

# 300-Series Grease Pump

## Operation and Programming Manual



Information subject to change without notice



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## 1.0) System Considerations

- Improper use of a centralized lubrication system may cause damage due to excessive or inadequate lubrication at the points to which it is connected.
- It is always necessary to comply with accident prevention and environmental regulations in the country where the centralized lubrication system is used.
- The manufacturer shall not be responsible for damages originating from improper use or unauthorized modification of the system or its components. Furthermore, the manufacturer shall not be responsible for damages originating from the use of non-original spare parts or parts not certified by the manufacturer or for damages originating from the use of improper lubricants.

### 1.1) System Description

**Figure 1** shows a schematic of a series progressive lubrication system in its basic form. The system schematic is comprised of the following components:

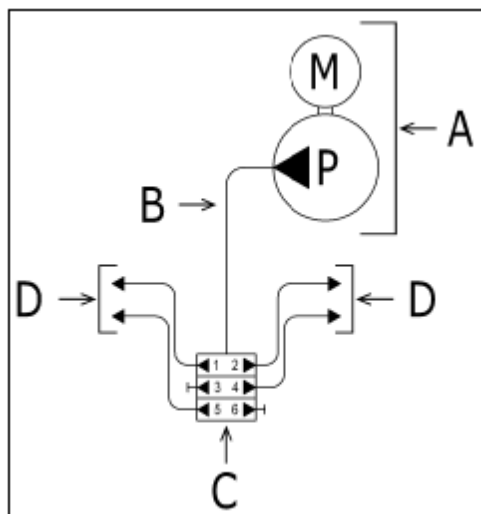


Figure 1

**A—Electric pump with reservoir**

**B—Main line**

**C—Series progressive valve**

**D—Feed lines**

Centralized lubrication systems significantly reduce maintenance costs of equipment on which they are installed, lowering downtime for maintenance and increasing the life of lubricated components.

## 1.2) Technical Specifications

The 300-Series is a piston pump driven by an eccentric cam that can accommodate a maximum of three pumping elements (**Figure 2 ref. A, B, C**)

The pump housing is a compact offering that was designed to maximize resistance to mechanical stresses.

The reservoir (**Figure 2 ref. F**) is transparent polycarbonate molded for the 2L version and modular (**Figure 2 ref. G**) for the 4L and 8L versions.

Refilling the reservoir is accomplished by means of a grease fitting located on the front of the pump body (**Figure 2 ref. F1/G1**)

The shaped roller system and windscreen wiper help eliminate air bubbles from the grease inside the reservoir, thus ensuring a trouble free operation also at low temperatures.

The worm reduction gear with helical wheel and DC low voltage electric motor can be controlled directly or through the control timer (**Figure 2 ref. E**).

The 300-Series can be supplied in various versions characterized by the supply voltage (12 and 24 VDC; 110 and 220 VAC), the capacity of the reservoir (2 - 4 - 8 liters), the control system, the presence of a cycle sensor and the presence of low grease level detection.

## 1.2) Technical Specifications - Continued

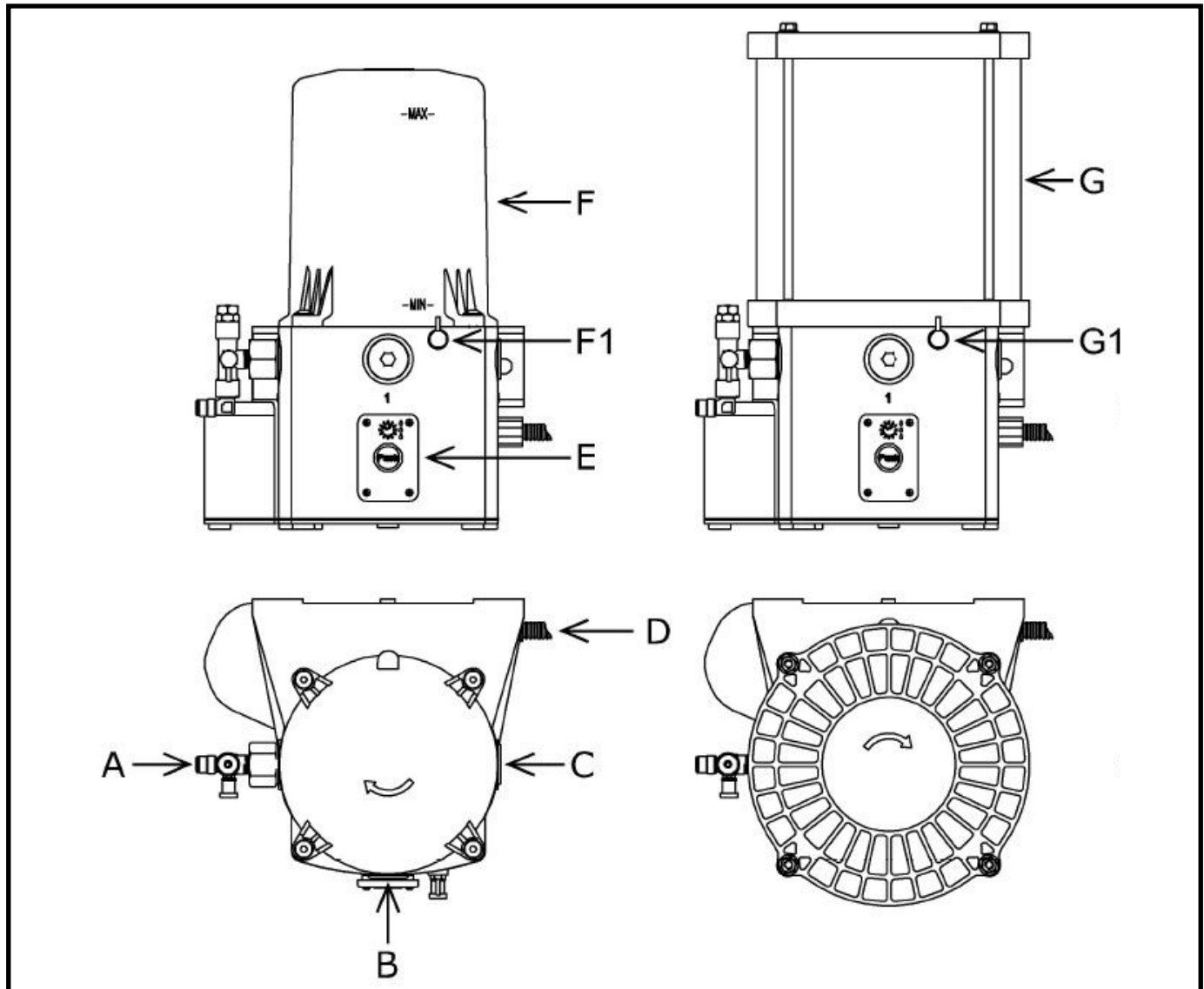


Figure 2

## 1.2) Technical Specifications - Continued

- |  |       |  |
|--|-------|--|
| ⇒ Operating temperature                    | _____ | From -25°C to +70°C                                    |
| ⇒ Number of outlets                        | _____ | 1, 2 or 3  |
| ⇒ Pumping system                           | _____ | 6 mm dia. cam driven piston                            |
| ⇒ Pump outlet                              | _____ | 1/8" NPT(F)  |
| ⇒ Reservoir capacity                       | _____ | 2L, 4L or 8L   |
| ⇒ Lubricant                                | _____ | Grease up to NLGI 2                                    |
| ⇒ Reservoir fill                           | _____ | Grease fitting - M10x1                                 |
| ⇒ System for air removal                   | _____ | Rotating cylinder/windscreen wiper                     |
| ⇒ Capacity per outlet                      | _____ | .17 in <sup>3</sup> /min @ 22 RPM                      |
| ⇒ Reduction gear                           | _____ | Worm w/helical wheel - shielded DC electric motor      |
| ⇒ Available operating voltages             | _____ | 12 VDC, 24VDC, 110VAC (60Hz), 220VAC (60Hz)            |
| ⇒ Current (nominal)                        | _____ | 1A @ 12VDC, .5A @ 24VDC<br>.2A @ 110VAC, .1A @ 220VAC  |
| ⇒ Current (peak)                           | _____ | 6.5A @ 12VDC, 3A @ 24VDC<br>.3A @ 110VAC, .2A @ 220VAC |
| ⇒ Speed                                    | _____ | 22 RPM   |
| ⇒ Protection class                         | _____ | IP65   |
| ⇒ Control system                           | _____ | None, Timer or Timer and Sensor (Feedback)             |
| ⇒ Type of memory (timer)                   | _____ | EEPROM   |
| ⇒ Pause setting (timer)                    | _____ | From 5 minutes to 12 hours                             |
| ⇒ Run time setting (timer)                 | _____ | From 20 seconds to 8 minutes                           |
| ⇒ Low level                                | _____ | Optional for all versions                              |
| ⇒ Max current (low level sensor)           | _____ | 0.5 A  |
| ⇒ Max inductive current (low level sensor) | _____ | 0.1 A  |

1.2) Technical Specifications - Continued

**Table A** (below) shows the empty weight of each pump in standard configuration with a single element installed:

Reservoir Capacity	Weight
2 liters	3.3 kg
4 liters	4.8 kg
8 liters	5.5 kg

Table A

**Figure 3** shows the dimensions of each pump model expressed in [mm]:

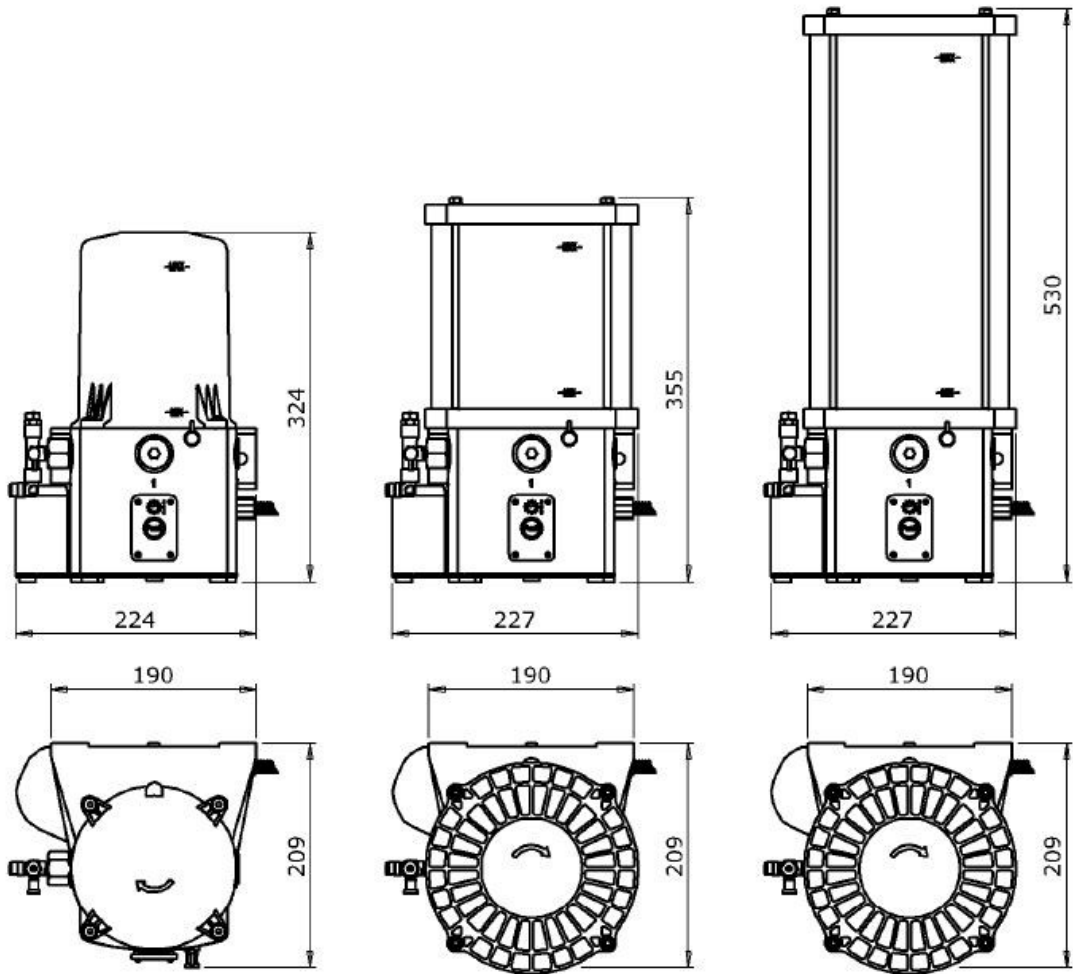


Figure 3



### 1.3) Pumping Element

Threaded into the pump housing and driven by means of an eccentric cam, the pumping element is the heart of the 300-Series grease pump.

The suction side of the pumping element features dual inlets while the piston features a safety and discharge valve that automatically discharges excessive pressure.



The components of the pumping element are premium quality alloyed steel that have been treated to provide a high resistance to wear and plated to provide excellent resistance to corrosion.

**Figure 4** shows the pumping element at work:

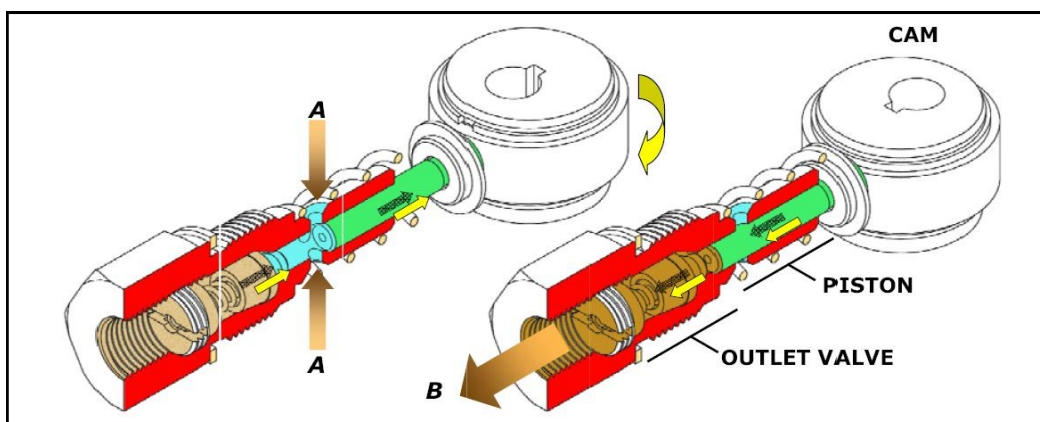


Figure 4

The closure of the delivery valve and the stroke of the piston to BDC (bottom dead center) creates a vacuum inside the suction chamber through which dual inlets **A** draw in grease - highlighted in blue. The piston, highlighted in green, is then acted upon by the eccentric cam to begin the pumping phase by which grease overcomes the delivery valve and is forced out of the element **B**. Once the piston reaches TDC (top dead center) it begins the return stroke, aided by the return spring and eccentric cam, closing the delivery valve. This process continues until the pump is turned off and the eccentric cam stops turning.

### 1.3) Pumping Element - Continued

- ⇒ Bore \_\_\_\_\_ 6 mm O.D.
- ⇒ Useful stroke \_\_\_\_\_ 6 mm
- ⇒ Flow rate \_\_\_\_\_ .17 in<sup>3</sup>
- ⇒ Weight \_\_\_\_\_ 250 gr
- ⇒ Pressure relief \_\_\_\_\_  $P_{\max} = 250 \pm 50$  bar
- ⇒ Element Outlet Thread \_\_\_\_\_ G1/4"



The flow rate listed was under the following conditions: Lubricant consistency of NLGI 2, ambient temperature of 68°, back pressure of 100 bar, motor speed of 22 rpm and rated voltage of 12/24 V DC.

### 1.4) Pressure Relief Assembly

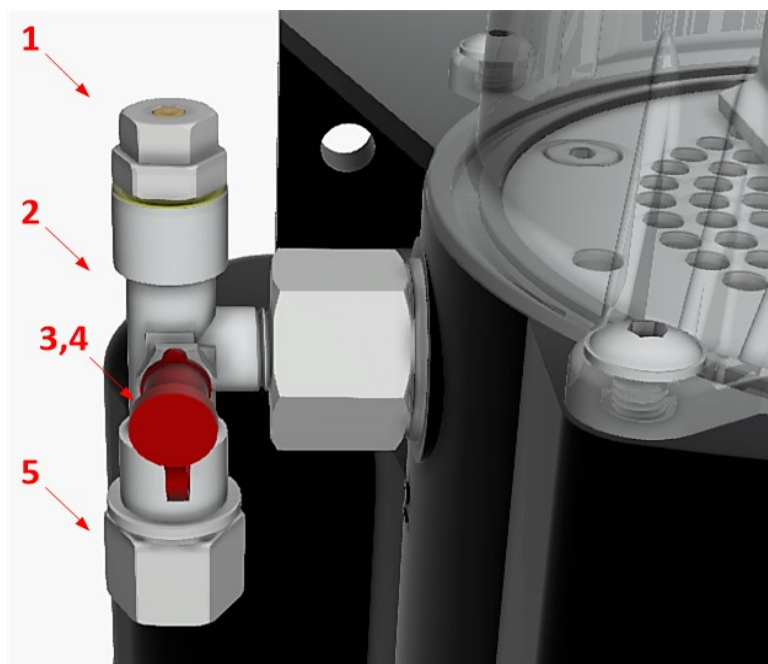


Figure 5

1. Signaling valve - Extends its indicator pin to signal overpressure/ vents overpressure. Pin automatically retracts when overpressure corrected.
2. Tee fitting
3. Manual grease fitting
4. Grease fitting cap
5. Outlet adapter



Do not modify or remove the pressure relief assembly - In case of malfunction contact customer service.

## 2.0) Timer

The timer is located inside the pump housing in order to stay protected from water, dust and other contaminants. The function of the timer is to automatically control the 300-Series pump for run time and/or pause time.

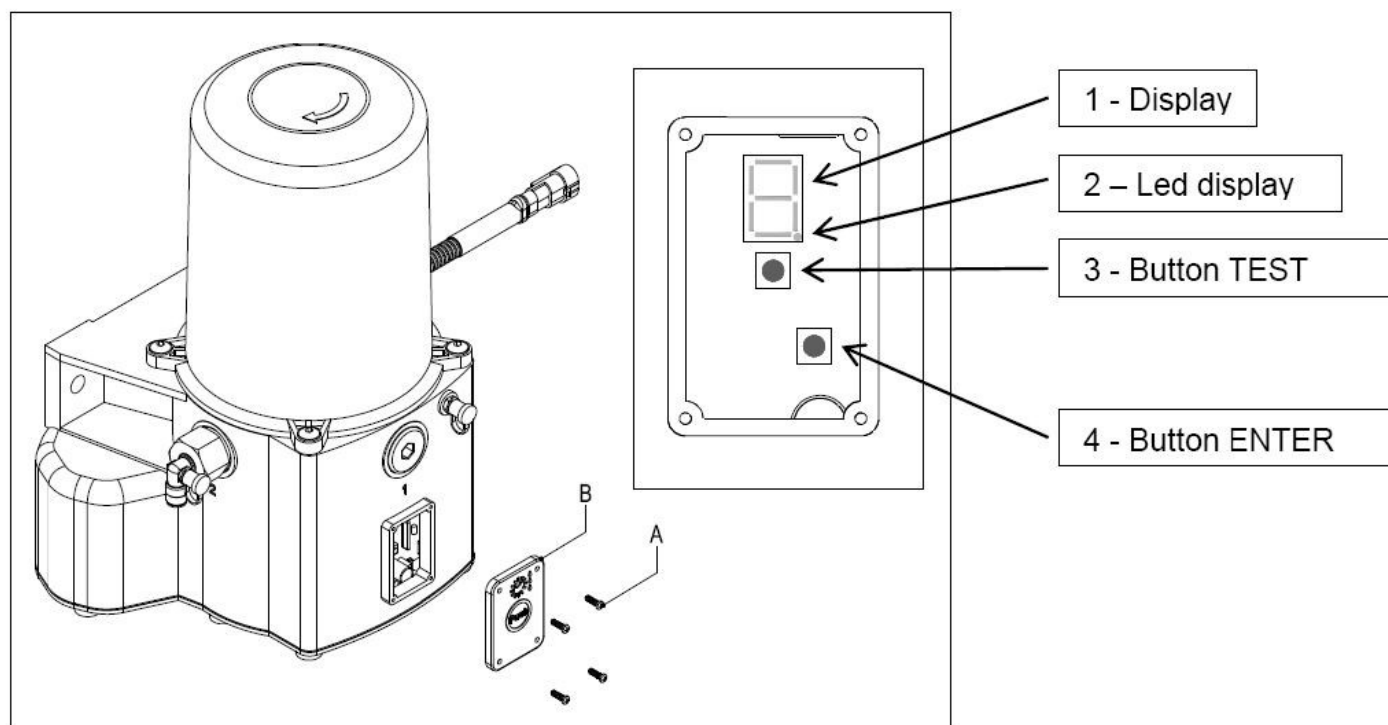


Figure 6

Pos.	Type	Description
1	Display	Displays the parameters that have been set during the time setting procedure The display LEDs turn on in sequence during normal operation.
2	LED display	Illuminates to indicate that power has been applied
3	Button TEST	Press briefly while in programming mode to toggle between <b>P</b> (pause) and <b>L</b> (working/run). Press briefly to change <b>P</b> (pause) and <b>L</b> (working/run) values once displayed
4	Button ENTER	Hold for 3 seconds to enter programming mode Press briefly to display current <b>P</b> (pause) or <b>L</b> (run) value Press briefly to return to programming mode Hold for 3 seconds to save newly entered values

## 2.1) Programming

The following section summarizes the operations that need to be performed to program the 300-Series pump.



**Note** - Timer will retain the current Pause and/or Run value to its internal memory in the event of a power outage. Once power is restored, the controller will recall the saved data and start counting time from the point and status in which its operation had been interrupted.

Step	Action	Effect
1	Remove screws "A" and remove the cover "B" to access the timer	<b>This step gives access to the timer for programming</b>
2	Hold <b>ENTER</b> for 3 seconds	The display turns on and shows letter "P" (Pause).
3	Press <b>ENTER</b>	The display will show the current value for parameter "P"
4	Press <b>TEST</b> to change the value of parameter "P"	Each press of the button will advance to the next available pause value
5	Press <b>ENTER</b> to confirm the setting	The displayed value is stored to parameter "P" and the display will once again display the letter "P"
<b>Note:</b> For pumps with timer <u>and</u> sensor controls (feedback), skip directly to step 10. The only parameter that can be set is the pause time as the sensor determines the run time.		
6	Press <b>TEST</b> to alternate the display from "P" to "L"	The display now shows the letter "L" (Run Time)
7	Press <b>ENTER</b>	The display will show the current value for parameter "L"
8	Press <b>TEST</b> to change the value of parameter "L"	Each press of the button will advance to the next available run value
9	Press <b>ENTER</b> to confirm the setting	The displayed value is stored to parameter "L" and the display will once again display the letter "L"
10	Hold <b>ENTER</b> for 3 seconds	The display will turn off and is ready to run with the newly saved parameters
11	Re-install cover "B" and secure with screws "A"	Pump is programmed and ready to go



**Note** - 300 Series Pumps with timer (non-feedback) contain the following default settings unless otherwise noted.  
 Pause **P** = 8 (5 Hours)      Work **L** = 2 (1 Minute)

## 2.1) Programming - Continued

The following table (B) defines the time value for each number/letter shown on the timer display.

Pause Setting - "P"		Run Setting - "L"	
Display	Time	Display	Time
0	5 min	0	20 sec
1	10 min	1	40 sec
2	15 min	2	1 min
3	30 min	3	1.5 min
4	1 h	4	2 min
5	2 h	5	2.5 min
6	3 h	6	3 min
7	4 h	7	3.5 min
8	5 h	8	4 min
9	6 h	9	4.5 min
A	7 h	A	5 min
B	8 h	B	5.5 min
C	9 h	C	6 min
D	10 h	D	6.5 min
E	11 h	E	7 min
F	12 h	F	8 min

Table B

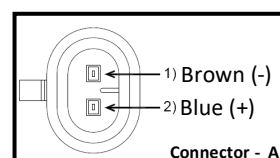
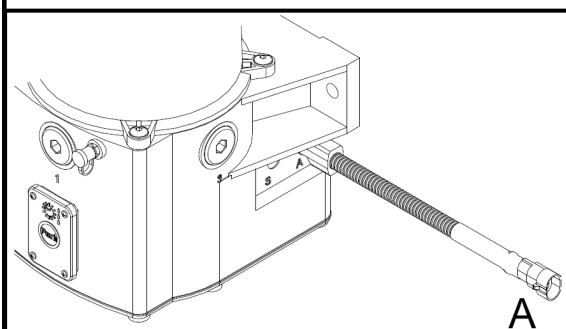


**Note** - Pumps with timer and sensor controls (feedback) allow a 10 minute window in which the system must complete its lubrication cycle before triggering an alarm.

## 2.2) Electrical Connections

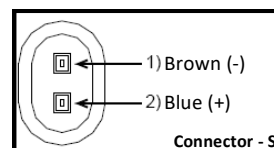
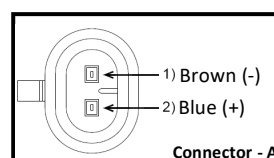
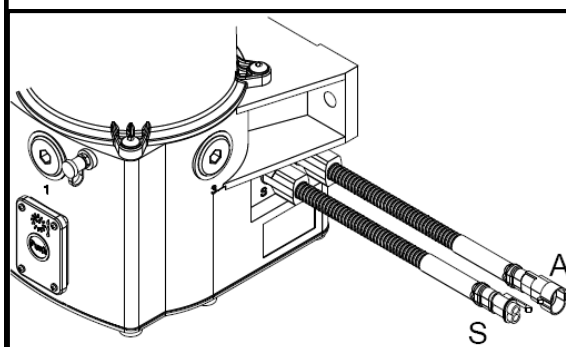
The following section contains information on making electrical connections to your specific 300-Series pump.

- Electrical Connection For **DC** Pump With or Without Timer



Power is supplied via the 2-wire connector jutting from the “A” location on the pump body. Be sure to use the appropriate power cable.

- Electrical Connection For **DC** Pump With or Without Timer - Includes Low Level



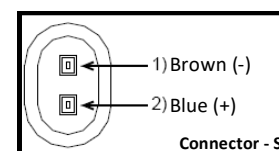
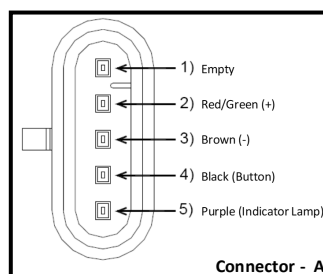
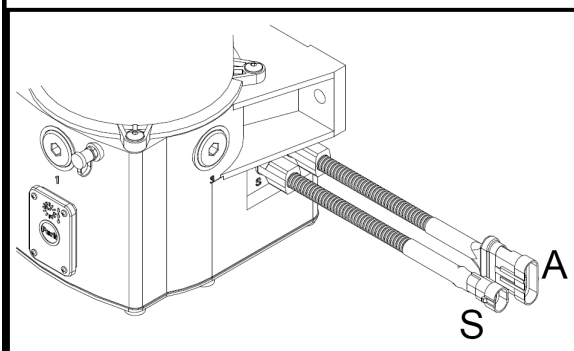
Power is supplied via the 2-wire connector jutting from the “A” location on the pump body. Be sure to use the appropriate cable.

Low level is indicated via the 2-wire connector jutting from the “S” location on the pump body. Be sure to use the appropriate cable.

## 2.2) Electrical Connections - Continued

The following section contains additional information on making electrical connections to your specific 300-Series pump.

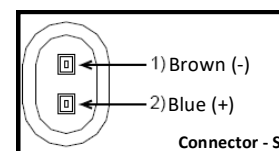
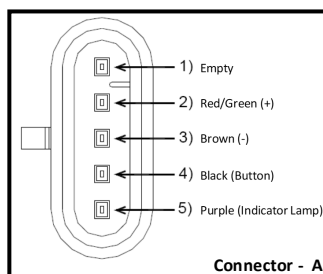
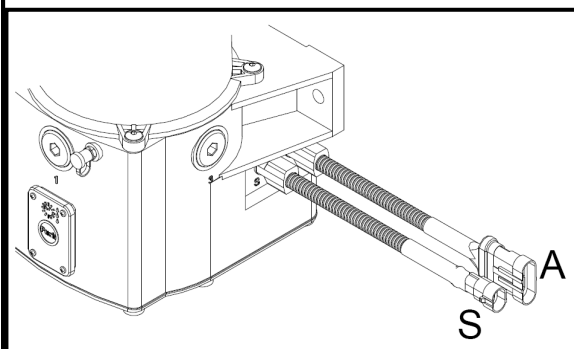
### • Electrical Connection For DC Pump With Timer and Sensor (Feedback)



Power is supplied to the pump via the 5-wire connector jutting from the “A” location on the pump body. Connection to an illuminated push button, for visual alarm indication, can be achieved through this connector as well. Be sure to use the appropriate cable.

The cycle sensor connects via the 2-wire connector jutting from the “S” location on the pump body. Be sure to use the appropriate cable.

### • Electrical Connection For DC Pump With Timer, Sensor (Feedback) and Low Level



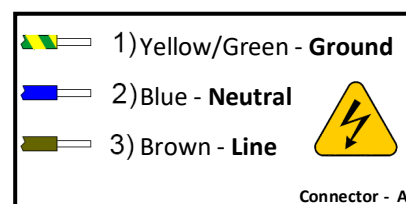
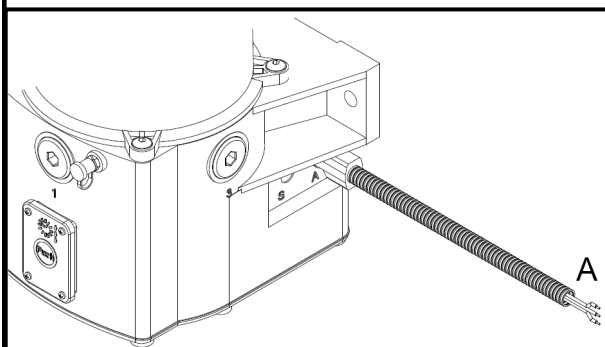
Power is supplied to the pump via the 5-wire connector jutting from the “A” location on the pump body. Connection to an illuminated push button, for visual indication of low level and other alarms, can be achieved through this connector as well. Be sure to use the appropriate cable.

The cycle sensor connects via the 2-wire connector jutting from the “S” location on the pump body. Be sure to use the appropriate cable.

## 2.2) Electrical Connections - Continued

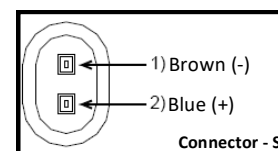
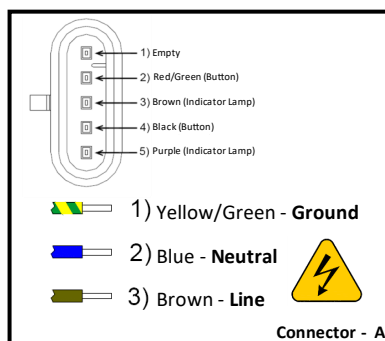
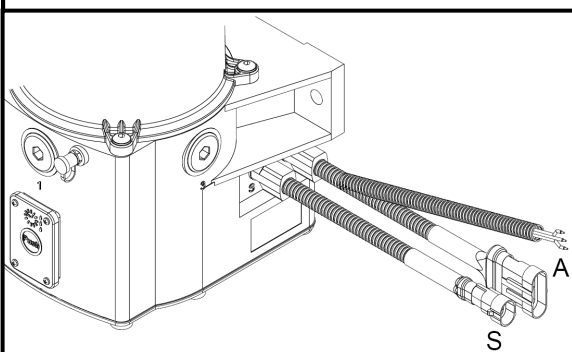
The following section contains additional information on making electrical connections to your specific 300-Series pump.

### • Electrical Connection For AC Pump With or Without Timer



Power is supplied to the pump via the 3-wire cable jutting from the “A” location on the pump body.

### • Electrical Connection For AC Pump With Timer and Sensor (Feedback)



Power is supplied to the pump via the three flying leads jutting from the “A” location on the pump body. Connection to an illuminated push button, for visual indication of alarms, can be achieved via the 5-wire connector jutting from the “A” location on the pump body. Be sure to use the appropriate cable.

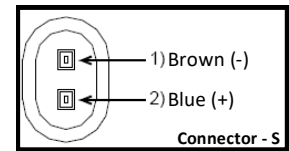
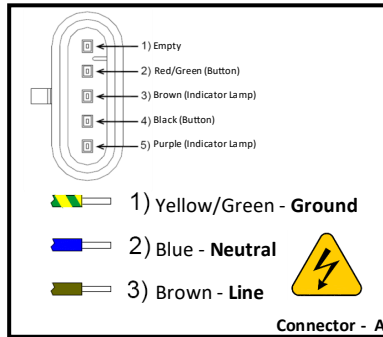
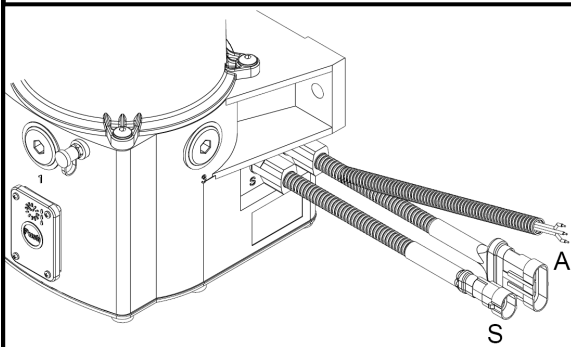
The cycle sensor connects via the 2-wire connector jutting from the “S” location on the pump body. Be sure to use the appropriate cable.



## 2.2) Electrical Connections - Continued

The following section contains additional information on making electrical connections to your specific 300-Series pump.

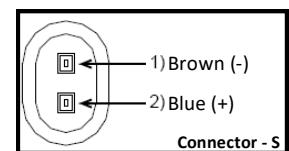
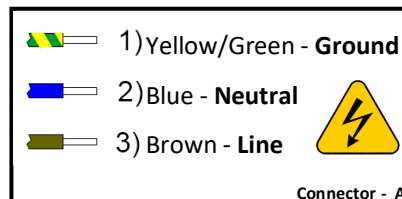
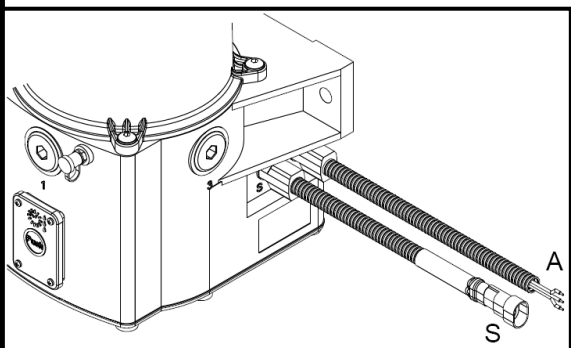
### • Electrical Connection For AC Pump With Timer, Sensor (Feedback) and Low Level



Power is supplied to the pump via the three flying leads jutting from the “A” location on the pump body. Connection to an illuminated push button, for visual indication of low level and other alarms, can be achieved via the 5-wire connector jutting from the “A” location on the pump body. Be sure to use the appropriate cable.

The cycle sensor connects via the 2-wire connector jutting from the “S” location on the pump body. Be sure to use the appropriate cable.

### • Electrical Connection For AC Pump With or Without Timer - Includes Low Level



Power is supplied to the pump via the 3-wire cable jutting from the “A” location on the pump body.

Low level is indicated via the 2-wire connector jutting from the “S” location on the pump body. Be sure to use the appropriate cable.

## 2.3) Illuminated Remote Pushbutton

An illuminated remote pushbutton is recommended for 300-Series pumps equipped with timer and sensor (feedback) for visual indication of all alarms, including low level if applicable.

Illuminated Pushbutton Status/Operation	Explanation
On for a few seconds when powered up	The indicator light turns on for a few seconds when system is first powered up. Indicator light stays on until the timer has completed an initial systems
Blinking	Indicator light blinks when the pump is running
Solid On	Indicator light is solid on when there is a system alarm or low grease level
When Pressed	If the pushbutton is pressed during normal operation a work cycle is started. Upon successful completion of a work cycle the timer returns to automatic mode. If the pushbutton is pressed while solid-on (alarm), a work cycle is started. Upon successful completion of a work cycle the timer



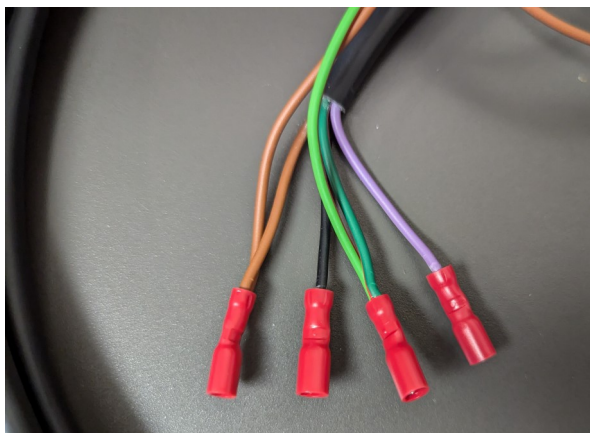
Figure 7

### Features and Specifications

- Anodized Aluminum Body
- Polycarbonate LED Lens
- Identification Bezel: Included
- Momentary Actuation
- Panel Cut-Out: 19 mm diameter
- Sealing Degree: IP67

## 2.3) Illuminated Remote Pushbutton Continued - DC Pump Models

The following section provides technical information required to install an illuminated pushbutton with your DC pump when equipped with timer and sensor (feedback).



300-Series pumps equipped with timer and sensor (feedback) controls are provided with a 5-wire flat connector/cable assembly. This cable assembly provides four leads with pre-installed spade connectors for direct attachment to your illuminated pushbutton as shown in **figure 8**.

Additional technical information for the proper installation of your illuminated push button, including panel cut-out diameter, can be found below in **figure 9** and **figure 10**.

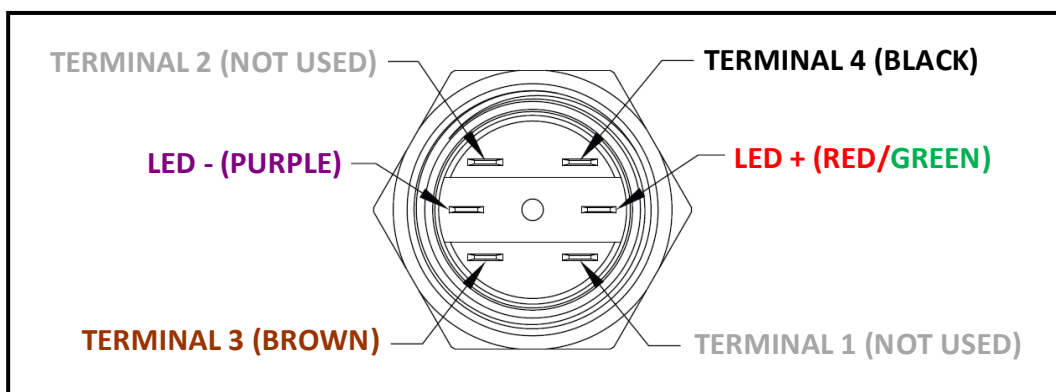


Figure 8

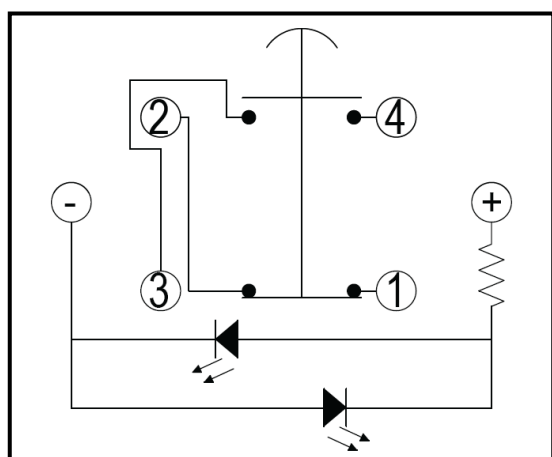


Figure 9

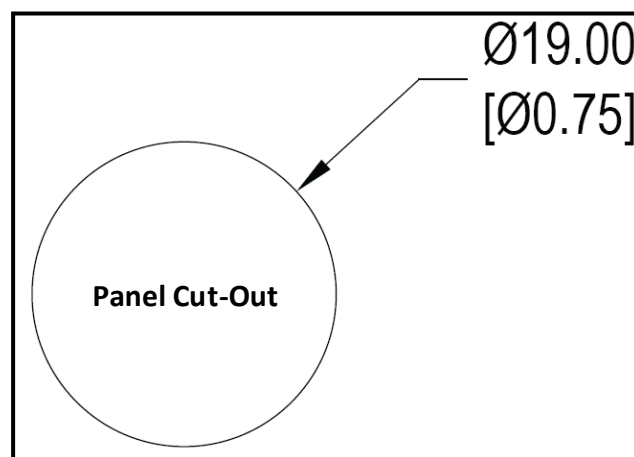
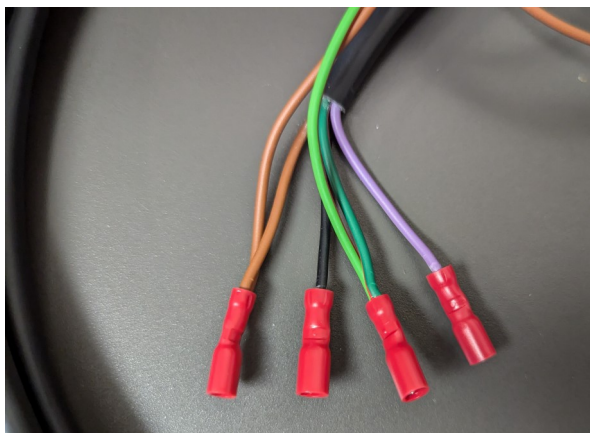


Figure 10

## 2.3) Illuminated Remote Pushbutton Continued - AC Pump Models

The following section provides technical information required to install an illuminated pushbutton with your AC pump when equipped with timer and sensor (feedback).



300-Series pumps equipped with timer and sensor (feedback) controls are provided with a 5-wire flat connector/cable assembly. This cable assembly provides four leads with pre-installed spade connectors for direct attachment to your illuminated pushbutton as shown in **figure 14**.

Additional technical information for the proper installation of your illuminated push button, including panel cut-out diameter, can be found below in **figure 9** and **figure 10**.

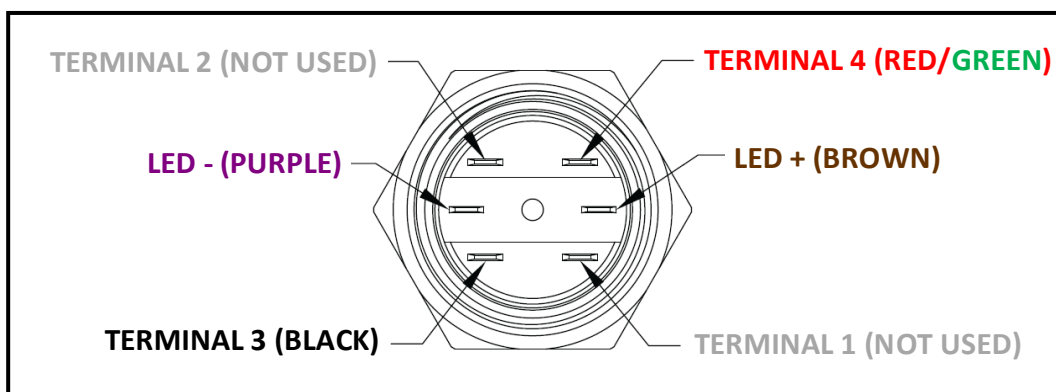


Figure 14

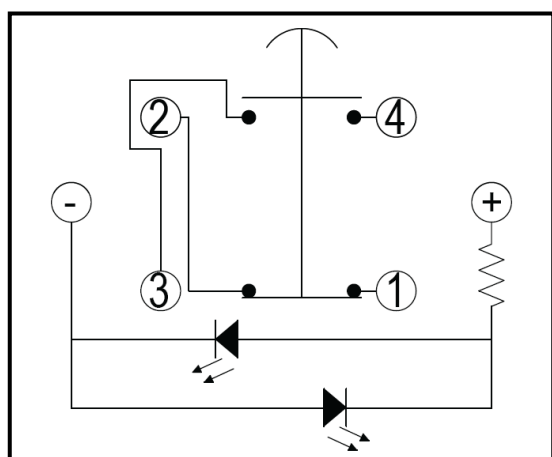


Figure 9

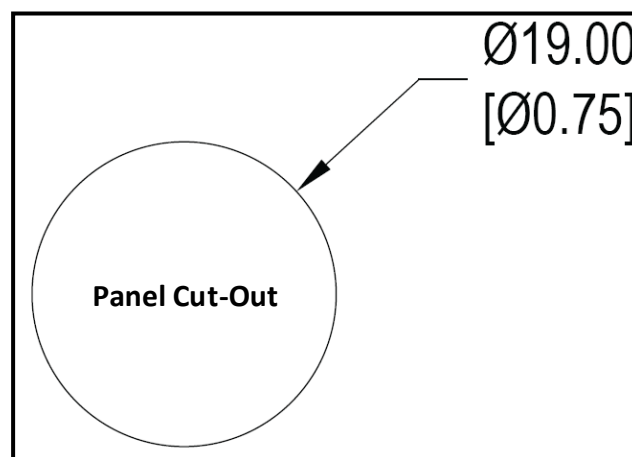


Figure 10

## 2.4) Cycle Sensor

This section outlines the use of a cycle sensor with 300-Series pumps when equipped with timer and sensor (feedback) controls.

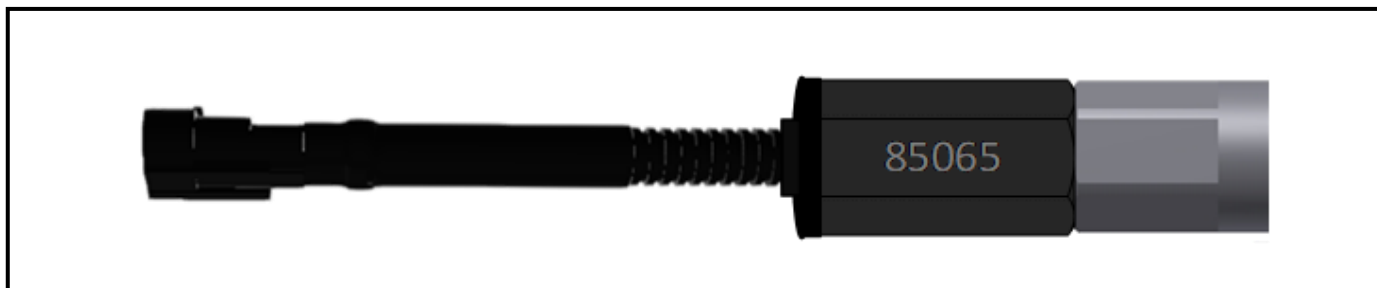


Figure 11

300-Series pumps equipped with timer and sensor (feedback) controls require a cycle sensor (**Figure 11**) to be installed onto one of the divider valves in the system. The sensor is used to determine the position of the spools inside the valve and signal the pump to stop when the valve has completed one full cycle.

The cycle sensor assembly can only be used on valves equipped with a cycle indicator pin as the new sensor assembly will replace the existing cycle indicator body. Consult your Intraflo representative for help determining the best sensor location for your application.



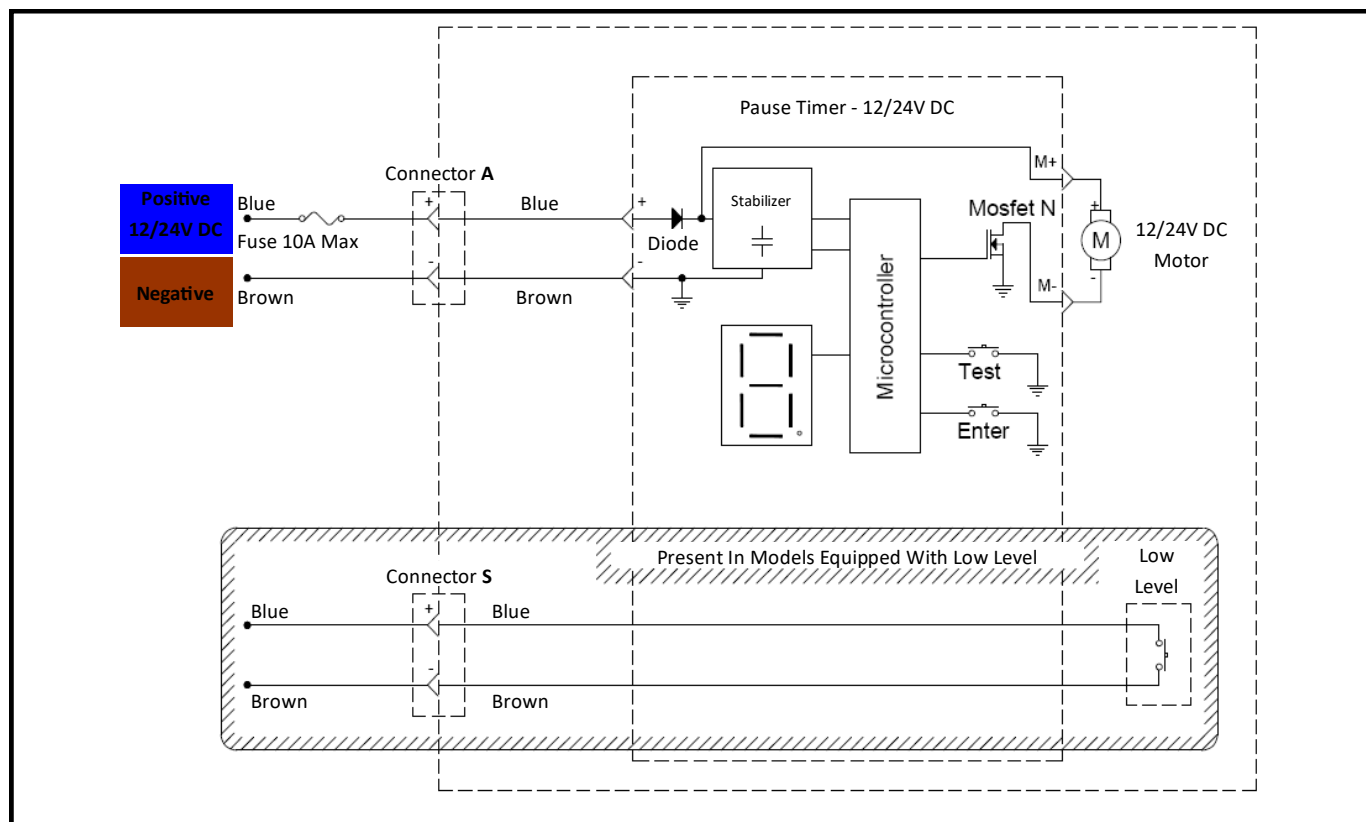
A two wire sensor cable with weather tight connectors is required for any 300-Series pump utilizing a cycle sensor. Consult your Intraflo representative should you require any guidance as to available cable lengths.



**Note** - Pumps with timer and sensor controls (feedback) allow a **10 minute** window in which the system must complete its lubrication cycle before triggering an alarm. The duration of this window cannot be modified.

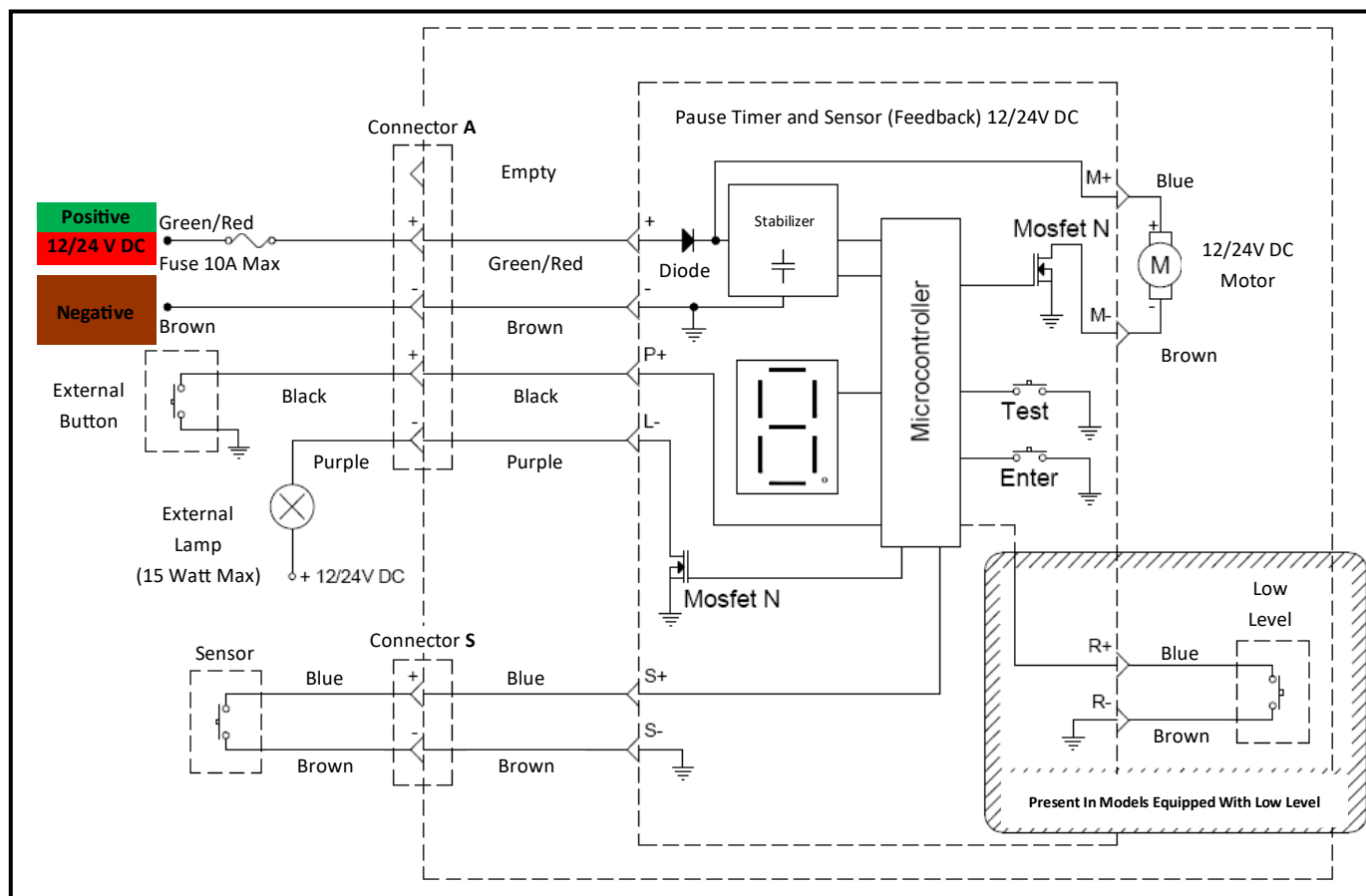
## 2.5) Wiring Diagram

### Wiring Diagram For 12/24V DC Pump With or Without Timer



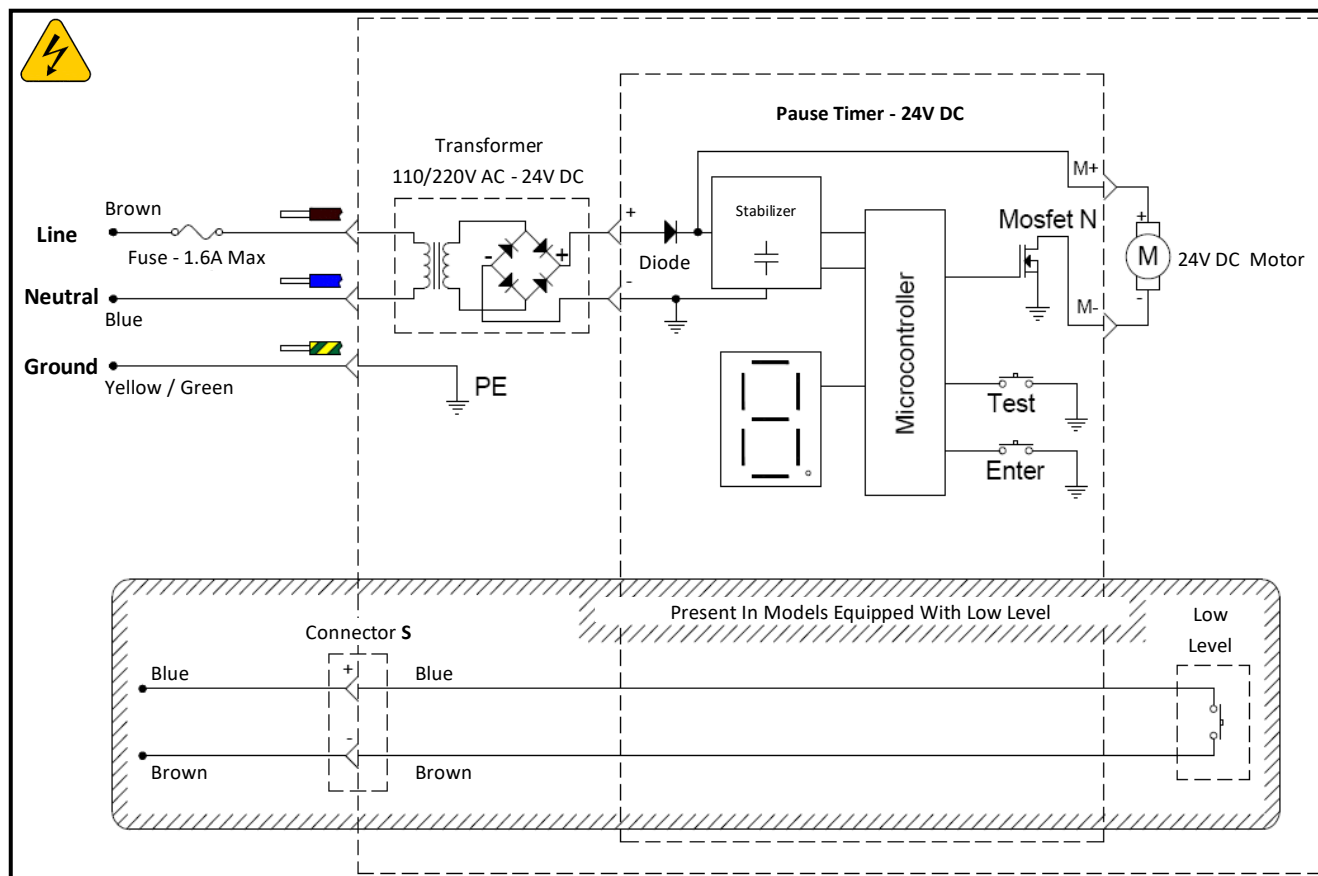
## 2.5) Wiring Diagram - Continued

### Wiring Diagram For 12/24V DC Pump With Timer and Sensor (Feedback)



## 2.5) Wiring Diagram - Continued

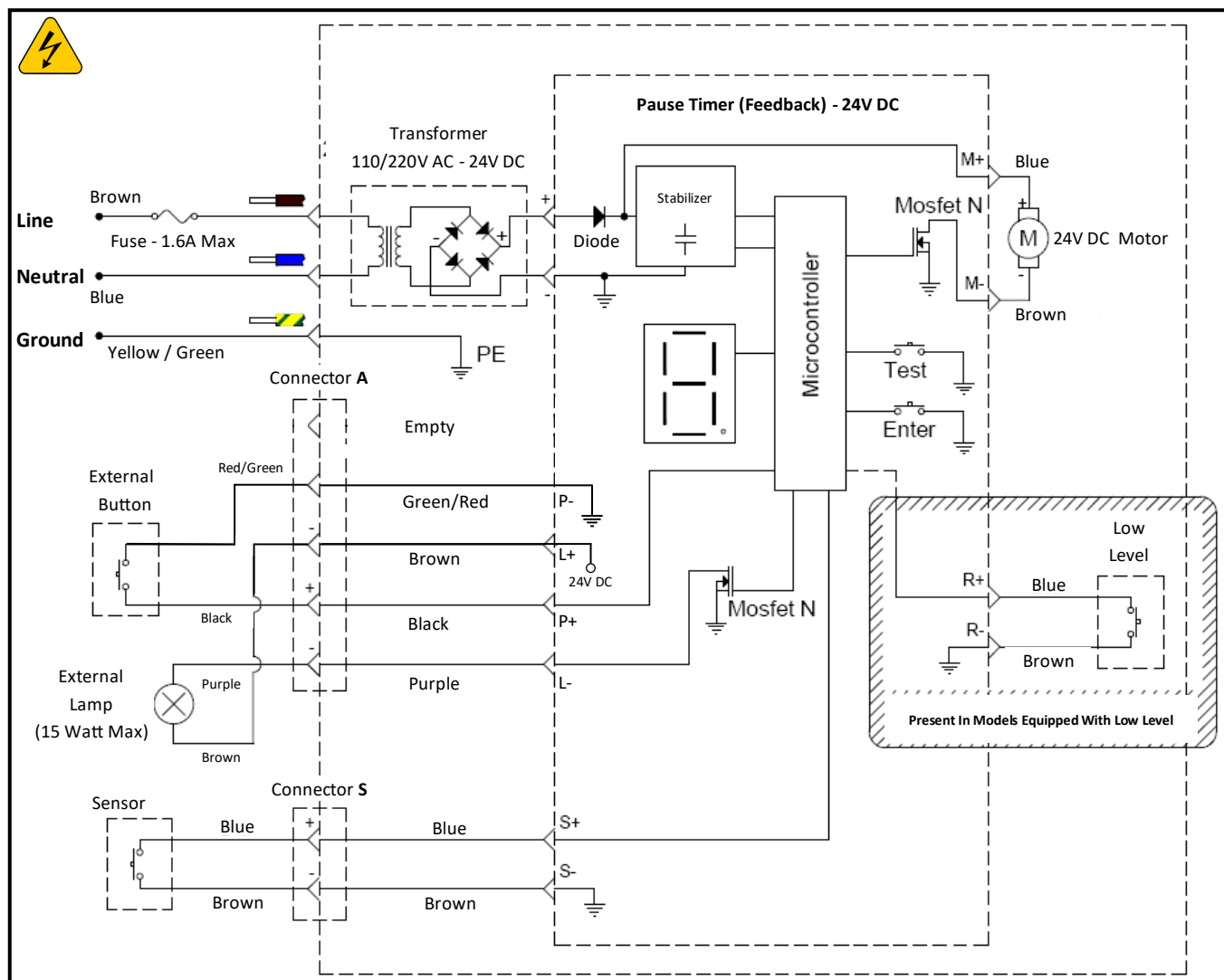
### Wiring Diagram For 110/220V AC Pump With or Without Timer





## 2.5) Wiring Diagram - Continued

### Wiring Diagram For 110/220V AC Pump With Timer and Sensor (Feedback)



### 3.0) Filling The Reservoir

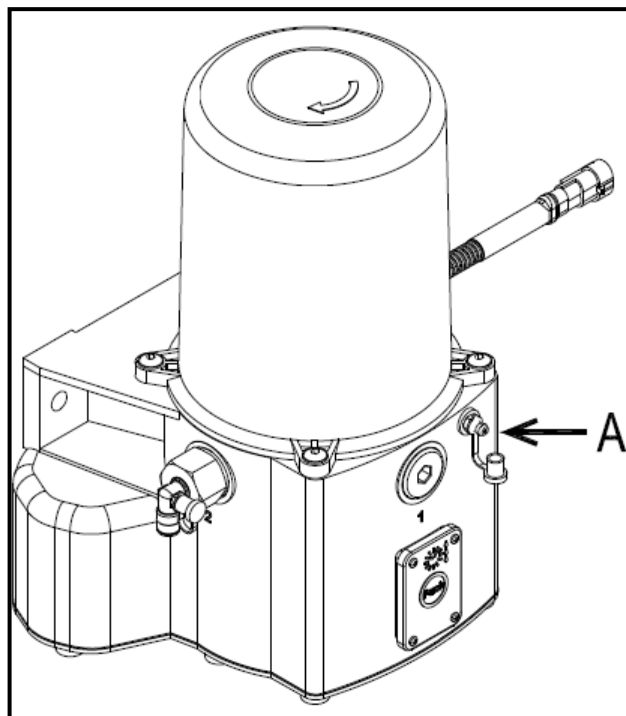


Figure 12

**The reservoir is filled by the grease fitting on the front of the pump “A”.**

1. Remove the cap from the grease fitting
2. Wipe grease fitting clean
3. Pump clean grease into the reservoir
4. Check and verify that the vent on the back of the reservoir is not damaged or blocked
5. Wipe grease fitting clean
6. Re-install grease fitting cap

Family description	NLGI grade	ASTM penetration at 25°C in 1/10 of mm
Fluid greases	000	445 – 475
Semi-fluid greases	00	400 – 430
Semi-fluid greases	0	355 – 385
Mild greases	1	310 – 340
Medium greases	2	265 – 295

Table C

**Table C** provides comparative data between NLGI (National Lubricating Grease Institution) and ASTM (American Society for Testing and Materials) for the lubricant ranges recommended for the 300-Series grease pump. A maximum grade of NLGI 2 is recommended for the 300-Series grease pump.

## 4.0) Mounting Dimensions



Reinforced mounting locations with two (2) large bolt holes make for a robust way to attach the 300-Series pump to your equipment.

Please note that the protrusion outlined in **Figure 13** is not a mounting hole, this is simply a feature to keep the pump sitting level once mounted.

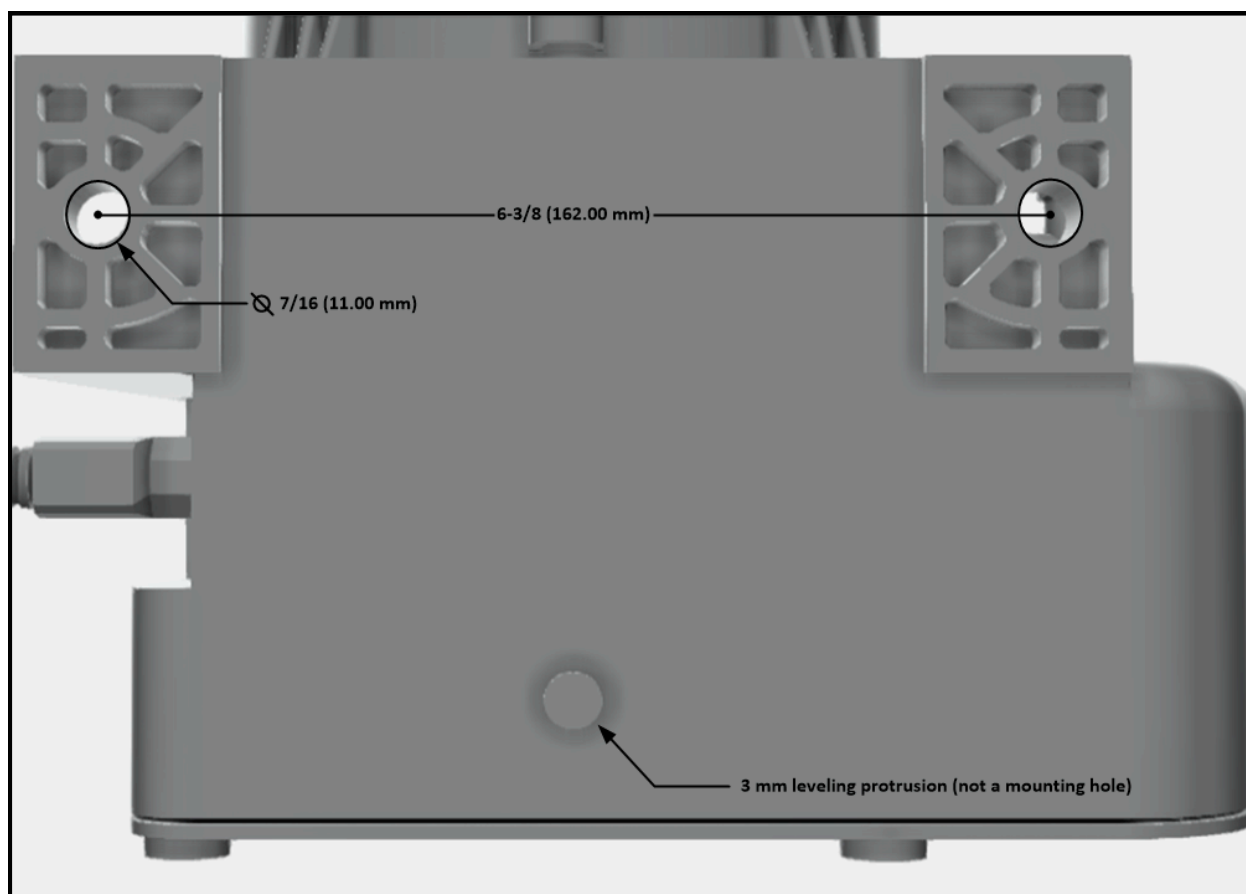


Figure 13



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