



# *Dripgard*

**Revision 04**

## *User Guide*

Document filename: Dripgard User Guide 19Nov15.doc

*Important notice: Hoffmann & Hoffmann reserves the right to change this document without further notice due to design improvements, functional modifications or quality/reliability amendments.*

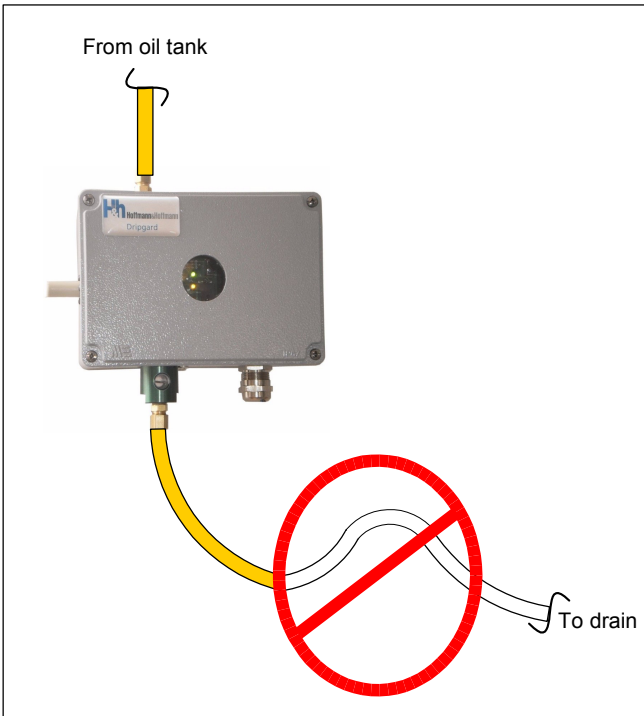
# CAUTION!

Avoiding unnecessary alarms and ensuring the free flow of oil.

## AVOID UNNECESSARY ALARMS

If the low drip rate alarm is set too close to the set drip rate, false alarms can result. For example, if the drip rate is set when the ambient temperature is high, then the alarm might go off when the ambient temperature drops substantially, such as in the evening.

## ENSURE THE FREE FLOW OF OIL



Entire drain tube must face downward to prevent oil backup.

# Contents

<b>1</b>	<b>Introduction .....</b>	<b>4</b>
1.1	Overview .....	4
1.2	External Layout .....	5
<b>2</b>	<b>Installation .....</b>	<b>7</b>
2.1	General .....	7
2.2	Well Site Requirements .....	7
2.3	Installation Kit .....	9
2.4	Wiring the Power and Control Cable.....	10
2.5	Setting the Oil Alarm Threshold .....	13
2.6	Typical Installation Wiring .....	13
<b>3</b>	<b>Operation .....</b>	<b>15</b>
3.1	PCB Controls and Indicators .....	15
3.2	Setting the Oil Alarm Levels .....	16
3.3	Oil Flow Control .....	16
3.3.1	Oil On/Off Control.....	17
3.3.2	Adjusting the Drip Rate .....	18
3.4	Resetting the Drippard .....	18
<b>4</b>	<b>Maintenance and Troubleshooting.....</b>	<b>19</b>
<b>5</b>	<b>Specifications.....</b>	<b>21</b>
5.1	Overall Dimensions .....	22
<b>6</b>	<b>Drippard Service Policy.....</b>	<b>23</b>
6.1	Installation .....	23
6.2	Product within the Warranty Period.....	23

# 1 Introduction

## 1.1 Overview

The Drippard is a passive vertical lineshaft lubrication-monitoring device that:

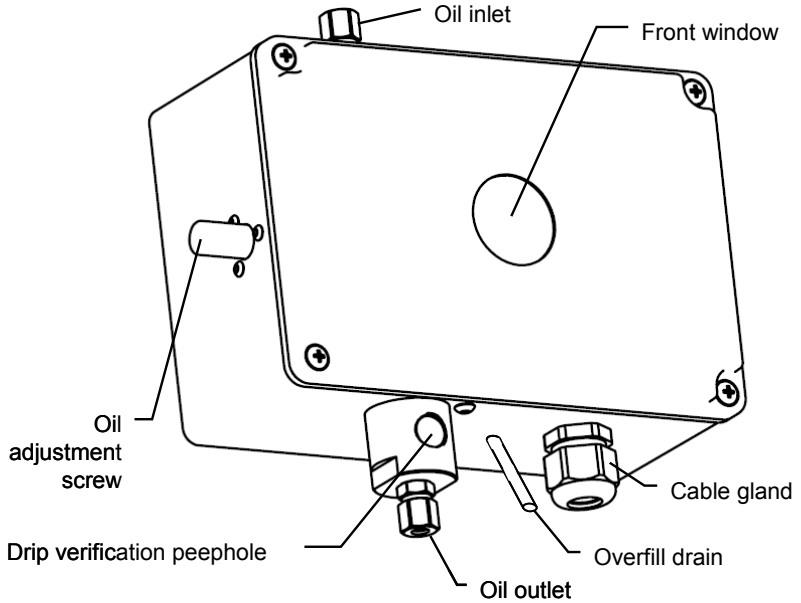
- Protects your irrigation turbine pump from running dry
  - Detects loss of oil supply
  - Detects clogged or pinched delivery input line/clogged output line
  - Enables automatic pre-lube dosing before the pump is turned on
- Controls external lamp/horn alarms
- Reduces oil consumption and prevents well contamination by dripping oil only when required
- Each drop sends a pulse that can be monitored by a local PLC
- Alarm can be set for N.O. or N.C. contacts with a slide switch



**Figure 1: Drippard**

## 1.2 External Layout

The external layout of the Drippard is shown in the figure below.



**Figure 2: Drippard external layout**

Table 1 explains the function of each component shown in Figure 2.

**Table 1: External connections and interface**

<b>Connection or control</b>	<b>Description</b>
Oil inlet	Oil from the oil tank enters here.
Oil outlet	Oil to the pump line shaft exits here.
Cable gland	Power and electrical connections are routed through here.
Oil adjustment screw	Enables the operator to adjust the oil drip rate.
Drip verification peephole	Allows the operator to view oil drops exiting the Dripgard.
Front window	Allows the operator to view the LEDs indicating system status.
Overfill drain	This tube allows oil to drain from the Dripgard in the event the outlet line is clogged.

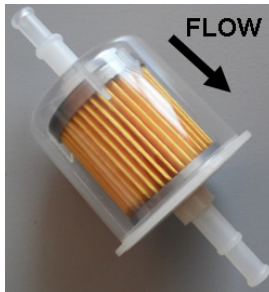
## 2 Installation

### 2.1 General

The Drippard installation procedure is simple and does not require any special tools, but requires site preparation.

### 2.2 Well Site Requirements

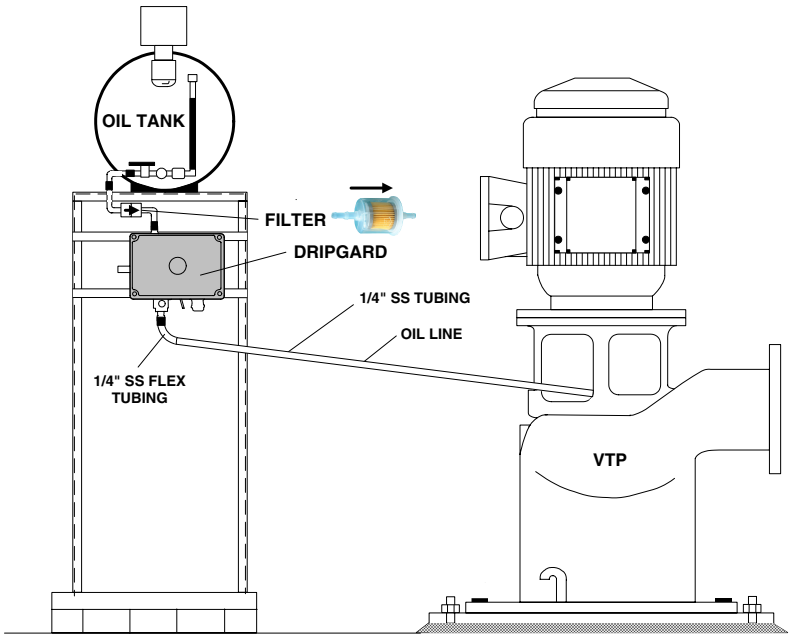
- Line power (100 to 240 VAC) must be available at the well pump.
- A sturdy, vertical pole with a welded metal plate should be in close proximity to the well pump.
- Installation of the supplied oil filter at the oil inlet is mandatory for proper functioning of the Drippard. Replace the filter periodically (every 6-12 months).



**Figure 3: In-line oil filter**

**Note:** For large oil tanks (35 to 50 gallons), mount the Drippard to the oil tank stand.

**Important:** The relative spacing between the oil tank, the Drippard, and the line-shaft inlet should be according to Figure 4. Ensure that the angle of the copper tube is sufficient for gravity flow from the Drippard to the line shaft.



**Figure 4: Installation requirements**



## 2.3 Installation Kit

The Drippard is supplied with the following:

- 4 – mounting bolts
- 8 – nuts
- 8 – lock washers
- 1 – oil filter

Make sure that all of the kit items are present.

Mounting the Drippard:

1. In order to mount the Drippard, drill four 1/4-inch holes in the metal plate that mounts the Drippard according to the drilling template shown in Figure 5: Drippard – rear view showing mounting centers
2. Remove the Drippard front cover.
3. Place a bolt into a mounting hole, and keep it in place by using a nut.
4. Repeat step 3 for the other bolts.
5. Secure the device to the metal plate using the remaining nuts and lock washers.
6. Install the inlet oil filter as shown in Figure 4, noting the filter is directional.

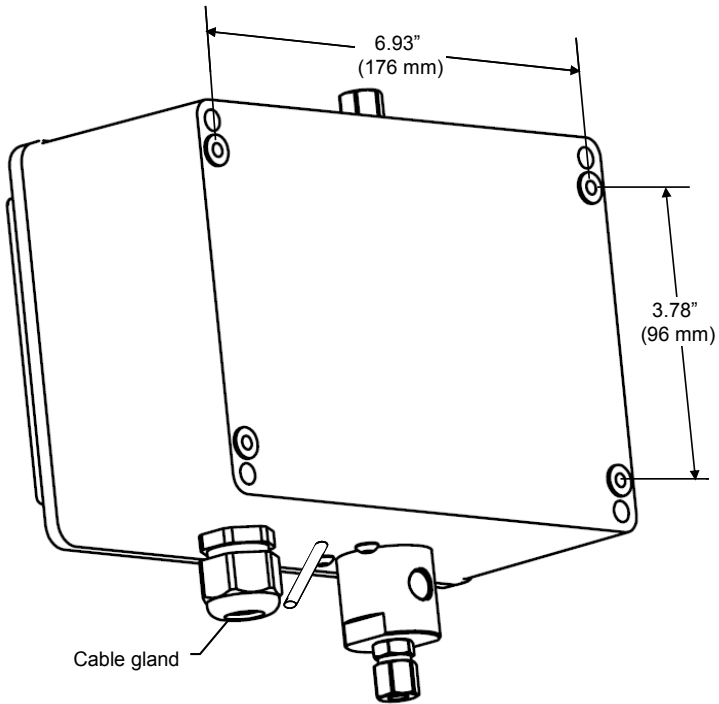


Figure 5: Dripgard – rear view showing mounting centers

## 2.4 Wiring the Power and Control Cable

The power and control cable is routed through the bottom of the connection box through the cable gland (see Figure 5).

Wire the Dripgard according to Figure 6. Connections are described in detail in Table 2.

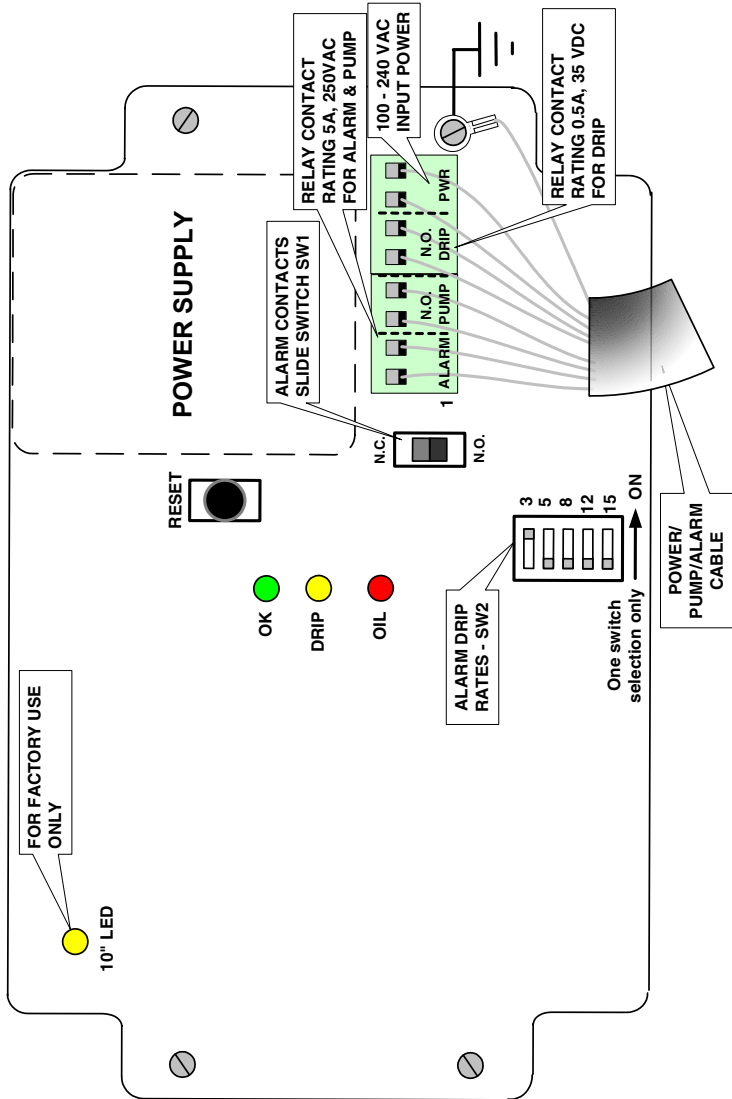
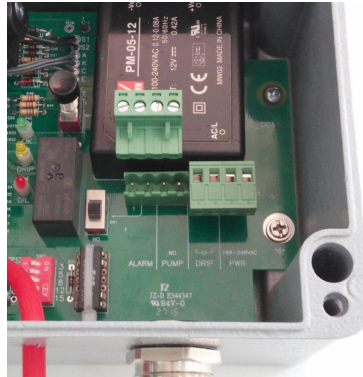


Figure 6: Drippard – wiring diagram

**Note:** Each of the connections associated with the terminal block are **not** polarity dependent.

1. Connect the green ground wire to a chassis screw or bolt, preferably using a ring terminal. See Figure 6.
2. Connect power/drip/pump/alarm cable to the modular connectors shown below according to Table 2.



**Figure 7: Modular connectors**

3. Connect the Drippard oil outlet (Figure 2 and Figure 4) to the well shaft inlet by means of flexible ¼-inch copper tubing.

**Table 2: Power/pump/alarm connections**

Connection Name	Terminal block #
ALARM – 1	1
ALARM – 2	2
PUMP – C	3
PUMP – N.O.	4
DRIP – C	5
DRIP – N.O.	6
AC POWER – L1	7
AC POWER – L2	8
CHASSIS GROUND	Chassis screw

**Note:** Use 18 AWG wires in the power/pump/alarm cable.

## 2.5 Setting the Oil Alarm Threshold

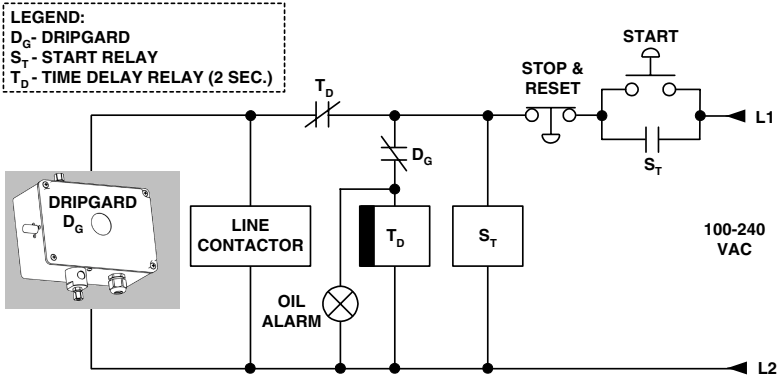
1. Open the Drippgard cover by removing the four cover screws.
2. Set the required alarm drip rate setting using the DIP switch (see Figure 6). Select only one switch.
3. Replace the Drippgard cover and tighten the four cover screws.

**Table 3: Drippgard response to oil availability**

Oil Availability	LED/Contact Status
Sufficient oil <i>(Drip rate greater than the oil alarm setting.)</i>	<ul style="list-style-type: none"><li>• OK LED is on</li><li>• OIL LED is off</li><li>• Drip N.O. contact is closed</li><li>• Pump N.O. contact is closed</li><li>• Alarm N.O. or N.C. according to switch position</li></ul>
Lack of oil <i>(Drip rate is less than the oil alarm setting.)</i>	<ul style="list-style-type: none"><li>• OK LED is off</li><li>• OIL LED is on</li><li>• Drip N.O. contact is open</li><li>• Pump N.O. contact is open</li><li>• Alarm N.O. or N.C. according to switch position</li></ul>

## 2.6 Typical Installation Wiring

A typical installation is shown in Figure 8. When oil drip rate falls below preset oil alarm threshold, the Drippgard triggers an alarm. This latched alarm signal connects to the motor control circuit, which shuts off the pump. As a result, the Drippgard is de-powered, thus cutting off the oil flow through the Drippgard by means of the built-in solenoid.



**Figure 8: Typical Drippgard installation wiring**

**Note:** The pre-lube feature is easy to implement by adding an additional time delay relay that turns on the Drippgard hours/minutes before turning on the pump.

## 3 Operation

### 3.1 PCB Controls and Indicators

Button and indicator locations on the Drippard PC board are shown below. Refer to Figure 6 for locations of buttons, switches, and indicators.

**Table 4: Drippard – controls and indicators**

Item	Name	Control or Indicator	Function
1	<b>OK</b>	Green LED	<p>Indicates that sufficient oil is delivered whether the well pump is on or off.</p> <p>This corresponds to oil drip rates in excess of the oil alarm setting.</p> <p>The LED is off when the drip rate is below the oil alarm setting, and the <b>OIL</b> LED lights.</p> <p>The PUMP N.O. contacts close and the ALARM N.O./N.C. contacts close/open when the <b>OK</b> LED is on. These relay contacts can be used to turn off the well pump and activate external lamp/horn.</p>
2	<b>Oil</b>	Red LED	<p>Indicates that the amount of oil delivered is less than the oil alarm setting.</p> <p>The PUMP N.O. contacts open and the ALARM N.O./N.C. contacts open/close when the <b>Oil</b> LED lights.</p> <p><i>The <b>Oil</b> LED turns off when resetting the Drippard.</i></p>

Item	Name	Control or Indicator	Function
3	<b>DRIP</b>	Yellow LED	This LED flashes and the N.O. DRIP output contact changes state whenever a drop passes the photoelectric sensors of the Drippard.
4	Oil alarm (drip rate) settings	DIP switches	Sets the oil alarm setting. Choose <b>only one</b> toggle switch, and push it up to the desired dpm value (3, 5, 8, 12, 15).
5	<b>10</b> ''	Yellow LED	<i>For factory use only.</i>
6	<b>RESET</b>	Push button	Resets the Drippard; see section 3.4.

### 3.2 Setting the Oil Alarm Levels

The oil alarm levels are selectable for drip rates of 3, 5, 8, 12, or 15 drips/minute (see Figure 6).

In the figure below, the oil alarm setting is set to three dpm (drips/minute).

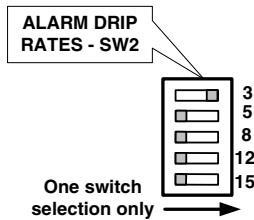


Figure 9: Oil alarm levels

### 3.3 Oil Flow Control

Oil flow through the Drippard (from oil inlet to oil outlet) is controlled by a built-in solenoid (see Figure 10).



Manual oil on/off control is possible by using the manual oil flow switch (see Figure 10).

The drip rate is adjusted using the oil adjustment screw (see Figure 10).

### 3.3.1 Oil On/Off Control

The solenoid is powered by the Drippgard power source. When the Drippgard is powered up, the solenoid allows oil flow. When powered down, the solenoid blocks oil flow.

**Note:** When the Drippgard triggers a pump shutoff signal (in case of lack of oil), the solenoid remains energized and may continue to drip oil (if oil is fed to the Drippgard oil inlet). In order to disable oil flow, while the Drippgard is sending the pump shutoff signal, the power source to the Drippgard must be turned off.

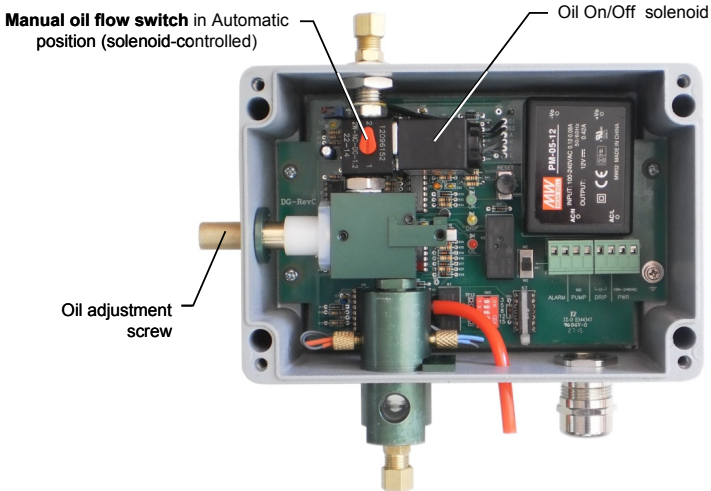


Figure 10: Solenoid and manual oil flow switch

Manual oil flow switch in Bypass position (not solenoid-controlled)

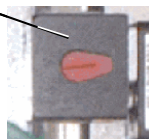


Figure 11: Manual oil flow switch in bypass position

The manual oil flow switch ensures continuous oil flow during power loss or if the solenoid is defective.

**Note:** For pre-season lubrication, the pump operator can manually open the oil flow switch, thus facilitating pre-lube of the pump line shaft without energizing the Dripgard.

When the manual oil flow switch is in the vertical position, operation is automatic (controlled by the solenoid). To allow oil flow when the Dripgard is not powered on, turn the manual oil flow switch to the right 90 degrees. In this bypass position, the valve is always open (see Figure 11).

### 3.3.2 Adjusting the Drip Rate

Turn the oil adjustment screw to set the oil flow rate to the desired level (see Figure 10). Turning the oil adjustment screw CCW (counter-clockwise) increases the drip flow rate.

Check flashing of the yellow DRIP LED to verify that oil is dripping. You can also use the drip verification peephole to check the drip rate.

## 3.4 Resetting the Dripgard

There are two ways to reset the Dripgard:

1. By removing the Dripgard cover and pressing the reset push button (see Figure 6).
2. By disconnecting the power source to the Dripgard and then reconnecting it.

In both cases, circuit voltage is interrupted and then restored.

## 4 Maintenance and Troubleshooting

**Table 5: Routine Maintenance**

Task	Frequency
Check for oil leaks	Monthly
Fully open the oil adjustment screw (turn fully CCW) for 5 seconds to clear obstructions that might have accumulated.	Weekly
Change the oil inlet filter periodically	6 – 12 months

**Table 6: Troubleshooting**

Problem	Possible Cause	Solution
No LEDs are lit.	<ul style="list-style-type: none"> <li>The unit is not powered</li> </ul>	<ul style="list-style-type: none"> <li>Check power source.</li> </ul>
No oil dripping – oil does not appear in oil peephole, nor does the Drip LED flash periodically.	<ul style="list-style-type: none"> <li>Partial or complete blockage in the input or output</li> <li>Empty oil tank.</li> </ul>	<ul style="list-style-type: none"> <li>Clean out by fully opening the metering adjustment screw for a few seconds, then re-close to the required drip setting.</li> <li>Fill empty oil tank.</li> </ul>
You want to quickly stabilize the Drippard for a new drip rate (see section 3.3.2 Adjusting the Drip Rate).	<ul style="list-style-type: none"> <li>You just refilled the oil tank.</li> </ul>	<ul style="list-style-type: none"> <li>Turn the oil adjustment screw CW to reduce the drip rate.</li> </ul>

Problem	Possible Cause	Solution
The OIL LED is on.	<ul style="list-style-type: none"> <li>• Oil tank is empty</li> <li>• A shut-off valve at the outlet of the oil tank might be closed</li> <li>• Oil flow from the oil tank may be obstructed.</li> <li>• Oil blockage between the Drippgard outlet pipe and the line-shaft.</li> </ul>	<ul style="list-style-type: none"> <li>• Refill the oil tank</li> <li>• Open the shut-off valve</li> <li>• Clean out any obstructions in the pipe between the oil tank and the Drippgard inlet</li> <li>• Clean out any obstructions in the delivery line between the Drippgard outlet and the line-shaft, or replace the delivery line.</li> </ul> <p><b>Note:</b> Reset the Drippgard after fixing the problem. See section 3.4.</p>

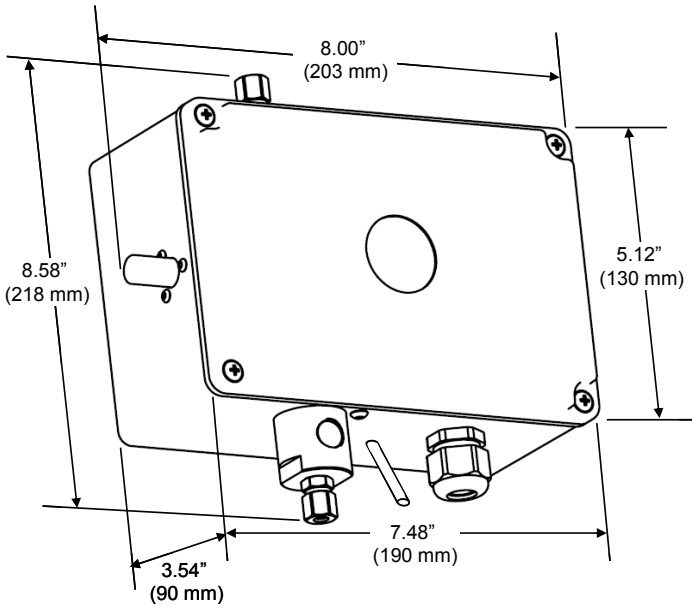
# 5 Specifications

**Table 7: Drippard specifications**

Supply voltage	100 VAC to 240 VAC, 50/60 Hz
Power consumption (max.)	10 W
Drip rate alarm settings	3, 5, 8, 12, 15 dpm
Pump Shutdown relay contact	110 VAC – 5A; 250 VAC – 5A
Alarm relay contact	110 VAC – 5A; 250 VAC – 5A
Drip relay contact	35 VDC – 0.5A
Oil on/off solenoid	12 VDC (internal voltage)
Drip volume	32 drops per 1 cc
Oil inlet/outlet	Male thread ¼" BSP
Dimensions (W x H x D)	8.58 x 8.00 x 3.54 inches (218 x 203 x 90 mm)
Weight	3.7 lbs. (1.7 kg)

All specifications shown are subject to change.

## 5.1 Overall Dimensions



**Figure 12: Drippard dimensions**

The Drippard enclosure is made of painted, cast aluminum.

## 6 Drippard Service Policy

This policy has been established to cover the servicing of Hoffmann & Hoffmann products.

### 6.1 Installation

1. Hoffmann & Hoffmann's representative or its authorized dealers will perform the installation work required and charge the customer directly.
2. In cases where there is a prior approval by Hoffmann & Hoffmann, the customer may do the installation.
3. The dealer will assume full responsibility for the installation work he performs.

### 6.2 Product within the Warranty Period

1. All Hoffmann & Hoffmann products have a one year limited warranty.
2. Hoffmann & Hoffmann Warranty will apply only to units installed by authorized Dealers or by the customer (if Hoffmann & Hoffmann authorized installation by the customer).
3. Hoffmann & Hoffmann is not responsible for damages caused by external factors, i.e. temperature extremes, power surges.
4. If the failure occurred during the Warranty Period, Hoffmann & Hoffmann will cover the repair cost. The customer will only pay for the shipment to the nearest Hoffmann & Hoffmann dealer.



**Corporate office:**

**Hoffmann & Hoffmann Ltd.**, 7 Shoham Str.,  
P.O.Box 7544, Petach Tikva 49170, Israel  
Tel: 972-3-923-2567; Fax: 972-3-923-2575;  
E-mail: [info@hw-well.com](mailto:info@hw-well.com)

**USA office:**

**Hoffmann & Hoffmann**, 2757 W. Jarlath Str.,  
Chicago, Illinois 60645  
Tel: 312-277-9191; 312-218-8997;  
Fax: 866-272-8433;  
E-mail: [info@hw-well.com](mailto:info@hw-well.com)

[www.hw-well.com](http://www.hw-well.com)

---