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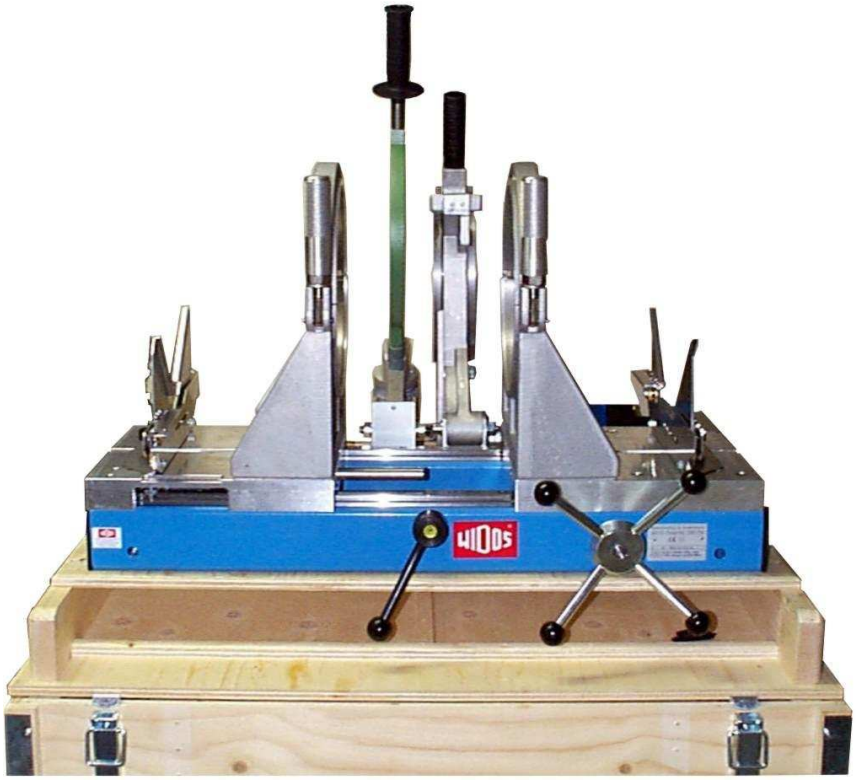
Kunststoffschweißtechnik

Working Instructions Translation

Heating element butt welding machine

WIDOS 2500 / OD 250



Keep for further use!

Type:	WIDOS **2500 / OD 250**
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

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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 service team 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 occur in exercise.

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.

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1. Description of product

The 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 2500 / OD 250 is made for the heating element butt welding of pipes and fittings out of PE, PP and PVDF with a diameter range of Ø = 50 - 250 mm (optional Ø = 20 – 40 mm).

(Standard diameters: 50 / 63 / 75 / 90 / 110 / 125 / 140 / 160 / 180 / 200 / 225 / 250 mm).
The following pipes are weldable:

Pipe size	PE	PP
OD 50 up to OD 180	SDR 11	SDR 6
up to OD 250	SDR 21	SDR 17,6

All use going beyond is not prescribed.
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 work.

1.2. Safety measures

In case of wrong use, wrong operation or wrong maintenance the machine itself or products being in the surrounding 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 advices must necessarily be adhered to.

1.3. Conformity

The machine corresponds in its construction to the valid recommendations of the European Community as well as to the according European standard specifications.
The development, manufacturing and mounting of the machine were made very carefully.

1.4. Marking of the product

The product is marked by a type label.
It contains the type, the serial number and the year of construction of the machine.

1.4.1. Technical data

1.4.1.1. WIDOS **2500 / OD 250** General data

Dimensions of pipes:	outside-Ø = 50 - 250 mm (optional, outside-Ø = 20 - 40 mm)
Material:	PP, PE , PVDF
Fuse protection:	16 A
Wire cross section:	1.5 mm²
Packing case:	960 x 690 x 710 mm
Emissions	- Noise exceeding 80 dB (A) may occur; during planing it is obligatory to wear ear protection! - When using the named pipe materials and when welding below 260°C / 500°F no toxicant damp arises
Ambient conditions in the welding area	- take care for cleanness (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, if necessary use a welding tent - avoid strong sun rays influence - protect from wind, shut the pipe ends

1.4.1.2. Heating element

Power:	1500 Watt	1500 Watt
Current:	6.5 A (± 10 %)	13,6 A (± 10 %)
Voltage:	230 V (± 10 %)	110 V (± 10 %)
Frequency:	50 Hz	60 Hz
Surface:	nonstick coated	
Attached elements:	- electronic temperature control - control lamp - connection cable with plug	

1.4.1.3. Planer

Power:	1050 Watt	1050 Watt
Current:	4.5 A (± 10 %)	9,5 A (± 10 %)
Voltage:	230 V (± 10 %)	110 V (± 10 %)
Frequency:	50 Hz	60 Hz
Attached elements:	- connecting cable with plug	

1.4.2. Equipment and accessories

The following tools and accessories are part of the first delivery:

1 each	Hexagonal socket screw key size 4 / 5 / 6 with T-grip for mounting / dismounting the reduction inserts
1 each	Hexagonal socket screw key size 5 / 6 / 8
1	Annular fork wrench size 13 (for clamping device)
1	Torx-screw driver T10
1	Tool bag for 10 parts

See spare parts list for order numbers and single parts. In case of an order please always give the machine number!

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.

These working instructions contain the most important indications to run the machine safely.

The safety indications are to be followed 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 possibly danger for the life and the health of persons.

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

This symbol means a possible dangerous situation.

- The disrespect of these indications may cause slight injuries or damages on goods.

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 means a possible dangerous situation by moving parts of the machine

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

This symbol means a possible risk of injury by noise exceeding 80 dB (A).

- Ear protection is obligatory

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

- The disrespect 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 job 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 has to 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 organization

- 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, and starting the operation, setting, tooling, operation, maintenance, inspection and repair.
- A person who is being trained may only work at the machine under supervision of an experienced person.

2.7. Specific dangers

2.7.1. Danger of combustion by heating element and welding area

You can burn yourself, inflammable materials may ignite!
The heating element is heated up to more that **250°C / 482°F**!

- Do not leave the heating element unsupervised.

- Do not leave the heating element unsupervised.
- Do not touch the surfaces of the heating element.
- Take enough safety distance to inflammable materials.
- Do wear safety gloves.
- Make sure that no person is in the swinging area of the heating element.
- When cleaning the hot heating element with detergents (e.g. with PE cleaner) there is the danger of inflammation. For this reason, please take care that the inflammation point is above the actual temperature of the heating element.
- Do not bring any fire sources (e.g. cigarettes) close thereto.

2.7.2. Danger of stumbling over electric wires

- Make sure that no person must step over the wires of heating element and planer.

2.7.3. Danger of injury, crushing by turret

You may crush your fingers resp. be beaten by the turret upon releasing the clamping lever during which the machine is under pressure.

- Hold the turret with one hand and only then release the clamping lever.
- Do not grip between clamped pipe endings..

2.7.4. Danger of cutting and catching clothes by the planer, danger of crushing at the guide rods

You can cut yourself or even get bones broken.

- Only wear clothes tight to the body.
- Do not wear jewellery during the work.
- If necessary, wear hair-net.
- Do not touch the faces of the planer.
- Take care that no person is standing in the swiveling area of the planer.

2.7.5. Risk of injury by noise

Noise exceeding 80 dB (A) may occur; during planing it is obligatory to wear ear protection!

2.8. Structural modifications on the machine

- No modifications, extensions or reconstructions may be made on the machine without permission of the manufacturer.
- Machine parts that are not in perfect condition are to be replaced immediately.
- Only use original **WIDOS** spare and wear parts.

2.9. 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
- 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 guidelines are to be followed.

The plastic pipes are clamped by means of 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.

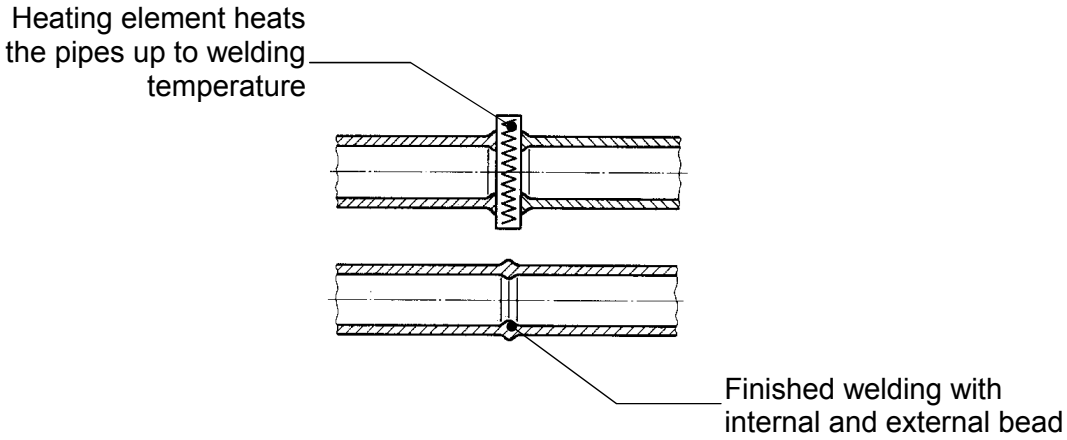
The cleaned and heated heating element is inserted and the pipes are pressed against the heating element under defined adjusting force. This process is called **"adjusting"**.

The applied force can be read on the scale. After the prescribed bead height being reached, the force 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 slide is 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**.

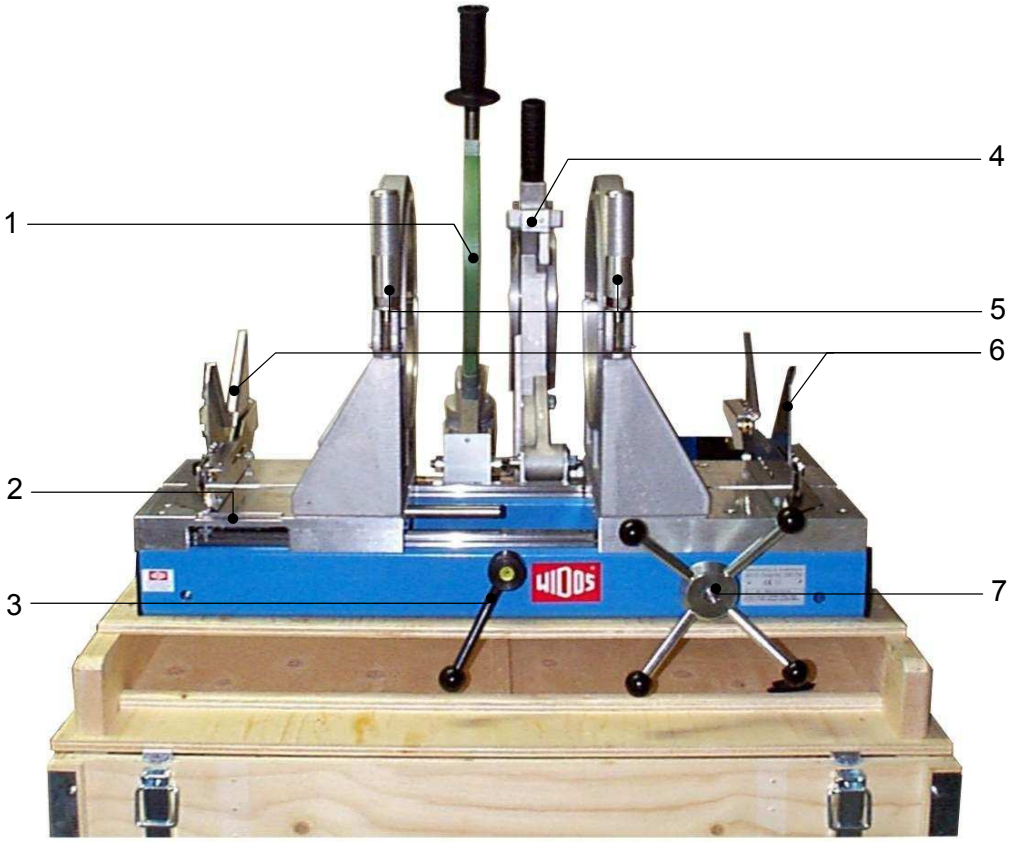
The pipes are joined under prescribed welding force and then cool down under pressure (**cooling time**).

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



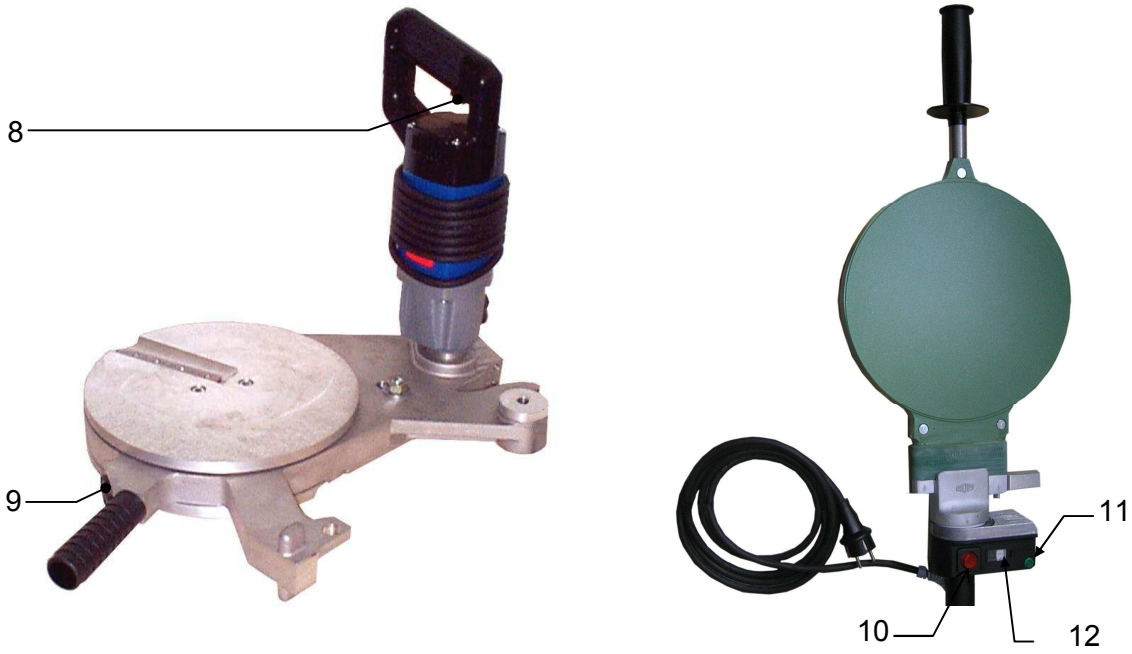
4. Operating and indicating elements

4.1. Elements on the basic machine



No.	*Denomination*	*Function*
1	Heating element	- Heating up the pipes. - Can be swiveled in and out.
2	Scale	- Display of the applied welding force. - max. display: 150 kN
3	Tension lever	- to arrest the support.
4	Planer	- to plane the pipes - Can be swiveled in and out.
5	Clamping device, right- / left-hand	- to clamp the pipes
6	Support for pipes, right- / left-hand	- Support the pipes
7	Cross handle	- Opening / shutting of the support. - Application of the adjusting force and of the jointing force

4.2. Elements at the planer and heating element



No.	*Denomination*	*Function*
	Planer	
8	Switch on/off	- For switching on / off the planer
9	Button	- As soon as the planer is switched on and the button is pressed, the planer turns round
	Heating element	
10	Switch on/off with lamp	- As soon as the heating element is switched on, it is heated up. - The red lamp lightens when the heating element is connected to the mains.
11	Adjusting screw	- Adjusting the temperature of the heating element.
12	Control lamp, green	There are three different states: - **Off**: signalizes that the heating element is not heated up at the moment or that it cools down. - **Blinking**: the heating element temperature is maintained by a certain pulse-position ratio. - **On**: signalizes that the heating element is heated up at the moment. The desired temperature has not been reached yet.

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 initiated 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.
- 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 humidity !
- According to VDE 0100, the use on construction sites is only allowed with a power distributor with a FI-security protective switch.
- Connect the heating element and planer to the mains supply (230 V / 50 Hz) / (110 V / 60Hz).

Lay electro wires carefully (danger of stumbling!)

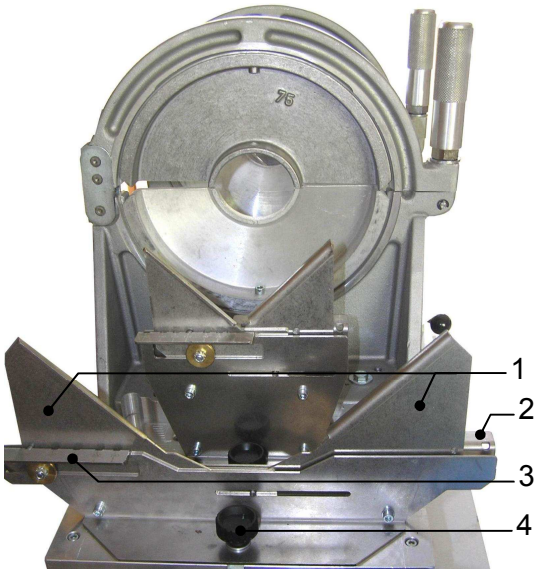
- Take into account the surrounding conditions:
  - The welding may not be performed under direct sun rays influence.
- If the surrounding temperature is under 5°C / 41°F, measures have to be taken:
  - Preheat the pipe ends if necessary.
- In addition, take measures against rain, wind and dust.

5.1.1. Assembly of the machine

- Detach the clamping handles of the transport case and lift off the case in an upward direction.
- Turn the case upside down with the open space on top and put it on the floor.
- Put the case floor together with the machine onto the open case.
- Refit the screwed-off heating element handle.
- Connect the planer to the local power supply (230 V / 16 A / 50 Hz) / (110 V / 16 A / 50-60 Hz).
- Connect the heating element to the local power supply (230 V / 16 A / 50 Hz) / (110 V / 16 A / 50-60 Hz).

The machine can be operated now.

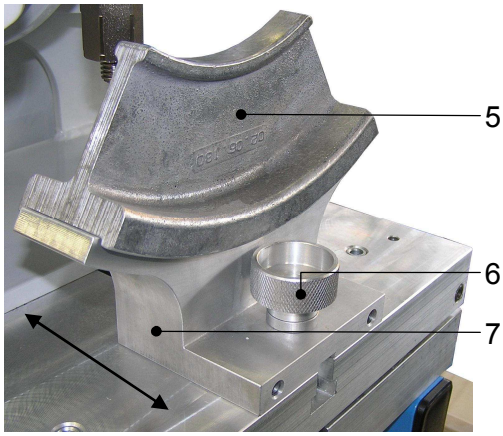
5.2. How to mount the pipe supports



For pipes with OD 50 – 160 mm, the small adjustable pipe supports out of sheet steel are provided.
For pipes with OD 180 – 250, the large adjustable pipe supports out of sheet steel are provided.
The required outside diameter of the pipe is adjusted by briefly lifting and displacing both supports (2). The sizes are engraved on the frontal and on the rear piece (3 + 4).

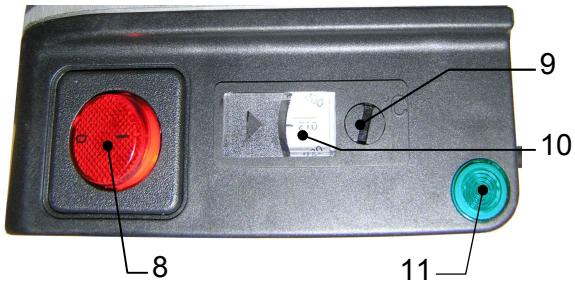
In order to change the pipe supports, release the knurled screws (4), remove the supports with the sliding blocks sideward out of the machine tables, and mount the required pipe supports in reverse order.

5.3. Aluminum pipe supports (optional)



You will need the optional pipe supports (5) for pipes with OD 20 – 40 mm.
Put the necessary pipe supports (5) onto the pipe bracket (7).
Align the pipes to each other.
Align the pipe bracket to the pipe (arrow) in horizontal direction.
Fix the pipe bracket (7) by the knurled screw (6).

5.4. How to set the heating element temperature



Switch on the heating element with the switch (no. 8) and set the necessary welding temperature at the adjusting screw (no. 9) at the handle, you can see the adjusting temperature on scale (10).
If the control lamp (no. 11) blinks, the nominal temperature has been reached and is maintained by means of a defined pulse-pause ratio.

5.5. Welding process

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

- Wear safety gloves as protection against combustion!
- 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 must be clean, especially non greasy, therefore they need to be cleaned shortly before each welding or in case of dirtiness by means of a fiber-free paper and a cleaning agent.

  The anti-stick coating of the heating element is to be undamaged in the working area.

5.5.1. How to align and clamp the pipes

- Screw the reduction inserts according to the pipe outside diameter to be welded.
- Align the pipe brackets according to the pipe outside diameter (chapter: 5.2).
- Open the clamping tools. Put the pipes with the same overhang to the inside of the clamping tools.
- Close them and clamp pipes.

5.5.2. How to plane the pipes

- Switch on the planer (chapter: 4.2, Nr. 8).
- Keep the button (no. 9) at the planer handle pressed.
- Drive workpieces to the planer with the cross handle and plane with low pressing force.
- You will have to carry out planing as long as a bilateral rotating chip has been produced.
- Open the support again, release button and swivel out the planer.
- Remove the produced cuttings without touching the worked surfaces.
- Close the support.

5.5.3. Mismatch compensation

- 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 x pipe wall thickness, the admissible gap must not exceed 0.5 mm.
- The mismatch compensation is carried out by further tightening or releasing of the clamping nuts. In case mismatch compensation was carried out, planing must be repeated afterwards.

5.5.4. Adjusting

- The adjusting pressure for the pipe dimension to be welded can be gathered from the welding table.
- Open support again slightly.
- Gather heating time, maximum change over time, cooling time and bead height for the pipe dimension to be welded from the table.
- Check the heating temperature. If the control lamp blinks, the nominal temperature has been reached and is kept constant by means of a defined pulse-position ratio.
- Swivel in the heating element which has been cleaned and brought to desired temperature. If necessary wait until the control lamp at the heating element is blinking in regular intervals.
- Drive the slides together by the hand wheel (chapter: 4.1 no. 7), shock-free under the determined aligning force.

  Read the applied force from the scale (no. 2).
- Fix the slide by the lever (no. 3) and maintain the force.

Necessarily hold tight to the turnstile before you release the clamping lever and if the slides have been driven together with force!

- As soon as the prescribed bead height is reached, reduce the force (heating force = appr.10 % of adjusting force).

  Important! Do not open the slide.

5.5.5. Heating

- Now the heating time starts.
- Press the stop-watch and compare the actual time with the nominal time taken from the welding table.

5.5.6. Change over

- Quickly drive the slide apart after the heating time has elapsed, release the clamping lever; **necessarily** hold tight to the turnstile.
- Swivel the heating element as quickly as possible back and close the support smoothly.

  The maximum time frame for this process is predetermined by the value for the change over time taken from the table.

5.5.7. Cooling

- Built up the welding force, arrest the support by the lever and press the stop-watch.
- If necessary, re-adjust the force during the cooling time (cooling force = adjusting force).

5.5.8. End of welding

Necessarily hold tight to the turnstile before you release the clamping lever and if the slides have been driven together with force!

- Release the clamping lever after the cooling time has elapsed and reduce the force by the turnstile.
- Open the clamping tools and remove the welded piece.
- Afterwards open the support.

Now the welding part is completed.

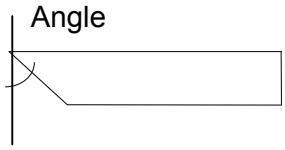
5.6. Welding of angles

When welding angles, the welding surface of the pipe and thus the necessary pressure changes.

Calculate the necessary pressure as follows:

- Take the prescribed value for adjusting or cooling from the table.
- Multiply the pressure value with factor /cos (angle).
  This will give the following factors:

Welding 15°	(chamfered pipe with 7,5°):	1,01
Welding 22,5°	(chamfered pipe with 11,25°):	1,02
Welding 30°	(chamfered pipe with 15°):	1,04



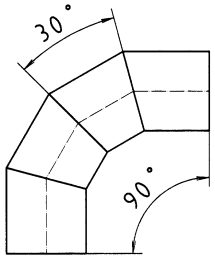
- Add the motional pressure as usual.

All the other welding parameters remain as usual.

5.7. Welding of segmented bends

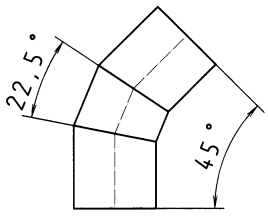
Calculate the sawing angle to be set (corresponding to the required angle at the clamping tools or clamping inserts) as follows:

$$\text{Sawing angle} = \frac{\text{Angle of the bend}}{\text{number of all welding surfaces}}$$



Example: 1 bend of 90°, 4 segments (6 welding surfaces)

$$\text{Sawing angle} = \frac{90°}{6} = 15°$$



Example: 2 bend of 45°, 3 segments (4 welding surfaces)

$$\text{Sawing angle} = \frac{45°}{4} = 11{,}25°$$

6. Welding log and tables

Report for heated plate welding of tubular components

❑ Laid above ground

❑ Laid underground

Material

Sheet of

Employer	Contracting company	Welding machine:	Weather conditions	Protective measures
			1 = sunny 2 = dry 3 = rain or snowfall 4 = wind	1 = none 2 = screen 3 = tent 4 = heating
Order tittle	Name of the welder / Identity no.	Make: Type:		
Order no.	Name a. company of the welding inspector	Machine no.: Year of manufacture:	In the case of multiple designations follow the figures as above: (e.g. 34 = rain and wind)	

Weld no.	Date	Pipe size Ø d x s mm	Heating element temperature 1) °C min / max	Movement pressure bar	Joining pressure bar	adjusted values 2) heat-up bar	adjusted values 2) bead-up bar	heat-up time 3) s	time to complete joining pressure 3) s	Change-over time 3) s	Cooling time under joining pressure 3) s	Ambient temperature °C	Code no. Weather	Code no. protect measures	Remarks

Signature of welder:

Date and signature of the welder inspector:

1) From normal internal, frequency according to 4.2.
2) The settings are the sum of the movement pressure and the indications of the manufacturer of the welding machine concerning equalization and joining pressure.
3) The measured values must be entered.

Table for PE

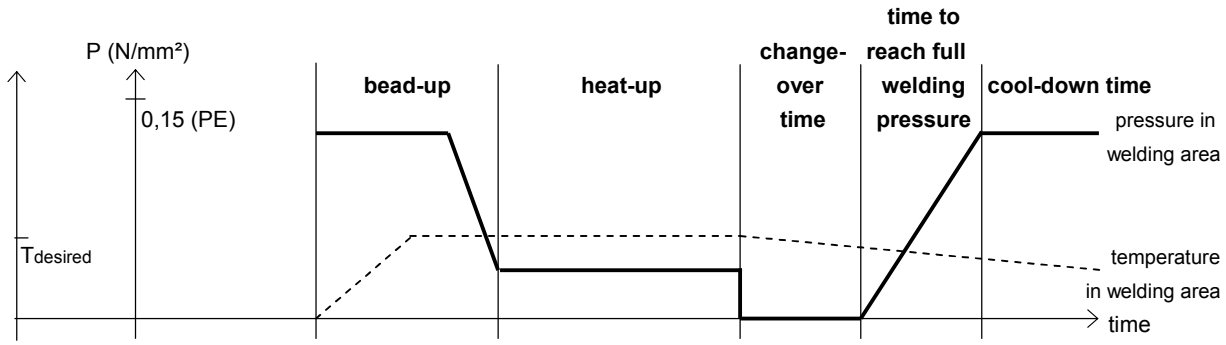
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
20	1,9	11	2	0,5	20	4	4	2	2
	2,3	9	2	0,5	23	4	4	2	2
	2,8	7,4	3	0,5	28	4	4	3	3
25	2,3	11	3	0,5	23	4	4	3	2
	2,8	9	3	0,5	28	4	4	3	3
	3,5	6	4	0,5	35	5	5	4	4
32	1,8	17	3	0,5	20	4	4	3	2
	1,9	17	3	0,5	20	4	4	3	2
	2,4	13,6	4	0,5	24	4	4	4	3
	2,9	11	4	0,5	29	4	4	4	3
	3,6	9	5	0,5	36	5	5	5	5
40	1,8	26	4	0,5	20	4	4	4	2
	1,9	21	4	0,5	20	4	4	4	2
	2,3	17,6	5	0,5	23	4	4	5	2
	2,4	17	5	0,5	24	4	4	5	3
	3,7	11	7	0,5	37	5	5	7	5
	4,5	9	8	1	45	5	5	8	6
	5,5	7,4	9	1,0	55	5	5	9	8

Table for PE

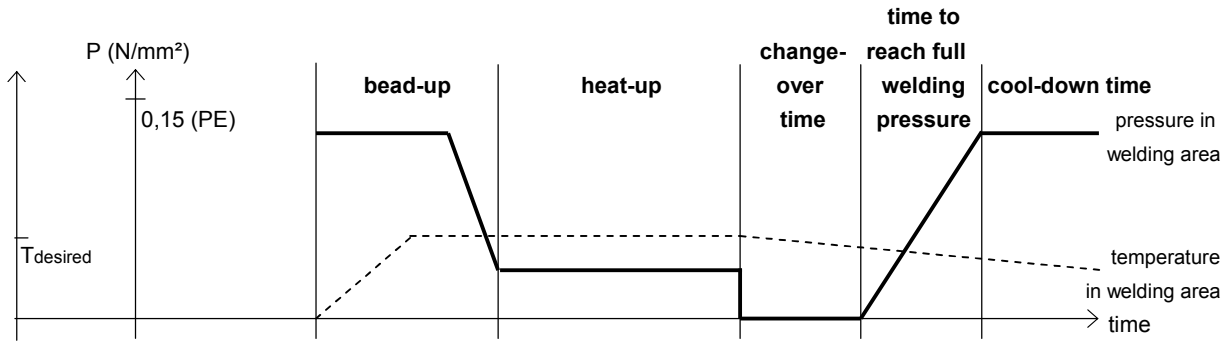
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
50	1,8	33	5	0,5	20	4	4	5	2
	2,0	26	5	0,5	20	4	4	5	2
	2,4	21	6	0,5	24	4	4	6	3
	2,9	17,6	7	0,5	29	4	4	7	3
	3,0	13,6	7	0,5	30	4	4	7	4
	3,7	13,6	9	0,5	37	5	5	9	5
	4,6	11	10	1,0	46	5	5	10	6
	5,6	9	12	1,0	56	5	5	12	8
63	1,8	41	6	0,5	20	4	4	6	2
	2,0	33	6	0,5	20	4	4	6	2
	2,5	26	8	0,5	25	4	4	8	3
	3,0	21	9	0,5	30	4	4	9	4
	3,6	17,6	11	0,5	36	5	5	11	5
	3,8	17	11	0,5	38	5	5	11	5
	4,7	13,6	13	1,0	47	5	5	13	6
	5,8	11	16	1,0	58	6	6	16	8
	7,1	9	19	1,5	71	6	6	19	10
	8,6	7,4	23	1,5	86	7	7	23	12

Table for PE

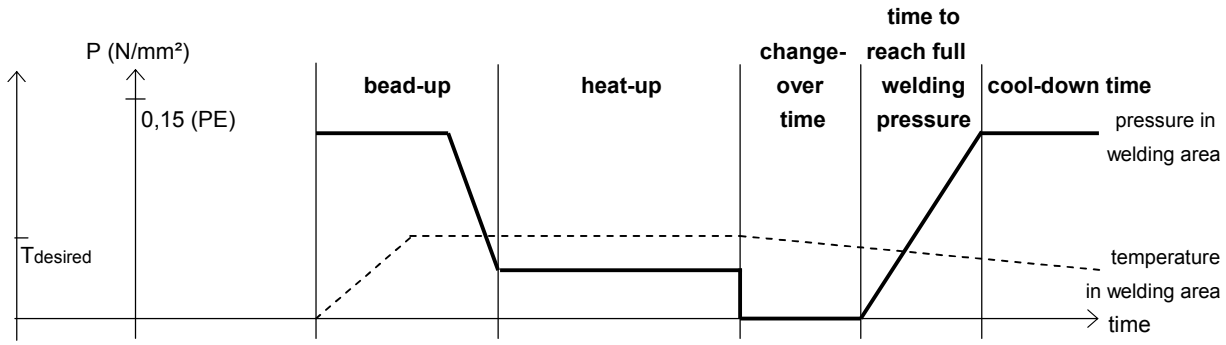
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
75	1,9	41	7	0,5	20	4	4	7	2
	2,3	33	8	0,5	23	4	4	8	2
	2,9	26	10	0,5	29	4	4	10	3
	3,6	21	13	0,5	36	5	5	13	5
	4,3	17,6	15	0,5	43	5	5	15	6
	4,5	13,6	15	1,0	45	5	5	15	6
	5,6	13,6	19	1,0	56	5	5	19	8
	6,8	11	22	1,0	68	6	6	22	10
	8,4	9	27	1,5	84	7	7	27	12
	10,3	7,4	32	1,5	103	7	7	32	14
90	2,2	41	10	0,5	22	4	4	10	2
	2,8	33	12	0,5	28	4	4	12	3
	3,5	26	15	0,5	35	5	5	15	4
	4,3	21	18	0,5	43	5	5	18	6
	5,1	17,6	21	1,0	51	5	5	21	7
	5,4	17	22	1,0	54	5	5	22	7
	6,7	13,6	27	1,0	67	6	6	27	10
	8,2	11	32	1,5	82	6	6	32	11
	10,1	9	39	1,5	101	7	7	39	14
	12,3	7,4	46	2,0	123	8	8	46	16

Table for PE

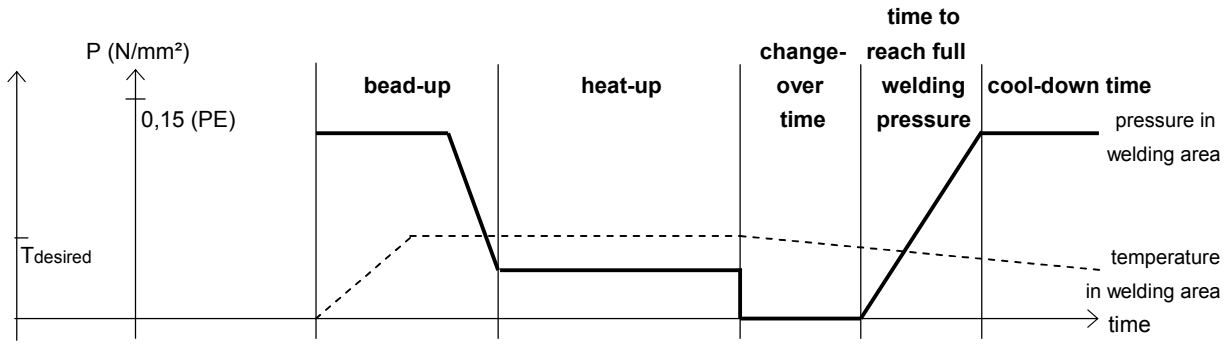
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
110	2,7	41	14	0,5	27	4	4	14	3
	3,4	33	18	0,5	34	5	5	18	4
	4,2	26	21	0,5	42	5	5	21	6
	5,3	21	27	1,0	53	5	5	27	7
	6,3	17	31	1,0	63	6	6	31	9
	6,6	17	33	1,0	66	6	6	33	9
	8,1	13,6	39	1,5	81	6	6	39	11
	10,0	11	48	1,5	100	7	7	48	14
	12,3	9	57	2,0	123	8	8	57	16
	15,1	7,4	68	2,0	151	9	9	68	20
125	3,1	41	18	0,5	31	4	4	18	4
	3,9	33	23	0,5	39	5	5	23	5
	4,8	26	28	1,0	48	5	5	28	6
	6,0	21	34	1,0	60	6	6	34	8
	7,1	17,6	40	1,5	71	6	6	40	10
	7,4	17	42	1,5	74	6	6	42	10
	9,2	13,6	51	1,5	92	7	7	51	13
	11,4	11	62	1,5	114	8	8	62	15
	14,0	9	74	2,0	140	9	9	74	18
	17,1	7,4	87	2,0	171	9	10	87	22

Table for PE

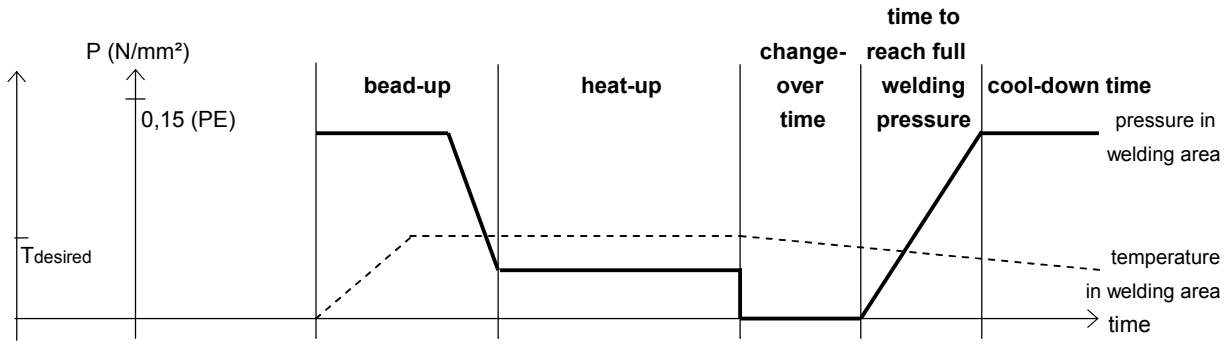
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
140	3,5	41	23	0,5	35	5	5	23	4
	4,3	33	28	0,5	43	5	5	28	6
	5,4	26	35	1,0	54	5	5	35	7
	6,7	21	43	1,0	67	6	6	43	10
	8,3	17	52	1,5	80	6	6	52	11
	10,3	13,6	63	1,5	83	7	7	63	12
	12,7	11	77	1,5	103	7	7	77	14
	15,7	9	92	2,0	127	8	8	92	17
	19,2	7,4	110	2,0	157	9	10	110	20
	23,3	6	129	2,5	192	10	11	129	24
160	4,0	41	30	0,5	40	5	5	30	5
	4,9	33	36	1,0	49	5	5	36	7
	6,2	26	45	1,0	62	6	6	45	9
	7,7	21	56	1,5	77	6	6	56	11
	9,1	17,6	65	1,5	91	7	7	65	13
	9,5	17	68	1,5	95	7	7	68	13
	11,8	13,6	83	1,5	118	8	8	83	16
	14,6	11	101	2,0	146	9	9	101	19
	17,9	9	120	2,0	179	10	11	120	23
	21,9	7,4	143	2,5	219	11	12	143	27

Table for PE

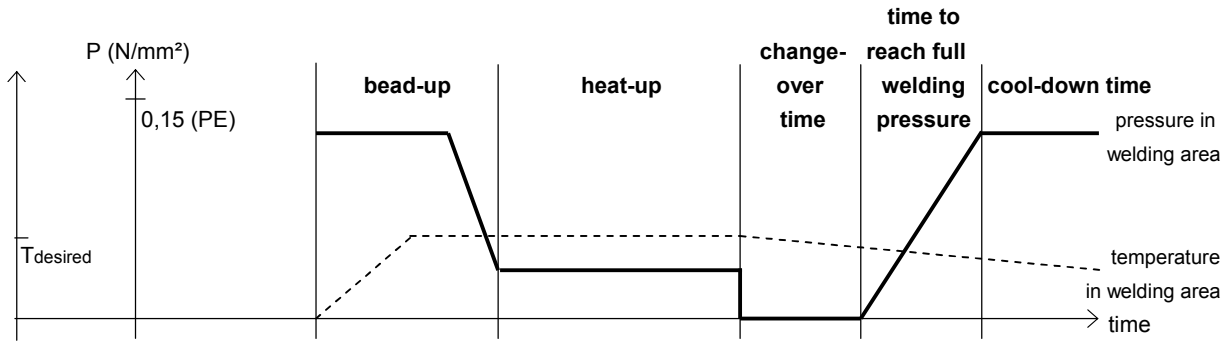
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
180	4,4	41	37	0,5	44	5	5	37	6
	5,5	33	46	1,0	55	5	5	46	8
	6,9	26	57	1,0	69	6	6	57	10
	10,2	17,6	82	1,5	86	7	7	82	12
	10,7	17	86	1,5	102	7	7	86	14
	13,3	13,6	105	1,5	107	7	7	105	14
	16,4	11	127	2,0	133	8	9	127	17
	20,1	9	152	2,0	164	9	10	152	21
	20,1	9	152	2,5	201	10	11	152	25
	24,6	7,4	181	2,5	246	12	13	181	30
200	4,9	41	46	1,0	49	5	5	46	7
	6,2	33	57	1,0	62	6	6	57	9
	7,7	26	70	1,5	77	6	6	70	11
	9,6	21	87	1,5	96	7	7	87	13
	11,4	17,6	102	1,5	114	8	8	102	15
	11,9	17	106	1,5	119	8	8	106	16
	14,7	13,6	129	2,0	149	9	9	129	19
	18,2	11	156	2,0	182	10	11	156	23
	22,4	9	188	2,5	224	11	12	188	28
	27,4	7,4	223	3,0	274	13	15	223	34

Table for PE

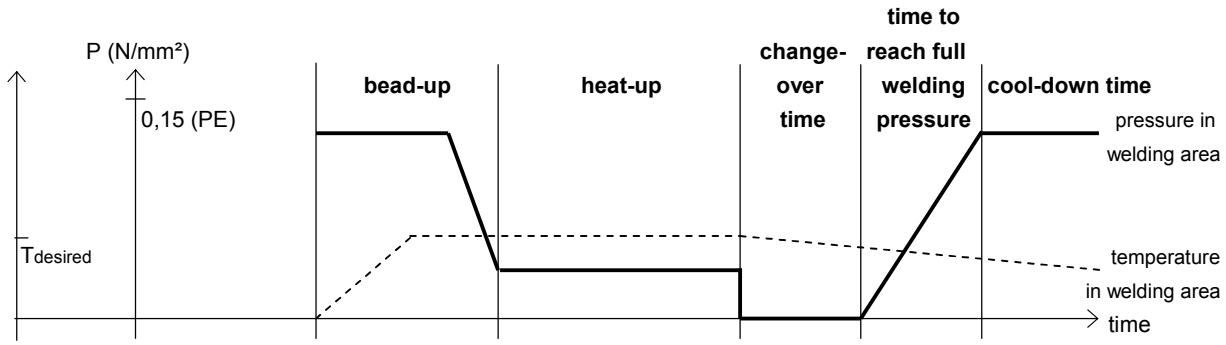
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
225	5,5	41	57	1,0	55	5	5	57	8
	6,9	33	71	1,0	69	6	6	71	10
	8,6	26	88	1,5	86	7	7	88	12
	10,8	21	110	1,5	108	8	8	110	15
	12,8	17,6	128	2,0	128	8	8	128	17
	13,4	17	134	2,0	134	8	9	134	18
	16,6	13,6	164	2,0	166	9	10	164	21
	20,5	11	198	2,5	205	10	12	198	26
	25,2	9	238	2,5	252	12	14	238	31
	30,8	7,4	282	3,0	308	14	16	282	38
250	6,2	41	72	1,0	62	6	6	72	9
	7,7	33	88	1,5	77	6	6	88	11
	9,6	26	109	1,5	96	7	7	109	13
	11,9	21	134	1,5	119	8	8	134	19
	14,2	17,6	158	2,0	142	9	9	158	16
	14,8	17	165	2,0	148	9	9	165	19
	18,4	13,6	201	2,0	184	10	11	201	23
	22,7	11	244	2,5	227	11	13	244	28
	27,9	9	293	3,0	279	13	15	293	34
	34,2	7,4	348	3,0	342	15	18	348	42

Table for PE

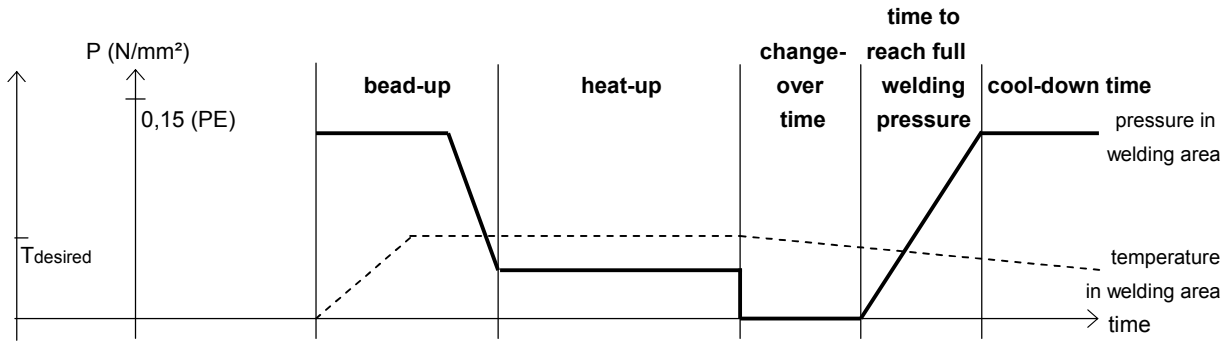
Foundation: 2207, 2208 DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
280	6,9	41	89	1,0	69	6	6	89	10
	8,6	33	110	1,5	86	7	7	110	12
	10,7	26	136	1,5	107	7	7	136	14
	13,4	21	169	2,0	134	8	9	169	18
	15,9	17,6	198	2,0	159	9	10	198	20
	16,6	17	207	2,0	166	9	10	207	21
	20,6	13,6	252	2,5	206	10	12	252	26
	25,4	11	305	2,5	254	12	14	305	31
	31,3	9	367	3,0	313	14	16	367	38
	38,3	7,4	437	3,5	383	16	20	437	47
315	7,7	41	112	1,5	77	6	6	112	11
	9,7	33	140	1,5	97	7	7	140	13
	12,1	26	173	2,0	121	8	8	173	16
	15,0	21	213	2,0	150	9	9	213	19
	17,9	17,6	251	2,0	179	10	11	251	23
	18,7	17	262	2,0	187	10	11	262	24
	23,2	13,6	320	2,5	232	11	13	320	29
	28,6	11	386	3,0	286	13	15	386	35
	35,2	9	465	3,0	352	15	18	465	43
	43,1	7,4	553	3,5	431	18	22	553	52

❶ **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

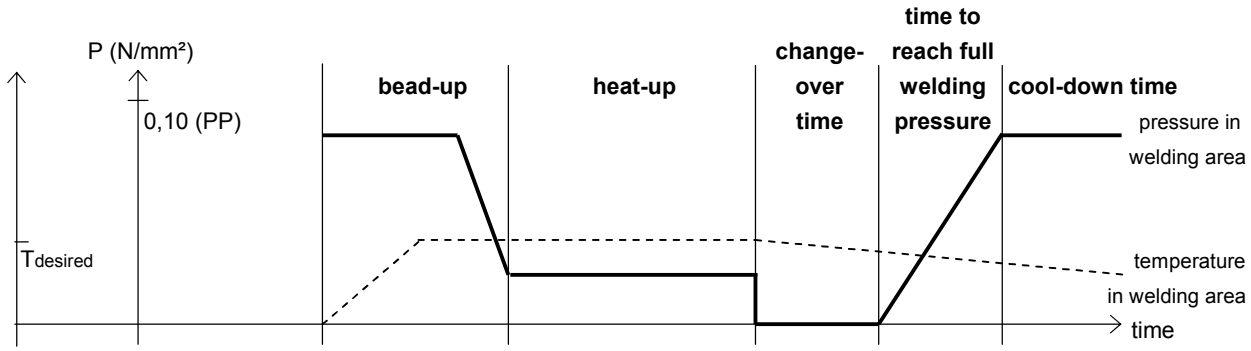
Table for PP

Foundation: 2207, 2208, DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
20	1,9	11	2	0,5	90	4	5	2	2
	2,8	7,4	2	0,5	104	4	5	2	3
	3,4	6	2	0,5	115	5	6	2	4
	4,1	5	3	0,5	128	5	6	3	5
25	2,3	11	2	0,5	95	4	5	2	2
	3,5	7,4	3	0,5	117	5	6	3	4
	4,2	6	3	0,5	130	5	6	3	6
	5,1	5	4	0,5	145	5	6	4	7
32	1,8	17,6	2	0,5	90	4	5	2	2
	2,9	11	3	0,5	106	4	5	3	3
	4,4	7,4	4	0,5	133	5	6	4	6
	5,4	6	5	0,5	149	5	6	5	8
	6,5	5	6	0,5	167	6	7	6	11
40	1,8	26	3	0,5	90	4	5	3	2
	2,3	17,6	3	0,5	95	4	5	3	2
	3,7	11	5	0,5	121	5	6	5	5
	5,5	7,4	6	0,5	151	5	6	6	8
	6,7	6	8	0,5	170	6	7	8	11
	8,1	5	9	1,0	190	6	8	9	14

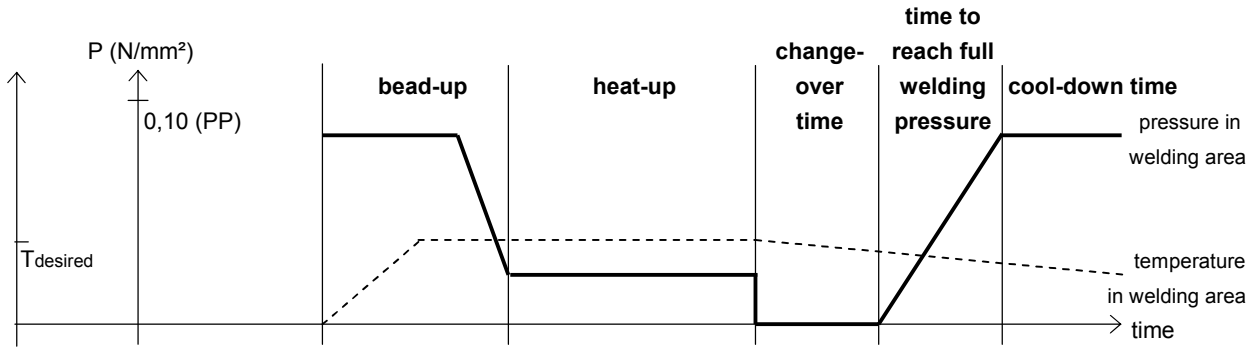
Table for PP

Foundation: 2207, 2208, DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
50	1,8	33	3	0,5	90	4	5	3	2
	2,0	26	4	0,5	90	4	5	4	2
	2,9	17,6	5	0,5	106	4	5	5	3
	4,6	11	7	0,5	137	5	6	7	6
	6,9	7,4	10	0,5	173	6	7	10	12
	8,3	6	11	1,0	193	6	8	11	14
	10,1	5	13	1,0	218	7	9	13	17
63	1,8	41	4	0,5	90	4	5	4	2
	2,0	33	4	0,5	90	4	5	4	2
	2,5	26	5	0,5	99	4	5	5	3
	3,6	17,6	7	0,5	119	5	6	7	4
	5,8	11	11	0,5	156	6	7	11	9
	8,6	7,4	15	1,0	197	6	8	15	15
	10,5	6	18	1,0	224	7	10	18	18
	12,7	5	21	1,0	254	7	12	21	21
75	1,9	41	5	0,5	90	4	5	5	2
	2,3	33	6	0,5	95	4	5	6	2
	2,9	26	7	0,5	106	4	5	7	3
	4,3	17,6	10	0,5	131	5	6	10	6
	6,8	11	15	0,5	172	6	7	15	12
	10,3	7,4	21	1,0	221	7	10	21	17
	12,5	6	25	1,0	251	7	11	25	21
	15,1	5	29	1,0	283	8	14	29	24

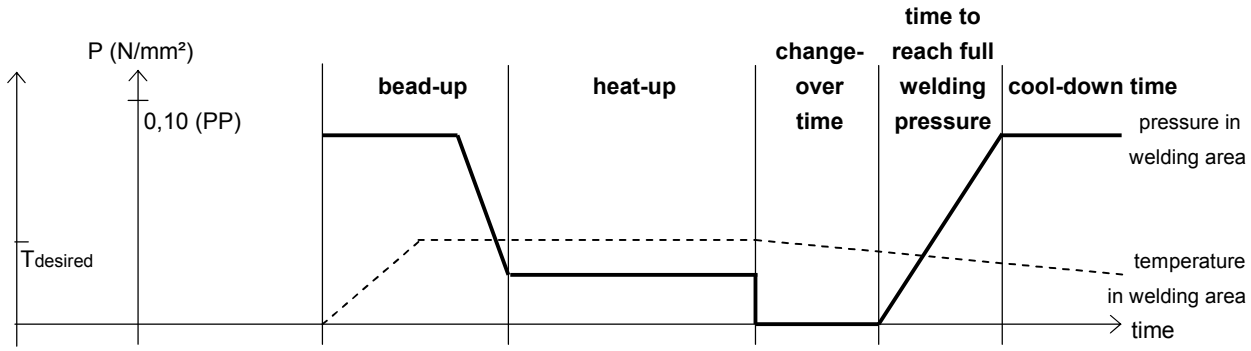
Table for PP

Foundation: 2207, 2208, DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
90	2,2	41	7	0,5	94	4	5	7	2
	2,8	33	8	0,5	104	4	5	8	3
	3,5	26	10	0,5	117	5	6	10	4
	5,1	17,6	14	0,5	145	5	6	14	7
	8,2	11	22	1,0	192	6	8	22	14
	12,3	7,4	31	1,0	249	7	11	31	20
	15,0	6	36	1,0	281	8	14	36	24
	18,1	5	41	1,0	319	9	16	41	29
110	2,7	41	10	0,5	103	4	5	10	3
	3,4	33	12	0,5	115	5	6	12	4
	4,2	26	14	0,5	130	5	6	14	6
	6,3	17,6	21	0,5	164	6	7	21	10
	10,0	11	32	1,0	217	7	9	32	17
	15,1	7,4	46	1,0	283	8	14	46	24
	18,3	6	53	1,0	322	9	16	53	29
	22,1	5	62	1,5	361	10	19	62	34
125	3,1	41	12	0,5	110	4	5	12	4
	3,9	33	15	0,5	124	5	6	15	5
	4,8	26	19	0,5	140	5	6	19	7
	7,1	17,6	27	1,0	176	6	7	27	12
	11,4	11	41	1,0	237	7	11	41	19
	17,1	7,4	58	1,0	307	8	15	58	27
	20,8	6	69	1,5	348	10	18	69	33
	25,1	5	79	1,5	391	11	21	79	39

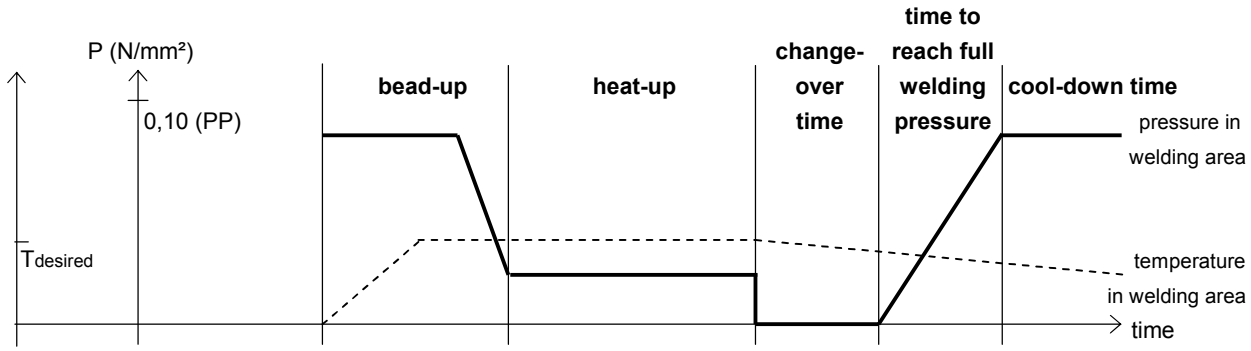
Table for PP

Foundation: 2207, 2208, DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
140	3,5	41	16	0,5	117	5	6	16	4
	4,3	33	19	0,5	131	5	6	19	6
	5,4	26	23	0,5	149	5	6	23	8
	8,0	17,6	34	1,0	189	6	8	34	14
	12,7	11	51	1,0	254	7	12	51	21
	19,2	7,4	73	1,5	332	9	17	73	30
	23,3	6	86	1,5	373	10	20	86	36
	28,1	5	99	2,0	416	12	24	99	43
160	4,0	41	20	0,5	126	5	6	20	5
	4,9	33	24	0,5	141	5	6	24	7
	6,2	26	30	0,5	162	6	7	30	10
	9,1	17,6	44	1,0	204	6	9	44	15
	14,6	11	67	1,0	277	8	13	67	24
	21,9	7,4	96	1,5	359	10	19	96	34
	26,6	6	112	2,0	405	11	23	112	41
	32,1	5	129	2,0	447	13	28	129	48
180	4,4	41	25	0,5	133	5	6	25	6
	5,5	33	31	0,5	151	5	6	31	8
	6,9	26	38	0,5	173	6	7	38	12
	10,2	17,6	55	1,0	220	7	10	55	17
	16,4	11	85	1,0	298	8	15	85	26
	24,6	7,4	121	1,5	386	11	21	121	38
	29,0	6	138	2,0	423	12	25	138	44
	36,1	5	164	2,0	478	14	31	164	54

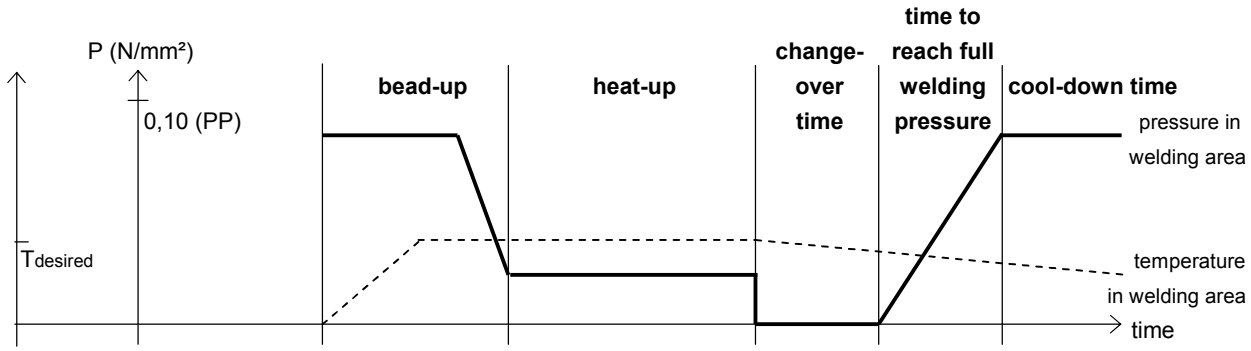
Table for PP

Foundation: 2207, 2208, DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
200	4,9	41	31	0,5	141	5	6	31	7
	6,2	33	38	0,5	162	6	7	38	10
	7,7	26	47	1,0	185	6	8	47	13
	11,4	17,6	68	1,0	237	7	11	68	19
	18,2	11	104	1,0	320	9	16	104	29
	27,4	7,4	149	2,0	411	11	23	149	42
	33,2	6	174	2,0	456	13	29	174	50
225	5,5	41	38	0,5	151	5	6	38	8
	6,9	33	48	0,5	173	6	7	48	12
	8,6	26	59	1,0	197	6	8	59	15
	12,8	17,6	86	1,0	255	7	12	86	21
	20,5	11	132	1,5	345	9	18	132	32
	30,8	7,4	188	2,0	437	12	26	188	47
	37,4	6	221	2,5	487	14	32	221	55
250	6,2	41	48	0,5	162	6	7	48	10
	7,7	33	59	1,0	185	6	8	59	13
	9,6	26	73	1,0	211	7	9	73	16
	14,2	17,6	106	1,0	272	8	13	106	23
	22,7	11	163	1,5	367	10	20	163	35
	34,2	7,4	232	2,0	463	13	29	232	51

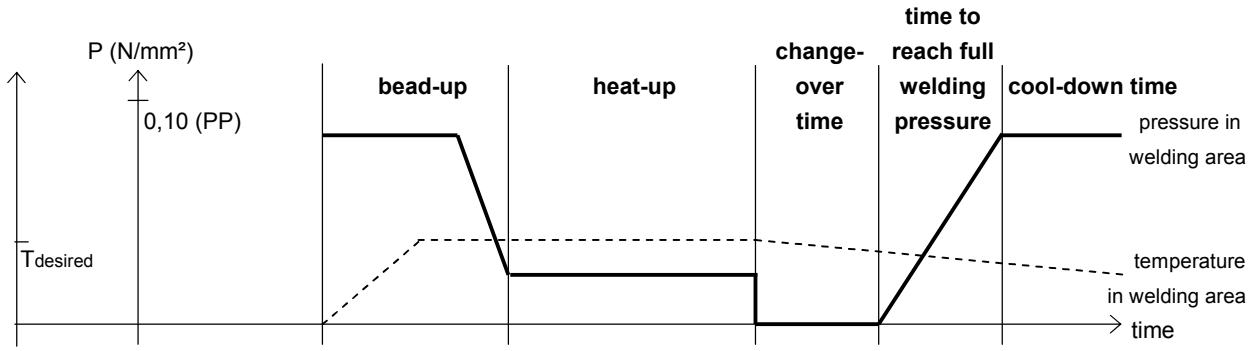
Table for PP

Foundation: 2207, 2208, DIN 16932 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 DO 160 / 250 / 315	OD 50 - 315
	ASM160 / ASM 315	OD 50 - 315

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 !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	SDR	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min] ❶
280	6,9	41	60	0,5	173	6	7	60	12
	8,6	33	74	1,0	197	6	8	74	15
	10,7	26	91	1,0	227	7	10	91	18
	15,9	17,6	132	1,0	292	8	14	132	26
	25,4	11	204	1,5	394	11	22	204	39
	38,3	7,4	291	2,5	493	14	33	291	57
315	7,7	41	75	1,0	185	6	8	75	13
	9,7	33	94	1,0	213	7	9	94	16
	12,1	26	116	1,0	246	7	11	116	20
	17,9	17,6	168	1,0	317	9	16	168	28
	28,6	11	258	2,0	420	12	24	258	44

❶ **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

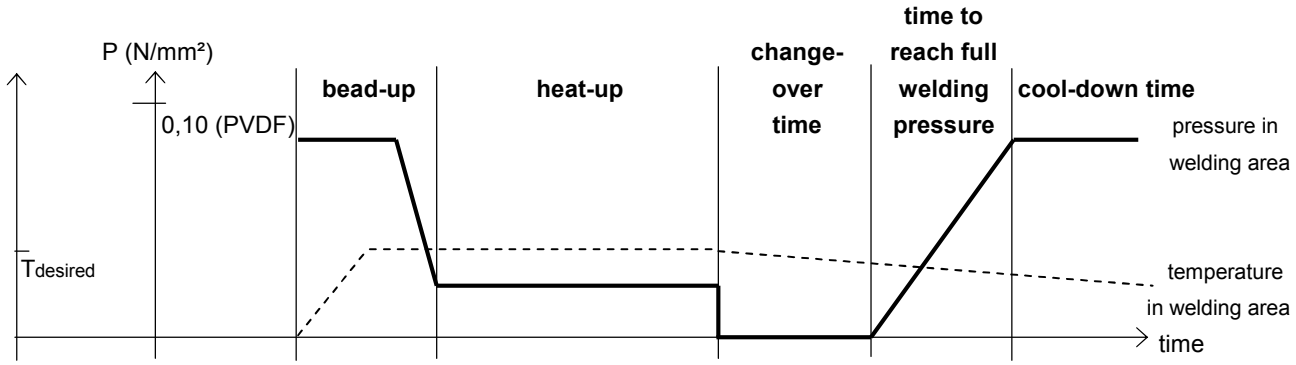
Table for PVDF

Foundation: 2208, 2207 Part 15 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 OD 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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

Additional to the given bead-up force and to the welding force the moving force of the support must be added !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min]
20	1,9	2	0,5	59	3	3	2	4,5
25	1,9	2	0,5	59	3	3	2	4,5
32	2,4	3	0,5	64	3	3	3	5,0
40	2,4	3	0,5	64	3	3	3	5,0
50	3,0	5	0,5	70	3	4	5	5,5
63	2,0	4	0,5	60	3	3	4	4,5
	3,0	6	0,5	70	3	4	6	5,5
	3,8	8	0,5	78	3	4	8	6,5
75	2,3	6	0,5	63	3	3	6	5,0
	3,6	9	0,5	76	3	4	9	6,5
	4,5	10	0,5	85	3	5	10	7,5
90	2,8	8	0,5	68	3	4	8	5,5
	4,3	12	0,5	83	3	4	12	7,0
	5,4	15	0,5	94	3	5	15	8,5
110	3,4	12	0,5	74	3	4	12	6,0
	5,3	18	0,5	93	3	5	18	8,5
	6,6	22	0,6	106	4	5	22	10,0
125	3,9	15	0,5	79	3	4	15	6,5
	6,0	23	0,6	100	4	5	23	9,0
140	4,3	19	0,5	83	3	4	19	7,0
	6,7	29	0,6	107	4	6	29	10,0
160	4,9	24	0,5	89	3	5	24	8,0
	7,7	37	0,7	117	4	6	37	11,0

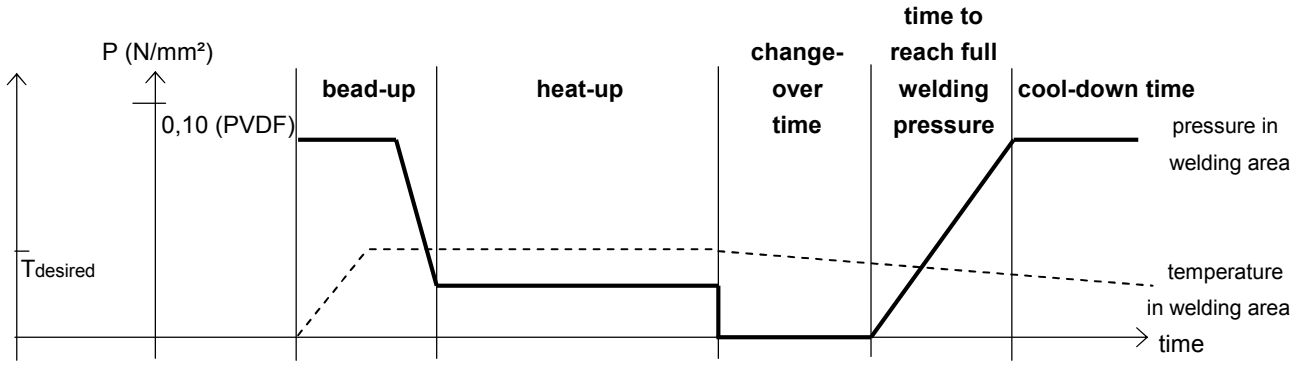
Table for PVDF

Foundation: 2208, 2207 Part 15 German association for welding

Use for:		
	Miniplast 2 / 110	OD 20 - 110
	Maxiplast / 501 / 900 / 955	OD 50 - 160
	Instaweld 160	OD 50 - 160
	2000 / 3000 Kombi	OD 50 - 250
	2500 OD 160 / 250 / 315	OD 50 - 315
	ASM 160 / ASM 315	OD 50 - 315

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

Additional to the given bead-up force and to the welding force the moving force of the support must be added !
1 kp = 10 N



pipe diameter OD [mm]	pipe wall (s) [mm]	bead-up force [kp] [daN]	circular bead min. [mm]	heat-up time [s]	max. change-over time [s]	time to reach welding pressure [s]	welding force [kp] [daN]	cool-down time [min]
180	5,5	31	0,5	95	4	5	31	8,5
	8,6	47	0,8	126	4	6	47	12,5
200	6,2	38	0,6	102	4	5	38	9,5
	9,6	58	1,0	136	4	7	58	13,5
225	6,9	48	0,7	109	4	6	48	10,5
	10,8	73	1,0	148	4	7	73	15,0
250	7,7	59	0,7	117	4	6	59	11,0
	11,9	90	1,1	159	4	8	90	16,5
280	8,6	74	0,8	126	4	6	74	12,5
315	9,7	94	1,0	137	4	7	94	13,5

7. Maintenance / Storage / Transport

7.1. General

- Replace damaged parts **immediately**, be particularly careful with electrical parts - dirt and wetness are very good current conductors.
- Only use original **WIDOS-spare parts**.

Prescribed maintenance and inspection work should be performed in time. The DVS gives the advice of inspection work after 1 year.
For machines with a specially high usage percentage the testing cycle should be shortened.
The work should be performed at the WIDOS GmbH company or by an authorized partner.

7.2. 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.

7.3. Planer

- **Never** 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 stress of the drive chain in the planer and grease it regularly. The cover of the planer can be screwed off for this purpose.

7.4. Storage

Do not grease the guide rods when using the machine in order to avoid damages by adhering dust.

- Keep the guiding and the gear rod of the basic machine free from dirt and make sure that they must be covered with a slight oil film if not in use.
- Store the machine dry.

7.5. Transport

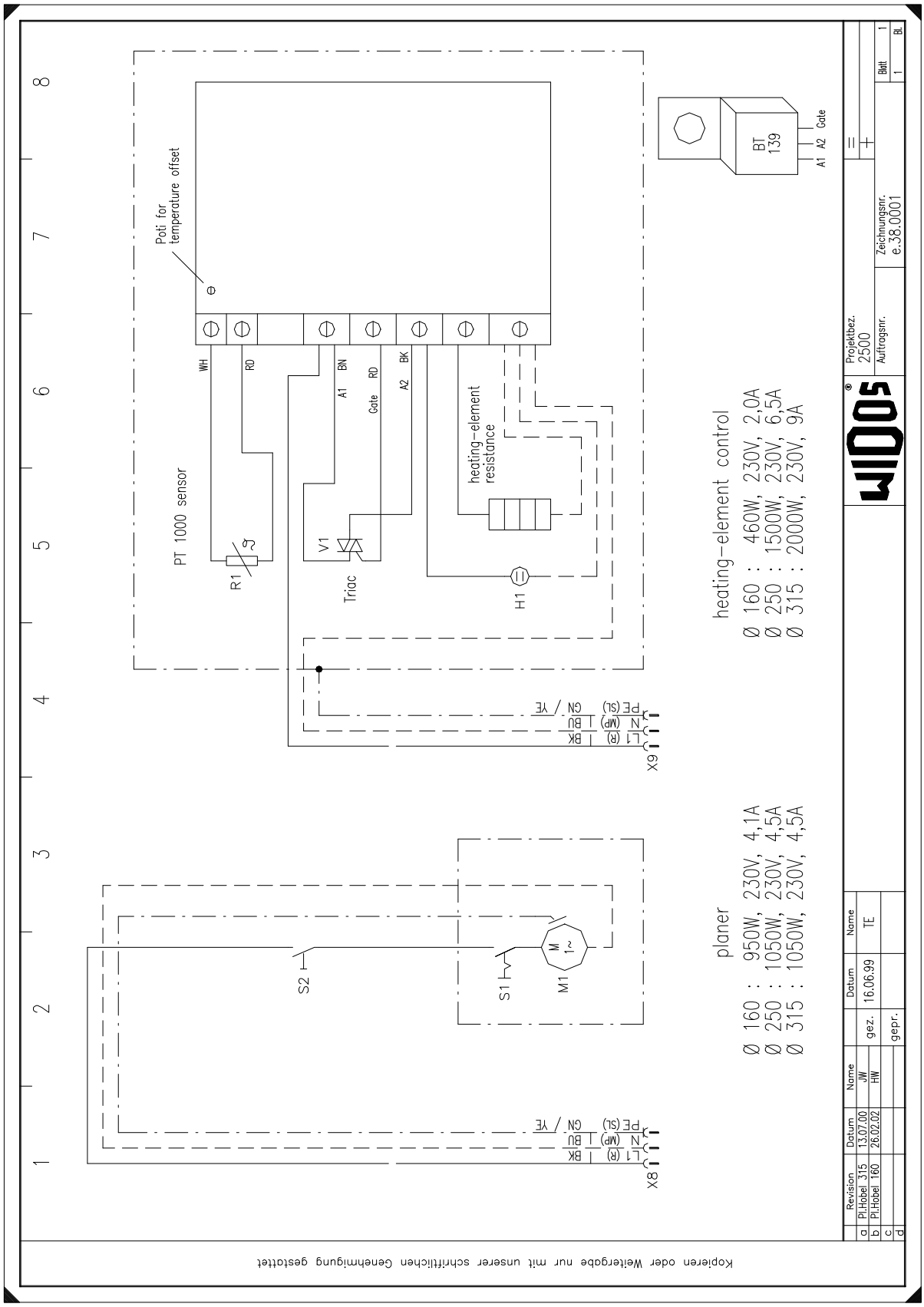
- Handle the machine carefully.
- Protect it from heavy vibrations and shocks.

7.6. Disposal

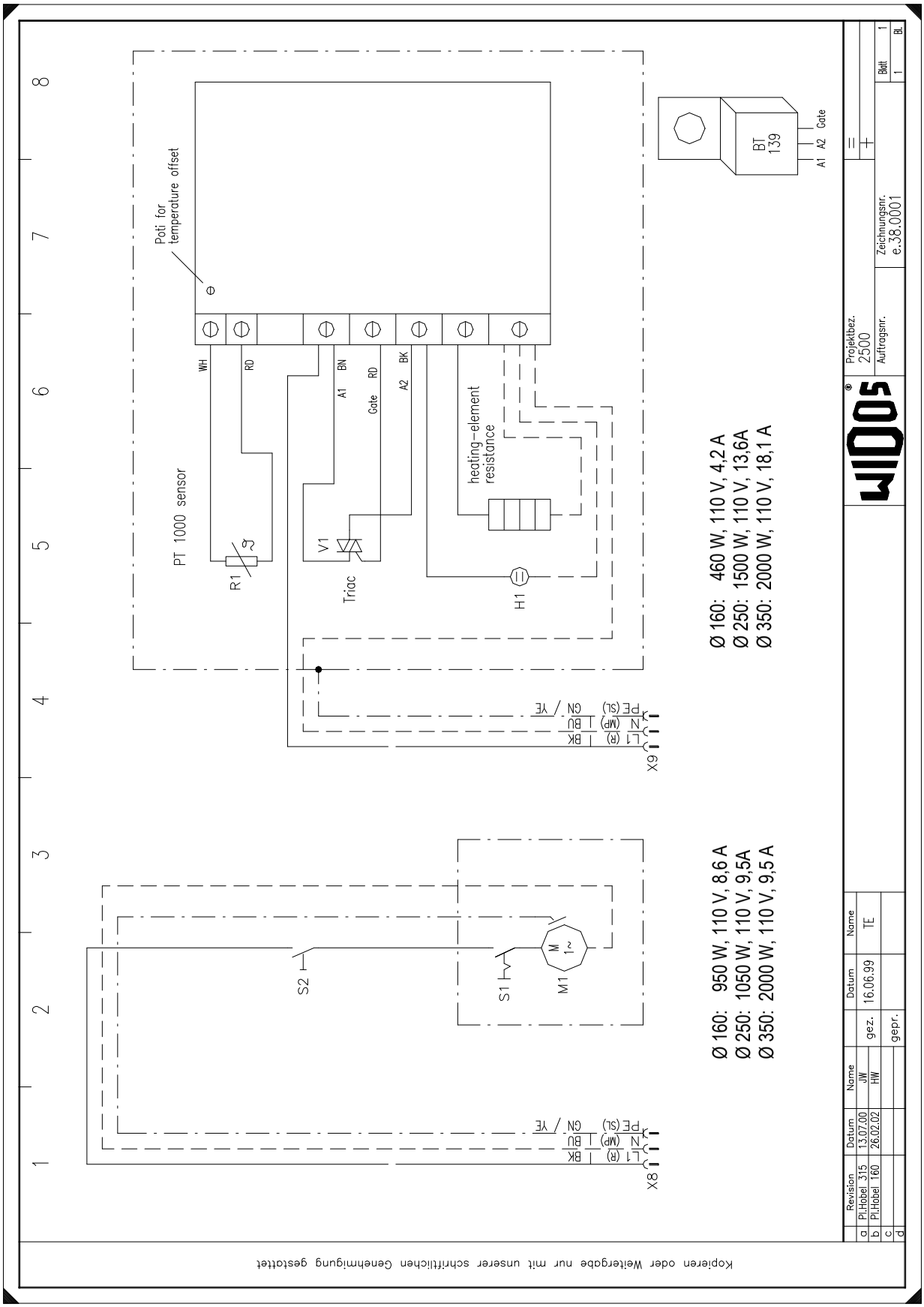
At the end of their life time, the machine and the wear parts have to be disposed of properly and non-polluting, and in accordance with the national laws of waste disposal.

8. Wiring diagram

8.1. Wiring diagram 230 V

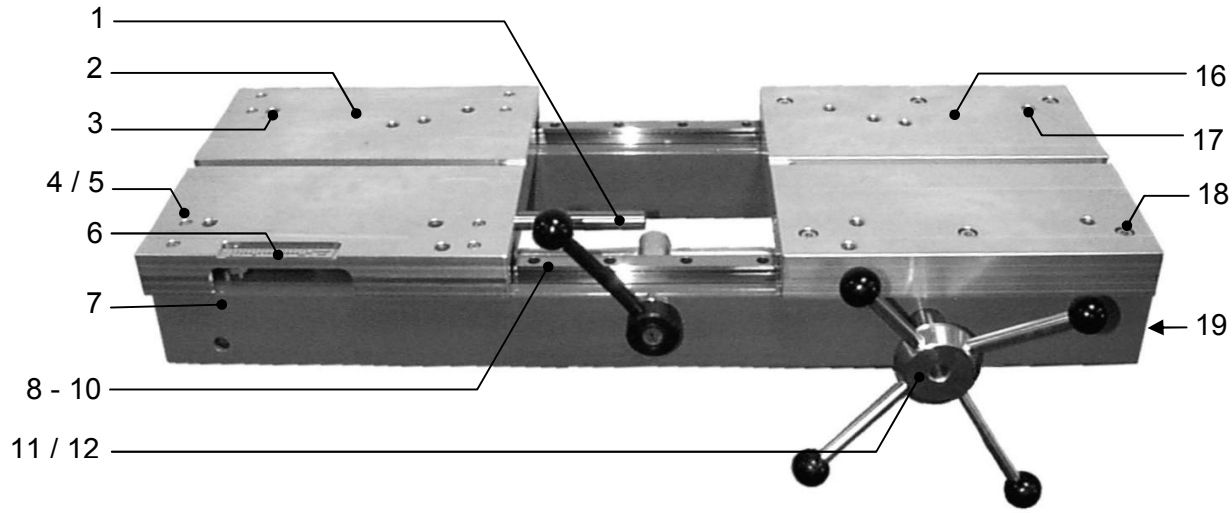


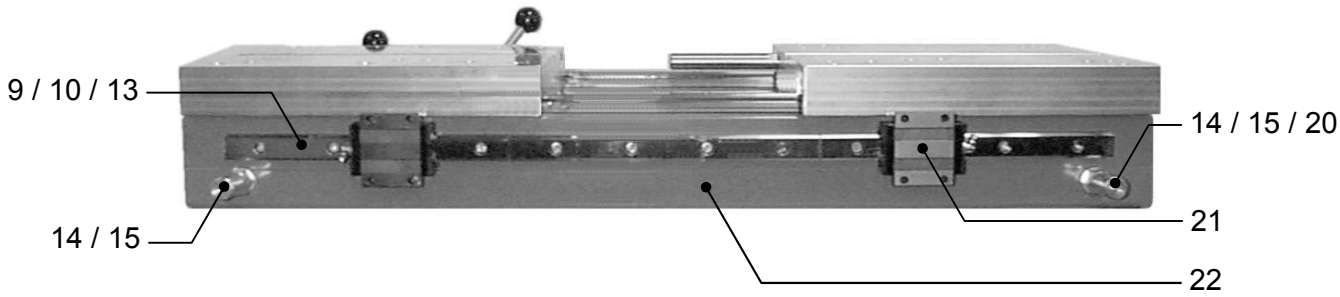
8.2. Wiring diagram 110 V



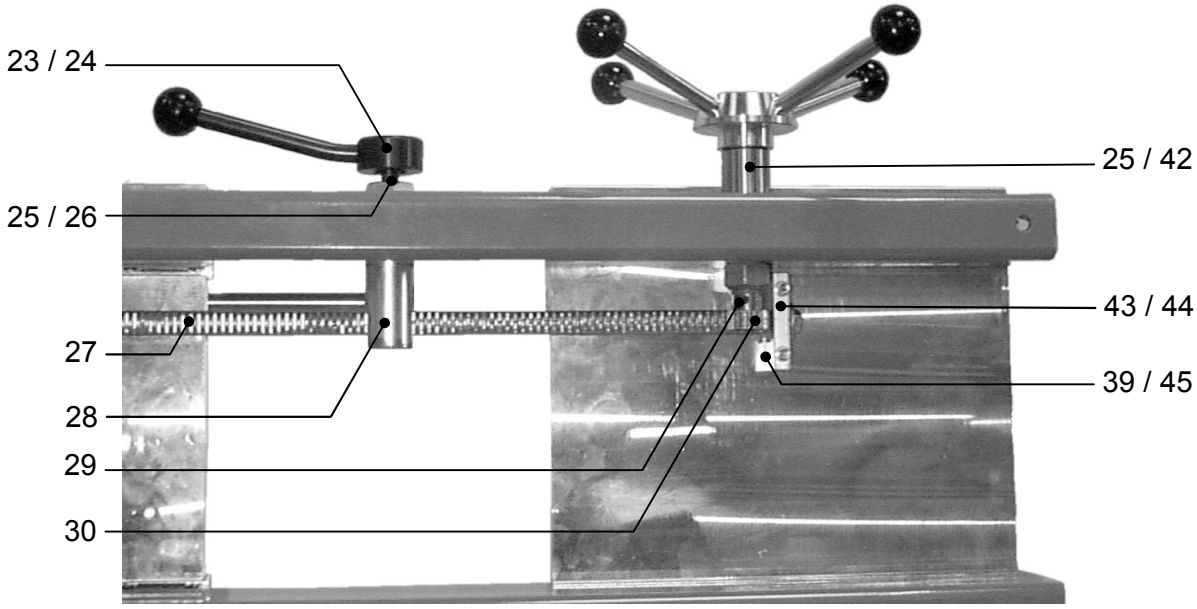
9. Spare parts list

9.1. Basic machine with motion

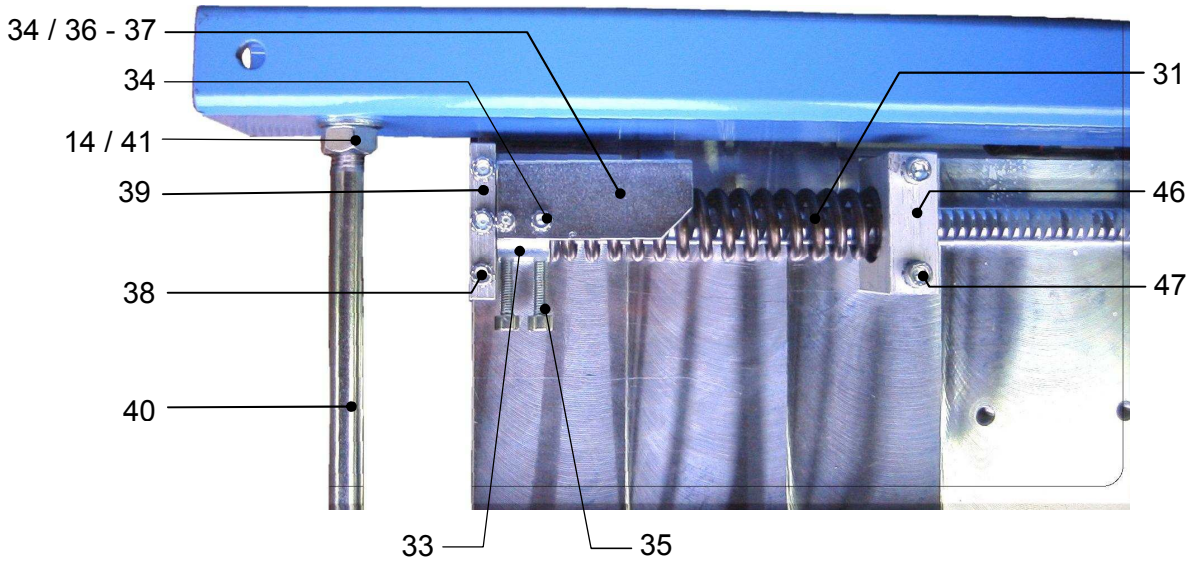




(view from below)



(view from below)



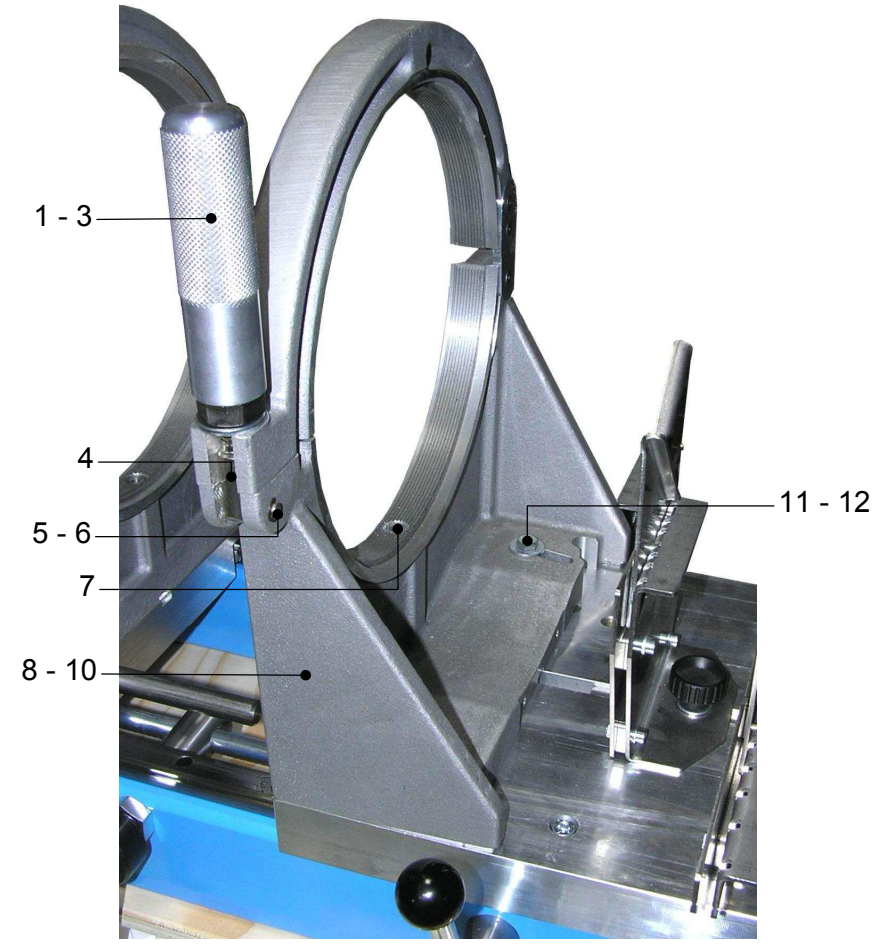
Basic Machine with Motion WIDOS 2500 / OD 250

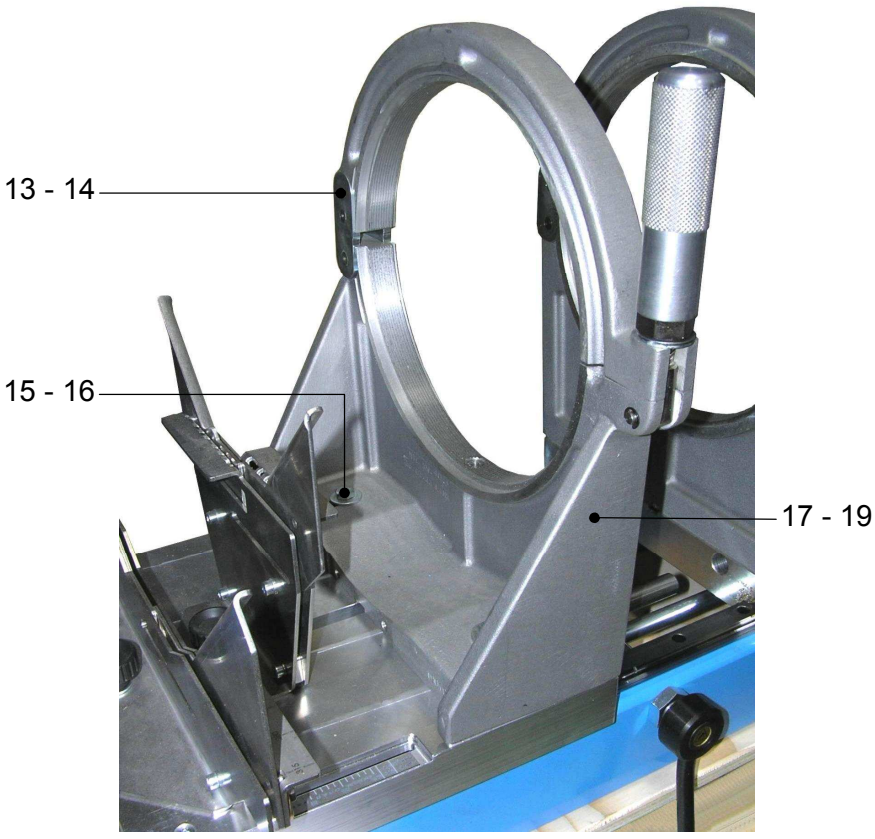
Pos.	*Name*	*Piece*	*Order no.*
1	Bolt for planer device	1	3804081
2	Support, movable	1	380103
3	Thread insert M 8x9	5	GEWK-M8
4	NSK-guide carriage	4	L20CLZ
5	Pan-head screw M 5x12 DIN 912	8	0912E012
6	Pressure scale	1	380120
7	Rail, in front	1	380101
8	NSK-guide rail 500 mm	2	L20500
9	Pan-head screw M 5x16 DIN 912	30	0912E016
10	Cap	30	L20501
11	Cross handle	1	B6516
12	Headless pin M 6x10 DIN 913	1	0913F010
13	NSK-guide rail 700 mm	1	L20700
14	Washer M 12 DIN 125	4	0125L
15	Stop nut	2	380114
16	Support, fix	1	380104
17	Thread insert M 8x15	9	GEW-M8
18	Pan-head screw M 8x40 DIN 912	6	0912H040
19	Sealing cap	4	J0204
20	Hexagon screw M 12x16 DIN 933	1	0933L016
21	NSK-guide carriage	2	L20ELZ
22	Rail, rear side	1	380102
23	Bolt for clamping lever	1	380110
24	Clamping lever	1	BM1240I
25	Nut for toothed rack	2	380109
26	Thrust pad	1	3801101
27	Toothed rack	1	380139
28	Sleeve for toothed rack	1	380108
29	Long-face pinion for gear wheel	1	380106KP
30	Clamping sleeve 3x18 DIN 1481	1	1481C018
31	Pressure spring	1	380135
32	Indicator angle	1	380137
33	Sleeve for indicator angle	1	380138
34	Pan-head screw M 4x8 DIN 912	2	0912D008
35	Pan-head screw M 6x30 DIN 912	2	0912F030
36	Hexagon nut M 6 DIN 934	1	0934F
37	Headless pin for indicator angle	1	380116
38	Pan-head screw M 5x40 DIN 912	5	0912E040
39	Support limit stop, movable	1	3801033
40	Threaded spindle	1	380113
41	Hexagon nut M 12 DIN 934	3	0934L
42	Sleeve for long-face pinion	1	380117
43	Washer M 8 DIN 933	1	9021H
44	Hexagon screw M 8x12 DIN 933	1	0933H012
45	Bearing for support, fix	1	3801042

Basic Machine with Motion WIDOS 2500 / OD 250

Pos.	*Name*	*Piece*	*Order no.*
46	Bearing for support, movable	1	380136
47	Pan-head screw M 6x40 DIN 912	2	0912F040
--	Hexagonal socket screw key size 4 with T-grip	1	ZIT04
--	Hexagonal socket screw key size 5 with T-grip	1	ZIT05
--	Hexagonal socket screw key size 6 with T-grip	1	ZIT06
--	Hexagonal socket screw key, angled size 5	1	ZIG05
--	Hexagonal socket screw key, angled size 6	1	ZIG06
--	Hexagonal socket screw key, angled size 8	1	ZIG08
--	Annular fork wrench size 13	1	ZRG13
--	Tool bag for 10 parts	1	ZWR

9.2. Clamping device



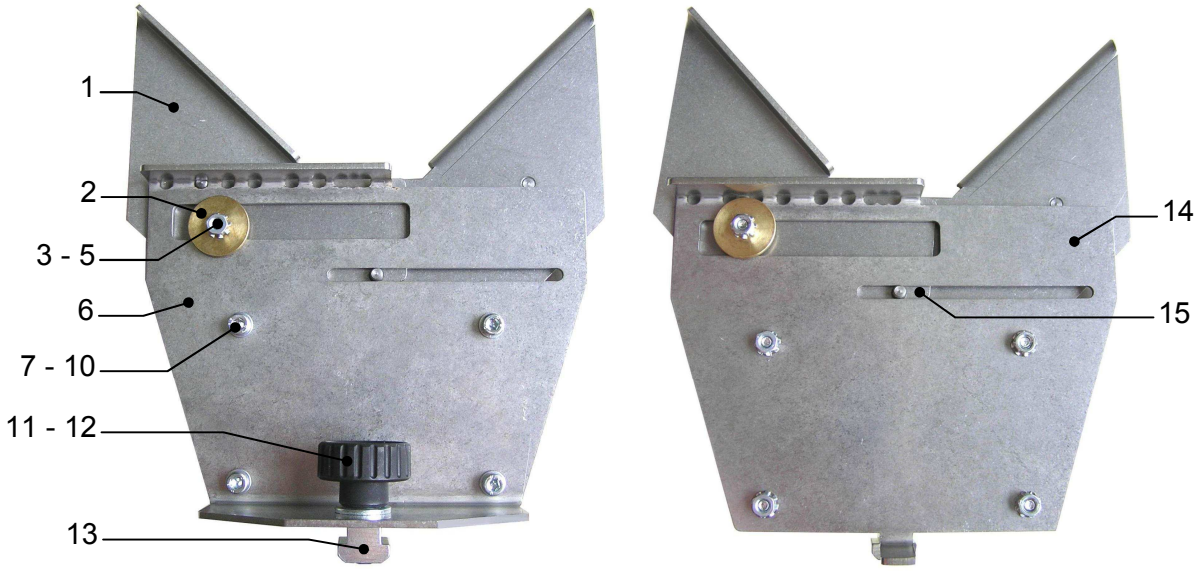


Clamping Device WIDOS 2500 / OD 250

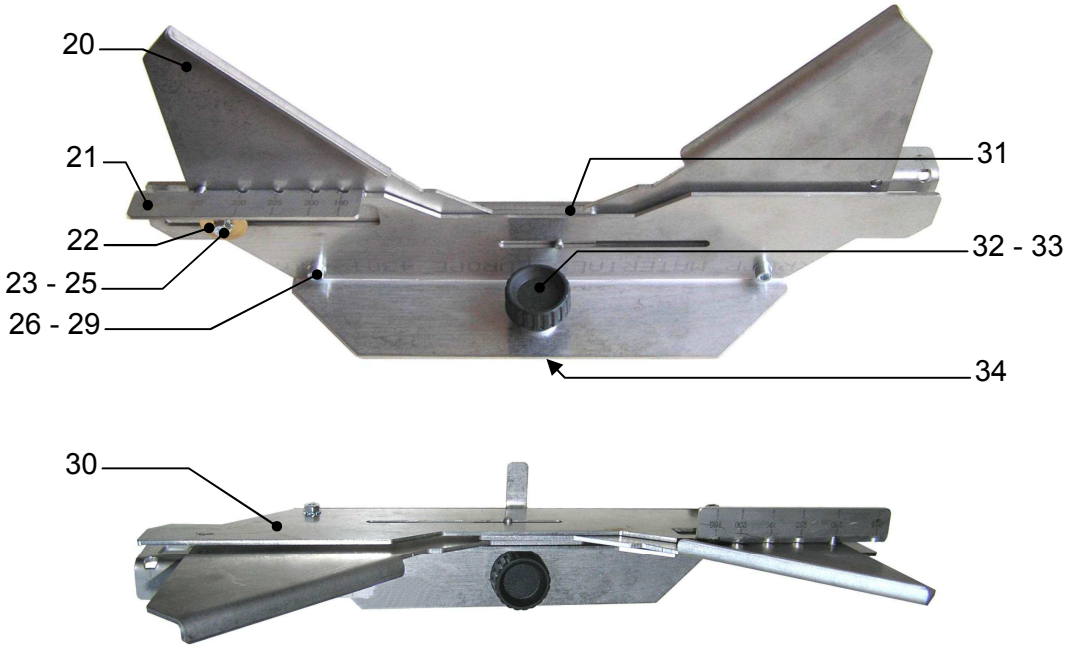
Pos.	Name	Piece	Order no.
1	Thrust washer	2	0134L
2	Nut	2	160109
3	Knurled bushing	2	S3807
4	Thread spindle	2	160108
5	Rivet	2	160111
6	Sealing ring 5 DIN 6799	2	6799E
7	Thread insert M 6x14	4	GEW-M6
8	Clamping tool, right-hand	1	380732R
9	Guidance for clamping tool	2	380705
10	Flat head screw M 4x10 DIN 963	2	0963D010
11	Pan-head screw M 8x40 DIN 912	2	0912H040
12	Washer M 8 DIN 9021	2	9021H
13	Shackle	4	S3804
14	Rivet	2	S3806
15	Pan-head screw M 8x40 DIN 912	2	0912H040
16	Washer M 8 DIN 9021	2	9021H
17	Clamping tool, left-hand	1	380732L
18	Guidance for clamping tool	2	380705
19	Flat head screw M 4x10 DIN 963	2	0963H040
--	Reduction insert OD (20 - 40) 50 - 200	2	0908...*
	Reduction insert large OD 50 - 200	2	0918...*
	Reduction insert super large OD 50 - 200	2	0928...*
--	Pan-head screw for reduction insert OD 50...200	4	0912F25X
	Flat head screw for reduction insert OD 225	4	7991F20X
--	Reduction insert (2-parts) OD 2" IPS	2	0908060
--	Reduction insert (2-parts) OD 3" IPS	2	0908088
--	Reduction insert (2-parts) OD 4" IPS	2	09081140
--	Reduction insert (2-parts) OD 6" IPS	2	0908168
--	Pan-head screw for reduction insert OD 2"…6"IPS	4	0912F25X
--	Reduction insert (2-parts) OD 8" IPS	2	0908219
	Flat head screw for reduction insert OD 8"IPS	4	7991F20X
	* When ordering, please indicate the dimension !		

9.3. Pipe supports

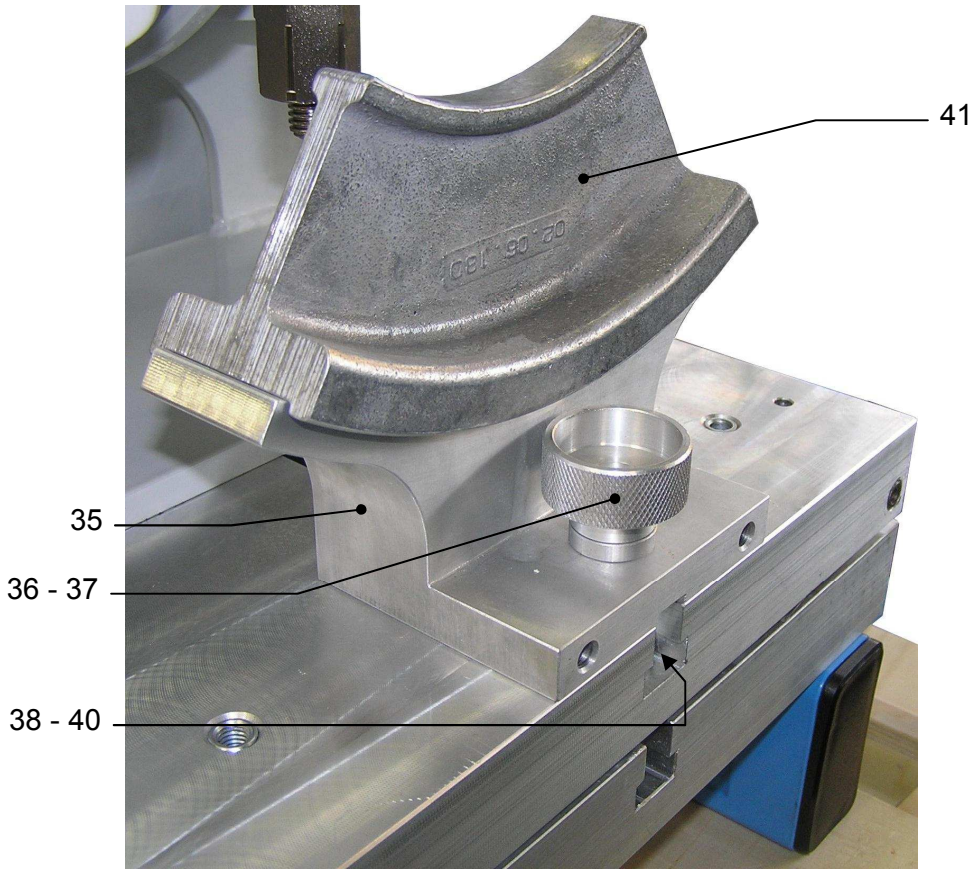
Pipe support for OD 50 – 160 mm



Pipe support for OD 180 – 250 mm



Pipe bracket with pipe supports



Supports for pipes WIDOS 2500 / OD 250

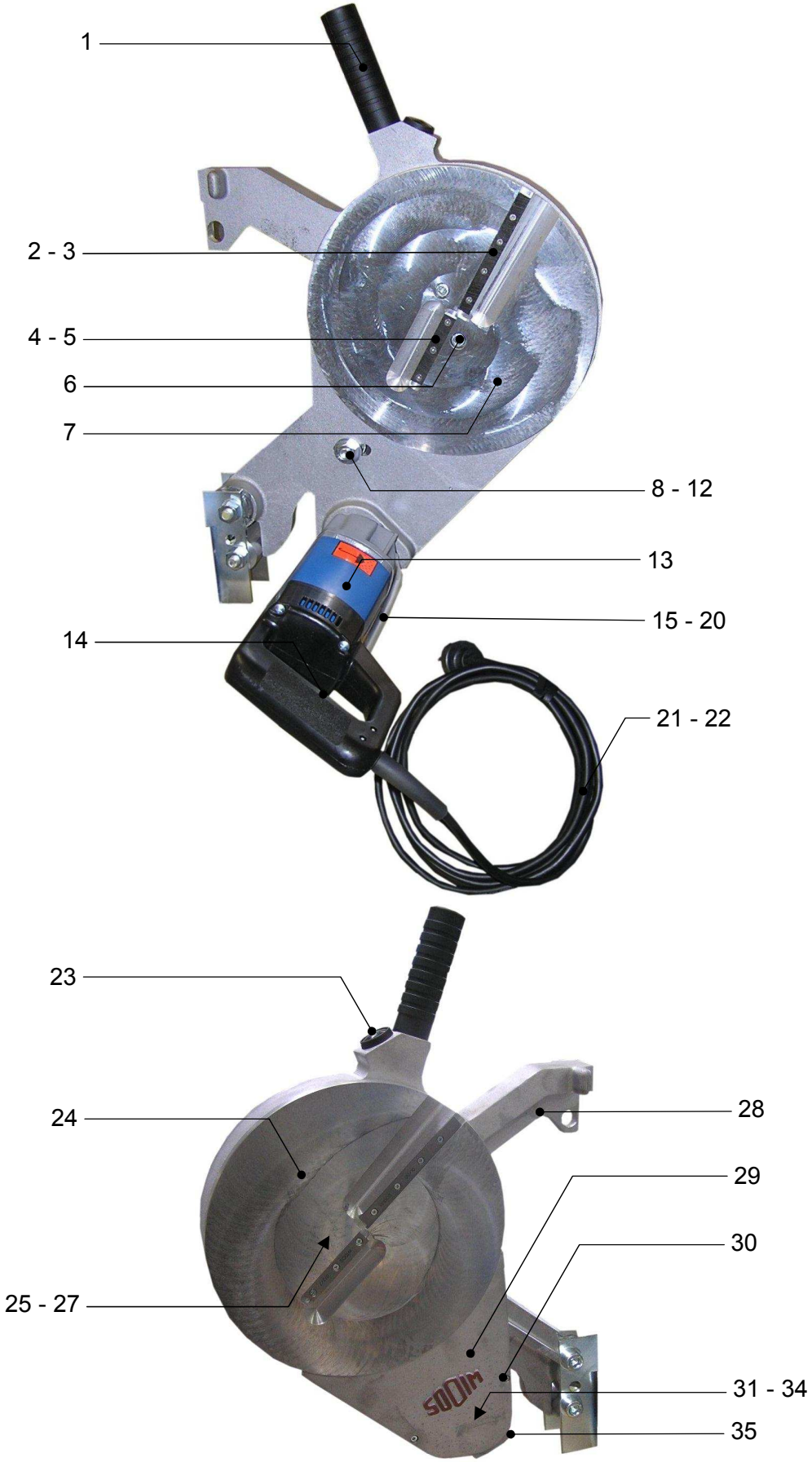
Pos.	Name	Piece	Order no.
	Pipe support OD 50 - 160		
1	Support	4	380634
2	Sliding washer	4	380635
3	Flat-head screw M 5x12 DIN 7991	4	7991E012
4	Tooth lock washer M5 Form A DIN 6797	4	6797E
5	Hexagon nut M 5 DIN 934	4	0934E
6	Support plate in the front	2	380631
7	Tooth lock washer M5 Form A DIN 6797	8	6797E
8	Hexagon nut M 5 DIN 934	8	0934E
9	Pan-head screw M 5x16 DIN 912	8	0912E016
10	Washer M 5 DIN 125	8	0125E
11	Knurled screw M10-20	2	380637
12	Washer M 10 B DIN 125	2	0125J
13	Nut for T-slot M10 DIN 508	2	0508J
14	Support plate in the rear	2	380632
15	Intermediate plate	2	380633
	Pipe support OD 180 - 250		
20	Support	4	380654
21	Frontal piece	2	380651
22	Sliding washer	4	380635
23	Flat-head screw M 5x12 DIN 7991	4	7991E012
24	Tooth lock washer M5 Form A DIN 6797	4	6797E
25	Hexagon nut M 5 DIN 934	4	0934E
26	Pan-head screw M 5x16 DIN 912	4	0912E016
27	Washer M 5 DIN 125	4	0125E
28	Tooth lock washer M5 Form A DIN 6797	4	6797E
29	Hexagon nut M 5 DIN 934	4	0934E
30	Rear piece	2	380652
31	Intermediate plate	2	380653
32	Knurled screw GN591-32-M10-20	2	380637
33	Washer M 10 B DIN 125	2	0125J
34	Nut for T-slot M10 DIN 508	2	0508J

Supports for pipes WIDOS 2500 / OD 250

Pos.	Name	Piece	Order no.
	Pipe bracket with pipe supports		
35	Pipe bracket OD 250	2	380734
36	Knurled screw	2	010605
37	Disc	2	S0103
38	Nut for T-slot M10 DIN 508	2	0508J
39	Guidance for clamping tool	2	4637006
40	Flat-head screw M 4x10 DIN 963	2	0963H010
41	Pipe support OD 20…OD 40	2	3806...*
41	Pipe support OD 2" IPS	2	106060
41	Pipe support OD 3" IPS	2	106088
41	Pipe support OD 4" IPS	2	106114
41	Pipe support OD 6" IPS	2	106168
41	Pipe support OD 8" IPS	2	106219

	* When ordering, please state the dimension !		

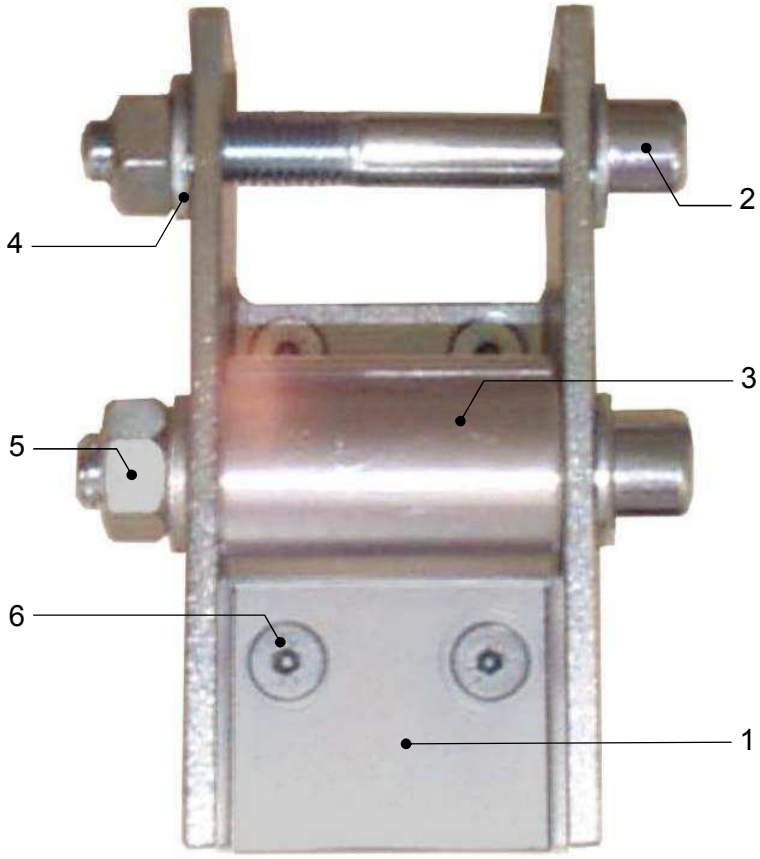
9.4. Planer



Planer WIDOS 2500 / OD 250

Pos.	*Name*	*Piece*	*Order no.*
1	Grip	1	H0906
2	Knife (120 mm)	2	MES120
3	Flat head screw Torx T-10 M 3x8 DIN 965	8	0965C008TX
4	Knife (72 mm)	2	MES072
5	Flat head screw Torx T-10 M 3x8 DIN 965	6	0965C008TX
6	Cylinder head screw M 8x30 DIN 912	2	0912H030
7	Planer disc, right	1	0924021
8	Bolt	1	091410
9	Ball bearing	2	L60001Z
10	Hexagon nut M 12 DIN 934	1	0934L
11	Washer M 12 DIN 134	1	0134L
12	Washer M 12 DIN 125	3	0125L
13	Driving machine 1050 W, 230 V	1	AMBF16
(13)	Driving machine 1050 W, 110 V	1	AMBF16110
14	Driving machine switch	1	ESMBF16
15	Collector carbon	1 Set	EKMBF16
16	Protection pipe	1	380427
17	Cable Ölflex 2x0,75 mm2	1 m	EL01207
18	Lusrte terminal 2-pin	1	EA1007
19	Lens head screw M 4x8 DIN 7985	5	0084D008
20	Tooth lock washer M4 DIN 6797	1	6797D
21	Connection cable 230 V	1	EK3220
(21)	Connection cable 110 V	1	on request
22	Antikink socket	1	EKT08
23	Button	1	ES3801
24	Planer disc, left	1	0924031
25	Ball bearing	1	L6013
26	Chain wheel (large) 3/8"x7/32", 76 teeth	1	091406
27	Flat head screw M 6x12 DIN 7991	4	7991F012
28	Holder for planer	1	380421
29	Cover	1	380424
30	Cylinder head screw M 4x12 DIN 912	2	0912D012
31	Chain wheel (short) 3/8", 11 teeth	1	K38011
32	Chain 3/8", 99 chain links	1	K38099
33	Chain joint 3/8"	1	KSCH38
34	Hexagon head screw M8x20 DIN 933	1	0933H020
35	Cylinder head screw M8x30 DIN 912	2	0912H030
--	Torx screw driver T 10	1	ZT10

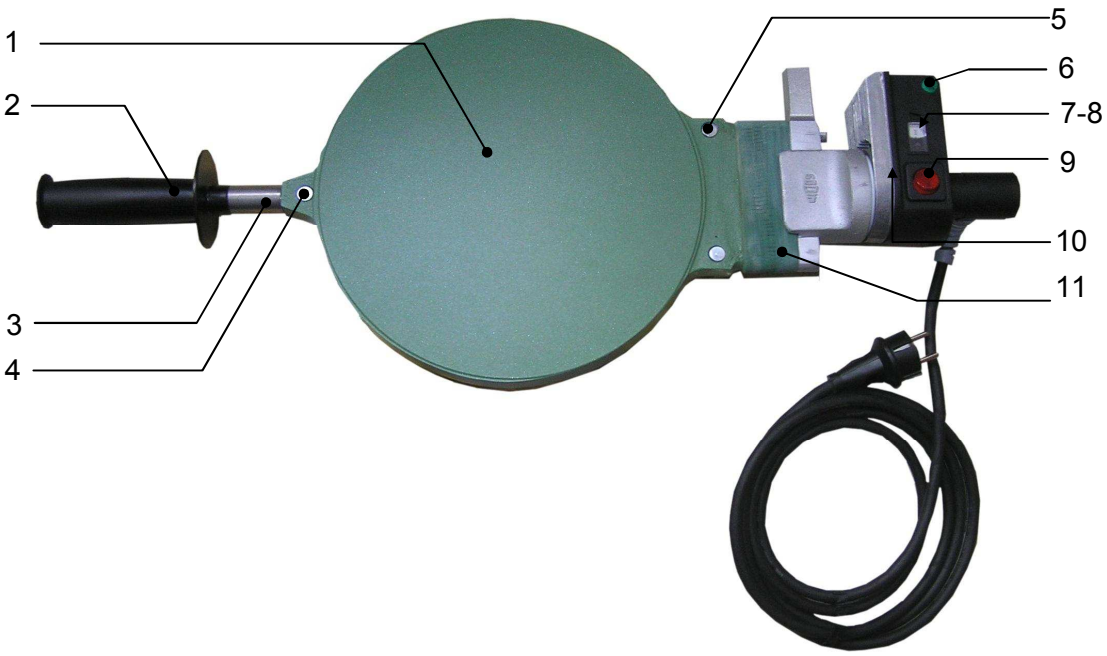
9.5. Planer holder

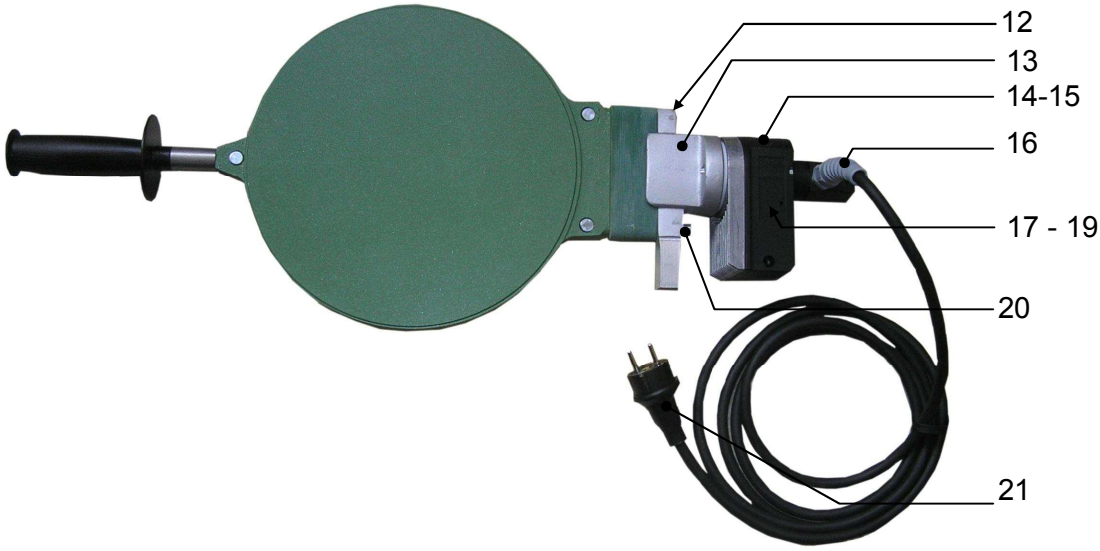


Planer Holder WIDOS 2500 / OD 250

Pos.	*Name*	*Piece*	*Order no.*
1	U-beam	1	3804041
2	Pan-head screw M 12x80 DIN 912	2	0912L080
3	Distance bushing for end stop of planer	1	380409
4	Washer M 12 DIN 125	4	0125L
5	Hexagon nut M 12 DIN 934	2	0934L
6	Pan head screw with low head M 6x14 DIN 7984	4	7984F014

9.6. Heating element

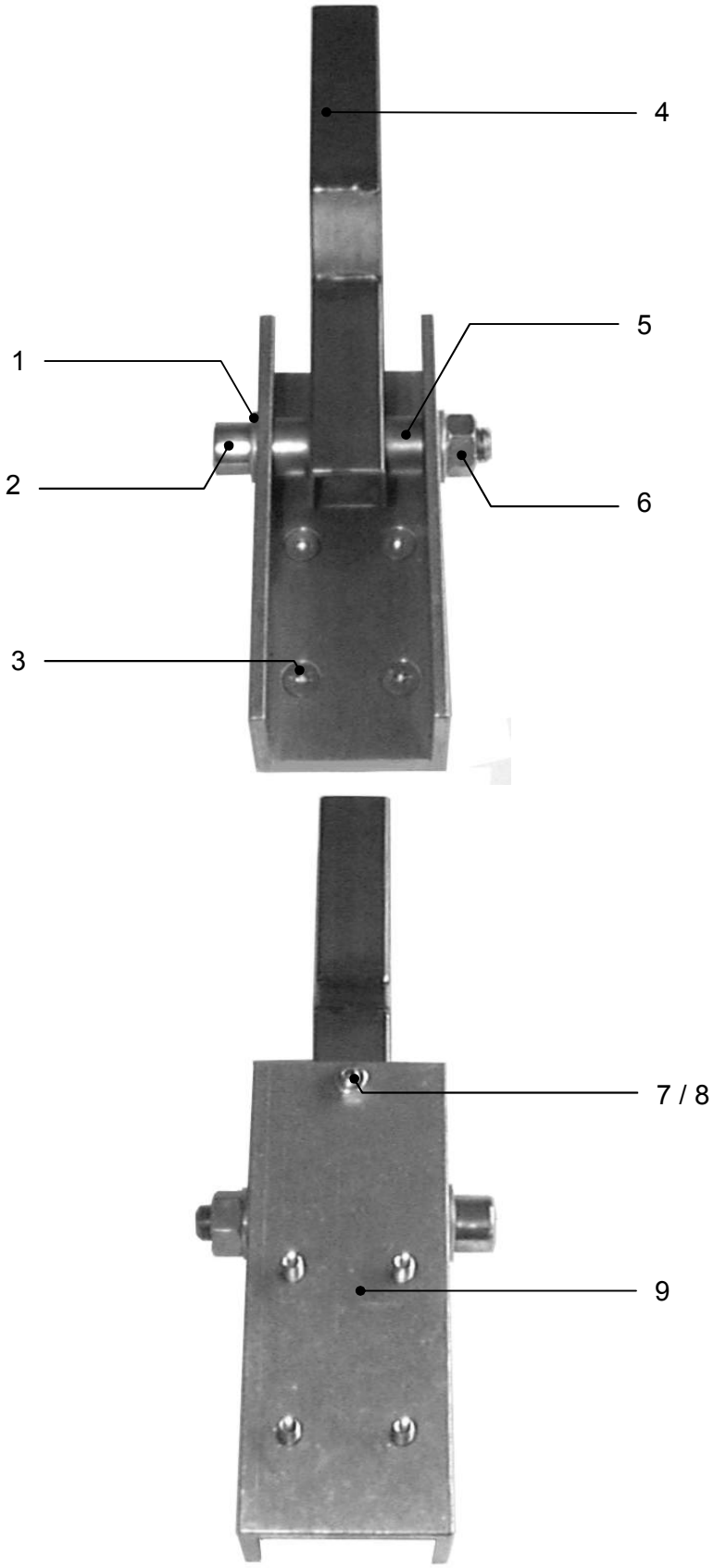




Heating Element WIDOS 2500 / OD 250

Pos.	*Name*	*Piece*	*Order no.*
1	Heating element complete 1000 W, 230 V	1	H0250E
	Heating plate new	1	HP0250E
	Heating plate in exchange	1	HPT0250E
(1)	Heating element complete 1000 W, 110 V	1	H0250E110
	Heating plate new	1	HP0250E110
	Heating plate in exchange	1	HPT0250E110
2	Grip	1	H0205
3	Handlebar	1	3805051
4	Tapped bushing	1	HGE-M6
5	Stud bolt	2	HGEW-M8
6	Control lamp, green	1	H2105
7	Turning knob with slot	1	H09075
8	Scale 180 - 280° (d 33)	1	H09074
9	Switch on/off, red	1	H0903
10	Insulating washer	1	012504
11	Insulating board	2	H0902
12	Pan-head screw M 6x80 DIN 912	1	0912F080
13	Joining piece	1	012503
14	Grip housing, short	1	H3807
15	Pan-head screw M 4x70 DIN 912	3	0912D070
16	Antikink socket	1	EKT08
17	Electronic control GZ4, 230 V	1	H0918220
(17)	Electronic control GZ4, 110 V	1	H0918110
18	Triac with heat sink	1	H09081
19	Sensor PT 1000	1	H09082
20	Pan-head screw M 6x90 DIN 912	1	0912F090
21	Connection cable 230 V	1	EK3220
(21)	Connection cable 110 V	1	on request

9.7. Heating element holder



Heating Element Holder WIDOS 2500 / OD 250

Pos.	*Name*	*Piece*	*Order no.*
1	Washer M 12 DIN 125	2	0125L
2	Pan-head screw M 12x80 DIN 912	1	0912L080
3	Pan head screw with low head M 6x14 DIN 7984	4	7984F014
4	Heating element holder	1	380508
5	Washer M 12 DIN 125	1	0125L
6	Hexagon head screw M 6 DIN 934	1	0934F
7	Grub screw M 6x14 DIN 913	1	0913F014
8	Hexagon head screw M 6 DIN 934	1	0934F
9	U-beam	1	380502

10. 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

Heating element butt welding machine

WIDOS 2500 / OD 250

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

1. DIN EN ISO 12100 – 1 and 2 (substitute 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. EN 60555, EN 50082, EN 55014,
   Electro-magnetic resistance

The complete technical documentation is available.

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

Ditzingen-Heimerdingen, the 01.02.2012

Martin Dommer (Technical director)