



EZ Series
Electronic Metering Pump
Instruction Manual



Notice

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1.0 Introduction

1.1 Welcome

Thank you for choosing an Iwaki Walchem EZ Series metering pump. This instruction manual deals with the correct installation, operation, maintenance and troubleshooting procedures for the EZ model metering pumps. Please read through it carefully to ensure the optimum performance, safety and service of your pump.

See our web site at www.walchem.com for additional product information and related accessories.

1.2 Safety and Caution Notes

Connect the pump to a **GROUND**ED outlet providing proper voltage. (115 V AC for models with electrical code **1** or 230 V AC for models with electrical code **2**.)

Avoid areas where ambient temperature exceeds 122°F (50°C) or falls below 32°F (0°C), or where the pump or tubing would be exposed to direct sunlight.

Disconnect the pump from electrical power source before performing any maintenance.

When working on or around a metering pump, always wear proper protective clothing and equipment as recommended by the supplier of the liquid being pumped.

Depressurize the discharge tubing before disconnecting the tubing or performing any maintenance on the pump.

1.3 Principle of Operation

The EZ series electronic metering pump consists of a pump unit, a drive unit, and a control unit. The drive unit is an electromagnetic solenoid. When the solenoid coil is energized by the control unit the armature shaft moves forward due to the magnetic force of the solenoid. The shaft is attached to a PTFE faced diaphragm which is part of the pump unit. The diaphragm is forced into the pump head cavity decreasing volume and increasing pressure which forces liquid in the pump head out through the discharge check valves. When the solenoid coil is de-energized, a spring returns the armature to its starting position. This action pulls the diaphragm out of the head cavity increasing volume and decreasing pressure. Atmospheric pressure then pushes liquid from the supply tank through the suction check valves to refill the pump head.

1.4 Specifications

Capacity/Pressure Rating

Size	Maximum Output Capacity		Output per Stroke (mL) (Fixed)	Maximum Pressure		Connection Size (in) Tubing O.D.
	(Gal/hr)	(mL/min)		PSI	MPa	
B10	0.6	38	0.11	150	1.0	3/8
B15	1.0	65	0.18	105	0.7	3/8
B20	1.5	95	0.26	60	0.4	3/8
B30	3.2	200	0.56	30	0.2	1/2

Adjustment Range

Recommended frequency adjustment range

0 to 360 strokes per minute

Materials of Construction

Liquid End Code	Pump Head & Fittings	Diaphragm	Valve Balls	Valve Seat	Valve Seals	Gasket	Tubing
FC	PVDF	PTFE (bonded to EPDM)	CE	PCTFE	PTFE	PTFE	PE
PC	GFRPP			FKM	FKM		
PE	GFRPP			EPDM	EPDM		
VC	PVC			FKM	FKM		
VE	PVC			EPDM	EPDM		

CE Alumina ceramic

EPDM Ethylene propylene diene monomer

FKM Fluoroelastomer

GFRPP Glass fiber reinforced polypropylene

PCTFE Polychlorotrifluoroethylene

PE Polyethylene

PTFE Polytetrafluoroethylene

PVC Polyvinylchloride (translucent)

PVDF Polyvinylidene fluoride

Electrical

50/60 Hz, single phase

EZB-N1- 115 VAC \pm 10% 0.9 Amp max. 16 watt avg.

EZB-N2 230 VAC \pm 10% 0.3 Amp max. 16 watt avg.

Operating Conditions

Ambient temperature 32°F to 122°F (0°C to 50°C)

Relative humidity 30% to 90% non-condensing

2.0 INSTALLATION

2.1 Unpacking

Open the shipping carton and inspect contents for damage. If any items are missing or damaged contact your local distributor to arrange for replacement.



Pumps are pre-primed with water at the factory. If the application is not compatible with water, drain and dry before use. Be sure to remove caps from fittings before attaching tubing.

Caution: Head bolts may have loosened during storage or shipment. Be sure to tighten to 19 lb-in torque.

2.2 Location

Choose a location for the pump which is clean, dry, close to an electrical outlet, and allows convenient access to frequency control and tubing connections. Avoid areas where ambient temperature exceeds 122°F (50°C) or falls below 32°F (0°C), or where the pump or tubing would be exposed to direct sunlight. Flooded suction (mounting the pump below the level of liquid in the supply tank) is strongly recommended, especially when pumping liquids that readily generate gas bubbles. Sodium hypochlorite and hydrogen peroxide are common examples of such liquids. (See Figure 1.)

If flooded suction mounting is not possible, a shelf adjacent to (but not directly above) the supply tank often works well. (See Figure 2.) The supply tank or cover can also be used if it has provisions for mounting a pump. (See Figure 3.) In any case, the total suction lift should not exceed 5 ft (1.5m).

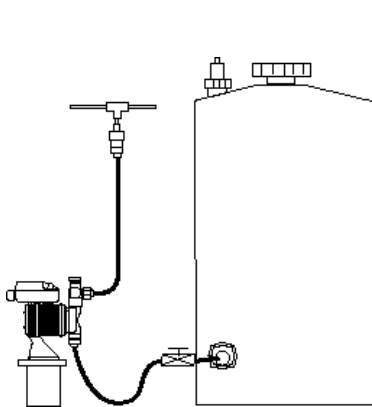


Figure 1
Flooded Suction

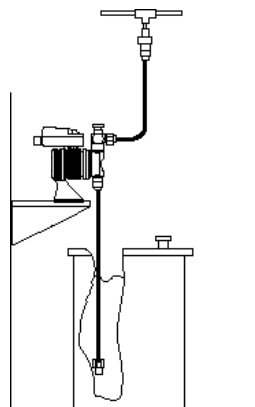


Figure 2
Shelf Mount

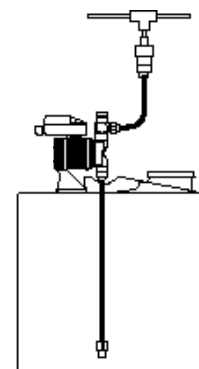


Figure 3
Tank Mount

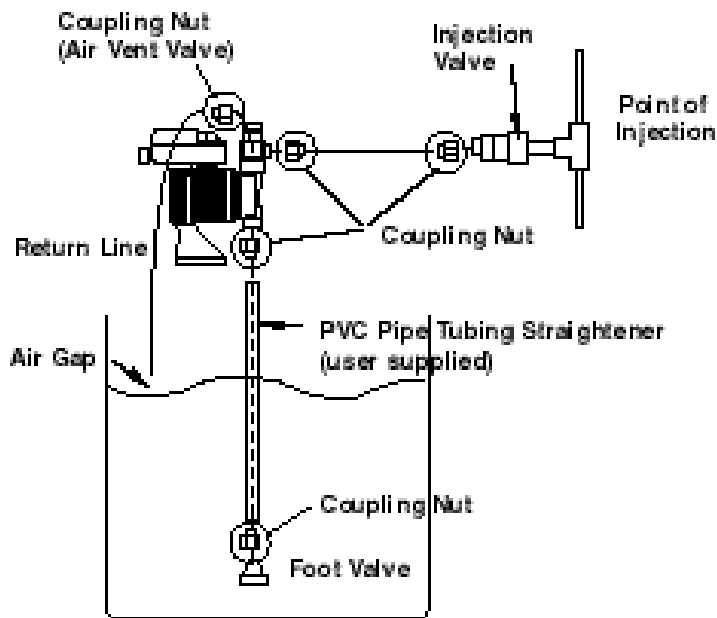


Figure 4 Connecting Tubing

2.3 Supply tubing

The supply tubing run should be as short as possible. For flooded suction mounting, install a shut-off valve with an appropriate tubing connector at the tank outlet. Cut a length of tubing from the coil supplied and install between the shut-off valve and the pump inlet fitting. For suction lift applications, install a foot valve on one end of suction tubing and cut the tubing to a length such that the foot valve hangs vertically about 1 in (25mm) above the bottom of the tank. Avoid any loops in the tubing run that could form a vapor trap. Running the tubing through a length of PVC pipe will help to keep tubing straight. Total vertical suction lift should be no more than 5 ft (1.5 m).

Attach tubing as shown in fig. 5 below. First slide the coupling nut, small end first, onto the tubing. Push the tubing over the valve housing tip *all the way to the valve housing shoulder*. (Tip: if the tubing is stiff from cold, dip the tubing end in hot tap water for a few minutes so it will slide on and flare out more easily.) Push the coupling nut onto the threads. Apply some pressure on the coupling nut and tubing while tightening the nut, making sure the tubing has not backed off of the shoulder of the valve housing.

Warning: all fittings and coupling nuts should be tightened by hand. If necessary, small pliers may be used to make it snug. DO NOT use excessive force or large wrenches.

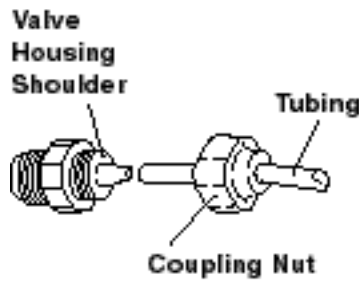


Figure 5 Attach Tubing

2.4 Discharge tubing

Cut a length of tubing long enough to go from the pump to the application (injection) point. Additional tubing can be ordered from your distributor. Avoid sharp turns or bends and hot surfaces. Routing tubing through rigid pipe such as PVC pipe is recommended for long runs and/or as protective shielding against corrosive chemicals. If applicable, install the injection valve in 1/2" NPT thread at the injection point (see section 2.5) and connect the discharge tubing to the injection valve.

Attach the tubing as described in section 2.3 and as shown in Figures 5 and 6. Note: Some models have an air vent valve with two outlet connections. The connection marked "OUT" is the discharge side to the application point. (Fig. 6.) Attach a second length of tubing to the air vent side (marked "AIR") and route back to the chemical solution tank or drum.

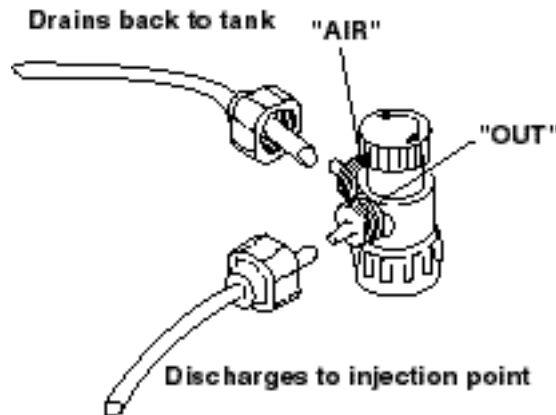


Figure 6 Air Vent Valve Tubing

2.5 Installing Injection/Back Pressure Valve

A fitting or tee with 1/2" NPTF threads and with sufficient depth will accept the injection valve assembly. If required, trim off an amount of the extension tip until it fits your fitting or tee. (Fig. 7.)

The position of the injection/back pressure valve can be at any orientation as long as the spring is retained in the valve. **DO NOT REMOVE THE SPRING.** Be sure to check and replace the spring as needed. Attach the tubing following the same instructions in section 2.3, connecting the supply tubing.

In addition to preventing backflow from pressurized lines, the injection valve acts as a back pressure valve when pumping into atmosphere or low pressure applications.

IMPORTANT: Always install the injection/back pressure valve at the end of the discharge tubing to prevent over-pumping in atmospheric or low pressure situations.

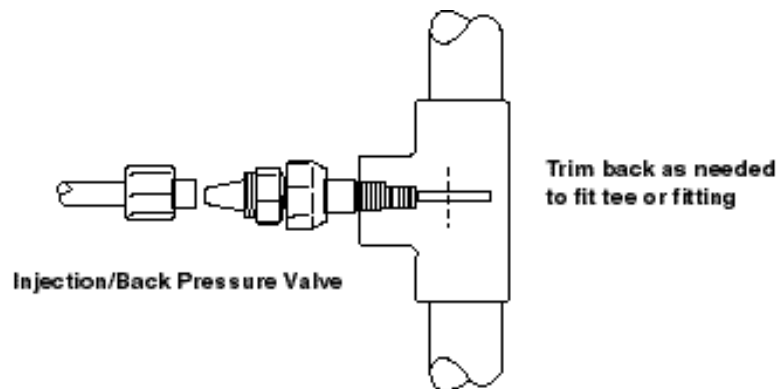


Figure 7 Injection Valve

See Bulletin E00015 for complete liquid ends parts list and exploded view.

2.6 Electrical

Connect the pump power cord to a **GROUND**ED outlet supplying proper voltage. Avoid branch circuits that also supply power to heavy machinery or other equipment that could generate electrical interference.

3.0 OPERATION



3.1 Priming

Install the pump as described above. With the pump turned on, set frequency at 100%. If the pump is equipped with an air vent valve, open the knob 1/2 turn. Liquid should move through the suction tubing and into the pump head. When liquid starts running through the vent tubing, close the air vent knob and continue with output adjustment described below. If the pump has no air vent valve, disconnect the discharge tubing from the injection valve. When liquid enters the discharge tubing at the pump head, set frequency to 0% to stop the pump and reconnect the discharge tubing to the injection valve.

Note: Pumps with FC liquid ends should use flooded suction when priming, due to the hard valve seat material.

3.2 Adjustment

If less than full output is required, set the frequency to the approximate percentage of maximum desired.

Example: Model EZB20N1-VE has maximum output of 1.5 GPH. Desired output is 1.2 GPH. $1.2 \div 1.5 = 0.8$ or 80%, so set frequency knob at 80.

3.3 Calibration

If exact output calibration is required, first prime and adjust the pump as above. Then connect a calibration column to the suction side of the pump. Turn the pump on for one minute and read the amount of liquid pumped from the column. Adjust the frequency up or down as necessary and check the output again. When the desired output is reached, disconnect the calibration column and reconnect the suction tubing. (See Figure 8.)

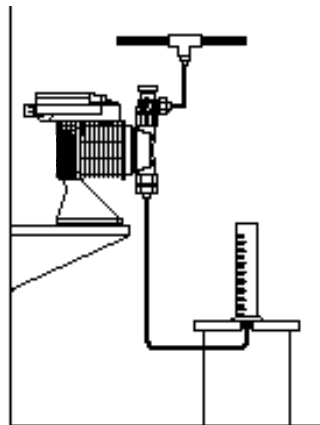


Figure 8 Calibration

4.0 Maintenance



Caution: Before working on the pump, disconnect the power cord, depressurize the discharge tubing and drain or flush any residual liquid from the pump head and valves.

4.1 Diaphragm Replacement

Remove the power cord from the electrical outlet and disconnect the suction tubing, discharge tubing, and air vent tubing. Remove the four head bolts with a 4mm or 5mm hex wrench. Unscrew the diaphragm and remove its retainer (small disk behind the diaphragm). Install the new retainer and diaphragm on the shaft. Turn the diaphragm clockwise until it bottoms on the shaft. Replace the pump head and tighten the head bolts to a torque of 19 lb-in (2.16 N-m).

4.2 Valve Replacement

Make sure the discharge side has been depressurized. Remove the supply (suction) and discharge tubing. Remove the suction fitting, two valve cartridges, o-ring and gasket(s). Install the new o-ring, gasket(s) and valve cartridges. Be sure both valve seats are in the same orientation. Refer to Figure 9, below. Tighten the suction fitting. Similarly remove and replace the discharge valve cartridges, o-ring and gasket(s).

Note: Refer to bulletin E00015 for complete parts list and exploded view.

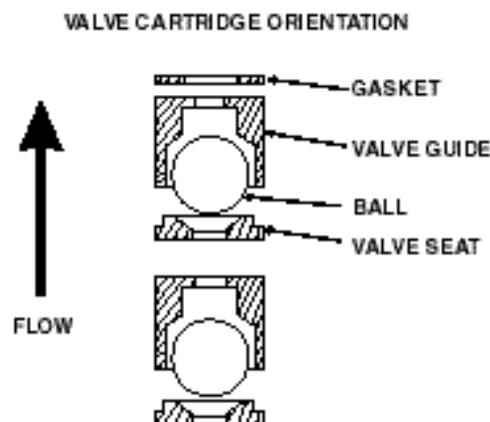


Figure 9
Valve Cartridge Orientation

4.3 Tubing

Check ends of tubing for splits, cracks, or thin spots. Examine the full length of tubing for damage due to chafing, abrasion, stress cracks, excessive temperature or exposure to ultraviolet light (direct sunlight or mercury vapor lamps). If any signs of deterioration exist, replace the entire length of tubing. It is a good idea to replace discharge tubing on a regular preventive maintenance schedule every 12 months.

5.0 Troubleshooting

Caution: Before working on the pump disconnect the power cord, depressurize the discharge tubing and drain or flush any residual liquid from the pump head and valves.

<u>Problem</u>	<u>Possible Cause</u>	<u>Corrective Action</u>
<i>Pump does not start</i>	Faulty wiring	Correct wiring
	Improper voltage	Connect to proper voltage source
	Electronic control unit is damaged	Replace control unit
<i>Pump does not prime</i>	Air in suction tubing	Reroute suction tubing to eliminate air trap
	Valve gasket is not installed	Install valve gasket
	Valve set assembly direction is wrong.	Reassemble valve set
	Pump is air locked	Open air vent valve
	Suction or discharge valve is clogged with foreign matter	Disassemble, inspect, clean
Ball stuck to valve seat	Disassemble, inspect, clean	

<u>Problem</u>	<u>Possible Cause</u>	<u>Corrective Action</u>
<i>Output fluctuates</i>	Suction or discharge valve is clogged with foreign matter	Disassemble, inspect, clean
	Air is trapped in pump	Open air vent valve
	Overfeeding	Install injection valve or back pressure valve
	Diaphragm is damaged	Replace diaphragm
<i>Liquid leaks</i>	Fitting or coupling nut is loose	Tighten
	Pump head is loose	Tighten pump head bolts Torque: 19 lb-in (2.16 N-m)
	Diaphragm is damaged	Replace diaphragm
	O-ring or valve gasket missing	Install o-ring or valve gasket

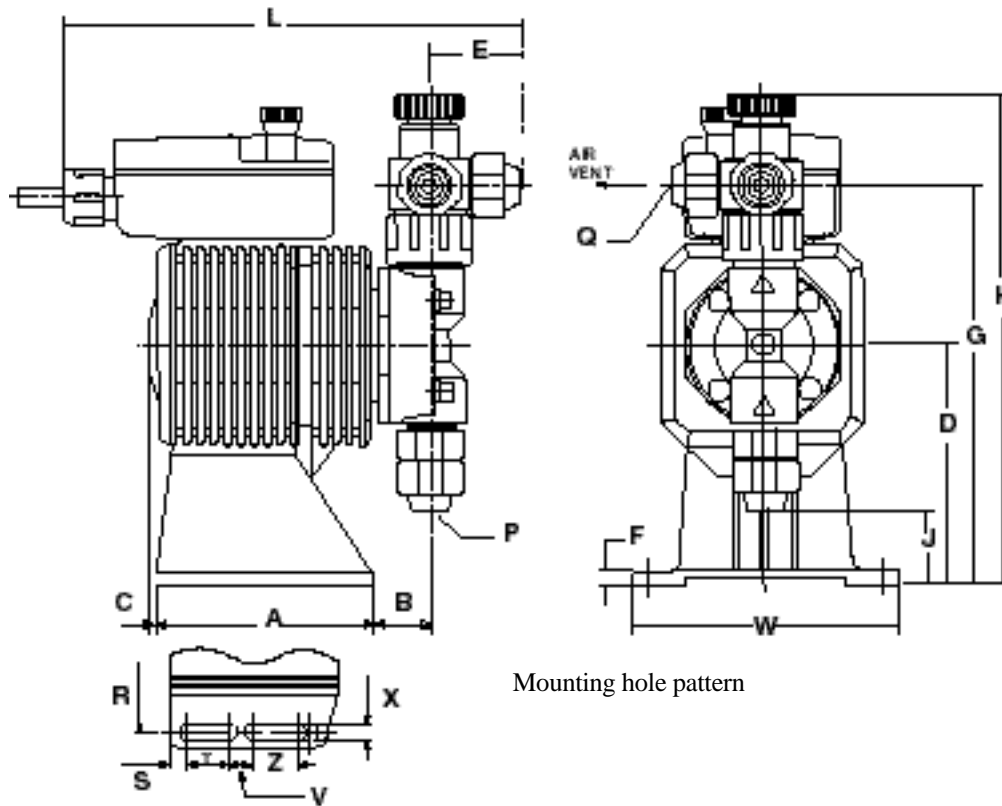
6.0 Model Code, Dimensions & Exploded View

6.1 Model Code

1
2
3
4
5
6
EZ
B15
N
1
-
VC
A

- 1 Pump Series
EZ Electronic metering pump with manual speed control (adjustable to 360 strokes per minute)
- 2 Capacity/Pressure Rating (See Section 1.4 for detailed chart.)
- 3 Control Module
N For all EZB models, fixed stroke length only.
- 4 Voltage
1 115 VAC, 50/60 Hz
2 230 VAC, 50/60 Hz
- 5 Liquid End (See Section 1.4 for detailed chart.)
- 6 Feature (optional)
A Automatic air vent installed, available on EZB10N1-VC and EZB15N1-VC only.

6.2 Dimensions



Mounting hole pattern

Model	A	B	C	D	E	F	G	H	J	L	P&Q tubing	W		
EZB 10 15 20	N1 N2	- VC	3.21	0.87	0.08	3.54	1.38	0.20	5.91	7.24	1.10	6.81	3/8" O.D.	3.94
		- VE												
		- PC - PE												
EZB 15 20	N1 N2	- FC	3.21	0.87	0.08	3.54	0.47	0.20	5.96	6.63	0.35	5.75	3/8" O.D.	3.94
		- VC - VE - PC - PE - FC												
EZB 30	N1 N2	- VC - VE - PC - PE - FC	3.21	1.02	0.08	3.54	0.63	0.20	6.73	6.63	0.35	6.22	1/2" O.D.	3.94

* Dimension with automatic air vent valve option

Mounting dimensions	R	T	Z	X
EZ all variations	3.46	0.63	1.26	0.24

All dimensions in inches

7.0 Service Policy

The EZ Series electronic metering pumps have a 2-year warranty on the entire pump.

Factory authorized repairs which are received by next-day-air (freight pre-paid) will be returned within 48 hours. Normal priority for returns is two weeks.

Out of warranty repairs are done on a flat fee (plus parts) basis after the warranty is expired.