Standard Pump

Oval Gear Meter High Viscosity Batch Control System

Models: 7610, 7611, 7620, 7621, 7614, 7615, 7624, 7625, 7630, 7631, 7640, 7641, 7634, 7635, 7644 & 7645

Table of Contents

Models: 7610, 7611, 7620, 7621, 7614, 7615, 7624, 7625, 7630, 7631, 7640, 7641, 7634, 7635, 7644 & 7645

1. Introduction

1.1. Unpacking

Please verify that the product is complete and without any damage. This package should contain the following parts:

1. Pump Motor
2. Pump Tube Assembly
3. Flow Chamber Assembly
4. Chamber Assembly/Batch Controller
5. Operating Instructions

1.2. Assembly

1. Remove the pump and motor from packaging.
2. Inspect all contents for damage.
3. Couple the motor to the pump tube by using the stainless steel connection nut or bolt pneumatic motor to the pump using the hardware provided by the manufacturer (see Figure 1).
4. Attach the flow chamber assembly to pump tube assembly by threading the Oval Gear Flow Chamber clockwise onto discharge of pump tube assembly (use teflon tape on the discharge threads to ensure a proper seal).
5. Connect communication cable from batch controller to mating plug located on the motor. (see Figure 1).

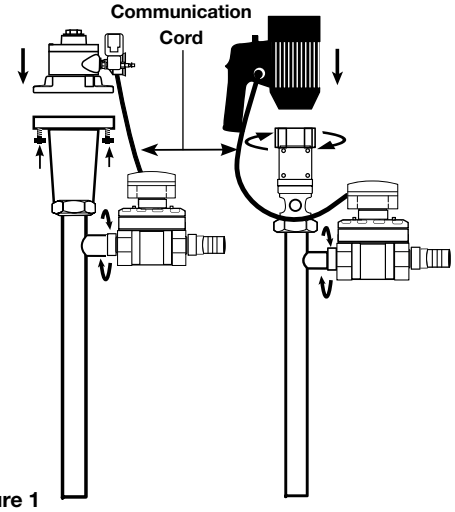


Figure 1

1.3. Start-Up & Safety Precautions

⚠ WARNING ***Do not use this batch control system to transfer flammable or combustible liquids or in an environment where flammable or combustible fumes are present. The batch control module emits an output signal; therefore, the system is not intrinsically safe. Failure to comply may result in serious injury or death.***

⚠ WARNING ***Before operating this equipment, the operator should thoroughly read and understand all instructions and safety warning labels including the manufacturer's instructions on the material being pumped.***

General Safety Information

1. The operator should wear suitable protective clothing including: face mask, safety shield or goggles, gloves, apron, and safety shoes.
2. Check a chemical resistance chart to be sure the chemical being pumped is compatible with pump construction.
3. All federal, state and local safety codes should be followed.
4. Make sure nameplate information corresponds to voltage supplied.

Pre-Start-Up

1. All connections must be properly in place and securely tightened. Stainless steel hose clamps are required on hose and must be properly tightened. Pump hand wheel must be snug, otherwise pump coupling damage can occur.
2. Confirm yellow meter communication cable is securely fastened to connection port located on the side of motor handle.
3. First use pump on water to become familiar with the assembly and check motor operation, flow rate, security of all hose connections, operation of speed control knob, liquid velocity and pump drainage.
4. Before starting motor, check to be sure hose is securely fastened in receiving vessel so hose cannot splash chemicals, causing injury.
5. Before connecting motor to power supply, be sure motor switch is OFF ("O" position) and speed control is turned down.
6. Never submerge pump below the discharge.
7. Never leave unit unattended during operation.
8. Do not use speed control knob as ON/OFF switch.*
9. If liquid appears below discharge assembly, check security of hose clamps and wing nut. If leakage fails to stop, cease operation. Neutralize pump and refer to specific parts list and operating instructions to repair. If unable to repair, contact factory.
10. When finished using pump, drain pump and hose thoroughly and operate on 1-2 gallons of clear water or neutral solution for 15-30 seconds to completely flush and rinse pump and hose assembly.
11. Never store the pump and hose assembly in the container. Always rinse thoroughly and hang on a wall bracket.

⚠ WARNING ****The speed control switch should not be used as the main ON/OFF switch. Using the speed control switch in this manner causes excessive wear to the potentiometer and may result in premature failure. The use of the speed control switch does not cut power to the motor and inadvertent activation could result in injury.***

1.4 Disassembly / Cleaning Procedures

1. Remove motor from pump tube. For models Electric Model: loosen Hex Nut in clockwise rotation (see Figure 2). For models Air Model: loosen (4) bolts that attach the pump to the motor (see Figure 3).

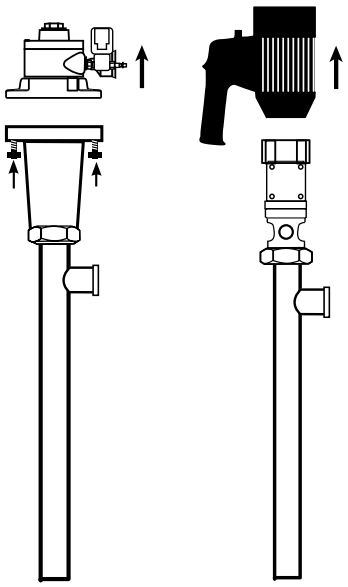


Figure 2 **Figure 3**

2. Loosen set screw on side of Hex Nut (see Figure 4).
3. Place a screwdriver (or similarly shaped object) in the mechanical seal inspection port (see Figure 4).
4. Use a large wrench to loosen the Hex Nut while simultaneously holding the screwdriver in the seal inspection port (see Figure 4).

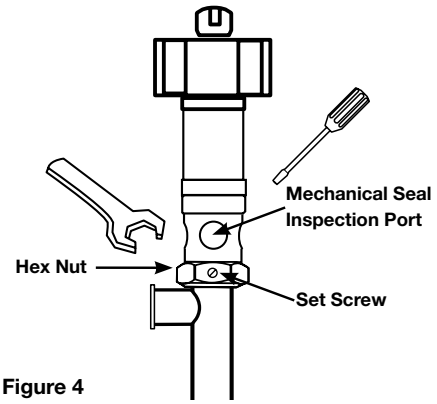


Figure 4

5. Once the Hex Nut is loosened, remove the outer tube from the drive shaft assembly (see Figure 5).

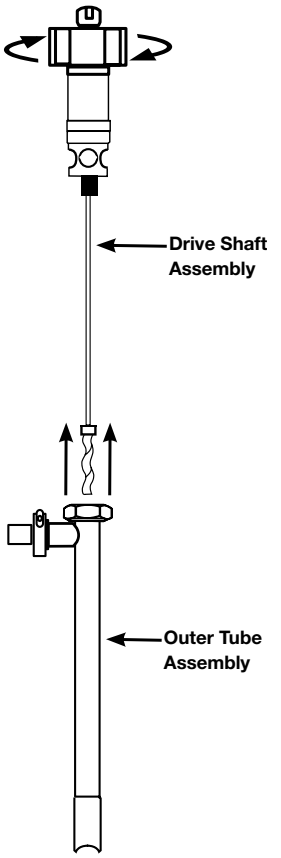


Figure 5

6. Remove the stator from the pump tube body by turning clockwise (see Figure 6).

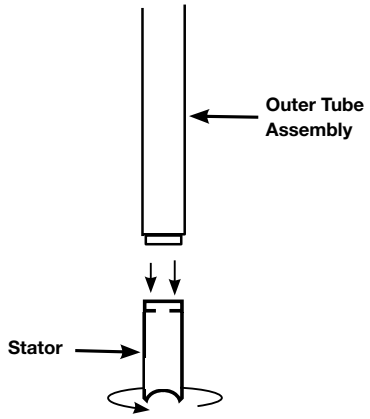


Figure 6

7. Hold the drive shaft in a fixed position and loosen the rotor (counterclockwise) located at the bottom of the drive shaft (see Figure 7).

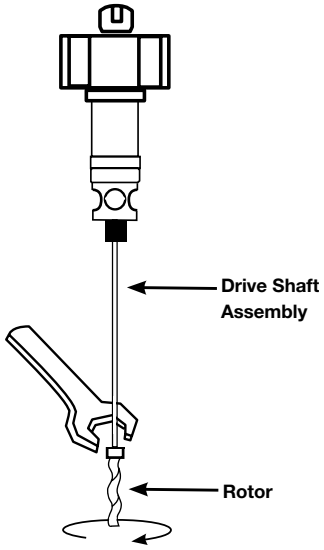


Figure 7

8. Insert a small screwdriver (or similar object) through the small hole on the shaft located inside the mechanical seal inspection port (see Figure 8).
9. While holding the small shaft still, loosen (counterclockwise) the pump drive shaft with large wrench. (see Figure 8).

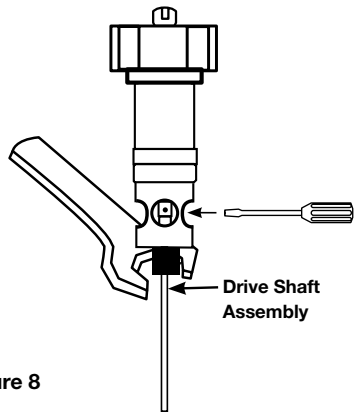


Figure 8

Mechanical Seal Replacement / Pump Assembly

1. Follow steps 1-9 under the Disassembly / Cleaning Procedures from above.
2. The mechanical seal will be exposed in the lower portion of the mechanical seal bushing (see Figure 9).

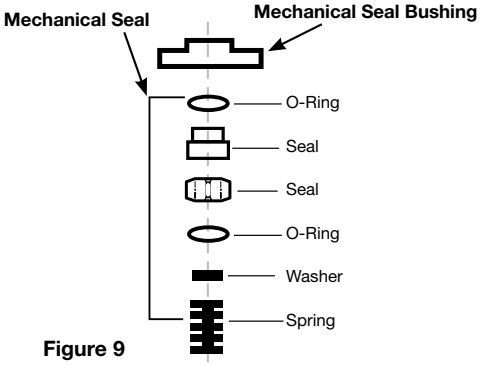


Figure 9

3. Remove damaged seal and replace with a new mechanical seal. Use a suitable lubricant on the seals O-rings.

⚠ WARNING ***Wear gloves when performing seal maintenance. Touching the seal face could cause premature failure.***

4. Reinstall mechanical seal bushing into bearing housing.
5. Thread drive shaft onto bearing housing shaft (see Figure 7, page 4).
6. Thread rotor onto drive shaft (see Figure 7, page 4).
7. Replace TFE stator insert into stator tube (see figure 10 & 11).

Note: Slide the TFE stator into the stator tube. Make sure the pin on the stator tube lines up with the notch on the TFE stator insert.

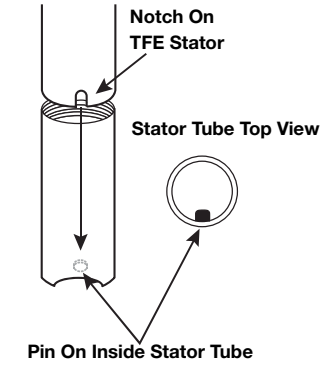


Figure 10

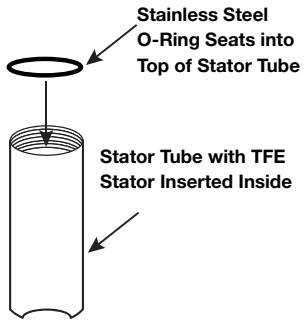


Figure 11

8. Thread stator can onto pump body (see Figure 7, page 4).
9. Apply a suitable lubricant on rotor.
10. Once Bearing Housing, drive shaft, and rotor are securely threaded together, insert this assembly into the pump body (see Figure 6, page 4).
11. Tighten the Hex Nut on the pump body to the Bearing housing. Use screwdriver (or similarly shaped object) in the mechanical seal inspection port (see Figure 5, page 4).
12. Use a large wrench to tighten the Hex Nut while simultaneously holding the screwdriver in the seal inspection port (see Figure 5, page 4).
13. Replace set screw into hex nut.
14. Reattach motor and resume operation. (see Figure 1, page 1).

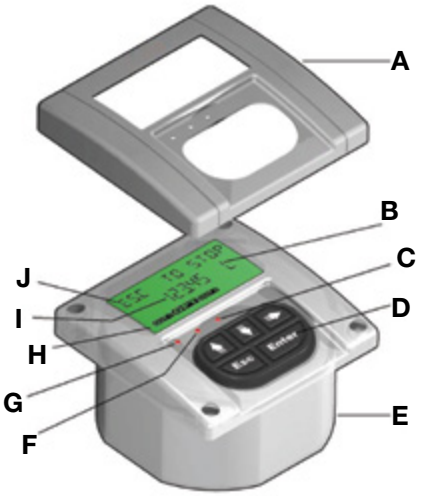
⚠ WARNING ***The 7600 series batch control system is a positive displacement pump and should never be operated against shut-off elements such as nozzles, valves, etc. Failure to comply may result in excessive pressure build resulting in serious injury and pump damage.***

2. Description

2.1. Design

The Batch Controller is designed for accurate and reliable batching or blending of a variety of liquids. The instrument combines complex control capability with easy calibration and operation. Self explaining calibration menus and 5-button keypad allow a user friendly setup of all the batch parameters while the high visible LCD display can show batch in progress, instant and totalized flow.

2.2. Technical Features



A. Removable Cover
B. 3 line LCD display
C. OUT 2 LED
D. 5 button silicone rubber keypad
E. ¼ DIN, IP65 monolithic enclosure
F. Open collector LED
G. OUT 1 LED
H. Output status icon line
I. 12 digit alphanumeric line
J. 12 digit alphanumeric line

Models: 7610, 7611, 7620, 7621, 7614, 7615, 7624, 7625, 7630, 7631, 7640, 7641, 7634, 7635, 7644 & 7645

3. Specifications

3.1. Oval Gear Meter Pump System Specifications

Model	Immersion Length	Wetted Parts	Voltage	Motors Drive	Discharge Fitting	Pumping Principle	Max Viscosity cps (mPAS)*	Max Discharge Pressure	Max Flow Range	Metering Principle	Accuracy	Max Temp
Electric Oval Gear Batch Control Systems 10,000 cps (mPAS)												
7610	39" (1000 mm)	316SS / PPS / Aluminum / PTFE / SIC	110-120V	TEFC (IP54)	1.5" (38 mm) Hose Barb	Progressive Cavity/ Positive Displacement	10,000	87 psi (6 bar)	2.6 GPM (9,8 LPM)- 12 GPM (45 LPM)	Oval Gear	+/- 0.63% of Full Scale +/- 1% of Reading	176º F (80º C)
7611	39" (1000 mm)		220-240V									
7620	47" (1200 mm)		110-120V									
7621	47" (1200 mm)		220-240V									
Electric Oval Gear Batch Control Systems 25,000 cps (mPAS)												
7614	39" (1000 mm)	316SS / PPS / Aluminum / PTFE / SIC	110-120V	TEFC (IP54)	1.5" (38 mm) Hose Barb	Progressive Cavity/ Positive Displacement	25,000	87 psi (6 bar)	2.6 GPM (9,8 LPM)- 7 GPM (26,5 LPM)	Oval Gear	+/- 0.63% of Full Scale +/- 1% of Reading	176º F (80º C)
7615	39" (1000 mm)		220-240V									
7624	47" (1200 mm)		110-120V									
7625	47" (1200 mm)		220-240V									
Air Oval Gear Batch Control Systems 10,000 cps (mPAS)												
7630	39" (1000 mm)	316SS / PPS / Aluminum / PTFE / SIC	110-120V	Air, 2 HP (1,5 KW)	1.5" (38 mm) Hose Barb	Progressive Cavity/ Positive Displacement	10,000	87 psi (6 bar)	2.6 GPM (9,8 LPM)- 12 GPM (45 LPM)	Oval Gear	+/- 0.63% of Full Scale +/- 1% of Reading	176º F (80º C)
7631	39" (1000 mm)		220-240V									
7640	47" (1200 mm)		110-120V									
7641	47" (1200 mm)		220-240V									
Air Oval Gear Batch Control Systems 25,000 cps (mPAS)												
7634	39" (1000 mm)	316SS / PPS / Aluminum / PTFE / SIC	110-120V	Air, 2 HP (1,5 KW)	1.5" (38 mm) Hose Barb	Progressive Cavity/ Positive Displacement	25,000	87 psi (6 bar)	2.6 GPM (9,8 LPM)- 7 GPM (26,5 LPM)	Oval Gear	+/- 0.63% of Full Scale +/- 1% of Reading	176º F (80º C)
7635	39" (1000 mm)		220-240V									
7644	47" (1200 mm)		110-120V									
7645	47" (1200 mm)		220-240V									

3.2. High Viscosity Batch Control System Electric Motors

Model	Voltage	Amps	Watts	HP	Phase	Hz	Enclosure	Variable Speed	Hazardous Duty	Shipping Wt lbs (kg)
SP-ENC-BC	110V	8.5	825	1	1	50-60	TEFC (IP54)	N	N	12.7 (5,7)
SP-ENC-2-BC	220V	5	825	1	1	50-60	TEFC (IP54)	N	N	12.7 (5,7)

3.3. High Viscosity Batch Control System Air Motors

Model	HP	KW	RPM	Enclosure	Frame	Flange	Air Consumption	Airline Size Inches	Shipping Weight
SP-A4	2	1,5	300–900	N/A	IEC#72/D71	B14/C140	80 CFM @ 100 psi 37 L/Sec @ 7 Bar	3/8"	12.0 (5,0)

Note: For optimum performance make sure proper size air lines are installed.

3.4. Technical Data

Associated flow sensor:

- FLS FlowX3 Hall effect with frequency output

Materials:

- Case: PC
- Field gasket: EPDM
- Keypad: 5-button silicone rubber

Display:

- 3 line LCD: 2 x 12 alphanumeric lines + 1 icon line
- Update rate: 1 second
- 7 different batches
- View flow rate while batching
- Remote start

Enclosure:

- IP65 front

Electrical

Supply Voltage: Supply Voltage: 90 to 240 VAC 50\60 Hz

Sensor Input (Frequency):

- Sensor power: 5 VDC @ < 20 mA
- Range: 0.5 to 1000 Hz
- Optically isolated from current loop
- Short circuit protected

Relay output:

- Mechanical SPDT contact
- Max voltage rating: 8A @ 24 VDC, 8A @ 240
- OUT1 – Batch: Batch in progress indication

SSR output:

- User selectable as START Batch, END Batch, OFF
- Optically isolated, 50mA MAX Sink, 24 VDC MAX pull-up voltage.

Environmental

Storage temperature: -15 to +80°C (5 to 176°F)

Relative humidity: 0 to 95% non-condensing

Standards and Approvals

Manufactured under ISO 9001 (Quality)

Manufactured under ISO 14001 (Environmental Management)

CE

4. Functions

This section describes all functions included with the batch controller and how they affect the OUT1 Batch Relay

4.1. OUT Batch Relay

The Batch Relay is dedicated to valve on/off control. It is energized at the start of the batch cycle and de-energized at the end of the batch cycle. It also can be manually deenergized by selecting STOP. A RESUME command can be given by either method to complete the batch or a START command can be given to start again from the beginning the batch cycle. The OUT1 icon on the LCD is always on while the corresponding green led indicator turns on when the batch is in progress and the contact is energized. There is an alarm if flow isn't detected in 30 seconds after a batch operation is started.

4.2. OUT SSR

This output can be left unused (OFF) or used to provide a Start of Batch pulse or a Stop of Batch pulse.

The output provides a 0.5 seconds pulse at the beginning or at the end of every batch cycle.

5. Operational Overview

The batch controller features a digital display and a five-button keypad for system set-up, calibration and operation. This section contains a description of the keypad functions and the general operation flowchart of the instrument.

5.1. Keypad Functions

The five push buttons of the keypad are used to navigate display levels and modify settings.

The function of each button may change according to display level; please refer totable (see Figure 12).

					
Level	**Function**				
Batch-View	Scroll through items	Scroll through items	Select items marked with >	Stop a batch cycle	Start a batch cycle Go to Menu Directory Level
Menu Directory	Scroll through items	Scroll through item	Enter menu for editing	Return to View	---------
Menu	Scroll through items	Scroll through items	Enter menu item for editing	Return to Menu Directory	---------
Edit	Modify an item or a flashing digit	Modify an item or a flashing digit	Scroll right through flashing digits	Return to Menu without saving	Save new settings

Figure 12

5.2. General Operation Flow Chart

The Batch Controller features four different levels as shown in the following flow chart illustrating the basic navigation concepts.

- ❒ **Batch-View Level:** this is the default level. After instrument set-up, all values and status of outputs will be available. The **ENTER** and **ESC** keys control batch start, stop and resume operation. Refer to section **7. Batch-View Level** for details.
- ❒ **Menu Directory Level:** there are two different Menu Directories for different set-up and calibration. Refer to section 8. Menu Directory Level for details. Access to this level is forbidden when a batch is running and it can be free or password protected.
- ❒ Entering the correct password allows direct access to next levels and to all editable items in all menus, until a return to View Level.
- ❒ Menu Level: the current setting for each item in a Menu can be viewed and selected for editing at this level. This is the default level. After instrument set-up, all values and status of outputs will be available. The **ENTER** and **ESC** keys control batch start, stop and resume operation. Refer to section **7. Batch-View Level** for details.
- ❒ **Edit Level:** all instrument parameters can be set, modified and saved at this level.
- ❒ Refer to section **9. Menu and Edit Levels** for details.

6. Batch-View Level

- During normal operation, the batch controller is in Batch-View Level displaying all measured values and the status of the Relay output (see Figure 8).
- To select the item you want displayed, press **UP or DOWN arrows.**
- The **ENTER** and **ESC** keys are used to control batch start, stop or resume operations.
- The batch volume can be programmed and the resettable totalize can be reset at this level.
- If the instrument is in a different level and no activity occurs for more than 3 minutes, it will return to Batch-View Level.
- **Changing display indication does not affect or interrupt instrument operation and calculation.**

In this menu it's possible to set the request batch, it's possible to set one of 7 different batches. It's possible to set the batch volume to section 8.1.2. Volume and K-factor.

7. Menu Directory Level

Access to this level can be free or password protected. Entering the correct password allows direct access to next levels and to all editable items in all menus, until a return to View Level (refers to section **8.2.5. Menu PWD** to select password protected access).

Two different menus are available to fully set-up the Batch Controller. These menus are separated in two different Menu Directories.

In terms of getting started and making batches, Calibration Menu is the most important menu in the Batch Controller and it is the only one included in the first Menu Directory (see Figure 13).

7.1. Free access (no password required)

(see Figure 14)

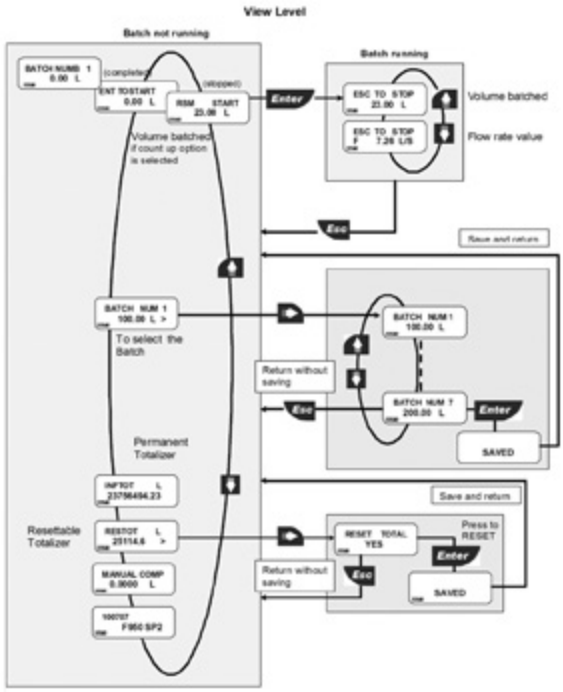


Figure 13

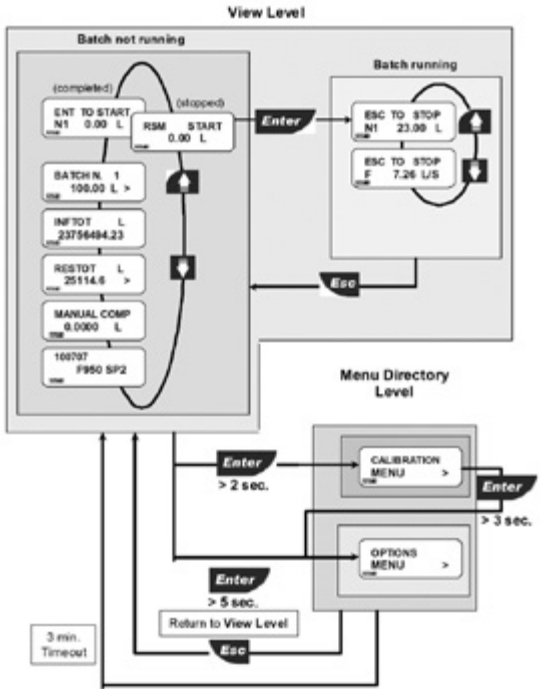


Figure 14 – Free access (no password required)

7.2. Password protected access

(see Figure 15)

8. Menu and Edit Levels

8.1 Calibration Menu

The Batch Controller basic settings are made in this menu (see Figure 16):

- **A.** o set batch volume, flow rate and totalize Engineering Units
- **B.** To set K-Factor
- **C.** To select the manual or automatic compensation*
- **D.** To set the mode of operation for the Solid State Relay Output

***Note:** In “AUTO” compensation mode, the instrument calculates the estimated overrun volume and automatically reduces the batch size for the next batch cycle.

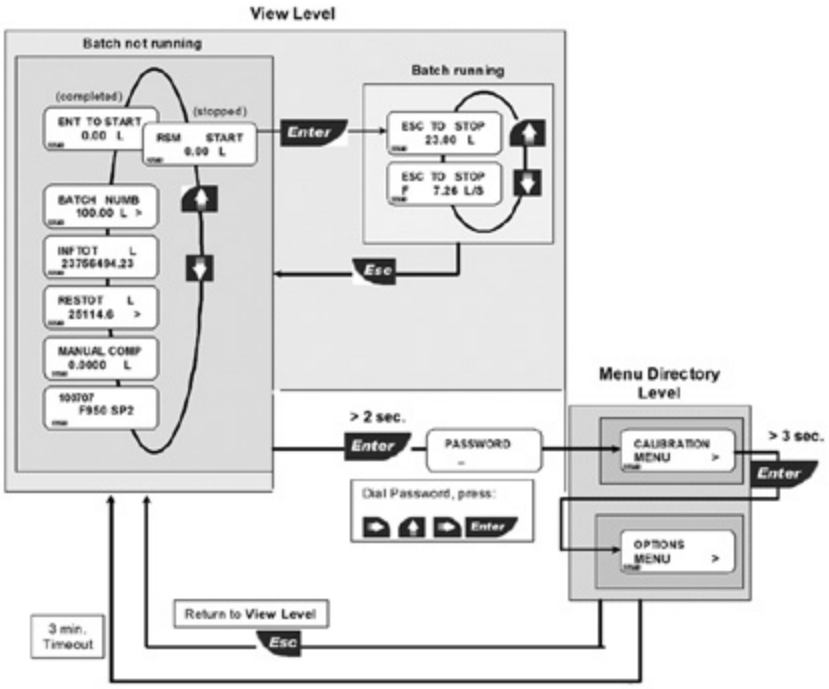


Figure 15 – Password protected access

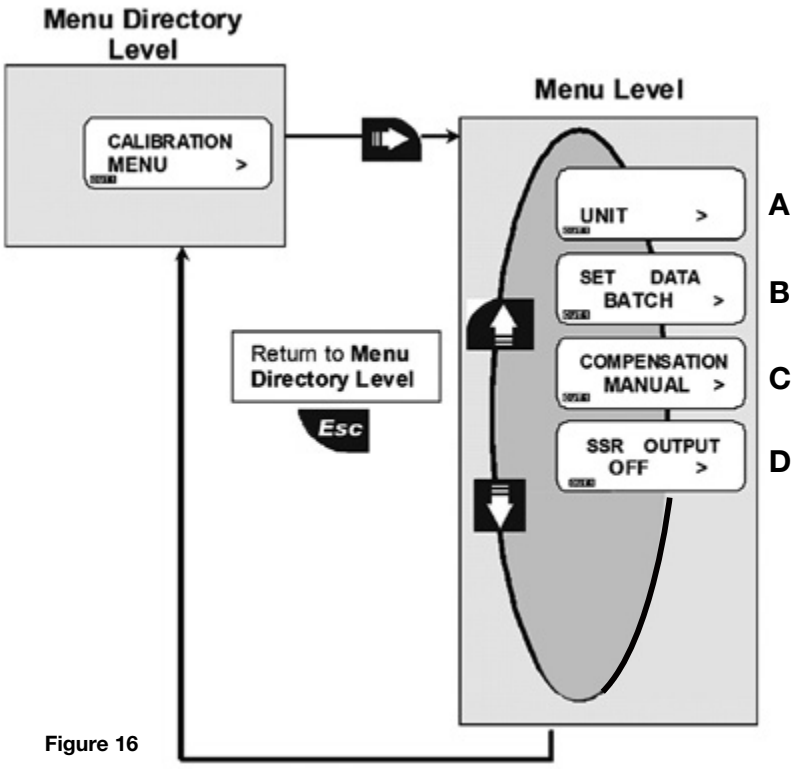


Figure 16

8.1.1. Unit

Set the engineering units for the batch volume, instant flow rate and the total flow rate.

All the options available are displayed on the LCD (see Figure 17).

Batch units available:

L = Liters

M3 = Cubic meter

GAL= Gallons

Cl = Centiliters

KG = Kilograms

MG = Mega grams

LB = Pound

OZ = Ounces

Flow units available:

L/S = Liters/sec

L/M = Liters/min

L/H = Liter/hour

GPM = Gallon per/min

M3/H = Cubic meter/hour

KG/S = Kilos/sec

KG/M = Kilos/min

KG/H = Kilos/hour

MG/H=Mega/hour

Total units available:

L = Liters

M3 = Cubic meter

GAL= Gallons

Cl = Centiliters

KG = Kilograms

MG = Mega grams

The instrument will automatically convert the values of the two totalizers in the new engineering units.

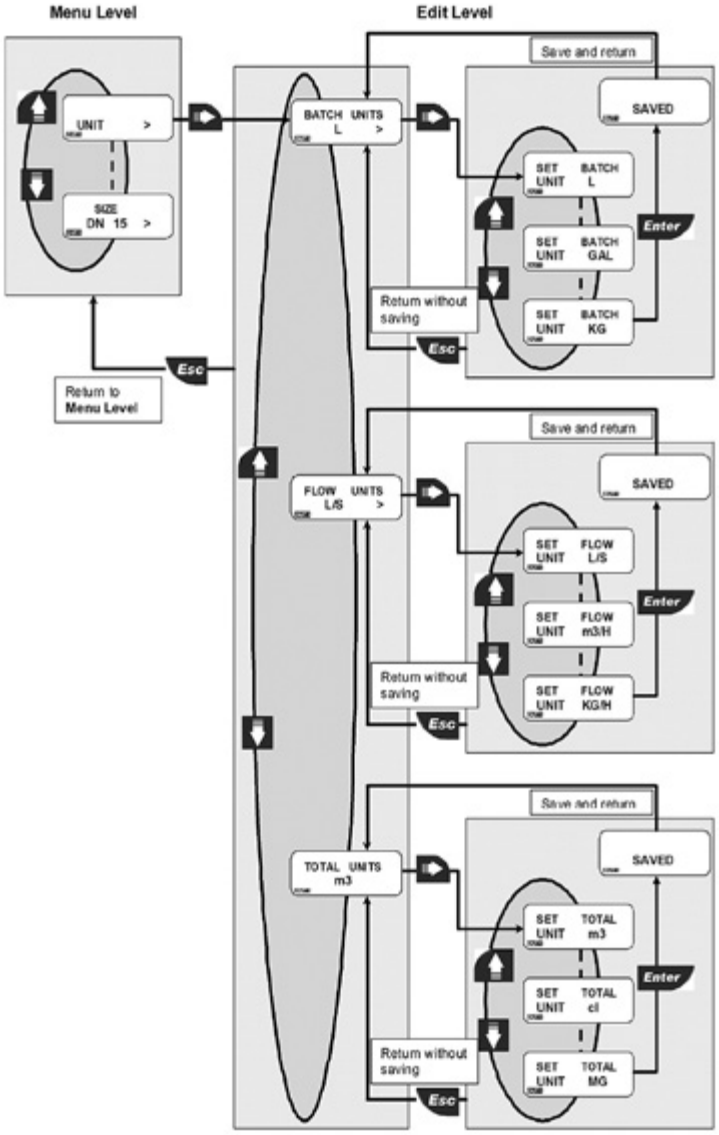


Figure 17

8.1.2. Volume and K-Factor

Set batch volume and K-Factor to tell the controller how to convert the input frequency from the flow sensor into a flow rate (see Figure 18).

Note: These K-Factors are based on water

which has a specific gravity of 1.0. For greater accuracy, refer to page 14-15 for in-field calibration procedures.

8.1.3. Compensation (MANUAL or AUTO)

Manual or automatic compensation for batch overrun is selected here. If manual overrun

compensation is selected the operator is also requested to enter the overrun volume.

The batch relay is dedicated to valve on/off control and it can be manually or automatically compensated for batch overrun.

Manual overrun compensation allows the operator to compensate for the throttle down of the motor. The operator is requested to enter the overrun volume to de-energize the batch relay early, compensating the throttle down of the motor and the batch overrun error.

Automatic overrun compensation counts sensor pulses during batch operation and any extra pulses after batch stop. The instrument calculates the estimated overrun volume and automatically reduces the batch size for the next batch cycle. During the next batch cycle, the batch relay will de-energize early closing the valve early and eliminating the overrun error.

The compensation setting won't be erased when the batch value is changed (see Figure 19).

Note: Compensation mode should be set to "AUTO" for most accurate results.

Note: When compensation mode is set to "AUTO" the first batch will always be larger than the amount intended. In every subsequent batch the meter will compensate for this over-run amount.

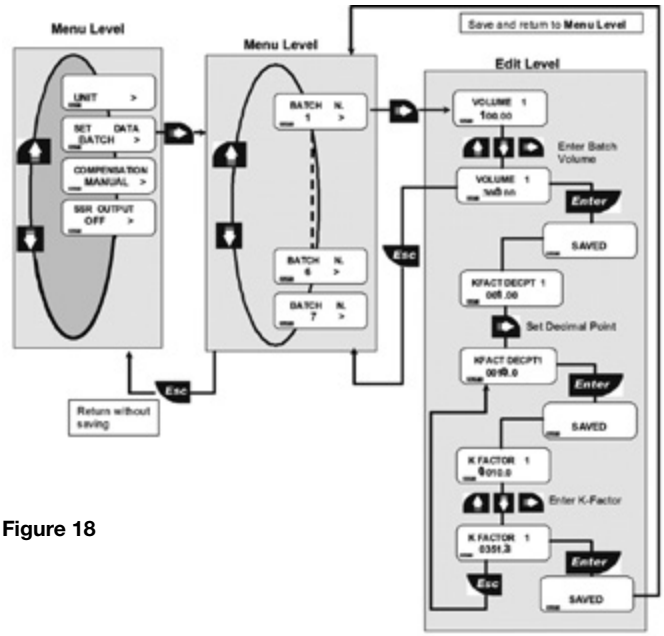


Figure 18

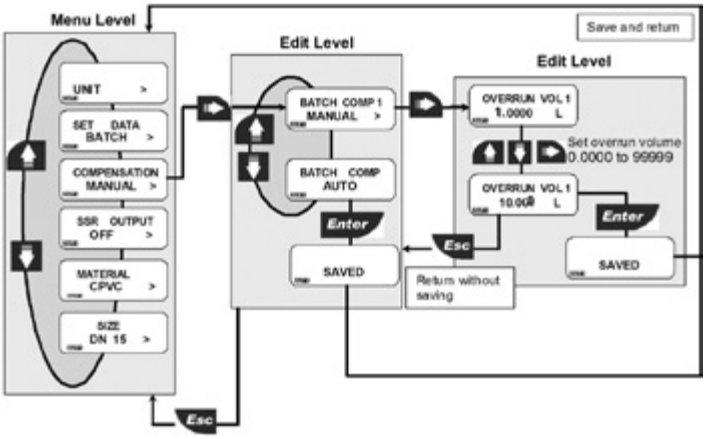


Figure 19 – Compensation (MANUAL or AUTO)

8.1.4. SSR Out

The mode of operation for the Solid State Relay Output can be selected between two different options: START Batch and END Batch (see Figure 20). **The signal can be disabled (set to OFF) if not used.** Refer to section.

8.2. Options Menu

A. To adjust LCD contrast

B. To select the averaging level of LCD, output and relay response

C. To set the flow rate decimal point position

D. To set the totalizer decimal point position

E. To set ON or OFF password protection to enter Menu Levels

F. To set ON or OFF password protection to reset totalizer

G. To select counter direction

H. To perform automatic calculation of K-Factor

I. To set ON or OFF ASEC

(see Figure 21)

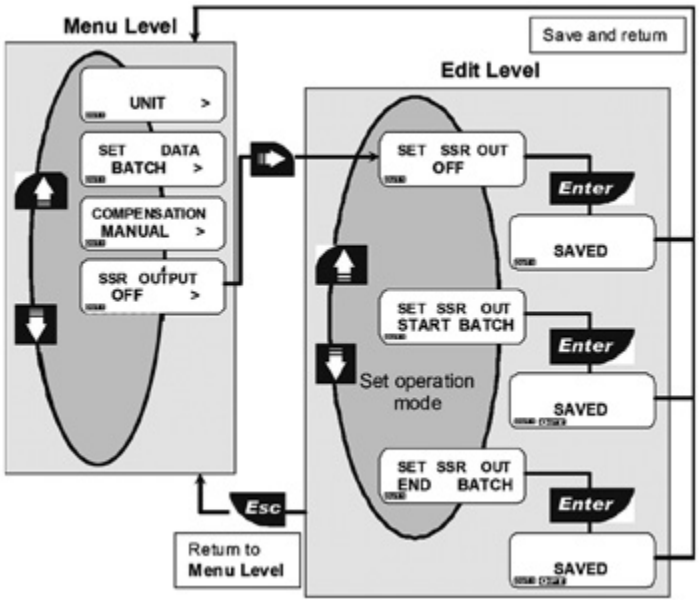


Figure 20

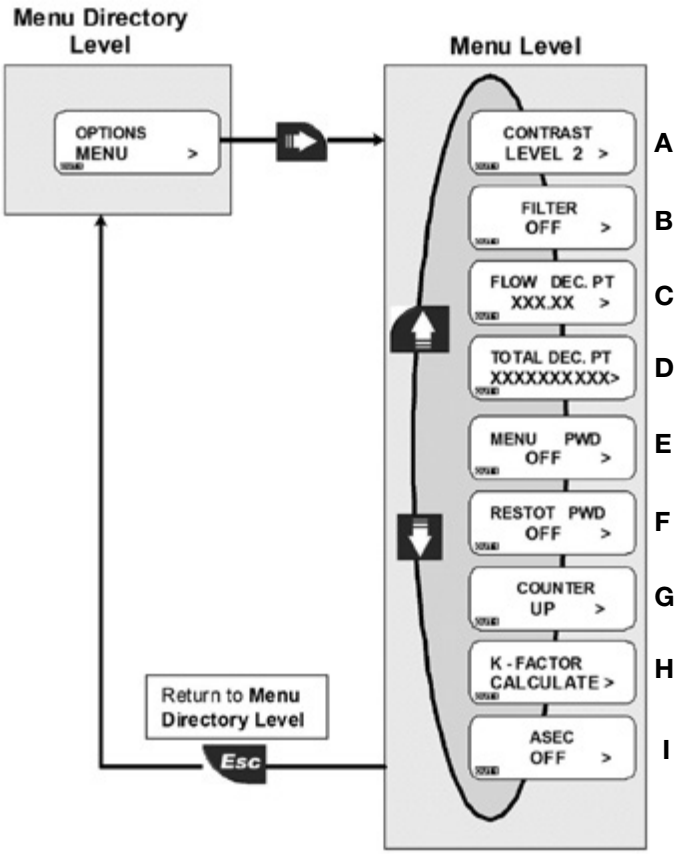


Figure 21

8.2.1. Contrast

Adjust the LCD contrast for best viewing. Five different levels are available, from 1 for low contrast up to 5 for high contrast (Figure 22).

8.2.2. Filter

Select the averaging level to dampen LCD indication output and relay response. **OFF:** no dampening effect, near instantaneous response (Figure 23).

8.2.3. Flow Decimal Point

Set the decimal point position to get the best resolution for the application (Figure 24). Select one of the following options:

X.XXXX ; XX.XXX ;

XXX.XX ; XXXX.X ;

XXXXX.

8.2.4. Total Decimal Point

Set the decimal point position to get the best resolution for the application (Figure 25). Select one of the following options

XXXXXXXX.XX

XXXXXXXXX.X

XXXXXXXXXX.

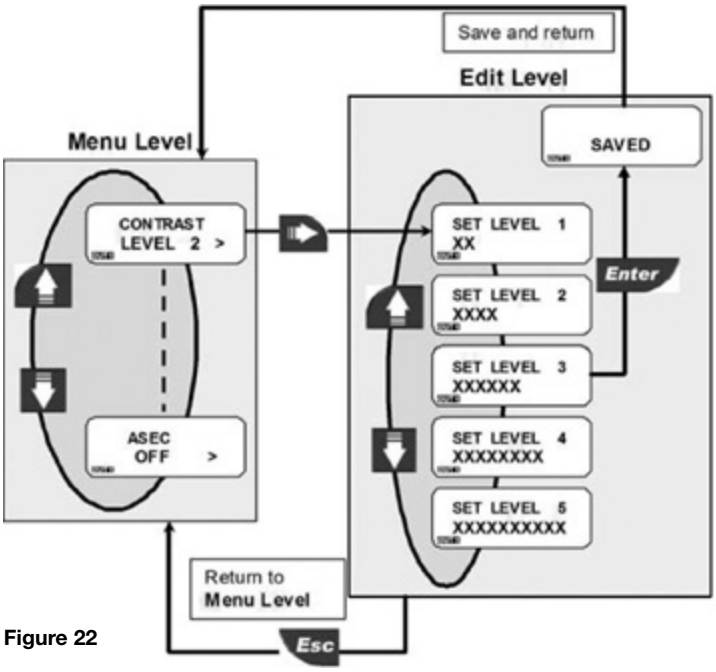


Figure 22

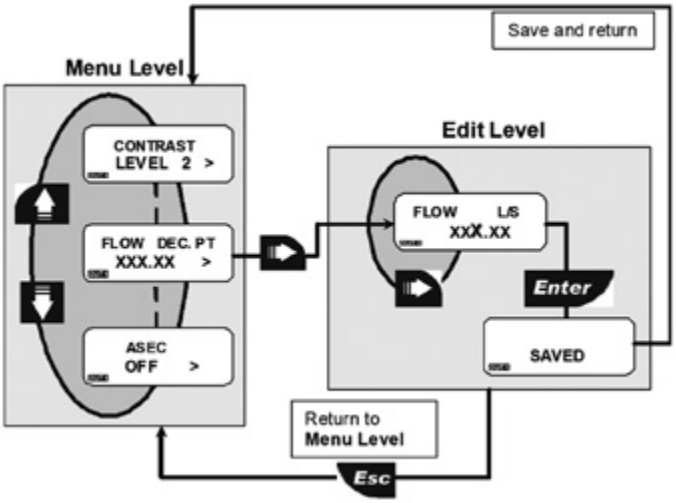


Figure 24

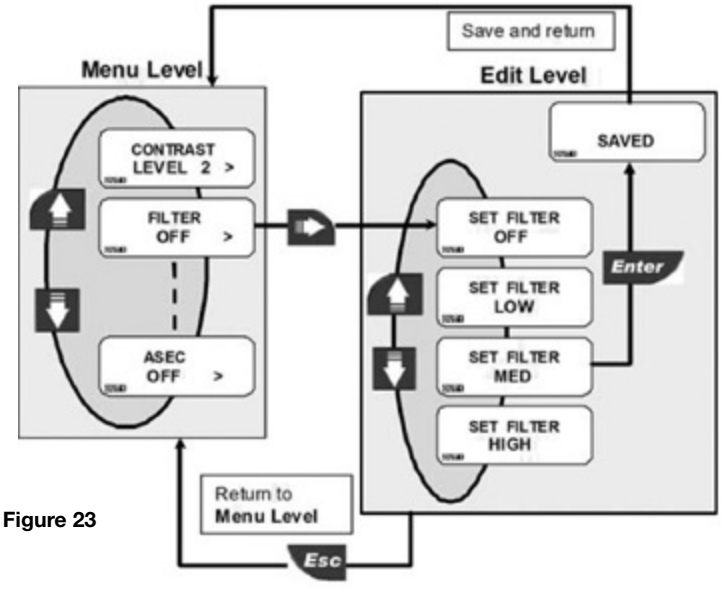


Figure 23

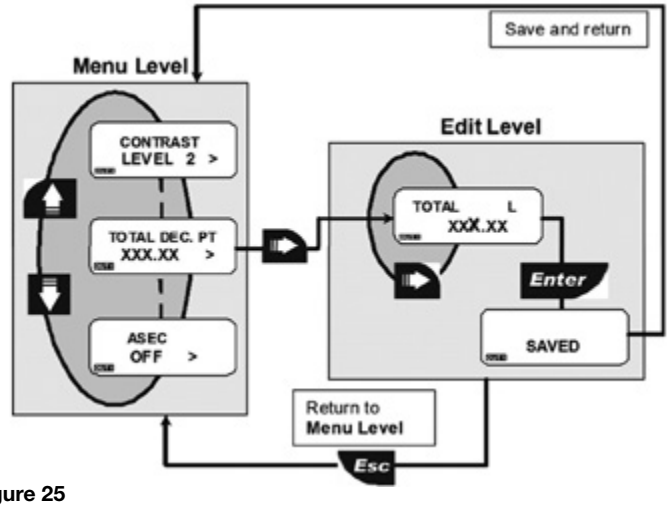


Figure 25

8.2.5. Menu PWD

Set ON the Menu PWD to protect access to Menu Directory Level and next levels (Figure 26).

8.2.6. Restot PWD

Set ON the Restot PWD to protect the resettable totalizer from undesired reset operations (Figure 27).

8.2.7. Counter Direction

Set UP or DOWN to select Batch display count direction: Up or Down (Figure 28).

8.2.8. K-Factor Calculate

Option used to perform automatic calculation of K-Factor by measuring the volume filled into a tank. This feature is used to get the highest possible accuracy (Figure 29).

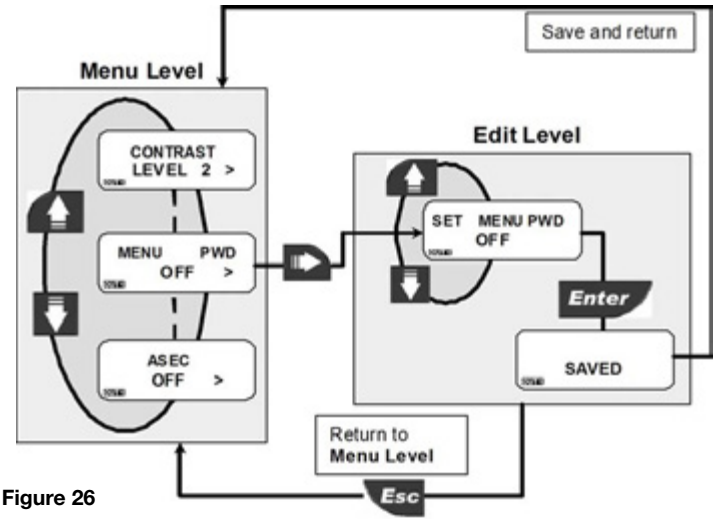


Figure 26

NOTE: the standard password is

and it cannot be modified.

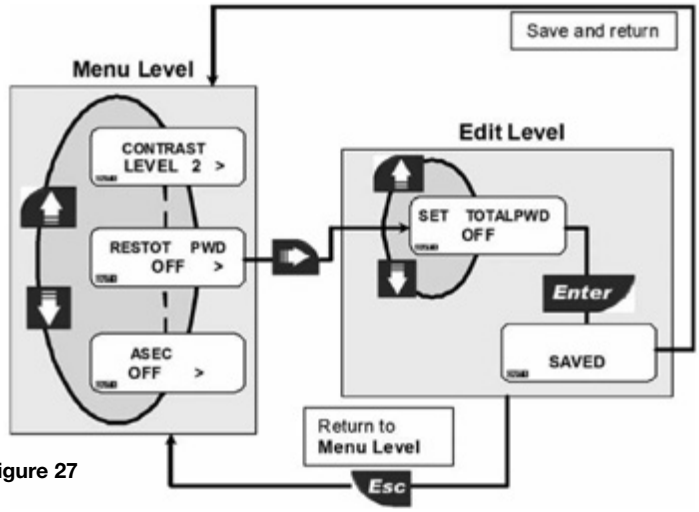


Figure 27

NOTE: the standard password is

and it cannot be modified.

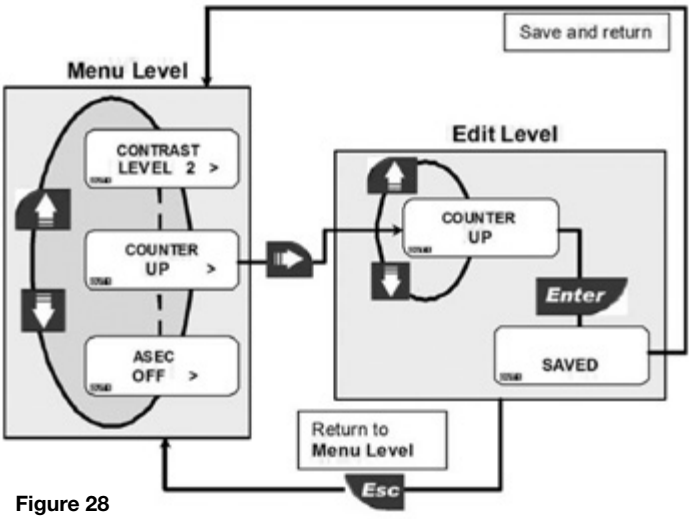


Figure 28

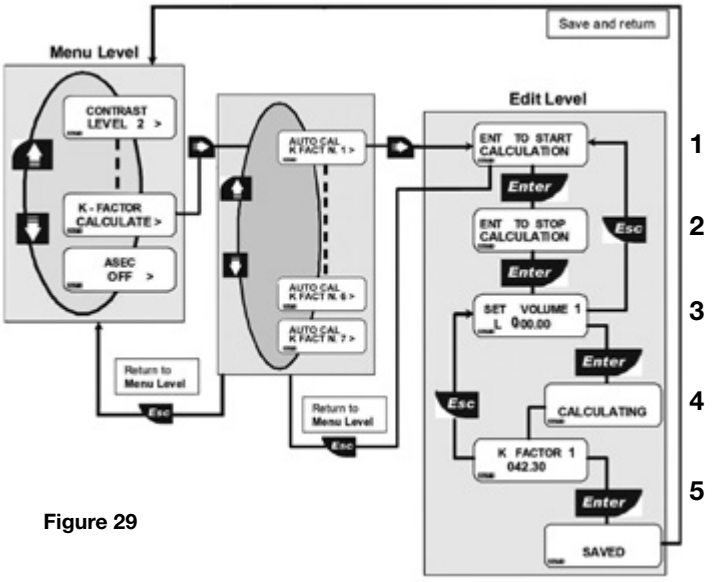


Figure 29

8.2.8. K-Factor Calculate (continued)

Note: For most accurate results, use a graduated container as the receiving vessel.

Note: The operator must predetermine the amount that will be pumped into the receiving vessel prior to starting the K-Factor Calculate process. This is the amount that will be entered into the meter during Step 3 of the process.

1. Press ENTER to start trial batch and automatic calculation. The Batch Controller starts counting pulses from the sensor.
2. When the fluid level in the receiving vessel reaches the predetermined amount, press ENTER to stop calculation. At this point, the Batch Controller stops counting pulses from the sensor. (Any fluid that comes out of pump discharge during the motor throttle down period has not been counted by the meter and should not be added to the final volume.)
3. Enter the predetermined volume and press ENTER
4. The Batch Controller is calculating the new K-Factor.
5. Successful K-Factor calculation. Press ENTER to accept new K-Factor or ESC to return without saving.

Note: The K-Factor is based on a constant flow. During a specific batch, the motor must remain on the same speed as when the K-Factor was calculated. Changing the speed of the motor in the middle of a batch will cause an inaccurate reading in the batch control module.

Helpful Hints:

- Speed potentiometer on motor should be turned to “Max” to ensure flow chamber is full during calibration process.
- The predetermined amount of fluid that will be pumped during the K-Factor Calculate process should be no less than 3 gallons or 12 liters.
- Using a larger receiving vessel than the amount you plan to pump for this process will decrease the turbulence of the liquid in the container, thereby making it easier to stop the meter at the predetermined volume.
- For increased accuracy, repeat the K-Factor Calculate process three times, notating the calculated K-Factor after each process. Then take the average of these K-Factors and manually enter this value to any of the seven available presets (see section 8.1.2)

8.2.9. ASEC

ASEC (Automatic Systematic Error Compensation) improve instrument performance. ASEC works starting from application’s parameter, particularly sensor body’s material and pipe’s size. To set ASEC OFF makes Size and Material Options useless, so it makes them unavailable from Calibration Menu (Figure 30).

Note: Leave ASEC setting “OFF” as it does not apply to this model.

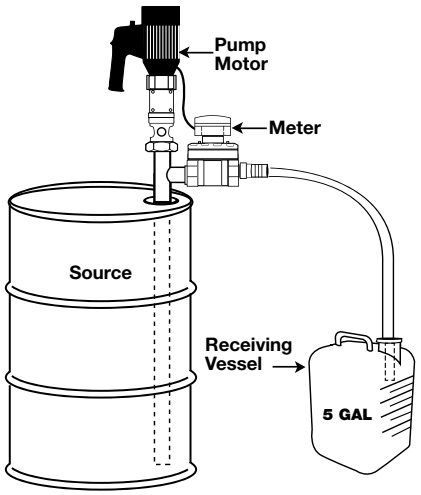
9. Troubleshooting

The instrument correctly installed is maintenance-free. The case and the front panel can be cleaned with soft cloth and an appropriate cleaning agent.

9.1. Display messages

(see Figure 31 below)

Recommended K-Factor Calculate Set-Up



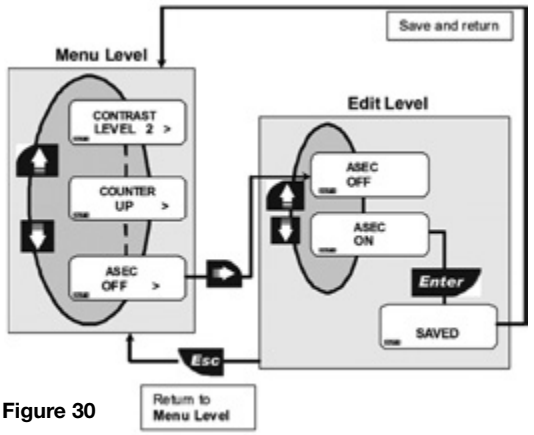


Figure 30

Display	Causes	Solutions
	• The display is OFF: no power supply provided	• Check power supply connection. Check “bridges ” between terminals
ESC TO STOP F OVF L/S	• Flow rate is in OVERFLOW: it exceeds the maximum display capability	• Change the flow rate engineering units
ENT TO START – 7.23 L ENT TO START 107.23 L	• Volume detected after batch end with count DOWN direction or with count UP direction (for the example consider Batch Volume = 100 L)	• Check and repair the cause of the leakage (i.e. broken or stuck shutoff valve)
SET VALUE MORE THAN 0	• K-Factor cannot be set to 0 • Batch Volume cannot be set to 0 • Overrun alarm volume cannot be set to 0 • Volume filled into the tank (during K-factor calculation procedure) cannot be set to 0	• Enter K-Factor value from 000.01 to 99999 • Enter any volume from 0.0001 to 99999 • Enter any volume from 0.0001 to 99999 • Enter any volume from 000.01 to 999.99
K FACTOR OUT OF RANGE	• The value calculated during the KFactor calculation procedure is out of range	• Move decimal point p osition or • Check entered volume
TOTAL OVF ERROR	• With the new engineering unit chosen, the totalized volume exceeds maximum display capability	• Change the totalizer engineering units

Figure 30 - Display Messages

Models: 7610, 7611, 7620, 7621, 7614, 7615, 7624, 7625, 7630, 7631, 7640, 7641, 7634, 7635, 7644 & 7645

Oval Gear High Viscosity Batch Control System – Electric Spare Parts List

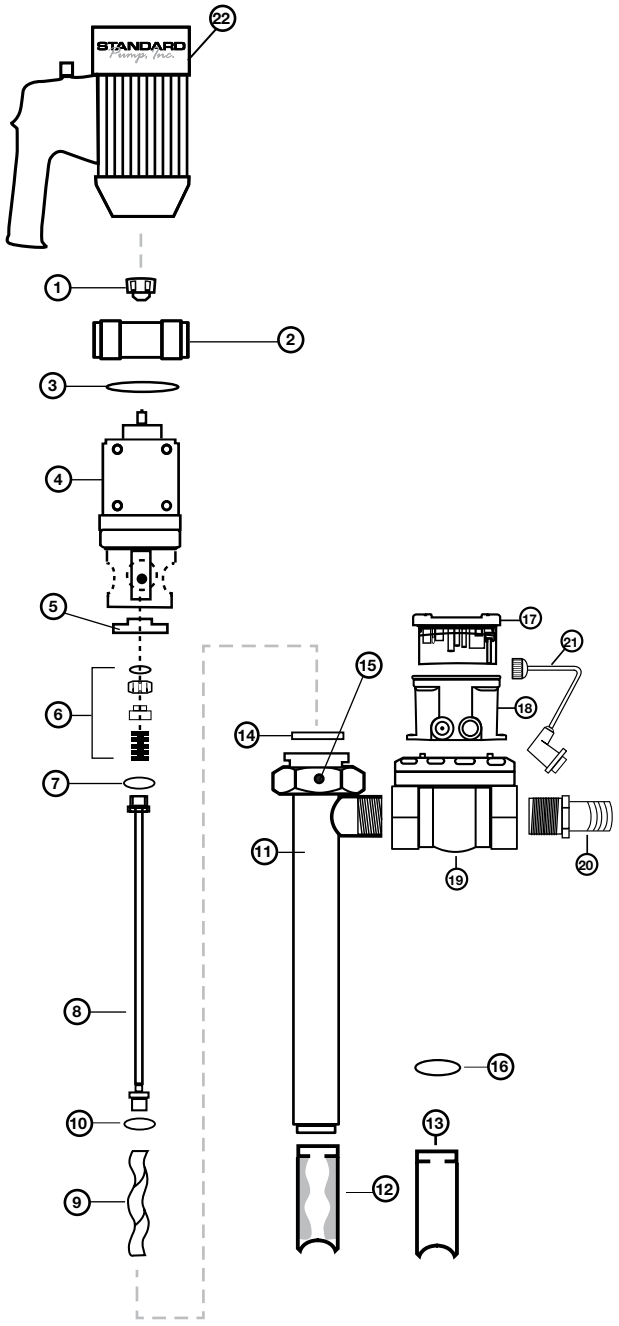


Figure 31

Electric Oval Gear BCS See Figure 31

Ref #	Description	P/N for Electric BCS
1	Pump Coupling	**1004**
2	Connection Nut, SS316	**8842**
3	Snap Ring, SS316	**8208**
4	Gear Reduction Unit, SS316 & Aluminum	**701**
5	Mechanical Seal Bushing, SS316	**702**
6	Mechanical Seal, SIC	**703**
7	Gasket, PTFE	**735**
8	Drive Shaft, SS316	
	Pump Sizes - SP-1851-39	**705**
	Pump Sizes - SP-751-39	**706**
	Pump Sizes - SP-1851-47	**706**
	Pump Sizes - SP-751-47	**707**
9	Rotor, SS316	
	Size 751	**708**
	Size 1851	**710**
10	Gasket, PTFE	**731**
11	Outer Tube Assembly, SS316	
	Pump Sizes - SP-1851-39	**771**
	Pump Sizes - SP-751-39	**772**
	Pump Sizes - SP-1851-47	**772**
	Pump Sizes - SP-751-47	**773**
12	Stator, PTFE (Stator Insert Only)	
	Size 751	**722**
	Size 1851	**724**
13	Stator Tube, SS316	
	Size 751	**774**
	Size 1851	**776**
14	Gasket, PTFE	**738**
15	Set Screw, SS316	**757**
16	Ring, SS316	**0016**
17	Batch Control Module	**F9.50.SP**
18	Batch Control Mounting Bracket	**F9.KW1**
19	Oval Gear Flow Chamber, Aluminum	**M40ARP-2EHZ**
20	Hose Barb, SS316, 1.5" (38 mm)	**HB150SS**
21	Communication Cable	**RSW 40-637/3 Ft.**
22	Batch Control Motor, TEFC	
	110-120V	**SP-ENC-BC**
	220-120V	**SP-ENC-2-BC**

Models: 7610, 7611, 7620, 7621, 7614, 7615, 7624, 7625, 7630, 7631, 7640, 7641, 7634, 7635, 7644 & 7645

Oval Gear High Viscosity Batch Control System – Air
Spare Parts List

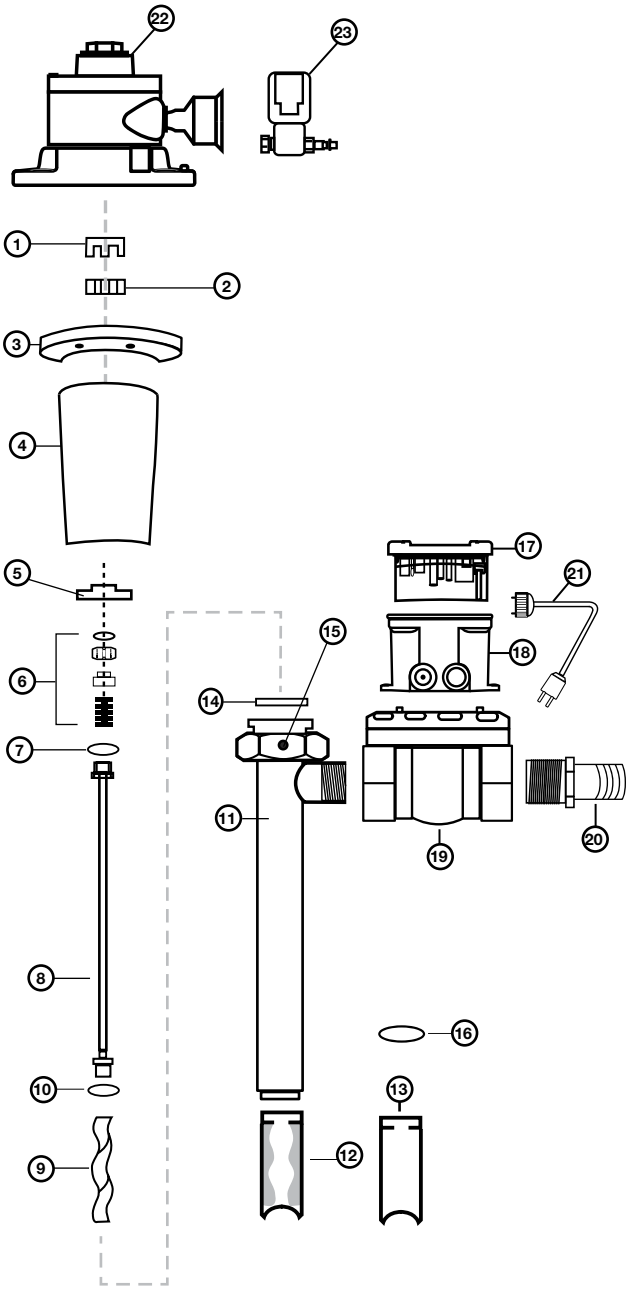


Figure 32

Air Oval Gear BCS See Figure 32

Ref #	Description	P/N for Electric BCS
1	Motor Coupling, 14 mm	**744**
2	Coupling Insert	**745**
3	Motor Mounting Flange, Aluminum	**760**
4	Bearing Housing Assembly, Aluminum	**759**
5	Mechanical Seal Bushing, SS316	**702**
6	Mechanical Seal, SIC	**703**
7	Gasket, PTFE	**735**
8	Drive Shaft, SS316	
	Pump Sizes - SP-1851-39	**705**
	Pump Sizes - SP-751-39	**706**
	Pump Sizes - SP-1851-47	**706**
	Pump Sizes - SP-751-47	**707**
9	Rotor, SS316	
	Size 751	**708**
	Size 1851	**710**
10	Gasket, PTFE	**731**
11	Outer Tube Assembly, SS316	
	Pump Sizes - SP-1851-39	**771**
	Pump Sizes - SP-751-39	**772**
	Pump Sizes - SP-1851-47	**772**
	Pump Sizes - SP-751-47	**773**
12	Stator, PTFE (Stator Insert Only)	
	Size 751	**722**
	Size 1851	**724**
13	Stator Tube, SS316	
	Size 751	**774**
	Size 1851	**776**
14	Gasket, PTFE	**738**
15	Set Screw, SS316	**757**
16	Ring, SS316	**0016**
17	Batch Control Module	**F9.50.SP**
18	Batch Control Mounting Bracket	**F9.KW1**
19	Oval Gear Flow Chamber, Aluminum	**M40ARP-2EHZ**
20	Hose Barb, SS316, 1.5" (38 mm)	**HB150SS**
21	Power Cord	
	110-120V	**8360**
	220-240V	**8705**
22	Pneumatic Motor, 2 HP (1,5 KW)	**SP-A4**
23	Solenoid Valve Kit, SS316	
	110-120V	**0031SS**
	220-240V	**0031SS-2**

Models: 7610, 7611, 7620, 7621, 7614, 7615, 7624, 7625, 7630, 7631, 7640, 7641, 7634, 7635, 7644 & 7645

Electric & Air Motors Spare Parts Lists

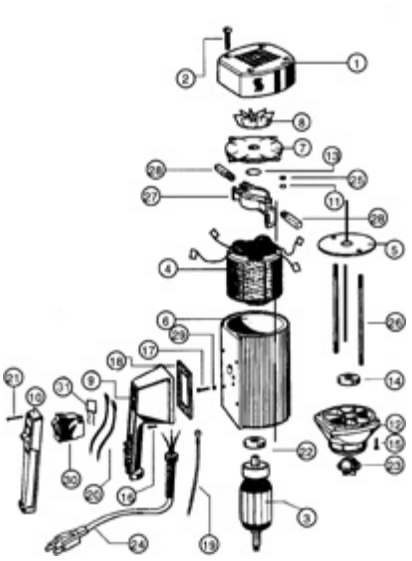


Figure 33 – SP-ENC

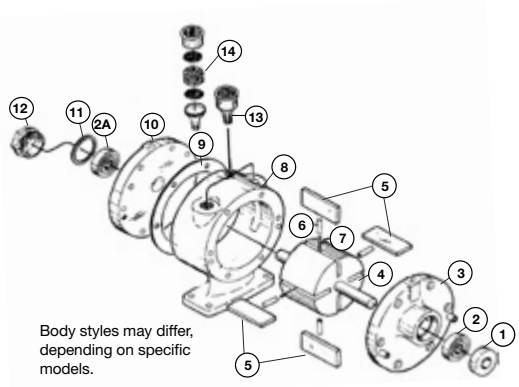


Figure 34 – SP-A4

SP-ENC See Figure 33

Ref. #	Description	P/N for SP-ENC	Qty
1	Motor Cover	**3000**	1
2	Screw, Motor Cover	**3130**	1
3	Armature, 110-120V	**3502**	1
	220-240V	**3701**	1
4	Stator, 110-120V	**3503**	1
	220-240V	**3702**	1
5	Guide Disc	**3504**	1
6	Motor Housing	**3510**	1
7	Bearing Cover	**3511**	1
8	Fan	**3512**	1
9	Switch Housing for Batch Control, Includes Potentiometer and BCS Port Connection		
	110-120V	**8006**	1
	220-240V	**8007**	1
10	Switch Cover	**8002**	1
11	Lock Washer	**8071**	2
12	Lower Housing	**8100**	1
13	Wave Washer	**8125**	1
14	Ball Bearing, Lower	**8126**	1
15	Screw, Lower Housing	**8130**	4
16	Screw, Switch Housing		
	110-120V	**8131**	4
	220-240V	**8131LVR**	4
17	Ground Screw	**8162**	1
18	Gasket, 110-120V	**8167**	1
	220-240V	**8167LVR**	1
19	Earthing Lead	**8185**	1
20	Lead	**8183**	2
21	Screw, Switch Cover	**8220**	5
22	Ball Bearing, Upper	**8331**	1
23	Motor Coupling	**8333**	1
24	Power Cord w/Strain Relief & Plug,		
	110-120V	**8360**	
	220-240V	**8705**	1
25	Hexagon Nut	**8448**	2
26	Rod Connector	**3703**	2
27	Brush Holder	**8508**	1
28	Carbon Brush, 110-120V	**8509**	2
	220-240V	**8703**	2
29	Star Washer	**8511**	1
30	Overload Switch,		1
	8.5 amp 110-120V	**8611**	
	5 amp 220-240V Low Voltage Release	**8704LVR**	1
31	EMI Filter	**8003**	1
32	Repair Kit 110-120V (includes PN's 8333 & (2) 8509)	**9055**	1
33	Repair Kit 220-240V (includes PN's 8333 & (2) 8703)	**9056**	1

SP-A4 See Figure 34

Ref. #	Description	P/N for SP-A4	Qty
Service kit – only service kits are available for parts replacement * Denotes parts included in the Service Kit		**1**	**K206C**
1	Shaft Seal	**B2328**	1
2*	Bearing, Drive End	**AB519**	1
3	Bearing, Dead End	**AA299J**	1
4*	End Plate, Drive	**AK425A**	1
5	Rotor Assembly	**AM455C**	1
6*	Vane		4
7	Push Pin		4
8	Vane, Spring		2
9*	Body	**AM410M**	1
10*	Shims	**B330**	2
11	End Plate, Dead	**AB622M**	1
12	End Cap, Gasket	**AA46**	1
13	End Cap, Dead	**AM307D**	1
	Muffler Assembly	**AC980**	1
14	Muffler Felt	**AC983**	1

⚠ SP-ENC Series motors should not be used to pump flammables.

Warranty

Declarations

Declaration of Conformity	When this unit is used as a stand alone unit it complies with: Machinery Directive 98/37/EC EN60204, EN60335-2-41, EN60335-1, Low Voltage Directive 73/23/Eec EN61010-1, EMC Directive 89/336/Eec EN55014, EN 550104, EN50081-1, EN50082-1
Declaration of Incorporation	When this pump unit is to be installed into machine or is to be assembled with other machines for installations, it must not be put into service until the relevant machinery has been declared in conformity with Machine Directive 98/37/EC EN60204, EN60335-2-41, EN60335-1.

Responsible person: Donald M. Murphy, President, Standard Pump, Inc.
1540 University Drive, Auburn, Georgia 30011
Ph: 001-770-307-1003 Fax: 001-770-307-1009
e-mail: info@standardpump.com
www.standardpump.com

Three year limited warranty

Standard Pump, Inc. warrants, subject to the conditions below, through either Standard Pump, Inc., it's subsidiaries, or its authorized distributors, to repair or replace free of charge, including labor, any part of this equipment which fails within **three years** of delivery of the product to the end user. Such failure must have occurred because of defect in material or workmanship and not as a result of operation of the equipment other than in accordance with the instructions given in this material. Specific exceptions include:

- Consumable items such as motor brushes, bearings, couplings and impellers. (Motor brushes typically have a life span of approximately 700 hours. This will vary with the manner in which the motor is used)

Conditions of exceptions include:

- Equipment must be returned by prepaid carriage to Standard Pump, Inc., its subsidiary or authorized distributor.
- All repairs, modifications must have been made by or with express written permission by Standard Pump, Inc., it's subsidiary or authorized distributor.
- Equipment which have been abused, misused, or subject to malicious or accidental damage or electrical surge are excluded.

Warranties purporting to be on behalf of Standard Pump, Inc. made by any person, including representatives of Standard Pump, Inc, its subsidiaries, or its distributors, which do not fall within the terms of this warranty shall not be binding upon Standard Pump, Inc. unless expressly approved in writing by a Director or Manager of Standard Pump, Inc. Information for returning pumps Equipment which has been contaminated with, or exposed to, bodily fluids, toxic chemicals or any other substance hazardous to health must be decontaminated before it is returned to Standard Pump, Inc, or its distributor. A returned goods authorization number (RGA #) issued by Standard Pump, Inc., its subsidiary or authorized distributor, must be included with the returned equipment. The RGA # is required if the equipment has been used. If the equipment has been used, the fluids that have been in contact with the pump and the cleaning procedure must be specified along with a statement that the equipment has been decontaminated.

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