

*Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain. Protect yourself and others by observing all safety information. Failure to comply with the Operating Instructions could result in personal injury and / or property damage.*

# Standard Pump DEF Pumps 9100 Series

## Safety Precautions

The responsibility for safe assembly, installation and operation ultimately rests with the operator. Read and understand all safety precautions and operating instructions before use. Careless operation may result in serious injury.

## General Safety Information

1. Before operating this pump, read and understand these operating instructions.
2. The operator should wear suitable protective clothing including: face mask, safety shield or goggles, apron and safety shoes.
3. Do not use any Standard Pump DEF Pump to transfer flammable or combustible liquids.

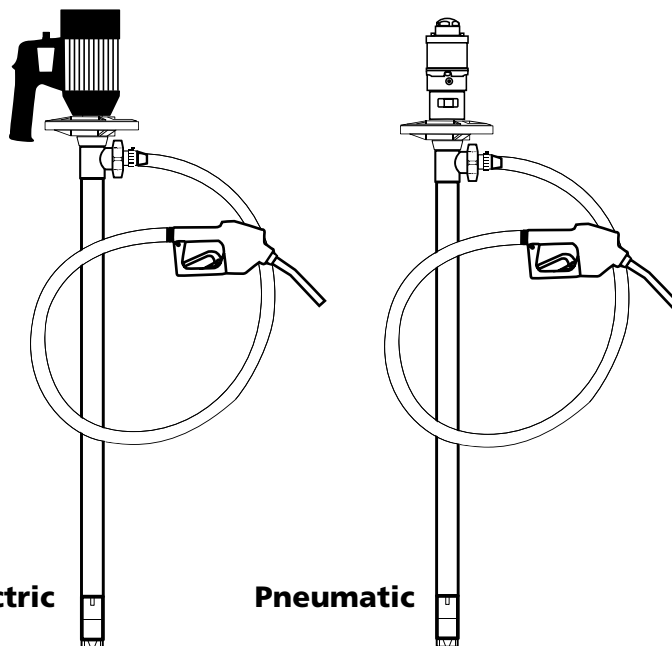
### **▲ WARNING**

*Failure to use approved equipment to transfer flammable or combustible materials may result in serious injury or death. Consult local and Federal safety regulations before operating in a Hazardous Duty environment.*

4. Before operation, confirm all pump connections are securely fastened.
5. Before starting the pump, confirm the discharge hose or pipe is securely fastened to the receiving vessel.
6. Never leave pump unattended.
7. Do not submerge the motor in any liquid.
8. It is not recommended to pump liquids with solids present.
9. Do not pump materials that exceed 1,000 cps (mPAS).

## Unpacking

The responsibility for safe assembly, installation and operation ultimately rests with the operator. Read and understand all safety precautions and operating instructions before use. Careless operation may result in serious injury.



# Standard Pump DEF Pump – Section 1

## Electric Pump

P/N	Motor	Flow Meter	Wetted Components	Immersion Length
9120	110-120 VAC /1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9121	220-240 VAC/1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9122	110-120 VAC /1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)
9123	220-240 VAC/1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)

*Hose Assembly: .75" (19 mm), 8ft. (2,4m) length.*

### Installation

1. Remove the pump tube and motor from the packaging.
2. Fasten the motor to the pump via the gray hand wheel located on top of the pump tube (See Figure 1).
3. Fasten approved hose to the discharge hose barb and hand nozzle (See Figure 2 & 3).
4. Always install the pump in a vertical manner (See Figure 4).
5. Slowly throttle the motor speed up to the desired setting (clockwise).

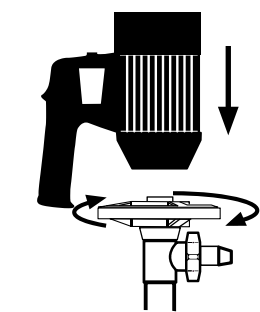


Figure 1

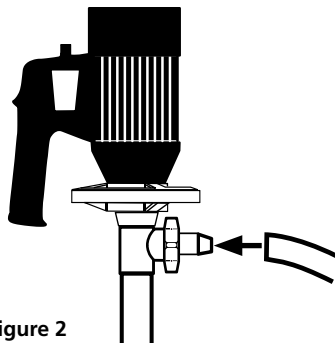


Figure 2

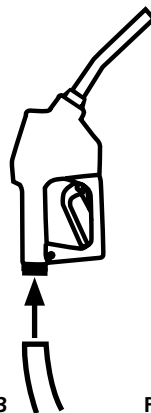


Figure 3

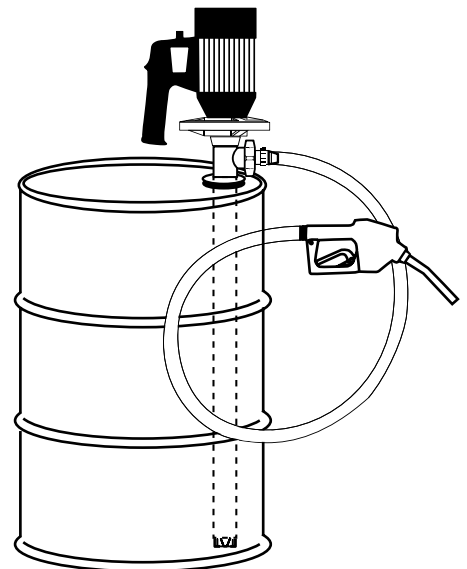


Figure 4

### For Repair Parts, call 1-866-558-8611

Please provide following information:

- Model number
- Serial number (if any)
- Part descriptions and number as shown in parts list

# Standard Pump DEF Pump – Section 2

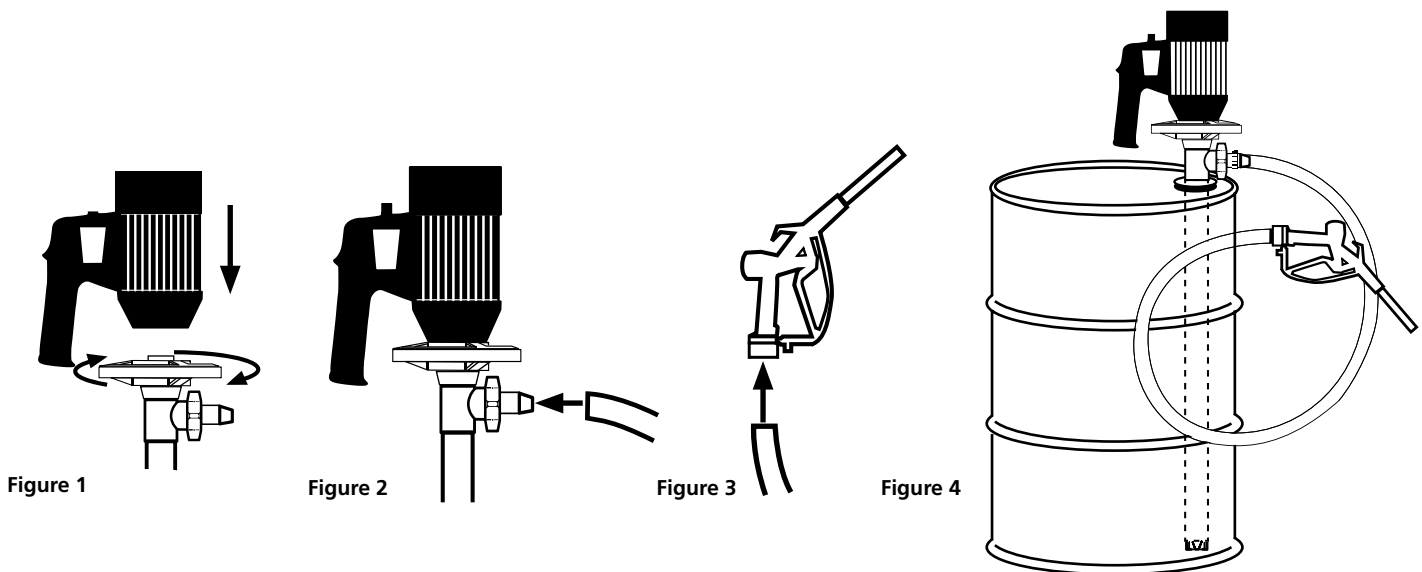
## Electric Pump

P/N	Motor	Flow Meter	Wetted Components	Immersion Length
9130	110-120 VAC /1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9131	220-240 VAC/1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9132	110-120 VAC /1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)
9133	220-240 VAC/1/50-60 Hz	No	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)

*Hose Assembly: .75" (19 mm), 8ft. (2.4m) length.*

### Installation

1. Remove the pump tube and motor from the packaging.
2. Fasten the motor to the pump via the gray hand wheel located on top of the pump tube (See Figure 1).
3. Fasten approved hose to the discharge hose barb and hand nozzle (See Figure 2 & 3).
4. Always install the pump in a vertical manner (See Figure 4).
5. Slowly throttle the motor speed up to the desired setting (clockwise).



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# Standard Pump DEF Pump – Section 3

## Electric Pump With Flow Meter

P/N	Motor	Flow Meter	Wetted Components	Immersion Length
9140	110-120 VAC /1/50-60 Hz	Yes	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9141	220-240 VAC/1/50-60 Hz	Yes	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9142	110-120 VAC /1/50-60 Hz	Yes	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)
9143	220-240 VAC/1/50-60 Hz	Yes	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)

*Hose Assembly: .75" (19 mm), 8ft. (2,4m) length.*

### Installation

1. Remove the pump tube and motor from the packaging.
2. Fasten the motor to the pump via the gray hand wheel located on top of the pump tube (See Figure 1).
3. Fasten approved hose to the discharge hose barb and hand nozzle (See Figure 2 & 3).
4. Always install the pump in a vertical manner (See Figure 4).
5. Slowly throttle the motor speed up to the desired setting (clockwise).

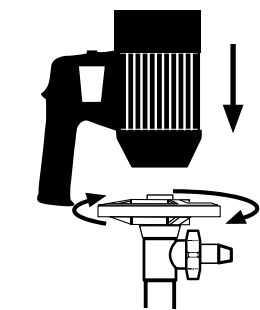


Figure 1

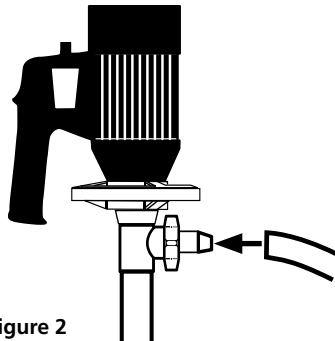


Figure 2

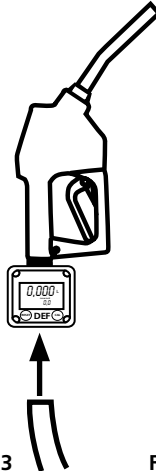


Figure 3

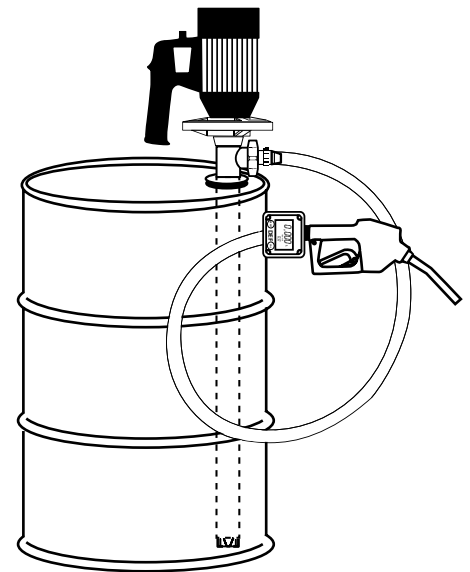


Figure 4

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Please provide following information:

- Model number
- Serial number (if any)
- Part descriptions and number as shown in parts list

# Standard Pump DEF Pump – Section 4

## Pneumatic Pump

### Pneumatic Models – 7500 RPM, 1/8" (3,2 mm) Air Inlet

P/N	Flow Meter	Wetted Components	Immersion Length
9150	No	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9152	No	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)

*Hose Assembly: .75" (19 mm), 8ft. (2,4m) length.*

### Installation

1. Remove the pump tube and motor from the packaging.
2. Fasten the motor to the pump via the gray hand wheel located on top of the pump tube (See Figure 1).
3. Fasten approved hose to the pump discharge hose barb and hand nozzle (See Figure 2 & 3).
4. Always install the pump in a vertical manner (See Figure 4).
5. Slowly throttle the motor speed up to the desired setting (clockwise).

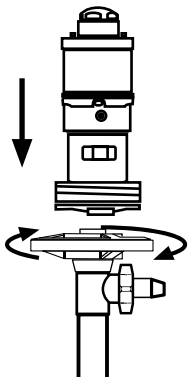


Figure 1

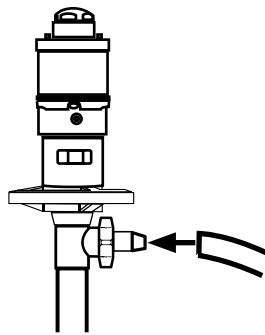


Figure 2



Figure 3

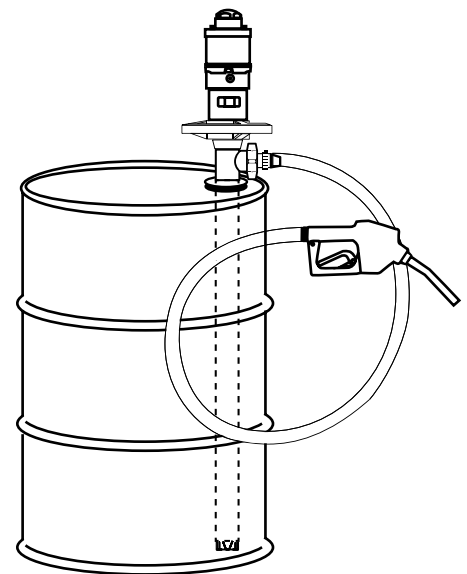


Figure 4

### For Repair Parts, call 1-866-558-8611

Please provide following information:

- Model number
- Serial number (if any)
- Part descriptions and number as shown in parts list

# Standard Pump DEF Pump – Section 5

## Pneumatic Pump

### Pneumatic Models – 7500 RPM, 1/8" (3,2 mm) Air Inlet

P/N	Flow Meter	Wetted Components	Immersion Length
9160	No	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9162	No	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)

*Hose Assembly: .75" (19 mm), 8ft. (2,4m) length.*

### Installation

1. Remove the pump tube and motor from the packaging.
2. Fasten the motor to the pump via the gray hand wheel located on top of the pump tube (See Figure 1).
3. Fasten approved hose to the pump discharge hose barb and hand nozzle (See Figure 2 & 3).
4. Always install the pump in a vertical manner (See Figure 4).
5. Slowly throttle the motor speed up to the desired setting (clockwise).

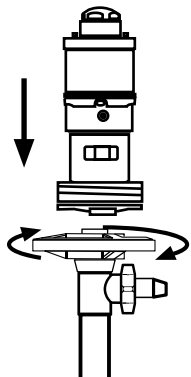


Figure 1

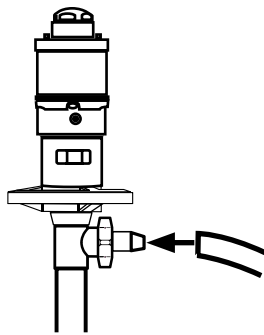


Figure 2

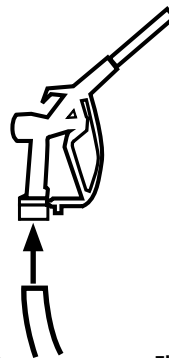


Figure 3

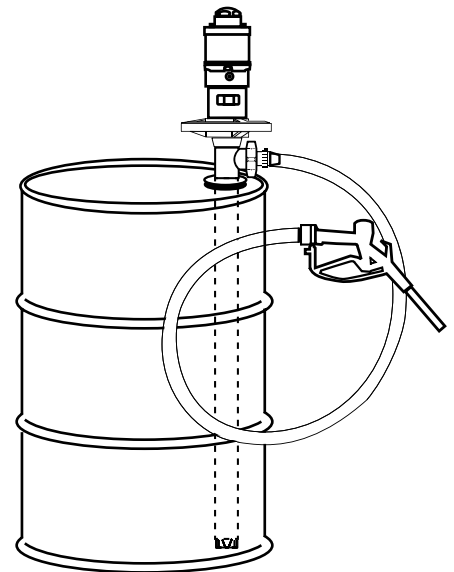


Figure 4

### For Repair Parts, call 1-866-558-8611

Please provide following information:

- Model number
- Serial number (if any)
- Part descriptions and number as shown in parts list

# Standard Pump DEF Pump – Section 6

## Pneumatic Pump With Flow Meter

### Pneumatic Models – 7500 RPM, 1/8" (3,2 mm) Air Inlet

P/N	Flow Meter	Wetted Components	Immersion Length
9170	Yes	Polypropylene, SS316, Carbon, EPDM	50" (1270 mm)
9172	Yes	Polypropylene, SS316, Carbon, EPDM	39" (1000 mm)

*Hose Assembly: .75" (19 mm), 8ft. (2,4m) length.*

### Installation

1. Remove the pump tube and motor from the packaging.
2. Fasten the motor to the pump via the gray hand wheel located on top of the pump tube (See Figure 1).
3. Fasten approved hose to the pump discharge hose barb and hand nozzle (See Figure 2 & 3).
4. Always install the pump in a vertical manner (See Figure 4).
5. Slowly throttle the motor speed up to the desired setting (clockwise).

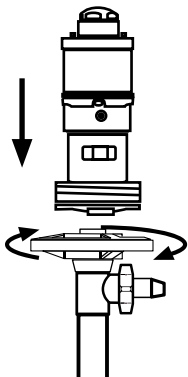


Figure 1

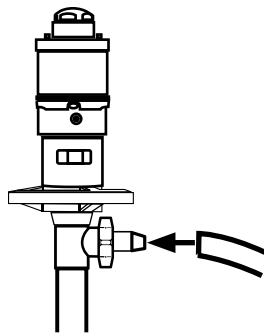


Figure 2

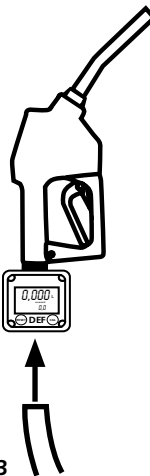


Figure 3

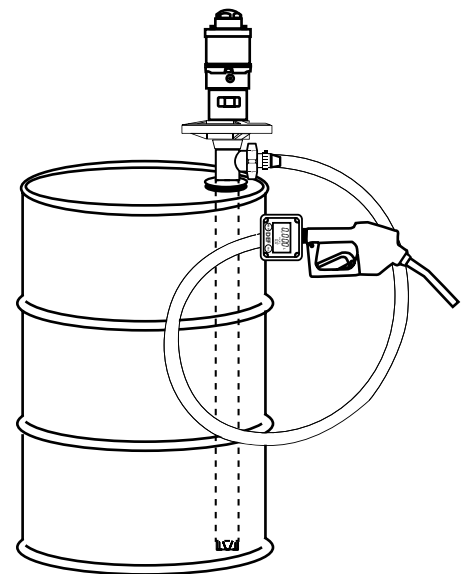


Figure 4

### For Repair Parts, call 1-866-558-8611

Please provide following information:

- Model number
- Serial number (if any)
- Part descriptions and number as shown in parts list

# Standard Pump DEF Pump – Section 7

## Meter

### METER

Electronic digital meter featuring a turbine measurement system, designed for precise measuring of low viscosity fluids.

The body is made of inconductive plastic material of light color, designed to be used with water / urea solution.

The card can be rotated with respect to its housing, thus allowing easy display readings in any position. The card housing, easily accessible, is closed by a plastic cover sealed through a rubber protection acting as a gasket as well. The whole unit can be easily removed by unscrewing the 4 screws fixing the card and the cover.

### MEASUREMENT SYSTEM

Turbine measurement system. The turbine is placed inside a hole through the body of the meter, fitted with threaded inlet and outlet. The body of the meter is made of a plastic material that allows several types of threads with relevant combinations. The meter has 2 rubber protections, designed to act as gaskets, too, and thus reducing the number of its components.

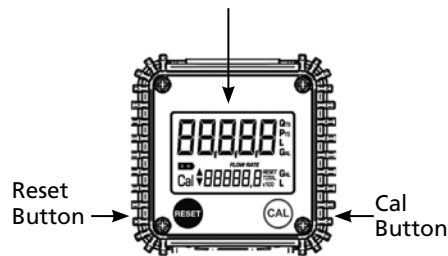


Figure 11 – Meter

### DISPLAY POSITIONING

The square shape of the meter body allows the card to be rotated in its housing, thus ensuring great versatility in positioning (Figure 12).

**WARNING** While fixing the meter card, make sure the battery contact cable is not placed above the circular housing of the bulb.

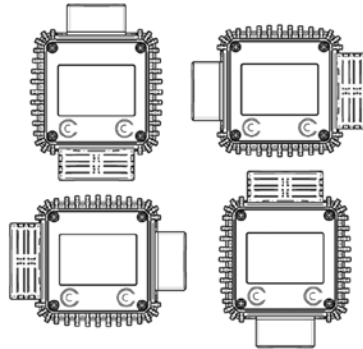


Figure 12

### OPERATING MODES

The user can choose between two different operating modes:

1. Normal Mode: Mode with display of Partial and Total dispensed quantities.
2. Flow Rate Mode: Mode with display of Flow Rate, as well as Partial dispensed quantity.

The meter features a non-volatile memory for storing the dispensing data, even in the event of a complete power break for long periods.

The measurement electronics and the LCD display are fitted in the top part of the meter which remains isolated from the fluid-bath measurement chamber and sealed from the outside by means of a cover.

### LCD DISPLAY

The “LCD” of the meter features two numerical registers and various indications displayed to the user only when the applicable function so requires (Figure 13).

Key:

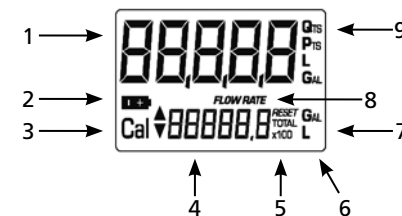


Figure 13

1. Partial register (5 figures with moving comma FROM 0.1 to 99999) indicating the volume dispensed since the reset button was last pressed;
2. Indication of battery charge;
3. Indication of calibration mode;
4. Totals register (6 figures with moving comma FROM 0.1 to 999999), that can indicate two types of Total:
  - 4.1. General Total that cannot be reset (TOTAL)
  - 4.2. Resettable total (Reset TOTAL)
5. Indication of total multiplication factor (x10 / x100 )
6. Indication of type of total, (TOTAL / Reset TOTAL);
7. Indication of unit of measurement of Totals: L=Litres Gal=Gallons
8. Indication of Flow Rate mode
9. Indication of unit of measurement of Partial:
  - Qts=Quarts
  - Pts=Pints
  - L=Litres
  - Gal=Gallons

### USER BUTTONS

The meter features two buttons (RESET and CAL) which individually perform two main functions and, together, other secondary functions. The main functions performed are:

1. For the reset key, resetting the partial register and resettable total (reset total)
2. For the cal key, entering instrument calibration mode.

Used together, the two keys permit entering configuration mode, useful for changing the units of measurements and calibration factor.

### BATTERY HOUSING

Powered by two standard type 1.5 V batteries (size AAA). The battery



# Standard Pump DEF Pump – Section 7

## Meter (continued)

housing, easily accessible, is closed by a metal cover sealed through a rubber protection acting as a gasket as well. The whole unit can be easily removed by unscrewing the 4 screws fixing the cover and the protection to the body.

### INSTALLATION

The meter features a threaded, perpendicular inlet and outlet (1" gas or ntp male and female that can be combined together). It has been designed to be easily installed in any position: fixed in-line or mobile on a dispensing nozzle. In order to improve the life of the turbine, it is recommended to fit a strainer before the meter itself.

**▲ WARNING** *At the female inlets, tighten the couplings at a max. torque of 55N/m.*

### DAILY USE

The only operations that need to be done for daily use are partial and/ or resettable total register resetting. Occasionally the meter may need to be configured or calibrated. To do so, please refer to the relevant chapters.

Below (Figure 14) are the two typical normal operation displays. One display page shows the partial and reset total registers. The other shows the partial and general total. Switch over from resettable total to general total display is automatic and tied to phases and times that are in factory set and cannot be changed.

**NOTE:** 6 digits are available for

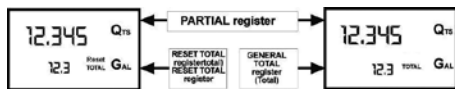


Figure 14

Totals, plus two icons x 10 / x100. The increment sequence is the following: 0.0 → 99999.9 → 999999 → 100000 x 10 →

999999 x 10 → 100000 x 100 → 999999 x 100

### DISPENSING IN NORMAL MODE

Normal mode is the standard dispensing (Figure 15). While the count is made, the partial and resettable total are displayed at the same time (reset total). Should one of the keys be accidentally pressed during dispensing, this will have no effect.

A few seconds after dispensing has ended, on the lower register, the display switches from resettable total to general total: the word reset above the word total disappears, and the reset total is replaced by the general total.

This situation is called standby and remains stable until the user operates the meter again.

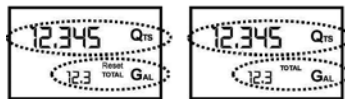


Figure 15

### PARTIAL RESET

The partial register can be reset by pressing the reset key when the meter is in standby, meaning when the display screen shows the word "TOTAL" (Figure 16).



Figure 16

After pressing the reset key, during reset, the display screen first of all shows all the lit-up digits and then all the digits that are not lit up (Figure 17).

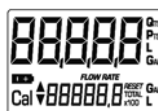


Figure 17

At the end of the process, a display page is first of all shown with the reset partial and the reset total (Figure 18)



Figure 18

and, after a few moments, the reset total is replaced by the non resettable Total (Figure 19).



Figure 19

### DISPENSING WITH FLOW RATE MODE DISPLAY

It is possible to dispense fluids, displaying at the same time (Figure 20):

1. The dispensed partial
2. The Flow Rate in [Partial Unit / minute] as shown on the following display page:

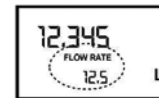


Figure 20

Procedure for entering this mode:

1. Wait for the Remote Display to go to Standby, meaning the display screen.
2. Shows Total only quickly press the CAL key.
3. Start dispensing

The flow rate is updated every 0.7 seconds. Consequently, the display could be relatively unstable at lower flow rates. The higher the flow rate, the more stable the displayed value (Figure 21).



Figure 21

# Standard Pump DEF Pump – Section 7

## Meter (continued)

**IMPORTANT:** The flow rate is measured with reference to the unit of measurement of the Partial. For this reason, in case of the unit of measurement of the Partial and Total being different, as in the example shown below, it should be remembered that the indicated flow rate relates to the unit of measurement of the partial. In the example shown, the flow rate is expressed in Qts/min. The word “Gal” remaining alongside the flow rate refers to the register of the Totals (Reset or NON Reset) which are again displayed when exiting from the flow rate reading mode.

To return to “Normal” mode, press the CAL key again. If one of the two keys RESET or CAL is accidentally pressed during the count, this will have no effect.

**IMPORTANT:** Even though in this mode they are not displayed, both the Reset Total and the General Total (Total) increase. Their value can be checked after dispensing has terminated, returning to “Normal” mode, by quickly pressing CAL.

### PARTIAL RESET

To reset the Partial Register, finish dispensing and wait for the Remote Display to show a Flow Rate of 0.0 as indicated in the illustration (Figure 22) then quickly press RESET.



Figure 22

### CALIBRATION

#### DEFINITIONS

Calibration factor or “k factor” :

Multiplication factor applied by the system to the electrical pulses received, to transform these into measured fluid units.

#### FACTORY K FACTOR:

Factory-set default factor. It is equal to 1,000. This calibration factor ensures utmost precision in the following operating conditions:

Fluid: diesel: fuel  
 Temperature: 68° f (20°c)  
 Flow rate: 2.64-31.7 gal/min  
 (10-120 litres/min)

#### USER K FACTOR:

Customized calibration factor, meaning modified by calibration.

#### WHY CALIBRATE

When operating close to extreme conditions, such as for instance with fluids close to acceptable range extremes (like diesel fuel at low temperatures) or in extreme flow rate conditions (close to minimum or maximum acceptable values), an on-site calibration may be required to suit the real conditions in which the meter is required to operate.

#### CALIBRATION PROCEDURE

The meter permits making quick and precise electronic calibration by changing the calibration factor (k factor).

There are 2 different ways of calibration:

1. On-site calibration, performed by means of a dispensing operation.
2. Direct calibration, performed by directly changing the k factor.

To enter the calibration phases it is necessary to press and hold down the “CAL” button.

Why enter the calibration phases?

- Display the currently used calibration factor
- Return to factory k factor after a previous calibration with user k factor
- Change the calibration factor using one of the two previously indicated procedures.

In calibration mode, the partial and total dispensed quantities indicated on the display screen take on different meanings according to the calibration procedure phase. During the calibration, the meter cannot perform any normal dispensing operations. In calibration mode, the totals are not increased.

**▲ WARNING** *The meter features a non-volatile memory. It keeps the calibration and dispensing data stored even after replacing new batteries or long periods of inactivity.*

#### DISPLAY OF CURRENT “K FACTOR” AND RESTORING “FACTORY K FACTOR”

By pressing the cal key while the appliance is in standby, the display page appears showing the current calibration factor used (Figure 23).



Figure 23

If you are using the meter with “factory k factor”, the display page shown in the diagram will be displayed, with the word “fact” (Figure 24).



Figure 24

If one “user k factor” has been set, the calibration factor set by the user (in our example 0.998) will be displayed.

The word “user” indicates a calibration factor set by the user is being used.

The flow chart (Figure 25) shows the switch over logic from one display page to another.

In this condition, the RESET key permits switching from User factor to Factory factor.

To confirm the choice of calibration factor, quickly press CAL while “User” or

# Standard Pump DEF Pump – Section 7

## Meter (continued)

“Fact” are displayed. After the restart cycle, the meter uses the calibration factor that has just been confirmed.

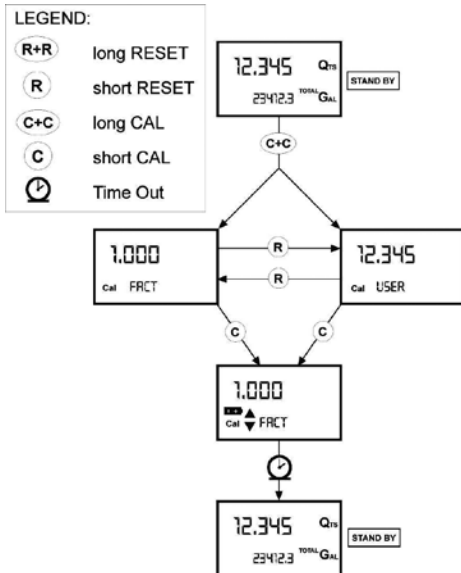


Figure 25

**WARNING** When the Factory Factor is confirmed, the old User factor is deleted from the memory

### IN-FIELD CALIBRATION

This procedure calls for the fluid to be dispensed into a graduated sample container in real operating conditions (flow rate, viscosity, etc.) requiring maximum precision.

**WARNING** For correct calibration, it is important to:

- completely eliminate air from the system before calibrating;
- use a precise Sample Container with a capacity of not less than 1.3 (5 litres), featuring an accurate graduated indicator.
- ensure calibration dispensing is done at a constant flow rate equivalent to that of normal use, until the container is full;
- not reduce the flow rate to reach the graduated area of the container during the final dispensing stage (the correct method during the final stages of sample container filling consists in making short top-ups at normal operation flow rate);

- after dispensing, wait a few minutes to make sure any air bubbles are eliminated from the sample container; only read the Real value at the end of this stage, during which the level in the container could drop.
- if necessary, carefully follow the procedure indicated below.

### IN-FIELD CALIBRATION PROCEDURE

#### 1. NONE

IN STAND BY



Figure 26 – Display For Operation 1

#### 2. LONG CAL KEY KEYING

The meter enters calibration mode, shows “CAL” and displays the calibration factor in use instead of total. The words “Fact” and “USER” indicate which of the two factors is currently in use.



Figure 27 – Display For Operation 2

#### 3. LONG RESET KEY KEYING

The meter shows “CAL” and the partial at zero. The meter is ready to perform on-site calibration.



Figure 28 – Display For Operation 3

#### 4. DISPENSING INTO SAMPLE CONTAINER

Without pressing any KEY, start dispensing into the sample container (Figure 29).



Figure 29

Dispensing can be interrupted and started again at will. Continue dispensing until the level of the fluid in the sample container has reached the graduated area (Figure 30). There is no need to reach a preset quantity.

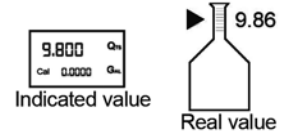


Figure 30



Figure 31 – Display For Operation 4

#### 5. SHORT RESET KEY KEYING

The meter is informed that the calibration dispensing operation is finished. Make sure dispensing is correctly finished before performing this operation. To calibrate, the value indicated by the partial totalizer (example 9.800) must be forced to the real value marked on the graduated sample container. In the bottom left part of the display an arrow appears (upwards and downwards), THAT SHOWS the direction (increase or decrease) of the USER K FACTOR value change when the operations 6 or 7 are performed.



Figure 32 – Display For Operation 5

#### 6. SHORT RESET KEY KEYING

Arrow direction changes. The operation can be repeated IF NECESSARY.



Figure 33 – Display For Operation 6

# Standard Pump DEF Pump – Section 7

## Meter (continued)

### 7. SHORT/LONG CAL KEY KEYING

The indicated value changes in the direction indicated by the arrow

- one unit for every short CAL key keying
- continually if the CAL key is kept pressed.

(for the first 5 units slowly and then quickly). If the desired value is exceeded, repeat the operations from point (6).



Figure 34 – Display For Operation 7

### 8. LONG RESET KEY KEYING

The meter is informed that the calibration procedure is finished. Before doing this, make sure the DISPLAYED factor is the ACTUAL factor (Figure 35).

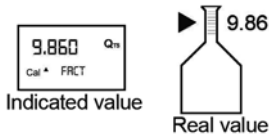


Figure 35

Indicated value Real value calculates the new USER K FACTOR. This calculation could require a few seconds, depending on the correction to be made. During this operation the arrow disappears but the CAL indication remains. If this operation is performed after operation (5), without changing the indicated value, the USER K FACTOR would be the same as the FACTORY K FACTOR, thus it is ignored.

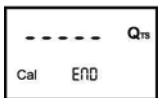


Figure 36 – Display For Operation 8

### 9. NO OPERATION

At the end of the calculation, the new USER K FACTOR is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition.



Figure 37 – Display For Operation 9

**WARNING** From now on, the indicated factor will become the calibration factor used by the meter and will continue to remain such even after a battery change.

### 10. NO OPERATION

The meter stores the new calibration factor and is ready for dispensing, applying the newly defined USER K FACTOR.



Figure 38 – Display For Operation 10

### DIRECT MODIFICATION OF K FACTOR

This procedure is especially useful to correct a “mean error” obtainable on the basis of several performed dispensing operations. If normal operation shows a mean percentage error, this can be corrected by applying to the currently used calibration factor a correction of the same percentage. In this case, the percentage correction of the USER K FACTOR must be calculated by the operator in the following way:

$$\text{New K Factor} = \text{Old K Factor} * \left( \frac{100 - E\%}{100} \right)$$

Example:  
 Error percentage found: E% - 0.9 %  
 CURRENT calibration factor: 1.000  
 New USER K FACTOR:  $1.000 * [(100 - (-0.9))/100] = 1.000 * [(100 + 0.9)/100] = 1.009$

Figure 39 – User K Factor Calculation

If the meter indicates less than the real dispensed value (negative error) the new calibration factor must be higher than the old one as shown in the example. The opposite applies if the meter shows more than the real dispensed value (positive error).

### 1. NONE

IN STAND BY: not in counting mode.

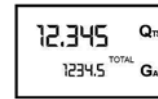


Figure 40 – Display Operation 1

### 2. LONG CAL KEY KEYING

The meter enters calibration mode, shows “CAL” and displays the calibration factor being used instead of the partial. The words “Fact” and “USER” indicate which of the two factors (factory or user) is currently being used.

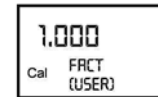


Figure 41 – Display For Operation 2

### 3. LONG RESET KEY KEYING

The meter shows “CAL” and the partial at zero. The meter is ready to perform on-site calibration by dispensing.

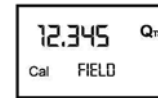


Figure 42 – Display For Operation 3

### 4. LONG RESET KEY KEYING

We now go on to Direct change of the calibration factor: the word “Direct” appears together with the Currently Used calibration factor. In the bottom left part of the display, an arrow appears (upwards or downwards) defining the direction

# Standard Pump DEF Pump – Section 7 Meter (continued)

(increase or decrease) of change of the displayed value when subsequent operations 5 or 6 are performed.



**Figure 42 – Display For Operation 4**

5. SHORT RESET KEY KEYING  
Arrow direction changes. The operation can be repeated to alternate the direction of the arrow.



**Figure 43 – Display For Operation 5**

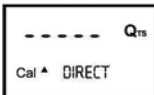
6. SHORT/LONG CAL KEY KEYING  
The indicated value changes in the direction indicated by the arrow

- one unit for every short CAL key keying
- continually if the CAL key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point (5).



**Figure 44 – Display For Operation 6**

7. LONG RESET KEY KEYING  
The meter is informed that the calibration procedure is finished. Before performing this operation, make sure the indicated value is that required.



**Figure 45 – Display For Operation 7**

8. NO OPERATION  
At the end of the calculation, the new USER K FACTOR is shown for a few seconds, after which the restart

cycle is repeated to finally achieve standby condition.



**Figure 46 – Display For Operation 8**

**WARNING** From now on, the indicated factor will become the calibration factor used by the meter and will continue to remain such even after a battery change.

9. NO OPERATION  
The meter stores the new work calibration factor and is ready to begin dispensing, using the USER K FACTOR that has just been calculated.



**Figure 47 – Display For Operation 9**

### METERS CONFIGURATION

Some models of the meter feature a menu with which the user can select the main measurement unit, Quarts (Qts), Pints (Pts), Litres (Lit), Gallons (Gal); The combination of the unit of measurement of the Partial register and that of the Totals is predefined according to the following table:

Combination no.	Unit of Measurement of the Partial Register	Register Unit of Measurement of the Totals Register
1	Litres (L)	Litres (L)
2	Gallons (Gal)	Gallons (Gal)
3	Quarts (Qts)	Gallons (Gal)
4	Pints (Pts)	Gallons (Gal)

To choose between the 4 available combinations (see Figure 48):

1. wait for the meter to go to Standby,
2. press the CAL and RESET keys together. Keep these pressed until the word "UNIT" appears on the screen together with the unit of measurement set at that time (in this

example Litres / Litres)

3. Press the reset key to select the desired combination of unit of measurement, amongst those shown below.
4. Save the new combination by pressing the CAL key at length. The meter will pass through the start cycle and will then be ready to dispense in the set units.



**Figure 48**

**WARNING** The Resettable Total and Total registers will be automatically changed to the new unit of measurement. NO new calibration is required after changing the Unit of Measurement.

### MAINTENANCE

The meter has been designed to require a minimum amount of maintenance.

The only types of maintenance required are the following:

1. Battery change – necessary when the batteries have run down
2. Cleaning of the turbine with washing or mechanically-handling

### BATTERY REPLACEMENT

2 x 1.5 V. alkaline batteries SIZE AAA.

The meter features two low-battery alarm levels:

1. When the battery charge falls below the first level on the LCD, the fixed battery symbol appears. In this condition, the meter continues to operate correctly, but the fixed icon warns the user that it is ADVISABLE to change the batteries.

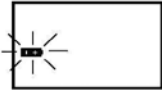


**Figure 49**

# Standard Pump DEF Pump – Section 7

## Meter (continued)

2. If operation continues without changing the batteries, the second battery alarm level will be reached which will prevent operation. In this condition the battery icon starts to flash and is the only one to remain visible on the LCD (Figure 50).



**Figure 50**

**⚠ WARNING** Do not discard the old batteries in the environment. Refer to local disposal regulations.

To change the batteries, with reference to the exploded diagram positions, proceed as follows:

1. Press RESET to update all the totals
2. Loosen the 4 fixing screws of the lower cover
3. Remove the old batteries
4. Place the new batteries in the same position as the old ones
5. close the cover again, by positioning the rubber protection as a gasket
6. The meter will switch on automatically and normal operation can be resumed.

The meter will display the same Reset Total, the same Total and the same Partial indicated before the batteries were changed. After changing the batteries, the meter does not need calibrating again.

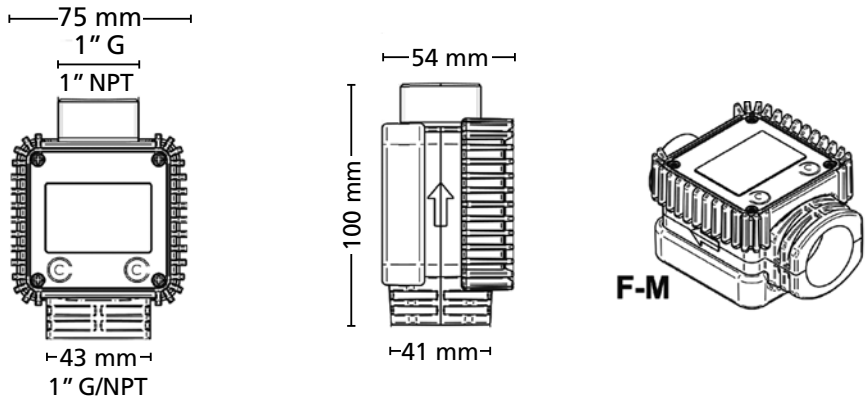
**CLEANING**

Any residual elements can be removed by washing or mechanically-handling. If this operation does not restore a smooth rotation of the turbine, it will have to be replaced.

**⚠ WARNING** Do not use compressed air onto the turbine in order to avoid its damage because of an excessive rotation

**TECHNICAL SPECIFICATIONS**

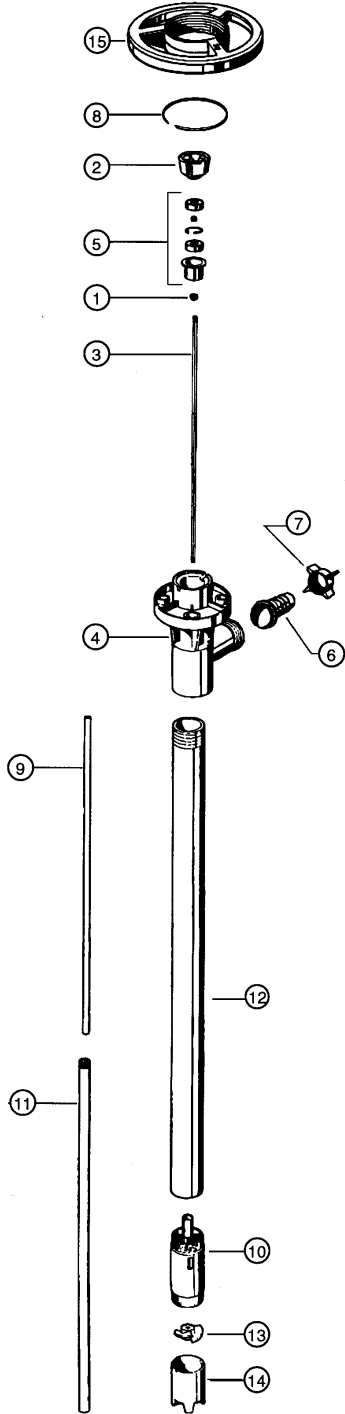
Measurement system	TURBINE
Resolution (nominal)	Hi Flow: 0.010 lit/pulse Low Flow: 0.005 lit/pulse
Flow Rate (Range)	COL. BLACK Flow Rates: 5 ÷ 120 (Litres/minute) FOR DIESEL FUEL, WATER COL. BEIGE Flow Rates: 5 ÷ 100 (Litres/minute) FOR WATER/UREA SOLUTION.
Operating pressure (Max)	10 (Bar) 145 (psi)
Bursting pressure (Min)	40 (Bar)
Storage temperature (Range)	-20 ÷ + 70 (°C)
Storage humidity (Max)	95 (% RU)
Operating temperature (Range)	-10 ÷ + 50 (°C)
Flow resistance	0.30 Bar at 100 lit/min.
Viscosity (Range)	2 ÷ 5.35 cSt
Accuracy	±1% after calibration within 10÷90 (litres/min) 2,65÷23,8 (gallons/min) range
Reproducibility (Typical)	±0,3 (%)
Screen	Liquid crystals LCD. Featuring: 5-figure partial 6-figure Reset Total plus x10 / x100 6-figure non reset Total plus x10 / x100
Power Supply	2x1.5 V alkaline batteries size AAA
Battery life	18 ÷ 36 months
Weight	0.25 Kg (including batteries)
Protection	IP65



# Standard Pump DEF Pump – Section 8

## 9100 – 39" (1000 mm)

## 9103 – 50" (1270 mm)

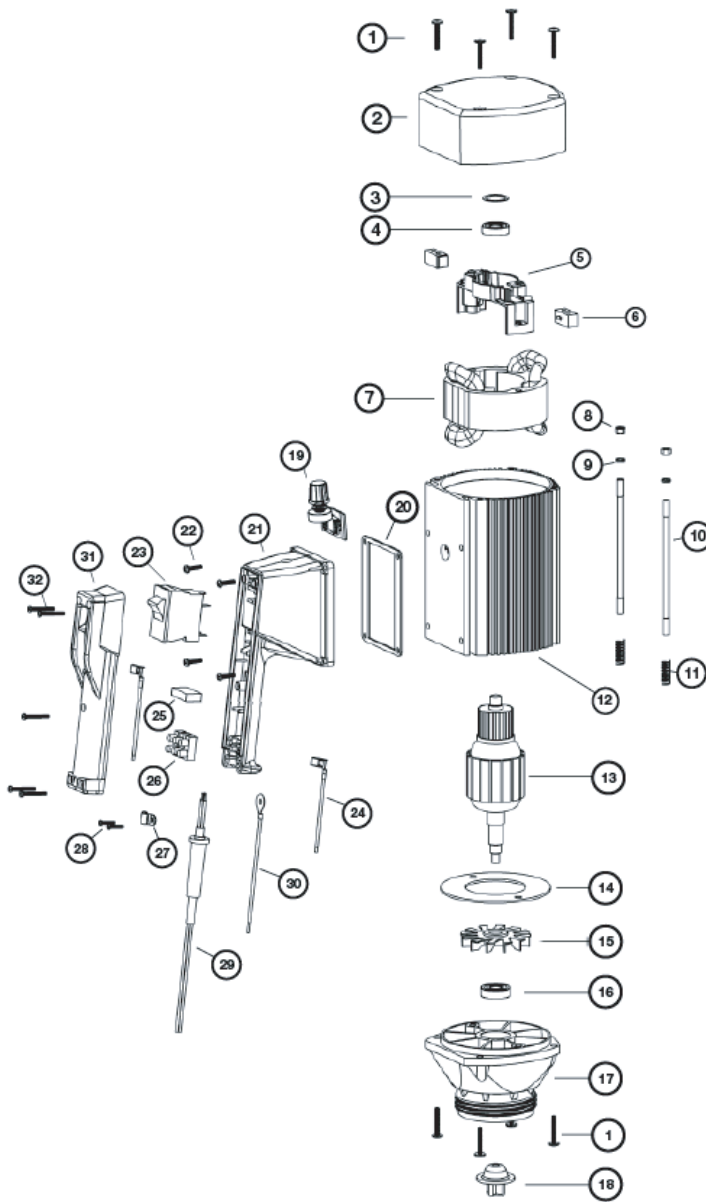


ITEM NUMBER	DESCRIPTION	PART NUMBER
1	V-seal, Viton	1000
2	Pump coupling	1004
3	Drive shaft, 39" (1000 mm) 50" (1270 mm)	2028 2030
4	Discharge housing	1028
5	Bearing unit assembled (2 each) Viton shielded bearings, spacer, snap ring, bearing can	1038
6	Hose barb, .75" (19 mm)	1051
7	Wing nut	1106
8	Snap ring	1508
9	Guide sleeve, PTFE 39" (1000 mm), 50" (1270 mm)	1514
10	Pump housing includes carbon bushing	1524
11	Inner tube, 39" (1000 mm) 50" (1270 mm)	1601 1623
12	Outer tube, 39" (1000 mm) 50" (1270 mm)	1603 1624
13	High pressure impeller	4608 HH
14	High pressure pump foot	1609 HH
15	Hand wheel	1842

**⚠** Polypropylene pumps should not be used to pump flammables.

# Standard Pump DEF Pump – Section 9

## SP-280P Series Motor Spare Parts



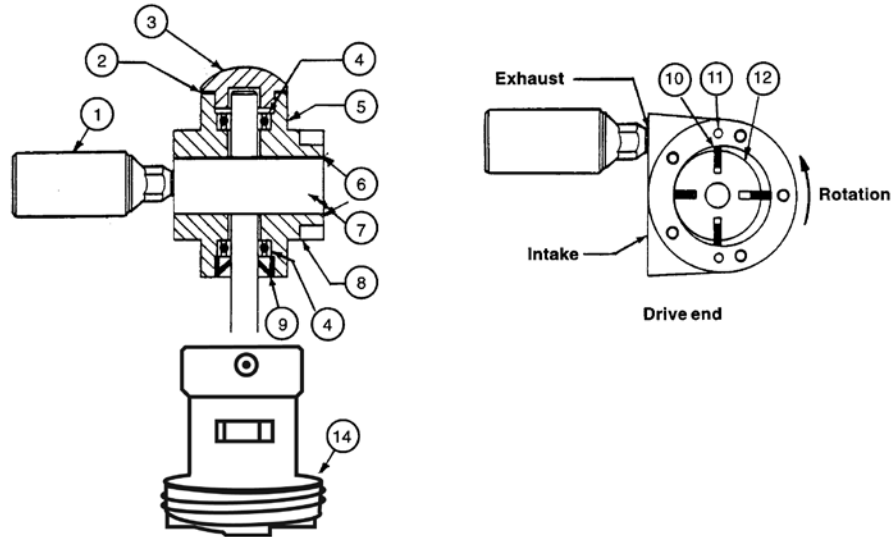
Ref. #	Description	P/N for SP-280P	Qty
1	Screw, Motor Cover/Lower Housing	8130P	8
2	Motor Cover	8000	1
3	Wave Washer	8125	1
4	Bearing, Upper	8331	1
5	Brush Holder	8508	1
6	Carbon Brushes		
	110V	8509	2
	220V	8703	2
7	Stator		
	110V	8503	1
	220V	8702	1
8	Hexagon Nut	8448	2
9	Lock Washer	8071	2
10	Rod Connector	8506	2
11	Pressure Spring	8507	2
12	Motor Housing	8510P	1
13	Armature		
	110V	8502	1
	220V	8701	1
14	Guide Disc	8504	1
15	Fan	8512	1
16	Bearing, Lower	8126	1
17	Lower Housing	8100	1
18	Motor Coupling	8333	1
19	Speed Potentiometer		
	110V	9803	1
	220V	9804	1
20	Gasket		
	110V	8167	1
	220V	8167LVR	1
21	Switch Housing		
	Fixed Speed	8001	1
	Variable Speed	8010	1
22	Screw, Switch Housing		
	110V	8131	4
	220V	8131LVR	4
23	Overload Switch		
	110V	8611	1
	220V (w/ LVR)	8704LVR	1
	220V (w/o LVR)	8704	1
24	Switch Lead	8185	2
25	EMI Filter	8003	1
26	Terminal Block	8001-3	1
27	Cable Clamp	8001-1	1
28	Screw, Cable Clamp	8001-2	2
29	Power Cord		
	110V	8360	1
	220V	8705	1
30	Earthing Lead	8183	1
31	Switch Cover	8002	1
32	Screw, Switch Cover	8220	5
n/a	Repair Kit (Includes Items 6 & 18)		
	110/220V	9055	1

**!** SP-280P open motor should not be used to pump flammables.



# Standard Pump DEF Pump – Section 10

## SP-A1 Series Motor Spare Parts



ITEM NUMBER	DESCRIPTION	PART NUMBER
1	Muffler	SAF350
2 *	Gasket	SAC229
3	Dead end cap	SAC228A
4 *	Bearing (2 required)	SAG549
5	Dead end plate	SAC617
6 *	Gasket (2 required)	SAC527
7	Body	SAE899
8	Drive end plate	SAC616
9 *	Shaft seal	SAC190A
10 *	Vane (4 required)	SAE893
11	Dowel pin (4 required)	SD324A
12	Impeller	SAE896
13	Repair kit*	SK285
	Includes item numbers 2, 4, 6, 9 and 10	
14	A1 adapter	9007

# Standard Pump DEF Pump – Section 11

## Electric Pump Packages



### Electric Package with Automatic Shut-off Nozzle

ITEM NUMBER	DESCRIPTION	PART NUMBER
1	Drum Pump Motor 110-120V 220-240V	<b>SP-280P-V</b> <b>SP-280P-2-V</b>
2	Drum Pump Tube Drums - 39" (1000 mm) Tote Tanks - 50" (1270 mm)	<b>9100</b> <b>9103</b>
3	CarboBlue, 8ft (2,4 m), 3/4" (19 mm) I.D.	<b>9110</b>
4	Auto-Shut Off, 316SS	<b>9111</b>



### Electric Package with Manual Nozzle

ITEM NUMBER	DESCRIPTION	PART NUMBER
1	Drum Pump Motor 9430 & 9432 9431 & 9433	<b>SP-280P-V</b> <b>SP-280P-2-V</b>
2	Drum Pump Tube Drums - 39" (1000 mm) Tote Tanks - 50" (1270 mm)	<b>9100</b> <b>9103</b>
3	Braided PVC, 8ft (2,4 m), 3/4" (19 mm) I.D.	<b>9033</b>
4	Polyethylene, 304SS	<b>9113</b>



### Electric Package with Automatic Shut-off Nozzle & Meter

ITEM NUMBER	DESCRIPTION	PART NUMBER
1	Drum Pump Motor 110-120V 220-240V	<b>SP-280P-V</b> <b>SP-280P-2-V</b>
2	Drum Pump Tube Drums - 39" (1000 mm) Tote Tanks - 50" (1270 mm)	<b>9100</b> <b>9103</b>
3	CarboBlue, 8ft (2,4 m), 3/4" (19 mm) I.D.	<b>9110</b>
4	Auto-Shut Off, 316SS	<b>9111</b>
5	Flow Meter	<b>9112</b>
6	Nozzle to Flow Meter Fitting	<b>9111-F1647500</b>
7	Flow Meter to Hose Barb Fitting	<b>9111-F16435000</b>

# Standard Pump DEF Pump – Section 12

## Air Pump Packages



### Air Package with Automatic Shut-off Nozzle

ITEM NUMBER	DESCRIPTION	PART NUMBER
1	Drum Pump Motor Air, 1/2 HP (370w)	<b>SP-A1</b>
2	Drum Pump Tube Drums - 39" (1000 mm) Tote Tanks - 50" (1270 mm)	<b>9100</b> <b>9103</b>
3	CarboBlue, 8ft (2,4 m), 3/4" (19 mm) I.D.	<b>9110</b>
4	Auto-Shut Off, 316SS	<b>9111</b>



### Air Package with Manual Nozzle

ITEM NUMBER	DESCRIPTION	PART NUMBER
1	Drum Pump Motor Air, 1/2 HP (370w)	<b>SP-A1</b>
2	Drum Pump Tube Drums - 39" (1000 mm) Tote Tanks - 50" (1270 mm)	<b>9100</b> <b>9103</b>
3	Braided PVC, 8ft (2,4 m), 3/4" (19 mm) I.D.	<b>9033</b>
4	Polyethylene, 304SS	<b>9113</b>



### Air Package with Automatic Shut-off Nozzle & Meter

ITEM NUMBER	DESCRIPTION	PART NUMBER
1	Drum Pump Motor Air, 1/2 HP (370w)	<b>SP-A1</b>
2	Drum Pump Tube Drums - 39" (1000 mm) Tote Tanks - 50" (1270 mm)	<b>9100</b> <b>9103</b>
3	CarboBlue, 8ft (2,4 m), 3/4" (19 mm) I.D.	<b>9110</b>
4	Auto-Shut Off, 316SS	<b>9111</b>
5	Flow Meter	<b>9112</b>
6	Nozzle to Flow Meter Fitting	<b>9111-F1647500</b>
7	Flow Meter to Hose Barb Fitting	<b>9111-F16435000</b>

# WARRANTY

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## Three year limited warranty

Standard Pump, Inc. warrants, subject to the conditions below, through either Standard Pump, Inc., its 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 250 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., its 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.

## STANDARD PUMP

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