

DRYKEEP INSTALLATION INSTRUCTIONS

Moisture is the enemy.... DryKeep® is the answer.

We reserve the right to make changes to any described details and technical data contained herein. Continuous product enhancement by DryKeep® and local conditions may result in deviations from this standard product installation.

DryKeep® is shipped from the factory fully assembled as shown in figure 1 below.

Although not shown, the installation for the single cylinder model RT-3 is exactly the same

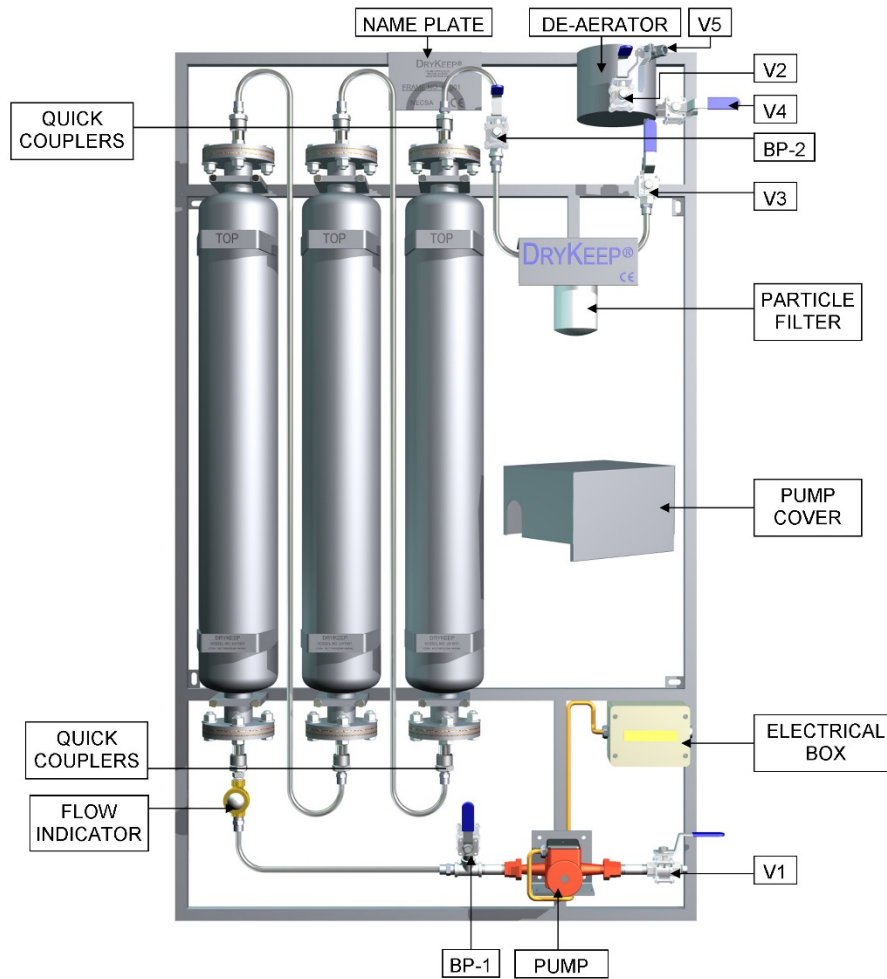


Figure 1: DryKeep® system layout

- V1-Inlet Valve
- V2- Outlet Valve
- V3-Particle Filter Valve
- V4-Alternative Outlet Valve
- V5 -Bleed Valve
- BP1 & BP2-Bypass Valves (for moisture content sampling)

The cylinders are factory filled with transformer oil and molecular sieve adsorbent beads. The unit can be mounted as received, or the cylinders can be removed prior to mounting to lighten the load and ease the installation process. The rest of the components are to be left on the framework. The DryKeep® system must be mounted vertically with inlet valve and the pump located at the bottom and de-aerator at the top. (Refer to Figure 1).

The installed location of DryKeep® is flexible. It can be installed wherever the customer prefers. For simple installation and optimal performance, DryKeep® should be installed as close to the transformer as possible. Some users elect to bolt or tack-weld the DryKeep® frame directly to the transformer tank as shown in Figure 2 below. Other options include hanging the DryKeep® frame on a wall near the transformer or securing the DryKeep® frame to a stand-alone frame adjacent to the transformer as shown in Figure 3. Contact DryKeep® USA for a recommended fabrication drawing. This remote, stand-alone frame is usually lag bolted to the concrete pad. If the optional climate-control enclosure is furnished, it is a free-standing enclosure which can also be lag bolted to a concrete pad.



Figure 2: DryKeep® installed directly on transformer



Figure 3: Installation adjacent to transformer on customer-fabricated free-standing frame

NOTE: We suggest that when installing the DryKeep® system on to a reactor that it be mounted on a free standing frame or an adjacent structure due to possible vibration influence on pipe work and connections. If mounted directly to the reactor structure, use vibration dampers. Contact us for further details.

FOR TRANSFORMERS IN-SERVICE:

For safety purposes, the transformer should be switched off and made safe before installation commences.

- 1) Upon receipt at the installation site, remove the top of the DryKeep® crate and unscrew the four (4) 1½" lag screws used to bolt the DryKeep® frame to the shipping crate.
- 2) Remove the system from the shipping crate and install the DryKeep® on the transformer, free-standing frame, wall or other structure, or position the optional enclosure to the location desired.
- 3) *Refer to Figures 1, 4, and 5.* To connect DryKeep® to the transformer, first remove the shipping plugs from the DryKeep® inlet and outlet valves.
- 4) Replace the transformer drain and fill valves flanges with flange adapters having ½" NPT unions (not supplied).
- 5) Using ½" NPT flexible stainless steel braided PTFE or other suitable flexible hose (not supplied), connect the bottom drain valve flange adapter to the DryKeep® inlet valve. To return the oil back to the transformer main tank, connect the ½" NPT hose to the DryKeep® outlet valve and then to the transformer fill valve flange adapter. *Optional climate-controlled enclosed units have pre-drilled entry points on the bottom and top of the right side of the enclosure. Use supplied 1/2 in. stainless steel liquidtight cord connector and wire mesh grips to route hoses through enclosure wall to the inlet and outlet valves.*



Figure 4: Connection from transformer to DryKeep® inlet valve.

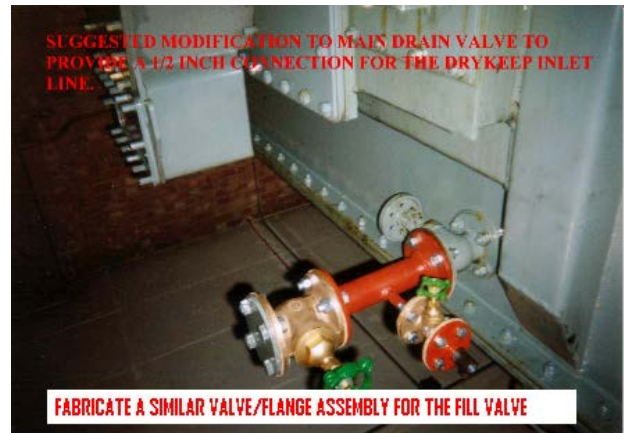


Figure 5: Drain valve adapted for DryKeep® installation

An optional installation kit containing ½" NPT flexible stainless steel braided PTFE hoses, flange adapters and fittings to connect to the transformer at the inlet and outlet is available. Contact DryKeep® USA for details.

FOR TRANSFORMERS NOT IN SERVICE:

For transformers under repair and not containing oil, modifications can be made to the transformer tank to add entry and exit fittings for the DryKeep® system. The entry and exit fittings need to be diagonally apart from each other (i.e. if top left, then bottom right) to avoid re-circulating the just-dried oil. If this is not an option, DryKeep® can still be installed in the same manner as described above for a transformer in service by using the drain and fill valves of the transformer.

ELECTRICAL CONNECTIONS:

Each DryKeep® system is supplied with a junction box equipped with terminal blocks and a circuit breaker, making the electrical connection quite simple. Connect the chosen power supply to the DryKeep® junction box to power the circulating pump. The pump is either a Grundfos single phase 120V-60Hz or 240V - 50 Hz, 0.95A max at speed position three pump. The black lead is the live line, the white is neutral, and the green is ground.

For units mounted inside the optional climate-controlled enclosure, drill a hole in the enclosure sized for the conduit. Run the AC power into the enclosure using the appropriately sized liquidtight fitting (not supplied) and then connect to the pump as per above.

COMMISSIONING:

- 1) Check the tightness of all cylinder flange bolts. The bolt torque for 16-mm bolts is 65 lb-ft or 88 nm and for 3/8" bolts is 40 lb-ft or 54 nm.
- 2) Check to insure that the quick couplers on the top and bottom of each cylinder are fully tightened. Hand-tighten only. Do not use wrenches.
- 3) Refer to Figure 1. Ensure that the DryKeep® outlet valve is closed.
- 4) Open the inlet valve (V1) of the DryKeep® system and start the pump.
- 5) Slowly open the bleed valve (V5) on the de-aerator tank. It is recommended that the installer have a vessel on hand to capture any oil that may come out of the bleed valve while it is open. Ensure that all the trapped air in the system escapes through the bleed valve.
- 6) Close the bleed valve on the de-aerator tank (V5) and slowly open the outlet valve (V4).
- 7) Open the bleed valve (V5) again after 15 minutes to remove any additional air from the system that may have collected in the top of the de-aerator. Again, it is recommended that the installer have a vessel on-hand to capture any oil that may come out of the bleed valve while it is open.
- 8) Monitor the system closely for 20 minutes and check for oil leaks and oil flow through the flow indicator and for any abnormalities. Once installed and commissioned the system will operate continuously.

NOTE: The pump will energize when the circuit breaker in the junction box is closed. When the unit reaches the appropriate dry-down level (based on the number of cylinder changes calculated), the pump speed should be reduced to the lowest setting so the system will continue to remove any moisture that continues to build up.

COMMISSIONING (CONTINUED):

Regular visual inspections must include:

- Checking for leaks
- Check if flow indicator turns
- Check if pump is operating

TROUBLESHOOTING:

If a leak is detected on the cylinder flanges, check to ensure that the cylinder flange bolts are tightened properly. The cylinder flange bolt torque for 16-mm bolts is 65 lb-ft or 88 nm. The cylinder flange bolt torque for 3/8" bolts is 40 lb-ft or 54 nm.

If the flow indicator is not turning but the pump is operating, first tighten all quick couplers to ensure that the annular ball valve has been released. Hand-tighten only. Do not use wrenches. If the flow indicator is still not turning, slightly loosen the flow indicator glass cover as it may be impeding the impeller rotation.

If the flow indicator still does not turn, the particle oil filter cartridge could be blocked and may require replacement.

If the pump is not operating, check for an electrical fault.

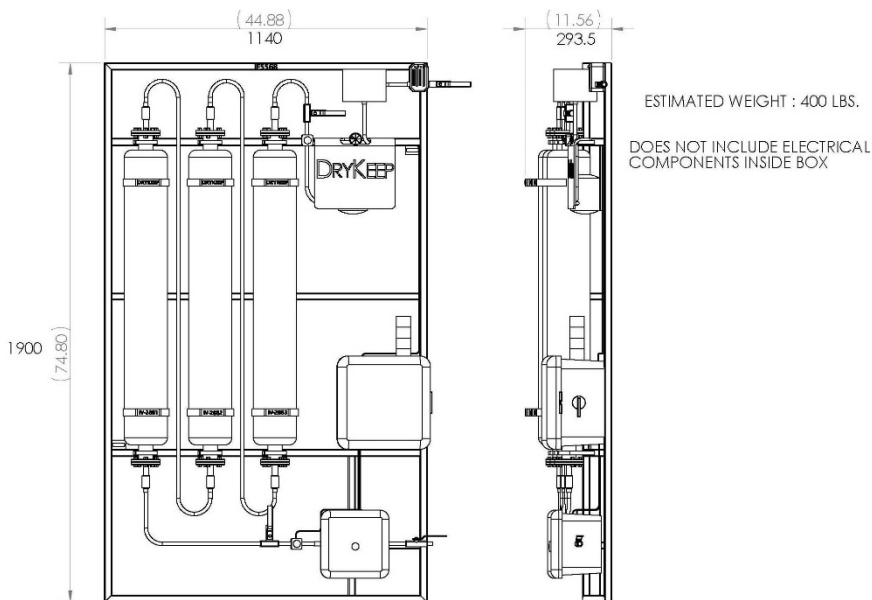


Figure 10: RT-9 dimensional drawing
(SMART cabinet shown, but not included)

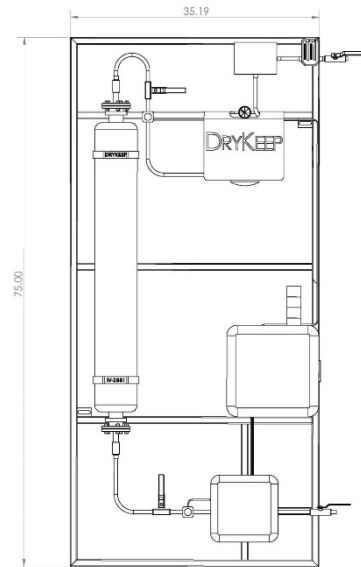


Figure 11: RT-3 dimension drawing
(SMART cabinet shown, but not included)

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