DiscAir™ TURBO
Model DA175T

Operating Instructions
Bedienungsanweisung

.

VISIPORT BY T2K

Table of Contents

This section covers the following topics:

» Parts and Equipment List

» Before You Begin Assembly

» Safety Information

» Warranty Information

Section 1.1, Parts and Equipment List

Unpack all DiscAir components carefully and verify that you have the following items:

1. DiscAir base assembly
2. DLC (Diamond-like carbon) coated spin disc (disc/drive assembly).
3. Standard VHB Mounting plate with O-ring (Units with DA175T.V designation)

   For transport, the Mounting Plate is lightly attached to the base assembly with screws. After unpacking, dispose of these screws. For the final attachment of the base assembly to the Mounting Plate, please use the provided nylon-coated screws (see Item 7).

   (This part is not if you order units with the DA175T.D Bolt-on designation.)
4. PVC Manifold with on/off valve (Units with DA.175T.H designation)
5. Pressure regulator (pre-installed and adjusted into base assembly)
6. Flexible polyurethane tubing, 1.0-meter (longer lengths available)
7. Tool kit & small parts bag including L-Key wrench, silicone sealant, nylon-coated screws
8. Installation Vacuum Pump (purchased separately as P/N 2209001)

(For replacement part numbers and desciptions, please refer to Section 4.)

Section 1.2, Before You Begin Assembly

Before beginning the installation of this product, please read this manual. The DiscAir installation process is straight forward. Determine the best location on the machine for the spin window and manifold. Careful attention to instruction details will ensure a successful installation and many hours of trouble free operation. Almost all installation problems result from the following:

1. Failure to adequately clean the window surface to receive the DiscAir installation.
2. Failure to replace used, contaminated polycarbonate windows for DiscAir installation.
3. Contamination of the bonding set adhesive from fingerprints or premature exposure of VHB.
4. Attempts to install DiscAir on "siliconized" or hard coated polycarbonate windows.
5. Failure to apply silicon rubber around the DiscAir base.
6. Machine tool windows that are not flat or rigidly mounted into the enclosure.

For additional information or clarification of these instructions, or for assistance with any aspect of your Discair spin window system, please contact T2K or your vendor.

Section 1.3, Safety Information

1. The DiscAir Turbo Model DA175T is designed to be mounted on a windows of machine tools with fully enclosed work area where metalworking fluids are used for lubrication.
2. DiscAir units rotate at up to 4.000 rpm. Even after turning off the air supply, the Disc/Drive Assembly (spin disc) will rotate for some time.
3. Turn off air supply to the spin window when performing service or entering the machine cabin. Do not touch or otherwise allow any body contact with the spin disc until rotation has ceased. Wear eye protection at all times when exposed to rotating spin disc.
4. Never operate the DiscAir without the spin disc installed, as this exposes underlying Bearing Assembly to metalworking fluids that may lead to premature destruction of the bearings.
5. Do not install a DiscAir spin window into a cutout unless the spin window has been bonded to a substrate at T2K.
6. Replace all spin discs that have been chipped, struck, cracked, dropped, or damaged in any way. This includes spin discs that show signs of etched metal from acidic or corrosive coolant and disc glass which exhibits unusual wear from chip bombardment. Do not operate the DiscAir until a new spin disc has been installed.
7. Warning: The regulator at the bottom of the unit has been pre-adjusted. For safety reasons this setting must not be changed!
8. Spin windows augment safety programs! Without the viewing benefits of spin windows, a machine operator may be tempted to bypass the machine tool interlock to get a look inside a machine cabin. Be safe. Install spin windows.

Section 1.4, Warranty Information

DiscAir components are warranted to be free from defects in materials and workmanship for six months. Components which fail within this period of time will be replaced without charge.

Abrasion to the spin disc is not covered by this warranty, nor is any other damage to the glass subsequent to its intact arrival due to drops, tool impacts, or other events arising from normal operation or mishandling.

Diamond-Like-Carbon (DLC) coated glass discs are much more resistant to scratching from chip activity than those made from standard uncoated chemically strengthened float glass, but it is not any more resistant to breakage from impacts due to droppage or projectiles.

Failure of components from misuse, improper air supply pressure or hookup, or failure to observe the restrictions set forth in these Operating Instructions is not covered by warranty. Failure of parts and/or components due to improper installation is not covered by warranty.

Freight costs for any items sent to T2K for warranty evaluation or repair is to be at customer's cost. A Returned-Goods-Authorization (RGA) number, issued by T2K, is required in order to return units to T2K. Items sent to T2K without such an RGA will not be accepted. Decisions to cover parts and/or components under warranty, and to replace or repair such parts is at the sole discretion of T2K.

This section covers the following topics:

- Window Substrates
- Surface Preparation
- Preparing Installation Layout
- Standard Bonding Method (Code V)
- Bolt-on Method (Code D)

Section 2.1, Window Substrates

Machine tool windows generally fall into one of two major substrate categories:

2.1 Polycarbonate Windows

The first window substrate type is composed of polycarbonate plastic sheets. Polycarbonate (PC) is a relatively inexpensive, impact-resistant, optically clear plastic. It is often sold under trade names such as Lexan, Makrolon, Tuffak, and Hyzod.

Polycarbonate window material must be as new and absolutely free of dirt and oily substances. Used, scratched, or oil-contaminated polycarbonate mounting surfaces must not be used, as they are no longer provide suitable surfaces for viewing, proper o-ring sealing, or for adhesion of bonded installations. Used, scratched, or oil-contaminated windows should be replaced prior to or together with DiscAir installation.[1]

If purchasing your own replacement window material, do not substitute acrylic sheet (plexiglas) for polycarbonate. Acrylic does not have the same impact resistant qualities as new polycarbonate. Similarly, do not substitute polycarbonate sheets with thicknesses thinner than the manufacturers' orginally supplied material. Due to improvements in the understanding of how polycarbonate can become brittle with time exposure to metalworking fluids, it is recommended that the polycarbonate window be treated as a wear item on a machine tool that should be replaced peridically according to manufacturers' recommendations.

2.2 Machine Tool Safety Windows

These window substrates are still primarily composed of polycarbonate for impact-resistance, but are built up of multiple layers and combine polycarbonate with glass on the inside surface of the window to provide scratch resistance to chip activity. This composite construction frequently is mounted into a metal frame, and sometimes completely encapsulates the polycarbonate layer with glass, frame, and a layer of plastic film on the outside surface to completely protect the polycarbonate impact layer from exposure to metalworking fluids. Such encapsulation is designed to extend the service life of the window.

1 T2K can provide assistance with window replacement and pre-mounting of spin windows. Contact T2K or your distributor for details.

Section 2.2, Surface Preparation

Cleanliness is foremost. Avoid touching clean surfaces. Wash your hands to prevent transferring oils or dirt to bonding surfaces.

Bonding sets are factory installed and protected with backing material. Do not touch the bonding set. Even with the backing in place, contamination from the bonding set edges can migrate onto contact surfaces if backing edges are rolled up or wrinkled. Do not remove the transfer paper from the bonding adhesive until just prior to use of the mounting plate.

An absolutely clean surface should pass a water break test. Use only clean (preferably distilled) water for this test. On a clean surface, water will sheet and uniformly adhere to a clean surface without beading or forming rivulets.

Section 2.2.1, Cleaning New Windows

Clean thoroughly with 50% water and 50% isopropyl alcohol solution. This may require that you dilute store-bought alcohol with distilled water. The decrease in alcohol concentration will lower the rate of evaporation and improve your cleaning efforts.

Section 2.2.2, Cleaning Used Windows

This procedure is for Machine Tool Safety Windows having glass as the mounting surface only. For the reasons explained in Section 2.1, mounting on polycarbonate material that has already been used is not possible!

- Wipe off excess contamination.
- Use detergent and water. Wipe clean with water soaked rags.
- Wipe window surface with common window cleaner and clean wipes.
- Prepare surface with 50% water and 50% isopropyl alcohol solution.

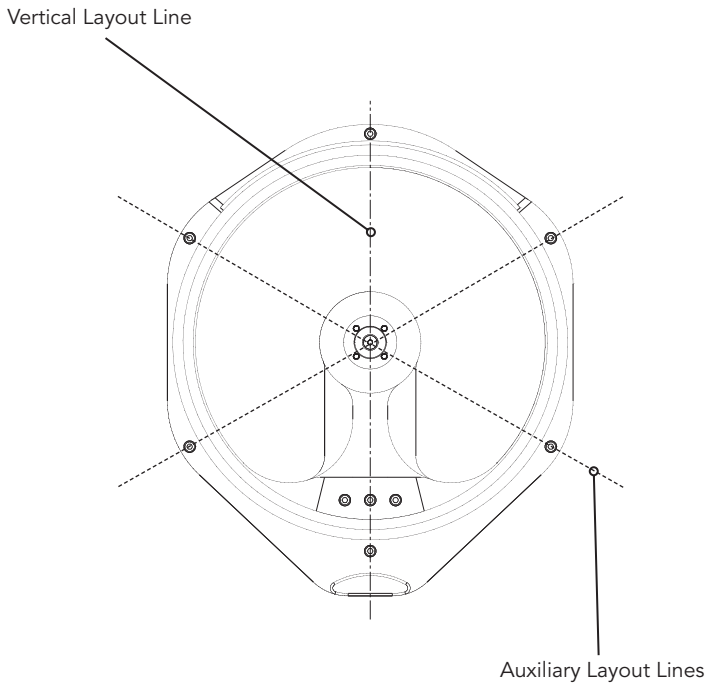
Section 2.2.3, Flatness Requirements

The surface of the mounting area must be flat within 0.3-mm or 0.012”. If the mounting surface is not flat, o-ring sealing can be compromised in direct-mounts and bonded mounts may begin to delaminate and leak due to the mechanical forces involved.

Section 2.3, Preparing Installation Layout

Use a marker to make a vertical reference line (Sharpie® brand or similar). This line should extend down through the center of the intended installation location, and be located outside on the operator’s side of the window, so that it is visible (through the window) from the machine side where the DiscAir will be installed.

For best results, choose a mounting locatation for the unit that optimizes the operator’s field of view and places the unit as far away from the coolant stream as possible.



Section 2.4, Standard Bonding Method (Code V)

1. Remove the hub cap, and glass disc. Set aside in a safe location.
2. Remove Mounting Plate Assembly from the Base. Insert 2 or more of the transport screws to hold the Mounting Plate Assembly. The orientation of mounting is as shown on the detail.
3. Strip off the backing from the bonding set. Do not touch exposed bonding surfaces.
4. Visually align DiscAir to reference marks. Holding the Mounting Plate assembly by the edges, slowly press into place.
5. With pressure applied from the opposite side, press the DiscAir firmly into place. It is very important that the adhesive carrier be bonded to the substrate completely around the entire periphery of the unit in order to accomplished the gasketing function as well as the adhesive function of the bondset material.[2]
6. For installers using the optional Installation Vacuum Pump, P/N 2209001[3]:

   Thread the 4-40 adapter tip into the vacuum port firmly enough to prevent a leak. Pump vacuum to 68 cm Hg and maintain vacuum for 30 minutes. Pump handle periodically to maintain vacuum, as gradual vacuum loss in pump is normal. A good bond has been achieved when the color of the VHB adhesive has turned uniformly to a slightly darker gray.
   Bleed vacuum and remove pump after 30 minutes.
7. Apply a small bead of supplied silicon rubber to seal around the entire circumference of the Mounting Plate Assembly. Form a uniform 3.5-mm / 0.150" bead of sealant between the Mounting Plate Assembly and the machine window, completely filling the chamfer around the Plate.. This provides protection from the dyes typically found in water soluble coolants. Carefully remove excess material if needed. Sealant should fully cure in 12 hours.
   Failure to apply the silicon rubber will void the manufacturers warranty.
8. Install O-Ring into the Base.
9. While holding the Base against the Mounting Plate Assembly, insert the 6 nylon-coated screws and fasten crosswise until hand-tight.
10. Install Disc/Drive Assembly and Hub Cap according to the instructions to be found in Section 4.2.2, Disc Installation and Rotation Test.

---

2 Installation without an Installation Vacuum Pump requires a "wetting out" period for the VHB adhesive material of at least 72 hours.

3 For best long-term results, T2K highly recommends the use of the Installation Vacuum Pump, availble through your distributor or from T2K.

Section 2.5, Bolt-on Method (Code D)

Because of varying material thicknesses, T2K does not provide screws or washers. The minimum engagement of screws into the Base of the DiscAir should be 6-mm / 0.250". The 6 mounting holes in the DiscAir Da175T Base have metric M4 threads.

The DiscAir base can be mounted to polycarbonate (PC) machine tool windows by drilling 6 each 0.166"/4.2mm diameter holes through the substrate, copying the hole pattern in the base. The O-Ring in the base prevents metalworking fluids from entering the inside of the unit base.

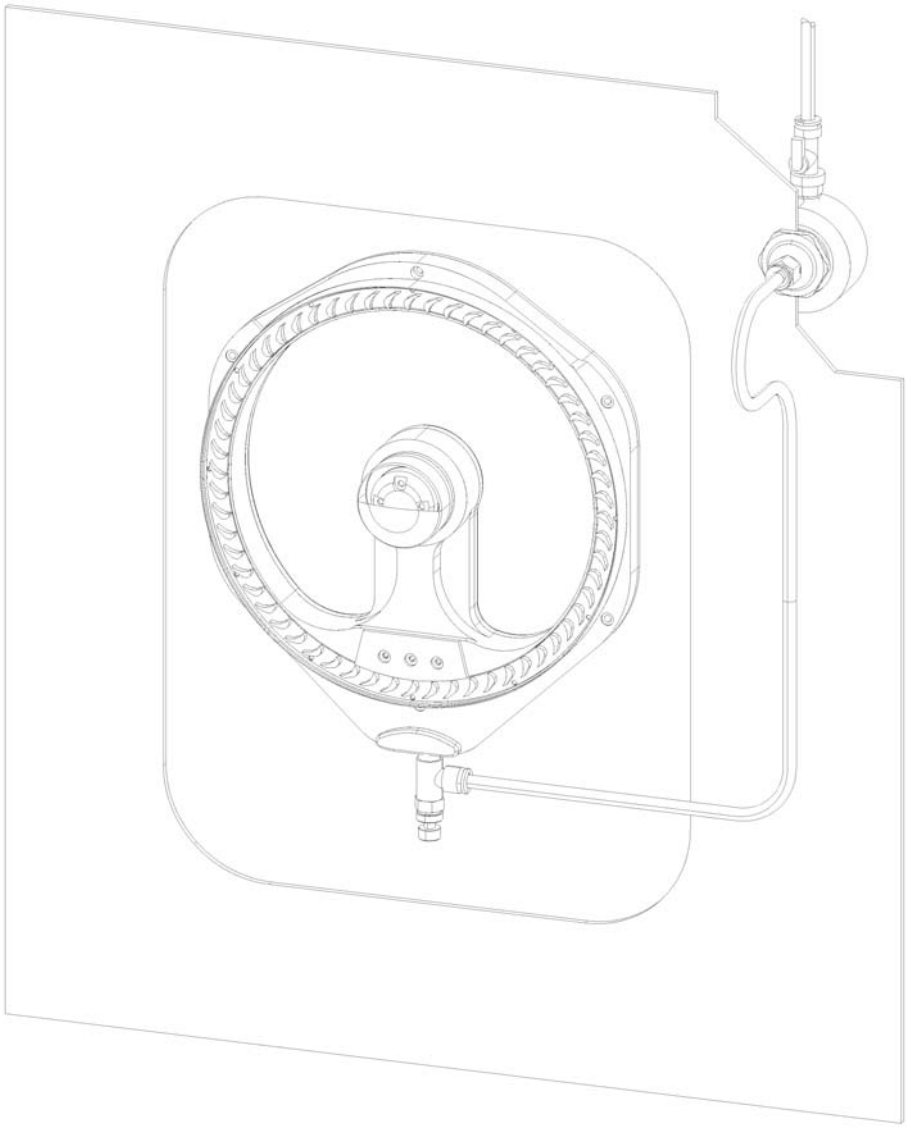
1. Temporarily remove the disc and the O-Ring from the Base.
2. Position the Base and drill one (top hole suggested) hole, 3.25mm / #30 drill through.
3. Insert a pin or second drill to maintain position and drill the remaining 5 holes to a depth of 2-3-mm / 0.125".
4. Finish drill 6 holes through with 4.2-mm / #19 drill. Remove burrs.
5. Install O-Ring into the Base.
6. While holding the Base against the window, insert the 6 nylon-coated screws and fasten crosswise until hand-tight. Use of washers under the screw heads is recommended.
7. Install Disc/Drive Assembly and Hub Cap according to the instructions to be found in Section 4.2.2, Disc Installation and Rotation Test.

This section covers the following topics:

» Air Hookup

» Installing the Manifold

» Air Consumption



Section 3.1, Air Hookup

Compressed air pressure supply should be between 5.3 - 5.7 Bar, or 77-83 psi. Running the DiscAir unit at a higher pressures could damage the unit.

The regulator to which the air supply tube is connected is pre-adjusted and should not be changed or adjusted. Higher settings might lead to serious damage to personnel and property.

Section 3.2, Installing the Manifold

The Manifold is commonly installed on the machine door and should be positioned for easy access. If a different location is desired, the length of the air supply tubing must be sufficient to accommodate door motion. The DiscAir DA175T comes standard with 1.0 meter of polyurethane tubing to connect the Manifold to the DiscAir units.

If the connection tubing used is longer than 3.0 meters or 10 feet, a fitting to connect the 6-mm tubing to 8-mm tubing should be installed to prevent pressure loss.

To install the Manifold/Valve proceed as follows:

1. Mark the desired mounting position.
2. Drill hole through sheet metal, 25-mm / 1.00" diameter. Deburr both sides.
3. Install unit with O-Ring in place, and tighten nut.

Section 3.3, Air Consumption

Air Consumption for the DiscAir Model DA175T is approximately 34 Lpm (liters per minute), which is equal to 1.2 CFM (cubic feet per minute).

This section covers the following topics:

» Operating Principle

» Maintenance and Troubleshooting

» Replacement Parts

» Customer Support

Section 4.1, Operating Principle

The Disc of the DiscAir unit is driven by a precisely metered steam of compressed air and reaches a no-load speed of approximately 4,000 rpm. The rotation of the Disc creates a centrifugal force that slings off coolant and chips.

To function properly, the DiscAir must always be rotating at a minimum effective speed when a machine is in use. Do not turn off air as any interruption diminishes functionality and might allow excessive coolant to leak into the unit.

The air supply tube is connected to the air regulator, which comes from the factory pre-adjusted. DO NOT TAMPER WITH THE FACTORY SETTING! Higher settings might lead to serious damage to personnel and property.

Section 4.2, Maintenance and Troubleshooting

During normal operation small chips and jelled metalworking fluid residues can accumulate in the labyrinth of the seal. This can lead to malfunctions.

Therefore, it is highly recommended that the DiscAir unit be cleaned on a regular (weekly) basis to avoid the following possible conditions:

» Disc does not spin well when spun by hand (without air)

» Disc does not readily gain speed when air supply is turned on

» Grinding noise when in use

» Splatter on the DiscAir-protected portion of the machine window

» Readily visible coolant remains inside the DiscAir

4.2.1 Disc Removal and Cleaning Procedure

It only takes three minutes to clean your DiscAir Turbo to insure continued maximum functionality!

Before following the few simple steps below, make sure your machine tool is turned off!

Be Safe! Please wear appropriate hand and eye protection whenever entering the cabin of your machine to perform cleaning and maintenance.

1. Turn off air supply to the DiscAir at the Manifold Valve
2. Inspect the Disc glass for cracks, impacts, or other damage prior to handling
3. Clean Disc and Hub Cap to remove contaminants (fluid and chips) from part surfaces
4. Unscrew the Hub Cap by hand while holding onto the Disc
5. While holding the Disc securely to keep it from dropping, remove 4 each Torx screws holding the Disc hub to the Bearing/Rotor assembly with the supplied 4-40 Torx wrench
6. Pull Disc assembly off the Bearing Rotor assembly and set aside.
7. Use a rag or wipes to remove any visible contamination from Base labyrinth and inside surface of Disc. Wipe any metalwokring fuilds and residue from machine window and from Base.

4.2.2 Disc Installation and Rotation Test

1. Insert the Torx wrench into one of the holes in the Disc Hub to align the holes of the Hub to the holes of the Bearing/Rotor assembly. Rotate Disc slightly as needed while pushing Disc lightly against the Rotor.
2. Reinstall the 4 Torx screws and tighten securely in crosswise pattern.
3. Hold Disc by hand and secure Hub Cap.
4. Before returning air to the unit, check free rotation by spinning Disc by hand. Disc should run easily and without scratching or scraping noises.

Section 4.3, Replacement Parts

See Exploded view on next page.

1	175T500	Disc/Drive Assembly, DA175T
2	175T5005	Hub Cap
3	175200	Rotor/Bearing Assembly
4	175TMPA	Mounting Plate Assembly, DA175T
5	175710	Short Manifold Assembly [Model Configuration Code H]
6	SC6-1/8-I	Pressure Regulator [Model Configuration Code R]
7	1X2170N	MPA O-Ring, Nitrile
	2209001	Installation Vacuum Pump (not pictured)

Section 4.4, Customer Support

Contact your distributor of T2K for parts and technical information.

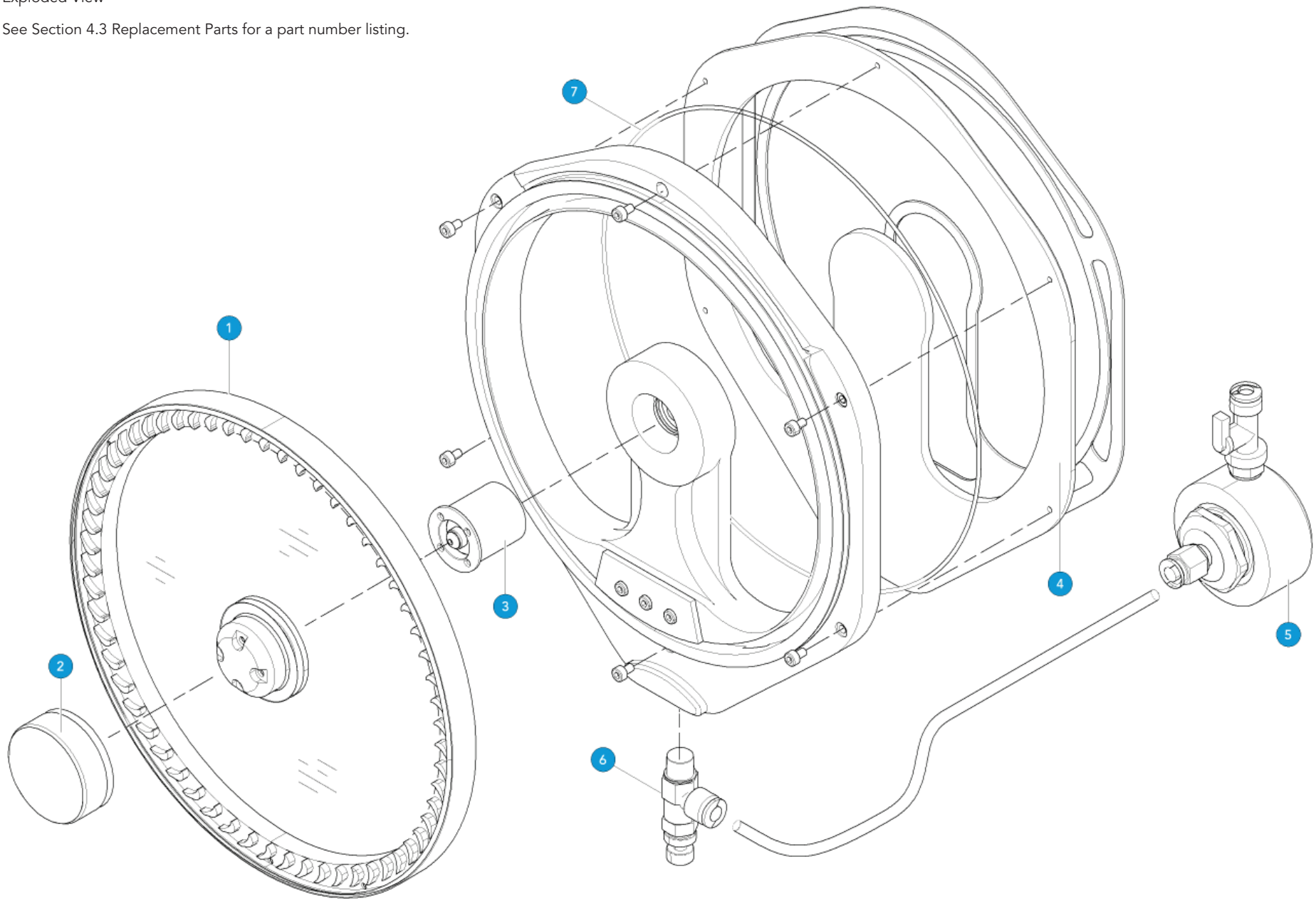
T2K is available on the web at www.t2k.net, where you can find installation instructions, drawing, and knowledgebase articles.

T2K Customer Support can also be reached via telephone at the numbers on the back cover, or through email at support@t2k.net.

DiscAir Turbo - Model DA175T

Exploded View

See Section 4.3 Replacement Parts for a part number listing.



DiscAir™ TURBO
Model DA175T

T2K - TOOLING 2000

17824 Northeast 65th Street
Redmond , Washington 98052-4902
USA

+001 (425) 558-0200
+001 (425) 558-0700 fax

Toll free (USA):
(800) 267-2120
(866) SPI-NWIN fax
(866) 744-6946 fax

Internet:
sales@t2k.net
www.t2k.net

VISIPORT® BY T2K