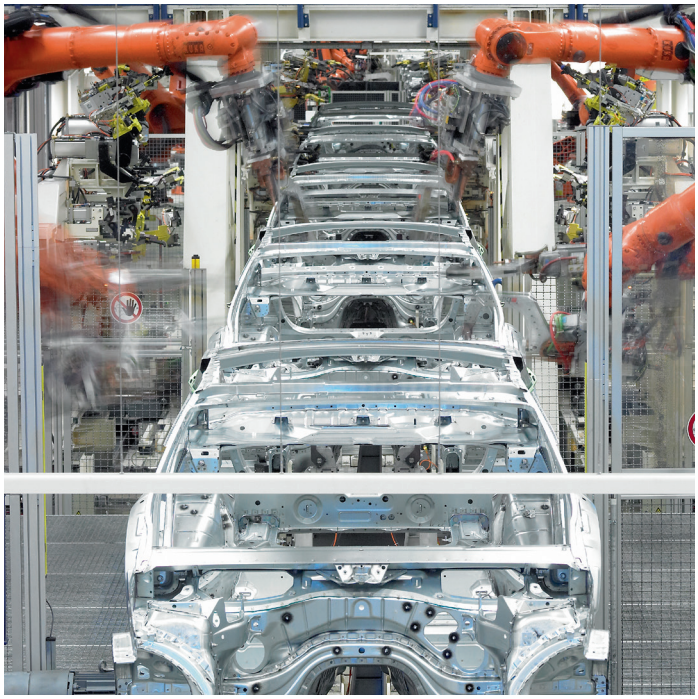
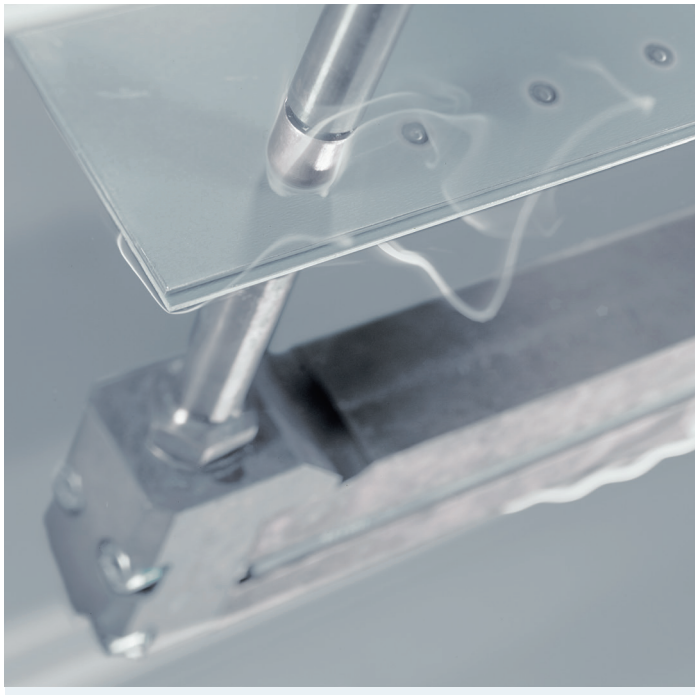
The Drive & Control Company

Rexroth
Bosch Group

Product Catalog
Resistance Welding



Introduction



Resistance Welding – Efficient and in the Highest Quality

Welding processes in the automotive industry have to meet the strictest requirements regarding process safety and quality. Weld controls PRC 7000 and welding transformers PSG 6000 from Rexroth – that is much more than a proven control and monitoring concept: users benefit from quicker commissioning, maximum availability and energy efficiency, simple handling and maximum flexibility.

Weld controls PRC provide:

- Up to 90 percent faster commissioning, in comparison to conventional technology
- Efficient handling and diagnostics with PRI 7000 software
- Optimized programming, control, and monitoring functionalities for maximum welding spot quality
- Up to 10.000 weld jobs, flexibly programmable with individual monitoring
- Maximum energy efficiency through modern power electronics: during welding the energy losses decrease by 30 %, and during production breaks even by 50 %, in comparison to conventional technology
- Open system architecture with integrated application layer and servogun functionality
- Flexibly configurable hardware:
  - Two power classes available
  - Each with air and water cooling
  - Can be combined with various fieldbus modules, expandable with bus couplers and I/O modules

Further **system components** from the Rexroth product portfolio extend the functional possibilities of the weld control:

- **Fieldbus couplers and I/O-Modules** allow connection of operating and display elements and further digital and analog signals
- **Servo drives** control servoelectric motors for gun stroke and/or tip dresser
- The **Safety zone module** monitors the safety devices and ensures a safe movement of the weld gun, if required
- **Gun data modules** store data and possibly transmit weld gun signals from/to the weld control

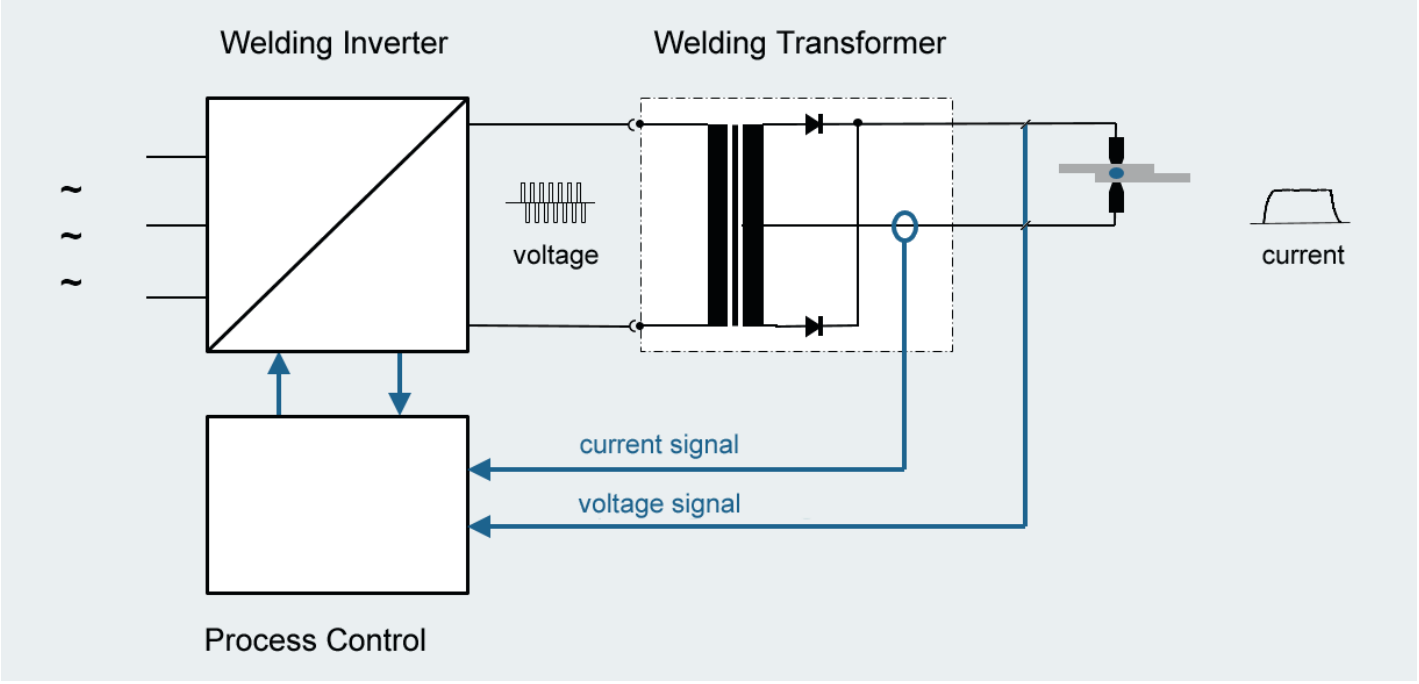
Welding transformers PSG complete the power pack:

- Standardized platform transformer for the automotive industry
- Optimal power transfer with minimum losses
- Monitoring function coordinated between weld control and transformer
- Optimal application possibilities thanks to a compact construction and low weight
- Nine power classes from 94 ... 250 kVA / 20 % D.C.
- DC output voltage 9.0 / 14.0 V
- Input supply voltage designed for 400 V ... 690 V mains
- Different types of power and signal connectors

Why Welding with Medium Frequency?

Resistance welding requires current strength in the kiloampere range. For this purpose, a small voltage (e.g. 9 V) with a large current is generated from the mains voltage (e.g. 400 V), with a welding transformer.
For classic AC welding with mains frequency (50 or 60 Hz), current and weld time are controlled by a thyristor, by means of phase shift. This has the disadvantage, that time and current can be varied with a minimum increment of 10 (resp. 8.3) msec. This is often too rough for precise control. The phase shift control generates a sinusoidal current with gaps. Direct current would feed the energy more quickly and evenly into the material.

Medium frequency welding combines the advantages of higher working frequency and direct current. A power inverter generates a controlled square-wave voltage in the kilohertz range from the mains voltage. This voltage is transformed down by a welding transformer and rectified on the secondary side. The result is a nearly rectangular current pulse with low residual ripple, which can be adjusted in millisecond steps.



The **welding inverter** is connected to three phases of the mains, which is always loaded symmetrically – a further advantage compared to the thyristor with AC welding.

At 1000 Hz operating frequency, the **process control** can react to disturbances within a millisecond and adjust the current or the weld time in 1 msec steps. This is the prerequisite for the use of an adaptive process regulation (see below).
Short weld times and steep current rise are possible.

As the frequency increases, the cross-section of an iron transformer core can be made smaller with the same power transmission.
Therefore, a **medium frequency welding transformer** is significantly lighter and more compact than a mains frequency transformer.

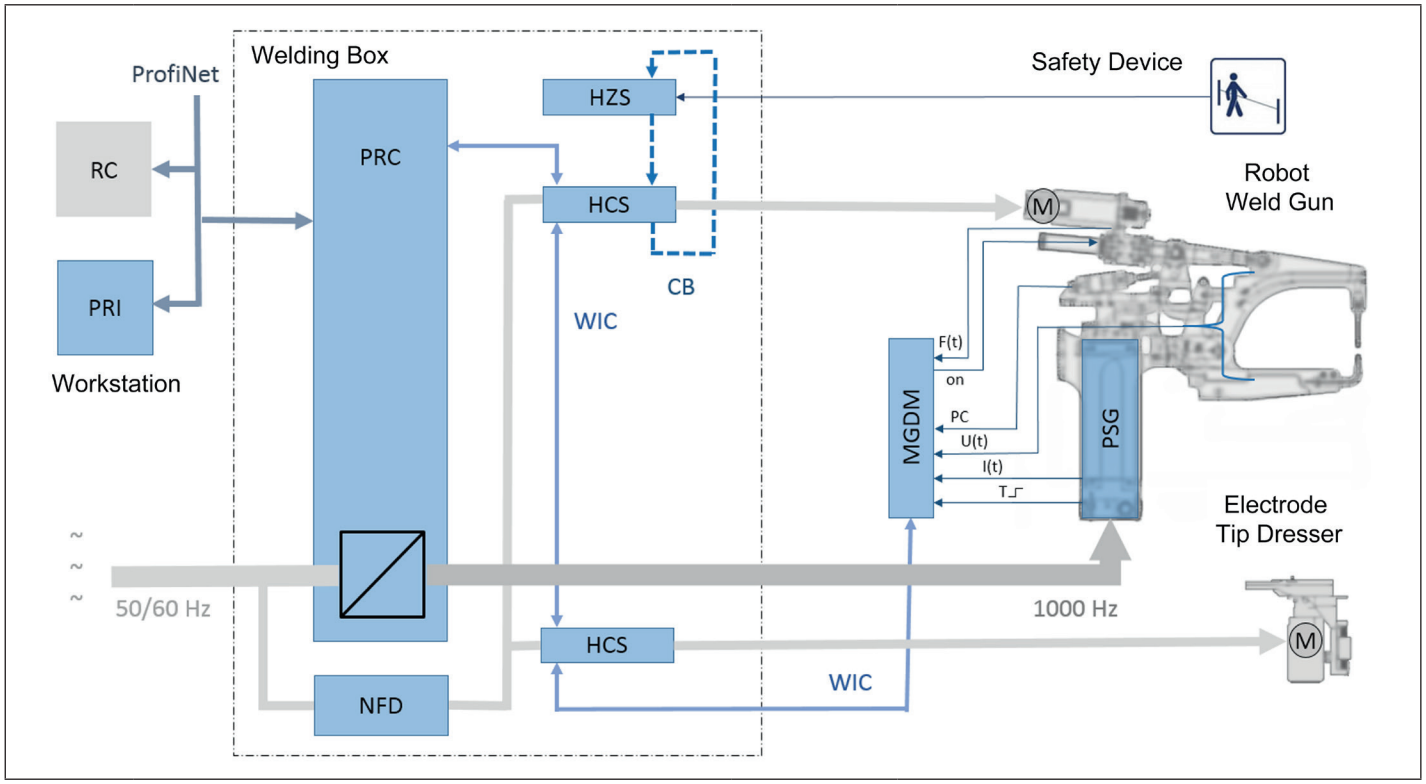
On the secondary side, the current is rectified.
Welding with direct current avoids inductive energy losses in the secondary circuit. The transformer power no longer has to be dimensioned according to the size of the welding window.

Controls for Resistance Welding

The weld control PRC is a process control and at the same time a power inverter. It also controls various technological processes: from opening and closing the weld gun to the dressing of the electrode tips.

The system configuration for two typical applications is shown below.

Robot cell with a servo-electric weld gun



System desgin

RC:	Robot control
PRI:	Workstation with software PRI 7000
PRC:	Weld control PRC 7000
NFD:	Mains filter for servo drives
HZS:	IndraDrive safety zone module
HCS:	IndraDrive servo module
WIC:	Weld interface controller bus
CB:	Communication bus
MGDM:	Measuring gun data module
PSG:	Welding transformer PSG 6000
F(t), U(t), I(t):	Analog feedback signals: force, voltage, current
On, PC, T:	Digital control and monitoring signals

The control components are installed in a compact control cabinet (“welding box”) or mounted on the weld gun.

The **welding transformer PSG 6000** generates the required high amperages and rectifies the welding current on the secondary side.

The **weld control PRC 7000** supplies the transformer with a regulated 1000-Hz AC voltage, which is fed from the 3-phase mains. The inverter controls the resulting power in the secondary circuit over the pulse width.

The process control is integrated in the welding inverter. It plays a central role in the execution, control and monitoring of the welding processes, as well as in the communication with the system components. It exchanges real-time signals with robot control, servo modules and gun data module, the tip dresser, as well as the sensor system. In addition, it realizes the data traffic with the operating device(s). For this purpose, it is equipped with signal inputs/outputs and bus interfaces.

The WIC (Weld Interface Controller) port of the weld control can be used to connect fieldbus couplers with I/O modules and servo modules. This extends the functional possibilities of the process control for the respective application. If required, additional weld guns and tip dressers can be connected.

Servo modules HCS control the servo-electric drives for weld guns and tip dressers.

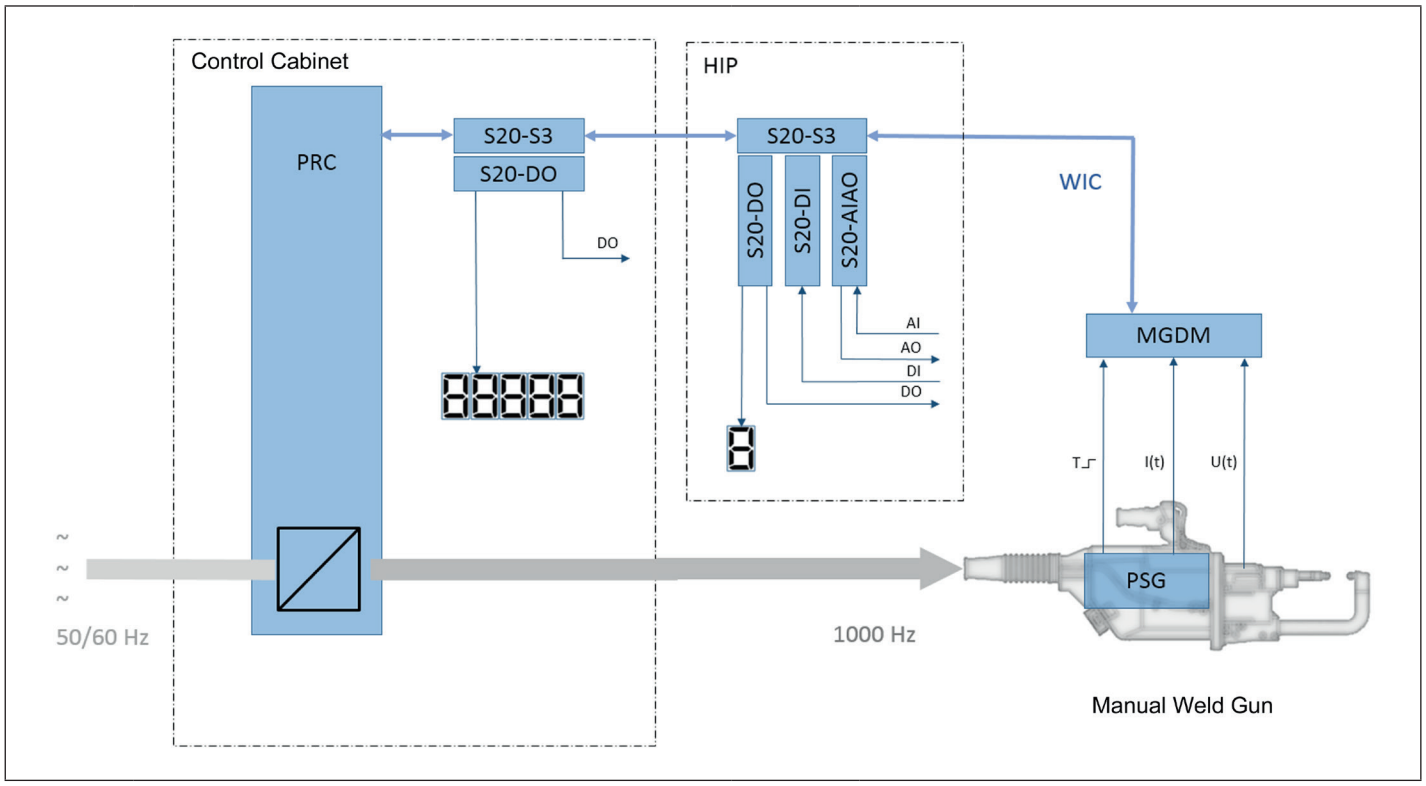
The **safety zone module HZS** coordinates the safety functions. It monitors the safety devices, such as protective doors or light barriers and ensures the safe movement of the weld guns, if necessary.

On the **gun data module GDM**, data for the operation of the weld gun are stored, e.g. the actual electrode wear and an electronic type label. These are available to the process control via the WIC bus.
The **measuring gun data module MGDM** also serves as a converter for current, voltage, force and temperature signals from the weld gun to the WIC bus.

The **operating software PRI 7000** is the user interface of the process control for parameterization and quality monitoring of the welding process.
It is used to set the welding parameters and the regulator. Both online and offline programming are possible.
Using the operating software, actual values, error messages and parameter changes can be displayed and documented.

Controls for Resistance Welding

Pneumatic manual weld gun



System design

PRC:	Weld control PRC 7000
WIC:	Weld interface controller bus
S20-S3:	Fieldbus coupler
S20-DO:	Digital output module
S20-DI:	Digital input module
S20-AIAO:	Analog I/O-module
HIP:	Hall installation plate for air and water
MGDM:	Measuring gun data module
PSG:	Welding transformer PSG 6000
I(t), U(t):	Analog feedback signals: current, voltage
DO, DI, T:	Digital control and monitoring signals
AO, AI:	Analog control and monitoring signals

Fieldbus couplers Sxx-S3 and **I/O modules Sxx-DI, Sxx-DO** and **Sxx-AIAO**, expand the signal input/output field of the weld control by additional digital and analog inputs/ outputs, e.g. for the connection of operating and display elements as well as for enable, command and feedback signals.

Fieldbus couplers and I/O modules **S20** are intended for installation in a control cabinet, whereas **S67** modules can be mounted on a weld gun.

It is also possible to connect several weld guns to a single weld control: the system layout can be flexibly adapted to the particular application, using fieldbus couplers and I/O modules.

For other applications, such as:
– robot cell with several servo-electric weld guns,
– the robot controls the gun as “seventh axis”
– stationary welding machines,
the system configuration can also be optimally designed.

The programmable logic function of the weld control (in preparation) configures the **I/O signal mapping** of the fieldbusses for the respective application.

Controls for Resistance Welding

Which Current Source for Which Welding Task?

We are offering weld controls in two power classes and for two mains voltage ranges, each with air and water cooling. The integrated process control is equipped with bus interfaces for the respective application and provides different special functions.

You will find technical basic data and engineering notes on weld controls on page 15 et sqq.

Welding transformers are available in nine power classes and two secondary voltage classes, in some cases for different primary voltages and with different connection technology. For details and engineering notes, please refer to the chapter Welding Transformers.

The power data of weld controls and transformers are harmonized with one another. The following table shows typical control-transformer combinations:

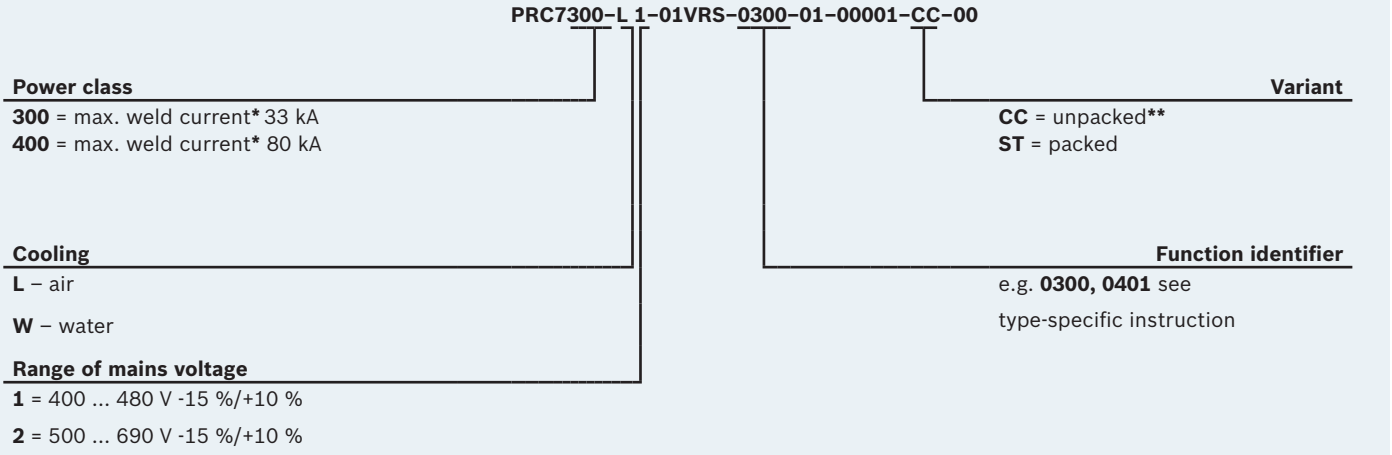
Control	Transformer	Secondary voltage class U_{2d} [V]	Secondary continous current I_{2P} [kA	Max. secondary current [1] I_{2max} [kA]
PRC 7300.xxx-X1	PSG 3075	9.0	5.0	15.8
	PSG 3100	9.3	5.5	25.2
	PSG 6130	9.0	6.1	17.3
	PSG 6170	9.0	6.1	17.3
	PSG 6180	14.0	4.2	20.9
	PSG 6250	14.0	4.2	17.3
PRC 7400.xxx-X1	2 x PSG 6130 parallel	9.0	13.0	34.6
	3 x PSG 6130 parallel	9.0	13.8	51.9
	4 x PSG 6130 parallel	9.0	13.8	69.2
	PSG 6180	14.0	5.7	35.5
	2 x PSG 6180 parallel	14.0	9.5	60.8
	PSG 6250	14.0	8.0	17.3
	2 x PSG 6250 parallel	14.0	9.5	34,6
	3 x PSG 6250 parallel	14.0	9.5	51.9
	4 x PSG 6250 parallel	14.0	9.5	60.8

[1] **Max. secondary current:** Peak loadability at 3 % D.C. and 50 msec weld time

Weld Controls PRC

Weld Controls PRC
Overview

Simlified Type Key



***** Maximum secondary current of the welding transformer at turns ratio 55:1 (mains voltage range 1) resp. 72:1 (mains voltage range 2)

****** Unpacked weld controls are intended for installation in a control cabinet at the manufacturer's site. Packaged controls can be ordered separately. This catalog contains only packaged controls.

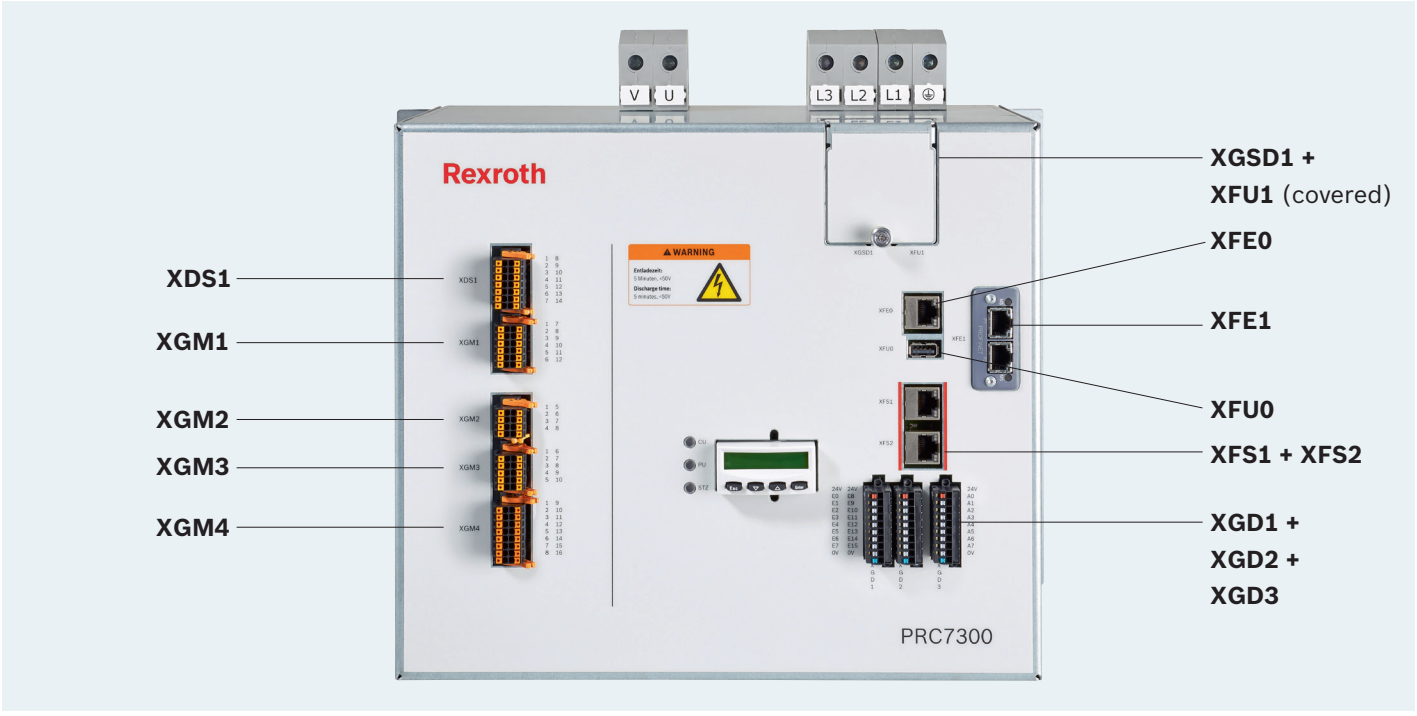
Technical Data

Type			PSG ...							
			PRC 7300-L1-...	PRC 7300-W1-...	PRC 7300-L2-...	PRC 7300-W2-...[1]	PRC 7400-L1-...	PRC 7400-W1-...	PRC 7400-L2-...	PRC 7400-W2-...[1]
Electrical Data										
Range of mains voltage		V	400 ... 480		500 ... 690		400 ... 480		500 ... 690	
Rated mains current (max. thermal continous current)		A	110		80		250		180	
Output frequency		Hz	1000							
Max. primary current (output current to transformer)		A	550		420		1600		1110	
Mechanical Data										
Weight		kg	13.8	13.1	13.8	13.1	30.8	28.1	30.8	28.1
Dimensions	Height	mm	320				496			
	Width	mm	370				385			
	Depth	mm	270	237	270	237	262	250	262	250

[1] **Particularity:** PRC 7xxx-W2 in IT-mains: 500 ... 580 V

Weld Controls PRC
Engineering Notes

Front view PRC 7300



The weld control PRC 7000 communicates with:

- The robot control/PLC via I/O-interfaces
- The programming device(s) via data bus interface(s) resp. USB
- Possibly servo drive module(s), the safty zone module and gun data module via the WIC (Weld Interface Controller) bus
- Possibly operating and display elements and the electrode tip dresser via digital I/O-signals

Operation, programming and diagnostics are carried out by means of a connected operating computer.
A diagnostics module on the front side allows additionally:

- to display the status of PRC and its firmware version,
- to display and set the Ethernet configuration,
- to display and reset errors/warnings,
- to re-start the control.

Optionally, it is possible to access the control via WebServer (in preparation).

Weld Controls PRC
Engineering Notes

Following signal interfaces are standard on board:
- Secondary current, secondary voltage, transformer temperature monitoring (XGM1)
- Analog command and actual values of electrode pressure, digital feedback electrode pressure (XGM2)
- Analog command and actual values of gun force, digital output Operate/Reset force sensor (XGM3)
- 16 digital inputs 24 VDC (XGD1, XGD2)
- 8 digital outputs 24 VDC (max. 100 mA) (XGD3)

Moreover

- Two WIC ports (XFS1, XFS2)
- One Ethernet port for the connection of an operating computer on site or via data network (XFE0)
- One USB port for local programming (XFU0)

In addition, there are two analog inputs and outputs and two digital high-speed inputs, which are not yet used (XGM4).
Optional function extensions can be enabled via SD card (XGSD1, behind the cover).

The universal interface slot is equipped with an Anybus module which, depending on the application, implements a type-specific I/O signal interface (XFE1).
Control types with different **I/O interfaces** are available:
– ProfiNet
– Ethernet/IP
– Others (in preparation)

Functionality of Weld Controls PRC 7000

Below we are listing the functional scope, which is common to all weld controls.
Additional functions for each control type are specified in the following chapters. The functions of the process control are reflected in the **I/O signal mapping**. For detailed descriptions, refer to the type-specific instructions.

Welding Tasks
– Up to 10.000 different welding tasks (sheet thickness combinations) are programmable
– Symbolic spot reference is possible

Welding Cycle
– Universally adjustable
– Programming times in milliseconds
– Up to 10 sequences with separate blocks configurable
– Block types: preconditioning, welding, post-conditioning
– Specific current profile can be defined for each sequence block

Regulation Modes
– PHA (phase shift)
– KSR (constant current regulation)
– UIR (adaptive regulator, optionally see page 20)
The control modes can be set separately for each weld time.

Monitoring Functions
– Reference currents can be programmed independently of the commanded values
– Percentage or absolute tolerance band, programmable asymmetrically
– Several monitoring functions can be set for each sequence block
– Automatic spot repetition when the current is too low, configurable

Power Correction
– Can be specified for each electrode separately

Weld Gun Management
– Management of all guns used (number depending on control type)
– Power increment (stepper function)
– Electrode tip dressing incl. start dressing
– Increment of the electrode force
– Prewarning table with graphical representation of the electrode wear

Control of Gun Force
– Force profile programmable for each sequence block,
– Output as analog and/or digital correcting variable (depending on control type)
– Analog or digital feedback (depending on control type)
– Force calibration for adjusting the force control variable to the used actuators

Tip Dresser Management
– Management of all tip dressers used
– Monitoring the milling cutter wear
– Prewarning table with graphical representation of the milling cutter wear

Calibration
– Of current (adjustment of the welding device to an external reference current meter)
– Of force (adjustment of the welding device to an external reference force measuring device)

Protocol Functions
– Error/event protocol with logging of weld errors
– Data change protocol
– Protocol of current values
– Electrode and milling cutter exchange protocol

Backup and Restore
– Backup, auto-backup and restore of data

Protection Class, Mounting Position
Weld controls PRC 7000 have the protection class IP 20 and are intended for installation in a control cabinet. If they, e.g., are installed in the rear wall of the cabinet, the heat sink can be located outside.

Air- or Water-Cooling?
Weld controls PRC 7000 are available in two performance classes, each with air and water cooling:

- PRC 7xxx-Lx ... air cooling
- PRC 7xxx-Wx ... water cooling

The thermal output power of each power class is the same for both types of cooling. Controllers with water cooling are preferably used in high duty cycle applications, e.g. for roll seam welding.

Air-cooled controls require forced cooling by fans and allow max. 45 °C cooling air temperature. We offer fan hoods as accessories, see chapter “Weld Controls PRC Accessories” on page 24.

Water-cooled controls require a minimum flow rate of 4 l/min and allow an inlet temperature between 18° and 30 °C, and max. 10 bar water pressure.

For further information on water-cooled controls, please refer to the application description:
Rexroth PS6000 Wx / PRC7000 Weld Timer and Welding Transformer with water cooling R911370699.

Weld Controls PRC
Engineering Notes

Mains Voltage
The controllers are connected three-phase to the TN, TT or IT mains.
There are the PRC 7000 weld controllers for two mains voltage ranges:

- PRC 7xxx-X1: 400 ... 480 V; -15 %/+10 %; 50/60 Hz
- PRC 7xxx-X2: 500 ... 690 V; -15 %/+10 %; 50/60 Hz
  (Peculiarity: PRC 7xxx-W2 in IT mains
  500 ... 580 V; -15 %/+10 %; 50/60 Hz)

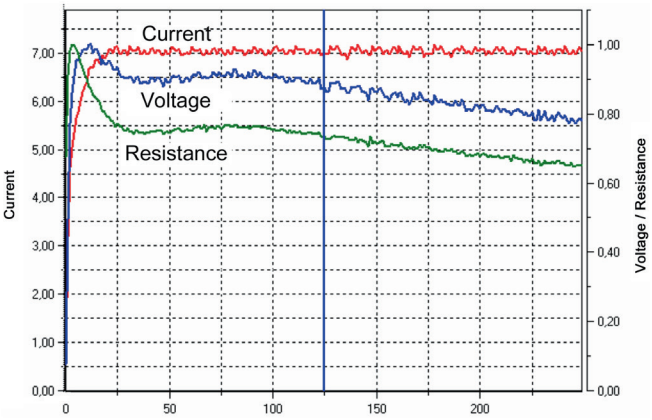
Adaptive UI Regulator (optional)

The adaptive UI (voltage/current) regulator ensures the optimal introduction of the necessary heat quantity into the spot during welding. It compensates for numerous disturbances, such as:

- Electrode wear
- Bad electrode tips
- Variation of electrode force
- Electrode misalignment
- Shunting
- Poor contact
- Different coatings of material
- Glue
- Edge welding
- Poor fitting
- Mains voltage fluctuations

The adaptive regulator adjusts current and weld time for each individual welding spot. This makes it possible to process different material combinations with the same welding program – a decisive advantage in manual welding. The adaptive regulator detects splashes and can react according to the specification.

Function
1. On the basis of a good welding with constant current regulation, the system determines the variation over time of electrode voltage and current and therefrom it calculates the resistance curve.



Typical current, voltage and resistance characteristics

2. A reference curve is created for the welding spot, from a series of resistance sequences thus obtained.
3. Using the reference curve, the UI regulator can then vary the welding current level and the weld time in such a way that the required heat quantity is reliably inserted into the welding spot, even if different disturbances occur.

Advantages of the UI regulator:

- Very wide bandwidth of compensable disturbances
- Significantly fewer user interventions when disturbances occur
- Better and more precise monitoring of the welding process, thanks to a variety of new monitoring parameters: process stability, process quality et al.
- Simple and fast parameterization of the monitoring functions by graphical representation of the actual values' distribution over time (histogram)
- Additional functions to improve the welding quality (e.g. glue function, thin-sheet function, compensation of gun resistance, Q-Stop-logics, monitoring of force) build on the possibilities of the UI regulation
- Fast parameterization of the adaptive UI regulator after sample welding of sheet metal strips (STC-Teach)

The adaptive UI regulator does not require any further sensor technology, in addition to a primary or secondary current measurement and a voltage tap on the arms of the weld gun. A primary current sensor is included in all PRC 7000 weld controls. Most PSG welding transformers contain a secondary current sensor, see chapter "Welding Transformers PSG".

The adaptive UI regulator can optionally be retrofitted. There are UI regulator options for steel and aluminum sheets, see chapter "Weld Control Options", on page 24.

Weld Controls PRC
Functional Overview

Electrical and mecanical data see page 16

Type	**PRC 7x00-x1-01VRS-0300-...**	**PRC 7x00-x1-01VRS-0401-...**	**PRC 7x00-x1-01VRS-0402-...**	**PRC 7x00-x1-01VRS-0403-...**
Application				
Control for manual weld guns	–	–	■	–
Control for pneumatic robot guns	■	–	–	■
Control for servo-electric robot guns		■	–	–
Fieldbus module[1]				
ProfiNet	■	■	–	–
Ethernet IP	–	–	–	■
Digital Inputs /Outputs[2]				
Inputs (control[1])	–	10	14	4
Inputs (extendible[3])	–	8	24	–
Outputs (control[1])	–	6	8	4
Outputs (extendible[3])	–	15	54	–
Analog Inputs /Outputs				
Inputs (control[1])	2	4	2	4
Inputs (extendible[3])	–	–	2	–
Outputs (control[1])	–	1	1	1
Outputs (extendible[3])	–	–	2	–
Special Features				
Status codes via fieldbus	–	■	–	■
Functions gun life, tip dresser wear, visualization electrode status, protocol of workpiece number	■	–	–	–
Functions servogun electric, tip dresser management	–	■	–	–
Functions electrode management for 2 guns, outputs for display of status and program selection	–	–	■	–

■ included with delivery — – nicht enthalten

[1] Contained in the control

[2] Actually used in/outputs, except transformer temperature, digital pressure feedback and mains circuit breaker trip

[3] In/output field extendible by bus couplers and I/O-modules resp. MGDM (see pages 28ff). The functionality, I/O-signal mapping and special features of the each control type are described in the type-specific instructions, see page 23.

PRC 7xxx
Ordering information

Description	Type Designation	Ref. No.
550 A max, air-cooled, ProfiNet, for pneumatic robot guns	PRC7300-L1-01VRS-0300-01-00001-ST-01	R911347586
550 A max, water-cooled, ProfiNet, for pneumatic robot guns	PRC7300-W1-01VRS-0300-01-00001-ST-01	R911382992
1.600 A max, water-cooled, ProfiNet, for pneumatic robot guns	PRC7400-W1-01VRS-0300-01-00001-ST-01	R911382489
1.600 A max, water-cooled, ProfiNet, for servo-electric robot guns	PRC7400-W1-01VRS-0401-01-00001-ST-01	R911382491
1.600 A max, water-cooled, discrete I/Os, for manual weld guns	PRC7400-W1-01VRS-0402-01-00001-ST-01	R911382493
550 A max, air-cooled, EthernetIP, for pneumatic robot guns	PRC7300-L1-01VRS-0403-01-00001-ST-01	R911381919
1.600 A max, air-cooled, EthernetIP, for pneumatic robot guns	PRC7400-L1-01VRS-0403-01-00001-ST-01	R911383151
1.600 A max, water-cooled, EthernetIP, for pneumatic robot guns	PRC7400-W1-01VRS-0403-01-00001-ST-01	R911383153

Handbooks

Titel	Ref. No.	
Instructions Rexroth PRC 7000	R911172834	Download
Type-specific instructions Rexroth PRC 7x00-Lx/Wx-300	R911342600	Download
Type-specific instructions Rexroth PRC 7x00-Lx/Wx-401	R911373593	–
Type-specific instructions Rexroth PRC 7x00-Lx/Wx-402	R911381739	–
Type-specific instructions Rexroth PRC 7x00-Lx/Wx-403	R911381576	Download
Description of application Rexroth PS6000 Wx / PRC7000 Weld Timer and Welding Transformer with water cooling	R911370699	Download

Weld Controls PRC
Options, Accessories, Spare Parts

The following functions are optionally available for retrofitting the PRC controls:

- UI-regulator steel ... adaptive voltage / current regulator (see page 20) for steel sheet
- UI-regulator steel+aluminum ... same for steel and aluminum sheets

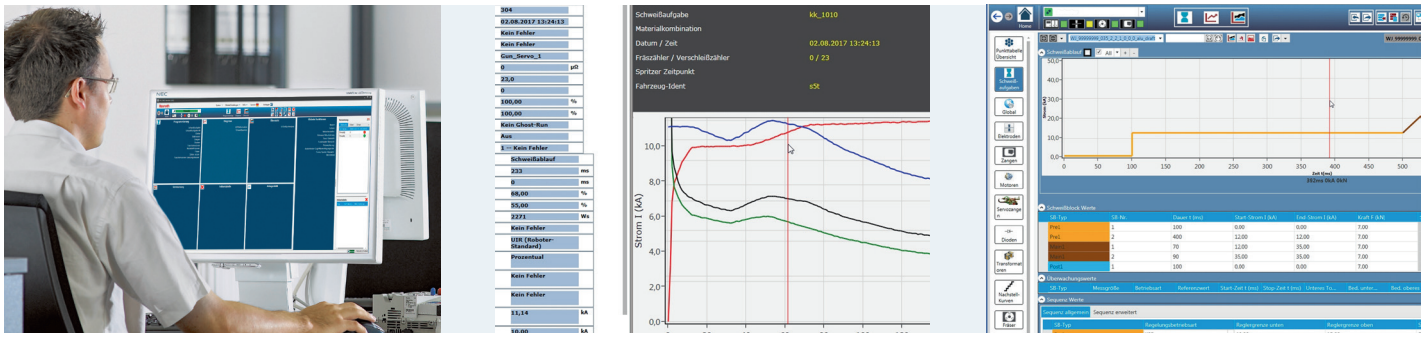
Type			PRC 7300-L1-01VRS-0300- ...	PRC 7300-W1-01VRS-0300- ...	PRC 7400-W1-01VRS-0300- ...	PRC 7400-W1-01VRS-0401- ...	PRC 7400-W1-01VRS-0402- ...	PRC 7300-L1-01VRS-0403- ...	PRC 7400-L1-01VRS-0403- ...	PRC 7400-W1-01VRS-0403- ...
Description	**Type Designation**	**Ref. No.**								
Option										
UI-regulator steel with force monitoring	Option UIR steel and force monitoring	1070094217	■	■	■	–	–	–	–	–
UI-regulator steel+aluminum with force monitoring	Option UI-regulator steel+aluminum and force monitoring	1070094218	□	□	□	■	■	■	■	■
Accessory										
Air fan hood for PRC 7300	Fan hood PRC7300	R911173733	□	–	–	–	–	□	–	–
Air fan hood for PRC 7400	Fan hood PRC7400	R911174586	–	–	–	–	–	–	□	–
Bag with 6 insert profiles for mains inlet and transformer output	Insert profiles set[1]	R911174037	■	■	■	■	■	■	■	■
Current sensor with M12 connector for secondary current measurement	SSR 81.20	1070081808	□	□	□	□	□	□	□	□
Spare Parts										
Operating and diagnostic module	Standard Controller	R911293458	✓	✓	✓	✓	✓	✓	✓	✓
Label for PRC	Label set PRC7300[2]	1070093582	✓	✓	✓	✓	✓	✓	✓	✓
Interface module Ethernet-IP	CFG-FBMODUL-AN-ETI-UP	R911173991	–	–	–	–	–	✓	✓	✓
Interface module ProfiNet-Wire	CFG-FBMODUL-AN-PNW-UP	R911173824	✓	✓	✓	✓	✓	–	–	–
Socket terminal board for XGD1, XGD2, XGD3	SET LED	R911173800	✓	✓	✓	✓	✓	✓	✓	✓
Socket terminal board for XDS1, XGM1, XGM2, XGM3, XGM4	SET B2CF 3.50 REDUZ.	R911173776	✓	✓	✓	✓	✓	✓	✓	✓

■ included with delivery □ accessory retrofittable ✓ suitable – not suitable

[1] Insert profiles for the power terminals are required for connecting conductors with a cross-section of 35 mm² or less, or with pin cable shoes, in order to ensure a secure connection.

[2] Three labels L1, L2, L3, PE, U, V for the terminals of the weld controls PRC 7300 and PRC 7400

Operating Software PRI 7000



The **PRI 7000** software is used to program, operate and diagnose the weld controls PRC 7000.

- The welding process is universally configurable: each of the over 10.000 welding tasks can be built from up to ten sequence blocks with their own power profile
- The regulation mode can be set separately for each weld time
- For each sequence block, current and other monitoring can be individually selected
- For each weld control the measurement of current and electrode force can be scaled to an external reference measuring device
- The power adjustment of electrode wear, the tip dressing, a force profile for each sequence block as well as an individual power correction can be set for each connected weld gun
- The software provides extensive protocol functions acc. to ISO 9000:
  - protocol of current values
  - protocol of errors/weld errors/events
  - data change protocol
  - electrode and milling cutter exchange protocol
- Certain events can be defined as “error” or “warning”, as required
- The user interface provides an overview of all weld controls by means of a system diagram, a control-related overview based on various filter criteria and a status display of all input / output signals of the weld controls
- The data can be backed up and restored using the Backup / Autobackup and Restore functions
- Programming is possible online or offline

System Requirements

- PC with min. 1 GHz processor
- Operating system Windows 7 or 10, Windows Server 2008 R2, Windows Server 2012
- Net Framework 4.5.1 or higher
- Memory:
  - RAM min. 4 GB
  - Hard disk 1 GB for PRI 7000 application, additional storage space for data
- Monitor resolution min. 1920 x 1080
- CD/DVD drive
- Ethernet card

Ordering information

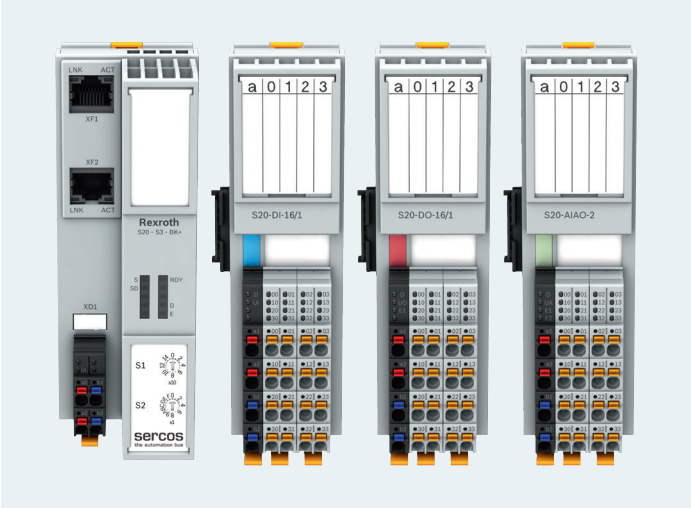
Description	Type Designation	Ref. No.
Software DVD, single license	PRI 7000	R911174535

System Components for Communication, Gun Control and Safety

Fieldbus Couplers and I/O-Modules

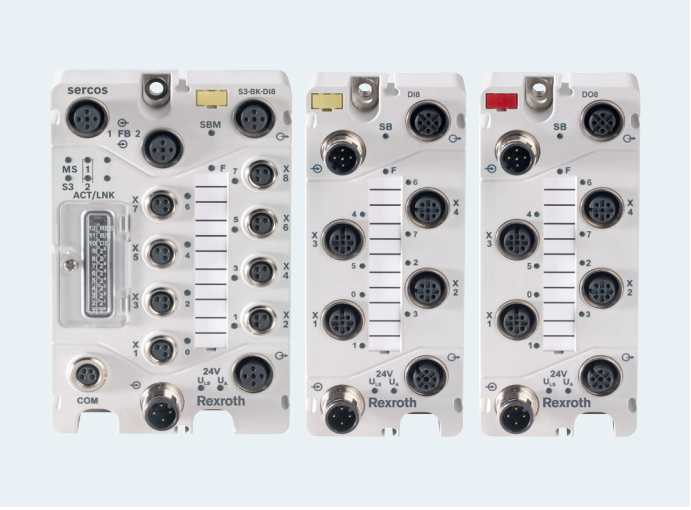
With fieldbus couplers and I/O-modules, the signal input/output field of the PRC weld controls is expanded by additional inputs/outputs. An application example is shown on the overview diagram Pneumatic manual weld gun, on page 12.

The firmware of the weld control determines the function of the inputs and outputs. For details, refer to the type-specific instructions for each weld control.
We are offering the modular I/O systems S20 and S67:



I/O system S20 with protection class IP20 is the freely scalable I/O system for cabinet installation.

- Easy installation thanks to toolless wiring
- The S20 I/O-modules can be easily connected decentrally via a bus coupler
- Robust design with a standard, expanded temperature range, minimal EMC emission and high vibration resistance



I/O system S67 with protection class IP67 allows you reliable, process-oriented and completely cabinet-free installation – even in extreme environmental conditions. These modules may be mounted e.g. directly on the weld gun.

- Fast and toolless installation via the M8 and M12 connectors as well as preassembled system cable
- Easy connection to the system via intelligent fieldbus couplers
- High protection class IP67 for extreme operating conditions with an expanded temperature range, minimal EMC emission and high vibration resistance

A selection of fieldbus couplers and I/O-modules S20 and S67, which are designed as system components in combination with weld controls PRC, are presented on the following pages.

The brochure I/O systems S20 and S67 for flexible automation provides an overview of the entire program**.**
I/O systems for flexible automation
(Reference No. R999001321).

Fieldbus Couplers and I/O-Modules S20
for cabinet installation

The I/O system S20 is in modular design with protection class IP20, for cabinet installation. It is used to transfer the process signals to a higher-level controller.
An S20 station consists of individual modules, which are snapped onto a support rail.
The head of the station is a bus coupler. The I/O-modules are connected to it.
The connection of the individual modules to one another and to the station head is realized by means of bus socket modules. These are snapped together in the support rail and form the local bus.

The bus coupler **S20-S3-BK+** with a network connection and an S20 local bus connection is the link between the network and the S20 station as the head of an S20 station.

- Fieldbus protocol Sercos v1.3
- 2 pcs. RJ45 connectors (with integrated switch)
- Rotary code switch for setting the Sercos address
- Up to 63 additional S20 users can be connected
- Electronic device type label
- Diagnostics and status indicators
- Dimensions H × W × D = 125.9 × 45 × 74 mm

The input module **S20-DI-16/1** and the output module **S20-DO-16/1** complete the I/O station.

- 16 resp. 32 digital inputs or outputs
- Outputs 24 V DC, 500 mA, protected against short circuit and overload
- Inputs 24 V DC, 2.4 mA
- Connection of the sensors / actuators in 1-wire technology
- Minimum update time < 100 µs, bus-synchronous
- Stored device type label
- Diagnostics and status displays
- Supplied with bus socket module
- Dimensions H × W × D = 126.1 × 35 × 54 mm

The **analog input/output module S20-AIAO-2** connects additional signals from the weld guns to the weld control.

- 2 analog inputs, 2 analog outputs,
- Voltage or current selectable individually: 0 ... 20 mA, 4 ... 20 mA, ± 20 mA, 0 ... 10 V, ± 10 V, 0 ... 5 V, ±5 V
- Connection of the sensors / actuators in 2-wire technology
- Delivery including bus socket module and connectors
- Dimensions: H × W × D = 126.1 × 35 × 54 mm

Please refer to the application description **S20 System and Installation** for a detailed description of all components (including bus socket modules and connectors) as well as information on installation distances, conductor cross-sections and connection technology
(Reference number R911335988).

Ordering information

Description	Type Designation	Ref. No.
Bus coupler Sercos	S20-S3-BK+	R911173318
Module 16 digital inputs 24 VDC	S20-DI-16/1	R911172543
Module 16 digital outputs 24 VDC	S20-DO-16/1	R911172542
Module 32 digital outputs 24 VDC	S20-DO-32/1	R911172535
Analog input-/output module: 2 analog inputs, 2 analog outputs	S20-AIAO-2	R911173743

Fieldbus Couplers and I/O-Modules S67
for use in peripherals

The modular I/O system S67 consists of fieldbus couplers, I/O-modules and, if required, power distributors with protection class IP67. The total expansion per IndraControl S67 node can be up to 500 meters, with a maximum distance between the individual S67 components of 50 m. The fieldbus coupler and the I/O-modules are only connected via the S-BUS cable, for communication and power supply.

A general description of all components can be found in the application description **Rexroth S67** (Reference number R911329572).
The manuals on the right provide detailed information on configuration, commissioning and accessories.

The fieldbus coupler **S67-S3-BK-DI8-M8** is the link to the fieldbus and thus to the data exchange with the higher-level control.

- 8 digital inputs
  - 24 V DC, 2.8 mA
  - connection type: M8 connector, A-coded, 3-pole
- USB port for service purposes
- Lockable control panel for the operating mode and address switch (DIP switch)
- Diagnostics and status indicators
- Expandable by up to 64 external I/O-modules
- Parameterization and configuration using the IndraWorks engineering tool
- Dimensions: H × W × D = 117 × 75 × 36 mm

Documentation: application description
S67 Sercos Coupler 8 Digital Inputs (M8)
(Reference number R911338401)

The input module **S67-DI8-M12** and the **output module S67-DO8-M12** extend the I/O field modularly.

- 8 digital inputs and outputs, respectively
  - inputs 24 V DC, 7.3 mA
  - outputs 24 V DC, 500 mA, protected against short circuit and overload
- Connection type: M12 connector, 3-pin
- Diagnostics and status displays
- Dimensions: H × W × D = 117 × 50 × 36 mm

Documentation: Application descriptions
S67 Digital Module 8 Inputs (4×M12)
(Reference number R911329550) and
S67 Digital Module 8 Outputs – 0.5 A
(Reference number R911342196).

Ordering information

Description	Type Designation	Ref. No.
Bus coupler S67 Sercos III	S67-S3-BK-DI8-M8	R911172899
Module 8 digital inputs (M12)	S67-DI8-M12	R911171788
Module 8 digital outputs (M12)	S67-DO8-M12	R911171790

Servo Drives HCS01
for gun stroke and electrode tip dresser

The **compact converters HCS01** are part of the Rexroth IndraDrive Cs product family. They are used to operate Rexroth IndraDyn motors or third-party motors.

The table on page 33 provides an overview of servo drives which we recommend for our PRC 7000 weld controls.

Following servo drives are available for resistance welding:
- For control and regulation of gun stroke, in two power classes
- For control of tip dresser without regulation, in a single power class

Servo drives for the gun stroke are available with the options Safe Stop or Safe Movement. The Safe Movement option, together with the HZS01 zone module, ensures that the weld guns are moving with a safe speed, when e.g. the door is open. See page 35 for more information.
For each servo drive, we provide the appropriate firmware, which must be ordered separately.
We are offering Sercos cable assemblies – examples on page 34.

Mains filters NFD03.1 reduce radio interference and network effects of the servo drives. They are used for the disturbance suppression of three-phase drive control units up to 480 V for 1 ... 6 axes and motor cable lengths up to a maximum of 75 m single-axis / 120 m multi-axis.

HCS01.1E-W0005, -W0028 and -W0054

Detailed technical data, notes on the mechanical and electrical project planning, for servo motors, for documentation and a description of the cables, accessories and additional components are available in the following manuals:
Rexroth IndraDrive Cs drive systems with HCS01; project planning manual
(Reference number R911322210)
Rexroth IndraDrive drive controllers power sections HCS01; operating instructions
(Reference number R911339012)
Rexroth IndraDrive additional components and accessories; project planning manual
(Reference number R911306140)

Servo drives HCS01: Technical basic data, function overview, firmware and suitable mains filters

Type HCS01.1E- ...			**W0005-A-03-E-S3-EC-NN-L3- ...**	**W0028-A-03-B-ET-EC-NN-L4- ...**	**W0028-A-03-B-ET-EC-NN-S5- ...**	**W0054-A-03-B-ET-EC-NN-L4- ...**	**W0054-A-03-B-ET-EC-NN-S5- ...**
Electrical Data							
Mains connection			3-phase AC-network 200 ... 500 V				
Continous current		A	2.0	11.5	11.5	21.0	21.0
Maximum current		A	5.0	28.0	28.0	54.0	54.0
Output voltage		V	3 × AC 0 ... 500 V				
Overall protection class			IP20				
Mechanical Data							
Weight		kg	0.72	1.7	1.7	4.22	4.22
Dimensions	Height	mm	215	268	268	268	268
	Width	mm	50	70	70	130	130
	Depth	mm	196	196	196	196	196
Functionality							
Control of electrode tip dresser			✓	–	–	–	–
Control and regulation of gun stroke			–	✓	✓	✓	✓
Option Safe Stop			■	■		■	
Option Safe Movement					■		■
Firmware							
FWA-INDRV*-MPE-... for servodrives for electrode tip dresser control			✓	–	–	–	–
FWA-INDRV*-MPB-... for servodrives for gun stroke control and regulation			–	✓	✓	✓	✓
Mains Filter							
for servodrives up to 30 A			✓	✓	✓	–	–
for servodrives up to 55 A			–	–	–	✓	✓

■ included ✓ suitable – not suitable

Ordering information

Description	Type Designation	Ref. No.
Servodrive electrode tip dresser up to 5 A	HCS01.1E-W0005-A-03-E-S3-EC-NN-L3-NN-FW	R911341015
Servodrive gun stroke with safe stop, up to 28 A	HCS01.1E-W0028-A-03-B-ET-EC-NN-L4-NN-FW	R911331611
Servodrive gun stroke with safe movement, up to 28 A	HCS01.1E-W0028-A-03-B-ET-EC-NN-S5-NN-FW	R911376620
Servodrive gun stroke with safe stop, up to 54 A	HCS01.1E-W0054-A-03-B-ET-EC-NN-L4-NN-FW	R911332723
Servodrive gun stroke with safe movement, up to 54 A	HCS01.1E-W0054-A-03-B-ET-EC-NN-S5-NN-FW	R911376621
Firmware for servodrive tip dresser	FWA-INDRV*-MPE-xxVRS-D5-1-NNN-NN	actual version on request
Firmware for servodrive gun stroke	FWA-INDRV*-MPB-xxVRS-D5-1-NNN-NN	
Sercos cable, 0,25 m long	RKB0061/00,25	R911372773
Sercos cable, 2 m long	RKB0062/002,0	R911372776
Mains filter for servodrives up to 30 A	NFD03.1-480-030	R911286919
Mains filter for servodrives up to 55 A	NFD03.1-480-055	R911286920

Safety Zone Module HZS01
for safe movement of the weld gun

The safety zone module HZS01 monitors the safety devices such as protective doors or light barriers and realizes, if necessary, the safe movement of the weld gun.
It provides the following security features:
- Safety Zone Acknowledge [SZA]
- Safety Zone Error [SZE]
- Safety Zone Input [SZI]
- Safe Door Locking [SDL]

- 2 × 8 digital inputs for 2-channel common selection of the safety functions at the safety zone nodes or 16 inputs for 1-channel selection
- 2 × 1 digital dynamic output (1 output pair) for safety zone acknowledgment, if all safety zone users display safety
- 2 × 1 digital dynamic output (1 output pair) Safety zone error if at least one safety zone subscriber indicates an error
- 2 × 1 digital dynamic output (1 output pair) for monitoring the wiring
- 2 × 1 digital output (1 output pair) for the control of the safe protective door lock
- Galvanic isolation exists between the inputs and outputs of the safety zone module and the other participants in a safety zone
- Protection class: IP20
- Dimensions: H × W × D = 120 × 35 × 107 mm

The safety zone module is controlled by the safety device and, for its part, drives the servo drives via the communication bus. For this we offer ready-made bus cables RKB0051 and RKB0052 (see below):

- Maximum total length of all cables in a safety zone: 2500 m
- Maximum length of a cable between two connection points: 100 m
- Number of security zone nodes (without HSZ01):
  - maximum of: 35
  - minimum: 1

Technical specifications, detailed functional description, configuration notes as well as a description of the cables and other accessories for the safety zone module are contained in the following manual:
Rexroth IndraDrive Additional Components and Accessories Project Planning Manual
(Reference number R911306140).

Ordering information

Description	Type Designation	Ref. No.
Safety zone module	HSZ01.1-D08-D04-NNNN	R911339573
Bus cable 0.25m	RKB0051/00,25	R911341092
Bus cable 0.55m	RKB0051/00,55	R911341093
Bus cable 1m	RKB0052/001,0	R911341079
Bus cable 2m	RKB0052/002,0	R911341083
Bus cable 5m	RKB0052/005,0	R911341082

Gun Data Modules GDM and MGDM

On the gun data modules data from the weld gun are stored, e.g.:

- an electronic type label,
- the actual electrode wear.

The electronic type label is used e.g. in the gun workshop to identify the weld gun. If guns are used one after the other at several weld controls, the current wear of the guns and electrodes must be known to the controls.

For this purpose, the gun data module GDM is used. The measuring gun data module MGDM also collects the measured values occurring at the weld gun, including preparation and preprocessing.

GDM and MGDM communicate with the weld control PRC via the WIC bus.

The **gun data module GDM** has a WIC port, via which the weld control or a service PC can access their respectively accessible memory range.
The service PC can retrieve the electronic type label of the gun, using a browser:

- Serial numbers
- Information on gun design
- Information on welding transformer

The weld control can read and write counter readings: electrode tip wear, dressing cycles, gun wear.

Protection class: IP65
Dimensions: H × W × D = 85 × 21 × 60 mm

Further information in the description of application **Rexroth GDM Gun Data Module** (Reference number R911339735).

The **measuring gun data module MGDM** moreover has plugs for the following signals from the weld gun:

- 24 digital inputs/outputs 24 VDC, individually configurable as input or output
- Gun coding
- Actual value of a force sensor
- Actual value and calibration of another force sensor
- Actual value of secondary voltage
- Setpoint and actual value for a proportional valve
- Secondary current and temperature contact of two welding transformers

Protection class: IP65
Dimensions: L × W × H = 200 × 167 × 22 mm

Further information in the Type-Specific Instructions **Rexroth PRC7000 MGDM Measuring Gun Data Module** (Reference number R911381901).

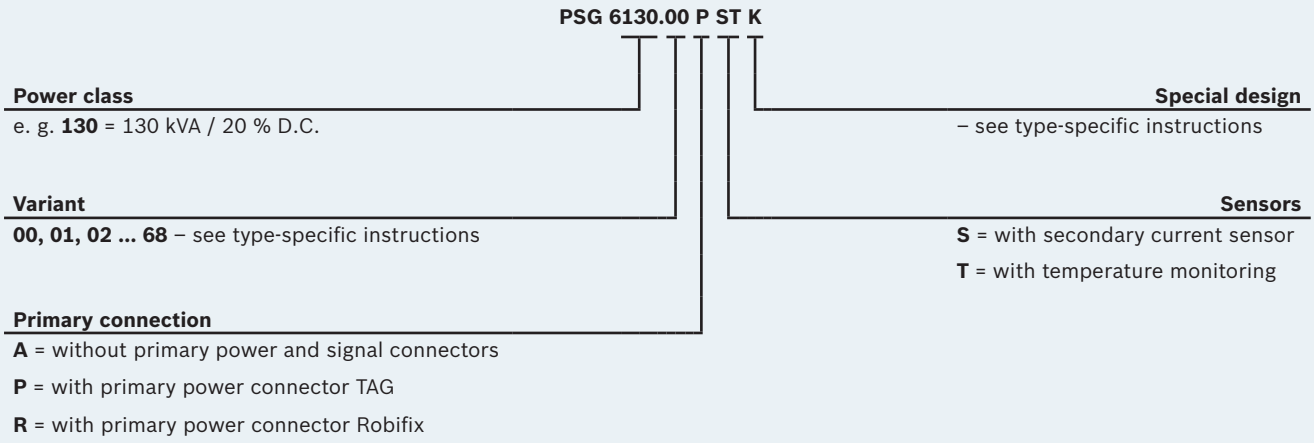
Ordering information

Description	Type Designation	Ref. No.
Gun data module	GDM.001	R911173166
Measuring gun data module	MGDM.001	R911174536

Welding Transformers PSG

Welding Transformers PSG –
Overview

Simplified Type Key

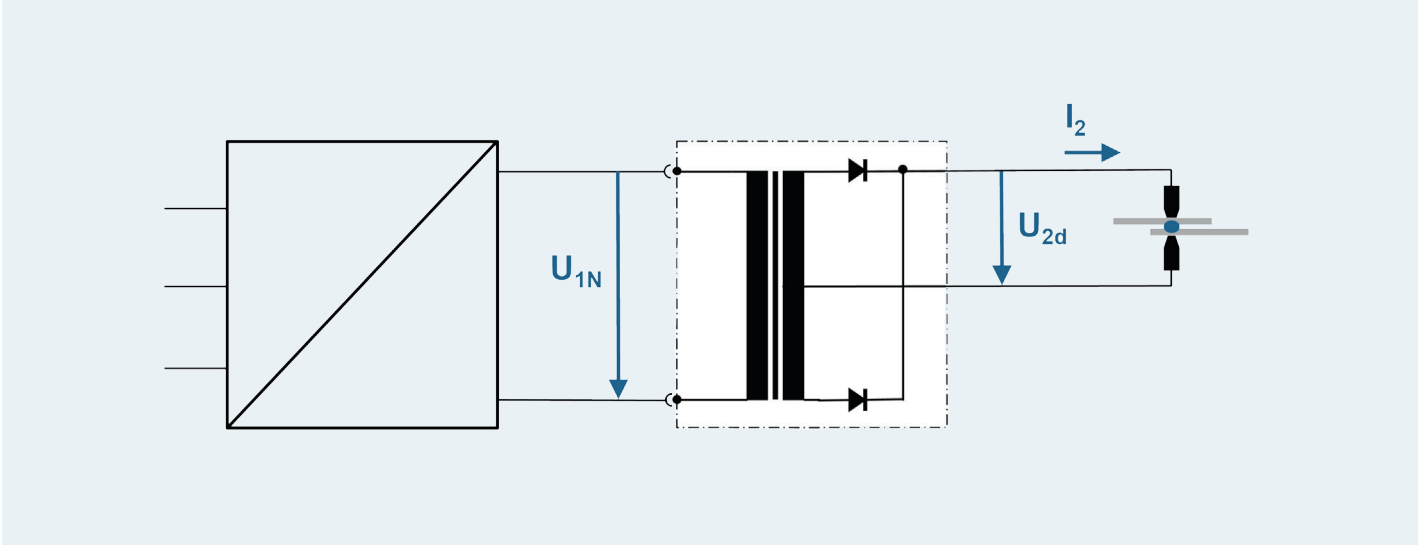


Technical Data

Type			PSG ...								
			PSG 3075 ...	PSG 3100 ...	PSG 6120 ...	PSG 6130 ...	PSG 6160 ...	PSG 6170 ...	PSG 6180 ...	PSG 6230 ...	PSG 6250 ...
Electrical Data											
Frequency		Hz					1000				
Nominal power / 20 % D.C.	S_{1N}	kVA	94	145	129	140	173	172	178	237	250
Secondary voltage class	U_{2d}	V	9.0	9.3	9.0	9.0	9.0	9.0	14.0	14.0	14.0
Continuous output current / 100 % D.C.	I_{2P}	kA	5.0	6.5	6.0	6.5	8.5	8.0	5.7	8.2	8.0
Output current / 20 % D.C.	I_2	kA	11.1	14.5	13.4	14.5	19.0	17.9	12.7	18.3	17.9
Mechanical Data											
Mass		kg	14.5	25.0	16.0	16.0 ... 20.0	23.0	19.0/ 19.6	23.0	26.0	23.0
Dimensions without plugs	Height	mm	108	127	125	106 ... 140	127	125/ 127	125	127	125
	Width	mm	150	160	160	150/ 160	171	160	160	171	160
	Length	mm	295/ 303	330/ 342	242	213 ... 319	380	262 ... 314	319	380	300

Welding Transformers PSG –
Engineering Notes

Welding inverter and transformer



U_{1N} ... primary voltage
U_{2d} ... secondary voltage
I_2 ... secondary current = weld current

Which Transformer for What Welding Task?

The welding transformer produces the intensity of current required for resistance welding, by stepping down the output voltage of the inverter (e.g. 530 V) to a low voltage (e.g. 9 V). Thus the secondary current is brought up in the same proportion.

The secondary current is rectified, which enables low-loss DC welding. Welding transformer and rectifier form the compact unit PSG.

- The choice of welding transformer depends on:
  - the required secondary voltage
  - the required power
  - the available primary voltage
  - the required design of connectors.
- In a second step, it is checked if the chosen transformer-rectifier unit would suit with the required load cycle.
- Afterwards it checks if the selected transformer can drive the required weld current through the given secondary resistance.
- Finally, the suitable design of power and signal connectors can be selected among different variants, if available.

Welding Transformers PSG –
Engineering Notes

Secondary Voltage
The secondary voltage of the transformer must be able to drive the required welding current through the existing resistance of secondary circuit.
We offer transformers in secondary voltage classes of 9 V and 14 V.
- 9 V transformers are suitable for spot welding of steel sheets, e.g. with transformer guns.
- 14 V transformers are recommended for spot welding of aluminum sheets, as well as for all applications with higher secondary resistance, e.g. stationary projection welding machines.

Nominal Power (Rated power)
The required welding power S_2 is calculated from weld current I_2, secondary voltage U_{2d} and duty cycle D.C.
The duty cycle is the percentage of weld time, with regard to the thermal integration time of the component concerned, in this case the transformer (60 seconds).
For welding transformers the nominal power is specified for 20 % D.C.
The nominal power S_{1N} of the transformer must be higher then the required welding power, also related to 20 % D.C.
The nominal power S_{1N} of the transformer must be higher then the required welding power, also related to 20 % D.C.

Sample welding task:
- I_2 = 18 kA, U_{2d} = 9 V, D.C. = 10 %
- Power during weld time:
  $S_2 = I_2 * U_{2d}$ = 18 kA * 9 V = 162 kVA
- Power related to 20 % D.C.:

$$S_{2N} = S_2 * \sqrt{\frac{D.C.}{20\ \%}} = 162\ kV\ * \sqrt{\frac{10\ \%}{20\ \%}} = 115\ kVA$$

Result:
Transformers PSG 6130 with 140 kVA nominal power are suitable for the given welding task.

Primary Voltage
The output voltage of Rexroth welding inverters is in a fixed ratio to the mains voltage. The selected transformer must match with the given mains voltage.
The primary connection plate of the transformers PSG 6xxx.xx RSTK is marked in color accordingly.

Mains voltage U_N	Primary voltage U_{1N}	Color of connection plate
400 V	530 V	black
480 V	645 V	blue
690 V	926 V	red

Welding Transformers PSG –
Engineering Notes

Checking the Load of Transformer and Diodes
In the course of dimensioning the transformer care must be taken that neither winding nor rectifier diodes are overloaded in operation. Due to the widely different thermal integration times of transformer (60 sec) and diodes (2 sec), their load cycles possibly must be considered separately.

The operating instruction "MF welding transformers PSG xxxx" describes the procedure. In the type-specific instruction of each transformer, the load diagrams of transformers and diodes can be found. The duty cycles given in this catalog (e.g. "Output current / 20 % D.C.") are always related to the integration time of transformers (60 sec).

Checking the Secondary Resistance
Furthermore it must be checked whether the required secondary current can really be achieved with the given secondary resistance.

For details, see operating instruction "MF welding transformers PSG xxxx" and the relevant type-specific instruction.

Protective Measures Against Inadmissibly High Contact Voltages
Welding transformers of the PSG series correspond to protection class 1 in accordance with EN 61558-1.
This means that protective measures as stipulated in EN 62135-1 must be provided to ensure protection against inadmissibly high contact voltages (in the event of an insulation breakdown between the primary and the secondary current circuit).

Possible protective measures in connection with medium-frequency transformers:

- **Direct Protective Conductor Connection**
  The negative pole of the secondary circuit is grounded using a protective conductor jumper. In this case the scope of protection is limited to the secondary circuit.

- **Fault-Voltage Protection (FV)**
  Voltage-operated earth leakage protective switch (i.a.w. EN 62135-1): it monitors the secondary circuit. For this purpose, the protective conductor jumper (MPE bridge) of the transformer has to be removed. The scope of protection is also limited to the secondary circuit.
  The transformers PSG 3075.11 PSV and PSG 3100.01 PSV have got a secondary tap from the minus pole for the fault-voltage protection (FV).

Welding Transformers PSG –
Engineering Notes

- **Earth Leakage Current Protection (FI)**
  Residual current protection circuit (i.a.w. EN 62135-1):
  It monitors the power inlet of the MF inverter by means of a measuring current transformer.
  In this case, the MPE bridge of the welding transformer has to be replaced by an appropriate ground fault protection resistor, see chapter Protective FI Resistors, page 72. The scope of protection extends from the current transformer to all following system components.

For more detailed information on protective measures, see the operating instruction “MF welding transformers PSG xxxx” (Reference number 1070087062).

Primary Power Connection
The primary power inlet (2pole+PE) can be connected permanently or pluggable.
The pluggable power connection is particularly suitable for gun transformers. Most transformer types have got a power connector Mulitcontact TAG or Robifix – for details see the relevant chapter and the chapter “Options”, page 67.
Examples of appropriate counterplugs are given in the relevant chapter and in the chapter “Accessories”.

A permanent power connection is suitable for e.g. stationary welding machines.
Transformers without pluggable power inlet come with open primary terminal space (protection class IP00), they must be adapted to the particular application by means of terminal boxes, see chapter “Accessories”.

Temperature Monitoring,
Measurement of Secondary Current
The temperature of primary winding and rectifier diodes in most transformers is monitored by temperature switches.

The secondary current is measured by a toroid sensor. Both signals are led out in the primary terminal space- pluggable or by individual wires. For details see the relevant chapter under “Options”.

Measurement of Secondary Voltage,
Force Signal
The secondary voltage for the adaptive UI regulation can be tapped either in the transformer, or the secondary voltage tapped at the weld gun is lead through the terminal space of the transformer, same as possibly the force signal from an external force sensor.

The signals are pluggable. For details see the relevant chapter under “Options”.

Examples of appropriate counterplugs are given in the relevant chapter and in the chapter “Accessories” on page 68 .

Welding Transformers PSG –
Engineering Notes

Water Cooling
For welding transformers PSG we recommend a closed cooling circuit; open cooling circuits are to be avoided. In the cooling system all components must be fitted with a potential equalisation. The maximum water pressure must not exceed 10 bar.

More details concerning suitable materials, dewing protection, connection technology and maintenance of the cooling circuit can be found in the Description of application “Weld Timer and Welding Transformer with water cooling”, (R911370699).

Dimensions, Hole Positions
The specified dimensions in this catalog are intended as rough reference values for the design.

Scale drawings with hole positions for fixing can be found in the relevant type-specific instructions.

PSG 3075 – Technical Data

PSG 3075.10 PZ

Type			PSG 3075.10 AZ	PSG 3075.10 PZ	PSG 3075.10 PSV	PSG 3075.11 PSV
Electrical Data						
Nominal power / 20 % D.C.	S_{1N}	kVA	94			
Primary voltage[1]	U_{1N}	V	530			
Secondary voltage class	U_{2d}	V	9.0			
Continuous output current / 100 %	I_{2P}	kA	5.0			
Output current / 20 % D.C.	I_2	kA	11.1			
Turns ratio	n	xx:1	55			
Options						
Primary power connection and signals pluggable			□	■	■	■
Primary power connector			[TAG 135]	TAG 135	TAG 150	TAG 150
Temperature monitoring integrated			■	■	■	■
Secondary current sensor integrated			■	–	■	■
Secondary voltage tap / lead-through			–	–	Lead-through	–
Force signal lead-through			–	–	–	–
Protective FI resistor integrated			–	–	■	–
Mass, Color						
Mass		kg	14.5			
Color			RAL 7005 gray			
Dimensions						
Height		mm	108			
Width		mm	150			
Length without plugs		mm	295	303	303	303
Length with plugs		mm	–	352	357	357
CAD Models						
STEP Files			Download		Download	Download

■ : included with delivery □ : accessory retrofittable — : not included

[1] **Primary voltage 530 V:** Output voltage of weld inverter with 400 V mains

PSG 3075 – Ordering information

Description	Type Designation	Ref. No.
94 kVA, without primary terminal box, with secondary current sensor	PSG 3075.10 AZ	1070088509
94 kVA, primary connection pluggable TAG 135, without secondary current sensor	PSG 3075.10 PZ	1070086612
94 kVA, primary connection pluggable TAG 150, with secondary current sensor	PSG 3075.10 PSV	R911170133
94 kVA, primary connection pluggable TAG 150, with secondary current sensor	PSG 3075.11 PSV	R911170744

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 3075.10 AZ/PZ	R911172816	Download
Type-specific instructions PSG 3075.1x PSV	R911172346	Download

Accessories

Description	Type Designation	Ref. No. / Manufacturer [2]	PSG 3075.10 AZ	PSG 3075.10 PZ	PSG 3075.10 PSV	PSG 3075.11 PSV
Primary terminal box						
for PG cable gland	TH3000/PG	1070917826	✓	–	–	–
for TAG connector	TH3000/MC	1070917827	✓	–	–	–
Counterplug [3] for primary power						
Power TSB [4] 135, Ø 25 mm²	PSG-MC 135/25	R911171645	–	✓	–	–
Power TSB [4] 150, Ø 25 mm²	PSG-MC 150/25	R911171646	–	–	✓	✓
Counterplug [3] for signals						
1 Output current + voltage	UT06128ST	Souriau	–	–	✓	–
Output current + FV tap [5]			–	–	–	✓
2 Output temperature	B8141-0	Turck	–	✓	✓	✓
3 Input voltage	B8141-0	Turck	–	–	✓	–

✓ : suitable

– : not suitable

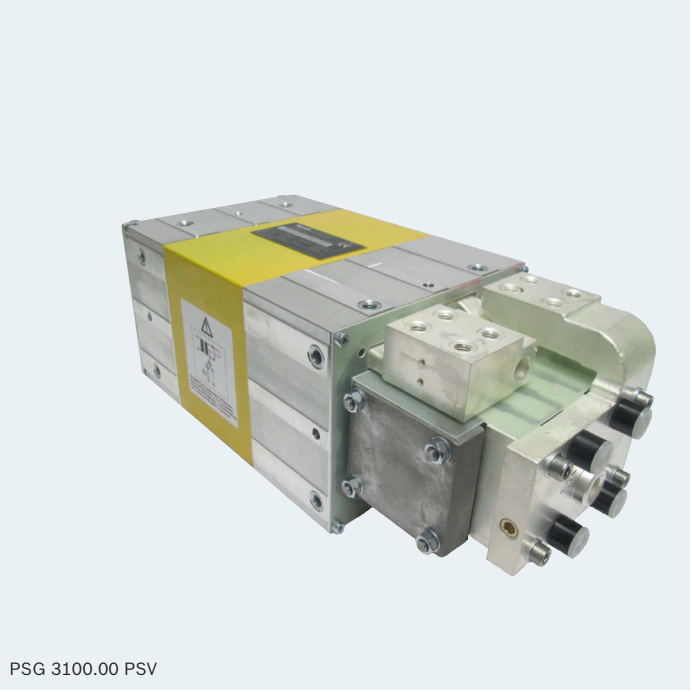
[2] **Reference number/Manufacturer:** We are giving Rexroth reference numbers or (if third-party product) the manufacturer and their type designation.

[3] **Counterplugs:** We are giving examples of suitable counterplugs, further types can be found in the manufacturers' catalogs.

[4] **Power TSB:** Multicontact counterplug for the indicated cross section

[5] **FV tap:** Secondary tap from minus pole for fault voltage (FV) protection

PSG 3100 – Technical Data



PSG 3100.00 PSV

Type			**PSG 3100.00 PSV**	**PSG 3100.01 PSV**	**PSG 3100.02 PSV**	**PSG 3100.03 PSV**
Electrical Data						
Nominal power / 20 % D.C.	S_{1N}	kVA		145		
Primary voltage [1]	U_{1N}	V		530		
Secondary voltage class	U_{2d}	V		9.3		
Continuous output current / 100 %	I_{2P}	kA		6.5		
Output current / 20 % D.C.	I_2	kA		14.5		
Turns ratio	n	xx:1		50		
Options						
Primary power connection and signals pluggable			■	■	■	■
Primary power connector			TAG 150	TAG 150	Robifix	Robifix
Temperature monitoring integrated			■	■	■	■
Secondary current sensor integrated			■	■	■	■
Secondary voltage tap / lead-through			Lead-through	FV tap	Lead-through	Lead-through
Force signal lead-through			–	–	–	–
Protective FI resistor integrated			■	–	■	■
Mass, Color						
Mass		kg		25.0		
Color				RAL 1004 yellow		
Dimensions						
Height		mm		127		
Width		mm		160		
Length without plugs		mm	330	330	342	342
Length with plugs		mm	384	384	380	380
CAD Models						
STEP Files				Download	Download	Download

■ : included with delivery — : not included

[1] **Primary voltage 530 V:** Output voltage of weld inverter with 400 V mains

PSG 3100 – Ordering information

Description	Type Designation	Ref. No.
145 kVA, Primary connection pluggable TAG 150, with lead-through of secondary voltage	PSG 3100.00 PSV	R911170161
145 kVA, Primary connection pluggable TAG 150, with secondary tap for FV protection	PSG 3100.01 PSV	R911170745
145 kVA, Primary connection pluggable Robifix, with lead-through of secondary voltage, additional shield connection for signal plug output current + voltage	PSG 3100.02 PSV	R911172136
145 kVA, Primary connection pluggable Robifix, with lead-through of secondary voltage	PSG 3100.03 PSV	R911173022

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 3100.0x PSV	R911172343	Download

Accessories

	Description	Type Designation	Ref. No. / Manufacturer [2]	PSG 3100.00 PSV	PSG 3100.01 PSV	PSG 3100.02 PSV	PSG 3100.03 PSV
Counterplugs [3] for primary power							
Power TSB [4] 150, Ø 35 mm²		PSG-MC 150/35	R911171647	✓	✓	–	–
Power Robifix		B-35-FZEE	Multicontact	–	–	✓	✓
Counterplugs [3] for signals							
1	Output current + voltage	UT06128ST	Souriau	✓	–	✓	✓
	Output current + FV tap [5]			–	✓	–	–
2	Output temperature	B8141-0	Turck	✓	✓	✓	✓
3	Input voltage	B8141-0	Turck	✓	–	✓	✓

✓ : suitable

– : not suitable

[2] **Reference number/Manufacturer:** We are giving Rexroth reference numbers or (if third-party product) the manufacturer and their type designation.

[3] **Counterplugs:** We are giving examples of suitable counterplugs, further types can be found in the manufacturers' catalogs.

[4] **Power TSB:** Multicontact counterplug for the indicated cross section

[5] **FV tap:** Secondary tap from minus pole for fault voltage (FV) protection

PSG 6120 – Technical Data

PSG 6120.00 RL

Type			**PSG 6120.00 RL**
Electrical Data			
Nominal power / 20 % D.C.	S_{1N}	kVA	129
Primary voltage [1]	U_{1N}	V	530
Secondary voltage class	U_{2d}	V	9.0
Continuous output current / 100 %	I_{2P}	kA	6.0
Output current / 20 % D.C.	I_2	kA	13.4
Turns ratio	n	xx:1	55
Options			
Primary power connection and signals pluggable			■
Primary power connector			Robifix
Temperature monitoring integrated			–
Secondary current sensor integrated			–
Secondary voltage tap / lead-through			–
Force signal lead-through			–
Protective FI resistor integrated			–
Mass, Color			
Mass		kg	16.0
Color			RAL 1004 yellow
Dimensions			
Height		mm	125
Width		mm	160
Length without plugs		mm	242
Length with plugs		mm	280
CAD Models			
STEP Files			Download

■ : included with delivery — : not included

[1] **Primary voltage 530 V:** Output voltage of weld inverter with 400 V mains

PSG 6120 – Ordering information

Description	Type Designation	Ref. No.
129 kVA, Primary connection pluggable Robifix, lateral cooling water connection	PSG 6120.00 RL	R911172946

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 6120.00 RL	R911339825	Download

Accessories

Description	Type Designation	Manufacturer	PSG 6120.00 RL
Counterplugs for primary power			
Power Robifix	B-35-FZEE	Multicontact	✓

✓ : suitable

PSG 6130 for Welding Machines and Manual Guns – Technical Data

PSG 6130.00 AS

Type			**PSG 6130.00 AS**	**PSG 6130.00 PS**	**PSG 6130.00 PSC**	**PSG 6130.00 PSK**	**PSG 6130.00 PSM**	**PSG 6130.01 PSM**	**PSG 6130.00 PTK**
Electrical Data									
Nominal power / 20 % D.C.	S_{1N}	kVA				140			
Primary voltage [1]	U_{1N}	V				530			
Secondary voltage class	U_{2d}	V				9.0			
Continuous output current / 100 %	I_{2P}	kA				6.5			
Output current / 20 % D.C.	I_2	kA				14.5			
Turns ratio	n	xx:1				55			
Options									
Primary power connection and signals pluggable			☐	■	■	■	■	■	■
Primary power connector			[TAG150]	TAG 150	TAG 135	TAG 150	TAG 150	TAG 150	TAG 150
Temperature monitoring integrated			■	■	■	■	–	■	■
Secondary current sensor integrated			■	■	■	■	■	■	–
Secondary voltage tap / lead-through			Tap	Tap	Lead-thr.	Lead-thr.	–	Lead-thr.	Lead-thr.
Force signal lead-through			–	–	–	–	–	–	■
Protective FI resistor integrated			–	–	–	■	■	■	■
Mass, Color									
Mass		kg	16.0	15.4	15.3	20.0	19.0	19.0	17.0
Color						RAL 1004 yellow			
Dimensions									
Height		mm	127	127	127	125	140	140	125
Width		mm				160			
Length without plugs		mm	219	273	273	300	319	319	294
Length with plugs		mm	–	289	295	322	373	373	316
CAD Models									
STEP Files			Download						

■ : included with delivery ☐ : accessory retrofittable – : not included

[1] **Primary voltage 530 V:** Output voltage of weld inverter with 400 V mains

PSG 6130 for Robot Guns – Technical Data

PSG 6130.00 RSTK

PSG 6130.00 PSTK	PSG 6130.00 RSTK	PSG 6130.01 RSTK	PSG 6130.02 RSTK	PSG 6130.10 RSTK	PSG 6130.11 RSTK	PSG 6130.12 RSTK	PSG 6130.20 RSTK	PSG 6130.22 RSTK	PSG 6130.30 RSTK
Electrical Data									
					140				
530	530	645	926	530	645	926	530	926	530
					9.0				
					6.5				
					14.5				
55	55	66	95	55	66	95	55	95	55
Options									
■	■	■	■	■	■	■	■	■	■
TAG 150	Robifix	Robifix	Robifix	Robifix	Robifix	Robifix	Robifix	Robifix	Robifix
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
Lead-thr.	Lead-thr.	Lead-thr.	Lead-thr.	Lead-thr.	Lead-thr.	Lead-thr.	Lead-thr.	Lead-thr.	Lead-thr.
■	■	■	■	■	■	■	–	–	■
■	■	■	■	■	■	■	■	■	■
Mass, Color									
17.0					16.2				
					RAL 1004 yellow				
Dimensions									
125					106				
160					150				
295					285				
317					332				
CAD Models									
Download	Download	Download	Download	Download	Download	Download	Download	Download	Download

■ : included with delivery ☐ : accessory retrofittable – : not included

[1] **Primary voltage 530 V / 645 V / 926 V:** Output voltage of weld inverter with 400 V / 480 V / 690 V mains

PSG 6130 – Ordering information

Description	Type Designation	Ref. No.
140 kVA, without primary terminal box	PSG 6130.00 AS	1070086613
140 kVA, Primary connector TAG 150	PSG 6130.00 PS	1070088554
140 kVA, Primary connector TAG 135	PSG 6130.00 PSC	R911170054
140 kVA, Primary connector TAG 150, Special version BMW	PSG 6130.00 PSK	R911170132
140 kVA, Primary connector TAG 150, Special version Mercedes	PSG 6130.00 PSM	R911170128
140 kVA, Primary connector TAG 150, Special version Mercedes	PSG 6130.01 PSM	R911171823
140 kVA, Primary connector TAG 150, Special version BMW	PSG 6130.00 PTK	R911171139
140 kVA, Primary connector TAG 150, Special version BMW	PSG 6130.00 PSTK	R911173020
140 kVA, Primary connection Robifix, primary 530 V, Signal connector AIDA w/o Reset	PSG 6130.00 RSTK	R911172751
140 kVA, Primary connection Robifix, primary 645 V, Signal connector AIDA w/o Reset	PSG 6130.01 RSTK	R911172767
140 kVA, Primary connection Robifix, primary 926 V, Signal connector AIDA w/o Reset	PSG 6130.02 RSTK	R911172768
140 kVA, Primary connection Robifix, primary 530 V, Signal connector AIDA w. Reset	PSG 6130.10 RSTK	R911173181
140 kVA, Primary connection Robifix, primary 645 V, Signal connector AIDA w. Reset	PSG 6130.11 RSTK	R911173926
140 kVA, Primary connection Robifix, primary 926 V, Signal connector AIDA w. Reset	PSG 6130.12 RSTK	R911173927
140 kVA, Primary connection Robifix, primary 530 V, Signal connector Burndy	PSG 6130.20 RSTK	R911173295
140 kVA, Primary connection Robifix, primary 926 V, Signal connector Burndy	PSG 6130.22 RSTK	R911173296
140 kVA, Primary connection Robifix, primary 530 V, Signal connector Intercontec	PSG 6130.30 RSTK	R911174059

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 6130.00 AS	R911172341	Download
Type-specific instructions PSG 6130.00 PS / PSC	R911344478	Download
Type-specific instructions PSG 6130.00 PSK	R911344477	Download
Type-specific instructions PSG 6130.0x PSM	R911337512	Download
Type-specific instructions PSG 6130.00 PTK	R911172342	Download
Type-specific instructions PSG 6130.00 PSTK	R911338021	Download
Type-specific instructions PSG 6130.xx RSTK	R911172815	Download

PSG 6130 – Accessories

Description		Type Designation	Ref. No./ Manufacturer [2]	PSG 6130.00 AS	PSG 6130.00 PS	PSG 6130.00 PSC	PSG 6130.00 PSK	PSG 6130.00 PSM	PSG 6130.01 PSM	PSG 6130.00 PTK	PSG 6130.00 PSTK	PSG 6130.0x RSTK	PSG 6130.1x RSTK	PSG 6130.2x RSTK	PSG 6130.30 RSTK
Primary terminal box															
For PG screw connection		TH6000/PG	R911172927	✓	–	–	–	–	–	–	–	–	–	–	–
For TAG connector		TH6000/MC	R911172769	✓	–	–	–	–	–	–	–	–	–	–	–
Counterplugs [3] for primary power															
Power TSB [4] 135, Ø 25 mm²		PSG-MC 135/25	R911171646	–	–	✓	–	–	–	–	–	–	–	–	–
Power TSB [4] 150, Ø 35 mm²		PSG-MC 150/35	R911171647	–	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Power Robifix		B-35-FZEE	Multicontact	–	–	–	–	–	–	–	–	✓	✓	✓	✓
Counterplugs [3] for signals															
1	Output current + voltage	CA-07S1N1280DN - 1619772	Coninvers	–	–	✓	✓	–	–	–	–	–	–	–	–
	Output voltage + force			–	–	–	–	–	–	✓	–	–	–	–	–
	Output current + voltage + force			–	–	–	–	–	–	–	✓	–	–	–	–
	Output current + voltage + force	UT06128ST	Souriau	–	–	–	–	–	–	–	–	–	–	✓	–
	Output current + voltage + temperature + force	IE-PS-V14MHYB-10P (AIDA)	Weidmüller	–	–	–	–	–	–	–	–	✓	✓	–	–
		ASTA015FR017 30235000	Intercontec	–	–	–	–	–	–	–	–	–	–	–	✓
2	Output current + temperature	B8141-0	Turck	–	✓	–	–	–	–	–	–	–	–	–	–
	Output temperature	B8141-0		–	–	✓	✓	–	–	–	–	–	–	✓	–
	Output current + voltage	BS8141-0		–	–	–	–	✓	–	–	–	–	–	–	–
	Output current + temperature	BS8141-0		–	–	–	–	–	✓	–	–	–	–	–	–
	Input force	B8141-0		–	–	–	–	–	–	✓	✓	✓	–	–	–
	Input force + reset, power supply of force sensor[5]	BS8141-0		–	–	–	–	–	–	–	–	–	✓	–	✓
3	Input voltage	B8141-0		–	–	✓	✓	✓	–	✓	✓	✓	✓	✓	✓
	Output voltage	B8141-0		–	✓	–	–	–	–	–	–	–	–	–	–
4	Output temperature	B8141-0		–	–	–	–	–	–	✓	✓	–	–	–	–

✓ : suitable

– : not suitable

[2] **Reference number/Manufacturer:** We are giving Rexroth reference numbers or (if third-party product) the manufacturer and their type designation.

[3] **Counterplugs:** We are giving examples of suitable counterplugs, further types can be found in the manufacturers' catalogs.

[4] **Power TSB:** Multicontact counterplug for the indicated cross section

[5] **Input force + reset, power supply of force sensor:** Signals from/to force sensor- force signal input, reset output, power supply.

PSG 6160 – Technical Data

The PSG 6160 welding transformers are with terminal box. The primary voltage can be supplied through cable glands on four sides.
In transformers PSG 6160.00 TS23x the signals from secondary current sensor and temperature monitoring can be wired on terminals. The signal cables can be led out on the end face.

PSG 6160.00 TS231

Type			**PSG 6160.00 TS231**	**PSG 6160.00 TS232**	**PSG 6160.00 TS233**	**PSG 6160.00 GM231**	**PSG 6160.00 GM232**	**PSG 6160.00 GM233**
Electrical Data								
Nominal power / 20 % D.C.	S_{1N}	kVA	173					
Primary voltage [1]	U_{1N}	V	530	645	800	530	645	800
Secondary voltage class	U_{2d}	V	9.0					
Continuous output current / 100 % D.C.	I_{2P}	kA	8.5					
Output current / 20 % D.C.	I_2	kA	19.0					
Turns ratio	n	xx:1	55	72	87	55	72	87
Options								
Primary power connection and signals pluggable			–	–	–	–	–	–
Primary power connector			–	–	–	–	–	–
Temperature monitoring integrated			■	■	■	–	–	–
Secondary current sensor integrated			■	■	■	–	–	–
Secondary voltage tap / lead-through			–	–	–	–	–	–
Force signal lead-through			–	–	–	–	–	–
Protective FI resistor integrated			–	–	–	–	–	–
Mass, Color								
Mass		kg	23.0					
Color			Aluminum bright					
Dimensions								
Height		mm	127					
Width		mm	171					
Length		mm	380					
CAD Models								
STEP Files			Download	Download	Download	Download	Download	Download

■ : included with delivery — : not included

[1] **Primary voltage 530 V / 645 V / 800 V:** Output voltage of weld inverter with 400 V / 480 V / 690 V mains

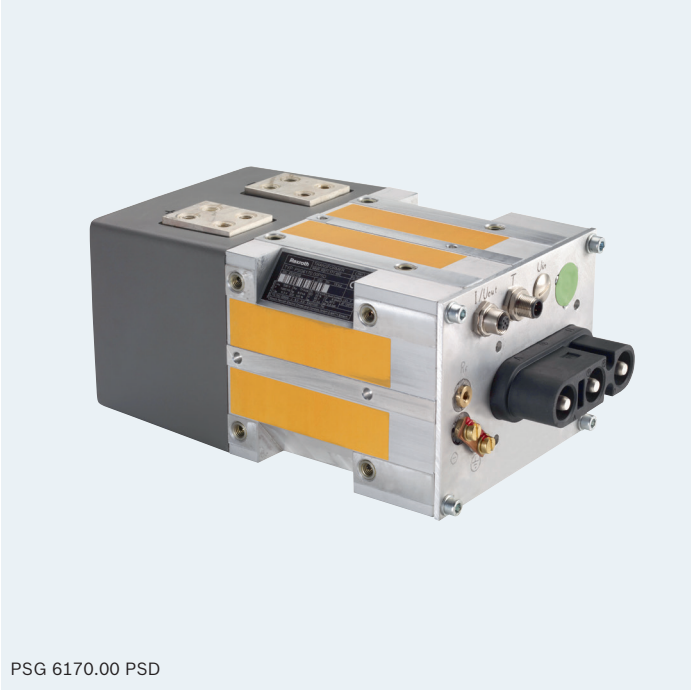
PSG 6160 – Ordering information

Description	Type Designation	Ref. No.
171 kVA, for 530 V primary voltage, w. temperature monitoring and sec. current sensor	PSG 6160.00 TS231	R911170944
171 kVA, for 645 V primary voltage, w. temperature monitoring and sec. current sensor	PSG 6160.00 TS232	R911170945
171 kVA, for 800 V primary voltage, w. temperature monitoring and sec. current sensor	PSG 6160.00 TS233	R911170946
171 kVA, for 530 V primary voltage, w/o temperature monitoring and sec. current sensor	PSG 6160.00 GM231	R911170370
171 kVA, for 645 V primary voltage, w/o temperature monitoring and sec. current sensor	PSG 6160.00 GM232	R911170371
171 kVA, for 800 V primary voltage, w/o temperature monitoring and sec. current sensor	PSG 6160.00 GM233	R911170372

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 6160.00 TS23x	R911172347	Download
Type-specific instructions PSG6160.00 GM23x	R911172817	Download

PSG 6170 – Technical Data



PSG 6170.00 PSD

Type			PSG 6170.00 ASTK	PSG 6170.00 PSD	PSG 6170.00 PTK	PSG 6170.68 AT
Electrical Data						
Nominal power / 20 % D.C.	S_{1N}	kVA	172			
Primary voltage [1]	U_{1N}	V	530			
Secondary voltage class	U_{2d}	V	9.0			
Continuous output current / 100 %	I_{2P}	kA	8.0			
Output current / 20 % D.C.	I_2	kA	17.9			
Turns ratio	n	xx:1	55			
Options						
Primary power connection and signals pluggable			□	■	■	□
Primary power connector			[TAG 150]	Robifix	TAG 150	[TAG 150]
Temperature monitoring integrated			■	■	■	■
Secondary current sensor integrated			■	■	–	–
Secondary voltage tap / lead-through			–	–	Lead-through	–
Force signal lead-through			–	–	Lead-through	–
Protective FI resistor integrated			–	■	■	–
Mass, Color						
Mass		kg	19.0	19.0	19.0	19.6
Color			RAL 1004 yellow			
Dimensions						
Height		mm	125	127	125	125
Width		mm	160			
Length without plugs		mm	272	267	314	262
Length with plugs		mm	–	305	336	–
CAD Models						
STEP Files			Download		Download	Download

■ : included with delivery — : not included

[1] **Primary voltage 530 V:** Output voltage of weld inverter with 400 V mains

PSG 6170 – Ordering information

Description	Type Designation	Ref. No.
172 kVA, without primary terminal box, with secondary current sensor	PSG 6170.00 ASTK	R911171455
172 kVA, with primary terminal box, with secondary current sensor	PSG 6170.00 PSD	R911171460
172 kVA, with primary terminal box, without secondary current sensor	PSG 6170.00 PTK	R911171939
172 kVA, without primary terminal box, without secondary current sensor	PSG 6170.68 AT	R911171677

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 6170.00 ASTK	R911338820	Download
Type-specific instructions PSG 6170.00 PSD	R911172344	Download
Type-specific instructions PSG 6170.00 PTK	R911338808	Download
Type-specific instructions PSG 6170.68 AT	R911172818	Download

Accessories

Description	Type Designation	Ref. No./ Manufacturer [2]	PSG 6170.00 ASTK	PSG 6170.00 PSD	PSG 6170.00 PTK	PSG 6170.68 AT
Primary terminal box						
For PG cable gland	TH6000/PG	R911172927	✓	–	–	✓
For TAG connector	TH6000/MC	R911172769	✓	–	–	✓
Counterplugs [3] for primary power						
Power Robifix	B-35-FZEE	Multicontact	–	✓	–	–
Power TSB [4] 150, Ø 35 mm²	PSG-MC 150/35	R911171647	–	–	✓	–
Counterplugs [3] for signals						
1 Output force +voltage	CA-07S1N1280DN - 1619772	Coninvers	–	–	✓	–
2 Output current	BS8141-0	Turck	–	✓	–	–
Input force	B8141-0	Turck	–	–	✓	–
3 Input voltage	B8141-0	Turck	–	–	✓	–
4 Output temperature	B8141-0	Turck	–	✓	✓	–

✓ : suitable

– : not suitable

[2] **Reference number/Manufacturer:** We are giving Rexroth reference numbers or (if third-party product) the manufacturer and their type designation.

[3] **Counterplugs:** We are giving examples of suitable counterplugs, further types can be found in the manufacturers' catalogs.

[4] **Power TSB:** Multicontact counterplug for the indicated cross section

PSG 6180 – Technical Data

PSG 6180.00 RSTK

Type			PSG 6180.00 RSTK	PSG 6180.01 RSTK	PSG 6180.10 RSTK	PSG 6180.11 RSTK	PSG 6180.30 RSTK	PSG 6180.32 RSTK
Electrical Data								
Nominal power / 20 % D.C.	S_{1N}	kVA	178	215	180	215	178	251
Primary voltage [1]	U_{1N}	V	530	645	530	645	530	926
Secondary voltage class	U_{2d}	V	14.0					
Continuous output current /100 %	I_{2P}	kA	5.7	7.5	5.7	7.5	5.7	8.0
Output current / 20 % D.C.	I_2	kA	12.7					
Turns ratio	n	xx:1	38	50	38	50	38	66
Options								
Primary power connection and signals pluggable			■	■	■	■	■	■
Primary power connector			Robifix	Robifix	Robifix	Robifix	Robifix	Robifix
Temperature monitoring integrated			■	■	■	■	■	■
Secondary current sensor integrated			■	■	■	■	■	■
Secondary voltage tap / lead-through			Lead-through	Lead-through	Lead-through	Lead-through	Lead-through	Lead-through
Force signal lead-through			■	■	■	■	■	■
Force signal with reset			–	–	■	■	■	■
Protective FI resistor integrated			■	■	■	■	■	■
Mass, Color								
Mass		kg	23.0					
Color			RAL 8001 brown					
Dimensions								
Height		mm	125					
Width		mm	160					
Length without plugs		mm	319					
Length with plugs		mm	357					
CAD Models								
STEP Files			Download	Download	Download	Download	Download	Download

■ : included with delivery — : not included

[1] **Primary voltage 530 V / 645 V / 926 V:** Output voltage of weld inverter with 400 V / 480 V / 690 V mains

PSG 6180 – Ordering information

Description	Type Designation	Ref. No.
178 kVA, Primary voltage 530 V, Signal connector AIDA	PSG 6180.00 RSTK	R911172752
178 kVA, Primary voltage 645 V, Signal connector AIDA	PSG 6180.01 RSTK	R911172902
178 kVA, Primary voltage 530 V, Signal connector AIDA, force signal with reset	PSG 6180.10 RSTK	R911174469
251 kVA, Primary voltage 926 V, Signal connector AIDA, force signal with reset	PSG 6180.11 RSTK	R911174470
178 kVA, Primary voltage 530 V, Signal connector Intercontec, force signal with reset	PSG 6180.30 RSTK	R911174332
251 kVA, Primary voltage 926 V, Signal connector Intercontec, force signal with reset	PSG 6180.32 RSTK	R911174333

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 6180.xx RSTK	R911337513	Download

Accessories

Description	Type Designation	Mat.-Nr./ Manufacturer [2]	PSG 6180.x0 RSTK	PSG 6180.x1 RSTK	PSG 6180.30 RSTK	PSG 6180.32 RSTK
Counterplugs [3] for primary power						
Power Robifix	B-35-FZEE	Multicontact	✓	✓	✓	✓
Counterplugs [3] for signals						
1 Output current + voltage + temperature + force	IE-PS-V14MHYB-10P (AIDA)	Weidmüller	✓	✓	–	–
	ASTA015FR 01730235000	Intercontec	–	–	✓	✓
2 Input force	B8141-0	Turck	✓	✓	✓	✓
3 Input voltage	B8141-0	Turck	✓	✓	✓	✓

✓ : suitable

– : not suitable

[2] **Reference number/Manufacturer:** We are giving Rexroth reference numbers or (if third-party product) the manufacturer and their type designation.

[3] **Counterplugs:** We are giving examples of suitable counterplugs, further types can be found in the manufacturers' catalogs.

PSG 6230 – Technical Data

PSG 6230.00 GM234

Type			PSG 6230.00 GM234	PSG 6230.00 GM235	PSG 6230.00 GM236
Electrical Data					
Nominal power / 20 % D.C.	S_{1N}	kVA		237	
Primary voltage [1]	U_{1N}	V	530	645	800
Secondary voltage class	U_{2d}	V		14.0	
Continuous output current / 100 %	I_{2P}	kA		8.2	
Output current / 20 % D.C.	I_2	kA		18.3	
Turns ratio	n	xx:1	38	50	61
Options					
Primary power connection and signals pluggable			–	–	–
Primary power connector			–	–	–
Temperature monitoring integrated			–	–	–
Secondary current sensor integrated			–	–	–
Secondary voltage tap / lead-through			–	–	–
Force signal lead-through			–	–	–
Protective FI resistor integrated			–	–	–
Mass, Color					
Mass		kg		26.0	
Color				Aluminum bright	
Dimensions					
Height		mm		127	
Width		mm		171	
Length without plugs		mm		380	
Length with plugs		mm		–	
CAD Models					
STEP Files				Download	

– : not included

[1] **Primary voltage 530 V / 645 V / 800 V:** Output voltage of weld inverter with 400 V / 480 V / 690 V mains

PSG 6230 – Ordering information

Description	Type Designation	Ref. No.
237 kVA, for 530 V primary voltage	PSG 6230.00 GM234	R911170929
237 kVA, for 645 V primary voltage	PSG 6230.00 GM235	R911170930
237 kVA, for 800 V primary voltage	PSG 6230.00 GM236	R911170931

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 6230.00 GM23x	R911172819	Download

PSG 6250 – Technical Data

PSG 6250.00 ASTK

Type			**PSG 6250.00 ASTK**
Electrical Data			
Nominal power / 20 % D.C.	S_{1N}	kVA	250
Primary voltage [1]	U_{1N}	V	530
Secondary voltage class	U_{2d}	V	14.0
Continuous output current / 100 %	I_{2P}	kA	8.0
Output current / 20 % D.C.	I_2	kA	17.9
Turns ratio	n	xx:1	38
Options			
Primary power connection and signals pluggable			☐
Primary power connector			[TAG 150 resp, TAG 250] [2]
Temperature monitoring integrated			■
Secondary current sensor integrated			■
Secondary voltage tap / lead-through			–
Force signal lead-through			–
Protective FI resistor integrated			–
Mass, Color			
Mass		kg	23.0
Color			RAL 8001 brown
Dimensions			
Height		mm	125
Width		mm	160
Length without plugs		mm	300
Length with plugs		mm	–
CAD Models			
STEP Files			Download

■ : included with delivery ☐ : accessory retrofittable – : not included

[1] **Primary voltage 530 V:** Output voltage of weld inverter with 400 V mains

PSG 6250 – Ordering information

Description	Type Designation	Ref. No.
250 kVA	PSG 6250.00 ASTK	R911171938

Handbooks

Title	Ref. No.	
Operating instructions Rexroth PSG xxxx MF welding transformers	1070087062	Download
Description of application Welding Transformer with water cooling	R911370699	Download
Type-specific instructions PSG 6250.00 ASTK	R911337513	Download

Accessories

Description	Type Designation	Ref. No.	PSG 6250.00 ASTK
Primary terminal box			
for PG cable gland	TH6000/PG	R911172927	✓
for TAG 150 connector	TH6000/MC	R911172769	✓
for TAG 250 connector	TH6250/MC	R911174776	✓

✓ : suitable

[1]**Primary voltage 530 V:** Output voltage of weld inverter with 400 V mains

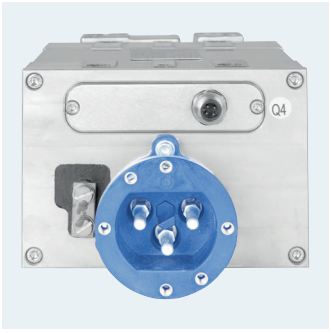
[2]Power connectors TAG 150 are designed for rated current up to 180 A, thus 6,84 kA continous secondary current.
For higher current, the terminal box TH6250/MC can be used. It is designed for power connectors TAG 250, which can be loaded corresponding to the maximum continuous secondary current of PSG 6250.00 ASTK

Welding Transformers PSG – Options

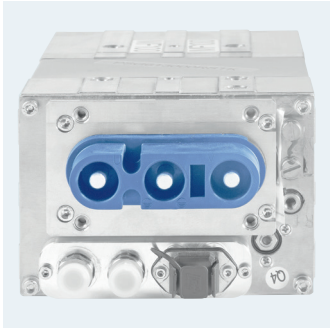
Primary Power Inlet and Signals Pluggable
Most transformer types come with pluggable power inlet and with signal connectors for temperature monitoring, measurement of secondary current, tap or lead-through of secondary voltage for the adaptive UI regulation and lead-through of force signal. The respective counterplugs are not included.

Transformers without pluggable power inlet come with open primary terminal space (protection class IP00), that must be adapted to the particular application by means of terminal boxes, see chapter “Accessories”.

Primary Power Connector
Pluggable primary power inlet with TAG- and Robifix connectors.



TAG 135



Robifix

Temperature Monitoring Integated
Secondary Current Sensor Integrated
Most transformer types contain a temperature switch for monitoring the primary winding and rectifier diodes, and also a toroid sensor for measuring the secondary current.

Both signals are led out at the primary-side terminal space – pluggable or by individual wires.

Tap/Lead-through of Secondary Voltage
Lead-through of Force Signal

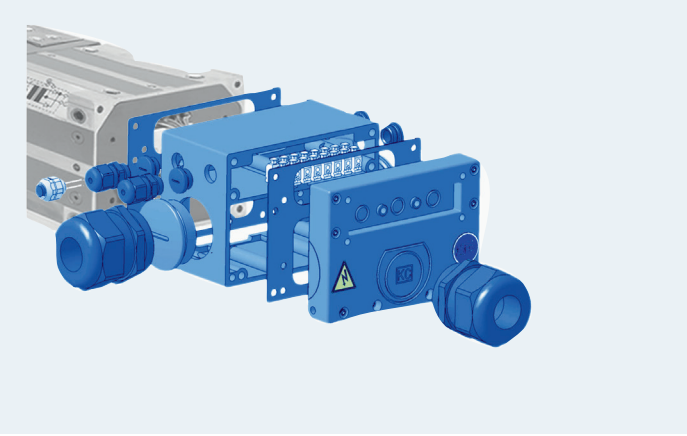
The secondary voltage for adaptive UI control is either tapped in the welding transformer or the secondary voltage tapped at the weld gun is lead through the terminal space of the transformer, same as possibly the force signal from an external force measuring device.

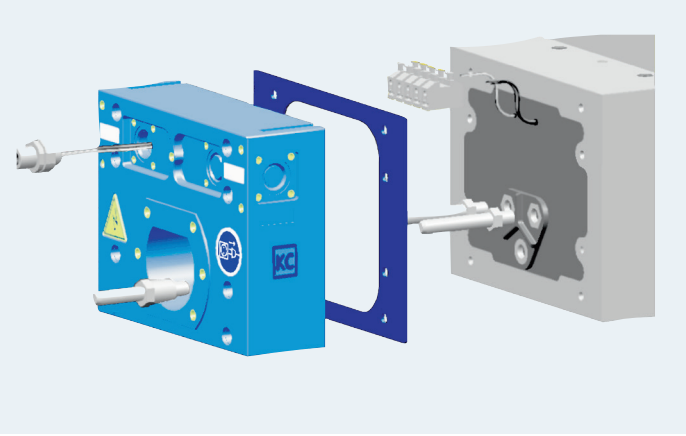
Welding Transformers PSG Accessories

Primary Terminal Boxes

The transformer types PSG 3075.10 AZ, PSG 6130.00 AS, PSG 6170.00 ASTK, PSG 6170.68 AT and PSG 6250.00 ASTK come without primary power and signal plugs. They must be adapted to the particular application by means of terminal boxes.

By this, the protection class of the primary-side terminal space increases from IP00 to IP55.





- Terminal box with PG cable glands:
  The cable is lead in at the desired side through PG glands and connected with cable lugs to the terminals U, V and PE.

- Terminal box for TSB plug:
  The included three pins are screwed into the terminals U, V and PE. Then the TSB counterplug is inserted.

Dimensions:
TH3000/xx: H × W × D = 106 × 150 × 63 mm
TH6000/xx: H × W × D = 125 × 160 × 105 mm

We are offering terminal boxes of comp. Kempf as accessories.

Ordering information

Description	Type Designation	Ref. No.
Primary terminal box with PG cable glands for PSG 3075.10 AZ	TH3000/PG	1070917826
Primary terminal box for Multicontact connector for PSG 3075.10 AZ	TH3000/MC	1070917827
Primary terminal box with PG cable glands for PSG 6xxx	TH6000/PG	R911172927
Primary terminal box for TSB 150 connector for PSG 6xxx	TH6000/MC	R911172769
Primary terminal box for TSB 250 plug for PSG 6250	TH6250/MC	R911174776

Welding Transformers PSG Accessories

Counterplugs for Power and Signals

The signals from the temperature monitoring and the secondary current sensor, the secondary voltage and the force signal are lead in and out on the primary side of the single transformer types differently. They are spread over up to four plugs.

For details, see the related chapter of this catalog. Hereinafter we are giving examples of suitable counterplugs. Further types can be found in the manufacturers' catalogs.

		Counterplugs für Primär-Leistung					Counterplugs for signals							
							1				2		3	4
Rexroth Ref. No.		R911171645	R911171646	R911171647										
Type		TSB 135/25	TSB 150/25	TSB 150/35	TSB 250/95	Robifix-B-35-FZEE	UT06128ST	CA - 07S1N1280DN - 1619772	IE-PS-V14MHYB-10P (AIDA)	ASTA015FR01730235000	B8141-0	BS8141-0	B8141-0	B8141-0
Manufacturer		Multicontact	Multicontact	Multicontact	Multicontact	Multicontact	Souriau	Coninvers	Weidmüller	Intercontec	Turck	Turck	Turck	Turck
Transformer	**Ref. No.**													
PSG 3075.10 AZ	1070088509	[✓]	[✓]	–	–	–	–	–	–	–	–	–	–	–
PSG 3075.10 PZ	1070086612	✓	–	–	–	–	–	–	–	–	✓	–	–	–
PSG 3075.10 PSV	R911170133	–	✓	–	–	–	✓	–	–	–	✓	–	✓	–
PSG 3075.11 PSV	R911170744	–	✓	–	–	–	✓	–	–	–	✓	–	–	–
PSG 3100.00 PSV	R911170161	–	–	✓	–	–	✓	–	–	–	✓	–	✓	–
PSG 3100.01 PSV	R911170745	–	–	✓	–	–	✓	–	–	–	✓	–	–	–
PSG 3100.02 PSV	R911172136	–	–	–	–	✓	✓	–	–	–	✓	–	✓	–
PSG 3100.03 PSV	R911173022	–	–	–	–	✓	✓	–	–	–	✓	–	✓	–
PSG 6120.00 RL	R911172946	–	–	–	–	✓	–	–	–	–	–	–	–	–

✓ : suitable [✓] : suitable with appropriate terminal box – : not suitable

Explanation of signals on plugs 1 to 4: in the chapter on the respective transformer

		Counterplugs for primary power					Counterplugs for signals							
							1				2		3	4
Rexroth Ref. No.		R911171645	R911171646	R911171647										
Type		TSB 135/25	TSB 150/25	TSB 150/35	TSB 250/95	RobiFix-B-35-FZEE	UT06128ST	CA - 07S1N1280DN - 1619772	IE-PS-V14MHYB-10P (AIDA)	ASTA015FR01730235000	B8141-0	BS8141-0	B8141-0	B8141-0
Manufacturer		Multicontact	Multicontact	Multicontact	Multicontact	Multicontact	Souriau	Coninvers	Weidmüller	Intercontec	Turck	Turck	Turck	Turck
Transformer	**Ref. No.**													
PSG 6130.00 AS	1070086613	–	[✓]	[✓]	–	–	–	–	–	–	–	–	–	–
PSG 6130.00 PS	1070088554	–	–	✓	–	–	–	–	–	–	✓	–	✓	–
PSG 6130.00 PSC	R911170054	✓	–	–	–	–	–	✓	–	–	✓	–	✓	–
PSG 6130.00 PSK	R911170132	–	–	✓	–	–	–	✓	–	–	✓	–	✓	–
PSG 6130.00 PSM	R911170128	–	–	✓	–	–	–	–	–	–	–	✓	✓	–
PSG 6130.01 PSM	R911171823	–	–	✓	–	–	–	–	–	–	–	✓	–	–
PSG 6130.00 PTK	R911171139	–	–	✓	–	–	–	✓	–	–	✓	–	✓	✓
PSG 6130.00 PSTK	R911173020	–	–	✓	–	–	–	✓	–	–	✓	–	✓	✓
PSG 6130.00 RSTK	R911172751	–	–	–	–	✓	–	–	✓	–	✓	–	✓	–
PSG 6130.01 RSTK	R911172767	–	–	–	–	✓	–	–	✓	–	✓	–	✓	–
PSG 6130.02 RSTK	R911172768	–	–	–	–	✓	–	–	✓	–	✓	–	✓	–
PSG 6130.10 RSTK	R911173181	–	–	–	–	✓	–	–	✓	–	–	✓	✓	–
PSG 6130.11 RSTK	R911173926	–	–	–	–	✓	–	–	✓	–	–	✓	✓	–
PSG 6130.12 RSTK	R911173927	–	–	–	–	✓	–	–	✓	–	–	✓	✓	–
PSG 6130.20 RSTK	R911173295	–	–	–	–	✓	–	✓	–	–	✓	–	✓	–
PSG 6130.22 RSTK	R911173296	–	–	–	–	✓	–	✓	–	–	✓	–	✓	–
PSG 6130.30 RSTK	R911174059	–	–	–	–	✓	–	–	–	✓	–	✓	✓	–
PSG 6160.00 TS231	R911170944	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6160.00 TS232	R911170945	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6160.00 TS233	R911170946	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6160.00GM 231	R911170370	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6160.00GM 232	R911170371	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6160.00GM 233	R911170372	–	–	–	–	–	–	–	–	–	–	–	–	–

✓ : suitable [✓] : suitable with appropriate terminal box – : not suitable

Explanation of signals on plugs 1 to 4: in the chapter on the respective transformer

		Counterplugs for primary power					Counterplugs for signals							
							1				2		3	4
	Rexroth Ref. No.	R911171645	R911171646	R911171647										
	Type	TSB 135/25	TSB 150/25	TSB 150/35	TSB 250/95	RobiFix-B-35-FZEE	UT06128ST	CA - 07S1N1280DN - 1619772	IE-PS-V14MHYB-10P (AIDA)	ASTA015FR01730235000	B8141-0	BS8141-0	B8141-0	B8141-0
	Manufacturer	Multicontact	Multicontact	Multicontact	Multicontact	Multicontact	Souriau	Coninvers	Weidmüller	Intercontec	Turck	Turck	Turck	Turck
Transformer	**Ref. No.**													
PSG 6170.00 ASTK	R911171455	–	[✓]	[✓]	–	–	–	–	–	–	–	–	–	–
PSG 6170.00 PSD	R911171460	–	–	–	–	✓	–	–	–	–	–	✓	–	✓
PSG 6170.00 PTK	R911171939	–	–	✓	–	–	–	✓	–	–	✓	–	✓	✓
PSG 6170.68 AT	R911171677	–	[✓]	[✓]	–	–	–	–	–	–	–	–	–	–
PSG 6180.00 RSTK	R911172752	–	–	–	–	✓	–	–	✓	–	✓	–	✓	–
PSG 6180.01 RSTK	R911172902	–	–	–	–	✓	–	–	✓	–	✓	–	✓	–
PSG 6180.10 RSTK	R911174469	–	–	–	–	✓	–	–	✓	–	✓	–	✓	–
PSG 6180.11 RSTK	R911174470	–	–	–	–	✓	–	–	✓	–	✓	–	✓	–
PSG 6180.30 RSTK	R911174332	–	–	–	–	✓	–	–	–	✓	✓	–	✓	–
PSG 6180.32 RSTK	R911174333	–	–	–	–	✓	–	–	–	✓	✓	–	✓	–
PSG 6230.00 GM234	R911170929	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6230.00 GM235	R911170930	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6230.00 GM236	R911170931	–	–	–	–	–	–	–	–	–	–	–	–	–
PSG 6250.00 ASTK	R911171938	–	–	[✓]	[✓]	–	–	–	–	–	–	–	–	–

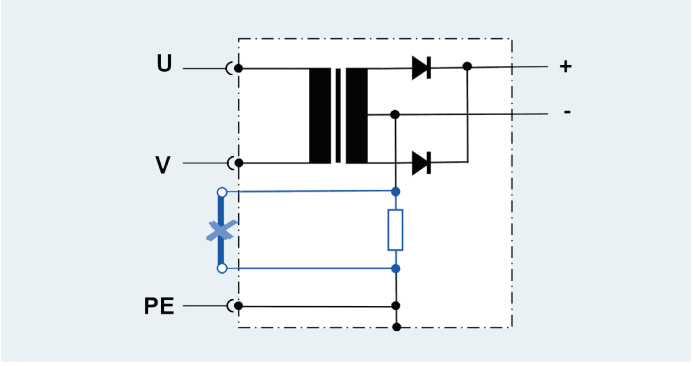
✓ : suitable — : not suitable Explanation of signals on plugs 1 to 4: in the chapter on the respective transformer

Welding Transformers PSG Accessories

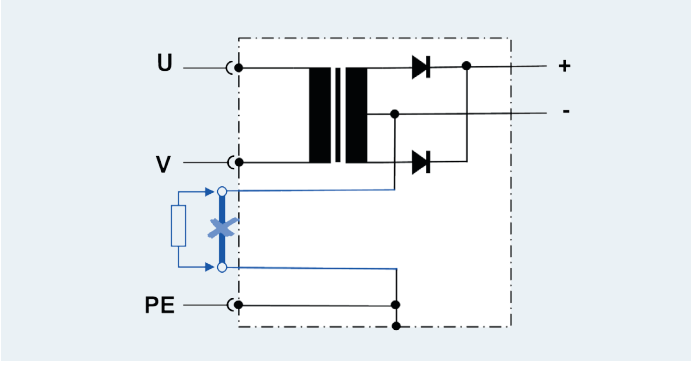
Protective FI Resistors

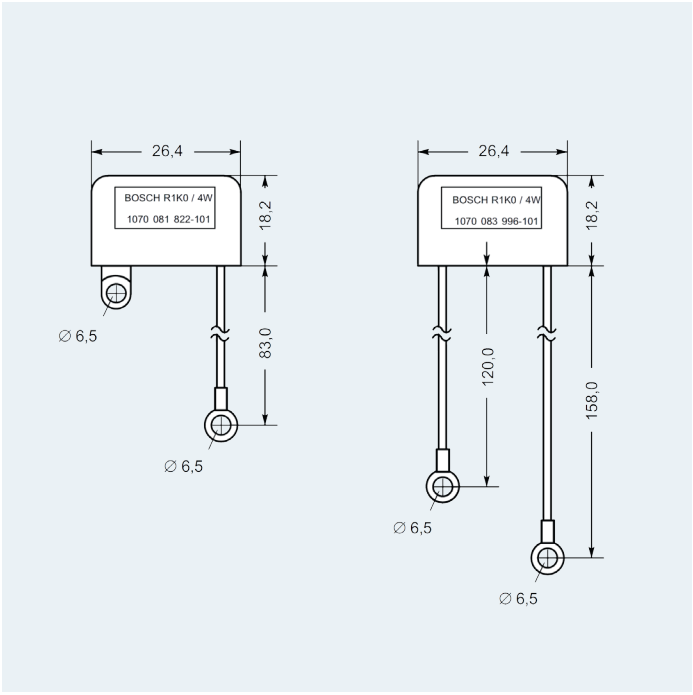
When using a residual current circuit (acc. to EN 62135-1), the MPE bridge of the welding transformer has to be replaced by a suitable protective FI resistor.

For **transformers with integrated protective FI resistor** the MPE jumper must be removed and reconnected. Thus, the protective FI resistor is activated.

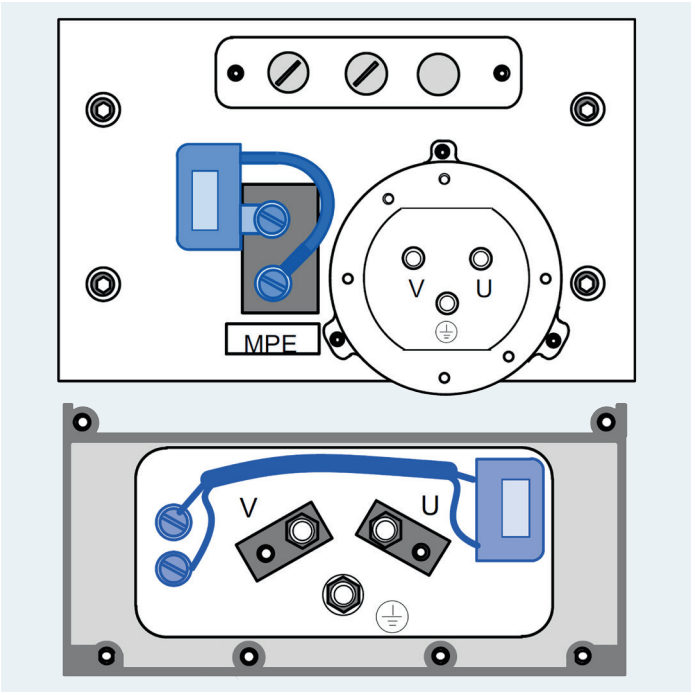


For **transformers without integrated protective FI resistor** we offer it as accessory. It can be mounted in place of the MPE bridge. Depending on the space situation on the primary side of the transformer, a protective FI resistor with short or long connection cables can be used, see page 73.





Protective FI resistor with short or long connection cables



Possible installation situations

The protective FI resistor with short connection cables can be attached outside to transformers with pluggable power connection, the resistor with long connection cables is suitable for installation in terminal boxes with limited space.

For installation instructions, see “MF-Melding Transformers PSG xxxx”.

Protective FI Resistors – Ordering information

Description	Type Designation	Ref. No.
Protective FI resistor with short connection cables	R1K0/4W	1070081822
Protective FI resistor with long connection cables	R1K0/4W/U	1070083996

Abbreviations

AI	Analog input
AIDA	Requirements of German automotive manufacturers
AO	Analog output
CB	Communication bus
DI	Digital input
DO	Digital output
D.C.	Duty cycle
EMC	Electromagnetic compatibility
FI	Failure current
FV	Failure voltage
GDM	Gun data module
H × W × D	Height × Width × Depth
HCS	Type designation of Rexroth servodrives
HIP	Hall installation plate
HZS	Type designation of Rexroth zone safety module
I/O	Input/output
KSR	Constant current regulation
L × W × D	Length × Width × Depth
MF	Medium frequency
MGDM	Measuring gun data module
MPE	Protective earth
NFD	Type designation of Rexroth mains filters
PE	Protective earth
PG	Armored thread
PHA	Phase shift
PRC	Type designation of Rexroth weld controls
PRI	Type designation of Rexroth operating software
PSG	Type designation of Rexroth welding transformers
Q-Stop	Quality-Stop
RC	Robot control
Robifix	Type designation of Multicontact power connectors
PLC	Programmable Logic Controller
STC	Sheet thickness combination
STEP	Standard for the Exchange of Product Model Data (CAD-data format)
TAG, TSB	Type designation of Multicontact power connectors
UI-, UIR	Voltage-current-(regulator)
WIC	Weld Interface Controller (serial bus system)

Index

The Drive & Control Company

Rexroth
Bosch Group

Bosch Rexroth AG
Berliner Straße 25
64711 Erbach, Deutschland
www.boschrexroth.com

Your contact with sales in Germany:
sales.resistance-welding@boschrexroth.de

For world-wide contacts see:
https://addresses.boschrexroth.com/EN/en_EN

R911382070/2018-04