/ maintenance manual for further information. 2) If problem persists then replace the plunger and seal gland assembly (see replacement parts section of this manual) USE GENUINE MCI SOLUTIONS REPLACEMENT PARTS ONLY



Maintenance Instructions

These maintenance instructions are intended for MCI Solutions electrical chemical injection systems
■ Model 3401

Please ensure you have fully read and understood the general safety section of this manual before proceeding with any maintenance procedures

Please read all of these instructions before installing, operating or maintaining any of this equipment

Maintenance Safety Instructions

DANGER!

Be sure to turn off all power to the equipment before proceeding with any maintenance procedures outlined in this section.

REMOVE THE FUSE OR DISCONNECT POWER SUPPLY

This equipment can start and stop automatically. Keep clear of all moving parts

Be sure to follow the CSA WARNINGS located at all electrical entry points on our system

CAUTION!

Maintenance, upkeep and electrical tasks are to be performed by technically competent, trained and/or qualified personnel only.

When connecting power supply ensure all connections match the polarity orientation label located on the inside cover of the pump box, FAILURE TO CONNECT WIRES AS PER DIAGRAM WILL RESULT IN DAMAGE TO THE ELECTRICAL COMPONENTS AND/OR SERIOUS BODILY INJURY.

! DO NOT CONNECT OR DISCONNECT THE MOTOR FROM THE CONTROL MODULE WHILE THE CONTROLLER IS ENERGIZED. DAMAGE TO THE MOTOR OR CONTROLLER CAN RESULT

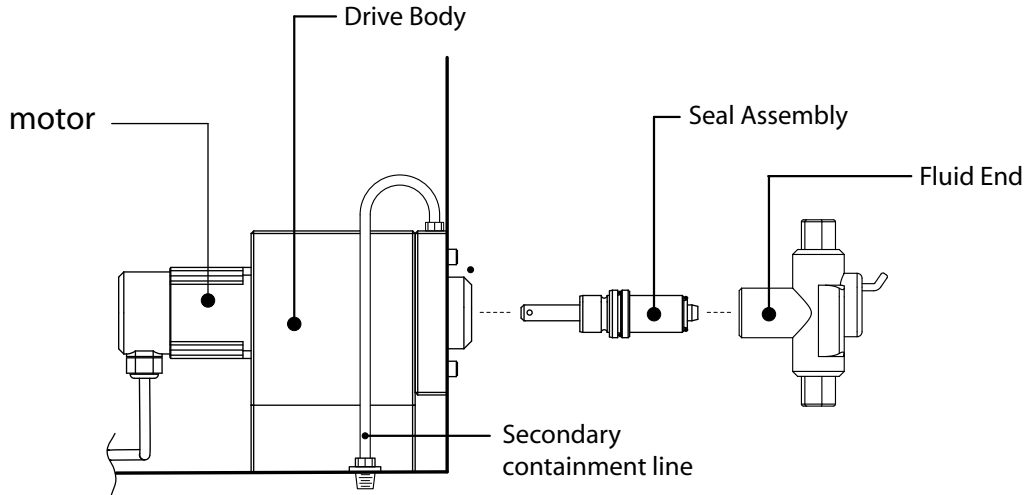
Wear appropriate personal protective equipment as specified in your company's safe work procedures

Study all MSDS sheets that pertain to the chemical/chemicals that you will be exposed to and ensure that all necessary safety equipment is available before beginning any maintenance procedures.

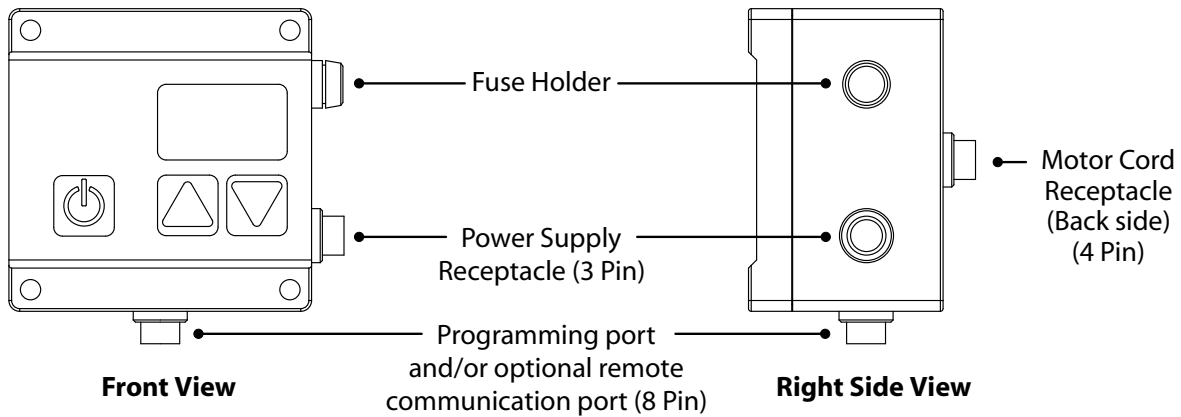
Ensure you have all the necessary replacement parts at your disposal before you begin disassembly.

GENERAL SYSTEM VIEWS

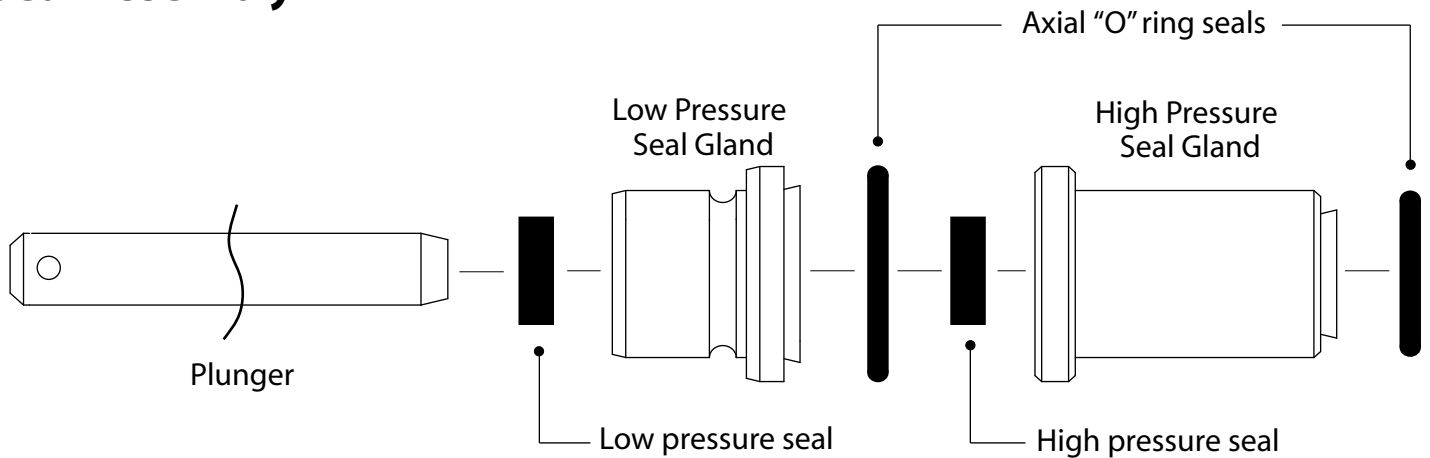
Drive components



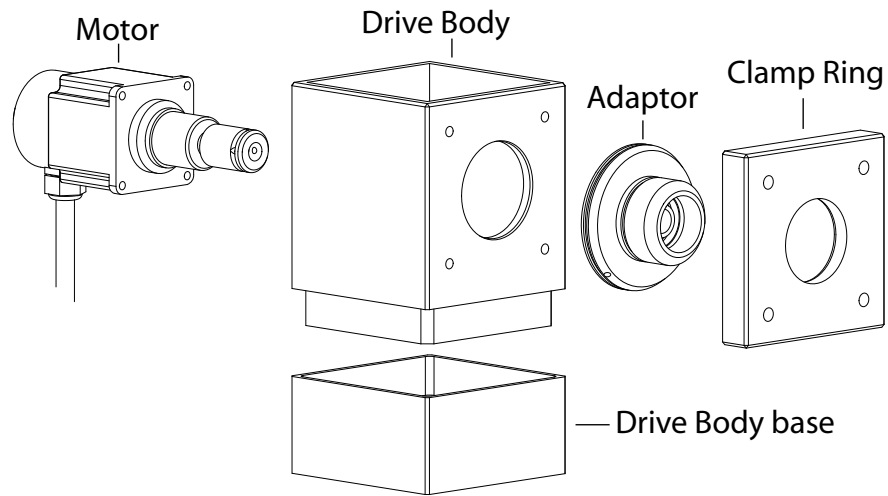
Controller



Seal Assembly



Drive Assembly



General Maintenance Procedures

STEP 1

Turn off the pump drive by pressing the ON/OFF button on the control interface
 Stop the pump at the completion of the suction stroke, this is when the motor shaft is retracted.
 This will allow the most room for working in this area and will ensure the seal gland assembly is least likely to be pressurized.

STEP 2

Remove the fuse and/or disconnect the power supply to the controller

STEP 3

Locate the suction line isolation valve and close

STEP 4

Locate the discharge line isolation valve and close

STEP 5

Open the bleed screw on fluid end to relieve any pressure build up. and to drain any fluid that remains in the pump. MAKE SURE A SUITABLE CONTAINER IS USED TO CAPTURE ANY LOST FLUID

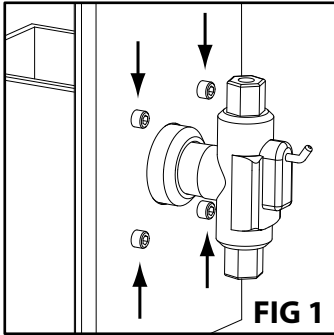
STEP 6

Crack open the suction and discharge lines.

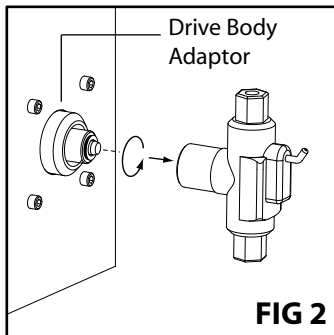
⚠ CAUTION! LINES MAY STILL BE PRESSURIZED

STEP 7

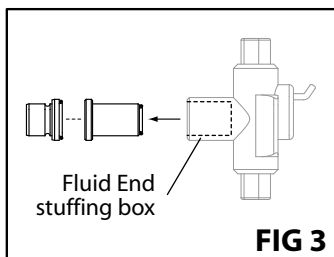
Completely disconnect the suction and discharge lines from the fluid end again making sure all lost fluid is contained

STEP 8

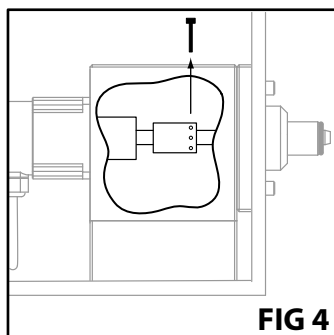
Ensure the four locking bolts on the Drive Body are tight AS SHOWN [FIG1]

STEP 9

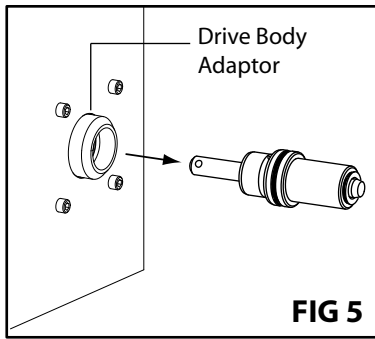
Turn fluid end counter clock-wise to unwind from drive body adaptor AS SHOWN [FIG 2]

STEP 10

Check the fluid end stuffing box to ensure the low pressure seal gland, high pressure seal gland and the axial "O" ring seal integral to the high pressure seal gland been removed. AS SHOWN [FIG 3]
Once removed ensure stuffing box is thoroughly cleaned and set aside for re-use.

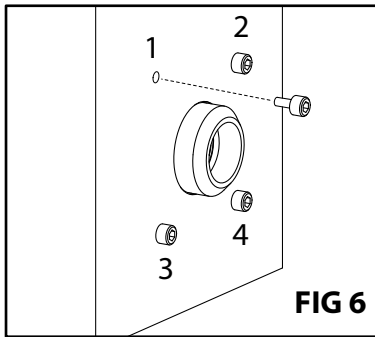
STEP 11

Remove the connecting pin that attaches the plunger to the motor shaft adaptor AS SHOWN [FIG 4]

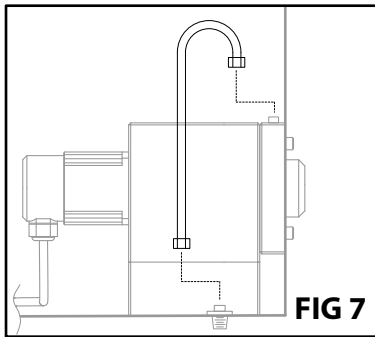
STEP 12

Remove the plunger and remaining seal glands (If any) from the drive body adaptor by pushing the entire assembly out from inside the drive body adaptor. AS SHOWN [Fig 5]

IF DRIVE BODY ADAPTOR SEALS ARE TO BE REPLACED PROCEED AS FOLLOWS, OTHERWISE PROCEED TO STEP 14

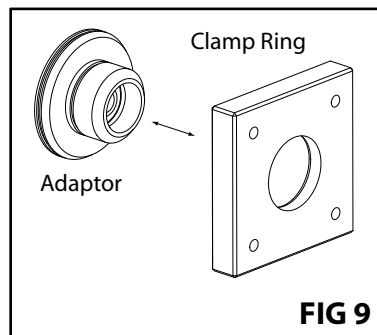
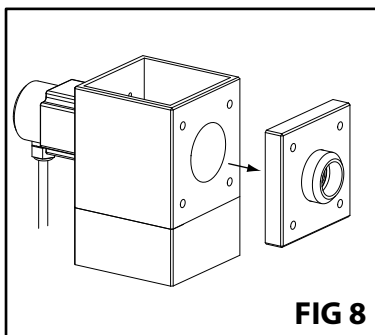
STEP 13

A) Remove all (4) 1/4" Socket head cap screws that are used to retain the Drive body adaptor. AS SHOWN [FIG 6]



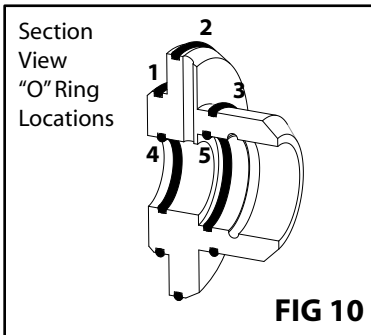
B) Disconnect and remove the secondary containment line. AS SHOWN [FIG 7]
LINE MAY BE FULL OF FLUID. REMOVE WITH CAUTION AND CONTAIN ALL LOST FLUID

C) Slide the entire Drive Body/Motor towards towards the controller in the pump box (left) to ensure adequate room for the following steps:



D) Remove the Clamp ring and adaptor from the drive body. AS SHOWN [FIG 8]

E) Push the adaptor out of the clamp ring AS SHOWN [FIG 9]

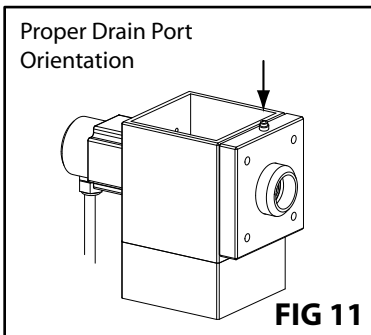
STEP 13 CONTINUED

F) Remove the (2) Internal "O" rings and and the (3) external "O" rings from the adaptor. AS SHOWN [FIG 10]

G) Thoroughly clean and inspect the adaptor

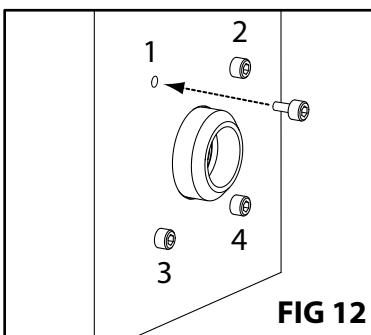
H) Install new set of "O" Rings

I) Insert the adaptor back into the Clamp Ring



J) Place the adaptor and clamp ring assembly back onto the drive body and ensure the drain port in the clamp ring is located in the 12:00 (vertical) position. AS SHOWN FIG 11

K) Slide entire Drive Body/Motor Assembly back into position



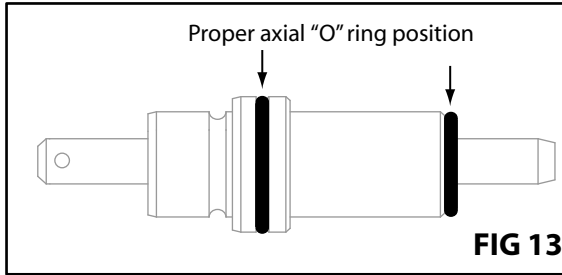
L) Install the (4) 1/4" Socket head cap screws back through the enclosure, clamp ring and into the drive body. AS SHOWN [FIG 12]

M) Temporarily tighten the (4) 1/4" Socket head cap screws

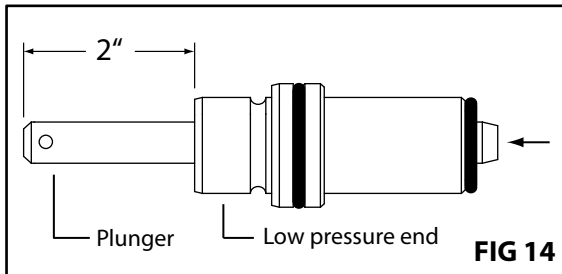
N) Connect the secondary containment drain line and tighten fittings securely.

STEP 14

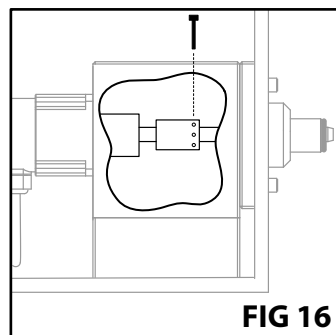
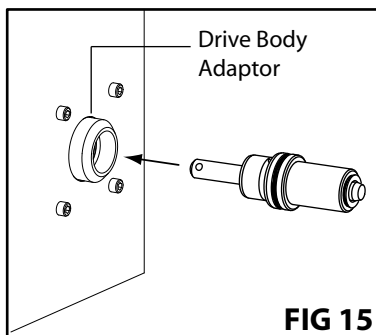
Thoroughly clean the adaptor and make sure the internal "O" rings are properly seated and in good condition.

STEP 15

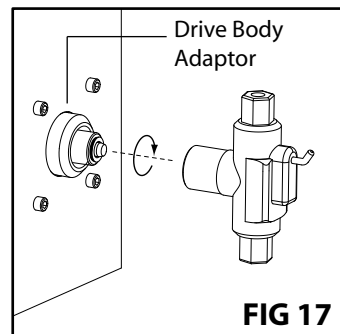
Remove new plunger and seal gland assembly from packaging and inspect for any damages that may have occurred in transit. Ensure the axial "O" ring seals are positioned as per [FIG 13]

STEP 16

Slide the plunger through the seal assembly until 2" of the plunger is protruding past the low pressure end. AS SHOWN [FIG 14] (This allows for easy installation of connector pin in STEP 17)

STEP 17

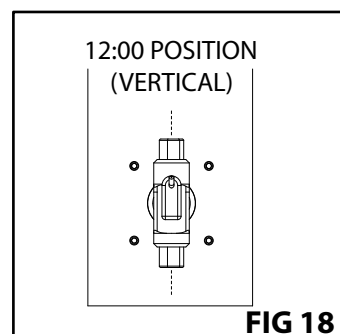
Insert the entire seal assembly into the drive body adaptor. AS SHOWN [FIG 15]
Then install the provided connecting pin through the motor connector and plunger. AS SHOWN [FIG 16] (Rotate plunger if necessary to align motor connector with plunger)

STEP 18

Push the seal glands along the plunger until the low pressure seal gland is flush with the inside of the drive body adaptor

Thread fluid end into the Drive body adaptor (4) AND TIGHTEN COMPLETELY AS SHOWN [FIG 17] **At this time do not worry if fluid end is not in vertical position when tightened, this will be corrected in STEP 19**

- !
IMPORTANT: To prevent leaks ensure fluid end is securely tightened into Drive body adaptor.
- **Failure to engage seals will result in leaks.**

STEP 19

Loosen the four locking bolts that were temporarily tightened in STEP 2. Once loosened rotate fluid end until it is oriented in a 12:00 (vertical) position. AS SHOWN [FIG 18]
When in vertical position re-tighten the four locking bolts to secure fluid end in place.

IF SUCTION AND DISCHARGE CHECK VALVES ARE TO BE REBUILT OR REPLACED DO SO NOW - IF NOT PROCEED TO STEP 26

REFER TO FLUID END MANUFACTURERS INTRUCTIONS FOR THE CORRECT PROCEDURE FOR THIS REBUILD OR REPLACEMENT

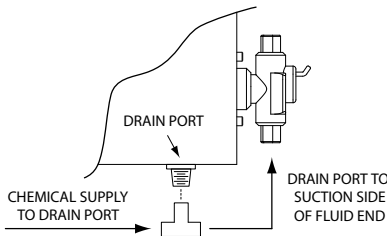
STEP 26

! WARNING!

Only properly qualified and trained personnel should be involved in the setting up, putting into service, inspecting , servicing and repairing of the plumbing for the fluid end.

Ensure National, Provincial/State and local codes are followed when plumbing equipment. Failure to follow these laws can result in serious bodily injury even death.

Connect the suction and discharge lines to the fluid end.



STEP 27

When safe to do so , open the suction and discharge line isolation valves

STEP 28

Refer to the fluid end manufacturers procedure for bleeding air from the fluid end and their recommended startup procedure

STEP 29

Connect the power cable to the controller and re-start the pump when it is safe to do so.
IF AUTO START IS NOT ENABLED YOU WILL NEED TO PUSH THE ON/OFF BUTTON TO BEGIN CYCLING THE PUMP

STEP 30

Determine the injection rate that is required and adjust the velocity accordingly. To do so simply press the ARROW UP key or the ARROW down key until the desired stroke per minute display setting is achieved

STEP 31

Double check injection rates using a calibrated tank/barrel gauge to ensure the pump is circulating fluid and is not air locked.

REPLACING THE CONTROLLER

Before connecting power to the control board ensure that you are clear of all moving parts, serious injuries can occur. MACHINE CAN START AUTOMATICALLY



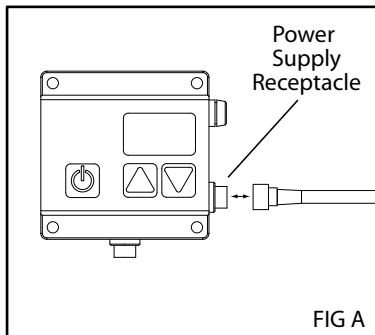
When attaching/re-attaching the power supply cord to the controller, ensure connections are fully made up and tightened.

LOOSE CONNECTIONS CAUSE ARCING AND EROSION OF THE PINS WHICH DESTROY THE INTEGRITY OF THE CONNECTIONS

STEP 1

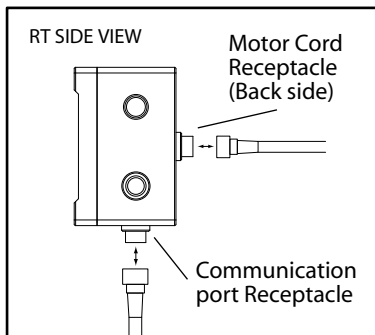
Turn off the pump by pressing the ON/OFF button.

STEP 2



Disconnect the power cord AS SHOWN [FIG A]

STEP 3



Disconnect the motor cord and/or the remote communication port.
NEVER DISCONNECT THE MOTOR CORD OR COMMUNICATION PORT WHEN THE CONTROLLER IS POWERED UP. THIS CAN DAMAGE THE ELECTRONICS

STEP 4

Replace worn controller with new controller

STEP 5

Connect the motor cord and/or the remote communication port

STEP 6

Connect the power cord and press the ON/OFF button to begin cycling the pump

ATTENTION: MOTOR CAN START AUTOMATICALLY USE CAUTION WHEN ATTACHING POWER CORD

REPLACING THE MOTOR



Before attempting a motor change ensure the power to the controller and the motor are disconnected. **MACHINE CAN START AUTOMATICALLY**



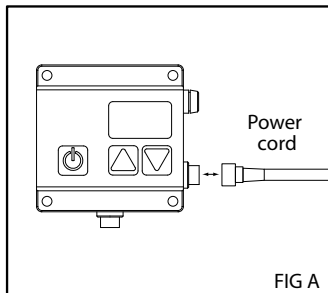
When attaching/re-attaching the power supply cord to the controller box ensure connections are fully made up and tightened.

LOOSE CONNECTIONS CAUSE ARCING AND EROSION OF THE PINS WHICH DESTROY THE INTEGRITY OF THE CONNECTIONS

STEP 1

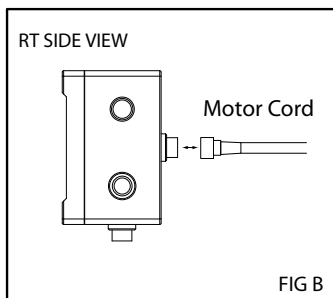
Turn off the pump by pressing the ON/OFF button.

STEP 2



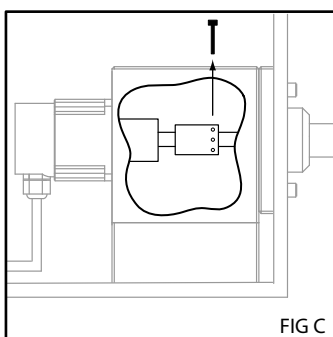
Disconnect the power cord AS SHOWN [FIG A]

STEP 3



Disconnect the motor cord. AS SHOWN [FIG B]
NEVER DISCONNECT THE MOTOR CORD OR COMMUNICATIN PORT WHEN THE CONTROLLER IS POWERED UP. THIS CAN DAMAGE THE ELECTRONICS

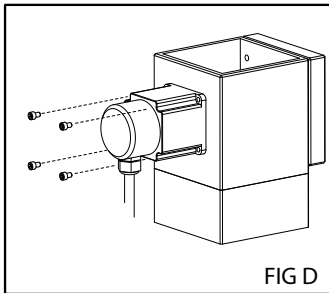
STEP 4



Remove the connecting pin that attaches the plunger to the motor shaft adaptor AS SHOWN [FIG 4]

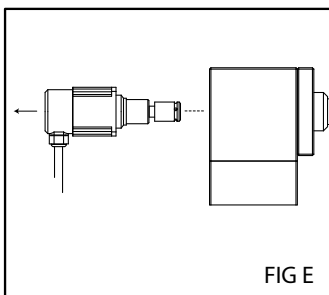
REPLACING MOTOR (Continued)

STEP 5



Remove all (4) motor mount screws from the drive body assembly.
AS SHOWN [FIG D]

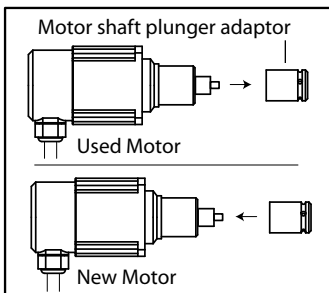
STEP 6



Remove motor from drive body assembly.
AS SHOWN [FIG E]

If your replacement motor has been supplied with a motor shaft plunger adaptor skip the next step and proceed with STEP 8

STEP 7



Unscrew motor shaft plunger adaptor from the used motor by turning it counter clockwise.
Once removed inspect it for any damages and thoroughly clean the adaptor.
Next, thread the adaptor onto replacement motor by turning clockwise until tightened. AS SHOWN [FIG F]

STEP 8

Attach motor to drive body assembly with motor cord oriented towards the base of the enclosure

STEP 9

Install and tighten all (4) motor mount screws to secure motor to drive body

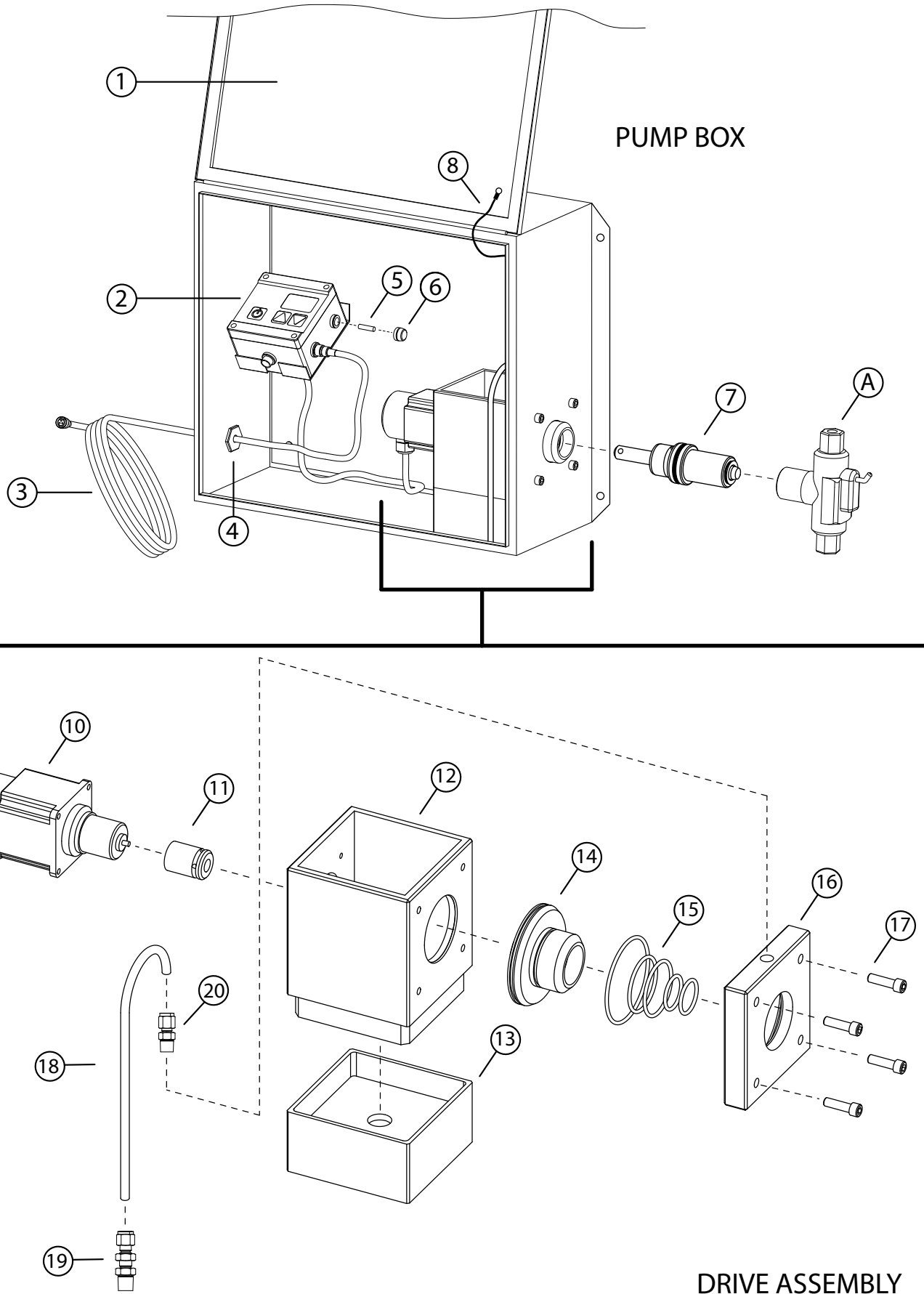
STEP 10

Re-connect the motor cord to the controller box

STEP 11

Re-connect the power cord and press the ON/OFF button to begin cycling the pump. **ATTENTION: MOTOR CAN START AUTOMATICALLY USE CAUTION WHEN ATTACHING POWER CORD**

ITEM LIST



SPARE PARTS ORDER - ITEM LIST

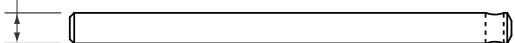
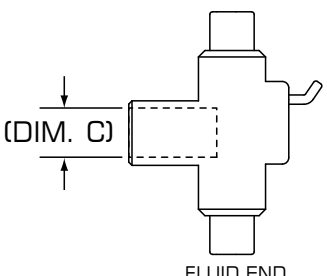
Only the use of original MCI SOLUTIONS spare parts will ensure proper operation, reliability and long service life.

To ensure accurate and prompt parts delivery, the following information must be provided when ordering parts:

- Serial Number (Found on front cover of pump box enclosure)
- Model Number (Found on front cover of pump box enclosure)
- Item Number (Separate Part Number required for all seal assembly orders (SEE ITEM 7 BELOW))
-

ITEM LIST

1	Chemical Injection System Enclosure
2	Controller Module
3	Power cord
4	Power Cord Strain relief
5	Replacement Fuse
6	Fuse Cover

7	<p>Complete Seal Assembly</p> <p>MCI SOLUTIONS has a variety of seal assemblies to suit different plunger diameters and to suit most conventional positive displacement fluid ends.</p> <p>Please use this part number key to easily identify required seal assembly.</p> <p>When ordering please provide part number from the part key below:</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>PLUNGER DIAMETER (DIM. A)*</p> <table border="1"> <tr> <td>4</td> <td>1/4" PLUNGER</td> </tr> <tr> <td>6</td> <td>3/8" PLUNGER</td> </tr> <tr> <td>8</td> <td>1/2" PLUNGER</td> </tr> </table> </div> <div style="text-align: center;"> <p>(DIM. A)*</p>  <p>PLUNGER</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> <p>GLAND HOUSING DIAMETER (DIM. C)</p> <table border="1"> <tr> <td>6</td> <td>3/4" DIAMETER</td> </tr> <tr> <td>7</td> <td>7/8" DIAMETER</td> </tr> <tr> <td>8</td> <td>1.0" DIAMETER</td> </tr> </table> </div> <div style="text-align: center;"> <p>(DIM. C)</p>  <p>FLUID END</p> </div> </div> <p>Part # : Z - [] - A - []</p>	4	1/4" PLUNGER	6	3/8" PLUNGER	8	1/2" PLUNGER	6	3/4" DIAMETER	7	7/8" DIAMETER	8	1.0" DIAMETER
4	1/4" PLUNGER												
6	3/8" PLUNGER												
8	1/2" PLUNGER												
6	3/4" DIAMETER												
7	7/8" DIAMETER												
8	1.0" DIAMETER												

Part # Example: Z - 4 - A - 6 - This part number would order a seal assembly with a plunger diameter of 1/4" and would fit a fluid end with a gland housing diameter of 3/4" inches.

ITEM LIST

8	Ground Cable
9	Motor Mount Screws
10	Replacement Motor
11	Motor Shaft Plunger Adaptor
12	Drive Body
13	Drive Body Base
14	Secondary Containment Adaptor
15	Static "O" Ring Seal kit for ITEM 14
16	Clamp Ring
17	Clamp Ring mount screws
18	Secondary Containment line
19	Bulkhead Fitting (Attaches ITEM 18 to Suction Line of Fluid End)
20	Tube fitting (Attaches ITEM 18 to ITEM 16)

OPTIONAL ITEMS

A	Fluid End Contact MCI SOLUTIONS at: +1.250.263.0977 for more details on models offered. www.mcisolutions.ca
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CONTACT MCI SOLUTIONS FOR SPARE PARTS, DIAGNOSTIC ANALYSIS AND/OR TECHNICAL SUPPORT:

MCI SOLUTIONS - Corporate Headquarters
 SS2, Site 26, Comp. 2
 8540 Old Fort Road
 Fort St. John, B.C.
 V1J 4M7

Telephone: (250) 263.0977

Fax: (250) 263.0978

E-mail: mike@mcisolutions.ca

E-mail: chris@mcisolutions.ca

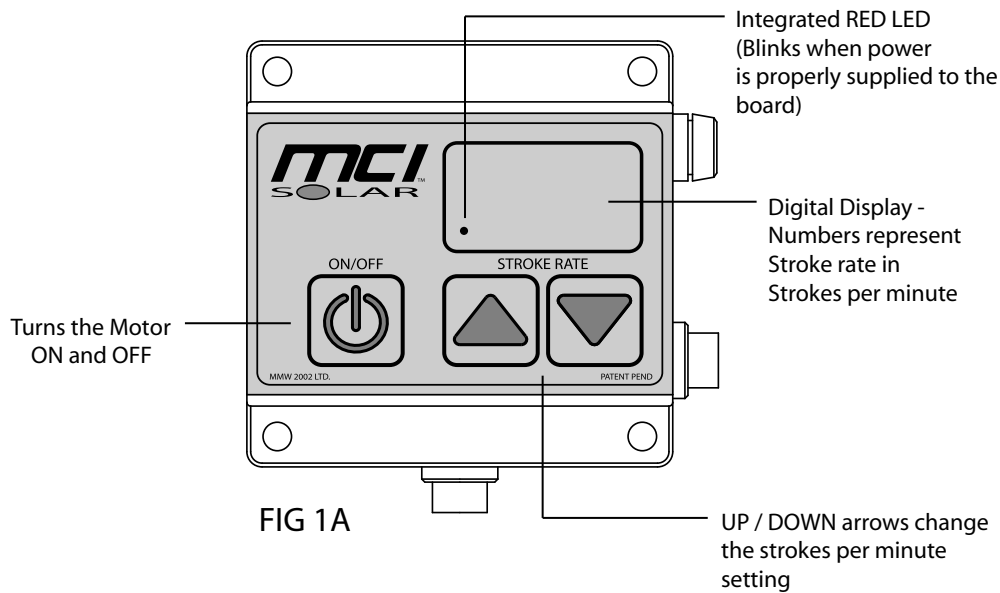
OPERATING INSTRUCTIONS

Please ensure you have fully read and understood all sections of this manual before proceeding with operation of this equipment.

MCI SOLUTIONS simple interface has been designed to simplify the process of setting and adjusting the chemical injection drive.

This section has been added to explain how to use the 3-button controller

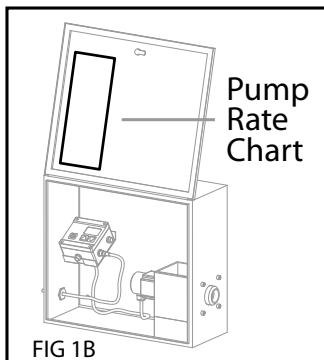
CONTROLLER OVERVIEW



STEP 1

- Determine the diameter of fluid end Plunger [INCH]
- Determine model of pump. This can be found on the CSA label located on the front cover of the pump box enclosure. i.e. 3401

STEP 2



Locate the PUMP RATE CHART found on the inside of the pump box access panel LOCATION SHOWN [FIG 1B]

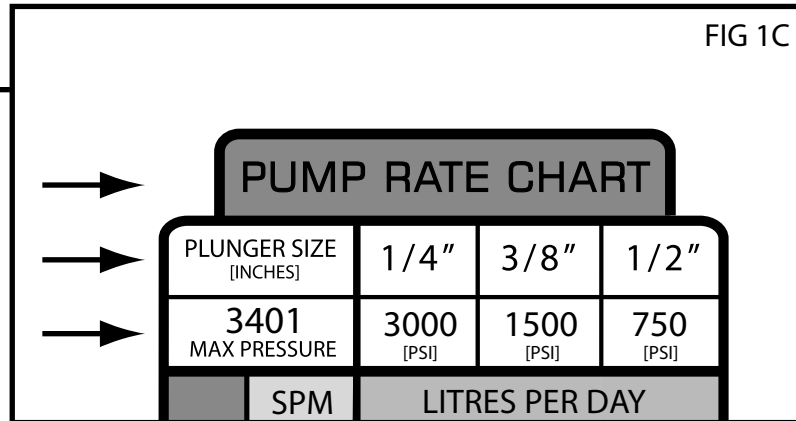
STEP 3

View pump rate chart and ensure the discharge pressure is within the maximum pressure range for given model number and plunger diameter. AS SHOWN [FIG 1C]

PUMP RATE CHART				
PLUNGER SIZE (INCHES)	1/4"	3/8"	1/2"	
3401 MAX PRESSURE	3000 (PSI)	1500 (PSI)	750 (PSI)	
SPM	LITRES PER DAY			
0.1	0.12	0.26	0.46	
0.2	0.23	0.52	0.93	
0.3	0.35	0.78	1.4	
0.4	0.46	1.0	1.9	
0.5	0.58	1.3	2.3	
1.0	1.2	2.6	4.6	
1.5	1.7	3.9	7.0	
2.0	2.3	5.2	9.3	
2.5	2.9	6.5	11.6	
3.0	3.5	7.8	13.9	
3.5	4.0	9.1	16.2	
4.0	4.6	10.4	18.5	
4.5	5.2	11.7	20.8	
5	5.8	13.0	23.2	
5.5	6.4	14.3	25.5	
6	7.0	15.6	27.8	
6.5	7.5	16.9	30.1	
7	8.1	18.24	32.4	
7.5	8.7	19.6	34.8	
8	9.3	20.8	37.1	

STROKES PER MINUTE

PUMP OUTPUT IN LITRES/DAY BASED ON 1 INCH (25.4mm) STROKE LENGTH



Example: 1/4" Plunger and Model 3401 injection system has a MAXIMUM operating discharge head pressure of 3000 PSI

DO NOT EXCEED MAXIMUM OPERATING PRESSURE

STEP 4

PUMP RATE CHART				
PLUNGER SIZE (INCHES)	1/4"	3/8"	1/2"	
3401 MAX PRESSURE	3000 (PSI)	1500 (PSI)	750 (PSI)	
SPM	LITRES PER DAY			
0.1	0.12	0.26	0.46	
0.2	0.23	0.52	0.93	
0.3	0.35	0.78	1.4	
0.4	0.46	1.0	1.9	
0.5	0.58	1.3	2.3	
1.0	1.2	2.6	4.6	
1.5	1.7	3.9	7.0	
2.0	2.3	5.2	9.3	
2.5	2.9	6.5	11.6	
3.0	3.5	7.8	13.9	
3.5	4.0	9.1	16.2	
4.0	4.6	10.4	18.5	
4.5	5.2	11.7	20.8	
5	5.8	13.0	23.2	
5.5	6.4	14.3	25.5	
6	7.0	15.6	27.8	
6.5	7.5	16.9	30.1	
7	8.1	18.24	32.4	
7.5	8.7	19.6	34.8	
8	9.3	20.8	37.1	

STROKES PER MINUTE

PUMP OUTPUT IN LITRES/DAY BASED ON 1 INCH (25.4mm) STROKE LENGTH

Choose the optimal output volume from the litres per day (dark grey) columns for your specified plunger size

When you have chosen a volume determine the Stroke per minute setting for that volume by looking to the far left column on the same row (light grey). AS SHOWN [FIG 1D]

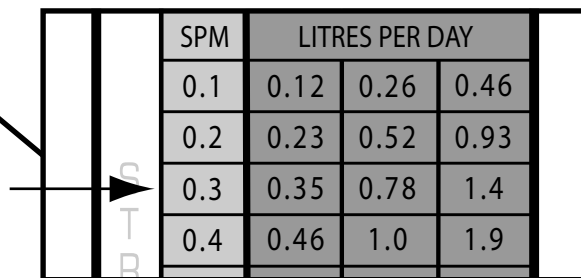


FIG 1D

Example: To achieve 0.35 LPD with a 1/4 Plunger. The strokes per minute setting is 0.3 SPM.

STEP 5

Ensure all cables are attached to the controller as per installation instructions. Once the power cord is properly attached you should see a blinking red LED in the bottom left of the display screen LED LOCATION SHOWN IN FIG 1A

Press the ON/OFF button to begin cycling pump if it does not have an autosart function. The pump should begin cycling.

Next, Press the UP / DOWN Arrows on the controller until the desired Strokes Per Minute setting is displayed.

That is all there is to setting up this chemical injection system.

If at anytime you wish to change the volume/Strokes per minute setting, simply press the UP / DOWN arrow keys which will activate the digital display (Display shuts off after 5 seconds with no activity to conserve power). Push the UP / DOWN arrow keys a second time within 5 seconds to make adjustments.

STEP 6

It is recommended to check injection rates using a calibrated tank/barrel gauge to ensure the fluid end is circulating fluid and is not air locked.

Read the instructions in this manual carefully before installing or starting the system. MCI SOLAR MFG will accept no liability for damages due to non-observance of this manual.

⚠ CAUTION!

If the instructions in this operating manual are not adhered to or are inadequately adhered to, there shall be no entitlement to services under the warranty and the CSA declaration of conformity shall cease to be valid

Information in this manual is subject to change without notice and does not represent a commitment on the part of MCI SOLAR MFG LTD.