

LEISTER

ALLIED
POWER TOOLS

**LHS 91
BASIC
SYSTEM**





Operating Instructions (Translation of the original operating instructions)



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

LHS 91 BASIC / LHS 91 SYSTEM Air heaters

Application

The Leister air heaters LHS 91 BASIC and LHS 91 SYSTEM are suitable for installation in machines, systems or devices and are designed for continuous operation.

- Diverse types of **drying and heating processes**
- **Shrinking and welding** of packaging films and formed parts
- **Heating** of continuous furnaces and vessels
- **Activation and dissolving** of solvent-free adhesives and hot-melt adhesives
- **Sterilisation** of packaging materials such as bottles, corks and containers
- **Separation and fusing** of synthetic threads and fabrics
- **Soldering processes** on thin sheet metal parts
- **Acceleration** of mixing processes and **removal** of foams resulting during mixing or filling processes
- **Welding** of thermoplastics
- **Removal** of plastic flashing
- **Brightening** of plastic surfaces



Warning



Danger of death when opening the device, as live parts and connections are exposed. The device must be fully disconnected from the mains before opening it.



Danger of fire and explosion if air heaters are installed and used incorrectly, especially in the vicinity of flammable materials and explosive gases.



Danger – can cause burns! Do not touch the heating element tube and nozzle while they are hot. Allow the device to cool. Do not direct hot-air stream towards people or animals.



Caution



The **nominal voltage** indicated on the device must correspond to the mains voltage.
IEC/EN 61000-3-11; $Z_{max} = 0.013\Omega + j 0.0083\Omega$. If necessary, consult your electricity supply utility.



Devices of protection class I must be earthed with a protective earth conductor.



The device **must not be left unattended** when in use.
Heat can reach combustible materials which are out of sight. The device may only be used by **trained personnel** or under their supervision. Children may not use the device under any circumstances.



Keep **away from wet and damp areas.**

Installation declaration

(in terms of the EC machinery directive 2006/42; Appendix II B)

Leister Technologies AG, Galileo-Strasse 10, CH-6056 Kaegiswil/Switzerland hereby declares the partly completed machinery

Designation: **Air Heater**
Type: **LHS 91**
Option: **BASIC or SYSTEM**

– as far as it is possible from the scope of supply – fulfills the applicable essential requirements of the EC machinery directive (2006/42).

The partly completed machinery furthermore complies with the provisions of the following EC directive(s):

EC directive(s): 2004/108 (until 19.04.2016), 2014/30 (starting 20.04.2016)

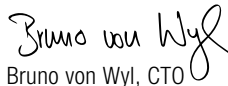
2006/95 (until 19.04.2016), 2014/35 (starting 20.04.2016)

2011/65

Harmonised standards: EN 12100, EN 55014-1, EN 55014-2, EN 61000-6-2, EN 61000-3-12,
EN 61000-3-11 (Z_{max}), EN 62233, EN 60335-2-45, EN 50581

In addition, we declare the relevant technical documentation for this partly completed machinery is compiled in accordance with Annex VII (part B) and will be electronically transmitted to national authorities in response to a reasoned request. Authorised documentation representative: Volker Pohl, Manager Product Conformity
The partly completed machine must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the EC machinery directive (2006/42), where appropriate.

Kaegiswil, 08.02.2016


Bruno von Wyl, CTO


Andreas Kathriner, GM

Disposal



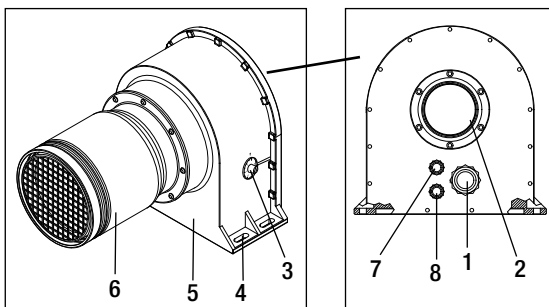
Electrical equipment, accessories and packaging should be recycled in an environmentally friendly way. **For EU countries only:** Do not dispose of electrical equipment with household refuse!

Technical Data

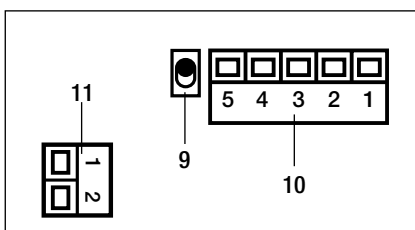
Type		BASIC		SYSTEM		
Voltage	V~	3 × 400	3 × 480	3 × 230	3 × 400	3 × 400
Frequency	Hz	50/60		50/60		
Power	kW	32		28	11	32
Minimum air volume	l/min.	3800		2200	1100	3100
Maximum temperature	°C	650		650		
Ambient temperature	°C	<60		<60		
Max. inlet air temperature	°C	<100		<50		
Emission level	L _{pA} (dB)	<70		<70		
Weight	kg	13.5		13.5		
Dimensions	mm	447 × 312 × 306		447 × 312 × 306		
Conformity mark		CE		CE		
Safety standard		Ⓢ		Ⓢ		
Protection class I		Ⓢ		Ⓢ		

The right to make technical changes is reserved

Device Description



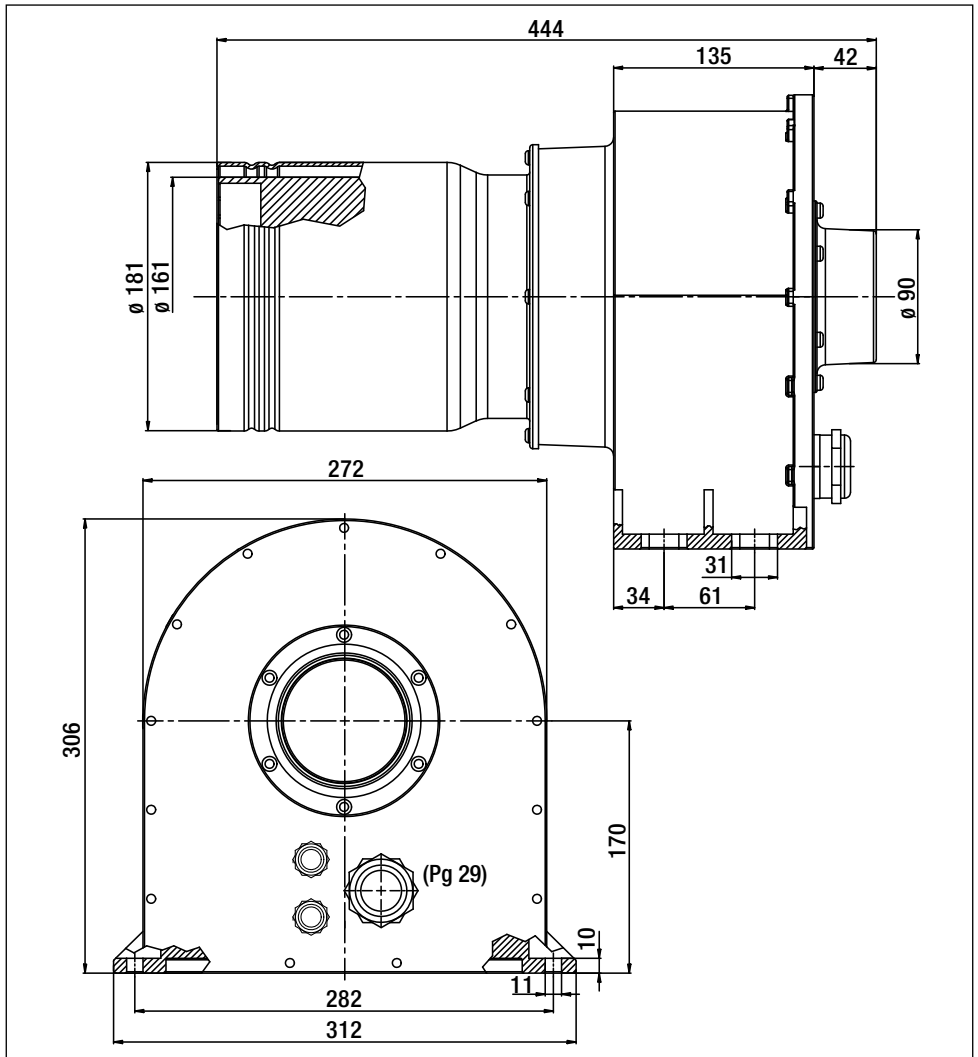
- 1 Cable gland for mains connection
- 2 Air-inlet nozzle \varnothing 60 or \varnothing 90
- 3 Potentiometer for power setting
- 4 Assembly foot
- 5 Housing
- 6 Heating element pipe with protective tube
- 7 Cable gland for control connection
4–20 mA or 0–10V
- 8 Cable gland for alarm contact
- 9 Potentiometer / Interface switch
Down: Potentiometer
Up: Interface
- 10 Interface
- 11 Alarm contact



Installation

- The device must be fastened with four screws on the **assembly foot (4)**
- The installation must ensure that
 - only cold air is supplied
 - no excess (heat) residue builds up
 - the device is not subject to jets of hot air from another device.
- Protect the device from mechanical vibrations and shocks.

Installation dimensions in mm



Air supply

- In order to protect the device and heating element, the specified minimum air volume must never be fallen below and the maximum temperature (hottest point measured 3 mm before the **heating element tube (6)**) must never be exceeded. If the minimum air volume is fallen below, the heat output must be interrupted immediately.
- Observe direction of air flow.
- Do not exceed the specified maximum inlet air temperature!
- Leister blowers must be used as an air supply (observe direction of rotation and compression preheating).
- Use a Leister stainless steel filter on the blower air intake if the air contains dust. In the case of critical dusts (e.g. electrically conductive, damp or metal dusts), special filters must be used to avoid short-circuits in the device.

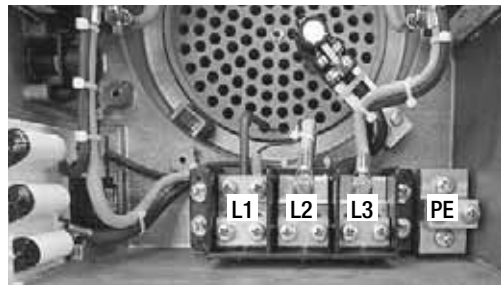
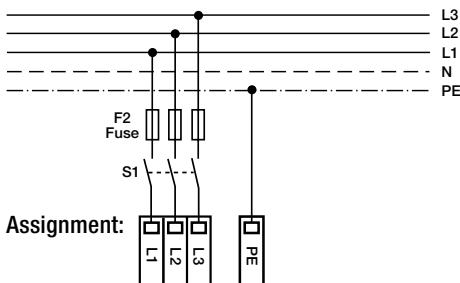
Attention: Always operate device with air supply !

Wiring diagram

- The device must be connected by a qualified expert in accordance with the connection diagram.
- The mains connection must have a sufficient wire cross-section.
- It must be ensured that the connection lines do not come into contact with the heating element tube and are not exposed to the hot air jet.

S1: A suitable device for full disconnection from the mains with a **contact distance of 3 mm** must be provided in the mains connection.

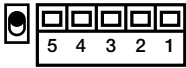
Connection diagram:



System interface LHS 91 SYSTEM

The power of the unit can be controlled via the **interface (10)** with the signals IC 4–20 mA or UC 0–10 V. A supply voltage of US 15–26 VDC is also required. The **switch (9)** must be put on upper position.

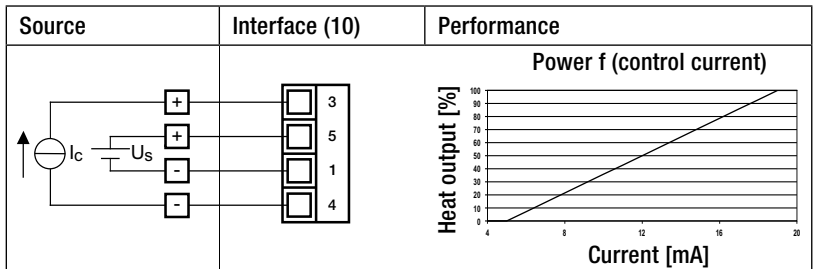
Pin assignment (10)

1	U_S GND	
2	U_C 0–10 V	
3	I_C 4–20 mA	
4	I_C GND	
5	U_S	

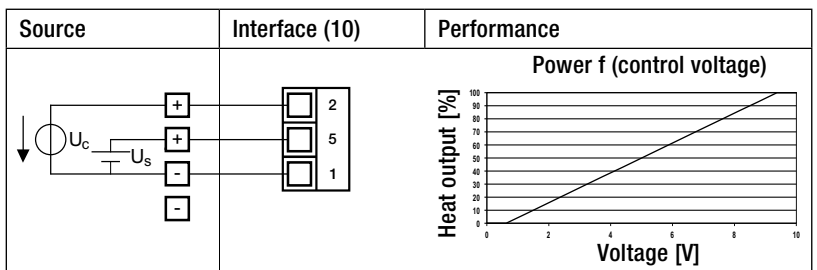
Technical Data

Supply voltage	U_S	15–26 VDC
	U_S max.	26 VDC
	Power consumption at 24 VDC	12 mA
Control current	I_C	4–20 mA DC
	I_C ripple max.	< 0.1 mA DC
	I_C max.	22 mA DC
	Input resistance (type)	230 Ohm
Control voltage	U_C	0–10 VDC
	U_C ripple max.	< 0.05 VDC
	U_C max.	12 VDC
	Input resistance (type)	280 kOhm

Control signal 4–20 mA



Control signal 0–10 VDC

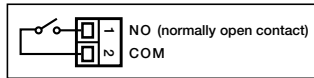


Alarm LHS 91 SYSTEM

Technical Data:

Relay contact SPST - NO
250V / 30VDC, 3A $\cos \varphi = 1$

Pin assignment (11)



Closed loop control LHS 91 SYSTEM

Temperature controller CSS

4–20 [mA]
0–10 [V]

LHS 91 SYSTEM



Thermocouple

Open loop control LHS 91 SYSTEM

Temperature controller CSS

4–20 [mA]
0–10 [V]
0–100 %

LHS 91 SYSTEM



External potentiometer

4–20 [mA]
0–10 [V]
0–100 %

LHS 91 SYSTEM



Operation

- Mount corresponding nozzle or reflector, if required.
- It must be ensured that the hot air can flow out freely, as otherwise the device can be damaged by the excess heat building up (risk of fire !).
- ATTENTION: Comply with minimum air volume as per technical data.
- Switch on mains.
- Allow device to cool down after heating mode.

Operation LHS 91 BASIC

The temperature can only be influenced by the air volume supplied by the user.



**ATTENTION: Do not fall below the minimum air volume (see technical data) !
The device is not fitted with heating element and device protection !**

Operation LHS 91 SYSTEM

1. Heating power infinitely adjustable with **potentiometer for power setting (3)**.

NOTE: The **switch (9)** must be put on lower position.

or

2. Heating power infinitely adjustable via **control connection (7)** with **interface (10)**.

NOTE: The **switch (9)** must be put on upper position.

- **Heating element protection function**

If there is a risk of the heating element overheating, the power supply to the heating element will be reduced.

- **Device protection function**

If there is a risk of the device overheating (too hot inlet air, excess heat reside, absence of air), the power supply to the heating element will be interrupted and the working contact of the **alarm relay (11)** opened. This can optionally be evaluated for fault detection.

- **Actions when the device protection responds**

- The device must be disconnected from the electrical power supply for 5 seconds so that it can be restarted.
- Check air supply.
- Check air volume.
- Check air flow.
- Reconnect device to the electrical power supply.

Changing the nozzle or reflector



Danger – can cause burns! Do not touch the heating element tube and nozzle while they are hot.
Allow the device to cool down before replacing the nozzle / reflector.

Training

Leister Technologies AG and its authorised service points provide free application courses.

3D drawings

3D drawings of the LHS line air heaters are available from your service point or at www.leister.com

Accessories

Only Leister accessories may be used.

- Leister offers a wide range of accessories, e.g.
 - Temperature controls
 - Nozzles
 - Blowers
- Accessories at www.leister.com

Service and Repairs

- 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. Heating elements are 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.



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