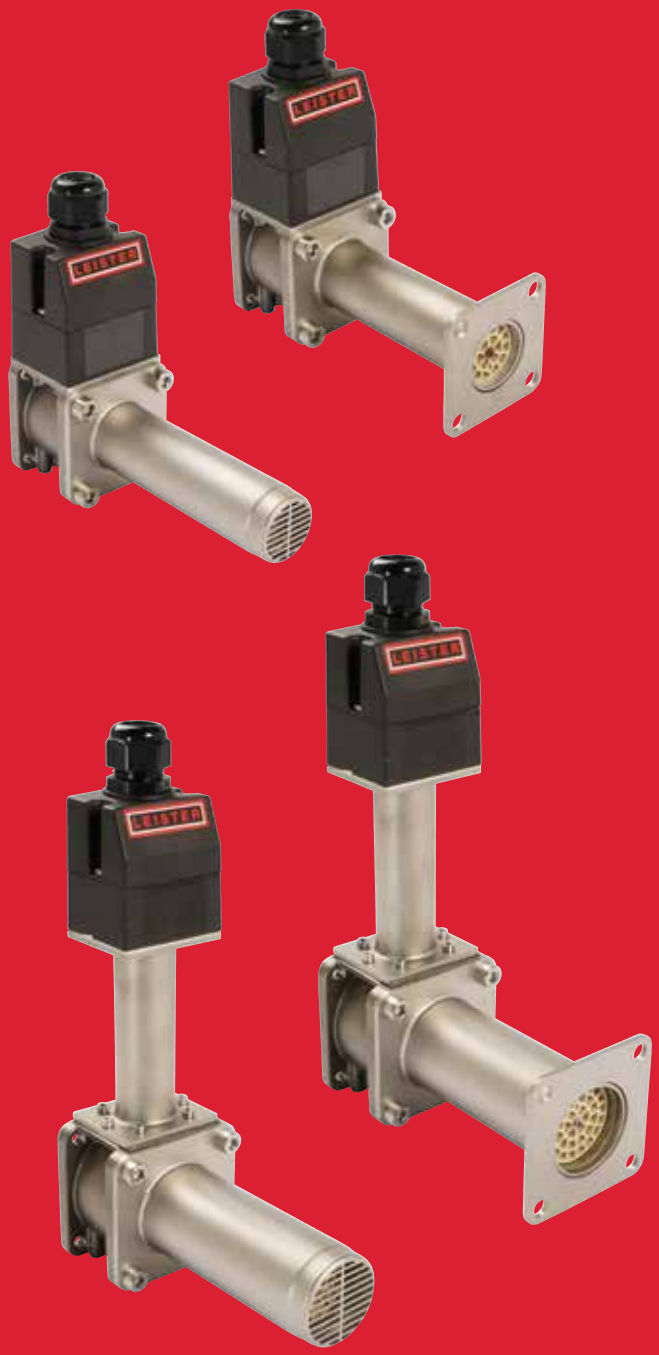
LEISTER

PROCESS HEAT



General Catalog

Process Heat

Intelligent and efficient
hot-air solutions.

www.cmc.pt

We know how.

Leister Technologies AG, Corporate Center, Kaegiswil, Switzerland

Leister Technologies AG, factory, Sarnen, Switzerland

Leister Technologies AG, factory, Kaegiswil, Switzerland

Leister Technologies Ltd.
Shanghai, China

Leister Technologies GmbH
Hagen, Germany

Leister Technologies Benelux B.V.
Houten, Holland

Leister Technologies Italia S.r.l.
Milan, Italy

Leister Technologies LLC
Itasca, USA

Leister Technologies KK
Yokohama, Japan

Leister Technologies India Pvt. Ltd.
Chennai, India

Leister delivers performance.

For 70 years, Leister has been the worldwide leader in the field of plastic welding and industrial hot-air applications. In addition we also offer innovative and effective lasersystems and microsystems. Leister is proud to develop and produce all products in Switzerland – so you can always rely on the proverbial Swiss made quality.

Over 98 percent of our products are exported. With an established network of 130 sales and service centers all over the globe, you will find a Leister partner guaranteed. We are local worldwide.

PLASTIC WELDING

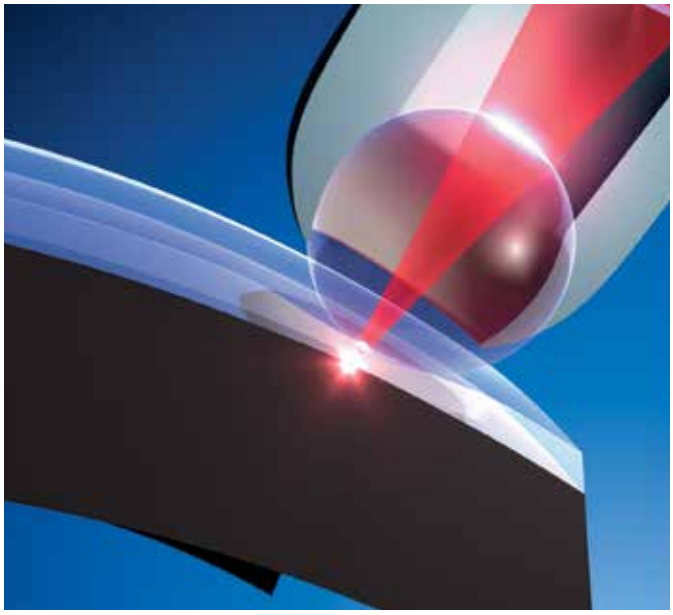
For decades now, Leister has been the worldwide market leader. The performance and reliability of our products makes Leister the first choice. Our tools are used in roofing, billboards, tarpaulins, civil engineering, tunneling, landfills, flooring, plastic fabrication, and shrinking to name a few.

PROCESS HEAT

Hot-air is increasingly deployed in industrial processes. Typical applications include activating, heating, curing, melting, shrinking, welding, sterilizing, drying and warming to name a few. Leister customers profit from our extensive engineering knowledge and benefit from our recommendations during the conceptual design of hot-air applications.

LASER PLASTIC WELDING

Leister's innovative and patented laser bonding solutions provide alternative production processes in automotive, medical, sensor, electronics and textile manufacturing as well as microsystems technology. Our clean, precise and non-invasive laser technology can also be applied to process heat applications.



Hot-air for industrial processes
Wherever you need heat, Leister Technologies AG provides high quality hot-air blowers, air heaters and blowers. Additionally, a wide range of accessories facilitate integration of the equipment into production processes. There is a wide range of applications – Leister offers the appropriate solution.

Research and development
With years of experience in plastic processing and industrial processes we are the ideal partner to work your application. We take pride in consistently developing new and innovative products as well as continually improving existing products. We strive to provide our customers with outstanding quality, reliability, performance and cost-efficient products.

Quality management
As an innovator, Leister commits to transparent and consistent quality management. Leister Technologies AG is certified to complywith the ISO 9001 quality standards. All processes are regularly audited and improved to comply with all quality-relevant criteria; therefore, our products enjoy a reputation of providing reliable service even after years of use - even under adverse conditions!

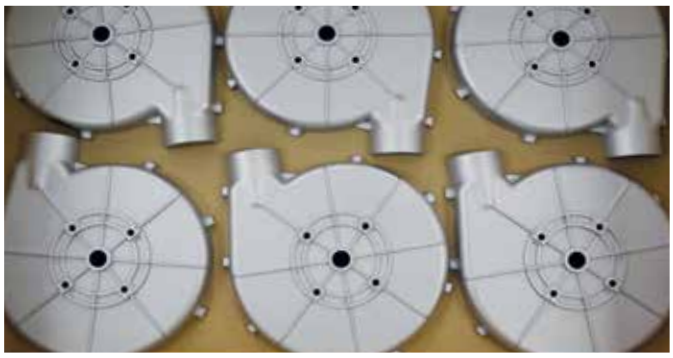
Testing and certification
Our products are designed and developed to comply with nationally and internationally recognized standards. These include both product-specific standards – such as ISO, IEC, EN or UL standards – as well as application-specific standards. For our client‘s protection, tests are carried out by accredited and independent test institutes. The products are then certified and qualified to carry the conformity marking.

Application and laboratory testing
Our team of experts will assist you in choosing the right equipment for your application process. Running a series of tests on your applications will help optimize processes. Leister’s internal applications laboratory allows for comprehensive testing of all manufactured tools and equipment. This testing provides accurate process analysis and documentation to our customers.

More than 130 Sales and Service Centers in over 100 countries
We believe that the basis for customer satisfaction lies within the quality of our products and the smooth operation of our global service network. A close network of more than 130 sales and service centers in more than 100 countries ensures competent and responsive service. Distributors and their staff are trained and certified by Leister on a regular basis; therefore, Leister know-how is locally available to you at all times.

LEISTER

We know how.



Leister hot-air technology: Proven thousands of times.

- heating
- shrinking
- welding
- activating or detaching
- igniting and burning
- removing
- separating or fusing
- pasteurizing and sterilizing
- smoothing and shining
- accelerating
- dissolving
- connecting
- simulating
- de-icing
- inspecting

Food industry: To ensure that candy looks as good as it tastes, it is smoothed after production using precisely controlled hot air from Leister.

Paper industry: Freshly printed paper – from simple labels to banknotes – is often dried with hot-air after printing to ensure high print quality while enabling faster processing speeds.

Automotive industry: To permanently attach interior panels and plastic trim, plastic rivets have to be heated and the rivet heads formed with cold dyes. Using several Leister LE MINIs, the individual rivets can be heated simultaneously with pinpoint precision.

Brewing and beverage industry: Shrinkable plastics are increasingly replacing metal caps. A Leister HOTWIND or an LHS series air heater with the appropriate blower supplies the reflector with hot air.

Cosmetics: Hot air is used in several stages during the production of lipstick. For example, to give the lipstick a glossy finish. Afterwards, a plastic film is shrunk onto the product using hot-air during packaging.

Logistics: To ensure the pallets' load doesn't separate or spill, a PE shrink film cover is placed over it and shrunk using a Leister hot-air blower.

Food industry: Coffee can be roasted with hot air using Leister products To ensure high quality roasting, the temperature is precisely controlled.

Food industry: Thanks to Leister, the PE-coated milk carton can be dried, sterilized and welded.

Why do our customers trust Leister?

Leister hot-air systems are deployed in countless industrial production processes. There is hardly an industry which does not profit from the diverse advantages – whether through cost-effectiveness or because many processes simply become more efficient with hot air.

Know-how
Decades of experience in plastics processing and in industrial processes make us the ideal hot-air technology partner.

Consulting
As the worldwide market leader with our network of more than 130 sales and service centers in more than 100 countries — we are always local and can provide assistance at your location.

Extensive Leister product range
Every hot-air application in all industrial processes can be matched with products from Leister.

Our extensive product range includes:
- Innovative, system-compatible air heaters
- Powerful, robust blowers
- Compact, flexible hot-air blowers
- Comprehensive range of accessories

Customized solutions
Along with our broad product range, we also offer products developed according to your individual specifications.

Development
We constantly develop and optimize our products. Our customers benefit from continuous improvement, high quality, reliability, performance and cost-effectiveness.

Application laboratory
Our application laboratory is equipped with the most up-to-date measuring equipment and therfore extremely well-suited for simulating applications and processes. With this service, we support you in finding a fast and efficient solution.

Independent safety testing
Independent testing is yet another feature Leister offers to ensure top quality and safety of our products. All Leister air heaters and hot-air blowers are tested by the independent test center “Electrosuisse”.

Combination options with air heaters, blowers and temperature regulators.


LEISTER
LEISTER
made in Switzerland
LHS SYSTEM 21S
230V ~
50/60Hz
8.5A
2000W
Serial no
1004215461
Article no
139.910

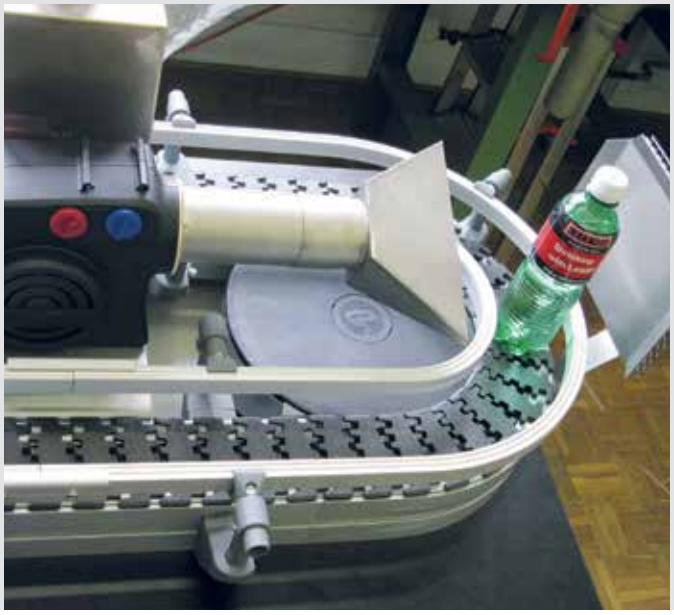
Contents

$$V = R * I$$

$$P = V * I$$

$$I = \frac{P}{V}$$


LEISTER



Hot-air Blowers

The new MISTRAL: The incomparable hot-air blower.

Two model groups are available in this range – the MISTRAL 2, 4, and 6 PREMIUM, and the top-of-the-range MISTRAL 6 SYSTEM. All MISTRAL 6 devices are equipped with a maintenance-free brushless blower motor, making them perfectly-suited to continuous operation. The MISTRAL 6 SYSTEM can either be operated using its integrated controls or via an external system interface.

Hot-air blower

MISTRAL PREMIUM / SYSTEM

1

Maintenance-free
Thanks to its brushless motor, the new MISTRAL [6] PREMIUM / SYSTEM is perfectly suited to continuous operation

2 / 3

Innovative:
Using the "e-drive" operating unit, the air volume and temperature for the MISTRAL SYSTEM can be adjusted to suit every application.

Fully-integrated:
Main switch with integrated push button function for programming (MISTRAL SYSTEM).

4

Multifaceted:
Can be operated as a device with integrated control or via an external system interface for integration into a closed-loop system (MISTRAL SYSTEM).

5

Informed:
Display with user status information and programming (MISTRAL SYSTEM).

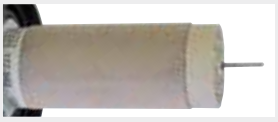
	PREMIUM			SYSTEM
	2	4	6	6
Brushless blower motor			•	•
Brush motor with replacement carbon brushes		•		
Brush motor	•			
Integrated heating element and tool protection	•	•	•	•
Integrated code switch for potentiometer (internal / external)	•	•	•	
Infinitely adjustable heating capacity and air volume with the "e-drive"				•
Automatic cool-down function				•
Remote control interface for temperature / air volume				•
Integrated temperature probe				•
Target / actual values display				•

MISTRAL SYSTEM

6

Innovative design:
Special baffle for an even airflow distribution and an optimised, aerodynamic airflow velocity.

7



Integrated:
Thermocouple in the MISTRAL SYSTEM for enhanced precision.

8

Quick to connect:
Thanks to the integrated air-hose connection adapter with its internal 1-inch thread, an additional adapter is not required.

9

Convenient:
Its state-of-the-art industrial design and convenient mounting tabs are sure to impress.

10

Automatic cooling:
The MISTRAL SYSTEM is equipped with an automatic cool-down function. In the MISTRAL PREMIUM, the blower and heater can be controlled separately.

11

Easy to switch:
The MISTRAL PREMIUM can be switched from an internal to an external potentiometer (optional). As a result, the temperature can even be controlled from the outside.

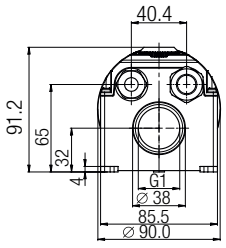
Hot-air blower

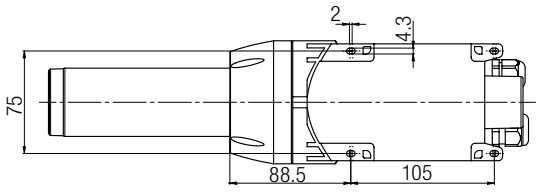
MISTRAL PREMIUM / SYSTEM

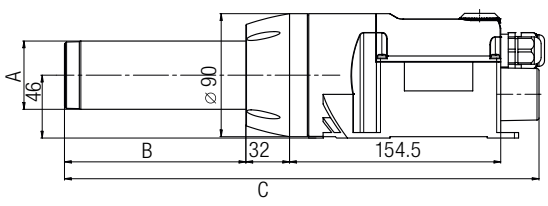
MISTRAL PREMIUM

Installation dimensions in mm

	A	B	C
230 V / 2300 W 100 V / 1500 W	∅ 36.5	106.8	321.2
230 V / 4500 W	∅ 50	137.8	352.2
230 V / 3400 W 120 V / 2400 W 200 V / 3000 W 220 V / 3100 W	∅ 50	108	322.5





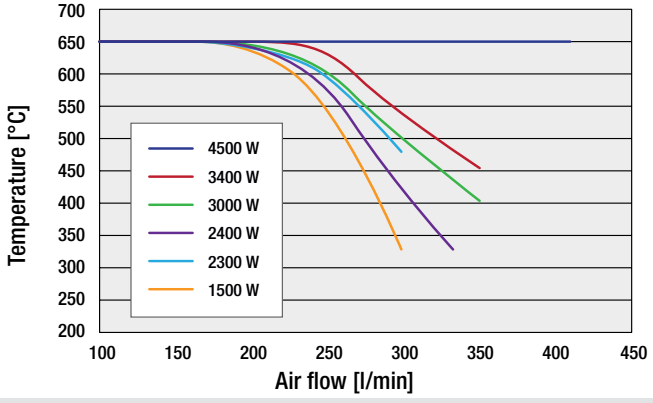


Technical data		MISTRAL 2, 4, 6 PREMIUM						
Model		**2**	**4**	**6**	**6**	**6**	**6**	**6**
Voltage	V~	230	120	120	230	230	230	220
Power	W	3400	2400	2400	2300	3400	4500	3100
Temperature open	°C	520	490	430	500	510	650	510
Max. air volume (20 °C)	l/ min.	350	300	350	300	350	400	350
Pressure	kPa	3.5	3.5	2.5	2.5	2.5	3.0	2.5
Weight	kg	1.4	1.4	1.4	1.4	1.4	1.5	1.4
∅	mm	50	50	50	36.5	50	50	50
Conformity mark		CE			CE c UL us			CE KC
Article no. MISTRAL 2, 4, 6 PREMIUM		**147.963**	**147.964**	**147.965**	**148.006**	**147.966**	**147.967**	**146.522**

Model		**MISTRAL 6 SYSTEM**						
Voltage	V~	100	120	200	230	230	230	220
Power	W	1500	2400	3000	2300	3400	4500	3100
Temperature open	°C	650	650	650	650	650	650	650
Air volume (20 °C) min. max.	l/ min.	100 300	100 350	100 350	100 300	100 350	100 400	100 350
Pressure	kPa	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Weight	kg	1.2	1.4	1.4	1.2	1.4	1.5	1.4
∅	mm	36.5	50	50	36.5	50	50	50
Conformity mark					CE c UL us			CE KC
Article no. MISTRAL 6 SYSTEM		**147.972**	**147.969**	**147.973**	**147.975**	**146.701**	**147.968**	**146.524**

Frequency	Hz	50 / 60
Emission levels	dB(A)	65
Dimensions		see bottom left
Protection class II		⧈
Approval mark		ⓢ

We reserve the right to make technical changes



Accessories ↘ 16

HOTWIND PREMIUM / SYSTEM: The versatile hot-air blower.

Its brushless motor ensures that this hot-air blower has a long service life. The air volume can now be set infinitely up to 900 l/min via the potentiometer. The wide range of applications makes the new HOTWIND SYSTEM truly impressive: be it as a unit with integrated control or as a unit for integration in a closed-loop control circuit using a system interface.

Hot-air blower

HOTWIND PREMIUM / SYSTEM

HOTWIND SYSTEM

1		**Infinitely adjustable:** Potentiometers for stepless adjustment of the heater and blower (PREMIUM and SYSTEM).
2		**Remote controlled:** Interface with alarm contact in the HOTWIND SYSTEM for controlling the air volume and heat output, using 4 – 20 [mA] or 0 – 10 [V] signal.
3		**Integrated:** Thermocouple in the HOTWIND SYSTEM for even greater precision.
4		**User friendly:** Display on the HOTWIND SYSTEM provides the user with status information.
5		**Cleverly combined:** Main switch with integral function button for programming (SYSTEM).
6		**Automatic cooling:** HOTWIND PREMIUM and HOTWIND SYSTEM are equipped with an automatic cool-down function.

	PREMIUM	SYSTEM
Heat output and air volume steplessly adjustable with potentiometer	•	•
Integrated power electronics	•	•
Protection against heating element or device overheating	•	•
Brushless blower motor	•	•
Alarm output		•
Integrated temperature probe		•
Integrated temperature control		•
Remote control interface for temperature or power set point		•
Remote control interface for air volume adjustment		•
Display for showing the setpoint and actual values (°C or °F)		•

Hot-air blower

HOTWIND PREMIUM / SYSTEM

HOTWIND PREMIUM

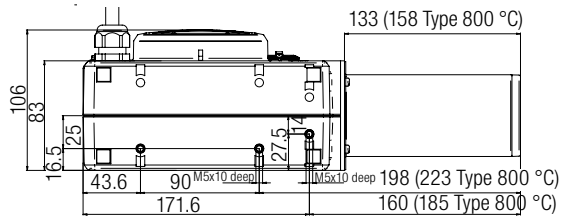
Technical data HOTWIND PREMIUM / HOTWIND SYSTEM

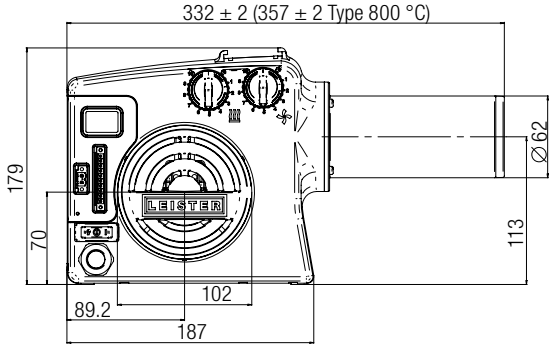
Voltage	V~	120	230	230	230	230	230	400	220
Power consumption	W	2300	2300	2300	3100	3680	3680	5400	3350
Frequency	Hz	50 / 60							
Max. air outlet-temperature	°C	650	650	650	800	650	650	650	650
Air flow (20 °C)	l/min.	200 – 900							
Static pressure	kPa	0.8	1.0						
Noise emission	dB(A)	< 70							
Weight without cable	kg	2.2			2.3	2.2		2.4	2.2
Dimensions		see below							
Protection class II		⧈							
Conformity mark		CE cULus	CE	CE cULus	CE	CE	CE cULus		CE
Safety standard		ⓢ	ⓢ	ⓢ	ⓢ	ⓢ	ⓢ		
Without connecting plug		•		•			•	•	
Connecting plug (Euro)			•		•	•			
Connecting plug (Korea)									•
order. No. HOTWIND PREMIUM		140.095	142.612	142.643	142.608	142.609	140.098	142.644	143.299
order. No. HOTWIND SYSTEM *		142.636	142.646	140.096		142.645	142.640	142.641	143.804

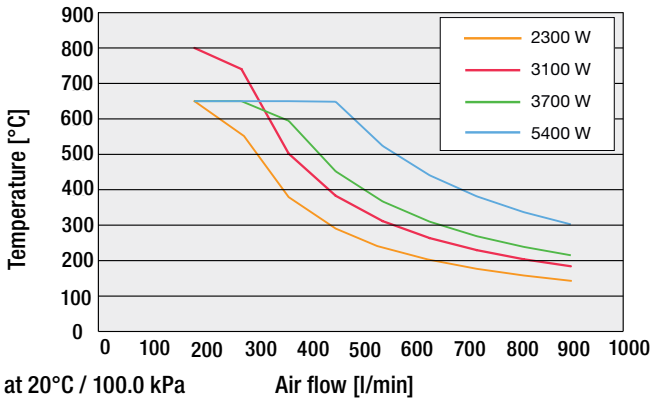
* Note: Interface with cover, connecting plug included.

Subject to change without notice.
Connection voltage non-switchable.

Installation dimensions in mm

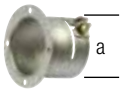






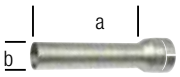
Accessories ↘ 17

Accessories MISTRAL PREMIUM / SYSTEM (⌀ 50 mm)

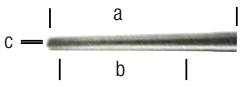


107.254 Flange connector, push-fit
a = 70 mm

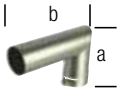
Nozzle adapter, push-fit (a x b)
122.332 from (a) ⌀ 50 mm to (b) ⌀ 62 mm
122.924 from (a) ⌀ 50 mm to (b) ⌀ 37 mm



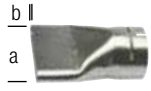
107.255 Extension nozzle, push-fit (a × b)
160 × 36.5 mm



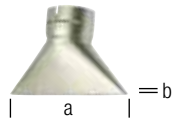
Tubular nozzle, push-fit (a × b × c)
105.950 460 × 300 × 2 mm
107.257 590 × 420 × 1.7 mm
105.955 836 × 660 × 1 mm
105.952 900 × 800 × 0.9 mm



107.256 Angled nozzle, push-fit (a × b)
shank length 106 x 162, ⌀ 50 mm

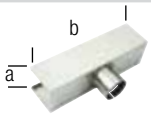


Wide slot nozzle, push-fit (a × b)
105.961 45 × 12 mm, lenth 350 mm
107.258 70 × 10 mm

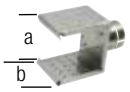


Wide slot nozzle, push-fit (a × b)
106.057 100 × 4 mm
106.060 150 × 6 mm
107.270 150 × 12 mm
106.061 300 × 6 mm

107.331 Hinged reflector, push-fit (d × b)
70 × 70 mm



107.340 Shell reflector, push-fit (a × b)
45 × 250 mm



Sieve reflector, push-fit (a × b)
107.327 70 × 75 mm
107.333 110 × 150 mm

107.330 Hinged reflector, push-fit (d × b)
125 × 22 mm

107.286 PVC air hose
⌀ 38 mm

107.287 Hose clip for ⌀ 38 and 60 mm
air hose

106.127 Sieve reflector «douche» (⌀ 50.5 mm)
⌀ 65

153.245 Stainless steel filter kit (⌀ 38 mm),
push-fit on air intake

106.956 Thermocouple with plug
1 m cable

Thermocouple extension cable
with plug and connection
106.958 2 m
106.960 4 m
106.962 10 m

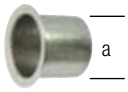
123.039 CSS – Temperature controller
(MISTRAL SYSTEM)

137.720 E5CC – Digital temperature controller
(MISTRAL SYSTEM)

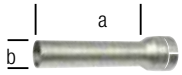
148.812 External potentiometer box,
analogue, 10 kΩ, with 3 m signal cable
(MISTRAL PREMIUM)

Accessories for ⌀ 36.5 mm can be found on page 40 (LHS 21 analogue air heaters)

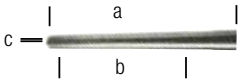
Accessories HOTWIND PREMIUM / SYSTEM (⌀ 62 mm)



125.317 Flange connector, push-fit
a = 90 mm



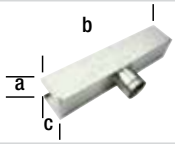
107.247 Extension nozzle, push-fit (a × b)
200 × 45 mm



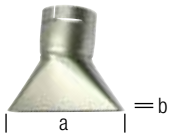
Tubular nozzle, push-fit (a × b × c)
105.907 354 × 204 × 4.5 mm
105.919 456 × 306 × 3 mm
107.253 700 × 550 × 1.7 mm
114.136 795 × 655 × 1.5 mm
105.906 1100 × 1000 × 4 mm

107.265 Angled nozzle, push-fit (a × b)
shank length 120 x 115, ∅ 62 mm

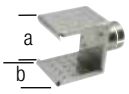
107.245 Round nozzle, push-fit
d = 40 mm



Shell reflector, push-fit
107.342 50 × 400 × 80 mm (a × b × c)
106.174 65 × 400 × 95 mm
106.175 80 × 400 × 80 mm



Wide slot nozzle, push-fit (a × b)
107.260 85 × 15 mm
107.259 150 × 12 mm
105.977 200 × 9 mm
107.263 250 × 12 mm, with sieve insert
107.262 300 × 4 mm
105.992 400 × 4 mm
105.991 500 × 4 mm



Sieve reflector, push-fit (a × b)
106.143 45 × 75 mm
107.329 70 × 75 mm
107.336 110 × 152 mm

107.335 Sieve reflector, push-fit
∅ 150 mm

107.248 Stainless steel filter,
push-fit on air intake

141.723 Hand tool kit
(handle and protective tube)

113.351 Extension tube, push-fit (a × b)
275 × ∅ 62 mm

VULCAN SYSTEM: The clever muscle man.

The muscle man among the hot-air blowers leaves no doubts about its performance. It is compactly built and easy to integrate into industrial processes. Just as Leister's smaller hot-air blowers, VULCAN SYSTEM can be controlled remotely through a standard analog interface.

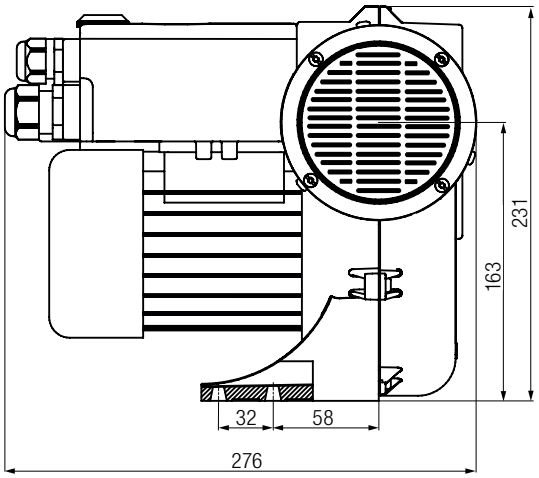
Hot-air blower

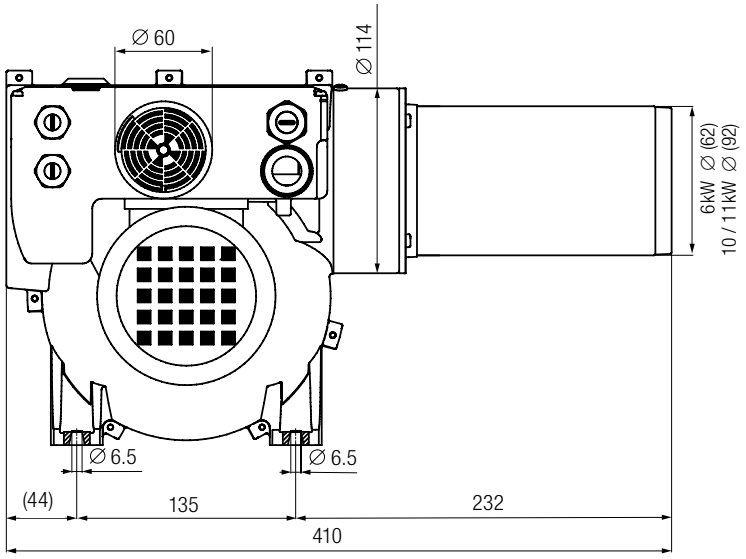
VULCAN SYSTEM

Voltage	V~	3 × 230		3 × 400		3 × 480	
Power consumption	kW	6	10	6	11	6	11
Order no.		**143.407**	**143.406**	**143.402**	**140.463**	**143.405**	**143.404**

Technical Data VULCAN SYSTEM Frequency	50 Hz	60 Hz
Heating power steplessly adjustable with potentiometer	•	
Standard control interface through a 4 - 20 mA or a 0 - 10 V signal	•	
Integrated power electronics	•	
Protection against heating element or device overheating	•	
Brushless blower motor with FC control	•	
Alarm output	•	
Integrated temperature control	•	
Integrated temperature probe	•	
Display for showing the setpoint and actual values	•	
Max. air outlet temperature °C	650	
Max. air flow l/min (20 °C) 3 × 230 V~	850	1500
Max. air flow l/min (20 °C) 3 × 400 V~ / 3 x 480 V~	950	1700
Static pressure kPa	3.1	4.0
Noise emission level db (A)	65	
Weight (kg)	9.3	
Conformity mark	CE	
Protection class I	⏚	
Safety standard		

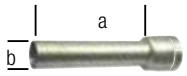
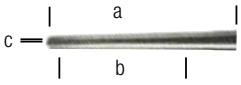
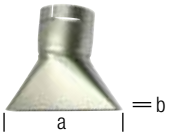
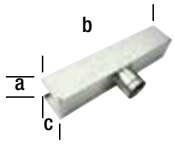
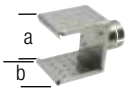
Installation dimensions in mm





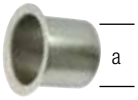
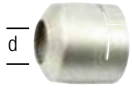
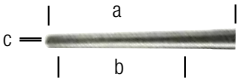
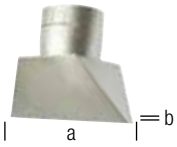
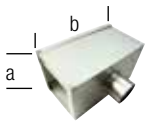
Accessories VULCAN SYSTEM

6 kW (⌀ 62 mm)

	**125.317**	Flange connector, push-fit a = 90 mm
	**107.245**	Round nozzle, push-fit d = 40 mm
	**107.247**	Extension nozzle, push-fit (a × b) 200 × 45 mm
	**107.265**	Angled nozzle, push-fit (a × b) shank length 120 x 115, ∅ 62 mm
		Tubular nozzle, push-fit (a × b × c)
	105.907	354 × 204 × 4.5 mm
	105.919	456 × 306 × 3 mm
	107.253	700 × 550 × 1.7 mm
	114.136	795 × 655 × 1.5 mm
	105.906	1100 × 1000 × 4 mm
		Wide slot nozzle, push-fit (a × b)
	107.260	85 × 15 mm
	107.259	150 × 12 mm
	105.977	200 × 9 mm
	107.263	250 × 12 mm, with sieve insert
	107.262	300 × 4 mm
	105.992	400 × 4 mm
	105.991	500 × 4 mm
		Shell reflector, push-fit
	107.342	50 × 400 × 80 mm (a × b × c)
	106.174	65 × 400 × 95 mm
	106.175	80 × 400 × 80 mm
		Sieve reflector, push-fit (a × b)
	106.143	45 × 75 mm
	107.329	70 × 75 mm
	107.336	110 × 152 mm
	**107.335**	Sieve reflector, push-fit ∅ 150 mm
	**107.277**	Stainless steel filter, push-fit on air intake

Accessories VULCAN SYSTEM

10/11 kW (⌀ 92 mm)

	**125.318**	Flange connector, push-fit a = 120 mm
	**107.244**	Round nozzle, push-fit d = 50 mm
	**107.273**	Extension nozzle, push-fit (a × b) 500 × 60 mm
	**107.269**	Angled nozzle, push-fit (a × b) shank length 175 × 175 mm
		Tubular nozzle, push-fit (a × b × c)
	106.031	1000 × 800 × 2 mm
	106.035	1185 × 900 × 1.6 mm
	107.268	1288 × 1000 × 1.5 mm
	106.033	1550 × 1350 × 1.1 mm
		Wide slot nozzle, push-fit (a × b)
	107.274	130 × 17 mm
	106.028	220 × 12 mm
	107.272	300 × 12 mm
	106.018	400 × 10 mm
	106.024	500 × 7 mm
	107.267	500 × 15 mm
	106.023	600 × 4 mm
	106.026	600 × 9 mm
	**107.341**	Shell reflector, push-fit (a × b) 160 × 370 mm
	**107.276**	Sieve reflector, push-fit ∅ 260 mm
	**107.277**	Stainless steel filter, push-fit on air intake
	**133.517**	Thermocouple holder

IGNITER BM4 / BR4 – Ignites just about anything.

The new IGNITER ignition blower from Leister has been specially developed for installation into pellet and wood chip boilers. The IGNITER BR4 with 3.4 kW has what it takes. The interface was selected so that the ignition blowers can easily be installed into any heating boiler.

Hot-air blower

IGNITER

1

Easy:
Connector plug located directly on the device means easy removal and installation and fewer device configurations.

2

Clever:
New assembly support for positioning in the furnace.

3

Linked:
Connection adapter for air hose located directly on the device with inner 1" thread (no extra accessories needed).

4

Additional:
Pipe joint adapter with M14 thread for easy adaptation of the heat conduction lines and extensions (available only for IGNITER BM4).

5

Protected:
Heating element protection with phototransistor and device protection via temperature protection circuit.

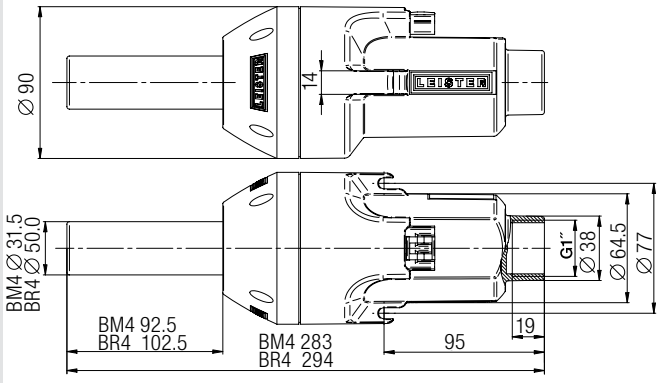
reddot design award
winner 2013

Clean ignition process due to optimum heat level.

Technical Data		IGNITER BM4					BM4 with M14 screw adapter	BM4 with 3/8" screw adapter	BR4
Voltage	V	120	120	230	230	230	230	230	230	230
Frequency	Hz	50 / 60								
Power rating	W	1100	1550	600	1100	1600	1100	1600	1100	3400
Min. air volume	l/min 20°C	230	230	80	230	230	230	230	230	360
Air pressure	kPa	2.48	2.48	0.3	2.48	2.48	2.48	2.48	2.48	4.00
Max temperature	°C	600	600	500	600	600	600	600	600	650
Noise emission level	dB (A)	68	68	58	68	68	68	68	68	68
Aperture	mm ∅	90								
Weight	kg	1.0 (without power supply cord)								1.2
Length	mm	283								294
Conformity mark		CE cULus								CE
Safety standard										
Certification		CCA								
Protection class II										
Article no.		141.882	141.881	139.232	140.711	139.231	144.012	145.449	142.421	146.296

We reserve the right to make technical changes.
Plug for cable connection and cable are not included.

Installation dimensions in mm



Accessories IGNITER

156.095 Heater tube 3/8" for extensions
156.094 Heater tube M14 for extensions

153.245 Stainless steel filter kit (∅ 38 mm), push-fit on air intake

107.286 PVC Air hose ∅ 38 mm / ∅ 1.5 in

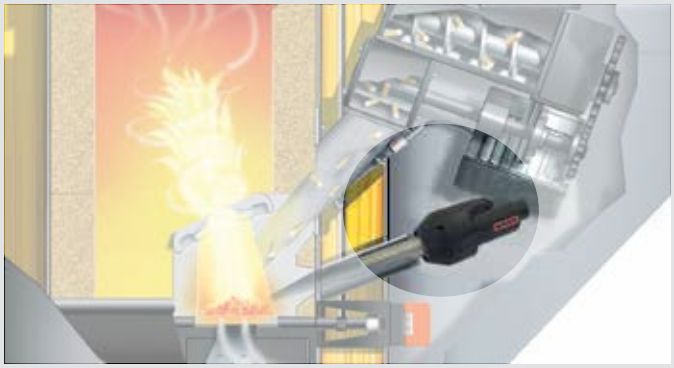
107.287 Hose bracket for hose ∅ 38 mm / ∅ 1.5 in and ∅ 60 mm / ∅ 2.4 in

142.717 Heating element 230 V ~ 1550 W
150.871 Heating element 230 V ~ 1050 W
150.872 Heating element 230 V ~ 550 W
142.718 Heating element 120 V ~ 1500 W
150.873 Heating element 120 V ~ 1050 W
145.606 Heating element (BR4) 230 V ~ 3300 W

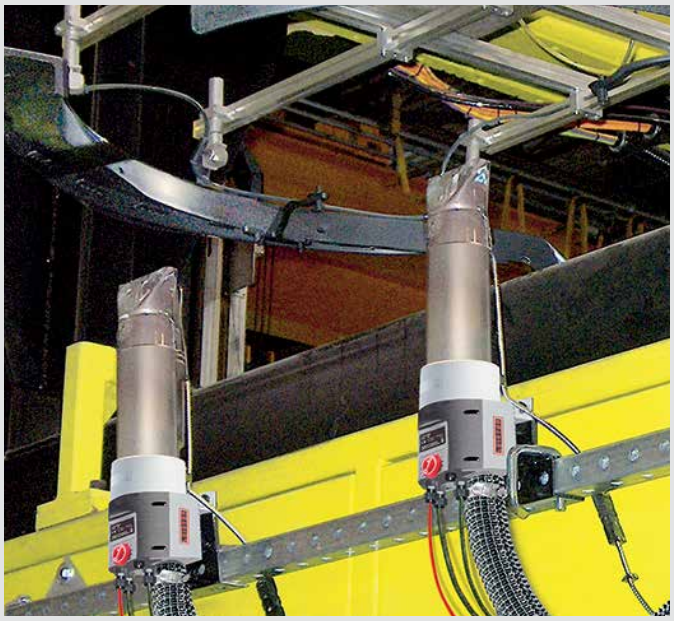
142.967 Power supply cord (rubber) with WAGO plug 3 x 1 mm² x 3 m
143.131 Power supply cord (silicone) with WAGO plug 3 x 1 mm² x 3 m

142.976 Plug with strain relief, kit (WAGO 770) cable ∅ 4.5 – 8 mm
148.429 (BR4) Plug with strain relief, kit (WAGO 770) cable ∅ 8 – 11.5 mm

142.359 Accessory adapter to TRIAC S Economy heating pipe



Installation arrangement



Air Heaters / Controllers

Leister’s air heaters: From mini to giant.

Leister’s air heater highlight:

The LHS series.

Picture: LHS 21S SYSTEM (p. 28 – 29)

1		**Compact:** Small dimensions for installation in tight spaces.
2		**Reliable:** Very durable heating elements thanks to innovative, patented heating element protection.
3		**Easy Maintenance:** Faster and easier heating element change.
4		**Power electronics:** External power control becomes obsolete and system design times are reduced.
5		**Thermocouple:** The integral thermocouple in SYSTEM devices improves precision and enables reproducibility.
6		**User friendly:** The display of the SYSTEM devices provides users precise local information.

7 Professional integration or controlled stand-alone operation

Operation modes LHS SYSTEM	Control mode	Adjustment mode
Internal (potentiometer) set point.	Temperature set point by potentiometer. Display shows temperature set point and actual temperature.	Capacity set point by potentiometer. Display shows capacity set point in % and actual temperature.
External (interface) set point.	Temperature set point by external controller. Display shows temperature set point and actual temperature.	Capacity set point by external controller. Display shows capacity set point in % and actual temperature.

The LHS air heater family

The LHS air heater family covers an impressive power range from 550 W to 40 kW. The diversity of this portfolio makes it ideal for practically all hot-air applications. By choosing LHS air heaters, you are investing in devices that are manufactured using state-of-the-art technology. Between them, the CLASSIC, PREMIUM and SYSTEM models offer the ideal solutions for users' differing requirements.

Features	CLASSIC	PREMIUM	SYSTEM
Easy to integrate (mounted from above)	✓	✓	✓
Overheat detection with alarm output for the heating element	✓		
Tool overheat detection with alarm output	✓		
Overheat protection with alarm output for the heating element		✓	✓
Tool overheat protection with alarm output		✓	✓
Infinitely adjustable heating capacity via potentiometer		✓	✓
Remote control via analogue interface (4 – 20 mA or 0 – 10 V)			✓
Various open-loop and closed-loop control modes available for selection			✓ *
LED display (target/actual value display)			✓ *

* = except the LHS 91 SYSTEM

Alongside its optimised design and traditional Leister quality, the patented heating element protection guarantees yet another increase to the service life of the heating element. Thanks to their built-in temperature probes and controllers, integrating the LHS SYSTEM air heaters has never been easier. The integrated power electronics make external power controls a thing of the past and even simplify the wiring.

Model		LHS 15	LHS 21		LHS 41		LHS 61		LHS 91
			S	L	S	L	S	L	
Power Range from – to		0.55 kW 0.77 kW	1.0 kW 2.0 kW	3.3 kW 3.3 kW	2.0 kW 3.6 kW	2.0 kW 5.5 kW	4.0 kW 9.0 kW	5.0 kW 16 kW	11 kW 40 kW
Catalogue page		26	28		30		32		34

LHS 15: Tiny and reliable.

The tiny air heater provides hot air up to 650 °C. All prominent features of Leister air heaters also are offered with this tiny heater: long-life heating element, reliable protection systems, standard interfaces. Simply summarizing – the same Leister quality as usual. This makes it a perfect tool for applications in Semiconductor, Electronics, Automotive and other industries.

Air heater

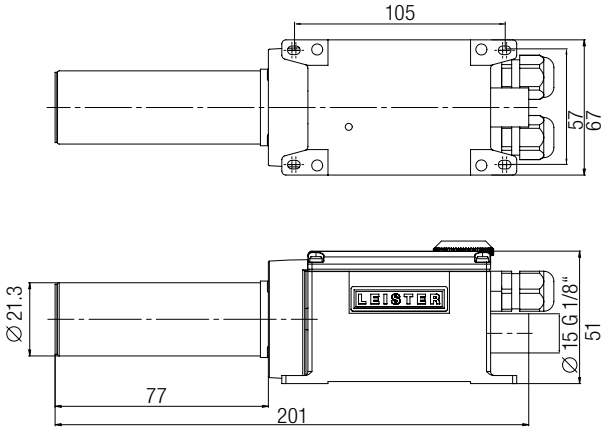
LHS 15

Technical data

Max. air outlet temperature	°C	650
Max. air inlet temperature	°C	65
Max. ambient temperature	°C	65
Min. air flow		As per diagram
Max. inlet pressure	kPa	100
Weight	kg	0.48
Conformity mark		CE
Approval mark		
Protection class II		

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power

Installation dimensions in mm



Combination possibilities

- Leister air heater at maximum heat power and without nozzle with Leister blower at 50 Hz, 1.5 m hose length and unimpeded air outflow.
- Hot-air temperature 3 mm after air outlet, measured at the hottest point.
- Air flow at 20 °C, 100.0 kPa compliant with ISO 6358.

Power Typ	Number LHS 15 x power cons. kW	Air flow l/min.	Temperatur °C
ROBUST	1 × 0.77	1 × 150	420
ROBUST	2 × 0.77	2 × 130	460

Air flow and temperature values may deviate from those above based on the design of the entire hot-air system (including nozzles, air hoses, environmental conditions).

Deflashing foil sleeves from charcoal filter elements

Air heater

LHS 15 CLASSIC

Heating power not adjustable

Detection of heating element and device overheating with alarm output

Air heater

LHS 15 PREMIUM

Heating power steplessly adjustable with potentiometer

Protection against heating element and device overheating with alarm output

Air heater

LHS 15 SYSTEM

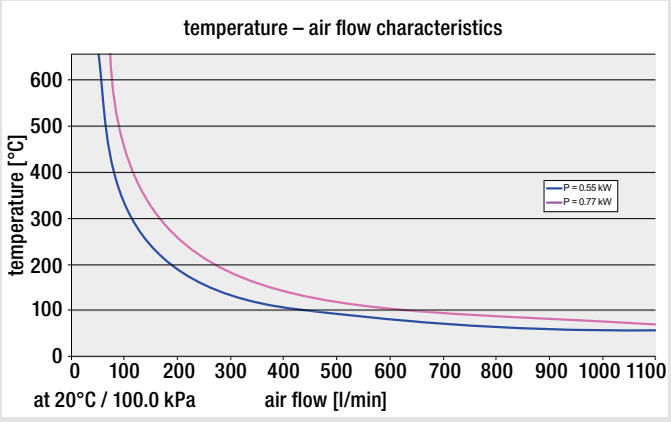
Heating power or temperature steplessly adjustable with potentiometer or remote control interface

Protection against heating element and device overheating with alarm output

Remote control interface for external temperature controllers (Leister CSS, or PLCs)

Order no.:	CLASSIC	PREMIUM	SYSTEM
LHS 15 0.55 kW/120 V	139.873	139.908	139.894
LHS 15 0.77 kW/230 V	139.874	139.893	139.895

Contact a Leister sales partner in your region for professional advice and information on our other air heaters and blowers.



Accessories ↘ 40

LHS 21: Designed for professionals.

These advanced air heaters are distinguished by their extremely small dimensions – especially the lean design (only 67 mm wide) – as well as their long service life. Designed for professional integration into machine systems, the new LHS series enables any specific application. Sterilizing, drying, welding, cleaning, shrinking, shaping, deburring and activating are now more efficient and reliable thanks to Leister's proven hot-air technology!

Air heater

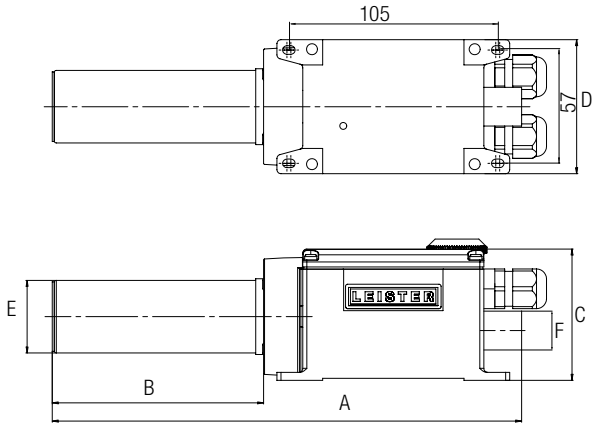
LHS 21

Technical data
LHS 21S / 21L

Max. air outlet temperature	°C	650
Max. air inlet temperature	°C	65
Max. ambient temperature	°C	65
Min. air flow		As per diagram
Max. inlet pressure	kPa	100
Weight 21S / 21L	kg	0.55 / 0.65
Conformity mark		CE
Approval mark		
Protection class II		

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power

Installation dimensions in mm



Type	A	B	C	D	E	F
LHS 21S	236	106	66	67	∅ 36.5	∅ 19.5 G 3/8''
LHS 21L	266	136	66	67	∅ 36.5	∅ 19.5 G 3/8''

Combination possibilities

- Leister air heater at maximum heat power and without nozzle with Leister blower at 50 Hz, 1.5 m hose length and unimpeded air outflow.
- Hot-air temperature 3 mm after air outlet, measured at the hottest point.
- Air flow at 20°C, 100.0 kPa compliant with ISO 6358.

Power Typ	Number LHS 21S x power cons. kW	LHS 21S x Air flow l/min.	LHS 21S Temperature °C
ROBUST	1 × 1.0	1 × 640	160
ROBUST	2 × 1.0	2 × 420	200
ROBUST	4 × 1.0	4 × 240	300
ROBUST	1 × 2.0	1 × 590	300
ROBUST	2 × 2.0	2 × 390	380
ROBUST	4 × 2.0	4 × 220	540
MONO	2 × 1.0	2 × 341	236
MONO	1 × 2.0	1 × 525	333
MONO	2 × 2.0	2 × 353	450
Power Typ	**Number LHS 21L x power cons. kW**	**LHS 21L x Air flow l/min.**	**LHS 21L Temperature °C**
ROBUST	1 × 3.3	1 × 550	520
ROBUST	2 × 3.3	2 × 390	610
AIRPACK	2 × 3.3	2 × 1210	270
AIRPACK	4 × 3.3	4 × 700	340

Air flow and temperature values may deviate from those above based on the design of the entire hot-air system (including nozzles, air hoses, environmental conditions).

High-end air heaters on an indexing table for producing light bulbs.

Air heater

LHS 21 CLASSIC

Heating power not adjustable

Detection of heating element and device overheating with alarm output

Air heater

LHS 21 PREMIUM

Heating power steplessly adjustable with potentiometer

Protection against heating element and device overheating with alarm output

Air heater

LHS 21 SYSTEM

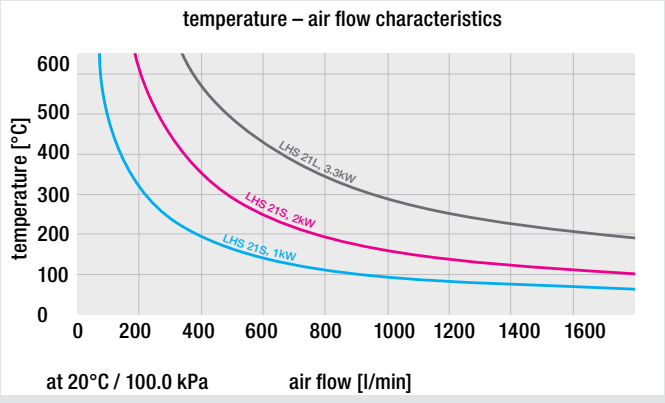
Heating power or temperature steplessly adjustable with potentiometer or remote control interface

Protection against heating element and device overheating with alarm output

Remote control interface for external temperature controllers (Leister CSS, or PLCs)

Order No.:		CLASSIC	PREMIUM	SYSTEM
LHS 21S	1.0 kW/120V	139.868	140.454	140.458
LHS 21S	1.0 kW/230V	139.869	140.455	140.459
LHS 21S	2.0 kW/120V	139.870	140.456	140.460
LHS 21S	2.0 kW/230V	139.871	139.909	139.910
LHS 21L	3.3 kW/230V	139.872	140.457	140.461

Contact a Leister sales partner in your region for professional advice and information on our other air heaters and blowers.



Accessories ↘ 40

LHS 41: Small but high performance.

The medium size LHS 41 series air heaters cover an extremely wide application range. The small footprint enables easy integration into machines. The heater tube diameter of 50 mm allows passing sufficient air flow, also for high performance applications.

Air heater

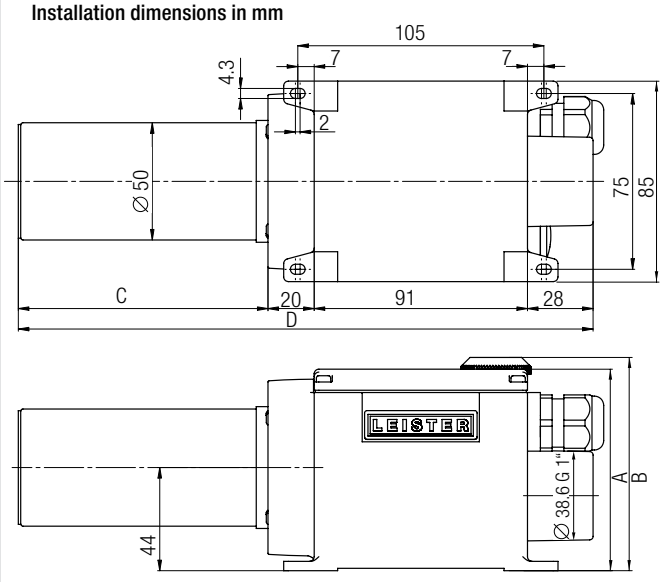
LHS 41

Technical data
LHS 41S / 41L

Max. air outlet temperature	°C	650
Max. air inlet temperature	°C	65
Max. ambient temperature	°C	65
Min. air flow		As per diagram
Max. inlet pressure	kPa	100
Weight 41S / 41L	kg	0.85 / 0.95
Conformity mark		CE
Approval mark		
Protection class II		

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power

Installation dimensions in mm



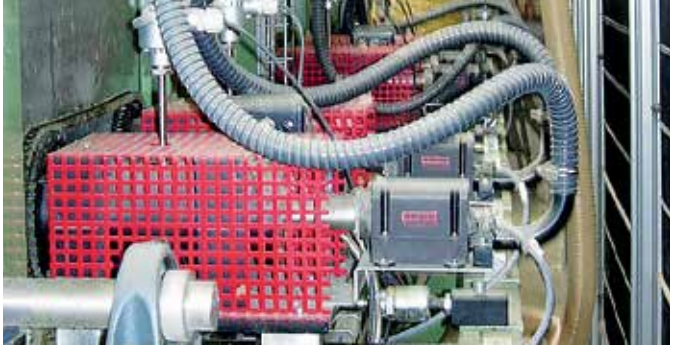
Type	A	B	C	D
LHS 41S CLASSIC	86	86	106	245
LHS 41L CLASSIC	86	86	136	275
LHS 41S PREMIUM	86	91	106	245
LHS 41L PREMIUM	86	91	136	275
LHS 41S SYSTEM	86	91	106	245
LHS 41L SYSTEM	86	91	136	275

Combination possibil ities

- Leister air heater at maximum heat power and without nozzle with Leister blower at 50 Hz, 1.5 m hose length and unimpeded air outflow.
- Hot-air temperature 3 mm after air outlet, measured at the hottest point.
- Air flow at 20°C, 100.0 kPa compliant with ISO 6358.

Power Typ	Number LHS 41S x power cons. kW	LHS 41S x Air flow l/min.	LHS 41S Temperature °C
ROBUST	2 × 2.0	2 × 480	300
ROBUST	4 × 2.0	4 × 250	450
ROBUST	1 × 3.6	1 × 810	370
ROBUST	2 × 3.6	2 × 470	540
SILENCE	2 × 2.0	2 × 460	290
SILENCE	4 × 2.0	4 × 380	300
SILENCE	1 × 3.6	1 × 440	600
SILENCE	2 × 3.6	2 × 410	600
SILENCE	4 × 3.6	4 × 330	600
ASO	4 × 2.0	4 × 500	230
ASO	4 × 3.6	4 × 480	450
MONO	1 × 2.0	1 × 750	250
MONO	1 × 3.6	1 × 665	468
Power Typ	**Number LHS 41L x power cons. kW**	**LHS 41L x Air flow l/min.**	**LHS 41L Temperature °C**
ROBUST	2 × 2.0	2 × 510	310
ROBUST	4 × 2.0	4 × 270	470
ROBUST	1 × 4.4	1 × 810	390
ROBUST	2 × 4.4	2 × 450	560
SILENCE	2 × 2.0	2 × 453	320
SILENCE	4 × 2.0	4 × 368	330
SILENCE	1 × 4.4	1 × 410	620
SILENCE	2 × 4.4	2 × 400	620
SILENCE	4 × 4.4	4 × 330	630
ASO	4 × 2.0	4 × 500	270

Air flow and temperature values may deviate from those above based on the design of the entire hot-air system (including nozzles, air hoses, environmental conditions).



LHS air heaters in a production line for drying insulating material.

Air heater

LHS 41 CLASSIC

Heating power not adjustable

Detection of heating element and device overheating with alarm output

Air heater

LHS 41 PREMIUM

Heating power steplessly adjustable with potentiometer

Protection against heating element and device overheating with alarm output

Air heater

LHS 41 System

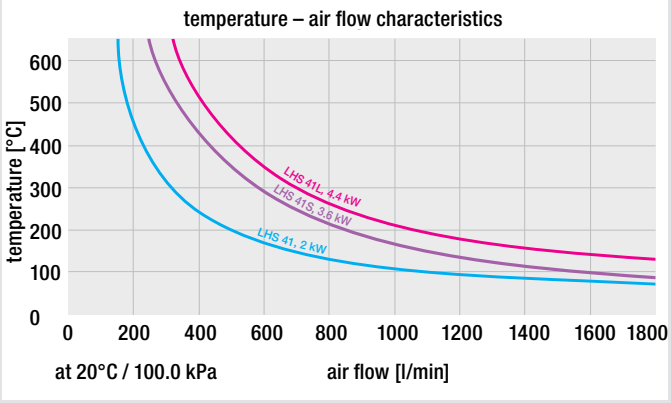
Heating power or temperature steplessly adjustable with potentiometer or remote control interface

Protection against heating element and device overheating with alarm output

Remote control interface for external temperature controllers (Leister CSS, or PLCs)

Order No.:		CLASSIC	PREMIUM	SYSTEM
LHS 41S	2.0 kW/120V	143.292	143.289	143.279
LHS 41S	2.0 kW/230V	143.291	143.287	143.278
LHS 41S	3.6 kW/230V	143.290	143.283	142.489
LHS 41L	4.4 kW/230V	145.726	145.435	145.729
LHS 41L	2.0 kW/400V	143.293	143.281	142.492
LHS 41L	4.4 kW/400V	143.294	143.282	143.280
LHS 41L	5.5 kW/400V	145.727	145.438	145.728

Contact a Leister sales partner in your region for professional advice and information on our other air heaters and blowers.



Accessories ↘ 41

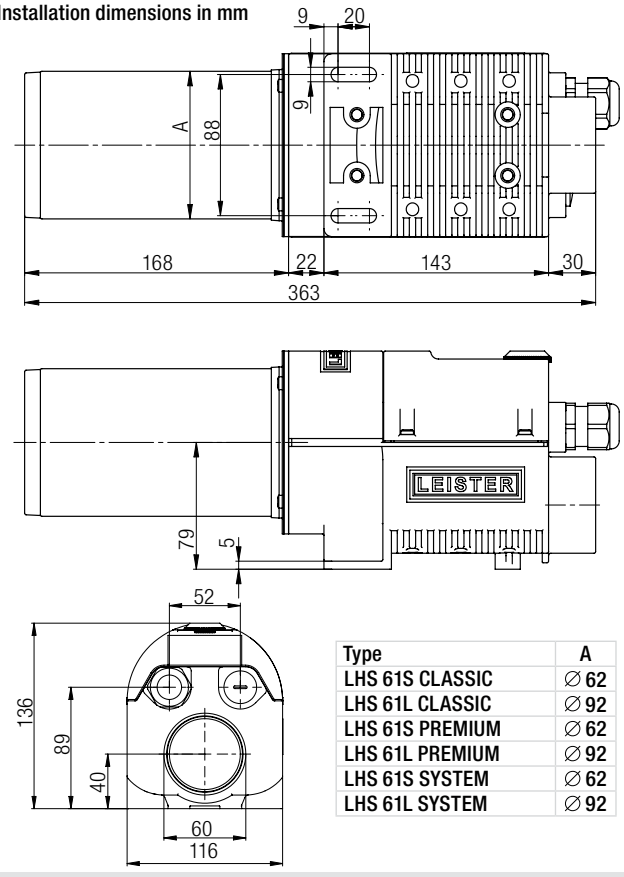
LHS 61: The large powerful models.

The LHS 61 series is your choice for high performance applications. The outlet diameter of 62 mm for LHS 61S versions and 92 mm for LHS 61L versions allow high air flows with up to 16 kW heating power.

Air heater

LHS 61

Installation dimensions in mm



Type	A
LHS 61S CLASSIC	∅ 62
LHS 61L CLASSIC	∅ 92
LHS 61S PREMIUM	∅ 62
LHS 61L PREMIUM	∅ 92
LHS 61S SYSTEM	∅ 62
LHS 61L SYSTEM	∅ 92

Combination possibilities

- Leister air heater at maximum heat power and without nozzle with Leister blower at 50 Hz, 1.5 m hose length and unimpeded air outflow.
- Hot-air temperature 3 mm after air outlet, measured at the hottest point.
- Air flow at 20°C, 100.0 kPa compliant with ISO 6358.

Power Typ	Number LHS 61S x power cons. kW	LHS 61S x Air flow l/min.	LHS 61S Temperature °C
ROBUST	2 × 4.0	2 × 500	490
ROBUST	1 × 6.0	1 × 910	410
SILENCE	2 × 4.0	2 × 620	380
SILENCE	1 × 6.0	1 × 690	500
SILENCE	2 × 4.0	2 × 620	380
SILENCE	2 × 6.0	2 × 590	510
ASO	2 × 4.0	2 × 830	310
ASO	2 × 6.0	2 × 743	430
ASO	4 × 6.0	4 × 667	470
AIRPACK	1 × 4.0	1 × 3080	120
AIRPACK	2 × 4.0	2 × 1730	170
AIRPACK	4 × 4.0	4 × 960	280
AIRPACK	1 × 6.0	1 × 2950	160
AIRPACK	2 × 6.0	2 × 1700	240
AIRPACK	4 × 6.0	4 × 970	390
Power Typ	**Number LHS 61L x power cons. kW**	**LHS 61L x Air flow l/min.**	**LHS 61L Temperature °C**
ROBUST	1 × 8.0	1 × 1038	500
SILENCE	2 × 8.0	2 × 1029	440
SILENCE	1 × 11.0	1 × 1220	480
SILENCE	2 × 11.0	2 × 980	560
AIRPACK	1 × 8.0	1 × 3433	190
AIRPACK	2 × 8.0	2 × 2313	310
AIRPACK	4 × 8.0	4 × 979	510
AIRPACK	1 × 11.0	1 × 3380	230
AIRPACK	2 × 11.0	2 × 1840	380
AIRPACK	4 × 11.0	4 × 1010	590
AIRPACK	1 × 16.0	1 × 3450	360
AIRPACK	2 × 16.0	2 × 1930	550
ASO	1 × 11.0	1 × 1600	390
ASO	2 × 11.0	2 × 1480	420
ASO	4 × 11.0	4 × 1160	520
ASO	1 × 16.0	1 × 1500	610

Air flow and temperature values may deviate from those above based on the design of the entire hot-air system (including nozzles, air hoses, environmental conditions).

Three LHS 61S air heaters with wide slot nozzles in a wrapping line.

Air heater

LHS 61 CLASSIC

Heating power not adjustable

Detection of heating element and device overheating with alarm output

Air heater

LHS 61 PREMIUM

Heating power steplessly adjustable with potentiometer

Protection against heating element and device overheating with alarm output

Air heater

LHS 61 SYSTEM

Heating power or temperature steplessly adjustable with potentiometer or remote control interface

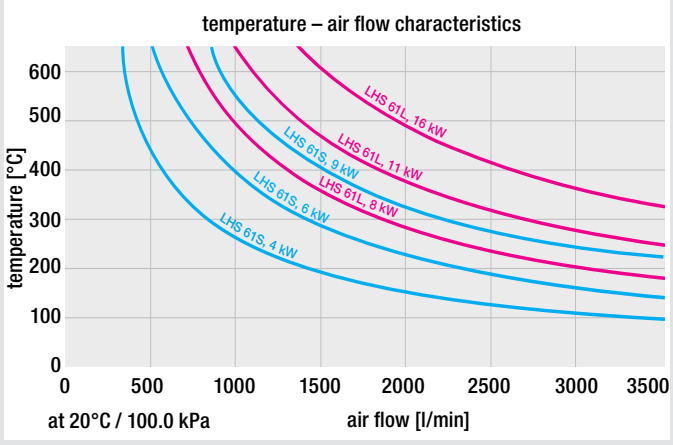
Protection against heating element and device overheating with alarm output

Remote control interface for external temperature controllers (Leister CSS, or PLCs)

Technical data

LHS 61S / 61L		
Max. air outlet temperature	°C	650
Max. air inlet temperature	°C	65
Max. ambient temperature	°C	65
Min. air flow		As per diagram
Max. inlet pressure	kPa	100
Weight 61S / 61L	kg	3.15 / 3.65
Conformity mark		CE
Approval mark		GS
Protection class I		⏚

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power



61S								
Voltage	V ~	3 × 230			1 × 400	3 × 400		
Power	kW	4	6	8	8.5	4	6	9
CLASSIC	Order no.	143.707	143.696	142.839	145.732	143.708	143.490	143.697
PREMIUM	Order no.	143.714	143.484		145.442	143.715	143.481	143.716
SYSTEM	Order no.	143.726	143.727		145.734	143.728	142.496	143.729
Voltage	V ~	1 × 480	3 × 480					
Power	kW	8	4	6				
CLASSIC	Order no.	145.730	143.709	143.698				
PREMIUM	Order no.	145.439	143.717	143.483				
SYSTEM	Order no.	145.733	143.730	143.731				

61L							
Voltage	V ~	3 × 230		3 × 400		3 × 480	
Power	kW	8	10	5	8		8
CLASSIC	Order no.	143.710	143.489	143.711	143.712		143.713
PREMIUM	Order no.	143.718	143.719	143.720	143.721		143.723
SYSTEM	Order no.	143.732	143.733	143.734	143.735		143.736
Voltage	V ~			3 × 400		3 × 480	
Power	kW			11	16	11	16
CLASSIC	Order no.			143.699	143.488	143.700	143.487
PREMIUM	Order no.			143.722	143.485	143.724	143.486
SYSTEM	Order no.			142.568	143.478	143.737	143.479

Accessories ↘ 42 / 43

LHS 91: The intelligent power giant.

With power of up to 40 kW, the LHS 91 is the tool for even the most demanding of heating applications. With this performance it is even capable of replacing many gas-fired heaters.

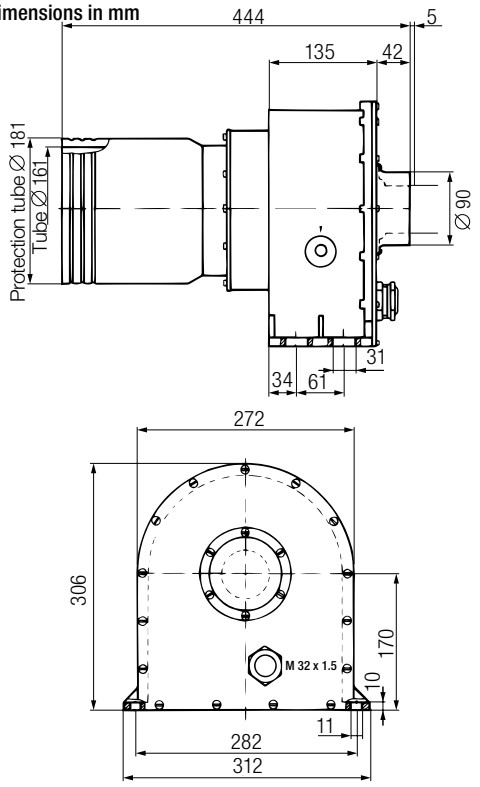
Air heater

LHS 91

Technical data LHS 91S		BASIC	SYSTEM
Max. air outlet temperature	°C	650	650
Min. air flow acc. as per diagram			
Max. air inlet temperature	°C	100	50
Max. ambient temperature	°C	60	60
Weight	kg	13.5	13.5
Mark of conformity		CE	CE
Protection class I		⏚	⏚

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power

Installation dimensions in mm



Tension	V ~	3 × 400		3 × 480	3 × 480
Power cons.	kW	11	32	32	40
BASIC	**Order no.**		**100.764**	**100.766**	**139.206**
SYSTEM	**Order no.**	**140.358**	**140.356**	**146.862**	**145.685**

∅ 90 mm air inlet nozzle as standard

Combination possibilities

- Leister air heater at maximum heat power and without nozzle with Leister blower at 50 Hz, 3 m hose length and unimpeded air outflow.
- Hot-air temperature 3 mm after air outlet, measured at the hottest point.
- Air flow at 20°C, 100.0 kPa compliant with ISO 6358.

Power Typ	Number LE x power cons. kW	Air flow l/min.	Temperature °C
ASO	2 × 32	2 × 4200	500
AIRPACK	1 × 32	1 × 3300	540

Air flow and temperature values may deviate from those above based on the design of the entire hot-air system (including nozzles, air hoses, environmental conditions).

Two air heaters and two blowers used to dry impregnated Eternit piping. Two wide slot nozzles ensure the air is evenly distributed.

Air heater

LHS 91 BASIC

Heating power not adjustable

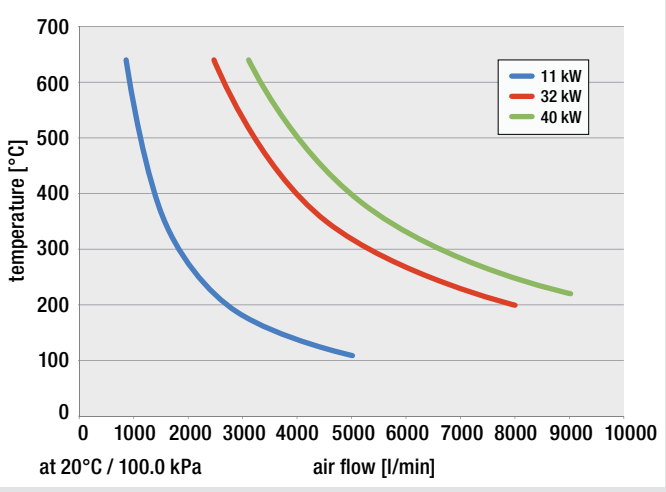
Air heater

LHS 91 SYSTEM

Heating power or temperature steplessly adjustable with potentiometer or remote control interface

Protection against heating element and device overheating with alarm output

Remote control interface for external temperature controllers (Leister CSS, or PLCs)

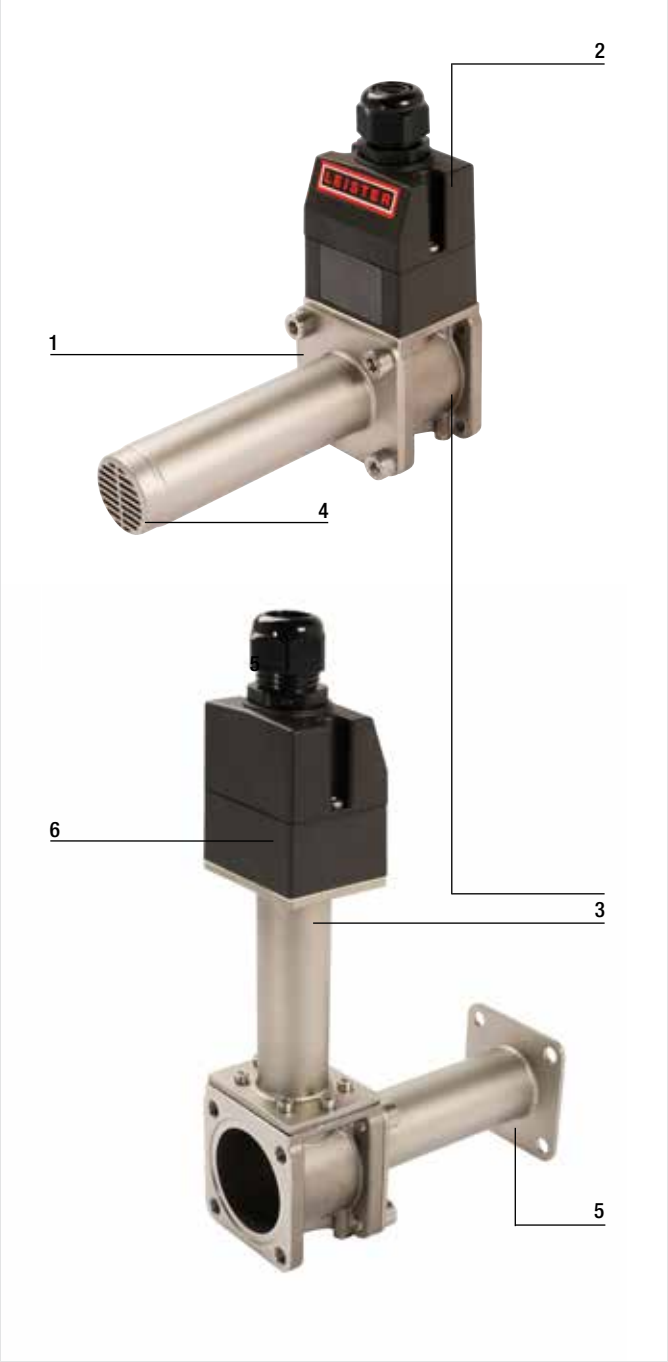


Accessories ↘ 43

New LHS 210/410

Leister Air Heaters

LHS 210/410



1

Compact:
Small dimensions for installation in tight spaces.

2

Connection:
Connecting the power supply is also very easy thanks to the well thought-out design.

3

Various versions:
SF = Single Flange
SF-R = Single Flange for Recirculation
DF = Double Flange
DF-R = Double Flange for Recirculation

4

Compatible with various nozzles:
The LHS SF is compatible with numerous nozzles from Leister, which enables countless application possibilities.

5

Double flange for piping installations:
Thanks to its flanges on both sides, the Leister LHS DF / DF-R tubular air heater is easy to install in piping systems and is suitable for a wide range of industrial processes and applications.

6

LHS SF-R / DF-R air heater for recirculation:
The housing connection is located outside the air flow. In addition, the housing connection is protected against overheating, making it possible to work with air inlet temperatures up to 350°C.

LHS 210

The LHS 210 is a small air heater from the Leister. Due to its particularly compact design, it can be easily integrated into industrial plants with limited space.

LHS 210 SF

LHS 210 SF-R

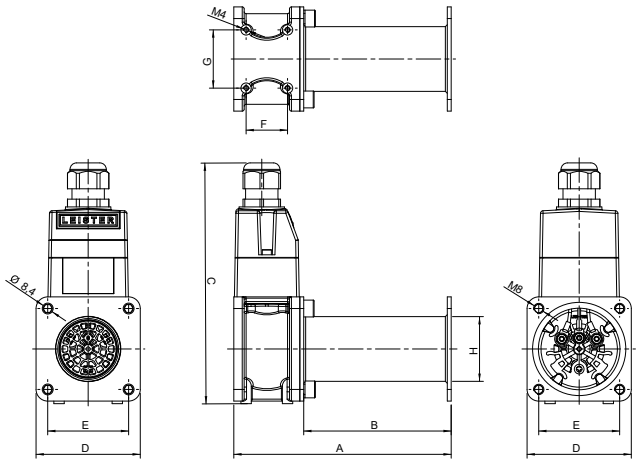
LHS 210 DF

LHS 210 DF-R

The housing connection on the LHS 210 is located outside the air flow, allowing the air to flow through the air heater unhindered and with hardly any loss in pressure. In addition, the housing connection of the LHS 210 SF-R and DF-R is protected against overheating, making it possible to work with air inlet temperatures up to 350°C.

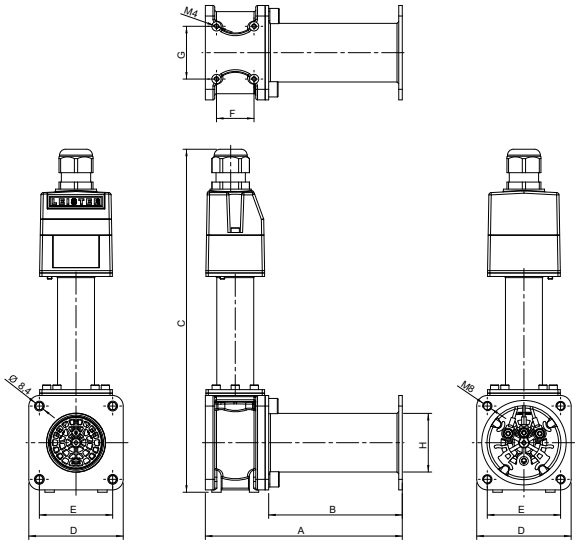
Technical Data		LHS 210 SF	LHS 210 SF-R	LHS 210 DF	LHS 210 DF-R
Frequency	Hz	50/60	50/60	50/60	50/60
Nozzle connection ∅	mm	36.5	36.5		
Max. air outlet temperature	°C	650	650	650	650
Max. air inlet temperature	°C	100	350	100	350
Max. ambient temperature	°C	65	65	65	65
Max. supply air pressure	kPa	100	100	100	100
Weight	kg	1.19	1.51	1.25	1.57
Mark of conformity					
Protection class I					

Installation dimensions in mm



Typ	A	B	C	D	E	F	G	H
LHS 210 SF	178	124	175	67	50.8	32	34	36.5
LHS 210 DF	168	114	175	67	50.8	32	34	36.5

Installation dimensions in mm



Typ	A	B	C	D	E	F	G	H
LHS 210 SF-R	178	124	282	67	50.8	32	34	36.5
LHS 210 DF-R	168	114	282	67	50.8	32	34	36.5

Order no.:			
LHS 210 SF, 120 V / 2 kW	170.898	LHS 210 SF-R, 120 V / 2 kW	170.909
LHS 210 SF, 230 V / 1 kW	170.899	LHS 210 SF-R, 230 V / 1 kW	170.910
LHS 210 SF, 230 V / 2 kW	170.900	LHS 210 SF-R, 230 V / 2 kW	170.911
LHS 210 SF, 230 V / 3.3 kW	170.901	LHS 210 SF-R, 230 V / 3.3 kW	170.912
LHS 210 DF, 120 V / 2 kW	170.920	LHS 210 DF-R, 120 V / 2 kW	170.931
LHS 210 DF, 230 V / 1 kW	170.921	LHS 210 DF-R, 230 V / 1 kW	170.932
LHS 210 DF, 230 V / 2 kW	170.922	LHS 210 DF-R, 230 V / 2 kW	170.933
LHS 210 DF, 230 V / 3.3 kW	170.923	LHS 210 DF-R, 230 V / 3.3 kW	170.934

LHS 410

The LHS 410 is a compact air heater from Leister. It offers an even higher air volume than the LHS 210. Thanks to its small design, it can be easily integrated into various industrial processes with limited space. Connecting the power supply is also very easy due to the well thought-out design.

LHS 410 SF

LHS 410 DF

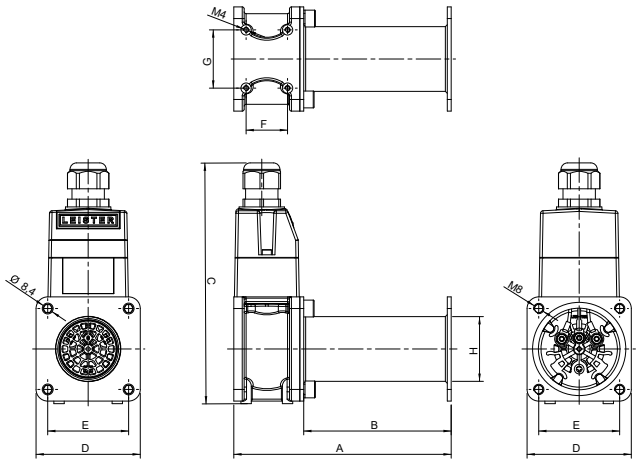
LHS 410 SF-R

LHS 410 DF-R

The housing connection on the LHS 410 is located outside the air flow, allowing the air to flow through the air heater unhindered and with hardly any loss in pressure. In addition, the housing connection of the LHS 410 SF-R and DF-R is protected against overheating, making it possible to work with air inlet temperatures up to 350°C.

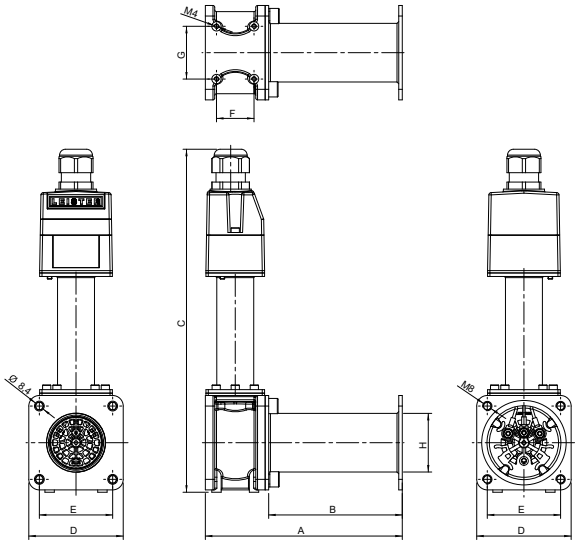
Technical Data		LHS 410 SF	LHS 410 SF-R	LHS 410 DF	LHS 410 DF-R
Frequency	Hz	50/60	50/60	50/60	50/60
Nozzle connection ∅	mm	50	50		
Max. air outlet temperature	°C	650	650	650	650
Max. air inlet temperature	°C	100	350	100	350
Max. ambient temperature	°C	65	65	65	65
Max. supply air pressure	kPa	100	100	100	100
Weight	kg	1.55	1.89	1.65	1.99
Mark of conformity					
Protection class I					

Installation dimensions in mm



Typ	A	B	C	D	E	F	G	H
LHS 410 SF	178	124	186	81	62.5	32	45	50
LHS 410 DF	168	114	186	81	62.5	32	45	50

Installation dimensions in mm



Typ	A	B	C	D	E	F	G	H
LHS 410 SF-R	178	124	293	81	62.5	32	45	50
LHS 410 DF-R	168	114	293	81	62.5	32	45	50

Order no.:			
LHS 410 SF, 120 V / 2 kW	170.902	LHS 410 SF-R, 120 V / 2 kW	170.913
LHS 410 SF, 230 V / 2 kW	170.903	LHS 410 SF-R, 230 V / 2 kW	170.914
LHS 410 SF, 230 V / 3.6 kW	170.904	LHS 410 SF-R, 230 V / 3.6 kW	170.915
LHS 410 SF, 230 V / 4.4 kW	170.905	LHS 410 SF-R, 230 V / 4.4 kW	170.916
LHS 410 SF, 400 V / 2 kW	170.906	LHS 410 SF-R, 400 V / 2 kW	170.917
LHS 410 SF, 400 V / 4.4 kW	170.907	LHS 410 SF-R, 400 V / 4.4 kW	170.918
LHS 410 SF, 400 V / 5.5 kW	170.908	LHS 410 SF-R, 400 V / 5.5 kW	170.919
LHS 410 DF, 120 V / 2 kW	170.924	LHS 410 DF-R, 120 V / 2 kW	170.935
LHS 410 DF, 230 V / 2 kW	170.925	LHS 410 DF-R, 230 V / 2 kW	170.936
LHS 410 DF, 230 V / 3.6 kW	170.926	LHS 410 DF-R, 230 V / 3.6 kW	170.937
LHS 410 DF, 230 V / 4.4 kW	170.927	LHS 410 DF-R, 230 V / 4.4 kW	170.938
LHS 410 DF, 400 V / 2 kW	170.928	LHS 410 DF-R, 400 V / 2 kW	170.939
LHS 410 DF, 400 V / 4.4 kW	170.929	LHS 410 DF-R, 400 V / 4.4 kW	170.940
LHS 410 DF, 400 V / 5.5 kW	170.930	LHS 410 DF-R, 400 V / 5.5 kW	170.941

High temperature air heater: Our hottest models.

The high temperature air heaters are suitable for temperatures up to 900 °C. The devices have no integrated power electronics.

High temperature air heater

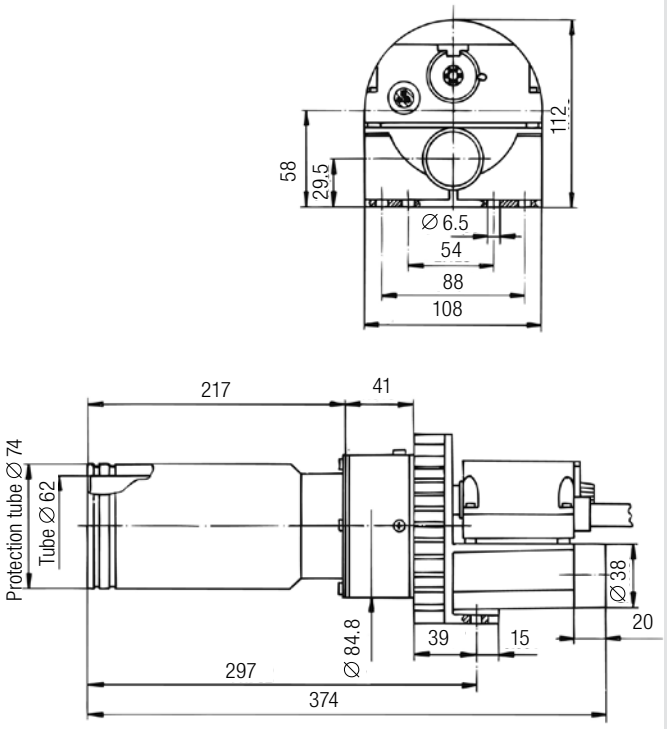
LE 5000 HT (up to 900 °C)

Technical data
High temperature LE 5000 HT

No integrated power electronics		•
Heating element tube with protective tube		•
Max. air outlet temperature	°C	900
Min. air flow	Nl/min	580
Max. air inlet temperature	°C	100
Max. ambient temperature	°C	100
Weight	kg	2.25
Mark of conformity		CE
Protection class I		⏚

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power
Nl = Standard litres according to ISO 6358

Installation dimensions in mm



Optional temperature regulation
With CSS (CSS EASY) and Solid state relay (p 58 – 59)

Voltage	V ~	3 × 400
Power consumption	kW	11
Order no.		**108.717**

Combination possibilities
- Leister air heater at maximum heat power and without nozzle with Leister blower at 50 Hz, 1.5 m hose length and unimpeded air outflow.
- Hot-air temperature 3 mm after air outlet, measured at the hottest point.
- Air flow at 20 °C, 100.0 kPa compliant with ISO 6358.

Power-Type	Number LE x Power cons. kW	Air flow l/min.	Temperature °C
ROBUST	1 × 11	1 × 800	800
AIRPACK	1 × 11	1 × 2800	360
AIRPACK	2 × 11	2 × 1500	550

Air flow and temperature values may deviate from those above based on the design of the entire hot-air system (including nozzles, air hoses, environmental conditions).

Accessories ↘ 42

Two LE 10 000 HT air heaters and an ASO blower in combination with a shrink tunnel.

High temperature air heater

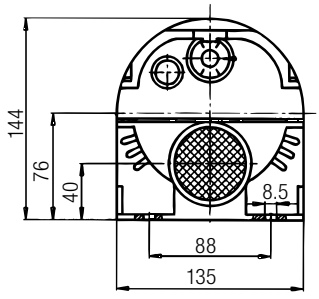
LE 10000 HT (up to 900 °C)

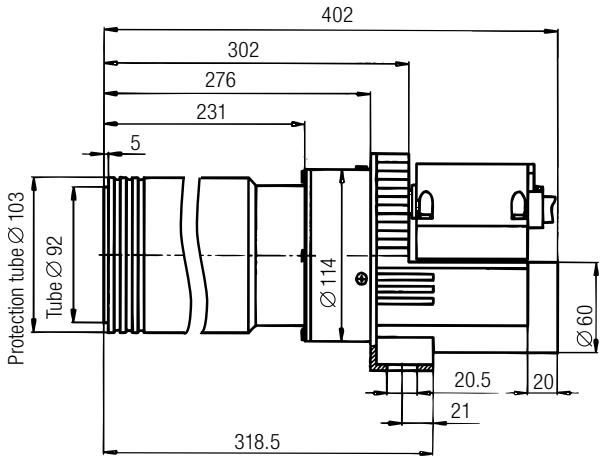
Technical data
High temperature LE 10000 HT

No integrated power electronics		•
Heating element tube with protective tube		•
Max. air outlet temperature	°C	900
Min. air flow	Nl/min	800
Max. air inlet temperature	°C	100
Max. ambient temperature	°C	100
Weight	kg	4.0
Mark of conformity		CE
Protection class I		⏚

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power
Nl = Standard litres according to ISO 6358

Installation dimensions in mm





Optional temperature regulation
With CSS (CSS EASY) and Solid state relay (p 58 – 59)

Voltage	V ~	3 × 400	3 × 480
Power consumption	kW	15	15
Order no.		**110.568**	**113.349**

Combination possibilities
- Leister air heater at maximum heat power and without nozzle with Leister blower at 50 Hz, 1.5 m hose length and unimpeded air outflow.
- Hot-air temperature 3 mm after air outlet, measured at the hottest point.
- Air flow at 20 °C, 100.0 kPa compliant with ISO 6358.

Power-Type	Number LE x Power cons. kW	Air flow l/min.	Temperature °C
ROBUST	1 × 15	1 × 1100	850
ASO	1 × 15	1 × 2200	690
ASO	2 × 15	2 × 2100	700
AIRPACK	1 × 15	1 × 3400	340
AIRPACK	2 × 15	2 × 1650	620

Air flow and temperature values may deviate from those above based on the design of the entire hot-air system (including nozzles, air hoses, environmental conditions).

Accessories ↘ 43

LE MINI: The precise and accurate minis.

The world's smallest air heater with an integrated temperature probe. Especially suited for applications in which heat is concentrated to a point. It is simple to incorporate into the tightest spaces. LE MINI operates with compressed air at a pressure of 200 kPa. Model versions are available with or without an integrated sensor. The SENSOR KIT add-on box offers a plug'n play solution with its integrated power electronics and temperature regulator.

Air heater

LE MINI

Air heater

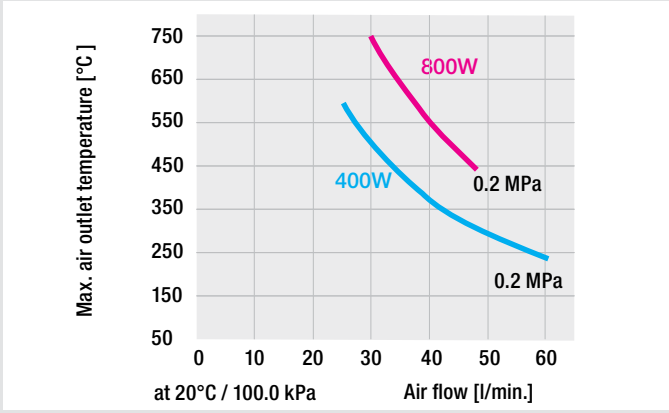
LE MINI SENSOR

Air heater

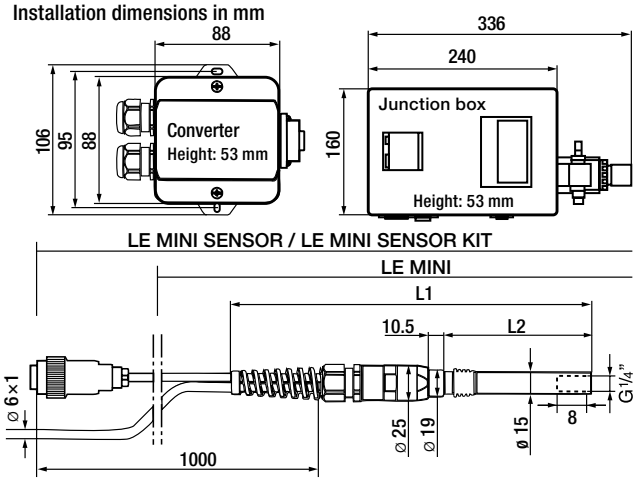
LE MINI SENSOR KIT

Technical data			LE MINI	LE MINI SENSOR	LE MINI SENSOR KIT
Temperature regulator integrated into the connection box					•
Integrated temperature probe				•	•
Thermoswitch for device protection			•	•	•
Heating element protection				•	•
Analogue output (passive) 4 – 20 mA				•	
Pressure reduction valve					•
Max. air outlet temperature	°C	400 W	600	600	600
		800 W	750	750	750
Min. air flow	l/min.	400 W	25	10	10
		800 W	30	10	10
Max. air inlet temperature	°C		60	60	60
Max. ambient temperature	°C		60	60	60
Max. supply air pressure	kPa		200	200	200
Weight LE MINI	kg	400 W	0.12	0.12	0.12
		800 W	0.15	0.15	0.15
Weight Converter	kg			0.19	
Weight Terminal box	kg				2.15
Mark of conformity			CE	CE	CE
Protection class II			⧈	⧈	⧈

Voltage	V ~	120	230	230
Power consumtion	W	400	400	800
Approval mark			ⓢ	ⓢ
LE MINI	**Order no.**	**115.683**	**115.682**	**115.369**
LE MINI SENSOR	**Order no.**	**117.371**	**117.370**	**117.369**
LE MINI SENSOR KIT	**Order no.**	**128.536**		**125.416**



Installation dimensions in mm



	L1	L2
Type 400	253	104
Type 800	308	159

LE MINI: Cable and hose lengths: 3 m
LE MINI SENSOR: Hose length: 3 m

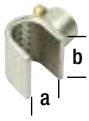
Accessories LE MINI (⌀ 21.3 mm)

107.282 Flange connector, push-fit
a = 40 mm

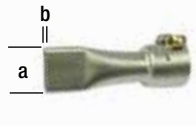
117.955 Nozzle adapter, screw-fit for nozzles
∅ 21.3 mm

Round nozzle, push-fitr
105.624 ∅ 5 mm, 45 mm straight
107.145 ∅ 10 mm, 45 mm straight

Round nozzle, push-fit
107.152 ∅ 12 mm with screw terminal



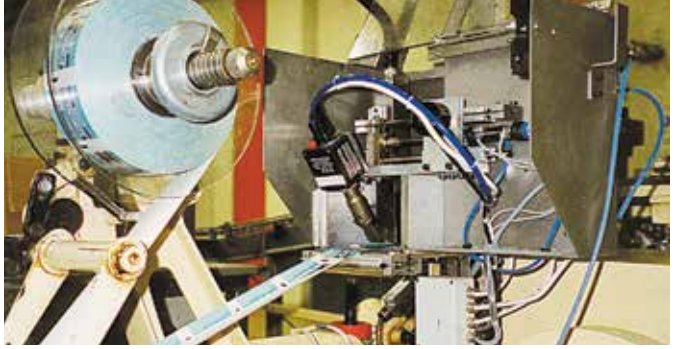
Sieve reflector, push-fit (a × b)
107.310 20 × 35 mm
107.311 50 × 35 mm



Wide slot nozzle, push-fit (a × b)
105.549 10 × 2 mm, angled
105.559 20 × 2 mm, length 55 mm
105.548 40 × 5 mm
105.547 50 × 8 mm

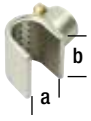
129.407 cable prolongation 2 m,
with plug and connection
113.806 cable prolongation 5 m,
with plug and connection

> LE MINI SENSOR
> LE MINI SENSOR KIT

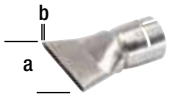
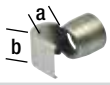


Air heater and blower for drying labels. Fast drying allows for high throughput speeds.

Accessories LHS 15 (⌀ 21.3 mm)

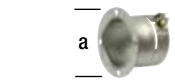
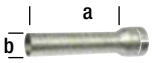
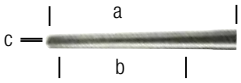
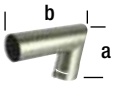
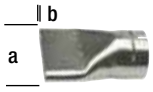
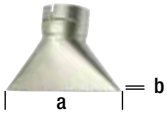
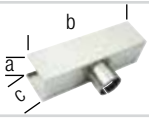
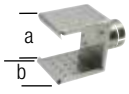
	**107.282**	Flange connector, push-fit a = 40 mm
	**105.624** **107.145**	Round nozzle, push-fitr ⌀ 5 mm, 45 mm straight ⌀ 10 mm, 45 mm straight
	**107.152**	Round nozzle, push-fit ⌀ 12 mm with screw terminal
	**107.310** **107.311**	Sieve reflector, push-fit (a × b) 20 × 35 mm 35 × 50 mm
	**105.549** **105.559** **105.548** **105.547**	Wide slot nozzle, push-fit (a × b) 10 × 2 mm, angled 20 × 2 mm, length 55 mm 40 × 5 mm 50 × 8 mm
	**144.035**	Compressed air connection
	**143.533**	Adapter plate LHS 15 instead LE 700
	**149.941**	Round nozzle (⌀ 21.3)
	**150.097**	Air inlet reduction valve
	**150.192**	Heater tube (⌀ 21.3) with protection tube

Accessories LHS 21 (⌀ 36.5 mm)

	**125.316**	Flange connector, push-fit a = 62 mm
	**107.251**	Extension nozzle, push-fit (a × b) 210 × 36.5 mm
	**107.003** **107.002**	Round nozzle, push-fit ⌀ 12 mm ⌀ 12 mm with screw terminal
	**107.261** **108.078** **105.982**	Wide slot nozzle, push-fit (a × b) 70 × 4 mm 100 × 4 mm 150 × 4 mm
	**107.308** **107.309**	Sieve reflector, push-fit (a × b) 35 × 50 mm 20 × 35 mm
	**107.314**	Spoon reflector, push-fit (a × b) 25 × 30 mm
	**107.319**	Sieve reflector «Douche», push-fit ⌀ 65 mm
	**106.132**	Shell reflector, push-fit (a × b × c) 150 × 26 × 44 mm
	**133.515**	Thermocouple holder
	**144.037**	Compressed air connection
	**142.230** **143.480**	Adapter plate LHS 21 instead LHS 20 LHS 21 instead LE 3000
	**150.194** **150.193**	Heater tube (⌀ 36.5) with protection tube for LHS 21L Heater tube (⌀ 36.5) with protection tube for LHS 21S
	**149.942**	Round nozzle (⌀ 36.5)
	**150.098**	Air inlet reduction valve

Drying pills, mints and sweets and smoothing their coatings.

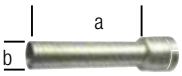
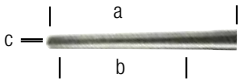
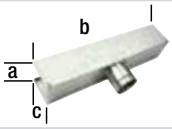
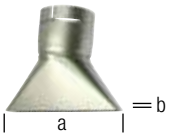
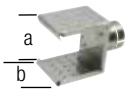
Accessories LHS 41 (⌀ 50 mm)

	**107.254**	Flange connector, push-fit a = 70 mm
	**122.332** **122.924**	Nozzle adapter, push-fit (a × b) from (a) ∅ 50 mm to (b) ∅ 62 mm from (a) ∅ 50 mm to (b) ∅ 37 mm
	**107.255**	Extension nozzle, push-fit (a × b) 160 × 36.5 mm
	**105.950** **107.257** **105.955** **105.952**	Tubular nozzle, push-fit (a × b × c) 460 × 300 × 2 mm 590 × 420 × 1.7 mm 836 × 660 × 1 mm 900 × 800 × 0.9 mm
	**107.256**	Angled nozzle, push-fit (a × b) shank length 106 × 162, Ø 50 mm
	**105.961** **107.258**	Wide slot nozzle, push-fit (a × b) 45 × 12 mm, length 350 mm 70 × 10 mm
	**106.057** **106.060** **107.270** **106.061**	Wide slot nozzle, push-fit (a × b) 100 × 4 mm 150 × 6 mm 150 × 12 mm 300 × 6 mm
	**107.331**	Hinged reflector, push-fit (d × b) 70 × 70 mm
	**107.340**	Shell reflector, push-fit (a × b × c) 45 × 250 × 71 mm
	**107.327** **107.333**	Sieve reflector, push-fit (a × b) 70 × 75 mm 110 × 150 mm
	**107.330**	Hinged reflector, push-fit (d × b) 125 × 22 mm
	**106.127**	Sieve reflector “Douche”, push-fit ∅ 65 mm

	**133.516**	Thermocouple holder
	**144.038**	Compressed air connection
	**142.232** **143.436**	Adapter plate LHS 41 instead LHS 40 Adapter plate LHS 41 instead LE 3300
	**149.943**	Round nozzle (∅ 50)
	**150.096**	Air inlet reduction valve
	**150.195** **150.196**	Heater tube (∅ 50) with protection tube for LHS 41S Heater tube (∅ 50) with protection tube for LHS 41L

Accessories

LHS 61S & LE 5000 HT (⌀ 62 mm)

	**125.317**	Flange connector, push-fit a = 90 mm
	**113.351**	Extension tube, push-fit (a × b) 275 × ∅ 62 mm
	**107.247**	Extension nozzle, push-fit (a × b) 200 × 45 mm
	**105.907** **105.919** **107.253** **114.136** **105.906**	Tubular nozzle, push-fit (a × b × c) 354 × 204 × 4.5 mm 456 × 306 × 3 mm 700 × 550 × 1.7 mm 795 × 655 × 1.5 mm 1100 × 1000 × 4 mm
	**127.062**	Nozzle adapter ∅ 62 mm, ∅ 60 mm, length 110 mm, to connect with blow-off nozzle
	**107.265**	Angled nozzle, push-fit (a × b) shank length 120 × 115, ∅ 62 mm
	**107.245**	Round nozzle, push-fit d = 40 mm
	**107.342** **106.174** **106.175**	Shell reflector, push-fit 50 × 400 × 80 mm (a × b × c) 65 × 400 × 95 mm 80 × 400 × 80 mm
	**107.260** **107.259** **105.977** **107.263** **107.262** **105.992** **105.991**	Wide slot nozzle, push-fit (a × b) 85 × 15 mm 150 × 12 mm 200 × 9 mm 250 × 12 mm, with sieve insert 300 × 4 mm 400 × 4 mm 500 × 4 mm
	**106.143** **107.329** **107.336**	Sieve reflector, push-fit (a × b) 45 × 75 mm 70 × 75 mm 110 × 152 mm
	**149.624**	Protection tube adapter for LHS 61S

Accessories

LHS 61S & LE 5000 HT (⌀ 62 mm)

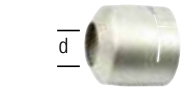
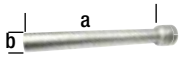
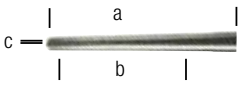
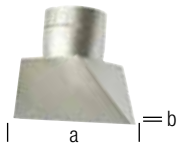
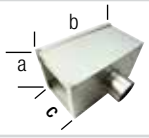
	**107.335**	Sieve reflector “Douche”, push-fit ∅ 150 mm
	**133.517 ***	Thermocouple holder
	**144.039 ***	Compressed air connection
	**143.575 ***	Adapter plate LHS 61S instead LE 5000

* = Only for LHS 61S

Utilizing precisely controlled hot-air
to shrink PE sleeves on cans.

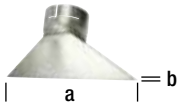
Accessories

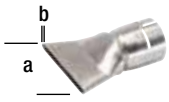
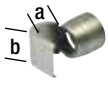
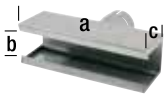
LHS 61L & LE 10000 HT (⌀ 92 mm)

	**125.318**	Flange connector, push-fit a = 120 mm
	**107.244**	Round nozzle, push-fit d = 50 mm
	**107.273**	Extension nozzle, push-fit (a × b) 500 × 60 mm
	**107.269**	Angled nozzle, push-fit (a × b) shank length 175 × 175 mm
	**106.031** **106.035** **107.268** **106.033**	Tubular nozzle, push-fit (a × b × c) 1000 × 800 × 2 mm 1185 × 900 × 1.6 mm 1288 × 1000 × 1.5 mm 1550 × 1350 × 1.1 mm
	**107.274** **106.028** **107.272** **106.018** **106.024** **107.267** **106.023** **106.026**	Wide slot nozzle, push-fit (a × b) 130 × 17 mm 220 × 12 mm 300 × 12 mm 400 × 10 mm 500 × 7 mm 500 × 15 mm 600 × 4 mm 600 × 9 mm
	**107.341**	Shell reflector, push-fit (a × b × c) 160 × 370 × 210 outside/158 inside
	**107.276**	Sieve reflector “Douche”, push-fit ∅ 260 mm
	**133.517 ***	Thermocouple holder
	**144.039 ***	Compressed air connection
	**149.629**	Protection tube adapter for LHS 61L

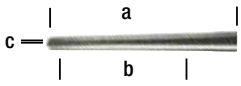
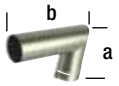
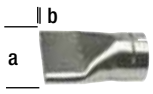
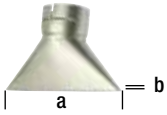
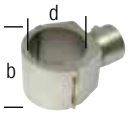
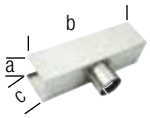
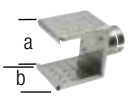
* = Only for LHS 61L

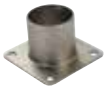
Accessories LHS 91 (⌀ 161 mm)

	**125.319**	Flange connector, push-fit a = 192 mm
	**107.230**	Round nozzle, push-fit d = 100 mm
	**107.233**	Extension nozzle, push-fit (a × b) 400 × 100 mm
	**107.235** **107.234** **105.856** **105.859**	Wide slot nozzle, push-fit (a × b) 500 × 15 mm 1200 × 10 mm 1600 × 8 mm 2000 × 10 mm

	**125.316**	Flange connector, push-fit a = 62 mm
	**107.251**	Extension nozzle, push-fit (a × b) 210 × 36.5 mm
	**107.003** **107.002**	Round nozzle, push-fit ∅ 12 mm ∅ 12 mm with screw terminal
	**107.261** **108.078** **105.982**	Wide slot nozzle, push-fit (a × b) 70 × 4 mm 100 × 4 mm 150 × 4 mm
	**107.308** **107.309**	Sieve reflector, push-fit (a × b) 35 × 50 mm 20 × 35 mm
	**107.314**	Spoon reflector, push-fit (a × b) 25 × 30 mm
	**107.319**	Sieve reflector “Douche”, push-fit ∅ 65 mm
	**106.132**	Shell reflector, push-fit (a × b × c) 150 × 26 × 44 mm
	**149.942**	Round nozzle (∅ 36.5)
	**106.956**	Thermocouple with plug, 1 m cable
	**106.958** **106.960** **106.962**	Thermocouple extension cable with plug and connection 2 m 4 m 10 m
	**123.039** **137.720**	CSS – Controller E5CC – Controller

	**161.643**	Inlet flange kit, ∅ 38 mm
	**161.646**	Gasket housing
	**161.832**	Thermocouple with holder for LHS 210 SF
	**161.854**	Thermocouple with holder for LHS 210 DF
	**161.856**	Nozzle adapter to ∅ 36.5 mm for LHS 210 DF

	**107.254**	Flange connector, push-fit a = 70 mm
	**122.332** **122.924**	Nozzle adapter, push-fit (a × b) from (a) ∅ 50 mm to (b) ∅ 62 mm from (a) ∅ 50 mm to (b) ∅ 37 mm
	**107.255**	Extension nozzle, push-fit (a × b) 160 × 36.5 mm
	**105.950** **107.257** **105.955** **105.952**	Tubular nozzle, push-fit (a × b × c) 460 × 300 × 2 mm 590 × 420 × 1.7 mm 836 × 660 × 1 mm 900 × 800 × 0.9 mm
	**107.256**	Angled nozzle, push-fit (a × b) shank length 106 × 162, Ø 50 mm
	**105.961** **107.258**	Wide slot nozzle, push-fit (a × b) 45 × 12 mm, length 350 mm 70 × 10 mm
	**106.057** **106.060** **107.270** **106.061**	Wide slot nozzle, push-fit (a × b) 100 × 4 mm 150 × 6 mm 150 × 12 mm 300 × 6 mm
	**107.331**	Hinged reflector, push-fit (d × b) 70 × 70 mm
	**107.340**	Shell reflector, push-fit (a × b × c) 45 × 250 × 71 mm
	**107.327** **107.333**	Sieve reflector, push-fit (a × b) 70 × 75 mm 110 × 150 mm

	**107.330**	Hinged reflector, push-fit (d × b) 125 × 22 mm
	**106.127**	Sieve reflector “Douche”, push-fit ∅ 65 mm
	**149.943**	Round nozzle, ∅ 50 mm
	**106.956**	Thermocouple with plug, 1 m cable
	**106.958** **106.960** **106.962**	Thermocouple extension cable with plug and connection 2 m 4 m 10 m
	**123.039** **137.720**	CSS – Controller E5CC – Controller
	**161.645** **161.644**	Inlet flange kit, ∅ 38 mm Inlet flange kit, ∅ 60 mm
	**161.647**	Gasket housing
	**161.833**	Thermocouple with holder for LHS 410 SF
	**161.855**	Thermocouple with holder for LHS 410 DF
	**161.857**	Nozzle adapter to ∅ 50 mm for LHS 410 DF

Save Energy with Leister.

Large amounts of energy and with that, money, can be saved by recycling the hot air. Leister has customized solutions for combining air heaters and blowers which are suitable for recycling hot air thanks to a design made to withstand high-temperatures.

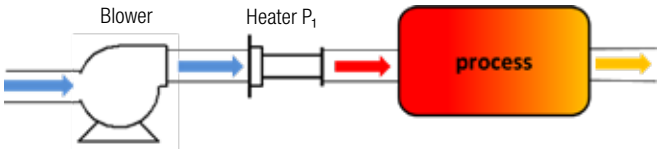
Hot Air Recycling Saves Energy and Costs

In order to heat a defined volume of air (air flow) to the desired temperature, a certain amount of energy needs to be present. The greater the difference in temperatures ΔT between the air inlet and the air outlet, the more energy that is needed. The ΔT is reduced by operating with hot air recirculation. That saves energy and costs.

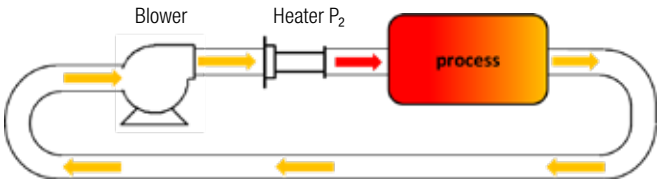
To 'recycle' the hot air from the process, both the blower and the air heater have to withstand the high temperatures at the air inlet side. LEISTER's double-flange air heaters types LE 5000 DF-R and LE 10000 DF-R (page 46/47) and the RBR blower (page 54) provide the solution. Air with a temperature of up to 350°C can be moved, reheated and recirculated without a problem.

When accessories such as insulated hoses, high-temperature seals and various flanges are added, systems with air heaters and blowers become perfectly supplemented for recycling applications.

Hot Air System without Recirculation



Hot Air System with Recirculation



$P_2 < P_1$

Sample calculation:
To heat 4000 l/min of air flow to a desired temperature of T2 = 500°C, different outputs are required, depending on the air inlet temperature T1.

T_1 = 20°C	–>	38.7 kW	
T_1 = 160°C	–>	27.4 kW	29.2 % compared with 20°C
T_1 = 350°C	–>	12.1 kW	68.7 % compared with 20°C
			55.8 % compared with 160°C

These differences also match the potential savings in energy. The energy savings are 159 600 kWh per year when the recirculation mode is used and the inlet temperature is 350°C, instead of working with ambient air at 20°C (in 24-hour operation, for 250 working days).

Annual energy consumption at T1 = 20° C > 232 200 kWh.
Annual energy consumption at T1 = 350° C > 72 600 kWh,
Savings = 159 600 kWh

If the price of electricity (commercial, large consumers) is € 0.12 / kWh, the potential savings per year is € 19,152 just from using DF-R type double-flange air heaters. Based on a 24-hour operation, 250 days per year, T1 = 350°C instead of 20°C and T2 = 500°C and 4000 l / min air flow.

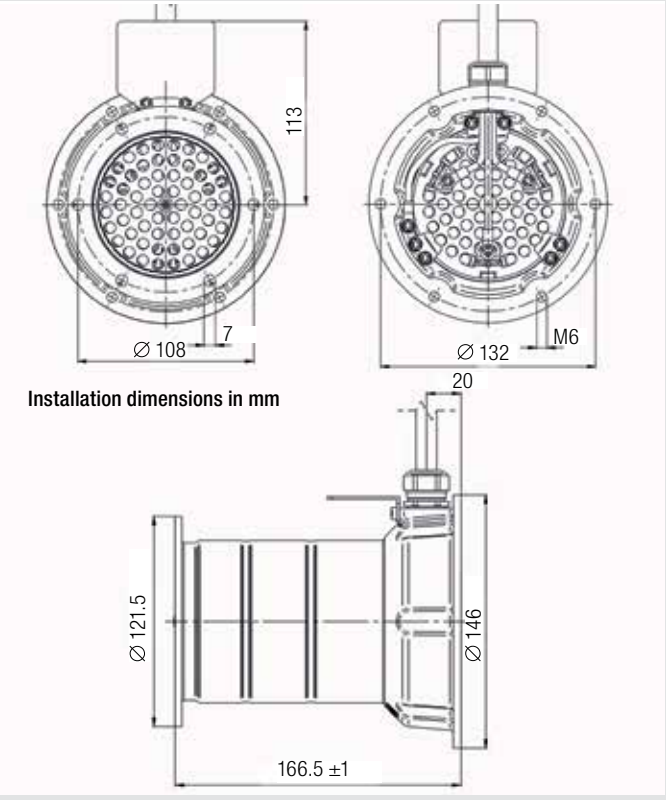
Hot air system for hot air recirculation.

LE 10 000 DF-C “Clean Air Heater”.

The Clean Air Heater is the next step in completing the double-flange product range. This air heater is suitable for industries with stringent requirements for “clean” environments such as: food and beverage, medical, pharmaceutical, cosmetics and electronics manufacturing. The LE 10 000 DF-C was developed using the newest standards for clean production defined by the European Hygienic Engineering & Design Group (EHEDG). The Clean Air Heater’s design minimizes particle emission and is exclusively manufactured using nontoxic materials.

Air heater

LE 10 000 DF-C



Installation dimensions in mm

Technical data
LE 10 000 DF-C

Easy to integrate into existing air systems			•
Suitable for recycling air			•
Simple and safe fixture options			•
No integrated power electronics			•
Max. air outlet temperature	°C		650
Min. air flow	Nl/min	4.5 kW	320
		5.5 kW	420
		8.0 kW	610
		10 kW	760
		11 kW	840
		17 kW	1300
Max. air inlet temperature	°C		150
Max. ambient temperature	°C		100
Weight including cable	kg		3.9
Conformity mark			CE cULus
Protection class I			⏚

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power
Nl = Standard litres according to ISO 6358

Voltage	V ~	3 × 230	3 × 230	3 × 400	3 × 400	3 × 400
Power consumption	kW	8.0	10	5.5	11	17
LE 10 000 DF-C	**Order no.**	**146.288**	**146.916**	**147.323**	**147.324**	**147.325**

Voltage	V ~	3 × 480	3 × 480	3 × 480
Power consumption	kW	4.5	8.0	10
LE 10 000 DF-C	**Order no.**	**153.783**	**154.088**	**154.276**

Additional versions available on request

LE 5000 DF / LE 10 000 DF product portfolio

Product	Type	Power range	Max. inlet temperature	Max. outlet temperature
Standard	LE 5000 DF	4.5 – 7.5 kW	150° C	700° C
	LE 10 000 DF	5.5 – 17 kW	150° C	650° C 900° C
Recirculation	LE 5000 DF-R	4.5 – 8 kW	350° C	700° C
	LE 10 000 DF-R	5.5 – 17 kW	350° C	650° C 900° C
Clean	**LE 10 000 DF-C**	**5.5 – 17 kW**	**150° C**	**650° C***

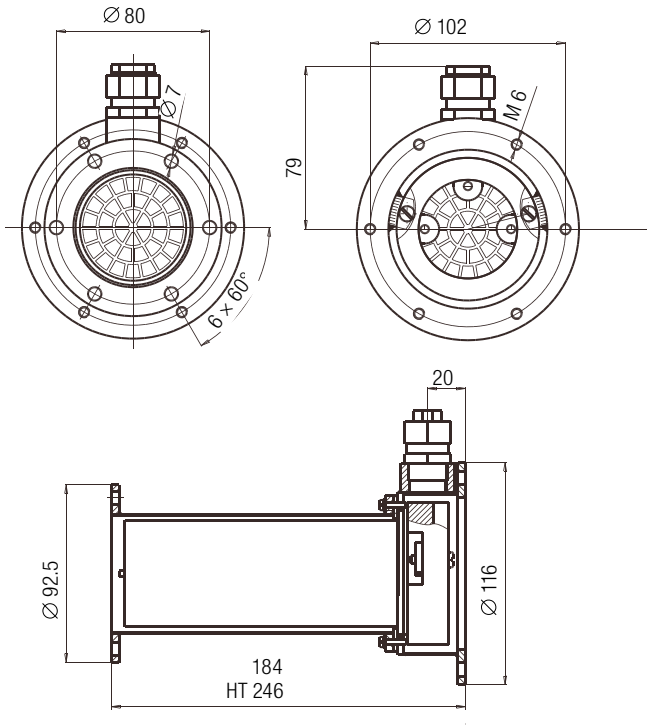
* Max. temperature for applications in food production according to material certification 400°C / 752 °F (ask Leister Customer Support team for details)

Air heater

LE 5000 DF-R / DF / DF HT

LE 5000 DF-R

Installation dimensions in mm



Technical data LE 5 000 DF		LE 5000 DF-R	LE 5000 DF	LE 5000 DF HT
Easy to integrate into existing air systems		•	•	•
Suitable for recycling air		•	•	•
Simple and safe fixture options		•	•	•
No integrated power electronics		•	•	•
Max. air outlet temperature	°C	700	700	900
Min. air flow	Nl/min 4.5 kW	320	320	
	6.5 kW	460	460	
	7.0 kW			380
	7.5 kW	530	530	400
	8.0 kW	550	550	
	11 kW			580
Max. air inlet temperature	°C	350	150	150
Max. ambient temperature	°C	200	100	100
Weight including cable	kg	2.0	2.6	3.1
Conformity mark		CE	CE c UL us	
Protection class I			⏚	

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power
Nl = Standard litres according to ISO 6358

Optional temperature regulation
With CSS (CSS EASY) and Solid state relay (p 58 – 59)

Voltage	V ~	3 × 200	3 × 230	3 × 400	3 × 400	3 × 400	3 × 400
Power	kW	7.0	8.0	4.5	6.5	7.5	11
LE 5000 DF-R	**Order no**		**146.793**	**146.480**	**146.794**	**146.795**	
LE 5000 DF	**Order no**		**116.067**	**117.551**		**114.240**	
LE 5000 DF*	**Order no**			**128.879**	**127.872**		
LE 5000 DF HT	**Order no**	**151.676**				**147.334**	**147.820**

*sealed

Additional versions available on request

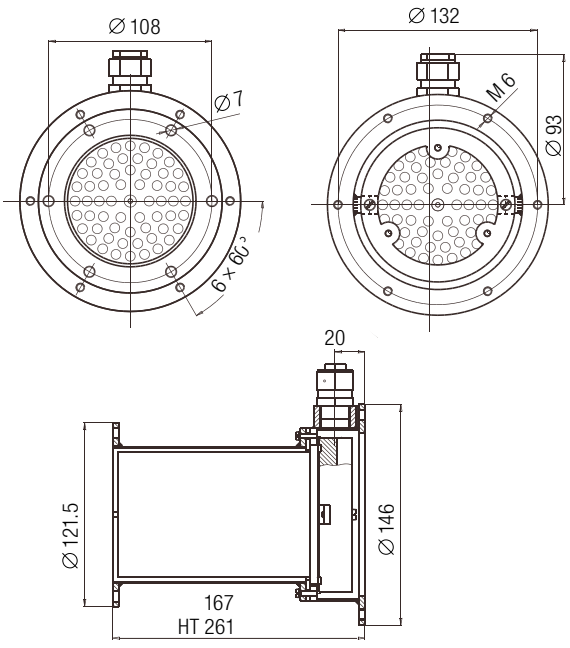
Energy efficient hot-air recycling with LE 5000 DF-R air heater on a shrinking tunnel.

Air heater

LE 10000 DF-R / DF / DF HT / DF-R HT

LE 10 000 DF-R

Installation dimensions in mm



Technical data LE 10 000 DF			LE 10 000 DF-R	LE 10 000 DF-R HT	LE 10 000 DF	LE 10 000 DF HT
Easy to integrate into existing air systems			•	•	•	•
Suitable for recycling air			•	•	•	•
Simple and safe fixture options			•	•	•	•
No integrated power electronics			•	•	•	•
Max. air outlet temperature	°C		650	900	650	900
Min. air flow	Nl/min	5.5 kW	420		420	
		8.0 kW	610		610	
		11 kW	840		840	
		16 kW	1220		1220	
		17 kW	1300		1300	
		15 kW HT		800		800
Max. air inlet temperature	°C		350	350	150	150
Max. ambient temperature	°C		200	200	100	100
Weight including cable	kg		2.7	3.3	3.4	4.0
Conformity mark			CE		CE cULus	
Protection class I			⏚			

Minimum quantity of air at air inlet temperature of 20°C at 100% heating power
Nl = Standard litres according to ISO 6358

Optional temperature regulation
With CSS (CSS EASY) and Solid state relay (p 58 – 59)

Voltage	V ~	3 × 400	3 × 400	3 × 400	3 × 480	3 × 480
Power consumption	kW	5.5	11	17	8.0	16
LE 10 000 DF-R	**Order no**	**146.796**	**146.479**	**146.797**	**146.942**	**146.946**
LE 10 000 DF	**Order no**	**115.571**	**114.555**	**116.135**	**117.276**	**117.759**
LE 10 000 DF*	**Order no**			**130.865**		

Voltage	V ~	3 × 400	3 × 480
Power consumption	kW	15	15
LE 10 000 DF-R HT	**Order no**	**146.850**	
LE 10 000 DF HT	**Order no**	**116.056**	**117.313**

*sealed

Additional versions available on request

Accessories LE 5000 DF

	**152.371**	Inlet flange ∅ 60 mm
	**152.372**	Outlet flange ∅ 62 mm
	**152.905**	Outlet flange ∅ 92.5 / 60.7 × 3 mm
	**152.441** **152.443**	Sealing inlet Sealing outlet
	**152.520**	Adapter ∅ 60 mm (inside) to ∅ 90 mm (outside)
	**152.522**	Adapter ∅ 62 mm (inside) to ∅ 92 mm (outside)

Accessories LE 10000 DF

	**152.373**	Inlet flange ∅ 90 mm
	**152.374**	Outlet flange ∅ 92 mm
	**152.906**	Outlet flange ∅ 121.5 / 89.5 × 3 mm
	**152.442** **152.444**	Sealing inlet Sealing outlet
	**152.521**	Adapter ∅ 90 mm (inside) to ∅ 60 mm (outside)
	**152.523**	Adapter ∅ 92 mm (inside) to ∅ 62 mm (outside)

The inlet sides special design and materials allow for high air inlet temperatures.

High degree of manufacturing quality

The electrical supply's functioning and safety are guaranteed even under extreme conditions.

High quality temperature resistant cable

The new double-flange air heaters are manufactured using Leister's well-known high quality standards.

Robust structural design

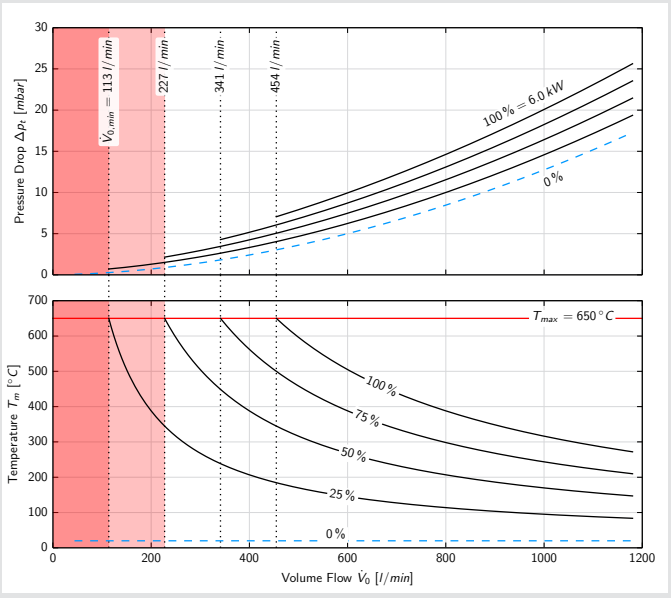
photos: Type LE 5000 DF-R

Designing hot air systems correctly.

Knowledge of the physical properties of all the components used is essential for the correct design of hot air equipment and systems. Two values are of particular importance to the user: Pressure loss depending on air flow and Temperature depending on air flow. Both values are additionally dependent on the heating output of the air heater.

With the construction of a unique measurement system, LEISTER has laid the foundations for the correct physical specification of these interrelationships. For this, systematic measurements across the entire area of utilization of the air heaters and a calculation of the models with the aid of dimensionless key indicators is necessary. As a result, the interconnections of pressure loss, volumetric flow and temperature can be displayed in relation to standard conditions.

Leister measurement apparatus.



Example of pressure loss and temperature curves for an air heater of the type LHS 61S SYSTEM (3 × 400 V / 6 kW).

Monitoring system


LEISTI

LE 5000 HT-U & LE 5000 HT-S

Hot Air High Speed Side Sealing

Leister hot air side sealing

LE 5000 HT-U & LE 5000 HT-S

LE 5000 HT-U

LE 5000 HT-S

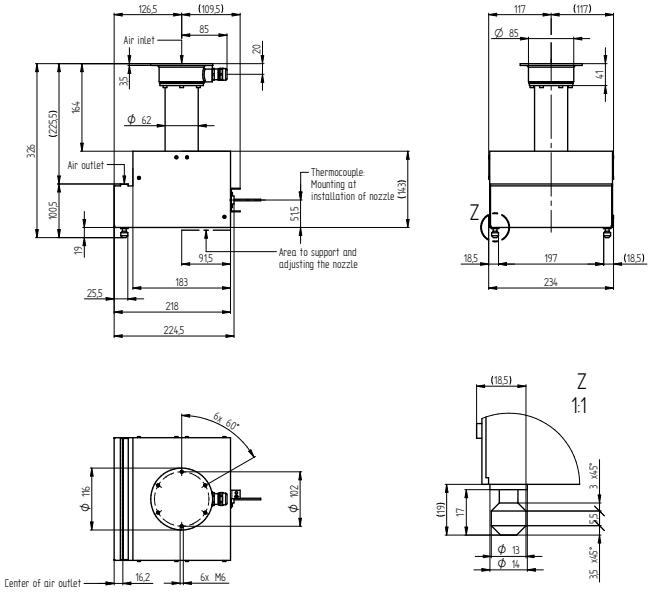
- Reduction of CO2 Footprint
- Factory Safety Requirements
- Operator Safety
- Energy Efficiency
- Process Reproducibility

The hot air sealing unit for liquid packaging include two different units: The LE 5000 HT-U air heater has the hot air outlet on the upper side, while the LE 5000 HT-S blows the hot air downwards. The air outlet openings are designed precisely for welding the longitudinal seam in liquid packaging. Thanks to the great thermal insulation on the units, the maximum amount of energy is implemented in the weld seam.

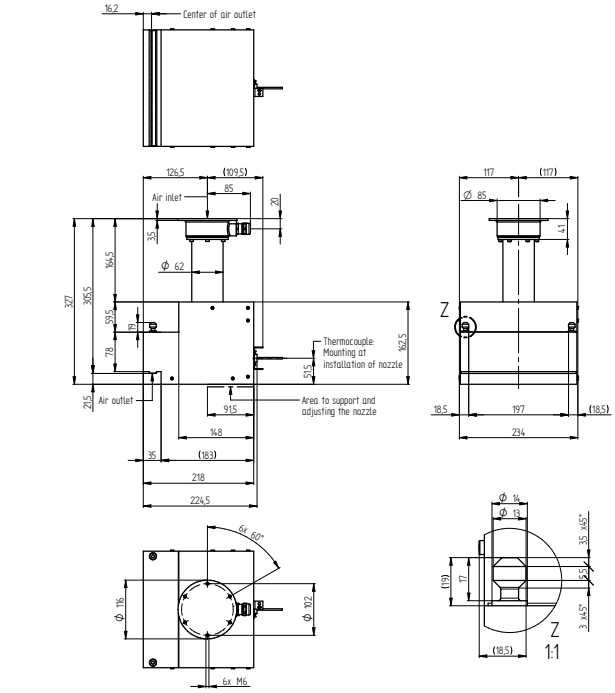
The sealing unit arrives a production speed up to 700 m/min and operate with an air temperature at 900°C. The customer can control the sealing units very easy on temperatures and airflow, this makes the process much more precise than a process with gas flame.

The Pre sealing units consist of 2 LE 5000 HT-U devices, which are used in the prefold section of the machine shown by Fortuna GmbH.

Installation dimensions in mm LE 5000 HT-U



Installation dimensions in mm LE 5000 HT-S



Technical Data		LE 5000 HT-U		LE 5000 HT-S	
Voltage	V	3 x 200	3 x 400	3 x 200	3 x 400
Frequency	Hz	50 / 60	50 / 60	50 / 60	50 / 60
Power	kW	7	7.5	7	7.5
Max. air outlet temperature	°C	900	900	900	900
Max. air inlet temperature	°C	80	80	80	80
Max. ambient temperature	°C	80	80	80	80
Min. air volume (20 °C)	l/min	400	400	400	400
Max. static pressure	kPa	100	100	100	100
Weight	kg	9	9	9	9
Mark of conformity		CE	CE	CE	CE
Protection class I		⏚	⏚	⏚	⏚
Article number		163.564	116.761	163.565	116.763

Hot Air versus Gas Flame

CO_2 Footprint: To reduce the CO_2 footprint hot air offers the option to consume the power from renewable resources like wind power, solar power, etc. Gas cannot offer this benefit since it requires fossil resources.

Factory Safety Requirements: Using hot air eliminates all the costly safety requirements for gas.

Operator Safety: There is no open flame with hot air. Hot air systems are enclosed in organic fiber based ceramics and have a very low surface contact temperature even though the process operates at 900 °C.

Energy Requirement: Typical energy consumption for a flame sealer with gas burners is appropriately 90 kW. Hot air systems also use approximately 90 kW.

Process Reproducibility: Setting up the machine for each type of board is much easier and more precise with electric heaters. The welding seam is much more precise.

Accessories LE 5000 HT-U / LE 5000 HT-S

	**137.720**	E5CC temperature controller, 100-240 V
	**159.220**	Semiconductor relay, 3 x 600V/40A
	**103.429**	ROBUST, 3 x 230/400V 50Hz, 3 x 265/460V 60Hz
	**153.358**	Frequency converter C200-012, 230V
	**166.237**	Air hose ø 38 mm, silicone, temperature-resistant
	**107.354**	Stainless steel filter, slidable to the suction side

	**107.287**	Hose clip ø 38/60 mm
	**107.291**	Hose connection adapter ø 62 mm, 1 output
	**152.371**	Inlet flange, ø 60 mm
	**152.441**	Gasket HT LE 5000 DF, inlet
		Fastening **163.535** LE 5000 HT-U (2 units) **163.536** LE 5000 HT-S (2 units) **163.596** LE 5000 HT-U (3 units) **163.598** LE 5000 HT-S (3 units) **163.604** LE 5000 HT-U (4 units) **163.606** LE 5000 HT-S (4 units)

Temperature regulators: The masters of precision.

Leister temperature regulators allow the air temperature of air heaters and hot-air blowers to be precisely regulated. These regulators are perfectly matched to our Leister devices and facilitate easy and fast installation. They include a digital display for target/actual temperature and two freely programmable alarm outputs.

	Temperature controller CSS EASY	Temperature controller CSS	Temperature controller E5CC
			
Technical Data	**CSS EASY**	**CSS**	**E5CC**
Suitable for Leister air heaters	LHS SYSTEM	LHS SYSTEM, LE MINI SENSOR Universally deployable temperature regulator	LE 5000/10 000 DF + SSR, LHS Classic + SSR, LE 5000/ 10 000 HT + SSR, MISTRAL
Regulation type	PID	PID	PID
Ready to use with preconfigured parameter set	•	• (for LHS SYSTEM, MISTRAL SYSTEM, HOTWIND SYSTEM, VULCAN SYSTEM)	•
Accuracy	> 0.2 % of scale value at 25 °C	> 0.2 % of scale value at 25 °C	> 0.2 % of scale value at 25 °C
Switchover C° / F°	Configurable via keypad	Configurable via keypad	Configurable via keypad
Temperature sensor / input	Type K / socket	Type K, PT100, screw connectors	Type K / PT100, screw connectors
Alarm output	2 independently configurable alarms, Output at 2 floating relay contacts, 4-fold connector block	2 independently configurable alarms, Output at 2 floating relay contacts, Screw connector	2 independently configurable alarms, Output at 2 floating relay contacts, Screw connector
Connection to air heater	RJ-45 socket for Leister Control Cable (see accessories)	Screw connectors	Via SSR with PWM signal or 4-20mA
Voltage	100 – 240 VAC, max. 8 VA	100 – 240 VAC, max. 8 VA	100 – 240 VAC, max. 8 VA
Mains connection lead	3 m, with Euro plug	Without lead, screw connectors	Without lead, screw connectors
Mechanics	Regulator built into housing, ready to operate, can also be integrated into the front panel, with cut-out 67 × 67 mm	Regulator for front panel integration, with cut-out 45 × 45 mm	Regulator for front panel integration, with cut-out 45 × 45 mm
Dimensions (L × W × H)	175 × 72 × 72 mm	109 × 48 × 48 mm	66 × 48 × 48 mm
Weight kg	0.45	0.20	0.10
Conformity mark	CE cULus	CE cULus	CE cULus
Protection class II	⧈	⧈	⧈
Order no.	**125.944**	**123.039**	**137.720**

Controllers and interfaces: The clever combination.

Accessories CSS EASY / CSS

System Interface cable
144.030 1 m
144.028 3 m
144.026 5 m
One end single wires, one end RJ45

106.956 Thermocouple with plug, 1 m cable

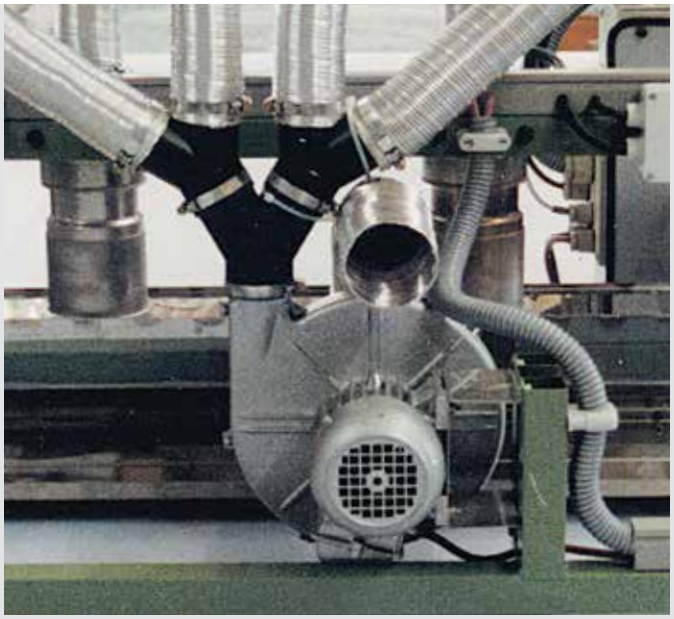
Thermocouple extension cable with plug and connection
106.958 2 m
106.960 4 m
106.962 10 m

Accessories Solid state relay

159.220 Solid state relay 3 × 600 V / 40 A
Input: PWM

133.540 Solid state relay 1 × 230 V / 15 A
Input: PWM


LEISTER



Blowers / Frequency Converters

Radial Blower Recirculation RBR: The recycling specialist.

The RBR can withstand air temperatures of up to 350°C on the inlet side because of its design making it especially suitable for hot air recycling. By combining the double-flange air heaters type DF-R and other accessories, hot air systems can be constructed that recycle the hot air from the process which saves significant amounts of energy and costs.

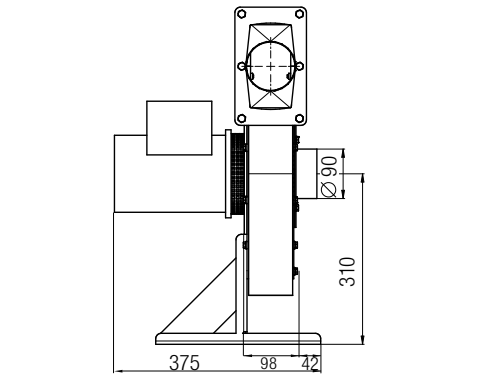
Medium pressure blower

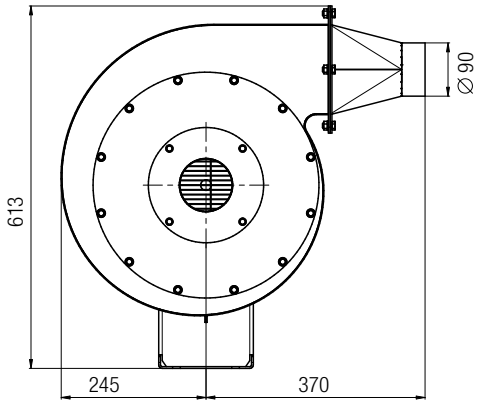
RBR

Technical data RBR
Design: radial blower

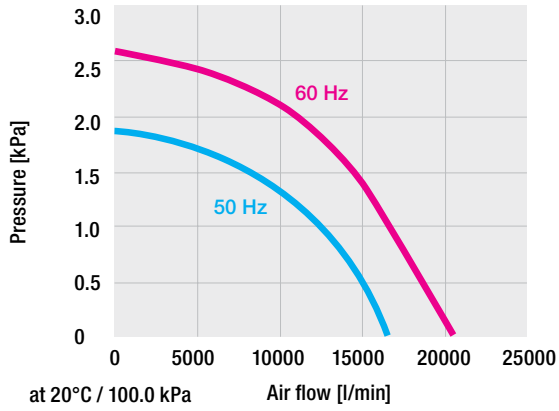
Frequency	Hz	50	60
Air flow (20 °C)	l/min	16800	20000
Static pressure	kPa	1.75	2.5
Max. ambient temperature	°C	60	60
Max. air inlet temperature	°C	350	350
Noise emission level	dB (A)	61	61
Environmental protection (IEC 60529)		IP 54	IP 54
Outside diameter air inlet	mm	∅ 90	∅ 90
Outside diameter air outlet	mm	∅ 90	∅ 90
Weight	kg	19.0	19.0
Conformity mark		CE	CE
Protection class I		⏚	⏚
Can be controlled with FC (page 62), 20 – 60 Hz			

Installation dimensions in mm





Voltage	V ~ 50 Hz V ~ 60 Hz	3 × 230 / 400 3 × 277 / 480
Power consumption	W	550 / 660
Without cable	**Order no.**	**156.049**



Accessories ↘ 60

SILENCE: The quieter option.

No blower no air! In industrial processes one blower can often supply several air heaters in parallel. Our durable and maintenance-free blowers are a result of uncompromising quality standards and decades of experience. SILENCE, Leister's mid-range blower, is very quiet during operation at 61 dB(A). Developed to withstand operating conditions with air intake temperatures of 100° C to 200° C. Delivers optimum & effortless performance in ambient temperatures up to 75° C.

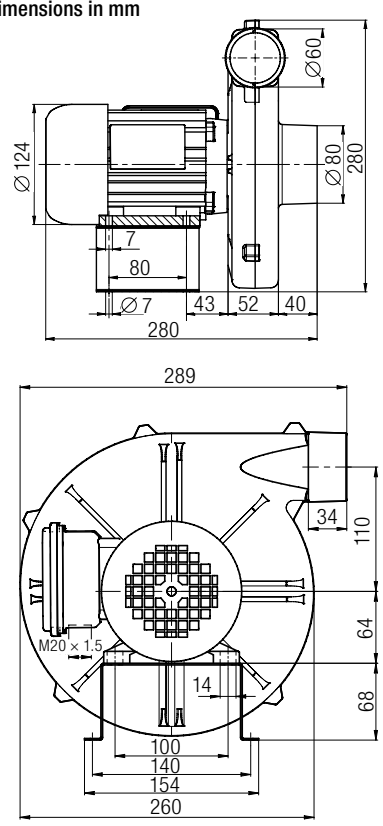
Medium pressure blower

SILENCE

Technical data SILENCE
Design: radial blower

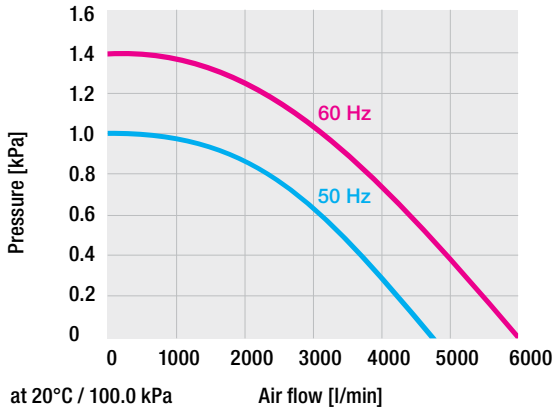
Frequency	Hz	50	60
Air flow (20 °C)	l/min	4700	6000
Static pressure	kPa	1.0	1.4
Max. ambient temperature	°C	75	75
Max. air inlet temperature	°C	200	200
Noise emission level	dB(A)	61	61
Environmental protection (IEC 60529)		IP 54	IP 54
Outside diameter air inlet	mm	∅ 80	∅ 80
Outside diameter air outlet	mm	∅ 60	∅ 60
Weight	kg	9.0	9.0
Conformity mark		CE (ErP n/a)	CE (ErP n/a)
Protection class I		⏚	⏚
Can be controlled with FC (page 62), 20 – 80 Hz			

Installation dimensions in mm



Voltage	V ~ 50 Hz V ~ 60 Hz	1 × 230	3 × 230 / 400 3 × 440 – 480
Power consumption	W	250	250
Without cable	**Order no.**		**103.507**
3 m cable / Euro plug	**Order no.**	**103.510**	

Additional versions available on request



Accessories ↘ 60

ASO: The air flow giant.

At 60 Hz, the ASO delivers 15 900 l/min. When used with the appropriate accessories it can supply several Leister air heaters in parallel.

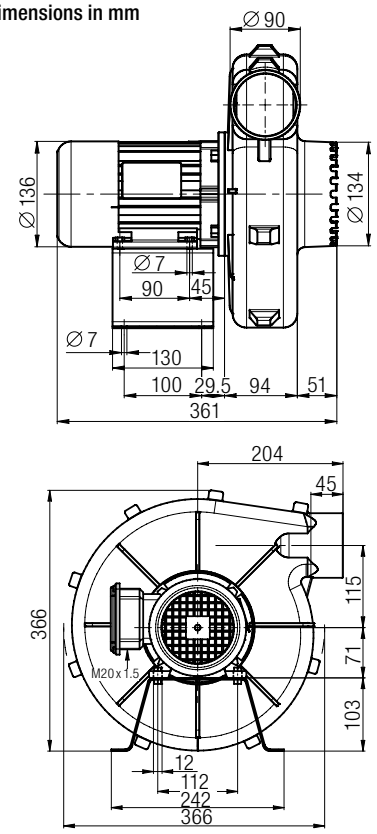
Medium pressure blower

ASO

Technical data ASO
Design: radial blower

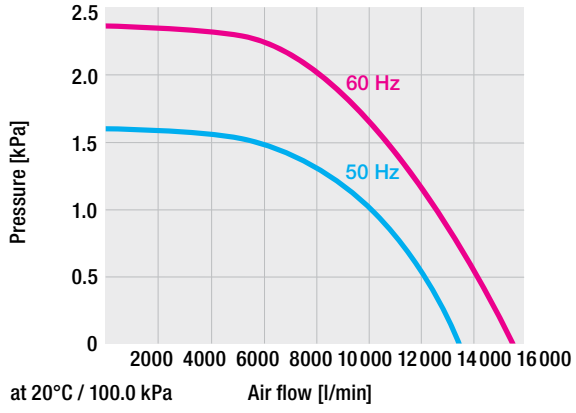
Frequency	Hz	50	60
Air flow (20 °C)	l/min	13500	15900
Static pressure	kPa	1.6	2.4
Max. ambient temperature	°C	60	60
Max. air inlet temperature	°C	200	200
Noise emission level	dB (A)	70	70
Environmental protection (IEC 60529)		IP 54	IP 54
Outside diameter air inlet	mm	∅ 134	∅ 134
Outside diameter air outlet	mm	∅ 90	∅ 90
Weight	kg	15.0	15.0
Conformity mark		CE	CE
Protection class I		⏚	⏚
Can be controlled with FC (page 62), 20 – 60 Hz			

Installation dimensions in mm



Voltage	V ~ 50 Hz V ~ 60 Hz	1 × 230	3 × 230 / 400 3 × 440 – 480
Power consumption	W	550	550
Without cable	**Order no.**		**103.527**
3 m cable / Euro plug	**Order no.**	**103.530**	

Additional versions available on request



Accessories ↘ 60

ROBUST: The name speaks for itself.

Very compact design with enormous power. Thanks to efficient sound insulation the ROBUST high pressure blower is very quiet. It can be installed in all orientations and is virtually indestructible even under extreme conditions and continuous operation.

High pressure blower

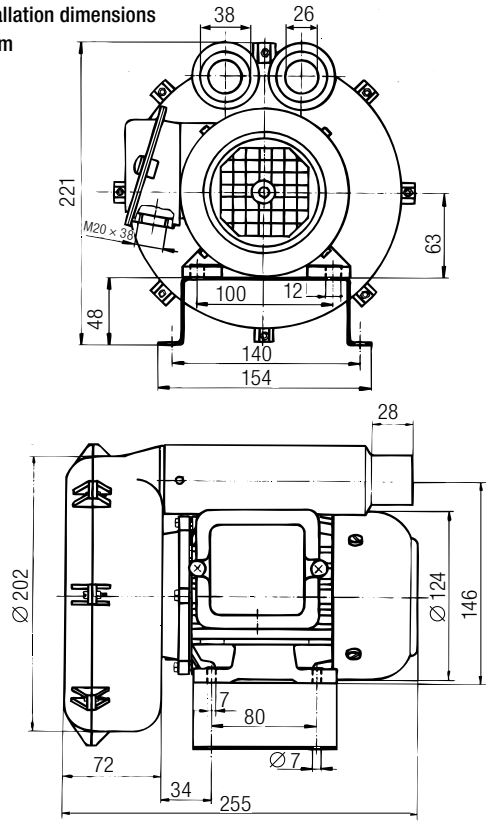
ROBUST

Technical data ROBUST
Design: Side Channal Blower

Frequency	Hz	50	60
Air flow (20 °C)	l/min	1200	1300
Static pressure	kPa	8.0	10.5
Max. ambient temperature	°C	60	60
Max. air inlet temperature	°C	60	60
Noise emission level	dB(A)	62	62
Environmental protection (IEC 60529)		IP 54	IP 54
Outside diameter air inlet	mm	∅ 38	∅ 38
Outside diameter air outlet	mm	∅ 38	∅ 38
Weight	kg	8.0	8.0
Conformity mark		CE	CE
Protection class I		⏚	⏚

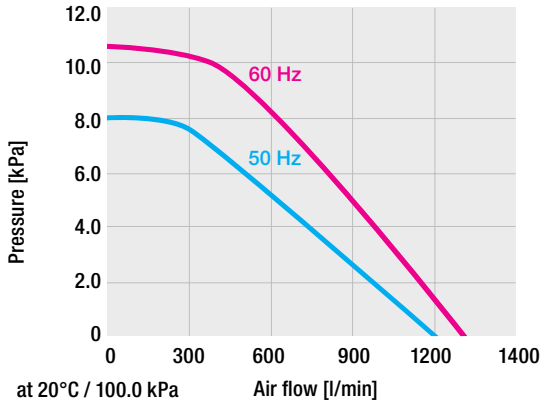
Can be controlled with FC (page 62), 20 – 60 Hz

Installation dimensions in mm



Voltage	V ~ 50 Hz V ~ 60 Hz	1 × 120	1 × 230	3 × 230 / 400 3 × 440 – 480
Power consumption	W	250	250	250
Without cable	**Order no.**	**103.434**		**103.429**
3 m cable / Euro plug	**Order no.**		**103.432**	

Additional versions available on request



Accessories ↘ 61

AIRPACK: The full pressure provider.

If high air pressure is required, the AIRPACK is the answer! It is used wherever large air volumes at high pressure are required. Its impressive power means it can supply several Leister air heaters in parallel. The AIRPACK delivers sufficient pressure to efficiently supply Leister blow-off nozzles.

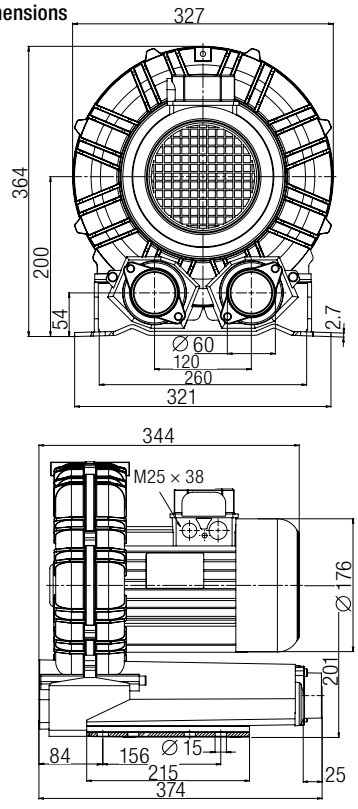
High pressure blower

AIRPACK

Technical data AIRPACK
Design: Side Channal Blower

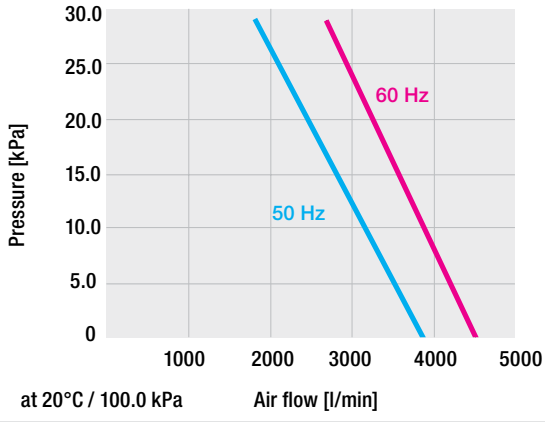
Frequency	Hz	50	60
Air flow (20 °C)	l/min	3900	4500
Static pressure	kPa	30.0	30.0
Max. ambient temperature	°C	40	40
Max. air inlet temperature	°C	40	40
Noise emission level	dB (A)	73	73
Environmental protection (IEC 60529)		IP 54	IP 54
Outside diameter air inlet	mm	∅ 60	∅ 60
Outside diameter air outlet	mm	∅ 60	∅ 60
Weight	kg	26	26
Conformity mark		CE	CE
Protection class I		⏚	⏚
Can be controlled with FC (page 62), 20 – 60 Hz			

Installation dimensions in mm



Voltage	V ~ 50 Hz V ~ 60 Hz	3 × 230 / 400 3 × 440 – 480
Power consumption	W	2200
Without cable	**Order no.**	**119.358**

Additional versions available on request



Accessories ↘ 61

MONO: Compact with high performance.

In spite of its compact dimensions, the newly-developed, MONO 6 SYSTEM blower continues to impress due to its high air volume of up to 600 l/min. One of its new features is the ability to adjust the air volume, either on the device itself, via the “e-drive” operating unit, or through the external interface. As a result, the blower can be adapted perfectly to suit every application. With its maintenance-free, brushless motor, the blower is ideal for continuous operation.

High pressure blower

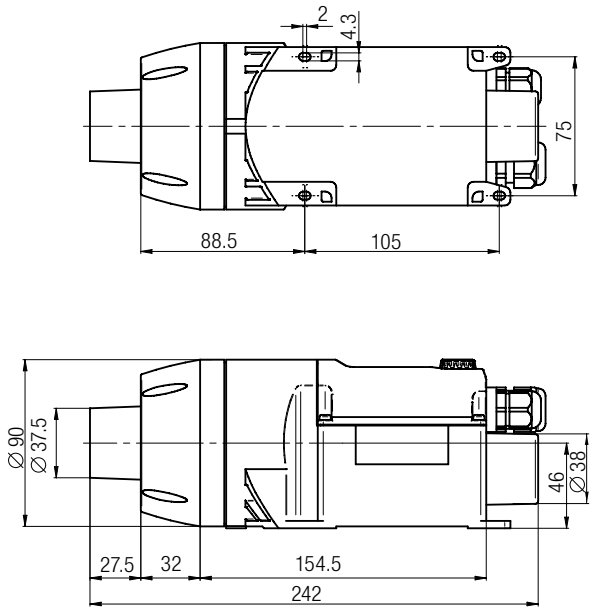
MONO 6 SYSTEM

Technical data

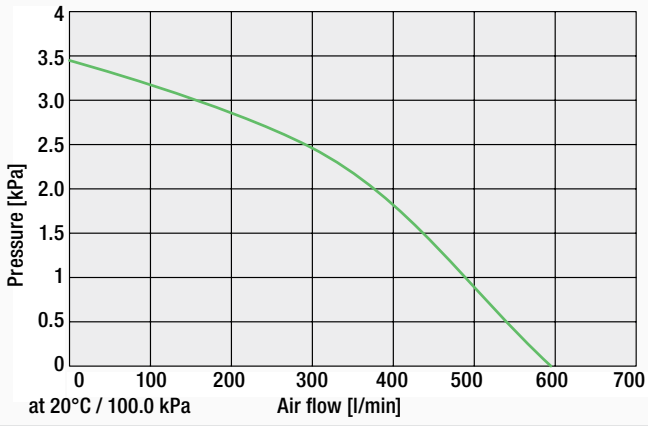
Frequency	Hz	50 / 60
Air flow (20 °C)	l/min	250 – 600
Static pressure	kPa	3.6
Max. ambient temperature	°C	60
Outside diameter air outlet	mm	∅ 38
Weight with 3 m cable	kg	1.0
Conformity mark		CE (ErP n/a)
Protection class II		⧈

Voltage	V ~	230	120
Power consumption	W	120	120
Order no.		**146.702**	**149.638**

Installation dimensions in mm



- Adjustable air volume
- Compact and efficient
- “e-drive” operating unit
- Brushless motor
- Tool protection
- System interface
- Mounting tabs



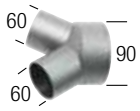
Accessories ↘ 60

Accessories SILENCE (⌀ 60 mm)

	**107.288**	PVC air hose ∅ 60 mm
	**107.287**	Hose clip for ∅ 38 mm and ∅ 60 mm air hose
	**107.240**	Closing cap ∅ 60 mm attachable to hose connection adaptor 107.238 and 107.278
	**107.294**	Stainless steel filter, push-fit on air intake
	**110.887**	Motor capacitor 230 V
	**107.291**	Hose connection adaptor made of PA with 1 air outlet for ∅ 38 mm hose, push-fit on air outlet
	**107.278**	Hose connection adaptor made of PA, push-fit on air outlet
	**107.292**	Hose connection adaptor made of PA with 2 air outlets for ∅ 38 mm hose, push-fit on air outlet
	**107.293**	Hose connection adaptor made of PA, push-fit on adaptor 107.292
	**107.295**	Manually-operated air flow adjuster Size 214 × 88 × 133 mm
	**107.296**	Air flow off/on switch The air flow is interrupted on command (pneumatic 500 kPa) to the heaters. Size 214 × 88 × 133 mm

Special nozzles available on request. Leister does not provide any warranty for its products if using non-Leister blowers or accessories,.

Accessories ASO (⌀ 90 mm)

	**107.237**	PVC air hose ∅ 90 mm
	**107.236**	Hose clip for ∅ 90 mm air hose
	**107.239**	Stainless steel filter, push-fit on air intake
	**111.771**	Motor capacitor 230 V
	**107.238**	Hose connection adaptor made of PA, push-fit

Accessories MONO (⌀ 38 mm)

	**153.245**	Stainless steel filter kit (∅ 38 mm), push-fit on air intake
	**107.286**	PVC air hose ∅ 38 mm
	**107.287**	Hose clip for ∅ 38 mm and ∅ 60 mm air hose

Accessories RBR (⌀ 90 mm)

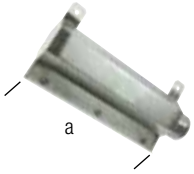
		Air hose HT, temperature resistant up to + 350 ° C, insulated
	152.439	∅ 60 mm, 2 m
	152.440	∅ 60 mm, 5 m
	155.419	∅ 90 mm, 2 m
	155.420	∅ 90 mm, 5 m
	**152.518**	Hose clip inside for Hose HT ∅ 60 bridge type 55 - 75 mm
	152.519	Hose clip outside for Hose HT ∅ 60 bridge type 85 - 105 mm
	155.421	Hose clip inside for Hose HT ∅ 90 bridge type 95 - 115 mm
	155.422	Hose clip outside for Hose HT ∅ 90 bridge type 125 - 145 mm

The combination of blow-off nozzles and blowers allows fast and efficient drying of beverage bottles.

Accessories ROBUST (⌀ 38 mm)

	**113.859** **107.350** **107.286** **166.237**	PVC air hose ∅ 14mm PVC air hose ∅ 19 mm PVC air hose ∅ 38 mm Silicone air hose ∅ 38 mm, temperature resistant up to 250°C
	**107.290**	Hose clip for ∅ 19 mm air hose
	**107.242**	Closing cap ∅ 19 mm, attachable to hose connection adaptor 107.298
	**107.354**	Stainless steel filter, push-fit on air intake
	**108.623** **104.017**	Motor capacitor 230 V~ Motor capacitor 120 V~
	**107.298**	Hose connection adaptor made of PA, push-fit on ROBUST blower and adapter 107.293 for hose connection
	**107.281**	Hose connection adaptor made of PA (∅ 38 mm), 3 outputs, each 14 mm
	**107.287**	Hose clip for air hose ∅ 38 mm and ∅ 60 mm
	**107.241**	Closing cap ∅ 38 mm, attachable to hose connection adaptor 107.292 and 107.293
	**107.293**	Hose connection adaptor made of PA, push-fit
	**108.755**	Hand operated air flow adjuster and on/off switch. Size 214 × 88 × 133 mm
	**107.299**	Air flow off/on switch The air flow is interrupted on command (pneumatic 500 kPa) to the heaters. Size 214 × 88 × 133 mm

Accessories AIRPACK (⌀ 60 mm)

	**107.287**	Hose clip for air hose ∅ 38 mm and ∅ 60 mm
	**107.241**	Closing cap ∅ 38 mm push-fit on hose connection adaptors 107.292 and 107.293
	**107.288**	PVC air hose ∅ 60 mm
	**107.240**	Closing cap ∅ 60 mm, push-fit on hose connection adaptors 107.278
	**107.291**	Hose connection adaptor made of PA with 1 air outlet for ∅ 60 mm hose. Push-fit on air outlet
	**107.292**	Hose connection adaptor made of PA with 2 air outlets for ∅ 38 mm hose. Push-fit on air outlet
	**107.278**	Hose connection adaptor made of PA, Push-fit on air outlet
	**110.895**	Stainless steel filter, push-fit on air intake
	**125.907** **125.908**	Blow-off nozzle, push-fit Outlet opening adjustable 1 – 5.5 mm a = 300 mm a = 482.6 mm Connector ∅ 60 mm

Special nozzles available on request
Leister does not provide any warranty for its products if using non-Leister blowers or accessories.

Frequency converters: More power for your blower.

Because air volume and heating performance can be set independently, precisely and reproducibly from each other, the C 200-012 and C 200-034 frequency converters improve your hot-air processes. The C 200-012 and C 200-034 give the blowers the flexibility to adjust the air volume up or down.

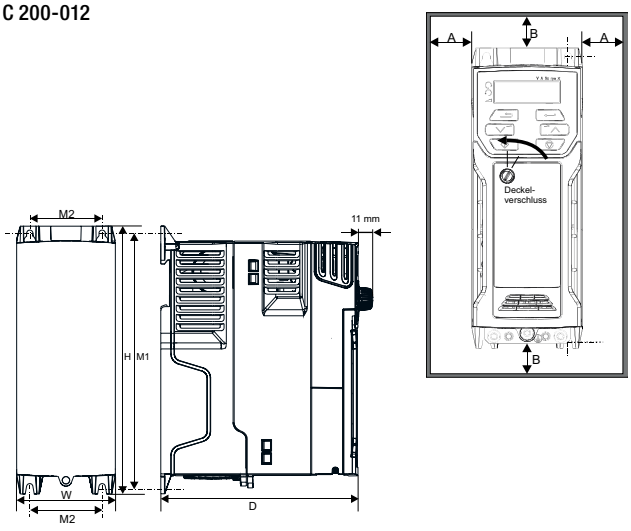
Frequency converter

C 200-012

Frequency converter

C 200-034

Installation dimensions in mm
C 200-012



Converter size	H	W	D	M1	M2	∅	A	B
	mm	mm	mm	mm	mm	mm	mm	mm
C 200-012	160	75	130	143	53	5	0	100
C 200-034	226	90	160	215	70.7	5		

Technical data

		C 200-012	C 200-034
Input voltage	V	1 × 200 - 240	3 × 380 -480
Max. blower rated power	W	750	2200
Frequency	Hz	50 / 60	50 / 60
Typical input current at full load	A	10.4	9.6
Output rated power (100%)	A	4.2	5.6
Weight	kg	0.7	1.4
Conformity mark		CE	CE
Approval mark		UL	UL
Protection class I		⏚	⏚
Order no.		**153.358**	**153.474**

Conversion table

	metric		US -units		Comments
Temperature	100	°C	212	°F	°F = °C*1.8+32
	20	°C	68	°F	
	0	°C	32	°F	
Length	25.4	mm	1	in	
	0.305	m	1	ft	
Weight	1	kg	2.2	lbs	
	0.454	kg	1.0	lbs	
Air flow	28.3	l/min	1	cfm	
	100	l/min	3.53	cfm	
Static pressure	6.89	kPa	1	psi	1 kPa = 10 mbar
	1	kPa	0.145	psi	
Speed	0.305	m/min	1	ft/min	
	1	m/min	3.28	ft/min	
Output	1	kg/h	2.2	lbs/h	
	0.454	kg/h	1	lbs/h	
Energy	1	kJ	0.948	BTU	(british thermal unit)

Useful formulas: Help yourself.

Most industrial processes require energy. Bringing energy into processes requires power and time. The following there are some simple, basic calculations that can give first estimations on required heating power. Additional application tests are always recommended and supported by Leister.

The following formulas are meant as rules-of-thumb. They can be employed as first estimations to plan equipment. The calculated values serve as approximate values. Losses are not considered.

Electric power, current and voltage

$$V = R * I$$

$$P = V * I$$

V = Voltage [V]
R = Resistance [Ohm]
I = Current [A]
P = Power [W]

Example single-phase:
V = 230 V
P = 1 kW (e.g. LHS 21S CLASSIC, 139.869)

$$I = \frac{1000}{230} = 4.35\,[A]$$ ➡ single-phase

$$I = \frac{P}{V}$$ ➡ single-phase

$$I = \frac{P}{V * \sqrt{3}}$$ ➡ three-phase

Example three-phase:
V = 3 * 400 V
P = 6 kW (e.g. LHS 61S SYSTEM, 3 x 400 V / 6 kW, 142.496)

$$I = \frac{6000}{400 * \sqrt{3}} = 8.66\,[A]$$ ➡ three-phase

Electrical output with voltage differences

$$P_{act} = \frac{V_{act}^2}{V_{nom}^2} * P_{nom}$$

P_{act} = effective Power [W]
P_{nom} = nominal Power [W]
V_{act} = effective Voltage [V]
V_{nom} = nominal Voltage [V]

Example:
V_{act} = 200 V
V_{nom} = 230 V
P_{nom} = 1 kW (e.g. LHS 21S CLASSIC, 139.869)

$$P_{200V} = \frac{200^2}{230^2} * 1000 = 756\,[W]$$

Do not reduce voltage to control power with air heaters from the LHS PREMIUM or the LHS SYSTEM line!

Heating power calculated from air flow and temperature difference

$$P = c_{air} * \frac{1}{60\,000} * \dot{V} * \rho_{air} * \Delta T$$

P = Power [kW]
c_{air} = Heat capacity of air [kJ/kgK]
$\dot{V}$ = Air flow [l/min]
ρ_{air} = Density of air [kg/m^3]
ΔT = Temperature difference [°C]

$\frac{1}{60000}$ = Conversion factors due to chosen units

Specific heat capacity of air c_{air}: 1.005 kJ/kgK
Density of air (at 20°C and 101.3 kPa) ρ_{air}: 1.204 kg/m^3

Example:

Air flow	$\dot{V}$	= 1200 l/min
Temp. of environment	T_{start}	= 25 °C
Target temperature	T_{end}	= 500 °C

$$P = 1.005 * \frac{1}{60000} * 1200 * 1.204 * (500–25) = 11.5\ [kW]$$

11.5 kW is the power required to heat the air to the target temperature.

For estimating the needed heating power, please consider: Your process may also need energy for other wanted or unwanted effects (losses etc.).

Heat loss via Isolation

$$\frac{Q}{t} = \lambda * \frac{A}{d} * \Delta T = P$$

P = Power [W]
Q = Heat energy [J]
t = Time [s]
λ = Heat transfer coefficient [W/m*K]
A = Surface [m^2]
d = Thickness of wall [m]
ΔT = Temperature difference [°C]

Example:

Box made from Styrofoam	
Dimensions (H*W*T)	= 0.5 m x 1 m x 1 m
Wall thickness of box	= 5 cm
T inside box	= 80 °C
T outside box	= - 20 °C
Heat conductivity for Styrofoam	= 0.05 W/mK
The surface of the box is A = 2*(1*1)+4*(0.5*1)	= 4 m^2

$$P = 0.05 * \frac{4}{0.05} * 100 = 400\ [W]$$

400 W are required to hold the temperature inside the box on 80°C with an environment temperature of -20°C.

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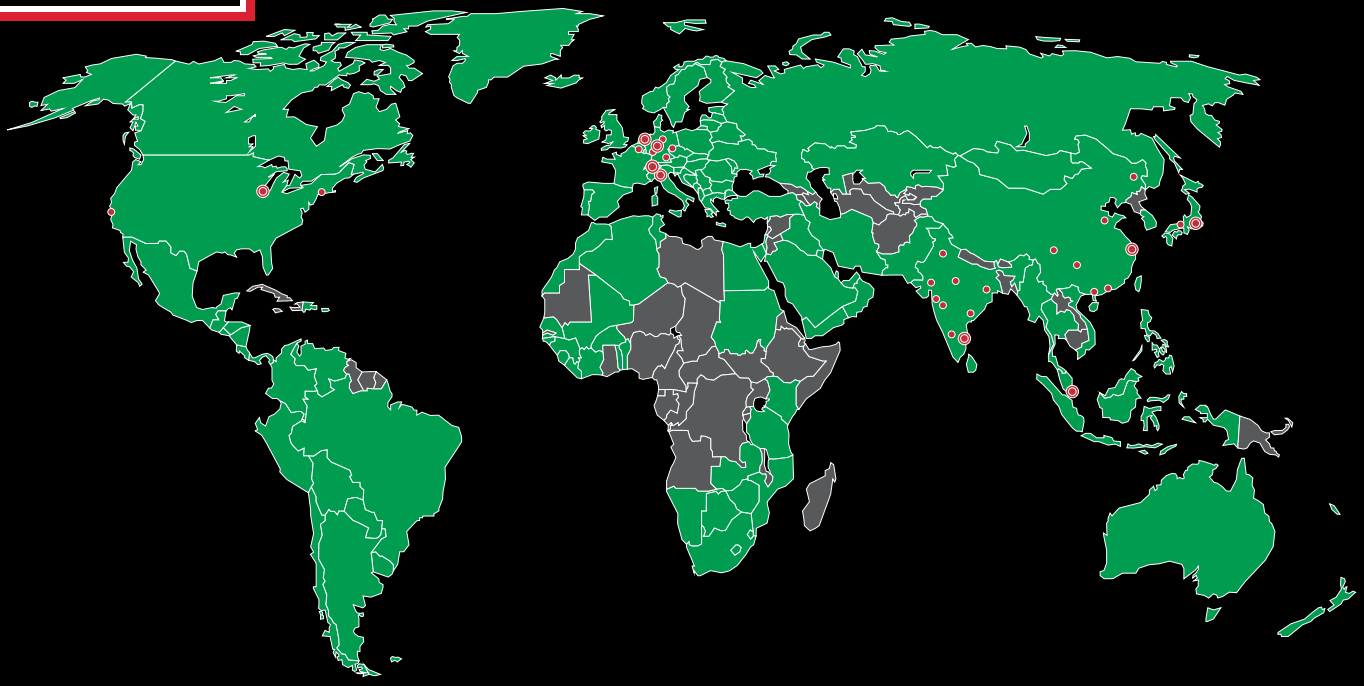

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Process Heat / EN / 09.2021