

TANNER SYSTEMS, INC.

80/90 SERIES DE-ICERS

Getting the proper anti-freeze to the proper place at the proper time is fundamental to preventing downtime and increasing productivity with compressed air lines. To help meet this basic industrial need, we offer the Tanner Systems compact 80/90 series De-icers: Models T-83, T-85, T-87, T-89 or T-90. These are pneumatic components designed to introduce our special deicant* fluids, TANNERGAS®, FREEZE-BAN or NO-TOX2®, into the compressed air flow. The fluid then bonds to the moisture in the air stream, prevents it from freezing and allows it to exhaust through the pneumatic tools.

Air motors, cylinders and control valves are typical production components that are often de-iced with an in-line TANNER® De-icer. The design concept and the underlying principle of operation are simple and apply to all 80 or 90 series De-icers. There are no moving parts in the TANNER® De-icer design -- as a result, there are few operational problems or repairs required. Figure #1 is a cut away drawing of a T-90 TANNER® De-icer with the various parts called out.

Assuming 100 psig line pressure and no flow, there will be equal pressure throughout the De-icer (see figure #2). For proper operation there must be line pressure in the Bowl, R-3. This is supplied through the Check Valve, R-47. This Valve is a simple, spring-loaded, normally open, 2-way Valve. When the Fill Plug, R-20, is in place the underside surface of the Fill Plug pushes and holds the Check Valve open, which allows line pressure into the Bowl. There will be a brief and initial flow of air into the Bowl as the Bowl comes up to line pressure. The only flow into the Bowl thereafter is minimal – only enough to compensate for usage of TANNER® deicant* fluids. The pressure in the Bowl will, thereafter, remain at line pressure.

FIGURE 1, Model T-90

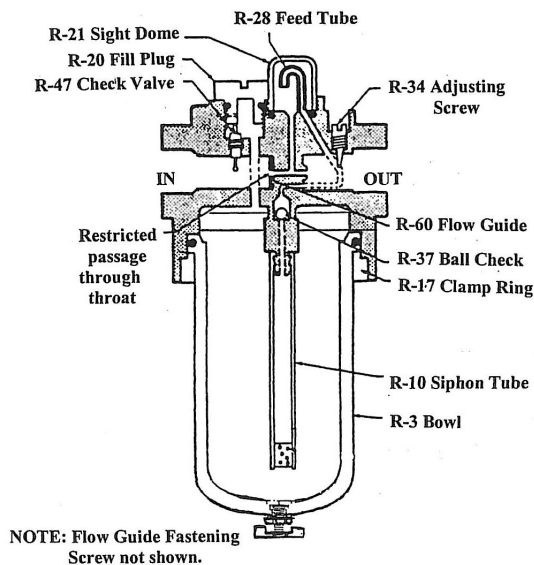


FIGURE 2, Model T-90

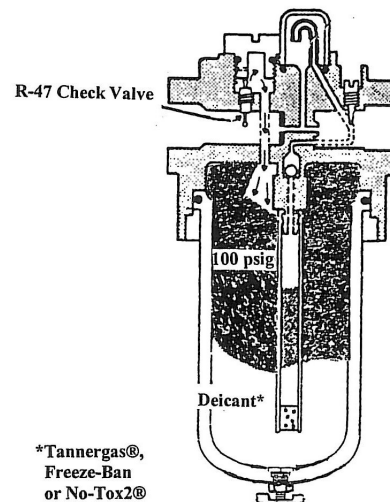


FIGURE 3, Model T-90

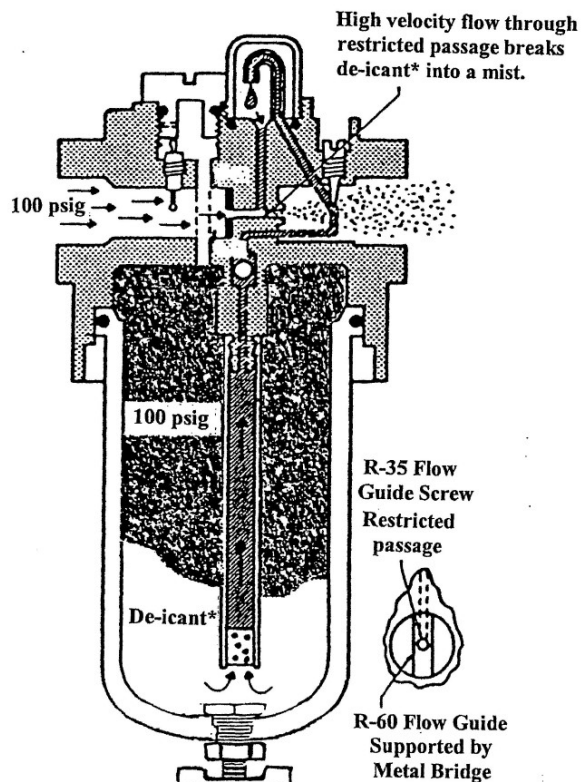
When air flows through the De-icer to the application, the De-icer automatically begins to deliver anti-freeze* to the air stream (figure #3). As velocity of the air flow increases, the pressure decreases. There will, therefore be a lower pressure in the restricted passage than in the Bowl. This pressure difference is the energy source that moves the TANNER® de-icant* from the Bowl, up the Siphon Tube, R-10, past the Ball Check, R-37, and past the feed Adjustment Screw, R-34. Drops will appear at the Feed Tube, R-28, and will then flow into the restricted passage. Here the high velocity air breaks the anti-freeze* into a mist which is carried down stream.

Pressure difference will vary depending on the air flow rate through the De-icer and the diameter of the restricted passage. In any case the pressure difference created within the passage will rarely exceed 5 psi.

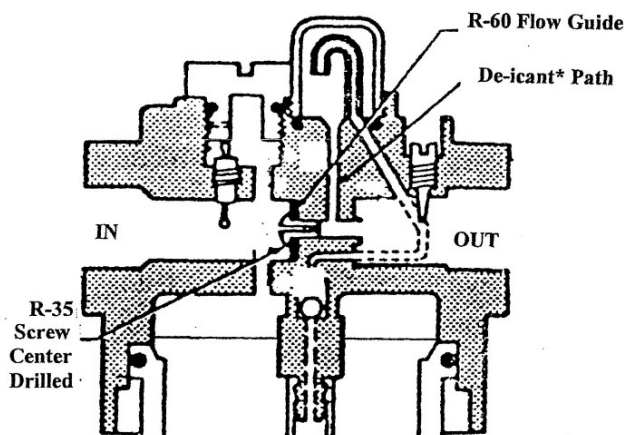
It should be clear from figure #3 that the diameter of the restricted passage is too small to allow very much air flow without severe pressure drop across the De-icer. This, indeed, would be the case if all the air had to go through the restriction. To avoid this, Tanner Systems De-icers are designed with a Flow Guide (a flat, circular, pliable disc) which is fastened to the inlet of the restricted passage (detail drawing #1). The restricted passage is located in a metal bridge in the throat of the De-icer with a bypass area on each side. The passage is threaded and the Flow Guide disc is fastened in place with a center-drilled Flow Guide Screw.

At low flows all the air will flow through the restricted passage and the velocity through the passage will be great enough to assure that there is enough pressure differential to bring the TANNER® de-icant* out of the reservoir to the passage. As flow increases pressure drop across the passage soon reaches a point when the Flow Guide disc folds back to allow bypass air flow around the passage. As bypass air flow varies, the velocity of the air through the restricted passage will vary in direct ratio. This means that once the feed rate is set (Example: 1 drop for every 20 scfm (standard cubic foot per minute) the RATIO of anti-freeze* to air will remain the same even though the air flow may change.

*Tannergas®,
Freeze-Ban
or No-Tox2®



DETAIL DRAWING 1
Model T-90



The rate of TANNER® de-icant* delivery may be controlled by turning the Adjusting Screw, R-34, counter-clockwise for more and clockwise for less. Be certain that the unit is adjusted while there is air movement through the Body. This De-icer delivers all the TANNER® de-icant* down stream that passes through the Sight Dome, R-21. The rate of delivery will change automatically to deliver more during the higher air flows and less for lower air flows. However it may be necessary to adjust the original flow setting to accommodate changing temperatures and humidity conditions.

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Tanner De-icers can be filled without having to shut off the air supply. When filling the T-90 or T-83 De-icer the Fill Plug, R-20, is removed (see detail drawing #2); two things happen in sequence:

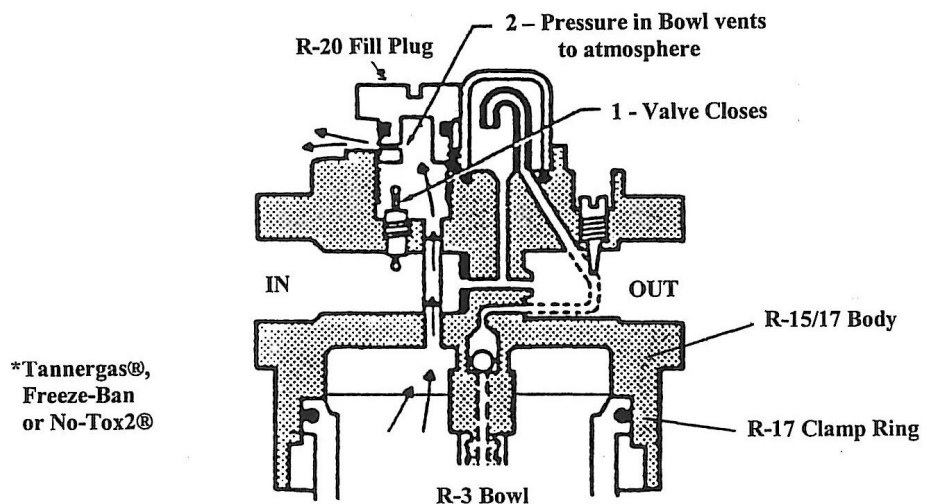
1. The Check Valve, R-47, closes so that line pressure is blocked at the Check Valve.
2. A small vent hole in the Fill Plug is opened to atmosphere and Bowl pressure is vented. This eliminates the danger of removing the Fill Plug while it is still under Bowl pressure.

Once the Fill Plug, R-20, is removed the Bowl can be filled with TANNERGAS®, FREEZE-BAN or NO-TOX2® through the opening which is centrally located on top of the De-icer. Once filled, replacing the Fill Plug reverses the above sequence and the unit is ready for operation.

NOTE: The larger, 2-gallon and 5-gallon Bowls, Models T-85, T-87 and T-89 De-icers, can be filled under pressure by the following procedures:

1. Bleed air from tank through R-36 Vent/Bleed Plug (R-20 on the T-85). Bleed air slowly to prevent the Vent/Bleed Plug from disengaging under pressure.
2. Open 1" Gate Valve, R-65, slowly and fill.
3. Close 1" Gate Valve, R-65, and replace Vent/Bleed Plug tightly.

DETAIL DRAWING 2
Model T-90



IMPORTANT: Please refer to our website for parts diagrams on all the de-icers. It is important to note that Tanner De-icers are engineered to work specifically with Tanner Systems de-icing products:
TANNERGAS®, FREEZE-BAN or NO-TOX2®,
referred to as "de-icant" or "anti-freeze" in this form.
Use of any other type of compound will void the warranty.

TANNER SYSTEMS, INC.

The De-Icer People since 1928

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