Product data sheet

Control units DAI-1300S / 2300S

Areas of Application

The inverter **DAI-1300S / DAI2300S** are high-performance control-units for stud welding for drawn-arc and shot cycle stud-welding processes **(DAI-1300S: up to welding diameter 13mm, type SD, DAI-2300S: up to welding diameter 22mm, type SD)** with integrated **multi-point technology** for the **connection of up to four welding guns**.

Due to the multi-point technique, welding elements with different dimensions and related to one component (product) can be welded more efficiently from one to the other diameter or length without time-consuming retooling. The user can dispense with the "multi-pass welding"; Productivity is markedly increased.

Easy to use with a multi-functional four-inch display screen and different saving of special user-defined welding programs allows the inverter for maximum operator comfort. The inverter is especially designed in mobile use on construction sites with easy handling and high reliability.
Generously dimensioned bucking and steering rollers allow transport even under unfavorable ambient conditions.

Technical features

- Extremely good welding-quality: Process reliability through precise and extremely fast constant current regulation, characterized particularly high process reliability in all welding tasks;
- Monitoring and rapid control of all parameters and functions in the welding circuit by high-performance microprocessor;
- Compact design with high power reserves;
- Wide range power supply for using with other voltages (320V AC ... 495 V AC 50 / 60Hz), also for the operation with generators, for example, suitable;
- Sophisticated cooling concept, therefore very high clock sequences possible (ideally suited for automation);
- STOP function for all fault messages (internal or process-related), automatic interruption of the welding-process and visualization of the errors by means of clear warning symbols;
- State of the art HMI (Human-Machine-Interface): Simple Dialog operator interface with menu structure and single-button operation and display of all relevant parameters for the operator on a large four-inch display;
- standard version Multi-point technology: connection and operation of up to four welding guns in any combination or sequence and general equipment of each guns outlet with a gas module for welding under inert gas atmosphere;
- Detection of the respective gun position by START triggering on the gun or contact detection on the workpiece and immediate switching to the respective program position (automatic switching on the control unit, gun position assignment is shown in the graphic display);
- Welding parameters for each gun separately adjustable via comfort control;
- Automatic operation (optional), gas function, position measuring functions, electrical process control (optional) can be set separately for each gun position;
- Library Function: Permanently stored standard welding programs and additional variable, custom welding programs can be stored (parameters setting and controlling separately for each welding gun);
- Special functions for complex welding tasks;
- Lightweight: Ideal for portable use on construction sites;
- Low power consumption with very high efficiency: high energy efficiency and therefore better environmental compatibility;
- Thermostatically controlled fan.
- **Optional:**
  - **Multi-point technology with automatic function***[1]: Combination of **automatic welding-guns AND manual welding guns** possible in any combination possible (for automatic operation, **up to four** automatic modules are available with max. Configuration so that **4 automatic welding guns** and up to a maximum of **4 fully automatic stud-feeding system BZ-V01** can be connected;
  - **Process data acquisition - and evaluation of all electrical and mechanical parameters for each gun position**;
  - USB interface for transmission of process data to an external PC / laptop or similar;

***1: Automatic-module required**

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Technical specifications

	DAI-1300S	DAI-2300S
Welding area (max. welding diameter)	M3 – M16 (RD), Ø2mm – 13mm (SD)	M3 – M24 (RD), Ø2mm – 22mm (SD)
Weldable material	carbon and stainless steel, aluminium-alloy	
Welding application	Drawn-Arc (with ceramics or protective gas), Short-cycle	
Welding current I(A)	100A – **1000A,** infinitely variable	100A – **2000A**, infinitely variable
Welding time t(ms)	5 – 1000ms (1500ms), infinitely variable	
Welding guns connections	4x separately controlled welding guns / automatic welding guns / fully automatic stud-feeding system BZ-V01 can be connected;	
Applicable welding guns / welding heads	**Can be used in any combination:** GAP / GAP-M, DA-10 / DA-10M, DA-12 / DA-12M, DA-19M, ATP-8 / ATP-8M*1, KAH-100D*2; Rapidor QF*2 *1: Automatic welding gun only in conjunction with optional automatic module *2: Automatic welding head, with this control unit only for **automatic** applications and positioning-arm	**Can be used in any combination:** GAP / GAP-M, DA-10 / DA-10M, DA-12 / DA-12M, DA-19M, DA-22M ATP-8 / ATP-8M*1, KAH-100D*2; Rapidor QF*2 *1: Automatic welding gun only in conjunction with optional automatic module *2: Automatic welding head, with this control unit only for **automatic** applications and positioning-arm
fault diagnosis	Phase failure Over temperature Defective solenoid and / or control cable	
Process control system **(optional)**	Monitoring and evaluation of welding current and arc voltage as internal energy content on the welding time with setting the upper and lower action limits. Monitoring and evaluation*3 of data of an electromechanical measuring system (stud overlap, lift, depth of immersion, piston velocity with defining the upper and lower action limits. ***3: Evaluation only in conjunction with optional process control**	
Interfaces (optional)	**USB-B:** Optional to transfer the data from the process control system to a computer.	
Power supply U (V), wide range	3 x 320...500V – 50/60Hz – 32A(slow fuse)	3 x 320...500V – 50/60Hz – 63A (slow fuse)
Power connector	CEE 32A	CEE 63A
Type of cooling	F (thermostatically controlled fan)	
Protection class	I (basic insulation)	
Degree of protection	IP 23	
Dimensions (Length x Width x High)	1007 mm x 477.5 mm x 1249 mm	
Weight	80 kg	115kg

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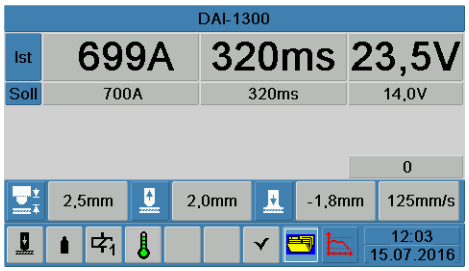
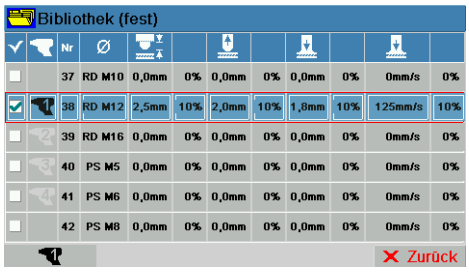
Digital process control system

The optionally available **digital process control** consists of **process data acquisition** and **process data storage**. It documents **welding current, welding time** and **arc voltage**. The energy content in joules is calculated and recorded either on the basis of firmly determined firing voltage values or as a result of a measurement-technical detection (eg. at the welding head) and constantly compared with the results from reference welds.

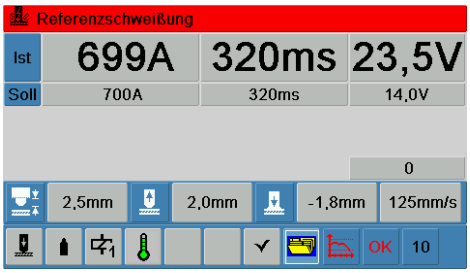
In addition to the recording of the electrical parameters, the mechanical parameters for **stud-overlap, lift measure, immersion and piston velocity** can be measured and read out by means of the optional welding guns with integrated electromechanical position measuring system.



- Measurement of the way of stud (stud overlap, lift measure, depth of immersion und velocity of the piston)
- Display of the values by means of clear warning symbols in the display and recording in the ring memory and process data memory



- Monitoring the welding process
- Constant comparison of nominal and actual values with preset intervention limits (in percent)
- Indication of the impermissible deviations by means of clear warning symbols in the display and recording in the ring memory and process data memory



- Simple referencing, that means training of the system with using of min. 10 reference welds or more
- Actuation of the "OK button" only after perfect optical and / or mechanical evaluation of the respective individual welds

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 process control, constant comparison of actual and preset setpoints with warning or blocking of the power unit.

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Technical data welding-guns

As follow all welding guns with and without a position measuring system, which can be used with the **DAI-1300 S / DAI-2300S** in its performance class. The **welding-guns** with **integrated position measuring system** enable simple adjustment and correction of the **stud overlap, lift adjustment, depth of immersion and piston speed** by simple reading on the inverter. **These parameters are immediately displayed when the gun is connected to the inverter without having activated the electrical process control.**
Together with the optional electrical process control, these data are stored for monitoring the quality.

Type of welding gun	**GAP/ GAP-M*[1]**	**DA-10 / DA-10M*[1]**	**DA-12 / DA-12M*[1]**	**DA-19M*[1] DA-22M*[1 und *6]**	**ATP-8*[2] / ATP-8M*[1 und 2]** Automatikschweißpistole
Welding process	Short-cycle welding process (with or without protection gas)		Drawn arc process with ceramic or gas		Drawn arc / short cycle
Welding range	metrics M3 – M10(Ø11mm*[3])	metrics M3 – M10(Ø11mm*[3])	metrics M3 – M12(Ø12mm*[3])	**DA-19M**:metrics M8 – M20 (Ø16mm*[3]) **DA-22M**: metrics M8 – M24 (Ø22mm*[3])	metrics M3 – M8 Länge: 6mm – 30mm*[4]
Piston guide	Linear ball guide	Slide bearing guide (optional: linaer ball guide)	Linear ball guide	Double linear ball guide	Slide bearing guide
Position measuring system	**Only for welding-guns from M-series: For position measuring of stud-overlap, lift, depth of immersion and piston velocity**				
Lift adjustment	1,0...4,0mm, infinitely adjustable via scale at welding gun	Constant lift 1,5mm	Constant Lift 2,0mm	2,0mm...6mm, in steps á 0,5mm (lift read and adjustable via scale and in case of connected position measuring system monitored at the display of DAI-1300S / DAI-2300S)	1,0...6,0mm, infinitely adjustable
Vertical positioning	Manually, without circular level			Vertical adjustment with circular level (welding position PA, circular level integrated in the end cap)	Manually, without circular level
Length compensation		Ball carrier system			
Piston damper	. /.			Hydraulics damper (continiously adjustable)	. / .
Welding cable	3m, 25mm²	5m, 35mm²		**DA-19M**:5m, 50mm² **DA-22M**:5m, 95mm² (*[5])	3m, 25mm²
Weight (without cabel)	0,85kg			**DA-19M**: 2,10kg **DA-22M**: 2,70kg	1,8kg

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

*2: Required automatic module in control unit

*3: Maximum welding-diameter (according standard DIN EN 13918); Material, group of material and class of mechanical strength of usable welding elements and allowed welding-joints of studs und ground material see DVS-Roule 0902 “Drawn arc welding” and DVS-Roule 0967 „Calculation of welding joints“

*4: Other length on request

*5: Welding cable external

*6: DA-22M is particularly suitable for the DAI-2300S power unit

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