



Compliant Deburring Tool for Robot User's Quick Guide

AC100F



Website



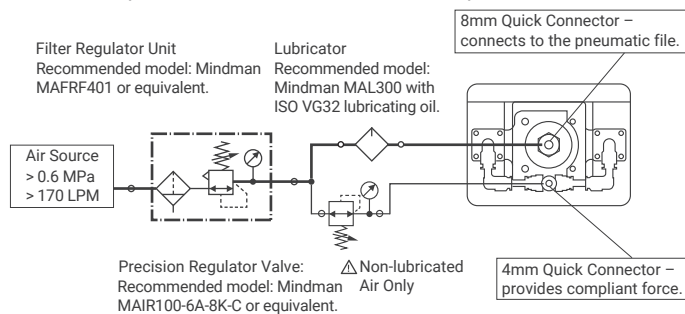
Youtube

Maintenance

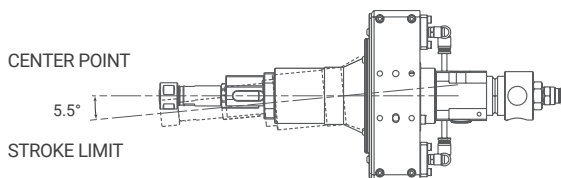
- Daily:** Check whether the grinding tool is damaged or wore, replace it immediately when it has invalid. Check air conditions and make sure the filter cup is not full of water, drain it in time. Check the lubricating oil drip rate is normal.
- Weekly:** Ensure the spindle operates smoothly without weird noises. Make sure compliant tool movements work smoothly, and the spindle is able to return to the CENTER POINT. Shake the spindle gently by hand at the CENTER POINT, and the mechanical gap should be less than 0.5mm. The spindle should be able to reach both forward and backward LIMIT POSITION. If any defect is discovered, please contact your supplier.

Before Use

- Prepare a suitable air source as shown as the illustration below. The maximum flow rate of the thick lines should exceed the air consumption of the pneumatic tool. For model AC100F, please refer to the dimension drawing. The spindle air connector uses an 8mm outer diameter tube, and the compliant force connector uses a 4mm quick connector.



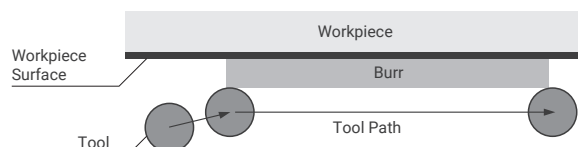
- Check the CENTER POINT (*1) first; giving 0.2 MPa pressure to the compliant force connector while the spindle is turning off. Make sure the spindle is able to return to the CENTER POINT as shown as the illustration below. Please contact your supplier if it couldn't return to or is not on the CENTER POINT.



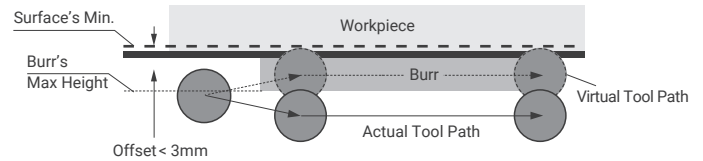
- Turn the spindle on when it is on the CENTER POINT, and listen to its high-frequency sounds. If there are any other low-frequency sounds or noises, or if the spindle doesn't rotate or is not smooth, please contact your supplier.
- Install the compliant tool on the robot or a fixed position by screw holes and pin holes on the mounting plate (*2).
- Set up TCP (Tool Center Point) of the compliant tool in the robot controller by using either the designed dimensions or the four-point calibration method (*3).
- You have finished the pre-use preparation, now you can start teaching-in robot paths or run auto path generation.

Path Teaching Guidelines

- Return the pneumatic file to the CENTER POINT and move it along the workpiece (*4). Teach-in a path to keep the acting point of the cutter precisely in contact with the burrs and the areas that need to be removed.



- Set an offset (virtual depth of cut) along the path of the cutter that you just taught-in. The purpose of the offset is to prevent the tip from detaching from the workpiece, and to provide a stable contact force (compliant force). The key to setting an offset is to imagine a virtual path of the cutter at the CENTER POINT. The offset should be greater than the total tolerance to be absorbed, but less than 3mm to avoid collision with the STROKE LIMIT.



- If the burrs were too high to set an offset smaller than 3mm, it may be necessary to repeat the action several times over the corresponding paths, and each time bringing the virtual depth of cut of the CENTER POINT closer to the final position.
- If the robot path is curved, it may need to use more path points than a straight robot path. Slow down the robot when the burrs are large, speed up when they are small. Before officially activating the deburring operation, make sure the path of the robot works smoothly.

Operation

- Set the compliant force to a small value, such as 0.2MPa, then start operating the deburring process.
- Increase the compliant force if the burrs were not completely removed. If some burrs were removed but others remain, slow down the robot in the corresponding segments. If the cutter cuts too deep, reduce the compliant force or increase the robot speed.
- If the tip bounces on the workpiece, this is because the compliant force has been set too small. Increasing the compliant force or slowing down the robot will solve this issue.
- If the pneumatic file is blocked during operation, it may be caused by the high material removal rate. Reducing the compliant force or slowing down the robot will solve this issue.

Cautions

- This product is exclusively designed for robot deburring work, DO NOT use it for other purposes.
- For your safety, DO NOT approach the robot when it is in automatic operation mode.
- Tips and burrs could cause injuries, be cautious when working with them.
- Tips and compliant tools could be damaged by collision. Always check the robot paths before setting it to automatic operation mode.
- Compliant tools could be damaged by severe bouncing of the tips on the workpiece. Always perform checks before setting it to automatic operation mode.
- The air supplied to the precision regulator and compliant force should NOT be lubricated, otherwise, the compliant tools will be damaged.
- The noise from the deburring operation could damage your hearing, always wear ear protection during work.
- The file should only contact the workpiece from its side. Any contact in a direction other than the compliant direction, including the tip or the non-compliant side, will result in damage to the mechanism and is not covered under warranty.

Appendix

Compliant Stroke	(°)	± 5.5
Compliant Force	(N)	6-15
Compliant Pressure	(MPa)	0.2-0.5 (2-5 bar)
Spindle Pressure	(MPa)	≥0.6 (6 bar)
Air consumption	(LPM)	Compliant force: neglectable, Pneumatic File: 170
Lubrication	(drops/min)	1-2 (Only for pneumatic spindle)
Reciprocating Frequency	(bpm)	5000
Reciprocating Stroke	(mm)	10
Collet Size	(mm)	Ø6
Ambient Temperature	(°C)	+5~35
Ambient Humidity	(%)	<95
Weight	(kg)	2

- *1. The CENTER POINT may not align exactly with the designed position. A tolerance or gap smaller than 0.5mm is normal.
- *2. Please contact your supplier to obtain the 3D and 2D drawings of the compliant tool, or download them from our website.
- *3. It is recommended to begin with the designed dimensions and then use the four-point calibration method to refine the TCP accuracy. When implementing the four-point calibration method, use a sharp dummy tip to indicate the desired TCP point.
- *4. The robot can either hold the workpiece or the tool, depending on system integration requirements.