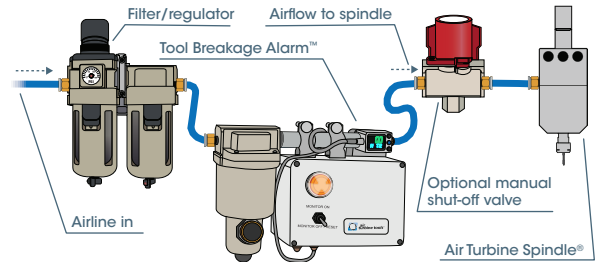


### Pre-Installation

1. Ensure Air Supply is turned off before installing the Tool Breakage Alarm™ monitor.
2. Mount monitor and filter on to your CNC.
3. Connect the airline to the filter supplied with the spindle to the airline from your compressor. From the filter connect the air line into the Tool Breakage Alarm™ monitor inlet port as shown in **figure 1**.
4. From the system monitor, connect the airline to your **Air Turbine Spindle®**.
5. **OPTIONAL:** Connect the alarm output port to your control and program for the Tool Breakage Alarm™ monitor to stop your program.



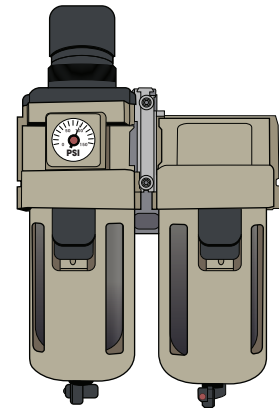
**Figure 1:** System monitor airline diagram showing the connection from a filter/regulator to the Tool Breakage Alarm™ and then to the Air Turbine Spindle®.



**WARNING**  
Connection to air supply starts spindle rotation.

### Initial Airline Setup

1. Ensure your air supply is adequate and set regulator at 90 psi/6.2 bar at the CFM, L/s specified flow rate for your **Air Turbine Spindle®** as shown in the table in **figure 5 on the next page**.
2. Ensure all hoses, couplings and connections have the minimum internal diameter specified for your spindle. Refer to **figure 4 on the next page** for the specific minimum size ID required for your model.
3. Set your machine spindle control for zero spindle rotation and close the machine door securely.
4. Connect the system monitor power cord to 120 volt outlet, confirm that the air supply on/off switch is in the 'off' position.

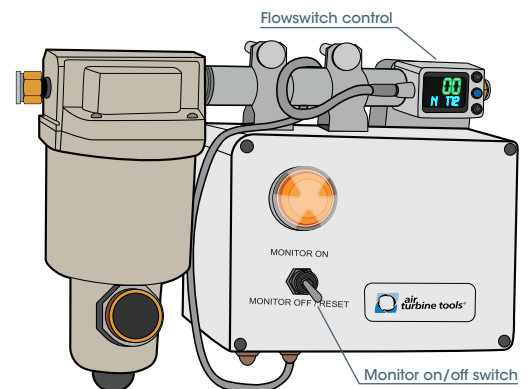
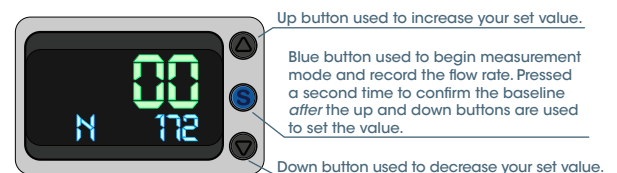


**Figure 2:** Ensure the filter/regulator properly set to 90 psi/6.2 bar.

### Record Baseline Air Consumption and Start your Monitor

1. Turn on the air. Record the baseline cubic feet per minute/liters per second air consumption running while your spindle in idle for 5 minutes with no cutting load or until the CFM/ L/s flow is stable.
2. On the flowswitch control, press the center blue button to begin measurement mode to record air flow rate while there is no load.
3. Press the up and down buttons on the flowswitch control to change the top value to match the baseline number displayed on the flowswitch control.
4. Press the blue button for the second time to confirm and fix your baseline.
5. Start your program on your CNC control and start cutting.
6. Flip the switch on the front of the system monitor to the 'on' position.

If your tool breaks or your compressor malfunctions the system will activate the light and klaxon. If connected to your CNC control and properly programmed, the system monitor will stop your machine.



**Figure 3:** Diagram of the flowswitch control and system monitor.

**Questions? Call +1 561-994-0500 or email [ask@airturbinetools.com](mailto:ask@airturbinetools.com)**

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### Air Hoses and Fittings Requirements

Avoid fittings, couplings and hoses with a smaller internal diameter than the minimum required for your model. Any connections smaller than the minimum will restrict air flow and reduce power to your Air Turbine Tool®. You can find the minimum required internal diameter (ID) for fittings and hoses for your tool on the table shown in **figure 4**.

Air flow restrictions (such as air leaks and obstructions) cause under power performance and drags your tool through the material, damaging the bearings. **Some fittings with nominal internal dimensions may have an ID passage that is smaller than stated and restrict air flow and power.** It only takes one fitting with an internal diameter that is too small to reduce air flow and power of your Air Turbine Tool®.

#### General Air Fitting Dimensions

- › **1/4" male > ID** - Usually 0.210" but some variations occur.
- › **1/4" male (high flow, harbor) ID** - 0.277" with 1/4" NPT male thread.
- › **3/8" male hole** - 0.283" to 0.285" with thread of 3/8" - NPT (internal ID of female mating OD appears even smaller ID).
- › **1/2" male hole** - 0.375" (0.655" OD).

#### General Hoses

Actual internal diameter on brass fittings (i.e. swedged on ends) of standard Goodyear, etc. brands of 1/2" & 3/8" hose have various internal dimensions. As an example, Goodyear 1/2" Red hose with 3/8" / 9.5mm NPT fitting has an internal diameter hole of 0.282", which is sufficient for models that require a minimum ID of 6mm, but not for models that require a minimum ID of 8 mm. Goodyear black 3/8" / 9.5mm hose has internal diameter hole on swedged fittings of ~0.265" and is suitable for models requiring a 6 mm ID or smaller.

Model	Hose/Connector Minimum Required Internal Diameter	
	Metric	Imperial
› 600X › 601 › 602	4 mm	5/32"
› 625	6 mm	15/64"
› 625X › 650 › 660	8 mm	5/16"
› 650X	10 mm	2/5"

**Figure 4:** Air Turbine Tools® hose/fitting/connector internal diameter specifications.

### Idle CFM / L/S Rating V.S Working Air Consumption Ratings

Air Turbine Tools® consume more air as the cutting load or the amount of material removed increases. This is normal operation of our patented governor which maintains high speed on your tool path and makes Air Turbine Tools® efficient in air consumption.

Air Turbine Spindles® Idle CFM (L/S) and Working Air Consumption Ratings			
Model	Speed RPM	Air Consumption Idle CFM (L/S)	Air Consumption Working Flow (L/S)
600X	65,000	3.5 (1.65)	5 (2.36)
	80,000		
601, 602	40,000	4.5 (2.1)	5 (2.36) - 6 (2.83)
	50,000		
	65,000		
	90,000	5 (2.36)	
625	30,000	12 (5.66)	11 (5.19) - 20 (9.44)
	40,000	14 (6.61)	
	50,000		
	65,000	16 (7.55)	
625X	30,000	16 (7.55)	22 (10.38) - 30 (14.16)
	40,000	20 (9.44)	
	50,000		
625XVS	30,000 - 50,000	12 (5.66) - 20 (9.44)	11 (5.19) - 30 (14.16)
650	25,000	13 (6.14)	14 (6.61) - 35 (16.52)
	30,000	18 (8.49)	
	40,000		
650X	25,000	14 (6.61)	19 (8.97) - 40 (18.89)
	30,000	20 (9.44)	
	40,000	23 (10.85)	
650XVS	25,000 - 40,000	13 (6.14) - 23 (10.85)	14 (6.61) - 40 (18.89)
660	50,000	20 (9.44)	20 (9.44) - 35 (16.52)

**Figure 5:** Idle CFM (L/S) and working air consumption ratings for Air Turbine Spindles®

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