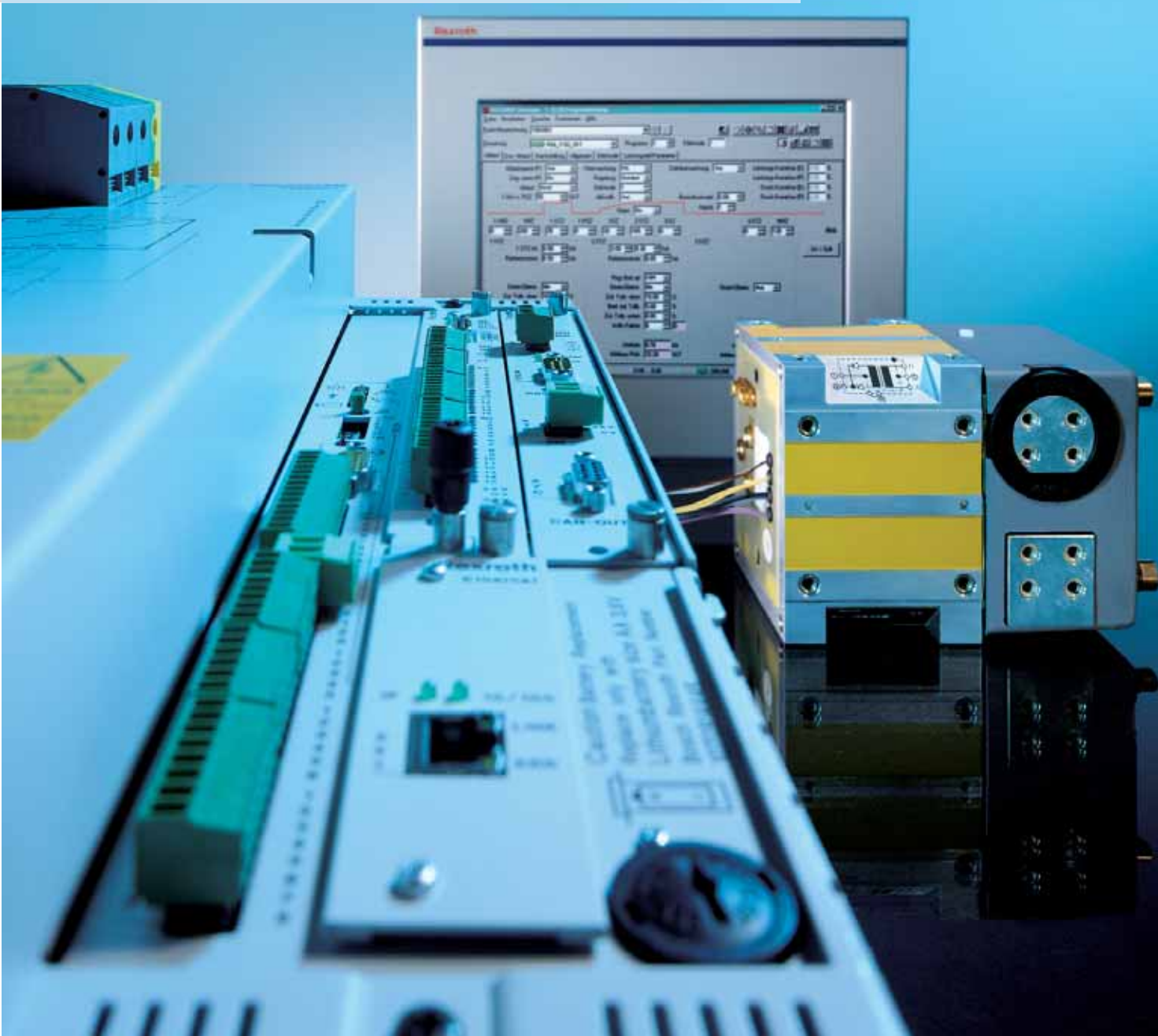


Rexroth PS 6000

The integrated system for the highest quality in resistance welding

Safe, flexible and economical



Rexroth PS 6000 – powerful in medium frequency and AC applications

Used in countless applications, welding systems made by the European market leader Rexroth are the first choice of satisfied car manufacturers, tier one suppliers, and welding equipment manufacturers worldwide. Our new PS 6000 system for applications up to 360 kA is the sequel to this success story.

The benefits for you: increased process reliability, reduced rework costs and consistent weld spot quality – even with the most challenging material combinations.

The modular concept behind the PS 6000 integrates fully compatible and coordinated components in one particularly cost-effective system:

- intelligent inverter
- highly dynamic electric servo cylinder
- precise pneumatic servo cylinder
- powerful medium frequency transformers

The flexible control system, adaptive control modes and high-dynamic servo drives allow you to break into new innovative applications. Standard functions, such as constant-current regulation, pressure regulation, electrode management and tip dressing, ensure the weld quality lives up to your demands.

Benefits

- high reliability achieved through the use of tried and tested technology
- maximum flexibility in the I/O and network area thanks to plug-in cards such as PROFIBUS, PROFINET IO, DeviceNet, INTERBUS and Ethernet TCP/IP
- 100% quality control and documentation of spot welds derived from the latest ultrasonic technology
- expulsion reduction achieved by adaptive control of the welding process
- electric or pneumatic servo gun drives integrated into the compact weld control
- Windows-based user interface for all process functions with SQL database
- innovative functions for process monitoring and component protection
- flexibility for retrofitting function and process modules



Rexroth PS 6000 – the powerful system solution for the automotive industry and for suppliers and manufacturers of welding systems



Intelligent inverter

Modular medium frequency resistance welding control system with integrated servo gun control (servo electric or servo pneumatic) and PSQ 6000 process module. Upgrades are possible with plug-in I/O modules for all commonly-used networks.



Highly dynamic electric servo cylinder

Our innovative drive with an integrated force sensor allows for opening and closing the welding guns with position and force accurately with user definable settings. The regulated and safe operation ensures the best process quality.



Precise pneumatic servo cylinder

The optimum combination of intelligent electronics, along with the power and low price of pneumatics. The control ensures high speed with “soft touch” positioning, freely programmable position control and maximum repeatability and “follow-up” accuracy of the electrode force.



Powerful medium frequency transformers

Medium frequency transformers combining high power density with compact dimensions and low weight. Included features: temperature monitoring, secondary current sensor and voltage tap.

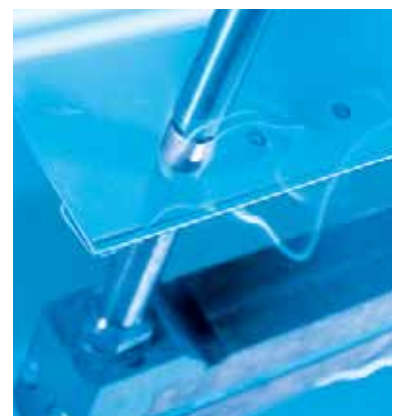
System components



Development/Engineering



System solution

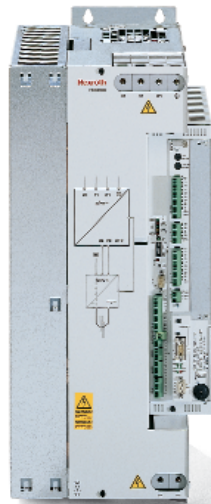




PSI 63 S inverter

Inverter up to 36 kA with integrated servo gun control

- air-cooled
- PSQ 6000 quality control board (optional)
- connection to PSG 6130 MF transformer
- UL-certified



PSI 6200 inverter

Inverter for steel and aluminium applications and resistance seam welding up to 54 kA

- water-cooled
- PSQ 6000 quality control board (optional)
- connection to PSG 6130 MF transformer



PSI 6500 inverter

Inverter for resistance seam and projection welding applications up to 120 kA

- water-cooled
- master-slave functions
- parallel connection of max. 3 inverters for currents of up to 360 kA



PSI 6000 series – flexible in terms of plug-in I/O cards, field buses and function and process modules

Rexroth PSQ 6000 – for supreme quality in spot welding

The PSQ 6000 control board with the unique quality monitoring system will ensure maximum process reliability on your production line using intelligent current/voltage or ultrasonic pulse monitoring and control. The innovative technology also includes in-process monitoring of the weld. This process is supported by documentation, logging and statistical process control via the BOS 6000 user interface.

For process assurance Rexroth offers the option of retrofitting the PSQ 6000 control board which can be used for current/voltage and ultrasonic control. It is part of the PSQ 6000 quality assurance system which controls, monitors and logs the welding process.

Integrated ultrasonic control and testing

Integrated in the process, the ultrasonic measuring system monitors the quality of the spot welds during the actual welding process. Ultrasonic pulses are used to control the size of the molten weld nugget, and to calculate and display the spot diameter.

Adaptive current/voltage control
For demanding material and metal combinations Rexroth offers adaptive current/voltage control with monitoring functions for pass/fail assessments.

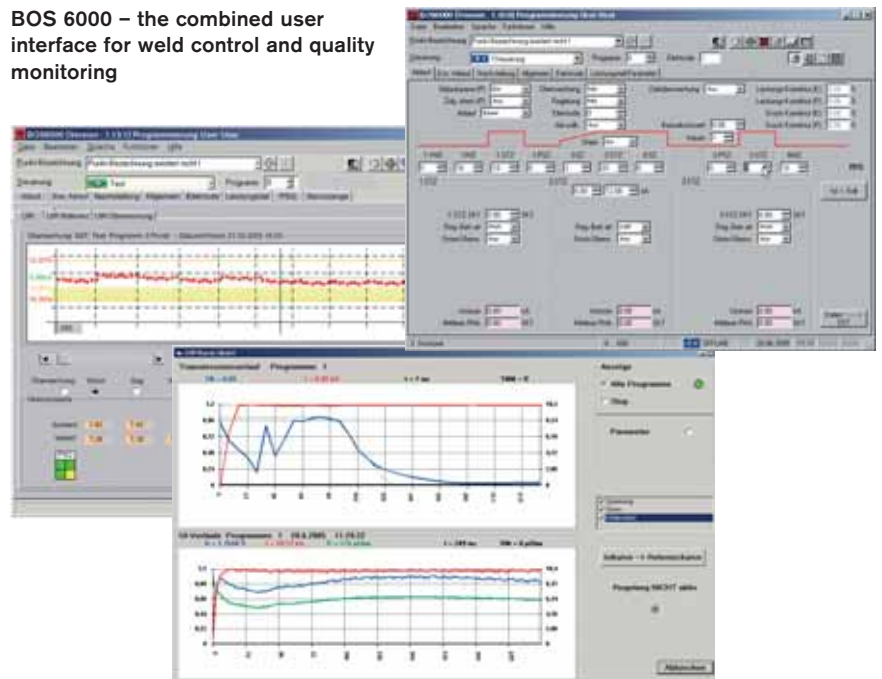
Combined current/voltage control and ultrasonic testing

This allows accurate inspection of the molten state of the spot welds and includes online display of the ultrasonic transmission variations concurrent with current, voltage and resistance characteristics in one diagram.



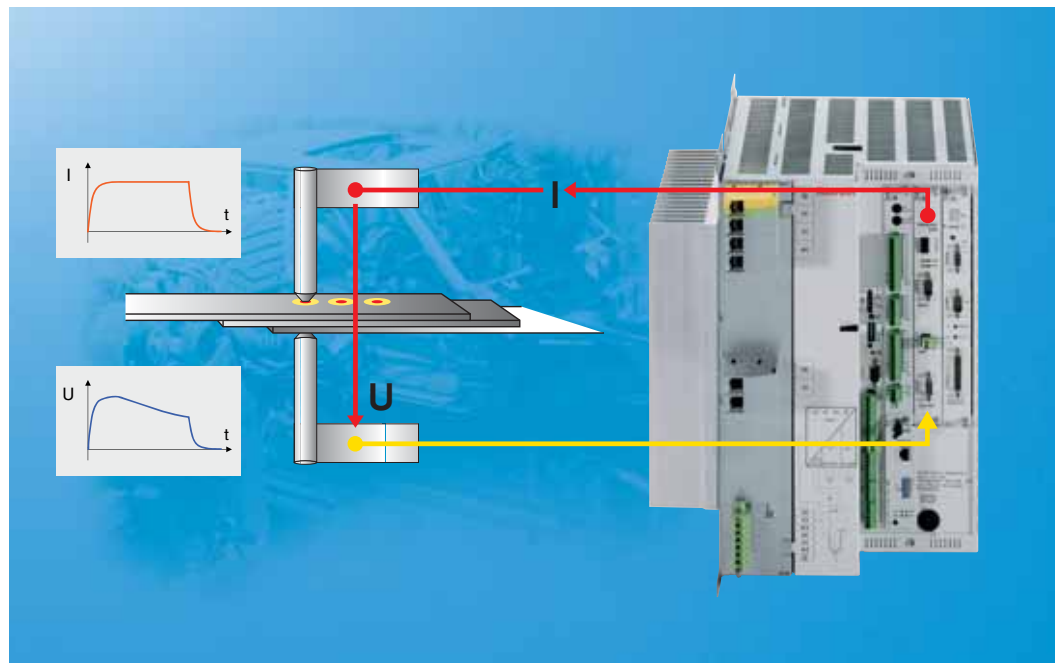
PSQ 6000 control board – for the ultimate quality control in spot welding

BOS 6000 – the combined user interface for weld control and quality monitoring



Adaptive current/voltage control for the highest spot weld quality

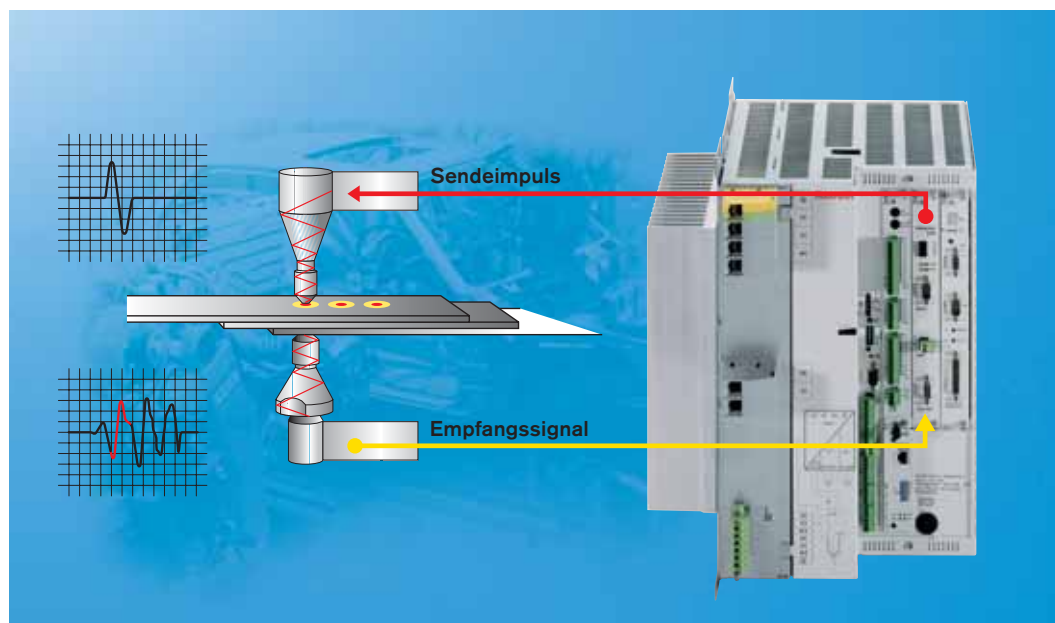
The adaptive current/voltage control mode gives you added flexibility for future requirements in the welding process. By measuring current and voltage, the course of resistance and energy can also be recorded, controlled and accurately evaluated during welding. The adaptive control algorithm ensures constant weld quality and reduced expulsion. Expensive rework is no longer required.



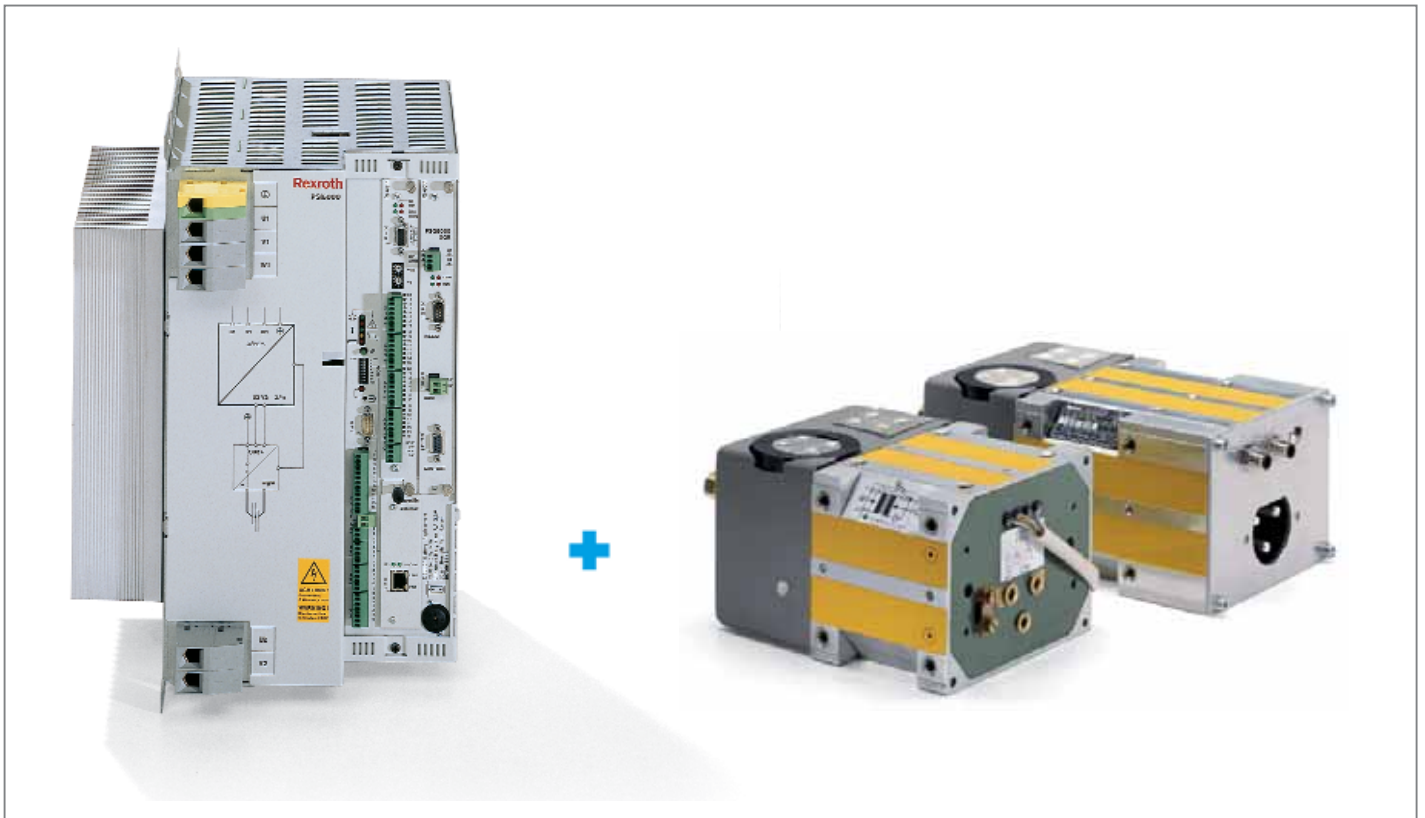
Adaptive current/voltage control – consistent weld quality and reduced expulsion

Ultrasonic control for constant weld spot diameter

The ultrasonic monitoring and regulation system ensures the quality of the spot welds during the actual welding process. Being based on an independent measurement, the advantage of the ultrasonic transmission curve is its reliability in displaying and documenting the weld spot diameter. The destructive testing of spot welds with hammer and chisel can be eliminated. The ultrasonic system comprises the XQR control board, UDM signal processor and ultrasonic sensors.



Ultrasonic control – quality assured during the actual welding process



PSI 6000 and PSG 6000 – the coordinated power pack

Combination		Nominal DC voltage	Secondary current	
Inverter	Transformer	U_{sec} (V)	I_{const} (kA)	I_{max} (kA)
PSI 6100	PSG 3075	8,4	4,2	18
	PSG 6130	9,0	6,5	20
PSI 6300	2 x PSG 3075	8,4	6,5	36
	PSG 6130	9,0	6,5	36
PSI 6200	2 x PSG 6130	9,0	13,0	66
	PSG 3200	13,0	6,5	40
PSI 6500	6 x PSG 6130	9,0	36,5	132
	3 x PSG 3200	13,0	19,5	91

PSG 6000 transformer series		PSG 6130	PSG 6170
Output	P (kVA at 20 % duty cycle)	130	170
Nominal DC voltage	U_{sec} (V)	9	9
Continuous on-state current	I_{sec} (kA)	6,5	8,5
Cooling water flow	\dot{m} (l/min)	8	8
Dimensions	W x H x D (mm)	160 x 127 x 262	160 x 127 x 297
Mass	m (kg)	16	19

Transformer engineering program for optimized welding power

Every medium-frequency transformer is exposed to a thermal load during welding. This load acts on the rectifiers (diodes) as well as on the iron/copper parts of the medium-frequency transformer. The TTP transformer engineering program provides assistance with sizing the transformer. And it also points to existing performance reserves.

Given the different heat capacities for the rectifier and the iron/copper parts it is necessary to calculate two duty cycles when sizing the transformer.

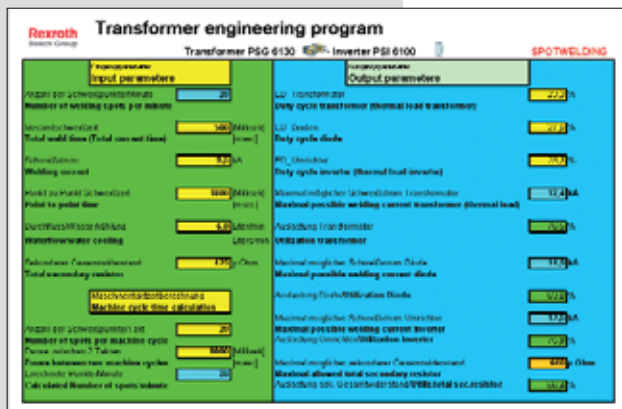
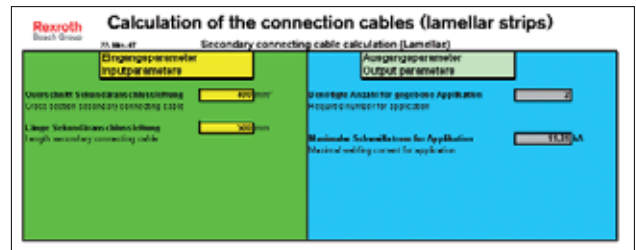
The TTP transformer engineering program from Rexroth assists you with the sizing of medium-frequency transformers and inverters for your welding tasks.

With the help of the duty cycle values and the welding current calculated by TPP, the load diagram is automatically checked to see whether the selected medium-frequency transformer is adequate for the welding job in question.

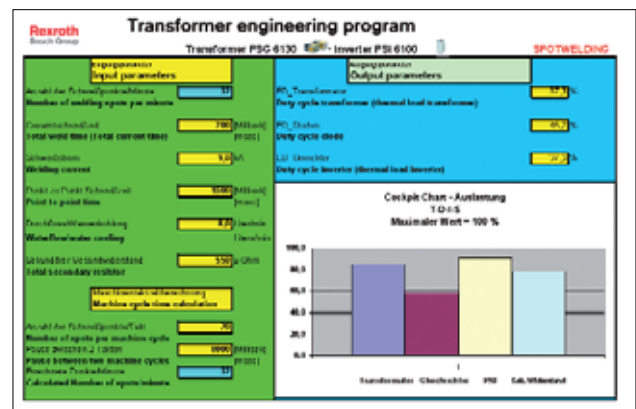
Also calculated is the thermal load on the inverter.

The inverter has to supply the required welding current for a certain duty cycle. This is verified by TPP and any performance reserves are indicated. Furthermore, the values calculated by TPP can be used for configuring the secondary section (e.g. connection cables).

Calculation of the connection cables (lamellar strips)



Transformer engineering program



Indication of performance reserves

Transformer types from the 3000 series

Version with PSG	With secondary voltage pick-off for control	With pick-off for secondary circuit monitoring	Secondary voltage for control looped through	Multi-contact connection MC 135 (mains/DC link)	Multi-contact connection MC 150 (mains/DC link)	Internal current measuring coil and temperature monitoring	Built-in/cast-in MPE resistor	Output voltage, secondary	PG connection (mains/DC link)
3075.10 PZ				400 V/500 V		Temperature monitoring		8,4 V	
3075.10 PSV			X		400 V/500 V	X	X	8,4 V	
3075.11 PSV		X			400 V/500 V	X		8,4 V	
3075.10 AZ	X					X		8,4 V	(without PG) 400 V/500 V
3075.10 AZS		X				X		8,4 V	(without PG) 400 V/500 V
3100.00 PSV			X		400 V/500 V	X	X	8,4 V	
3100.01 PSV		X			400 V/500 V	X		8,4 V	
3200.00 A						X		8,4 V	(without PG) 400 V/500

Transformer types from the 6000 series

Version with PSG	With secondary voltage pick-off for control	With pick-off for secondary circuit monitoring	Secondary voltage for control looped through	Multi-contact connection MC 135 (mains/DC link)	Multi-contact connection MC 150 (mains/DC link)	Internal current measuring coil and temperature monitoring	Built-in/cast-in MPE resistor	Output voltage, secondary	PG connection (mains/DC link)
6130.00 AS	X					X		9 V	(without PG) 400 V/500 V
6160.00 AS	X					X		11 V	(without PG) 400 V/500 V
6130.00 PS	X				400 V/500 V	X		9 V	
6130.00 PSC			X	400 V/500 V		X		9 V	
6130.00 PSK			X		400 V/500 V	X		9 V	
6130.00 PSV			X		400 V/500 V	X	X	9 V	
6160.00 PSV			X		400 V/500 V	X	X	11 V	
6130.00 PSM			X		400 V/500 V	X	X	9 V	
6130.00 PSD			X		400 V/500 V	X	X	9 V	

Rexroth PST 6000 – cost-effective AC series for standard applications

Ideal for standard applications – the PST 6000 AC series developed by Rexroth. With the same mechanical footprint as the PSI 6300/6100 series inverters, you have the option of upgrading your AC system to medium frequency with minimal cost. Naturally these control systems offer you the same flexibility in the I/O area and all the control functions of the entire PS 6000 system.



Air-cooled version – ideal for spot-welding applications



Water-cooled version – the solution of choice for continuous operation on projection welding and seam welding jobs

The AC control systems are designed for applications up to 250 kVA

- air-cooled/water-cooled
- optimum weld result by means of

primary or secondary current control

- competitive solution for standard applications

Characteristic		PST 6100L	PST 6100W	PST 6250L	PST 6250W
Line connection grounded TN or TT system		400 V -20 % to 600 V +10 %, 50/60 Hz			
Rated transformer output 20 % duty cycle, at 400 V~ and 80 % transformer load up to 20 % system utilization	kVA	77/145*	167	224	257
Rated transformer output 50 % duty cycle, at 400 V~ and 80 % transformer load up to 50 % system utilization	kVA	16/62,5*	106	65/141*	162
Rated line current; max. continuous thermal current	A	69/130*	150	200	230
Connection cross-section	mm ²	50	50	95	95
Weight	kg	12,5	21	13	21,5

* without/with fan hood

Rexroth PST 600E – compact power packs for stationary machines and manual welding units

For stationary welding machines and manual welding workstations – the PST 600E AC controllers from Rexroth have a compact, slim design which makes them up to 60 % smaller and lighter. Nevertheless the PST 600E has the same extensive functions and the same user-friendly operation and programming as the PST 6000 modular controller.



Air-cooled version – ideal for manual welding gun applications and simple projection welding tasks



Water-cooled version – ideal for manual welding gun and projection welding applications requiring more power

The AC control systems are designed for applications up to 95 or 155 kVA.

- air cooling/water cooling
- parallel input/output box with coordinated scope of functions
- high-precision primary current control without external current sensor –

no more cables and connectors

- optional slot for fieldbus module (Ethernet)
- ideal, attractively priced solution for use on older welding systems

Characteristic		PST 610EL	PST 610EW	PST 625EL	PST 625EW	PST 650EW
Kühlung		Air	Water	Air	Water	Water
Line connection grounded TN or TT system		400 V –20 % to 600 V +10 %, 50/60 Hz				
Maximum output current for duty cycle	A%	300/300* 10/20*	300 20	389/365* 15/30*	400 30	2 400 10
Rated transformer output 50 % duty cycle, at 400 V~ and 80 % transformer load up to 50 % system utilization	kVA	68/95*	95	106/141*	155	500
Rated line current; max. continuous thermal current	A	95/130*	130	200	230	800
Connection cross-section	mm ²	50	50	95	95	240
Weight	kg	8,6	7,9	13	9,1	11,2

* without/with fan hood

Rexroth BOS 6000 – operation and observation to perfection

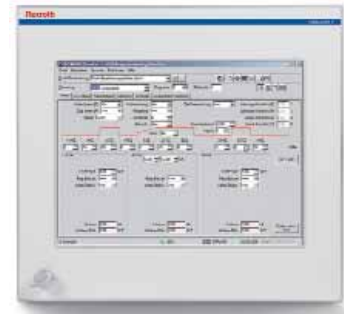
The BOS 6000 user interface is a user-friendly, future-proof system for monitoring and operation; it is Windows-based with integrated SQL database functionality. BOS 6000 allows joint operation of the weld control system, process module and servo gun control in one standard interface.

BT 6 – the compact operator terminal

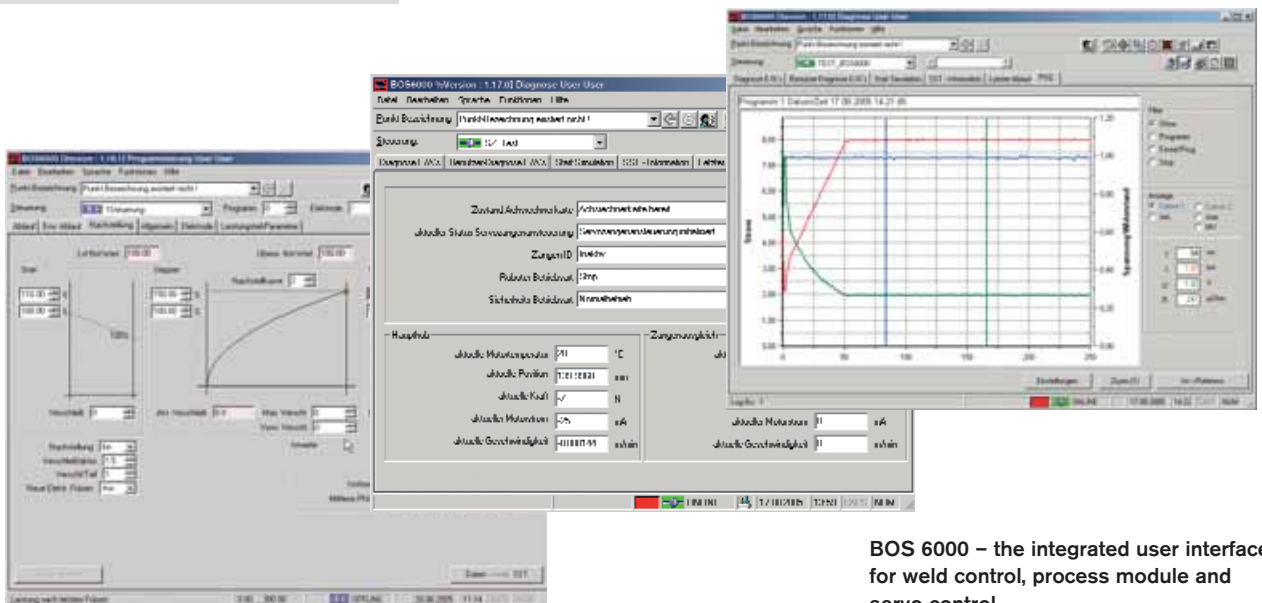


Given its dimensions, the space-saving BT 6 control and diagnostic unit is ideal for installation in control cabinet doors or operator consoles. For flexible use on site we can also supply this terminal as a handheld programming unit.

IndraControl VPP 40 – the robust industrial PC



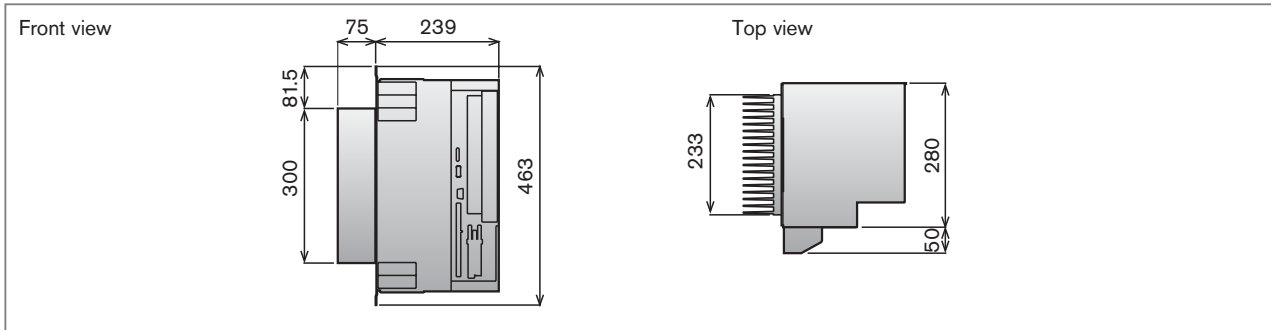
The VPP 40 industrial PC is the complete solution for control, operation and visualisation. It is specifically designed for use as a Stand-alone or networked PC and can be integrated inexpensively in control cabinets. Depending on the operating requirements this PC can be supplied with a touch screen or keyboard.



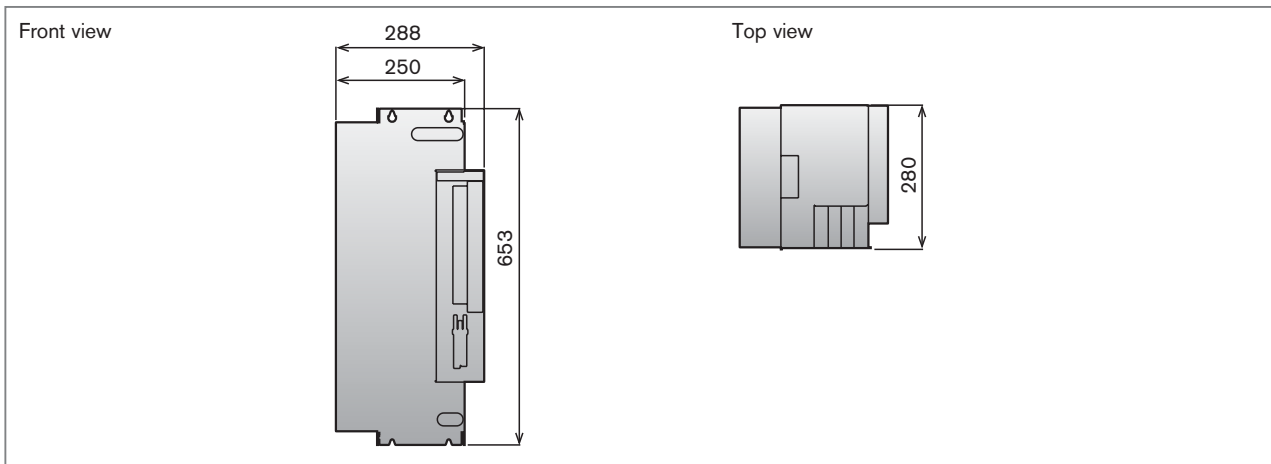
BOS 6000 – the integrated user interface for weld control, process module and servo control

PS 6000 – supreme power housed in compact design

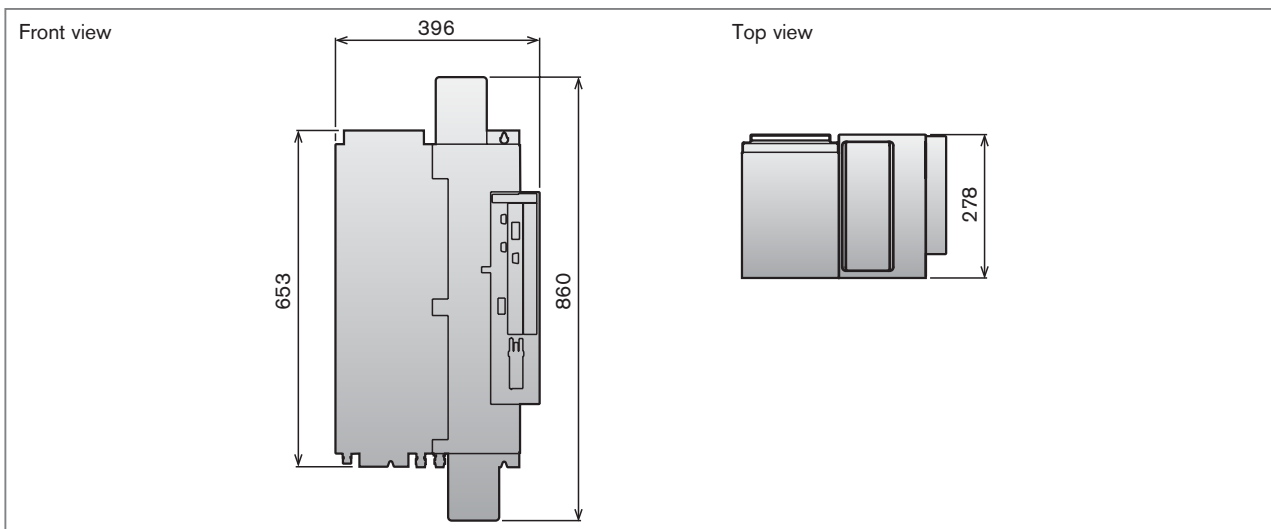
PSI 6100/6300 and PST 6000 (air-cooled)



PSI 6200

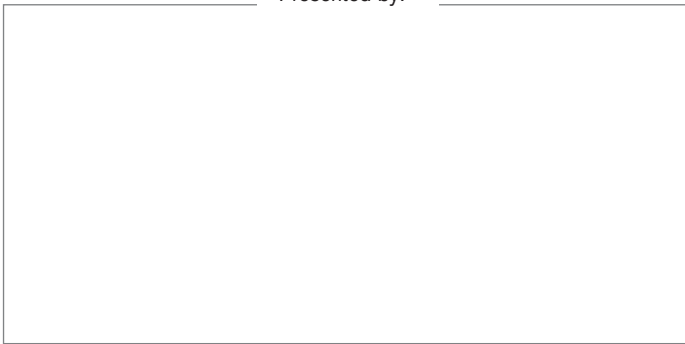


PSI 6500



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