LEISTER®

ASTRO

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Operating Instructions (Translation of the original operating instructions) GB

Read the operating instructions carefully before starting the device and keep them for future reference.

Leister ASTRO
Automatic Wedge Welding Machine

Application

The Leister ASTRO is an automatic wedge welding machine for overlap welding of geomembrane liners in earthwork and civil engineering.

- Thermoplastic geomembrane liners: Polyethylene PE-HD, PE-LD, Polypropylene PP.
- Type of seam: Welding seams are pro-duced in accordance with DVS 2225 part I and BAM.
  Other dimensions are pos-sible on request.
  DVS: German Welding Society for welding
  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 wedge tool can present a fire and explosion hazard especially near combustible materials and explosive gases.

Do not touch the element housing and 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.

Connect the tool to a socket outlet with protective earth conductor. Any interruption of the protective earth conductor within or outside the tool is danger-ous! Use only extensions cables with a protective earth conductor!

Risk of entanglement ! Do not touch pressure rollers when closing or during operation.

Caution

The voltage rating stated on the tool should correspond to the mains voltage. In the case of a power loss, disengage the hot wedge.

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. Radiant heat from the hot wedge can ignite flammable materials. The device machine may only be used by qualified specialists or under their supervision. Children are not authorized to use this device.

Protect the tool from damp and wet.

Conformity

Leister Technologies AG, Galileo-Strasse 10, CH-6056 Kaegiswil/Switzerland confirms that this product, in the version as brought into circulation through us, fulfils the requirements of the following EC directives.

Directives: 2006/42, 2004/108, 2006/95, 2011/65

Harmonised standards: EN 12100-1, EN 12100-2, EN 14121-1
EN 55014-1, EN 55014-2, EN 61000-6-2,
EN 61000-3-2, EN 61000-3-3,
EN 62233, EN 60335-2-45, EN 50581

Kaegiswil, 29.08.2012

Bruno von Wyl, CTO Beat Mettler, COO

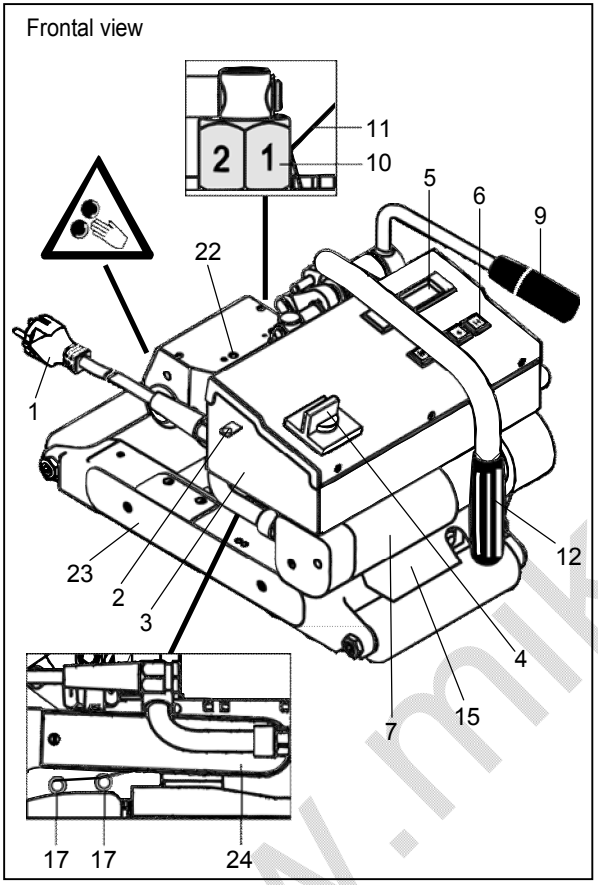
Disposal

Power tools, accessories and packaging should be sorted for environmental-friendly recycling. Only for EC countries: Do not dispose of power tools into household waste! According to the European Directive 2002/96 on waste electrical and electronic equipment and its incorporation into national law, power tools that are no longer suitable for use must be separately collected and sent for recovery in an environmental-friendly manner.

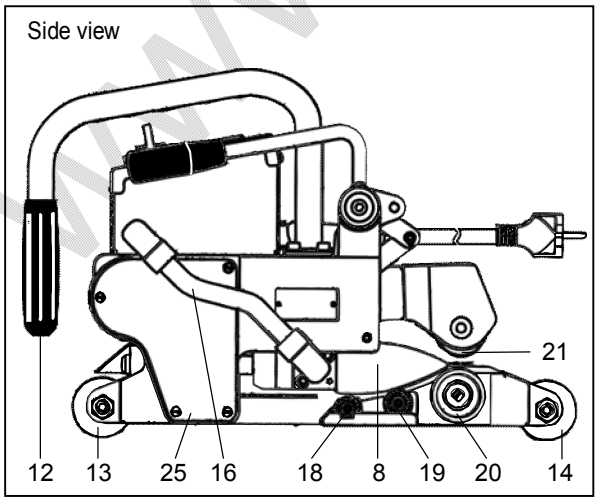
Technical data

Voltage	V~	200, 230 (mains voltage is not reversible)
Frequency	Hz	50/60
Power consumption	W	1800
Temperature	°C / °F	max. 420 / 788
Welding pressure	N / lbs	max. 1500 / 337
Drive	m/min / feet	0.8– 5.0 / 2.6 – 16.5
Overlap width	mm / Inch	max. 150 / 5.9
Thickness of material	mm / mil	1.5 – 3.0
Noise emission level	L_{pA} (dB)	< 71
Size L×W×H	mm	475 × 355 × 315
Weight	kg / lbs	23 / 50
Conformity mark		CE
Protection class I		⏚

Technical data and specifications are subject to change without prior notice.



1 Power supply cord
2 Cable clip
3 Housing of electronics
4 Main switch
5 Display
6 Keyboard
7 Motor/ Drive
8 Hot wedge
9 Lever
10 Adjustment screw for welding pressure
11 Locking spring of adjustment screw
12 Carrying handle / Guide handle
13 Front wheel
14 Back wheel
15 Foil guide
16 Cable conduit for hot wedge
17 Pinch roller
18 Front guide roller
19 Rear guide roller
20 Lower drive/pressure roller
21 Upper drive/pressure roller
22 Adjustment screw for swivel head
23 Chain guard of lower part
24 Chain guard of tension arm
25 Chain guard of gear case



Functional description

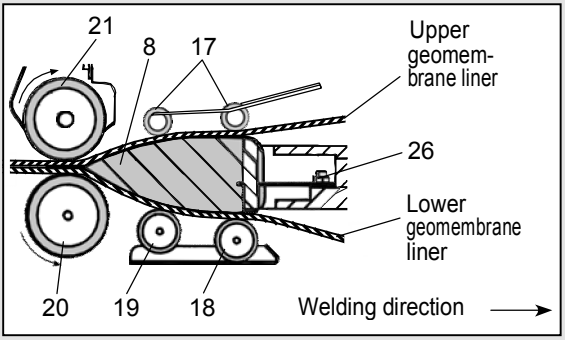
- Heating system → The hot air temperature is steplessly adjustable and eletronically controlled. It is a floating hot wedge. (Illustration A).
- Welding pressure → infinitely variable (steplessly adjustable). The welding pressure is transmitted via a toggle lever to the pressure rollers. The swivel head guarantees the equalization of the pressure to both welded sections (c and d) as well as on a welded seam without test channel (Illustration B). This allows T-joints to be welded easily. During the welding process the pressure adjusts itself linearly to the change in material thickness of the geomembrane liners.
- Drive → The welding speed is adjustable and electronically controlled in steps of 0.1 m/min / feet. Digital display of SET and ACTUAL values. The power transmission works through a three stage planetary gear.

Adjusting the hot wedge

Adjusting of the guide rollers for the requested material thickness (Illustration A).

- Adjustments may only be made to the hot-wedge (8) after it has cooled down.
- Engage the automatic wedge-welding machine on the geomembrane liner or film to be welded.
- Stretch the lever (9) (Illustration C).
- Loosen the hexagon cap screw of the rear guide roller (19).
- The distance between the hot wedge (8) and the rear guide roller (19) should be the thickness of the material and the sharp tongue of the wedge should lie centrically to the pressure rollers (20/21).
- Tighten the hexagon cap screw of the rear guide roller (19).
- Loosen the hexagon cap screw of the front guide roller (18).
- The distance between hot wedge (8) and front guide roller (18) should be about 1 mm.
- Tighten the hexagon cap screw of the front guide roller (18).

Illustration A / Cross-section diagram of hot wedge system



8 Hot wedge
9 Lever
17 Pinch roller
18 Front guide roller
19 Rear guide roller
20 Lower drive/pressure roller
21 Upper drive/pressure roller
22 Adjustment screw for swivel head
23 Chain guard of lower part
24 Chain guard of tension arm
25 Chain guard of gear case
26 Fastening screw for hot wedge

Illustration B / Cross sectional diagram of an overlap weld

Seam thickness reduction = a – b
a Thickness of the upper and lower membrane
b Thickness of the welded seam
c Welded section 1
d Welded section 2
e Test channel

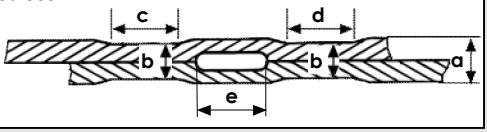
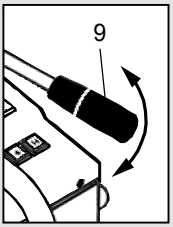


Illustration C



Welding parameter

Welding pressure

- Insert the two strips of the material to be welded between the lower drive-/pressure roller (20) and the upper drive/pressure roller (21) by approx. 5 mm (Illustration E). Pull the lever (9) (Illustration C). The hot wedge is automat-ically pushed forward. Push and hold down the locking spring (11). Turn the adjustment screw for welding pressure (10) until the drive/ pressure rollers (20/21) slightly touch the material to be welded. Let go the locking spring (11) and release the tension of the lever (9).
- Keep pushing the locking spring of the adjustment screw (11). Adjust the welding pres-sure by turning the corresponding adjustment screw (10) according to illustration D and let go the locking spring (11) at the requested welding pressure.
- Warning: If the maximum welding pressure of 1500 N is exceeded mechanical damage may occur.

Illustration D

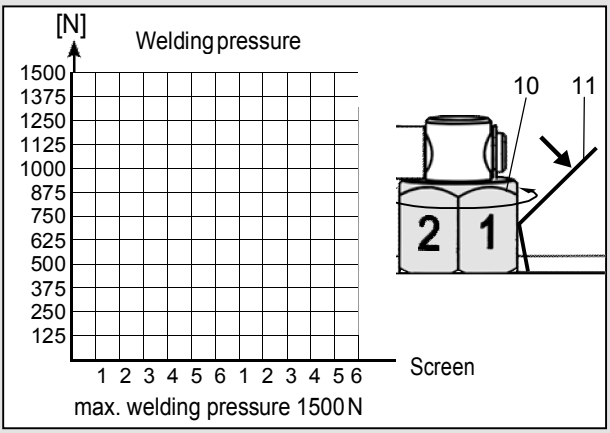


Illustration E

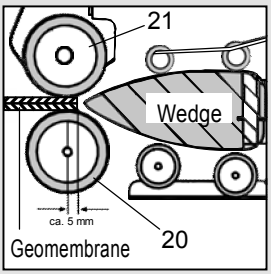
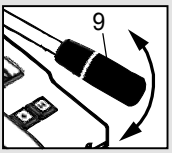
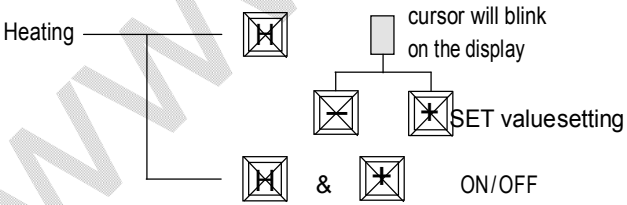


Illustration C



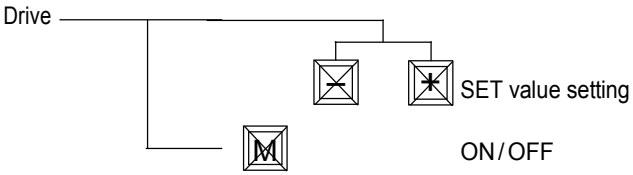
Welding temperature

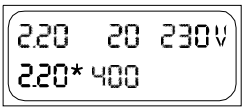
- Set the welding temperature with the [H], [▼], [▲] keys. The temperature is dependent on the material and the ambient temperature. The in-put SET value will be shown on the display. Switch on the heating by pressing the [H] and [▲] keys simultaneously. Heating up time approx. 5 mins.



Welding Speed

- According on the film or geomembrane liner and the influence of the weather, set the welding speed with the [▼] [▲] keys. The in-put SET value will be shown on the display.





Welding preparation

- Laying — Width of overlap is about 80mm to 130mm. Geomembrane liners must be clean between the overlap as well as above and below.
- Mains supply — At least 3kW (generator) supplied with an RCCB
- Cable to mains — A minimum cable cross section in accordance with the table.

200–230V~	to 50 m	3 × 1.0 mm²
	to 100 m	3 × 2.5 mm²
120V~	to 50m	3 × 1.5 mm²
	to 100 m	3 × 2.5 mm²

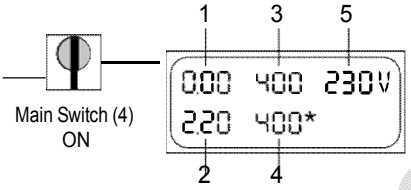
Operating conditions

- Before putting into operation, check power supply cord (1) and connector as well as extension cable for electrical and mechanical damage. Do not operate the equipment if damage is found.

Connect the equipment to nominal voltage.
The nominal voltage indicated on the equipment must correspond to the mains voltage.
In the case of a power loss, disengage the hot wedge (8).

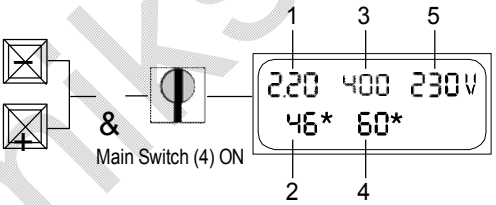
- Start the device with Main- or Control-Level.

Main - Level



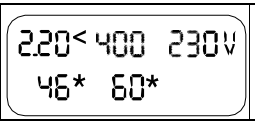
1 Speed	ACTUAL value
2 Speed	SET value
3 Temperature	ACTUAL value
4 Temperature	SET value
5 Voltage display	ACTUAL value

Control - Level



1 Speed	ACTUAL value
2 Speed	Power consumption in %
3 Temperature	ACTUAL value
4 Temperature	Power consumption in %
5 Voltage display	ACTUAL value

< Overload indication * Heating / Drive active



- Check the welding process and identify faults by means of the display of power consumption.

Display 4	Heating reason for fault after heating up timet
100 %	• mains under-voltage
Display 2	**Drive reason for fault**
100 %	• mains under-voltage
100 % or <	• overlap of the geomembrane liner too wide
100 % or <	• dirt on the drive rollers (20/21)
100 % or <	• max. welding pressure (1500 N) has been exceeded
100 % or <	• high welding speed with large sudden overload (ie anchoring trench, joints....)

If malfunction does not disappear, contact service center

Test Weld

- WARNING: Welding parameters must be verified by means of test welds before the welding operation is performed.
- Perform test weld as per the welding instructions of the material manufacturer and national standards, directives or start parameters as shown in the table.

HD - PE (material thickness in mm)			
1.5	2.0	2.5	3.0
420 °C	420 °C	420 °C	420 °C
5.0 m/min.	4.5 m/min.	4.2 m/min.	4.0 m/min.
1250 N	1500 N	1500 N	1500 N

Welding

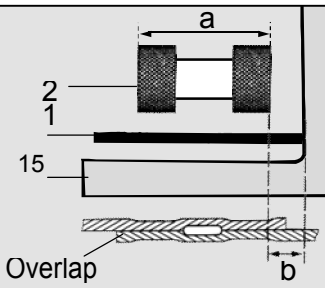
- Check: – Drive/ Pressure rollers (20/21) as well as the hot wedge (8) must be clean before engaging into the geomembrane liner or film.
  – Cable length/Cable guide.
- Adjust welding parameters, see page 15.
- The welding temperature must be achieved.
- Guide and position the automatic welding machine into the over-lapped geomembrane liner or film.
- Switch on drive motor with [M] key on keyboard (6).
- Pull the lever (9).

Beginning of welding process

- Check the welded seam (wash/seam thickness reduction). As required, adjust the welding speed with [ ] [ ] keys on keyboard (6).
- The automatic welding machine is guided along the overlap with the carrying handle/guide handle (12), so that the frontal width of the overlap is kept within the 22mm zone (see illustration F).

Illustratio

15 Foil guide
21 Upper drive/pressure roller
(a 50 mm or 45 mm)
23 Chain guard of lower part
b Max. frontal width of
a overlap
a 50 mm = b 22 mm



End of welding process

- Release the tension lever (9) 1 cm before the end of the welded seam.
- Switch off the drive motor with key [M] on the keyboard (6). Switch off the heat-ing by pressing the [ ] and [ ] keys on the keyboard (6) simultaneously.

After completion of the welding work, allow the hot wedge (8) to cool down and remove the power supply cord from the mains socket.

Transport

- Use the storage case included in delivery when transporting the ASTRO hot-wedge welding machine. The storage case is equipped with a carrying handle.

Do not use the handles of the storage case, the tension lever (9) and handle /guide handle (12) of the automatic hot-wedge welding machine for transport by crane.

Use the carrying handle / guide handle (12) to lift the automatic hot-wedge welding machine by hand.

Allow the hot-wedge (8) to cool down before transport.

Training

- Leister Technologies AG and its authorised Service Centres offer free welding courses and training. Informationen below www.leister.com.

Accessories

- Only Leister accessories should be used

Maintenance

- Check power supply cord (1) and plug for electrical and mechanical damage.
- Clean hot wedge (8) with a copper brush.
- Clean drive and pressure rollers (20/21) with a wire brush.
- Treat chain (22) with a suitable spray as required (chain guard 23/24).
- Check whether rollers (13/14/17/18/19) are running smoothly.

Service and repair

- The tool should be checked by an authorized Service Center if the following message appears on the display (5): «maintenance; servicing».
- Repairs should only be carried out by authorised Leister Service Centres. They guarantee a correct and reliable repair service within reasonable period, using original spare parts in accordance with the circuit diagrams and spare parts lists.

Warranty

- For this tool, we generally provide a warranty of one (1) year from the date of purchase (verified by invoice or delivery document). Damage that has occurred will be corrected by replacement or repair. The electrical hot-wedge is excluded from this warranty
- Additional claims shall be excluded, subject to statutory regulations.
- Damage caused by normal wear, overloading or improper handling is excluded from the guarantee.
- Warranty claims will be rejected for tools that have been altered or changed by the purchaser.

Your authorised Service Centre is:

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