

Resistivity Management Unit

CO₂ Injector

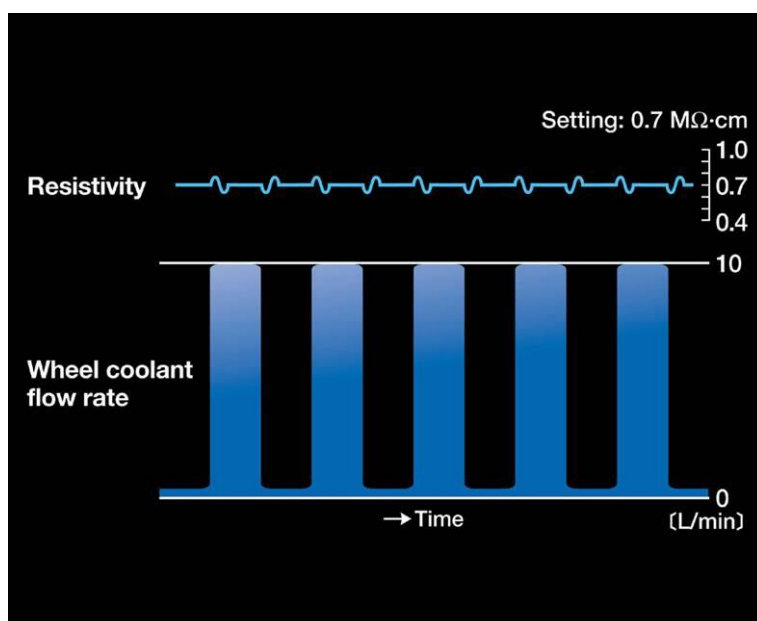
High quality processing through direct link to dicing saw

Workpiece charging significantly reduced

The CO₂ Injector lowers the resistivity of purified water by dissolving carbon dioxide gas into the dicing cutting water. Once the user-set resistivity is reached, the CO₂ Injector maintains this level with a high degree of accuracy. By lowering the degree of static charge the workpiece acquires during cutting, the CO₂ Injector helps prevent particle adhesion and device damage caused by static electricity.

Stable control of resistivity

The CO₂ Injector was designed especially for dicing saws, in which, owing to processing requirements, the flow rate of cutting water is extremely variable. Thanks to the feedback control using the resistivity sensor and the multi-stage mixing system, which adjusts carbon dioxide concentration in two stages, the resistivity can be adjusted very accurately. When cutting water is turned on or off, the variation in resistivity generally becomes particularly larger. However, with the CO₂ injector, stability can be maintained, so that the constant discharge of cutting water is no longer necessary.



Resistivity vs. cutting water flow (schematic)

Easy control via a direct link to dicing saw

The CO₂ Injector is easily controlled through the dicing saw interface, allowing for real-time monitoring of cutting water flow and resistivity during cutting. Settings for alarm activation or process termination can be configured to protect yield when user-specified tolerances are exceeded.

Logging of resistivity measurements

The CO₂ Injector may be set to log resistivity measurements automatically when dicing saw functions are initiated, when the dicing of each wafer is complete, and when an alarm is activated. This logging function can be a valuable contributor to process quality design and management.

Compact size and dicing saw build-in

The CO₂ Injector fits neatly within the case of the DFD6240, DFD6340/6341, DFD6361/6362, and DFD6450.

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Compatibility with DFD600 Series

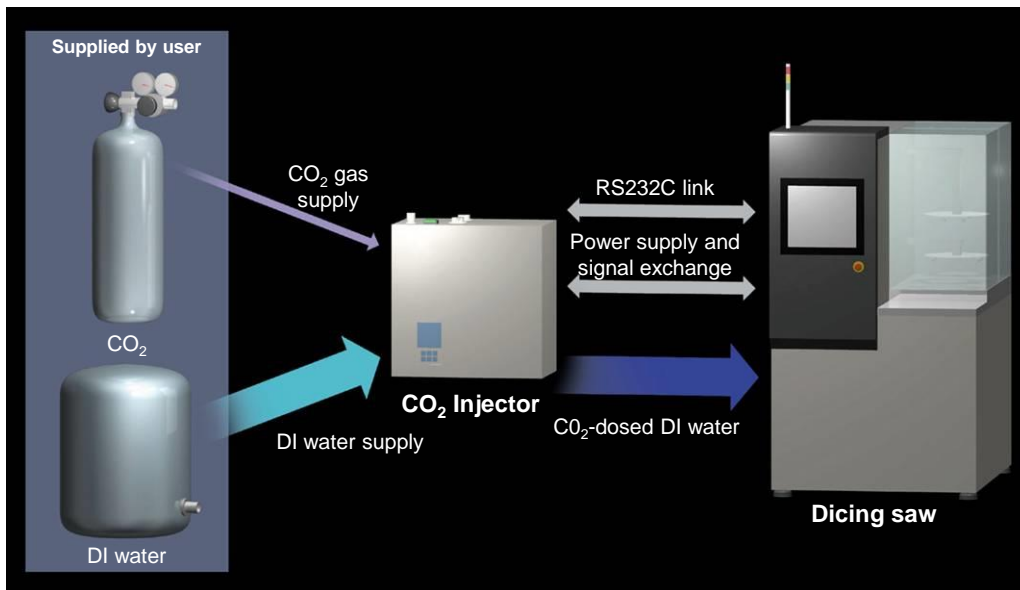
A specification that supports connectivity with the DFD600 series is also available. (Limited to some models)



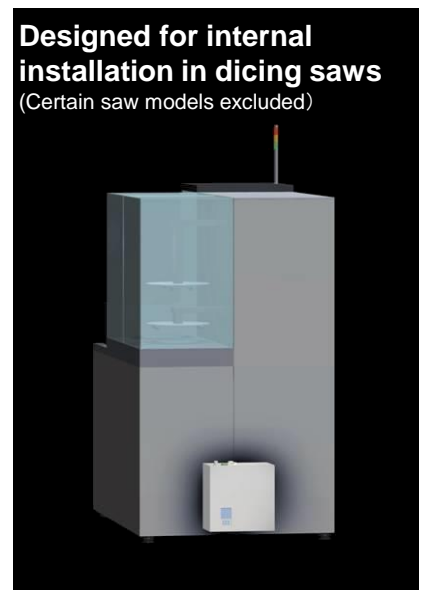
Dicing saw control screen



CO₂ Injector information



Configuration of the CO₂ Injector, dicing saw, and utilities



Designed for internal installation in dicing saws
(Certain saw models excluded)

Installation location for the CO₂ Injector inside a dicing saw

Specification

Specification	Unit	Standard specification	Low-resistivity specification
Flow rate	L/min	3 ~ 15	
Resistivity setting range	MΩ·cm	0.5 ~ 1.0	0.2~0.6
Resistivity fluctuation range*	-	Within targeted specific resistance ±10 %	Within targeted specific resistance ±0.06 MΩ·cm
Deionized water supply pressure	MPa	0.2 ~ 0.5	
Coolant temperature	Deg C	20 ~ 25	
CO ₂ consumption	g/h	Refer to the attached table	
Machine dimensions (WxDxH)	mm	328 x 178 x 365	
Machine weight	kg	Approx.13	

*The flow rate is constant within the range from 3 to 15 L/min at the supply water temperature

Note: This machine does not include a CO₂ gas cylinder and cylinder stand

< CO₂ consumption >

Standard specification

	1.0 MΩ·cm	0.7 MΩ·cm	0.5 MΩ·cm
6 L/min	1.20	1.38	1.92
9 L/min	1.38	1.65	2.46
15 L/min	1.74	2.19	3.54

Low-resistivity specification

	0.6 MΩ·cm	0.4 MΩ·cm	0.2 MΩ·cm
6 L/min	1.59	2.46	6.82
9 L/min	1.97	3.26	9.81
15 L/min	2.72	4.87	15.78

Environmental conditions

- Use CO₂ gas free of oil and other contaminants (99.5 % pure or higher). Further, use of a gas filter (0.3µm or less) is recommended.
- Keep room temperature between 20 - 25 °C.
- Keep spindle cooling water the same as room temperature (fluctuations within ±1 °C).
- The machines should be used in an environment free from external vibration. Do not install machine near a ventilation opening, heat generation equipment or oil mist generating parts.
- This machine uses water. In case of water leakage, please install the machine on the floor with sufficient waterproofing and drainage treatments.

* This machine does not include a CO₂ gas canister or regulator.

* All pressures specified above are gauge pressures.

* As the above specification may change due to technical modifications. Please confirm when placing your order.

* For further information, please contact your local sales representative.