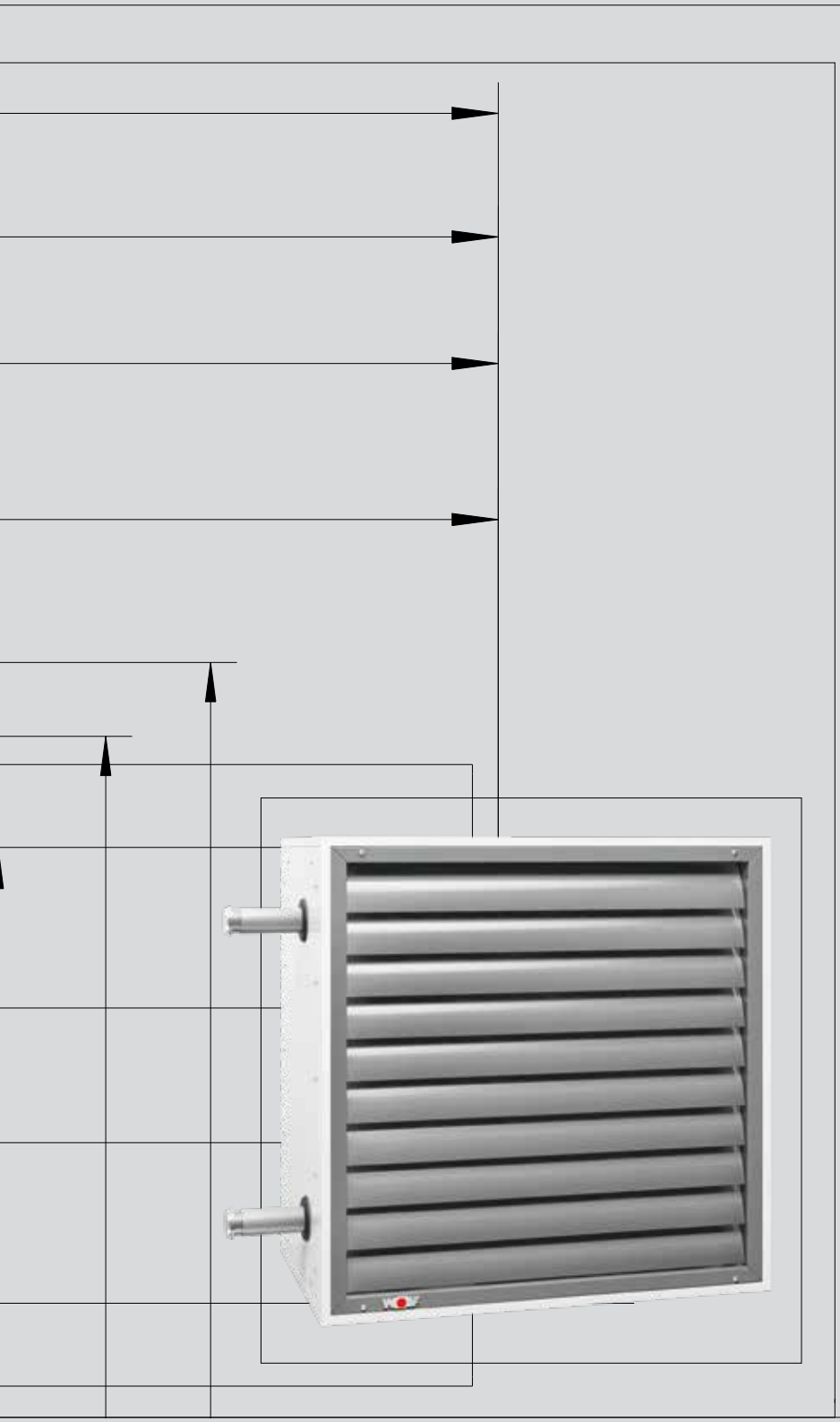
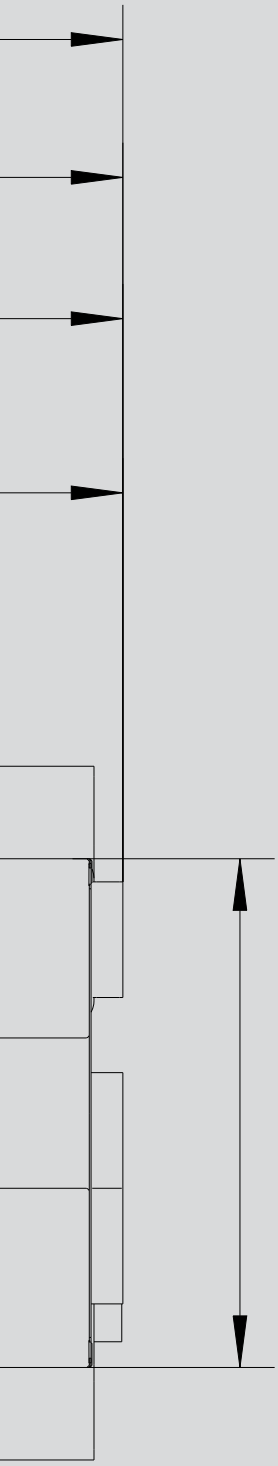
WOLF
UNIT HEATERS

LH-EC / LH





THE EXTENSIVE
EQUIPMENT RANGE

from system supplier WOLF offers the ideal solution for commercial and industrial buildings, new build and modernisation projects alike.
The range of WOLF control units can meet any requirement for heating convenience.
All equipment is easy to operate, highly energy efficient and reliable.
Solar thermal systems can also be swiftly integrated into existing systems.

WOLF equipment is easy and quick to install and maintain.

LH-EC / LH UNIT HEATER
DESCRIPTION

5 types of Cu/Al heat exchanger
for each unit heater size for
low pressure hot water LPHW,
medium pressure hot water MPHW or steam
Alternative: Steel/zinc-plated heat exchanger

4 unit sizes
for air flow rates up to 9000 m³/h,
heating output up to 235 kW

Motor/fan unit
energy efficient and quiet
axial fans for 3x400 V,
50 Hz or 1x230 V, 50 Hz.

BENEFITS OF THE WOLF
UNIT HEATER
LH-EC / LH

Large choice
of accessories

Variable speed control
through 0-10 V (DC) signal
in the LH-EC for precise
matching of the speed to
requirements

Can be installed
horizontally or vertically

LH-EC
as a particularly energy saving
version with exceptionally quiet
external rotor motor fan units

LH-EC UNIT HEATER
STANDARD UNIT

VARIABLE SPEED EC FAN UNIT
(1 x 230 V, 50 Hz)

The fan units with EC motors used in the LH-EC are particularly energy saving and quiet at higher air flow rates compared with the standard version. Variable speed control occurs via a 0-10 V (DC) signal and is perfectly straightforward with the LM2 ventilation module or alternatively a variable speed controller. This means the speed can always be matched precisely to requirements, with high motor efficiency right across the control range thanks to EC technology.

Protection rating IP 54, insulation class B, winding protection through integral temperature monitoring. Performance table, see "LH-EC 25 unit heater" on pages 10-13.

LH UNIT HEATER
STANDARD UNIT

STANDARD VERSION

Three-phase motor 3 x 400 V, 50 Hz; star configuration: lower speed; delta configuration: upper speed
Protection rating IP 54, insulation class F, ball bearing with special grease for -25 to +140 °C
for any installation position, maintenance-free
Winding protection through integral thermal contacts, which break the control circuit in the step switch or control module if the motor overheats and switch off the motor.
When the winding temperature falls, the drive starts again automatically.
Winding protection is only effective in conjunction with a step switch or control module.
For connection, see pages 34-38.
If a commercial switch or speed controller is used, the motor is not under guarantee.
For motor rating, see performance table on pages 14-21.

SPECIAL DRIVES

Single phase fan 1x230 V, 50 Hz, upper speed only; lower speed with 5-step switch.

LH		25	40	63	100
Max. power consumption	(kW)	0.17	0.28	0.39	-
Max. current drawn	(A)	0.73	1.25	1.78	-

Protection rating IP 54, insulation class F, winding protection as in standard version or thermal contacts are connected in series with the motor winding on site.
When the winding temperature falls, the drive starts again automatically.
For connection, see page 36.

LH-EC / LH UNIT HEATER
STANDARD UNIT

CASING

Sectional frame made of welded, zinc-plated steel pentapost profiles.
Casing made of zinc-plated sheet steel.
Rear panel designed with deep-drawn inlet nozzle.
Discharge louvre with individually adjustable air guide fins.

FAN

Axial fan units comprising sickle blade impeller, external rotor motor and grille. Fans are quiet and maintenance-free, suitable for any installation position.
Max. ambient temperature: -20 °C to +40 °C.

HEAT EXCHANGER

Heat exchanger Cu/Al
5 types of heat exchanger for each unit heater type for **low pressure hot water** LPHW, **medium pressure hot water** MPHW or **steam** D

Heat exchanger made of Cu/Al, header made of steel, removable from the side
Frame made of zinc-plated sheet steel
Connections with imperial thread for LPHW and MPHW
Flange and mating flange for steam

Important information:

To transfer the heating output, connect the heat exchangers in countercurrent operation.

For LPHW or MPHW: threaded connector for PN 16 to 140 °C
- Water flow on air discharge side top/bottom
- Water return on air intake side top/bottom
- Connection side in direction of airflow right/left
- For connection dimensions, see performance table

For steam: with flange and mating flange up to 9 bar saturated steam
- Steam connection top
- Condensate return bottom
- Connection side in direction of airflow left only
- For connection dimensions, see performance table

ALTERNATIVE:

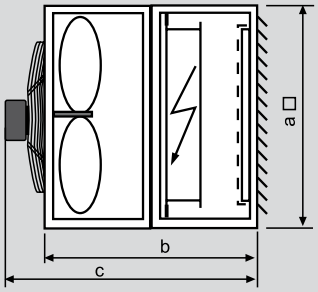
STEEL/ZINC-PLATED HEAT EXCHANGER

Heat exchanger and header made of steel/zinc-plated, removable from the side suitable for **low pressure hot water** LPHW, **medium pressure hot water** MPHW or **steam** D
Frame made of zinc-plated sheet steel
Connections with flange and mating flange
Connections with imperial thread for LPHW and MPHW
Flange and mating flange for steam

PROTECTION MEASURES:

To prevent overheating damage to the motor electronics in LH-EC units, it is important to ensure that the supply of heating medium to the heat exchanger is interrupted when the fan is not running.

ELECTRIC HEATING COIL
INCL. HIGH LIMIT SAFETY CUT-OUT



Dimensions

LH	25	40	63	100
a	500	630	800	1000
b	600	600	600	680
c	710	715	720	810

Heating output stages:

LH	25	40	63	100
a	12 kW	20 kW	25 kW	35 kW
b		Higher outputs on request		

Circuit:

12 kW:	4-stage	1/4, 2/4, 3/4, 4/4
20 kW:	4-stage	1/4, 2/4, 3/4, 4/4
25 kW:	5-stage	1/5, 2/5, 3/5, 4/5, 5/5
35 kW:	5-stage	1/5, 2/5, 3/5, 4/5, 5/5

To prevent overheating, observe the following minimum air flow rates:

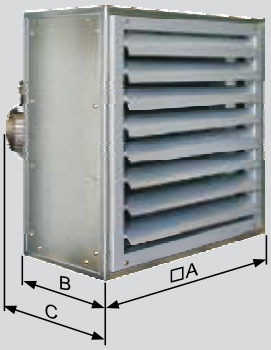
LH		25	40	63	100
LR horizontal	$\dot{V}$min [m³/h]	800	1600	2500	4000
LR vertical	$\dot{V}$min [m³/h]	1000	2200	3200	5000

PROTECTION MEASURES:

Ensure that the electric heating coil will always be switched off when the airflow falls below the minimum air flow rate. Furthermore, the electric heating coil must only be switched on by one or more contactors with a control circuit that is routed via the safety temperature limiters connected in series.

LH-ATEX UNIT HEATER
STANDARD UNIT

CASING



Explosion-proof version for potentially explosive atmospheres, explosion zone 2
II 3G c IIB T4 X

For wall or ceiling mounting, for outdoor air, recirculation air or mixed air mode, for heating or ventilation

Sectional frame made of welded and zinc-plated steel pentapost profiles
Casing made of zinc-plated sheet steel
Rear panel designed with deep-drawn inlet nozzle
Discharge louvre with individually adjustable air guide fins

Dimensions

LH-ATEX	25	40	63	100
A	500	630	800	1000
B	300	300	300	340
C	345	350	355	405

FAN MOTOR UNIT

Complete fan motor grille unit, axial fan with impeller made of aluminium, impeller tips with plastic cover strip. Motor is quiet and maintenance-free, suitable for any installation position. Three-phase motor 3 x 400 V, 50 Hz, protection rating IP 44, thermal category CL F.

Star configuration: lower speed, delta configuration: upper speed.
Max. ambient temperature: -20 °C to +40 °C. Full motor protection through integral thermistor.

LH-ATEX		25	40	63	100
Max. power consumption	(kW)	0.14/0.11	0.33/0.25	0.33/0.24	0.50/0.34
Speed	(rpm)	1350/1000	1350/1000	900/700	900/700
Max. current drawn	(A)	0.28/0.19	0.66/0.44	0.60/0.40	0.89/0.55

HEAT EXCHANGER

Heat exchanger Cu/Al
4 types of heat exchanger for each unit heater type for **low pressure hot water** LPHW or **medium pressure hot water** MPHW.
Heat exchanger made of Cu/Al, header made of steel, removable from the side. Frame made of zinc-plated sheet steel.
Connections with imperial thread
Notes: Threaded connector for PN 16 to 140 °C, water flow on air discharge side top/bottom, water return on air intake side top/bottom. Connection side in direction of airflow right/left. For heat exchanger connections, see performance table.

Steel/zinc-plated heat exchanger
3 types of heat exchanger for each unit heater type for **low pressure hot water** LPHW or **medium pressure hot water** MPHW.
Heat exchanger and header made of steel/zinc-plated, removable from the side. Frame made of zinc-plated sheet steel, connections with flange and mating flange.

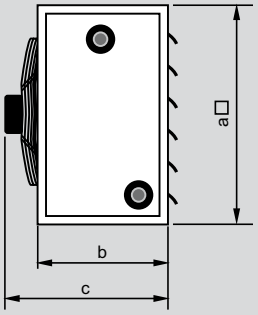
ACCESSORIES

EXPLOSION-PROOF ATEX TERMINAL BOX
Fitted and wired

THERMISTOR TRIGGERING UNIT
For on-site installation on control panel
Note: The thermistor triggering unit should only be installed outside the potentially explosive area

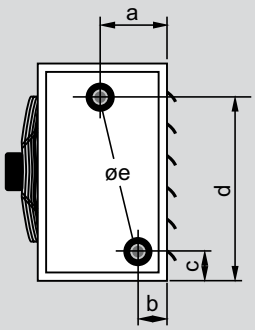
A1Ü CONTROL MODULE
As full motor protection for single speed operation
Operating voltage 3 x 400 V, control voltage 230 V, output 3 kW, protection rating IP 54
Note: The A1Ü control module (only for LH 40-ATEX, LH 63-ATEX, LH 100-ATEX) should only be installed outside the potentially explosive area.

EXPLOSION-PROOF SWITCH
For A1Ü control module, operating voltage 690 V, max. current 16 A (4 A), protection rating IP 66



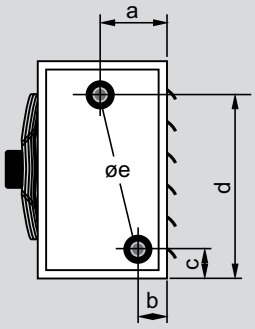
DIMENSIONS OF STANDARD UNIT LH-EC / LH / LH-ATEX

Size		25	40	63	100
a	mm	500	630	800	1000
b	mm	300	300	300	340
c	mm	410	415	420	485



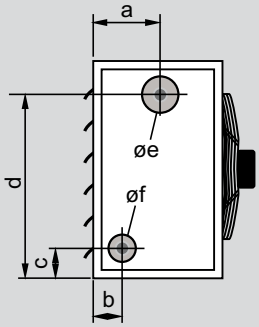
CONNECTIONS LH 25 - 100, TYPE 1 - 4, CU/AL

Size		25 -1	25 -2/-3/-4	40 -1	40 -2/-3/-4	63 -1	63 -2/-3/-4	100 -1	100 -2/-3/-4
a	mm	98	158	98	143	103	143	124	179
b	mm	68	68	68	83	63	83	84	89
c	mm	72	75	76	80	75	78	95	89
d	mm	425	425	554	550	726	722	906	912
Øe	mm	¾"	1"	¾"	1"	1"	1¼"	1"	1½"



CONNECTIONS LH 25 - 100, TYPE 1 - 3, ZINC-PLATED STEEL

Size		25 -1	25 -2/-3/-4	40 -1	40 -2/-3/-4	63 -1	63 -2/-3/-4	100 -1	100 -2/-3/-4
a	mm	100	158	100	158	98	153	118	168
b	mm	66	68	66	68	68	73	88	98
c	mm	86	86	91	91	86	86	86	86
d	mm	409	405	534	530	705	695	885	865
Øe	mm	¾"	1"	¾"	1"	1"	1¼"	1"	1½"



CONNECTIONS LH 25 - 100, TYPE STEAM, CU/AL

Size		25	40	63	100
a	mm	137	158	152	165
b	mm	90	99	84	100
c	mm	91	60	63	85
d	mm	421	591	725	894
Øe	mm	DN 40	DN 40	DN 50	DN 50
Øf	mm	DN 20	DN 20	DN 25	DN 32

LH-EC 25 UNIT HEATER
PERFORMANCE TABLE

For low pressure hot water										For saturated steam				For medium pressure hot water						
Type		**1**		**2**		**3**		**4**			**D**				**1**		**2**		**3**	
Speed [rpm]		1500		1500		1500		1500			1500				1500		1500		1500	
Flow rate $\dot{V}_0$ [m³/h]		2400		2300		2050		1950			2400				2400		2300		2050	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}		$\dot{Q}_0$	t_{LA}			$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C	t_{LE}[°C]	kW	°C		t_{LE}[°C]	kW	°C	kW	°C	kW	°C
	- 15	11.5	-2	16.4	4	19.4	10	24.4	18	- 15	28.5	16		- 15	25.4	13	35.7	26	41.5	39
	- 10	10.2	2	14.7	7	17.4	13	21.9	20	- 10	27.0	20		- 10	24.1	17	33.8	30	39.4	42
	- 5	9.0	5	12.9	11	15.4	16	19.3	22	- 5	25.6	24		- 5	22.8	21	32.0	33	37.3	45
LPHW	± 0	7.8	9	11.9	14	13.4	18	16.9	24	**1.1**	± 0	24.2	28	**MPHW**	± 0	21.5	25	30.2	37	35.2	48
45/35	+ 5	6.6	13	9.6	17	11.4	21	14.4	26	**bar**	+ 5	22.9	32	**110/90**	+ 5	20.2	29	28.4	40	33.1	51
	+ 10	5.4	17	7.9	20	9.5	24	12.0	28		+ 10	21.5	36		+ 10	18.9	33	26.6	44	31.1	54
	+ 15	4.3	20	6.3	23	7.6	26	9.6	30		+ 15	20.2	40		+ 15	17.7	37	24.9	47	29.1	57
	+ 20	3.1	24	4.7	26	5.7	28	7.2	31		+ 20	18.8	44		+ 20	16.4	41	23.2	50	27.1	60
	- 15	12.8	-1	18.2	6	21.4	13	26.9	22	- 15	30.6	19		- 15	27.9	16	39.0	30	45.2	44
	- 10	11.5	3	16.4	9	19.4	16	24.3	24	- 10	29.1	23		- 10	26.6	20	37.2	34	43.1	47
	- 5	10.3	7	14.7	13	17.4	18	21.8	26	- 5	27.7	27		- 5	25.2	24	35.3	37	41.0	50
LPHW	± 0	9.0	11	13.0	16	15.4	21	19.3	28	**1.5**	± 0	26.3	31	**MPHW**	± 0	23.9	28	33.5	41	38.9	53
50/40	+ 5	7.8	14	11.3	19	13.4	24	16.8	30	**bar**	+ 5	24.9	35	**120/100**	+ 5	22.6	32	31.7	44	36.8	56
	+ 10	6.6	18	9.6	22	11.4	26	14.4	32		+ 10	23.6	39		+ 10	21.3	36	29.9	48	34.7	59
	+ 15	5.5	22	8.0	25	9.5	29	12.0	33		+ 15	22.2	42		+ 15	20.1	40	28.2	51	32.7	62
	+ 20	4.3	25	6.3	28	7.6	31	9.7	35		+ 20	20.9	46		+ 20	18.8	44	26.4	55	30.7	65
	- 15	12.6	-1	18.3	6	21.8	13	27.5	22	- 15	32.6	21		- 15	28.2	16	39.7	31	46.2	45
	- 10	11.4	3	16.5	9	19.8	16	25.0	25	- 10	31.2	25		- 10	26.8	20	37.8	34	44.0	48
	- 5	10.1	7	14.8	13	17.7	19	22.4	27	- 5	29.7	29		- 5	25.5	24	35.9	38	41.9	51
LPHW	± 0	8.9	10	13.1	16	15.8	22	19.9	29	**2.0**	± 0	28.3	33	**MPHW**	± 0	24.2	28	34.1	42	39.8	55
60/40	+ 5	7.7	14	11.4	19	13.8	24	17.5	31	**bar**	+ 5	26.9	37	**130/100**	+ 5	22.9	32	32.3	45	37.7	58
	+ 10	6.6	18	9.7	22	11.8	27	15.0	32		+ 10	25.6	41		+ 10	21.6	36	30.5	49	35.7	61
	+ 15	5.4	22	8.1	25	9.9	29	12.6	34		+ 15	24.2	45		+ 15	20.4	40	28.8	52	33.7	64
	+ 20	4.3	25	6.5	29	8.0	32	10.2	36		+ 20	22.9	49		+ 20	19.1	44	27.1	55	31.7	67
	- 15	15.2	2	21.9	10	25.9	19	32.6	29	- 15	35.6	24		- 15	28.5	17	40.3	32	47.2	46
	- 10	14.0	6	20.1	14	23.8	21	30.0	32	- 10	34.2	29		- 10	27.2	21	38.4	35	45.0	49
	- 5	12.7	10	18.3	17	21.8	24	27.4	34	- 5	32.7	33		- 5	25.8	25	36.6	39	42.9	53
LPHW	± 0	11.5	13	16.6	20	19.8	27	24.9	36	**3.0**	± 0	31.3	37	**MPHW**	± 0	24.5	29	24.8	42	40.8	56
70/50	+ 5	10.3	17	14.9	24	17.8	30	22.4	38	**bar**	+ 5	29.9	41	**140/100**	+ 5	23.2	33	33.0	46	38.7	59
	+ 10	9.1	21	13.2	27	15.8	33	30.0	40		+ 10	28.5	45		+ 10	21.9	37	31.2	49	36.7	62
	+ 15	7.9	25	11.5	30	13.9	35	17.6	42		+ 15	27.2	49		+ 15	20.7	41	29.4	53	34.6	65
	+ 20	6.7	28	9.9	33	12.0	38	15.2	43		+ 20	25.8	52		+ 20	19.4	44	27.7	56	32.6	68
	- 15	17.8	5	25.4	14	29.9	24	37.4	36	- 15	39.8	29		- 15	30.7	19	43.6	35	49.9	50
	- 10	16.5	9	23.6	18	27.8	27	34.8	38	- 10	38.3	33		- 10	29.3	23	41.1	38	47.7	53
	- 5	15.3	13	21.8	21	25.8	30	32.3	41	- 5	36.8	37		- 5	28.0	27	39.2	42	45.6	56
LPHW	± 0	14.0	16	20.1	25	23.7	33	29.8	43	**5.0**	± 0	35.4	41	**MPHW**	± 0	26.6	31	37.4	46	43.5	60
80/60	+ 5	12.8	20	18.3	28	21.7	35	27.3	45	**bar**	+ 5	24.0	45	**140/110**	+ 5	25.3	35	35.6	49	41.4	63
	+ 10	11.6	24	16.6	31	19.7	38	24.8	47		+ 10	32.6	49		+ 10	24.0	39	33.8	53	39.3	66
	+ 15	10.4	28	15.0	34	17.8	41	22.4	49		+ 15	31.2	53		+ 15	22.8	43	32.0	46	37.3	69
	+ 20	9.2	32	13.3	37	15.9	43	20.0	51		+ 20	29.8	57		+ 20	21.5	47	30.3	60	35.3	72
	- 15	20.4	8	28.9	18	33.9	29	42.2	42	- 15	49.0	35									
	- 10	19.1	12	27.1	22	31.7	32	39.6	45	- 10	43.5	39									
	- 5	17.0	15	25.3	25	29.7	35	37.0	47	- 5	42.0	43									
LPHW	± 0	16.5	19	23.5	29	27.6	38	34.4	50	**9.0**	± 0	40.5	47								
90/70	+ 5	15.3	23	21.7	32	25.6	41	31.9	52	**bar**	+ 5	39.1	52								
	+ 10	14.0	27	20.0	35	23.6	44	29.5	54		+ 10	37.7	56								
	+ 15	12.8	31	18.3	39	21.6	46	27.0	56		+ 15	36.3	60								
	+ 20	11.6	35	16.6	42	19.7	49	24.6	58		+ 20	34.9	64								
Power consumption [kW] (1 x 230 V)		max. 0.165		max. 0.165		max. 0.165		max. 0.165			max. 0.165				max. 0.165		max. 0.165		max. 0.165	
Current cons. [A] (1 x 230 V)		max. 1.35		max. 1.35		max. 1.35		max. 1.35			max. 1.35				max. 1.35		max. 1.35		max. 1.35	
Air throw of wall mounted unit [m]*		17.5		16.5		15.5		14.5			17.5				17.5		16.5		15.5	
Air throw of ceiling unit [m]*		6.2		6.0		5.6		5.4			6.2				6.2		6.0		5.6	
Sound pressure level dB [A]**		52		52		52		52			52				52		52		52	
Heat exchanger water capacity [l]		0.7		1.0		1.1		1.8							0.7		1.0		1.1	
Heat exchanger connections		R ¾"		R 1"		R 1"		R 1"			DN 40 - DN 20				R ¾"		R 1"		R 1"	

* When t_{LA} - t_{Raum} = 10 K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

For low pressure hot water											For saturated steam			For medium pressure hot water						
Type		**1**		**2**		**3**		**4**				**D**				**1**		**2**		**3**	
Speed [rpm]		1350		1350		1350		1350				1350				1350		1350		1350	
Flow rate $\dot{V}_0$ [m³/h]		3800		3700		3400		3050				3800				3800		3700		3400	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}			$\dot{Q}_0$	t_{LA}			$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C		t_{LE}[°C]	kW	°C		t_{LE}[°C]	kW	°C	kW	°C	kW	°C
	- 15	21.0	0	25.2	3	33.8	11	38.6	19		- 15	46.0	17		- 15	46.0	17	54.8	24	71.7	41
	- 10	18.8	3	22.5	6	30.3	14	34.7	21		- 10	43.7	21		- 10	43.6	21	52.0	28	68.0	44
	- 5	16.6	7	19.9	10	26.9	17	30.7	23		- 5	41.4	25		- 5	41.2	25	49.2	32	64.4	47
LPHW	± 0	14.4	11	17.3	13	23.5	19	26.9	25	**1.1**	± 0	39.2	29	**MPHW**	± 0	38.9	29	48.4	35	60.8	50
45/35	+ 5	12.2	14	14.7	16	18.3	20	23.1	27	**bar**	+ 5	37.0	33	**110/90**	+ 5	36.6	32	43.6	39	57.3	53
	+ 10	10.1	18	12.2	20	15.0	23	19.3	28		+ 10	35.8	37		+ 10	34.3	36	40.9	42	53.8	56
	+ 15	8.0	21	9.7	23	11.7	25	15.6	30		+ 15	32.7	40		+ 15	32.1	40	38.3	46	50.4	59
	+ 20	5.9	25	7.2	26	8.4	27	11.9	32		+ 20	30.5	44		+ 20	29.8	44	35.6	49	47.0	62
	- 15	23.3	1	27.9	5	37.3	14	42.4	22		- 15	49.4	19		- 15	50.3	20	60.0	28	78.0	46
	- 10	21.0	5	25.2	8	33.7	17	38.4	24		- 10	47.1	24		- 10	47.9	24	57.1	32	74.3	49
	- 5	18.8	9	22.5	12	30.2	20	34.5	26		- 5	44.8	28		- 5	45.5	28	54.3	35	70.7	52
LPHW	± 0	16.6	12	19.9	15	26.8	22	30.6	28	**1.5**	± 0	42.5	31	**MPHW**	± 0	43.2	32	51.5	39	67.1	55
50/40	+ 5	14.4	16	17.3	18	23.4	25	26.8	30	**bar**	+ 5	40.3	35	**120/100**	+ 5	40.9	36	48.7	43	63.5	58
	+ 10	12.3	19	14.7	22	20.1	27	23.0	32		+ 10	38.1	39		+ 10	38.6	40	46.0	46	60.0	61
	+ 15	10.2	23	12.2	25	16.8	30	19.3	34		+ 15	36.0	43		+ 15	36.3	43	43.3	50	56.6	64
	+ 20	8.1	26	9.7	28	13.5	32	15.6	35		+ 20	33.8	47		+ 20	34.1	47	40.6	53	53.2	67
	- 15	23.3	1	28.1	5	38.3	15	44.0	23		- 15	52.7	22		- 15	51.1	21	60.9	29	79.9	47
	- 10	21.1	5	25.4	9	34.8	18	40.0	25		- 10	50.3	26		- 10	48.6	25	58.1	32	76.2	51
	- 5	18.9	9	22.7	12	31.3	20	36.1	28		- 5	48.1	30		- 5	46.3	29	55.2	36	72.6	54
LPHW	± 0	16.7	12	20.1	15	27.9	23	32.2	30	**2.0**	± 0	45.8	34	**MPHW**	± 0	43.9	32	52.4	40	69.6	57
60/40	+ 5	14.5	16	17.5	19	24.5	26	28.3	32	**bar**	+ 5	43.6	38	**130/100**	+ 5	41.6	36	49.7	43	65.4	60
	+ 10	12.4	19	15.0	22	21.1	28	24.5	33		+ 10	41.4	42		+ 10	39.3	40	46.9	47	61.9	63
	+ 15	10.3	23	12.5	25	17.8	30	207.0	35		+ 15	39.2	46		+ 15	37.0	44	44.2	50	58.5	66
	+ 20	8.2	27	10.0	28	14.5	33	17.0	37		+ 20	37.0	49		+ 20	34.8	48	41.6	54	55.0	69
	- 15	28.0	5	33.6	9	45.3	20	51.7	30		- 15	57.6	25		- 15	51.8	21	61.9	29	81.8	49
	- 10	25.7	8	20.8	13	41.7	23	47.7	32		- 10	55.2	29		- 10	49.4	25	49.1	33	78.1	52
	- 5	23.4	12	28.2	16	38.2	26	43.7	34		- 5	52.9	33		- 5	47.0	29	56.2	37	74.5	55
LPHW	± 0	21.2	16	25.5	19	34.7	29	39.8	37	**3.0**	± 0	50.6	37	**MPHW**	± 0	44.7	33	53.4	41	70.9	58
70/50	+ 5	19.0	19	23.9	23	31.3	31	35.9	39	**bar**	+ 5	48.4	41	**140/100**	+ 5	42.4	37	50.7	44	67.3	62
	+ 10	16.9	23	20.3	26	27.9	34	32.1	41		+ 10	46.2	45		+ 10	40.1	41	48.0	48	63.8	65
	+ 15	14.7	26	17.8	29	24.6	36	28.4	42		+ 15	44.0	49		+ 15	37.8	44	45.3	51	60.3	67
	+ 20	12.6	30	15.2	32	21.3	39	24.6	44		+ 20	41.8	53		+ 20	35.6	48	42.6	55	56.9	70
	- 15	32.5	8	39.0	13	52.1	26	59.1	36		- 15	64.3	30		- 15	55.4	24	66.1	32	86.2	52
	- 10	30.2	12	36.2	16	48.5	29	55.1	39		- 10	61.9	34		- 10	53.0	28	63.2	36	82.5	56
	- 5	28.0	15	33.5	20	44.9	31	51.1	41		- 5	59.6	38		- 5	50.6	32	60.3	40	78.8	59
LPHW	± 0	25.7	19	30.8	23	41.4	34	47.2	43	**5.0**	± 0	57.3	42	**MPHW**	± 0	48.2	36	57.5	44	75.2	62
80/60	+ 5	23.5	23	28.2	27	38.0	37	43.3	46	**bar**	+ 5	55.0	46	**140/110**	+ 5	45.9	39	54.7	47	71.6	65
	+ 10	21.3	26	25.6	30	34.6	40	39.5	48		+ 10	52.7	50		+ 10	43.6	43	51.9	51	68.1	68
	+ 15	19.1	30	23.0	33	31.2	42	35.7	50		+ 15	50.5	54		+ 15	41.3	47	49.2	54	64.6	71
	+ 20	17.0	33	20.4	37	27.9	45	32.0	52		+ 20	48.3	58		+ 20	39.0	51	46.6	58	61.2	74
	- 15	37.1	11	44.3	17	58.7	31	66.4	43		- 15	72.8	36								
	- 10	34.7	15	41.6	20	55.1	34	62.3	45		- 10	70.3	40								
	- 5	32.4	18	38.8	24	51.5	37	58.3	48		- 5	68.0	44								
LPHW	± 0	30.1	22	36.1	27	48.0	40	54.4	50	**9.0**	± 0	65.6	49								
90/70	+ 5	27.9	26	33.4	31	44.5	42	50.5	52	**bar**	+ 5	63.3	53								
	+ 10	25.7	30	30.7	34	41.1	45	46.7	54		+ 10	61.0	57								
	+ 15	23.5	33	28.1	37	37.7	48	42.9	57		+ 15	58.8	61								
	+ 20	21.3	37	25.5	41	34.4	50	39.1	59		+ 20	56.6	65								
Power consumption [kW] (1 x 230 V)		max. 0.31		max. 0.31		max. 0.31		max. 0.31				max. 0.31				max. 0.31		max. 0.31		max. 0.31	
Current cons. [A] (1 x 230 V)		max. 1.4		max. 1.4		max. 1.4		max. 1.4				max. 1.4				max. 1.4		max. 1.4		max. 1.4	
Air throw of wall mounted unit [m]*		26		25		22.5		19.5				26				26		25		22.5	
Air throw of ceiling unit [m]*		6.1		5.9		5.5		5.0				6.1				6.1		5.9		5.5	
Sound pressure level dB [A]**		55		55		55		55				55				55		55		55	
Heat exchanger water capacity [l]		1.0		1.5		2.0		2.5								1.0		1.5		2.0	
Heat exchanger connections		R ¾"		R 1"		R 1"		R 1"				DN 40 - DN 20				R ¾"		R 1"		R 1"	

* When t_{LA} - t_{Raum} = 10 K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

LH-EC 63 UNIT HEATER
PERFORMANCE TABLE

For low pressure hot water										For saturated steam				For medium pressure hot water							
Type			1		2		3		4			D				1		2		3	
Speed [rpm]			1000		1000		1000		1000			1000				1000		1000		1000	
Flow rate $\dot{V}_0$ [m³/h]			5500		5400		5000		4800			5500				5500		5400		5000	
			$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}			$\dot{Q}_0$	t_{LA}			$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]		kW	°C	kW	°C	kW	°C	kW	°C	t_{LE}[°C]		kW	°C	t_{LE}[°C]		kW	°C	kW	°C	kW	°C
		- 15	34.4	2	44.7	7	53.6	13	65.3	21		- 15	70.6	19		- 15	73.8	21	95.4	32	112.6	45
		- 10	30.8	5	40.0	10	48.1	16	58.7	23		- 10	70.4	25		- 10	70.0	24	90.5	35	106.8	48
		- 5	27.3	9	35.4	13	42.6	18	52.2	25		- 5	66.8	28		- 5	66.3	28	85.7	39	101.2	51
LPHW		± 0	23.8	12	30.9	16	37.3	21	45.7	27	**1.1**	± 0	63.2	32	**MPHW**	± 0	62.6	32	81.0	42	95.6	54
45/35		+ 5	20.4	16	26.4	19	32.0	23	39.4	28	**bar**	+ 5	59.7	36	**110/90**	+ 5	59.0	36	76.3	45	90.1	56
		+ 10	17.0	19	22.0	22	26.8	26	33.1	30		+ 10	56.2	40		+ 10	55.4	39	71.6	49	84.7	59
		+ 15	13.7	22	17.7	25	21.6	28	26.9	32		+ 15	52.8	43		+ 15	51.9	43	67.0	52	79.3	62
		+ 20	10.4	26	13.4	27	16.5	30	28.7	33		+ 20	49.4	47		+ 20	48.4	46	62.5	55	74.1	65
		- 15	37.9	3	49.2	9	58.9	16	71.6	25		- 15	76.0	22		- 15	80.5	24	104.1	36	122.3	50
		- 10	34.3	7	44.5	12	53.3	19	64.9	27		- 10	75.8	27		- 10	76.7	28	99.1	40	116.6	53
		- 5	30.8	10	39.9	15	47.9	21	58.4	28		- 5	72.2	31		- 5	73.0	32	94.3	43	110.9	56
LPHW		± 0	27.3	14	35.4	18	42.5	24	51.9	30	**1.5**	± 0	68.6	35	**MPHW**	± 0	69.3	35	89.5	46	105.3	59
50/40		+ 5	23.8	17	30.9	21	37.2	26	45.5	32	**bar**	+ 5	65.1	39	**120/100**	+ 5	65.6	39	84.7	50	99.8	62
		+ 10	20.4	21	26.5	24	32.0	29	39.2	34		+ 10	61.6	43		+ 10	62.0	43	80.1	53	94.3	65
		+ 15	17.1	24	22.1	27	26.8	31	33.0	35		+ 15	58.2	46		+ 15	58.5	46	75.4	56	88.9	68
		+ 20	13.8	28	17.8	30	21.7	33	26.9	37		+ 20	54.8	50		+ 20	54.9	50	70.9	59	83.6	70
		- 15	38.9	4	50.4	10	61.0	17	75.0	26		- 15	84.8	26		- 15	82.3	25	106.4	37	125.6	62
		- 10	35.3	7	45.7	13	55.5	20	68.4	28		- 10	81.1	30		- 10	78.5	29	101.5	41	119.9	55
		- 5	31.8	11	41.1	16	50.0	23	61.8	30		- 5	77.5	34		- 5	74.8	32	96.6	44	114.2	58
LPHW		± 0	28.3	14	36.6	19	44.6	25	55.3	32	**2.0**	± 0	73.9	38	**MPHW**	± 0	71.1	36	91.8	48	108.6	61
60/40		+ 5	24.9	18	32.1	22	39.3	27	48.8	34	**bar**	+ 5	70.3	42	**130/100**	+ 5	67.4	40	87.1	51	103.1	64
		+ 10	21.4	21	27.7	25	34.0	30	42.5	36		+ 10	66.8	45		+ 10	63.8	44	82.4	54	97.6	67
		+ 15	18.1	25	23.3	28	28.8	32	36.1	37		+ 15	63.3	49		+ 15	60.2	47	77.8	58	92.2	70
		+ 20	14.7	28	18.9	31	23.6	34	29.8	39		+ 20	59.9	53		+ 20	56.7	51	73.2	61	86.9	72
		- 15	46.0	7	59.7	14	71.8	23	87.6	33		- 15	92.8	30		- 15	81.1	26	108.8	28	128.9	53
		- 10	42.4	11	55.0	18	69.2	26	80.9	36		- 10	89.0	34		- 10	80.3	29	103.8	42	123.2	57
		- 5	38.8	14	50.3	21	60.7	28	74.3	38		- 5	85.3	38		- 5	76.6	33	99.0	45	117.5	60
LPHW		± 0	35.3	18	45.7	24	55.3	31	67.8	40	**3.0**	± 0	81.7	42	**MPHW**	± 0	72.9	37	94.1	49	111.9	63
70/50		+ 5	31.8	22	41.2	27	49.9	34	61.3	42	**bar**	+ 5	78.1	46	**140/100**	+ 5	69.2	41	89.4	52	106.3	66
		+ 10	28.4	25	36.7	30	44.6	36	55.0	43		+ 10	74.6	49		+ 10	65.6	45	84.7	56	100.8	69
		+ 15	25.0	28	32.3	33	39.4	38	48.7	45		+ 15	71.1	53		+ 15	62.0	48	80.1	59	95.4	71
		+ 20	21.6	32	27.9	36	34.2	41	42.4	47		+ 20	67.6	57		+ 20	58.5	52	75.5	62	90.1	74
		- 15	53.1	11	68.8	19	82.3	29	99.8	40		- 15	103.6	35		- 15	89.1	28	115.0	41	135.3	57
		- 10	49.4	14	64.1	21	76.7	31	93.1	42		- 10	96.6	37		- 10	85.2	32	110.0	45	129.5	60
		- 5	45.8	18	59.4	25	71.1	34	86.4	445		- 5	96.1	43		- 5	81.4	36	105.1	49	123.8	63
LPHW		± 0	42.3	22	54.7	28	65.7	37	79.9	47	**5.0**	± 0	92.4	47	**MPHW**	± 0	77.7	40	100.3	52	118.2	66
80/60		+ 5	38.7	25	50.2	32	60.3	39	73.5	49	**bar**	+ 5	88.7	51	**140/110**	+ 5	74.0	43	95.8	46	112.6	69
		+ 10	35.3	29	45.6	35	54.9	42	67.1	51		+ 10	85.2	55		+ 10	70.4	47	90.8	59	107.1	72
		+ 15	31.8	32	41.2	38	49.7	44	60.8	52		+ 15	81.6	59		+ 15	66.8	51	86.1	62	101.7	75
		+ 20	28.4	36	36.8	40	44.5	47	54.6	54		+ 20	78.1	63		+ 20	63.2	55	91.5	65	96.3	78
		- 15	60.0	14	77.8	23	92.6	34	111.6	47		- 15	117.3	42								
		- 10	55.4	20	73.0	27	86.9	37	104.9	49		- 10	113.4	46								
		- 5	52.1	23	68.3	30	81.3	40	98.2	51		- 5	109.6	50								
LPHW		± 0	49.1	25	63.6	33	75.8	43	91.7	54	**9.0**	± 0	105.9	54								
90/70		+ 5	45.6	29	59.0	36	70.4	45	85.2	56	**bar**	+ 5	102.2	58								
		+ 10	42.0	32	54.4	39	65.0	48	78.8	58		+ 10	96.6	62								
		+ 15	38.6	36	49.9	42	59.7	50	72.5	60		+ 15	95.0	66								
		+ 20	35.1	39	45.5	45	54.5	53	66.3	62		+ 20	91.4	70								
Power consumption [kW] [1 x 230 V]			max. 0.40		max. 0.40		max. 0.40		max. 0.40				max. 0.40				max. 0.40		max. 0.40		max. 0.40	
Current cons. [A] [1 x 230 V]			max. 1.8		max. 1.8		max. 1.8		max. 1.8				max. 1.8				max. 1.8		max. 1.8		max. 1.8	
Air throw of wall mounted unit [m]*			27		26		23		22				27				27		26		23	
Air throw of ceiling unit [m]*			7.3		7.1		6.3		6.0				7.3				7.3		7.1		6.3	
Sound pressure level dB [A]**			56		56		56		56				56				56		56		56	
Heat exchanger water capacity [l]			2.5		3.5		3.5		5.5								2.5		3.5		3.5	
Heat exchanger connections			R 1"		R 1¼"		R 1¼"		R 1¼"				DN 50 - DN 25				R 1"		R 1¼"		R 1¼"	

* When t_{LA} - t_{Raum} = 10 K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

For low pressure hot water

Type		1		2		3		4	
Speed [rpm]		900		900		900		900	
Flow rate $\dot{V}_0$ [m³/h]		9400		9300		8700		8200	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C
	- 15	58.6	2	75.3	7	96.9	15	112.6	21
	- 10	52.5	5	67.4	10	87.0	17	101.3	23
	- 5	46.5	9	59.6	13	77.2	19	90.2	25
LPHW	± 0	40.6	12	52.0	16	67.6	22	79.2	27
45/35	+ 5	34.8	16	44.4	19	58.1	24	68.4	29
	+ 10	29.9	19	36.9	22	48.7	26	57.7	31
	+ 15	23.3	22	29.6	24	39.4	28	47.1	32
	+ 20	17.7	26	22.3	27	30.2	30	36.5	33
	- 15	64.6	3	83.1	9	106.4	17	123.1	25
	- 10	58.4	7	75.2	12	96.5	20	111.8	27
	- 5	52.4	10	67.4	15	86.6	22	100.6	29
LPHW	± 0	46.5	14	59.6	18	77.0	25	89.6	31
50/40	+ 5	40.6	17	52.0	21	67.4	27	78.8	32
	+ 10	34.8	21	44.5	24	58.0	29	68.1	34
	+ 15	29.1	24	37.1	27	48.6	32	57.5	36
	+ 20	23.4	27	29.7	30	39.4	34	47.0	37
	- 15	66.2	4	84.7	9	110.7	19	130.2	27
	- 10	60.1	7	76.8	12	100.7	21	118.8	29
	- 5	54.1	11	69.0	15	90.9	24	107.6	31
LPHW	± 0	48.2	14	61.3	19	81.2	26	96.5	33
60/40	+ 5	42.3	18	53.7	22	71.6	29	85.6	35
	+ 10	36.5	21	46.2	24	62.0	31	74.7	37
	+ 15	30.8	25	38.8	27	52.6	33	63.9	38
	+ 20	25.1	28	31.4	30	43.2	35	53.1	40
	- 15	78.4	7	100.6	14	129.9	25	151.3	34
	- 10	72.2	11	92.6	17	119.9	27	139.9	36
	- 5	66.2	14	84.7	20	110.0	30	128.7	38
LPHW	± 0	60.2	18	76.9	23	100.2	32	117.6	40
70/50	+ 5	54.2	21	69.2	26	90.5	35	106.6	42
	+ 10	48.4	25	61.6	29	81.0	37	95.8	44
	+ 15	42.6	28	54.1	32	71.5	39	85.0	46
	+ 20	36.8	32	46.7	35	62.2	42	74.4	47
	- 15	90.4	11	116.2	18	148.7	30	171.8	41
	- 10	84.2	14	108.1	21	138.6	33	160.4	43
	- 5	78.1	18	100.2	25	128.6	36	149.1	45
LPHW	± 0	72.0	21	92.3	28	118.8	38	138.0	47
80/60	+ 5	66.0	25	84.5	31	109.1	41	127.0	49
	+ 10	60.1	29	76.8	34	99.5	43	116.1	51
	+ 15	54.2	32	69.2	37	90.0	46	105.4	53
	+ 20	48.4	35	61.7	40	80.6	48	94.8	55
	- 15	102.3	14	131.6	23	167.1	36	191.8	47
	- 10	96.0	18	123.4	26	156.9	39	180.3	49
	- 5	89.8	21	115.3	29	146.9	42	169.0	52
LPHW	± 0	83.7	25	107.4	32	137.0	44	157.8	54
90/70	+ 5	77.6	29	99.5	36	127.2	47	146.8	56
	+ 10	71.6	32	91.8	39	117.6	49	136.0	58
	+ 15	65.7	36	84.1	42	108.0	52	125.2	60
	+ 20	59.9	39	76.6	45	96.6	54	114.6	62
Power consumption [kW] (1 x 230 V)		max. 0.58		max. 0.58		max. 0.58		max. 0.58	
Current cons. [A] (1 x 230 V)		max. 2.7		max. 2.7		max. 2.7		max. 2.7	
Air throw of wall mounted unit [m]*		32		31		29		27	
Air throw of ceiling unit [m]*		7.9		7.8		7.6		7.2	
Sound pressure level dB [A]**		56		56		56		56	
Heat exchanger water capacity [l]		3.5		5.5		7.5		9.5	
Heat exchanger connections		R 1"		R 1½"		R 1½"		R 1½"	

For saturated steam

		D	
		900	
		9400	
		$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C
	- 15	125.0	20
	- 10	118.9	24
	- 5	112.8	28
1.1	± 0	102.8	31
bar	+ 5	101.0	36
	+ 10	95.1	39
	+ 15	89.3	43
	+ 20	83.7	47
	- 15	134.3	23
	- 10	121.8	27
	- 5	122.0	31
1.5	± 0	116.0	35
bar	+ 5	110.0	39
	+ 10	104.2	42
	+ 15	98.4	46
	+ 20	92.7	50
	- 15	143.3	25
	- 10	137.1	29
	- 5	131.0	33
2.0	± 0	124.9	37
bar	+ 5	118.9	41
	+ 10	113.0	45
	+ 15	107.2	49
	+ 20	101.4	53
	- 15	156.8	29
	- 10	150.5	33
	- 5	144.3	37
3.0	± 0	138.2	41
bar	+ 5	132.1	45
	+ 10	126.2	49
	+ 15	120.2	53
	+ 20	114.5	57
	- 15	175.1	34
	- 10	168.7	39
	- 5	162.5	43
5.0	± 0	156.3	47
bar	+ 5	146.4	50
	+ 10	144.1	55
	+ 15	138.1	59
	+ 20	132.3	62
	- 15	198.3	41
	- 10	191.9	45
	- 5	185.5	49
9.0	± 0	179.2	54
bar	+ 5	173.0	58
	+ 10	166.9	62
	+ 15	160.7	66
	+ 20	154.8	70
Power consumption [kW] (1 x 230 V)		max. 0.58	
Current cons. [A] (1 x 230 V)		max. 2.7	
Air throw of wall mounted unit [m]*		32	
Air throw of ceiling unit [m]*		7.9	
Sound pressure level dB [A]**		56	
Heat exchanger water capacity [l]			
Heat exchanger connections		DN 65 - DN 32	

For medium pressure hot water

		1		2		3	
		900		900		900	
		9400		9300		8700	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C
	- 15	125.7	20	161.6	31	202.9	47
	- 10	119.3	24	153.2	35	192.6	50
	- 5	112.9	28	145.1	38	182.4	63
MPHW	± 0	106.7	32	137.0	41	172.4	56
110/90	+ 5	100.5	36	129.0	45	162.5	58
	+ 10	94.4	39	121.1	48	152.7	61
	+ 15	88.4	43	113.3	51	143.1	64
	+ 20	82.4	46	105.6	54	133.6	66
	- 15	137.2	24	176.4	35	220.3	52
	- 10	130.8	28	168.0	39	209.9	55
	- 5	124.4	31	159.6	42	199.7	58
MPHW	± 0	118.1	35	151.5	46	189.6	61
120/100	+ 5	111.8	39	143.5	49	179.7	64
	+ 10	105.7	43	135.5	52	169.9	67
	+ 15	99.6	46	127.7	56	160.2	70
	+ 20	93.6	50	119.9	59	150.7	72
	- 15	140.3	25	180.0	36	226.5	54
	- 10	133.8	28	171.6	40	216.1	57
	- 5	127.4	32	163.2	43	205.9	60
MPHW	± 0	121.1	36	155.2	47	195.8	63
130/100	+ 5	114.9	40	147.1	50	185.9	66
	+ 10	108.7	44	139.2	54	176.1	69
	+ 15	102.6	47	131.4	57	166.4	72
	+ 20	96.6	51	123.6	60	156.8	74
	- 15	143.4	25	183.8	37	232.7	56
	- 10	136.9	29	175.4	41	222.3	59
	- 5	130.5	33	167.1	45	212.1	62
MPHW	± 0	124.2	37	159.0	48	202.0	65
140/100	+ 5	117.9	41	150.9	51	192.0	68
	+ 10	111.8	45	142.9	55	182.1	71
	+ 15	105.7	48	135.1	58	172.4	74
	+ 20	99.6	52	127.3	61	162.8	76
	- 15	151.8	28	194.7	40	243.7	59
	- 10	145.2	32	186.2	44	233.3	62
	- 5	138.8	36	177.9	48	223.0	66
MPHW	± 0	132.4	40	169.7	51	212.9	69
140/110	+ 5	126.1	43	161.6	55	202.9	72
	+ 10	119.9	47	153.6	58	193.0	75
	+ 15	113.8	51	145.7	61	183.3	77
	+ 20	107.7	54	137.8	65	173.7	80
Power consumption [kW] (1 x 230 V)		max. 0.58		max. 0.58		max. 0.58	
Current cons. [A] (1 x 230 V)		max. 2.7		max. 2.7		max. 2.7	
Air throw of wall mounted unit [m]*		32		31		29	
Air throw of ceiling unit [m]*		7.9		7.8		7.6	
Sound pressure level dB [A]**		56		56		56	
Heat exchanger water capacity [l]							
Heat exchanger connections		R 1"		R 1½"		R 1½"	

* When t_{LA} - t_{Raum} = 10 K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

LH 25 UNIT HEATER
PERFORMANCE TABLE

For low pressure hot water

Type		1				2				3				4			
Speed [rpm]		1350		1000		1350		1000		1350		1000		1350		1000	
Flow rate $\dot{V}_0$ [m³/h]		2100		1700		2000		1600		1800		1450		1700		1350	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
	- 15	10.7	-2	9.5	0	15.1	5	13.2	7	17.9	11	15.5	13	22.1	20	18.7	22
	- 10	9.5	2	8.5	3	13.5	8	11.8	10	16.0	14	13.9	16	19.8	22	16.8	24
	- 5	8.4	6	7.4	7	11.9	11	10.4	13	14.1	17	12.3	18	17.6	23	14.9	25
LPHW	± 0	7.2	10	6.4	11	10.3	15	9.1	16	12.3	19	10.7	21	15.3	25	13.0	27
45/35	+ 5	6.1	13	5.5	14	8.8	18	7.7	19	10.5	22	9.2	23	13.1	27	11.1	29
	+ 10	5.0	17	4.5	18	7.3	21	6.4	22	8.8	24	7.6	25	10.9	29	9.3	30
	+ 15	4.0	21	3.5	21	5.8	24	5.1	24	7.0	27	6.1	28	8.8	30	7.5	31
	+ 20	2.9	24	2.6	25	4.3	27	3.8	27	5.3	29	4.6	30	6.6	32	5.7	33
	- 15	11.9	0	10.5	1	16.7	7	14.6	9	19.7	14	17.1	16	24.4	23	20.5	25
	- 10	10.7	4	9.5	5	15.1	10	13.2	12	17.8	17	15.5	19	22.1	25	18.6	27
	- 5	9.5	8	8.5	9	13.5	14	11.8	15	16.0	19	13.9	21	19.8	27	16.7	29
LPHW	± 0	8.4	11	7.5	12	11.9	17	10.4	18	14.1	22	12.3	24	17.5	29	14.8	31
50/40	+ 5	7.3	15	6.5	16	10.4	20	9.1	21	12.3	25	10.7	26	15.3	31	12.9	32
	+ 10	6.2	19	5.5	19	8.8	23	7.7	24	10.5	27	9.2	28	13.1	32	11.1	34
	+ 15	5.1	22	4.5	23	7.3	26	6.4	27	8.8	29	7.7	31	10.9	34	9.3	35
	+ 20	4.0	26	3.6	26	5.8	29	5.1	30	7.0	32	6.2	33	8.8	36	7.5	37
	- 15	11.7	0	10.4	1	16.8	7	14.7	9	20.1	15	17.5	17	25.0	24	21.2	27
	- 10	10.6	4	9.4	5	15.2	11	13.3	13	18.2	17	15.9	20	22.7	26	19.3	29
	- 5	9.4	7	8.4	9	13.6	14	12.0	16	16.4	20	14.3	22	20.4	28	17.4	30
LPHW	± 0	8.3	11	7.4	12	12.1	17	10.6	19	14.5	23	12.7	25	18.2	30	15.5	32
60/40	+ 5	7.2	15	6.4	16	10.5	20	9.3	22	12.7	25	11.1	27	15.9	32	13.6	34
	+ 10	6.1	18	5.5	19	9.0	23	7.9	24	10.9	28	9.6	29	13.7	33	11.7	35
	+ 15	5.0	22	4.5	23	7.5	26	6.6	27	9.2	30	8.1	31	11.5	35	9.9	37
	+ 20	4.0	26	3.6	26	6.0	29	5.3	30	7.4	32	6.5	34	9.4	37	8.1	38
	- 15	14.1	3	12.6	5	20.1	12	17.6	14	23.8	20	20.7	23	29.5	31	25.0	34
	- 10	13.0	7	11.5	8	18.5	15	16.2	17	21.9	23	19.1	26	27.2	33	23.0	36
	- 5	11.8	10	10.5	12	16.9	18	14.8	20	20.1	26	17.5	28	24.9	35	21.1	38
LPHW	± 0	10.7	14	9.5	16	15.3	21	13.4	23	18.2	28	15.9	31	22.6	37	19.2	40
70/50	+ 5	9.5	18	8.5	19	13.7	25	12.0	26	16.4	31	14.3	33	20.4	39	17.3	42
	+ 10	8.4	22	7.5	23	12.2	28	10.7	29	14.6	34	12.7	36	18.2	41	15.5	43
	+ 15	7.3	25	6.6	26	10.7	31	9.4	32	12.8	36	11.2	38	16.0	43	13.6	45
	+ 20	6.3	29	5.6	30	9.1	34	8.0	35	11.1	38	9.7	40	13.8	44	11.8	46
	- 15	16.6	6	14.7	8	23.3	16	20.4	19	27.5	26	23.8	29	33.9	38	28.6	41
	- 10	15.4	10	13.6	12	21.7	19	18.9	22	25.6	28	22.2	31	31.6	40	26.6	43
	- 5	14.2	14	12.6	15	20.1	23	17.5	25	23.7	31	20.6	34	29.3	42	24.7	45
LPHW	± 0	13.0	17	11.6	19	18.5	26	16.1	28	21.8	34	19.0	37	27.0	45	22.8	47
80/60	+ 5	11.9	21	10.6	23	16.9	29	14.8	31	20.0	37	17.4	39	24.7	47	20.9	49
	+ 10	10.7	25	9.6	26	15.3	32	13.4	34	18.2	39	15.8	42	22.5	48	19.1	51
	+ 15	9.6	29	8.6	30	13.8	35	12.1	37	16.4	42	14.3	44	20.3	50	17.2	53
	+ 20	8.5	32	7.6	33	12.2	38	10.7	40	14.6	44	12.7	46	18.1	52	15.4	54
	- 15	18.9	9	16.8	11	26.5	20	23.1	23	31.1	31	26.9	34	38.1	44	32.1	48
	- 10	17.7	13	15.7	15	24.9	24	21.8	27	29.2	34	25.2	37	35.9	47	30.1	50
	- 5	16.5	17	14.7	19	23.2	27	20.2	30	27.2	37	23.6	40	33.5	49	28.2	53
LPHW	± 0	15.3	20	13.6	22	21.6	30	18.8	33	25.4	40	22.0	43	31.2	51	26.3	55
90/70	+ 5	14.2	24	12.6	26	20.0	34	17.4	36	23.5	42	20.4	45	28.9	54	24.4	57
	+ 10	13.0	28	11.6	30	18.4	37	16.1	39	21.7	45	18.8	48	26.7	56	22.5	59
	+ 15	11.9	32	10.6	33	16.8	40	14.7	42	19.9	48	17.3	50	24.5	58	20.7	60
	+ 20	10.8	35	9.6	37	15.3	43	13.4	45	18.1	50	15.7	53	22.3	60	18.9	63
Power consumption [kW] (3 x 400 V)		max. 0.17		max. 0.10		max. 0.17		max. 0.10		max. 0.17		max. 0.10		max. 0.17		max. 0.10	
Current cons. [A] (3 x 400 V)		max. 0.32		max. 0.16		max. 0.32		max. 0.16		max. 0.32		max. 0.16		max. 0.32		max. 0.16	
Air throw of wall mounted unit [m]*		15.5		12.5		14.5		12		13		10.5		12.5		10	
Air throw of ceiling unit [m]*		5.7		4.7		5.4		4.5		5.0		4.2		4.8		4.0	
Sound pressure level dB [A]**		56		50		56		50		56		50		56		50	
Heat exch. water capacity [l]		0.7				1.0				1.1				1.8			
Heat exchanger connections		R ¾"				R 1"				R 1"				R 1"			

For saturated steam

Type		D			
Speed [rpm]		1350		1000	
Flow rate $\dot{V}_0$ [m³/h]		2100		1700	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C
	- 15	26.3	18	23.2	21
	- 10	25.0	22	22.0	25
	- 5	22.4	30	19.7	33
1.1	± 0	21.1	34	18.6	36
bar	+ 5	19.9	38	17.5	40
	+ 10	18.6	41	16.4	44
	+ 15	18.6	41	16.4	44
	+ 20	17.4	45	15.3	47
	- 15	28.2	21	24.9	24
	- 10	26.9	25	23.7	28
	- 5	25.6	29	22.5	32
1.5	± 0	24.3	33	21.4	35
bar	+ 5	23.0	36	20.3	39
	+ 10	21.8	40	19.2	43
	+ 15	20.5	44	18.1	47
	+ 20	19.3	48	17.0	50
	- 15	30.1	23	26.5	26
	- 10	28.8	27	25.3	30
	- 5	27.5	31	24.2	24
2.0	± 0	26.2	35	23.0	38
bar	+ 5	24.9	39	21.9	42
	+ 10	23.6	43	20.8	46
	+ 15	22.4	47	19.7	49
	+ 20	21.1	50	18.6	53
	- 15	32.9	27	29.0	30
	- 10	31.6	31	27.8	34
	- 5	30.2	35	26.6	38
3.0	± 0	28.9	39	25.5	42
bar	+ 5	27.6	43	24.3	46
	+ 10	26.3	47	23.2	50
	+ 15	25.1	50	22.1	53
	+ 20	23.8	54	21.0	57
	- 15	36.7	31	32.3	35
	- 10	35.3	36	31.1	40
	- 5	34.0	40	29.9	44
5.0	± 0	32.7	44	28.8	48
bar	+ 5	31.4	48	27.6	51
	+ 10	30.1	52	26.5	55
	+ 15	28.8	56	25.3	59
	+ 20	27.5	59	24.2	63
	- 15	41.5	37	36.5	42
	- 10	40.1	42	35.3	46
	- 5	37.4	50	32.9	54
9.0	± 0	36.1	54	31.8	58
bar	+ 5	34.8	58	30.6	62
	+ 10	34.8	58	30.6	62
	+ 15	33.5	62	29.5	66
	+ 20	32.2	66	28.3	70
Power consumption [kW] (3 x 400 V)		max. 0.17		max. 0.10	
Current cons. [A] (3 x 400 V)		max. 0.32		max. 0.16	
Air throw of wall mounted unit [m]*		15.5		12.5	
Air throw of ceiling unit [m]*		5.7		4.7	
Sound pressure level dB [A]**		56		50	
Heat exch. water capacity [l]					
Heat exchanger connections		DN 40 - DN 20			

* When t_{LA} - t_{Raum} = 10 K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

For medium pressure hot water

Type		1				2				3			
Speed [rpm]		1350		1000		1350		1000		1350		1000	
Flow rate $\dot{V}_0$ [m³/h]		2100		1700		2000		1600		1800		1450	
	t_{LE}[°C]	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C
MPHW 110/90	- 15	23.6	15	20.9	18	32.7	28	28.5	32	38.1	41	32.9	45
	- 10	22.3	19	19.8	21	31.0	32	27.0	36	36.1	44	31.2	48
	- 5	21.1	23	18.7	25	29.4	35	25.5	39	34.2	47	29.5	51
	± 0	19.9	27	17.6	29	27.7	39	24.1	42	32.3	50	27.9	54
	+ 5	18.7	30	16.6	33	26.1	42	22.7	46	30.4	53	26.2	57
	+ 10	17.5	34	15.6	37	24.5	46	21.3	49	28.5	56	24.6	59
	+ 15	16.4	38	14.5	40	22.9	49	19.9	52	26.7	59	23.1	62
	+ 20	15.2	42	13.5	44	21.3	52	18.5	55	24.9	62	21.5	65
MPHW 120/100	- 15	25.9	18	22.9	21	35.8	32	31.1	37	41.5	46	35.7	50
	- 10	24.6	22	21.8	25	34.1	36	29.6	40	39.5	49	34.1	53
	- 5	23.4	26	20.7	29	32.4	40	28.1	43	37.5	52	32.4	57
	± 0	22.2	30	19.6	32	30.7	43	26.7	47	35.6	56	30.7	59
	+ 5	21.0	34	18.6	36	29.1	47	25.3	50	33.7	59	29.1	62
	+ 10	19.8	37	17.5	40	27.4	50	23.9	53	31.9	61	27.5	65
	+ 15	18.6	41	16.5	44	25.8	53	22.5	57	30.0	64	25.9	68
	+ 20	17.5	45	15.5	47	24.2	56	21.1	60	28.2	67	24.3	71
MPHW 130/100	- 15	26.1	18	23.2	21	36.4	33	31.7	37	42.4	47	36.6	52
	- 10	24.9	22	22.1	25	34.7	37	30.2	41	40.4	51	34.9	55
	- 5	23.7	26	21.0	29	33.0	40	28.7	44	38.5	54	33.2	58
	± 0	22.4	30	19.9	33	31.3	44	27.3	48	36.5	57	31.6	61
	+ 5	21.2	34	18.8	37	29.7	47	25.8	51	34.6	60	29.9	64
	+ 10	20.1	38	17.8	40	28.0	51	24.4	54	32.8	63	28.3	67
	+ 15	18.9	42	16.8	44	28.0	51	24.4	54	32.8	63	28.3	67
	+ 20	17.7	45	15.7	48	24.9	57	21.7	61	29.1	69	25.2	72
MPHW 140/100	- 15	26.4	18	23.4	22	37.0	34	32.2	38	43.3	49	37.4	53
	- 10	25.2	22	22.3	26	35.3	38	30.8	42	41.3	52	35.7	57
	- 5	24.0	26	21.3	29	33.6	41	29.3	45	39.4	55	34.1	60
	± 0	22.7	30	20.2	33	31.9	45	27.9	49	37.4	58	32.4	63
	+ 5	21.6	34	19.1	37	30.3	48	26.4	52	35.5	61	30.8	66
	+ 10	20.4	38	18.1	41	28.7	52	25.0	55	33.7	64	29.2	68
	+ 15	19.2	42	17.1	45	27.1	55	23.6	59	31.8	67	27.6	71
	+ 20	18.0	46	16.0	48	25.5	58	22.2	62	30.0	70	26.0	74
MPHW 140/110	- 15	28.4	21	25.2	24	39.4	37	34.3	42	45.7	52	39.5	57
	- 10	27.2	25	24.1	28	37.7	41	32.8	45	43.8	56	37.7	60
	- 5	25.9	29	23.0	32	36.0	45	31.3	49	41.8	59	36.1	64
	± 0	24.7	33	21.9	36	34.3	48	29.8	52	39.9	62	34.4	67
	+ 5	23.5	37	20.8	40	32.7	52	28.4	56	38.0	65	32.8	70
	+ 10	22.3	41	19.8	44	31.0	55	27.0	59	36.1	68	31.2	72
	+ 15	21.1	45	18.7	48	29.4	58	25.6	62	34.2	71	29.6	75
	+ 20	19.9	49	17.7	51	27.8	62	24.2	66	32.4	74	28.0	78

Power consumption [kW] (3 x 400 V)	max. 0.17	max. 0.10	max. 0.17	max. 0.10	max. 0.17	max. 0.10
Current cons. [A] (3 x 400 V)	max. 0.32	max. 0.16	max. 0.32	max. 0.16	max. 0.32	max. 0.16
Air throw of wall mounted unit [m]*	15.5	12.5	14.5	12	13	10.5
Air throw of ceiling unit [m]*	5.7	4.7	5.4	4.5	5.0	4.2
Sound pressure level dB [A]**	56	50	56	50	56	50
Heat exch. water capacity [l]	0.7		1.0		1.1	
Heat exchanger connections	R ¾"		R 1"		R 1"	

LH 40 UNIT HEATER
PERFORMANCE TABLE

For low pressure hot water

Type		1				2				3				4			
Speed [rpm]		1350		1000		1350		1000		1350		1000		1350		1000	
Flow rate $\dot{V}_0$ [m³/h]		3500		2500		3400		2400		3100		2200		2800		2000	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
	- 15	20.1	0	16.5	3	24.0	4	19.5	7	31.9	12	25.3	16	36.3	19	28.4	23
	- 10	17.9	4	14.8	6	21.4	7	17.4	10	28.6	15	22.7	18	32.6	21	25.5	24
	- 5	15.8	7	13.1	9	18.9	10	15.4	13	25.3	17	20.2	20	28.9	23	22.7	26
LPHW	± 0	13.7	11	11.3	13	16.4	14	13.4	16	22.1	20	17.6	22	25.3	25	19.9	28
45/35	+ 5	11.7	15	9.7	16	14.0	17	11.4	19	18.9	22	15.1	25	21.7	27	17.1	29
	+ 10	9.6	18	8.0	19	11.6	20	9.5	21	15.8	25	12.7	27	18.2	29	14.4	312
	+ 15	7.7	21	6.4	23	9.2	23	7.5	24	12.7	27	10.2	29	14.7	31	11.6	32
	+ 20	5.7	25	4.8	26	6.9	26	5.7	27	9.7	29	7.8	31	11.2	32	8.9	33
	- 15	22.2	2	18.3	4	26.6	6	21.5	9	35.1	15	27.9	19	39.9	23	31.1	26
	- 10	20.1	5	16.5	8	24.0	9	19.4	12	31.7	18	25.2	21	36.1	25	28.2	28
	- 5	17.9	9	14.8	11	21.4	12	17.4	15	28.5	20	22.7	23	32.5	27	25.4	30
LPHW	± 0	15.8	13	13.1	15	18.9	16	15.4	18	25.2	23	20.1	26	28.8	29	22.6	32
50/40	+ 5	13.8	16	11.4	18	16.5	19	13.4	21	22.1	25	17.6	28	25.2	31	19.8	33
	+ 10	11.7	20	9.7	21	14.0	22	11.4	24	18.9	28	15.1	30	21.7	33	17.0	35
	+ 15	9.7	23	8.0	25	11.6	25	9.5	27	15.8	30	12.7	32	18.2	34	14.3	36
	+ 20	7.7	27	6.4	28	9.3	28	7.6	30	12.8	32	10.2	34	14.7	36	11.6	38
	- 15	22.3	2	18.4	5	26.7	6	21.8	9	36.1	16	28.9	20	41.5	24	32.6	28
	- 10	20.1	6	16.7	8	24.2	9	19.7	12	32.8	19	26.2	22	37.7	26	29.7	30
	- 5	18.0	9	14.9	11	21.6	13	17.7	15	29.5	21	23.7	25	34.0	28	26.8	32
LPHW	± 0	15.9	13	13.2	15	19.2	16	15.7	18	26.3	24	21.1	27	30.4	30	24.0	34
60/40	+ 5	13.9	16	11.6	18	16.7	19	13.7	21	23.1	26	18.6	29	26.7	32	21.2	35
	+ 10	11.9	20	9.9	22	14.3	22	11.8	24	20.0	29	16.1	31	23.2	34	18.4	37
	+ 15	9.9	23	8.3	25	11.9	25	9.8	27	16.8	31	13.6	33	19.6	36	15.6	38
	+ 20	7.9	27	6.6	28	9.6	28	7.9	30	13.7	33	11.1	35	16.1	37	12.9	39
	- 15	26.7	5	22.0	8	31.9	10	25.9	14	42.6	21	33.9	26	48.6	31	38.0	35
	- 10	24.5	9	20.3	12	29.4	13	23.9	17	39.3	24	31.3	28	44.9	33	35.1	37
	- 5	22.4	13	18.5	15	26.8	17	21.8	20	36.0	27	28.7	31	41.2	35	32.3	39
LPHW	± 0	20.3	16	16.8	19	24.3	20	19.8	23	32.7	30	26.1	33	37.5	38	29.4	41
70/50	+ 5	18.2	20	15.1	22	21.8	23	17.8	26	29.5	32	23.6	36	33.9	40	26.6	43
	+ 10	16.1	23	13.4	26	19.3	27	15.8	29	26.3	35	21.1	38	30.3	41	23.9	45
	+ 15	14.1	27	11.7	29	16.9	30	13.8	32	23.2	37	18.6	40	26.7	43	21.1	46
	+ 20	12.1	30	10.1	32	14.5	33	11.9	35	20.1	39	16.2	42	23.2	45	18.4	48
	- 15	31.1	9	25.6	12	37.1	14	30.1	18	49.0	27	38.9	32	55.6	38	43.3	42
	- 10	28.9	12	23.8	16	34.5	17	27.9	21	45.6	30	36.2	35	51.8	40	40.4	45
	- 5	26.7	16	22.0	19	31.9	21	25.9	25	42.3	33	33.6	37	48.1	42	37.5	47
LPHW	± 0	24.5	20	20.2	23	29.3	24	23.8	28	39.0	35	31.0	40	44.4	44	34.7	49
80/60	+ 5	22.4	23	18.5	26	26.8	28	21.8	31	35.8	38	28.5	42	40.8	47	31.9	51
	+ 10	20.3	27	16.8	30	24.3	31	19.8	34	32.6	41	26.0	44	37.2	49	29.1	52
	+ 15	18.3	30	15.1	33	21.9	34	17.8	37	29.4	43	23.5	47	33.6	51	26.4	54
	+ 20	16.2	34	13.4	36	19.4	37	15.9	40	26.3	46	21.0	49	30.1	52	23.7	56
	- 15	35.4	12	29.1	16	42.1	18	34.1	23	55.2	32	43.7	38	62.4	44	48.5	49
	- 10	33.1	16	27.3	19	39.5	21	32.0	26	51.8	35	41.1	40	58.6	47	45.5	52
	- 5	30.9	19	25.5	23	36.9	25	29.9	29	48.5	38	38.4	43	54.8	49	42.7	54
LPHW	± 0	28.8	23	23.7	27	34.3	28	27.8	32	45.2	41	35.8	46	51.1	51	39.8	56
90/70	+ 5	26.6	27	21.9	30	31.8	32	25.7	36	41.9	44	33.3	48	47.5	53	37.0	58
	+ 10	24.5	30	20.2	33	29.2	35	23.7	39	38.7	46	30.7	51	43.9	56	34.2	60
	+ 15	22.4	34	18.5	37	26.8	38	21.7	42	35.5	49	28.2	53	40.3	58	31.5	62
	+ 20	20.3	37	16.8	40	24.3	42	19.7	45	32.4	51	25.8	55	36.8	60	28.8	63
Power consumption [kW] (3 x 400 V)		max. 0.28		max. 0.22		max. 0.28		max. 0.22		max. 0.28		max. 0.22		max. 0.28		max. 0.22	
Current cons. [A] (3 x 400 V)		max. 0.6		max. 0.3		max. 0.6		max. 0.3		max. 0.6		max. 0.3		max. 0.6		max. 0.3	
Air throw of wall mounted unit [m]*		23		16		22.5		15		20		13.5		18		12	
Air throw of ceiling unit [m]*		5.6		4.1		5.5		3.9		5.0		3.6		4.5		3.3	
Sound pressure level dB [A]**		60		54		60		54		60		54		60		54	
Heat exch. water capacity [l]		1.0				1.5				2.0				2.5			
Heat exchanger connections		R ¾"				R 1"				R 1"				R 1"			

For saturated steam

Type		D			
Speed [rpm]		1350		1000	
Flow rate $\dot{V}_0$ [m³/h]		3500		2500	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C
	- 15	43.8	18	35.7	23
	- 10	41.6	22	34.0	27
	- 5	39.4	26	32.2	31
1.1	± 0	37.3	30	30.5	34
bar	+ 5	35.2	34	28.8	38
	+ 10	33.2	38	27.1	42
	+ 15	31.1	41	25.4	45
	+ 20	29.1	45	23.8	49
	- 15	47.0	21	38.4	26
	- 10	44.8	25	36.6	30
	- 5	42.6	29	34.8	33
1.5	± 0	40.6	33	33.1	37
bar	+ 5	38.4	36	31.4	41
	+ 10	36.3	40	29.7	45
	+ 15	34.3	44	28.0	48
	+ 20	32.2	48	26.3	52
	- 15	50.1	23	40.9	28
	- 10	47.9	27	39.1	32
	- 5	45.8	31	37.4	36
2.0	± 0	43.6	35	35.6	40
bar	+ 5	41.5	39	33.9	44
	+ 10	39.4	43	32.2	47
	+ 15	37.3	47	30.5	51
	+ 20	35.3	50	28.8	55
	- 15	54.8	27	44.7	23
	- 10	52.6	31	42.9	36
	- 5	50.4	35	41.1	40
3.0	± 0	48.2	39	39.4	44
bar	+ 5	46.1	43	37.6	48
	+ 10	44.0	47	35.9	52
	+ 15	41.9	50	34.2	55
	+ 20	39.8	54	32.5	59
	- 15	61.2	31	49.9	38
	- 10	58.9	36	48.1	42
	- 5	56.7	40	46.2	46
5.0	± 0	54.5	44	44.5	50
bar	+ 5	52.3	48	42.7	54
	+ 10	50.2	52	40.9	58
	+ 15	48.1	56	39.2	61
	+ 20	46.0	60	37.5	65
	- 15	69.3	38	56.4	45
	- 10	67.0	42	54.6	49
	- 5	64.7	46	52.7	53
9.0	± 0	62.5	50	50.9	57
bar	+ 5	60.3	54	49.1	61
	+ 10	58.1	58	47.3	65
	+ 15	56.0	62	45.6	69
	+ 20	53.8	66	43.9	73
Power consumption [kW] (3 x 400 V)		max. 0.28		max. 0.22	
Current cons. [A] (3 x 400 V)		max. 0.6		max. 0.3	
Air throw of wall mounted unit [m]*		23		16	
Air throw of ceiling unit [m]*		5.6		4.1	
Sound pressure level dB [A]**		60		54	
Heat exch. water capacity [l]					
Heat exchanger connections		DN 40 - DN 20			

* When $t_{LA} - t_{Raum} = 10$ K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

For medium pressure hot water

Type		1				2				3			
Speed [rpm]		1350		1000		1350		1000		1350		1000	
Flow rate $\dot{V}_0$ [m³/h]		3500		2500		3400		2400		3100		2200	
	t_{LE}[°C]	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C	$\dot{Q}_0$ kW	t_{LA} °C
MPHW 110/90	- 15	43.8	18	35.9	23	52.1	26	42.0	31	67.4	43	53.1	49
	- 10	41.5	22	34.1	27	49.4	29	39.8	35	63.9	46	50.4	52
	- 5	39.3	26	32.2	31	46.7	33	37.7	38	60.5	49	47.7	55
	± 0	37.1	30	30.4	34	44.1	36	35.6	42	57.2	52	45.1	58
	+ 5	4.9	33	28.6	38	41.5	40	33.5	45	53.8	55	42.5	60
	+ 10	32.7	37	26.9	41	38.9	43	31.4	48	50.6	57	40.0	63
	+ 15	30.6	41	25.1	45	36.4	47	29.4	51	47.4	60	37.4	65
	+ 20	28.5	44	23.4	48	33.9	50	27.4	54	44.2	63	34.9	68
MPHW 120/100	- 15	48.0	21	39.3	27	56.9	29	45.8	36	73.3	48	57.7	54
	- 10	45.7	25	37.4	30	54.2	33	43.7	39	69.8	51	54.9	58
	- 5	43.4	29	35.6	34	51.5	37	41.5	43	66.4	54	52.3	60
	± 0	41.2	33	33.8	38	48.9	40	39.4	46	63.0	57	49.6	63
	+ 5	39.0	37	31.9	42	46.2	44	37.3	49	59.7	60	47.0	66
	+ 10	36.8	41	30.2	45	43.7	47	35.2	53	56.4	63	44.5	69
	+ 15	34.6	44	28.4	49	41.1	51	33.1	56	53.2	66	41.9	71
	+ 20	32.5	48	26.7	52	38.6	54	31.1	59	50.0	68	39.4	74
MPHW 130/100	- 15	48.7	22	40.0	27	57.9	30	46.7	37	75.1	49	59.2	56
	- 10	46.4	26	38.1	31	55.2	34	44.5	40	71.6	52	56.5	59
	- 5	44.1	30	36.2	35	52.5	38	42.4	44	68.2	56	53.8	62
	± 0	41.9	34	34.4	39	49.8	41	40.2	47	64.8	59	51.2	65
	+ 5	39.7	37	32.6	42	47.2	45	38.1	50	61.5	62	48.6	68
	+ 10	37.5	41	30.8	46	44.6	48	36.1	54	58.2	65	46.0	71
	+ 15	35.3	45	29.1	49	42.1	52	34.0	57	55.0	67	43.5	73
	+ 20	33.2	49	27.3	53	39.5	55	32.0	60	51.8	70	41.0	76
MPHW 140/100	- 15	49.4	22	40.6	28	58.9	31	47.6	38	76.9	51	60.8	58
	- 10	47.1	26	38.8	32	56.1	35	45.4	41	73.5	54	58.1	61
	- 5	44.9	30	36.9	36	53.5	38	43.2	45	70.0	57	55.4	64
	± 0	42.6	34	35.1	39	50.8	42	41.1	48	66.7	60	52.8	67
	+ 5	40.4	38	33.3	43	48.2	45	39.0	51	63.3	63	50.2	70
	+ 10	38.3	42	31.5	47	45.6	49	36.9	55	60.0	66	47.6	73
	+ 15	36.1	46	29.8	50	43.0	52	34.9	58	56.8	69	45.0	76
	+ 20	34.0	49	28.0	54	40.5	56	32.9	61	53.6	72	42.5	78
MPHW 140/110	- 15	52.8	25	43.3	31	62.7	34	50.5	41	81.0	54	63.7	62
	- 10	50.5	29	41.4	35	60.0	38	48.3	44	77.5	58	61.0	65
	- 5	48.2	33	39.6	39	57.3	41	46.2	48	74.0	61	58.3	68
	± 0	46.0	37	37.7	42	54.6	45	44.0	51	70.6	64	55.7	71
	+ 5	43.7	41	35.9	46	52.0	49	41.9	55	67.3	67	53.1	74
	+ 10	41.5	45	34.1	50	49.4	52	39.8	58	64.0	70	50.5	77
	+ 15	39.4	48	32.3	53	46.8	56	37.8	62	60.7	73	47.9	79
	+ 20	37.2	52	30.6	57	44.2	59	35.7	65	57.5	76	45.4	82

Power consumption [kW] (3 x 400 V)	max. 0.28	max. 0.22	max. 0.28	max. 0.22	max. 0.28	max. 0.22
Current cons. [A] (3 x 400 V)	max. 0.6	max. 0.3	max. 0.6	max. 0.3	max. 0.6	max. 0.3
Air throw of wall mounted unit [m]*	23	16	22.5	15	20	13.5
Air throw of ceiling unit [m]*	5.6	4.1	5.5	3.9	5.0	3.6
Sound pressure level dB [A]**	60	54	60	54	60	54
Heat exch. water capacity [l]	1.0		1.5		2.0	
Heat exchanger connections	R ¾"		R 1"		R 1"	

LH 63 UNIT HEATER
PERFORMANCE TABLE

For low pressure hot water

Type		1				2				3				4			
Speed [rpm]		900		700		900		700		900		700		900		700	
Flow rate $\dot{V}_0$ [m³/h]		5300		400		5200		3900		4600		3500		4400		3400	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
	- 15	33.6	2	28.6	4	43.6	7	36.5	10	50.7	14	42.1	17	61.3	22	50.5	24
	- 10	30.2	5	25.6	7	39.1	10	32.7	13	45.5	17	37.8	19	55.1	24	45.4	26
	- 5	26.7	9	22.7	11	34.6	13	29.0	15	40.4	19	33.6	21	49.0	26	40.4	28
LPHW	± 0	23.3	12	19.8	14	30.2	16	25.3	18	35.3	22	29.4	24	42.9	27	35.5	29
45/35	+ 5	20.0	16	17.0	17	25.8	19	21.7	21	30.3	24	25.3	26	37.0	29	30.6	31
	+ 10	16.7	19	14.2	20	21.5	22	18.1	23	25.4	26	21.2	28	31.1	31	25.8	32
	+ 15	13.4	22	11.5	23	17.3	25	14.6	26	20.5	28	17.2	30	25.3	32	21.0	33
	+ 20	10.2	26	8.7	27	13.1	28	11.1	29	15.7	30	13.2	31	19.5	33	16.3	34
	- 15	37.1	4	31.5	6	48.1	10	40.2	12	55.7	17	46.2	20	67.1	25	55.2	28
	- 10	33.6	7	28.5	9	43.5	13	36.4	15	50.5	20	41.9	22	60.9	27	50.1	30
	- 5	30.1	11	25.6	13	39.0	16	32.6	18	45.3	22	37.6	25	54.8	29	45.1	32
LPHW	± 0	26.7	14	22.7	16	34.6	19	28.9	21	40.2	25	33.5	27	48.7	31	40.1	33
50/40	+ 5	23.3	18	19.8	19	30.2	22	25.3	24	35.2	27	29.3	29	42.8	33	35.3	35
	+ 10	20.0	21	17.0	22	25.9	24	21.7	26	30.3	29	25.2	31	36.9	34	30.5	36
	+ 15	16.7	24	14.2	26	21.6	27	18.1	29	25.4	31	21.2	33	31.0	36	25.7	37
	+ 20	13.5	28	11.5	29	17.4	30	14.6	31	20.6	33	17.2	35	25.3	37	21.0	39
	- 15	38.0	4	32.4	6	49.3	10	41.3	13	57.8	18	48.2	22	70.5	27	58.3	30
	- 10	34.6	8	29.4	10	44.7	13	37.5	16	52.6	21	43.9	24	64.2	29	53.2	32
	- 5	31.1	11	26.5	13	40.2	16	33.8	19	47.4	23	39.6	26	58.1	31	48.1	34
LPHW	± 0	27.7	15	23.6	17	35.8	19	30.1	22	42.3	26	35.4	28	52.0	33	43.2	36
60/40	+ 5	24.3	18	20.8	20	31.4	22	26.5	24	37.3	28	31.2	31	46.0	35	38.2	37
	+ 10	21.0	22	18.0	23	27.1	25	22.8	27	32.3	30	27.1	33	40.0	36	33.3	39
	+ 15	17.7	25	15.2	26	22.8	28	19.3	30	27.4	33	23.0	34	34.1	38	28.5	40
	+ 20	14.4	28	12.4	29	18.5	31	15.7	32	22.5	35	19.0	36	28.1	39	23.6	41
	- 15	45.0	8	38.3	10	58.3	15	48.8	18	67.9	24	56.5	28	82.2	35	67.7	38
	- 10	41.5	11	35.3	14	53.7	18	45.0	21	62.6	27	52.1	30	75.9	37	62.6	40
	- 5	38.0	15	32.3	17	49.2	21	41.2	24	57.5	29	47.8	33	69.7	39	57.6	42
LPHW	± 0	34.6	18	29.4	21	44.7	24	37.5	27	52.3	32	43.6	35	63.7	41	52.6	43
70/50	+ 5	31.2	22	26.5	24	40.3	27	33.8	30	47.3	34	39.4	37	57.6	42	47.7	45
	+ 10	27.8	25	23.7	27	35.9	30	30.2	32	42.3	37	35.3	39	51.7	44	42.8	47
	+ 15	24.5	29	20.9	30	31.6	33	26.6	35	37.3	39	31.2	41	45.8	46	38.0	48
	+ 20	21.2	32	18.1	34	27.3	36	23.0	38	32.4	41	27.2	43	39.9	47	33.2	49
	- 15	51.9	11	44.1	14	67.3	19	56.2	23	77.8	30	64.5	34	93.5	41	76.9	45
	- 10	48.4	15	41.0	18	62.6	23	52.3	26	72.5	33	60.2	36	87.2	44	71.7	47
	- 5	44.8	18	38.1	21	58.0	26	48.5	29	67.3	35	55.9	39	81.1	46	66.7	49
LPHW	± 0	41.4	22	35.1	25	53.5	29	44.7	32	62.1	38	51.6	41	74.9	48	61.7	51
80/60	+ 5	37.9	25	32.2	28	49.0	32	41.0	35	57.0	40	47.4	44	68.9	50	56.8	53
	+ 10	34.5	29	29.3	31	44.6	35	37.4	38	52.0	43	43.3	46	63.0	52	52.0	54
	+ 15	31.2	32	26.5	35	40.2	38	33.7	41	47.0	45	39.2	48	57.1	53	47.1	56
	+ 20	27.8	36	23.7	38	35.9	41	30.1	43	42.1	48	35.1	50	51.3	55	42.4	58
	- 15	58.8	14	49.8	18	76.0	24	63.4	28	87.5	35	72.4	40	104.5	48	85.7	52
	- 10	55.1	18	46.7	22	71.3	27	59.5	31	82.2	38	68.0	43	98.2	50	80.6	54
	- 5	51.6	22	43.7	25	66.7	30	55.6	34	76.9	41	63.7	45	92.0	53	75.5	56
LPHW	± 0	48.1	25	40.8	29	62.1	34	51.9	37	71.7	44	59.4	48	86.1	55	70.6	58
90/70	+ 5	44.6	29	37.8	32	57.6	37	48.1	40	66.6	46	55.2	50	79.9	57	65.6	60
	+ 10	41.2	33	34.9	35	53.2	40	44.4	43	61.5	49	51.0	52	73.9	59	60.8	62
	+ 15	37.8	36	32.1	39	48.8	43	40.8	46	56.5	51	46.9	55	68.0	61	56.0	64
	+ 20	34.4	40	29.2	42	44.4	46	37.2	49	51.6	54	42.9	57	62.2	63	51.2	65
Power consumption [kW] (3 x 400 V)		max. 0.34		max. 0.25		max. 0.34		max. 0.25		max. 0.34		max. 0.25		max. 0.34		max. 0.25	
Current cons. [A] (3 x 400 V)		max. 0.79		max. 0.35		max. 0.79		max. 0.35		max. 0.79		max. 0.35		max. 0.79		max. 0.35	
Air throw of wall mounted unit [m]*		26		18		24		17		21		15		20		14	
Air throw of ceiling unit [m]*		7.1		5.3		6.9		5.1		6.1		4.5		5.8		4.4	
Sound pressure level dB [A]**		59		53		59		53		59		53		59		53	
Heat exch. water capacity [l]		2.5				3.5				3.5				5.5			
Heat exchanger connections		R 1"				R 1¼"				R 1¼"				R 1¼"			

For saturated steam

	D			
	900		700	
	5300		4000	
	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
t_{LE}[°C]	kW	°C	kW	°C
- 15	72.4	21	61.0	25
- 10	68.8	25	58.0	29
- 5	65.3	29	55.0	33
± 0	61.8	33	52.1	37
+ 5	58.4	37	49.2	40
+ 10	55.0	40	46.4	44
+ 15	51.7	44	43.5	47
+ 20	48.3	47	40.7	51
- 15	77.7	24	65.5	28
- 10	74.2	28	62.5	32
- 5	70.6	32	59.5	36
± 0	67.1	36	56.5	40
+ 5	63.7	39	53.6	43
+ 10	60.2	43	50.8	47
+ 15	56.9	47	47.9	50
+ 20	53.5	50	45.1	54
- 15	82.9	27	69.9	31
- 10	79.3	31	66.8	35
- 5	75.8	34	63.8	39
± 0	72.2	38	60.8	43
+ 5	68.8	42	57.9	46
+ 10	65.3	46	55.0	50
+ 15	61.9	50	52.2	54
+ 20	58.6	53	49.4	57
- 15	90.7	30	76.3	36
- 10	87.0	34	73.3	40
- 5	83.4	38	70.2	43
± 0	79.9	42	67.3	47
+ 5	76.4	46	64.3	51
+ 10	72.9	50	61.4	55
+ 15	69.5	54	58.5	58
+ 20	66.1	58	55.7	62
- 15	101.3	36	85.2	42
- 10	97.6	40	82.1	46
- 5	93.9	44	79.0	49
± 0	90.3	48	76.0	53
+ 5	86.8	52	73.0	57
+ 10	83.3	56	70.0	61
+ 15	79.8	60	67.1	65
+ 20	76.4	63	64.3	68
- 15	114.6	42	96.3	49
- 10	110.9	47	93.2	53
- 5	107.2	51	90.1	57
± 0	103.5	55	87.0	61
+ 5	99.9	59	84.0	65
+ 10	96.4	63	81.0	69
+ 15	92.9	67	78.0	73
+ 20	89.4	71	75.1	77
	max. 0.34		max. 0.25	
	max. 0.79		max. 0.35	
	26		18	
	7.1		5.3	
	59		53	
	DN 50 - DN 25			

1.1 bar | **1.5 bar** | **2.0 bar** | **3.0 bar** | **5.0 bar** | **9.0 bar**

* When $t_{LA} - t_{Raum} = 10$ K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

For medium pressure hot water

Type		1				2				3			
Speed [rpm]		900		700		900		700		900		700	
Flow rate $\dot{V}_0$ [m³/h]		5300		400		5200		3900		4600		3500	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
	- 15	72.2	21	61.0	25	93.2	33	77.5	38	106.3	46	87.7	51
	- 10	68.5	25	57.9	29	88.4	36	73.5	41	100.9	49	83.2	54
	- 5	64.8	29	54.8	33	83.7	39	69.6	44	95.6	52	78.9	57
MPHW	± 0	61.3	32	51.8	36	79.1	43	65.8	47	90.3	55	74.5	60
110/90	+ 5	57.7	36	48.8	40	74.5	46	62.0	50	85.1	58	70.3	62
	+ 10	54.2	40	45.9	43	69.9	49	58.2	53	80.0	61	66.1	65
	+ 15	50.8	43	43.0	47	65.5	52	54.5	56	75.0	63	61.9	67
	+ 20	47.3	47	40.1	50	61.0	55	50.8	59	70.0	66	57.8	70
	- 15	78.8	24	66.5	29	101.6	37	84.4	42	115.5	52	95.1	57
	- 10	75.1	28	63.4	33	96.8	40	80.4	46	110.0	55	90.6	60
	- 5	71.4	32	60.3	37	92.0	44	76.4	49	104.7	58	86.2	63
MPHW	± 0	67.8	36	57.3	40	87.4	47	72.6	52	99.4	61	81.9	66
120/100	+ 5	64.2	40	54.3	44	82.7	50	68.7	55	94.2	63	77.6	68
	+ 10	60.7	43	51.3	47	78.2	54	65.0	58	89.0	66	73.4	71
	+ 15	57.2	47	48.4	51	73.7	57	61.2	61	84.0	69	69.2	74
	+ 20	53.7	51	45.5	54	69.2	60	57.5	64	78.9	72	65.1	76
	- 15	80.5	25	68.1	30	103.9	38	86.4	44	118.6	53	97.9	59
	- 10	76.8	29	65.0	34	99.1	41	82.4	47	113.2	57	93.4	62
	- 5	73.2	33	61.9	38	94.3	45	78.5	50	107.8	60	89.0	65
MPHW	± 0	69.5	37	58.9	41	89.6	48	74.6	54	102.6	63	84.7	68
130/100	+ 5	66.0	41	55.8	45	85.0	52	70.8	57	97.4	65	80.4	71
	+ 10	62.4	44	52.9	48	80.5	55	67.0	60	92.2	68	76.2	73
	+ 15	58.9	48	49.9	52	75.9	58	63.3	63	87.1	71	72.0	76
	+ 20	55.5	52	47.0	55	71.5	61	59.6	66	82.1	74	67.9	78
	- 15	82.3	26	69.7	31	106.5	39	88.5	45	121.8	55	100.7	61
	- 10	78.6	30	66.6	35	101.4	43	84.5	49	116.4	58	96.2	64
	- 5	74.9	34	63.5	39	96.6	46	80.5	52	111.0	61	91.8	67
MPHW	± 0	71.3	38	60.4	42	92.0	50	76.7	55	105.7	64	87.5	70
140/100	+ 5	67.7	42	57.4	46	87.3	53	72.8	58	100.5	67	83.2	73
	+ 10	64.2	45	54.4	50	82.7	56	69.0	61	95.3	70	78.9	76
	+ 15	60.7	49	51.5	53	78.2	59	65.3	65	90.2	73	74.7	78
	+ 20	57.2	52	48.6	57	73.8	63	61.6	68	85.2	76	70.6	81
	- 15	87.1	29	73.6	34	112.3	42	93.2	48	127.7	59	105.2	65
	- 10	83.4	33	70.5	38	107.4	46	89.2	52	122.2	62	100.7	68
	- 5	79.7	36	67.4	41	102.6	49	85.3	55	116.9	65	96.3	71
MPHW	± 0	76.0	40	64.3	45	97.9	53	81.4	59	111.5	68	92.0	74
140/110	+ 5	72.4	44	61.3	49	93.3	56	77.5	62	106.3	71	87.7	77
	+ 10	68.9	48	58.3	52	88.7	60	73.7	65	101.1	74	83.4	79
	+ 15	65.4	51	55.3	56	84.1	63	70.0	68	96.0	77	79.2	82
	+ 20	61.9	55	52.4	59	79.6	66	66.2	71	91.0	80	75.1	85

Power consumption [kW] (3 x 400 V)	max. 0.34	max. 0.25	max. 0.34	max. 0.25	max. 0.34	max. 0.25
Current cons. [A] (3 x 400 V)	max. 0.79	max. 0.35	max. 0.79	max. 0.35	max. 0.79	max. 0.35
Air throw of wall mounted unit [m]*	26	18	24	17	21	15
Air throw of ceiling unit [m]*	7.1	5.3	6.9	5.1	6.1	4.5
Sound pressure level dB [A]**	59	53	59	53	59	53
Heat exch. water capacity [l]	2.5		3.5		3.5	
Heat exchanger connections	R 1"		R 1¼"		R 1¼"	

LH 100 UNIT HEATER
PERFORMANCE TABLE

For low pressure hot water

Type		1				2				3				4			
Speed [rpm]		900		700		900		700		900		700		900		700	
Flow rate $\dot{V}_0$ [m³/h]		9000		6700		8800		6500		8300		6000		7700		5600	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
	- 15	57.1	2	48.1	4	72.8	7	60.4	10	93.9	15	75.1	18	107.5	22	84.5	25
	- 10	51.2	5	43.1	7	65.2	10	54.1	12	84.3	17	67.5	20	96.8	24	76.1	27
	- 5	45.3	9	38.2	11	57.7	13	47.9	15	74.8	20	60.0	23	86.1	26	67.9	28
LPHW	± 0	39.6	12	33.4	14	50.3	16	41.8	18	65.5	22	52.5	25	75.7	28	59.7	30
45/35	+ 5	33.9	16	28.6	17	43.0	19	35.7	21	56.3	24	45.2	27	65.4	29	51.7	31
	+ 10	28.3	19	23.9	20	35.7	22	29.8	23	47.2	27	38.0	28	55.1	31	43.7	33
	+ 15	22.8	22	19.3	24	28.6	25	23.9	26	38.2	29	30.9	30	45.0	32	35.8	34
	+ 20	17.3	26	14.7	27	21.6	27	18.1	28	29.3	31	23.8	32	35.0	34	27.9	35
	- 15	62.9	4	53.0	6	80.4	9	66.5	12	103.1	18	82.3	21	117.5	25	92.2	29
	- 10	57.0	7	48.0	9	72.7	12	60.2	15	93.4	20	74.7	24	106.7	27	83.8	30
	- 5	51.1	11	43.0	13	65.1	15	54.0	18	83.9	23	67.1	26	96.1	29	75.5	32
LPHW	± 0	45.3	14	38.2	16	57.7	18	47.8	21	74.6	25	59.7	28	85.6	31	67.4	34
50/40	+ 5	39.6	18	33.4	19	50.3	21	41.8	23	65.3	27	52.3	30	75.2	33	59.3	35
	+ 10	33.9	21	28.7	22	43.0	24	35.8	26	56.2	30	45.1	32	65.0	35	51.3	37
	+ 15	28.4	24	24.0	26	35.9	27	29.9	29	47.2	32	37.9	34	54.9	36	43.5	38
	+ 20	22.9	28	19.4	29	28.8	30	24.0	31	38.2	34	30.9	35	44.9	38	35.7	39
	- 15	64.6	4	54.5	7	81.9	10	68.2	13	107.3	19	86.2	23	124.4	28	98.3	32
	- 10	58.6	8	49.5	10	74.3	13	61.9	16	97.6	22	78.5	25	113.6	30	89.8	33
	- 5	52.8	11	44.6	13	66.8	16	55.7	19	88.1	24	70.9	28	102.9	32	81.5	35
LPHW	± 0	47.0	15	39.8	17	59.3	19	49.5	21	78.7	27	63.5	30	92.3	34	73.2	37
60/40	+ 5	41.3	18	35.0	20	52.0	22	43.5	24	69.4	29	56.1	32	81.9	35	65.1	38
	+ 10	35.6	22	30.2	23	44.7	25	37.5	27	60.2	31	48.7	34	71.5	37	57.0	40
	+ 15	30.1	25	25.5	26	37.5	28	31.5	29	51.1	33	41.5	35	61.2	39	48.9	41
	+ 20	24.5	28	20.9	29	30.4	30	25.6	32	42.0	35	34.2	37	50.9	40	40.8	42
	- 15	76.5	8	64.4	10	97.3	14	80.7	18	125.9	25	100.8	30	144.5	35	113.7	39
	- 10	70.5	11	59.4	14	89.5	18	74.3	21	116.2	28	93.0	32	133.6	37	105.2	41
	- 5	64.5	15	54.4	17	81.9	21	68.1	24	106.6	30	85.4	34	122.9	39	96.9	43
LPHW	± 0	58.7	18	49.5	21	74.4	24	61.9	27	97.1	33	77.9	36	112.3	41	88.6	44
70/50	+ 5	52.9	22	44.7	24	67.0	27	55.7	30	87.8	35	70.5	39	101.9	43	80.5	46
	+ 10	47.2	25	39.9	27	59.6	30	49.7	32	78.5	38	63.2	41	91.5	45	72.4	48
	+ 15	41.5	29	35.2	31	52.4	33	43.7	35	69.4	40	55.9	43	81.3	46	64.5	49
	+ 20	35.9	32	30.5	34	45.2	35	37.8	37	60.3	42	48.7	44	71.1	48	56.6	50
	- 15	88.2	11	74.2	14	112.3	19	93.0	23	144.0	31	114.9	36	164.0	41	128.6	46
	- 10	82.1	15	69.1	18	104.5	22	86.6	26	134.3	34	107.2	38	153.0	44	120.1	48
	- 5	76.1	18	64.1	21	96.8	25	80.2	29	124.6	36	99.6	41	142.3	46	111.8	50
LPHW	± 0	70.2	22	59.1	25	89.2	28	74.0	32	115.1	39	92.0	43	131.7	48	103.5	52
80/60	+ 5	64.4	25	54.2	28	81.7	32	67.8	35	105.7	41	84.6	45	121.3	50	95.4	54
	+ 10	58.6	29	49.4	31	74.3	35	61.7	38	96.4	44	77.2	47	110.9	52	87.4	55
	+ 15	52.9	32	44.6	35	67.0	38	55.7	40	87.2	46	70.0	49	100.7	54	79.4	57
	+ 20	47.2	36	39.9	38	59.7	40	49.7	43	78.2	48	62.8	51	90.6	55	71.6	58
	- 15	99.7	14	83.8	18	127.1	23	105.0	28	161.8	37	128.8	42	182.9	48	143.0	53
	- 10	93.6	18	78.7	22	119.3	27	98.6	31	152.0	39	121.0	45	172.0	50	134.5	55
	- 5	87.6	22	73.6	25	111.5	30	92.2	34	142.2	42	113.3	47	161.2	53	126.2	57
LPHW	± 0	81.6	25	68.6	29	103.8	33	85.8	37	132.7	45	105.8	49	150.6	55	118.0	59
90/70	+ 5	75.7	29	63.7	32	96.2	36	79.6	40	123.2	47	98.3	52	140.1	57	109.8	61
	+ 10	69.8	33	58.3	36	88.7	39	73.5	43	113.9	50	90.9	54	129.7	59	101.8	63
	+ 15	64.1	36	54.0	39	81.3	42	67.4	46	104.7	52	83.6	56	119.5	61	93.9	65
	+ 20	58.4	40	49.2	42	74.0	45	61.4	48	95.6	55	76.4	58	109.4	63	86.0	66
Power consumption [kW] (3 x 400 V)		max. 0.75		max. 0.50		max. 0.75		max. 0.50		max. 0.75		max. 0.50		max. 0.75		max. 0.50	
Current cons. [A] (3 x 400 V)		max. 1.6		max. 0.85		max. 1.6		max. 0.85		max. 1.6		max. 0.85		max. 1.6		max. 0.85	
Air throw of wall mounted unit [m]*		30		23		30		22		28		20		26		20	
Air throw of ceiling unit [m]*		7.7		5.6		7.6		5.5		7.1		5.0		6.6		4.6	
Sound pressure level dB [A]**		64		58		64		58		64		58		64		58	
Heat exch. water capacity [l]		3.5				5.5				7.5				9.5			
Heat exchanger connections		R 1"				R 1½"				R 1½"				R 1½"			

For saturated steam

Type		D			
Speed [rpm]		900		700	
Flow rate $\dot{V}_0$ [m³/h]		9000		6700	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C
	- 15	121.8	21	101.8	25
	- 10	115.8	25	96.8	29
	- 5	109.9	29	91.9	33
1.1	± 0	104.1	33	87.0	36
bar	+ 5	98.4	36	82.2	40
	+ 10	92.7	40	77.5	44
	+ 15	87.1	44	72.8	47
	+ 20	81.5	47	68.1	51
	- 15	130.8	24	109.3	28
	- 10	124.8	28	104.3	32
	- 5	118.9	31	99.3	36
1.5	± 0	113.0	35	94.4	40
bar	+ 5	107.2	39	89.6	43
	+ 10	101.5	43	84.8	47
	+ 15	95.9	47	80.1	50
	+ 20	90.3	50	75.4	54
	- 15	139.6	26	116.6	31
	- 10	133.6	30	111.6	35
	- 5	127.6	34	106.6	39
2.0	± 0	121.7	38	101.6	43
bar	+ 5	115.8	42	96.8	46
	+ 10	110.1	46	92.0	50
	+ 15	104.4	49	87.2	54
	+ 20	98.8	53	82.5	57
	- 15	152.7	30	127.5	35
	- 10	146.6	34	122.4	39
	- 5	140.5	38	117.3	43
3.0	± 0	134.6	42	112.4	47
bar	+ 5	128.7	46	107.5	51
	+ 10	122.9	50	102.6	55
	+ 15	117.2	54	97.8	58
	+ 20	111.5	57	93.1	62
	- 15	170.5	35	142.3	41
	- 10	164.3	39	137.1	45
	- 5	158.2	43	132.0	49
5.0	± 0	152.2	47	127.0	53
bar	+ 5	146.2	51	122.0	57
	+ 10	140.4	55	117.1	61
	+ 15	134.6	59	112.3	65
	+ 20	128.8	63	107.5	68
	- 15	193.1	42	161.0	49
	- 10	186.8	46	155.7	53
	- 5	180.6	50	150.6	57
9.0	± 0	174.5	54	145.5	61
bar	+ 5	168.5	59	140.4	65
	+ 10	162.5	63	135.4	69
	+ 15	156.6	67	130.5	73
	+ 20	150.8	70	125.7	76
Power consumption [kW] (3 x 400 V)		max. 0.75		max. 0.50	
Current cons. [A] (3 x 400 V)		max. 1.6		max. 0.55	
Air throw of wall mounted unit [m]*		30		23	
Air throw of ceiling unit [m]*		7.7		5.6	
Sound pressure level dB [A]**		64		58	
Heat exch. water capacity [l]					
Heat exchanger connections		DN 65 - DN 32			

* When $t_{LA} - t_{Raum} = 10$ K

** Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m³

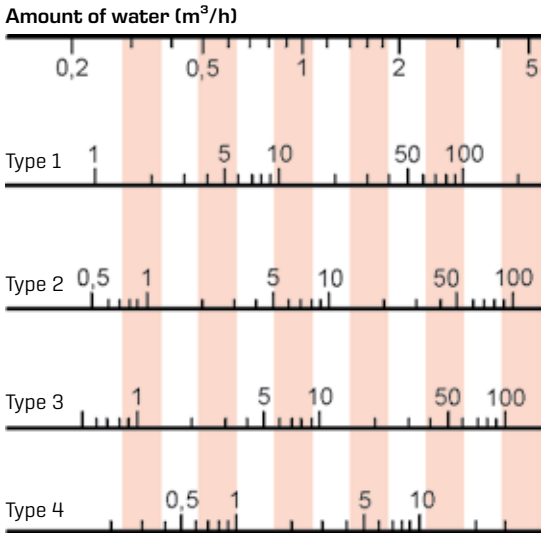
For medium pressure hot water

Type		1				2				3			
Speed [rpm]		900		700		900		700		900		700	
Flow rate $\dot{V}_0$ [m³/h]		9000		6700		8800		6500		8300		6000	
		$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}	$\dot{Q}_0$	t_{LA}
	t_{LE}[°C]	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
MPHW 110/90	- 15	122.5	21	102.7	26	156.1	32	128.5	37	196.3	48	155.6	54
	- 10	116.3	25	97.5	29	148.1	35	122.0	41	186.3	51	147.7	57
	- 5	110.1	29	92.3	33	140.1	39	115.5	44	176.5	54	140.0	59
	± 0	104.0	32	87.2	37	132.3	42	109.1	47	166.8	56	132.4	62
	+ 5	98.0	36	82.2	40	124.6	45	102.7	50	157.3	59	124.8	54
	+ 10	92.0	40	77.2	44	117.0	49	96.5	53	147.8	62	117.4	67
	+ 15	86.2	43	72.3	47	109.5	52	90.3	56	138.5	64	110.1	69
	+ 20	80.4	47	67.5	50	102.1	55	84.2	59	129.3	67	102.8	72
MPHW 120/100	- 15	133.7	24	112.0	29	170.3	36	140.1	42	213.1	53	168.6	59
	- 10	127.4	28	106.8	33	162.2	40	133.4	45	203.1	56	160.7	62
	- 5	121.2	32	101.6	37	154.2	43	126.9	49	193.2	59	152.9	65
	± 0	115.1	36	96.4	40	146.3	47	120.4	52	183.5	62	145.3	68
	+ 5	109.0	40	91.4	44	138.6	50	114.1	55	173.8	65	137.7	71
	+ 10	103.0	43	86.4	47	130.9	53	107.8	58	164.4	68	130.2	73
	+ 15	97.1	47	81.4	51	123.3	56	101.6	61	155.0	70	122.9	76
	+ 20	91.2	50	76.5	54	115.8	60	95.4	64	145.8	73	115.6	78
MPHW 130/100	- 15	136.7	25	114.7	30	173.9	37	143.3	43	219.2	55	173.8	62
	- 10	130.4	29	109.4	34	165.8	41	136.6	47	209.1	58	165.9	65
	- 5	124.2	33	104.2	38	157.8	44	130.1	50	199.3	61	158.1	68
	± 0	118.0	37	99.1	41	149.9	48	123.7	53	189.6	64	150.5	70
	+ 5	112.0	41	94.0	45	142.2	51	117.3	57	180.0	67	142.9	73
	+ 10	106.0	44	89.0	49	134.5	54	111.0	60	170.4	70	135.4	76
	+ 15	100.0	48	84.0	52	126.9	58	104.8	63	161.0	72	128.0	78
	+ 20	94.2	51	79.1	56	119.4	61	98.6	66	151.8	75	120.7	81
MPHW 140/100	- 15	139.8	26	117.4	31	177.6	38	146.6	45	225.2	57	178.9	64
	- 10	133.5	30	112.1	35	169.5	42	139.9	48	215.3	60	171.0	67
	- 5	127.2	34	106.9	39	161.5	46	133.4	52	205.3	63	163.3	70
	± 0	121.1	38	101.7	43	153.6	49	126.9	55	195.5	66	155.6	73
	+ 5	115.0	41	96.7	46	145.8	52	120.5	58	185.9	69	148.0	75
	+ 10	109.0	45	91.6	50	138.1	56	114.2	61	176.4	72	140.5	78
	+ 15	103.0	49	86.7	53	130.5	59	108.0	64	167.0	75	133.1	81
	+ 20	97.2	52	81.8	57	123.0	62	101.8	67	157.7	77	125.7	83
MPHW 140/110	- 15	147.9	29	124.0	34	188.0	42	154.7	48	235.9	60	186.6	67
	- 10	141.5	33	118.6	38	179.8	45	148.0	52	225.7	63	178.7	70
	- 5	135.3	36	113.4	42	171.8	49	141.4	55	215.8	67	170.9	73
	± 0	129.1	40	108.2	45	163.9	52	134.9	58	206.0	70	163.2	76
	+ 5	123.0	44	103.1	49	156.1	56	128.5	61	196.3	73	155.6	79
	+ 10	116.9	48	98.1	53	148.3	59	122.2	65	186.8	75	148.1	82
	+ 15	110.9	51	93.1	56	140.7	62	116.0	68	177.4	78	140.7	84
	+ 20	105.0	55	88.1	60	133.2	66	109.8	71	168.1	81	133.4	87

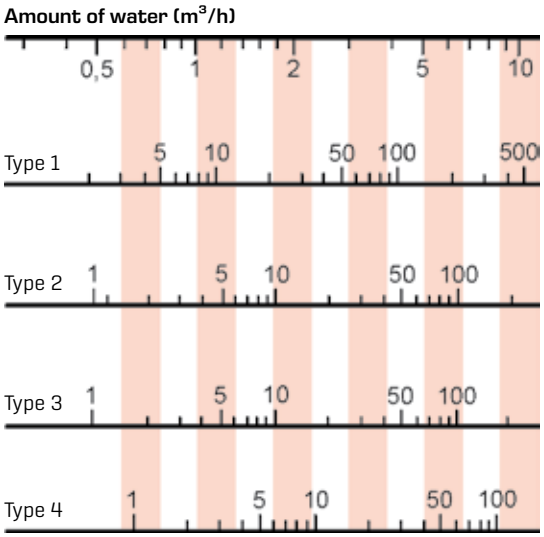
Power consumption [kW] [3 x 400 V]	max. 0.75	max. 0.50	max. 0.75	max. 0.50	max. 0.75	max. 0.50
Current cons. [A] [3 x 400 V]	max. 1.6	max. 0.55	max. 1.6	max. 0.55	max. 1.6	max. 0.5
Air throw of wall mounted unit [m]*	30	23	30	22	28	20
Air throw of ceiling unit [m]*	7.7	5.6	7.6	5.6	7.1	5.0
Sound pressure level dB [A]**	64	58	64	58	64	58
Heat exch. water capacity [l]	3.5		5.5		7.5	
Heat exchanger connections	R 1"		R 1½"		R 1½"	

LH-EC / LH UNIT HEATER
WATER PRESSURE DROPS

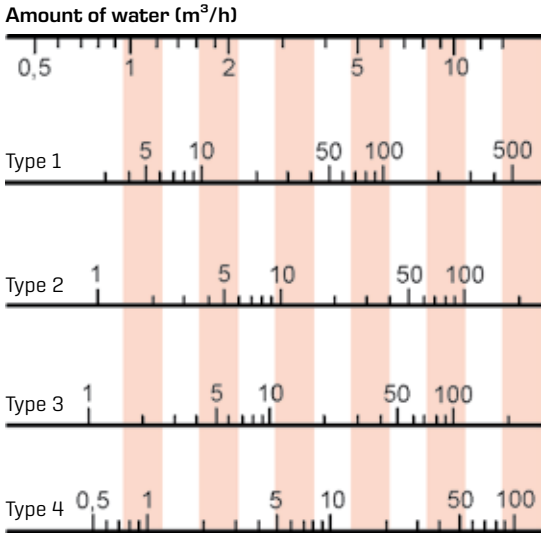
WATER PRESSURE DROP [kPa] LH-EC / LH 25



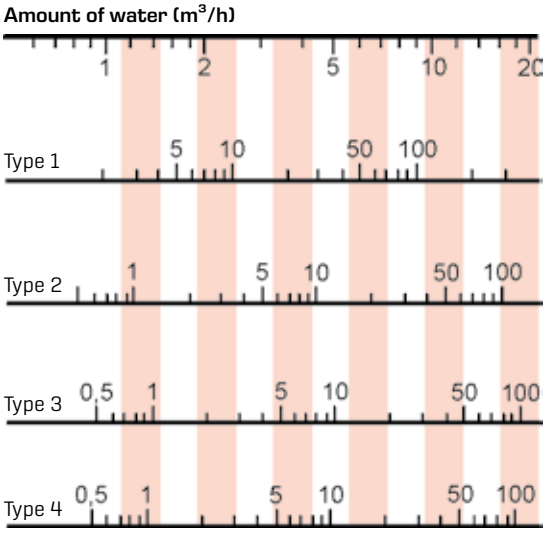
WATER PRESSURE DROP [kPa] LH-EC / LH 40

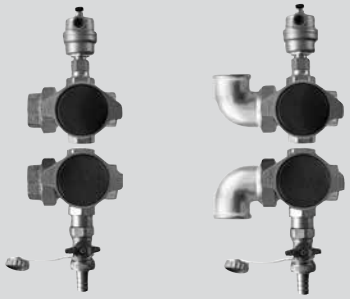


WATER PRESSURE DROP [kPa] LH-EC / LH 63



WATER PRESSURE DROP [kPa] LH-EC / LH 100





SHUT-OFF SETS FOR HEAT EXCHANGERS

Shut-off set as straight-through version or right angle version for heat exchanger flow and return for LH-EC / LH 25 type 2/3/4, LH-EC / LH 40: type 2/3/4, LH-EC / LH 63: type 1, LH-EC / LH 100: type 1 suitable for heating water temperatures up to max. 110 °C and an operating pressure up to max. 10 bar

Comprising:
Threaded connection 1" for connecting to flow and return with flat gasket
Automatic air vent valve (quick-action air vent valve) with automatic shut-off valve
Drain & fill valve with cap and hose connection
Ball valves with female thread 1" in flow and return
Connection option ¾" male thread (e.g. for thermometers) in flow and return

HYDRONIC BALANCING VALVE

DN 20	4 - 15	l/min
DN 20	8 - 30	l/min
DN 25	6 - 20	l/min
DN 25	10 - 40	l/min
DN 32	20 - 70	l/min
DN 40	30 - 120	l/min

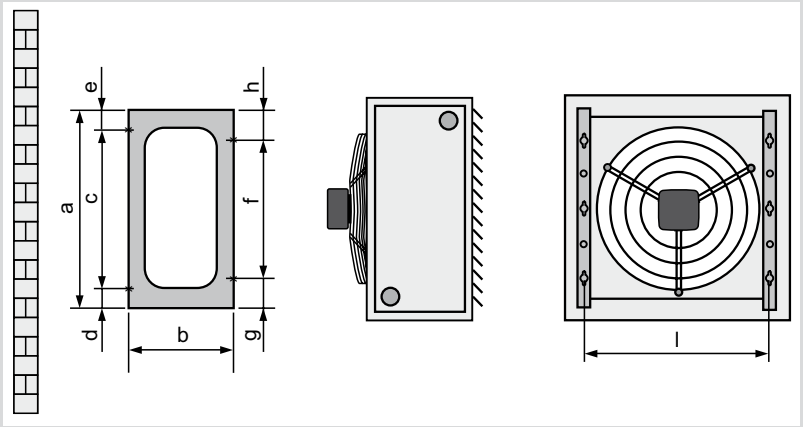
FLANGE SET

Comprising 2 threaded flanges,
2 welded flanges, 2 flat gaskets,
plus hexagon bolts and hexagon nuts

DN 20	R ¾"	LH-EC/LH 25, 40	Type 1
		LH 25-ATEX	Type 1
DN 25	R 1"	LH-EC/LH 25, 40	Type 2/3/4
		LH 25/40-ATEX	Type 2/3/4
		LH-EC/LH 63.100	Type 1
		LH 63/100-ATEX	Type 1
DN 32	R 1¼"	LH-EC/LH 63	Type 2/3/4
		LH 63-ATEX	Type 2/3/4
DN 40	R 1½"	LH-EC/LH 100	Type 2/3/4
		LH 100-ATEX	Type 2/3/4

FIXING BRACKETS

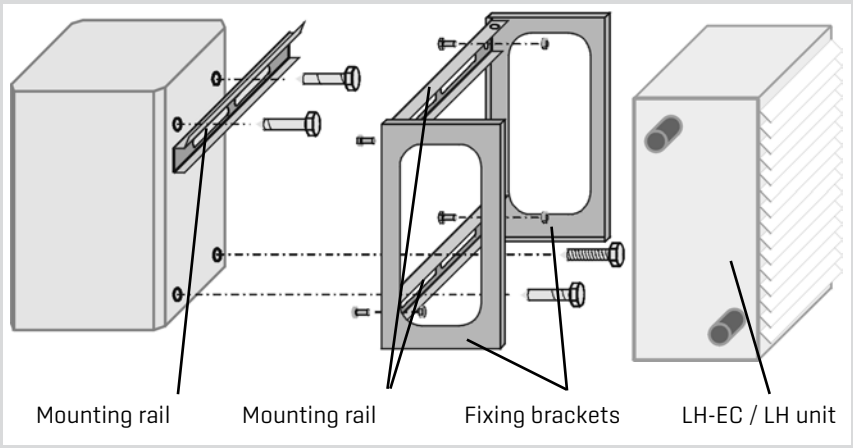
For wall and ceiling mounting, made of 2 mm folded zinc-plated sheet steel.
Installation set, complete
Comprising:
2 brackets, hexagon bolts for mounting on LH-EC / LH unit



Sizes	a	b	c	d	e	f	g	h	i
25	480	250	380	70	30	170	155	155	434
40	480	250	2x170	90	50	2x170	70	70	564
63	784	350	170+340+170	72	32	3x170	137	137	734
100	784	350	170+340+170	72	32	3x170	137	137	894

FIXING SET FOR CONCRETE BEAM, VERTICAL

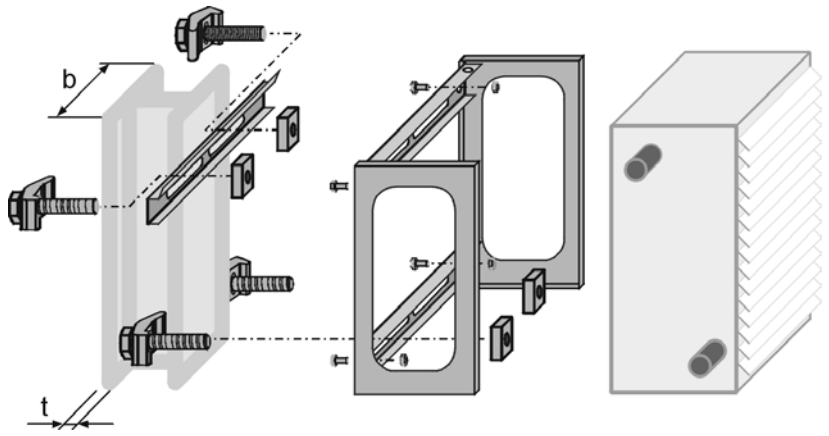
For fixing the LH-EC / LH to a concrete beam by hooking it into a pre-assembled mounting rail. Provide rawl plugs and screws on site.
Comprising: Installation rail, 2 mounting rails (zinc-plated sheet steel), screws and nuts.



Sizes	a	b	c	d	e	f	g	h	i
25	480	250	380	70	30	170	155	155	434
40	480	250	2x170	90	50	2x170	70	70	564
63	784	350	170+340+170	72	32	3x170	137	137	734
100	784	350	170+340+170	72	32	3x170	137	137	894

FIXING SET FOR STEEL BEAM, VERTICAL

For fixing to a steel beam by hooking into a pre-assembled mounting rail using clamping claws. Suitable for all steel beams with a flange width "b" of 100 mm to 300 mm, and a flange thickness "t" of 6 mm to 21 mm.
Comprising: Installation rail, 2 mounting rails (zinc-plated sheet steel), 4 clamping claws, screws and nuts.

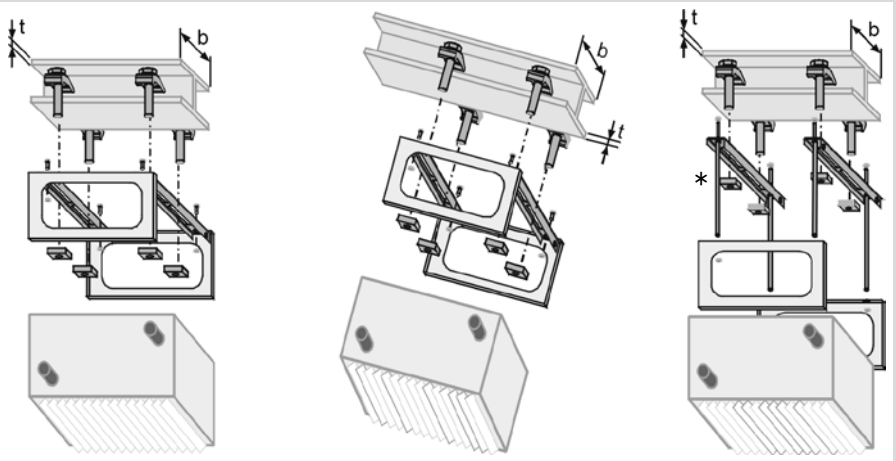


Sizes	a	t
25	100-300	6-21
40	100-300	6-21

FIXING SET FOR STEEL BEAM, HORIZONTAL AND TILTED, WITHOUT SELF-ALIGNING BRACKETS

For fixing to a horizontal or tilted steel beam with a flange width "b" of 100 mm to 300 mm, and a flange thickness "t" of 6 mm to 21 mm.
Comprising: 2 mounting rails (zinc-plated sheet steel), 4 clamping claws, screws and nuts. * Provide M8 threaded rods on site.

Installation examples:



Fixing directly to a horizontal steel beam

Fixing directly to a tilted steel beam

Suspended fixing to a horizontal steel beam

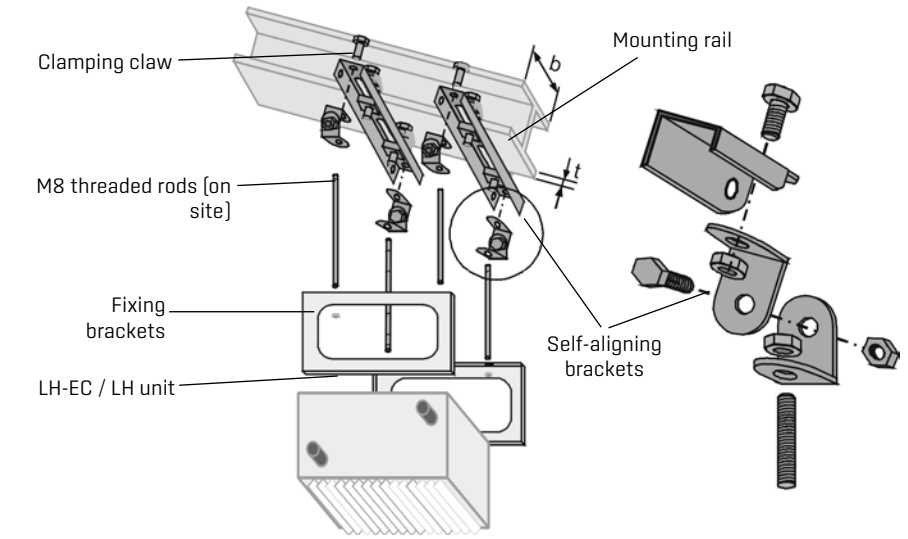
Sizes	a	t
25	100-300	6-21
40	100-300	6-21

PLEASE NOTE:

Before using the fixing sets, check and factor in the static regulations of the on-site concrete pillars or steel beams.
Installation only in standard units with a total depth of 300 mm.

FIXING SET FOR TILTED STEEL BEAM WITH SELF-ALIGNING BRACKETS

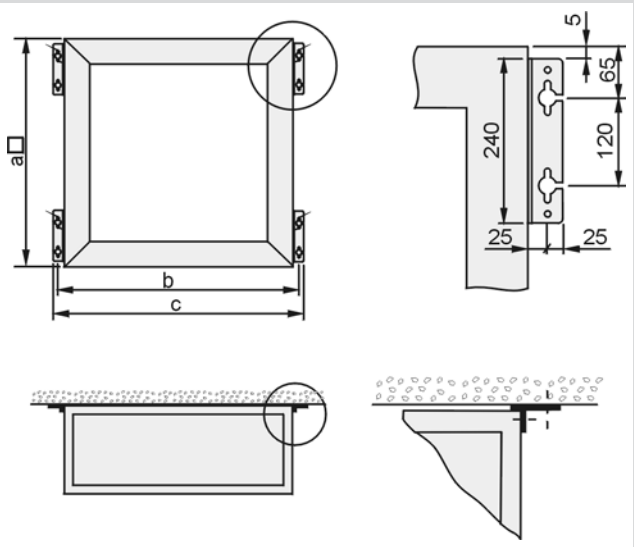
For fixing to a steel beam with a flange width "b" of 100 mm to 300 mm, and a flange thickness "t" of 6 mm to 21 mm.
Comprising: 2 mounting rails (zinc-plated sheet steel), 4 clamping claws, 4 self-aligning brackets, screws and nuts.



Sizes	b	t
25	100-300	6-21
40	100-300	6-21

MOUNTING BRACKET

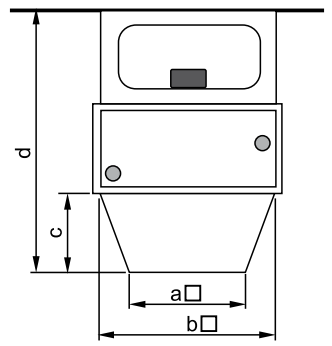
For installing the LH-EC / LH unit on the wall or ceiling with fitted mixed air box, recirculation air box, outdoor air box or filter box, zinc-plated.
4 mounting brackets are required for fixing. These are provided with the relevant intake accessories. (Sealing against wall/ceiling on site).



Sizes	a	b	c
25	500	550	600
40	630	680	730
63	800	850	900
100	1000	1050	1100

DISCHARGE CONE

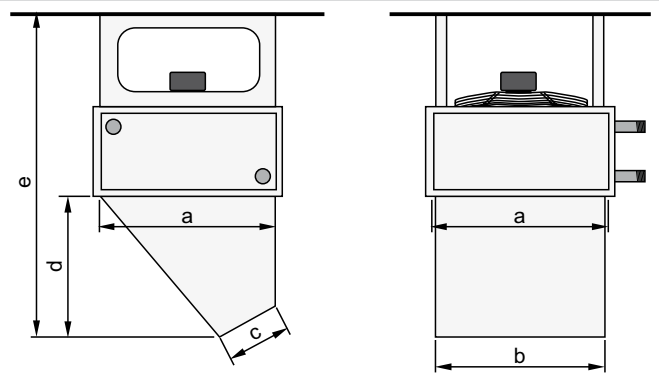
For increasing the air throw when the unit is installed at height.
(For air throw values, see page 52)



Sizes	a	b	c	d
25	280	460	200	750
40	370	590	240	790
63	430	760	270	920
100	530	920	320	1010

DISCHARGE NOZZLE

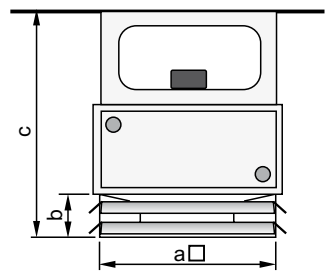
For a larger air throw, suitable as air curtain at doors.
Discharge temperature for air curtain approx. 10-15 °C above room temperature.
(For air throw values, see page 52)



Sizes	a	b	c	d	e
25	460	420	190	390	940
40	590	550	250	480	1030
63	760	720	260	585	1235
100	920	880	320	685	1375

FOUR-WAY DISCHARGE

With adjustable air guide fins, suitable for heating low rooms with even air distribution to all four sides.



Sizes	a	b	c
25	500	155	705
40	630	155	705
63	800	155	805
100	1000	155	845

LH-EC / LH UNIT HEATER
DISCHARGE ACCESSORIES

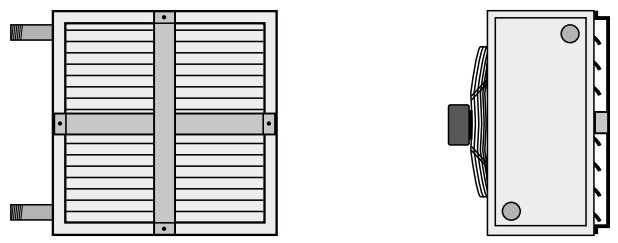
DISCHARGE CROSS

Improved air circulation and temperature distribution thanks to intensive mixing of the warm air stream with the indoor air.

The reduced temperature of the warm air stream increases the air throw.

Reduced air temperature in the ceiling area, thus reduced ventilation and transmission heat losses; energy saving up to 15 %.

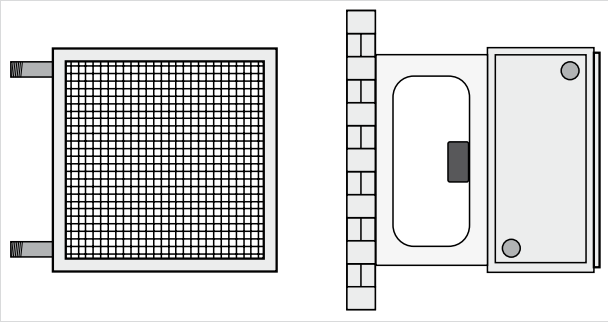
(For air throw values, see page 52)



WIDE SPREAD DISCHARGE

For greater lateral spread of the warm air stream.

Air jet cone up to approx. 120°; horizontal and vertical fins individually adjustable.



INDUCTION LOUVRE

Induction louvre to optimise the air throw and temperature distribution

WALL MOUNTED UNIT

FUNCTION DESCRIPTION

The induction louvre divides the warm air stream from the unit heater into partial streams and draws secondary air (indoor air) from behind the fins directly into the core of the warm air stream.

The secondary air taken in causes intensive mixing of the warm air with the indoor air over a very short distance, thus reducing the temperature of the warm air stream.

This temperature reduction decreases the thermal lift of the warm air stream and increases the air throw, particularly at higher air discharge temperatures.

The induction louvre (and therefore also the direction of the warm air stream) is adjustable either by hand or with the aid of an actuator and can therefore be set to suit any operating or local conditions.

CEILING UNIT

ENERGY SAVINGS

Avoids high temperatures close to the ceiling and the associated ventilation and transmission heat losses. Energy savings of up to 15 % are achievable.

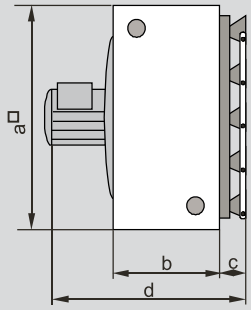
EXISTING SYSTEMS EASILY RETROFITTED

The induction louvre is easily installed, so retrofitting to existing systems poses no problems.

STANDARD DELIVERY

Induction louvre mounted on the unit, with servomotor 230 V / 50 Hz for switching via pushbuttons.

Alternative: induction louvre with secondary air cone, manually adjustable.

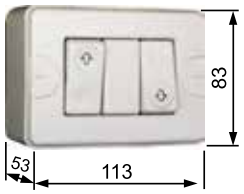


DIMENSIONS OF STANDARD UNIT WITH INDUCTION LOUVRE LH-EC / LH 25-100

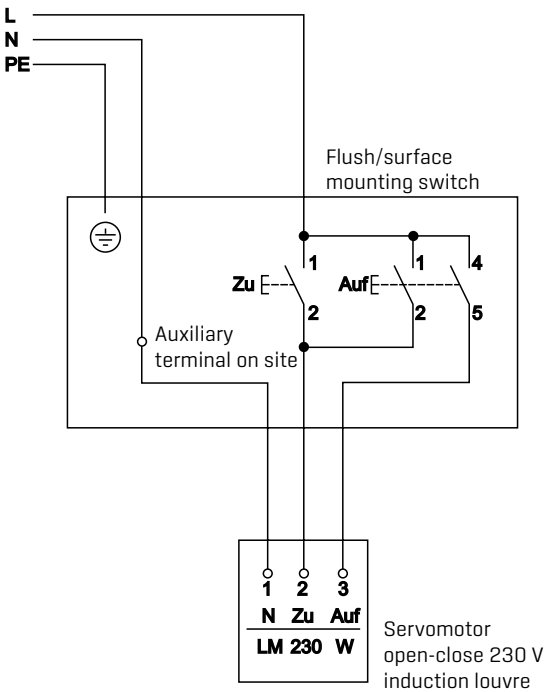
Size		25	40	63	100
a	mm	500	630	800	1000
b	mm	300	300	300	340
c	mm	120	120	120	120
c	mm	530	535	540	605

PUSHBUTTONS FOR 230 V / 50 HZ ACTUATOR
INDUCTION LOUVRE WITH SECONDARY AIR CONE

For flush/surface mounting;
for variable adjustment of the induction louvre to optimise the air throw.



Operating voltage	230 V
Max. current	10 A
IP rating	IP 20



LH-EC / LH UNIT HEATER
INDUCTION LOUVRE TECHNICAL INFORMATION

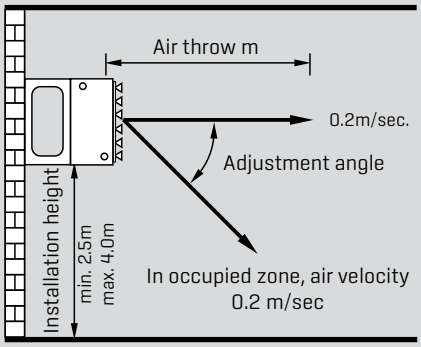
CLEARANCES

Clearances for wall mounted units and clearances for ceiling units, fins vertical

Ceiling unit, fins deflected

Size	25	40	63	100
Wall mounted unit:				
LH-EC / LH to LH-EC / LH	7-9 m	9-11 m	11-13 m	13-15 m
LH-EC / LH to side wall	3-4 m	3-5 m	4-6 m	5-7 m
Ceiling unit:				
LH-EC / LH to LH-EC / LH	-12 m	-14 m	-16 m	-18 m
LH-EC / LH to side wall	4-6 m	5-7 m	6-8 m	7-9 m

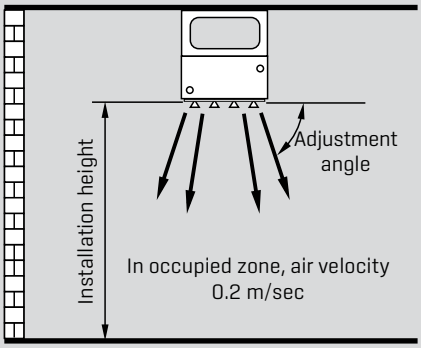
AIR THROW OF WALL MOUNTED UNIT



Size	25				40				63				100			
Type	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Air throw [m]*																
Upper speed	19	18	16	15	27	26	23	21	29	27	25	23	36	35	34	32
Lower speed	16	15	13	12	20	19	16	14	22	20	18	17	30	28	26	25

* Values are air throws under defined operating conditions (mixing temperature 10 K above room temperature)

INSTALLATION HEIGHT OF CEILING UNIT

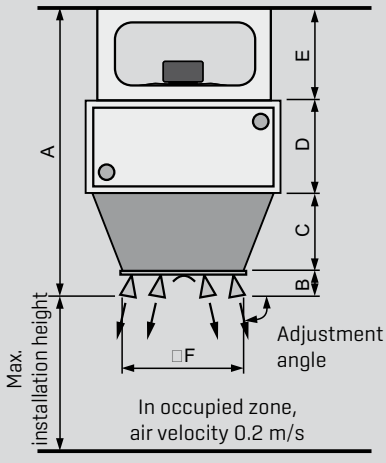


Meas. inst. height (m) * LH-EC / LH type	25				40				63				100			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ΔT=20 K; fins deflected	5	4.5	4	3.5	6	5.5	5	4.5	7	6.5	6	5.5	8	7.5	7	6.5
ΔT=20 K; fins vertical	6	5.5	5	4.5	7	6.5	6	5.5	8	7.5	7	6.5	9	8.5	8	7.5
ΔT=10 K; fins deflected	6	5.5	5	4.5	7	6.5	6	5.5	8	7.5	7	6.5	9	8.5	8	7.5
ΔT=10 K; fins vertical	7	6.5	6	5.5	8	7.5	7	6.5	9	8.5	8	7.5	10	9.5	9	8.5

* The optimum fin angle depends on the local conditions, i.e. room geometry, furniture, temperature stratification and air movement. The data can therefore only be used as a guide

ΔT = air temperature downstream of heat exchanger - air temperature upstream of heat exchanger

INSTALLATION HEIGHT OF CEILING UNIT
with adaptor cone and induction louvre



	A	B	C	D	E	F
LH-EC / LH 63	1040	120	270	300	350	460
LH-EC / LH 100	1130	120	320	340	350	590

Max. installation height (m) * LH-EC / LH		63		100	
	Type	1	2	1	2
Flow rate	[m³/h]	3300	3200	5600	5500
ΔT=10 K; fins deflected		12	11	11	10
ΔT=10 K; fins vertical		13.5	12.5	12.5	11.5

* The optimum fin angle depends on the local conditions, i.e. room geometry, furniture, temperature stratification and air movement. The data can therefore only be used as a guide

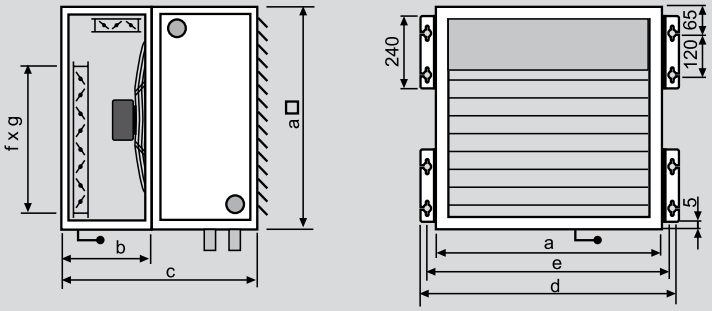
ΔT = air temperature downstream of heat exchanger - air temperature upstream of heat exchanger

Greater installation heights on request

(For outdoor air/mixed air mode, unit heaters are subject to EU regulation 1253/2014. In Germany, requirements in accordance with VDI6022 must also be observed)

MIXING BOX

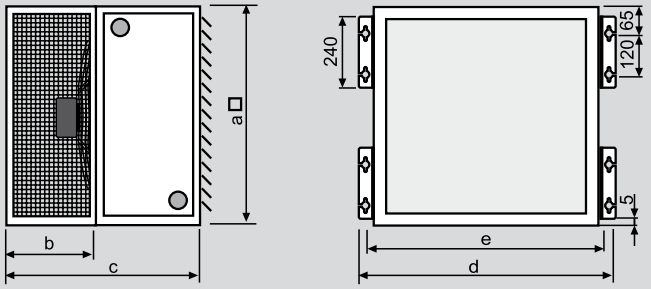
Mixing box, zinc-plated. For individual adjustment of the air change rate. Outdoor air intake at the back, recirculation air intake at the side or, when the mixed air box is rotated by 90°, from above/below. Variable adjustment between pure recirculation air operation via mixed air to pure outdoor air mode by hand or using a 230 V servomotor.



Sizes	a	b	c	d	e	f	g
25	500	500	800	600	550	400	400
40	630	500	800	730	680	360	530
63	800	500	800	900	850	530	700
100	1000	540	880	1100	1050	690	860

RECIRCULATION AIR BOX

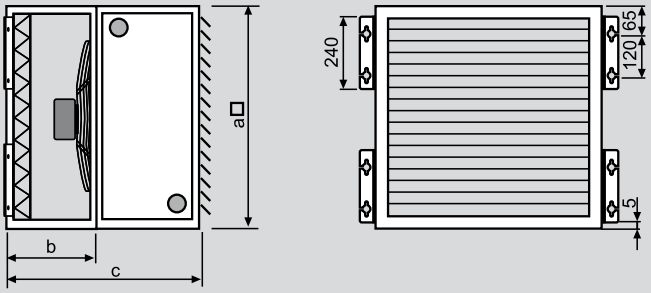
Recirculation air box, zinc-plated, for recirculation air intake through two grilles at the side or, when rotated by 90°, intake from top and bottom.



Sizes	a	b	c	d	e
25	500	300	600	600	550
40	630	500	800	730	680
63	800	500	800	900	850
100	1000	540	880	1100	1050

FILTER BOX

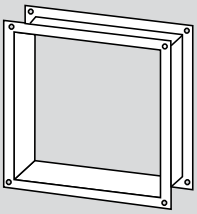
Filter box, zinc-plated. With filter element as dust trap in outdoor air and mixed air modes, filter category ISO Coarse 45% (G4). Mounting brackets on request.



Sizes	a	b	c
25	500	500	800
40	630	500	800
63	800	500	800
100	1000	540	880

FLEXIBLE CONNECTION

Flexible connection, 4-hole profile frame. Zinc-plated sheet steel.



Variable speed control
EC fan 230 V

Variable speed controller

LM2
ventilation module

Universal
timer with
7-day
program

Room thermostat
clock with 24-hr/7-
day program

Room thermostat clock
with 7-day program and
remote sensor

Room thermostat, industrial version

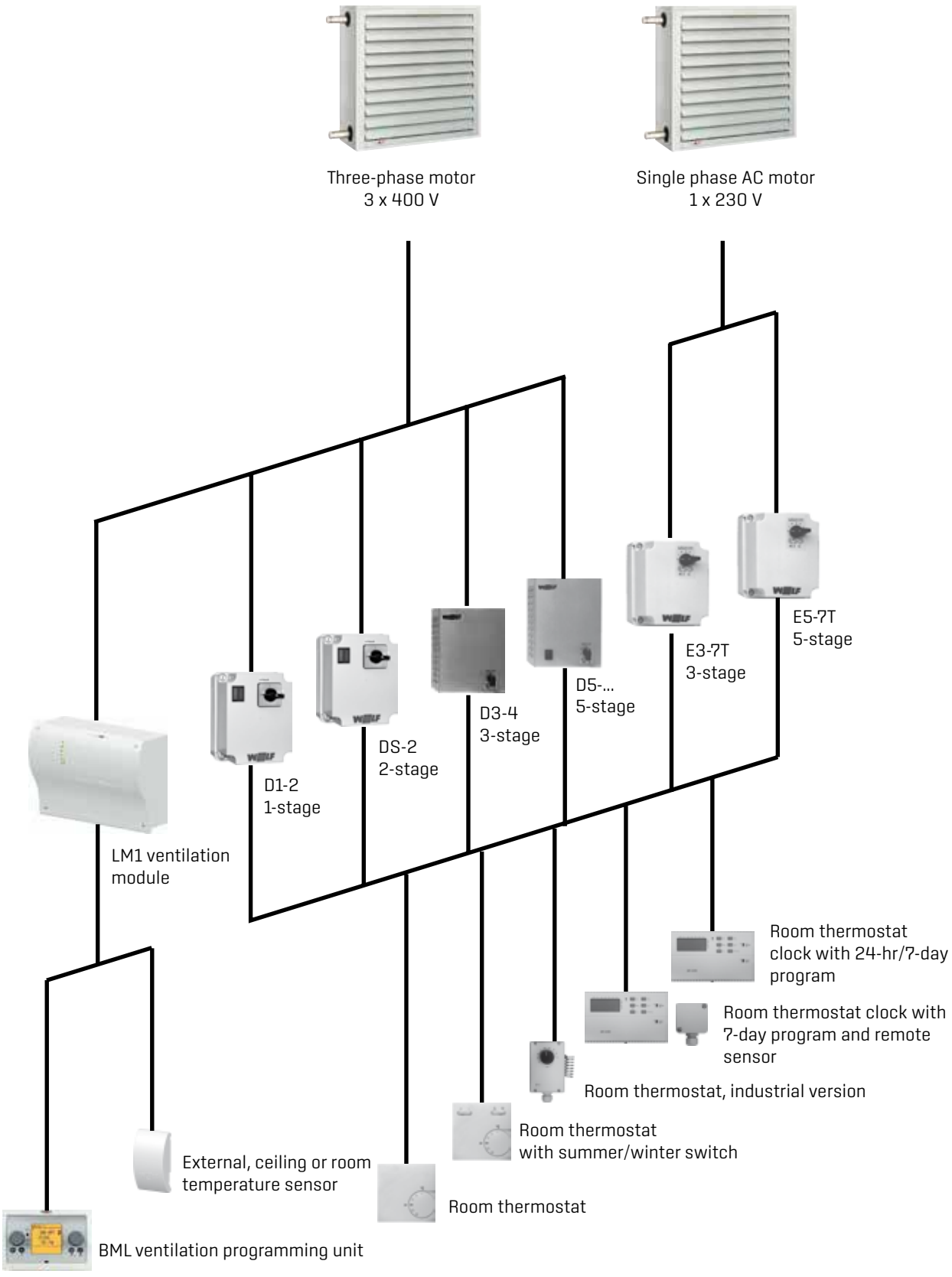
External, ceiling or room
temperature sensor

Room thermostat
with summer/winter switch

BML ventilation programming unit

Room thermostat

LH UNIT HEATER
SWITCHING AND CONTROL DEVICES

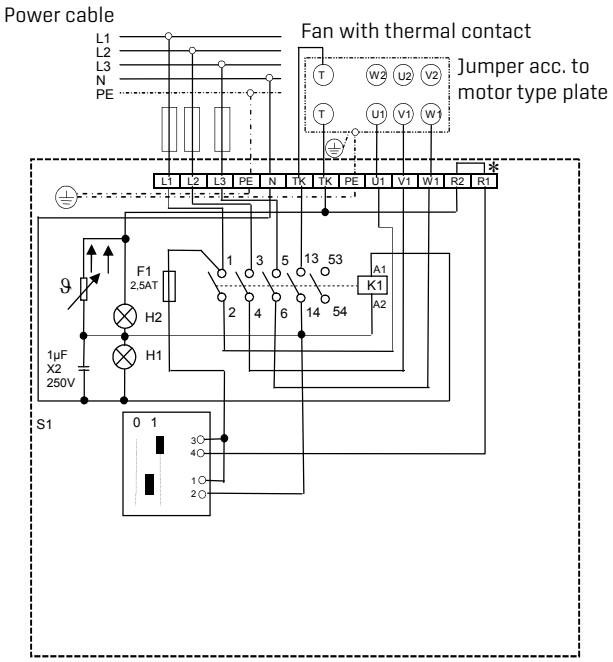


1-STEP SWITCH D1-2

For single speed operation of one or more unit heaters with full motor protection and lock preventing unintentional restart.

Operating voltage	400 V
Control voltage	230 V
Max. current	8 A
Weight	0.9 kg
IP rating	IP 54

Lockout when winding temperature exceeds limit (motor).
Restart: set step switch to 0, then set the required speed stage.



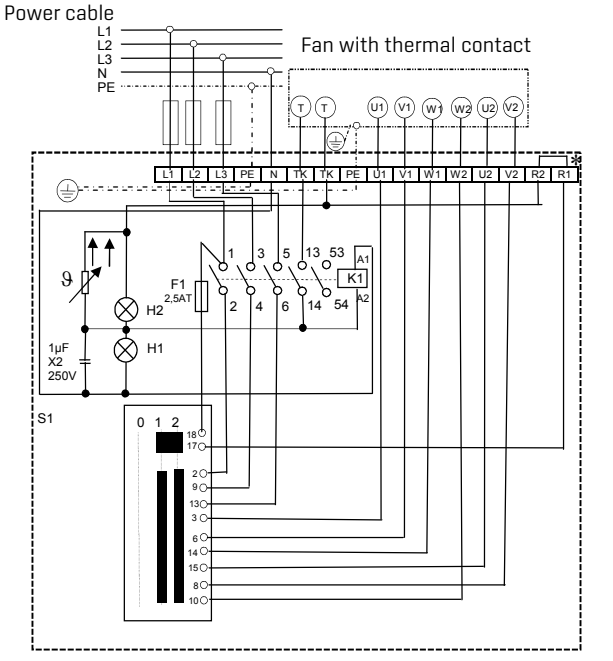
* Remove jumper if connecting a room thermostat
H1 - Operation (green), H2 - Fault (red)
S1/K1 - Contact assignment depending on make
T - TB/TW thermal contact
Contact K1 53-54 heating demand

2-STEP SWITCH DS-2

For 2-speed operation of one or more unit heaters with full motor protection and lock preventing unintentional restart.

Operating voltage	400 V
Control voltage	230 V
Max. current	8 A
Weight	0.9 kg
IP rating	IP 54

Lockout when winding temperature exceeds limit (motor).
Restart: set step switch to 0, then set the required speed stage.



* Remove jumper if connecting a room thermostat
H1 - Operation (green), H2 - Fault (red)
S1/K1 - Contact assignment depending on make
T - TB/TW thermal contact
Contact K1 53-54 heating demand

F2-4 5.0 AT

NOTE:

No motor guarantee without switching devices for full motor protection.
If the permissible winding temperature is exceeded, without a switching device for full motor protection, the motor may be irreparably damaged.

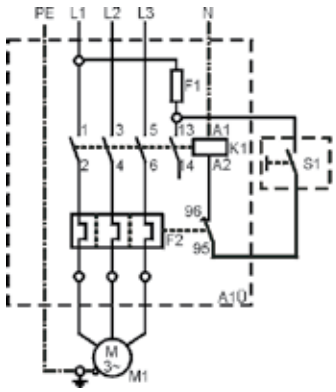
Full motor protection switch for 3 x 230 V on request.

A1Ü CONTROL MODULE (WITHOUT EXPLOSION-PROOF SWITCH)

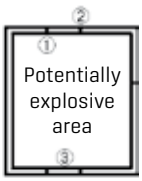
As full motor protection for single speed LH motors in explosion-proof design.

The A1Ü control module must be installed outside the potentially explosive area.

Operating voltage	400 V
Control voltage	230 V
Max. current	2.7 A
Weight	0.6 kg
IP rating	IP 55



K1 Auxiliary contactor
F1 Control fuse
F2 Therm. motor circuit breaker
S1 Explosion-proof switch
M1 Fan motor



1 Explosion-proof switch
2 A1Ü relay
3 Explosion-proof fan

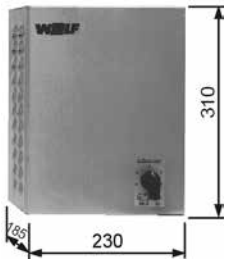
Installation locations:

A1Ü outside potentially explosive area

Explosion-proof switch inside potentially explosive area

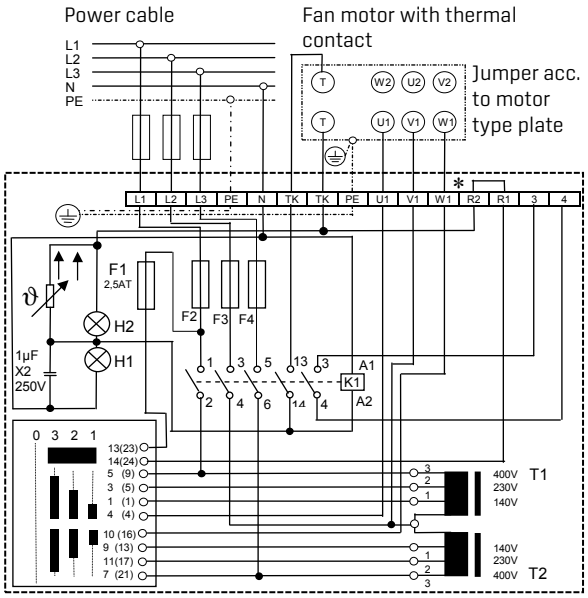
3-STEP SWITCH D 3-4 WITH LOCK PREVENTING UNINTENTIONAL RESTART

For 3-speed operation of one or more unit heaters with full motor protection.



Operating voltage	400 V
Control voltage	230 V
Max. current	4 A
Weight	8.0 kg
IP rating	IP 20

Lockout when winding temperature exceeds limit (motor)
Restart: set step switch to 0, then set the required speed stage.



* Remove jumper if connecting a room thermostat
H1 - Operation (green), H2 - Fault (red)
S1/K1 - Contact assignment depending on make
T - TB/TW thermal contact
Contact 3/4 - heating demand

F2-4 = D5-1 - 1.25 AT (6.3x32 mm)

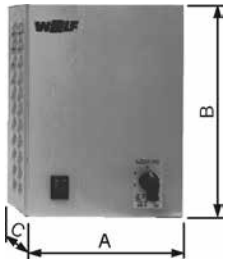
NOTE:

No motor guarantee without switching devices for full motor protection.
If the permissible winding temperature is exceeded, without a switching device for full motor protection, the motor may be irreparably damaged.

Full motor protection switch for 3 x 230 V on request.

5-STEP SWITCH D 5...

For 5-speed operation of one or more unit heaters with full motor protection and lock preventing unintentional restart.



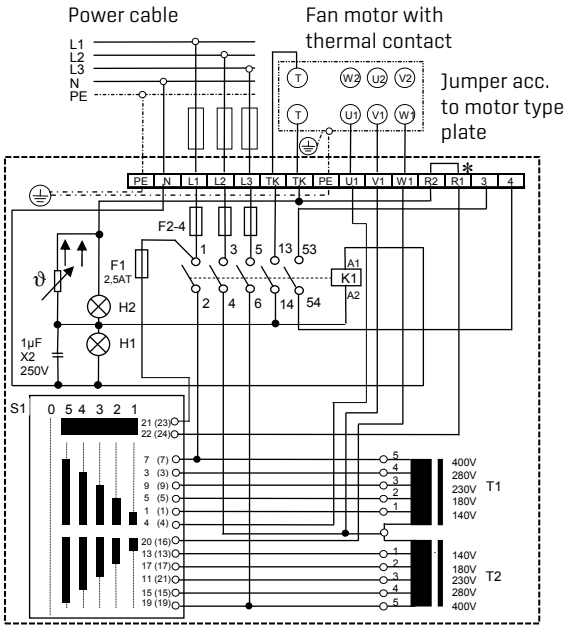
Dimensions

TYPE		D5-1	D5-3	D5-7	D5-12	D5-19
Width	A	150	230	230	230	310
Height	B	200	310	310	310	385
Depth	C	175	185	185	185	225

Dimensions

TYPE		D5-1	D5-3	D5-7	D5-12	D5-19
Operating voltage	V	400	400	400	400	400
Control voltage	V	230	230	230	230	230
Max. current	A	1	2	4	7	12
Weight	kg	4.5	7	9	19	27
IP rating	IP	40	20	20	20	20

Lockout when winding temperature exceeds limit (motor).
Restart: set step switch to 0, then set the required speed stage.



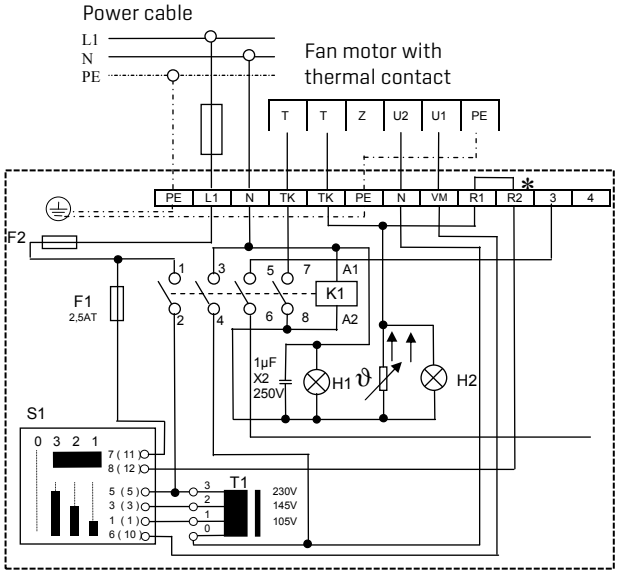
* Remove jumper if connecting a room thermostat
H1 - Operation (green), H2 - Fault (red)
S1/K1 - Contact assignment depending on make
T - TB/TW thermal contact
Contact 3/4 - heating demand
F2-4 = D5-1 - 1.25 AT (6.3x32 mm)

3-STEP SWITCH E 3-7T
WITH LOCK PREVENTING UNINTENTIONAL RESTART

For 3-speed operation of one or more unit heaters with single phase AC motor with full motor protection.

Operating voltage	230 V
Max. current	7 A
Weight	4.5 kg
IP rating	IP 40

Lockout when winding temperature exceeds limit (motor).
Restart: set step switch to 0, then set the required speed stage.



* Remove jumper if connecting a room thermostat
H1 - Operation (green), H2 - Fault (red)
S1/K1 - Contact assignment depending on make
T - TB/TW thermal contact
Contact 3/4 - heating demand
F2 - 8.0 AT (6.3x32 mm)

NOTE:

No motor guarantee without switching devices for full motor protection.
If the permissible winding temperature is exceeded, without a switching device for full motor protection, the motor may be irreparably damaged.

Full motor protection switch for 3 x 230 V on request.

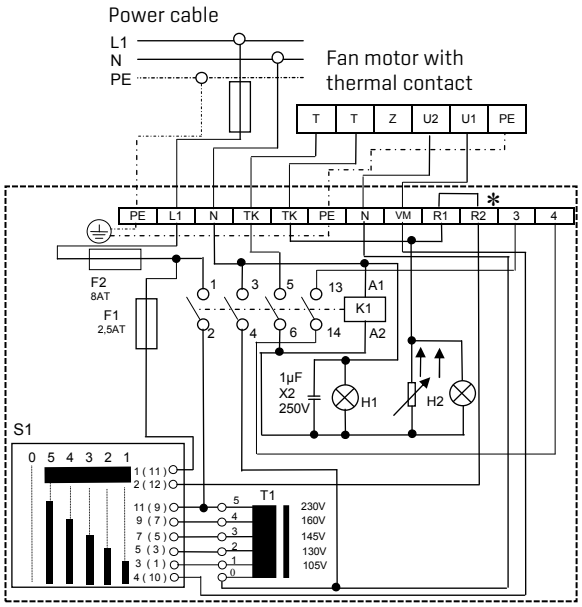
LH UNIT HEATER
SWITCHING DEVICES

5-STEP SWITCH E 5-7T
WITH LOCK PREVENTING UNINTENTIONAL RESTART

For 5-speed operation of one or more unit heaters with single phase AC motors with full motor protection.

Operating voltage	230 V
Max. current	7 A
Weight	4.5 kg
IP rating	IP 40

Lockout when winding temperature exceeds limit (motor).
Restart: set step switch to 0, then set the required speed stage.



* Remove jumper if connecting a room thermostat
H1 - Operation (green), H2 - Fault (red)
S1/K1 - Contact assignment depending on make
T - TB/TW thermal contact
Contact 3/4 - heating demand

NOTE:

No motor guarantee without switching devices for full motor protection.
If the permissible winding temperature is exceeded, without a switching device for full motor protection, the motor may be irreparably damaged.

Full motor protection switch for 3 x 230 V on request.

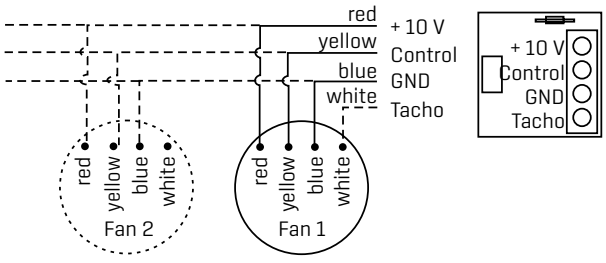
LH-EC UNIT HEATER
SWITCHING DEVICES

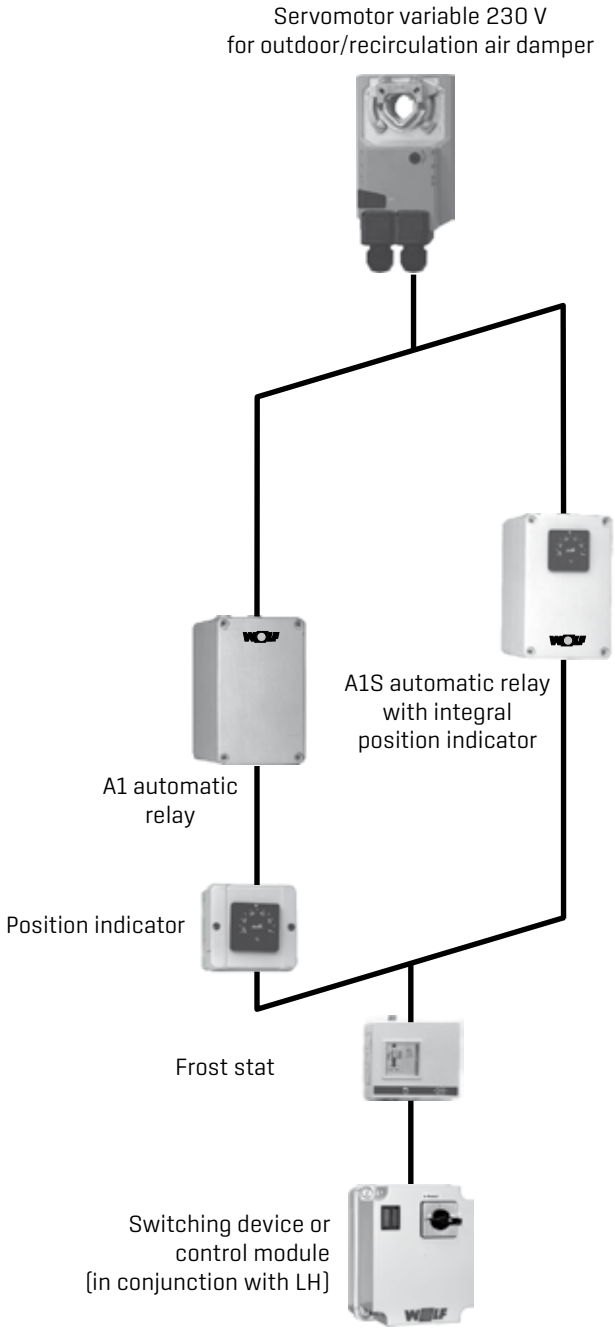
VARIABLE SPEED CONTROLLER 0-10 V

For variable operation of one or more unit heaters with EC motor

Up to 10 LH-EC units can be operated at variable speed with one speed controller.

Operating voltage	10 V (DC)
Control voltage	0-10 V (DC)
Max. current	1.1 mA
Pressure drop	0-10 kOhm (Lin)
Weight	0.1 kg
IP rating	IP 54





SERVOMOTOR OPEN - CLOSE 230 V

For motorised actuation of an outdoor air damper in conjunction with the A1 automatic relay.

Starting up the LH-EC / LH	→	outdoor air damper opens
Shutdown of the LH-EC / LH	→	outdoor air damper closes or frost protection cuts in

VARIABLE SERVOMOTOR 230 V OR 24 V

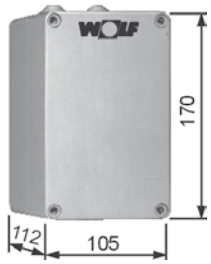
For variable motorised actuation of outdoor/recirculation air dampers in conjunction with the A1 automatic relay and a position indicator in the control panel or on finished walls or with the A1S automatic relay with integral position indicator.

Starting up the LH-EC / LH	→	outdoor air damper opens until selected value; recirculation air damper closes accordingly.
Shutdown of the LH-EC / LH	→	outdoor air damper closes or frost protection cuts in; recirculation air damper is opened 100 %.

A1 AUTOMATIC RELAY

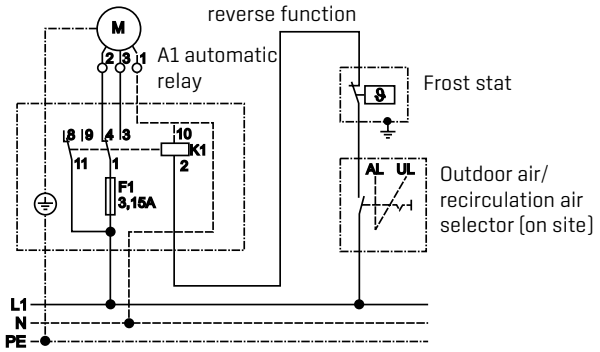
Auxiliary relay for automatic actuation of the outdoor air damper with 230 V "open-close" servomotor.

When the LH-EC / LH unit is switched off or the frost stat cuts in, the A1 automatic relay moves the servomotor to the "close" position. When the unit is switched on, the servomotor is moved to the "open" position.

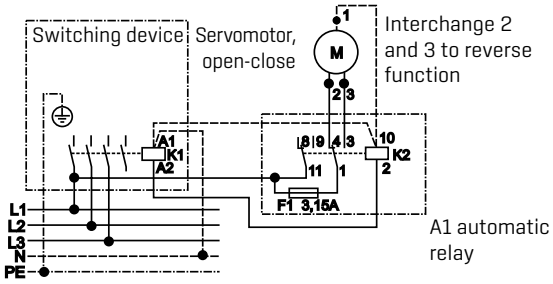


Operating voltage	230 V
Max. output	1.5 kW
Weight	0.5 kg
IP rating	IP 54

Servomotor, open-close Interchange 2 and 3 to reverse function



Circuit diagram in conjunction with LH

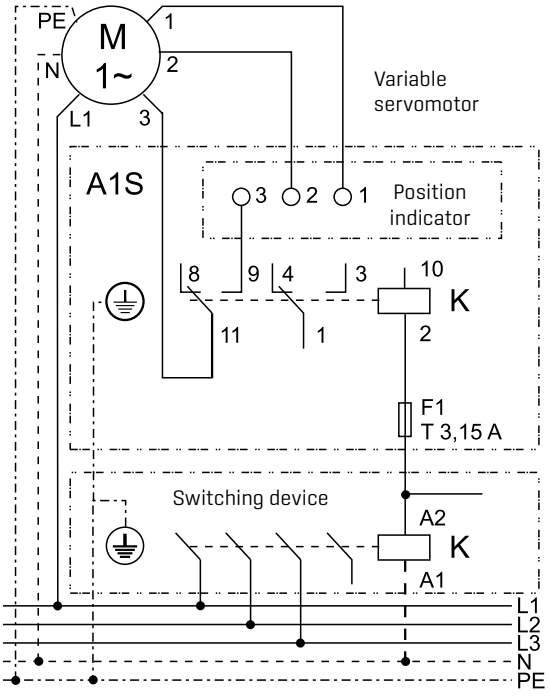


A1S AUTOMATIC RELAY

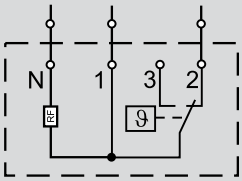
Auxiliary relay with integral position indicator for automatic actuation of the mixed air damper with 230 V variable servomotor.

When the LH-EC / LH unit is switched off or the frost stat cuts in, the A1S automatic relay moves the servomotor to the "close" position.

Control voltage	230 V
Max. output	1.5 kW
Weight	0.5 kg
IP rating	IP 54



Circuit diagram in conjunction with LH



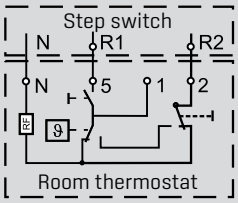
ROOM THERMOSTAT

In plastic enclosure 75 x 75 x 25 mm for surface mounting. Breaking capacity for heating 10(4) A, cooling 5(2) A at 230 V / 50 Hz, thermal feedback.

Temperature range 5-30 °C

Switching differential 0.5 K

Protection rating IP 30



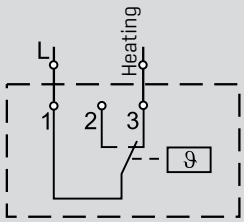
ROOM THERMOSTAT WITH SUMMER/WINTER SWITCH

In plastic enclosure 75 x 75 x 25 mm for surface mounting. Breaking capacity for heating 10(4) A, cooling 5(2) A at 230 V / 50 Hz, thermal feedback.

Temperature range 5-30 °C

Switching differential 0.5 K

Protection rating IP 30



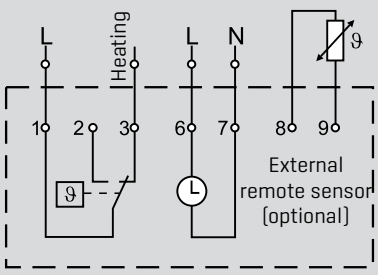
ROOM THERMOSTAT IN INDUSTRIAL VERSION

In plastic enclosure 145 x 112 x 68 mm for surface mounting. Breaking capacity 16(4) A at 230 V / 50 Hz

Temperature range 0-40 °C

Switching differential ±0.75 K

Protection rating IP 54



ROOM THERMOSTAT CLOCK WITH 7-DAY PROGRAM

In plastic enclosure 132 x 82 x 32 mm for installation in plug-in base; day and night temperatures can be adjusted separately.

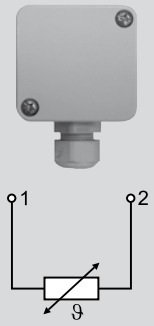
Temperature setback can be adjusted by 2-10 K

Breaking capacity 10(4) A at 230 V / 50 Hz

Temperature range 5-40 °C

Switching differential adjustable ±0.1 to 3 K

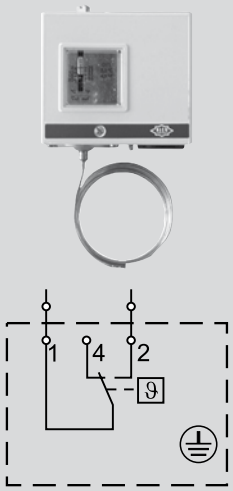
Protection rating IP 20



REMOTE SENSOR FOR ROOM THERMOSTAT CLOCK

In plastic enclosure 52 x 50 x 35 mm for installation in plug-in base

Protection rating IP 54



FROST STAT

When the air discharge temperature falls below the selected value, the frost stat switches the LH-EC / LH unit off to prevent frost damage to the heat exchanger. When the air discharge temperature rises, the LH-EC / LH unit starts again automatically.

The frost stat must be wired in series to the thermal contacts.

Breaking capacity 10 A at 230 V / 50 Hz

Setting range 2 °C to 20 °C

Switching differential 2.5 K

Protection rating IP 43

Dimensions W x H x D 85 x 75 x 40 mm

INTERMEDIATE TERMINAL BOX

Intermediate terminal box for parallel wiring of up to 3 LH units with 3 x 400 V, 50 Hz motors.

Protection rating IP 54

Dimensions W x H x D 105 x 170 x 112 mm

Omnipolar repair switch AR8

Fitted and wired

BML VENTILATION PROGRAMMING UNIT

- Room temperature-dependent control
- Graphic display with backlighting
- Simple user prompts via plain text display
- Control by rotary selector with pushbutton function
- 4 function buttons for frequently used functions (info, temperature settings, speed settings, fresh air proportion)
- Installation either in the ventilation module or in the wall mounting base as a remote control
- Only one BML ventilation programming unit required to control up to 7 zones
- Demand-optimised boiler water temperature request via eBUS
- eBUS interface

WALL MOUNTING BASE

Wall mounting base for using the BML ventilation programming unit as a remote control

LM1 VENTILATION MODULE (INCL. ROOM TEMPERATURE SENSOR)

- Ventilation module for controlling unit heaters with a two-stage motor
- Easy controller configuration by selecting one of the pre-defined system schemes
- Demand-optimised room temperature control via unit heater speed
- Switching of the heating circuit pump
- Switching of one heat generator
- Demand-optimised boiler water temperature request via eBUS
- eBUS interface with automatic energy management
- BML ventilation programming unit can be clipped into place

LM2 VENTILATION MODULE

- LM2 ventilation module to control the room temperature via speed or mixer
- 2-stage motor control in conjunction with LM1 ventilation module or variable motor control via 0-10 V signal in conjunction with EC fan
- Easy controller configuration by selecting one of the pre-defined system schemes
- Switching of one heat generator
- Demand-optimised boiler water temperature request via eBUS
- eBUS interface with automatic energy management
- BML ventilation programming unit can be clipped into place
- Mixed air damper control (in conjunction with 24 V servomotor)
- Induction louvre control

EXTERNAL, CEILING OR ROOM TEMPERATURE SENSOR

DIFFERENTIAL PRESSURE SWITCH

Differential pressure switch, loose, for on-site control

5-STEP SWITCH

Electronic 5-stage speed controller, input 0-10 V

SUPPLY AIR SENSOR AND SENSOR RETAINER

For measuring the supply air temperature

ISM 5 LON INTERFACE MODULE

For connecting LM1 and LM2 ventilation modules
to a building management system using
LON standard network variables

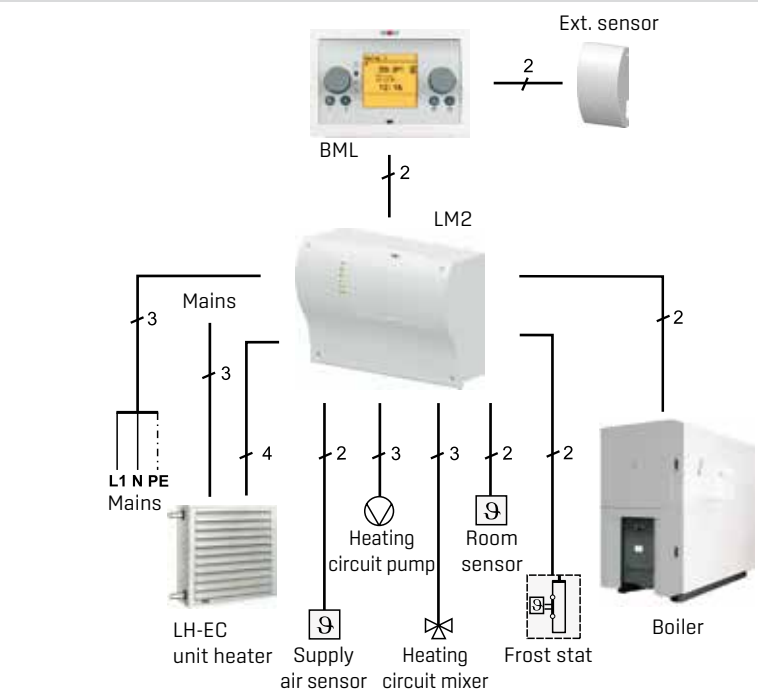
LM2 VENTILATION MODULE WITH BML IN CONJUNCTION WITH LH-EC

DESCRIPTION

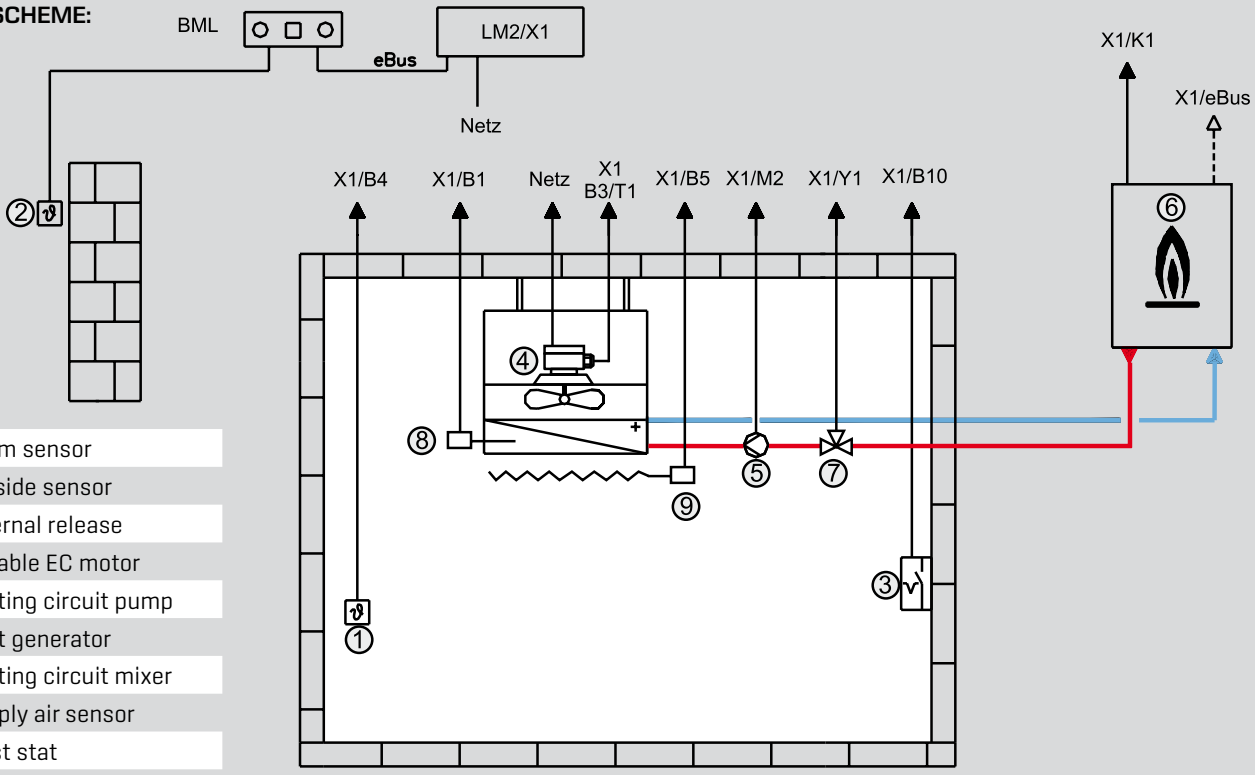
This configuration is used for heating buildings in conjunction with unit heaters. The room temperature is captured by a sensor, and the fan, heating circuit pump, heat generator and heating circuit mixer are switched on or off subject to demand.

There is the possibility of preselecting mixer or variable speed control.

Example:
Ventilation unit, heating with room control



SYSTEM SCHEME:



1	Room sensor
2	Outside sensor
3	External release
4	Variable EC motor
5	Heating circuit pump
6	Heat generator
7	Heating circuit mixer
8	Supply air sensor
9	Frost stat

LH UNIT HEATER
CONTROL (WRS)

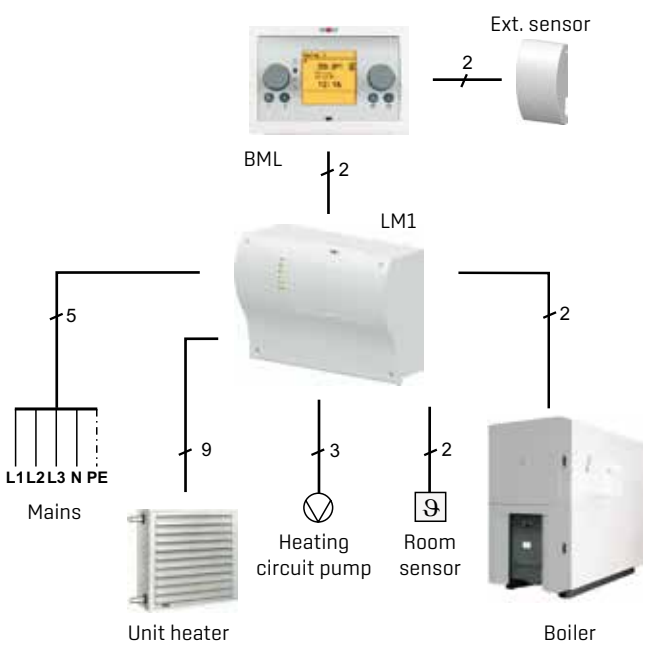
LM1 VENTILATION MODULE WITH BML

DESCRIPTION

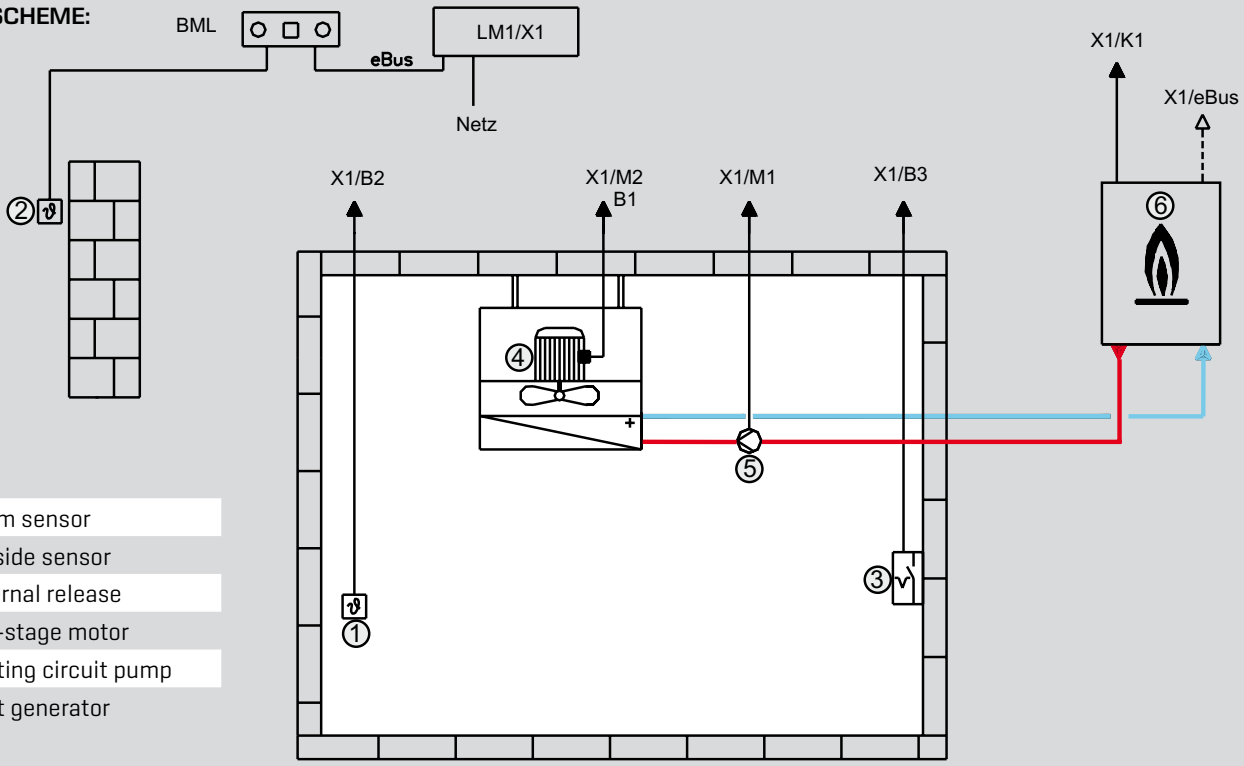
This configuration is used for heating buildings in conjunction with unit heaters. The room temperature is captured by a sensor and the fan, heating circuit pump and heat generator are switched on or off subject to demand.

If the temperature deviation (set room temperature to actual room temperature) is low, the fan is operated in stage 1. If the temperature deviation is greater, it is switched to stage 2.

Example:
Ventilation unit, heating with room control



SYSTEM SCHEME:

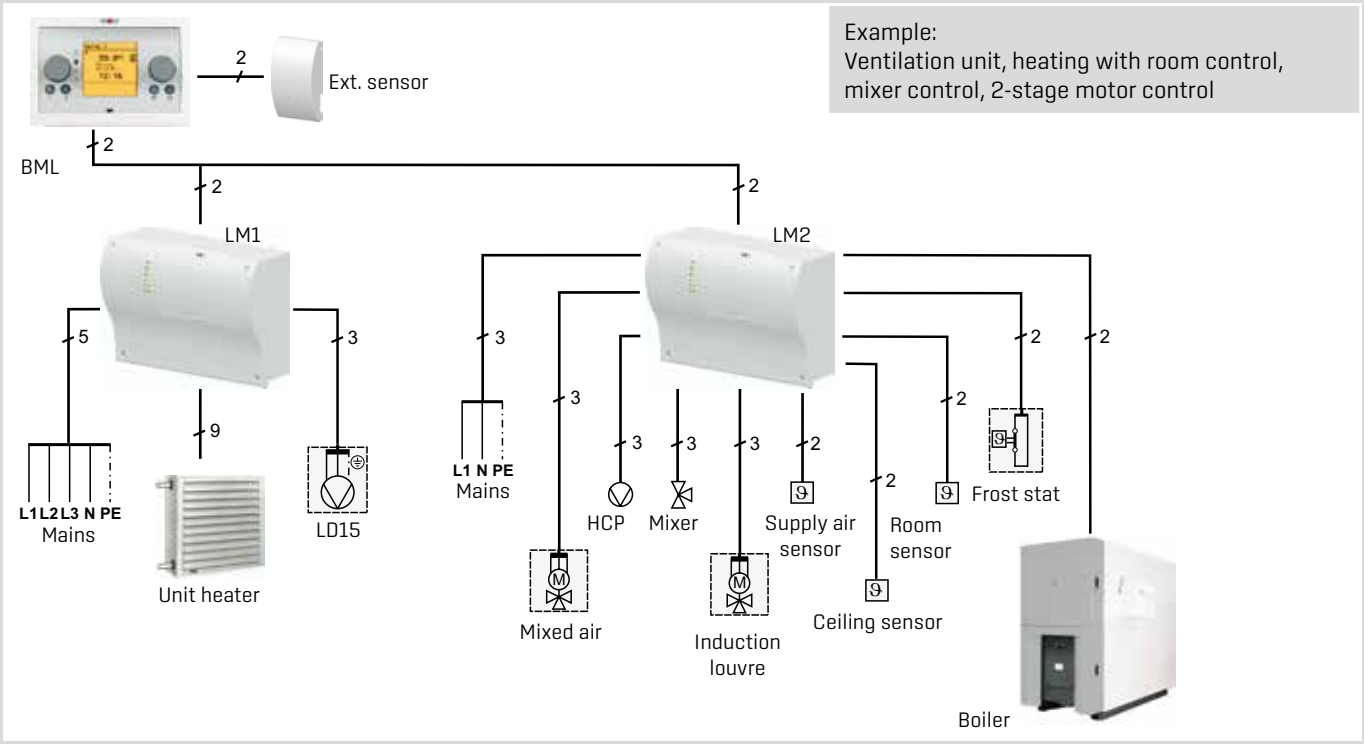


1	Room sensor
2	Outside sensor
3	External release
4	Two-stage motor
5	Heating circuit pump
6	Heat generator

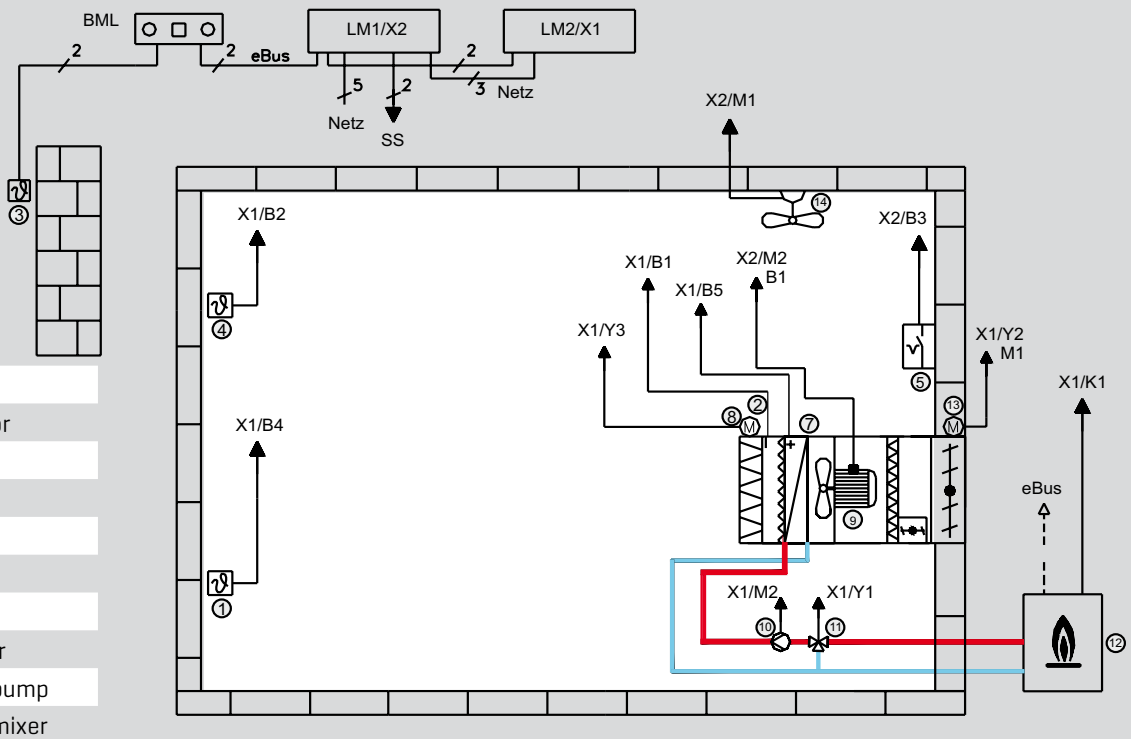
LM1 AND LM2 VENTILATION MODULE WITH BML

DESCRIPTION:

This configuration is used for heating buildings in conjunction with unit heaters. The room temperature is captured by a sensor, and the fans, heating circuit pump, heating circuit mixer and heat generator are switched on or off subject to demand.



SYSTEM SCHEME:



1	Room sensor
2	Supply air sensor
3	Outside sensor
4	Ceiling sensor
5	External release
7	Frost stat
8	Induction louvre
9	Two-stage motor
10	Heating circuit pump
11	Heating circuit mixer
12	Heat generator
13	Mixer air dampers
14	LD15, ceiling fan

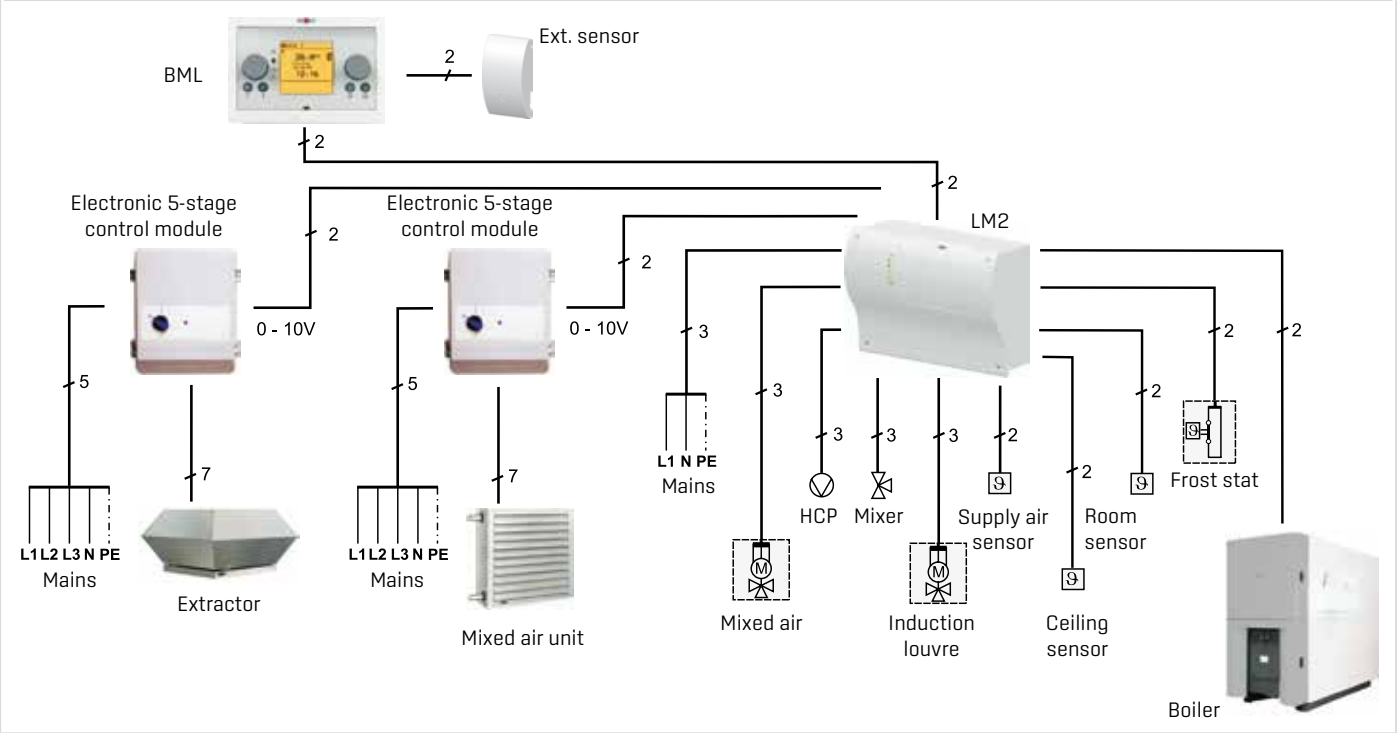
LH UNIT HEATER
CONTROL (WRS)

LM2 VENTILATION MODULE WITH BML

DESCRIPTION:

This configuration is used for heating buildings in conjunction with unit heaters. The room temperature is captured by a sensor, and the fans, heating circuit pump, heating circuit mixer and heat generator are switched on or off subject to demand. The extract air fan is enabled subject to the fresh air proportion.

Example:
Ventilation unit, heating with room control, mixer control, motor control with 5-stage electronic speed controller



System scheme:

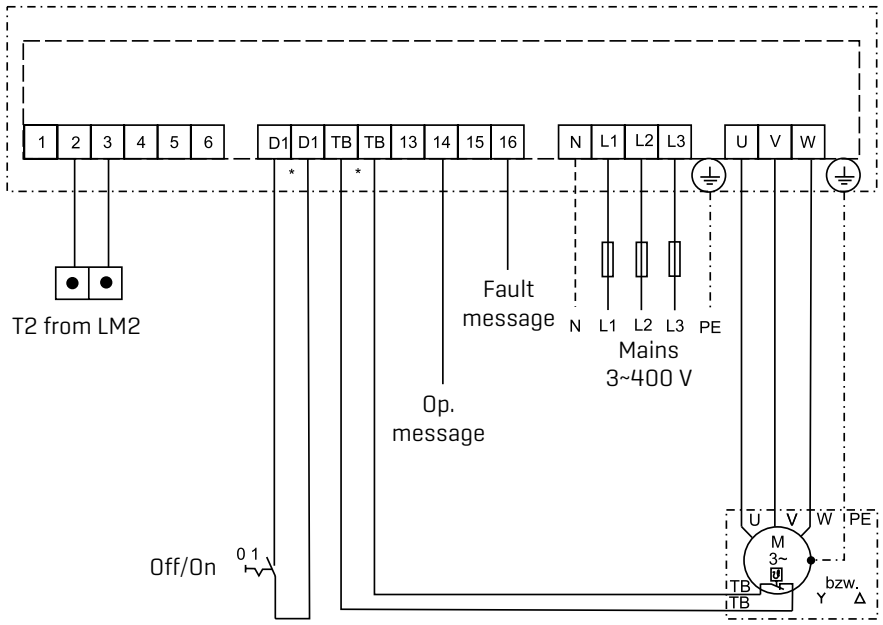
1	Room sensor
2	Supply air sensor
3	Outside sensor
4	Ceiling sensor
5	Mixed air damper
6	Fan
7	Frequency converter
8	Heating circuit pump
9	Heating circuit mixer
10	Heat generator
11	Frost stat
12	Induction louvre

L=170 W=220 H=315

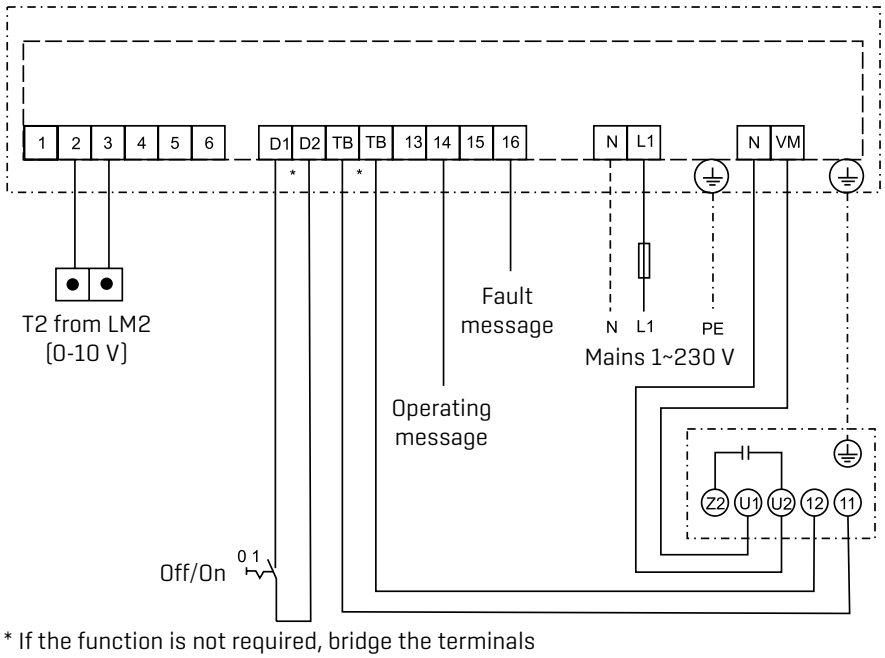
5-STEP SWITCH 0-10 V:

SWITCH TYPE	D5-2F	D5-4F	E5-6F
Voltage	400 V	400 V	230 V
Max. current	2 A	4 A	6 A
Weight	7.4 kg	11.0 kg	5.2 kg
IP rating	IP 21	IP 21	IP 20

CONNECTION DIAGRAM D5-.....



CONNECTION DIAGRAM E5-6F



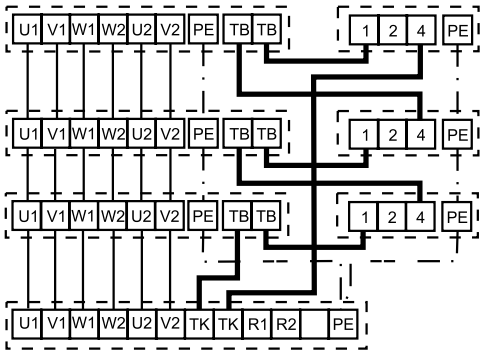
LH UNIT HEATER
ELECTRICAL CONNECTION/SPECIAL DRIVES

NOTE:

LH units of various sizes and ratings up to the maximum permissible power or current rating can be connected in parallel to a full motor protection switching device.

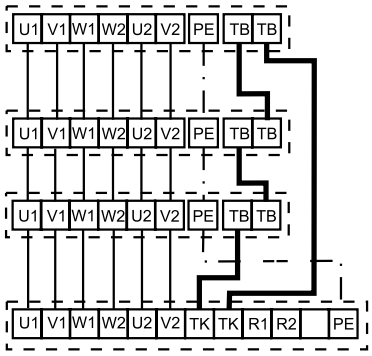
When connecting multiple unit heaters, the motor terminals must be connected in parallel and the thermal contacts and frost stats must be connected in series.

LH units with thermal contact and frost stat



LH step switch or control module (e.g. DS-2 step switch)

LH units with thermal contact



LH step switch or control module (e.g. DS-2 step switch)

Number of cores for connecting cables

CONNECTION FROM / TO	SWITCHING DEVICE D1-2	DS-2	D3-4	D5-...	E3-7T	E5-7T	A1Ü	A1	A1S
Mains	5	5	5	5	3	3	5	-	-
LH motor 3 x 400 V	6	9	6	6	-	-	4	-	-
LH motor 1 x 230 V	-	-	-	-	5	5	-	-	-
Room thermostat	¾[1]	¾[1]	¾[1]	¾[1]	¾[1]	¾[1]	-	-	-
Room thermostat clock	5	5	5	5	5	-	-	6[2]	
A1 auto. relay	4	4	4	4	4	4	-	-	-
A1S control module	4	4	-	4	-	4	-	-	-
Servomotor	-	-	-	-	-	-	-	4	6
Explosion-proof switch	-	-	-	-	-	-	3	-	-

[1] If using a room thermostat with thermal feedback.
[2] 2-stage.
Make the connection to the frost stat using 3 cores.

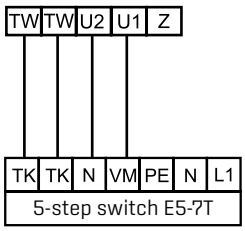
SINGLE PHASE AC MOTORS 230 V / 50 HZ

Single phase AC motors are supplied up to LH 63 with the higher speed.

Thermal contacts in series with the motor winding.

Speed control with 5-step switch type E5-3 for LH 25, 40, 63

Thermal contacts in series with the motor winding



LH-ATEX THREE-PHASE MOTOR 3 X 400 V/50 HZ

3~ motor with 2 speeds via Δ/Y changeover.
Full motor protection through integral thermistors.
No jumpers when using speed changeover switch.

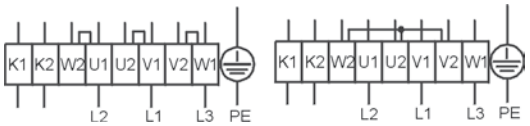
1U = brown
1V = blue
1W = black

2U = red
2V = grey
2W = orange

K1 = white
K2 = white

High speed:
Δ circuit

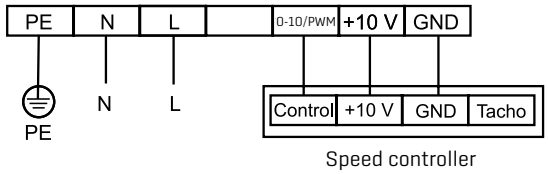
Reduced speed:
Y circuit



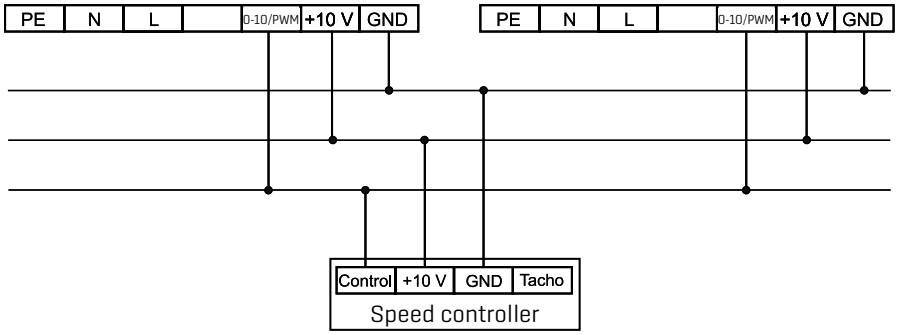
LH-EC ELECTRICAL CONNECTION

CONTROL VIA VARIABLE SPEED CONTROLLER 0-10 V

Parallel connection of multiple LH-EC units via variable speed controller

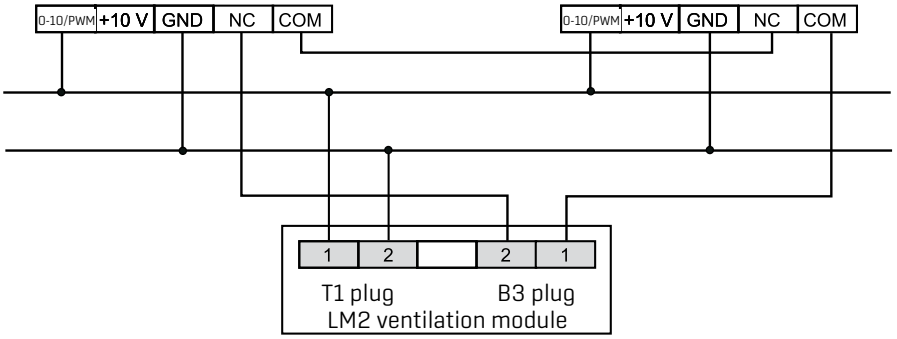


Up to ten LH-EC units can be operated at variable speed with one speed controller.



CONTROL OF LH-EC 40 - 100 VIA LM2 VENTILATION MODULE

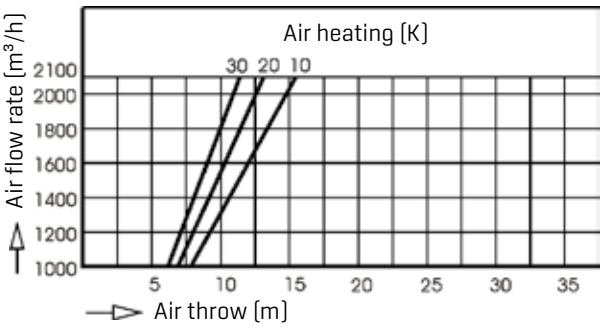
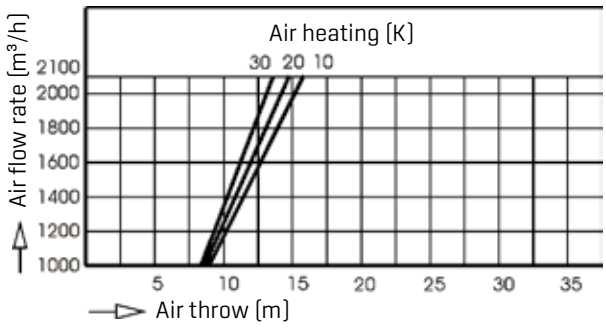
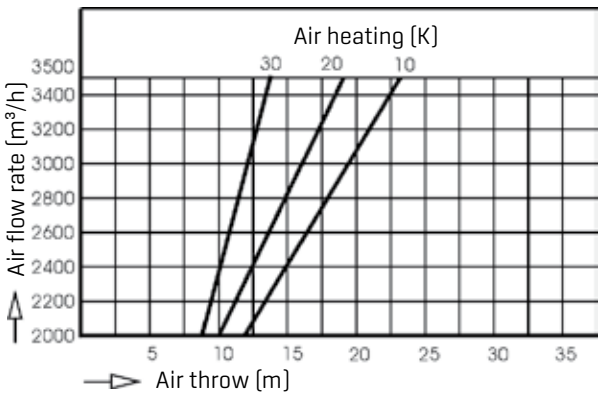
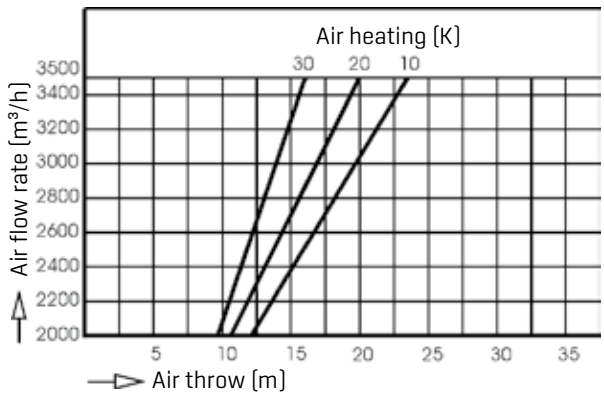
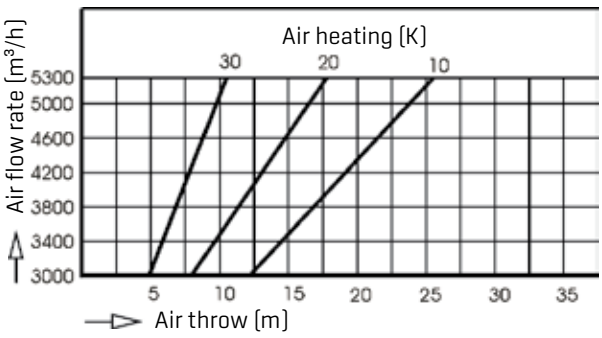
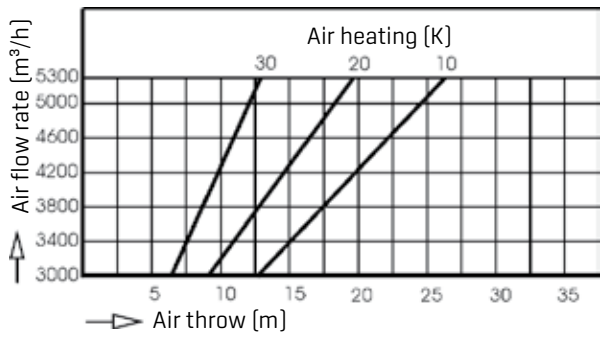
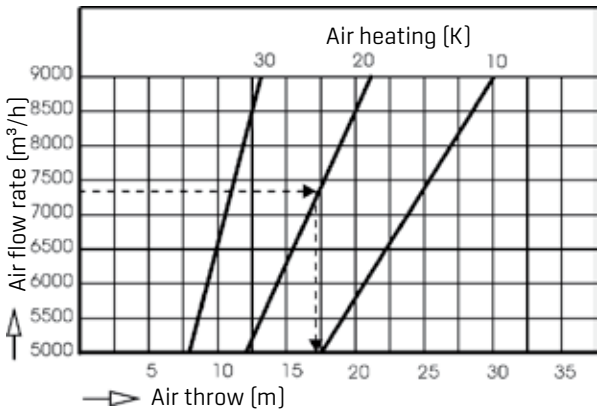
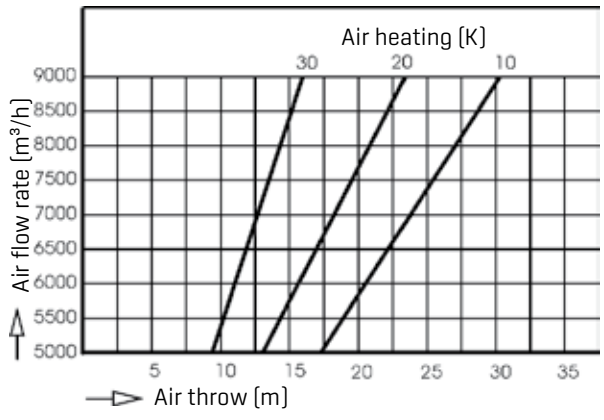
Parallel connection of multiple LH-EC 40 - 100 units via LM2 ventilation module



Up to five LH-EC 40 - 100 units can be operated at variable speed with one LM2 ventilation module.

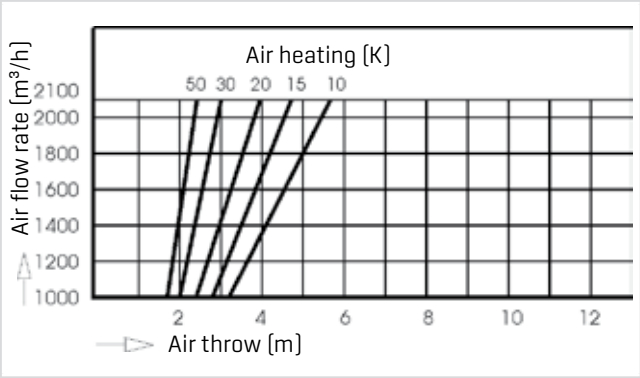
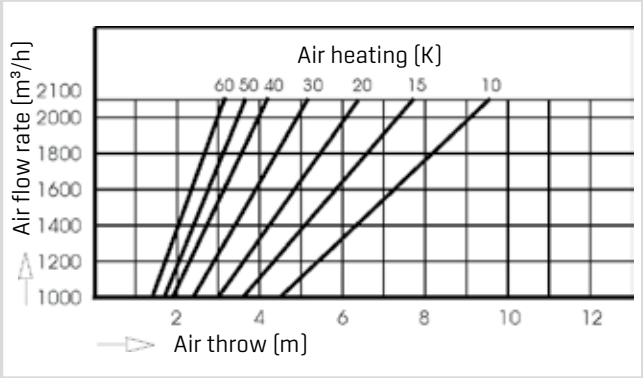
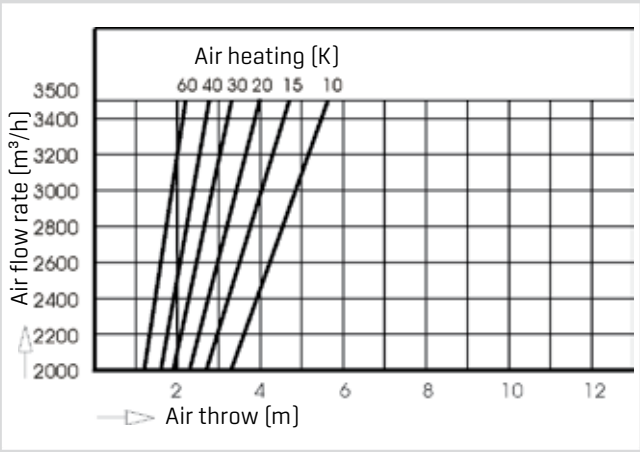
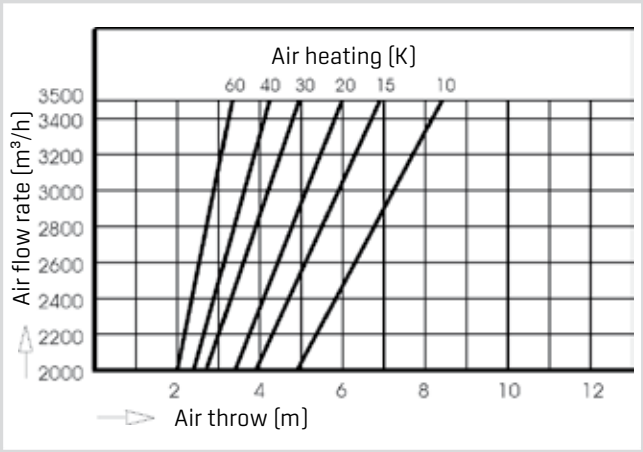
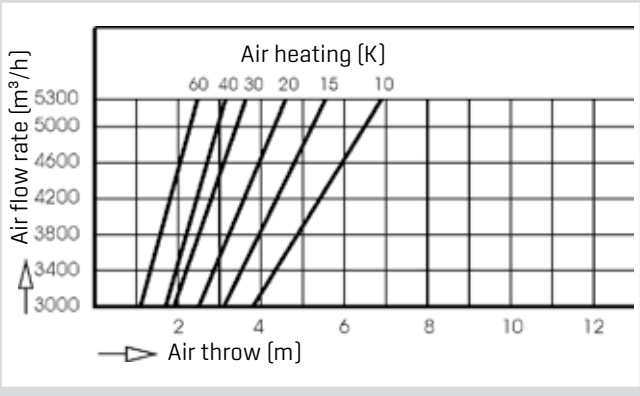
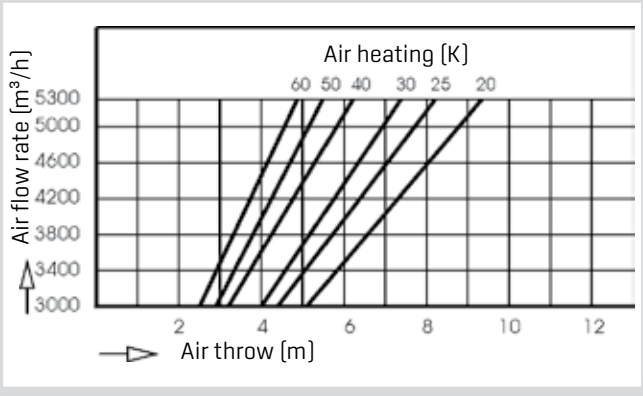
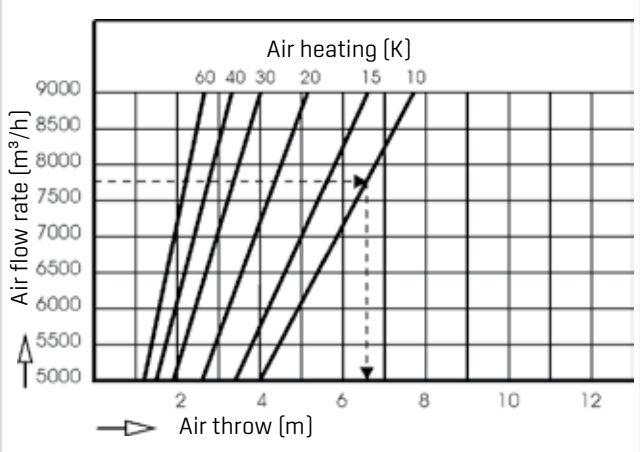
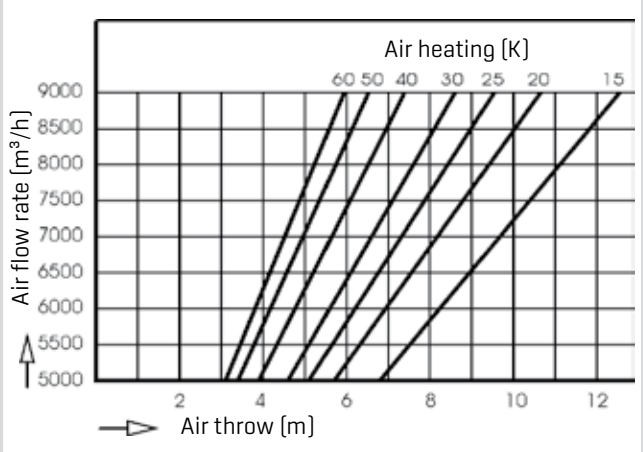
Control of LH-EC 25 via LM2 ventilation module on request.

THE HORIZONTAL AIR THROW IS THE DISTANCE TRAVELLED BY THE WARM AIR DISCHARGED BY A WALL MOUNTED LH-EC / LH UNIT

	With discharge louvre or wide spread discharge	With discharge louvre or discharge cross
LH-EC / LH 25		
LH-EC / LH 40		
LH-EC / LH 63		
LH-EC / LH 100		

Example: LH 100 with discharge louvre; $\Delta t_L = t_{LAeff} - t_{Raum}$ = 20 K; air volume = 7300 m³/h
Result: horizontal air throw = 17 m

THE VERTICAL AIR THROW IS THE DISTANCE TRAVELLED BY THE WARM AIR DISCHARGED BY AN LH-EC / LH CEILING UNIT

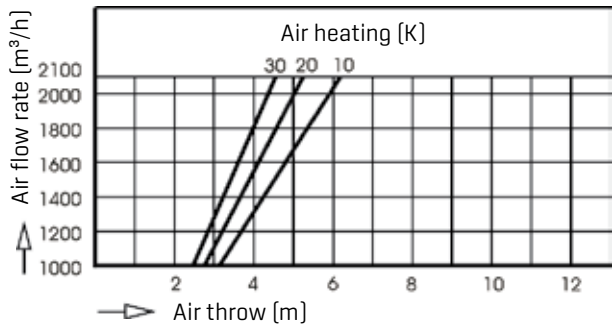
	With discharge louvre or wide spread discharge	With discharge louvre or discharge cross
LH-EC / LH 25		
LH-EC / LH 40		
LH-EC / LH 63		
LH-EC / LH 100		

Example: LH 100 with discharge louvre; $\Delta t_L = t_{LAeff} - t_{Raum}$ = 10 K; air volume = 7750 m³/h
Result: vertical air throw = 6.6 m

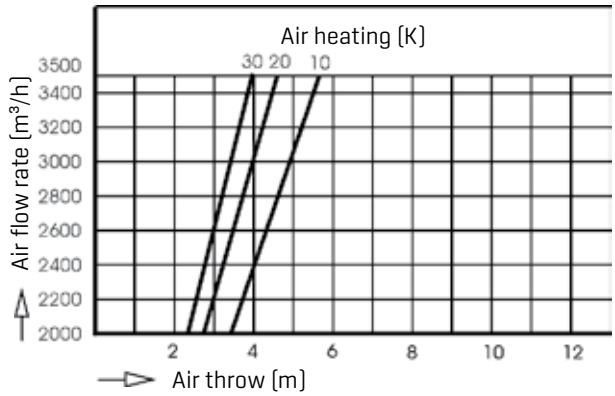
THE VERTICAL AIR THROW IS THE DISTANCE TRAVELLED BY THE WARM AIR DISCHARGED BY AN LH-EC / LH CEILING UNIT

With discharge louvre or wide spread discharge

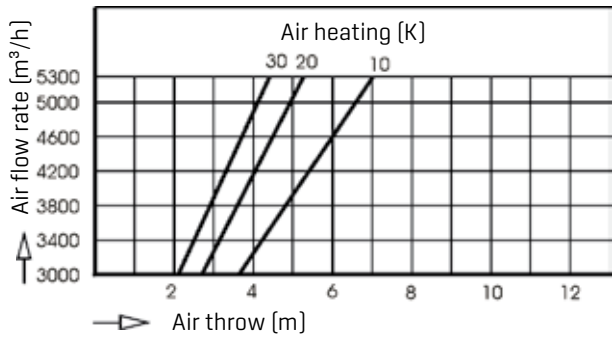
LH-EC / LH 25



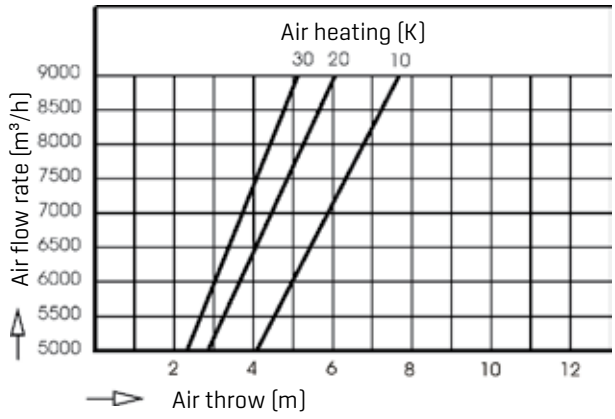
LH-EC / LH 40



LH-EC / LH 63



LH-EC / LH 100



SYMBOLS

Conversion:

1 Pa = 0.1 mm WS
1 kPa = 1000 Pa

$\dot{V}$	= flow rate	m^3/h
$\dot{V}_B$	= reference flow rate	m^3/h
$\dot{V}_0$	= catalogue flow rate	m^3/h
$\dot{V}_{eff}$	= effective flow rate	m^3/h
t_{LE}	= air intake temperature	°C
t_{LA}	= air discharge temperature	°C
t_{LAeff}	= effective air discharge temperature	°C
Δt_L	= air heating	K
Δt_W	= temp. spread of water	K
W	= amount of water	m^3/h
$\dot{Q}$	= thermal output	kW
$\dot{Q}_0$	= catalogue thermal output	kW
$\dot{Q}_{eff}$	= effective thermal output	kW
Δp	= air pressure drop	Pa
Δp_W	= water pressure drop	kPa
e	= heating factor	
q_{eff}	= heating output factor	
l_{eff}	= air flow rate factor	
K	= accessory index for entire unit	

Accessory index K:

Mixing box	3
Four-way discharge	2
Discharge nozzle	2
Discharge cone	2
Wide spread discharge	0
Filter, clean	5
Intake duct	2
Rain hood	2
Intake louvre	7
Non-return flap	3
Outdoor air box	0
Recirculation air box	0
Intake hood	1
Discharge cross	1
Induction louvre (wall)	2
Induction louvre (ceiling)	3

For on-site accessories, calculate k:

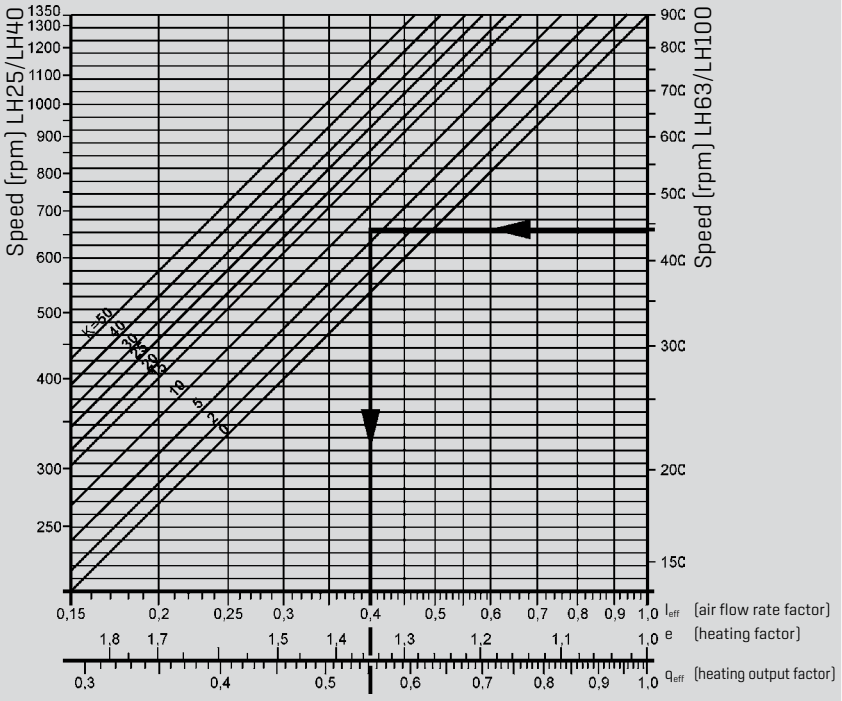
$$k = 0.1 \cdot \Delta p \cdot \left[\frac{\dot{V}_B}{\dot{V}}\right]^2$$

Δp = air pressure drop (Pa) at $\dot{V}$ (m^3/h)

$\dot{V}$ = flow rate (m^3/h) at Δp (Pa)

LH	$\dot{V}_B$
25	2000 m^3/h
40	3000 m^3/h
63	6000 m^3/h
100	10000 m^3/h

PERFORMANCE DIAGRAM



EXAMPLE

Assuming:

LH 100 type 4, t_{LE} = -5 °C, LPHW 50/40

From performance table on page 20: (always take figures for high speed, because correction factors for operation at lower speeds are taken into account in the performance diagram.)

$\dot{V}_0$ = 7700 m^3/h
$\dot{Q}_0$ = 96.1 kW
t_{LA} = 29 °C
Δt_{LO} = (29+5) K = 34 K

Supply voltage 3 x 400 V Δ with
5-step switch, set to step 1
From speed table on page 55: 440 rpm

Accessories: mixing box k = 3;
On-site accessories: fresh air duct

Δp = 10 Pa at 5000 m^3/h

$$k = 0.1 \cdot 10 \cdot \left[\frac{10000}{5000}\right]^2$$

k = 4
k = 3 + 4 = 7

LH 100, 440 rpm, k = 7

From performance diagram:

l_{eff} = 0.4
e = 1.35
q_{eff} = 0.55

Find:

Effective air flow rate	$\dot{V}_{eff}$
Effective air heating	$\Delta t_{L\,eff}$
Effective air discharge temp.	$t_{LA\,eff}$
Effective heating output	$\dot{Q}_{eff}$
Water flow rate	W
Water pressure drop	Δp_w

Solution:

$\dot{V}_{eff} = \dot{V}_0 \cdot l_{eff}$ = 7700 m^3/h · 0.4 = 3080 m^3/h

$\Delta t_{L\,eff} = \Delta t_{LO} \cdot e$ = 34 K · 1.35 = 45.9 K

$t_{LA\,eff} = t_{LE} + \Delta t_{L\,eff}$ = -5 + 45.9 °C = 40.9 °C

$\dot{Q}_{eff} = \dot{Q}_0 \cdot q_{eff}$ = 96.1 kW · 0.55 = 52.9 kW

$$w = \frac{0.86 \cdot \dot{Q}_{eff}}{\Delta t_w} = \frac{0.86 \cdot 52.9}{10} = 4.5\ m^3/h$$

Δp_w (see diagram on page 20) = 8.5 kPa

LH-EC UNIT HEATER
SOUND PRESSURE LEVEL

SOUND PRESSURE LEVEL/SOUND POWER LEVEL SUBJECT TO SPEED

	LH-EC 25			LH-EC 40			LH-EC 63			LH-EC 100		
Control voltage	Speed	Sound power level	Sound pressure level*	Speed	Sound power level	Sound pressure level*	Speed	Sound power level	Sound pressure level*	Speed	Sound power level	Sound pressure level*
V	rpm	dBA	dBA 2 m	rpm	dBA	dBA 2 m	rpm	dBA	dBA 2 m	rpm	dBA	dBA 2 m
10	1500	72	59	1350	74	62	1000	74	63	900	72	63
9	1450	70	58	1330	74	62	950	73	62	860	71	62
8	1320	67	55	1300	73	61	850	69	59	810	70	60
7	1170	64	52	1170	70	58	750	66	55	720	66	57
6	1020	61	49	1010	66	54	640	62	51	610	63	53
5	860	56	44	850	61	50	530	58	47	510	58	48
4	700	50	39	670	55	43	430	52	41	410	54	45
3	540	43	32	490	49	37	320	44	34	305	47	40
2	370	34	26	330	41	28	210	34	27	205	39	32
1	220	25	22	160	39	25	105	33	26	100	38	32

* Sound pressure level measured in a room of average absorption, room size approx. 1500 m^3

SPEED TABLE FOR LH FAN MOTORS

SUPPLY VOLTAGE	STAGE	LH 25 Speed rpm	LH 40 Speed rpm	LH 63 Speed rpm	LH 100 Speed rpm
Single step switch					
3 x 400 V Δ	-	1350	1350	900	900
3 x 400 V Y	-	1000	1000	700	700
3 x 230 V Δ	-	1000	1000	700	700
Two-step switch					
3 x 400 V Δ	II	1350	1350	900	900
3 x 400 V Y	I	1000	1000	700	700
3 x 230 V Δ	II	1350	1350	900	900
Three-step switch					
3 x 400 V Δ	III	1350	1350	900	900
230 V Δ	II	1150	1150	800	750
140 V Δ	I	750	800	550	500
3 x 400 V Y	III	1000	1000	700	700
230 V Y	II	700	800	500	500
140 V Y	I	400	450	300	300
1 x 230 V	III	1350	1350	900	
145 V	II	1250	900	750	
105 V	I	750	600	500	
Five-step switch					
3 x 400 V Δ	V	1350	1350	900	900
280 V Δ	IV	1280	1300	850	840
230 V Δ	III	1210	1200	800	750
180 V Δ	II	1050	1090	710	620
140 V	I	800	800	550	500
3 x 400 V Y	V	1000	1000	700	700
3 x 230 V Δ	IV	800	840	590	540
	III	660	700	500	440
	II	490	550	400	350
	I	360	400	300	270
1 x 230 V	V	1350	1350	900	
160 V	IV	1290	1140	750	
145 V	III	1230	960	640	
130 V	II	1160	780	540	
105 V	I	750	650	500	

SOUND PRESSURE LEVEL/SOUND POWER LEVEL SUBJECT TO SPEED

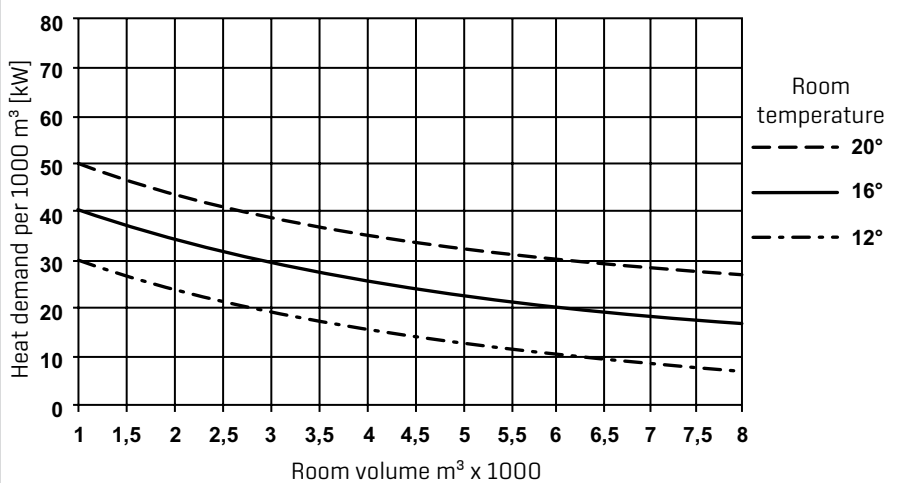
LH 25			LH 40			LH 63			LH 100		
Speed	Sound power level	Sound pressure level*	Speed	Sound power level	Sound pressure level*	Speed	Sound power level	Sound pressure level*	Speed	Sound power level	Sound pressure level*
rpm	dBA	dBA 2 m	rpm	dBA	dBA 2 m	rpm	dBA	dBA 2 m	rpm	dBA	dBA 2 m
1350	74	63	1350	78	67	900	77	66	900	82	71
1290	73	62	1300	77	66	850	76	65	840	80	69
1280	73	62	1200	75	64	800	74	63	750	78	67
1230	72	61	1140	74	63	750	73	62	700	76	65
1210	72	61	1090	73	62	710	71	60	620	74	63
1160	71	60	1000	72	61	700	71	60	540	71	60
1050	68	57	960	71	60	640	70	59	440	66	55
1000	68	57	840	68	57	590	68	57	350	61	50
860	64	53	780	66	55	560	67	56	270	56	45
800	63	52	700	64	53	540	66	55	220	51	40
660	58	47	580	60	49	500	64	53	160	44	33
530	53	42	550	58	47	400	59	48			
490	52	41	530	58	47	360	57	46			
430	49	38	490	56	45	300	53	42			
360	45	34	400	51	40	280	52	41			
320	43	32	380	50	39	210	45	34			
240	36	25	280	44	33						

* Sound pressure level determined for a room of average absorption, room size approx. 1500 m³.

APPROXIMATE HEAT DEMAND CALCULATION

A precise calculation of the heat demand in accordance with DIN 4701 is also recommended when sizing unit heaters. However, a precise calculation is often not possible due to a lack of time or incomplete data relating to the design.
The diagram below can be used to determine the approximate heat demand.

Design: Exterior walls: 25 cm brick or equivalent
Roofing: aerated concrete or equivalent
Heating in recirculation air operation



Correction factors

Additions:

Corrugated roof, uninsulated	+40 %
Corrugated roof, thinly insulated	+20 %
Wooden roof with tar paper or sheet steel	+20 %
External metal wall, uninsulated	+20 %
Extremely narrow halls	+20 %
Large window in external wall	+10 %

Deductions:

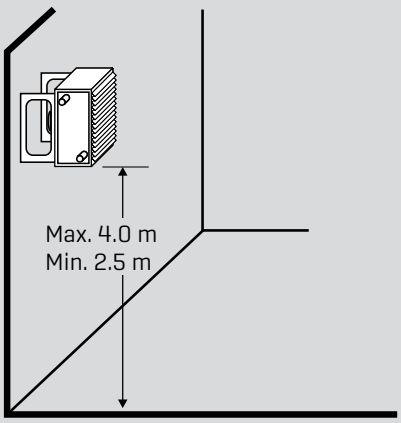
External wall 75 % adjoining another building	-15 %
External wall 50 % adjoining another building	-10 %
External wall without windows, solid brick	-30 %
Heated upper floor	-30 %
For each side with a heated adjoining room	-10 %

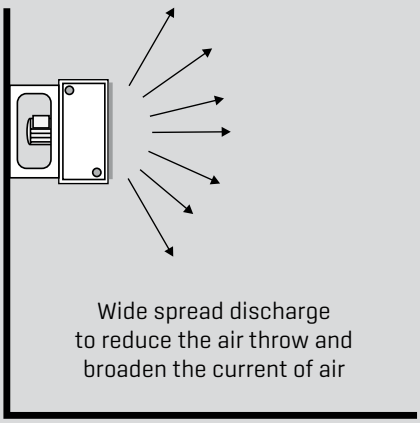
GENERAL INFORMATION ON DESIGN

Required air flow rate (m^3/h) at least 2.5 and preferably 3-4 times the room volume.
Never direct immediately towards occupants.
Distance between units 10-15 m.
Distance from floor for wall mounted units at least 2.5 m and max. 4 m.
Observe air throw.
Use wide spread discharge if unit heater is not far from opposite wall.
Use discharge cone or induction louvre if air throw of ceiling unit is insufficient with standard discharge louvre.
Use four-way discharge in low-ceilinged rooms if distance from bottom of discharge louvres to floor is less than approx. 2.5 m.

Installation of wall mounted unit (recomm. discharge temp. 35 °C)

In dusty rooms, we recommend filter sections to protect the fins. Filters require regular maintenance and must be accessible.

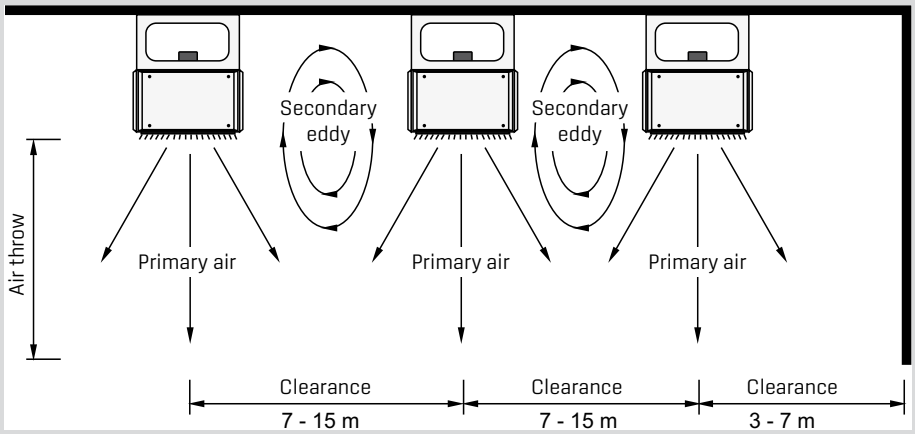


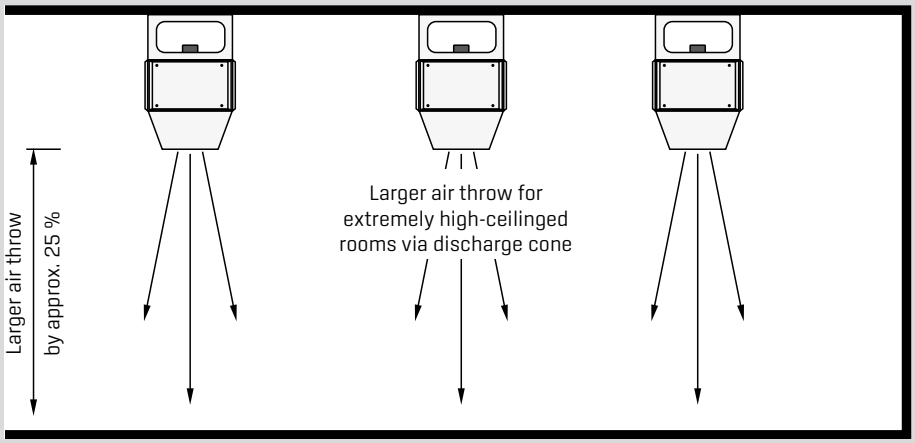


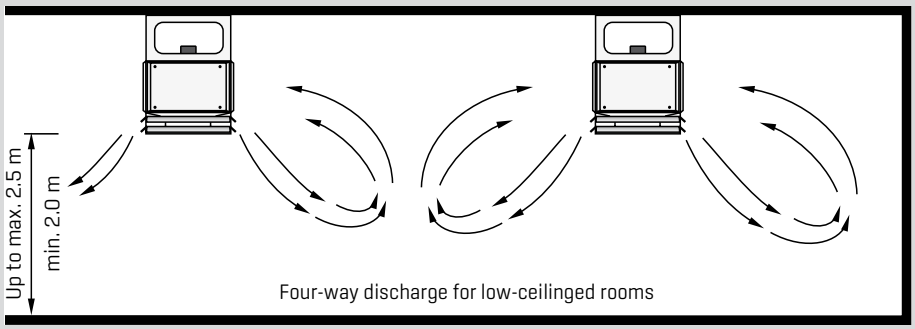
CLEARANCES

Clearances for LH-EC / LH ceiling unit or wall mounted unit in m

LH-EC / LH	LH-EC / LH to LH-EC / LH	LH-EC / LH to wall
25	7 - 9	3 - 4
40	9 - 11	3 - 5
63	11 - 13	4 - 6
100	13 - 15	5 - 7







Discharge accessories for optimum air distribution
Given the distances specified above, air heat increase Δt_L [= $t_{Ausblas}$ - t_{Raum}] of approx. 25 K and high speed

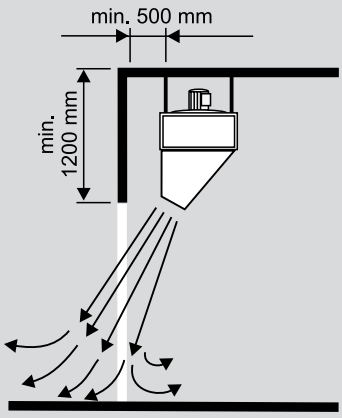
LH-EC / LH	25	40	63	100
Clearance: discharge/floor				
Up to 2.5 m	Four-way discharge	Four-way discharge	Four-way discharge	Four-way discharge
3-4 m	Wide spread discharge louvre	Wide spread discharge louvre	Wide spread discharge	Wide spread discharge
4-5 m	Cone	Cone	Louvre	Wide spread discharge
5-6 m	Cone	Cone	Cone	Louvre
From 6 m	Cone	Cone	Cone	Cone

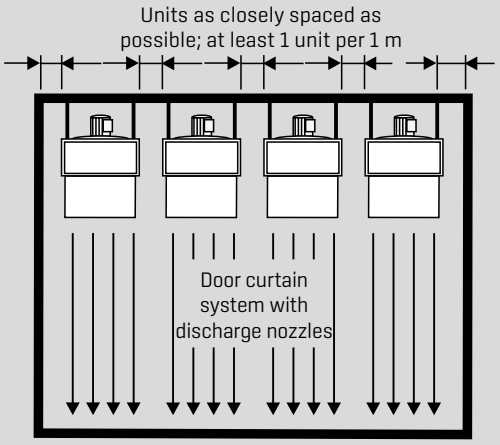
This accessory selection table is no longer valid at a temperature differential Δt_L of more than 30 K, because of the reduced penetration depth.

LH-EC / LH UNIT HEATER
TECHNICAL INFORMATION

Door curtain system with discharge nozzle

Position unit heaters right next to each other for a door curtain system. If requirements are high, use a double-row array. Discharge temperature 10-15 K above room temperature.





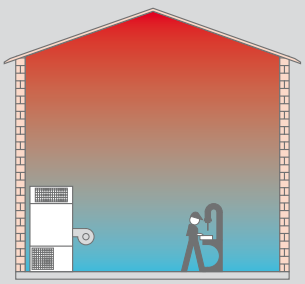
Additional LH-EC / LH unit heater without heat exchanger installed to improve air circulation

Flow rate for unit heaters without heat exchangers

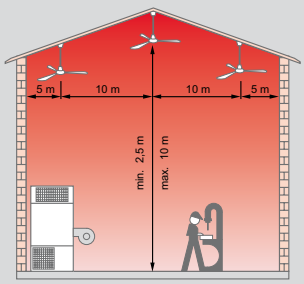
LH-EC / LH		25	40	63	100
Flow rate	m^3/h	1400/2400	2400/3950	3950/6000	6100/10700
Speed	rpm	1000/1350	1000/1350	700/900	700/900

CEILING FAN LD 15
TECHNICAL INFORMATION FOR CEILING FAN

The air throw of the LD 15 without temperature stratification is approx. 10 m. From a room height of 7 m, the LD 15 should be mounted vertically offset to achieve sufficient air throws. An LD 15 should be mounted at the highest point of the room to avoid warm air cushions under the ceiling.
Switching off ceiling fans while the hall doors are open (e.g. using door switches) helps to keep more warm air in the room. The ceiling fans should always be positioned so that there are no workplaces directly in the discharge cone.
The distances between the LD 15 units should not exceed 10 m and the distances to the side walls should not exceed 5 m. One LD 15 for an area of approx. 100 m^2 can be estimated. Depending on the room height and local conditions, this is approx. 2 units/100 m^2



Natural stratification



Homogenised stratification

CEILING FAN LD 15

For recirculation air operation and ceiling installation with statically and dynamically balanced blades.
Colour: traffic white RAL 9016

Ceiling fans push the heat build-up in the ceiling area back down to the living area in winter operation. Better temperature distribution both increases comfort and saves energy. In summer, a pleasant indoor environment can be created by air circulation.

SPECIFICATION

TYPE		LD 15
Number of blades		3
Diameter	cm	Ø 142
Installed height	cm	69
Air circulation	m^3/h	15,000
Speed	rpm	300
Operating voltage		230 V / 50 Hz
Power consumption	W	75
Max. current drawn	A	0.35
Sound pressure level*	dB(A)	34
Total weight	kg	10.5

* Sound pressure level at 5 m distance, measured in a room of average absorption, room size approx. 1500 m^3.

Warm air recirculation control system

With the warm air recirculation control system, temperature sensors in the floor and ceiling area capture the ambient temperature. The ceiling fan is switched on or off depending on the setting of the corresponding temperature differential.

Permiss. ambient temperature		-10 to 50 °C
Operating voltage		230 V / 50 Hz
Max. permiss. switching current		8 A (4 A motor power)
Switching contact		1 changeover contact, relay contact
Start differential	Δt On	1 to 10 K (recomm. 6 K)
Stop differential	Δt Off	1 to 10 K (recomm. 4 K)

Note:
When using warm air recirculation control systems, the sensors should not be installed next to doors, windows or uninsulated hot water pipes. The positioning of the sensors and the temperature spread Δt-On and Δt-Off settings on the temperature differential controller are vitally important to wellbeing. If necessary, these should be optimised by prior testing.

Variable speed controller

Speed controller for variable operation of max. five (3 A) or three (1.5 A) ceiling fans.

Permiss. ambient temperature	-10 to 35 °C
Operating voltage	230 V / 50 Hz
Max. permiss. switching current	1.5 A / 3 A

Suspension rods (on request)

To achieve sufficient air throws in high-ceilinged rooms (from approx. 7 m), suspension rods of different lengths are available on request for vertically offset installation of ceiling fans.

Length - suspension rod	cm	20	90	150	200
Installed height - ceiling fan	cm	44	114	174	224

LH-EC / LH UNIT HEATER
INSTALLATION EXAMPLES

GENERAL GUIDELINES:

Always position WOLF unit heaters so they do not direct air immediately towards people or machinery.

It is advisable to use a number of small heaters instead of one large unit in order to achieve even temperature distribution in the room. Where possible, position the units so that they increase air circulation rather than blowing against each other. Free intake of recirculation air must be ensured at all times.

The air throw of WOLF unit heaters should be set to suit the dimensions of the room. The figures in the performance tables are standard values that can be matched to the room dimensions through accessories such as a discharge cone, wide spread discharge and four-way discharge.

WOLF unit heaters give out very low levels of sound. The dB(A) values in the performance tables are averages, measured in a room of average absorption at a distance of 5 m from the unit heater.

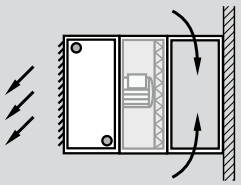
Overheating due to heat build-up can cause damage if ceiling unit motors are at a standstill. The flow temperature must therefore be limited to
115 °C with a filter box fitted
140 °C with no attachments fitted.

All control and shut-off valves must close automatically when the fan switches off.

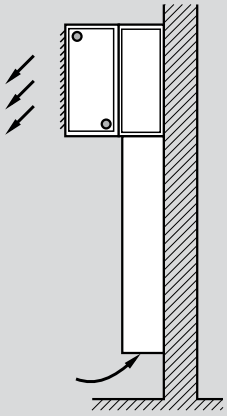
For outdoor air/mixed air mode, the requirements of VDI6022 must be met in Germany.

LH-EC / LH WALL MOUNTING

With filter box and bracket

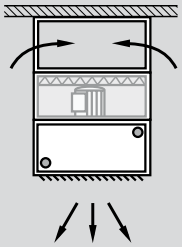


With recirculation air box

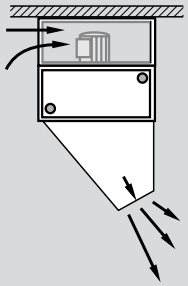


LH-EC / LH CEILING MOUNTING

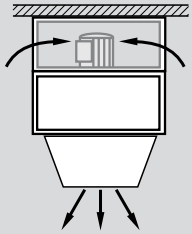
With bracket

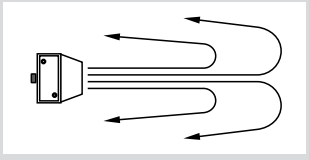


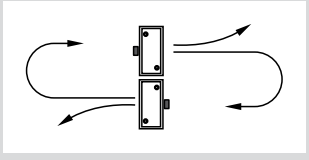
With discharge nozzle

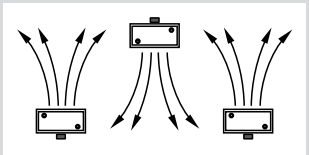


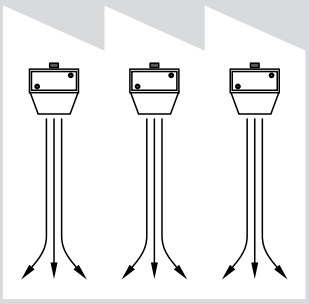
With discharge cone and bracket

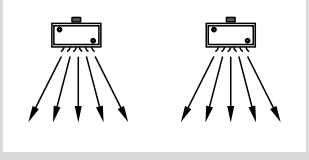


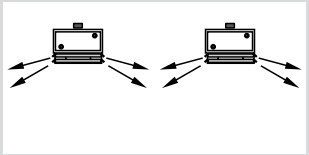










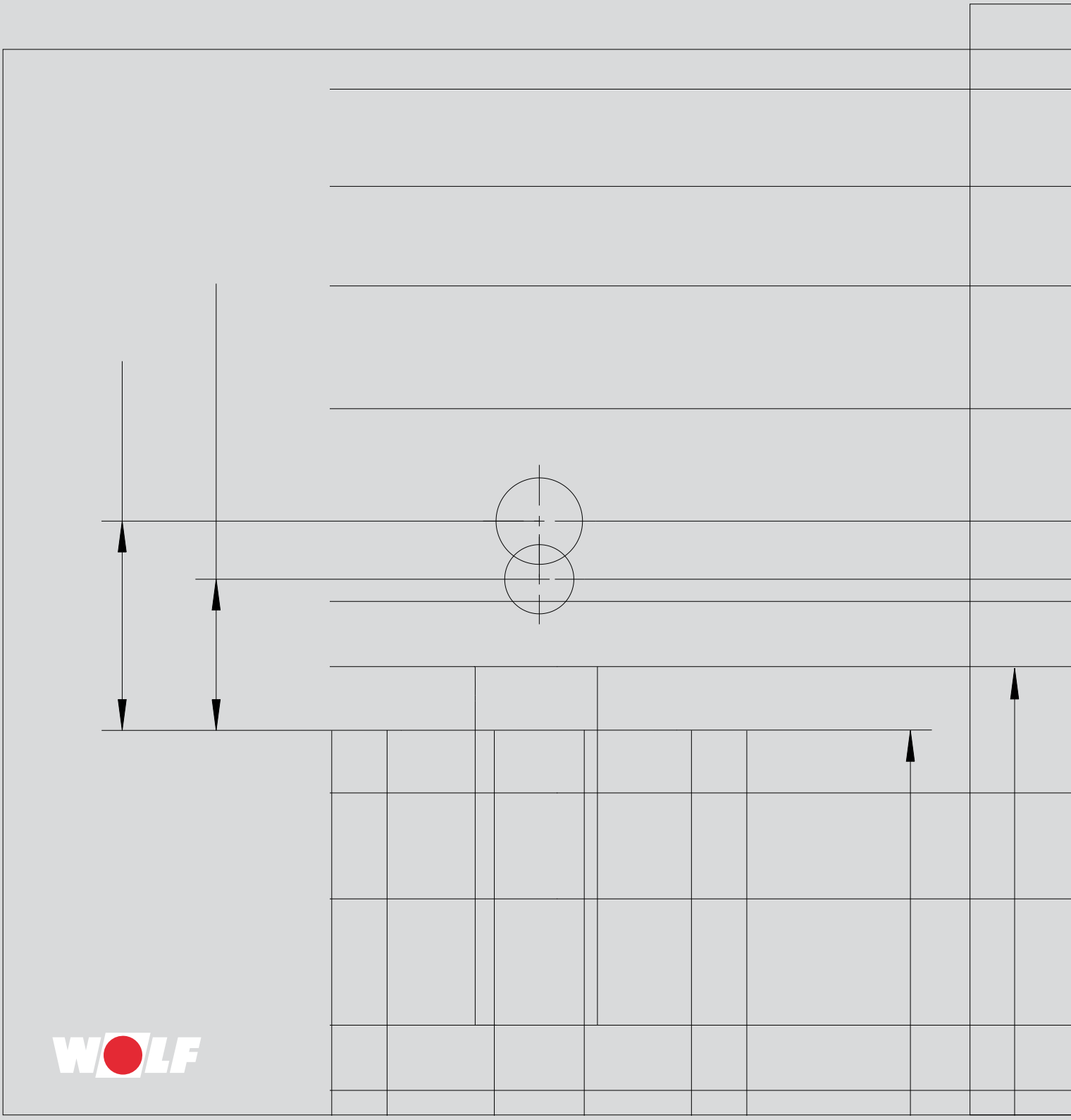


Weight in kg

Standard unit			LH-EC 25 LH 25	LH-EC 40 LH 40	LH-EC 60 LH 60	LH-EC 100 LH 100
LPHW and MPHW	Unit heater type 1	Cu/Al	24	32	48	76
	Unit heater type 2	Cu/Al	26	35	51	82
	Unit heater type 3	Cu/Al	27	36	52	84
	Unit heater type 4	Cu/Al	28	38	54	88
	Unit heater type 2	Zn-pl. st.	53	80	127	186
	Unit heater type 3	Zn-pl. st.	65	85	136	212
	Steam unit heater type D	Cu/Al		45	65	97
	Electric unit heater 6 kW		35	On request	On request	On request
	Electric unit heater 9 kW		23			
	Electric unit heater 12 kW		23			
Intake accessories						
	Mixing box		26	32	42	68
	Recirculation air box		16	28	31	50
	Filter box		13	16	20	37
Discharge accessories						
	Discharge nozzle		5	7	10	14
	Discharge cone		4	12	19	27
	Wide spread discharge		4	7	11	16
	Four-way discharge		5	7	13	16
	Discharge cross		0.4	0.5	1.1	1.3
	Induction louvre		3	4	7	9
	Adaptor cone				18	26
Miscellaneous fixing brackets (1 set)			3	3	9	9

Dealer address

WOLF GMBH / POSTFACH 1380 / D-84048 MAINBURG / TEL. +49.0.87 51 74-0 / FAX +49.0.87 51 74-16 00 / www.WOLF.eu



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