

ServoSPATZ+M400/M600/M900 Technologie Controller

The **ServoSPATZ+** high-tech controller is a 1,000 Hz-medium-frequency inverter power source with integrated servo drive control. With its scope of functions it is especially designed to meet the demands of automated serial production in car body construction. The modular **SPATZ+ M400/M600/M900** controller can be configured for operations with up to two servoelectric guns. In combination with external medium-frequency transformers and brushless servo motors with spindle drive, the **ServoSPATZ+** is a powerful, inexpensive solution for resistance welding units in the welding current range between 3 kA and 65 kA. The control and the medium-frequency inverter of are housed in a compact, IP20 case is designed for inexpensive installation in a switch cabinet.

The integration of the drives into the welding control is advantageous. It also facilitates the process sequence-determined control of electrode force, electrode displacement and equalisation force. Moreover, the force and displacement measurements allow the optimisation of gun closing time and force build-up speeds. The power output stages of both drive axles possess - at an intermediate circuit voltage of 560 V - a peak current of 32 A for the electrode force drive and for welding gun equalisation.

Each welding is controlled during the welding process every 0.5 ms. The applied control technique is the adaptive **ServoMASTER** resp. **AluMASTER** control method. Constant Current Control (CCC), Constant Power Control (CPC) and Constant Voltage Control (CVC) are also at disposal. The control process of the servo drives is regulated at a 8 kHz clock frequency. If the set parameters are not met, the power is adjusted during the running welding process.



Technical Data	
Welding spot selection	64 Bit
Number of programs	1,024
Welding impulses / Program	16
Control modes	MASTER, ServoMASTER, AluMASTER CCC, CPC, CVC
Force program	yes
Sensor monitoring	yes
Limit value monitoring	yes
NUGGET Index	yes
Automatic limit value determination	yes
Tip dresser control and supervision	yes
Welding data recorder	yes
Interfaces	USB, PROFIBUS-DP, INTERBUS-S, PROFINET, ETHERNET
Welding Inverter	
Mains voltage U_1	3-400 V - 480 V, 50/60 Hz
Nominal power S_N	140 - 150 kVA with 20 % ED, 400 V 90 kVA with 50 % ED, 400 V
Output voltage U_{2N}	500 V / 1,000 Hz, 400 V
Output current I_{2max}	450 A / 650 A / 950 A
Supply Voltage DC	24 V DC / 5 A
Drive axles	Max. 2
Cooling	Water-cooled or air-cooled (ambient air temperature max. 50 °C / 122 °F)
Type of protection	IP20
Dimensions (H x W x D)	390 x 200 x 345 mm (15.4 x 7.9 x 13.6 in)
Weight	20 kg / 21 kg / 22 kg (44.1 lb / 46.3 lb / 48.5 lb)
Servomodule SPATZ+ SPM for electrode force and equalizer motor	
Intermediate circuit voltage U_{2N}	560 V
I_{2N}	10 A
I_{2max}	32 A
I/O-Modul SPATZ+	
Digital inputs / outputs	16 / 11
Analog outputs -10 V to 10 V	1 / 1



The **ServoSPATZ+** high-tech controller can be connected via 2-wire Bus with the **ServoSPATZ+GM** gun module which is mounted on the welding gun or the welding machine. This gun module preprocesses the sensor signals for the welding current, the electrode voltage and, if necessary, for the electrode force and the electrode displacement. Encoder signals of the servo motors are, moreover, processed and, together with the sensor signals, transmitted via the 2-wire Bus to the **ServoSPATZ+** controller. Doing this, the high number of signal lines which is required especially by servo drives is minimised and the susceptibility to disturbances is reduced.

All welding program data, **MASTER** reference curves, motor parameters, geometry data and other maintenance and machine information data which are required for the operation of a specific welding gun are thus stored in the **ServoSPATZ+GM** gun module. Every time the system is switched on or every time the welding gun is changed, the data are automatically transferred to the high-tech controller. All servo guns or machines which are equipped with the gun identification system can be operated with any high-tech controller and without repeated pre-operational work. The welding guns can be programmed "offline" by the gun manufacturer or by the maintenance staff, thus weld parameter determination in the line is no longer necessary.

For the fast I/O communication with higher-level devices - e.g. robot control unit or line SPS - a fieldbus extension board is available. Alternatively, 16 additional digital inputs and 11 outputs on the **ServoSPATZ+** I/O module ensure reliable data exchange via standard logs with 24 V DC signals.

Online-Programming, analysis and diagnosis are the connecting links between production, quality control and process engineering. Via the USB interface and by means of a notebook and the PC software **SPATZStudio** the user is provided with further detailed information. The Ethernet interface in connection with the line PC software **SPATZStudioNET** allows the cross-linkage of all welding operations with a line and/or industrial computer and the permanent storage of welding data.

Connection options

