

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

PE10X-XXX-XXX-XXXX
PE15X-XXX-XXX-XXXX
PE20X-XXX-XXX-XXXX
PE30X-XXX-XXX-XXXX

ELECTRONIC INTERFACE for Diaphragm Pumps

RELEASED: 3-26-13
 REVISED: 10-30-15
 (REV: D)



**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

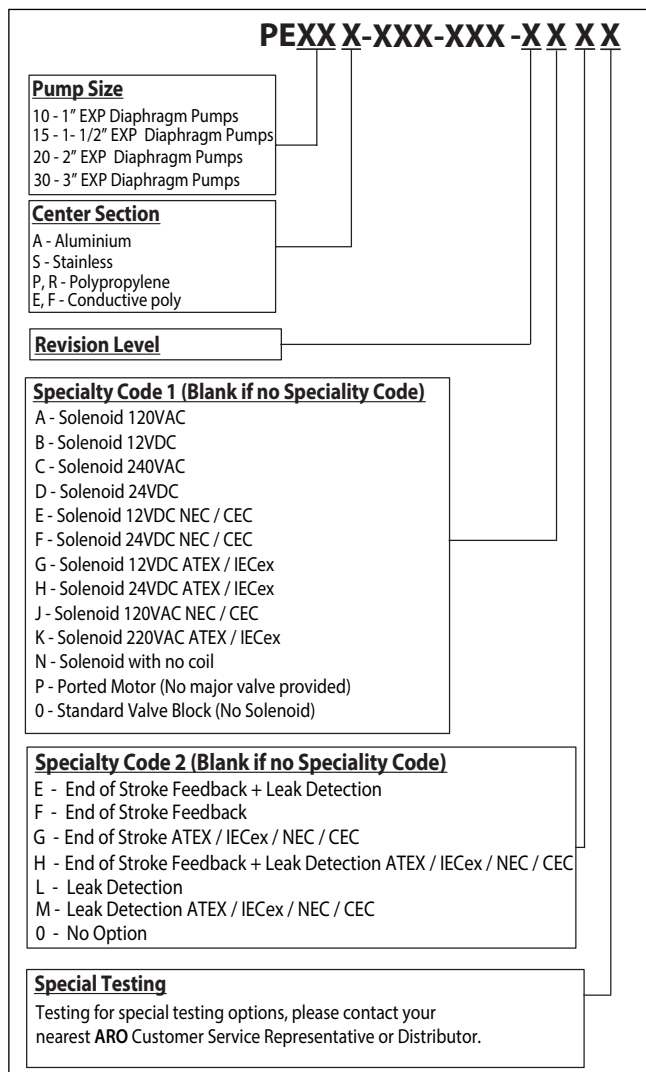
PUMP DATA

PE10X-XXX-XXX-XXXX is PE series 1" EXP Diaphragm Pumps with electronic interface.
PE15X-XXX-XXX-XXXX is PE series 1- 1/2" EXP Diaphragm Pumps with electronic interface.
PE20X-XXX-XXX-XXXX is PE series 2" EXP Diaphragm Pumps with electronic interface.
PE30X-XXX-XXX-XXXX is PE series 3" EXP Diaphragm Pumps with electronic interface.

GENERAL DESCRIPTION

This manual is supplemental information for the electronic interface options on the PE series of pumps. For complete pump installation, disassembly and reassembly, safety information, and other general pump information, please refer to the PD pump manual that was also included with the pump. This electronic interface includes options for solenoid control, end of stroke feedback, leak detection (diaphragm failure), cycle counting on the major valve, and a ported motor with no major valve for user-supplied control directly to the two diaphragm air chambers. Solenoid control allows the cycle rate of the pump to be controlled electronically. With Solenoid control, when the solenoid is energized, the pump strokes and dispenses the fluid in one chamber. When the solenoid is de-energized, the pump strokes in the opposite direction, dispensing the fluid in the other chamber. By providing continuous ON - OFF signals to the solenoid, the fluid transfer rate may be increased or decreased remotely. End of stroke feedback can be used in conjunction with the solenoid valve to cycle the pump based upon completion of each stroke. The leak detection option incorporates an optical fluid sensor in each air chamber to provide a signal when a diaphragm has failed and fluid is leaking through the pump. The cycle counter option provides a closed contact output each time the pump completes a cycle. This option is not available combined with solenoid control. The ported motor with no major valve is provided as an option for users who want to supply compressed air directly to each diaphragm and control the operation of the pump with their own external air controls.

MODEL DESCRIPTION CHART



PARTS LIST / ALUMINUM CENTER BODY

Item	Description	Part no	Qty
101	Centerbody (PE10A & PE15A)	97025	(1)
	(PE20A & PE30A)	97031	(1)
111	Spool (PE10A-XXX-XXX-X0XX, PE15A-XXX-XXX-X0XX)	95835	(1)
	All PE10A, PE15A with Solenoid	95835-2	(1)
	(PE20A-XXX-XXX-X0XX, PE30A-XXX-XXX-X0XX)	95651	(1)
	All PE20A, PE30A with Solenoid	95651-2	(1)
121	Sleeve (PE10A-XXX-XXX-XPXX, PE15A-XXX-XXX-XPXX)	96323	(2)
	(PE20A-XXX-XXX-XPXX, PE30A-XXX-XXX-XPXX)	96613	(2)
134	Screw (PE10A-XXX-XXX-XPXX, PE15A-XXX-XXX-XPXX)	96340	(4)
	(PE20A-XXX-XXX-XPXX, PE30A-XXX-XXX-XPXX)	95923	(4)
135	Valve Block (PE10A-XXX-XXX-X0XX)	95942-3	(1)
	(PE15A-XXX-XXX-X0XX)	95942-1	(1)
	All PE10A with Solenoid	95942-6	(1)
	All PE15A with Solenoid	95942-5	(1)
	(PE20A-XXX-XXX-X0XX, PE30A-XXX-XXX-X0XX)	96334-1	(1)
	All PE20A, PE30A with Solenoid	96334-3	(1)
403	Valve (All PEXXA with Solenoid)	114102	(1)
407	Carrot Plug (PE10/15)	96316	(1)
	(PE20/30)	96317	(1)
411	Adapter (PEXXA-XXX-XXX-XAXX, PEXXA-XXX-XXX-XBXX, PEXXA-XXX-XXX-XCXX, PEXXA-XXX-XXX-XDXX, PEXXA-XXX-XXX-XEXX, PEXXA-XXX-XXX-XFXX, PEXXA-XXX-XXX-XGXX, PEXXA-XXX-XXX-XHXX, PEXXA-XXX-XXX-XJXX, PEXXA-XXX-XXX-XKXX, PEXXA-XXX-XXX-XNXX)	96953	(1)
413	Coil Nut (All PEXXA with Solenoid)	119380	(1)

Item	Description	Part no	Qty	
414	Coil, 120VAC (PXXXX-XXX-XXX-XAXX)	116218-33	(1)	
	Coil, 12VDC (PXXXX-XXX-XXX-XBXX)	116218-38	(1)	
	Coil, 240VAC (PXXXX-XXX-XXX-XCXX)	116218-35	(1)	
	Coil, 24VDC (PXXXX-XXX-XXX-XDXX)	116218-39	(1)	
	Coil, 12VDC ATEX / IECeX (PXXXX-XXX-XXX-XGXX)	117345-38	(1)	
	Coil, 24VDC ATEX / IECeX (PXXXX-XXX-XXX-XHXX)	117345-39	(1)	
	Coil, 220VAC ATEX / IECeX (PXXXX-XXX-XXX-XKXX)	117345-35	(1)	
	Coil, 12VDC NEC/CEC (PXXXX-XXX-XXX-XEXX)	114772-38	(1)	
	Coil, 24VDC NEC/CEC (PXXXX-XXX-XXX-XFXX)	114772-39	(1)	
	Coil, 120VDC NEC/CEC (PXXXX-XXX-XXX-XJXX)	114772-33	(1)	
	415	O-Ring (All PEXXA with Solenoid)	114103	(1)
	416	O-Ring (All PEXXA with Solenoid)	114104	(1)
	417	Screw (All PEXXA with Solenoid)	96728647	(2)
	418	Tube (All PEXXA with Solenoid)	15309974	(1)
419	Seal (All PEXXA with Solenoid)	96957	(1)	
420	Snap Ring (All PEXXA with Solenoid)	Y147-43	(1)	
421	Retainer (All PEXXA with Solenoid)	15309990	(1)	
428	O-Ring (All PEXXA with Solenoid)	Y325-13	(1)	
429	Solenoid Muffler (All PEXXA with Solenoid)	116464	(1)	

PARTS LIST / STAINLESS STEEL CENTER BODY

Item	Description	Part no	Qty
101	Centerbody (PE10S & PE15S)	97034	(1)
	(PE20S & PE30S)	97040	(1)
111	Spool (PE10S-XXX-XXX-XQXX, PE15S-XXX-XXX-XQXX)	95835	(1)
	All PE10S, PE15S with Solenoid	95835-2	(1)
	(PE20S-XXX-XXX-XQXX, PE30S-XXX-XXX-XQXX)	95651	(1)
	All PE20S, PE30S with Solenoid	95651-2	(1)
121	Sleeve (PE10S-XXX-XXX-XPXX, PE15S-XXX-XXX-XPXX)	96323	(2)
	(PE20S-XXX-XXX-XPXX, PE30S-XXX-XXX-XPXX)	96613	(2)
134	Screw (PE10S-XXX-XXX-XPXX, PE15S-XXX-XXX-XPXX)	96340	(4)
	(PE20S-XXX-XXX-XPXX, PE30S-XXX-XXX-XPXX)	95923	(4)
135	Valve Block (PE10S-XXX-XXX-XQXX)	95939-3	(1)
	(PE15S-XXX-XXX-XQXX)	95939-1	(1)
	All PE10S with Solenoid	95939-6	(1)
	All PE15S with Solenoid	95939-5	(1)
	(PE20S-XXX-XXX-XQXX, PE30S-XXX-XXX-XQXX)	96337-1	(1)
	All PE20S, PE30S with Solenoid	96337-3	(1)
403	Valve (All PEXXS with Solenoid)	114102	(1)
407	Carrot Plug (PE10/15)	96316	(1)
	(PE20/30)	96317	(1)
411	Adapter (PEXS-XXX-XXX-XAXX, PEXXS-XXX-XXX-XBXX, PEXS-XXX-XXX-XCXX, PEXXS-XXX-XXX-XDXX, PEXS-XXX-XXX-XEXX, PEXXS-XXX-XXX-XFXX, PEXS-XXX-XXX-XGXX, PEXXS-XXX-XXX-XHXX, PEXS-XXX-XXX-XJXX, PEXXS-XXX-XXX-XKXX, PEXS-XXX-XXX-XNXX)	96953	(1)
413	Coil Nut (All PEXXS with Solenoid)	119380	(1)

Item	Description	Part no	Qty	
414	Coil, 120VAC (PXXS-XXX-XXX-XAXX)	116218-33	(1)	
	Coil, 12VDC (PXXXX-XXX-XXX-XBXX)	116218-38	(1)	
	Coil, 240VAC (PXXXX-XXX-XXX-XCXX)	116218-35	(1)	
	Coil, 24VDC (PXXXX-XXX-XXX-XDXX)	116218-39	(1)	
	Coil, 12VDC ATEX / IECex (PXXXX-XXX-XXX-XGXX)	117345-38	(1)	
	Coil, 24VDC ATEX / IECex (PXXXX-XXX-XXX-XHXX)	117345-39	(1)	
	Coil, 220VAC ATEX / IECex (PXXXX-XXX-XXX-XKXX)	117345-35	(1)	
	Coil, 12VDC NEC / CEC (PXXXX-XXX-XXX-XEXX)	114772-38	(1)	
	Coil, 24VDC NEC / CEC (PXXXX-XXX-XXX-XFXX)	144772-39	(1)	
	Coil, 120VAC NEC / CEC (PXXXX-XXX-XXX-XJXX)	144772-33	(1)	
	415	O-Ring (All PEXXS with Solenoid)	114103	(1)
	416	O-Ring (All PEXXS with Solenoid)	114104	(1)
	417	Screw (All PEXXS with Solenoid)	96728647	(2)
418	Tube (All PEXXS with Solenoid)	15309974	(1)	
419	Seal (All PEXXS with Solenoid)	96957	(1)	
420	Snap Ring (All PEXXS with Solenoid)	Y147-43	(1)	
421	Retainer (All PEXXS with Solenoid)	15309990	(1)	
428	O-Ring (All PEXXS with Solenoid)	Y325-13	(1)	
429	Solenoid Muffler (All PEXXS with Solenoid)	116464	(1)	

PARTS LIST / PLASTIC CENTER BODY

Item	Description	Part no	Qty
101	Centerbody (PE10P & PE15P) and (PE10R & PE15R)	97026	(1)
	(PE10E & PE15E) and (PE10F & PE15F)	97032	(1)
	(PE20P, PE 20R & PE30R, PE20Y)	97037	(1)
	(PE20E, PE20F & PE30F)	97044	(1)
111	Spool (PE10E-XXX-XXX-X0XX, PE15E-XXX-XXX-X0XX, PE10F-XXX-XXX-X0XX, PE15F-XXX-XXX-X0XX, PE10P-XXX-XXX-X0XX, PE15P-XXX-XXX-X0XX, PE10R-XXX-XXX-X0XX, PE15R-XXX-XXX-X0XX)	96293	(1)
	All PE10E, PE10F, PE10P, PE10R, PE15E, PE15F, PE15P & PE15R with solenoid	96293-2	(1)
	(PE20E-XXX-XXX-X0XX, PE20F-XXX-XXX-X0XX, PE20P-XXX-XXX-X0XX, PE20R-XXX-XXX-X0XX, PE20Y-XXX-XXX-X0XX, PE30F-XXX-XXX-X0XX, PE30R-XXX-XXX-X0XX)	95651	(1)
	All PE20E, PE20F, PE20P, PE20R, PE20Y, PE30F & PE30R with solenoid	95651-2	(1)
	121	Sleeve (PE10X-XXX-XXX-XPXX, PE15X-XXX-XXX-XPXX)	96323
(PE20X-XXX-XXX-XPXX, PE30X-XXX-XXX-XPXX)		96613	(2)
134	Screw (PE10X-XXX-XXX-XPXX, PE15X-XXX-XXX-XPXX)	96340	(6)
	(PE20X-XXX-XXX-XPXX, PE30X-XXX-XXX-XPXX)	95323	(4)
135	Valve Block (PE10E-XXX-XXX-X0XX, PE10F-XXX-XXX-X0XX)	96174-3	(1)
	(PE10P-XXX-XXX-X0XX, PE10R-XXX-XXX-X0XX)	96174-1	(1)
	(PE15E-XXX-XXX-X0XX, PE15F-XXX-XXX-X0XX)	95834-5	(1)
	(PE15P-XXX-XXX-X0XX, PE15R-XXX-XXX-X0XX)	95834-1	(1)
	All PE10E, PE10F with solenoid	96174-6	(1)
	All PE15E, PE15F with solenoid	95834-6	(1)
	All PE10P, PE10R with solenoid	96174-4	(1)
	All PE15P, PE15R with solenoid	95834-4	(1)
	(PE20E-XXX-XXX-X0XX, PE20F-XXX-XXX-X0XX, PE20P-XXX-XXX-X0XX, PE20R-XXX-XXX-X0XX, PE20Y-XXX-XXX-X0XX)	95789	(1)
	(PE30F-XXX-XXX-X0XX, PE30R-XXX-XXX-X0XX)	95789-3	(1)
All PE20E, PE20F, PE20P, PE20R, PE20Y, PE30F & PE30R with solenoid	95789-3	(1)	
403	Valve (All PEXXR with Solenoid)	114102	(1)
407	Carrot Plug (PE10/15)	96316	(1)
	(PE20/30)	96317	(1)

Item	Description	Part no	Qty	
411	Adapter (PEXXX-XXX-XXX-XAXX, PEXXX-XXX-XXX-XBXX, PEXXX-XXX-XXX-XCXX, PEXXX-XXX-XXX-XDXX, PEXXX-XXX-XXX-XEEX, PEXXX-XXX-XXX-XFEX, PEXXX-XXX-XXX-XGXX, PEXXX-XXX-XXX-XHXX, PEXXX-XXX-XXX-XJXX, PEXXX-XXX-XXX-XKXX, PEXXX-XXX-XXX-XNXX)	96953	(1)	
	Coil Nut (All PEXXR with Solenoid)	119380	(1)	
414	Coil, 120VAC (PXXXX-XXX-XXX-XAXX)	116218-33	(1)	
	Coil, 12VDC (PXXXX-XXX-XXX-XBXX)	116218-38	(1)	
	Coil, 240VAC (PXXXX-XXX-XXX-XCXX)	116218-35	(1)	
	Coil, 24VDC (PXXXX-XXX-XXX-XDXX)	116218-39	(1)	
	Coil, 12VDC ATEX / IECex (PXXXX-XXX-XXX-XGXX)	117345-38	(1)	
	Coil, 24VDC ATEX / IECex (PXXXX-XXX-XXX-XHXX)	117345-39	(1)	
	Coil, 220VAC ATEX / IECex (PXXXX-XXX-XXX-XKXX)	117345-35	(1)	
	Coil, 12VDC NEC / CEC (PXXXX-XXX-XXX-XEEX)	114772-38	(1)	
	Coil, 24VDC NEC / CEC (PXXXX-XXX-XXX-XFEX)	114772-39	(1)	
	Coil, 120VAC NEC / CEC (PXXXX-XXX-XXX-XJXX)	114772-33	(1)	
	415	O-Ring (All PEXXX with Solenoid)	114103	(1)
	416	O-Ring (All PEXXX with Solenoid)	114104	(1)
417	Screw (All PEXXX with Solenoid)	96728647	(2)	
418	Tube (All PEXXX with Solenoid)	15309974	(1)	
419	Seal (All PEXXX with Solenoid)	96957	(1)	
420	Snap Ring (All PEXXX with Solenoid)	Y147-43	(1)	
421	Retainer (All PEXXX with Solenoid)	15309990	(1)	
428	O-Ring (All PEXXX with Solenoid)	Y325-13	(1)	
429	Solenoid Muffler (All PEXXX with Solenoid)	116464	(1)	

PARTS LIST / PEXXX-XXX-XXX-XXXX

Item	Description	Part no	Qty
1	Rod, Connecting (PE10)	97146	(1)
	(PE15)	97147	(1)
	(PE20)	97386	(1)
	(PE30)	97387	(1)
74	Pipe Plug (Not Shown) (PEXXA-XXX-XXX-XXFX, PEXXA-XXX-XXX-XXGX, PEXXA-XXX-XXX-XXGX) (PEXXF-XXX-XXX-XXFX, PEXXF-XXX-XXX-XXGX, PEXXF-XXX-XXX-XXGX) (PEXXR-XXX-XXX-XXFX, PEXXR-XXX-XXX-XXGX, PEXXR-XXX-XXX-XXGX) (PEXXS-XXX-XXX-XXFX, PEXXS-XXX-XXX-XXGX, PEXXS-XXX-XXX-XXGX) (PEXXY-XXX-XXX-XXFX, PEXXY-XXX-XXX-XXGX, PEXXY-XXX-XXX-XXGX) (PEXXE-XXX-XXX-XXFX, PEXXE-XXX-XXX-XXGX, PEXXE-XXX-XXX-XXGX) (PEXXP-XXX-XXX-XXFX, PEXXP-XXX-XXX-XXGX, PEXXP-XXX-XXX-XXGX)	Y17-51-S	(2)
	Bushing (PE10)	97391	(1)
	(PE15)	97392	(1)
	(PE20, PE30)	97394	(1)
	Plug (Stainless Steel) (Plastic)	Y17-13-S 93897-1	(1) (1)

Item	Description	Part no	Qty
283	Leak Detector Sensor (PEXX-XXX-XXX-XXEX, PEXX-XXX-XXX-XXLX)	96270-1	(2)
	Leak Detection Sensor ATEX / IECex / NEC / CEC (PXXXX-XXX-XXX-XXHX, PXXXX-XXX-XXX-XXMX)	96270-2	(2)
405	Elbow, Street	97397	(1)
410	ASM, Adapter - Sensor (PE10)	97119	(1)
	ASM, Adapter - Sensor (PE20 & PE30)	97121	(1)
	ASM, Adapter - Sensor (PE15)	97396	(1)
	ASM, Adapter - Sensor (PE10, HE)	97408	(1)
	ASM, Adapter - Sensor (PE15, HE)	97410	(1)
	ASM, Adapter - Sensor (PE20 & PE30, HE)	97411	(1)
97412	Barrier Amplifier, End of Stroke (PEXXX-XXX-XXX-XXGX), (PEXXX-XXX-XXX-XXHX)	97412	(1)
	ZENER Barrier, Leak Detection (PEXXX-XXX-XXX-XXHX), (PEXXX-XXX-XXX-XXMX)	97414	(1)

SOLENOID

GENERAL DESCRIPTION

Without end of stroke feedback, solenoid control can only be used to cycle the pump based on timing. The following curves represent the flow rates of a pump based on timed operation of the solenoid at a common operating point of 70 psig air pressure and 30 psi of back pressure.

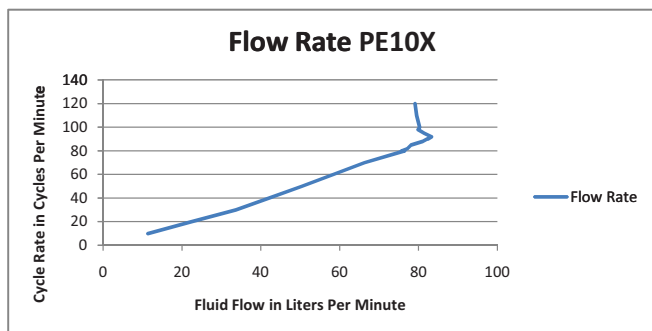
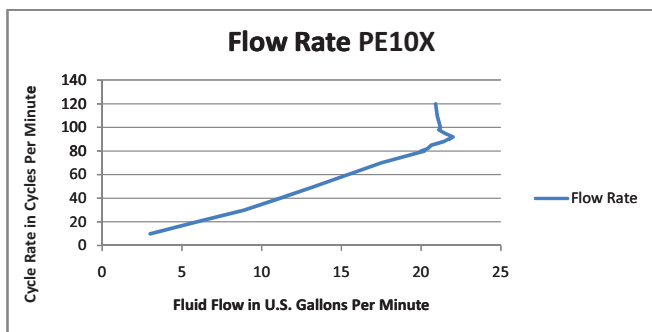


Figure 1

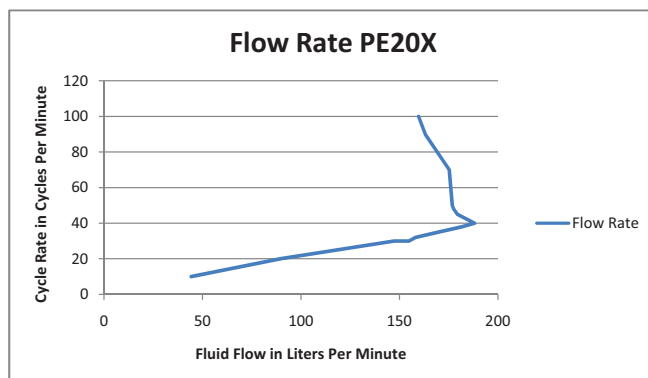
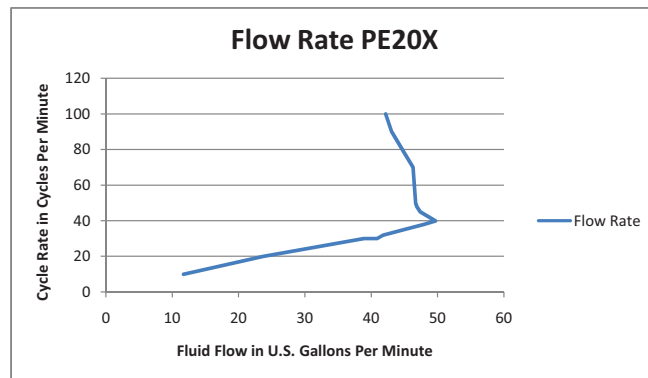


Figure 2

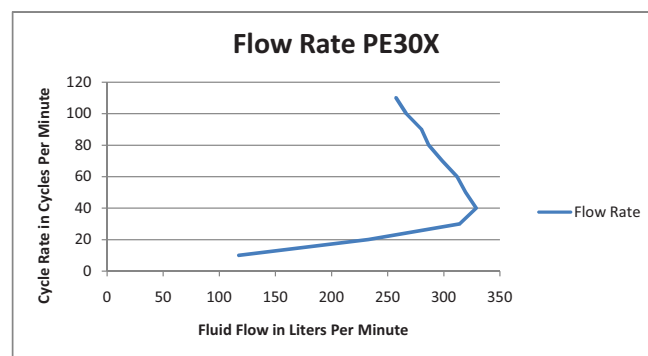
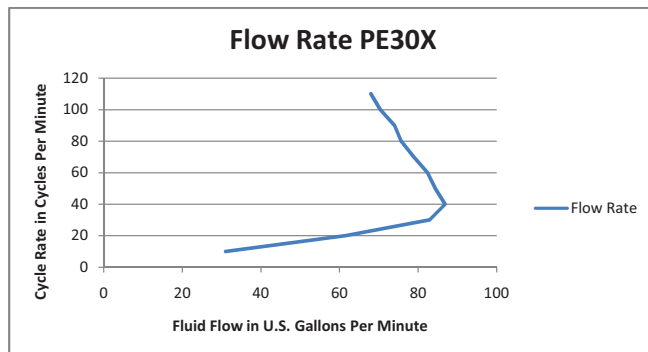
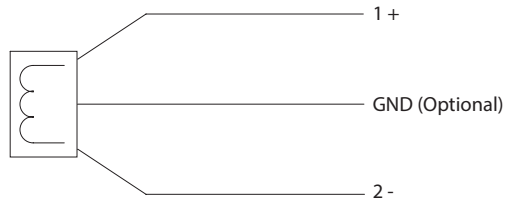
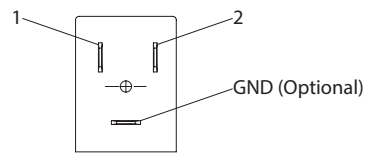
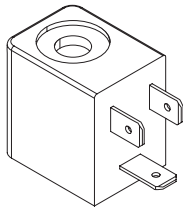
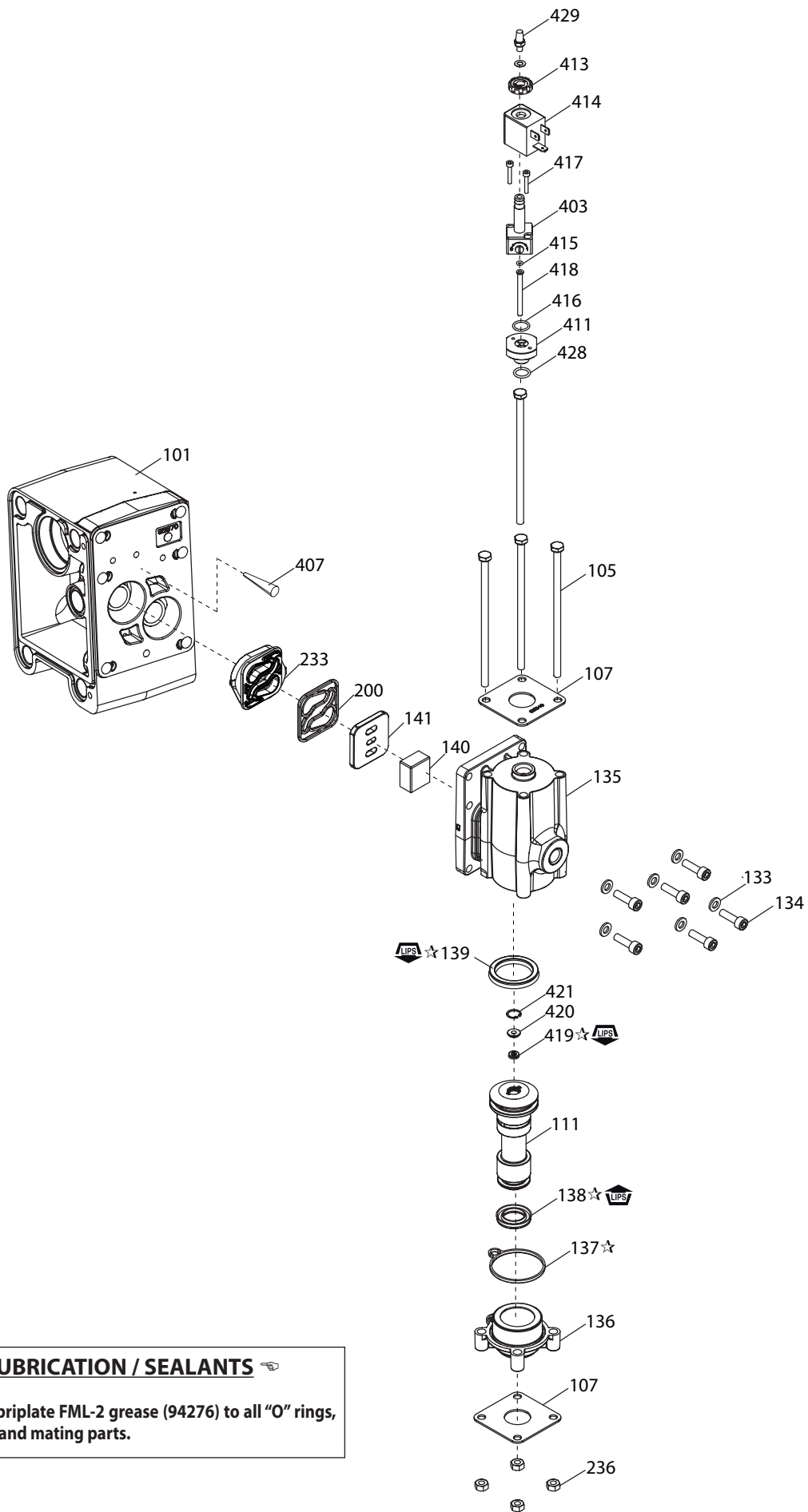


Figure 3

NON - HAZARDOUS DUTY SOLENOID WIRING DIAGRAM



GENERAL DESCRIPTION



LUBRICATION / SEALANTS

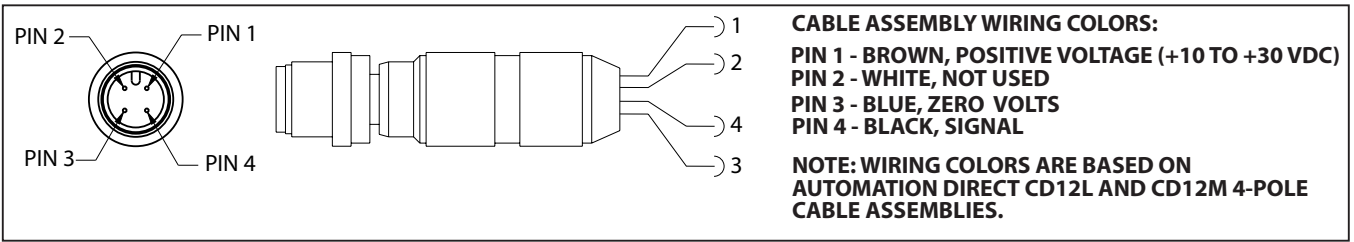
☆ Apply Lubriplate FML-2 grease (94276) to all "O" rings, "U" cups and mating parts.

Figure 4

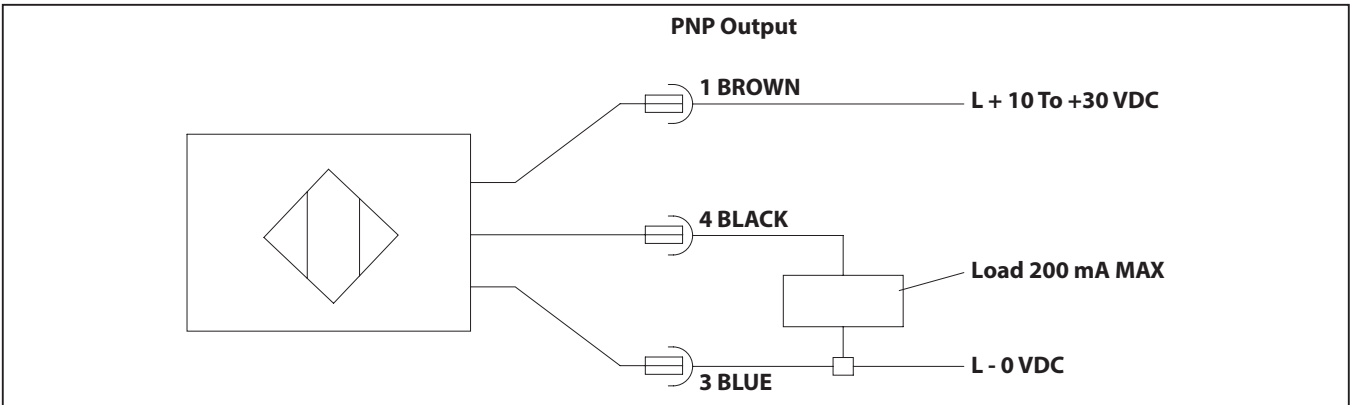
NON - HAZARDOUS DUTY END OF STROKE

With End of Stroke feedback, The End of stroke sensor detects when the diaphragm rod has reached the end of each stroke. This allows closed loop control of the diaphragm pump, verifying each stroke is complete.

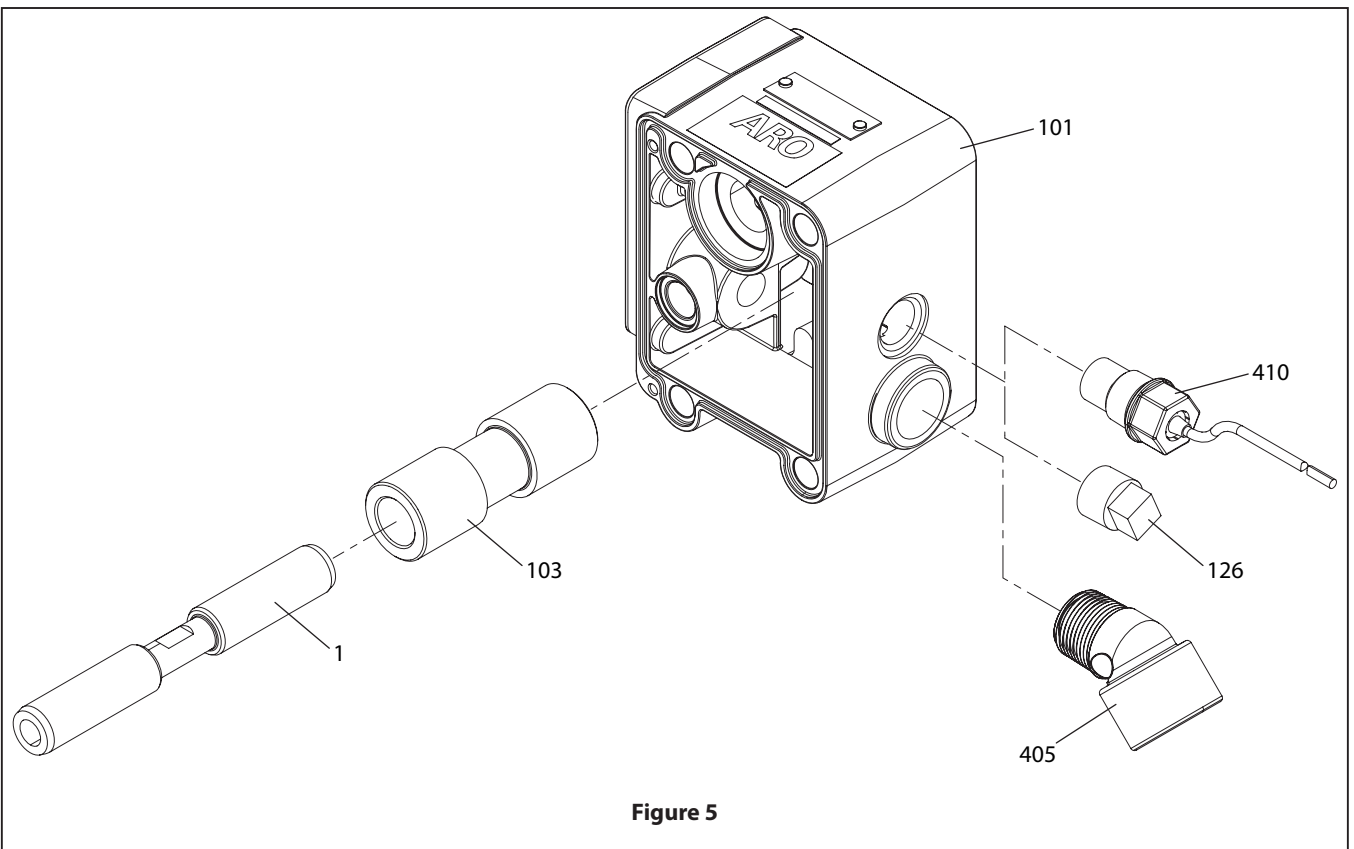
End of Stroke / Cycle Sensor Pinout, M12 Connector



End of Stroke / Cycle Sensor Pinout, Wiring Diagram (No Connector)



PART LIST



NON - HAZARDOUS DUTY LEAK DETECTION

GENERAL DESCRIPTION

An ARO® diaphragm pump equipped with the ARO Leak Detection Sensor warns of a diaphragm failure by sensing the presence of liquid in the air chamber of the pump. This system uses a liquid sensor in each of the two air chambers which will send an output signal when fluid is detected.

INSTALLATION AND WARNINGS

NOTE: ALL WIRING MUST COMPLY WITH ALL LOCAL AND / OR NATIONAL ELECTRICAL CODES.

- Electrical codes that apply must be strictly adhered to; failure to do so may lead to shock hazard or serious injury.
- Some local electrical codes may require the installation of rigid conduit.

- The Leak Detection Sensor components must be installed by a qualified electrician in compliance with all national, state and local codes and regulations to reduce the risk of electrical shock or other serious injury during installation and operation.
- ARO is not responsible for accidents resulting from improper installation of components or hardware.
- **HAZARDOUS VOLTAGE.** Do not attempt any service without disconnecting all electrical supply sources.

PART LIST / PEXXX-XXX-XXX-XXEX, PEXXX-XXX-XXX-XXLX

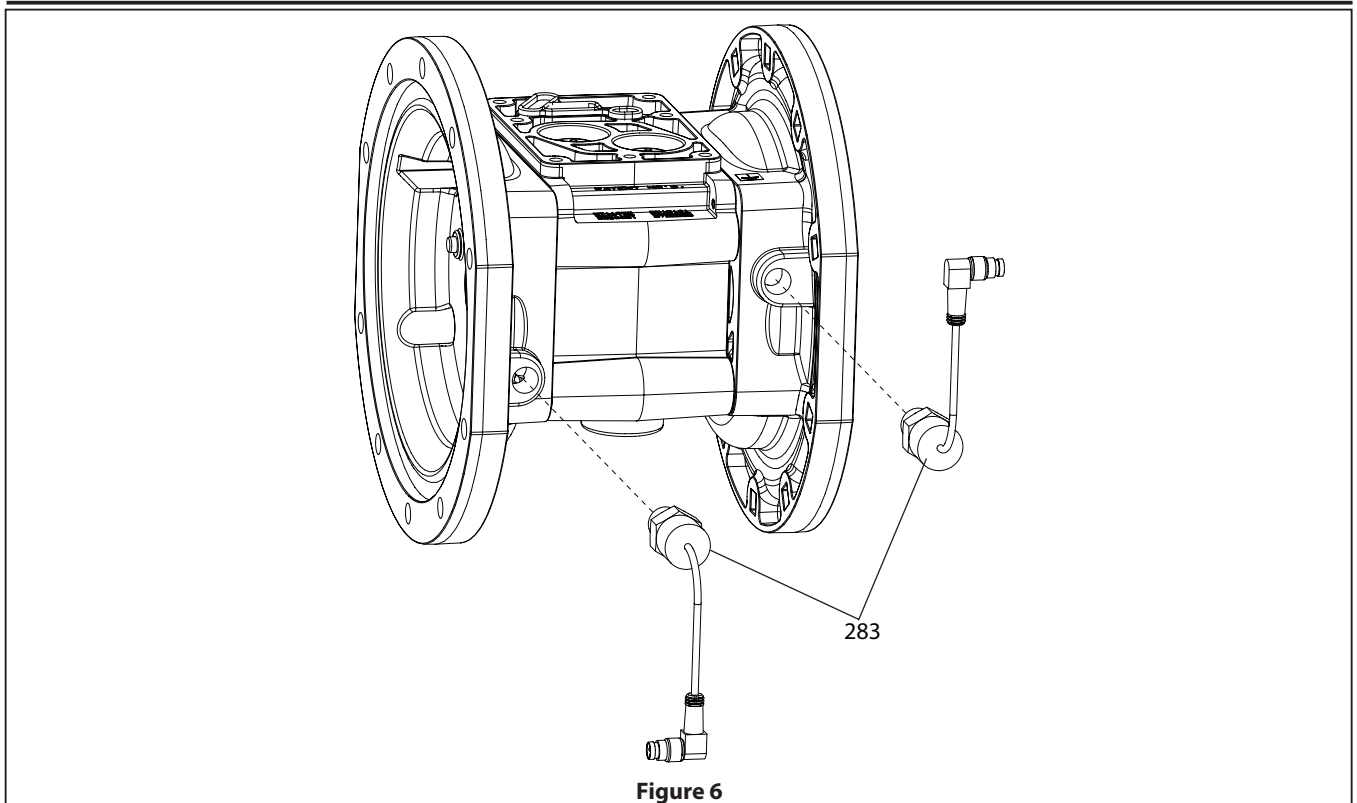


Figure 6

LEAK DETECTION - PINOUT DESCRIPTIONS

96270-1 SENSOR PINOUTS

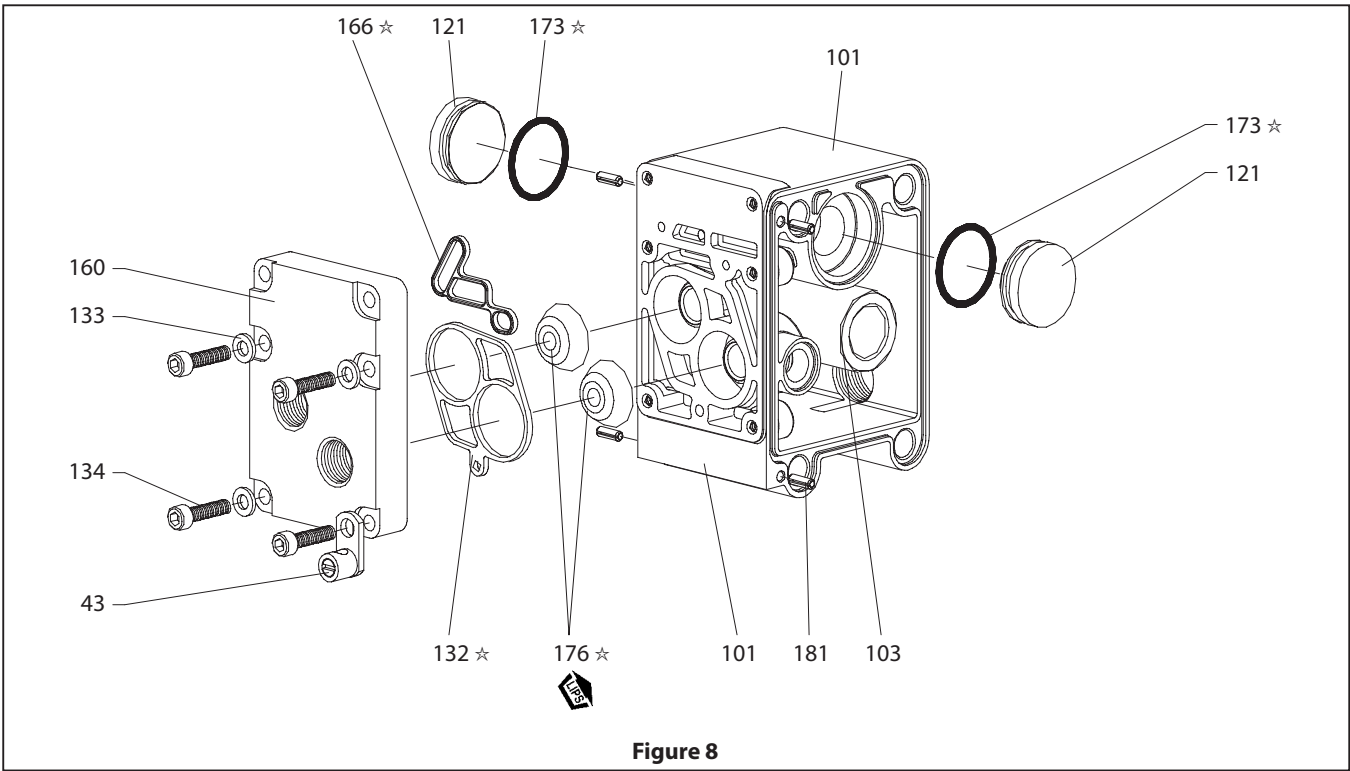
Pinout	Function
1	+24 VDC
3	Ground
4	Signal

TURCK (PICOFAST) Connector PSW 3M -2/90

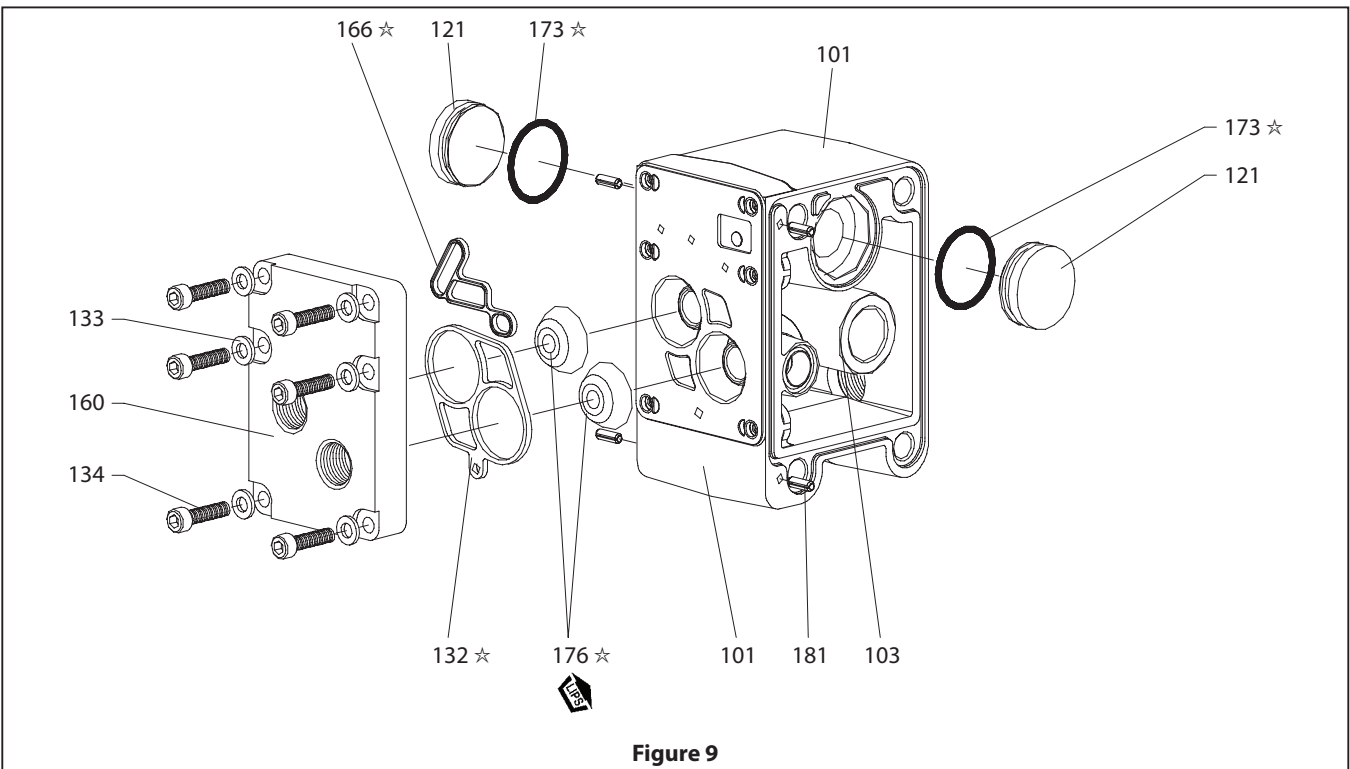
Figure 7

PORTED NO MOTOR OPTIONS

PART LIST- PEXXA-XXX-XXX-XPXX / PEXXS-XXX-XXX-XPXX



PART LIST - PEXXR-XXX-XXX-XPXX



INSTALLATION OF ELECTRONIC INTERFACE COMPONENTS FOR HAZARDOUS DUTY APPLICATIONS

Pumps that will operate in environments defined as "hazardous locations" must only be installed, connected and set-up by qualified personnel with knowledge and understanding of protection classes, regulations and provisions for apparatus in hazardous areas, for the region where the pump will operate, because these regulations and provisions, along with the definition of what constitutes hazardous areas vary by location.

Make sure the pump and its accessories comply with the specific requirements of the area it will be installed in. ARO Electronic interface Pumps (PE series) and its components are available with the following certifications:

- United States
 - Class I, Division 1, Groups A-D, T4
 - Class II, Division 1, Groups E-G, T135°C
 - Class I, Zone 1, Group IIC, T4
 - Zone 20, Group IIIC, T135°C

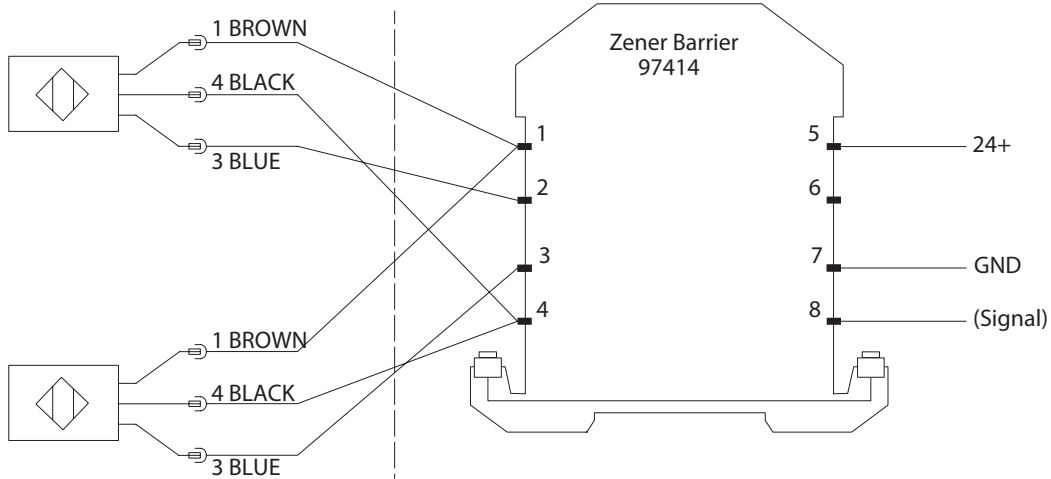
- Canada
 - Class I, Division 1, Groups A-D, T4
 - Class II, Division 1, Groups E-G, T135°C
 - Class I, Zone 1, Group IIC, T4
 - Zone 20, Group IIIC, T135°C

- ATEX (Europe)
 - ATEX Category 2
 - Zone 1, Group IIC, T4
 - Zone 21, Group IIIC, T135°C

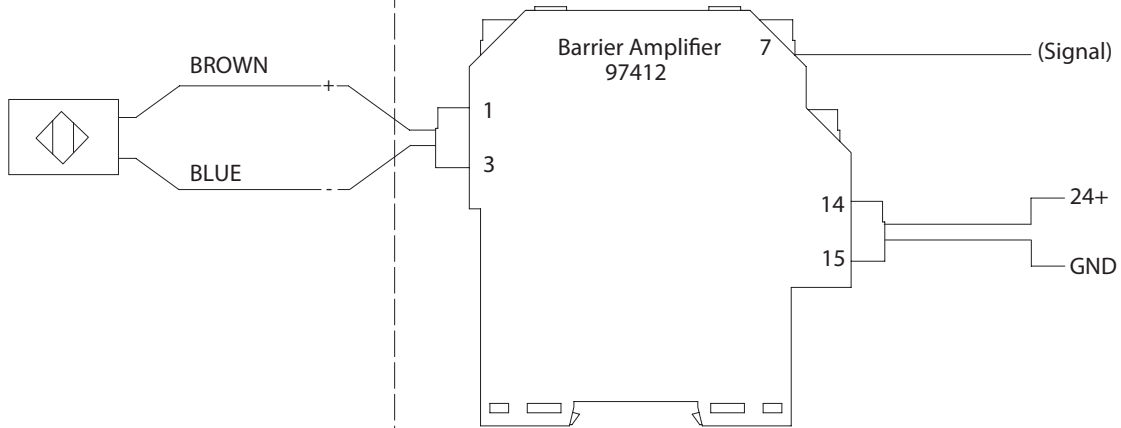
- IEC
 - IEC Category 2
 - Zone 1, Group IIC, T4
 - Zone 21, Group IIIC, T135°C

HAZARDOUS DUTY EI PUMP WIRING DIAGRAM

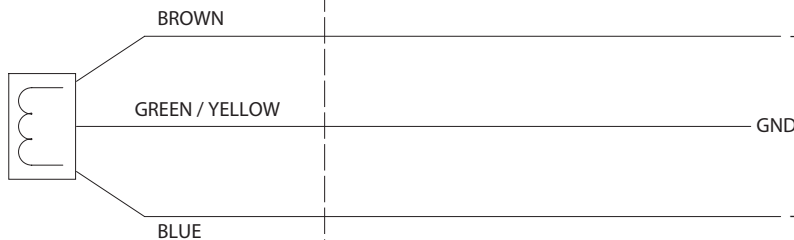
LEAK DETECTION SENSORS



END OF STROKE SENSOR



SOLENOID COIL



HAZARDOUS ZONE

SAFE ZONE

NOTE: Installer is responsible for extending cables and bringing them outside hazardous area using approved methods and components.