

# LEISTER Twinny S □

## AUTOMATIC COMBI-WEDGE WELDING MACHINE



Please read operating instructions carefully before use and keep for further reference.

### APPLICATION

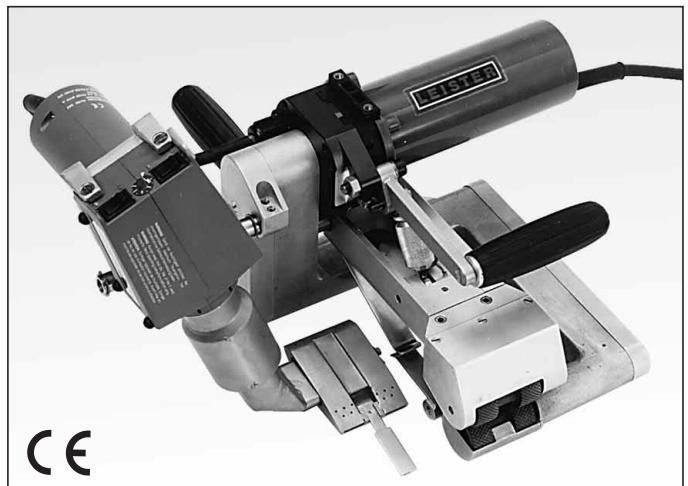
The LEISTER Twinny S is an Automatic Combi-Wedge Welding Machine for overlap welding and manufacturing of films and geomembrane liners in tunnels as well as earthwork and civil engineering. The heat is transmitted by using the best combination of contact and hot air.

Type	Hot Wedge System	Type of Material	Material Thickness
Civil Engineering	Long Combi-wedge	PE-HD, PE-C, PFA, PD, PP PVC-P, PE-LD, ECB, EVA	0,8 – 2,0 mm 1,0 – 3,0 mm
	Short Combi-wedge	PE-HD, PE-C, PFA, PD, PP PVC-P, PE-LD, ECB, EVA	0,3 – 1,0 mm 0,3 – 2,0 mm

- **Overlap** max. 125 mm / 5 inch
- **Type of seam** Welding seams are produced in accordance with DVS 2225 part 1 and BAM. Other dimensions are possible on request.

**DVS:** German Welding Association

**BAM:** Federal Institute for Materials Research and Testing, Berlin





## WARNING



**Danger!** Unplug the tool before opening it as live components and connections are exposed.



Incorrect use of the hot air tool can present a **fire and explosion hazard** especially near combustible materials and explosive gases.



Do not touch the element housing and hot wedge when hot as they can cause **burns**. Allow the tool to cool down. Do not point the hot air flow in the direction of people or animals.



## CAUTION



The **voltage rating** stated on the tool should correspond to the mains voltage.



For personal protection, we strongly recommend the tool be connected to an **RCCB (Residual Current Circuit Breaker)** before using it on construction sites.



The tool **must be** operated under supervision. The heat can reach combustible materials which are out of sight.



**Protect** the tool from **damp and wet**.

## APPROVAL MARKS



The tool is **CCA** certificated (**CENELEC Certification Agreement**).

## TECHNICAL DATA

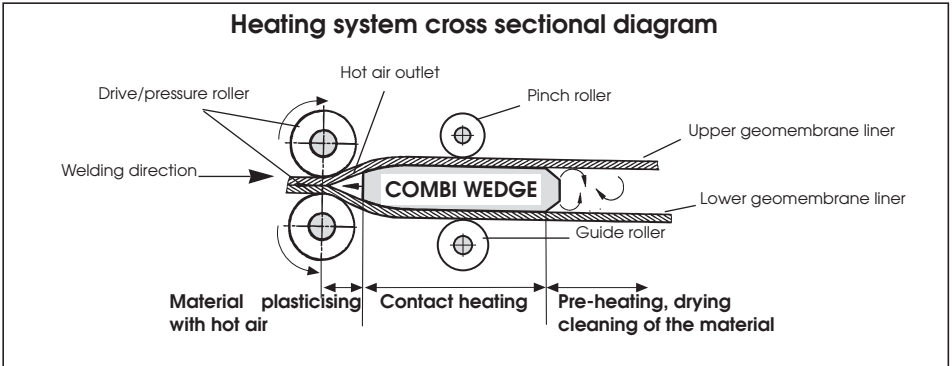
## electrical safety double insulated

Voltage	V~	100, 120, 200, 230 ★
Power consumption	W	1600, 1900, 2200, 2300/2900
Frequency	Hz	50 / 60
Temperature	°C / °F	20–600
Welding Pressure	N /lbs (pound)	max. 1000
Drive	m/min. /feet	0,2–2,5 (4,0)
Emissions level	L <sub>PA</sub> (dB)	71
Size	mm	350 x 390 x 270
Weight	kg	6,9 (Civil Engineering) / 6,5 (Tunnel Construction)

★ mains voltage cannot be switched over

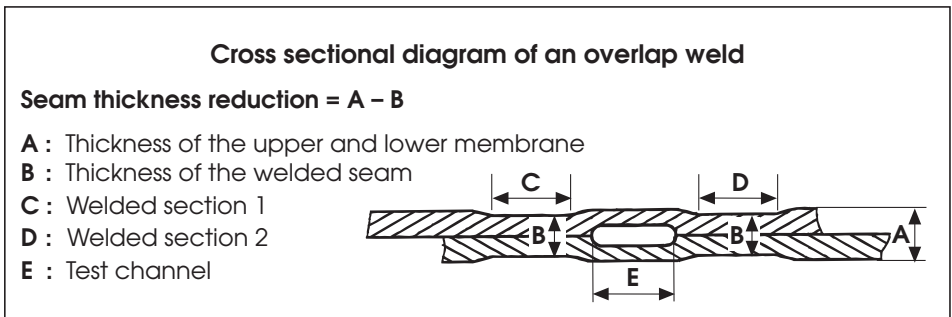
- **Heating system** → The hot air temperature is steplessly adjustable and electronically controlled. The heat transmission occurs with optimum combination of all the advantages of contact and hot air.

The flexible combi wedge contains **three heating zones**:



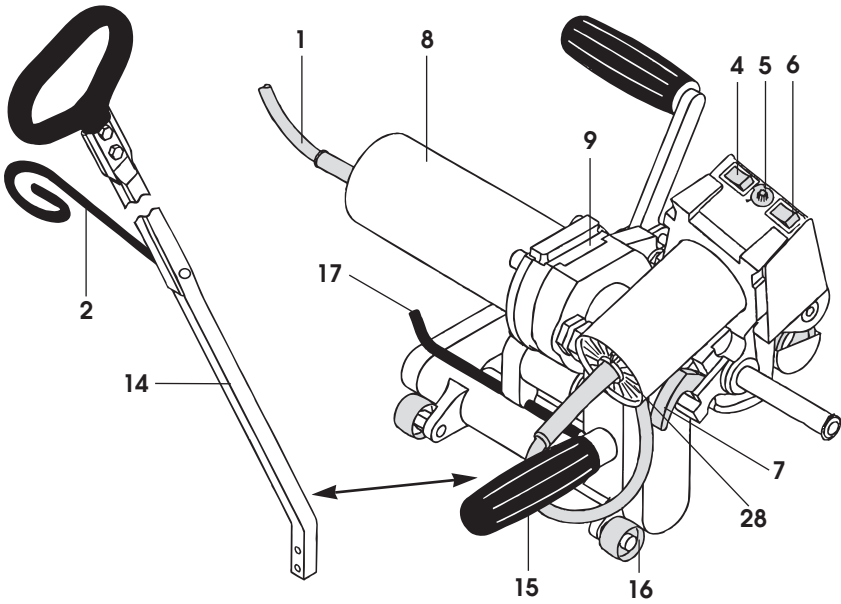
- **Welding pressure** → steplessly adjustable. The welding pressure is transmitted via a toggle lever to the pressure rollers. The **swivel head guarantees the equalisation of the pressure** to both welded sections (C and D) as well as on a welded seam without test channel.

This allows T-joints to be welded easily. During the welding process the welding pressure adjusts itself linearly to the change in material thickness of the geomembrane liner.

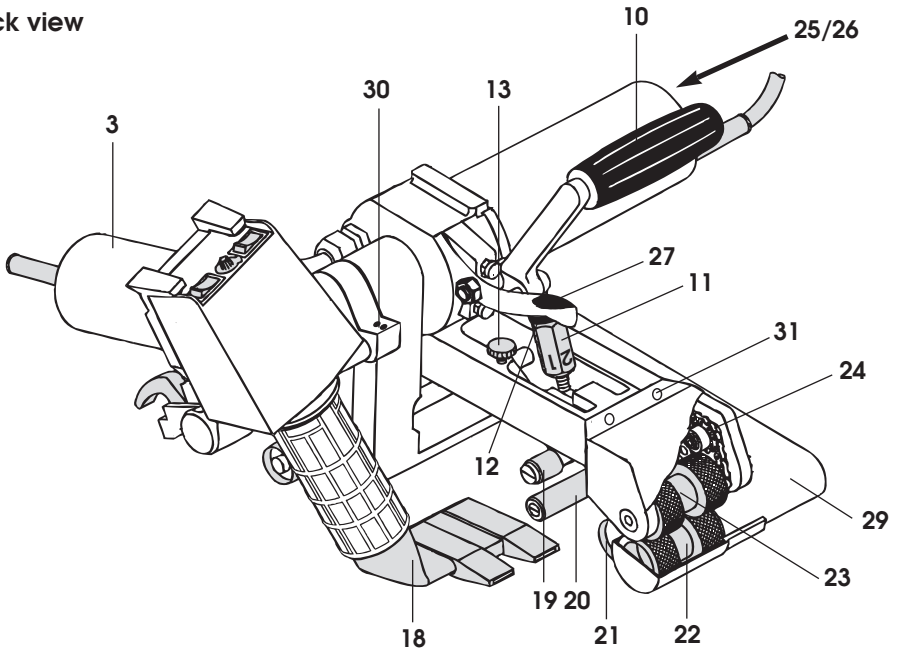


- **Drive** → double drive system, is steplessly adjustable and electronically controlled. The automatic control system with tachogenerator is designed in such a way, that the adjusted welding speed remains constant independently of the load. The power transmission to the drive/pressure rollers works through a **planetary gear**.

Frontal view



Back view



## Description of tool

## LEISTER Twinnly S

1. Cable to mains
2. Cable holder
3. Hot air blower
4. Heater ON/OFF
5. Potentiometer for heater
6. Two-step switch for air volume
7. Locking lever
8. Handle
9. Drive/power transmission
10. Lever for welding pressure
11. Adjustment screw for welding pressure
12. Locking screw
13. Adjustment screw for pinch roller
14. Guide bar
15. Guide handle
16. Travelling wheel
17. Restraining-bar
18. Combi-wedge
19. Pinch roller
20. Guide roller
21. Rear travelling wheel
22. Lower drive/pressure roller
23. Upper drive/pressure roller
24. Chain
25. Drive ON/OFF
26. Potentiometer for drive with scale
27. Lever for locking mechanism
28. Air filter
29. Lower part of the chassis
30. Setscrew, guide shaft
31. Adjustment screw, swivel head

## WELDING

## LEISTER Twinnly S

### Welding preparation

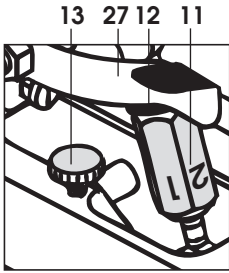
- Check:
  - *Laying out of material* Width of overlap 80 mm to 125 mm  
Geomembrane liners must be clean between the overlap as well as above and below
  - *Mains supply* at least 5 kW (generator)  
**supplied with an RCCB**
  - *Cable to mains* a minimum cable cross section in accordance with the table

230 V~	to 50 m	<b>2x1,5 mm<sup>2</sup> / 2x14 AWG</b>
	to 100 m	<b>2x2,5 mm<sup>2</sup> / 2x12 AWG</b>
120 V~	to 50 m	<b>2x1,5 mm<sup>2</sup> / 2x14 AWG</b>
	to 100 m	<b>2x2,5 mm<sup>2</sup> / 2x12 AWG</b>

### Operating conditions

- Attach **guide bar (14)** or **guide handle (15)**.
- Move the **hot air blower (3)** out and lift up until it locks.
- Connect the tool to the mains.
- Adjust welding parameters, see page 6.

– Welding pressure

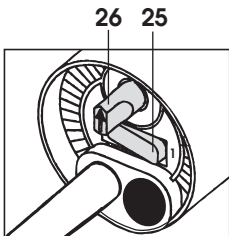
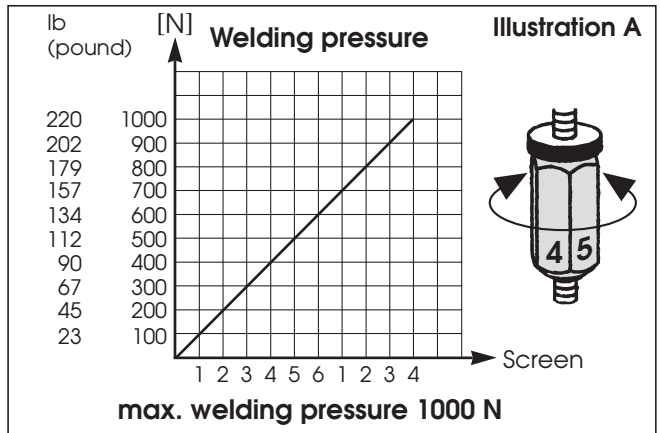


Engage and position the automatic welding machine onto the material to be welded. Tighten the **tension lever (10)** without engaging the combi-wedge. Gently tighten the **drive/pressure rollers (22/23)** with the **adjustment screw (11)** onto the material to be welded touching the material only lightly. Unlock the **lever for the mechanism (27)** and release the **tension lever (10)** at the same time.

Following **illustration A**, rotate the **adjustment screw (11)**. Tighten the **locking screw (12)** by hand. As required, adjust the pressure of the **pinch roller (19)** by using the **adjustment screw for pinch roller (13)**.

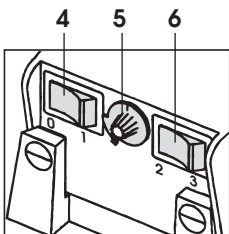
**Please note:**

When exceeding the max. welding pressure of 1000 N, mechanical damage can occur.



– Welding speed

Depending on the welding suitability of the film or geomembrane liner and the effects of the weather, set the welding speed with the **potentiometer for drive (26)** according to the scale.



– Temperature

Adjust the welding temperature with the potentiometer for **heater (5)**. The air volume is adjusted with the **two-step switch (6)** (depending on the material and combi-wedge). Switch on the **hot air blower (4)**. Heating up time approx. 5 min.

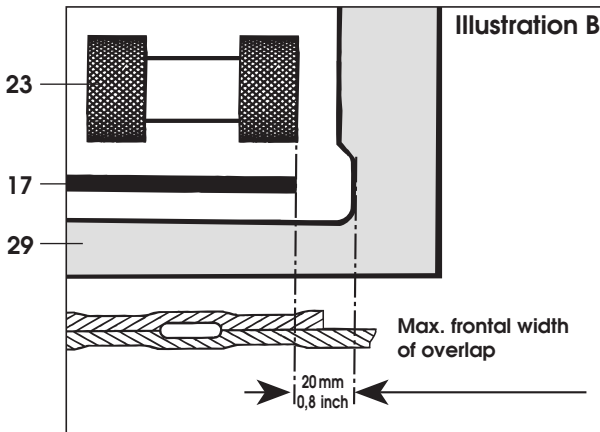
## Welding procedure

- Check
  - The **drive/pressure rollers (22/23)** as well as the **combi-wedge (18)** must be clean before engaging them into the geomembrane liner or film.
  - Required welding temperature must be achieved
  - Cable length / cable guide
- Guide and position the automatic welding machine into the over-lapped geomembrane liner or film.
- Switch on **drive (25)**
- Engage the **hot wedge (18)**
- Pull the **lever (10)**



### Beginning of the welding process

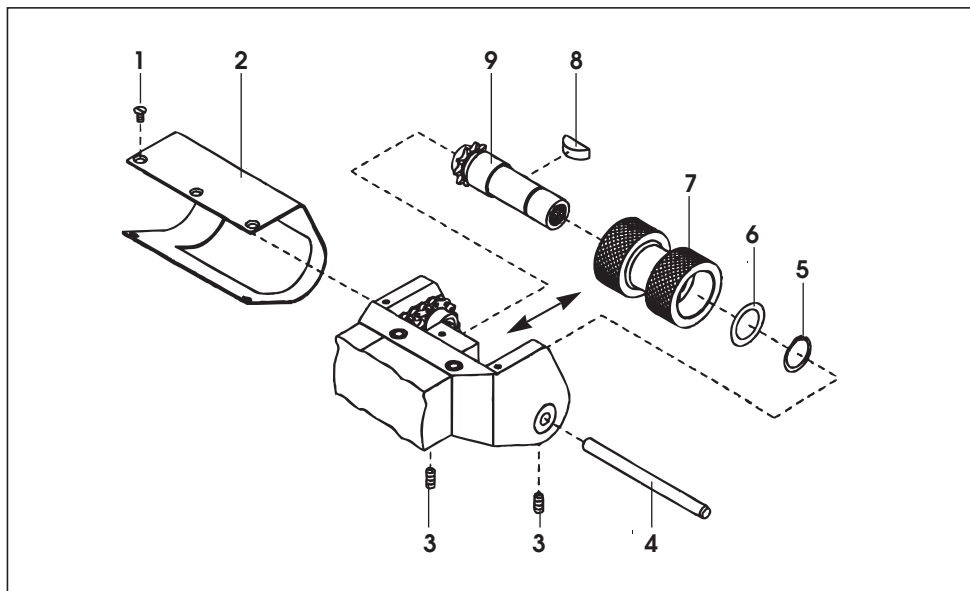
- Check the welded seam (wash/seam thickness reduction). As required, adjust the welding speed with the **potentiometer for drive (26)**.
- The automatic welding machine is guided along the overlap with the **guide bar (14)** or at the **guide handle (15)**, so that the frontal width of the overlap is kept within the 20 mm / 0,8 inch zone (see illustration B).



### End of welding process

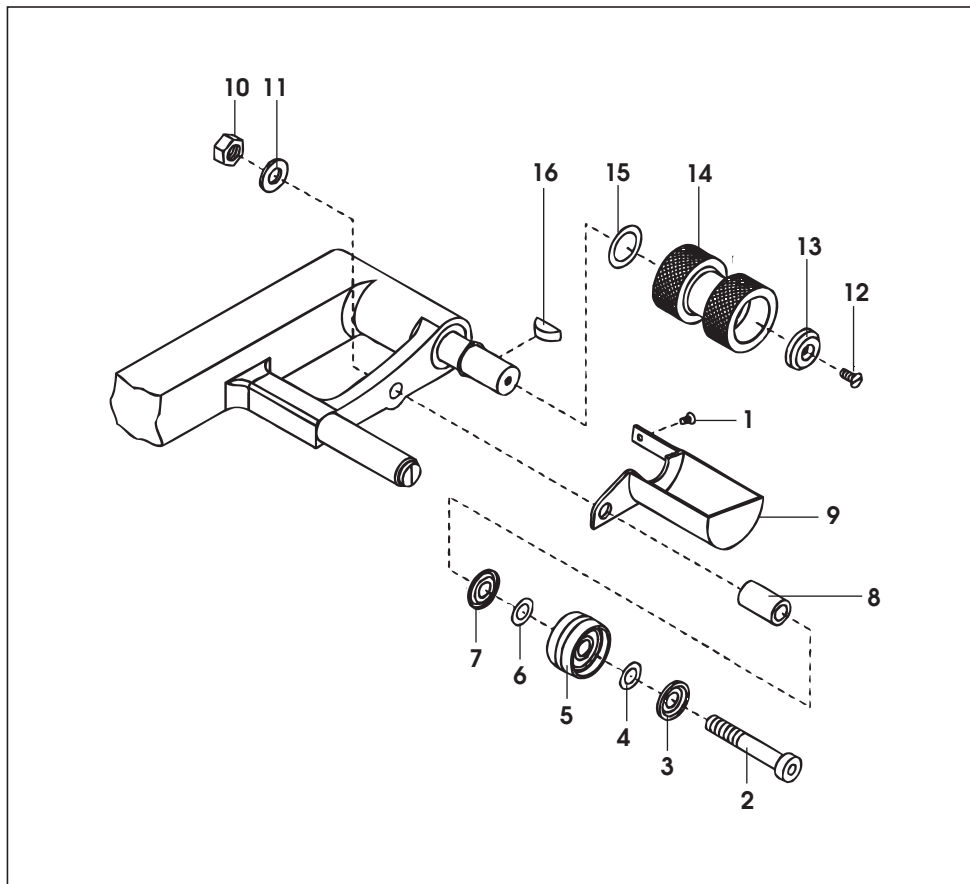
- Release the **tension lever (10)** and pull the **combi-wedge** out of the overlap and swivel up.
- Switch off the **drive motor (25)**. Set **potentiometer heater (5)** to zero to let the **combi-wedge (18)** cool down. Then switch off the **heating (4)**.

Different overlap joints can be produced with the LEISTER Twinny for various applications, e.g. in tunnel construction or civil engineering. These differ in width of the welded seam and in width of the test channel. Welding seams without test channel can also be produced. In order to achieve these different welding seams, the appropriate drive/pressure rollers have to be installed. These drive/pressure rollers are manufactured either in aluminium or stainless steel depending on customers' requests.



- |  |                                 |
|--|---------------------------------|
| 1. Countersunk screw M3x6              | 6. Spacer                       |
| 2. Guard plate for swivel head         | <b>7. Drive/pressure roller</b> |
| 3. Setscrew M4x8                       | 8. Woodruff key                 |
| 4. Cylinder pin 6x80                   | 9. Upper drive shaft complete   |
| 5. Guard ring (shaft $\varnothing$ 15) |                                 |

**Dismantling of the drive pressure rollers, in sequence Nos. 1 – 9**  
**Assembly of the drive/pressure rollers, in reverse order Nos. 9 – 1**

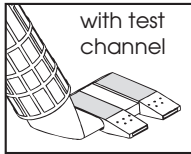


- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1. Countersunk screw M3x6            | 9. Guard plate drive/pressure roller |
| 2. Cylinder screw M8x50              | 10. Hexagon nut M8                   |
| 3. Nilos ring $\varnothing$ 8/20x1,8 | 11. Washer M8                        |
| 4. Shim $\varnothing$ 8/14x0,1       | 12. Countersunk screw M4x12          |
| 5. Rear travelling wheel complete    | 13. Locking washer                   |
| 6. Shim $\varnothing$ 8/14x0,1       | <b>14. Drive/pressure roller</b>     |
| 7. Nilos ring $\varnothing$ 8/20x1,8 | 15. Spacer $\varnothing$ 15/22x0,3   |
| 8. Spacer brush                      | 16. Woodruff key 5x6,5               |

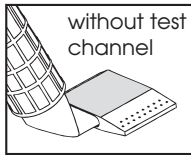
**Dismantling of the drive/pressure rollers, in sequence Nos. 1 - 16.  
 Assembly of the drive/pressure rollers, in reverse order Nos. 16 - 1.**

Depending on the material to be welded one should use either the heating system with either the **long or short combi-wedge**.

### Long Combi-wedge



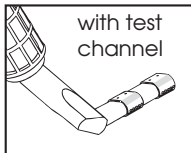
- Application/guidelines  
Depending on the material, possibly deviating  
PE-HD, PE-C, PFA, PP material thickness of **0,8 – 2,0 mm / 32 – 80 mil**  
PVC-P, PE-LD, ECB, EVA material thickness of **1,0 – 3,0mm / 40 – 120 mil**



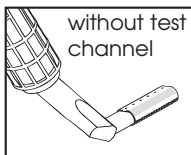
- Contains three heating zones: pre-heating, contact heating, material plasticising

The long combi-wedge produces a very high welding quality as well as high welding speeds by combining contact heat and hot air.

### Short Combi-wedge



- Application/guidelines  
Depending on the material, possibly deviating  
PE-HD, PE-C, PFA, PP material thickness of **0,3 – 1,0 mm / 12 – 40 mil**  
PVC-P, PE-LD, ECB, EVA material thickness of **0,5 – 2,0 mm / 20 – 80 mil**



- **Makes welding of films from 0,3 mm / 12 mil thickness possible**

- In order to prevent thin materials melting onto the contact area, the material to be welded is carried by a hot air cushion. The contact with the short combi-wedge is thus very brief.

- Maximum possible width of welding seam without test channel 50 mm / 2 inch
- Welding seam width, with test channel in accordance with DVS 2225 part 1 and BAM.
- Other dimensions possible on request

### Work process

- Loosen four screw on the **combi-wedge (18)**.
- Install the new heating system.
- Lightly tighten screw.
- Move the **combi-wedge (18)** between drive/pressure rollers.
- Align the **combi-wedge (18)** with the **pressure rollers (22/23)**.
- Tighten screws.
- Test-weld/check: The test channel must be in the centre of the welding seam.
- As required, adjustments can be made to the running-in depth of the heating system with the **inner hexagonal screw (30)**, in order to run the test channel off-centre.





**Service Record LEISTER Twinny S**

This document should be kept up to date during repair or servicing by the authorized LEISTER Service Centre. This document should be in the possession of the owner of the equipment.

**Technical data**

**Type of Automatic Hot Air Welding Machine** .....

**Order No.** .....

**Serial No** .....

**Rated voltage** ..... **V**

**Rated capacity** ..... **W**

**Sale** ..... **date**

**Service**

1. Date ..... Service Centre ..... Signature .....

2. Date ..... Service Centre ..... Signature .....

3. Date ..... Service Centre ..... Signature .....

4. Date ..... Service Centre ..... Signature .....

5. Date ..... Service Centre ..... Signature .....

6. Date ..... Service Centre ..... Signature .....

**Repair**

1. Date ..... Service Centre ..... Signature .....

2. Date ..... Service Centre ..... Signature .....

3. Date ..... Service Centre ..... Signature .....