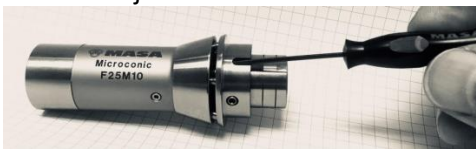


Instructions for Use of Microconic F##M10 Cartridge and Microconic Collets

Install Microconic Cartridge In Machine:

Step	Action	Notes
1	Put machine in safe state for changing of collet	Follow manufacturer's recommended procedures.
2	Remove spindle nose cap and collet	Machine should be in "open collet" state.
3	Remove spring	Store the spring in a safe place for future use with legacy collets. (The spring will interfere with proper function of the Microconic cartridge.)
4	Clean spindle taper and Microconic cartridge	Carefully wipe the seating surfaces to assure no particles are present.
5	Insert Microconic cartridge into spindle	
6	Install spindle nose cap	Tighten normally.
7	Adjust machine collet closer	Adjust machine collet closer for medium-firm force when in "closed" state. Set adjustment by the standard method for the machine. (Note that actual collet force will be controlled later by the Microconic cartridge.)
8	Verify runout/concentricity	Make sure machine is in "closed collet" state. Test the concentricity of the machine spindle by indicating the extended nose of the Microconic cartridge. The Microconic cartridge is precision ground to gage-like tolerances. Runout less than 3 μm (.0001" inch) is typical for a machine in excellent condition. If worse, try re-cleaning and reinstalling the cartridge.

Install Microconic Collet Into Cartridge:

Step	Action	Notes
9	Put machine in safe state for changing of collet	Microconic cartridge should already be installed per prior steps.
10	Put machine in "closed collet" state	
11	Verify position of adjustment lock screw. 	Using the black handle Masa hex screwdriver, lightly tighten the adjustment lock screw and then loosen it ½ - 1 turn only.
12	Insert Microconic collet into cartridge	Make sure collet and cartridge are clean and free of debris particles. Rotate collet to engage key in keyway, and then continue rotating to engage the thread.

CONTINUED: Instructions for Use of Microconic F##M10 Cartridge and Microconic Collets

Step	Action	Notes
12a	OVER-GRIP ONLY: Screw-in collet until it stops See <i>OVER-GRIP DETAILED INSTRUCTIONS AND CAUTIONS</i>	**Machine must be in "closed collet" state** Screw the collet into the cartridge until it stops when it contacts the end of the cartridge. The collet should remain fully open .
12b	OVER-GRIP ONLY: Put machine in "open collet" state	
12c	OVER-GRIP ONLY: Tighten collet exactly 1¼ - 1½ turns	
12d	OVER-GRIP ONLY: Put machine in "closed collet" state	The machine will pull the collet into the cartridge and close it. Then proceed with the next steps, same as a standard collet.
13	Set collet to working diameter Adjust clamping force.	**Machine must be in "closed collet" state** a) Use supplied MicroGrad dial collet wrench with micrometer graduations (∅.02mm or .001"). b) Screw the collet into the cartridge until it closes tightly onto a gage pin the same size as your work piece. This is the "ZERO CLAMPING" position. Note the position of the graduations on the MicroGrad wrench. c) Back off 1 graduation, remove gage pin, then go back to the ZERO CLAMPING position. d) Now count the graduations as you tighten the collet. For a firm grip on solid workpieces typically a closure of about .08mm (.003") is a good starting point. Experience will soon teach the best settings for different applications. The closure amount is repeatable and can be recorded in the job setup plan for future setups to eliminate "trial and error".
14	Tighten adjustment lock screw	Using the black handle Masa hex screwdriver, moderately tighten the adjustment lock screw (do not over-tighten). CAUTION: Never leave wrench inserted – remove it immediately.
15	Prepare machine for use	Collet is now installed. Opening /closing of collet will be under normal machine control. IF OVER-GRIP: See "OVER-GRIP DETAILED INSTRUCTIONS AND CAUTIONS" for further usage instructions.

Remove Microconic Collet From Cartridge:

Step	Action	Notes
16	Put machine in safe state for changing of collet	Follow manufacturer's recommended procedures. Microconic collet should already be installed in cartridge per prior steps.
17	Loosen adjustment lock screw	Back out 1 turn maximum. Use supplied hex key wrench. CAUTION: Never leave wrench inserted – remove it immediately.
18	Remove Microconic collet	Use supplied MicroGrad wrench. Unscrew collet from cartridge.
19	(Done)	Ready to install another Microconic collet as needed.