



Plamatreat PTU - R2U standard production cell

Flexible automation of Openair-Plasma® processes through ready-to-use (R2U) robotic application, Industry 4.0-ready

Process automation for Openair-Plasma® processes

The PTU (plasma treatment unit) is available with various handling options for easy in-line integration. Movement of both the jet and the component can be robotically controlled. Parts can be optionally supplied via an integrated conveyor belt or a turntable. Openair-Plasma® processes are used wherever surfaces require preparation prior to subsequent sealing, bonding or overspraying with plastics. This is done by moving a mobile plasma nozzle across the contour to be treated or moving the component past a stationary plasma nozzle.



Plasma treatment of the groove of a pivotable housing



KUKA robot, Plamatreat PCU and control panel

How it works

The effect of plasma treatment varies depending on the type of material being treated. In addition to microfine cleaning to molecular level, with plastics, for example, reactive groups can be embedded in the surface. It is also possible to apply functional nanocoatings selectively to surfaces using the Openair® coating technology PlasmaPlus®.

With plasma generated under atmospheric pressure and extensive process controls, Openair-Plasma® systems are ideally suited to integration in continuous flow production. The surface to be treated is conveyed automatically. Up until now Openair-Plasma® technology had to be adapted to a range of different movement control systems and compatible with diverse interfaces.

The Plamatreat PTU production cells offer a modular platform which resolves many of these issues. The use of the R2U robot pack makes for very flexible and effective interfaces between the robot, plasma unit and machine control system. In conjunction with the latest plasma technology, this ensures that a wide range of plasma parameters are securely recorded and documented, providing the basis for seamless system integration. The standard Plamatreat automation system comprising two closely coupled processors selectively controls the motion sequence and plasma parameters. The user interface is standardized and intuitive.

Long-time stable adhesion promotion

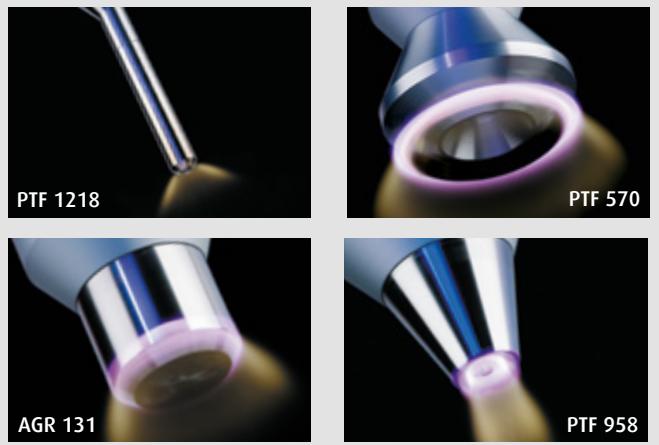
Highly sophisticated plasma nozzles pretreat the adhesive surface with precision, thereby facilitating the use of modern adhesives. The entire Openair-Plasma® system is fully compatible with robotic applications and suitable for integration into in-line processes. This makes it a versatile tool for the fine cleaning and activation of polymeric surfaces.



PFW10 plasma nozzle

Integrated Openair-Plasma® jets

The latest rotary or stationary plasma jets are available for integration in the Plasmatreat platform. Those opting to automate their processes with a mobile plasma source will find the connection cables highly flexible. As well as plasma devices for surface treatment, the automation platform incorporates all the features required for PlasmaPlus® plasma coating; from the provision of suitable plasma additives (precursors) to the automated maintenance of coating jets and the targeted capture of byproducts.



R2U robotic integration

From process-specific, highly effective process automation of x/y/z linear systems to flexible robotic automation using KUKA R2U industrial robots. High-level safety functions integrated into the control system for optimal use of the operating range. Track control for uniform plasma densities throughout the operating range.



KUKA robot with plasma unit

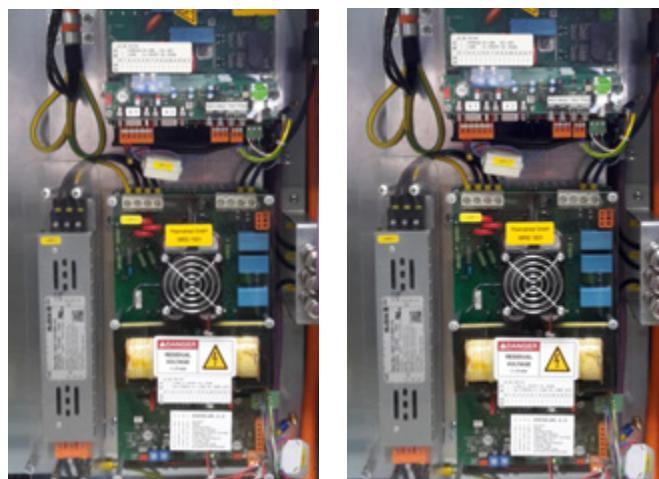


Extensive plasma process control

The PCU unites several plasma control functions in an SMD assembly specific to the nozzle, records the current plasma density and controls nozzle selection and parameters. Durable, plug-in versions of the connectors enable maximum flexibility and rapid interchangeability of plasma jets.

Up to two stand-alone plasma generators

Highly-integrated plasma pulse generators supply up to two plasma nozzles in an extremely efficient, highly flexible manner that can be tailored to individual processes. The plasma densities specified for cleaning and coating processes are generated reliably and reproducibly.



Total control of the PTU



All system components have flexible bus interfaces which enables them to be optimally combined for dedicated applications. Communication, process data storage and visualization is handled by an integrated control unit, whilst operation is via a 15" touchscreen control panel or an alternative within the network.

Applications and technical data for PTU - R2U process automation

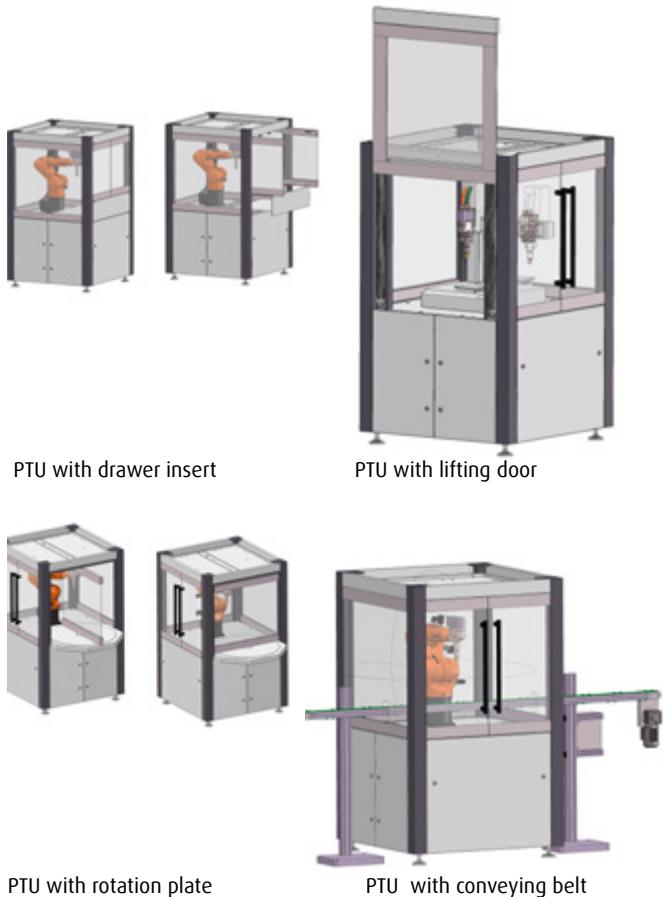
The PTU has been designed especially as a stand-alone automation system for diverse applications in the automotive supplier and electronic manufacturing sectors.

Typical production capacities in these areas are approx. 1000 parts per shift. The system can safely achieve these quantities when used in conjunction with a parts feeder with optional automation. The inherent process flexibility also allows smaller batches of different products to be automated on one system.

Technical Data

Supply Voltage:	3x400V, 16A
Dimensions (mm):	1200x1200 800x1200
Height:	1800mm
Plasma power:	max. 2 plasma nozzles 250/500/1000 W
Automation:	x/y/z - system 300,400,500 or 600mm 6 axis- KUKA R2U robot fully integrated max. 6kg load-bearing-capacity
Part handling:	manuel turntable belt with workpiece carrier
max. treatment area:	approx. 400x400mm

Optional the PTU is deliverable with automatic assembly or semi-automatic component handling:



PTU systems are available in three different basic configurations:

The Openair-Plasma® process has been used successfully for years as an affordable and environmentally friendly means of pretreating plastic surfaces in diverse industrial production processes. However, high-performance plastics such as POM (polyoxymethylene) require a more extensive plasma treatment. The PlasmaPlus® process developed by Plasmatreat now makes it possible to apply a plasma polymer adhesion-promoting layer to hard-to-bond plastics without the use of solvents. This is achieved by continuously injecting the plasma with a chemical additive which is deposited on the surface in the form of a reactive plasma polymer to produce a cross-linked layer. This process enables adhesive bonds to be created which remain stable and do not migrate under even the most adverse conditions.

Various fully or partially automated parts handling systems are optionally available for the PTU.

Experienced Plasmatreat engineers are on hand throughout the world to assist you with automating Openair-Plasma® processes for your application. We are happy to supply you with a rental system to test out, subject to availability.