



DATA SHEET

Plasma Control Unit (PCU)

Control Unit for Perfect Plasma Treatment

Plasma surface treatments range from gentle cleaning and activation to the application of functional coatings which give surfaces entirely new characteristics. In most cases the sign of a good plasma treatment is that it leaves no visible traces. How do you evaluate the results of the treatment? Indicators such as a visual inspection of the plasma beam to assess its color, for example, are not an adequate means of assessing the quality of plasma treatment.

With more than twenty-five years' experience in this field, we can confirm that continuous monitoring of the key process parameters is essential to ensure process reliability. For this reason, the PCU incorporates a variety of control and monitoring functions to ensure the consistently high quality and reproducibility of the plasma treatment. For example, power and voltage values are measured directly at the jet by the Plasma Power Measurement Module (PPM).

The Light Control Module (LCM) continuously monitors the visual presence of plasma, while the Gas Flow Control Module (GFM) continuously adjusts the flow of process gas maintain constant gas flow under varying conditions. Functions such as the Pressure Control Module (PCM) for monitoring dynamic jet pressure and the Rotation Control Module (RCM) for monitoring jet rotation provide information about the condition of the jet head and, if available, the condition of the motors, bearings, etc. This is the only way to ensure that the treatment is applied exactly where it is needed and that the desired surface effects are reproducible.

The self-explanatory display on the PCU (Fig.1) shows the operator the key process parameters. It also facilitates rapid response times, since selected settings can be entered quickly on the spot.

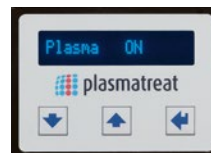


Fig.1: The LC display on the front of the PCU enables the operator to check values and control the PCU. S generators are controlled via their own built-in display.

Benefits at a Glance

- Accurate control of the density and intensity of the plasma beam by controlling the power and the gas volume
- Secondary performance measurement directly on the electrodes of the plasma jet for consistent plasma treatment quality
- Provides valuable information about the condition of the jet head and in the case of rotary jets, an indication of the wear on the motor and bearings
- Integrated soft-start function extends the service life of the installed components
- Compact design for simple, flexible installation

Technical Data

Model versions	PCU-L	PCU-M	PCU-H	PCU-DM
Plasma power	200 – 400 W	400 – 600 W	600 – 800 W	2 x 500 W
Compatible generators	FG5001(S), FG5002(S), FG5005(S), FG5007R(S)			
Connectable plasma jets	Jets in the appropriate power range, e.g.: PFW10, PFW30, PFW70, RD1004, RD2004			RD2005, RD1010
Compressed air flow control	max. 80 l/min at 5 bar (per PCU, depending on the plasma jet)			up to 95l/min
Compatible gases	Air, nitrogen, optional special gases			
Required inlet pressure	5 bar			6 bar
Permissible ambient temperature	0 °C bis +45 °C			
Weight	5,85 kg			10,6 kg
Dimensions (L x W x H)	300 x 200 x 125 mm			350 x 320 x 125 mm
IP rating	IP54			
Required footprint for angled X91 – connector	200 x 717 mm			290 x 717 mm
Required footprint for straight X91 – connector	200 x 867 mm			290 x 867 mm

Modular Construction

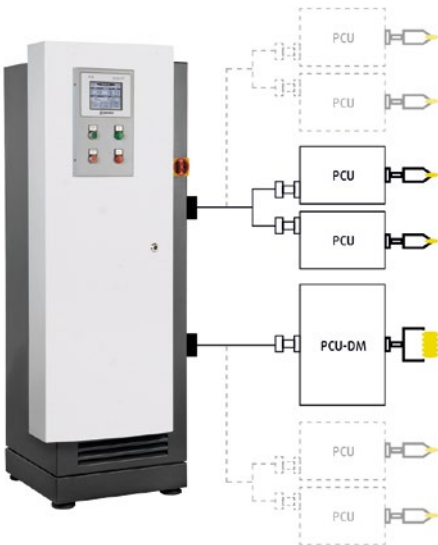


Fig.2: Example modular configuration with one generator FG5005(S). With this configuration it is possible to connect up to 4 Y-boxes and 8 PCUs to control 8 plasma jets.

The PCU can be installed in all mounting positions and is connected to the generator via an internal CAN Bus. Other cables are used for control purposes and to transfer energy to the plasma jet. The integrated transformer (HTR) provides the high voltage required to operate the jet. The generator is integrated into higher-level process and production sequences via EtherCAT or other optional bus systems.

Using a Y-box (Fig.2), several PCU functional modules can be interconnected and operated by one generator, depending on the number of plasma jets required. This makes it possible to create a modular structure. Plug-and-play quick change components are supported by a flexible configuration menu that allows jets to be added and removed.

Generators

S generators (with PLC/touchscreen) can be used in conjunction with PCUs. This gives full access to all the PCU functions and enables operating parameters to be checked and adjusted via the generator’s touchscreen. This enables particularly efficient operation of the plant.



FG5001S