

WILKERSON®

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Installation & Service Instructions
83-130-000

Electronic Regulator
Model ER1 / ER2

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⚠ WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

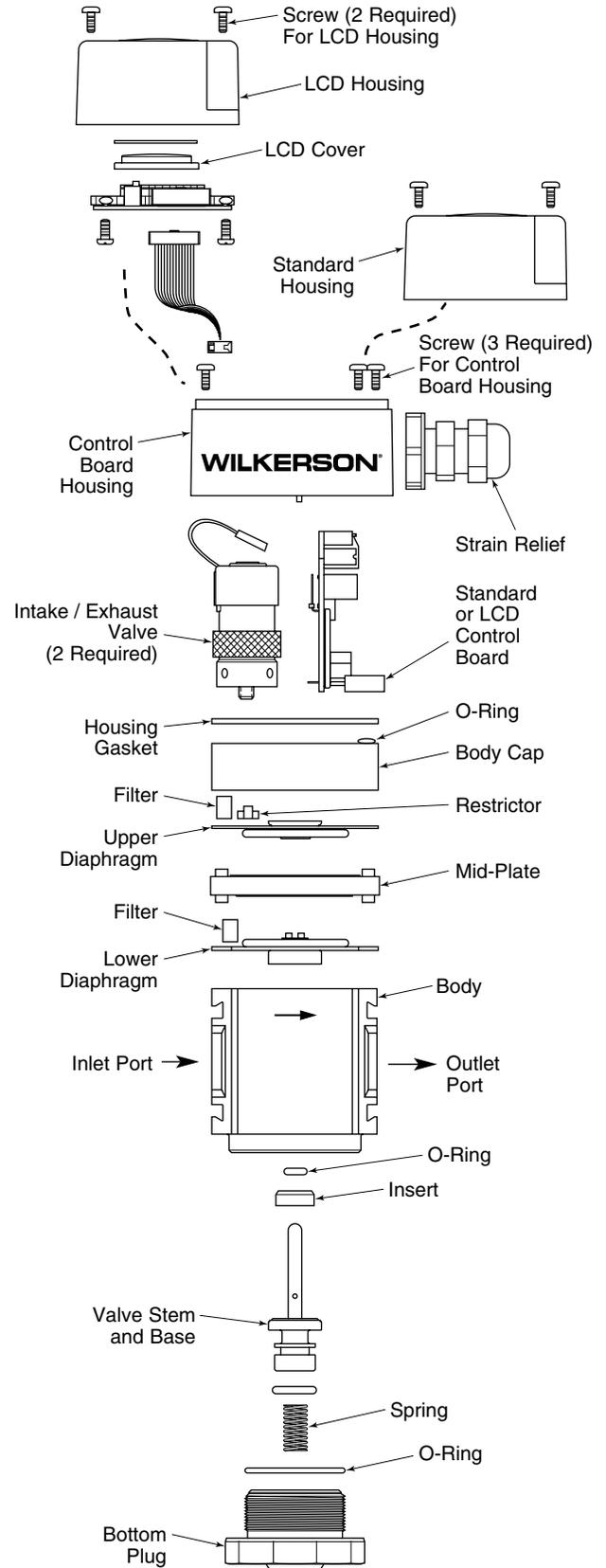
⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from The Company, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by The Company and its subsidiaries at any time without notice.

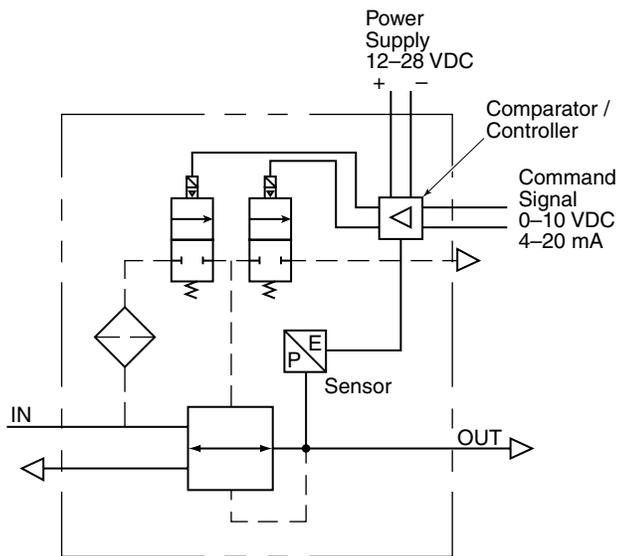
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Description

The ERI and ER2 are high flow electro-pneumatic regulators capable of delivering accurate pressures over a wide range of flows. The units have a variety of port sizes, ranging from 1/4 inch to 3/4 inch NPT and “G” series threads and use the convenient Wilkerson 18/28 series modular mounting. The ER series consists of an integral system of two control valves and feedback transducer to provide closed-loop control. In addition the units come with an optional LCD display that displays the outlet pressure in psig or bar.

The ER series regulators are controlled by either a 0–10 VDC or 4–20 mA external input signal, or by internal adjustment for stand-alone operation. The control signal is compared to the output signal of the internal pressure sensor and the regulator adjusts the pressure accordingly. The pressure sensor signal is also an output of 0–10 VDC for external monitoring.



Installation

Mechanical Installation

1. ⚠ Refer to the WARNING above.
2. Do not install until you have read the entire product information sheet.
3. Minimum inlet pressure 20 psig (1.4 bar)
Maximum inlet pressure 150 psig (10.3 bar)
Minimum temperature 40°F (4.4°C)
Maximum temperature 125°F (51.6°C)
4. Prior to installation, ensure that the pressure in the line where this product is to be connected is at atmospheric pressure 0 psig (0 bar).
5. Install a quality Wilkerson filter upstream of the unit for maximum trouble free operation.
6. Install with the air flow in the same direction as the arrow on the unit. **DO NOT** restrict the air flow with undersize piping or fittings, unless maximum flow is not required.

Electrical Connection

Since the same control board is used for all control signal options (Figure 3A) to provide maximum flexibility at minimum cost, the board must be configured for each particular application by positioning the jumpers correctly and wiring correctly. **This is a very important step to ensure optimum performance.**

Determine what signal you will be using to control the regulator and follow the instructions for that application. The control board must be configured and wired accordingly.



Caution: Improper wiring may result in damage to the unit.

To configure the unit for the desired option, and to connect the external wires to unit, remove the housing by removing the two screws on top of the unit (Figure 4). Carefully lift the housing off and lay it to one side, making sure not to damage the ribbon cable that connects the control board to the LCD board.

The jumpers should be configured correctly from the factory for the configuration ordered and will only need to be changed if once the unit is received, the user decides on different control signal, pressure display or pressure range. (Refer to Figure 2)

Option #1 Sensor feedback signal

Internal sensor Jumper on position #5

Option #2 LCD display mode

- a. psig Jumper on position #4
- b. bar Jumper off position #4

NOTE: If using bar option, be careful not to lose jumper.

Option #3 Control signal

- a. 0–10 VDC Jumper on position #1
or
- b. Internal control Jumper on position #2
or
- c. 4–20 mA Jumper on position #3

NOTE: Only one control signal at a time can be used.

Option #4 Pressure Range

Each control board has two pressure ranges available and can be selected by the **Jumper on position #7**

The high range board can be configured for either:

- a. 0–90 psig (0–6 bar) Jumper on position #7
or
- b. 0–125 psig (0–8,6 bar) Jumper off position #7

The low range board can be configured for either:

- a. 0–30 psig (0–2 bar) Jumper on position #7
or
- b. 0–60 psig (0–4 bar) Jumper off position #7

First feed the cable through the strain relief provided and remove the retaining nut for the strain relief. Now feed the wires through the hole in the control board housing, slide the retaining nut over the wires and secure the strain relief to the housing making sure to have the required amount of wire to connect them to the terminal block. Once this is completed you can connect the wires to the terminal block as the following describes.

Now, with the unit configured to the desired options, the external electrical connection of the unit can be done. This is accomplished by securing the wires directly to the control board terminal block on the upper right hand side of the unit (Figure 3). It is recommended that a shielded cable with the required number of wires for your application be used to connect the unit if using an external control and monitor signal. The shield should be connected to the supply ground and not to the unit. If using the internal control, only a supply voltage will be required, although the monitor signal can be used.

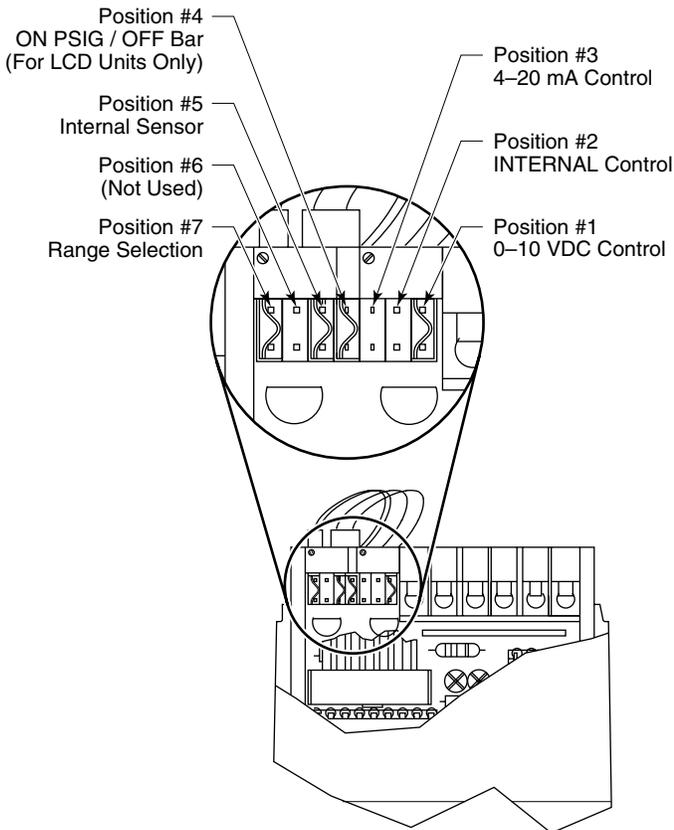


Figure 2 – Jumper Connections

If using an external control circuit, connect the wires to the appropriate terminals as follows: (Refer to Figure 3)

Control signal:

- If using a 0–10 VDC control signal, connect the control wire to position #5.
- If using a 4–20mA control signal, connect control wire to position #6.

Monitor signal: (If used)

- Connect the external monitor feedback to position #3, this outputs a 0–10 VDC that corresponds to a 1 VDC per 10% of range.

Supply voltage and common ground:

- Connect the supply voltage positive pole (+) to position #1.
- Connect the common ground (-) for supply, control and monitor signals to position #2.

If using the internal resistor control, wire the unit as follows:

Monitor signal: If monitor signal is not required, no connection is required.

- Connect the external monitor feedback to position #3, this outputs a 0–10 VDC that corresponds to a 1 VDC per 10% of range.

Supply voltage and common ground:

- Connect the supply voltage positive pole (+) to position #1.
- Connect the common ground (-) for supply, and monitor signals to position #2.



CAUTION: Reversing the polarity of the supply signal may result in damage to the board.

Once the wires are properly located, secure the wires in the terminal block and tighten the strain relief to secure the wires and provide protection from the environment.

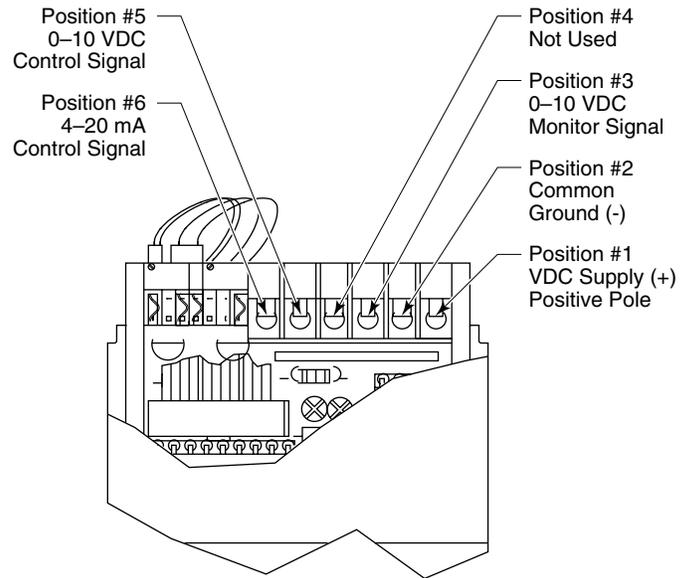


Figure 3 – Terminal Block

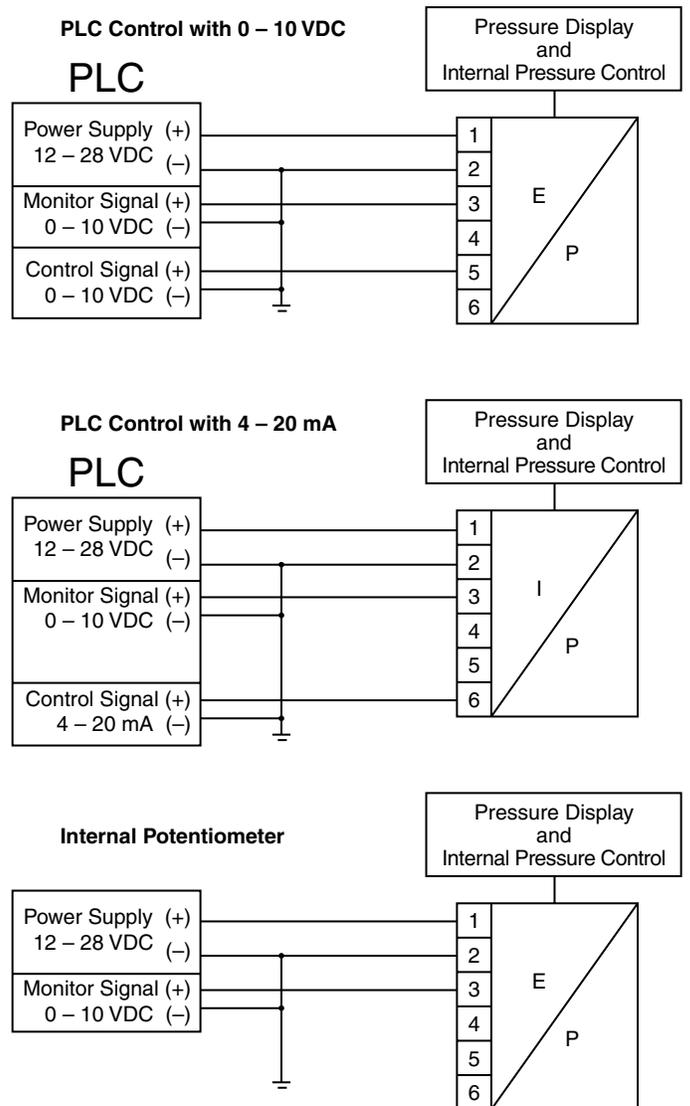


Figure 3A – Control Options

Zero and Span Adjustment

The zero and span adjustment was set at the factory and should not require any further adjustment. If the zero and span do need to be adjusted, energize the unit. Input 0 VDC to the control signal and using a volt meter, measure the output on the position #3 of the terminal block. The output should be -0.01 to 0 VDC. If not turn the zero potentiometer (*Figure 4*) until the output is correct. To adjust the span, attach an external pressure gauge and apply 8 VDC to the control signal. Then adjust the span potentiometer (*Figure 4*) until the P2 pressure is 80% of the range selected [i.e. 24 psig (1,6 bar) for 0–30 psig (0–2 bar), 48 psig (3,3 bar) for 0–60 psig (0–4 bar), 72 psig (4,9 bar) for 0–90 psig (0–6 bar), 100 psig (6,8 bar) for 0–125 psig (0–8,6 bar)]. This completes the zero and span adjustments.

Now carefully replace the cover. It can be installed in two positions, 180 degrees apart from each other. Then replace the two securing screws.

The unit is now ready for operation. Supply pressure and power to the unit can be turned on.

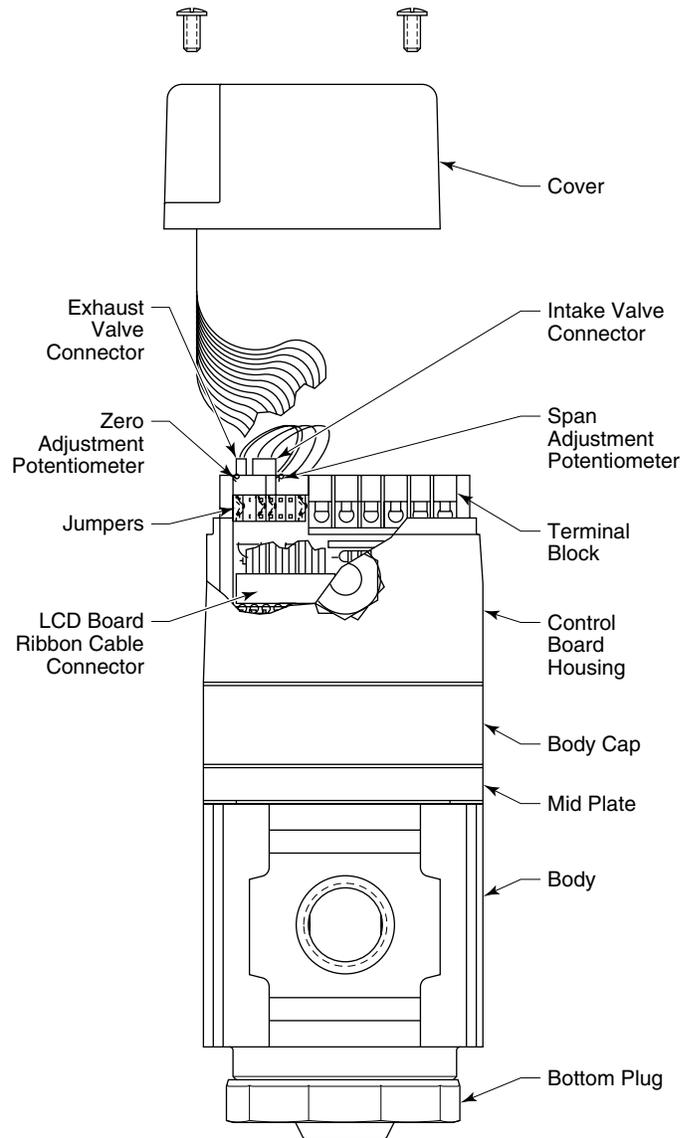


Figure 4

If Internally Controlled (On LCD Units Only)

To adjust the pressure, pry the internal adjustment cap off. With power and pressure to the unit turn the adjustment screw (*Figure 5*) until the desired pressure is achieved then replace the cap.

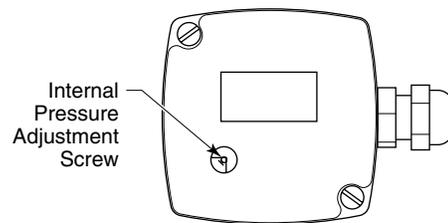


Figure 5

Maintenance



- 1. DEPRESSURIZE THE AIR LINE PRIOR TO ATTEMPTING ANY SERVICE TO THE UNIT! IT IS ALSO RECOMMENDED THAT POWER TO THE UNIT BE DISCONNECTED PRIOR TO SERVICING.**
- 2. Main Valve:** Remove bottom plug, valve assembly and valve spring. Inspect all the seals and components for damage and replace as required. Clean all seals and components with soft cloth and lightly lubricate the valve O-ring, bottom plug O-ring and valve stem with MAGNALUBE-G lubricant and reassemble in reverse order.
- 3. LCD Display:** Remove the two screws from the LCD cover and carefully remove the cover. Turning the cover over, remove the two screws inside that retain the LCD board to the cover and lift out the LCD board. Unplug the display board from the ribbon cable. If defective replace with a new LCD board and re-connect the ribbon cable. Making sure the LCD lens and seal are in place, replace the LCD board in the cap and secure with the two screws. Replace the cover back on the unit and secure with the two screws.
- 4. Control Board:** If unit is an LCD type, remove the LCD display board from the cap as described in step #3 and unplug the ribbon cable from the LCD board. Now unscrew the three screws that retain the control board housing and unplug the valves from the back of the control board. Carefully lift the housing with the control board still inside. Remove the control board from the bottom of the housing and replace with the new control board. Reassemble in reverse order.
- 5. Valve Replacement:** The electronic valves cannot be serviced internally. If failure occurs, replace the valve. To replace the valves, remove the housing as described in step #4 above. Once the housing is removed, unscrew the defective valve from the cap. Making sure to replace with correct valve [3 position connector for intake valve and 2 position connector for the exhaust valve (*Figure 6*)], screw the valve down until it seals on the base of the valve seal. Reassemble the control board and cap as described in steps #3 and #4.
- 6. Diaphragm, Mid-plate and Regulator Cap:** Remove the control board and housing as described in step #4 and remove the exhaust valve. Now remove the two screws that secure the cap to the regulator body. Lift the cap from the body. Remove the upper and lower diaphragms, noting which one is upper and lower, from the mid-plate. Examine the diaphragms and relief seat in the lower diaphragm for wear and tears and replace as required. Replace the filter in the mid plate. Clean all surfaces and components with a soft cloth and reassemble in reverse order.

NOTE: Any time the mid-plate is removed, replace the internal filters (see exploded view for locations). One is in the cap for the exhaust, one is in the mid-plate for the intake.

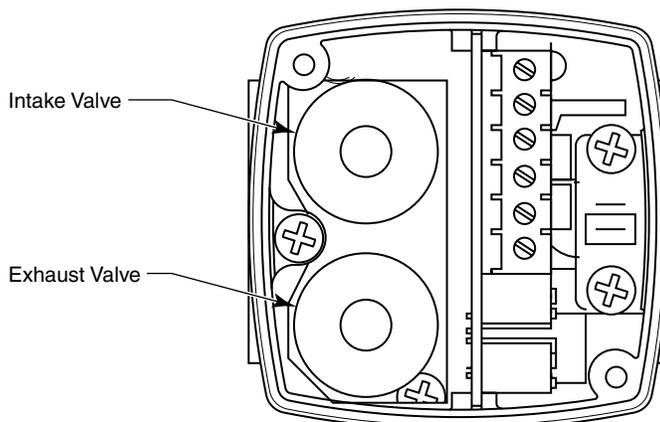
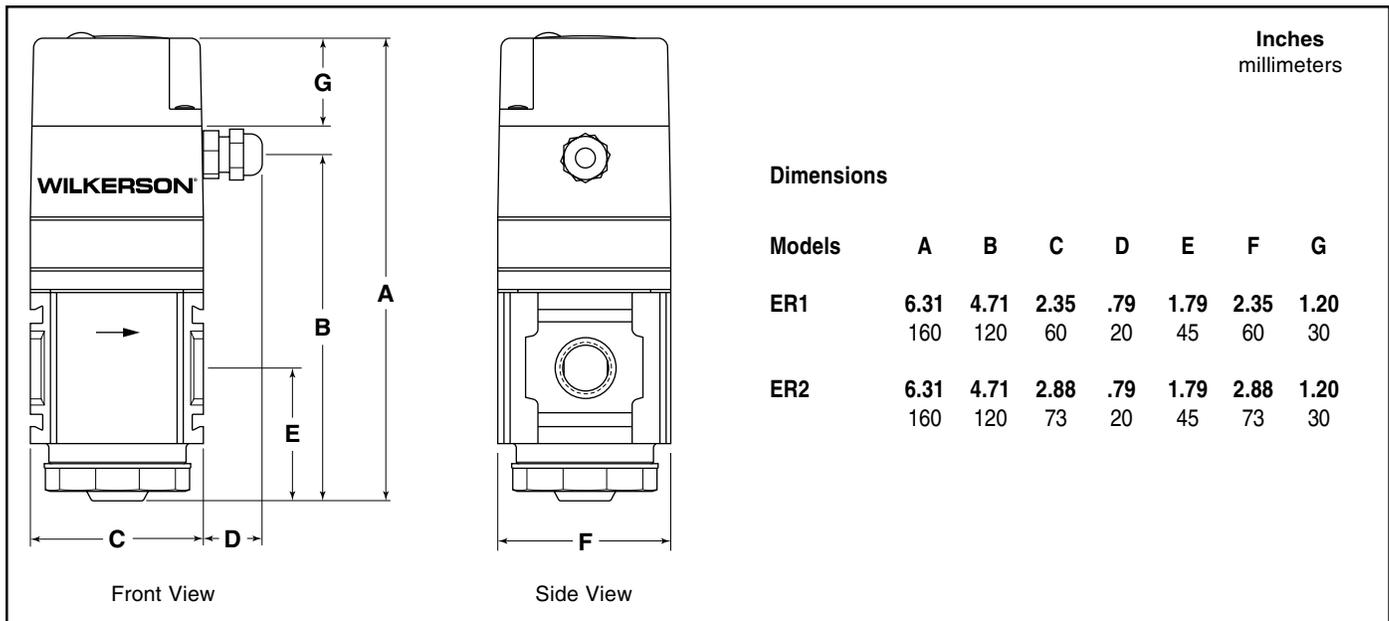


Figure 6



Repair Kits and Replacement Parts

Control Board LCD 30/60 psig (2.0/4.0 bar)	ERP-95-786
Control Board LCD 90/125 psig (6.0/8.6 bar) ...	ERP-95-788
Control Board, STD, 30/60 psig (2.0/4.0 bar) ...	ERP-95-798
Control Board, STD, 90/125 psig (6.0/8.6 bar) .	ERP-95-799
LCD Board and Ribbon	ERP-95-787
Intake Valve	ERP-95-790
Exhaust Valve	ERP-95-791
Diaphragm Kit, ER1	ERP-95-792
Diaphragm Kit, ER2	ERP-95-793
Bottom Valve and Valve Spring	ERP-95-794

Specifications

	Min	Max	Nom	Units
Supply Voltage	12	28	—	VDC
Supply Current	—	250	80	mA
Control Signal				
Voltage	0	10	—	VDC
Impedance	—	—	200	KOHM
Current	4	20	—	mA
Impedance	—	—	600	OHM
Internal	—	—	—	—
Monitor Output	0	10	—	VDC
Overall Accuracy	—	—	1.5%	SCALE
Supply Pressure	20 (1.4)	150 (10.3)	—	psig (bar)
Output Pressure	0 (0.0)		30/60/90/125 (2/4/6/8.6)	psig (bar)
Temperature	40 (4.4)	125 (51.6)	—	°F (°C)

Flow Rate [150 psig (10 bar) inlet and 90 psig (6 bar) outlet with a 5 psid (0.3 bar)]

ER1	200 SCFM (94.3 dm ³ /s)
ER2	200 SCFM (94.3 dm ³ /s)

Note: For optimum operation, inlet pressure should be a minimum of 15 psig (1.0 bar) above the controlled pressure.

Troubleshooting

Unit Fails to Operate

- 1) Verify supply voltage
- 2) Verify control voltage
- 3) Intake valve or controller failure
- 4) Apply 12 VDC to valve and listen for slight click indicating valve is working
- 5) Replace control board

Unit Remains Pressurized

- 1) Verify control voltage
- 2) Exhaust valve or controller failure
- 3) Apply 12 VDC to valve and listen for slight click indicating valve is working
- 4) Replace control board

LCD Fails to Display Pressure

- 1) Verify supply voltage
- 2) Verify that ribbon cable is secure on both ends
- 3) Have dealer check LCD board and replace if necessary
- 4) Replace control board

Unit Has Constant Leak or is Unstable

- 1) Inspect and clean bottom valve seals and lubricate bottom valve
- 2) Inspect and clean diaphragms