

Working Instructions Translation

Sheet welding machine

WIDOS PSM 20



Keep for further use!

Type: WIDOS PSM 20
Serial number: / Year of construction: see type label

Customers' entries

Inventory no.:
Location:

Manufacturer's address

WIDOS
W. Dommer Söhne GmbH
Einsteinstraße 5
D-71254 Ditzingen-Heimerdingen
Telephone: ++49 (0) 71 52 / 99 39 – 0
Fax: ++49 (0) 71 52 / 99 39 – 40

Order of spare parts and sales service:

Please directly order at manufacturer or subsidiaries:

WIDOS GmbH
An der Wiesenmühle 15
D-09224 Grüna / Sachsen
Telephone: ++49 (0) 3 71 / 8 15 73 - 0
Fax: ++49 (0) 3 71 / 8 15 73 - 20

WIDOS
W. Dommer Söhne AG
St. Gallerstr. 93
CH – 9201 Gossau
Telephone: ++41 (0) 71 / 388 89 79
Fax: ++41 (0) 71 / 388 89 73

Purpose of the document

These working instructions give you information about all important questions which refer to the construction and the safe working of your machine.

Just as we are, you are obliged to engage in these working instructions, as well.

Not only to run your machine economically but also to avoid damages and injuries.

Should questions arise, contact our advisers in the factory or in our subsidiary companies. We will help you with pleasure.

According to our interest to continuously improve our products and working instructions, we kindly ask you to inform us about problems and defects which might appear in practical experience.

Thank you.

Structure of the working instructions

This manual is arranged in chapters which belong to the different using phases of the machine. Therefore the searched information can be easily found.



©10.12.2013 **WIDOS**

W. Dommer Söhne GmbH

Einsteinstraße 5

D-71254 Ditzingen-Heimerdingen

All rights reserved

Reprinting only allowed with permission of the corporation.

Any changes are subject to technical innovations.

- 1. DESCRIPTION OF PRODUCT 6**
 - 1.1. Usage and non-intended use.....6**
 - 1.2. Safety measures6**
 - 1.3. Conformity6**
 - 1.4. Designation of the product7**
 - 1.4.1. Technical data7
 - 1.4.1.1. WIDOS **PSM 20** General data7
 - 1.4.1.2. Heating element.....7
 - 1.4.1.3. Hydraulic aggregate.....8
 - 1.4.2. Accessories (optional)8
 - 1.4.3. Wear parts8
- 2. SAFETY RULES..... 9**
 - 2.1. Explication of the different symbols.....9**
 - 2.2. Obligations of the operator.....10**
 - 2.3. Obligations of the worker10**
 - 2.4. Measures of organization10**
 - 2.5. Information about safety precautions10**
 - 2.6. Instructions for the staff10**
 - 2.7. Dangers while handling the machine11**
 - 2.8. Special dangers11**
 - 2.8.1. Danger of stumbling over electric wires11
 - 2.8.2. Danger of combustion by heating element and welding area11
 - 2.8.3. Danger of crushing between and near the clamping beams.....12
 - 2.9. Structural modifications on the machine.....12**
 - 2.10. Cleaning of the machine12**
 - 2.11. Warranty and liability.....12**
- 3. FUNCTIONAL DESCRIPTION 13**
- 4. OPERATING AND INDICATING ELEMENTS 14**
 - 4.1. Components at the heating element.....15**
 - 4.2. How to clamp the sheet.....16**
 - 4.2.1. How to change the clamping beams16
 - 4.3. How to clamp sheets for angle welding17**
 - 4.4. How to open the clamping beam to remove the pieces18**
 - 4.5. How to weld a pipe out of sheets.....19**
 - 4.6. Service unit.....19**
- 5. STARTING AND OPERATING 20**
 - 5.1. Starting.....20**
 - 5.2. Welding process21**

6. WELDING TABLES	23
6.1. Formulas for the welding of sheets with special measures	23
7. MAINTENANCE / STORAGE / TRANSPORT	26
7.1. General	26
7.2. Clamping elements	26
7.3. Cleaning of the machine	26
7.4. Checking of the level of the hydraulic oil	26
7.4.1. Used hydraulic oil	27
7.5. Service unit	27
7.6. Transport	27
7.7. Disposal	27
8. ELECTRIC DIAGRAM	28
9. DECLARATION OF CONFORMITY	31

1. Description of product

This chapter gives important basic information about the product and its prescribed use. All technical details of the machine are put together as a general arrangement.

1.1. Usage and non-intended use

The **WIDOS PSM 20** is a workshop machine for the heating element butt welding of sheets made out of PE and PP for the thickness range up to 20 mm and width of plate up to 2000 mm.

Any other use of this machine is non-intended.

The machine is only to be used in a technically perfect condition as well as intended, safety- and danger-conscious in compliance with the working instructions and the relevant safety regulations (especially the regulations for the prevention of accidents).

The described plastic welding machine may only be operated, maintained and repaired by persons who are trained and informed about the dangers.

The manufacturer is not responsible for any damages caused by inappropriate handling or operation.

For personal injuries, material and property damages resulting herefrom, only the user is responsible!

Prescribed use also means:

- following all indications of these working instructions and
- performing the inspection and maintenance work.

1.2. Safety measures

In case of wrong use, wrong operation or wrong maintenance, the machine itself or products standing nearby can be damaged or destroyed.

Persons in the endangered area may be injured.

Therefore these working instructions have to be thoroughly read and the corresponding safety regulations must necessarily be observed.

1.3. Conformity

The machine corresponds in its construction to the valid recommendations of the European Community as well as to the European standard specifications.

The development, manufacturing and mounting of the machine were executed very carefully.

1.4. Designation of the product

The product is designated by a type label.

It contains the type of the machine, the serial number and the year of construction.

1.4.1. Technical data

1.4.1.1. WIDOS PSM 20 General data

Welding pressure:	maximum 59 kN with 250 bar
Sheet size max.:	- length up to 2000 mm - width up to 20 mm
Welding material:	PE and PP
Fuse protection:	16 A
Dimensions (W x L x H):	appr. 950 x 2500 x 1200 mm
max. working pressure pneumatic;	6 bar
Emissions:	- By using the stated plastic materials during operation within a temperature range of up to 260° C, no poisonous vapors are generated.
Ambient conditions	- Keep the workshop clean (no dust at the welding area) - If secured by an appropriate measurement that allowed conditions for welding are indicated, it is possible to work in any outside temperature condition as far as the welder is not constrained in its manual skill - Avoid humidity - Avoid strong sunlight - Avoid strong wind

1.4.1.2. Heating element

Power:	3,6 kW
Current:	15,6 A (± 10 %)
Voltage:	230 V (± 10 %)
Frequency:	50 Hz
Surface:	anti-stick coated
Included components:	- electronic temperature adjustment - control lamp - connection cable with shock-proof plug

1.4.1.3. Hydraulic aggregate

Power:	315 Watt
Voltage:	230 V ($\pm 10\%$)
Amperage:	1,5 A
Frequency:	50 Hz
Phase displacement:	approx.18°
Hydraulic oil tank:	approx. 1 l
Type of protection	IP 54
Electric motor and pump:	
Engine revolution:	1330 U/min
max. working pump:	approx. 250 bar
Working pressure:	adjustable up to 250 bar

1.4.2. Accessories (optional)

Unit/ Machine	Denomination	Article number
1	Spacer for angle welding with sheet thickness 10 mm	8215601-10
1	Spacer for angle welding with sheet thickness 15 mm	8215601-15
1	Spacer for angle welding with sheet thickness 20 mm	8215601-20
2	Screw clamp 100 x 50 mm	on request

1.4.3. Wear parts

Unit/ Machine	Denomination	Article number
1	Heating plate complete	8215800
2	Heating cartridge $\varnothing 10 \times 1060$; 1,8 kW; 230 V	on request
1	Temperature probe PT1000	H09082

For article numbers and single parts, please contact the WIDOS Company.

2. Safety rules

A basic premise for working safely and without disturbances is the knowledge of the basic safety signs and rules.

- These working instructions provide you with the most important information to safely run the machine.
- The safety information has to be respected by all persons working with the machine.

2.1. Explication of the different symbols

The working instructions contain the following signs for certain situations:



This symbol means a possible danger to a person's life and health.

- The disrespect of this indication may have heavy consequences for the health.



This symbol means a possibly dangerous situation.

- The disrespect of this indication may cause light injuries or damages of machine parts.



This symbol means a possibly dangerous situation due to hot surfaces.

- The disrespect of these indications may lead to heavy burns, respectively to ignition or even fire.



This symbol means a possibly dangerous situation by moving parts of the machine

- The disrespect of these indications may cause heavy crushing of parts of the body resp. damages of machine parts.



This symbol gives important indications for the proper use of the machine.

- The disrespect of this indication may lead to malfunctions and damages on the machine or on parts in the surrounding.



Under this symbol you get user hints and particularly useful information.

- It is a help for using all the functions on your machine in an optimal way and helps you to make the job easier.

The regulations for the prevention of accidents are valid (UVV).

2.2. Obligations of the operator

The owner is obliged to only let persons work at the machine who

- know about basic safety and accident prevention rules and who are instructed in the handling of the machine
- the worker also must have read and understood the safety chapter of this manual and certify this by his signature.

The safety-conscious working of the staff has to be checked in regular intervals.

2.3. Obligations of the worker

Before working at the machine, all persons in charge of it oblige themselves:

- to follow the basic safety and accident protection rules.
- to have read and understood the safety chapter and the warnings in this manual and to confirm by their signature that they have understood well.
- to inform themselves about the functions of the machine before using it.

2.4. Measures of organization

- The necessary personal protection equipment is to be provided by the operator.
- All available safety equipment is to be inspected regularly.

2.5. Information about safety precautions

- The working instructions are to be permanently kept at the place of use of the machine. They are to be at the operator's disposal at any time and without effort.
- In addition to the manual, the common valid and the local accident protection rules and regulations for the environmental protection must be available and followed.
- All safety and danger indications on the machine have to be in a clear, readable condition.
- Every time the machine changes hands or is being hired to a third person, the working instructions are to be sent along with the machine and their importance is to be emphasized.

2.6. Instructions for the staff

- It must be clearly defined who is responsible for transport, mounting and dismounting, starting the operation, setting and tooling, operation, maintenance and inspection, repair and disassembly.
- Only skilled and trained persons are allowed to work at the machine.
- A person who is being trained may only work at the machine under supervision of an experienced person.

2.7. Dangers while handling the machine

The **WIDOS PSM 20** is constructed according to the latest technical standard and the acknowledged technical safety rules.

However, dangers for the operator or other persons standing nearby may occur. Also damages of the machine itself or of other parts are possible.

The machine has to be only used

- according to the prescriptions
- in technically safe condition

Disturbances which may affect the safety of the machine must be immediately eliminated.



Only skilled persons are allowed to work at electric appliances.

- The electric equipment of the machine has to be regularly checked.
- Loose connections and damaged cables have to be immediately replaced.
- The heating element has to be protected against rain and dripping water.
- According to VDE 0100, the machine may only be applied on building sites via power distributors with FI security switch.

2.8. Special dangers

2.8.1. Danger of stumbling over electric wires

- Make sure that nobody has to step over the cable to the heating element.

2.8.2. Danger of combustion by heating element and welding area



You can burn parts of your body and inflammable materials can ignite!

The heating element can be heated up to more than **250° C!**

- Do not leave the machine with the heated heating element unattended.
- Do not touch the surface of the heating element.
- Take enough safety distance to inflammable materials.
- Do wear safety gloves.
- Pay attention that nobody is in the area of the heating element.
- While cleaning the heating element with cleaning agents (e.g. with PE-cleaning agent) there is the danger of igniting. Therefore pay attention that the flashpoint is smaller than the temperature of the heating element, do not put inflammable materials next to it (e.g. cigarette).

2.8.3. Danger of crushing between and near the clamping beams



You can crush, grip or squeeze your fingers.

- When open the clamping beams \Rightarrow swivel in piston rod up to stop and after it deposit the beam.
- While closing the clamping beams do not put parts of your body between beams and sheet.
- While the tables are driving together do not put parts of your body between beams and sheets.

2.9. Structural modifications on the machine

- No modifications, extensions or reconstructions may be made on the machine without permission of the manufacturer. In case of disrespect the warranty or liability will expire.
- Machine parts which are not in a perfect condition are to be immediately replaced.
- Only use original **WIDOS** spare and wear parts.
- In case of purchase orders please always indicate the **machine number!**

2.10. Cleaning of the machine

The materials you use for cleaning the machine have to be properly treated and have to be appropriately disposed, especially:

- when cleaning with solvents
- when greasing with oil and grease.

2.11. Warranty and liability

Our „General Sales and Delivery Conditions“ are principally valid.

They are at the owner's disposal at the latest when signing the contract.

Warranty and liability demands referring to damages of persons or objects are suspended if they are caused by one or several of the following reasons:

- not using the machine according to the prescriptions
- improper transport, building-up, starting and operating the machine and maintenance
- ignoring the information given in this manual
- structural changes at the machine without permission
- unsatisfactory checking of machine parts which are worn out
- repairs performed in an inexpert way
- catastrophes by external influence and Acts of God.

3. Functional description

All international and national process guidelines are to be basically followed!

By using the clamping beams the plastic sheets are clamped by pneumatic cylinder and foot valve.

Afterwards the position of the sheets are checked and if necessary changed.

Now the heating element is slewed in and the sheets are pressed on the heating element at a defined pressure. This process is called "**adjusting**".

The applied power can be seen on the pressure gauge you find on the machine.

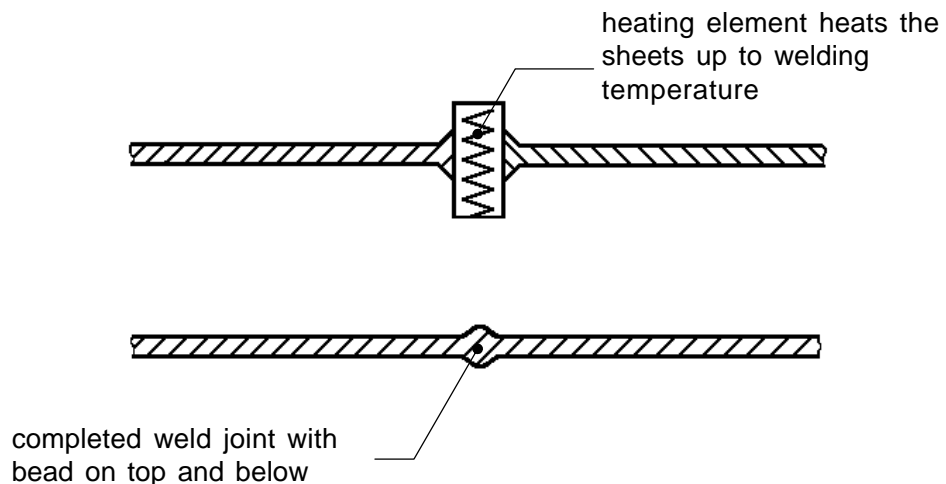
Having reached the mandatory bead height the pressure is reduced, the **heating time** begins. This time is used to reach the welding temperature at the sheet ends.

After the ending of the heating-up, the tables drive apart, the heating element quickly slews out of the machine and the tables drive together again, we call this **change-over time**.

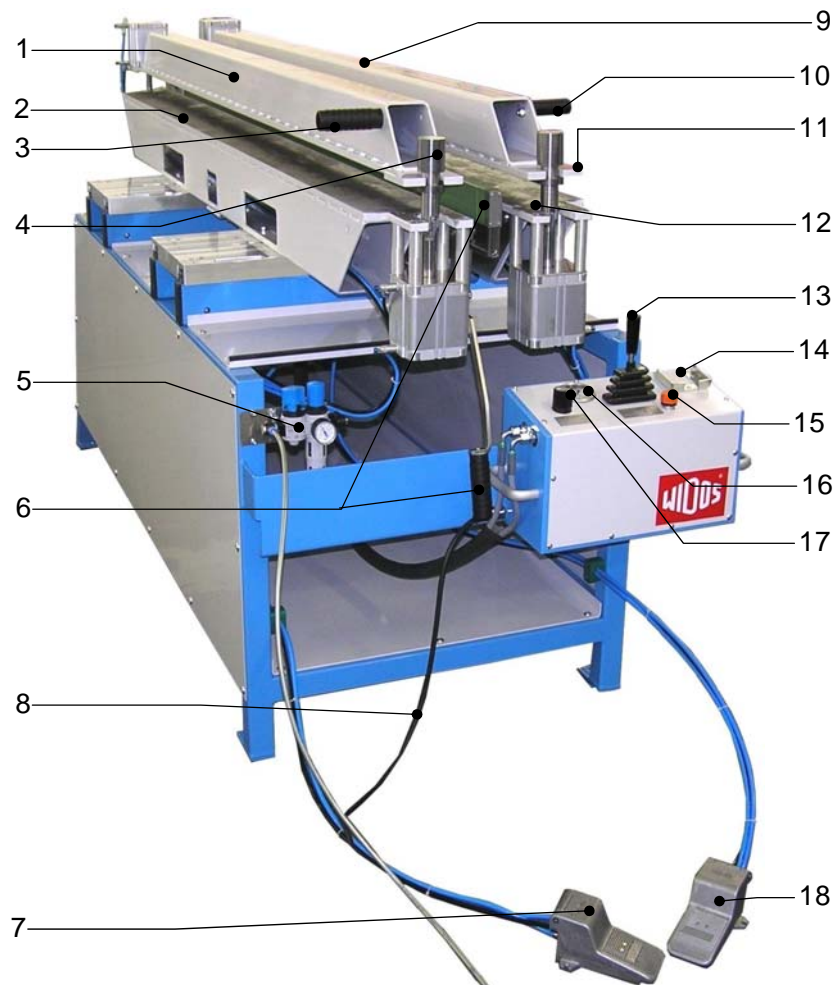
The sheets are joined at the needed welding pressure and cool down under pressure (**cooling time**).

The welding joint can be clamped out and the welding process is completed.

Image of a heating element butt welding:



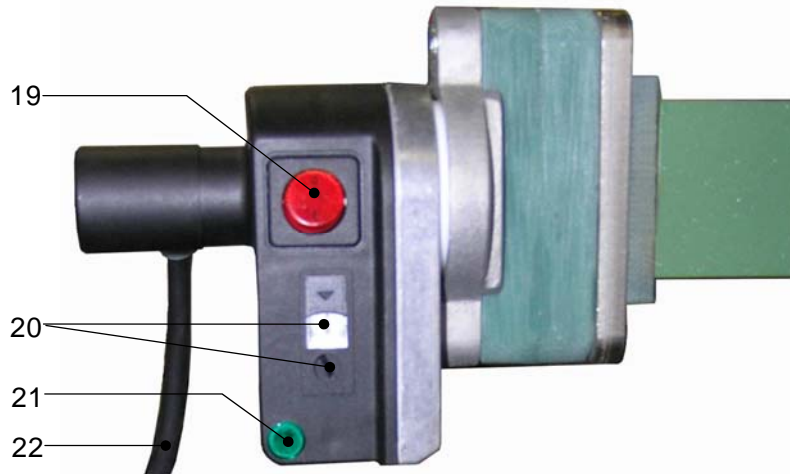
4. Operating and indicating elements



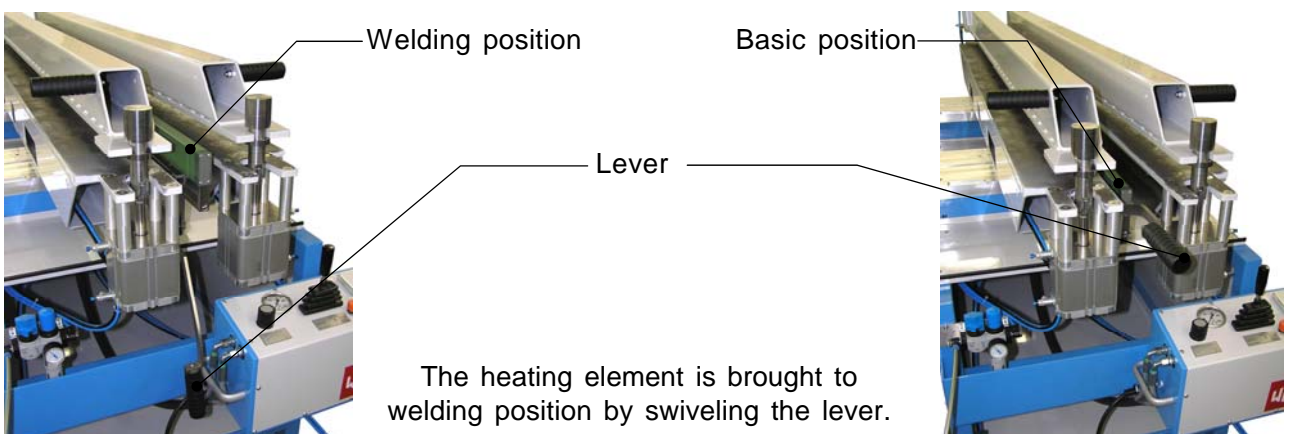
No.	Denomination	Function
1	Clamping beam, left side	clamp sheet
2	Rest, left side	support sheet
3	Grip, left side	clamping beam moving (to the top and below)
4	Piston rod, left side	clamp left clamping beam, swiveling
5	Service unit	connect the machine with compressed air supply
6	Heating element and lever	heating up the sheets and swiveled it (to the top and below)
7	Foot valve	pneumatically clamping left side
8	Cable with plug	connect the hydraulic with power supply
9	Clamping beam, right side	clamp sheet
10	Grip, right side	clamping beam moving (to the top and below)
11	Rest, right side	support sheet
12	Piston rod, right side	clamp right clamping beam, swiveling
13	Lever for hydraulic	opening and closing the tables
14	Place for stop watch	place for the stop watch (optional) giving a good view on it.
15	Oil dipstick	oil filler neck / checking the oil level. Oil level must be between the two marks
16	Pressure gauge	Indicating of the hydraulic pressure

No.	Denomination	Function
17	Pressure regulator	set the pressure for welding
18	Foot valve	pneumatically clamping right side

4.1. Components at the heating element

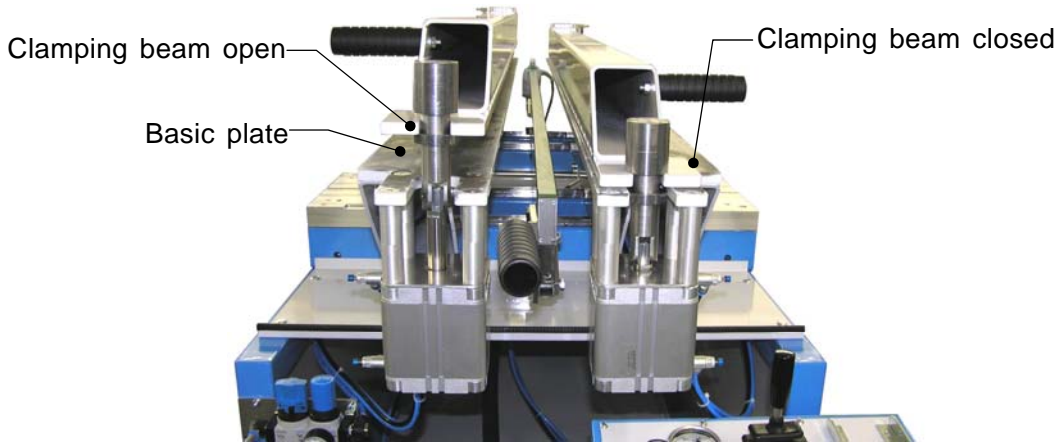


No.	Denomination	Function
19	on-off switch with lamp, red	- as soon as the heating element is turned on, it is heated up. - lamp is red if connected to the mains
20	Setting screw with display	- For regulating the temperature of the heating element
21	control lamp, green	We differ between 3 status: <ul style="list-style-type: none"> • Off: Signal for the state that the heating element does not heat up or cool down at the moment. • Blinking: The temperature of the heating element stays stable. This is realized by the pulse-interval relation. • ON: Signal for the state that the heating element is heated up at the moment. The desired temperature is not yet reached.
22	connection cable	- cable for the connection with the local power supply 230 V / 50 Hz, covering 16 A

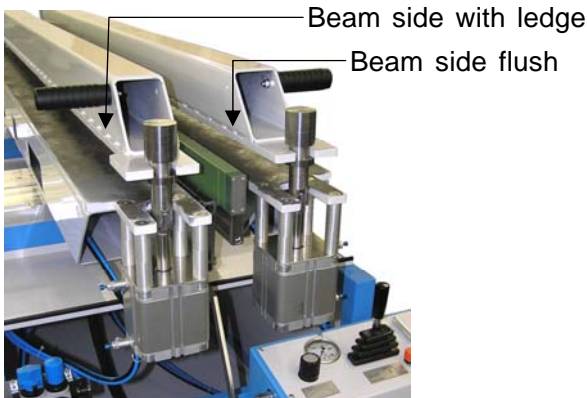


4.2. How to clamp the sheet

Insert and clamp each sheet between clamping beams and basic plate.



- In order to clamp, release the clamping beam by the corresponding foot switch.
- Insert the plastic sheet onto the basic plate and align the sheet in a way that the welding surface overlaps to the inside in rectangular manner and at a short distance.

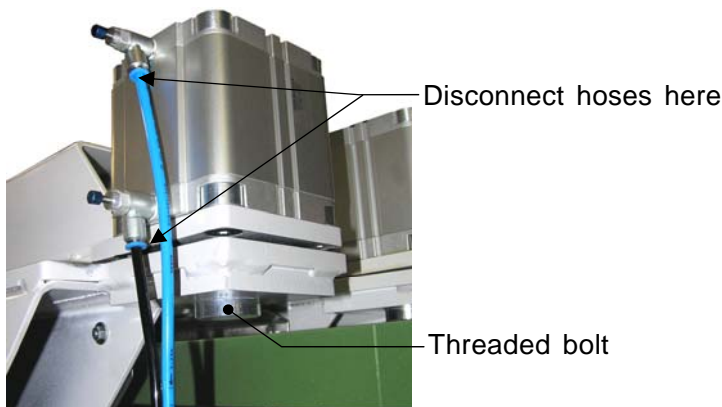


The clamping beams are flush on one side and feature a ledge on the opposite side. The beams may be used on both sides.

While welding sheets, especially thin sheets, you must use the ledge side on the inside; then the sheets are clamped close to the weld.

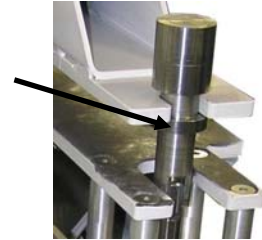
While welding angles you must insert the beam flush to the center in order that the vertical sheet may be supported.

4.2.1. How to change the clamping beams

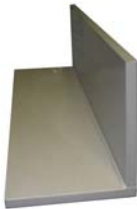


- Detach the threaded bolts at the rear cylinder and disconnect the pneumatic hoses from the cylinder (left image).
- Slightly lift the clamping beams at the front and swing the piston rods forwards out (right image).

- Remove the clamping beams, disassemble each handle and mount it on the opposite side.
- Insert the beams back again into the machine; left beam to the right and right beam to the left.
- Fix both rear cylinders and clamping beams using the threaded bolts.
- Connect the hydraulic hoses to the cylinder; the blue hose at the top and black one at the bottom.
- Lift the clamping beam at the front and swing the piston rods in again; the beam must rest on the washer afterwards.



4.3. How to clamp sheets for angle welding



You may weld an angle out of two plastic sheets on the **WIDOS PSM 20**.

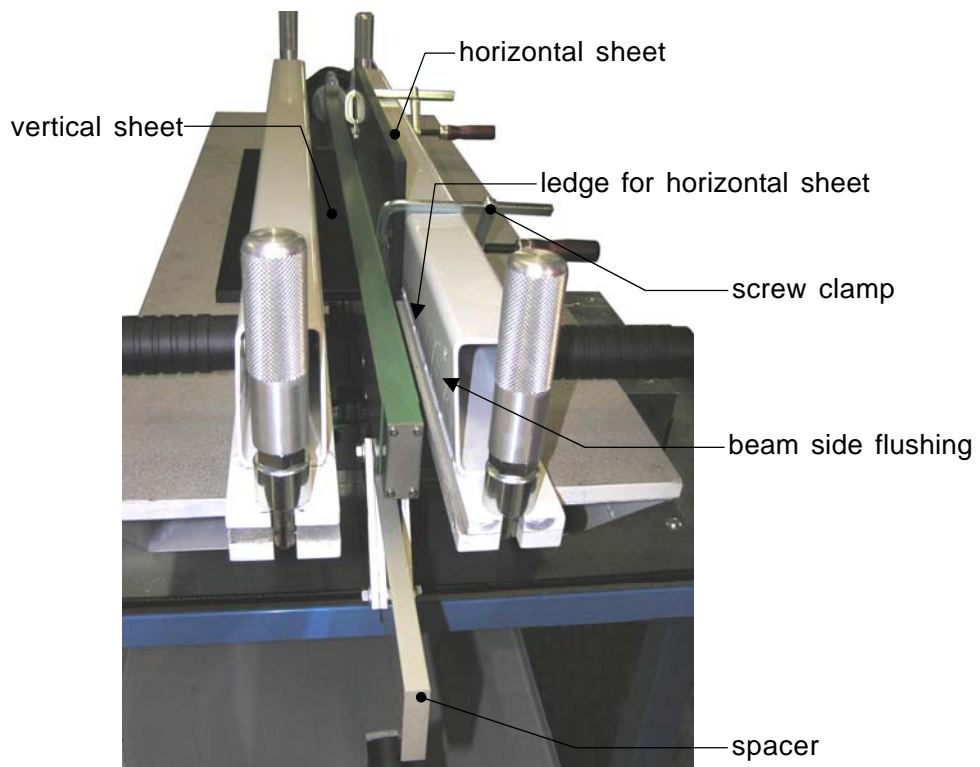
The horizontal sheet of 10 - 20 mm is clamped onto the left side (chapter: 4.2).

The vertical sheet, from 5 mm thickness, is clamped onto the right side.

First clamp the right beam (without sheet) tightly onto the right attachment.

Put the vertical sheet onto the interior of the right clamping beam onto the ledge and fix sheet e.g. with screw clamps.

(The picture shows a machine with manual clamping)



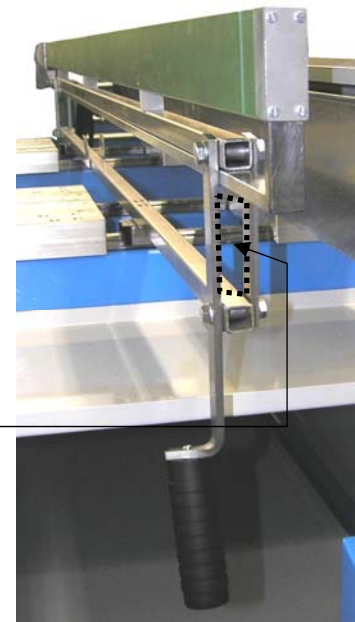
Lift the heating element and fix it additionally in the height by a spacer.

The machine features (optional) spacers for a sheet thickness of 10 / 15 / 20 mm of the horizontal sheet.

Always align spacer and sheet thickness to each other in order that the vertical sheet is only heated at the welding area.

- Spacer height 65 mm for sheet thickness of 10 mm
- Spacer height 70 mm for sheet thickness of 15 mm
- Spacer height 75 mm for sheet thickness of 20 mm

Insert the spacer here into the base frame of the lifted heating element.



Remove the spacer after heating, otherwise the heating element cannot swing downwards.

4.4. How to open the clamping beam to remove the pieces

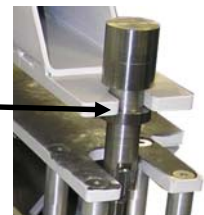


- Lift the clamping beam at the front and swing the piston rods forwards out.
- Now remove the angle or the pipe forwards out of the machine.



Since the clamping beam is very heavy, you may insert a spacer between clamping beam and support in order to remove a welding piece. The spacer may have a height of **max. 60 mm**, otherwise it may damage the rear part of the piston rod!

- Lift the clamping beam at the front, remove the space and swing the piston rod in again; the beam must rest on the washer afterwards.



4.5. How to weld a pipe out of sheets

The PSM 20 allows you to weld a plastic sheet together to get a pipe.

- For this purpose clamp the plastic sheet on one side.
- Now bend the sheet and fix it on the opposite side.



You may harm yourself! As soon as the tension reduces, the bent sheet will resile into its original position.

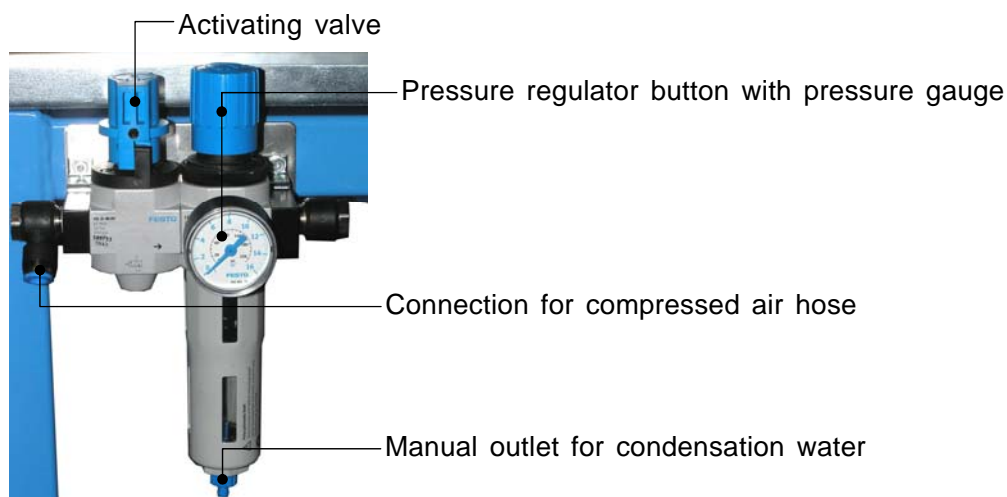


It is recommended to secure the bent and clamped sheet additionally by clamping belts.

- After welding open both clamping beams (chapter: 4.4) and remove the welded pipe forwards out of the machine.

4.6. Service unit

- Activate valve by turning.



The service unit (LFR-1/8-D-MINI-KC) regulates the fed compressed air onto the adjusted working pressure and compensates pressure fluctuations. It clears the compressed air from dirt particles and condensation water. It is not intended for the use of other media (liquids or gases).

In order to adjust the regulator:

- slowly ventilate device.
- pull the pressure regulator button for the unlocking upwards (away from housing).
- Turn the pressure regulator button until the desired pressure is shown on the pressure gauge. The input pressure must be at least 1 bar larger than the output pressure.
- Press the pressure regulator button downwards (towards the housing). Thereby, it is secured against unintentional twisting.

5. Starting and operating

The instructions of this chapter are supposed to guide you in the operation of the machine and lead you during the appropriate starting of the machine. This includes:

- the safe operation of the machine;
- using all the possible options of the machine;
- economic operation of the machine.

5.1. Starting

- Having removed the packaging material the attached guide pulleys have to be mounted on the left side and the trestle pulleys on the right side of the basic cradle.
- Connect the hydraulic with mains (230 V / 50 Hz / 16 A).
- Connect the heating element with mains (230 V / 50 Hz / 16 A).
- Connect one pneumatic hose to the local compressed air supply (6 – 8 bar) and to the connector of the service unit (chapter: 4.4)



The machine only has to be introduced and used by skilled persons.
For their qualification they must pass an exam of plastic welding according to DVS and DVGW.



Before starting the hydraulic check the level of the oil in order to avoid damages on the pump.

If necessary add hydraulic oil of the quality HLPD 32 (chapter: 7.4).

- In dangerous situations for man and machine you have to immediately disconnect the machine from the mains plug.
- Having finished the welding work and during intervals you have to turn off the heating element. Furthermore you have to control that no unauthorized person can use the machine.
- Protect machine against humidity!
- The use on building sites is only permitted when respecting VDE 0100 and using current distribution with FI-safety-switch.



Carefully install electric cables (danger of stumbling)!

- Pay attention to environmental conditions:
 - The welding process may not take place in case of direct insolation.
- If local temperature is under 5° C the following measures have to be taken:
 - if necessary heat-up sheet ends.
- Take measures against rain, wind and dust.

5.2. Welding process

The respectively valid welding prescriptions (ISO / CEN / DVS...) are to be basically followed.

- Do wear safety gloves as a protection against burning!
- A stop-watch must be available for recording the actual times for heating and cooling.
- A welding table must be available from which the parameters for the sheet dimensions to be welded prescribed by the welding prescriptions may be taken.
- The surface of the heating element has to be clean, especially free of oil, and has to be cleaned before every welding process resp. if it is dirty with non-fibering paper or cleaning agent (e.g. PE - cleaner). The ant-stick coating of the heating element has to be intact.
- Slew the heating element to the lower position, turn it on and adjust the needed welding temperature at the adjusting screw at the handle (see point 4.1 No. 20).
 - When the green control lamp is blinking (21), the desired temperature is reached and stays stable with the help of a pulse-interval relation.
- The sheets have to be clean and free of oil in the welding area.
- Open the both clamping beams with foot valves.
- Insert the first plastic sheet below the clamping beam, parallel to the support, and fix the clamping beam by the corresponding foot switch (see chapter 4.2).
- Insert the second plastic sheet below the other clamping beam, align the sheet to the first one and fix the clamping beam by the corresponding foot switch.
- Close the tables, <valve lever> on "FORWARDS", thereby reading the **movement pressure** on the manometer. The movement pressure is displayed exactly when the slide with the clamped sheets passes over into its movement.
- Check sheet displacement and crack at the ends of the nudging sheets. According to DVS 2207 the displacement of the tolerated crack may not be larger than 0,5 mm.
 - The mismatch compensation is done by releasing the clamping beams with the foot switches and by shifting the plastic sheets. Afterwards, fix the clamping beams again using the foot switches.
- Take the adjusting force for the sheet dimensions to be welded out of the table. Add the movement pressure.
- Set the resulting pressure value at the pressure relief valve and check it by actuating the <valve lever>.
- Take the heating up time, max. change-over time, cooling-down time and height of bead for the sheet dimensions to be welded out of the table.
- Open tables again slightly, <valve lever> on "BACKWARDS".
- Slew in the cleaned heating element when it has reached the desired temperature. If necessary wait until the control lamp smoothly blinks.

You must insert the spacer now during angle welding (chapter: 4.3).

- Drive the slides with identified adjusting force and hitchless to the heating element, <valve lever> on: "FORWARDS".
- When the prescribed revolving bead height is reached, reduce pressure. For this purpose, move the valve lever to position: „Pressure release“ until the desired heating pressure is built up (heating pressure = approx. 10% of the adjustment pressure).
- The heating up time starts now. Press the stop-watch and compare the actual time with the nominal time taken from the table.
- After expiration of the heating time, open the slides quickly with <valve lever> to "BACKWARDS". Slew out the heating element as quickly as possible and close the slide smoothly, <valve lever> on "FORWARDS".

You must remove the spacer now during angle welding (chapter: 4.3).

- When the welding pressure is built up, press the stop-watch and keep the control lever for approximately 10s on position „pressure“ so that the hydraulic accumulator can be filled. During the cooling time re-adjust pressure, if necessary (the pressure for cooling is the same as the set adjustment pressure).
- After expiration of the cooling time, release pressure, <valve lever> on: „Pressure release“
- Open the clamping beam with foot valves.
- Remove the welded part to one side.

While welding angles or pipes, open the front clamping beams (chapter: 4.4) and remove the welded piece to the front.

Afterwards, necessarily shut the open clamping beams again.

- open the slides <valve lever> on: "BACKWARDS".

6. Welding tables

6.1. Formulas for the welding of sheets with special measures

The aligning pressure = welding pressure can be calculated for all sheets with special measures by the following formula.

Sheets out of PE:

$$L * W * 0,15 / 23$$

Sheets out of PP:

$$L * W * 0,10 / 23$$

Table for PE

Heating up time = 10 x wall thickness [sec]

Cooling down time under joining pressure = 1,333 * wall thickness [min]

PE 80

The standard value for the heating element temperature is between 200° C - 220° C.

For **smaller** wall thickness higher temperatures should be realized.

PE 100

The standard value for the heating element temperature is 220° C.

The change-over and pressure building up time should be realized with PE 100 as fast as possible!

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Tickness	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Bead height	0,5	0,5	1	1	1	1,5	1,5	1,5	1,5	1,5	1,5	2	2	2	2	2	2	2	2
Lenght	Joining pressure [bar]																			
100	1	2	2	3	4	4	5	6	6	7	8	8	9	10	10	11	12	12	13	14
120	1	2	3	4	4	5	6	7	8	8	9	10	11	11	12	13	14	15	15	16
140	1	2	3	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18	19
160	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
180	2	3	4	5	6	8	9	10	11	12	13	15	16	17	18	19	20	22	23	24
200	2	3	4	6	7	8	10	11	12	14	15	16	17	19	20	21	23	24	25	27
220	2	3	5	6	8	9	11	12	13	15	16	18	19	21	22	23	25	26	28	29
240	2	4	5	7	8	10	11	13	15	16	18	19	21	22	24	26	27	29	30	32
260	2	4	6	7	9	11	12	14	16	17	19	21	23	24	26	28	29	31	33	34
280	2	4	6	8	10	11	13	15	17	19	21	22	24	26	28	30	32	33	35	37
300	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
320	3	5	7	9	11	13	15	17	19	21	23	26	28	30	32	34	36	38	40	42
340	3	5	7	9	12	14	16	18	20	23	25	27	29	32	34	36	38	40	43	45
360	3	5	8	10	12	15	17	19	22	24	26	29	31	33	36	38	40	43	45	47
380	3	5	8	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
400	3	6	8	11	14	16	19	21	24	27	29	32	34	37	40	42	45	47	50	53

Table for PE

Heating up time = 10 x wall thickness [sec]

Cooling down time under joining pressure = 1,333 * wall thickness [min]

PE 80

The standard value for the heating element temperature is between 200° C - 220° C.

For **smaller** wall thickness higher temperatures should be realized.

PE 100

The standard value for the heating element temperature is 220° C.

The change-over and pressure building up time should be realized with PE 100 as fast as possible!

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Tickness	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	1	1	1	1,5	1,5	1,5	1,5	1,5	1,5	2	2	2	2	2	2	2	2
Lenght																				
420	3	6	9	11	14	17	20	22	25	28	31	33	36	39	42	44	47	50	53	55
440	3	6	9	12	15	18	21	23	26	29	32	35	38	41	44	46	49	52	55	58
460	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49	52	55	58	61
480	4	7	10	13	16	19	22	26	29	32	35	38	41	44	47	51	54	57	60	63
500	4	7	10	14	17	20	23	27	30	33	36	40	43	46	49	53	56	59	62	66
520	4	7	11	14	17	21	24	28	31	34	38	41	45	48	51	55	58	62	65	68
540	4	8	11	15	18	22	25	29	32	36	39	43	46	50	53	57	60	64	67	71
560	4	8	11	15	19	22	26	30	33	37	41	44	48	52	55	59	63	66	70	74
580	4	8	12	16	19	23	27	31	35	38	42	46	50	53	57	61	65	69	72	76
600	4	8	12	16	20	24	28	32	36	40	44	47	51	55	59	63	67	71	75	79
620	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81
640	5	9	13	17	21	26	30	34	38	42	46	51	55	59	63	67	71	76	80	84
660	5	9	13	18	22	26	31	35	39	44	48	52	56	61	65	69	74	78	82	87
680	5	9	14	18	23	27	32	36	40	45	49	54	58	63	67	71	76	80	85	89
700	5	10	14	19	23	28	32	37	42	46	51	55	60	64	69	74	78	83	87	92
720	5	10	15	19	24	29	33	38	43	47	52	57	62	66	71	76	80	85	90	94
740	5	10	15	20	25	29	34	39	44	49	54	58	63	68	73	78	83	87	92	97

Table for PE

Heating up time = 10 x wall thickness [sec]

Cooling down time under joining pressure = 1,333 * wall thickness [min]

PE 80

The standard value for the heating element temperature is between 200° C - 220° C.

For **smaller** wall thickness higher temperatures should be realized.

PE 100

The standard value for the heating element temperature is 220° C.

The change-over and pressure building up time should be realized with PE 100 as fast as possible!

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Tickness	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	1	1	1	1,5	1,5	1,5	1,5	1,5	1,5	2	2	2	2	2	2	2	2
Lenght	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
760	6	11	16	21	26	31	36	41	46	51	56	62	67	72	77	82	87	92	97	102
780	6	11	16	21	27	32	37	42	47	53	58	63	68	74	79	84	89	94	100	105
800	6	11	17	22	27	33	38	43	49	54	59	65	70	75	81	86	91	97	102	107
820	6	11	17	22	28	33	39	44	50	55	61	66	72	77	83	88	94	99	105	110
840	6	12	17	23	29	34	40	45	51	57	62	68	73	79	85	90	96	101	107	113
860	6	12	18	23	29	35	41	46	52	58	64	69	75	81	87	92	98	104	110	115
880	6	12	18	24	30	36	42	47	53	59	65	71	77	83	89	94	100	106	112	118
900	7	13	19	25	31	37	43	49	55	61	67	73	79	85	91	97	103	109	115	121
920	7	13	19	25	31	37	43	50	56	62	68	74	80	86	92	99	105	111	117	123
940	7	13	19	26	32	38	44	51	57	63	69	76	82	88	94	101	107	113	119	126
960	7	13	20	26	32	39	45	52	58	64	71	77	84	90	96	103	109	116	122	128
980	7	14	20	27	33	40	46	53	59	66	72	79	85	92	98	105	111	118	124	131
1000	7	14	20	27	34	40	47	54	60	67	74	80	87	94	100	107	114	120	127	134
1020	7	14	21	28	34	41	48	55	62	68	75	82	89	95	102	109	116	123	129	136
1040	7	14	21	28	35	42	49	56	63	70	77	83	90	97	104	111	118	125	132	139
1060	8	15	22	29	36	43	50	57	64	71	78	85	92	99	106	113	120	127	134	141

Table for PE

Heating up time = 10 x wall thickness [sec]

Cooling down time under joining pressure = 1,333 * wall thickness [min]

PE 80

The standard value for the heating element temperature is between 200° C - 220° C.

For **smaller** wall thickness higher temperatures should be realized.

PE 100

The standard value for the heating element temperature is 220° C.

The change-over and pressure building up time should be realized with PE 100 as fast as possible!

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Tickness	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	1	1	1	1,5	1,5	1,5	1,5	1,5	1,5	2	2	2	2	2	2	2	2
Lenght	8	15	22	29	36	44	51	58	65	72	79	87	94	101	108	115	122	130	137	144
1100	8	15	22	30	37	44	52	59	66	74	81	88	95	103	110	117	125	132	139	147
1120	8	15	23	30	38	45	53	60	67	75	82	90	97	105	112	119	127	134	142	149
1140	8	16	23	31	38	46	53	61	69	76	84	91	99	106	114	122	129	137	144	152
1160	8	16	24	31	39	47	54	62	70	77	85	93	101	108	116	124	131	139	147	154
1180	8	16	24	32	40	47	55	63	71	79	87	94	102	110	118	126	134	141	149	157
1200	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
1220	9	17	25	33	41	49	57	65	73	81	89	98	106	114	122	130	138	146	154	162
1240	9	17	25	33	42	50	58	66	74	83	91	99	107	116	124	132	140	148	157	165
1260	9	17	26	34	42	51	59	67	76	84	92	101	109	117	126	134	142	151	159	167
1280	9	17	26	34	43	51	60	68	77	85	94	102	111	119	128	136	145	153	162	170
1300	9	18	26	35	44	52	61	69	78	87	95	104	112	121	130	138	147	155	164	173
1320	9	18	27	35	44	53	62	70	79	88	97	105	114	123	132	140	149	158	167	175
1340	9	18	27	36	45	54	63	71	80	89	98	107	116	125	134	142	151	160	169	178
1360	10	19	28	37	46	55	64	73	82	91	100	109	118	127	136	145	154	163	172	181
1380	10	19	28	37	46	55	64	74	83	92	101	110	119	128	137	147	156	165	174	183
1400	10	19	28	38	47	56	65	75	84	93	102	112	121	130	139	149	158	167	176	186

Table for PE

Heating up time = 10 x wall thickness [sec]

Cooling down time under joining pressure = 1,333 * wall thickness [min]

PE 80

The standard value for the heating element temperature is between 200° C - 220° C.

For **smaller** wall thickness higher temperatures should be realized.

PE 100

The standard value for the heating element temperature is 220° C.

The change-over and pressure building up time should be realized with PE 100 as fast as possible!

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Thickness	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	1	1	1	1,5	1,5	1,5	1,5	1,5	1,5	2	2	2	2	2	2	2	2
Lenght	10	19	29	38	47	57	66	76	85	94	104	113	123	132	141	151	160	170	179	188
1440	10	20	29	39	48	58	67	77	86	96	105	115	124	134	143	153	162	172	181	191
1480	10	20	29	39	49	58	68	78	87	97	107	116	126	136	145	155	165	174	184	194
1500	10	20	30	40	49	59	69	79	89	98	108	118	128	137	147	157	167	177	186	196
1520	10	20	30	40	50	60	70	80	90	100	110	119	129	139	149	159	169	179	189	199
1540	11	21	31	41	51	61	71	81	91	101	111	121	131	141	151	161	171	181	191	201
1560	11	21	31	41	51	62	72	82	92	102	112	123	133	143	153	163	173	184	194	204
1580	11	21	31	42	52	62	73	83	93	104	114	124	134	145	155	165	176	186	196	207
1600	11	21	32	42	53	63	74	84	94	105	115	126	136	147	157	167	178	188	199	209
1620	11	22	32	43	53	64	74	85	96	106	117	127	138	148	159	170	180	191	201	212
1640	11	22	33	43	54	65	75	86	97	107	118	129	140	150	161	172	182	193	204	214
1660	11	22	33	44	55	65	76	87	98	109	120	130	141	152	163	174	185	195	206	217
1680	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
1700	12	23	34	45	56	67	78	89	100	111	122	134	145	156	167	178	189	200	211	222
1720	12	23	34	45	57	68	79	90	101	113	124	135	146	158	169	180	191	202	214	225

Table for PE

Heating up time = 10 x wall thickness [sec]

Cooling down time under joining pressure = 1,333 * wall thickness [min]

PE 80

The standard value for the heating element temperature is between 200° C - 220° C.

For **smaller** wall thickness higher temperatures should be realized.

PE 100

The standard value for the heating element temperature is 220° C.

The change-over and pressure building up time should be realized with PE 100 as fast as possible!

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Thickness	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	1	1	1	1,5	1,5	1,5	1,5	1,5	2	2	2	2	2	2	2	2	2
Lenght	12	23	35	46	57	69	80	91	103	114	125	137	148	159	171	182	193	205	216	227
1740	12	23	35	46	58	69	81	92	104	115	127	138	150	161	173	184	196	207	219	230
1760	12	24	35	47	59	70	82	93	105	117	128	140	151	163	175	186	198	209	221	233
1780	12	24	36	47	59	71	83	94	106	118	130	141	153	165	177	188	200	212	224	235
1800	12	24	36	48	60	72	84	95	107	119	131	143	155	167	179	190	202	214	226	238
1820	13	25	37	49	61	73	85	97	109	121	133	145	157	169	181	193	205	217	229	241
1840	13	25	37	49	61	73	85	98	110	122	134	146	158	170	182	195	207	219	231	243
1860	13	25	37	50	62	74	86	99	111	123	135	148	160	172	184	197	209	221	233	246
1880	13	25	38	50	62	75	87	100	112	124	137	149	162	174	186	199	211	224	236	248
1900	13	26	38	51	63	76	88	101	113	126	138	151	163	176	188	201	213	226	238	251
1920	13	26	38	51	64	76	89	102	114	127	140	152	165	178	190	203	216	228	241	254
1940	13	26	39	52	64	77	90	103	116	128	141	154	167	179	192	205	218	231	243	256
1960	13	26	39	52	65	78	91	104	117	130	143	155	168	181	194	207	220	233	246	259
1980	14	27	40	53	66	79	92	105	118	131	144	157	170	183	196	209	222	235	248	261

Table for PP

Heating up time = **15 x** wall thickness [sec], for 2 - 4 mm wall thickness; and **16 x** wall thickness [sec], for 5 - 10 mm wall thickness
 Cooling down time under joining pressure = **2,0 x** wall thickness [min], for 2 - 4 mm; and **1,75 x** wall thickness [min] for >4 - 10 mm v
 The standard value for heating element temperature is 210° C ± 10 °C, for **smaller** wall thickness higher temperatures have to be realized.

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Thickness	Joining pressure [bar]																			
	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1	1	1	1,5
Lenght	1	2	2	3	3	4	4	4	4	5	5	6	6	7	7	7	8	8	9	9
100	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
120	2	2	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12
140	2	2	3	4	4	5	5	6	6	7	7	8	8	9	10	10	11	11	12	13
160	2	3	3	4	4	5	5	6	7	7	8	9	10	10	11	12	12	13	14	14
180	2	3	4	4	5	6	7	8	8	9	10	11	11	12	13	14	15	15	16	16
200	2	3	4	5	6	7	7	8	8	9	10	11	12	13	14	15	16	17	17	18
220	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20
240	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	17	18	19	20	21
260	3	4	5	6	7	8	10	11	11	12	13	14	15	16	17	19	20	21	22	23
280	3	4	5	7	8	9	10	11	11	13	14	15	16	18	19	20	21	22	24	25
300	3	4	6	7	8	10	11	12	12	14	15	16	17	19	20	21	23	24	25	27
320	3	5	6	7	9	10	12	13	13	14	16	17	19	20	21	23	24	26	27	28
340	3	5	6	8	9	11	12	14	14	15	17	18	20	21	23	24	26	27	29	30
360	4	5	7	8	10	11	13	15	15	16	18	19	21	22	24	26	27	29	30	32
380	4	5	7	9	10	12	14	15	15	17	19	20	22	24	25	27	29	30	32	34
400	4	6	7	9	11	13	14	16	16	18	20	21	23	25	27	28	30	32	34	35

Table for PP

Heating up time = **15 x** wall thickness [sec], for 2 - 4 mm wall thickness; and **16 x** wall thickness [sec], for 5 - 10 mm wall thickness
 Cooling down time under joining pressure = **2,0 x** wall thickness [min], for 2 - 4 mm; and **1,75 x** wall thickness [min] for >4 - 10 mm v

The standard value for heating element temperature is 210° C ± 10 °C, for **smaller** wall thickness higher temperatures have to be realized.

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Thickness	Joining pressure [bar]																			
	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1	1	1	1,5
Lenght	4	6	8	10	11	13	15	17	17	19	21	22	24	26	28	30	32	33	35	37
420	4	6	8	10	11	13	15	17	18	20	22	23	25	27	29	31	33	35	37	39
440	5	7	9	11	13	15	17	19	19	21	23	25	27	29	31	33	35	37	39	41
460	5	7	9	11	13	15	17	19	20	22	24	27	29	31	33	35	37	40	42	44
480	5	7	9	11	13	15	17	19	21	23	25	28	30	32	34	37	39	41	43	46
500	5	7	9	11	14	16	18	20	21	23	26	29	31	33	36	38	40	43	45	47
520	5	8	10	12	15	17	19	22	22	24	27	30	32	35	37	39	42	44	47	49
540	6	8	11	13	16	18	21	23	23	26	28	31	33	36	38	41	43	46	48	51
560	6	8	11	14	17	19	21	24	24	27	29	32	34	37	40	42	45	47	50	53
580	6	9	11	14	17	19	22	25	25	27	30	33	36	38	41	44	46	49	52	54
600	6	9	12	14	17	20	23	26	26	28	31	34	37	39	42	45	48	51	53	56
620	6	9	12	15	18	21	23	26	26	29	32	35	38	41	44	46	49	52	55	58
640	6	9	12	15	18	21	24	27	27	30	33	36	39	42	45	48	51	54	57	60
660	7	10	13	16	19	22	25	28	28	31	34	37	40	43	46	49	52	55	58	61
680	7	10	13	16	19	22	26	29	29	32	35	38	41	44	47	51	54	57	60	63
700	7	10	13	17	20	23	26	29	29	33	36	39	42	46	49	52	55	58	62	65
720	7	10	14	17	20	24	27	30	30	34	37	40	43	47	50	53	57	60	63	67
740	7	11	14	17	21	24	28	31	31	34	38	41	45	48	51	55	58	62	65	68

Table for PP

Heating up time = **15 x** wall thickness [sec], for 2 - 4 mm wall thickness; and **16 x** wall thickness [sec], for 5 - 10 mm wall thickness
 Cooling down time under joining pressure = **2,0 x** wall thickness [min], for 2 - 4 mm; and **1,75 x** wall thickness [min] for >4 - 10 mm v
 The standard value for heating element temperature is 210° C ± 10 °C, for **smaller** wall thickness higher temperatures have to be realized.

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Thickness	Joining pressure [bar]																			
	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1	1	1	1,5
Lenght	7	11	14	18	21	25	28	32	32	35	39	42	46	49	53	56	60	63	67	70
800	8	11	15	18	22	25	29	33	33	36	40	43	47	50	54	58	61	65	68	72
820	8	11	15	19	22	26	30	33	33	37	41	44	48	52	55	59	63	66	70	74
840	8	12	15	19	23	27	30	34	34	38	42	45	49	53	57	60	64	68	72	75
860	8	12	16	20	23	27	31	35	35	39	43	46	50	54	58	62	66	69	73	77
880	8	12	16	20	24	28	32	36	36	40	44	47	51	55	59	63	67	71	75	79
900	9	13	17	21	25	29	33	37	37	41	45	49	53	57	61	65	69	73	77	81
920	9	13	17	21	25	29	33	37	37	41	45	50	54	58	62	66	70	74	78	82
940	9	13	17	21	26	30	34	38	38	42	46	51	55	59	63	67	71	76	80	84
960	9	13	18	22	26	30	35	39	39	43	47	52	56	60	64	69	73	77	81	86
980	9	14	18	22	27	31	35	40	40	44	48	53	57	61	66	70	74	79	83	87
1000	9	14	18	23	27	32	36	40	40	45	49	54	58	63	67	71	76	80	85	89
1020	10	14	19	23	28	32	37	41	41	46	50	55	59	64	68	73	77	82	86	91
1040	10	14	19	24	28	33	37	42	42	47	51	56	60	65	70	74	79	83	88	93
1060	10	15	19	24	29	33	38	43	43	47	52	57	62	66	71	76	80	85	90	94
1080	10	15	20	24	29	34	39	44	44	48	53	58	63	67	72	77	82	87	91	96
1100	10	15	20	25	30	35	39	44	44	49	54	59	64	69	74	78	83	88	93	98
1120	10	15	20	25	30	35	40	45	45	50	55	60	65	70	75	80	85	90	95	100
1140	11	16	21	26	31	36	41	46	46	51	56	61	66	71	76	81	86	91	96	101

Table for PP

Heating up time = **15 x** wall thickness [sec], for 2 - 4 mm wall thickness; and **16 x** wall thickness [sec], for 5 - 10 mm wall thickness
 Cooling down time under joining pressure = **2,0 x** wall thickness [min], for 2 - 4 mm; and **1,75 x** wall thickness [min] for >4 - 10 mm v
 The standard value for heating element temperature is 210° C ± 10 °C, for **smaller** wall thickness higher temperatures have to be realized.

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Thickness	Joining pressure [bar]																			
	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1	1	1	1,5
Lenght	11	16	21	26	31	36	42	47	47	52	57	62	67	72	77	83	88	93	98	103
1180	11	16	21	27	32	37	42	47	47	53	58	63	68	74	79	84	89	94	100	105
1200	11	16	22	27	32	38	43	48	48	54	59	64	69	75	80	85	91	96	101	107
1220	11	17	22	27	33	38	44	49	49	54	60	65	71	76	81	87	92	98	103	108
1240	11	17	22	28	33	39	44	50	50	55	61	66	72	77	83	88	94	99	105	110
1260	12	17	23	28	34	39	45	51	51	56	62	67	73	78	84	90	95	101	106	112
1280	12	17	23	29	34	40	46	51	51	57	63	68	74	80	85	91	97	102	108	114
1300	12	18	23	29	35	41	46	52	52	58	64	69	75	81	87	92	98	104	110	115
1320	12	18	24	30	35	41	47	53	53	59	65	70	76	82	88	94	100	105	111	117
1340	12	18	24	30	36	42	48	54	54	60	66	71	77	83	89	95	101	107	113	119
1360	13	19	25	31	37	43	49	55	55	61	67	73	79	85	91	97	103	109	115	121
1380	13	19	25	31	37	43	49	55	55	61	67	74	80	86	92	98	104	110	116	122
1400	13	19	25	31	38	44	50	56	56	62	68	75	81	87	93	99	105	112	118	124
1420	13	19	26	32	38	44	51	57	57	63	69	76	82	88	94	101	107	113	119	126
1440	13	20	26	32	39	45	51	58	58	64	70	77	83	89	96	102	108	115	121	127
1460	13	20	26	33	39	46	52	58	58	65	71	78	84	91	97	103	110	116	123	129
1480	14	20	27	33	40	46	53	59	59	66	72	79	85	92	98	105	111	118	124	131
1500	14	20	27	34	40	47	53	60	60	67	73	80	86	93	100	106	113	119	126	133
1520	14	21	27	34	41	47	54	61	61	67	74	81	88	94	101	108	114	121	128	134
1540	14	21	27	34	41	47	54	61	61	67	74	81	88	94	101	108	114	121	128	134

Table for PP

Heating up time = **15 x** wall thickness [sec], for 2 - 4 mm wall thickness; and **16 x** wall thickness [sec], for 5 - 10 mm wall thickness
 Cooling down time under joining pressure = **2,0 x** wall thickness [min], for 2 - 4 mm; and **1,75 x** wall thickness [min] for >4 - 10 mm v
 The standard value for heating element temperature is 210° C ± 10 °C, for **smaller** wall thickness higher temperatures have to be realized.

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

Thickness	Joining pressure [bar]																			
	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1	1	1	1,5
Lenght	14	21	28	34	41	48	55	62	62	68	75	82	89	95	102	109	116	123	129	136
1560	14	21	28	35	42	49	55	62	62	69	76	83	90	97	104	110	117	124	131	138
1580	14	21	28	35	42	49	56	63	63	70	77	84	91	98	105	112	119	126	133	140
1600	15	22	29	36	43	50	57	64	64	71	78	85	92	99	106	113	120	127	134	141
1620	15	22	29	36	43	50	58	65	65	72	79	86	93	100	107	115	122	129	136	143
1640	15	22	29	37	44	51	58	65	65	73	80	87	94	102	109	116	123	130	138	145
1660	15	22	30	37	44	52	59	66	66	74	81	88	95	103	110	117	125	132	139	147
1680	15	23	30	37	45	52	60	67	67	74	82	89	97	104	111	119	126	134	141	148
1700	15	23	30	38	45	53	60	68	68	75	83	90	98	105	113	120	128	135	143	150
1720	16	23	31	38	46	53	61	69	69	76	84	91	99	106	114	122	129	137	144	152
1740	16	23	31	39	46	54	62	69	69	77	85	92	100	108	115	123	131	138	146	154
1760	16	24	31	39	47	55	62	70	70	78	86	93	101	109	117	124	132	140	148	155
1780	16	24	32	40	47	55	63	71	71	79	87	94	102	110	118	126	134	141	149	157
1800	16	24	32	40	48	56	64	72	72	80	88	95	103	111	119	127	135	143	151	159
1820	17	25	33	41	49	57	65	73	73	81	89	97	105	113	121	129	137	145	153	161
1840	17	25	33	41	49	57	65	73	73	81	89	98	106	114	122	130	138	146	154	162
1860	17	25	33	41	50	58	66	74	74	82	90	99	107	115	123	131	139	148	156	164
1880	17	25	33	41	50	58	66	74	74	82	90	99	107	115	123	131	139	148	156	164

Table for PP

Heating up time = **15 x** wall thickness [sec], for 2 - 4 mm wall thickness; and **16 x** wall thickness [sec], for 5 - 10 mm wall thickness
 Cooling down time under joining pressure = **2,0 x** wall thickness [min], for 2 - 4 mm; and **1,75 x** wall thickness [min] for >4 - 10 mm v
 The standard value for heating element temperature is 210° C ± 10 °C, for **smaller** wall thickness higher temperatures have to be realized.

1 kp = 23 N; For the given adjusting and welding pressure the movement pressure of the welding slide has to be added!

		Joining pressure [bar]																		
Thickness	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	19	20
Bead height	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1	1	1	1	1	1	1	1	1	1	1	1,5
Lenght	17	25	34	42	50	58	67	75	75	83	91	100	108	116	124	133	141	149	157	166
1900	17	26	34	42	51	59	67	76	76	84	92	101	109	117	126	134	142	151	159	167
1940	17	26	34	43	51	60	68	76	76	85	93	102	110	119	127	135	144	152	161	169
1960	18	26	35	43	52	60	69	77	77	86	94	103	111	120	128	137	145	154	162	171
1980	18	26	35	44	52	61	69	78	78	87	95	104	112	121	130	138	147	155	164	173
2000	18	27	35	44	53	61	70	79	79	87	96	105	114	122	131	140	148	157	166	174

7. Maintenance / storage / transport

7.1. General

- Damaged parts have to be immediately replaced, in particular be careful with electric parts, dirt and humidity are very good conductors.
- In case of repair do only use original **WIDOS – spare parts**.



All maintenance and repair work must be executed with the machine being switched off.

Thereby, the machine has to be protected against unintentional activation.



Prescribed maintenance and repair work are to be executed in due time. DVS recommends repair work after one year.

Machines which are loaded above the average, the checking cycle should be shortened. The work have to be executed by company WIDOS GmbH or by one of its authorized representatives.



The linear guides must be cleaned **every week**, e.g. with a brush.

Check the linear guide carriages **every 3 months** and grease them over the lubricating nipple if necessary.

Dirty guides may cramp and run heavily.

- Control resp. refasten all screwed connections if loose **every 3 months**.

7.2. Clamping elements

In order to warrant a long lifetime, threaded spindles and joint pieces for clamping the sheets should be regularly cleaned and greased.

7.3. Cleaning of the machine

The materials you use for cleaning the machine have to be properly treated and have to be appropriately disposed, especially:

- when cleaning with solvents
- when greasing with oil and grease.

7.4. Checking of the level of the hydraulic oil

- Before each starting of the machine check the oil level of the hydraulic pump in order to avoid damages.
- Unscrew the red closing screw (with integrate oil dipstick) on the top of the aggregate. Clean the oil dipstick with a dry cloth and insert it again into the tank, do not screw.
- Remove the oil dipstick again and check the level by means of the two marks (the oil level must be between the two marks). In case of oil level being beyond the lower mark refill oil of the quality HLPD 32 (chapter: 7.4.1).
- The oil level must not surpass the upper mark because otherwise there is the danger of overflowing in certain situations.
- Oil level check being finished, tighten again firmly the red closing screw.

7.4.1. Used hydraulic oil

Only use oil of the quality **HLPD 32**.

Properties: anticorrosive, resistant to ageing, contains wearing resistant agents, high rating and partly water binding.

The hydraulic oil must be disposed of professionally.

7.5. Service unit

When the level of the condensate is about 10 mm under the filter element:

Open the bleeder screw by turning it in anticlockwise direction (seen from below) to let off the condensed water.

With less flow despite same pressure setting:

Replace the filter element:

- Ventilate system and unit;
- Unscrew the filter bowl in an anti-clockwise direction;
- Hold new filter element only at lower end;
- Mount parts in the reverse order from dismantling;
- Restarting as described in chapter "settings" (see chapter: 4.6).

7.6. Transport

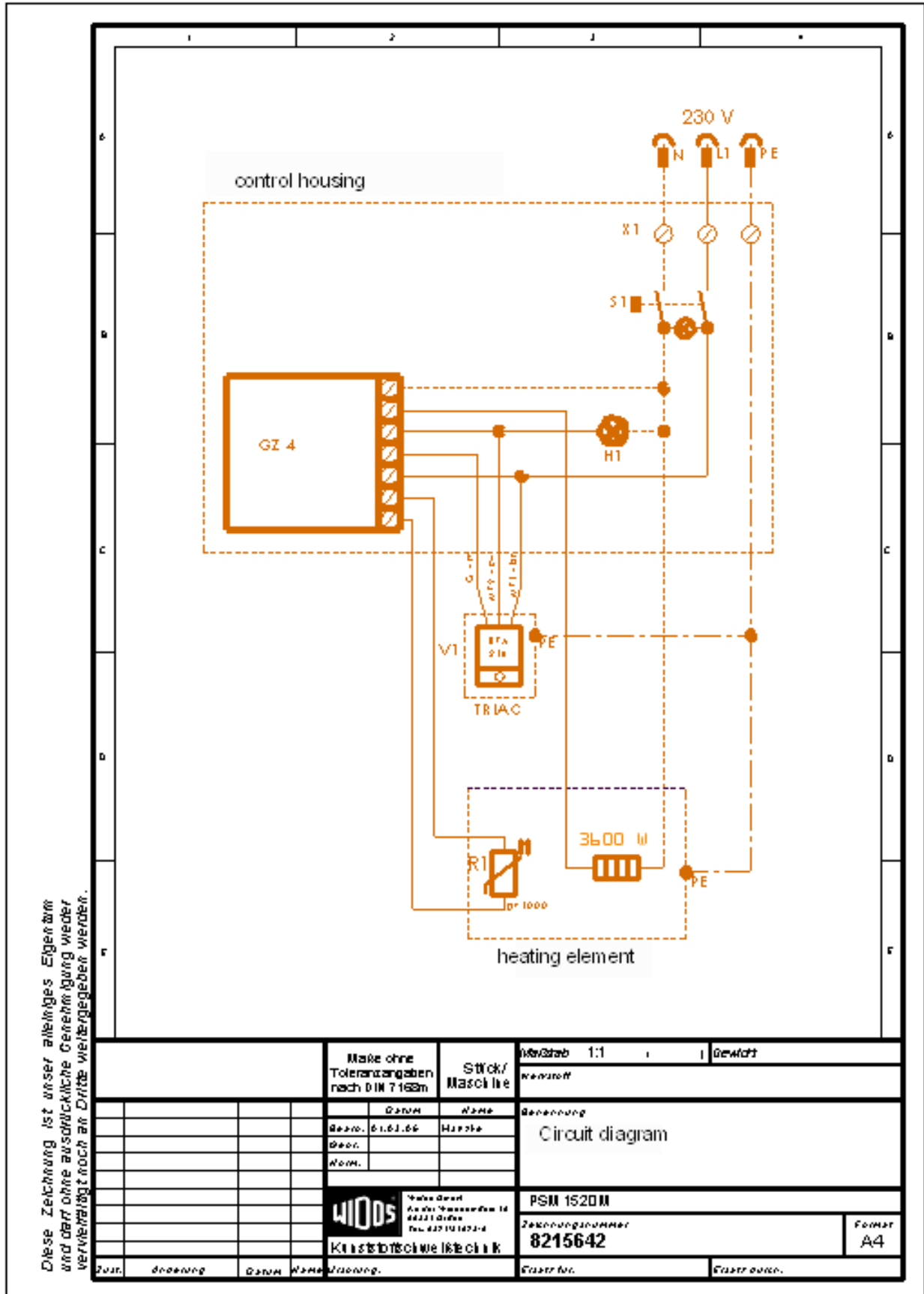
- The machine has to be carefully handled.
- Protect against shocks and hits.

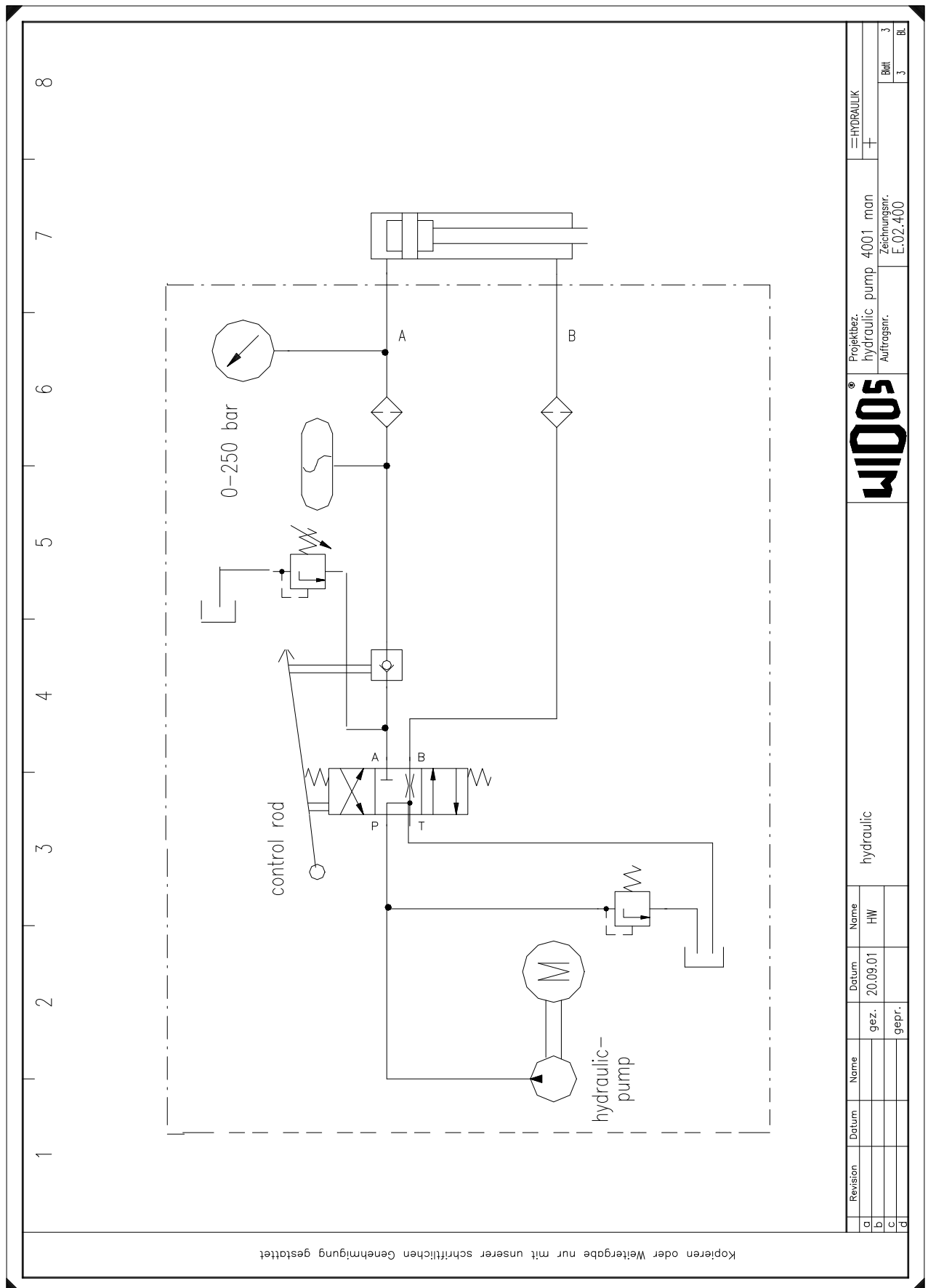
7.7. Disposal



The machine and wear parts have to be disposed of at the end of their useful life according to the common Waste Management Laws in a proper and environmentally sound manner.

8. Wiring diagrams

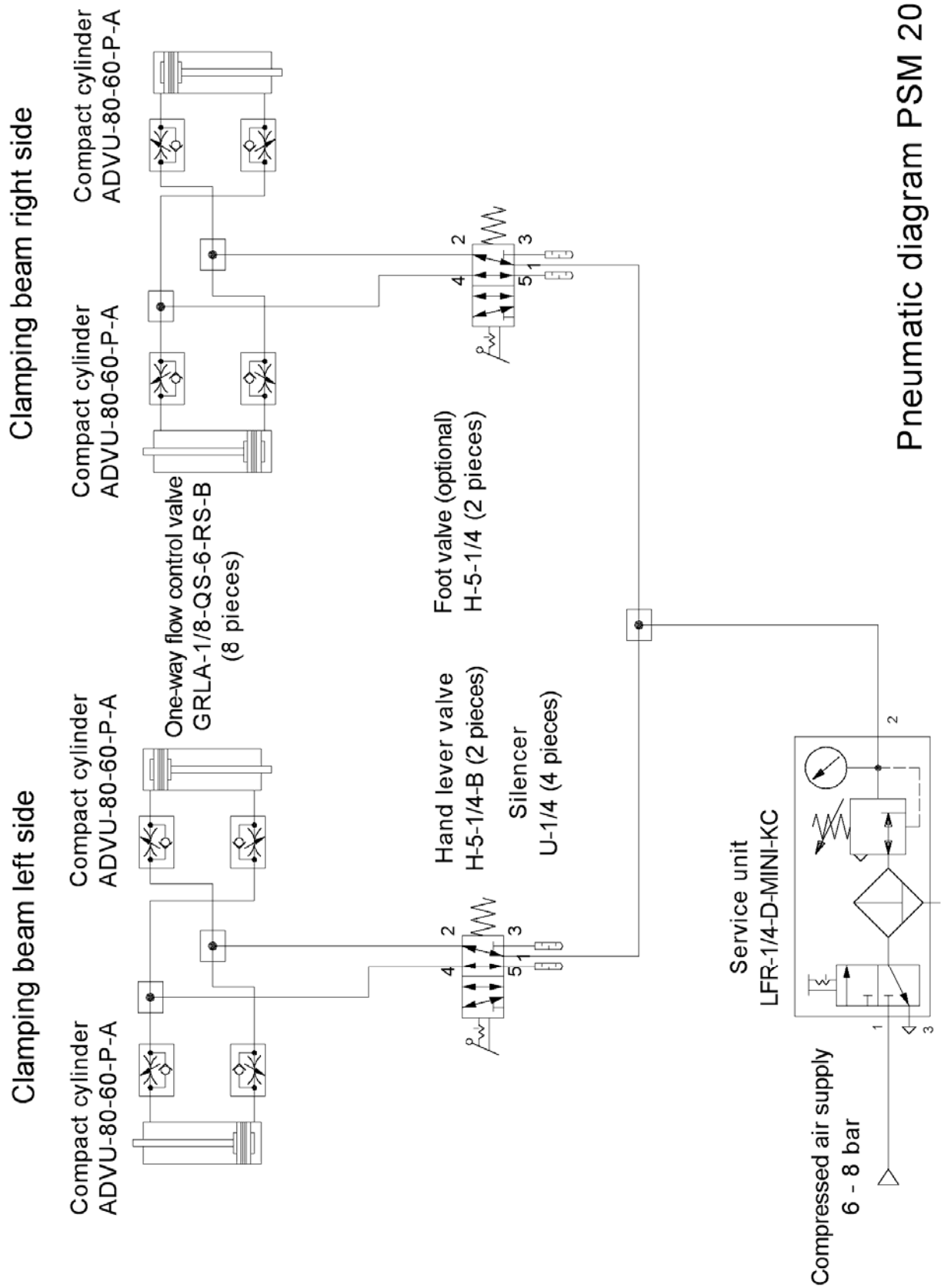




Revision	Datum	Name	Datum	Name
a			20.09.01	HW
b			gez.	gepr.
c				

Projektbez.		Projektbez.	hydraulic pump 4001 man
Auftragsnr.		Auftragsnr.	E.02.400
Zeichnungsnr.		Zeichnungsnr.	
Blatt		Blatt	3
			3
			Bl.

WIDOS		HYDRAULIK	
hydraulic		+	



Pneumatic diagram PSM 20

9. Declaration of conformity

in the sense of the EC-guideline, EC Machinery Directive 2006/42/EC

Company:

WIDOS GmbH
Einsteinstr. 5
D-71254 Ditzingen-Heimerdingen

declare under own responsibility that the product

Plastic welding machine
WIDOS **PSM 20**

to which this declaration refers, corresponds to the following norms and normative documents:

1. DIN EN ISO 12100 – 1 und 2 (substitute for DIN EN 292 parts 1 and 2)
Safety of machines, basic terminology, gen. design guidelines
2. DIN EN 60204.1
Electric equipment of industrial machines
3. EN 60555, EN 50082, EN 55014
Electro-magnetic compatibility
4. DIN EN 4413
Safety technology requirements at fluid technical devices and components
(hydraulic part)
5. DIN EN 4414
Safety technology requirements at fluid technical devices and components
(pneumatic part)

The technical documentation is completely available.

The working instructions are available in the language German and English.

Ditzingen-Heimerdingen, the 10.12.2013

Martin Dommer (Technical director)