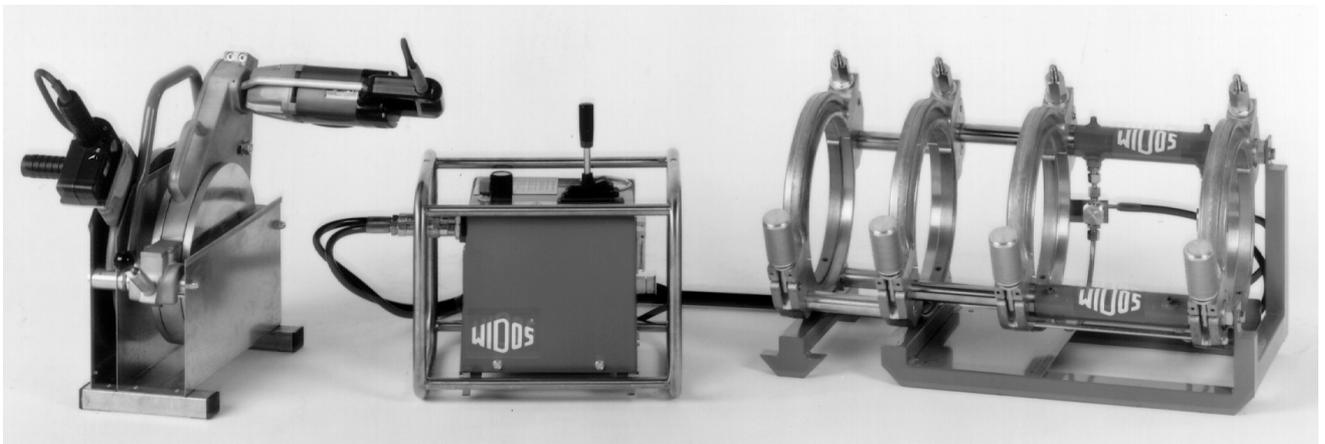


# Working Instructions Translation

## Heating Element Butt Welding Machine

### WIDOS 4600



Keep for further use!

Model:	Heating element butt welding machine
Type:	WIDOS 4600
Serial number / year of construction:	see type plate

## Customer Entries

Inventory-no.:

Place of working:

## Order of Spare Parts and After Sales Service:

### Address of Manufacturer

### WIDOS

W. Dommer Söhne GmbH  
Einsteinstr. 5

D-71254 Ditzingen-Heimerdingen

Phone: +49 (0) 71 52 99 39 - 0

Telefax: +49 (0) 71 52 99 39 - 40

[info@widos.de](mailto:info@widos.de)

<http://www.widos.de>

### Address of the Subsidiary Companies:

WIDOS GmbH

An der Wiesenmühle 15

D-09224 Grüna / Sachsen

Phone: ++49 371 / 8 15 73 - 0

Fax: ++49 371 / 8 15 73 - 20

### WIDOS

W. Dommer Söhne AG

St. Gallerstr. 93

CH-9201 Gossau

Phone: ++41 71 / 3 88 89 79

Fax: ++41 71 / 3 88 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 make our products and working instructions continuously better, we kindly ask you to inform us about problems and defects which occur during operation.

Thank you.

## Structure of the Working Instructions

This manual is arranged in chapters, which refer to the different operating phases of the machine.

Due to this structure, the searched information can be easily found.



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W. Dommer Söhne GmbH

Einsteinstraße 5

D-71254 Ditzingen-Heimerdingen

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Any changes prior to technical innovations.

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# 1. Description of the 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 Purpose-oriented Use

The WIDOS **4600** has been designed for heating element butt welding of pipes and fittings with a diameter range of  $\varnothing = 75 - 250$  mm.

It is a machine for construction sites and particularly designed for the usage on-site, as well as in the workshop.

For this reason, the frame is kept small so that it can be used even under difficult conditions (e.g. building ditches).

All use going beyond is not purpose-oriented.

The manufacturer is not responsible for damages caused by misuse.

The risk is held only by the user.

Also part of the purpose-oriented use is

- respecting all the indications of the working instructions and
- performing the inspection and maintenance works.

## 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 being in the endangered area may be injured.

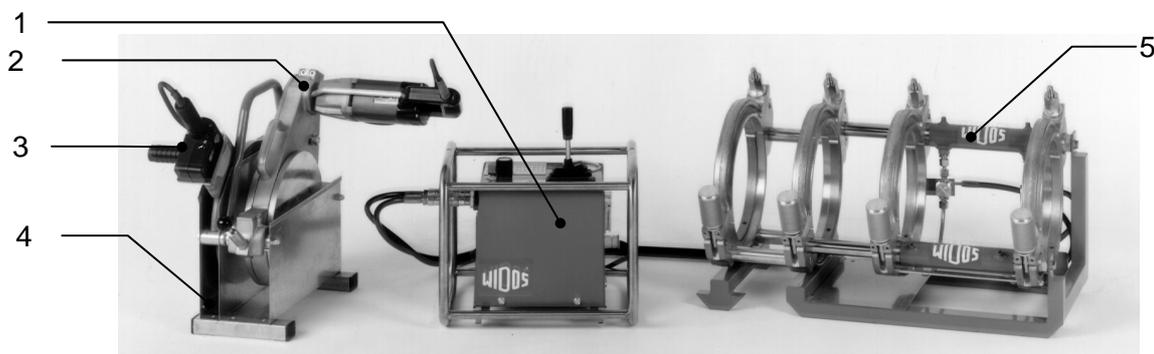
Therefore these working instructions have to be thoroughly read and the corresponding safety regulations must be necessarily adhered to.

## 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 made very carefully.

## 1.4. Machine Overview



1	Hydraulic aggregate
2	Planer
3	Heating element
4	Reception box
5	Basic machine with clamping tools

## 1.5. Designation of the Product

The product is designated by two type labels which are attached at the aggregate and at the basic machine.

They contain the type, the serial number and the year of construction of the machine.

### 1.5.1 Technical Data

#### 1.5.1.1 WIDOS 4600 General Data

Material:	PP, PE 80, PVDF, PE 100
Pipe diameter range:	outside- $\varnothing$ = 75 - 250 mm
Transport box (lxwxh):	appr. 950 x 850 x 570 mm
Weight:	appr. 40 kg
Cases with compartments for reduction inserts:	
4 compartments:	appr. 680 x 410 x 310 weight: appr. 10 kg
7 compartments:	appr. 1160 x 410 x 310 weight: appr. 16 kg
9 compartments:	appr. 1470 x 410 x 310 weight: appr. 21 kg
Packing box (lxwxh):	appr. 1230 x 980 x 670 mm
Weight:	appr. 67 kg
Weight (without boxes):	appr. 93 kg
Fuse:	16 A
Wire cross section:	1.5 mm <sup>2</sup>

Emissions	<ul style="list-style-type: none"> <li>- The sound intensity level while using the planer is appr. 86 dB (A).</li> <li>- When using the named pipe materials and when welding below 260°C no toxicant damp arises.</li> </ul>
Ambient conditions in the welding area:	<ul style="list-style-type: none"> <li>- Take care for cleanness (no dust at the welding area)</li> <li>- Do not weld below 5°C, if necessary preheat</li> <li>- Avoid humidity, if necessary put up a tent</li> <li>- Avoid strong sun rays influence</li> <li>- Protect from wind, shut the pipe ends</li> </ul>

### 1.5.1.2     Planer

Motor:	Monophase-alternating current motor
Power:	1050 Watt
Voltage:	230 V ( $\pm 10 \%$ )
Nominal current:	4.5 A
Frequency:	50 Hz ( $\pm 10 \%$ )
Speed n1 of motor:	760 rpm
Speed n2 of planer:	60 - 100 rpm
Attached elements:	On/off-switch with fixing device Connecting cable and plug with earthing contact
Weight:	appr. 14 kg

### 1.5.1.3     Heating Element

Power:	1500 Watt
Voltage:	230 V ( $\pm 10 \%$ )
Current:	6.5 A ( $\pm 10 \%$ )
Frequency:	50 Hz
Outside-Ø:	320 mm
Surface:	Nonstick coated
Elements:	Electronic temperature control Control lamps, on/off-switch Connecting cable and plug with earthing contact
Weight:	appr. 6 kg

#### 1.5.1.4 Hydraulic Aggregate

Power:	0,3 kW
Voltage:	230 V ( $\pm 10\%$ )
Current:	2,7 A
Frequency:	50 Hz
Hydraulic oil tank:	appr. 1 L
Electromotor and pump:	
Speed:	1380 (rpm)
Max. working pressure of pump:	appr. 120 bar
Working pressure:	100 bar
Volume velocity:	1.9 L/min
Weight :	appr. 23 kg

#### 1.5.1.5 Basic Frame

Dimensions (lxwxh):	800 x 420 x 460 mm
Reduction inserts:	Dimensions can be selected
Material frame:	Machinery steel
Material clamping shells:	Aluminium
Weight:	appr. 40 kg
Ø cylinder:	35 mm
Ø piston rod:	30 mm
Length of stroke of cylinder:	140 mm
Max. force: (F=P*A)	5200 N (at 100 bar)
Velocity of piston rod:	6.2 cm/s

See spare parts list for article numbers and single parts

## 1.6. Equipment and Accessories:

The following accessories are part of the first delivery:

1 x	Socket spanner size 27
3 x	Hexagonal socket screw short size 3; 6; 8
2 x	Hexagonal socket screw with T-grip size 4; 5
optional	Different sizes of reduction inserts, roller brackets for the pipes

## 2. Safety Rules

The base for the safe handling and the fault-free operation of this machine is the knowledge of the basic safety indications and rules.

The safety indications of this chapter represent the general part.  
Particular information is listed directly before the corresponding actions are described.

- These working instructions contain the most important information to run the machine safely.
- The safety information must be read by all persons working on the machine.

### 2.1. Explanation of the Symbols and Indications

In the working instructions, following denominations and signs are used for dangers:



This symbol means a possible danger for the life and the health of persons.

- The non-respect of these indications may have heavy consequences for the health.



This symbol means a possible dangerous situation.

- The non-respect of these indications may cause light injuries or damages on goods.



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

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



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

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



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

- The non-respect of these indications may conduct to malfunctions and damages on the machine or on goods in the surrounding.



Under this symbol you get user tips 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 work easier.

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

## 2.2. Obligations of the Owner

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

- know about basic safety and accident prevention rules and are instructed in the handling of the machine, as well as who
- have read and understood the safety chapter of this manual and certify this by their signature.

*The safety-conscious working of the staff should be checked in regular intervals.*

## 2.3. Obligations of the Worker

All persons who are to work at the machine are obliged before working:

- 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 well understood them.
- to inform themselves about the functions of the machine before using it.

## 2.4. Measures of Organisation

- All equipment required for personal safety is to be provided by the owner.
- All available safety equipment is to be inspected regularly.

## 2.5. Information about Safety Precautions

- The working instructions have 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 much 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 rent to third persons, the working instructions are to be sent along with and their importance is to be emphasized.

## 2.6. Instructions for the Staff

- Only skilled and trained persons are allowed to work at the machine.
- 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 dismounting.
- 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 machine WIDOS 4600 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 material damages are possible.

The machine must only be used:

- according to the purpose-oriented usage
- in safety technical impeccable status

*Disturbances, which may affect the safety of the machine must be cleared immediately.*

## 2.8. Maintenance and Inspection, Repair



All maintenance and repair works have to be basically performed with the machine in off position.

During this the machine has to be secured against unauthorized switching on.



Prescribed maintenance and inspection works should be performed in time.

The DVS gives the advice of inspection works after 1 year.

For machines with a specially high usage percentage the testing cycle should be shortened.

The works should be performed at the WIDOS GmbH company or by an authorized partner.

## 2.9. Dangers Caused by Electric Energy



Only skilled persons are allowed to work at electrical appliances !

- The electrical equipment of the machine has to be checked regularly.  
Loose connections and damaged cables have to be replaced immediately.
- If works at alive parts are necessary, a second person has to assist who can disconnect the machine from the mains if necessary.
- All electric tools (heating element, planer, aggregate) have to be protected from rain and dropping water (if necessary use a welding tent).
- According to VDE 0100, the use on construction sites is only allowed with a power distributor with a FI-safety switch.

## 2.10. Dangers Caused by the Hydraulics



System parts and pressure hoses should be made pressureless before beginning of any repair works. Even if the machine is switched off, pressure may be in the hydraulic accumulator!

- There is the danger of injuring the eyes by hydraulic oil squirting out
- Damaged hydraulic hoses have to be immediately replaced.
- Make a visual inspection of the hydraulic hoses before each work beginning.
- The hydraulic oil is inedible !

## 2.11. Special Dangers

### 2.11.1 Danger of Catching Clothes by the Planer



There is the danger of cutting yourself or even breaking bones !

- Only wear clothes tight to the body.
- Do not wear rings or jewellery during work.
- If necessary, wear a hair-net.
- Always put the planer back into the reception box after and before each use.
- Transport the planer at the handle only.
- Do not touch the planer surfaces.
- Switch the planer on only for usage. Otherwise the planer will start every time when the security microswitch is pressed.

### 2.11.2 Danger of being burnt by Heating Element, Reception Box and Welding Area



You can burn yourself, inflammable materials can be ignited!

The heating element temperature is heated up to more than **200°C** !

- Do not touch the surfaces of the heating element.
- Do not leave the heating element unsupervised.
- Take enough safety distance to inflammable materials.
- Wear safety gloves.
- Always put the heating element back into the reception box after and before each use.
- Transport the heating element at the handle only.

### 2.11.3 Danger of Stumbling over Hydraulic and Electric Wires

- Make sure that no person has to step over the wires.
- Lay the wires in such a way that the danger is kept to a minimum.

### 2.11.4 Danger of Squeezing by Clamping Devices and Guideways



There is the danger of serious injuries: on the one hand between the inner clamping devices and on the other hand between the outer clamping device and the end of the guideway.

- Do not stand or put hands between clamped pipe ends.
- Do not stand or put hands between the inner clamping devices with not yet clamped pipes.
- Do not block opening and closing of the machine slides.

## 2.12. Structural Modifications on the Machine

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

## 2.13. Cleaning the Machine

The used materials and tissues are to be handled and disposed of properly, especially:

- when cleaning with solvents
- when lubricating with oil and grease

## 2.14. Warranty and Liability

Fundamentally our "General Sales and Delivery Conditions" are valid.

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

Guarantee and liability demands referring to personal injuries or damages on objects are excluded if they are caused by one or several of the following reasons:

- not using the machine according to the prescriptions
- inexpert transport, mounting, starting, operating and maintenance of the machine
- running the machine with defective or not orderly mounted safety appliances
- ignoring the information given in this manual
- structural modifications on the machine without permission
- unsatisfactory checking of parts of the machine, which are worn out
- repairs performed in an inexpert way
- in case of catastrophes and force majeure.

### 3. Functional Description

Basically, the international and national process guidelines are to be followed.

The plastic pipes are clamped by means of the clamping devices.

Then the front sides of the pipes are cut plane and parallel by means of the **planer** and the misalignment of the pipes is checked.

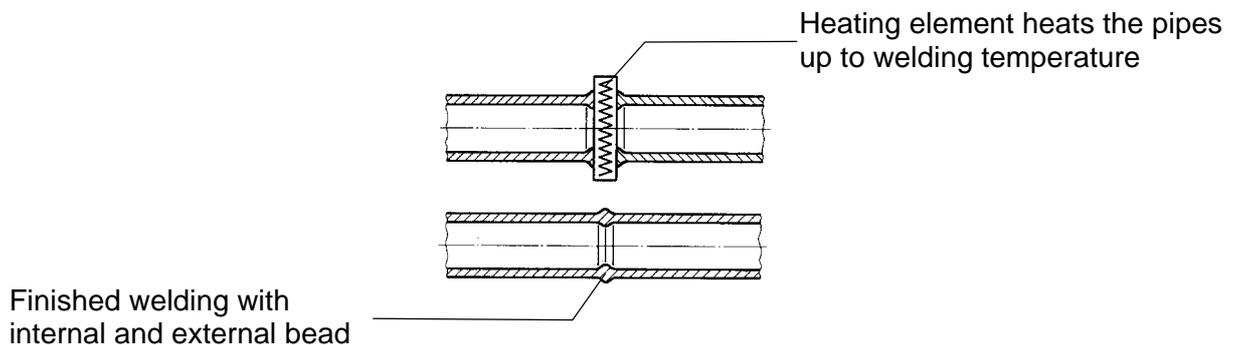
The heating element is inserted and the pipes are pressed against the heating element under defined adjusting pressure. This process is called "**adjusting**".

After the prescribed bead height being reached, pressure is reduced, the **heating time** begins. The function of this time is to heat up the pipe ends.

After expiration of the heating time, the slides are opened, the heating element is removed quickly and the pipes are driven together again. The time gap from the removal of the heating element to joining the pipes is called **change over time**.

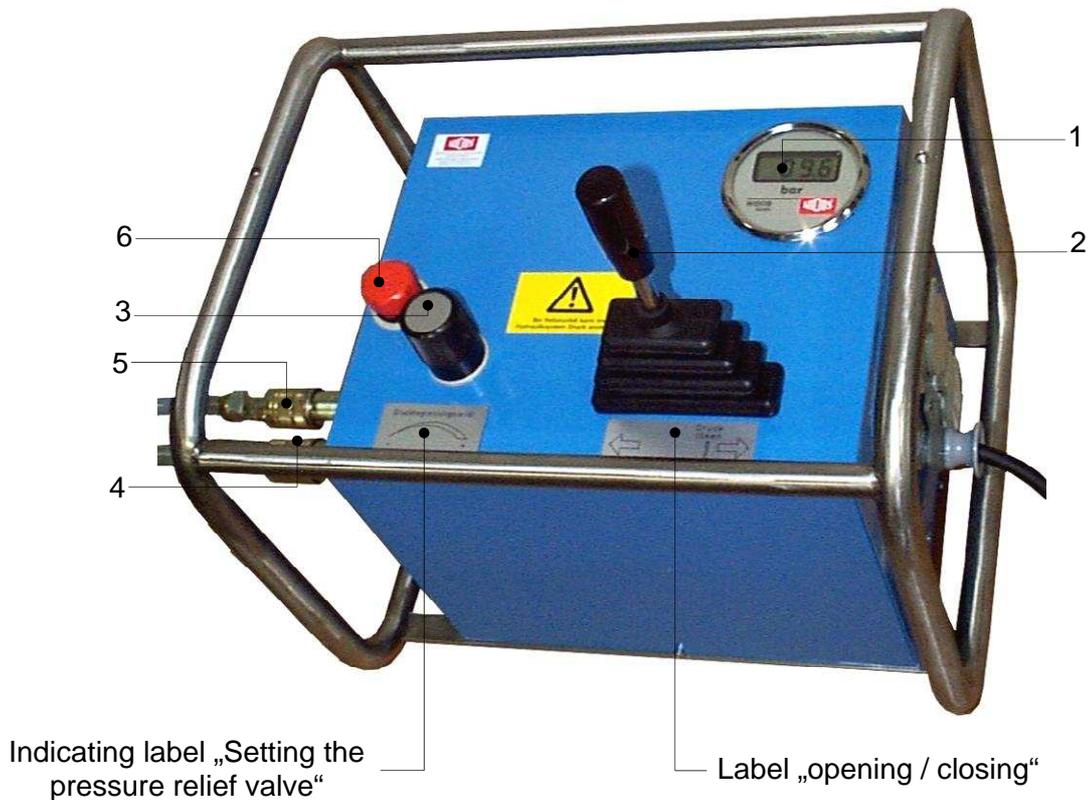
The pipes are joined under prescribed welding pressure and then cool down under pressure (**cooling time**).

The welded joint can be unclamped, the welding process is finished.



## 4. Operating and Indicating Elements

### 4.1. Elements on the Hydraulic Aggregate

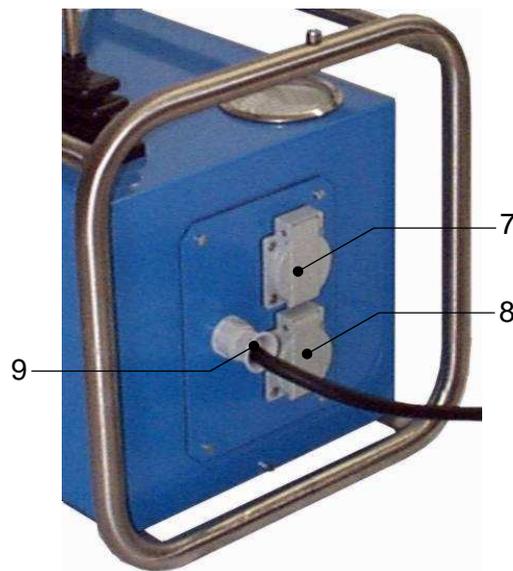


No.	Name	Function
1	Pressure gauge, digital	Digital display of the hydraulic pressure
2	Valve lever	Opening the slides. There are 4 different positions: - <b>to the left side</b> : slides close. - <b>in the middle</b> (usual position): the pressure which is currently achieved is kept (also by means of the built-in hydraulic accumulator) - <b>slightly to the right side</b> (position pressureless): a possibly existing pressure is released without moving the slides. Due to the hydraulic accumulator, it takes about 10 s until the pressure is completely released. - <b>to the right side</b> : slides open
3	Setting screw for pressure relief valve	- Limitation of the pressure to the desired value.
4	Hydraulic connection for closing the slides	- Non-dropping quick-acting coupling
5	Hydraulic connection for opening the slides	- Non-dropping quick-acting coupling
6	Screw with oil dipstick	- checking the oil level - oil filler neck

### 4.1.1 Hydraulic aggregat with pressure gauge analog

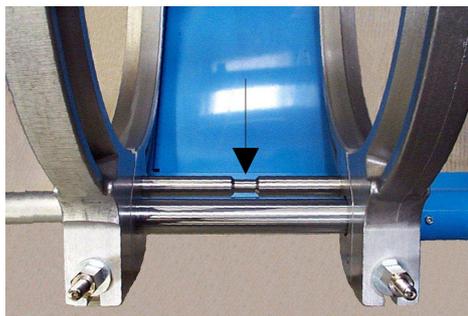


### 4.2. Elements on the side of the aggregate



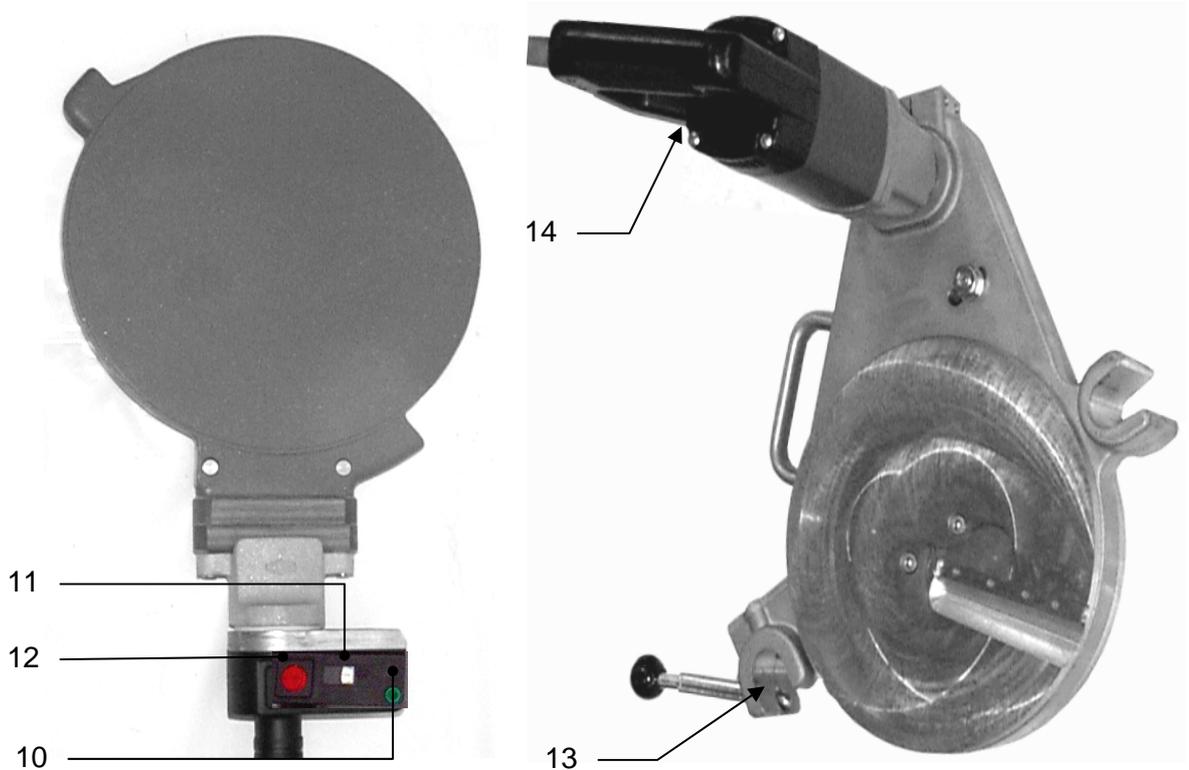
No.	Denomination	Function
7	Plug socket 230 V / 50 Hz	Possibility for connecting the planer / heating element
8	Plug socket 230 V / 50 Hz	Possibility for connecting the planer / heating element
9	Mains cable 230 V / 50Hz	Power supply

### 4.3. Separating device for heating element



There is a tear-off bar mounted between the movable and the fixed clamping shells on the basic machine. It prevents the heating element from sticking to the heated-up pipe ends. When inserting the heating element take care that it lies in the zone of the throat of the tear-off bar (see arrow).

### 4.4. Elements at heating element and planer



No.	Denomination	Function
10	Control lamp green	- There are three different states: <ul style="list-style-type: none"> <li>• off: signalizes that the heating element is not heated up at the moment or that it cools down</li> <li>• blinking: the heating element temperature is maintained by a certain pulse-position ratio</li> <li>• on: signalizes that the heating element is heated up at the moment. It has not yet reached the desired temperature</li> </ul>
11	Setting screw	- For regulating the temperature of the heating element
12	On/off-switch with red lamp	- As soon as the heating element is switched on, the red control lamp lightens
13	Locking lever with protection switch	- Protection against unintended running of the planer - Protection of the planer against jumping out of the machine - Planing is only possible if the security micro switch is pressed
14	On/off-switch for planer	- The planer can be switched on with the switch and the associated fixing knob. - The planer has to be switched off before and after each use.

## 5. Starting and Operating

The instructions of this chapter are supposed to initiate in the operation of the machine and lead 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



The machine may only be operated by trained and authorized persons. For the qualification, a plastic welding exam can be taken according to DVS and DVGW.

In situations of danger for persons and the machine, the mains plug has to be unplugged immediately.

In case of power failure, there may still be pressure in the hydraulic system. Therefore release pressure if need be.

After completion of the welding work and during breaks the machine has to be switched off. Further take care that no unauthorized person has access.

Protect the machine from wetness and moisture !

According to VDE 0100, the use on construction sites is only allowed with a power distributor with a FI-security protective switch.



Check the oil level of the hydraulic system before each starting of the control unit in order to avoid damages on the pump. The oil-level must be between the two marks at the oil dipstick.

- Connect the hydraulic aggregate to the mains (230 V / 50 Hz).
- Connect the heating element and the planer to the corresponding plug sockets of the aggregate.
- Connect the hydraulic hoses of the basic machine to the quick-acting couplings of the hydraulic aggregate.

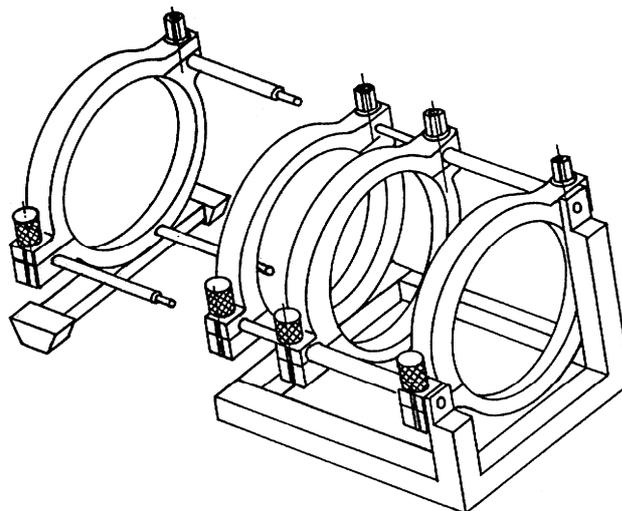


Lay hydraulic and electric wires carefully (danger of stumbling) !

- Take into account the surrounding conditions:
  - The welding may not be performed under direct sun rays influence.
  - Use a welding umbrella if necessary.
- If the surrounding temperature is under 5°C, measures have to be taken:
  - Use a welding tent or preheat the pipe ends if necessary.
  - In addition, take measures against rain, wind and dust.

### 5.1.1 Replacing the Reduction Inserts

- Unscrew the mounted reduction inserts by means of the provided Allan key.
- Screw the reduction inserts with the corresponding diameter into the clamping devices.
- If necessary (e.g. for T-pieces) the outer fixed clamping device can be dismantled by unscrewing the three hexagon socket screws.

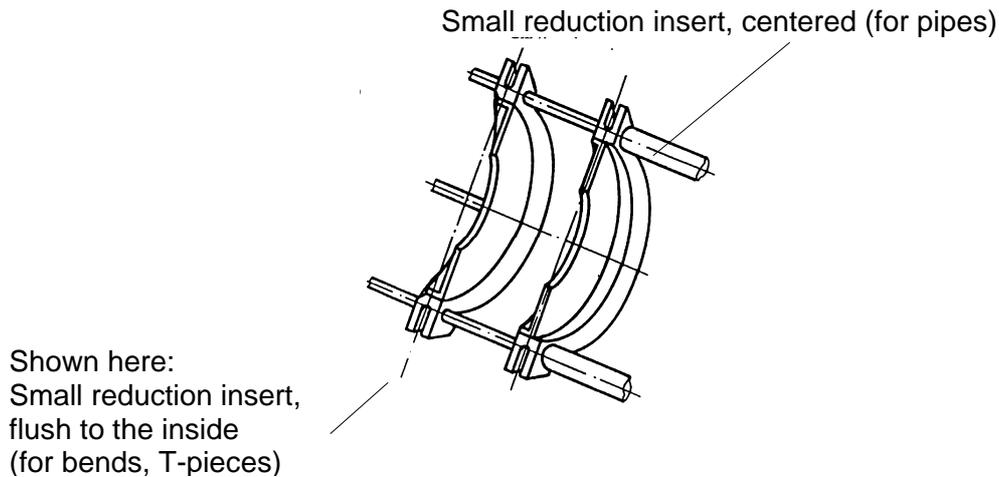


Dismantling of the outer fixed clamping device

### 5.1.2 Using Small and Large Reduction Inserts

#### Small Reduction Inserts:

- Pipe fittings often have only a short straight surface area on which they can be clamped.
- Fittings mostly need to be clamped in the inner clamping devices with the small reduction inserts.
- When fittings are to be welded (bends, T-pieces etc.), the inner small reduction insert can also be used flush to the inside or to the outside.



### Large Reduction Inserts

- They are mainly used for a good tightening and are generally mounted on the inner clamping devices.
- Super large reduction inserts have a specially high guidance quality and are mainly used during the welding of fittings with long legs which can only be clamped with a single clamping tool.

## 5.2. Welding Process

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



There is the danger of serious bruising.  
On the one hand between the inner clamping devices, on the other hand between the outer clamping device and the end of the guide bar.

- 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 pipe dimensions to be welded prescribed by the welding prescriptions may be taken.
- The heating element surfaces are to be clean and, above all, free from grease.  
Therefore they are to be cleaned with non-fraying paper and detergent (e.g. PE - cleaner) before every welding or if they are dirty.  
The anti-adhesive coating of the heating element has to remain undamaged in the working area.
- Switch on the heating element and set the required welding temperature at the setting screw at the handle. (look at 4.4 no. 10 - 12)
  - when the control light is blinking, the desired temperature is obtained and maintained by a certain pulse-position ratio.
- Screw in the reduction inserts according to the outside diameter of the pipes to be welded.

- Lay the pipes to be welded into the clamping devices, tighten firmly the clamping nuts and align the pipes with respect to one another.  
In case of long pipe ends, use WIDOS rollerstands for alignment.
- Close the slides, thereby reading the **movement pressure** on the manometer.  
The movement pressure is displayed exactly when the slide with the clamped-pipe passes over into its movement.  
Subsequently, open slides again such that the planer fits therebetween.
- Insert the planer between the pipe ends, allow handle to lock with the security micro switch and switch on.



There is the danger that the planer pulls in clothes !  
In case planer is switched on it will run immediately as soon as the security micro switch is pressed.  
Do not hold the planer on its front sides in any case.

- Move the pipe ends towards one another by means of the valve lever and plane same with a planing pressure between 1 and 15 bar above the movement pressure.  
Planing must be carried out until a revolving cutting has been formed on both sides.
- Open the slides again by means of the valve lever, switch off planer motor, remove planer and put it into the heat protection box.  
Remove the produced cuttings without contacting the worked surfaces
- Close slides.
- Check pipe mismatch and gap on the joining pipe ends.  
According to DVS 2207, the mismatch on the pipe outer side must not exceed  $0.1 \times$  pipe wall thickness, the admissible gap must not exceed 0.5 mm.  
The mismatch compensation is carried out by further tightening or releasing the clamping nuts.  
In case mismatch compensation was carried out, planing must be repeated afterwards.
- The adjustment pressure for the pipe dimension to be welded can be gathered from the table. Add the movement pressure.  
Set the resulting pressure value at the pressure limiter valve and check it by actuating the valve lever.
- Open slides again slightly.
- Gather heating time, maximum change-over time, cooling down time and bead height for the pipe dimension to be welded from the table.
- Move the heating element, which has been cleaned and brought to desired temperature, between the pipes, take care that it lies in the zone of the throat of the tear-off bar (see point 4.3 ).
- Close slides smoothly to the set adjustment pressure.  
When the prescribed revolving bead height is reached, reduce pressure. For this purpose, move the valve lever to the position „pressure-less“ until the desired heating pressure is built up (heating pressure = approx. 10% of the adjustment pressure).
- The heating 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, remove the heating element as quickly as possible, put it into the protection box and close the slides smoothly. The maximum time frame for this process is predetermined by the value for the change over time taken from the table.
- When the welding pressure is built up, press the stop-watch and keep the control lever for approximately 10s on the 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, remove the welded parts and open the slides.

## 6. Welding Log and Tables



# Table for PE



Foundation: 2207, 2208 DIN 16932 German association for welding

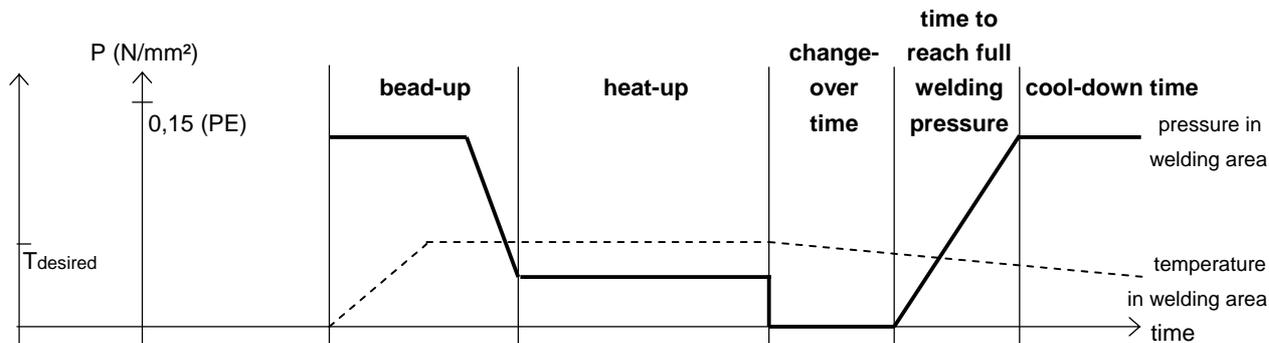
Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

**PE 80** The value for heating element temperature is between 200°C - 220°C.  
 The **smaller** the pipe wall the **higher** the temperature.

**PE 100** The standard value for heating element temperature is 220°C.  
 Increase the change-over time and the welding pressure time at PE 100 as fast as possible !

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min]
<b>75</b>	1,9	41	2	0,5	20	4	4	2	2
	2,3	33	2	0,5	23	4	4	2	2
	2,9	26	2	0,5	29	4	4	2	3
	3,6	21,0	3	0,5	36	5	5	3	5
	4,3	17,6	3	0,5	43	5	5	3	6
	4,5	17	3	1,0	45	5	5	3	6
	5,6	13,6	4	1,0	56	5	5	4	8
	6,8	11	5	1,0	68	6	6	5	10
	8,4	9,0	6	1,5	84	7	7	6	12
10,3	7,4	7	1,5	103	7	7	7	14	
<b>90</b>	2,2	41	2	0,5	22	4	4	2	2
	2,8	33	3	0,5	28	4	4	3	3
	3,5	26	3	0,5	35	5	5	3	4
	4,3	21,0	4	0,5	43	5	5	4	6
	5,1	17,6	4	1,0	51	5	5	4	7
	5,4	17	5	1,0	54	5	5	5	7
	6,7	13,6	6	1,0	67	6	6	6	10
	8,2	11	7	1,5	82	6	6	7	11
	10,1	9,0	8	1,5	101	7	7	8	14
12,3	7,4	9	2,0	123	8	8	9	16	

# Table for PE

Foundation: 2207, 2208 DIN 16932 German association for welding

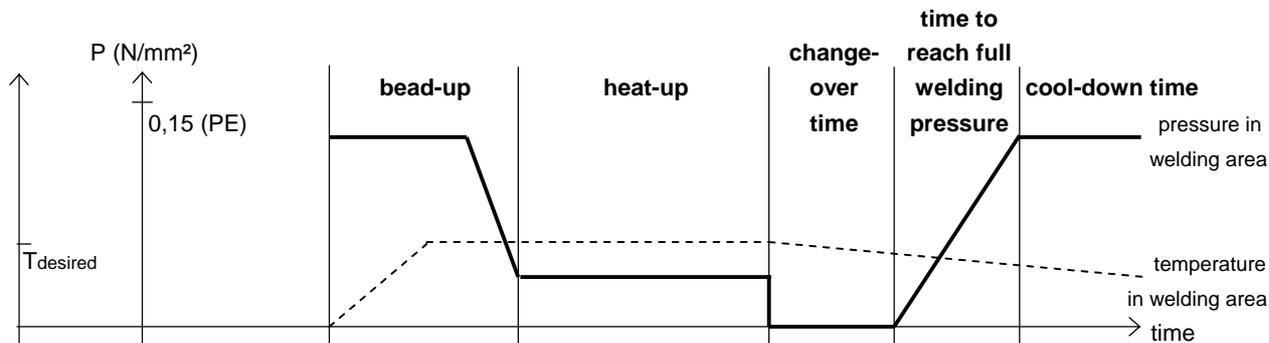
Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

**PE 80** The value for heating element temperature is between 200°C - 220°C.  
 The **smaller** the pipe wall the **higher** the temperature.

**PE 100** The standard value for heating element temperature is 220°C.  
 Increase the change-over time and the welding pressure time at PE 100 as fast as possible !

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min]
<b>110</b>	2,7	41	3	0,5	27	4	4	3	3
	3,4	33	4	0,5	34	5	5	4	4
	4,2	26	5	0,5	42	5	5	5	6
	5,3	21,0	6	1,0	53	5	5	6	7
	6,3	17,6	6	1,0	63	6	6	6	9
	6,6	17	7	1,0	66	6	6	7	9
	7,4	15	5	1,5	74	6	6	5	10
	8,1	13,6	8	1,5	81	6	6	8	11
	10,0	11	10	1,5	100	7	7	10	14
	12,3	9,0	11	2,0	123	8	8	11	16
<b>125</b>	15,1	7,4	13	2,0	151	9	9	13	20
	3,1	41	4	0,5	31	4	4	4	4
	3,9	33	5	0,5	39	5	5	5	5
	4,8	26	6	1,0	48	5	5	6	6
	6,0	21,0	7	1,0	60	6	6	7	8
	7,1	17,6	8	1,5	71	6	6	8	10
	7,4	17	8	1,5	74	6	6	8	10
	9,2	13,6	10	1,5	92	7	7	10	13
	11,4	11	12	1,5	114	8	8	12	15
14,0	9,0	15	2,0	140	9	9	15	18	
17,1	7,4	17	2,0	171	9	10	17	22	

# Table for PE

Foundation: 2207, 2208 DIN 16932 German association for welding

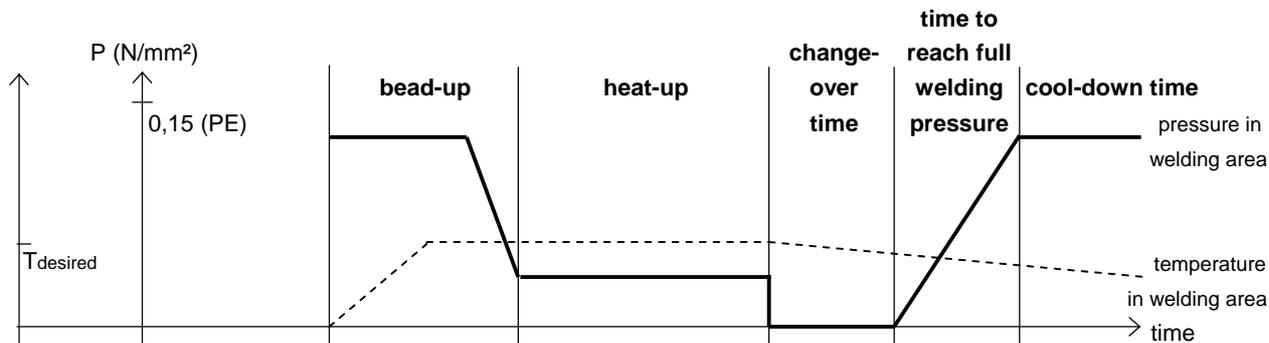
Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

**PE 80** The value for heating element temperature is between 200°C - 220°C.  
 The **smaller** the pipe wall the **higher** the temperature.

**PE 100** The standard value for heating element temperature is 220°C.  
 Increase the change-over time and the welding pressure time at PE 100 as fast as possible !

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min]
<b>140</b>	3,5	41	5	0,5	35	5	5	5	4
	4,3	33	6	0,5	43	5	5	6	6
	5,4	26	7	1,0	54	5	5	7	7
	6,7	21,0	9	1,0	67	6	6	9	10
	8,0	17,6	10	1,5	80	6	6	10	11
	8,3	17	10	1,5	83	7	7	10	12
	10,3	13,6	13	1,5	103	7	7	13	14
	12,7	11	15	2,0	127	8	8	15	17
	15,7	9,0	18	2,0	157	9	10	18	20
19,2	7,4	22	2,5	192	10	11	22	24	
<b>160</b>	4,0	41	6	0,5	40	5	5	6	5
	4,9	33	7	1,0	49	5	5	7	7
	6,2	26	9	1,0	62	6	6	9	9
	7,7	21,0	11	1,5	77	6	6	11	11
	9,1	17,6	13	1,5	91	7	7	13	13
	9,5	17	13	1,5	95	7	7	13	13
	11,8	13,6	16	2,0	118	8	8	16	16
	14,6	11	20	2,0	146	9	9	20	19
	17,9	9,0	24	2,0	179	10	11	24	23
21,9	7,4	28	2,5	219	11	12	28	27	

# Table for PE

Foundation: 2207, 2208 DIN 16932 German association for welding

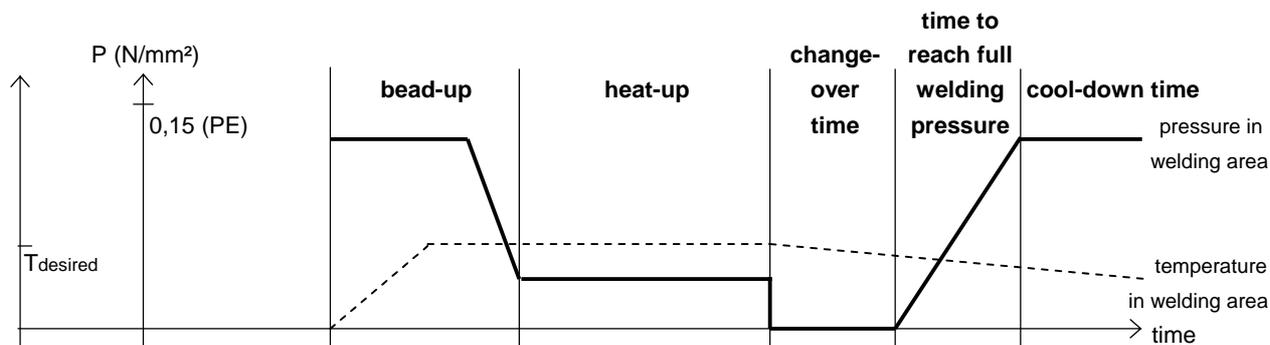
Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

**PE 80** The value for heating element temperature is between 200°C - 220°C.  
 The **smaller** the pipe wall the **higher** the temperature.

**PE 100** The standard value for heating element temperature is 220°C.  
 Increase the change-over time and the welding pressure time at PE 100 as fast as possible !

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min]
<b>180</b>	4,4	41	8	0,5	44	5	5	8	6
	5,5	33	9	1,0	55	5	5	9	8
	6,9	26	11	1,0	69	6	6	11	10
	8,6	21,0	14	1,5	86	7	7	14	12
	10,2	17,6	16	1,5	102	7	7	16	14
	10,7	17	17	1,5	107	7	7	17	14
	13,3	13,6	21	2,0	133	8	9	21	17
	16,4	11	25	2,0	164	9	10	25	21
	20,1	9,0	30	2,5	201	10	11	30	25
24,6	7,4	35	2,5	246	12	13	35	30	
<b>200</b>	4,9	41	9	1,0	49	5	5	9	7
	6,2	33	11	1,0	62	6	6	11	9
	7,7	26	14	1,5	77	6	6	14	11
	9,6	21,0	17	1,5	96	7	7	17	13
	11,4	17,6	20	1,5	114	8	8	20	15
	11,9	17	21	1,5	119	8	8	21	16
	14,7	13,6	25	2,0	147	9	9	25	19
	18,2	11	30	2,0	182	10	11	30	23
	22,4	9,0	37	2,5	224	11	12	37	28
27,4	7,4	43	3,0	274	13	15	43	34	

# Table for PE

Foundation: 2207, 2208 DIN 16932 German association for welding

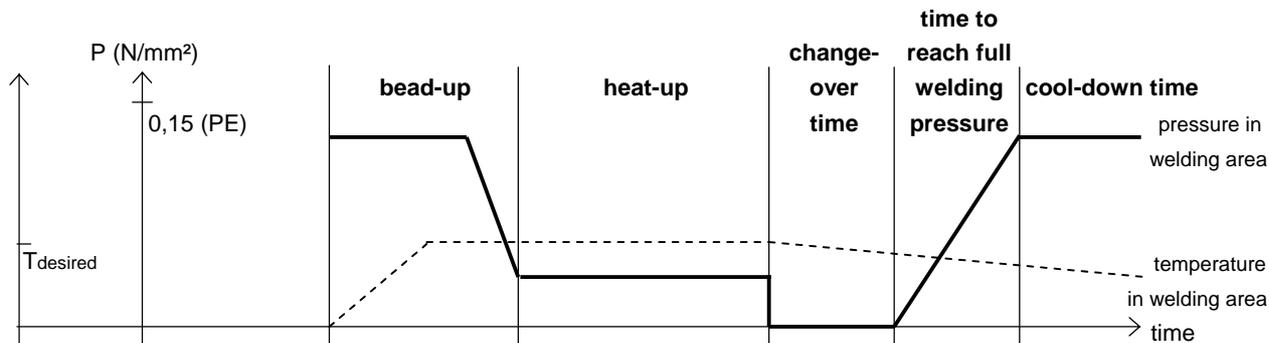
Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

**PE 80** The value for heating element temperature is between 200°C - 220°C.  
 The **smaller** the pipe wall the **higher** the temperature.

**PE 100** The standard value for heating element temperature is 220°C.  
 Increase the change-over time and the welding pressure time at PE 100 as fast as possible !

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min]
<b>225</b>	5,5	41	11	1,0	55	5	5	11	8
	6,9	33	14	1,0	69	6	6	14	10
	8,6	26	17	1,5	86	7	7	17	12
	10,8	21,0	21	1,5	108	8	8	21	15
	12,8	17,6	25	2,0	128	8	8	25	17
	13,4	17	26	2,0	134	8	9	26	18
	16,6	13,6	32	2,0	166	9	10	32	21
	20,5	11	38	2,5	205	10	12	38	26
	25,2	9,0	46	2,5	252	12	14	46	31
30,8	7,4	55	3,0	308	14	16	55	38	
<b>250</b>	6,2	41	14	1,0	62	6	6	14	9
	7,7	33	17	1,5	77	6	6	17	11
	9,6	26	21	1,5	96	7	7	21	13
	11,9	21,0	26	1,5	119	8	8	26	16
	14,2	17,6	31	2,0	142	9	9	31	19
	14,8	17	32	2,0	148	9	9	32	19
	18,4	13,6	39	2,0	184	10	11	39	23
	22,7	11	47	2,5	227	11	13	47	28
	27,9	9,0	57	3,0	279	13	15	57	34
34,2	7,4	67	3,0	342	15	18	67	42	

## Table for PE

Foundation: 2207, 2208 DIN 16932 German association for welding

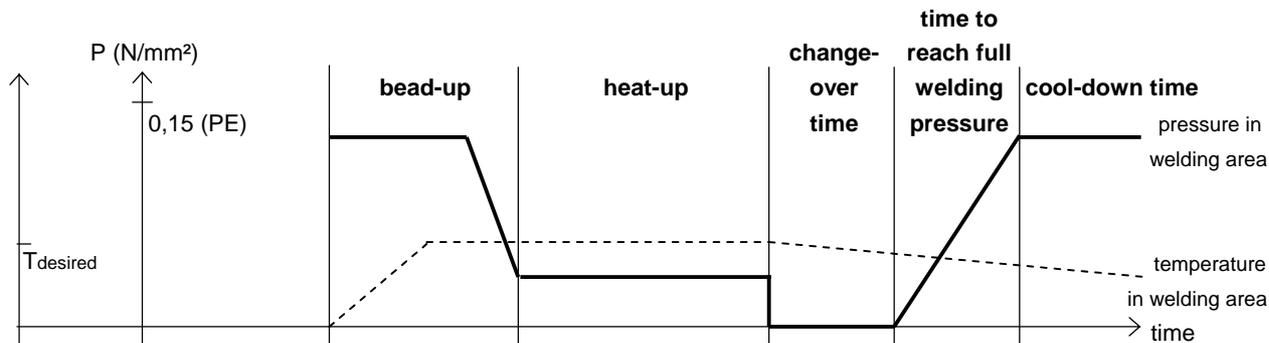
Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

**PE 80** The value for heating element temperature is between 200°C - 220°C.  
 The **smaller** the pipe wall the **higher** the temperature.

**PE 100** The standard value for heating element temperature is 220°C.  
 Increase the change-over time and the welding pressure time at PE 100 as fast as possible !

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min]
<b>280</b>	6,9	41	18	1,0	69	6	6	18	10
	8,6	33	22	1,5	86	7	7	22	12
	10,7	26	27	1,5	107	7	7	27	14
	13,4	21,0	33	2,0	134	8	9	33	18
	15,9	17,6	39	2,0	159	9	10	39	20
	16,6	17	40	2,0	166	9	10	40	21
	20,6	13,6	49	2,5	206	10	12	49	26
	25,4	11	59	2,5	254	12	14	59	31
	31,3	9,0	71	3,0	313	14	16	71	38
	38,3	7,4	84	3,5	383	16	20	84	47
<b>315</b>	7,7	41	22	1,5	77	6	6	22	11
	9,7	33	27	1,5	97	7	7	27	13
	12,1	26	34	2,0	121	8	8	34	16
	15,0	21,0	41	2,0	150	9	9	41	19
	17,9	17,6	49	2,0	179	10	11	49	23
	18,7	17	51	2,0	187	10	11	51	24
	23,2	13,6	62	2,5	232	11	13	62	29
	28,6	11	75	3,0	286	13	15	75	35
	35,2	9,0	90	3,0	352	15	18	90	43
	43,1	7,4	107	3,5	431	18	22	107	52

① Remaining under the cool-down time for up to 50% is allowed under the following conditions:

- prefabrication under workshop conditions
- low additional pressure at unclamping
- no additional pressure during further cooling down
- load onto the workpieces only after being completely cooled down
- Join parts with wall thickness  $\geq 15$  mm

# Table for PP

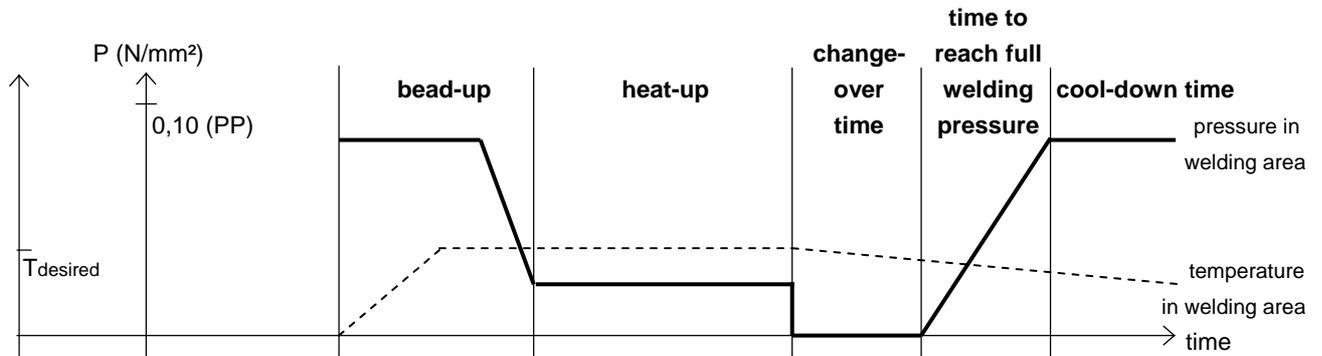
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

The standard value for heating element temperature is 210°C +/- 10°C.  
 The **smaller** the pipe wall the **higher** the temperature.

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min] ①
<b>75</b>	1,9	41	1	0,5	90	4	5	1	2
	2,3	33	2	0,5	95	4	5	2	2
	2,9	26	2	0,5	106	4	5	2	3
	4,3	17,6	2	0,5	131	5	6	2	6
	6,8	11	3	0,5	172	6	7	3	12
	10,3	7,4	5	1,0	221	7	10	5	17
	12,5	6	5	1,0	251	7	11	5	21
<b>90</b>	2,2	41	2	0,5	94	4	5	2	2
	2,8	33	2	0,5	104	4	5	2	3
	3,5	26	2	0,5	117	5	6	2	4
	5,1	17,6	3	0,5	145	5	6	3	7
	8,2	11	5	1,0	192	6	8	5	14
	12,3	7,4	6	1,0	249	7	11	6	20
	15,0	6	7	1,0	281	8	14	7	24
<b>110</b>	2,7	41	2	0,5	103	4	5	2	3
	3,4	33	3	0,5	115	5	6	3	4
	4,2	26	3	0,5	130	5	6	3	6
	6,3	17,6	4	0,5	164	6	7	4	10
	10,0	11	7	1,0	217	7	9	7	17
	15,1	7,4	9	1,0	283	8	14	9	24
	18,3	6	11	1,0	322	9	16	11	29

# Table for PP

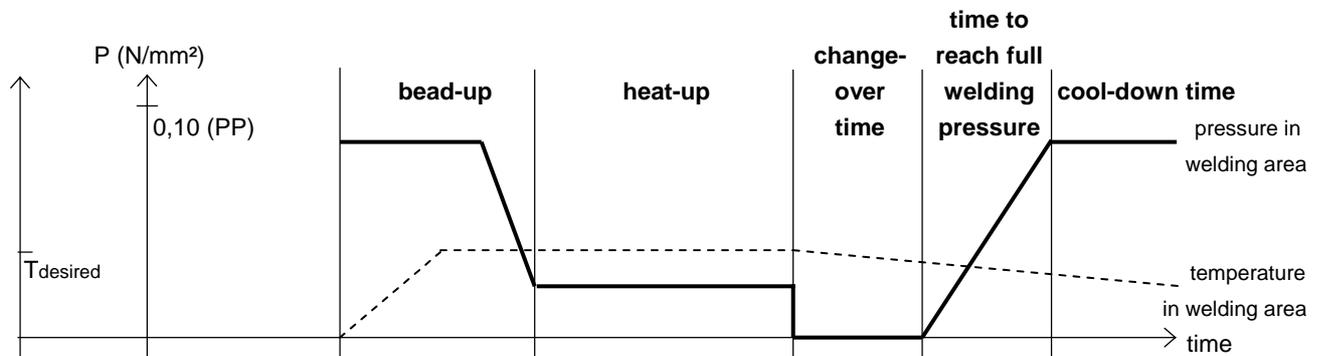
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

The standard value for heating element temperature is 210°C +/- 10°C.  
 The **smaller** the pipe wall the **higher** the temperature.

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min] <sup>①</sup>
<b>125</b>	3,1	41	3	0,5	110	4	5	3	4
	3,9	33	3	0,5	124	5	6	3	5
	4,8	26	4	0,5	140	5	6	4	7
	7,1	17,6	6	1,0	176	6	7	6	12
	11,4	11	8	1,0	237	7	11	8	19
	17,1	7,4	12	1,0	307	8	15	12	27
	20,8	6	14	1,5	348	10	18	14	33
<b>140</b>	3,5	41	3	0,5	117	5	6	3	4
	4,3	33	4	0,5	131	5	6	4	6
	5,4	26	5	0,5	149	5	6	5	8
	8,0	17,6	7	1,0	189	6	8	7	14
	12,7	11	10	1,0	254	7	12	10	21
	19,2	7,4	15	1,5	332	9	17	15	30
	23,3	6	17	1,5	373	10	20	17	36
<b>160</b>	4,0	41	4	0,5	126	5	6	4	5
	4,9	33	5	0,5	141	5	6	5	7
	6,2	26	6	0,5	162	6	7	6	10
	9,1	17,6	9	1,0	204	6	9	9	15
	14,6	11	13	1,0	277	8	13	13	24
	21,9	7,4	19	1,5	359	10	19	19	34
	26,6	6	22	2,0	405	11	23	22	41

# Table for PP

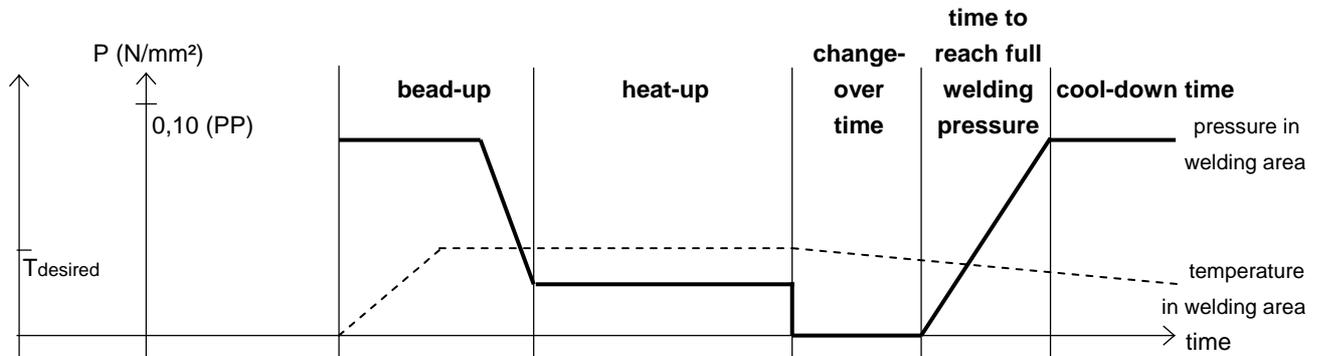
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

The standard value for heating element temperature is 210°C +/- 10°C.  
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Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min] <sup>①</sup>
<b>180</b>	4,4	41	5	0,5	133	5	6	5	6
	5,5	33	6	0,5	151	5	6	6	8
	6,9	26	8	0,5	173	6	7	8	12
	10,2	17,6	11	1,0	220	7	10	11	17
	16,4	11	17	1,0	298	8	15	17	26
	24,6	7,4	24	1,5	386	11	21	24	38
	29,0	6	27	2,0	423	12	25	27	44
<b>200</b>	4,9	41	6	0,5	141	5	6	6	7
	6,2	33	8	0,5	162	6	7	8	10
	7,7	26	9	1,0	185	6	8	9	13
	11,4	17,6	13	1,0	237	7	11	13	19
	18,2	11	20	1,0	320	9	16	20	29
	27,4	7,4	29	2,0	411	11	23	29	42
	33,2	6	34	2,0	456	13	29	34	50
<b>225</b>	5,5	41	8	0,5	151	5	6	8	8
	6,9	33	10	0,5	173	6	7	10	12
	8,6	26	12	1,0	197	6	8	12	15
	12,8	17,6	17	1,0	255	7	12	17	21
	20,5	11	26	1,5	345	9	18	26	32
	30,8	7,4	37	2,0	437	12	26	37	47
	37,4	6	43	2,5	487	14	32	43	55
<b>250</b>	6,2	41	10	0,5	162	6	7	10	10
	7,7	33	12	1,0	185	6	8	12	13
	9,6	26	14	1,0	211	7	9	14	16
	14,2	17,6	21	1,0	272	8	13	21	23
	22,7	11	32	1,5	367	10	20	32	35
	34,2	7,4	45	2,0	463	13	29	45	51

# Table for PP

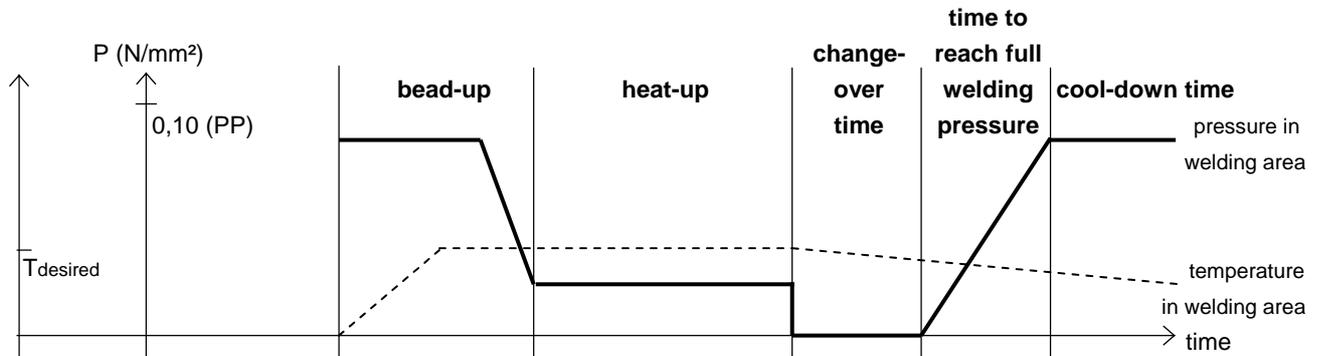
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

The standard value for heating element temperature is 210°C +/- 10°C.  
 The **smaller** the pipe wall the **higher** the temperature.

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min] <sup>①</sup>
<b>280</b>	6,9	41	12	0,5	173	6	7	12	12
	8,6	33	15	1,0	197	6	8	15	15
	10,7	26	18	1,0	227	7	10	18	18
	15,9	17,6	26	1,0	292	8	14	26	26
	25,4	11	40	1,5	394	11	22	40	39
	38,3	7,4	56	2,5	493	14	33	56	57
<b>315</b>	7,7	41	15	1,0	185	6	8	15	13
	9,7	33	18	1,0	213	7	9	18	16
	12,1	26	23	1,0	246	7	11	23	20
	17,9	17,6	33	1,0	317	9	16	33	28
	28,6	11	50	2,0	420	12	24	50	44

**①** Remaining under the cool-down time for up to 50% is allowed under the following conditions:

- prefabrication under workshop conditions
- low additional pressure at unclamping
- no additional pressure during further cooling down
- load onto the workpieces only after being completely cooled down
- Join parts with wall thickness ≥15 mm

# Table for PVDF

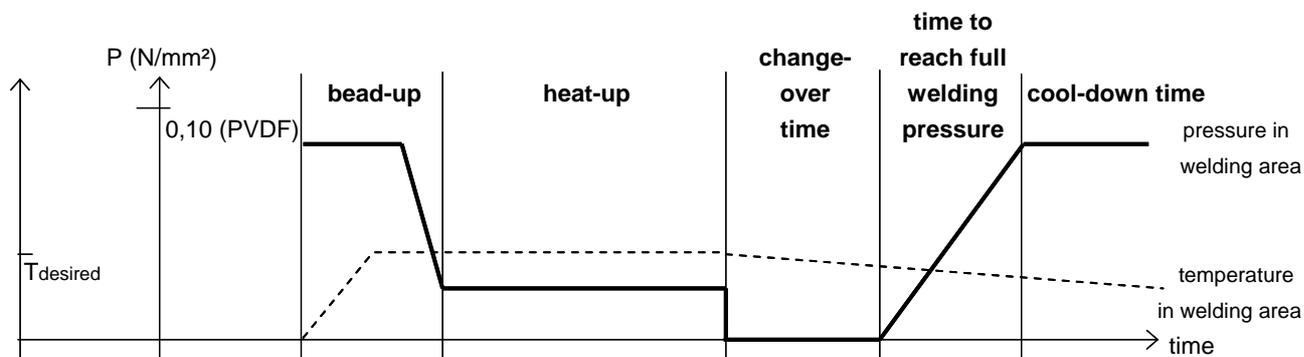
Foundation: 2208, 2207 Part 15 German association for welding

Use for: **4600 / 4502** OD 75 - 250  
**4800 / 4702 / 12"** OD 90 - 315

1 bar on manometer: **52 N**

The standard value for heating element temperature is 240°C +/- 8°C.  
 The **smaller** the pipe wall the **higher** the temperature.

Additional to the given bead-up force and to the welding force the moving force of the support must be added !



pipe diameter OD [mm]	pipe wall (s) [mm]	bead-up pressure [bar]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding pressure [bar]	cool-down time [min]
<b>75</b>	2,3	2	0,5	63	3	3	2	5,0
	3,6	2	0,5	76	3	4	2	6,5
	4,5	2	0,5	85	3	5	2	7,5
<b>90</b>	2,8	2	0,5	68	3	4	2	5,5
	4,3	3	0,5	83	3	4	3	7,0
	5,4	3	0,5	94	3	5	3	8,5
<b>110</b>	3,4	3	0,5	74	3	4	3	6,0
	5,3	4	0,5	93	3	5	4	8,5
	6,6	5	0,6	106	4	5	5	10,0
<b>125</b>	3,9	3	0,5	79	3	4	3	6,5
	6,0	5	0,6	100	4	5	5	9,0
<b>140</b>	4,3	4	0,5	83	3	4	4	7,0
	6,7	6	0,6	107	4	6	6	10,0
<b>160</b>	4,9	5	0,5	89	3	5	5	8,0
	7,7	8	0,7	117	4	6	8	11,0
<b>180</b>	5,5	6	0,5	95	4	5	6	8,5
	8,6	9	0,8	126	4	6	9	12,5
<b>200</b>	6,2	8	0,6	102	4	5	8	9,5
	9,6	12	1,0	136	4	7	12	13,5
<b>225</b>	6,9	10	0,7	109	4	6	10	10,5
	10,8	14	1,0	148	4	7	14	15,0
<b>250</b>	7,7	12	0,7	117	4	6	12	11,0
	11,9	18	1,1	159	4	8	18	16,5
<b>280</b>	8,6	15	0,8	126	4	6	15	12,5
<b>315</b>	9,7	18	1,0	137	4	7	18	13,5

## 7. Maintenance and Repair

### Goal of the chapter is:

- Keeping the nominal state and the operation capacity of the machine.
- Increasing the efficiency by avoiding non-planned outage.
- Efficient planning of the maintenance works and the maintenance tools.

### 7.1. Clamping Elements

- For a long service life clean and grease regularly the threaded spindles and the joint parts which are used for clamping the pipes.

### 7.2. Planer

- Check the stress of the drive chain in the planer and grease it regularly. Dismount the cover for that purpose.
- Do not lay the planer on its blades.
- Check the blades of the planer for sharpness, turn them if necessary (grinded on both sides, max. thickness of the cuttings: 0.2 mm !).
- Check the function of the safety micro switch.

### 7.3. Storage

- The cylindrical waves of the basic machine are to be kept free from dirtiness and need to be covered with a thin oil film if they are not being used.
- Store dry.

### 7.4. Used Hydraulic Oil

Only use **HLPD 32**.

Features: protection against corrosion, resistance to ageing, abrasion-reducing additives, high carrying capacity and particulary water retending.

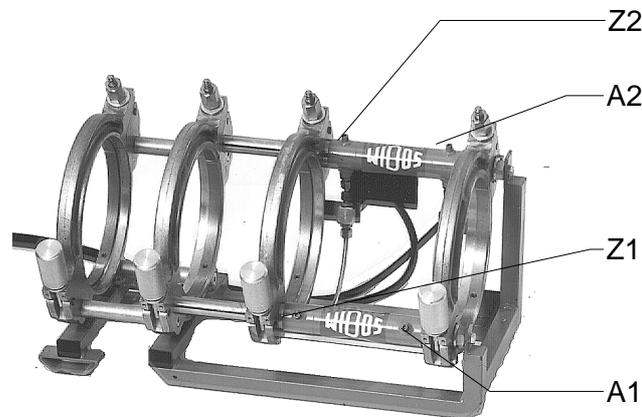


The hydraulic oil has to be disposed of properly.

### 7.5. Checking the Hydraulic Oil-Level

- Remove the red screw at the top of the aggregate.
- Take out the oil dipstick, clean it and insert it again.
- The oil-level must be between the two marks.

## 7.6. Venting the Hydraulic Cylinders



- Venting the hydraulic cylinder is not required, if
  - the hoses have been disconnected from the quick-action couplings at the control unit because the remaining oil in the hose is being kept by valves and for this reason no air can enter.
- The hydraulic cylinder **must be vented** if
  - there has been too less oil in the tank and air has been attracted.
  - there were leaky spots at the hoses or in the connections.
  - the hoses were unscrewed from the basic machine.
- Eliminate the cause of the air entrance.
- Open the machine completely.
- First unscrew the lower „vent screw (Z1) for closing“ (lefthand side).
- Connect the transparent venting hose and insert it in the collecting vessel of the aggregate.
- Close until there is no more air visible in the venting hose, then tighten again the vent screw.
- Close the machine completely.
- Unscrew the lower „vent screw (A1) for opening“ (righthand side).
- Connect the transparent venting hose and insert it in the collecting vessel of the aggregate.
- Open until there is no more air visible in the venting hose, then tighten again the vent screw.
- When the venting process at the lower vent screws is completed, repeat the process at the upper „vent screw (Z2) for closing“ (lefthand side), as well as at the upper „vent screw (A2) for opening“ (righthand side).



The lower vent screws always have to be vented at first because there is a direct connection between the upper and the lower cylinders.

If air remains in the lower cylinder, it will ascend in the upper cylinder when pressure is applied.

## 8. Transport

The machine can be transported in two transport boxes or in one packing box. One transport box contains the basic machine, the aggregate and the reception box with planer and heating element, the other box contains the reduction inserts.

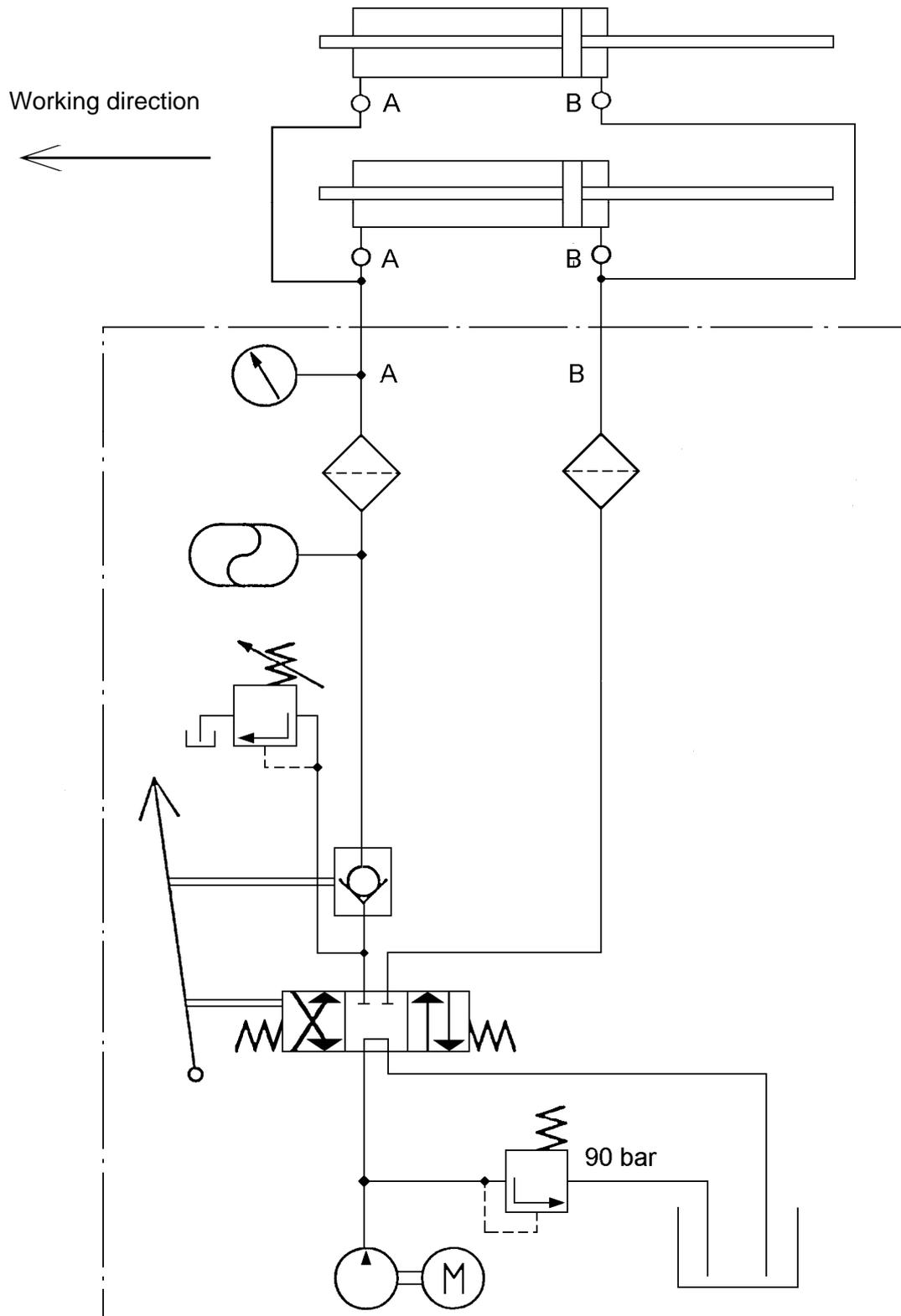
- In each box holders are included which are suitable for each single component in order to avoid slipping
- Put the components into the box in such a way that they are fitting in the holders.
- The hydraulic hoses at the basic machine should not be unscrewed (air penetration).
- Make sure that they are not squeezed.
- Handle the machine carefully.
- Do not tilt the aggregate too much. Otherwise there is the danger that oil may come out.
- Protect from heavy shocks and impacts.
- Make sure that the box cover is closed correctly.
- During the construction of the transport box a stress was put on a light-weight construction.
- Take much care when using automatic handling and carrying machines.



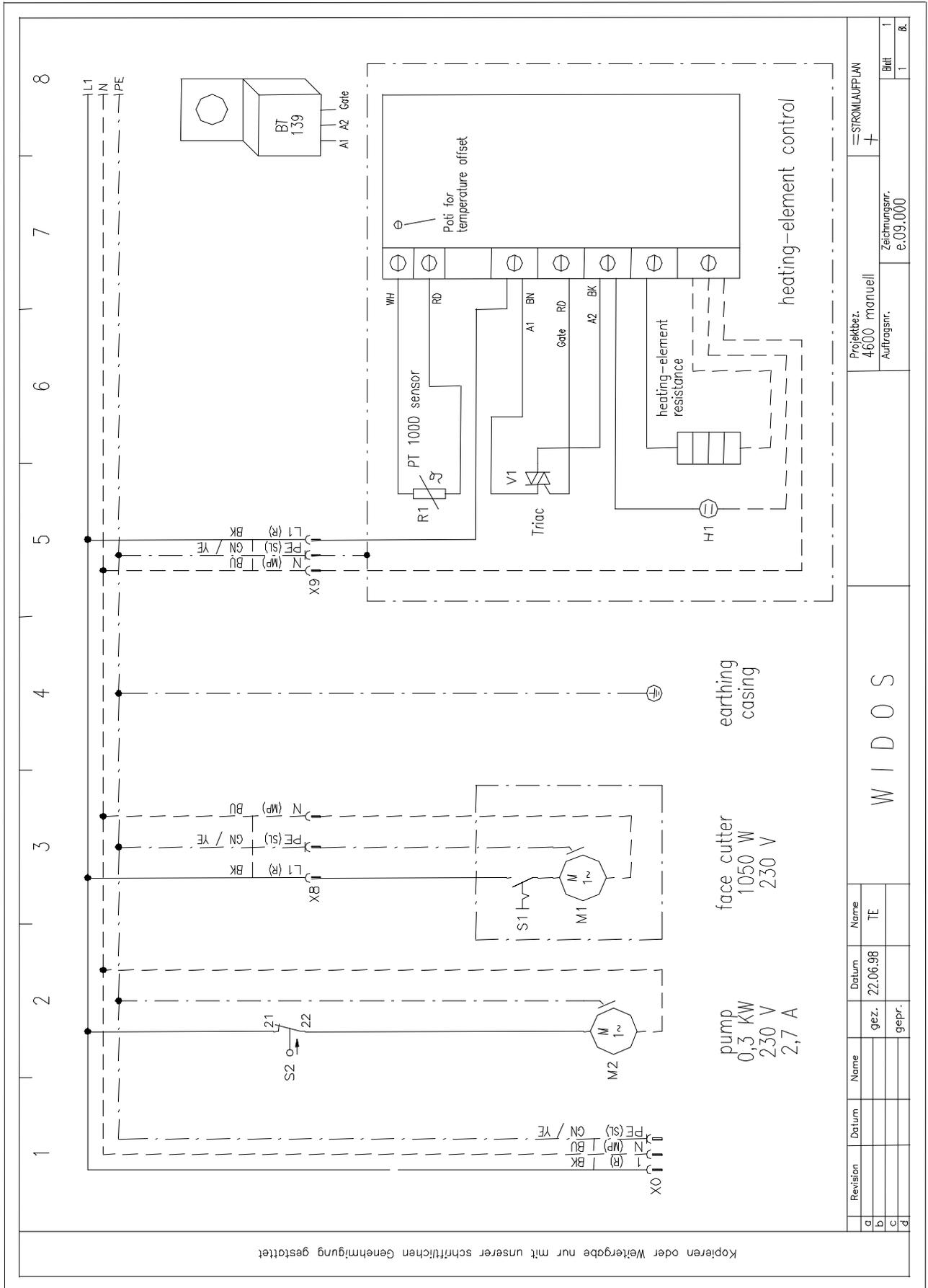
During the transport of the machine there may be cold weldings between the piston rod and the eyes of the planer housing. These spots on the piston rod may damage the sealing.

- Therefore the eyes must be lubricated with PTFE-spray before each transport!

## 9. Hydraulic and Electric Diagrams



Hydraulic diagram 4600



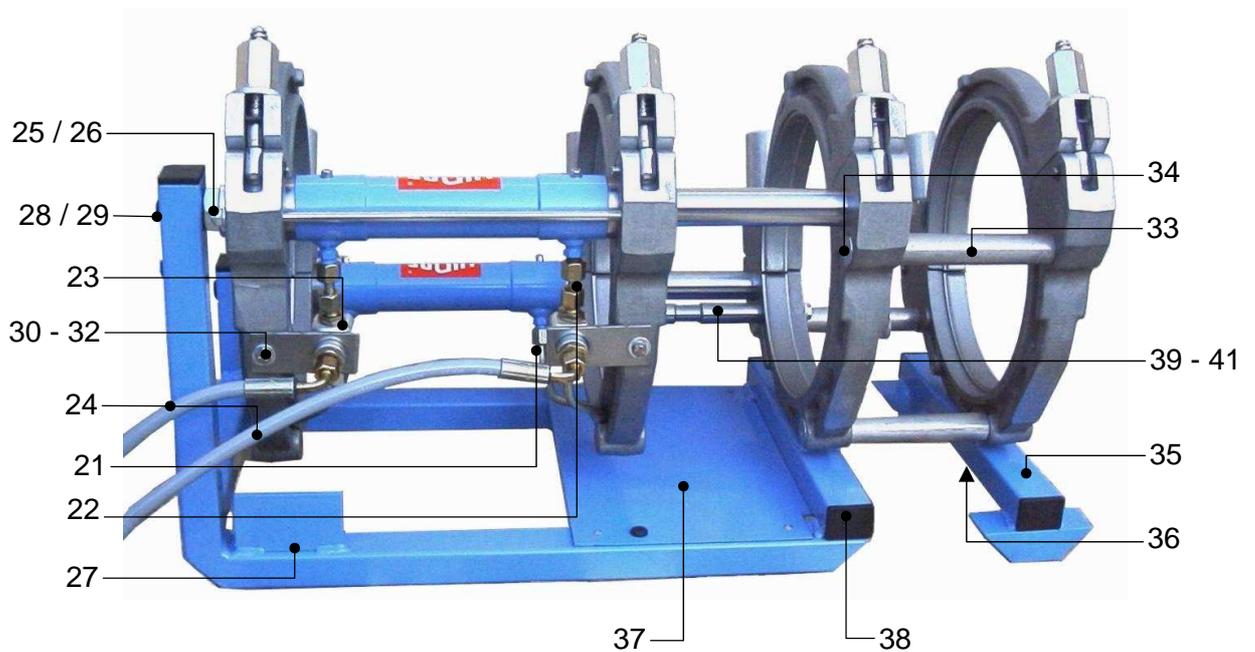
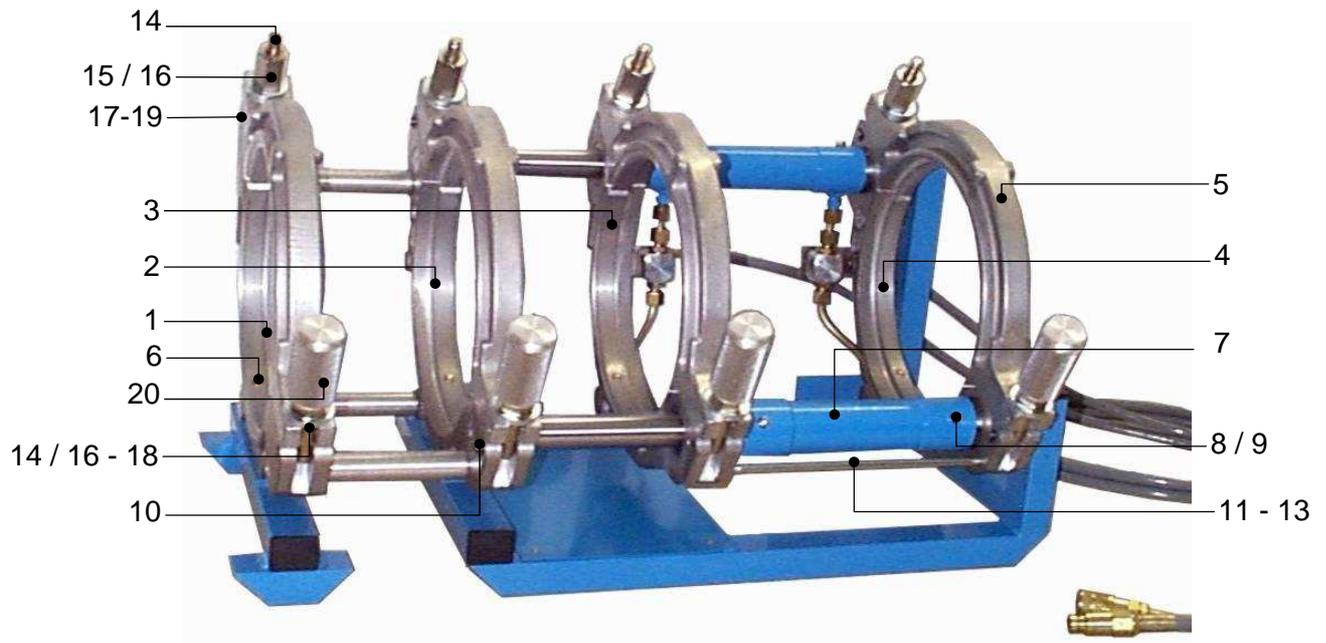
Revision	Datum	Name	Datum	Name
a			22.06.98	TE
b			gez.	
c			gepr.	
d				

W I D O S	
Projektbez. 4600 manuell	Zeichnungsnr. e.09.000
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## 10. Spare Parts List

### 10.1. Basic Machine



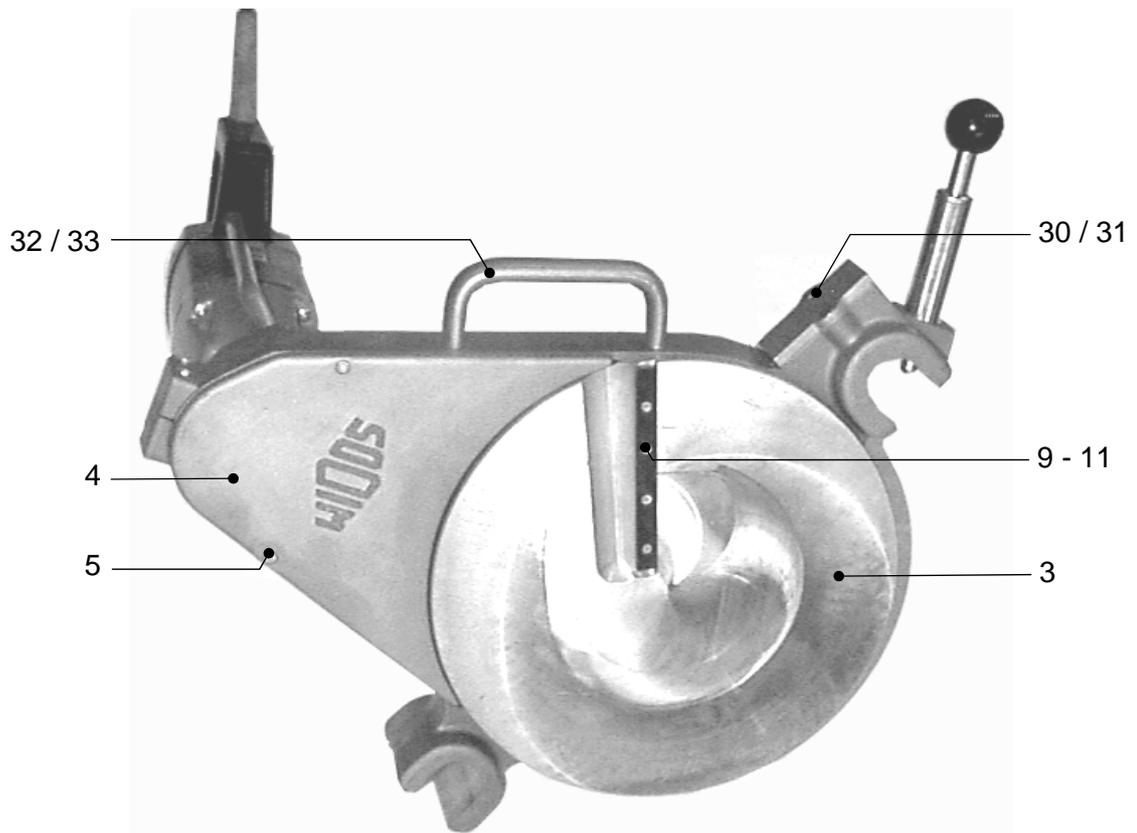
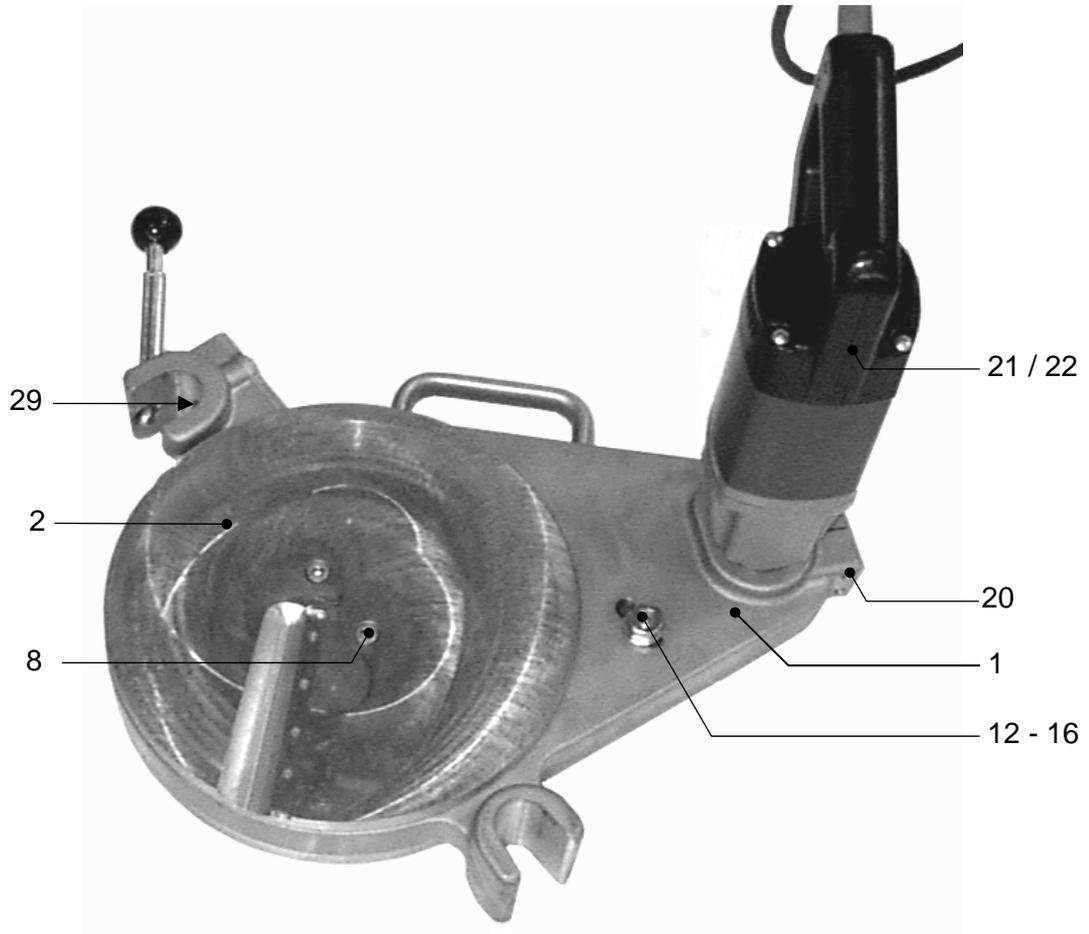
## Basic Machine WIDOS 4600

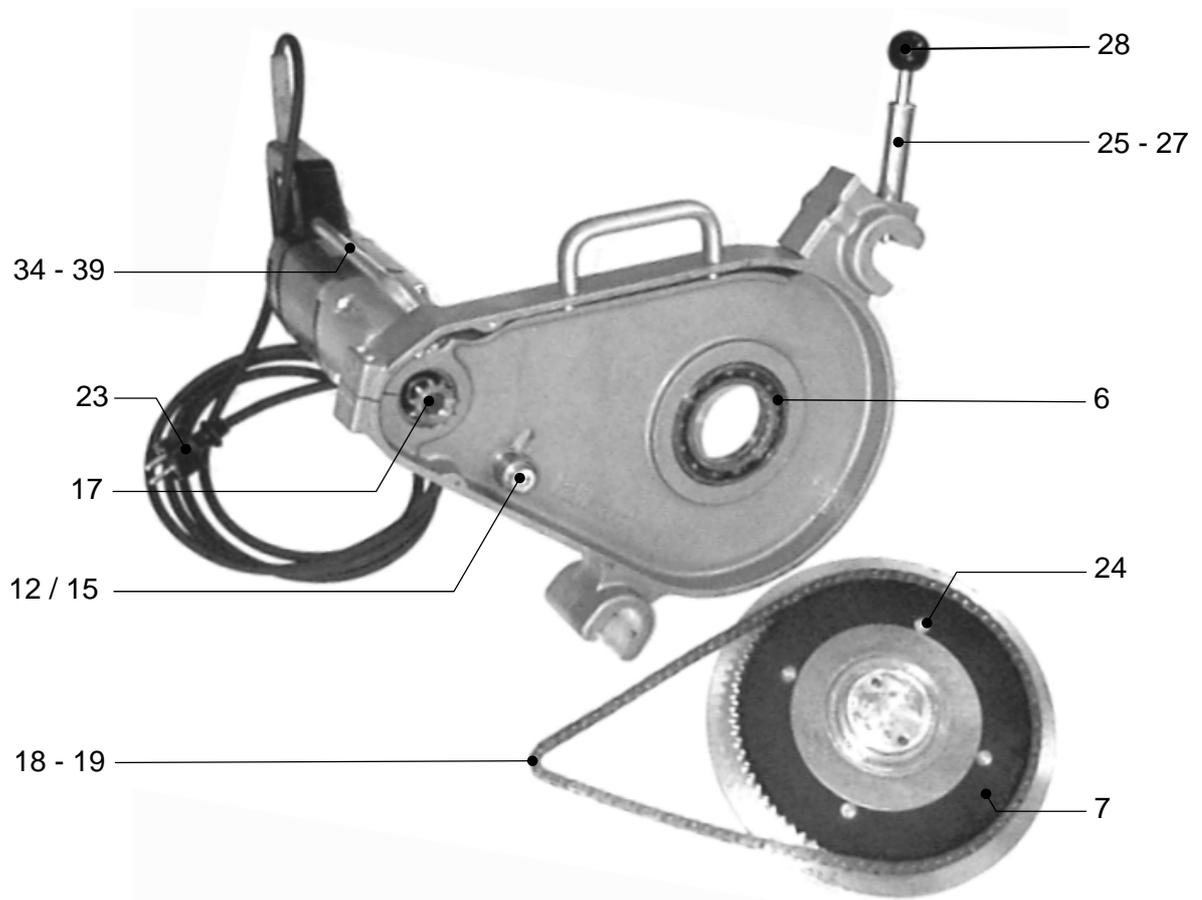
Pos.	Name	Piece	Order no.
1	Outer clamp shell, fixed	1	091101
2	Inner clamp shell, fixed	1	091102
3	Inner clamp shell, moveable	1	091103
4	Outer clamp shell, moveable	1	091104
5	Upper clamp shell	4	091105
6	Thread insert M 6	8	GEW-M6
7	Hydraulic cylinder	2	091106
	- Gasket for cylinder	2 set	D092106
8	Pan-head screw M 5x8 DIN 912	4	0912E008
9	Copper ring M5	4	on request
10	Flat-head screw M 12x20 DIN 7991	2	7991L020
11	Tension rod	2	091107
12	Hexagon nut M 8 DIN 985 self-locking	2	0985H
13	Washer M 8 DIN 125	2	0125H
14	Threaded spindle	8	091108
15	Nut	4	091109
16	Thrust washer M 14 DIN 6340	8	6340N
17	Rivet	8	091111
18	Lock washer size 7 DIN 6799	8	6799G
19	Spiral pin 4x40 DIN 7343	4	7343D040
20	Knurled nut	4	092109
21	Hydraulic hose (320 mm)	2	091112
22	Hydraulic hose (40 mm)	2	V094012
23	Filter	2	V092114
24	Hose bunch	1	VSCHL4600
25	End bolt	2	091117
26	Thrust washer	2	091133
27	Basic frame	1	091118
28	Pan-head screw M 10x20 DIN 912	2	0912J020
29	Washer M 10 DIN 125	2	0125J
30	Holder for filter	2	092120
31	Washer M6 DIN 9021	2	9021F
32	Hexagon-head screw M 6x20 DIN 933	2	0933F020
33	Shaft	3	091131
34	Flat-head screw M 12x30 DIN 7991	6	7991L030
35	Support	1	091141
36	Pan-head screw M 8x20 DIN 912	3	0912H020
--	Reducer inserts Ø75...225	1 set	0908...*
--	Reducer inserts large Ø75...225	1 set	0918...*
--	Reducer inserts extra large Ø75...25	1 set	0928...*
--	Pan-head screw for reduction inserts to Ø200	8	0912F25X
--	Flat screw for reduction inserts Ø225	8	7991F20X
37	Floor plate * 4 rivets	1 set	0911182?

**Basic Machine WIDOS 4600**

Pos.	Name	Piece	Order no.
38	Protective cap	6	J0203
39	Tear off bar for heating element	1	91503
40	Washer M 8 DIN 6340	2	6340H
41	Hexagon-head screw M 8x12 DIN 933	2	0933H012
--	Type plate	1	SCHT4600
--	Hydraulic fluid	2 l	HLPD35
--	Socket spanner SW 27	1	ZRS27
--	Plate "pressure values"	1	SCHM4600
	* When ordering necessarily give the dimensions !		

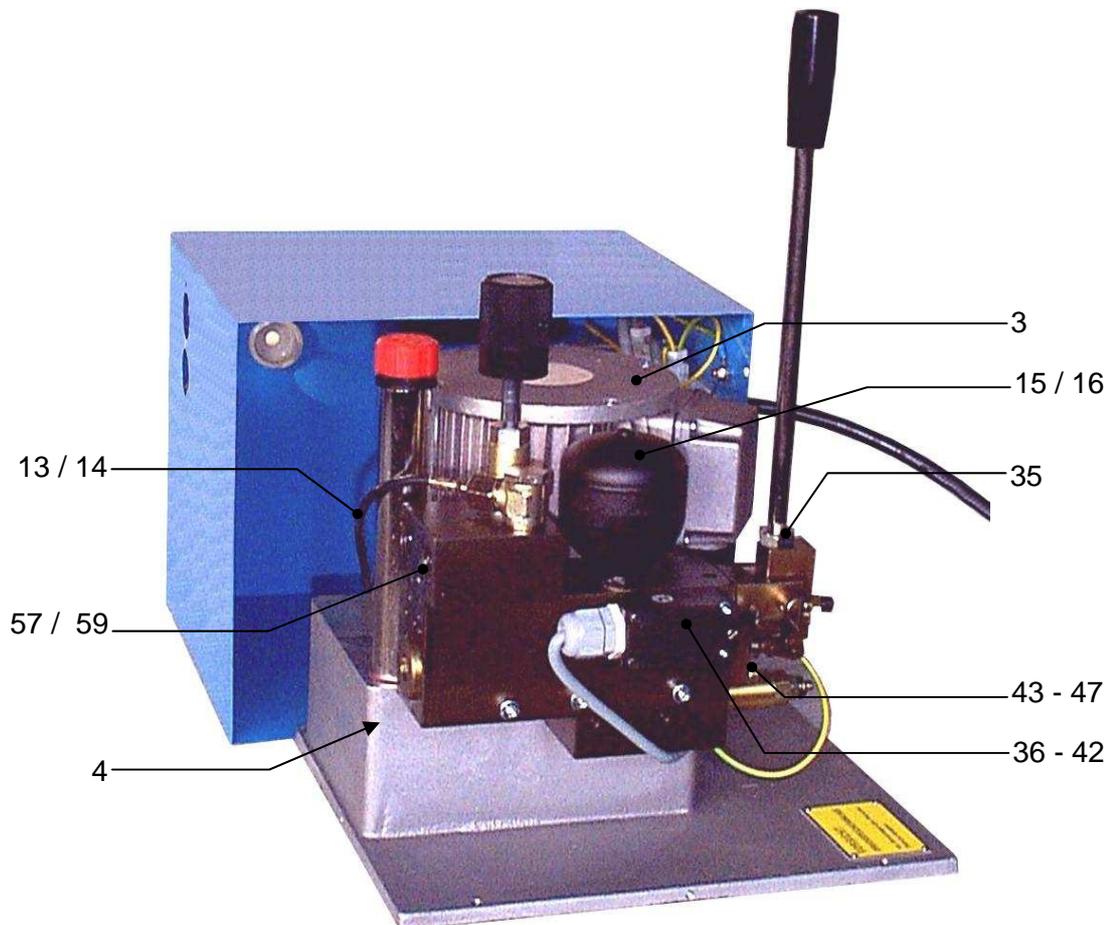
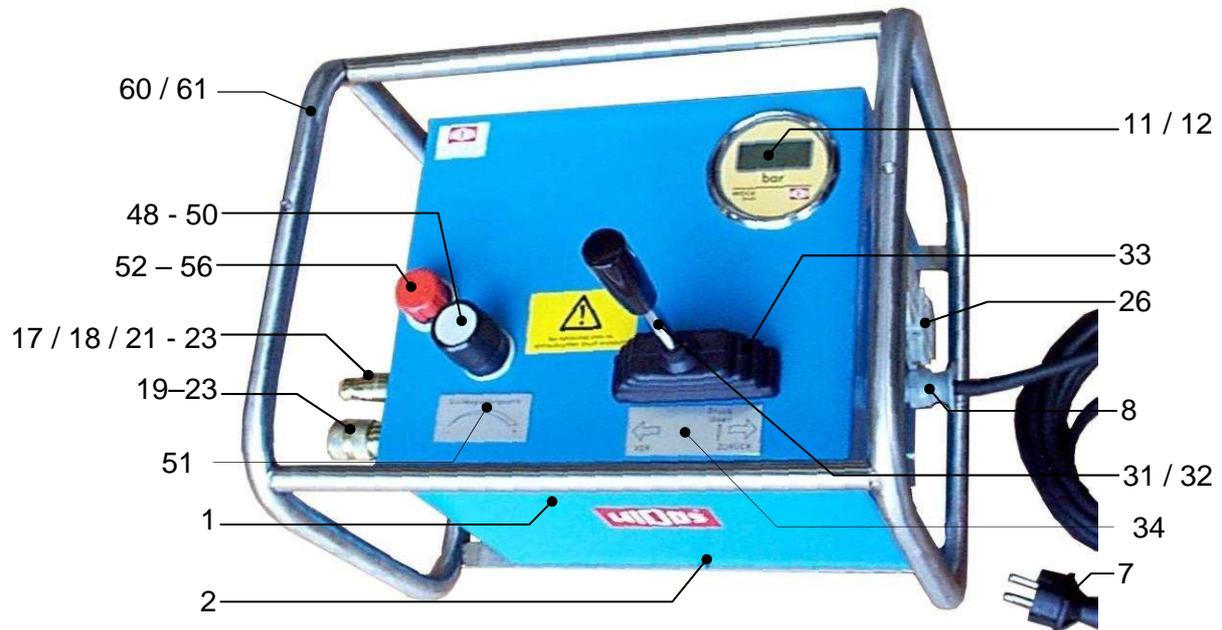
10.2. Planer

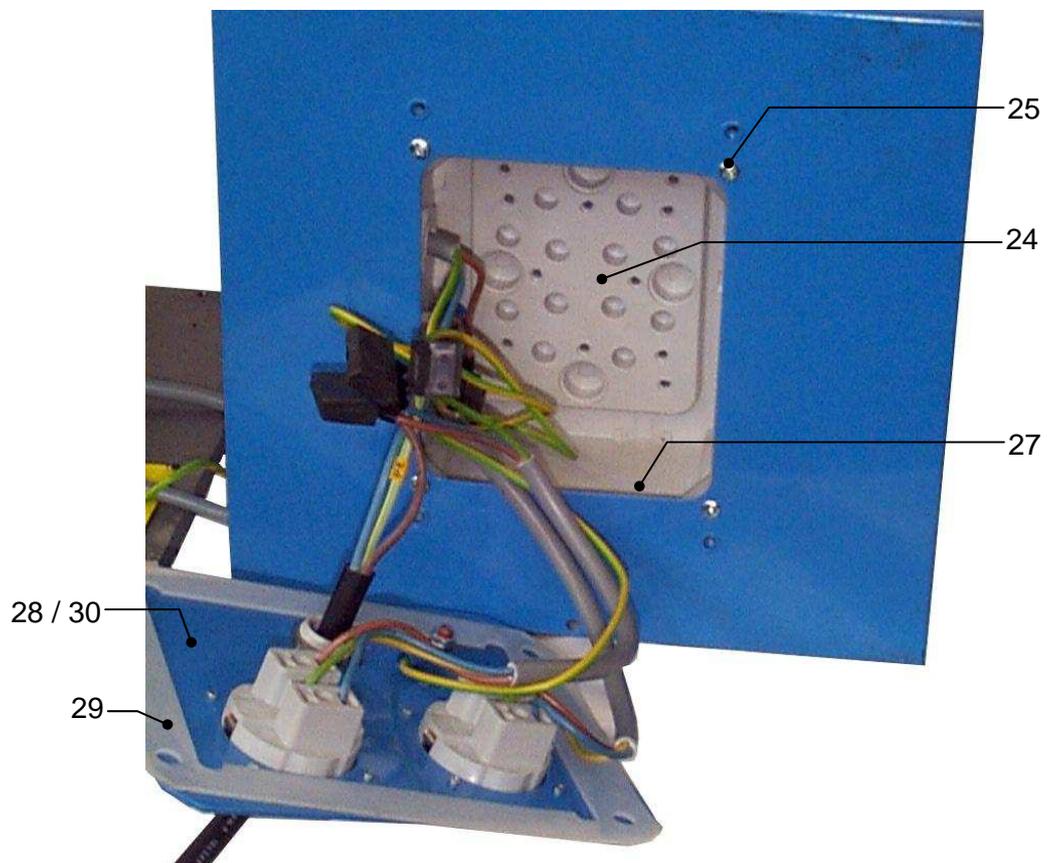
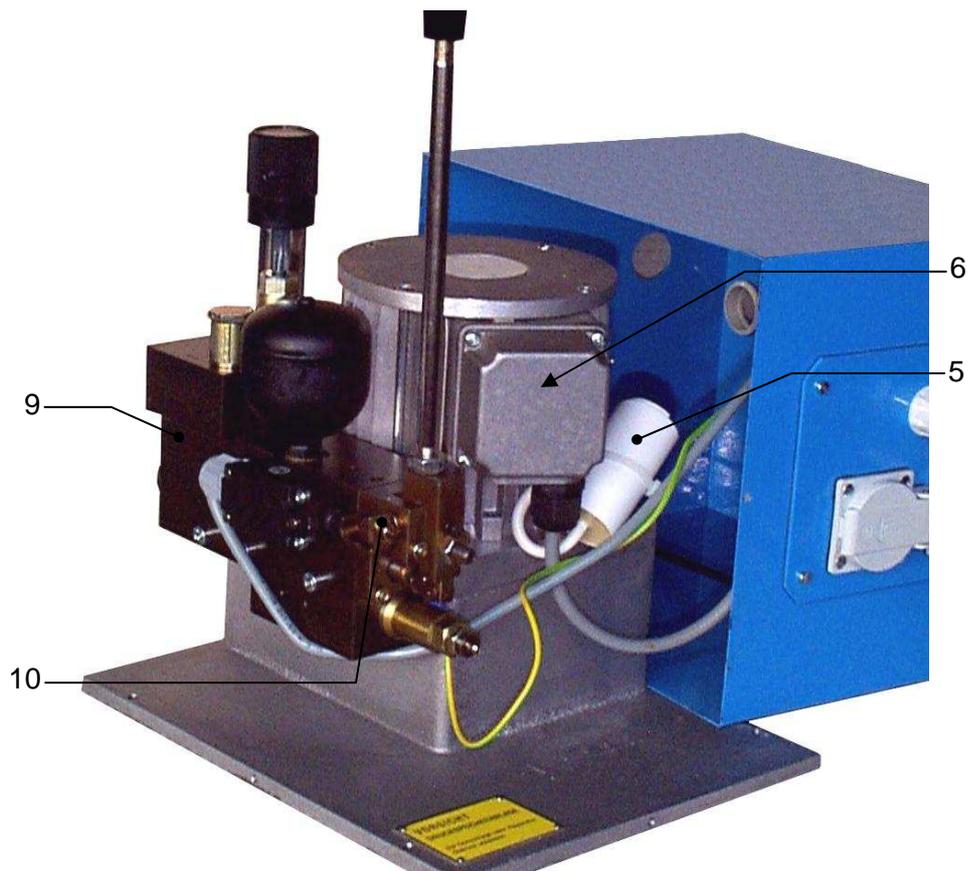




Planer WIDOS 4600			
Pos.	Name	Piece	Order no.
1	Fastener for planer	1	091401
2	Planer disk, right-hand	1	091402
3	Planer disk, left-hand	1	091403
4	Cover	1	091404
5	Pan-head screw M 4x12 DIN 912	2	0912D012
6	Ball bearing	1	L6013
7	Chain wheel, large	1	K38076
8	Pan-head screw M 8x30 DIN 912	2	0912H030
9	Knife	2	MES120
10	Flat-head screw M 3x8 DIN 965	8	0965C008
11	Bolster	2	MU120
12	Bolt for chain tightener	1	0914101
13	Ball bearing	2	L6001Z
14	Washer M 12 DIN 125	3	0125L
15	Washer M 12 DIN 134	1	0134L
16	Hexagon nut M 12 DIN 934	1	0934L
17	Chain wheel , small	1	K38011
18	Chain 3/8" 99 links	1	K38099
19	Chain joint	1	KSCH38
20	Pan-head screw M 8x30 DIN 912	2	0912H030
21	Driving motor 1050 W, 230 V	1	AMBF16
22	Switch for motor	1	ESMBF16
	Collector carbon	1 set	EKMBF16
23	Connecting cable	1	EK3220
24	Flat-head screw M 6x16 DIN 7991	4	7991F016
25	Lock bolt	1	091422
26	Grooved taper pin 4x16 DIN 1471	1	1471D016
27	Compression spring	1	FE006
28	Ball button C 32 M 8 DIN 319	1	0319-C32
29	Limit key button, complete	1	ES0102
30	Cover for planer switch	1	091420
31	Flat-head screw M 5x10 DIN 7991	2	7991E010
32	Bow grip	1	BG56520
33	Pan-head screw M 6x16 DIN 912	2	0912F016
34	Protective pipe	1	091405
35	Earth line 1x1,5 mm <sup>2</sup>	1	EL3015GG
36	Grub screw M 5x6 DIN 916	1	0916F006
37	Ring cable lug M 4	1	EA05425
38	Tooth lock washer A 4,3 DIN 6797	1	6797D
39	Pan-head screw M 4x6 DIN 84	1	0084D006

### 10.3. Hydraulic Aggregate





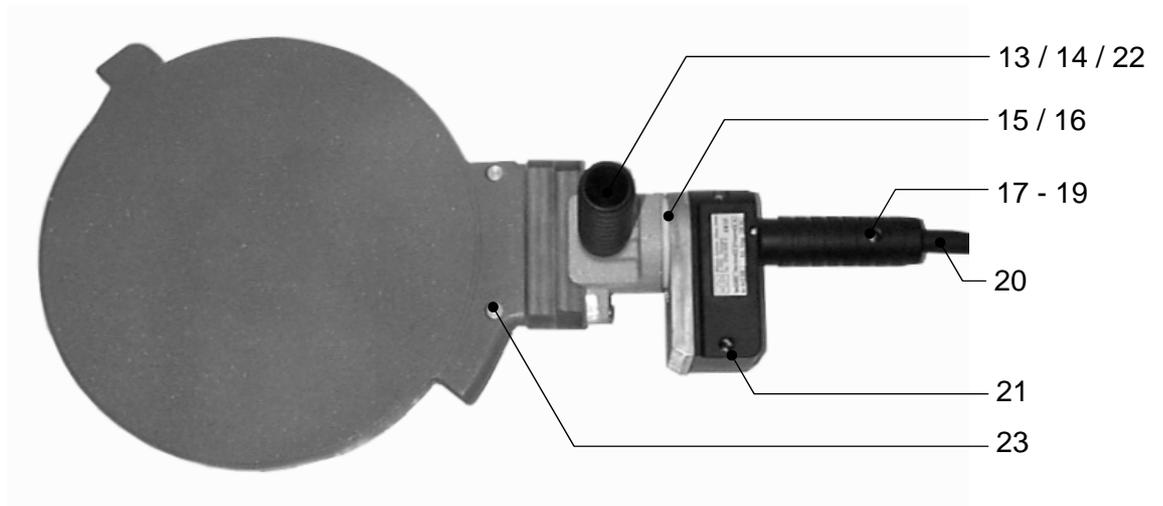
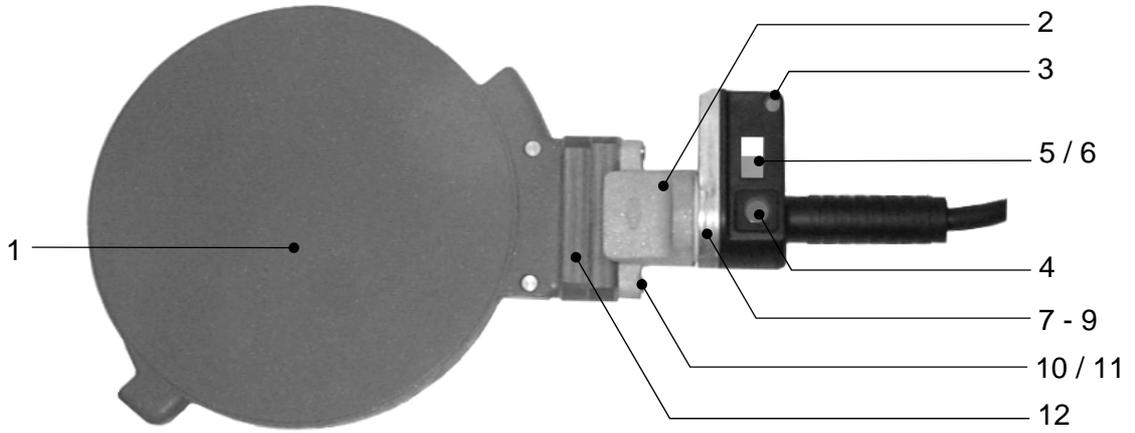
### Hydraulic Aggregate WIDOS 4600

Pos.	Name	Piece	Order no.
1	Cover	1	1010021
2	Pan-head screw M4x12 DIN 912	4	0912D012
3	Motor	1	on request
4	Pump 1.9 l	1	102103
5	Capacitor 12,5 µF	1	EK12220
6	Universal RC - link	1	EE0104
7	Connection cable with plug	1	EK32220
8	Screwed connection PG 13.5	1	EV0113
9	Valve	1	on request
10	Pan-head screw M6x45 DIN 912	4	0912F045
11	Pressure gauge, digital	1	101004D
11.1	Pressure gauge, analog	1	1006230
12	Screwed connection of pressure gauge	1	V042314
13	Mini hose	1	on request
14	Hose screwing	1	101008
15	Accumulator	1	101006
16	Ring for sealing 16x22.7x1.5	1	D16x22,7
17	Coupling box, flat packing	1	VMU14
18	Synthetic cap for VMU14	1	VKM14
19	Coupling plug, flat packing	1	VST14
20	Synthetic cap for VMST14	1	VKS14
21	Ring for sealing 16x22.7x1.5	2	D16x22,7
22	Screwed connection	2	V101024
23	O-ring 19x1,5	2	D19x1,5
24	Distributor box	1	on request
25	Pan-head screw M4x10 DIN 912	2	0912D010
26	Socket	2	EST0701
27	Seal, inside	1	1010024
28	Side part	1	1010022
29	Seal, outside	1	1010023
30	Pan-head tapping screw 3.5 x 20	4	7971C020
31	Valve lever	1	101013
32	Cylinder knob M10	1	101033
33	Bellows	1	101035
34	Plate "Release pressure"	1	SCHD-L
35	Hexagon nut M10 DIN 934	1	0934J
36	Pressure switch	1	ESEK 103
37	Pan-head screw M4x25 DIN 84	2	0084D025
38	Angle for pressure switch	1	on request
39	Washer M4 DIN 125	1	0125D
40	Pan-head screw M 4x10 DIN 912	1	0912D010
41	Set screw M5x10 DIN 915	1	0915E010
42	Bolt	1	101038
43	Adjusting screw	1	101036
44	Hexagon nut M6 DIN 934	3	0934F

**Hydraulic Aggregate WIDOS 4600**

Pos.	Name	Piece	Order no.
45	Plug-in element P83-1/2"x3/16"	1	101043
46	Bearing block	1	on request
47	Pan-head screw M5x45 DIN 912	2	0912E045
48	Control knob for pressure setting	1	101022
49	Bush	1	101047
50	Set screw	1	101050
52	Oil dipstick	1	101021
53	Hydraulic oil	1 l	HLPD35
54	Filler neck	1	101026
55	Copper ring 14x18x1.5 DIN 7603	1	D14x18
56	Cable bushing Kt21	2	EKT21
57	Leading-in for tubes size 22	2	EKT22
58	Sinter-filter 15x8 41180	2	101045
59	O-ring 16x2	2	D16x2
60	Protective mounting	1	101042
61	Pan-head screw M6x16 DIN 912	4	0912F016

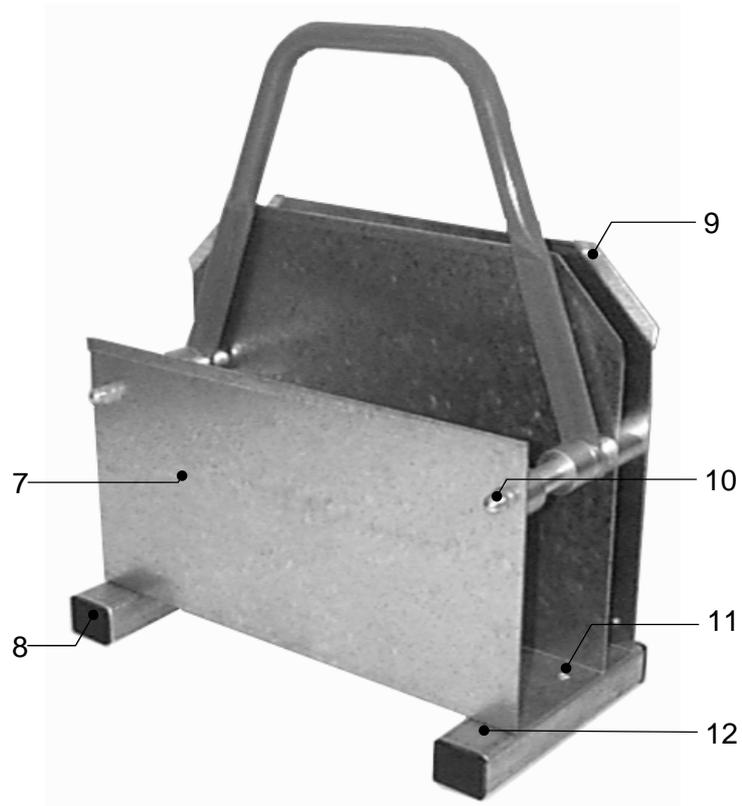
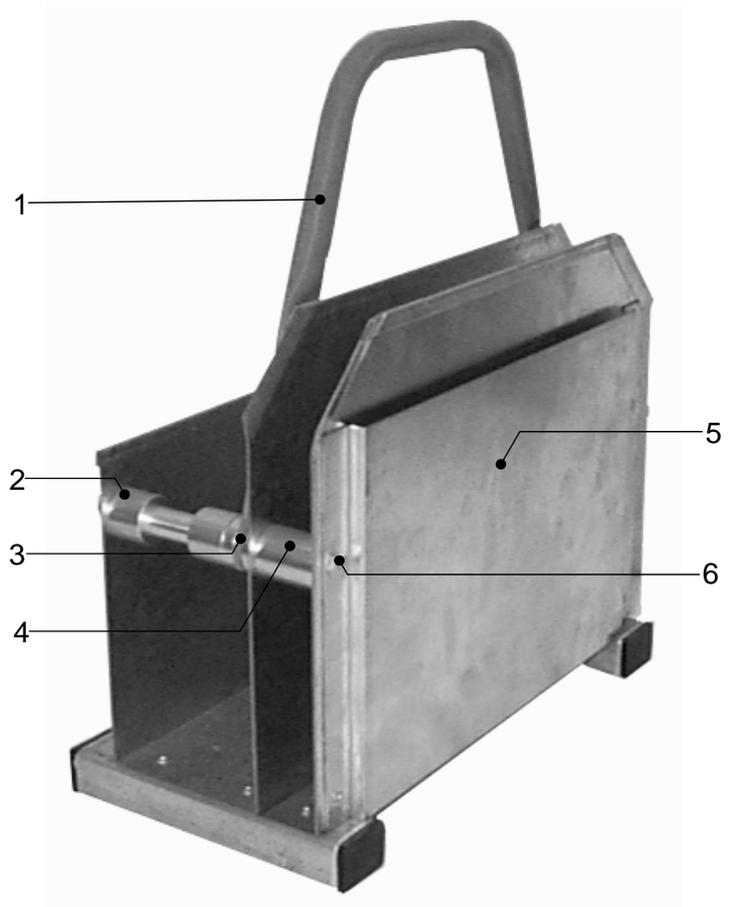
## 10.4. Heating Element



### Heating Element WIDOS 4600

Pos.	Name	Piece	Order no.
1	Heating element H 4600, 230 V	1	H4600E
	Heating plate H 4600 C1	1	HP4600E
	Heating plate in exchange	1	HPT4600E
2	Grip joining piece	1	H0909
3	Control lamp, green	1	H2105
4	Switch on/off with control lamp, red	1	H0903
5	Turning knob with slot	1	H09075
6	Scale 180 - 280 °(d 33)	1	H09074
7	Electronic control GZ4, 230V	1	H0918220
8	Triac with heat sink	1	H09081
9	PT 1000	1	H09082
10	Pan-head screw M 36x75 DIN 912	2	0912F070
11	Spring ring M 6 DIN 7980	2	7980F
12	Insulator plate	2	H0902
13	Grip	1	H0906
14	Cap for heating element grip	1	H09073
15	Teflon-conical nipple for heating element	1	H09091
16	Cylinder sheet metal screw M 4,8x13 DIN 7981	3	7981E013
17	Grip shell	1	H0907C
18	Cylinder sheet metal screw M 2,9x13 DIN 7981	2	7981C013
19	Strain relief	1	H09076
20	Connection cable 230 V	1	EK3220
21	Pan-head screw M 4x70 DIN 912	3	0912D070
22	Notch cone	1	GEW-M8
23	Threaded bolt	2	HGEW-M8

### 10.5. Protection Box



**Protection Box WIDOS 4600**

Pos.	Name	Piece	Order no.
1	Stirrup	1	094527
2	Spacing bolt for planer	2	092524
3	Spacing disk for stirrup	4	094526
4	Spacing bolt for heating element	2	092525
5	Heat absorbing steel sheet	1	094528
6	Hexagon bolt M 8x160 DIN 933	2	0933H160
7	Insertion for planer	1	094522
8	Fitting cap for 4-edges Pipes, 40x30x2	4	J0203
9	Insertion for heating element	1	094523
10	Hexagon domed cap nuts 6AU M 8 DIN 1587	2	1587H
11	Blind rivet 4x10 DIN 7337	8	7337D010
12	Foot-mounting	2	094521

## 11. Declaration of Conformity

In the sense of the EC guideline EG-MRL 2006/42/EG

Corporation

WIDOS GmbH  
Einsteinstr. 5  
D-71254 Ditzingen-Heimerdingen

declares under own responsibility that the product

Plastic Welding Machine  
**WIDOS 4600**

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

1. DIN EN ISO 12100 – 1 und 2 (replacement for DIN EN 292 part 1 and 2)  
Safety of machines, basic terminology, general guidelines for design
2. DIN EN 60204.1  
Electric equipment of industrial machines
3. DIN EN 4413  
Safety specifications for fluid technical installations and components
4. EN 60555, EN 50082, EN 55014,  
Electro-magnetic resistance

The technical documentation is completely available.

The working instructions in the language of the user are available.

The following technical documentation can be examined at the corporation mentioned above:

- testing documents
- other technical documents

Ditzingen-Heimerdingen, the 05.09.12

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Martin Dommer (Technical director)