

**LEISTER**

PLASTIC WELDING

# Roofing

2019/2020



## Flat- and Pitched Roofs

Everything for welding on the roof







Dear Leister customers

When working on the roof, you always need to be able to completely rely on your devices. This is our firm belief. And this is why you should quite rightly have high expectations of a Leister automatic roof welding machine: We guarantee to provide you with maximum device reliability and the best all-round service.

Our welding devices are highly reliable even in difficult conditions with undervoltage. A high level of flexibility is also required when it comes to automatic welders. Our devices are used in numerous roof applications as well as in situations where space is at a premium. With their sophisticated ergonomics, the easy-to-handle automatic roof welding machines are keeping abreast of the trend, which is moving away from manual welding and in the direction of automatic welding. Using the UNIROOF, you can carry out welding both in and on the parapet. The economic efficiency is also given to a high degree with automatic welding.

We always strive to tailor the devices to meet our customers' needs in the best way possible. Our development department is continually carrying out research into new technologies so that we can offer you the highest-possible quality. This is why you can count on Leister to provide devices that use state-of-the-art technology. Even under the harshest conditions, you can therefore rely on our automatic welders. This is what we have stood for for more than 70 years.

In this brochure, you will find numerous application options, as well as tips and tricks. These will help you to ensure a leak-free roof, whether you are using bitumen or plastic.

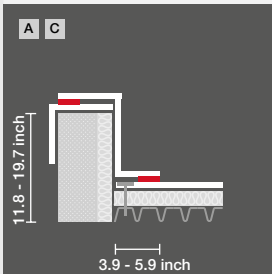
I hope you enjoy reading our brochure!

**Roland Beeler**

Business Line Plastic Fabrication, Roofing & Flooring (PRF)

# For all roof applications

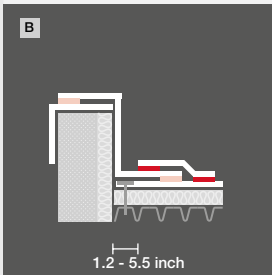
Whether you're working in or on the parapet, under vaults, or on flat surfaces – you are guaranteed to find the automatic welders you need among our wide range of products. Here, you will gain an overview of various roof applications and find out which automatic welders are suitable for which applications.



The **UNIROOF AT/ST** welds as close as 3.9 inch to the edge of the parapet or on the parapet without leaving a gap. Just one device for two applications. This flexibility enables a reliable jointing technique. Detail C enables anti-fall protection to be applied in a controlled and safe manner.

UNIROOF AT/ST

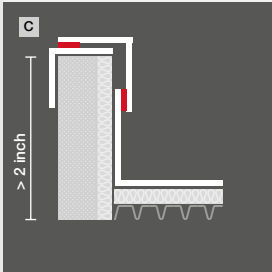
page: 18 - 20



As the **UNIDRIVE 500** only requires 1.2 - 1.6 inch to insert an overlap from right to left, you can weld tirelessly in a safer environment.

UNIDRIVE 500

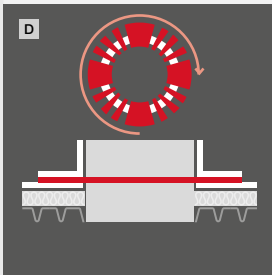
page: 15 - 17



Thanks to the handles of the **UNIDRIVE 500** it allows to weld difficult details ergonomically, cleanly and tightly. Thanks to the rotating nozzle and reversible drive, all welding applications can be carried out. The UNIROOF AT/ST can also be used as an alternative.

UNIDRIVE 500  
UNIROOF AT/ST

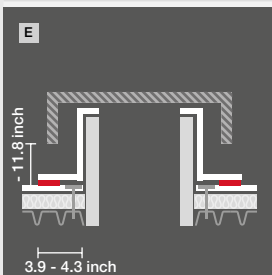
page: 15 - 17  
page: 18 - 20



The **UNIDRIVE 500** can be used flexibly and simplifies circular welding. This semi-automatic device is suitable for detail work and closes the gap between manual and automatic welding.

UNIDRIVE 500

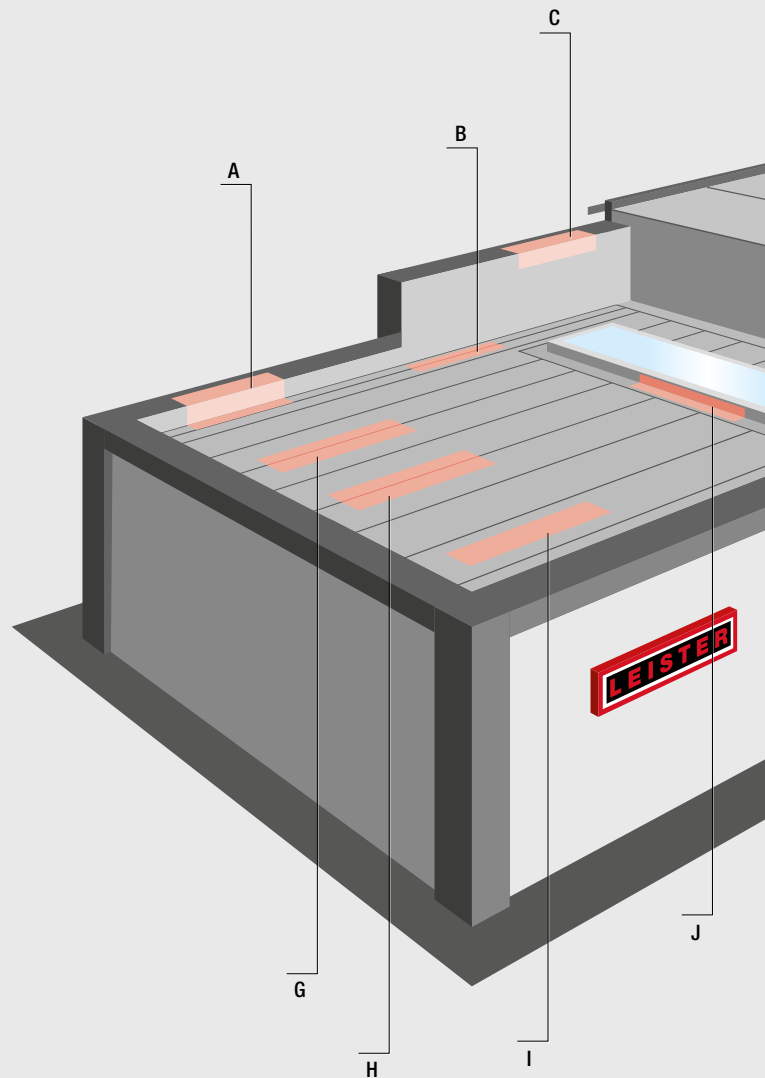
page: 15 - 17



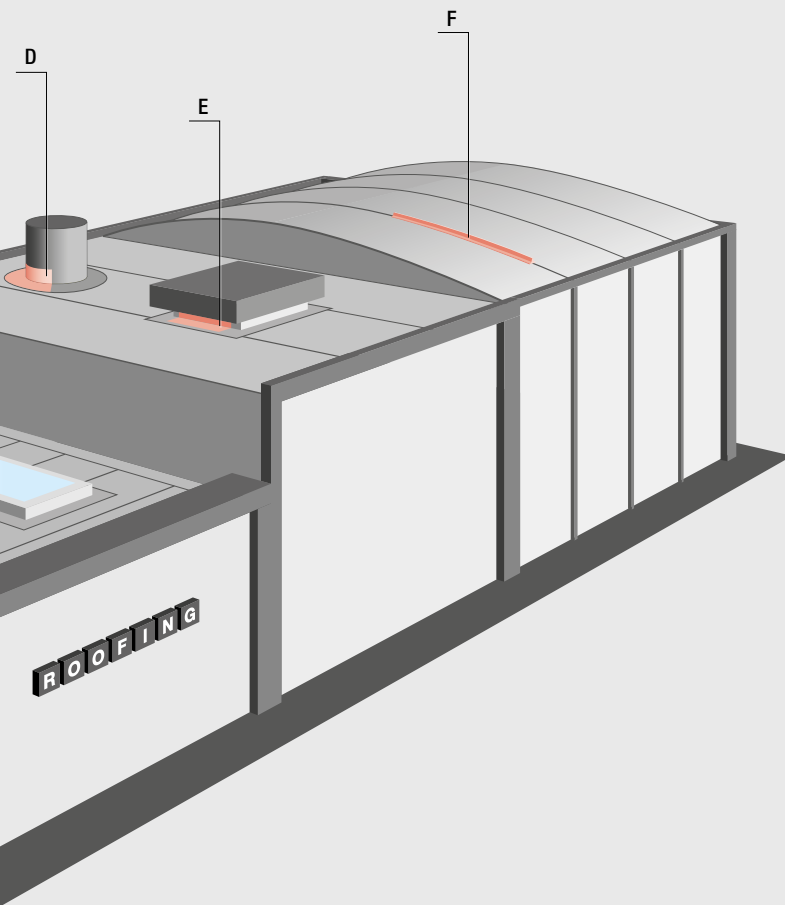
The **UNIROOF AT/ST** enables sealing sheets to be used even on a wide range of details, such as domed skylights, special balustrades, or renovations. This is made possible by its compact design and height, which does not exceed 11.8 inch.

UNIROOF AT/ST

page: 18 - 20

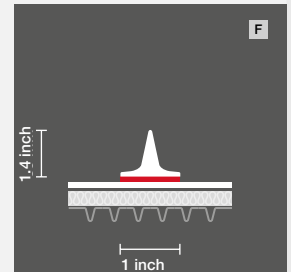






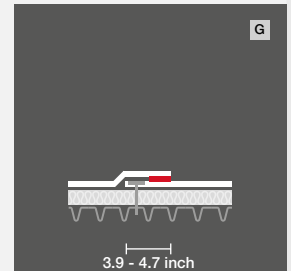
Arduous manual welding is a thing of the past. You can weld safely and ergonomically with the **UNIROOF AT/ST 155.414 kit for plastic roof profiles**. You can set the pressure rollers steplessly according to the width of the profile. At 78.7 inch/min, you can carry out welding extremely efficiently.

UNIROOF AT/ST 155.414 kit page: 20  
Due to the patent situation not available in the US



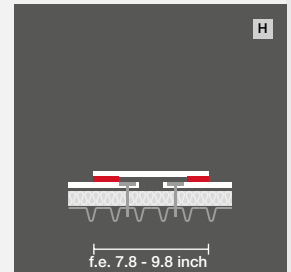
The popular, ergonomic **VARIMAT V2** automatic roof welder welds all TPO and PVC sealing sheets with extra pressure thanks to its patented pressure roller and trailing roller. Its high blowing capacity guarantees high efficiency for all sealing sheets. This is also possible with the UNIROOF AT/ST.

UNIROOF AT/ST page: 18 - 20  
VARIMAT V2 page: 22 / 23



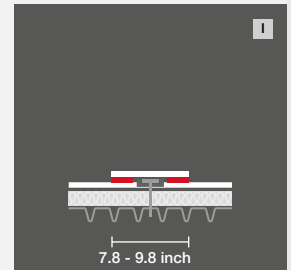
Sealing tape is welded over when fastening rails are used. Using the **UNIROOF AT/ST**, you will achieve a reliable weld in two sequences. This is also possible with the VARIMAT V2.

UNIROOF AT/ST page: 18 - 20  
VARIMAT V2 page: 22 / 23



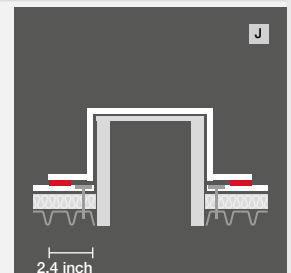
Sealing tape of between 7.8 and 9.8 inch is welded over when fastening rails are used. Using the **UNIROOF AT/ST** and VARIMAT V2, you will achieve a reliable weld in two sequences.

UNIROOF AT/ST page: 18 - 20  
VARIMAT V2 page: 22 / 23



The **VARIMAT V2 mirror kit** enables you to weld as close as 2.4 inch to the edge. The saves materials and is economical. The mirror-inverted nozzle is also suitable for numerous other applications.




Mirror kit for VARIMAT V2 page: 23








## The benefits of Leister at a glance:

### Robust device components

-  Low service costs with maintenance-free brushless drive and blower motors
-  Durable heating elements
-  Corrosion-resistant weights

### Performance

-  High welding speeds and top performance
-  Automatic welders with maximum flexibility cuts out steps in the process
-  Low failure rates at the construction site (even with a generator)

### Service

-  Support and device demonstration by our field service representatives
-  Everything available from a single source thanks to a wide product range
-  Tight distribution network with short delivery times
-  Welding window service
-  Long spare parts guarantee when discontinued after 7 years
-  Quick repair and service
-  We offer the option to rental welding equipment



Aldi logistics center 50000m2 TPO Membrane, Switzerland



Exploration Place First, Wichita, USA



Schöni transport Centre, Switzerland



### Roofing

Roofing welders and hot air tools overview	8 / 9
Tips and Tricks	10 – 14
UNIDRIVE 500	16 / 17
UNIROOF AT / ST	18 – 20
VARIMAT V2 / VARIMAT S	22 / 23
BITUMAT B2	24
EXAMO USB / Testing instrument	25

### Hot Air Tools for Roofing

TRIAC ST	26 – 28
TRIAC AT	27 / 28
ELECTRON ST	30 / 31
HOT JET S	32
General accessories	33



## Overview

### Roofing Welders






[illegible]

✓✓✓ = Highly suitable, ✓✓ = Suitable, ✓ = Limited suitability



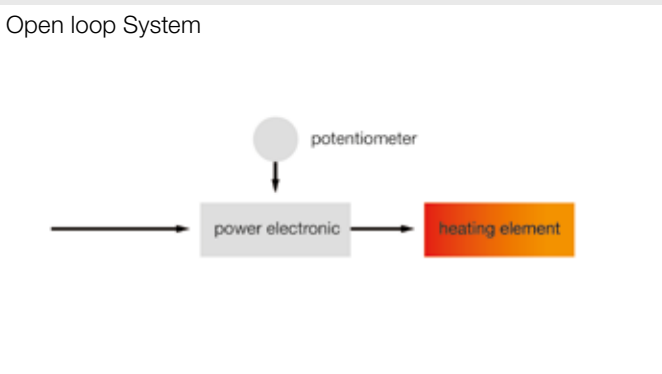
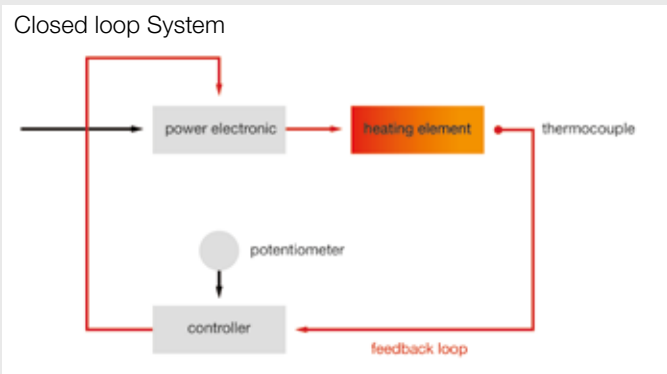


Manual welding with plastic sealing sheets.

Overview Hot-air hand tools				
Typ	TRIAC ST	TRIAC AT	ELECTRON ST	HOT JET S
Area of application	Joining of thermoplastic sealing sheets with high welding power	Joining of thermoplastic sealing sheets with high welding power	Joining of modified bitumen	Joining of thermoplastic sealing sheets in tight spaces. For detail work on roof gutters and parapets, for example
Starting welding parameters manual weld	PVC: From 680 F TPO: From 563 F	PVC: From 680 F TPO: From 563 F	Modified bitumen: From 1022 F	PVC: From 680 F TPO: From 563 F with 0.8 inch nozzle
Sealing sheets	Suitable for PVC/TPO sealing sheets with wide welding window	Suitable for PVC sealing sheets with wide welding window and TPO with narrow welding window	Modified bitumen	Suitable for PVC/TPO sealing sheets with narrow welding window
Electronic	Open loop	Close loop	Open loop	Open loop
Catalog page	 26 – 28	27 / 28	30 / 31	32

### Closed-loop system

The closed-loop technology means that the parameters are kept constant at all times, even in the event of voltage fluctuations, enabling reliable welding in the building site environment.



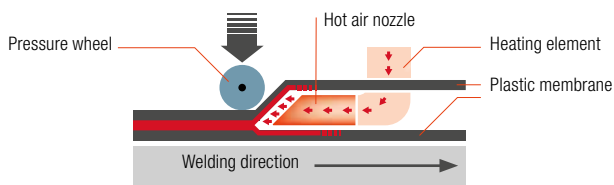
# Leister. We know how. - Tips and tricks

Leister Technologies AG offers high-quality welding devices for demanding tasks – in any industry where plastic is processed.

Here you can find a few tips and tricks that will help you ensure that your roof is leak-tight, whether the work involves bitumen or plastic.

## Know-how

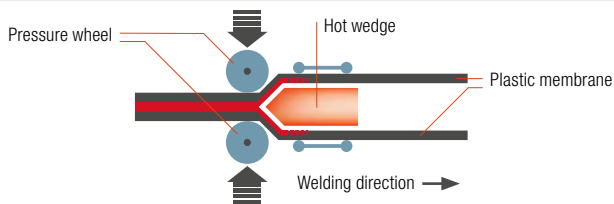
### Welding Methods



#### Hot-air welding

**Hand tools, automatic welders, stationary welding machines**

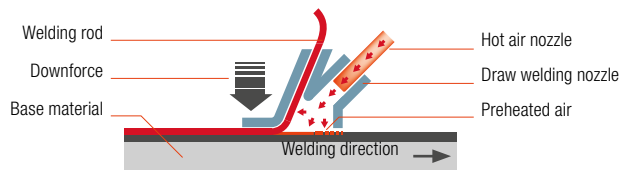
In hot gas welding, the thermal energy is controlled. Heated air is fed into the workpiece and the required amount of pressure is exerted onto the wheels.



#### Hot-wedge welding

**Wedge welders**

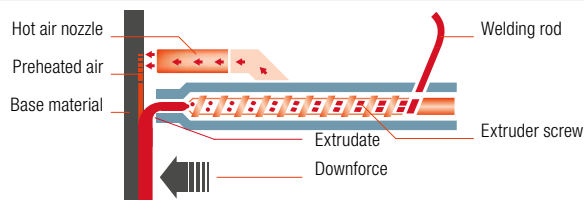
The process where the wedge is heated directly by heating cartridges. The generated heat is transferred directly onto the workpiece. This method also is suitable for thicker materials.



#### Draw Welding (Speed Welding)

**Hand tools**

This welding method requires the use of a speed welding nozzle. Preheat the surfaces to the appropriate temperature. The surfaces are plasticized by hot air and joined under consistent downward pressure.

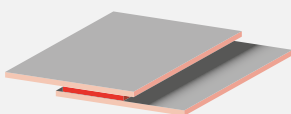


#### Extrusion Welding

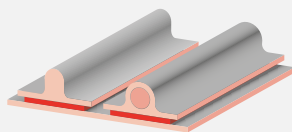
**Extrusion Welders (FUSION & WELDPLAST)**

In extrusion welding, the substrate is preheated with hot air and connected by adding the extrudate. The welding rod is fed into the heater barrel and the plastic is processed by the extruder screw.

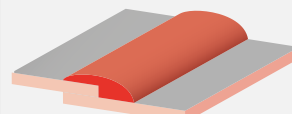
### Weld Types / Weld Geometries



**Overlap**



**Antivandalism**




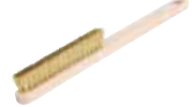






**Overlap seam**



Air partitioning keeps the hot air in the weld seam to ensure reliable welding.






## Know-how

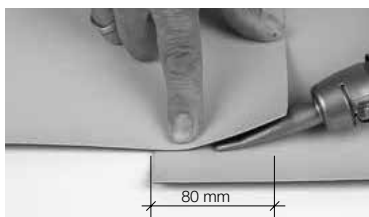
### Basic automatic welding machine equipment

	<b>132.429</b> Welding plates for optimum welding start and end		<b>116.798</b> Brass brush UNIROOF AT/ST and VARIMAT V2
	<b>151.382</b> Kehlfix		<b>151.847</b> Brass brush UNIDRIVE 500
	<b>106.972</b> Brass pressure roller with ball bearings		<b>137.855</b> Leister cutter
			<b>138.902</b> Hooked blade for LEISTER-cutter (10 dispenser with 10 pcs)
			<b>138.539</b> Straight-edge blade for LEISTER-cutter (10 dispenser with 10 pcs)

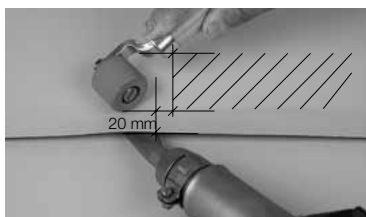
Caution! Always carry out test welds before starting lap welds. In the morning and in the afternoon

### Basic hot-air hand tool equipment

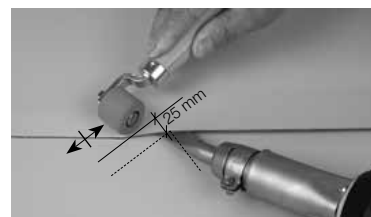
	Wide slot nozzle <b>107.132</b> 1.57 inch Wide slot nozzle <b>107.123</b> 0.78 inch Wide slot nozzle angled		<b>157.544</b> Leister foil scissors
	<b>107.124</b> 0.78 inch angled nozzle, 90° <b>105.503</b> 0.78 inch angled nozzle, 60° / 105°		<b>138.314</b> Seam probe tester for overlap seams
	silicone pressure roller <b>140.160</b> 1.57 inch mm <b>140.161</b> 0.78 inch <b>106.976</b> Pressure roller PTFE		



1. Stitching the overlap



2. Pre-welding



3. Final welding

## Know-how

### Correct hot-air welding

- Rule no. 1: weld like with like
- In all welding processes, ensure the correct temperature/pressure/speed settings are made so that seams can be created without problems. The joining surfaces must be dry and free from contamination.
- Always check the hot-air welding device (for blocked nozzles, for defective heating elements, and in case the filter requires cleaning)
- Carry out test welding and check seams for peeling
- In the case of homogeneous sealing sheets, elastic bands may be used as welding aids.

### Avoiding air inclusions

In the case of hard, uneven substrates (PIR/PUR with aluminum cladding) or mineral fiber insulation in combination with PVC sealing sheets, it is important to avoid air inclusions. You can prevent them by using a softer pressure roller together with a rake nozzle kit for the VARIMAT V2 automatic welding machine (see page 13).

### Manual welding process

The hot-air nozzle should be cleaned periodically to prevent contamination getting into the weld seam and to ensure that welding is able to take place at full power. The distance between the pressure roller and the nozzle opening should be between 20 and 30 mm to ensure that the weld seam is joined as efficiently as possible. The pressure roller must be guided so that it is parallel to the nozzle. This will ensure that the welding process yields the best possible results (see images above).

### Welding under building site conditions

#### Substrate properties

- Solid substrate with fine surface, no elevation (clean laying)
- The building ground should be free from pointed objects and stones.

#### Environmental conditions/Weather conditions/Rain

If it is raining, welding must not be carried out without special protective equipment.

#### Air temperature

Welding must be suspended at temperatures below +5°C in or-

der to prevent the roof sheeting being exposed to an excessively high thermal load (in accordance with DVS 2225-4).

#### Humidity

In some cases, excessively high humidity can cause condensation to form on the welding surface, which has a negative effect on the seam strength.

#### Wind

If there is strong wind, the required welding temperature may not be reached in some cases. This can be counteracted by raising the welding temperature by 20 to 30°C or reducing the speed by 20 to 40 cm/min. If the wind is excessively strong, the welding area should be shielded against wind or welding should be suspended.

#### Sun

Exposure to the sun will cause materials to heat up significantly, particularly black sealing sheets. The sheet will experience increased thermal expansion if this happens. This causes wrinkles, which makes the welding process more difficult and leads to an inadmissibly high level of tension in the seam area when the material cools.

#### Maintaining the hand tool

- The air inlet and filter must be cleaned periodically.
- The heating element should be cleaned periodically.



This will ensure that the right level of welding power is reached.

#### Defining the generator power

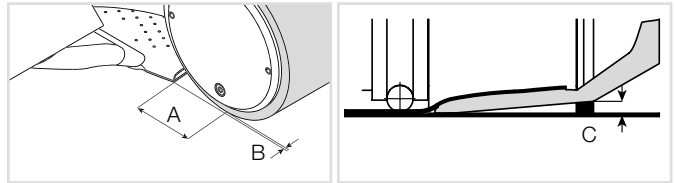
The generators must have the correct specifications in order to ensure safe operation:

- VARIMAT V2: Min. 10 KW to ensure a reserve for hand tools
- UNIROOF AT/ST: Min. 6 KW



## Adjusting nozzles for UNIROOF AT/ST and VARIMAT V2/S

- Distance between middle of spherical roller to tip of nozzle: 1.6 inch
- Position standard nozzle at a slight angle; approx. 0.04 inch (sketch C)
- Grip nozzle must lie flat



A = 1.6 inch / 42 mm +/-2

B = 0.04 - 0.08 inch / 1-2 mm

C = 0.04 inch / 1 mm

### Know-how

## What to note in the case of air inclusions.

### Rake nozzle kit to solve the problems caused by bubbles forming on hard surfaces.

Growing heat insulation requirements have caused roof structures to undergo changes in recent years. Additionally, hard PIR/ PUR or thicker mineral wool insulating materials with a higher level of compressive strength are now installed on the upper side. During the welding process, these insulating materials demonstrate virtually no temporary elastic behavior. These properties may cause air inclusions to arise in the weld seam of mechanically fastened PVC roof sealing sheets under certain climatic or local conditions. The new rake nozzle kit ensures that all leak-tightness and aesthetic requirements are met even in roof structures of this nature.

### Rake nozzle:

Continuous and constant weld seam width. To prevent air inclusions, the lower PVC roof sealing sheet is pressed down using the rake nozzle.

### Pressure roller:

The soft silicone pressure roller enables the pressure to be distributed as effectively as possible over uneven and hard substrates.



## Use the right extension cables!

### Voltage drop due to cable length

### Important facts

- The cable should be copper, with as large a cross-section as possible
- The cable should be as short as possible
- The following rules of thumb apply:  
Automatic welding machines: maximum 197 inch with 0.1 inch<sup>2</sup> cable, e.g., VARIMAT V2 4.6 KW 230 V/over 197 inch 1.57 inch<sup>2</sup> Manual welding: maximum 197 inch m with 0.6 inch<sup>2</sup> cable, e.g., TRIAC AT/ST 1.6 KW 230 V
- Plug for 20 amps and a secure connection
- A generator should have a capacity of 10 KW
- A stable electrical environment is required
- The fuse should have 20 amps for 230 volts and 16 amps for 400 volts

Copper cable	Varimat V2 230 V / 4600 W			Varimat V2 400 V / 5700 W		
	0.04 inch <sup>2</sup>	0.06 inch <sup>2</sup>	0.1 inch <sup>2</sup>	0.04 inch <sup>2</sup>	0.06 inch <sup>2</sup>	0.1 inch <sup>2</sup>
54 yd	200 V (-13 %)	209 V (-9%)	217 V (-6%)	377 V (-6%)	384 V (-4%)	390 V (-2.5%)
109 yd	177 V (-23 %)	192 V (-17%)	205 V (-11%)	256 V (-11%)	370 V (-8%)	381 V (-5%)
164 yd	159 V (-31 %)	177 V (-23%)	194 V (-16%)	338 V (-16%)	356 V (-11%)	372 V (-7%)
218 yd	144 V (-37 %)	164 V (-28%)	184 V (-20%)	321 V (-20%)	344 V (-14%)	363 V (-9%)
273 yd	132 V (-43 %)	154 V (-33%)	176 V (-24%)	306 V (-23%)	332 V (-17%)	355 V (-11%)
328 yd	121 V (-47 %)	144 V (-37%)	168 V (-27%)	292 V (-27%)	321 V (-20%)	347 V (-13%)
382 yd	112 V (-51 %)	136 V (-41%)	160 V (-30%)	280 V (-30%)	311 V (-22%)	340 V (-15%)
437 yd	105 V (-54 %)	128 V (-44%)	154 V (-33%)	268 V (-33%)	301 V (-25%)	332 V (-17%)
492 yd	98 V (-57 %)	121 V (-47%)	148 V (-36%)	258 V (-36%)	292 V (-27%)	326 V (-19%)
546 yd	92 V (-60 %)	115 V (-50%)	142 V (-38%)	248 V (-38%)	284 V (-29%)	319 V (-20%)
601 yd	87 V (-62 %)	110 V (-52%)	137 V (-41%)	239 V (-40%)	276 V (-31%)	312 V (-22%)

## Know-how

### Comparison: bitumen roof vs. plastic roof

STRUCTURE	WARM ROOF, BITUMINOUS, no slope	WARM ROOF, PLASTIC, sealing sheets without slope
	1 Extensive roof greening (can be walked on to a limited extent) 3.94 in 2 Drain protection mat 0.79–1.18 in 0.79 in 3 Bitumen sheets, 2-layer, EGV 3.5/EP5WF (root-resistant) 0.39 in 4 PU ALU 9.45 in U value 0.10 (W/(m <sup>2</sup> x K)) 9.45 in 5 Vapor barrier EVA 35 0.2 in 6 Concrete ceiling without slope 9.45 in	Extensive roof greening (can be walked on to a limited extent) 3.94 in Drain protection mat 0.79–1.18 in 0.79 in Plastic sealing sheet 0.08 in PU ALU 240 mm U value 0.10 (W/(m <sup>2</sup> x K)) 9.45 in Vapor barrier EVA 35 0.2 in Concrete ceiling without slope 9.45 in
EVALUATION		
Safety	<ul style="list-style-type: none"> <li>- Black sealing sheets cannot be identified</li> <li>- Sealing installed using flame and gas (working hygiene, <b>fire hazard</b>)</li> <li>+ Layer thickness of approx. 0.35 in (mechanical damage)</li> <li>- Bitumen is not generally root-resistant (only if herbicides are used, and these are washed out over time and enter groundwater).</li> <li>+ <b>Service life approx. 40 years</b></li> </ul>	<ul style="list-style-type: none"> <li>+ Plastic sealing sheets are marked and can be identified even after 50 years</li> <li>+ Installed using automatic welding machine (homogeneous welding)</li> <li>- Sealing 0.07 in, relatively thin but higher dielectric strength</li> <li>+ Plastic sealing sheets are root-resistant throughout their entire service life; no need for critical additives, etc.</li> <li>+ Clean installation without dirt</li> <li>+ <b>Service life 55 to more than 100 years</b></li> </ul>
Ecology	<ul style="list-style-type: none"> <li>- <b>Dismantling, disposal in municipal solid waste incineration plant</b></li> <li>- <b>Significant impact on the environment (compare environmental impact points calculation enclosure)</b></li> <li>- <b>Root resistance only incorporated with the use of herbicides</b></li> <li>- 6x higher fire load, weight/content by mass approx. 12 lb/yd<sup>2</sup></li> <li>- Mass with 6,632 yd<sup>2</sup> = approx. 66 to</li> </ul>	<ul style="list-style-type: none"> <li>+ TPO sealing sheets sorted according to category can be recycled</li> <li>+ <b>TPO sheets have a low impact on the environment and have the highest recommendation according to ECO (112 million environmental impact points; less than bitumen at 3,650 m<sup>2</sup>)</b></li> <li>+ <b>Root-resistant without herbicides</b></li> <li>+ Weight/content by mass approx. 4.41 lb/yd<sup>2</sup></li> <li>+ Mass with 6,632 yd<sup>2</sup> = approx. 11 to; i.e., a total of 55 to less weight with the plastic sealing sheet!</li> </ul>
Logistics	<ul style="list-style-type: none"> <li>- 6,632 yd<sup>2</sup>: 60 pallets more of material = more crane trains required</li> </ul>	<ul style="list-style-type: none"> <li>+ 6,632 yd<sup>2</sup>: total area with 10 pallets</li> </ul>
Costs	<ul style="list-style-type: none"> <li>+ Cost-neutral</li> </ul>	<ul style="list-style-type: none"> <li>+ Cost-neutral/the larger the industrial roof, the less expensive</li> </ul>
Warranty	<ul style="list-style-type: none"> <li>+ <b>10-year system warranty</b></li> </ul>	<ul style="list-style-type: none"> <li>+ <b>10 to 15-year full material warranty (for the entire system)</b></li> </ul>
Installation performance	<ul style="list-style-type: none"> <li>- More time required due to 2-layer installation, 10x1 m/8x1 m</li> </ul>	<ul style="list-style-type: none"> <li>+ Length of sealing sheets can be adjusted; faster installation, less impact on sheets = safer</li> </ul>

**Summary:** The plastic sealing sheet is the better option, depending on the design of the industrial roof and the permeation properties. As a result, plastic sealing sheets are set to gain a larger share of the market. Leister has the right solution for all sealing sheets.



## Reliable and cost-effective – everywhere – UNIDRIVE 500

The compact UNIDRIVE 500 semi-automatic hot-air welder impresses with its many advantages. Guided by two ergonomic handles, you can achieve the ideal pressure to ensure high-quality welding results. Change welding direction with ease via a rotating nozzle and reversible drive. The UNIDRIVE 500 is ideal for all roof applications, even in tight spaces, and welds two to three times faster than manual welding. Lap welding with the UNIDRIVE 500 – reliable and cost-effective – everywhere.

Semi-automatic hot-air welder

### UNIDRIVE 500

1		<b>Reliable:</b> Ergonomic handle for balanced pressure during manual welding
2		<b>Safe:</b> Constant parameters and reliable quality – even with undervoltage
3		<b>Flexible:</b> Stainless steel nozzle for all welding application
4		<b>Customized:</b> Reversible drive allows for welding in either direction







Whether on or at the roof parapet or welding domed skylights, connections, or small terraces – the UNIDRIVE 500 shows its worth when space is tight.

## Semi-automatic hot-air welder

### UNIDRIVE 500



- **Safe:** Constant parameters and reliable quality – even with undervoltage
- **Fast:** Up to three times faster than manual welding
- **Customized:** Reversible drive allows for welding in either direction
- **Practical:** Compact and lightweight semi-automatic hot-air welder: 9.9 lbs, 11.8 cm high
- **Economical:** Maintenance-free, brushless motors

Technical data		UNIDRIVE 500 100 V	UNIDRIVE 500 100 – 120 V	UNIDRIVE 500 220 – 240 V
Voltage	V~	100	120	230
Power	W	1500	1800	2200
Temperature	°F	220 – 1040		
Air volume	%	45 – 100		
Speed	ft/min	2.3 – 14.8		
Emission	L <sub>pA</sub> (dB)	70 (K = 3 dB)		
Size (L × H × B)	inches	11.7 × 6.8 × 10.8		
Weight	lbs	9.9		
Conformity mark		CE		
Protection class I		⊕		

#### Article No.:

163.144 UNIDRIVE 500, 1.6 inches, 220 – 240 V/2200 W, EU plug, Silicone rollers

163.147 UNIDRIVE 500, 1.6 inches, 100 – 120 V/1800 W, US plug, Silicone rollers

Additional versions available upon request

Included with purchase: Welding machine, device case, hex key, quick guide

### Accessories UNIDRIVE 500


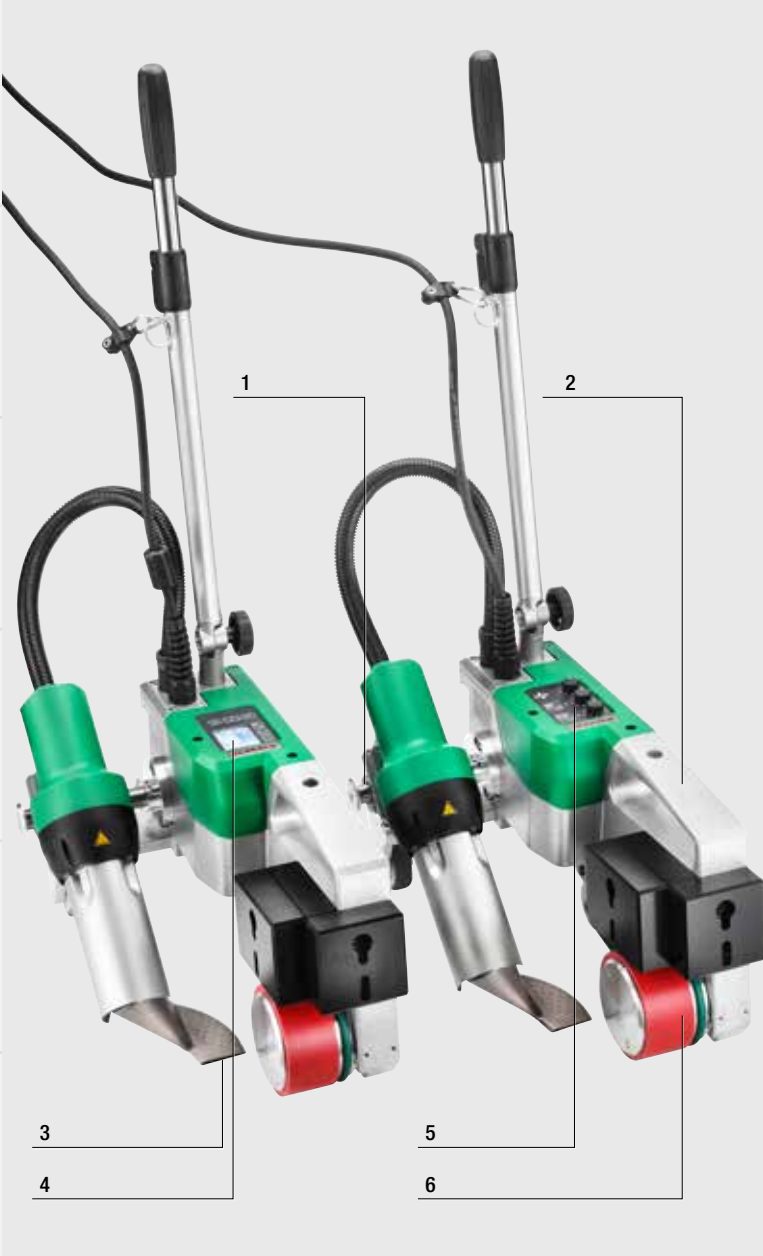





	<b>164.586</b> Overlap welding nozzle 0.6 inches <b>164.576</b> 1.2 inches <b>164.403</b> 1.6 inches
	<b>163.930</b> Pressure roller, steel 0.6 inches
	<b>163.357</b> Pressure roller, steel 1.6 inches
	<b>162.551</b> Support wheel, silicone
	<b>161.156</b> Silicone rubber roller 1.6 inches
	<b>159.911</b> Wheel for silicon rubber roller 1.6 inches
	<b>156.531</b> Carrying strap for Leister case

# UNIROOF AT/ST: Welding close to the edge made easy.

The new UNIROOF AT/ST roof welder is your flexible partner for welding thermoplastic roofing membranes on flat or pitched roofs (up to 30°). Thanks to its slim design and construction, as well as the movable transport axle, converting of the machine is no longer needed. Now, you can effortlessly weld close to the edge (to 100 mm / 4 inches) at the parapet or on the parapet and as easily in narrow circumstances.

Hot-air welder

## UNIROOF AT/ST

	<p><b>No more time consuming converting:</b> The ultra slim roof welding machine with its movable transport axle masters welding close to the edge (up to 3.9 inch) at or on the parapet, and wherever it gets narrow.</p>	
	<p><b>UNIROOF provides elaborate ergonomic handling thanks to steering bar and handle:</b> Roll or carry the UNIROOF whenever, wherever you want to, it's so handy!</p>	
	<p><b>UNIROOF AT:</b> The <b>closed-loop technology</b> for drive motor, temperature and air blower keeps the welding parameters at a constant level and thus delivers reliably leak proof results – a clear asset when it comes to process reliability and investment safety.</p>	
	<p><b>UNIROOF AT:</b> Functional <b>control panel with display</b> for welding parameters (set point and actual figures during runtime) as well as voltage for better control. Save time with programmable welding profiles for common roof membranes.</p>	
	<p><b>UNIROOF ST</b> for purists: <b>Closed-loop</b> controlled drive motor with <b>open-loop technology</b> for the control of temperature and air blower. Simple control (regulation) with potentiometer/rotary knobs.</p>	
	<p><b>Optimum overall performance and easy-to-operate:</b> The direct-driven, maintenance-free pressure wheel [brushless drive motor integrated in pressure wheel] leads to higher contact pressure, welding speed and thus causes zero chain wear.</p>	

With 3450 W performance, 230 V and 15 Amps in the box, the UNIROOF AT/ST offers speedy top performance on any roof.



Thanks to its ultra slim design, the UNIROOF welds effortlessly even in areas which are narrow and difficult to access.

#### Hot-air welder

### UNIROOF AT



- No retooling, thanks to movable transportation axle
- Maintenance-free direct drive and closed-loop technology
- Ergonomic handling, flexible relocating and optimal machine guiding
- 66% higher welding performance compared to similar machines

#### Hot-air welder

### UNIROOF ST












- No retooling, thanks to movable transportation axle
- Maintenance-free direct drive and open-loop technology
- Ergonomic handling, flexible relocating and optimal machine guiding
- 38% higher welding performance compared to similar machines

Technical Data		UNIROOF AT
Voltage	V~	100 / 120 / 220 – 240
Frequenz	Hz	50/60
Power	W	1500 / 1800 / 3450
Temperature, stepless	°F	210 – 1150
Air flow range	%	45 – 100
Drive speed, stepless	ft/min	3.3 – 33.0
Size (L × B × H)	inch	18.7 × 9.6 × 10.3
Weight	lbs	38.6 (incl. 3 additional weights)
Materials		PP, PVC, TPO, ECB, EPDM, EVA, FPO, PO, PIB (other materials upon request)
Conformity mark		CE
Protection class I		⊕
Fan		maintenance-free
Operation		Digital with display
Temperature control		Closed-loop System
<b>Article No.:</b>		
154.453	UNIROOF AT, 220 – 240 V/3450 W, 40 mm (1.6 inch), US without plug	
153.599	UNIROOF AT, 120 V/1800 W, 40 mm (1.6 inch), with US-plug	

Technical Data		UNIROOF ST
Voltage	V~	100 / 120 / 220 – 240
Frequenz	Hz	50/60
Power	W	1500 / 1800 / 3450
Temperature, stepless	°F	210 – 1150
Air flow range	%	45 – 100
Drive speed, stepless	ft/min	3.3 – 33.0
Size (L × B × H)	inch	18.7 × 9.6 × 10.3
Weight	lbs	38.6 (incl. 3 additional weights)
Materials		PP, PVC, TPO, ECB, EPDM, EVA, FPO, PO, PIB (other materials upon request)
Conformity mark		CE
Protection class I		⊕
Fan		brush motor
Operation		Potentiometer
Temperature control		Open-loop System
<b>Article No.:</b>		
154.454	UNIROOF ST, 220 – 240 V/3450 W, 40 mm (1.6 inch), US without plug	
153.601	UNIROOF ST, 120 V/1800 W, 40 mm (1.6 inch), with US-plug	

## Accessories UNIROOF AT/ST

	<b>155.414</b> Roof structure profile kit not for USA		<b>108.129</b> T-shape guide bar upper part
	<b>155.325</b> Grip-nozzle 1.6 inch		<b>156.446</b> UNIROOF AT/ST 3.15 inch bitumen kit
	<b>149.597</b> spring plate		
	<b>152.742</b> Additional weight, front		<b>155.473</b> Heating element 230 V / 3300 W <b>153.947</b> Heating element 120 V / 1800 W <b>154.231</b> Heating element 100 V / 1500 W <b>145.604</b> Heating element 120 V / 2300 W* * Suitable for undervoltage so that the temperature can be reached
	<b>152.741</b> Additional weight, lateral		
	<b>154.462</b> Nozzle calibration device		
	<b>132.429</b> 2 welding plates for optimum welding start		
	<b>138.817</b> Steelbrush to clean nozzle		
	<b>154.522</b> Transportation axle 11.8 inch		
	<b>152.706</b> Transportation axle 8.7 inch for radius welding		
	<b>154.827</b> Storage case UNIROOF		
	<b>155.577</b> Locking plate for additional weights		
	<b>137.843</b> T-shape guide bar		



versatile, easy to maintain, efficient

versatile, easy to maintain, efficient.





## VARIMAT V2: Fast and dependable.

Using the new VARIMAT V2, polymer roofing membranes can be welded more rapidly resulting in lower cost. Users appreciate its streamlined ergonomics and its ease of use. The clearly laid out operating unit's "e-Drive" allows for the control of all relevant weld parameters.



Highly reliable in application even at undervoltage.

Hot-air welder

### VARIMAT V2



- Process reliability: Machine cuts out if undervoltage is too high
- Patented spherical roller compensates unevenness
- Guide bar for ergonomic handling
- Maintenance free blower means lower service costs
- User-friendly display with "e-Drive" (press and turn control) to recall preset and saved welding settings
- Constant drive with regulated electronics

#### Technical data






Voltage	V~	230
Power	W	4600
Temperature	°F	212 – 1148
Speed	ft/min	2.3 – 39
Air flow range	%	50 – 100
Width of welding nozzle	inch	1.6
Size (L x W x H)	inches	25 x 17 x 13
Weight	lbs	77
Conformity mark	CE	
Protection class I	⊕	

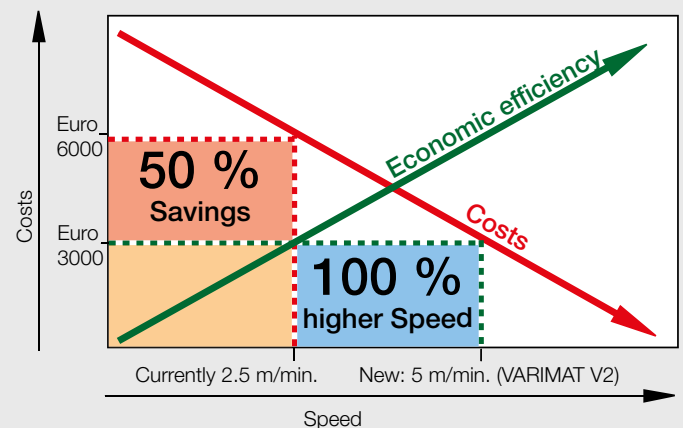
#### Article No.:

138.982	VARIMAT V2, 230 V / 4600 W, without plug, storage case
153.428	VARIMAT S, 230 V / 4600 W, Euro-plug
153.427	VARIMAT S, 400 V / 5700 W, CEE-plug

Additional versions available upon request.

### Accessories VARIMAT V2

1		<b>Ergonomic</b> Height and angle of guide-bar can be adjusted easily
2		<b>Maintenance-free</b> High performance and brushless blower motor, no brushes to change
3		<b>Intuitive</b> Protected design. Easy-to-view display with "e-drive" and easy-to-store welding settings
4		<b>Weld seam control</b> The green air dam belt keeps the hot air in the welded seam. <b>High speed</b> New welding nozzle with protected design for reliable welding quality
5		<b>More stability</b> The patented pressure roller smoothes out any unevenness





Welded with standard nozzle.



Welded with grip nozzle 25% higher weld seam strength.  
Mainly for TPO sealing sheets.

	<b>113.995</b> 1.2" (30 mm) grip-nozzle for TPO / FPO single plies
	<b>113.600</b> 1.6" (40 mm) grip-nozzle for TPO / FPO single plies
	<b>110.805</b> 0.8" (20 mm) overlap welding nozzle for thermoplastic sealing sheeting
	<b>107.067</b> Additional weight for even more pressure
	<b>139.048</b> Sturdy green plywood storage case 28 x 18.5 x 18 inches included with purchase
	<b>107.649</b> Replacement wheels
	<b>132.429</b> 2 welding plates for optimum welding start included with purchase
	<b>138.817</b> Steel brush to clean nozzle Included with purchase
	<b>146.514</b> Solar profile kit for Renolit
	<b>143.162</b> Gentle pressure roller for difficult ground conditions
	<b>119.111</b> Chuck cone for replacing silicone pressure roller
	<b>151.530</b> Mirror welding kit, nozzle right, for special welding applications
	<b>107.612</b> Heating elements 230 V / 4400 W

	<b>143.179</b> Complete set with rake nozzle, 1.57 inch and pressure roller, soft, 1.57 inch  Rake nozzle to solve the problems caused by bubbles forming on hard surfaces.
	<b>116.323</b> Rake nozzle, 1.57 inch
	<b>143.163</b> Pressure roller, soft, 1.57 inch (silicone only)
	<b>108.923</b> Welding unit bitumen-kit 3.15 inch, 230 V
	<b>108.924</b> Welding unit bitumen-kit 3.94 inch, 230 V
	<b>108.925</b> Welding unit bitumen-kit 4.72 inch, 230 V
	<b>108.927</b> Welding unit bitumen-kit 3.94 inch, 400 V / 6100 W
	<b>108.928</b> Welding unit bitumen-kit 4.72 inch, 400 V / 6100 W
	<b>115.892</b> Welding unit bitumen-kit 3.15 inch, 400 V / 6100 W
	<b>159.408</b> Nozzle positioning gauge VARIMAT V2



## BITUMAT B2: The flameless.

Welding of modified bitumen sheeting (SBS, APP) with the flameless BITUMAT B2 is much safer than welding with an open flame. The weld strength is significantly better and the single-step process makes welding more economical.



Easy unit guidance and clean working with the BITUMAT B2.

### Hot-air welder

## BITUMAT B2



- Flameless welding of modified bitumen
- No shrinking of the insulation due to integrated air dam
- Uniform welding results
- High working speed
- Requires only one user to efficiently weld seams (torch welding requires two)

### Technical data








Voltage	V~	230
Power	W	6700
Temperature	°F	68 – 1148
Speed	ft/min	2.7 – 40
Air flow range	%	85 – 100
Welding nozzle width	inch	3.0 / 4.0 / 4.7
Size (L x W x H)	inch	27.2 x 19.3 x 13.0
Weight	lbs	89 (with cable)
Conformity mark	CE	
Approval mark	S	
Protection class I	⊕	

### Article No.:

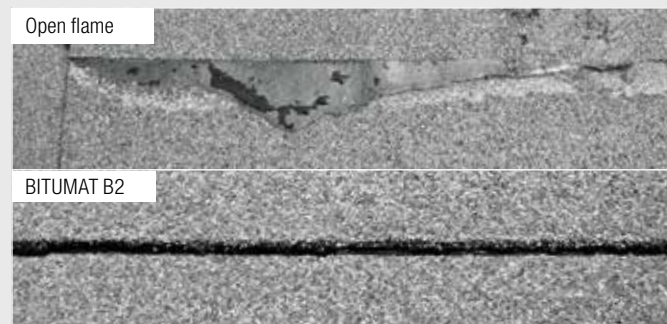
- 140.441 BITUMAT B2, 230V / 6700W, 3" (75 mm), without plug  
 140.439 BITUMAT B2, 230V / 6700W, 4" (100 mm), without plug

Additional versions available upon request.

## Accessories BITUMAT B2

	<b>138.048</b>	3" (75 mm) bitumen nozzle
	<b>138.047</b>	4" (100 mm) bitumen nozzle
	<b>137.895</b>	4" (100 mm) pressure roller with gap
	<b>137.896</b>	3" (75 mm) pressure roller with gap
	<b>140.229</b>	4" (100 mm) pressure roller w/out gap
	<b>140.228</b>	3" (75 mm) pressure roller w/out gap
	<b>156.447</b>	3.1" (80 mm) silicon pressure roller
	<b>158.222</b>	4" (100 mm) silicon pressure roller
	<b>140.476</b>	Lifting device
	<b>155.328</b>	BITUMAT B2 4.7 inch bitumen kit
	<b>140.489</b>	Sturdy storage case, 28 x 18 x 18 inches (included with purchase)
	<b>126.386</b>	Heating elements 230 V / 6500 W

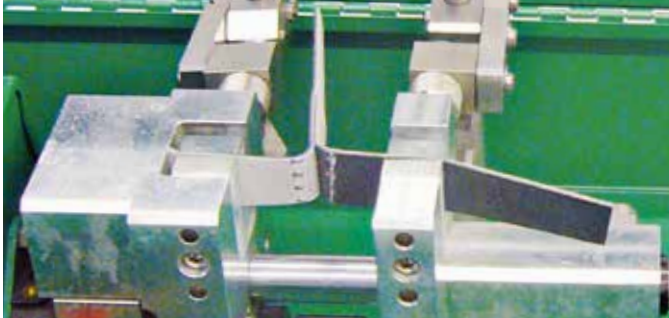
Considerably better welding results when compared with open flame tools. No damage to insulating material due to integrated air dam.





# EXAMO: The inspector.

Will your seam meet industry standards? Can it withstand the specified peel, tensile and shear forces? EXAMO performs tests at the construction site—quickly, reliably and effortlessly.



Testing a weld seam with the EXAMO USB.

## Tensiometer

### EXAMO 300F USB, 600F USB



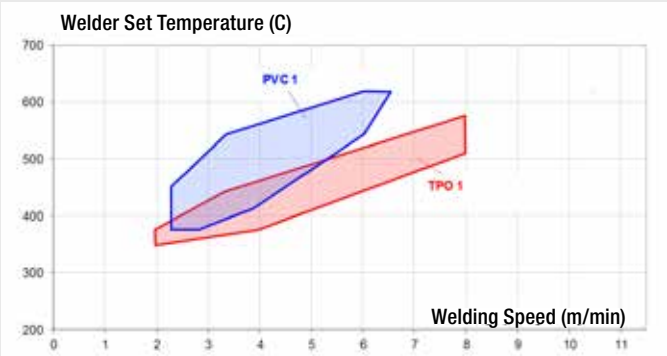
- Construction-site approved
- Handy, robust and reliable
- Testing of elongation, peak force, tear force, test speed and position
- Optional jaws suitable for geo textiles (see accessories)
- Electronic recording of measurement data

Technical Data			
Type		300F USB	600F USB
Voltage	V~	230	230
Power	W	200	200
Tensile load	N	4000	4000
Jaw spacing	mm	5 – 300	5 – 600
Range	inches	11.8	23.6
Test speed	inches/min	0.8 – 21.6	0.8 – 21.6
Sample thickness	mil	max. 276	max. 276
Sample width	inches	max. 1.6 (2.4 optional)	max. 1.6 (2.4 optional)
Size (L x W x H)	inches	29 x 11 x 7 (storage case)	41 x 11 x 7 (storage case)
Weight	lbs	30.8	38.6
Conformity mark		CE	CE
Protection class I		⊕	⊕
Article No.:			
139.063	EXAMO 600F USB, 120 V / 200 W, incl. USB memory stick, without plug		
139.059	EXAMO 300F USB, 230 V / 200 W, incl. USB memory stick, Euro plug		

### Accessories EXAMO 300F USB, 600F USB

	<b>134.832</b> Testing and calibration kit to test and calibrate your EXAMO USB
	<b>108.185</b> Jaw kit 2.36 inches (60 mm) for geotextiles, includes two pairs of jaws
	<b>144.416</b> USB Memory-stick

Leister offers a service to create a welding window. It is important to have the correct starting parameters, particularly when working with new or unfamiliar membrane.



Typical welding windows for TPO and PVC



Article No.:	
153.026	VACUUM BELL Ø 13" (320 mm)
153.025	VACUUM PUMP 120V
153.024	VACUUM PUMP 230V

For testing T-joints

# TRIAC ST – Design meets experience

The new TRIAC ST from Leister is primarily used for welding and plastic fabrication. During its development, a deliberate choice was made to do without extra technical features. Instead it is distinguished by comfort, being reliable versatile, robust and user friendly, like its predecessor the TRIAC S. A prominent feature here is the two-component handle, which is not only attractive, but also gives the user perfect grip. The low weight of less than one kilogram (2.2 lbs) ensures a perfect weight balance.

## Product advantage

1



### Ergonomic handling:

The 2-component handle and perfect tool balance ensure ideal grip and optimum working even under the toughest conditions.

### Perfect weight:

Weighing less than 2.2 lbs, the TRIAC ST is even lighter than its predecessor.

2



### Always keeps a cool head:

There is an actively cooled protective tube for greater work safety.

3



### Welding capacity:

Thanks to optimized high-roughness, the TRIAC ST guarantees high welding performance.

2



4



### Reliability:

A new temperature management and the high resistance to dust enable a long service life of the heating elements.

5



### Swiss thoroughness:

The air filters, located on either side, can easily be removed and cleaned. This ensures optimum air flow and maximum power output.

### Best protection:

The filters provide effective protection against moisture and dust.

# TRIAC AT: Robust and intelligent.

The TRIAC AT is an intelligent hot-air hand tool—for welding and shrinking plastics—that is suitable for on-site use. It is designed for the needs of even the most demanding professional. Every tool undergoes stringent quality checks prior to leaving the factory in Switzerland. This high-quality hot-air hand tool is equipped for all situations. Its universal areas of application are virtually unlimited. The TRIAC AT will continue to prove its merit in any weather condition and is just as effective outside as it is indoors – all during continuous operation.

## Hot-air hand tool

### TRIAC ST



- Suitable for the work site
- Functional design: two-component handle grip and optimum center of gravity ensure good ergonomics
- Quick clean air filters
- Automatic carbon stop and heating element protection provide automatic protective measures

#### Technical data

Voltage	V~	120
Frequency	Hz	50 / 60
Power	W	1600
Temperature	°F	104 – 1292
Air volume (68°F)	cfm	8.5 (17.7 cfm at max. temp)
Dynamic pressure	Pa	3000
Ø Nozzle holder	inches	1.24
Emission	dB(A)	67
Size (L × Ø)	inches	13 × 4, handle Ø 2
Weight	lbs	2 (without power cord)
Conformity mark	CE	
Approval mark	UL LISTED	
Protection class II	□	

#### Article No.:

- 141.228 TRIAC ST, 120 V / 1600 W for push-fit nozzles with US plug / UL  
 141.227 TRIAC ST, 230 V / 1600 W for push-fit nozzles with Euro plug

## Hot-air hand tool

### TRIAC AT



- Suitable for the work site
- Closed-loop controlled temperature
- Open loop controlled air volume
- Intelligent “e-Drive” operating unit
- Ergonomic handling
- Modern design

#### Technical data

Voltage	V~	120
Frequency	Hz	50 / 60
Power	W	1600
Temperature	°F	104 – 1148
Air volume (68°F)	cfm	5.7 – 8.5 (17.7 cfm at max. temp)
Dynamic pressure	Pa	1600 – 3000
Ø Nozzle holder	inches	1.24
Emission	dB(A)	67
Size (L × Ø)	inches	13 × 4, handle Ø 2
Weight	lbs	2 (without power cord)
Conformity mark	CE	
Approval mark	UL LISTED	
Protection class II	□	










#### Article No.:

- 141.316 TRIAC AT, 120 V / 1600 W, with US plug, °F  
 141.382 TRIAC AT, 120 V / 1600 W, with US plug, °C



Lap welding made easy.

## Accessories TRIAC ST / TRIAC AT

	<p>Wide slot nozzle, push-fit</p> <p><b>107.123</b> 0.8" (20 mm), angled</p> <p><b>107.132</b> 1.6" (40 mm), standard nozzle</p> <p><b>107.133</b> 1.6" (40 mm), perforated</p> <p><b>107.129</b> 2.4" (60 mm) for bitumen</p> <p><b>107.131</b> 3.1" (80 mm) for bitumen</p> <p>(more: <a href="http://www.leister.com/downloads">www.leister.com/downloads</a>)</p>		<p><b>107.124</b> 0.8" (20 mm) angled nozzle, 90°, push-fit</p>
	<p>Wide slot nozzle</p> <p><b>105.475</b> 0.8" (20 mm), straight</p> <p><b>105.485</b> 0.98" (25 mm), straight</p> <p><b>105.494</b> 1.2" (30 mm), angled</p>		<p><b>107.130</b> Wide slot nozzle 1.6" (40 mm), 60° bent</p> <p><b>107.125</b> 0.8" (20 mm) angled nozzle, 60°, push-fit, for right hander</p> <p><b>105.503</b> 0.8" (20 mm) angled nozzle, 60°, push-fit</p>
	<p><b>105.487</b> Wide slot nozzle 0.8" (20 mm), curved and angular, with clamping angle inwards</p>		<p><b>106.991</b> 0.2" (5 mm) speed weld nozzle, push-fit on Ø 0.2" (5 mm) tubular nozzle</p>
	<p><b>100.303</b> Ø 0.2" (5 mm), tubular nozzle, push-fit</p> <p><b>105.575</b> Ø 0.2 x 3.9" (5 x 100 mm), tubular nozzle, push-fit</p> <p><b>106.982</b> Ø 0.2 x 5.9" (5 x 150 mm), extension nozzle, push-fit</p>		
	<p><b>105.576</b> tubular nozzle Ø 0.2" (5 mm), 90° curved</p>		



Essential working device. The TRIAC is a partner you can rely on for detail work.







# ELECTRON ST – Strong, compact and handy

The new ELECTRON ST is a real powerhouse among Leister's hand tools. The appearance of this tool has been modeled after the new TRIAC range. For the user, this means improved ergonomics and, as a result, the ability to work in more comfort. Existing ELECTRON nozzles fit the new model.

## Product advantages

1



### Powerful:

Suitable for any application thanks to its outstanding power rating of up to 3400 W.

2



### Perfectly ergonomic:

3.5 ounces lighter and with a 2-component handle that's nearly 1/2 inch slimmer than its predecessor.

3



### Infinitely adjustable:

Easy air temperature adjustment up to 1202°F.

1

2

3

4

5

4



### Clean:

Air filters, located on either side, can be removed and cleaned in no time at all.

5



### Compatible:

All predecessor nozzles fit the ELECTRON ST.



Work safely with hot air.

## Hot-air hand tool

### ELECTRON ST



- Suitable for construction sites
- Leister's most powerful hand tool
- Easy-clean air filter
- Carbon stop and heating element protection provide automatic protective measures
- Sturdy tool case supplied

#### Technical data

Voltage	V~	230 / 230 / 120
Frequency	Hz	50 / 60
Power	W	2300 / 3400 / 2400
Temperature	°F	104 – 1202
Air volume (68°F)	cfm	12.7 (24.7 at max. temp)
Dynamic pressure	Pa	3400
Ø Nozzle holder	mm	50
Emission	dB(A)	67
Size (L × Ø)	inches	13 × 4, handle Ø 2
Weight	lbs	2 (without power cord)
Conformity mark	CE	
Approval mark		
Protection class II	□	

#### Article No.

145.562	ELECTRON ST, 120 V/2400 W for push-fit nozzles with US plug
145.574	ELECTRON ST, 230 V/3400 W for push-fit nozzles, without plug

### Accessories, ELECTRON ST

	<b>107.258</b>	Wide slot nozzle, push-fit 2.8 × 0.4» (70 x 10 mm), for bitumen
	<b>107.653</b>	Wide slot nozzle 3 × 0.08" (75 x 2 mm), push-fit
	<b>151.068</b>	Tool stand for 107.653
	<b>107.270</b>	Wide slot nozzle 6 × 0.5" (150 x 12 mm), push-fit
	<b>142.281</b>	Scraper nozzle
	<b>145.606</b>	Heating elements 230 V / 3300 W
	<b>149.675</b>	230 V / 2200 W
	<b>145.604</b>	120 V / 2300 W

# HOT JET S: Small and powerful.

As the most compact Hot-air hand tool from Leister, the HOT JET S' low weight of 1.3 lbs (including cord and slim handle) ensures high-powered, fatigue-free welding.

## Hot-air hand tool

### HOT JET S



- The smallest Leister Hot-air hand tool
- Stepless, electronically controlled temperature
- Stepless, electronically controlled air flow
- Low noise
- Flexible, integrated tool stand

#### Technical data

Voltage	V~	120
Frequency	Hz	50 / 60
Power	W	460
Temperature	°F	104 – 1112
Air volume (68°F)	cfm	1.4 – 3.9 (7.1 at max. temp)
Pressure static	Pa	230 – 1600
Ø Nozzle holder	inches	0.8
Emission	dB(A)	59
Size (L x Ø)	inches	9 x 3, Handle Ø 1.6
Weight	lbs	1.3 (without power cord)
Conformity mark	CE	
Approval mark	UL	
Protection class II	□	

#### Article No.:

- 100.859 HOT JET S, 120 V / 460 W with US plug (UL)  
 100.861 HOT JET S, 120 V / 460 W, with US plug

## Accessories HOT JET S

	<b>107.141</b> 0.6" (15 mm) wide slot nozzle, push-fit
	<b>107.142</b> 0.8" (20 mm) wide slot nozzle, push-fit
	<b>105.549</b> 0.4 x 0.08" (10x 2mm) wide slot nozzle
	<b>107.144</b> Ø 0.2" (5 mm) tubular nozzle, push-fit
	<b>105.556</b> 0.8" (20 mm) angled nozzle, 70° angled, push-fit
	<b>106.989</b> 0.12" (3 mm) speed welding nozzle, push-fit on Ø 0.2" (5 mm) tubular nozzle
	<b>106.990</b> 0.16" (4 mm) speed welding nozzle, push-fit on Ø 0.2" (5 mm) tubular nozzle
	<b>106.991</b> 0.2" (5 mm) speed welding nozzle, push-fit on Ø 0.2" (5 mm) tub. nozzle



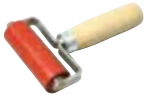










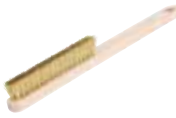

Suitable for complicated details or in tight spaces.



Leister scissors with special serrated edge for complex requirements when cutting plastic sheets.

## Hot-air hand tools

### General accessories

	<b>106.974</b> 3" (80 mm) silicone pressure roller
	<b>140.160</b> 1.6" (40 mm) silicone pressure roller with ball bearings (silicone)
	<b>140.599</b> Spare roll for 140.160
	<b>140.161</b> 1.1" (28 mm) silicone pressure roller with ball bearings (silicone)
	<b>140.598</b> Spare roll for 140.161
	<b>106.976</b> 1.1" (28 mm) PTFE pressure roller
	<b>106.972</b> Brass pressure roller with ball bearings
	<b>138.314</b> Seam probe tester for overlap seams
	<b>151.188</b> Chamfer plane for T-joints
	<b>157.544</b> Leister Universal scissors 10.2 inch with special shaft grinding
	<b>159.514</b> Weld seam test template
	<b>116.798</b> Brass brush
	<b>107.348</b> Tool rest for TRIAC AT, TRIAC ST, ELECTRON ST

	<b>137.855</b> Leister cutter with four spare blades
	<b>138.902</b> Hooked blade for LEISTER-cutter (10 dispensers with 10 pcs=100 pcs)
	<b>138.539</b> Straight-edge blade for LEISTER-cutter (10 dispensers with 10 pcs = 100 pcs)
	<b>151.382</b> Inside corner tool
	<b>116.586</b> Storage case for TRIAC AT, TRIAC ST, ELECTRON ST
	<b>160.353</b> Cable cord roller 27.3 yards (25 m), with 1 x CEE 400 V and 2 x EU socket 230 V
	<b>161.152</b> Cable cord roller 27.3 yards (25m), with 1 x CEE 400 V and 2 x T23 CH socket 230 V
	<b>161.207</b> Cable cord roller 27.3 yards (25m), with 1 x CEE 400 V and 2 x Typ E with ground pin socket 230 V
	<b>164.048</b> Cable cord roller 45 m, 4 x 230 V, EU socket
	<b>160.015</b> Cable extension cord 16 yards (15 m) PUR 5 x 2.5 mm2, with CEE 400V plug
	<b>159.239</b> Cable extension cord 16 yards 15 m PUR 3 x 2.5 mm2, with EU plug 230V



Kehlfix is the economic tool for efficient working.

More at the new accessories catalog at [www.leister.com/accessories](http://www.leister.com/accessories)



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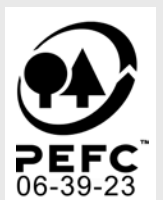
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