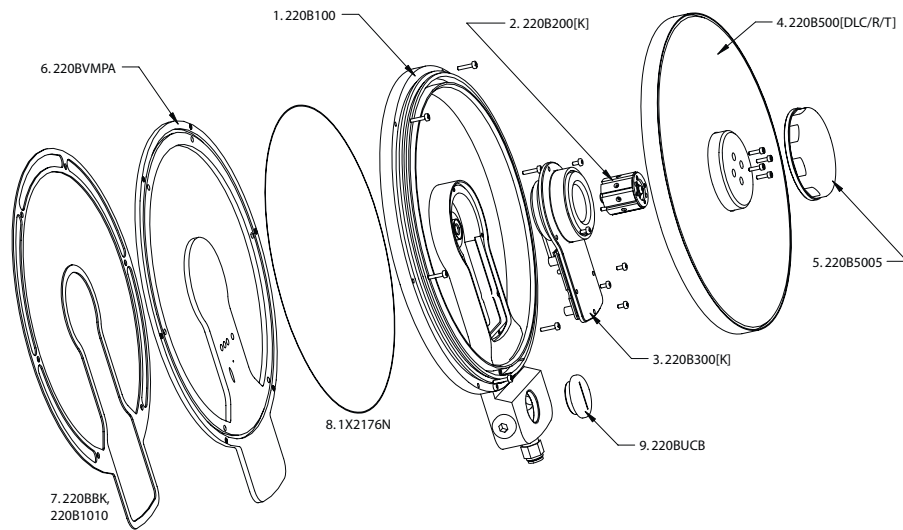


Visiport® Model VP220.B5

Installation Instructions





Replacement Part Notes

All Warranty Parts orders must include the unit serial number and machine tool application survey.

All prices are subject to change without notice. Call T2K or your dealer to confirm price and availability.

The shelf life of all silicone and VHB products is approximately 6 months. Customers should not stock these items, but order them for immediate use only. Customer should replace silicone edge seal at the first sign of failure, or every 18 months, whichever comes first.

All 220B700xx.x, 11660xx.xE, and 21660xx.xE items are specified per meter/foot length, or fraction thereof. For example, a 2.5 m length of Flex Conduit with Brown/Blue conductors takes part number 216602.5E, but is calculated at the 3.0 m price. Customer may specify lengths in feet by appending "F" to the end of the part number.

Diamond-like carbon (DLC) coated glass is both scratch and calcification resistant, but it is no more impact resistant than our standard chemically strengthened float glass.

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Visiport® B-Type Replacement Parts

Part No.	Description
220B100	Base Assembly
220B200K	Bearing/Rotor Assembly Kit: Rotor, Loctite
220B2090	Bearing/Rotor Assembly Extraction Tool
220B300-B5	Motor/Driver Assembly
220B500	Disc Assembly
220B500DLC	Disc Assembly, DLC (diamond-like carbon) Coated
220B500R	Disc Assembly, Ramp-Seal
220B500T	Disc Assembly, Toothed-Belt
220B5005	Hub Cap
220BBK	Bonding Kit: Bondset, Silicone Sealant
220BVMPA	VHB Mounting Plate Assembly, incl. Silicone Sealant
220BEMPA	Urethane Mounting Plate Assembly, incl. Silicone Sealant
220B1010	Bondset
220B1099	Bonding Fixture
5X2176N	MPA O-Ring, Nitrile, 5-pak
1X2176N	MPA O-Ring, Nitrile
2208031	Silicon Sealant
2209001	Installation Vacuum Pump
220BUCB	UCB Cover
220B700G	Terminal Box, w/o Fitting
220B7015G	Lid Assembly, Terminal Box
R2109	90° Power Cable Strain Relief
220B70xx.x	Power Cable cordage, Brown/Blue/Green-Yellow, xx.x m Length
N	Fitting for 8 mm PUR tubing
11660xx.xE	8 mm PUR-Tubing, Brown/Blue Conductors, xx.x m Length
H	37° Fitting for Flex Conduit
21660xx.xE	Flex Conduit, Brown/Blue Conductors, xx.x m Length
5C6X	90° Swivel Nut Elbow for H Fitting
G06	EO-Fitting for solid Metric tubing, 6-mm
G08	EO-Fitting for solid Metric tubing, 8-mm
G10	EO-Fitting for solid Metric tubing, 10-mm
G12	EO-Fitting for solid Metric tubing, 12-mm
220B3569	Plug for Unused Exit Port, (Part Code B)
2108016	ABS Wrench
220B900	Small Parts Kit
PS24-120	120W UL-508/TÜV 24 VDC Power Supply

Partial listing; please consult with T2K or your dealer for additional options.

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Visiport®

Model VP220.B5

Made in U.S.A.

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Overview of Visiport® B-Type Model Family

Visiport® 220.B5

The Visiport® 220.B5 is T2K's standard 10"/25-cm diameter form factor. Designed to be powered by a dedicated 24 volt direct current circuit of 5 amperes, T2K recommends powering the unit with a UL508 compliant 120 watt power supply capable of 24 ± 1 VDC output. Using a lower amperage or voltage will lead to underperformance and premature driver failure. The Visiport® 220.B5 has universal connectivity, allowing wire harness routing from the left, right, or bottom of the unit. All three harness connection ports are threaded to accept $G\frac{1}{4}$, BSPP $\frac{1}{4}$, or BSPT $\frac{1}{4}$ fittings.

Visiport® 180.B5

The Visiport® 180.B5 has an 8"/20-cm diameter size. Using the same driver as the Visiport® 220.B5, this model is effectively 30% more powerful, given the smaller surface area of the disc driven by the burshless DC motor. Fitting on narrow windows typically found on recent high production machining centers, the Visiport® 180.B5 is 2" narrower and 1" shorter than its Visiport® 220.B5 counterpart. Recommended for smaller machines or where the additional power is required for viewing machining operations situated close to the machine tool window.



Visiport® 220.B5 Model showing N-Fitting and PUR tubing exiting bottom connection port.

Visiport® B-Type Model Features

Visiport® units operate at a speed of 2,200 rpm, powered by a brushless DC motor and driver. The electrical requirement of the unit is 24 ± 1 Volt DC. As all driver electronics are built into the units, only two power supply wires are required instead of the customary eight leads necessitated by standard brushless driver designs.

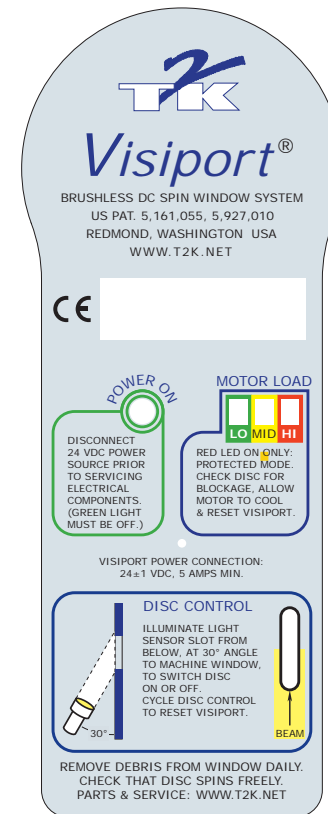
In addition to providing the standard toggle switch to provide positive indication of unit power on status, easy access to an on-off switch for machine maintenance, and a mechanical reset for the brushless DC motor controller circuit, T2K B-Type models have an additional optically actuated switch that allows the operator to turn the device on and off, and to perform motor reset, with the aid of a common shop tool, the flashlight. By simply wanding a light source over the opto-sensor, the Visiport® can be easily turned on and off prior to entry into the machine enclosure for service.

Previous generation Visiport® models provided LED lights to provide function status. The 4th Generation Visiport® B-Type now provides a bank of four LEDs. One indicates power on and the other three provide an indication of relative load on the motor with green, yellow, and red status LEDs. An operator whose Visiport® shows a red LED on a frequent basis has a good indicator that cleaning of the disc seal is warranted. A constantly lit red LED now indicates a motor fault.

The rotor of the unit has two instrument grade ball bearings and a compliment of eight high-power Neodymium-Iron-Boron (NdFeB) rare-earth magnets. This combination of components allows the B-Type Visiport® to perform reliably at 50 oz-in of continuous torque output. This exceeds the torque generated by any other spin window system on the market

Integrated into the electronics are reverse polarity protection, over current protection, and a thermistor to protect the motor from overheating. Load monitoring is now provided with three LEDs. New to the Visiport® B-Type is a photo-electric light sensor which allows power to the spin disc to be switched on and off with an appropriate light source, such as a flashlight. This feature allows the operator to easily reset the unit or shut the Visiport® off during machine tool maintenance procedures where incidental contact may occur.

Power supply wires are now connected to a terminal block in a cavity at the bottom of the Visiport® base, eliminating the previous cartridge design. The threaded hole that the terminal block is connected to also serves as the vacuum port for directly bonded units when removed. This location precludes the necessity to disassemble the unit and remove the motor to access the vacuum port as was required before for directly bonded units. The new terminal block connection also provides a PE terminal, allowing a ground conductor to be attached to the terminal block retaining screw between two supplied washers, if so desired.



To increase the flexibility of unit installation, the wire harness supplying power to the Visiport® can now be exited left, right, or down from the unit. Previous generations of Visiport® systems provided for side or bottom exits variously. The new B-Type provides both options in the same unit.

Harness wires are protected with one of several conduit options that prevent electrical contact between the power wires and metalworking fluids inside the machine enclosure.

In addition to protecting the Visiport® system's electrical components from fluid ingress, the conduit also provides the Visiport® with ambient air from outside to prevent the unit from fogging up due to the difference in relative temperature and humidity between the interior and exterior of the machine enclosure.

The previous generation of A-Type Visiport® units utilized a Flex conduit, consisting of stainless steel wire braid over a PTFE tube, terminated to a customer-designated length with ½"-20 brass fittings. This type of conduit is popular with customers for its heavy-duty resistance to all kinds of machining environments at low cost and maintenance. Visiport® B-Type units that will use this conduit system should be specified with the H-Fitting code.

In addition to Flex conduit, Visiport® B-type units may be specified with two alternate conduit types. For low cost and easy field installation, T2K now offers the Visiport® with push fittings compatible with 8-mm polyurethane (PUN) tubing. Long standard on the DiscAir models, T2K can supply lengths of PUN tubing that can be easily cut to size on-site during installation, a feature not possible with Flex conduit. Visiport® units that will be fitted with push fittings and PUN tubing should be specified with the N-Fitting code.

For customers desiring the design flexibility and toughness of steel tubing, T2K now offers a third conduit option. EO-type fittings are available in all major machine tool markets, and can be specified with Visiport® B-Type units by using one of the G-Fitting codes.

Visiport® units are attached to the machine tool window with a bondset, which is laser-cut from 3M VHB+ closed-cell acrylic foam material. T2K's patented application methodology distinguishes Visiport® units from all other designs that necessitate the cutting of a large diameter hole in the machine tool window for clamping, decreasing the window's impact resistance and operator safety as a consequence. Such designs are also impossible to use in retrofit situations where the machine tool is equipped with safety windows comprised of multiple layers of glass and polycarbonate.

Like the previous two generations of product, Visiport® B-Type units are equipped with six holes for bolt-on installations, where the unit is attached with bolts in addition to the standard VHB adhesive. Such bolt-on installations, while possible, are not recommended by T2K. The VHB adhesive has been tested with all type of machine tool window materials, and adheres well to glass and polycarbonate substrates, including siliconized scratch-resistant types. Anecdotal reports of units failing to bond adequately are driven by failure to clean the window substrate according to installation instructions, and by contamination of the adhesive by removal of the backing paper and handling of the adhesive prior to use.

T2K highly recommends the use of our standard Mounting Plate with every Visiport® application. Using a Mounting plate makes installations faster and easier. It also enables the easy and inexpensive remounting of the unit should the window of the machine require replacement at any time due to impact damage to the machine window glass or the biennial replacement of polycarbonate due to scratching or metalworking fluid embrittlement.

#

Components of Visiport® System

Spin Windows systems manufactured by T2K - TOOLING 2000 are sold under the Visiport® brand name. Visiport® is used to denote all T2K spin window systems powered electrically using 24 VDC brushless electric motors.

Unpack all Visiport components carefully. Verify that you have the following basic Visiport® B-Type system items: 1. Visiport® base assembly into which the drive components are mounted.

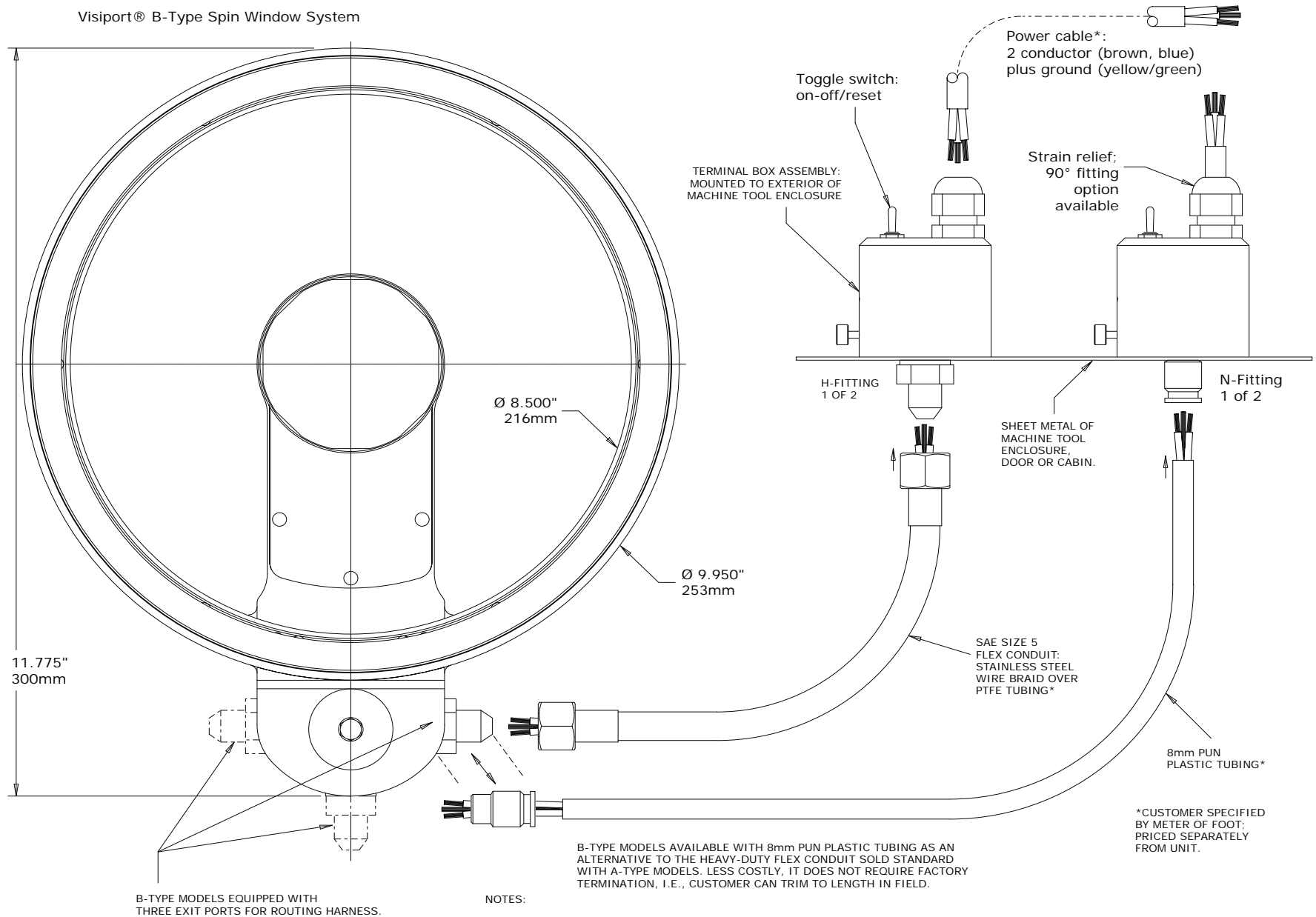
2. Spin disc assembly consisting of chemically-strengthened glass disc fixed to a seal ring and hub.
3. Hub cap to seal attachment screw holes of disc assembly from metalworking fluids.
4. ABS wrench to prevent overtightening Hub cap when in installing or removing spin disc assembly.
5. Mounting Plate Assembly (MPA); a subplate for easy attachment and removal of Visiport® from machine window:
 - A. MPA with VHB adhesive (standard), Visiport Configuration Code V
 - B. MPA with Urethane+VHB, Visiport Configuration Code E
6. Terminal box; the standard bulkhead assembly and on-off/reset switch point for retrofit installations.
7. Flex conduit, PUR plastic tubing, or steel tubing with matched fittings to aspirate unit and protect wire harness between Visiport® unit and machine enclosure bulkhead point where terminal box is installed: *¹
 - A. Flex Conduit; exact length terminated with throw nuts.
 - B. PUR Tubing; excess tubing and harness length can be cut down in field.
8. Power cable, for making electrical connection between Terminal box and power supply (length is customer specified)*
 - A. Part Number 200B70xx.x, where xx.x is total length in feet or meters, or
 - B. also available in a 10-m Stock power cable cordage length as Visiport Configuration Code P, or Part Number 220A7015.
9. Tool kit, with T10 Torx L-Key, two B1/4 plug fittings with seals for unused exit ports, spare screws, and silicone sealant with dispensing tip for use in creating an edge seal to protect attachment adhesive at periphery of unit from metalworking fluids.
10. Optional UL-508, DIN-rail mountable Power Supply, for machines with insufficient ampacity to power Visiport® on 24 VDC circuit. Part Number PS24-120
11. Optional hand-held Installation vacuum pump with manometer (one-time tool purchase for use with all T2K spin windows), Part Number 2209001. Used to install units more quickly and with higher bond integrity than otherwise possible using 3M recommended 3-day adhesive wet-out period.



* Length specified by customer. Ordered as a separate item from the base Visiport® system. ¹Information on additional fittings and tubing options are available from T2K:
 A. H-Fittings for flex conduit, wire braid over PTFE (teflon) tubing, or
 B. N-Fittings for polyurethane (PUR) tubing, or
 C. G-Fittings for metric steel pipe tubing

Basic Visiport® System Layout

Visiport® B-Type Spin Window System



Visiport® IS A REGISTERED TRADEMARK OF T2K.

FIGURE 1.



Before You Begin Assembly

Visiport installation is straight forward. Determine the best location for the spin window, junction box and conduit routing. Careful attention to instruction details will ensure a successful installation and many years of trouble free operation.

Almost all installation problems result from the following occurrences:

1. Inadequately and/or improperly cleaned window mounting surfaces.
2. Contamination of the bondset adhesive due to premature removal of transfer backing paper. Do not touch the adhesive with exposed fingers
3. Failure to apply silicon sealant around the Visiport VHB adhesive interface periphery.
4. Improper electrical connections.
5. Failure to supply electricity at required 24 VDC voltage and 5A current.
6. Attempting to bond to polycarbonate with a foil overlay.
7. Failure to use the Installation vacuum pump, or where not used, failure to allow Bondset to wet out for 72 hours to achieve maximum bonding strength.
8. Failure to seal vacuum port of mounting plate or failure to seat screw of terminal block to prevent coolant leakage.
9. Failure to use nylon-dipped sealing screws to mount unit to Mounting Plate.
10. Installations of the machine tool window where the surface is bowed enough to cause mechanical delamination of the Bondset

#



Electrical Hookup

The terminal box, when used, must be installed on the outside of the machine, and protected against exposure to coolants, lubricants, and all other shop fluids. Damage to the terminal box from exposure to coolant or chips is not covered under warranty. Certain installations performed by machine tool builders may be wired directly into the machine control, and powered through a shared or dedicated 24 Volt circuit, and therefore may not be equipped with the standard terminal box. Please refer to the manufacturer's documentation for electrical hookup details in this case.

The terminal box is ideally installed on the door frame of the machine using the shortest length conduit available. T2K recommends whenever possible to install the terminal box on top of the door. Optimum location of the terminal box is up to the customer. The customer should consider aesthetics, location of the 24 Volt power supply source, and ease of installation when positioning the terminal box.

Ensure that the Visiport spin window and the terminal box will not interfere with opening and closing of the machine door. Make careful measurements. Allow enough slack in the flexible conduit so that the door motion will not stress the electrical conduit.

The power cable should be connected to the 24 VDC auxiliary power source on your machine or a dedicated 24 VDC power supply. The power supply source must be regulated to +/- 1 VDC. The power source must be capable of dedicating 4 amps to each Visiport spin window on a continuous basis. We strongly advise against the Visiport being connected to interrupted power sources such as the tool changer power supply. Connecting incorrectly in this way will cause the spin disk rpm's to constantly load the motor while it spins up to full speed. This prevents effective removal of coolant, adversely impacts bearing wear, shortens the life of the motor driver electronics, and is not covered under warranty. T2K Spin Window Systems are engineered for continuous operation.

Power Cable Wiring:

Brown to +24 VDC.

Blue to power return.

#

Installing The Terminal Box

1. After determining the optimum junction box location well away from metalworking fluids, mark and drill a 1/2" (13 mm) hole in the machine enclosure. This hole will be used to pass the wire harness from inside the machine to the outside of the enclosure through the terminal box.

Remove any burrs that would prevent proper seating of the terminal box.

Please use safety glasses to prevent eye injury when performing this step.

2. Loosen the knurled retention screw on the terminal box and remove the cover. Set aside.
3. Remove the switch connector from the terminal base and unthread the fitting from the bottom of the terminal base.
4. Strip off the adhesive backing paper from the bottom of terminal base and set aside within easy reach of the previously drilled hole in the enclosure, making sure not to allow any objects to come into contact with the exposed adhesive.
5. Insert the terminal base fitting into the previously drilled hole from the inside of the enclosure, and carefully thread the terminal base onto the fitting a couple of turns, without touching the adhesive to the machine enclosure.

Once the threads have become securely engaged, press the terminal base down onto the machine enclosure. This adhesive ring will provide a seal to prevent metalworking fluids from exiting the machine through the hole drilled into the enclosure.

6. Secure the terminal base to the machine enclosure by completely threading the fitting into the terminal base, then replace the cover of the terminal box and secure the knurled retention screw.
7. Test the distance between the terminal box and the intended installation location of the Visiport. Temporarily attach one end of the flex conduit to the terminal base fitting in the machine and extending the rest of the flex conduit along the path to which the conduit will be secured. The other unsecured end of the flex conduit should easily reach the point the Visiport will be bonded to the window.

#



Window Surface Preparation

Cleaning:

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.

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

For New Windows

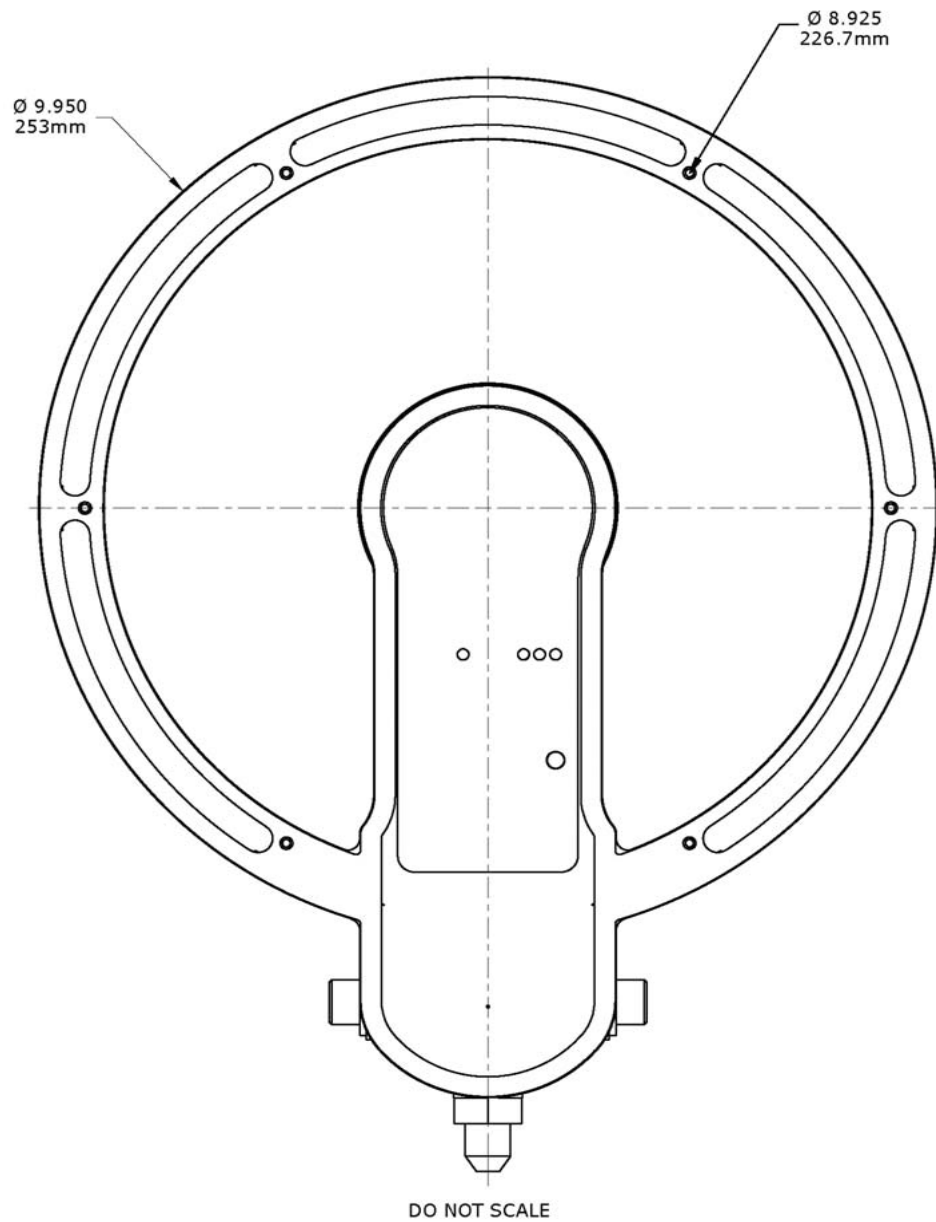
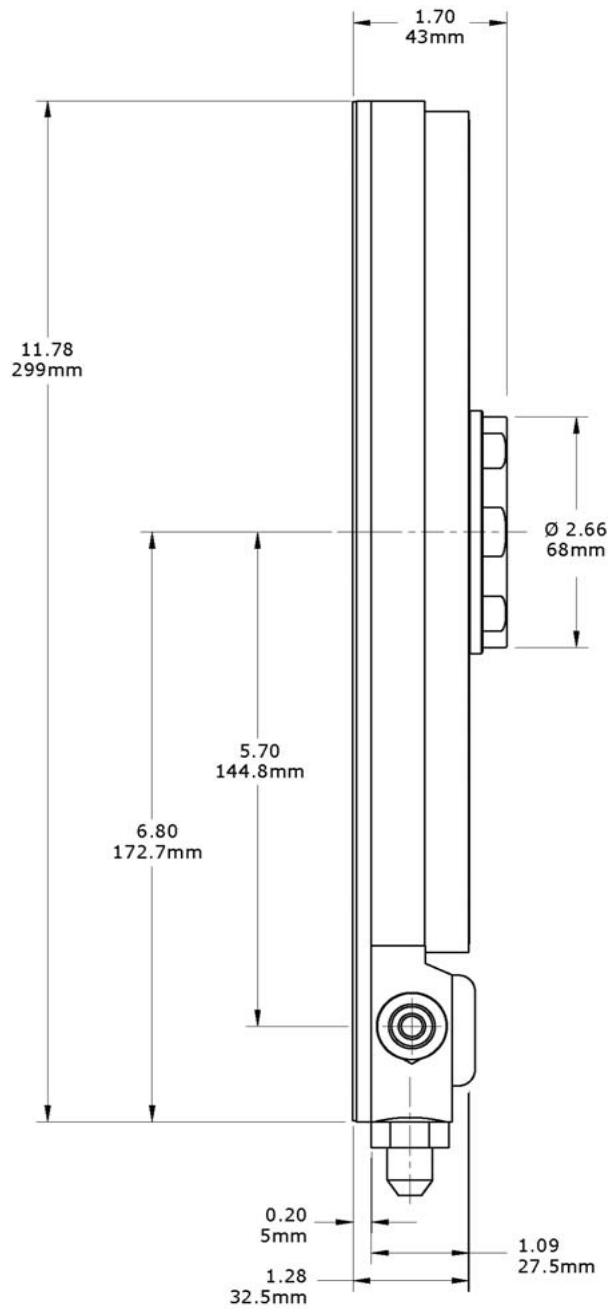
- Clean thoroughly with 50% water and 50% isopropyl alcohol solution.

For Contaminated Windows

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

Bonding The Visiport

1. Remove the glass disk by taking off the hub cap and removing the four disc screws using the supplied torx wrench. The unit should look as pictured in Figure 4b when complete.
2. Use a marker to make a vertical reference line on the operator's side of the window extending down through the center of the intended installation location. Make sure that the line is on the outside of the machine window, and that it remains visible when looking out through the window from inside the machine. The reference line will be used to help install the spin window system in a straight and vertical manner.
3. Align the 4-40 screw hole at the top of the center base section and the fitting in the bottom of the center base section to the vertical reference line on the far side of the window.
5. Strip off the backing paper from the bonding set. Do not touch exposed bonding surfaces.



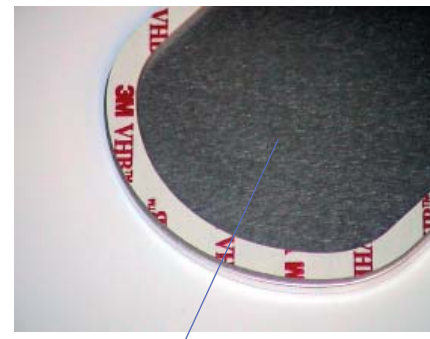
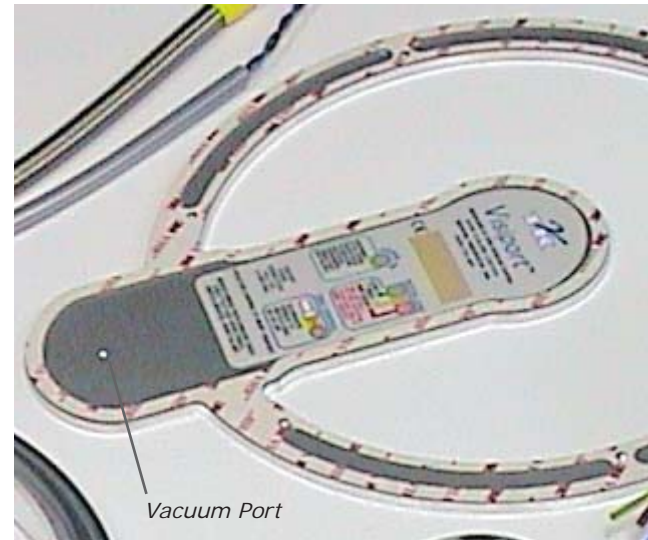
Installation Vacuum Pump

In order to accelerate the wetting out process (conformance of bondset material to the substrate surface), T2K offers a hand-held Installation vacuum pump. For more information or to order, contact customer service about part number 2209001. For all Visiport® B-Type models received equipped with the standard Mounting plate, use of the vacuum pump is easily performed after initial application of the mounting plate to the window substrate. Follow steps C through F below only.

The following Installation vacuum pump procedure is for Visiport® B-Type units received without a Mounting Plate, e.g., Visiport® 220.B5.HM, where the VHB is applied directly to the Visiport® base for direct bonding applications.

- A. Remove the universal connector cover using an X-mm Allen wrench.
- B. Carefully remove the terminal block by taking out the central screw using the supplied T-10 Torx L-Key wrench. Set terminal block aside.
- C. Moisten and place the hand held vacuum pump's suction cup over the vacuum port.
- D. Pump down by hand to 27 in. (68 cm). Watch for leaks as indicated by the vacuum gage.
- E. Keep vacuum applied 1 hour. Pump handle periodically as gradual vacuum loss is normal.
- F. Bleed off vacuum and remove pump.
- G. Carefully install terminal block in cavity without pinching pigtail wires. Secure central screw and replace Universal connector cover.
- H. **IMPORTANT:** Apply a small bead of supplied silicone sealant around the entire circumference of the Visiport® to form a seal between the Visiport® base and the machine window. The silicone sealant provides the bonding interface protection from metalworking fluids. Failures in bonding due to failure to apply the silicon rubber are not covered by the manufacturer's limited warranty.
- I. **IMPORTANT:** Apply a small amount of supplied silicone sealant to the vacuum port of the mounting plate to plug this hole from allowing coolant to seep into the bondset protected area of the window. This is unnecessary for the vacuum port in the Visiport base, as the Terminal Block mounting screw is supplied with a silicone coating seal.

To complete the Visiport installation, proceed to: "Terminal Block Assembly".



Standard Mounting Plate Vacuum Port.
Important: Seal after installation.



Vacuum Port in Visiport® Base.
(For M-Code installations only)

Auxiliary Bonding Method

This auxiliary attachment method is for customers requiring bolt mounting of the Visiport® in addition to attachment with the VHB adhesive. This auxiliary method is detailed here only as a guide.

T2K DOES NOT WARRANT FAILURES OR BREAKAGE OF COMPONENTS FROM INSTALLATION FAILURE USING THIS OR ANY OTHER ATTACHMENT METHOD.

Attachment of the Visiport to the window by the use of bolts is not recommended by T2K for several reasons:

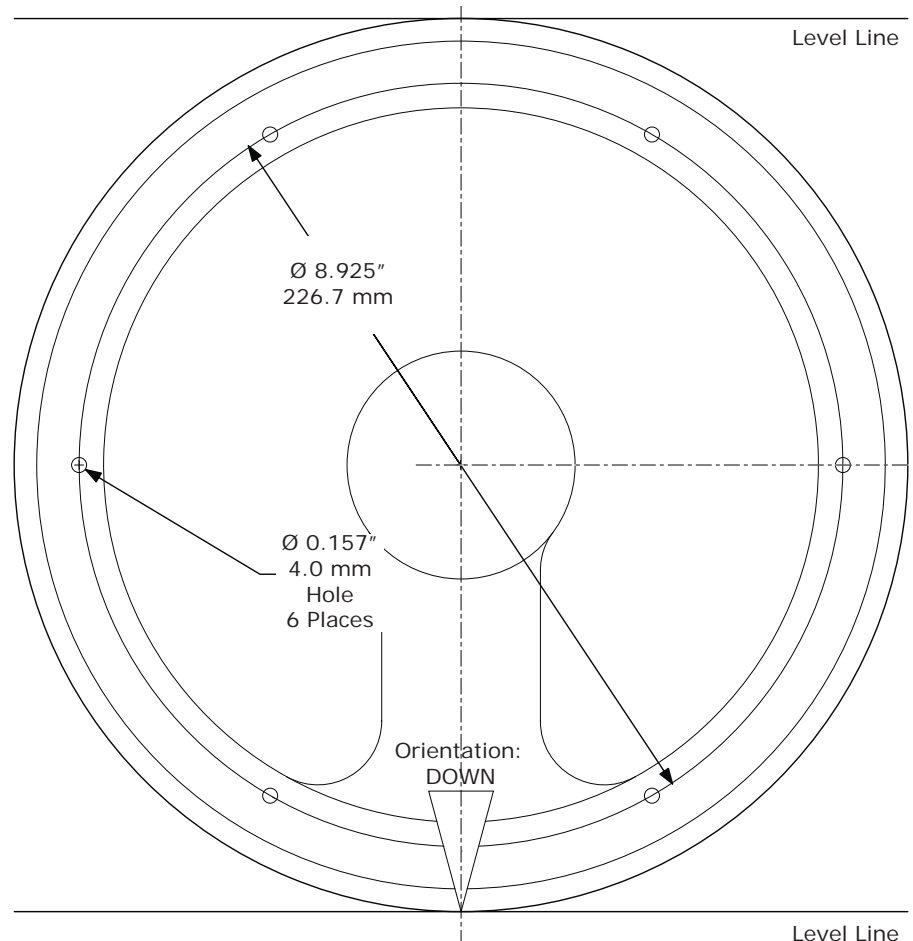
1. T2K has grave reservations about any method of installation that requires the user to put a hole into the window, regardless of size. Any size hole in the window promotes the invasion of metalworking fluids. Now that data regarding the embrittlement of polycarbonate windows over time has documented the need to maximize attention to the machine tool window to maintain safety, T2K strongly recommends that purely adhesive based methods be used to attach your Visiport®.
2. Testing of VHB adhesion using all type of window substrates, including siliconized polycarbonates sometime sold as mar- or scratch-resistant materials, demonstrates the effectiveness of VHB when used as directed. Reasons for bonding failure are explained in detail elsewhere in this manual, but generally result from lack of proper surface preparation.
3. T2K does not provide warranty for any components damaged through the use of this bonding method.

(Skip to next step if not using this option.)

For siliconized polycarbonate windows, customers have the option to install the Visiport with M4 button head screws and fender washers, as shown on the M4 installation drawing. (See Figure.)

Due to varying thicknesses of polycarbonate windows, T2K does not provide screws. Calculate the required screw length by using the provided formula.

- A. Align the drill template (available by special order from T2K) to the machine window so that it is square to the window frame.
- B. Temporarily tape or otherwise secure the template into drill position.
- C. Drill 6 each 4.0 mm holes on 8.925" dia. between centers.
- D. Temporarily install the three M4 set screws from the kit. Insert the set screws with the socket end facing out, equally spaced at 120°, by hand about 2 turns into the Visiport® base. These set screws are only used for alignment of the spin window.



Determining Screw Lengths for Auxiliary Method

Screw Length in mm: $\text{Length} = (t + k) + 2$

t = Polycarbonate Thickness (recommended minimum 10-mm)

k = Thread Engagement (min. 4-mm - max. 8 mm)

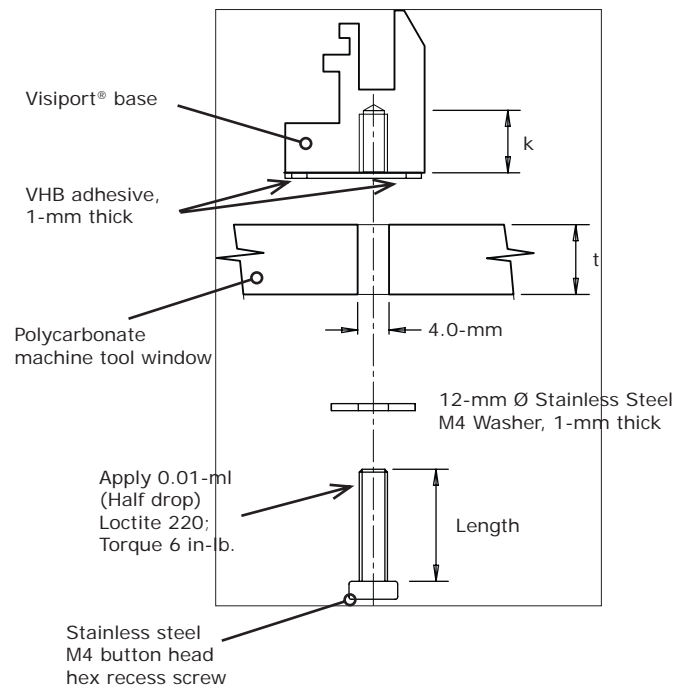
1-mm VHB adhesive + 1-mm Washer = 2-mm

Example: $\text{Length} = (10 + 4) + 2 = 16\text{-mm}$

Standard Metric screw length:

12-mm, 14-mm, 16-mm, 20-mm, 25-mm, 30-mm

Custom screw lengths are rarely required



Terminal Block Connection

Note: If you have ordered a wire harness from T2K with North American wire colors (Red, Black) rather than Harmonized wire colors (Brown, Blue), please substitute Red for diagrams and illustrations showing a Brown wire, and Black for Blue wire. (Warm for warm color, cold for cold color).

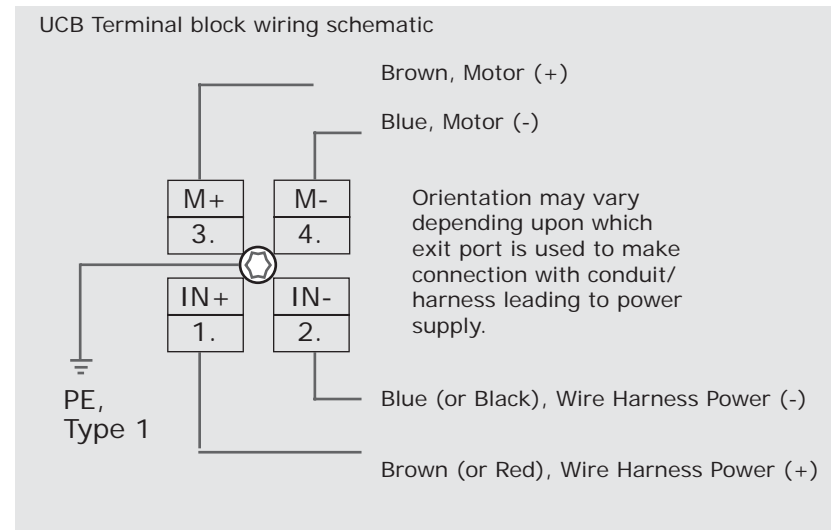
1. Remove the Universal Connection Block (UCB) Cover by using a 5/16" or 8-mm Hex Key as pictured.
2. The Brown and Blue wires from the Visiport® motor pigtail are already threaded through the base and are connected to the terminal block. It is not necessary to disconnect the motor pigtail wires.
3. The Visiport® is designed for left, right, or bottom wire harness exit. Simply install the fitting type desired into the threaded port corresponding to the desired exit direction. Take into account the orientation of the Visiport® as installed on the machine window. Fitting options include the H-Fitting (for 1/2"-20 flex conduit), N-Fitting (for 8-mm PUR tubing), or G-Fitting (EO-type for use with metric steel tubing).
4. After the fitting is secure, thread the wire harness through the fitting into the base, and install each wire into its color matched terminal. Push the wire harness, already threaded into the conduit, through the fitting and into the UCB cavity. Attached the wires to the cartridge terminal block, connecting brown to IN+ and blue to IN- as pictured below.
5. **Proceed to step 6 unless you require a PE terminal in the Visiport® unit**

Type 1: Connect the grounding wire by removing the central terminal block screw. Wrap the grounding wire once around the terminal block screw between the two aluminum washers. Replace the screw into the center of the terminal block and screw down securely. Do not over-tighten the screw. (The screw end should not project out the bottom of the base.) The terminal block screw is nylon-coated to keep the hole in the base watertight. The terminal screw hole can also be used as a vacuum port for non-standard M code units.

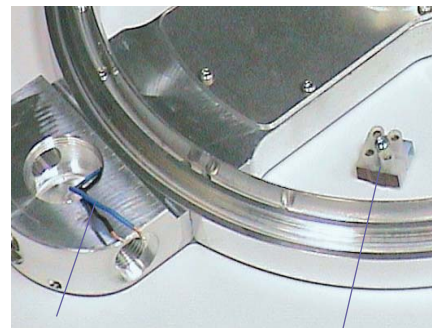
Type 2: Insert grounding wire into the grounding hole provided inside the UCB Cavity to the left of the motor pigtail entry hole.

6. Replace the UCB Cover, and complete the assembly of the conduit or tubing into the fitting to create a watertight seal against metalworkign fluids.

#



Terminal block (installed) Exit port



Motor pigtail Terminal block (removed)



PUR tubing Exit port plug fitting

Connecting Harness to Terminal Box

This procedure assumes that the wire harness has been threaded through and installed into the conduit type chosen (Flex conduit, PUR tubing, or solid pipe) and that the electrical connection of the harness to the Visiport base inside the UCB cavity has been made.

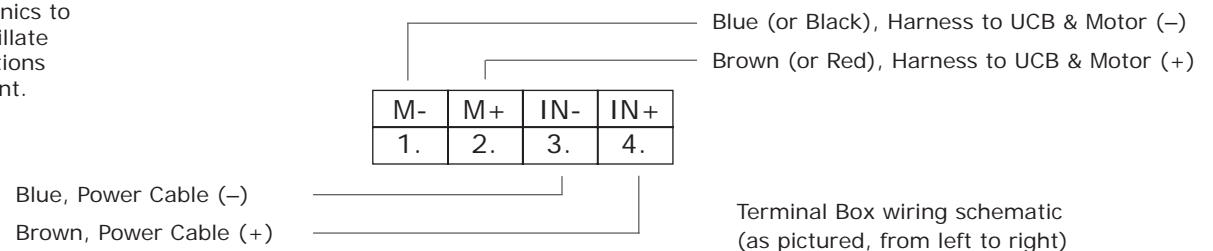
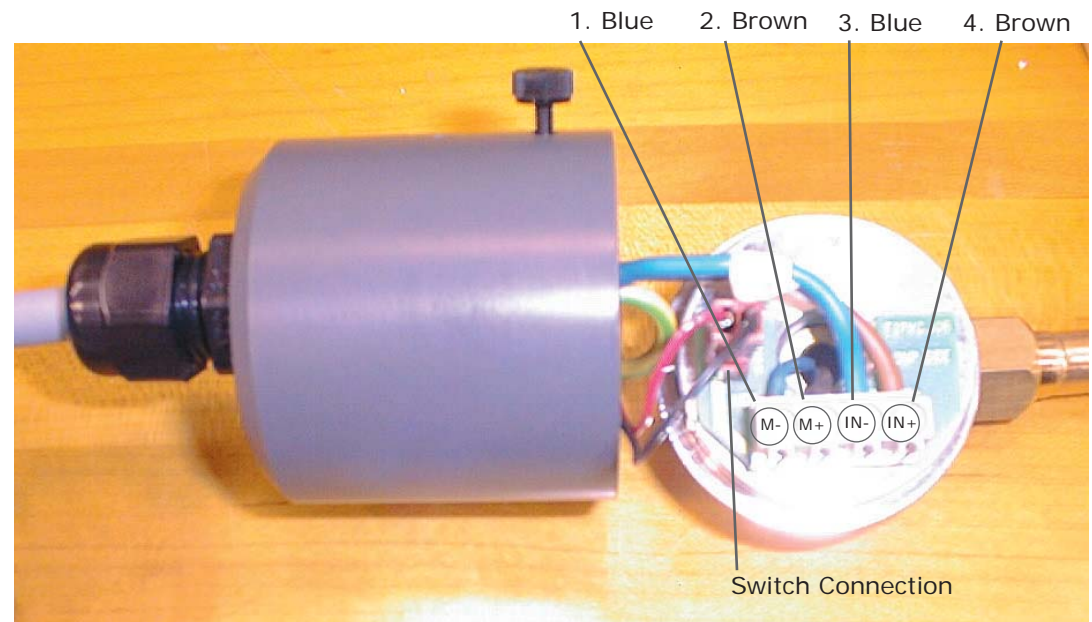
1. Install the Visiport® spin disc according to the Visiport Disc Removal and Replacement Procedure.
2. Remove the cover from the Terminal box and attach the keyed switch connector to the 2-pin header on the aluminum terminal base.
3. Push the wire harness through the terminal box fitting (H, N, or G) and temporarily connect the conduit to the fitting. At the terminal block, connect the two wire harness wires to M+ and M- as shown.
4. Loosen the strain relief fitting on the top of the terminal box, and insert the power cable through the top of the strain relief far enough that the wires can be easily connected to the terminal block inside.
5. At the terminal block, connect the two power cable wires to IN+ and IN- as shown. If a PE connection is required, secure the yellow/green striped conductor of the power cable and customer supplied wire harness section of the grounding wire together using a wire nut (not supplied) of the appropriate size for two 16-18 gage wires.
6. Back off any excess power cable through the strain relief so that there is enough uninsulated wire inside the terminal box to coil inside properly and without risk of pulling them out of the terminal strip.
7. Place plastic terminal cover back onto junction box. Tighten knurled securing screw and strain relief. Tighten all flex conduit and solid pipe fittings using two wrenches.
8. Hook up power cable to the machine 24 VDC power source, or T2K optional power supply, with the Brown power cable wire to Power (+) and Blue to Power (-). Turn on power using toggle switch.
9. With no coolant load, the Visiport should ramp up to full speed within 1-2 seconds. It is normal for the electronics to "seek" the preset 2100 rpm speed and appear to oscillate during the start-up, especially under operating conditions where coolant or other metalworking fluids are present.

If Visiport® disc does not rotate, set toggle switch to off and then switch back to the on position. If disk still does not rotate, double-check all electrical connections, and check for continuity and 24 VDC at the power supply and at the terminal box.

The machine power supply must be capable of delivering the following amperage for inrush and maximum load performance:

5 amps (Visiport® 220.B5 and 180.B5) for EACH installed unit.

This concludes the Visiport installation.



Operation of Visiport

When the unit is first turned on, it does not start until the power supply voltage is sensed at the required minimum, at which time LD1 (Power LED, Green) is turned on whenever the input power supply is present.

Three multipurpose LEDs (LD2, LD3, and LD4) are turned on according to operation mode. During the brief power on reset period, only LD4 (Red) is turned on, and then after the power-on reset period all three status LEDs, LD2 (Green), LD3 (Yellow), and LD4 (Red) are turned on in sequence.

When one or multiple alarm conditions occur or the photo-optic light sensor is flashed once, the unit is in STOP/ALARM mode. The unit can be reset or restarted by flashing the ambient light sensor once again.

Three LEDs are added to display current/torque level. Green, yellow, and red LEDs are turned on when the following conditions are met.

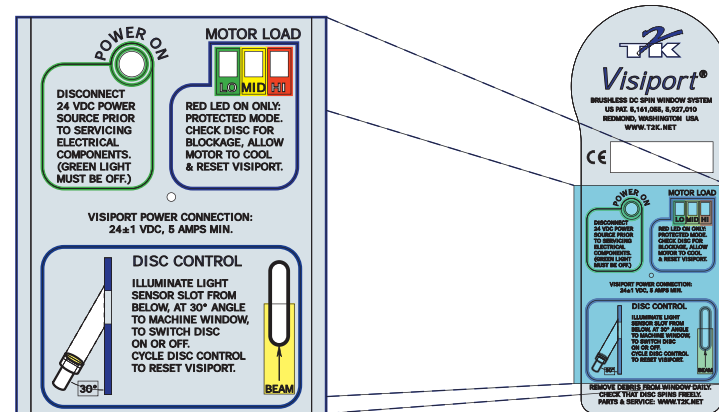
Green is lit when operating under 20 oz-in of torque. Yellow is lit when operating from 20 to 40 oz-in of torque, and Red is lit when operating over 40 oz-in of torque. This is considered excessive load. Momentary Red light indications are normal and do not indicate a problem.

If unit has otherwise been running normally, a Red light showing excessive load indications for an extended period of seconds through a constant display indicates a blockage or chip accumulation in the labyrinth of the disc seal between the disc assembly and the base of the unit. Maintenance to clear or clean away blockages and chip accumulations is required to restore the unit to proper function. Failure to clean the unit could lead to motor failure.

When the motor is operated under excessive load, it is protected by both a current limiting circuit and over temperature protection. Current Limiting can be observed by the fact that the spin window begins to slow down under excessive load. If the motor continues to operate at the constant Red light level, the operating temperature of the motor's windings will tend to increase.

At a winding temperature of 150°C, the motor will be shut down and the disc will cease to rotate. After the over-temperature shutdown, the winding must be allowed to cool to below 130°C and restarted by flashing a light at the sensor.

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LEDs and photo-optic light sensor locations

Disc Removal and Replacement Procedure

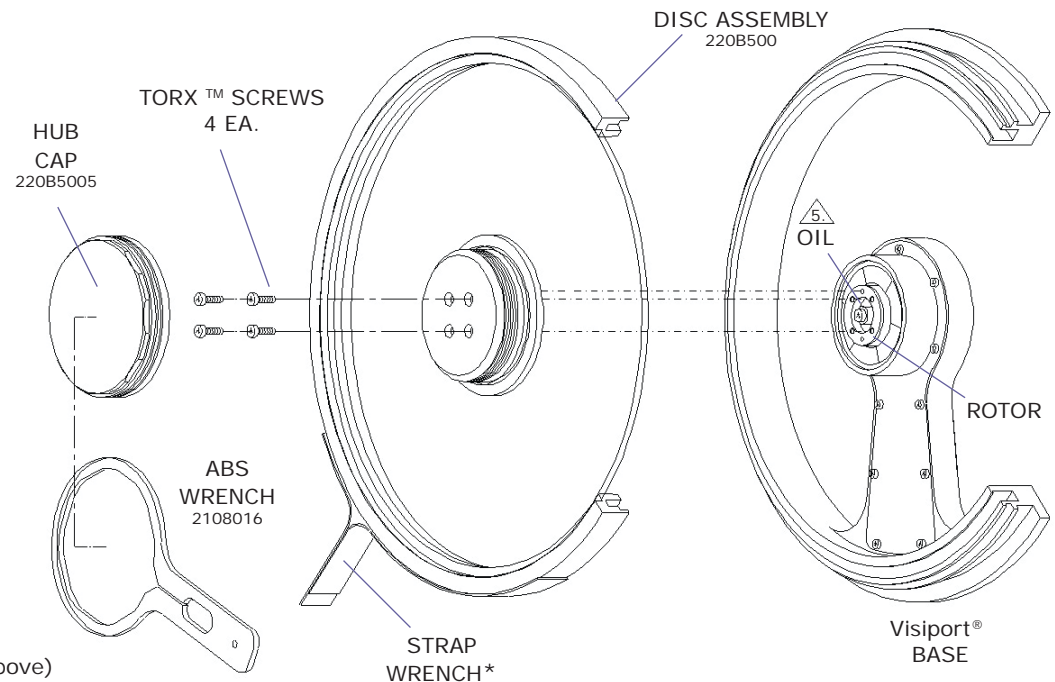
SAFETY PRECAUTIONS: READ BEFORE SERVICING Visiport®!

1. Turn off the Visiport® unit prior to servicing disc. If the removal procedure is to be undertaken as part of system maintenance or troubleshooting, due to the possibility of contact with metalworking fluids, please disconnect electrical power from Visiport® at the power supply and use appropriate safety precautions and procedures.
2. Use appropriate protective equipment and caution when working with glass disc! Chemically strengthened glass does not shatter like tempered glass. Use hand and eye protection whenever exposure to the glass disc is possible.
3. Visiport® B-Type models use high strength magnets and generate 50 oz-in of torque in operation. Incidental contact when servicing the machine should be avoided at all times. **DO NOT ATTEMPT TO STOP THE SPIN DISC BY HAND!** Use the on-off toggle switch, light sensor switch, or soft-key switch provided by the builder of your machine tool to turn off the device before servicing.
4. Remove Hub Cap with ABS Wrench by turning counter-clockwise. Restrain the Disc Assembly with a strap wrench if necessary.
5. Unscrew the 4 Torx™ screws using the T10 Torx™ L-Key.
6. Separate the Disc Assembly from Rotor with a straight pull not to exceed 5 pounds force.
7. Clean the mating surfaces of Rotor and the Disc Assembly.
8. Apply thin film of oil to Rotor inside diameter.
9. Orient the replacement Disc Assembly to the Rotor by using screw holes as a guide.
10. With the Disc Assembly parallel to the rotor, slowly press the Disc Assembly onto the rotor with a force not to exceed 2 lbs. Do not use the screws to draw the disk to the seated position.
11. Seat the 4 screws (about 5 turns) then torque to 12 inch pounds (about 1/6 turn further).
12. Rotate the Disc Assembly several turns by hand to assure that the Disc Assembly is running true.
13. Install Hub Cap (use ABS Wrench and strap wrench as described above) and torque clockwise until wrench slips or to 24 inch pounds.
14. The Visiport® may now be returned to service.

Deviation from these instructions may result in personal injury and/or damage to the VISIPOINT. Exercise caution when working with the glass disc at all times as any damage to disc is not covered by warranty.

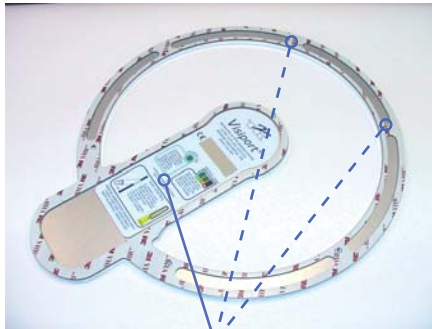
Tools required:

1. T-10 L-Key Torx™ driver
2. ABS Wrench
(Both from VISIPOINT tool kit.)
3. Strap wrench (*supplied by customer; to immobilize disc if required).
4. A torque indicating handle set to 12 inch pounds is recommended.

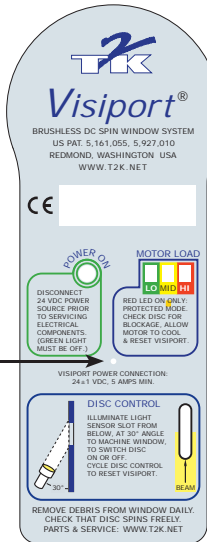


Model Production Changes

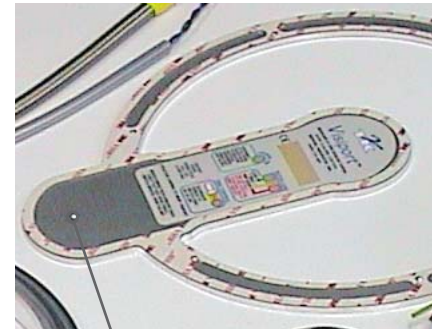
Current Model Version



Vacuum openings, Type 2
Middle of label, one of two top mounting plate holes (plug the other to retain vacuum).

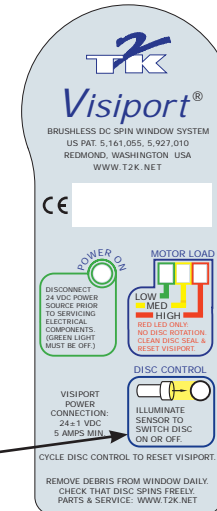


Early Model Version

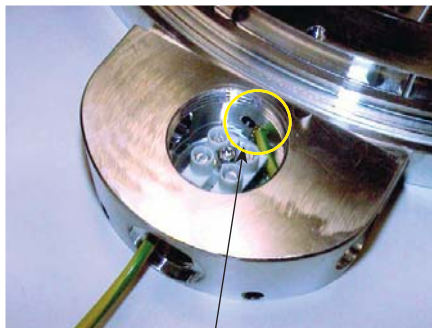


Vacuum opening, Type 1

Opto-Switch, Type 1



Current Model Version



Type 2 Grounding, PE-Connection

Early Model Version



Type 1 Grounding, PE-Connection.
Remains usable on current version

Visiport®

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Visiport® products are covered by one or more of the following US patents: 5,161,055, 5,927,010.

Visiport® is a registered trademark of TOOLING 2000.

Please call your distributor or TOOLING 2000 with technical questions or to order spare parts. Parts may also be ordered directly from T2K at the www.t2k.net web site.

Visiport® Model 220.B5
Installation Manual
Part Number 220B9500,
Revision 2006.1

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