Working Instructions
Translation

Heating Element Butt Welding Machine

WIDOS 2500 / OD 315
with clamping tools for T-90°

Keep for further use!
Product identification

Type: WIDOS 2500 / OD 315
Serial number: / year of construction: see typ plate

Customer entries

Inventory-no.: 
Place of working: 

Order of spare parts and after sales service:

Address of manufacturer

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Introduction

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.

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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 315 is made for heating element butt welding of pipes and fittings out of PE, PP and PVDF with a diameter range of Ø = 50 - 315 mm (standard diameter: 50 / 63 / 75 / 90 / 110 / 125 / 140 / 160 / 180 / 200 / 225 / 250 / 280 / 315 mm).

The following pipes are weldable:

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>PE</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD 50 up to OD 180</td>
<td>SDR 11</td>
<td>SDR 5</td>
</tr>
<tr>
<td>up to OD 225</td>
<td>SDR 17</td>
<td>SDR 7,4</td>
</tr>
<tr>
<td>up to OD 315</td>
<td>SDR 33</td>
<td>SDR 11</td>
</tr>
</tbody>
</table>

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 works.

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 corresponding 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 plate. 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 315 General data

<table>
<thead>
<tr>
<th>Dimensions of pipes:</th>
<th>outside-Ø = 50 - 315 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material:</td>
<td>PP, PE 80, PVDF, PE 100</td>
</tr>
<tr>
<td>Fuse protection:</td>
<td>16 A</td>
</tr>
<tr>
<td>Wire cross section:</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>Emissions</td>
<td>- Noise exceeding 80 dB (A) may occur; during planing it is obligatory to wear ear protection! - When using the named plastic materials and when welding below 260° C no toxicant damp arises.</td>
</tr>
<tr>
<td>Ambient conditions in the welding area</td>
<td>- take care for cleanliness (no dust at the welding area) - do not weld below 5°C, if necessary preheat - avoid humidity, if necessary use a welding tent - avoid strong sun rays influence - protect from wind, shut the pipe ends</td>
</tr>
</tbody>
</table>

1.4.1.2. Heating element

<table>
<thead>
<tr>
<th>Power:</th>
<th>2100 Watt</th>
<th>2100 Watt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current:</td>
<td>9.1 A (± 10 %)</td>
<td>19.1 A</td>
</tr>
<tr>
<td>Voltage:</td>
<td>230 V (± 10 %)</td>
<td>110 V</td>
</tr>
<tr>
<td>Frequency:</td>
<td>50 Hz</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Surface:</td>
<td>nonstick coated</td>
<td></td>
</tr>
<tr>
<td>Attached elements:</td>
<td>- electronic temperature control - control lamp - connecting cable with plug</td>
<td></td>
</tr>
</tbody>
</table>

1.4.1.3. Planer

<table>
<thead>
<tr>
<th>Power:</th>
<th>1150 Watt</th>
<th>1150 Watt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current:</td>
<td>4.6 A (± 10 %)</td>
<td>9.5 A</td>
</tr>
<tr>
<td>Voltage:</td>
<td>230 V (± 10 %)</td>
<td>110 V</td>
</tr>
<tr>
<td>Frequency:</td>
<td>50 Hz</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Attached elements:</td>
<td>- connecting cable with plug</td>
<td></td>
</tr>
</tbody>
</table>

1.4.2. Equipment and accessories

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

| 1 | 1 Tool bag for 10 parts |
| 1 | Hexagonal socket screw key size 5 with T-grip for mounting / dismounting the reduction inserts |
| 1 | Hexagonal socket screw key size 10 |
| 1 each | Fork wrench size 13 / 19 |
| 1 | Screw driver with Torx-drive T10 |

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 advises 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 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 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. Measure 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, and starting the operation.
- 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 2500 / OD 315 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 may only be used

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

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

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.

Protect the heating element and planer from rain and dropping water.

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

2.8. Specific dangers

2.8.1. Danger of stumbling over electric wires

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

2.8.2. Danger of being burnt by heating element and welding area

You can burn yourself, inflammable materials can be ignited.

The heating element temperature is heated up to more than 250° C!

- 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.
- Take care that no person is standing in the swivelling 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 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.

2.8.3. Danger of cutting and catching clothes by the planer, danger of squeezing

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 swivelling area of the planer.

2.8.4. Danger of injury, crushing by turret

You may crush your fingers resp. be beaten by the turret upon release of 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.
2.9. 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.

2.10. 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, starting and operation of the machine and maintenance.
- Ignoring the information given in this manual.
- Structural changes 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

<table>
<thead>
<tr>
<th>No.</th>
<th>Denomination</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heating element</td>
<td>- Heating up the pipes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Can be swivelled in and out.</td>
</tr>
<tr>
<td>2</td>
<td>Scale</td>
<td>- Display of the applied welding force.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- max. display: 150 daN (kp).</td>
</tr>
<tr>
<td>3</td>
<td>Tension lever</td>
<td>- Arresting the support.</td>
</tr>
<tr>
<td>4</td>
<td>Planer</td>
<td>- Planing the pipes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Can be swivelled in and out.</td>
</tr>
<tr>
<td>5</td>
<td>Clamping device, right- / left-hand</td>
<td>- Clamping the pipes / fittings</td>
</tr>
<tr>
<td>6</td>
<td>Support for pipes, right- / left-hand</td>
<td>- Support the pipes / fittings</td>
</tr>
<tr>
<td>7</td>
<td>Cross handle</td>
<td>- Opening / closing the support.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Application of the adjusting force and of the jointing force</td>
</tr>
</tbody>
</table>
4.2. Elements at the planer

<table>
<thead>
<tr>
<th>No.</th>
<th>Denomination</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Button</td>
<td>- As soon as the planer is switched on and the button is pressed, the planer turns round</td>
</tr>
<tr>
<td>9</td>
<td>Locking button</td>
<td>- by pressing the closing switch is maintained on „On”</td>
</tr>
<tr>
<td>10</td>
<td>Switch on/off</td>
<td>- For switching on / off the planer</td>
</tr>
</tbody>
</table>

4.3. Elements at the heating element

<table>
<thead>
<tr>
<th>No.</th>
<th>Denomination</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Switch on/off with lamp</td>
<td>- For switching on / off the planer</td>
</tr>
<tr>
<td>12</td>
<td>Adjusting screw</td>
<td>- Adjusting the temperature of the heating element</td>
</tr>
<tr>
<td>13</td>
<td>Control lamp, green</td>
<td>- There are three different states:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: signalizes that the heating element is heated up at the moment. The desired temperature has not been reached yet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blinking: the heating element temperature is maintained by a certain pulse-position ratio.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Signalizes that the heating element is not heated up at the moment or that it cools down.</td>
</tr>
</tbody>
</table>
4.4. Elements to weld bends / fittings

For welding arcs / moldings are several holes on the machine slide, and an engraved scale. The angles have three holes and an elongated hole.

Top view of left table:

When welding straight pipes, the pieces with the following bore holes are screwed together:
- Table 1 with angle 6
- Table 2 with angle 7

When welding bends 0 – 7,5°, the following bore holes are screwed:
- Table 5 with angle 8
- Table 3 with angle 9

When welding bends 7,5 – 15°, the following bore holes are screwed:
- Table 4 with angle 8
- Table 3 with angle 9

View onto left angle:

The desired angle can be read at the reading edge.
4.5. Clamping tools for welding T-90° with OD 180

Clamping tool large
Double clamping tool
Fixing screws
5. **Starting and operating**

The instructions of this chapter are given as an introduction into the operation of the machine and as guidelines for 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 people. 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 / 60 Hz).

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. Mounting the pipe supports

The image shows the pipe support OD 50–160 mm and OD 180–315 mm mounted one after the other.

Take the small support for pipes with OD 50 – 160 mm.

Take the large support for pipes with OD 180 – 315 mm.

The required outside diameter of the pipe is adjusted by briefly lifting and displacing both supports (1). The sizes are engraved on the frontal and on the rear piece (2 + 3).

For changing 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 50 – 280 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 + 5.3).
- 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**

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

- Switch on the planer (chapter: Fehler! Verweisquelle konnte nicht gefunden werden., no. 10) and fix the switch with button (no. 9).
- Keep the button (no. 11) 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 (no. 11), press switch (no. 10) 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: Fehler! Verweisquelle konnte nicht gefunden werden, 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)

\[
\text{Sawing angle} = \frac{45°}{4} = 11,25°
\]
5.8. **Welding T-pieces 90 ° (optional)**

5.8.1. **Exchanging the clamping devices**

*Clamping tool for pipes:*

- For changing the clamping devices unscrew the fixing screws and remove the pipe clamping device.
- The right-hand T-piece clamping device (see illustration) is mounted on the right machine side flush to the inside and the fixing screw is inserted.
- For the alignment of the right-hand clamping device, the planer is swivelled in and the right-hand clamping device is aligned parallel to the planer, then the fixing screw is tightened.
- Now the left-hand T-piece clamping device is mounted on the left machine side flush to the inside and to the frontal machine face, the fixing screw is inserted.
- The clamping device is also aligned parallel to the planer or to the right-hand clamping device and the screw is tightened.
5.8.2. Welding T-pieces

First weld:

- Mount the reduction inserts according to the pipe diameter to be welded.
- Insert the sawed pipes into the left-hand and right-hand T-piece clamping devices in such a manner that the distance between inner edge of the pipe and inner edge of the clamping device is the same at both pipes. Clamp the pipes.
- Insert the planer between the work pieces, switch it on and keep the button (no. 11) at the planer handle pressed. Plane parallel with low pressing force. Planing has to be carried out until a revolving cutting has been formed on both sides.
- Open the support again, release button (no. 11) and swivel out the planer.
- Remove the produced cuttings without touching the worked surfaces.
- Close the support.
- 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.

The welding process is the same as for straight pipes. Multiplicate the force values taken from the table with factor 0.71.

- After expiration of the cooling time, release the force, open the clamping tools, remove the welded parts and open the support.

Second weld:

- Turn the welded piece for 90°, insert it in the right-hand T-piece clamping device and clamp it.
- Insert the sawed pipe in the left-hand T-piece clamping device.
- Insert the planer between the work pieces, switch it on and keep the button (no. 11) at the planer handle pressed. Plane parallel with low pressing force. Planing has to be carried out until a revolving cutting has been formed on both sides.
- Open the support again and swivel out the planer.
- Remove the produced cuttings without touching the worked surfaces.
• Close the support.
• Check pipe mismatch and gap on the joining pipe ends (gap max. 0.5 mm). The mismatch between the pipe ends should be 1 – 2 mm (see the sketch). It is reached by moving the left-hand T-piece clamping device in the longhole of the fixing screw (after welding the mismatch is compensated again).

The welding process is the same as for straight pipes. Multiply the force values taken from the table with factor 1.41.

• After expiration of the cooling time, release the force, remove the welded parts and open the support.
5.8.3. Preparing pipes for T-pieces

Fabrication of T-pieces 90° / 60° / 45°  
(60° / 45° = Y-pieces)

**Basis:** desired angle of junction

**Step 1:** Preparation / sawing of pipes and cut the point

**Step 2:** First welding

**Step 3:** Second welding

Multiply the pressure values taken from the welding table with the following factors:

<table>
<thead>
<tr>
<th>Angle of junction</th>
<th>90°</th>
<th>60°</th>
<th>45°</th>
</tr>
</thead>
<tbody>
<tr>
<td>First welding</td>
<td>0.71</td>
<td>1.0</td>
<td>1.31</td>
</tr>
<tr>
<td>Second welding</td>
<td>1.04</td>
<td>1.15</td>
<td>1.08</td>
</tr>
</tbody>
</table>
6. Welding tables

You can access our website and select our welding tables via the qr code shown here. Select “2500-ASM 160-315” and the corresponding material (PE / PP / PVDF).
### Report for heated plate welding of tubular components

<table>
<thead>
<tr>
<th>Employer</th>
<th>Contracting company</th>
<th>Welding machine:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Make:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type:</td>
</tr>
<tr>
<td>Order title</td>
<td>Name of the welder</td>
<td>Identity no.</td>
</tr>
<tr>
<td>Order no.</td>
<td>Name of the company of the welding inspector</td>
<td>Machine no.:</td>
</tr>
<tr>
<td></td>
<td>Year of manufacture:</td>
<td>Weather conditions</td>
</tr>
</tbody>
</table>

- 1 = sunny
- 2 = dry
- 3 = rain or snowfall
- 4 = wind

In the case of multiple designations follow the figures as above: (e.g. 34 = rain and wind)

<table>
<thead>
<tr>
<th>Protective measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = none</td>
</tr>
<tr>
<td>2 = screen</td>
</tr>
<tr>
<td>3 = tent</td>
</tr>
<tr>
<td>4 = heating</td>
</tr>
</tbody>
</table>

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

Signature of welder:  
Date and signature of the weld 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.
7. Maintenance / storing / transport

Goal of the chapter is:

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

7.1. General

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

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.

- The linear guides for heating element and planer must be cleaned every week e.g. with a brush.
- Check the linear guide carriages every 3 months and grease them over the lubricating nipple if necessary.
- Chips or other impurities in the guides can be the cause if the heating element or the planer jam or run heavily.
- Check the tightness of loosened screws.
- Check the function of safety devices after completion of the maintenance works. Especially insulation, tension resistance and protective cables resistance.

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 before using the machine in order to avoid damage by adhering dust.

- Guide rods and gear racks are to be kept free from dirtness and need to be covered with a thin oil film.
- Store 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. Electric diagram

8.1. Electric diagram 230 V
8.2. Electric diagram 110 V
9. **Spare parts list**

You can access our website and select our spare parts lists via the qr code shown here. Select “2500 – OD 315”
10. Declaration of conformity

Issuing the declaration of conformity with regard to complying with the basic requirements and assembling the technical documentation is in the sole responsibility of:

<table>
<thead>
<tr>
<th>Manufacturer / Installation company:</th>
<th>WIDOS Wilhelm Dommer Söhne GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>WIDOS GmbH Eisenhowerstr. 5</td>
</tr>
<tr>
<td></td>
<td>D-71254 Ditzingen</td>
</tr>
</tbody>
</table>

Subject of the present declaration is the following device:

<table>
<thead>
<tr>
<th>Product name:</th>
<th>Heating element butt welding machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model name:</td>
<td>WIDOS 2500 / OD 160</td>
</tr>
<tr>
<td>Machine number:</td>
<td></td>
</tr>
<tr>
<td>Year of construction:</td>
<td></td>
</tr>
</tbody>
</table>

For the stated device we herewith declare that it complies with the basic requirements stipulated in the following designated harmonizing regulations:

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

Statement of the relevant harmonizing standards referred to, or indication of the specifications that the conformity is declared for:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN EN ISO 12100</td>
<td>Safety of machines, basic concepts, general layout guidelines</td>
</tr>
<tr>
<td>DIN EN 60204.1</td>
<td>Electric equipment of industrial machines</td>
</tr>
<tr>
<td>DIN EN 60555,</td>
<td></td>
</tr>
<tr>
<td>DIN EN 50082,</td>
<td></td>
</tr>
<tr>
<td>DIN EN 55014,</td>
<td></td>
</tr>
<tr>
<td>Electro-magnetic resistance</td>
<td></td>
</tr>
</tbody>
</table>

Entitled to compile the technical documentation:

<table>
<thead>
<tr>
<th>Name:</th>
<th>WIDOS Wilhelm Dommer Söhne GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Eisenhowerstr. 5</td>
</tr>
<tr>
<td></td>
<td>D-71254 Ditzingen</td>
</tr>
</tbody>
</table>

Signed on behalf of the company:

<table>
<thead>
<tr>
<th>Name, first name:</th>
<th>Dommer, Martin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function:</td>
<td>Technical director</td>
</tr>
</tbody>
</table>

Heimerdingen, 06.05.2019

Place / Date: Legally binding signature

This declaration is to certify the compliance with the mentioned harmonizing regulations, however does not include any assurance of properties.