



# PHOENIX™

Membrane Based lube and Hydraulic Oil Purifiers



**PHX-C4 OR C8 - 4 OR 8 GPM PORTABLE  
FILTER CART AND MEMBRANE DEHYDRATOR**



**GEAR OIL  
BEFORE AND AFTER  
4000 PPM WATER - 50 PPM**



**PHX-M-1 GPM 110/220V HAND CARRY  
MEMBRANE DEHYDRATOR**



**PHX-C1 1GPM PORTABLE  
FILTER CART AND MEMBRANE DEHYDRATOR**



**Simple**

**Safe**

**Reliable**

**Efficient**

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\* Disclaimer : Membrane operation diagram is illustrative Membrane is not claimed to be defect free and very modest amounts of oil permeate over into vacuum side. Any effects of this are minimized by system design and oil dehydration is not effected!

## IT'S REVOLUTIONARY



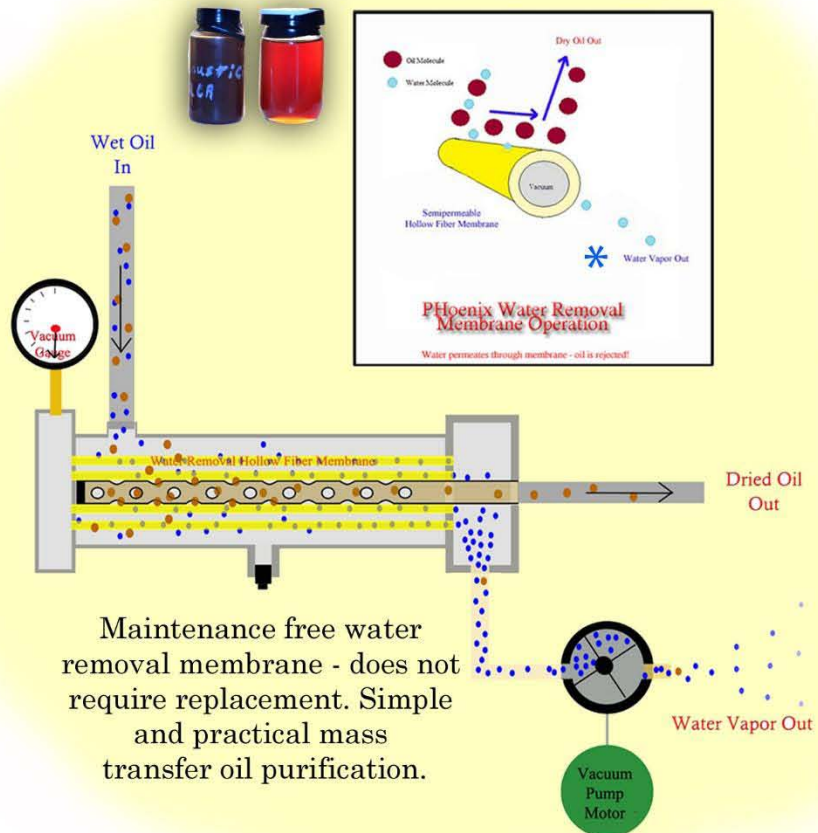
PHOENIX C4 - 4 GPM  
20 - 1000 GALLONS



PHOENIX C - 1 GPM  
5 - 150 GALLONS



PHOENIX M - MINI  
HAND CARRIED 1 GPM  
5- 150 GALLONS



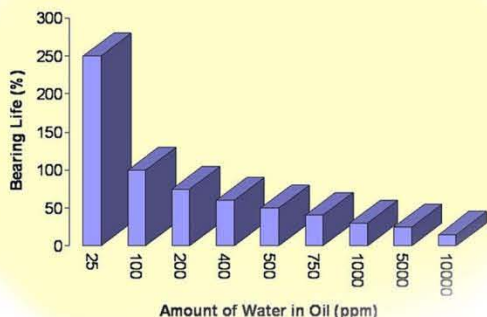
## IT'S RELIABILITY THROUGH SIMPLICITY

- \* Simple Design
- \* Easy to use
- \* Few moving parts
- \* Small footprint
- \* Very little maintenance required
- \* Unlimited water removal
- \* Autonomous
- \* Extremely portable
- \* Effective



# Why throw away perfectly good oil? Instead flush your system or reclaim with the PHoenix .

Effect of Water on Bearing Life



Cantley, R.E.,  
"The Effect of Water in Lubricating Oil on Bearing Fatigue Life"  
ASLE Transactions, 20(3), 244-248, 1997.

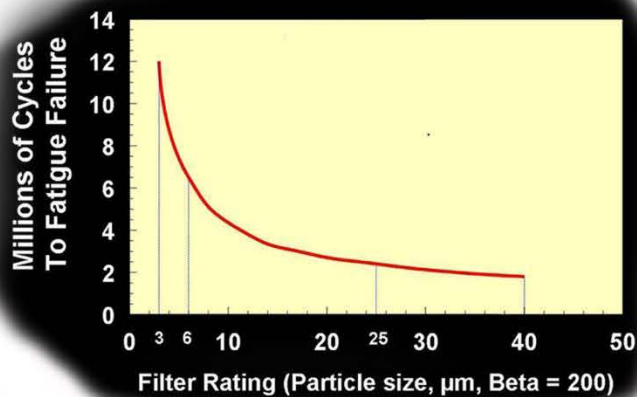
## IT'S SIMPLE!

The freer your lube and hydraulic systems are of water and particulate the fewer equipment breakdowns you will experience !

This means longer uninterrupted manufacturing run times along with more profits for your organization and less stress for you!

## THE PHOENIX REMOVES:

- \* Free Water 100%
- \* Emulsified Water 100%
- \* Dissolved Water - < 50 ppm
- \* Particulates - < 3 microns



Mcpherson, P., Bhachu, R., Sayles, R.,  
"The Influence of Filtration on Rolling Element Bearing Life".



Paper Plant - field results 220 weight  
Gear Box Oil - 48 gallon reservoir

## USE EXAMPLES

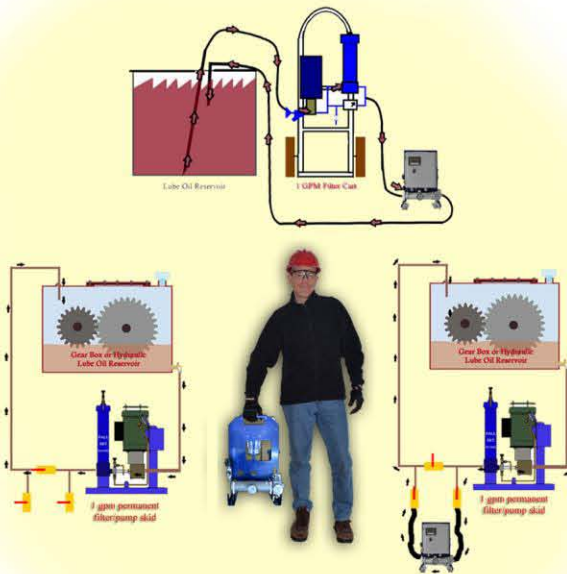
### COMPACT

The Phoenix Mini is small and portable enough to be lifted up and into a Windturbine Nacelle and yet reliable enough to be left operating 280 feet in the air unattended for months. Connection to the Gearbox takes less than a few minutes !



### VERSATILE

Add temporary or permanent dehydration to filter pump skids on small lube and hydraulic reservoirs, or with a flow control orifice by tapping off of existing pressure ports such as return filters, bearing supply or oil cooler supply lines. Connect downstream of a 1 gpm filter cart to turn a simple filter cart into an oil dehydrator!



### PORTABLE

PHoenix C1 and C4 provide stand alone portable kidney loop purification and are compact enough to move through doors, catwalks, up stairs and to most areas where traditional dehydrator technology cannot fit. Low oil hold up volume means limited oil loss between oil changes and 110 Volts makes it very easy to find power, turn on set and forget !



## APPLICATIONS AND INDUSTRIES SERVED

### ROAD CONSTRUCTION AND MINING

- \* Lift Hydraulic System flushing
- \* Track and Drive Train Gear Box flushing
- \* Bucket Truck Dielectric Hydraulic purification
- \* Transmission System flushing
- \* Conveyor Gear Box flushing



### COOLING TOWER GEARBOXES

Durable enough to be used outdoors on ACC (Air Cooled Condenser) or WCC (Water Cooled Condenser) fan Gear Boxes even in high vibration areas.

## OTHER POTENTIAL APPLICATION

#### Power Generation

- \* Combustion Turbine Lube
- \* Coal Mill Gear Boxes
- \* Conveyor Gear Boxes
- \* Boiler Feed Pump Lube
- \* Windturbine Gear Boxes
- \* EHC Control
- \* ACC - WCC Gear Boxes
- \* Scrubber Equipment Gear Boxes

#### Food and Beverage

- \* Food Grade Hydraulic Oil
- \* Conveyor Gear Boxes

#### Agriculture

- \* Conveyor Gear Boxes
- \* Harvesting Equipment Hydraulic

#### Pulp and Paper

- \* Wet end/dryer lube
- \* Press section lube and hydraulics
- \* Boiler Feed Pump lube
- \* Cooling Tower Gear Boxes

#### Primary Metals

- \* Roll mill gear and pinion lube

#### Transportation

- \* Ship Board Hydraulic-Lube
- \* Diesel Locomotive Gear Box
- \* Transmission Systems

#### Military

- \* Military Equipment Hydraulics
- \* Aircraft - Road Equipment

#### Light Industrial

- \* Oil Reclamation
- \* Blow Molding Hydraulic
- \* Machine Tool Hydraulic
- \* Injection Molding
- \* Automotive transfer line Hydraulic Oil

#### Fuels and Chemical

- \* Drilling Equipment Gear Box Flushing
- \* Extruder Gear Boxes
- \* Compressor Lube
- \* Boiler Feed Pump Lube
- \* Offshore Drilling Platforms

# PHoenix™ C4 OR C8

4 gpm or 8 gpm portable Membrane Oil Purifier Cart for 10 - 2000 Gallon Oil Reservoirs:

(Larger reservoirs possible depending on water ingress rate)

OPTIONAL 1" INLET/OUTLET HOSES SOLD SEPERATELY

PN: PHXC4MHS - MINERAL OIL  
PN: PHXC4PEHS - PHOSPHATE ESTER

PHOENIX SHOWN WITH OPTIONAL AQUATREX MOISTURE MONITORING SYSTEM (SEE PAGES 11-12 FOR DETAILS).



LOW MAINTENANCE GAST ROCKING PISTON VACUUM PUMP

CART FINISH - CHEMICALLY RESISTANT POWDER COATING - NOT PAINTED

PANEL MOUNTED PRESSURE GAUGES

\* Oil Pressure  
\* Membrane Vacuum

CART RIGGING AND LIFTING LUG

4" WATER REMOVAL MEMBRANE HOUSING

PARTICULATE FILTER PLUGGED INDICATOR

8 MICRON ABSOLUTE BETA 2000 SPIN ON FILTER

JIC OR ORB HYDRAULIC LEAK RESISTANT FITTINGS AND CONNECTIONS WHERE ALLOWABLE.

OUTLET OIL FLOW INDICATOR SIGHT GLASS



INLET OIL SAMPLE VALVE

HIGH QUALITY HEAVY DUTY BALDOR WASHDOWN DUTY MOTOR

PUMP INLET VACUUM GAUGE AND HIGH VACUUM CUT OFF SWITCH SUPPLIED WHEN AQUATREX OPTION IS PURCHASED

HIGH QUALITY 4 GPM C4 OR 8 GPM C8 VIKING GEAR PUMP

**BACK**



## Specifications

Flow Rate: 4 gpm constant  
 Inlet/Outlet Connections: 1" Male JIC  
 Available Voltage: 110 V or 220V  
 Max Amp Draw: 10 Amps  
 Fluid Pump Motor: 1/2 HP Washdown  
 Dry Weight: 250 Lbs  
 Inlet Pressure Range : -10 hg - 10 psig  
 Max Outlet Pressure: 45 psig  
 Maximum Oil Viscosity: 3000 Cst  
 Minimum Oil Viscosity: 10 Cst  
 Maximum Operating Temp: 190 F  
 Minimum Operating Ambient: 33F  
 Maximum Free Water Removal: 2-3 Gallons/Day  
 (Depending on Water Content, Oil Temp and Oil Type)

Oil Type: Low Volatile Mineral Based  
 Phosphate Ester Optional

Recommended Oil Reservoir Size: 10 - 1500 gallons  
 (Larger Possible depending on water ingress rate)

## Ordering Information

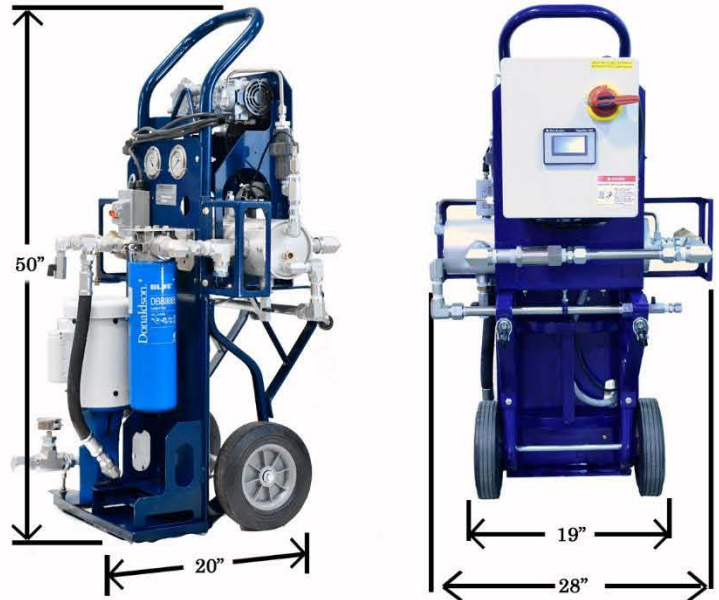
PHX-C4	Table 1	Table 2	Table 3	Table 4	Table 5
	Voltage	Aquatrex	Filter	Oil Type	Mount

**Table 1: Voltage Options**

A	110 V 60Hz - SP Standard
B	220 V 60Hz - SP Optional

**Table 2: Aquatrex Moisture Monitoring**

C	Without Aquatrex
D	With Aquatrex



**Dimensions**

Spare Parts	Qty	Part Number
6000 hr PmKit	1	PHXC4KIT
7 Micron Filter	1	MSCP568665

**Table 3: Filter Housing Option**

2	8 Micron B2000 Spin On Filter
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**Table 4: Oil Type**

G	Mineral Based Only
H	Phosphate Ester

**Table 5: Mounting**

BLANK	Portable Cart
1	Permanent Mount

# PHoenix™ C1

1 gpm portable Membrane Oil Purifier Cart for 5-200 gallon oil reservoirs!

Larger reservoirs possible depending on water ingress rates!

PHOENIX SHOWN WITH OPTIONAL AQUATREX MOISTURE MONITORING SYSTEM



CART FINISH - CHEMICALLY RESISTANT POWDER COATING - NOT PAINTED

OPTIONAL 3/4" INLET/OUTLET HOSES SOLD SEPERATELY

PN: PHXC1MHS - MINERAL OIL  
PN: PHXC1PEHS - PHOSPHATE ESTER

OUTLET OIL FLOW INDICATOR SIGHT GLASS



HIGH QUALITY HEAVY DUTY BALDOR WASHDOWN DUTY MOTOR

PUMP INLET VACUUM GAUGE AND HIGH VACUUM CUT OFF SWITCH SUPPLIED WHEN AQUATREX OPTION IS PURCHASED

HIGH QUALITY 1 GPM VIKING GEAR PUMP

LOW MAINTENANCE GAST ROCKING PISTON VACUUM PUMP

CART RIGGING AND LIFTING LUG

INLET OIL SAMPLE VALVE

PARTICULATE FILTER PLUGGED INDICATOR

8 MICRON B2000 SPIN ON FILTER ELEMENT AND FILTER DIFFERENTIAL CHANGEOUT INDICATOR

JIC OR ORB HYDRAULIC LEAK RESISTANT FITTINGS AND CONNECTIONS WHERE ALLOWABLE.

**BACK**



## Specifications

Flow Rate: 1 gpm constant  
 Inlet/Outlet Connections: 3/4" Male JIC  
 Available Voltage: 110 V or 220V  
 Max Amp Draw: 7 Amps  
 Fluid Pump Motor: 1/2 HP Washdown  
 Dry Weight: 180 Lbs  
 Inlet Pressure Range : -10 hg - 10 psig  
 Max Outlet Pressure: 45 psig  
 Maximum Oil Viscosity: 3000 Cst  
 Minimum Oil Viscosity: 10 Cst  
 Maximum Operating Temp: 190 F  
 Minimum Operating Ambient: 1/2 C or 33F  
 Maximum Free Water Removal: 1 - 2 Gal/Day  
 (Depending on Water Content, Oil Temp and Oil Type)  
 Dimensions: 19"W X 20" D X 50" H  
 Oil Type: Low Volatile Mineral Based  
 Phosphate Ester Optional

Recommended Oil Reservoir Size: 5-200 gallons  
 (Larger Possible depending on water ingress rate)

## Ordering Information

PHX-C	Table 1	Table 2	Table 3	Table 4	Table 5
	Voltage	Aquatrex	Filter	Oil Type	Mount

Table 1: Voltage Options

A	110 V 60Hz - SP Standard
B	220 V 60Hz - SP Optional

Table 2: Aquatrex Moisture Monitoring

C	Without Aquatrex
D	With Aquatrex



Dimensions

Spare Parts	Qty	Part Number
6000 hr PmKit	1	PHXC4KIT
7 Micron Filter	1	MSCP568665

Table 3: Filter Element

2	8 Micron B2000 Spin On Filter
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Table 4: Oil Type

G	Mineral Based Only
H	Phosphate Ester

Table 5: Oil Type

BLANK	Portable Cart
1	Permanent Mount

# PHoenix™ M

Mini - 1 gpm hand carried portable Membrane Purifier for oil reservoirs between 5 and 200 gallons.

(Larger reservoirs possible depending on water ingress rate)

OPTIONAL AQUATREX MOISTURE MONITORING SYSTEM NEMA 4 CONTROL BOX



SHOWN WITHOUT OPTIONAL AQUATREX MOISTURE MONITORING SYSTEM

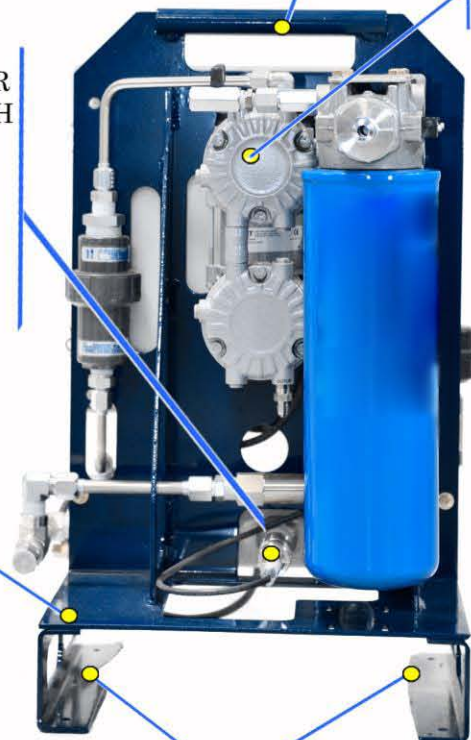
2" WATER REMOVAL MEMBRANE HOUSING WITH GLYCOL FILLED OIL PRESSURE AND VACUUM GAUGES

EASY TO GRAB LIFT HANDLE

LOW MAINTENANCE GAST ROCKING PISTON VACUUM PUMP

WATER SENSOR SUPPLIED WITH OPTIONAL AQUATREX MOISTURE MONITORING SYSTEM

CHEMICAL RESISTANT POWDER COATED ALUMINUM FRAME



OPTIONAL REMOVABLE MAGNETIC RAILS. TO LOCK DOWN PHOENIX TO METAL SURFACES. HELPFUL IN HIGH VIBRATION AREAS SUCH AS WINDTURBINES TO PREVENT TRAVEL FROM VIBRATION.



8 MICRON NON BYPASS BETA 2000 SPIN ON FILTER WITH FILTER PLUGGED INDICATOR

# PHoenix™ M - Mini



## Specifications

Flow Rate: 1 gpm constant  
 Inlet/Outlet Connections: 1/2" Male JIC  
 Available Voltage: 110 V or 220V  
 Max Amp Draw: 4 Amps  
 Dry Weight: 55 Lbs with Aquatrex  
                   35 Lbs without Aquatrex  
 Max Outlet Pressure: 45 psig  
 Maximum Oil Viscosity: 3000 Cst  
 Minimum Oil Viscosity: 10 Cst  
 Maximum Operating Temp: 190 F/  
 Minimum Operating Ambient: 1/2 C or 33F  
 Maximum Free Water Removal: 3/4 - 1 Liter/Day  
 (Depending on Water Content, Oil Temp and Oil Type)

Oil Type: Low Volatile Mineral Based  
 Phosphate Ester Optional

Recommended Oil Reservoir Size: 5-150 gallons  
 (Larger Possible depending on water ingress rate)

## Ordering Information

PHX-C

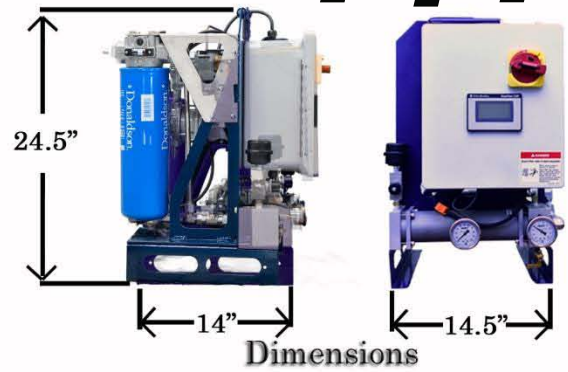
Table 1	Table 2	Table 3	Table 4	Table 5
Voltage	Aquatrex	Housing	Oil Type	Mag Rails

**Table 1: Voltage Options**

A	110 V 60Hz - SP Standard
B	220 V 60Hz - SP Optional

**Table 2: Aquatrex Moisture Monitoring**

C	Without Aquatrex
D	With Aquatrex



Spare Parts	Qty	Part Number
6000 HrPmKit	1	PHXC4KIT
MSCP568665	1	8 Micron Filter

**Table 3: Filter Housing Option**

2	8 Micron B 2000 Spin On Filter
F *	No Filter Housing Supplied

**Table 4: Oil Type**

G	Mineral Based Only
H	Phosphate Ester

**Table 5: Magnetic Rails**

I	With Magnetic Rails
J	Without Magnetic Rails

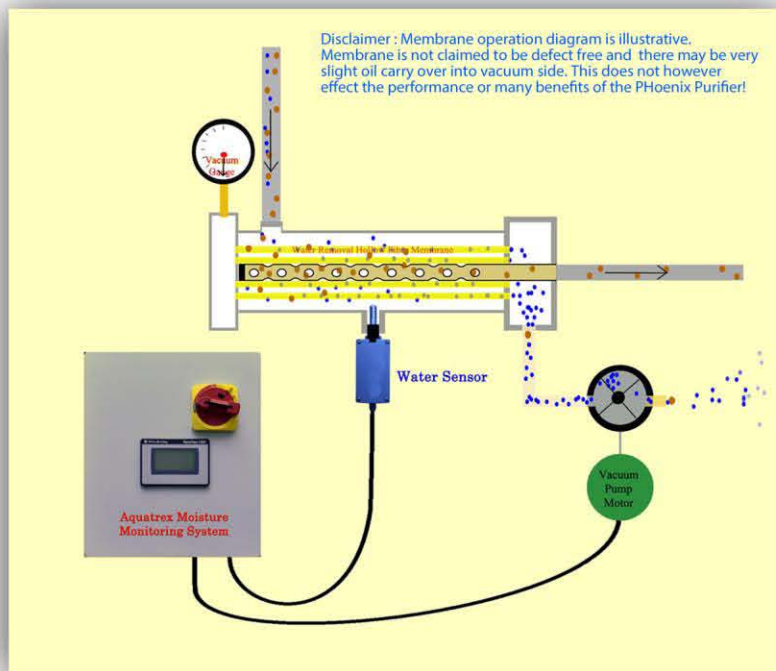
\* Only use option F if Phoenix is to be used with existing Donaldson 7 micron or lower filtration such as permanent filter/pump skids or Filter/Pump Cooler Packages.

## DO I EVEN HAVE WATER IN MY OIL?



EE364

Water Sensor



Optional PHOenix Aquatrex Moisture Monitoring System



## HOW CAN I TELL ?

The optional Aquatrex Moisture Monitoring System measures the level of water contamination in your oil using a Watersensor and displays it in percent saturation on the Aquatrex PLC touchscreen.



## WHAT ELSE CAN IT DO ?

### A SIMPLE DIAGNOSTIC TOOL.

The Aquatrex is also helpful when trying to identify troublesome and difficult to quantify intermittent water ingress. The Aquatrex touchscreen allows operators to program low and high water level set points. The Aquatrex will monitor the water level of the oil and only turn the water removing vacuum pump on when the high level has been reached and turn it back off when the low acceptable level has been reached.

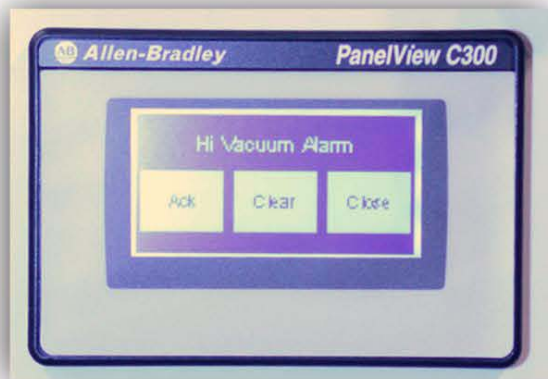
A resettable vacuum pump run time clock and cycle counter will monitor how often and for how long the PHoenix had to run to remove the water. More cycles and longer vacuum pump run times mean more water ingress.



### FLUID PUMP CONTROLER .

When used on the PHoenix C1 and C4 the Aquatrex will prevent cavitation and potential damage to the fluid pump where the inlet suction might become restricted. Restriction may be caused by accidental deadhead or due to temperature drops and significant oil viscosity increases from intermittent use of the lube or hydraulic system.

In the event of shutdown the Aquatrex will automatically try to start itself back up every hour if the oil viscosity lowers to acceptable levels. This feature makes the PHoenix totally autonomous and does not require operator reset.



### Aquatrex System Includes

- \* Weather Resistant Nema 4 Control Box
- \* Allen Bradley PLC and Components
- \* Epluse Water Sensor
- \* C1 & C4 only: Fluid Pump Vacuum Switch

Note: Aquatrex not compatible with Water Soluable PAG Oils.