

Auto Nozzle Changer

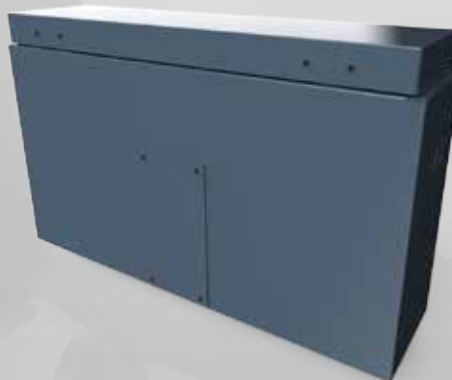
The most important part of fiber lasers is the cutting head. The cutting head ensures that the beam coming from the laser generator is made suitable for the cutting operation and the cutting speed, cutting precision and cutting quality are determined.

The nozzle, the most important component of the cutting head, allows the cutting gas to be transported coaxially with the laser beam to the cutting area and adjusts the gas pressure. The mouthpiece design defines the cutting quality of the cutting gas jet. The nozzle is selected according to the diameter of the mouth, the material type and the thickness of the sheet, which range from 0.8 mm to 4 mm. Therefore the operator who is to cut must change the nozzle for each new sheet type and thickness.



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This process, which is carried out manually in the laser cutting machine decreases the productivity of the work, and it causes the loss. For this reason, an automatic system is required to fulfill this task especially for the machines whose job list is determined.



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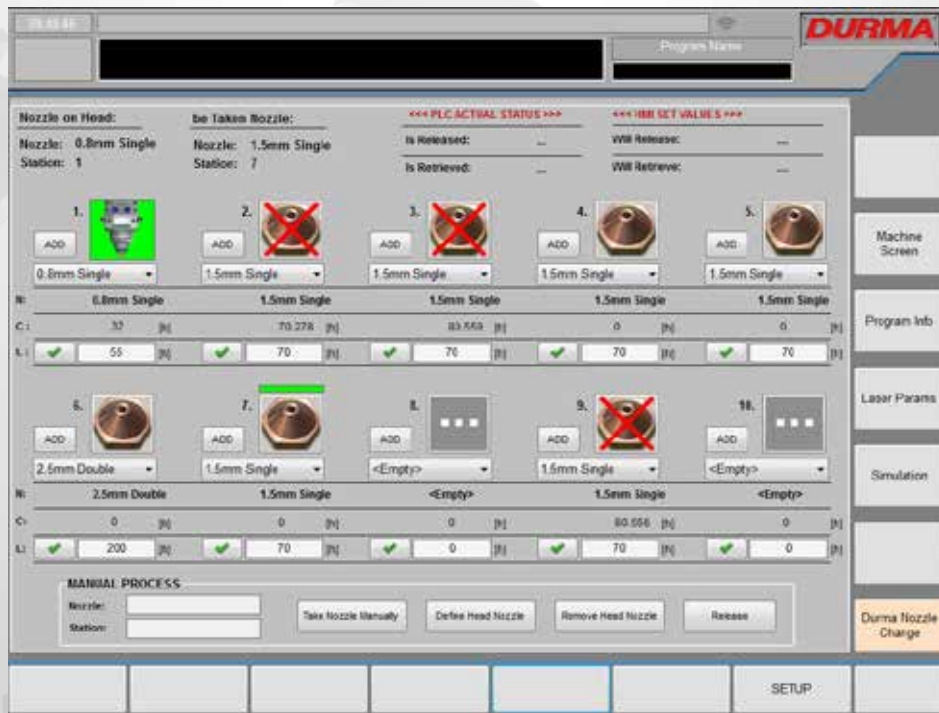
Located in laser cutting machines, this system has the ability to automatically take or replace nozzles under certain conditions. There are 10 stations in a single row on the mechanics it has, as well as a calibration plate, an engine that rotates the stations, a nozzle cleaning brush, a fiber sensor and a lifting system that moves up and down the system.



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The user must select the same configuration in HMI (Human-Machine-Interface) software after aligning the desired nozzles with the stations. If the system operation is required and the cutting head have a nozzle, it will stop at the empty station then drop the nozzle. After this the cutting head go to the station where the nozzle is expected to be received and perform the pickup operation. Hexagonal nozzles and stations are used instead of the standard round nozzle to allow the nozzle to be grasped comfortably during dropping and receiving operations. Also, the nozzle is chosen to be more durable than the ceramic standards it is tightened with.



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In the process of taking the nozzle; lifting mechanism lifts the system to a height where the cutting head can easily remove/leave the nozzle. The cutting head comes from the top of the station where the nozzle is desired to be picked up and slowly descends into the nozzle holder. The single row of stations does not require the cutting head to move to and from the position the sensor can detect. This situation It provides convenience in terms of time and control. Similarly, in the nozzle dropping process, the cutting head nozzle comes to the desired station from the top and slowly descends into the nozzle holder. After the nozzle is released, the cutting head goes up and passes the sensor control again. Thus, it is possible to control whether the nozzle is removed or not. Nozzle cleaning process and quick calibration process are performed and the process is completed.

