



Product data-sheet Control unit CDP-133M

Application area

The new generation of the **CDP-133M** capacitor discharge machines has advanced features such as **digital positioning measurement system** (stud-overlap, lifting dimension, depth of immersion and piston-speed) as well as **mechanical process monitoring for monitoring and recording of all mechanical parameters**. In addition, current and welding time can be recorded, displayed and monitored after tolerance. Library functions for permanently stored or variably stored welding parameters or optional multi-point operation are only a few features of the comfort control.

The operator structure of the CDP-M-series correlate to our inverter family DAI and the DA-800M.

Two switched-mode inverter chargers provide for fast charging and high welding capacity. Also available is a third optional charger, making these units up to the fastets on the market. Standard electronic three-setting capacity selection option allows optimal adjustment to all welding applications.

This product has been designed especially for heavy-duty use on CNC stud-welding equipment, but it can be also used with our manual welding guns as well as automatic welding gun for capacitor discharge stud-welding process.



Technical characteristics

- Electronically controlled inverter charging units allow very short charging cycles with a high welding sequence, which means that very high clock sequences are possible (excellently suited for automation);
- Monitoring and fast control of all parameters and functions in the welding circuit by high-performance microprocessor;
- monitoring the capacity of capacitors;
- Digital position measuring system also allows convenient adjustment of stud overlap and lift measure without the complete and optional process monitoring system;
- In case of undercut of pre-selected minimum values of stud-overlap, lift measure and immersion monitoring of error messages without connected the fully equipped digital process monitoring system;
- Soft start function for gentle charging of the capacitors after a long shutdown period;
- adjustment of welding parameters at SPS-control system of CNC-coordinate table machine and communication between SPS and control unit;
- STOP function for all error messages (device-internal or process-related), that means automatic interruption of welding operation;
- State-of-the-art HMI: simple dialog operation through menu structure and one-button operation as well as display of all parameters relevant to the operator on a large four-inch graphic display;
- Library function: permanently stored standard welding programs and additional variable, user-defined welding programs storable;
- Numerous special functions for complex welding tasks;
- Low weight and compact design;
- Low power consumption with very high efficiency: high energy efficiency and therefore better environmental compatibility;
- Thermostatically controlled fan.

Optional:

- **Intelligent multi-station technology:** this means operation of up to four manual and / or automatic welding guns in connection with our new switchbox DA - 4 possible;
- In multi-position mode, automatic detection of the respective welding gun by contact message and automatic switching to the respective setting menu on the inverter (parameter can be stored user-defined);
- Simultaneous operation of up to four automatic welding heads possible in conjunction with our CNC-technology;
- **Integrated digital process data system** and evaluation mechanical welding parameters: Recording of the way of each stud (stud-overlap, lift measure, immersion and speed), Comparison of the recorded parameters with the parameters of reference weldings;
- Additionally: Measurement and recording of welding current and welding time at each welding
- USB interface for transferring the process data to an external PC.



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Technical data

Welding range	Carbon and stainless steel, metrics M3 - M10* *: Zinc-coated metal sheets $\leq 20\mu\text{m}$ up to M8, Aluminium-alloy max. stud M6
Welding process	Capacitor discharge / tip ignition No. 786 according to ISO 4063
Welding sequence	20 studs / minute M8 (in continuous operation)
Capacity (switchable)	44.000 μF / 88.000 μF / 132.000 μF
Welding time t(ms)	1 - 3ms
Loading voltage	50 - 200V (220V)
Welding guns connections	controlled separately while using the switch-box DA with 4x welding guns connected;
Applicable welding gun / welding heads	CONTACT / CONTACT -M* ³ / GAP / GAP-M* ³ / ATP-8* ¹ / ATP-8M* ^{1*3} , KAH-100D* ² / Rapidor QF* ² ^{1*} : Automatic welding gun only in combination with optional automatic module for the CDP-99M; Enables the connection of a fully automatic bolster feed BZ-V01 ^{2*} : Automatic welding head only for CNC - and automatically applications, required CNC-module ^{3*} : "M" for guns with integrated measurement system
Fault diagnosis	Low capacity Overheat Defect lift magnet and/or control cable
Process monitoring system (optional)	Collection and analysis* ¹ of data of an electromechanical positioning system* ² (lifting-off distance, depth of immersion, piston runtime with defining the upper and lower action limits) additional measurement and recording* ¹ of welding current and welding time ^{1*} : Evaluation and recording only in conjunction with optional process control ^{2*} : Only in conjunction with guns with integrated positioning measuring system
Interfaces (optional)	USB-B: Optional to transfer the data from the digital process control system and position measuring system to a computer CNC interface: For the transmission / exchange of control signals with a higher-level CNC control in fully automatic operation.
Power supply	Rubber connector 230V/115V 50/60Hz, 16A
Welding bushes	DIX 50mm ²
Cooling method	F, thermostatic controlled
Degree of protection	I (basisisoliert)
Protection class	IP 23
Dimensions (length x WIDTH x HEIGHT)	470mm x 335mm x 275mm
Weight	16 - 18 kg

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Mechanical process monitoring, recording of electrical parameters and distance measuring system

The optionally available **mechanical process monitoring** consists of process data acquisition and process data storage. If welding guns are connected with the measuring system, the **mechanical parameters of the bolt overlap, the lifting dimension, the melting rate and the piston speed can be measured, documented and evaluated.** The recording of the electrical parameters **welding current** and **welding time** is also possible.



photo 1, above: way-measurement with process monitoring system

Left: Without process monitoring system real-time display of the mechanical parameters without data recording and evaluation after each welding:

- Measurement of the way of the stud (stud overlap, lift adjustment, depth of immersion and the piston speed) also possible without process monitoring system;
- The respective parameter is displayed in red as a warning when the preset intervention limits (adjustable in the submenu "Path measurement") are exceeded or exceeded.

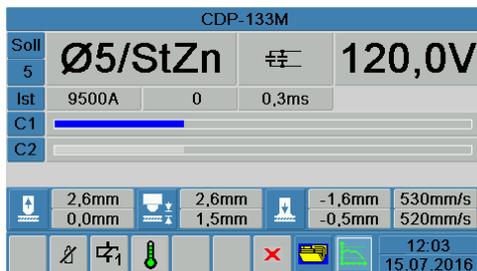


photo 2, above: Activated and ready to use process monitoring system

Photos center left and bottom left: Real-time display as well as recording and checking of electrical and mechanical parameters with data storage as well as referencing of process monitoring system:

- Monitoring of the welding process
- Permanent comparison of nominal and actual values with preset operating limits (in percent)
- Display of the permissible deviations by means of clear warning symbols in the display and recording in the ring memory and process data memory
- **Simple referencing**, that means teaching of the system by reference welding
- Pressing "Okay-Button" only after perfect optical and / or mechanical evaluation of the respective individual welds

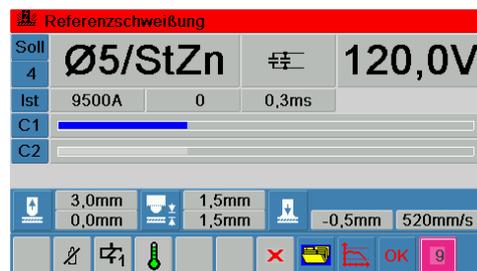


photo 3, above: referencing of process monitoring system

Advantages:

- Easy and comfortable adjustment and monitoring of the lifting measure as well as stud overlap directly on the display;
- The complex manual conventional measuring is no longer needed;
- In conjunction with the digital monitoring system, constant comparison of actual and preset setpoints with warning or blocking of the power unit.



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Technical data usable welding guns

At follows a sheet of all hand-welding guns with and without a position measuring system, which can be used with the **CDP-133M** in its performance class. The **guns with integrated distance measuring system** enable simple adjustment and correction of the stud **overlap, lift dimension, immersion and speed** by simple reading on the device. These parameters are immediately displayed when the gun is connected, even if the process control is not activated.

Together with the optional digital process control system, these data are stored for monitoring the quality.



Type of welding gun	CONTACT / CONTACT-M*1	GAP / GAP-M*1
Welding process	Contact	Gap
Area of application	Carbon and stainless steel	carbon and stainless steel, Aluminium and brass
Welding range (metrics)	2 - 11mm (M10*2)	2 - 11mm (M10*2)
Guidance	Sliding bearing	Präzisions-Linear ball guide
Position measuring system, for measurement of stud overlap, lift measure, immersion and velocity of piston	Only CONTACT-M*1	Only GAP-M*1
Lift adjustment	. / .	1,0...4,0mm, Infinitely adjustable via scale on welding gun
Pressure of spring	Infinitely adjustable	. / .
Welding cable	6,5m, 25mm ²	3,0m, 25mm ²
Housing material	Glass fiber reinforced thermoplastic	
Farbe	grey	
Dimensions (Length x WIDTH x Ø)	180mm x 135mm x 40mm	
Weight (without cable / with cable)	0,7 / 3,0kg	0,7 / 2,0kg

*1 :Welding-guns with integrated measurement system (Indication „M“)

*3: Maximum welding-diameter (according standard DIN EN 13918); group of material and class of mechanical strength of usable welding elements and allowed welding-joints of studs und ground material see DVS-Roule 0903 „Capacitor discharge welding“ and DVS-Roule 0967 „Calculation of of welding joints“

Note: Technical data Automatic welding gun ATP-8 / ATP-8M, fully automatic stud feeder BZ-V01 and automatic welding heads KAH-100D / RAPIDOR QF please refer to the separate data sheets.