*Auto***SPATZ***M1600/M2400 Medium Frequency Inverter Power Source*

- water cooled -

The *Auto***SPATZ***M1600/M2400* 1,000 Hz medium frequency inverter power source is used in combination with external medium frequency transformers as a high-performance, cost-effective DC power supply within a welding current range of 5 kA to 60 kA. It is especially designed for the demands of mass production with a high number of parts - e.g. automotive body shops**.**

Each welding operation is feedback controlled during the procedure. The control process takes place very quickly based on the 1 kHz inverter frequency. Actual values are compared with the set values every 0.5 ms. The output power is modified during the welding process if targets are not being met. The adaptive **MASTER** control process is frequently used. Constant Current Control (CCC), Constant Power Control (CPC) and Constant Voltage Control (CVC) are also provided.

At the end of each weld, the *Auto***SPATZ***M1600/M2400* checks whether the actual welding parameters keep within the set limits.

The online programming, analysis and diagnostics are the key links between production, quality control and process engineering. Three options are available. The handy graphical operating device **SPATZ***BG-02* meets the demand to be used under rough production conditions. Maintenance technicians can derive further detailed information with a notebook connected to the *Auto***SPATZ** RS232 interface and the *Auto***SPATZ***AS-01* PC software. An ETHERNET interface in combination with the Line-PC Software *Auto***SPATZ***AS-32* enables the networking of all welding operations with a line PC.

Through the graphic representation of the curve characteristics of the process signals welding current, electrode voltage, welding power, electrode force and electrode penetration the weld expert receives all information which he needs for adjusting the

Technical Data

No. of programs		63
Welding impulses / program		16
Control modes		**MASTER**, CCC, CPC, CVC
Weld parameter monitoring		yes
Stepper function		for CCC, CPC, CVC
Force schedule		yes
Slope up / slope down		yes
Signal inputs		current, voltage, force, penetration
Sensor monitoring		yes
Output for proportional valve		0 - 10 V DC
Mains voltage U_1		3~400 - 500 V, 50/60 Hz
max. power S_{max}	*M1600:*	800 kVA with 400 V
	M2400:	1,200 kVA with 400 V
Nominal power S_N		390 kVA with 50 % duty cycle, 400 V
Output voltage U_{2N}		500 V / 1,000 Hz
Output current I_{2max}	*M1600:*	1,600 A
	M2400:	2,400 A
Interfaces		*BG-02*, **MASDAT**, RS232, PROFIBUS-DP, ETHERNET
Digital inputs		13
Digital outputs		8
Cooling water		8 l/min at 20 °C 2.1 gal(US)/min at 68 °F
Pressure drop		0.1 bar at 4 l/min 1.5 PSI at 1.1 gal(US)/min
Type of protection		IP54
Dimensions (H x W x D)		600 x 680 x 350 mm 23.6 x 26.8 x 13.8 in
Weight	*M1600:*	90 kg / 198.4 lb
	M2400:	110 kg / 242.5 lb

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welding parameters. The recorded values of the welds and the graphic representation of the measured value trends are a useful tool for guaranteeing the weld spot quality for operators and maintenance technicians.

All 10,000 weld data records of the weld data recorder which is integrated in every *Auto***SPATZ***M1600/M2400* can be read and stored with the operating units. Each data record is comprised of the weld values, a time/date tag and information about the crossed limits and fault status.

An offline analysis of the weld data records with the **SPATZ***QS+* quality assurance software or a standard program - e.g. spreadsheet program - illustrates the quality control the present process status and process development.

For fast I/O communication with a higher level device - e.g. robot controller or line PLC - a PROFIBUS-DP interface is available. Alternatively, 13 additional digital inputs and 8 outputs ensure a reliable data exchange utilizing standard protocol with 24 V DC signals.

With every docking of the welding gun which is equipped with **MASDAT**, the *Auto***SPATZ***M1600/M2400* is automatically programmed with all weld parameters - e.g. **MASTER** reference curves - of the welding gun. Additionally, manufacturers' data and maintenance data are transferred to the *Auto***SPATZ**. On the other hand the *Auto***SPATZ** actualizes this data in the gun. The direct storage of data in the weld gun reduces the scope of organizational work relating to maintenance documentation, the updating of welding parameters and backup welding data.

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