



INTRODUCTION TO CONSTANT LEVEL LUBRICATION

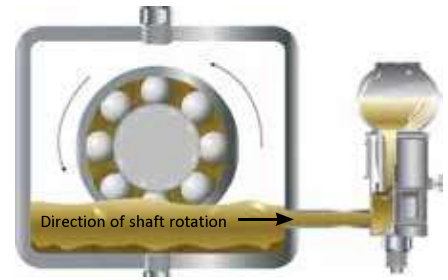
Constant level oilers are designed to maintain a predetermined oil level in a sump, which is necessary for proper lubrication. If the oil level were to drop below this point, the depleted oil would automatically be replenished by the lubricator, returning it to its original level. With the use of constant level oilers, maintenance efficiencies can be increased, while minimizing maintenance costs, and the loss of production time.

The majority of constant level oilers available are adjustable, allowing for use in many applications. However, there are oilers available that do not allow for fluid level adjustability, eliminating potential installation errors. Typically, constant level oilers are mounted on the side of the equipment facing the direction of shaft rotation. Some oilers allow for bottom mounting, on the oil sump, which prevents the oiler from misfeeding during applications that contain currents and turbulence formed by slinger rings, discs, and high rotating speeds.

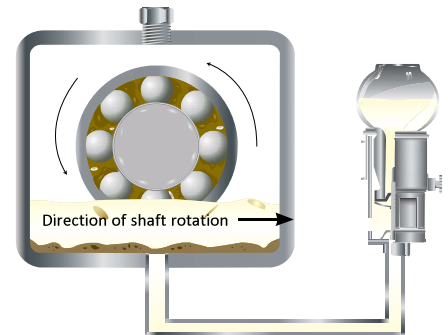
In most cases constant level oilers are vented to the outside atmosphere to work properly. Since these oilers are vented to the atmosphere, especially in harsh, dirty environments, contaminants are allowed to enter the lubricating oil. These contaminants are in the forms of moisture and/or particulate which are extremely damaging to oil and equipment life.

In order to combat the potential for oil contamination, the closed system oiler was developed. These oilers are effective in minimizing and eliminating the ingress of contaminants into the oil sump, especially in dirty environments. Some closed system oilers contain a pressure balancing line, which is connected from the headspace of the oil sump to an air chamber built into the surge body of the oiler. This air chamber is sealed from the outside atmosphere in order to prevent the ingress of contaminants. Additional types of closed system oilers are available that mount directly on the centerline of the oil level to be maintained. The exchange of air between the oil sump and the oiler is at the oilers base, which is mounted directly to the oil sump.

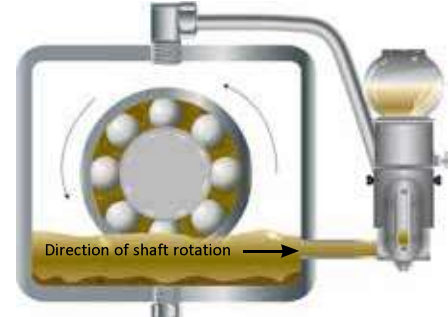
Several different types of constant level oilers are available to meet specific application needs, whether it is vented or non-vented, adjustable or nonadjustable they are an easy and effective method of maintaining proper oil level in equipment.



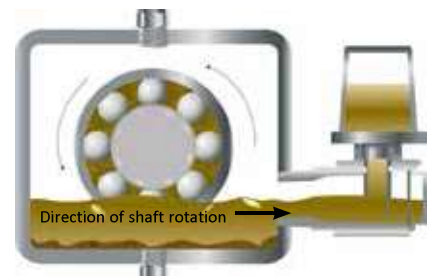
Vented constant level oiler with side connection



Vented constant level oiler with bottom connection



Closed system oiler with pressure balancing line



Closed system oiler mounted on center line of desired oil level



CONSTANT LEVEL OILERS



Opto-Matic Oiler – Glass



Opto-Matic Oiler – Plastic



Opto-Matic Closed System Oiler



Watchdog Oiler

Constant Level Oilers are used to maintain the lubricant level in piece of equipment the naturally depletes lubricant through use, wear, friction, misting or evaporation. As lubricant is depleted in equipment, such as bearings, gearboxes, or pump housings due to its natural operation and the generations of heat from friction, the level of lubricant changes. A constant level oiler can be used to maintain optimum performance.

CONSTANT LEVEL OILERS COMPARISON MATRIX

	Opto-Matic Oiler – Glass	Opto-Matic Oiler – Plastic	Opto-Matic Closed System Oilers	Watchdog Oilers
Reservoir Material	Glass Reservoir	Butyrate Plastic	Glass	Glass or Polysulfone
Body Material	Zinc or 316 Stainless Steel	Zinc	Zinc	Cast Aluminum, Polysulfone, or 316 Stainless Steel
Reservoir Capacity	2-1/2, 4, 8, or 16 oz.	2, 4, 8 oz.	4, 8, 16 oz.	4 oz.
Mounting Options	Side or Bottom	Side or Bottom	Side or Bottom	Side
Venting Type	Vented/Open System	Vented/Open System	Closed/Pressure Balanced System	Closed/Pressure Balanced System
Oil Level Sight Gauge	No	No	Yes	Yes
Wire Guard	Yes	No	Yes	Yes
Oil Level Adjustability	Yes	Yes	Yes	No



OPTO-MATIC® CONSTANT LEVEL OILERS



Opto-Matic Oilers provide an inexpensive method to automatically maintain a constant level of oil in a pump bearing housing, gear box, or other oil sump applications. Throughout processing industries, the Opto-Matic Oiler is the industry standard. Different reservoir capacities allow use in many applications.

Stainless steel models provide long life in corrosive environments in the chemical, pulp and paper, and mining industries.

FEATURES

- One piece glass reservoir ensures proper constant level function. Compared to competitive models, there is no possibility of air leakage that would cause overfilling of the bearing housing.
- Adjustable level setting allows use in many applications
- Multiple air vent slots provide for proper functioning at all times
- Large surge chamber helps prevent overflow of oil during machine start-up or shut-down
- Side and bottom connections for simplified installation

WIRE GUARDS



Model No. Standard	Model No. Stainless Steel	Description
30012	—	2-1/2 oz. Guard
30013	30313	4 oz. Guard
30016	30315	8 oz. Guard
30020	30320	16 oz. Guard

SPECIFICATIONS

	Standard	316 Stainless Steel
Max. Operating Temp.	250°F Continuous	
Reservoir	One-Piece Glass Bottle	
Casting	Zinc	316 Stainless
Finish	Zinc/Chromate Plated	Passivated
Internal Parts	Zinc Plated Steel	
O-ring	Viton®	

Viton® is a registered trademark of Du Pont Dow Elastomers.

SELECTION CHART-STANDARD

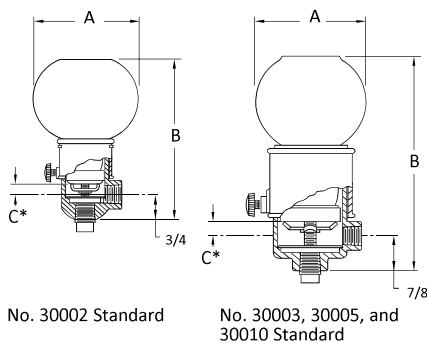
With Wire Guard	Without Wire Guard	Capacity	Connection (NPT)	Dimensions (in.)				
				A	B Min.	B Max.	C Min.	C Max.
40391	30002	2-1/2 oz.	1/4	2-1/2	3-15/16	4-1/4	11/32	9/16
40061	30003	4 oz.	1/4	2-11/16	5	5-3/4	9/32	1
40291	30005	8 oz.	1/4	3-3/16	5-15/16	6-11/16	9/32	1
40394	30010	16 oz.	1/4	4-1/8	6-13/16	7-9/16	9/32	1

* Metric thread sizes available. Add "-M" to part number for 1/4 BSPT connection port.

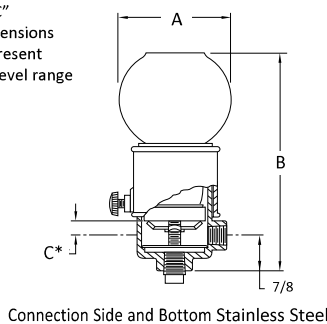
SELECTION CHART-316 STAINLESS STEEL

Side & Bottom Connect-With Wire Guard	Side & Bottom Connect-No Wire Guard	Capacity	Connection (NPT)	Dimensions (in.)				
				A	B Min.	B Max.	C Min.	C Max.
40060	30213	4 oz.	1/4	2-11/16	4-15/16	5-11/16	9/32	1
40063	30215	8 oz.	1/4	3-3/16	5-7/8	6-5/8	9/32	1
—	30220	16 oz.	1/4	4-1/8	6-3/4	7-1/2	9/32	1

* Metric thread sizes available. Add "-M" to part number for 1/4 BSPT connection port.



* "C" dimensions represent oil level range



See Spectrum Opto-Matic Collars on page 12 for color coding options.

CONTACT YOUR LOCAL TRICO AUTHORIZED DISTRIBUTOR FOR MORE INFORMATION

OPTO-MATIC® CONSTANT LEVEL OILERS



Opto-Matic Oilers provide a constant level of oil in a pump bearing housing, gear box, or other oil sump applications. Different reservoir capacities allow use in many applications.

“LS”, “EH”, and “EHB” models have a large surge chamber to minimize potential of leakage during oil surge conditions.

FEATURES

- High strength, transparent, ribbed plastic reservoir provides long life and impact resistance
- Adjustable level setting allows use in many applications
- Multiple air vent slots provide for proper functioning at all times
- Large surge chamber (LS, EH, and EHB models) prevents overflow of oil during machine start-up or shut-down
- Side and bottom connections for simplified installation



SPECIFICATIONS

Max. Operating Temp.	165°F Continuous
Reservoir	Butyrate Plastic
Casting	Zinc Die Cast
Finish	Bright Zinc Plated
Internal Parts	Zinc Plated Steel

SELECTION CHART-E, EB

Model No.		Capacity	Connection (NPT)	Dimensions (in.)				
E	EB			A	B Min.	B Max.	C Min.	C Max.
30052	30062	2 oz.	1/4	1-15/16	3-7/8	4-3/8	1/4	3/4
30054	30064	4 oz.	1/4	2-5/16	4-9/16	5-1/16	1/4	3/4
30058	30068	8 oz.	1/4	2-5/8	5-11/16	6-3/16	1/4	3/4

* Metric thread sizes available. Add “-M” to part number for 1/4 BSPT connection port.

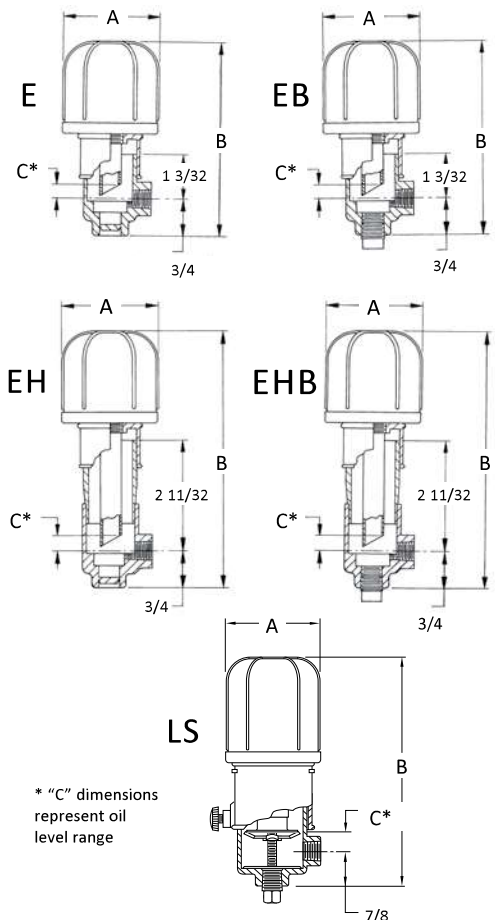
SELECTION CHART-EH, EHB (large surge chamber)

Model No.		Capacity	Connection (NPT)	Dimensions (in.)				
EH	EHB			A	B Min.	B Max.	C Min.	C Max.
30072	30082	2 oz.	1/4	1-15/16	5	5-1/2	1/4	3/4
30074	30084	4 oz.	1/4	2-5/16	5-11/16	6-3/16	1/4	3/4
30078	30088	8 oz.	1/4	2-5/8	6-13/16	7-5/16	1/4	3/4

SELECTION CHART-LS (large surge chamber)

Model No.		Capacity	Connection (NPT)	Dimensions (in.)				
				A	B Min.	B Max.	C Min.	C Max.
	30024	4 oz.	1/4	2-5/16	5-7/16	6-3/16	9/32	1
	30028	8 oz.	1/4	2-5/8	6-9/16	7-5/16	9/32	1

* Metric thread sizes available. Add “-M” to part number for 1/4 BSPT connection port.



See Spectrum Opto-Matic Collars on page 12 for color coding options.

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OPTO-MATIC® CLOSED SYSTEM OILERS



The Opto-Matic Closed System Oiler is designed for all types of equipment where a constant level in an oil sump must be maintained. The closed system design prevents contamination and spillage. The adjustable collar allows the oil level to be externally adjusted to the desired level. A 1/8 NPT port is provided for a vent line back to the housing to allow pressure balancing between the oiler and the housing.

FEATURES

- One piece glass reservoir ensures proper constant level function. Compared to competitive models, there is no possibility of air leakage that would cause overfilling of the housing.
- Adjustable level setting allows use in many applications
- Bottom of adjusting collar indicates actual oil level setting for easy set-up and maintenance
- Side and bottom connections for simplified installation
- 2" sight gauge for easy viewing of oil level




SELECTION CHART

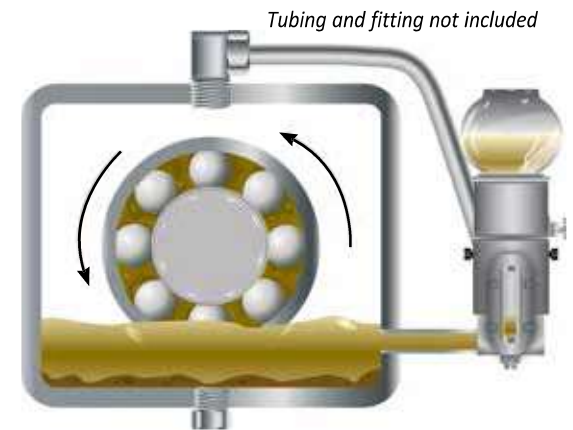
With Wire Guard	Without Wire Guard	Capacity	Dimensions (in.)			
			A	B Min.	B Max.	NPT
40101	30203	4 oz.	2-11/16	7-1/6	7-13/16	1/4
40102	30205	8 oz.	3-3/16	8	8-3/4	1/4
—	30210	16 oz.	4-1/8	8-7/8	9-5/8	1/4

SPECIFICATIONS

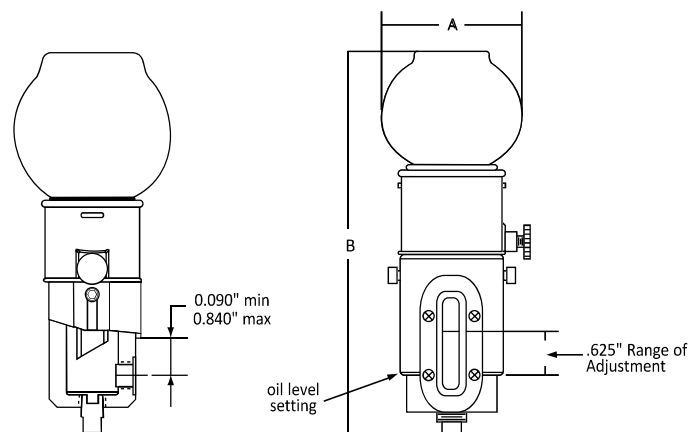
Max. Operating Temp.	250°F Continuous
Reservoir	One-Piece Glass Bottle
Upper Casting	Zinc
Lower Body	Zinc
Adjusting Collar	Zinc
O-Ring	Vilton®

WIRE GUARDS

	Model No.	Description
	30013	4 oz. Guard
	30016	8 oz. Guard
	30020	16 oz. Guard



Opto-Matic closed system oiler with pressure balancing line



See Spectrum Opto-Matic Collars on page 12 for color coding options.

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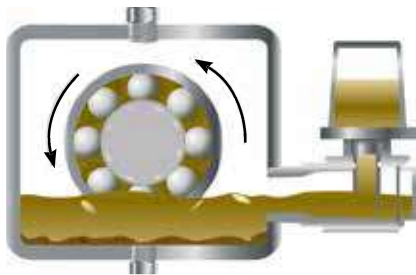


WATCHDOG® OILERS

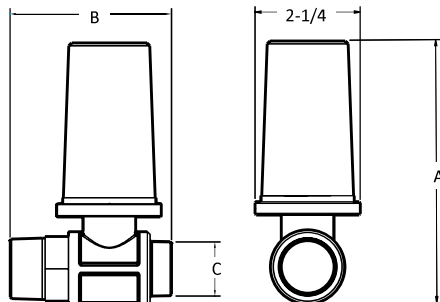
The Watchdog Oiler is designed for bearing housings, gear boxes, and other oil sump applications. It is ideal for use in the chemical processing, power generation, pulp and paper, and utility industries. The viewport provides visual indication of lubricant level and condition. Mounted on the centerline of the desired oil level, these constant level oilers do not require any adjustment or level setting.

FEATURES

- Closed system design prevents contamination and spillage
- No vent line to pump bearing housing required, simplifying installation
- 4 oz. reservoirs provide oil make-up
- Mounts on centerline of desired oil level, and does not require adjustment or level setting
- Integral viewport eliminates need for additional component



Watchdog Oiler mounted on centerline of desired oil level



SPECIFICATIONS

	Aluminum Body	Thermoplastic Body	Stainless Steel Body
Body	Cast Aluminum	Polysulfone	316 Stainless Steel
Reservoir	Glass	Polysulfone	Glass
Viewport	Glass	Polysulfone	Glass
Max. Operating Temp.	325°F/160°C	325°F/160°C	325°F/160°C
O-Ring	Viton®	Viton®	Viton®

SELECTION CHART

Model No.	Style	Capacity	Connection	Wire Guard	Dimensions (in.)		
					A	B	C
31804	Thermoplastic Body, Reservoir and Viewport	4 oz.	1 NPT	No	5-3/4	3-9/32	1
31818	Aluminum Body, Glass Reservoir and Viewport	4 oz.	1/2 NPT	No	6-1/4	4-1/8	1/2
31820		4 oz.	3/4 NPT	No	6-1/4	3-1/4	3/4
31821		4 oz.	1 NPT	No	6-1/4	3-1/4	1
31822		4 oz.	3/4 BSPT	No	6-1/4	4-1/8	3/4
31823		4 oz.	1 BSPT	No	6-1/4	3-1/4	1
31824		4 oz.	3/4 NPT	Yes	6-1/2	3-3/8	3/4
31825		4 oz.	1 NPT	Yes	6-1/2	3-3/8	1
31826		4 oz.	3/4 BSPT	Yes	6-1/2	4-1/8	3/4
31827		4 oz.	1 BSPT	Yes	6-1/2	3-3/8	1
31831	316 Stainless Steel Body, Glass Reservoir and Viewport	4 oz.	1 NPT	No	6-1/4	3-1/4	1
31833		4 oz.	1 NPT	Yes	6-1/2	3-3/8	1

OPTO LASER LEVEL

Trico's Opto Laser Level is an innovative tool that allows for quick and easy installation of the Opto-Matic Constant Level Oiler.

With the Opto Laser Level, installation of the Opto-Matic Oiler just became more user-friendly. In conjunction with the Opto-Matic Oiler, the Opto Laser Level will produce an immediate impact on your lubrication program.

Trico gives you even more with this quick, convenient and accurate method of installing the oiler – minimizing installation, reducing downtime and eliminating confusion. The Opto Laser Level is a must for every maintenance department responsible for set-up and upkeep of equipment that uses Opto-Matic Oilers.

FEATURES

- **Reusable** – The Opto Laser Level can be used to install multiple Opto-Matics in your plant
- **Lightweight** – Weighing 0.55 lbs, this tool fits in your hand for those hard to reach installation areas
- **Easy to Read** – Take the guess work out of installation with laser level alignment and visual level indicators
- **Portable** – Each Opto Laser Level comes in water-tight, foamed-lined, hard case with a handle for safe storage and convenient when transporting to the installation site



SPECIFICATIONS

Material	Aluminum Die Cast
Finish	Powder Coated
Components	Stainless Steel
Battery Type	CR123
Battery Life	50 Hrs
Laser Class	Class IIIA Laser Beam

SELECTION CHART

Model No.	Description
36470	Opto Laser Level with Water Tight Case



PRESSURE DIFFERENTIAL PRODUCTS

Frequent operation start-ups and environmental temperature swings in mechanical equipment can cause the air pressure inside oil sumps to increase and decrease, causing it to “breathe.” This “breathing” air, in most cases, comes from the external atmosphere through vents, fill ports, seals, and anywhere the oil sump is open to atmosphere. This can cause debris, dirt, and moisture to enter the equipment attacking and breaking down the equipment's vital lubricant and ultimately reducing the life of bearings and gears.

The EQUALIZER® Expansion Chamber reduces or eliminates this “breathing” action by replacing the vent, providing an extra 25 cubic inches of airspace, by a rolling diaphragm. This provides the extra air volume necessary to overcome expansion and retracting inside the housing, *eliminating the need for equipment to “breathe” contaminated and damaging external air.* But, just how much of this “breathing” occurs? Below is a typical installation of a common piece of equipment and the effects of temperature fluctuations.

Using the following volume and temperature parameters, these values can be entered into the plug-in worksheet supplied at: www.tricocorp.com/expansion-chambers/, or follow the **Selection of an Expansion Chamber** worksheet supplied on the following page. As shown here, a relatively common occurrence can produce up to almost 18 in³ of air expansion which escapes through the seals or vents. Conversely, that 18 in³ needs to return to the housing when temperatures cool. That is when the damage is done.

Closing your system is the most effective way to eliminate harmful contaminants from entering your system and the Equalizer Expansion Chamber supplies the added air volume to eliminate the need for breathing due to temperature fluctuations. This is especially important when used in harsh or contaminated environments and when frequent start-up and shut-downs are necessary.



Amount of Oil in Housing (oz)	Temp. Range of Housing (F)		Total Volume in Housing (oz.)	Total Expansion
	High	Low		
32	110	60	128	17.81 cubic inches

EQUALIZER EXPANSION CHAMBERS



Equalizer Expansion Chambers are designed to prevent pressure increase in closed systems. A rolling diaphragm provides a variable volume, that when properly sized, maintains oil housing pressure at or near zero PSI. The reduced pressure will extend seal life and help prevent leakage. Expansion chambers also protect the integrity of closed systems by preventing the exchange of air from the chamber to the surrounding atmosphere. A choice of thread sizes offers flexibility to the user.

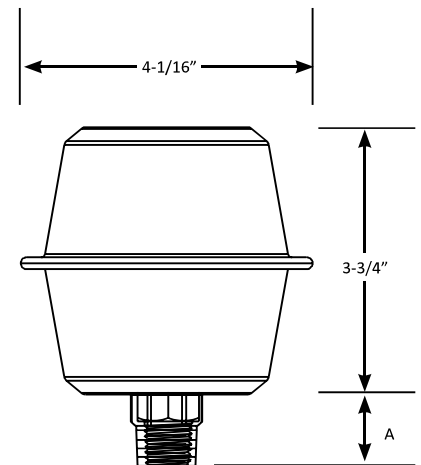
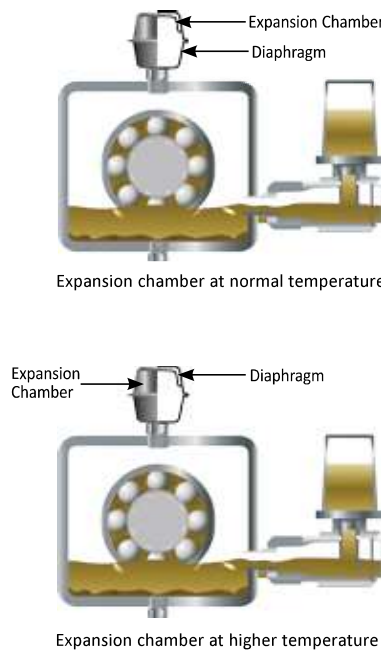
FEATURES

- Made from corrosion resistant stainless steel
- Controlled housing pressure extends seal life
- Prevents contamination ingress to help lubricants stay cleaner for longer life and improved performance
- Full 25 cubic inch air expansion capability
- Maintenance free operation

HELPFUL TIP:

Prevention of oil contamination and degradation is very often the most reliable means of preventing equipment failures. By minimizing the ways that contamination can enter equipment, lubricant cleanliness levels are increased. Products such as the Watchdog Oilers, Opto-Matic Closed System Oilers, Equalizer Expansion Chambers, and Watchdog Breathers, can help lubricants remain cleaner longer.

* For application assistance on calculating required capacities, please contact your local Trico authorized distributor or visit our web site for an online worksheet at www.tricocorp.com/expansion-chambers/.



SELECTION CHART

Model No.	Connection (NPT)	Capacity	Dim. (A) (in.)
31815	3/8	25 cu. in.	7/8
31816	1/2	25 cu. in.	1
31817	3/4	25 cu. in.	1-1/4

SPECIFICATIONS

Body	Stainless Steel
Diaphragm	Viton®
Max. Operating Temp.	350°F



SELECTION OF AN EXPANSION CHAMBER

DETERMINE TOTAL AIR EXPANSION

To determine the correct expansion chamber size required for your application, obtain the following data and follow the steps listed below. Please visit our website for assistance on calculating required capacities at www.tricocorp.com/expansion-chambers/.

1. The amount of oil, in ounces, normally in the bearing housing. _____ oz.
2. Multiply above answer by 1.804 to obtain _____ in³ (oil volume). Place this value into the table below **STEPS A & B** in³ (oil volume).
3. The temperature range of the bearing housing. High _____ °F Low _____ °F. Place High & Low temperature in **STEP C**. Subtract the low from the high and place in **STEP A** (high-low temp).
4. Complete **STEP A**. Multiply oil volume by temperature difference and coefficient of expansion. (NOTE: .0004 is coefficient of expansion for most turbine oils). Place answer in **STEP D**, in³ (oil expansion).
5. The total volume of the bearing housing. Many customers may not know this. Contact your pump manufacturer for this information. _____ oz. (total volume).
6. Multiply answer from above by 1.804 to obtain _____ in³ (sump volume). Place this value into the table **STEP B** in³ (sump volume).
7. Complete **STEP B**, subtract in³ (oil volume) from in³ (sump volume) to get in³ (air volume) and place answer in both places in **STEP C**, in³ (air volume).
8. Follow instructions in **STEP C** to get in³ (air expansion). Place answer into **STEP D** in³ (air expansion).
9. Complete **STEP D** by adding to get in³ (total expansion), with this information you can select the correct size expansion chamber for your application.

BEFORE STARTING, OBTAIN THE FOLLOWING DATA:

1 Amount of Oil in Housing (oz.)

2 Temp. Range of Housing (°F)

 High

 Low

3 Total Volume in Housing (oz.)

STEP A	Multiply the volume of oil with the temperature span to get oil expansion. _____ in ³ (oil volume) X _____ °F (high-low temp) X .0004 = _____ in ³ (oil expansion)
STEP B	Subtract the oil volume from the sump volume to get air volume. _____ in ³ (sump volume) — _____ in ³ (oil volume) = _____ in ³ (air volume)
STEP C	Determine the absolute temperature range for air, divide high temp + 460 by low temp + 460. Multiply (air volume) with temperature factor. Then subtract the (air volume) to get the air expansion for the maximum change in temperature. _____ in ³ (air volume) X $\frac{(\text{_____ high temp} + 460)}{(\text{_____ low temp} + 460)}$ _____ in ³ (air volume) = _____ in ³ (air expansion)
STEP D	Add (oil expansion) with (air expansion) to get total expansion. _____ in ³ (oil expansion) + _____ in ³ (air expansion) = _____ in ³ (total expansion)

CLOSED SYSTEM HOT SETUP KIT

Pressure differential between the equipment housing and surrounding atmosphere is a leading cause of moisture ingress. Equipment operation where housing temperature fluctuations occur during frequent on/off running conditions, process fluid temperature changes, outdoor use, and air flow over the equipment create a “breathing” condition as pressure is equalized.

This “breathing” condition allows moisture to be introduced into the equipment causing the oil to absorb it at a variable rate depending on temperature, oil type, and lubricant agitation. The Closed System Hot Setup kit is used to minimize the detrimental effects of equipment “breathing.”

FEATURES

- Includes all necessary fittings and hardware for quick, easy installation
- All fittings are in 316 Stainless Steel for corrosion resistance

SPECIFICATIONS

Model No.	Description
40103	Closed System Hot Setup Kit with 4 oz Closed System Oiler
40105	Closed System Hot Setup Kit with 8 oz Closed System Oiler
40110	Closed System Hot Setup Kit with 16 oz Closed System Oiler

