

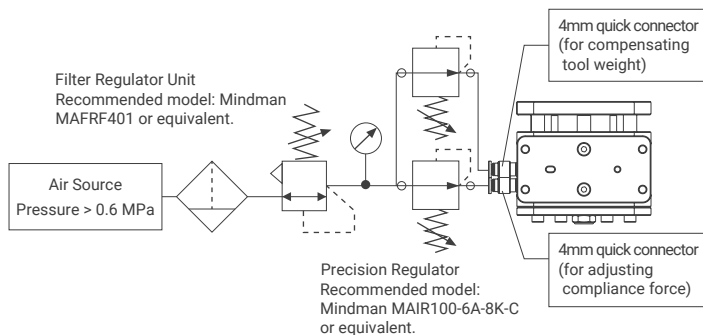


Maintenance

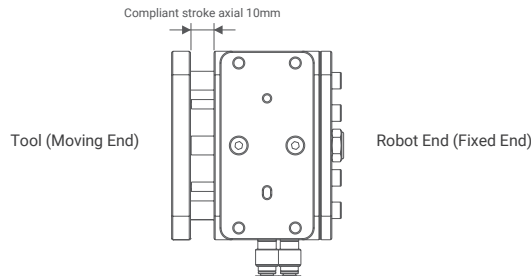
- Daily:** Check whether the grinding tool is damaged or wore, replace it immediately when it has invalid. Check air conditions and make sure the filter cup is not full of water, drain it in time. Check the lubricating oil drip rate is normal.
- Weekly:** Ensure the spindle operates smoothly without 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 the appropriate air supply as shown in the diagram below.



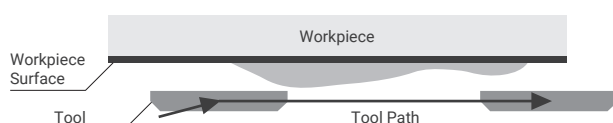
- Check the CENTER POINT (*1) first; giving 0.2 MPa pressure to the compliant force connector while the spindle is turning off. Make sure the spindle is able to return to the CENTER POINT as shown as the illustration below. Please contact your supplier if it couldn't return to or is not on the CENTER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



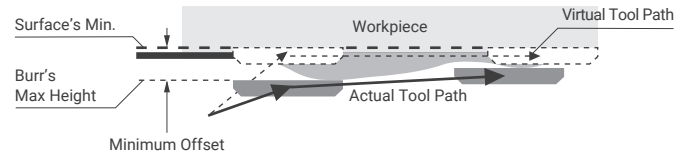
- If the compliance tool is horizontally mounted, the compliance force is roughly proportional to the input pressure. If mounted vertically downward (with the grinding tool at the bottom), the resulting force on the workpiece is the sum of the grinding tool weight and the compliance force. When deciding on the LCZ100 installation method, please consider the range of the compliance force.
- Mount the compliance tool onto the robot arm or a fixed position using the screw holes and positioning pin holes on the fixed end mounting plate. (*2)
- Install your grinding tool onto the movable end flange using the screw holes. You will need to design an appropriate fixture based on the shape of the tool.
- The direction of contact between the grinding tool and the workpiece must be parallel to the motion direction of the compliance tool.

Path Teaching Guidelines

- Keep the compliance tool fully extended, then teach the robot path so that the grinding tool just touches the area of the workpiece that needs to be grinded without interference (*3).



- Add an offset (virtual cutting depth) to the previously taught path. The purpose of setting this offset is to prevent the tool from losing contact with the workpiece and to provide stable contact force (compliance force). The key to setting the offset is to imagine the virtual path that the grinding tool would follow when the compliance tool is fully extended. This offset should absorb all dimensional errors, including the depth to be ground, but it should not be set too large to avoid over-grinding at the starting contact point or hitting the compliance tool's stroke limit.



- If the grinding amount is too large to be completed in one pass, the same path can be repeated multiple times.
- If the robot path is curved, it may require more path points than a straight path. Additionally, adjust the compliance tool's direction to align with the workpiece surface normal for optimal grinding results.
- When the tool contacts the workpiece, only axial movements (forward and backward) are allowed.

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

Model	LCZ100	
Compliant Stroke	(mm)	Unidirectional 10mm
Compliant Force	(N)	10~30
Compliant Pressure	(MPa)	0.2~0.5 (2~5bar)
Air Supply	(MPa)	≥0.6(6bar)
Air Consumption	(LPM)	Compliance Force: N/A
		Pneumatic Spindle: N/A
Lubricant	(drops/min)	N/A
Pneumatic Spindle Speed	(rpm)	N/A
Collet Size	(mm)	N/A
Ambient Temperature	(°C)	+5~35
Ambient Humidity	(%)	<95
Weight	(kg)	1.2

*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. The robot can either hold the workpiece or the tool, depending on system integration requirements.