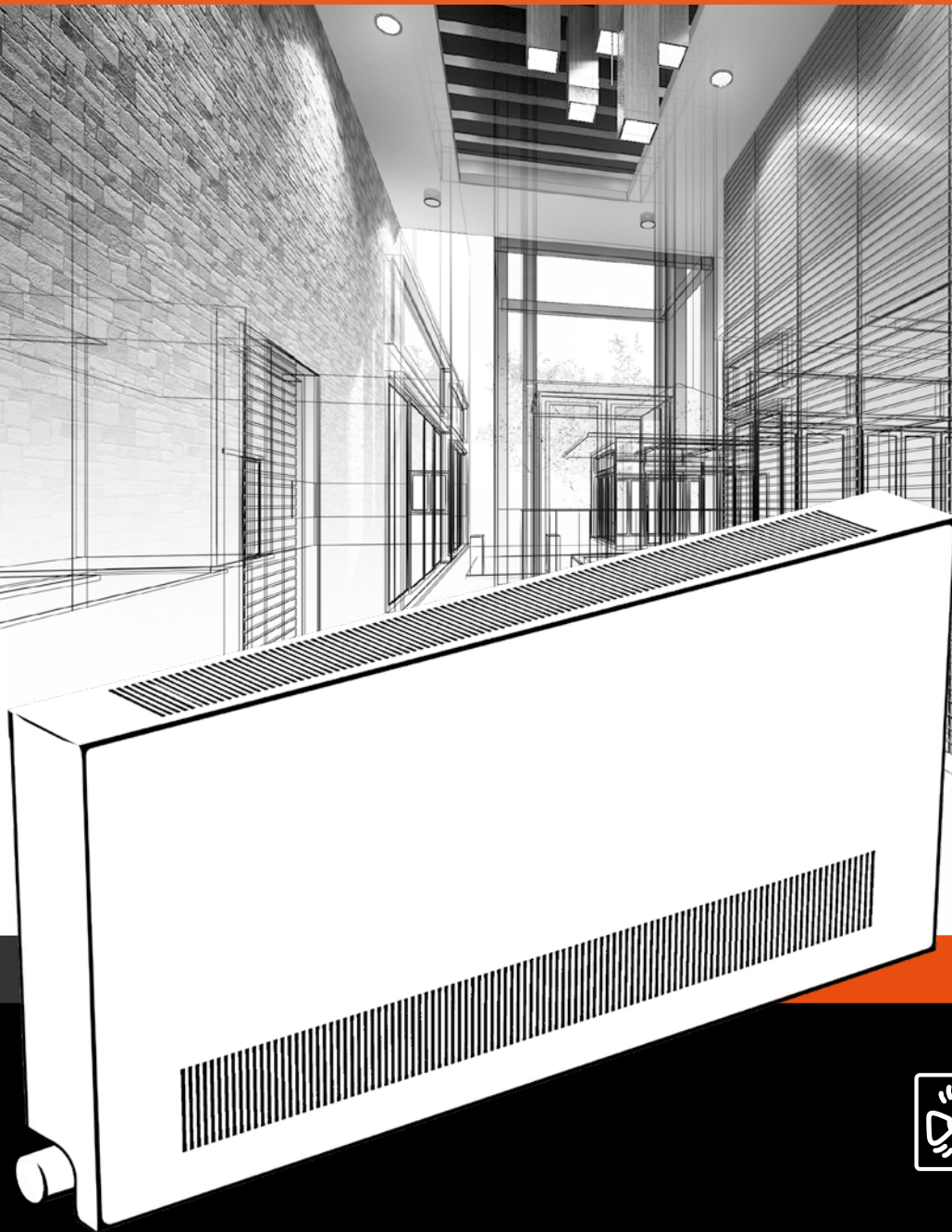


KORAWALL



Wall-mounted convectors with forced convection



THE KORADO GROUP

50 YEARS OF TRADITION

QUALITY – INTEGRITY – INNOVATION – DESIGN

The KORADO Group is a reliable partner for both small and large heating, cooling and heat recovery projects. Innovation guarantees high product quality and modern design, which is the basis for long-term cooperation.

SOLUTIONS FOR BUILDINGS OF ALL KINDS

Large-scale installations for shopping centres, or domestic heating at home? Standard or specially designed radiators, a bespoke convector, ventilation or heat recovery? The KORADO Group's comprehensive product portfolio offers a wide range of technical solutions for the ideal climate and interior design.

ECONOMIC, ECOLOGICAL AND EFFECTIVE THINKING

All our products are designed to reduce the energy consumption of buildings. Our heating units guarantee optimal performance, better air quality and lower energy consumption.

LICON s.r.o.

A 50-year tradition in the manufacture of convection heaters. A member of the KORADO group since 2013. LICON s.r.o. offers tailor-made projects for every type of building.



LICON s.r.o. convectors are sold all over the world. They are manufactured using the most up-to-date technology at our LICON plant in Liberec, Czech Republic.

The KORADO, a.s. Head Office and production site is a modern European plant manufacturing radiators and heating units. Our technological equipment and the layout of the 30.000 m² site ensures KORADO, a.s. looks forward to further development and growth.



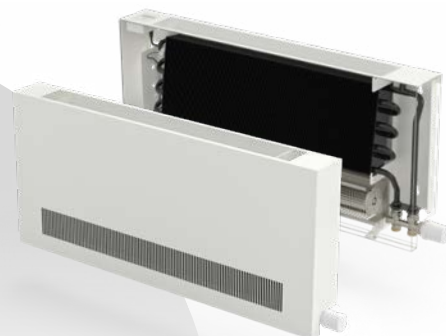
TRENCHHEATERS
KORAFLEX



FREE-STANDING
CONVECTORS
KORALINE



WALL-MOUNTED
CONVECTORS
KORAWALL



CONVECTORS
WITH FORCED
CONVECTION

FACADE
CONVECTORS
KORASPACE



CONVECTORS
WITH NATURAL
CONVECTION



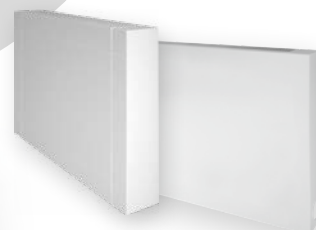
HEAT
EXCHANGERS
KORABASE



TRENCH HEATERS
KORAFLEX



FREE-STANDING
CONVECTORS
KORALINE



WALL-MOUNTED
CONVECTORS
KORAWALL

NEWS 2024

CENTRAL HEAT RECOVERY
UNITS **VENTBOX**



PRODUCT PORTFOLIO

We offer a very wide range of products under one brand which enables comprehensive solutions for all types of buildings and spaces, all of which contribute to maximum compatibility, simplicity of design and service, individual solutions and financial savings.

A solution for both high-temperature and low-temperature heat sources



Suitable for low temperature systems

– convectors achieve high efficiency even at low temperature gradients and are ideal for heating buildings where the heat source is a heat pump, solar system or condensing boiler.



Convectors with fans can provide effective heating and cooling – they cool in summer and heat in winter.



Convectors with fans can work at low temperature gradients – suitable for all types of heat pumps.

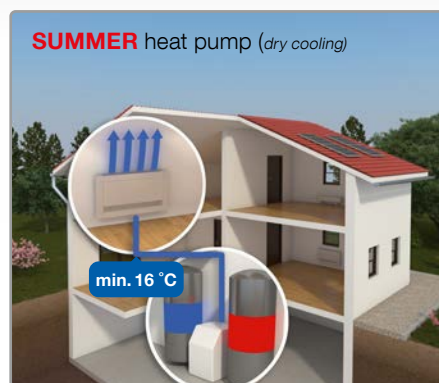
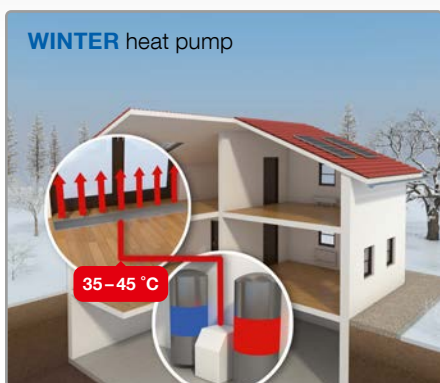


Low power consumption

– fans with low power consumption are used in the convector with forced convection.



High heat and cooling outputs – efficient solution for different types of heat sources.



KORAWALL Optimal-V WVO wall-mounted convector

CONTENTS

KORAWALL wall-mounted convectors with forced convection

KORAWALL Optimal-V WVO	10
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KORAWALL wall-mounted convectors with forced convection, autonomous control and main grid connection

KORAWALL Direct WVD – 24 V DC	16
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Regulation, Accessories,

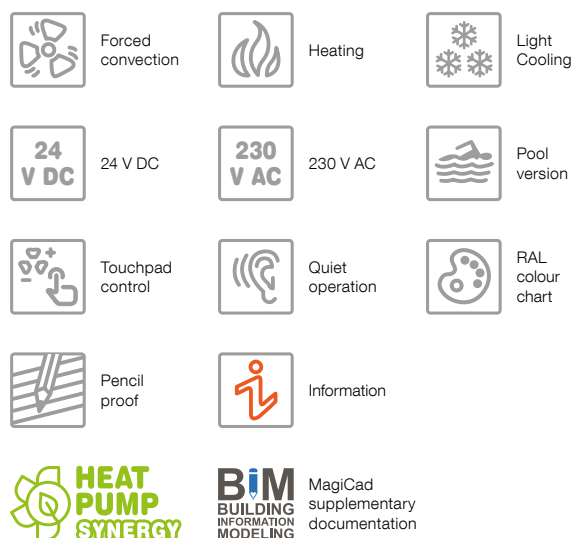
Technical Parameters and Acoustics

Regulation	22
Accessories	22
Wiring diagrams	25
Pressure losses	28
Convector assembly	28
Noise and acoustics	29
Example DC power supply size calculations	29

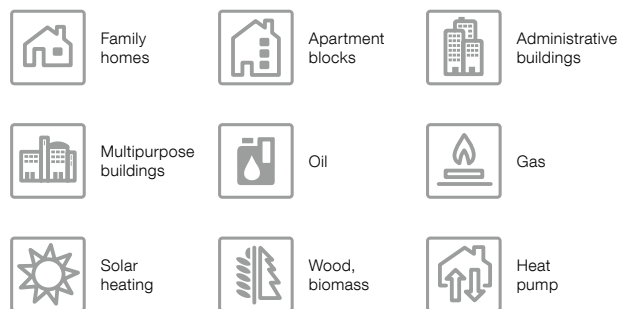
References

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Key to pictograms



Suitable applications of convectors



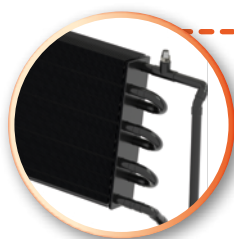
KORAWALL Direct WVD wall-mounted convector

KORAWALL WALL-MOUNTED CONVECTORS WITH FORCED CONVECTION



LIGHT COOLING

Energy-saving, condensation-free cooling.



HIGHLY EFFICIENT HEAT EXCHANGER

Sophisticated Al/Cu heat exchanger with RAL 9005 surface finish provides high heat output and is the heart of the wall-mounted convector.



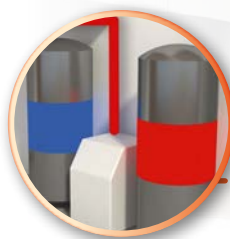
ACCURATE REGULATION

Simple operation using room thermostats. Easy adjustment of fan speed: reacts to temperature changes and thus ensures a pleasant resulting thermal comfort level within the room.



SUITABLE FOR LOW TEMPERATURE SYSTEMS

Convectors achieve high efficiency even at low temperature gradients and are ideal for heating buildings where the heat source is a heat pump, solar system or condensing boiler.



INCREASED HEAT OUTPUT

More efficient heating translates into financial savings and increased room temperature comfort.



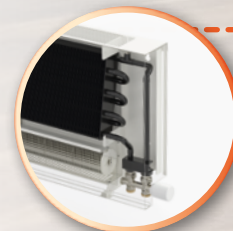
TIMELESS DESIGN

A modern look and choice of colours suitable for any interior.



UNIQUE FAN

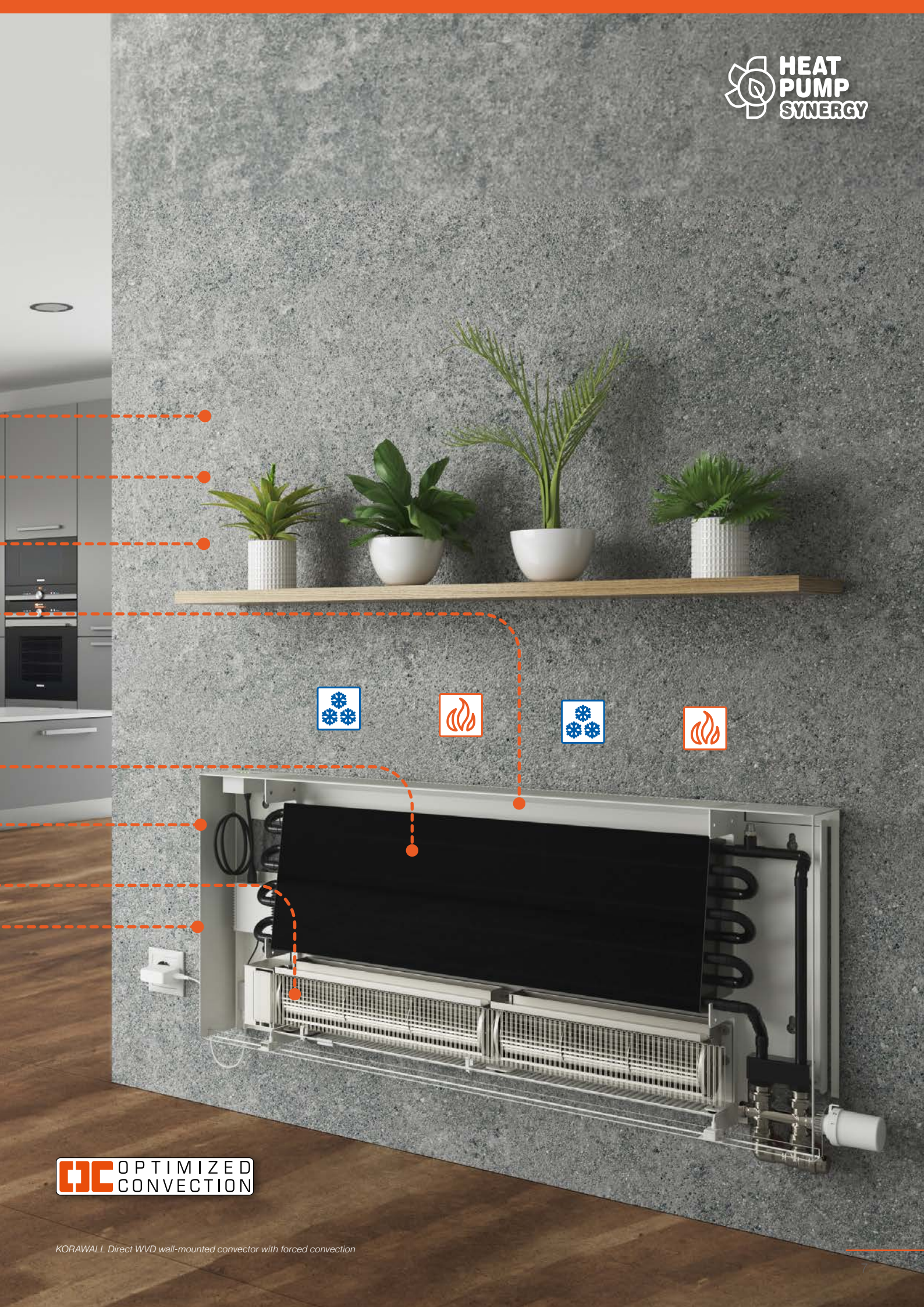
New low-energy EC fans with aluminium motors feature quiet operation and low-energy consumption.



POOL VERSION

Model line with stainless steel casing suitable for humid environments.

* custom production



OC OPTIMIZED
CONVECTION



Wall-mounted convector KORAWALL Optimal-V-WVO

KORAWALL

wall-mounted convectors
with forced convection



KORAWALL

Optimal-V WVO

HC OPTIMIZED CONVECTION

HEAT PUMP SYNERGY

Specification

Height	450 mm
Width	110 mm
Length	600, 750, 1 000, 1 250, 1 500, 1 750, 2 000 mm
Heat output	from 190 to 8 960 W
Cooling output	up to 1 419 W
Exchanger height	240 mm
Exchanger width	60 mm
Max. operating pressure	1.2 MPa
Max. operating temperature	90 °C
Surface temperature	40 °C*
Connection thread	internal G ½"
Hydraulic connection	bottom (right-side or left-side)



KORAWALL Optimal-V WVO wall-mounted convector is an efficient, energy-saving forced-convection heating unit and has a light cooling function. It is equipped with a set of high-performance, low-energy fans. Our wall-mounted units achieve high heating efficiency, even at low temperature gradients. Convectors with forced convection are ideal for installation situations with heat pumps, solar-energy systems, condensing boilers, or as an additional heat source for underfloor heating. They have the advantage of being a source of pleasant heat during the seasonal transition periods of the year. If needed, they can provide a rapid ambient temperature increase. Their light-cooling ability offers an additional option in summer. Wall-mounted convectors with fan can be operated via BMS. They react to changes in ambient temperature immediately, have very quiet operation and low surface temperature. These features of wall-mounted convectors with fan make them ideal for installation situations involving not only family houses or apartments, but also for use in public buildings.

Standard contents

- galvanized steel RAL 9016 white or RAL 9005 matt black casing
- weight-bearing part for anchoring the unit on wall in the colour of casing
- Al/Cu heat exchanger lacquered in black RAL 9005 with low water content, bleed valve and uniquely shaped fins for higher heat output
- a set of low-energy EC fans 24 V DC with terminal block and regulator
- dust filter
- installation instructions, installation template
- durable packaging

Optional accessories

- further RAL lacquers for casings available
- TEP 24 V DC thermoelectric actuator (see p. 23)
- LM straight/corner connection control valve (see p. 24)
- SIEMENS RDG 260T, RDG 260KN or RAB 21-DC room thermostats (see p. 22–23)
- QAA32 room temperature sensor (see p. 22)
- power supply (see p. 24)
- R-Box (see p. 24)

Note

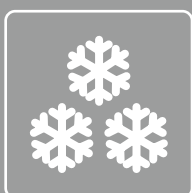
- Regulation elements are not included in the standard delivery package and must be ordered separately.
- Regulation elements are identical for all forced-convection products (OC system).



The unit is designed for cooling in the non-condensation zone only, i.e. above the dew-point temperature. The element is not equipped with condensate drainage.



forced convection heating



light cooling**



quiet operation



pencilproof grille



most RAL colour-chart lacquers available upon request

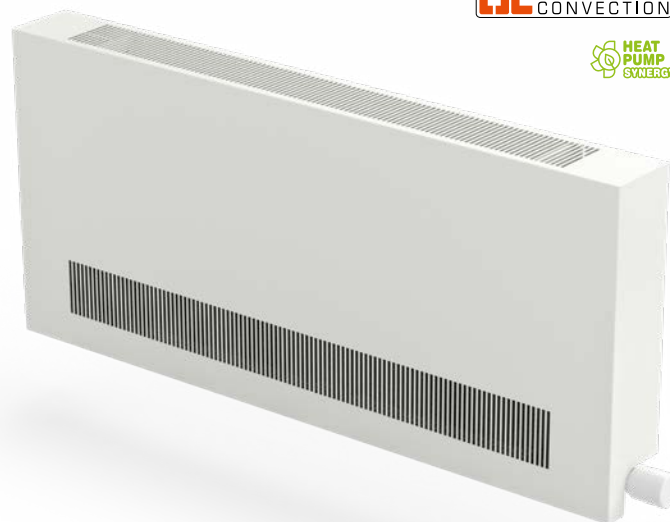
* according to inlet water temperature
** condensation-free

KORAWALL Pool-V WVP

Custom
production

HC OPTIMIZED
CONVECTION

HEAT
PUMP
SYNERGY



Specification

Height	450 mm
Width	110 mm
Length	600, 750, 1 000, 1 250, 1 500, 1 750, 2 000 mm
Heat output	from 190 to 8 960 W
Cooling output	up to 1 419 W
Exchanger height	240 mm
Exchanger width	60 mm
Max. operating pressure	1.2 MPa
Max. operating temperature	90 °C
Surface temperature	40 °C*
Connection thread	internal G ½"
Hydraulic connection	bottom (right-side or left-side)

KORAWALL Pool-V WVP wall-mounted convector is an efficient, energy-saving forced-convection heating unit and has a light cooling function designed for humid environments. The KORAWALL Pool-V WVP casing is made of AISI 316 stainless steel sheet metal. It is equipped with a heat exchanger and a set of high-performance, low-energy fans. Our wall-mounted units achieve high heating efficiency, even at low temperature gradients. Convectors with forced convection are ideal for installation situations with heat pumps, solar-energy systems, condensing boilers, or as an additional heat source for underfloor heating. They have the advantage of being a source of pleasant heat during the seasonal transition periods of the year. If needed, they can provide a rapid ambient temperature increase. Their light-cooling ability offers an additional option in summer. Wall-

-mounted convectors with fan can be operated via BMS. Due to their construction and surface finish, the KORAWALL Pool-V WVP convectors are ideal for any space with high air humidity levels (except for salt water pools and other sea-water environments).

Standard contents

- AISI 316 stainless steel RAL 9016 white or RAL 9005 matt black casing
- weight-bearing part for anchoring the unit on wall in the colour of casing
- Al/Cu heat exchanger lacquered in black RAL 9005 with low water content, bleed valve and uniquely shaped fins for higher heat output
- a set of low-energy EC fans 24 V DC with terminal block
- dust filter
- installation instructions, installation template
- durable packaging



KORAWALL Pool-V is a custom-made unit.
Delivery lead times and price are provided upon request.



The unit is designed for cooling in the non-condensation zone only, i.e. above the dew-point temperature. The unit is not equipped with condensate drainage.

Optional accessories

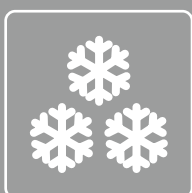
- further RAL lacquers for casings available
- TEP 24 V DC thermoelectric actuator (see p. 23)
- LM straight/corner connection control valve (see p. 24)
- SIEMENS RDG 260T, RDG 260KN or RAB 21-DC room thermostats (see p. 22–23)
- QAA32 room temperature sensor (see p. 22)
- power supply (see p. 24)
- R-Box (see p. 24)

Note

- Regulation elements are not included in the standard delivery package and must be ordered separately.
- Regulation elements are identical for all forced-convection products (OC system).



forced convection heating



light cooling**



suitable for humid
environments



quiet operation



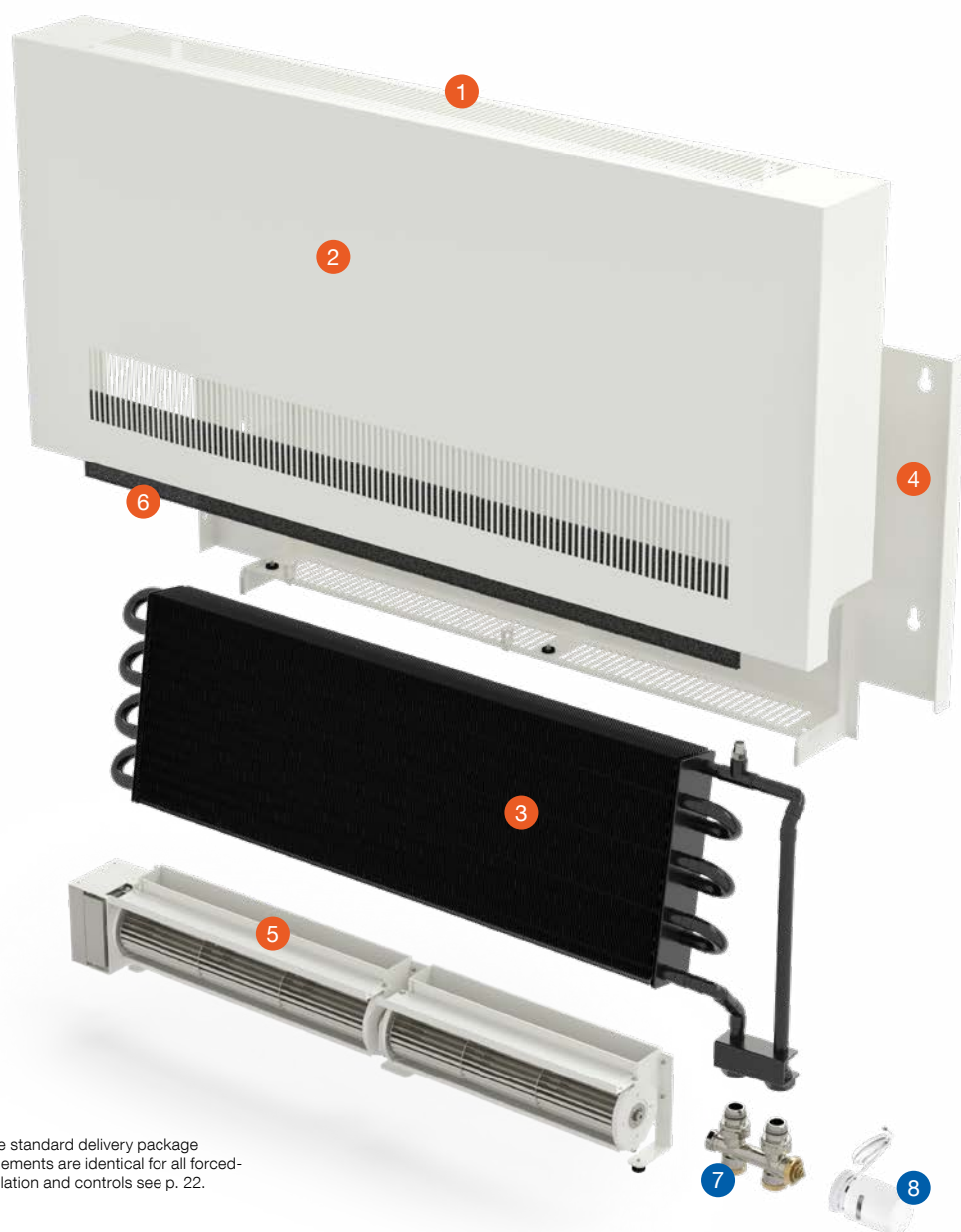
pencilproof grille

* according to inlet water temperature
** condensation-free

Convector composition

- 1 safety cover grille, punched into the casing
- 2 convector casing made of galvanized steel (KORAWALL WVO) or AISI 316 stainless steel (KORAWALL WVP) sheet metal
- 3 Al/Cu heat exchanger lacquered black RAL 9005
- 4 weight-bearing part for mounting the convector on the wall
- 5 a set of low-energy EC fans 24 V DC with terminal block
- 6 dust filter
- 7 LM thermostatic and control valve
- 8 thermoelectric actuator

- standard contents
- optional accessory KORAWALL Optimal-V WVO and KORAWALL Pool-V WVP optional accessories – see p. 10, 11



The regulation elements are not included in the standard delivery package and must be ordered separately. Regulation elements are identical for all forced-convection products (OC system). Electroregulation and controls see p. 22.



KORAWALL Optimal-V WVO

KORAWALL Pool-V WVP



height 450 mm / width 110 mm

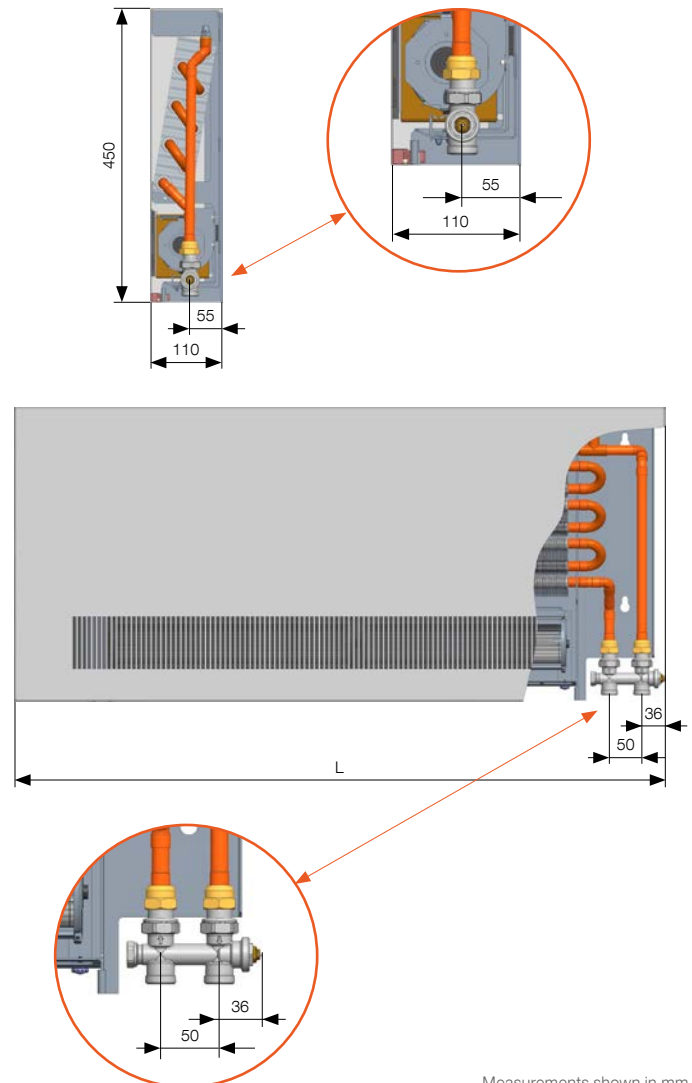
Heat outputs [W] at $t_1/t_2/t_i$ / EN 16430.

L [mm]	Fan speed setting	Heat output [W]				Cooling output 16/18/27 [°C]	Power consumption [W]	Acoustics	
		75/65/20 [°C]	55/45/20 [°C]	45/35/20 [°C]	35/30/20 [°C]			Sound pressure [dB(A)]	Sound power [dB(A)]
600	0	190	91	51	26	19	0	-	-
	1	1 058	619	404	247	140	2	23.2	31.2
	2	1 330	783	514	316	197	3	32.3	40.3
	3	1 688	1 003	664	411	267	6	40.8	48.8
750	0	278	134	75	38	28	0	-	-
	1	1 546	905	591	361	204	2	24.9	32.9
	2	1 944	1 145	752	462	288	3	34.0	42.0
	3	2 467	1 467	971	601	391	7	42.3	50.3
1000	0	424	204	114	58	42	0	-	-
	1	2 360	1 381	902	551	311	3	26.3	34.3
	2	2 967	1 747	1 148	705	440	4	35.2	43.2
	3	3 766	2 238	1 481	918	596	10	43.9	51.9
1250	0	570	274	153	78	57	0	-	-
	1	3 174	1 857	1 213	741	419	3	26.7	34.7
	2	3 991	2 350	1 543	948	592	5	35.3	43.3
	3	5 064	3 010	1 992	1 234	802	11	44.9	52.9
1500	0	716	345	192	98	71	0	-	-
	1	3 988	2 333	1 525	931	526	4	28.7	36.7
	2	5 014	2 952	1 939	1 191	744	8	37.4	45.4
	3	6 363	3 782	2 503	1 551	1 008	19	46.4	54.4
1750	0	863	415	232	118	85	0	-	-
	1	4 801	2 809	1 836	1 121	634	5	30.2	38.2
	2	6 037	3 555	2 335	1 434	895	9	38.9	46.9
	3	7 661	4 554	3 014	1 868	1 213	22	47.6	55.6
2000	0	1 009	485	271	138	100	0	-	-
	1	5 615	3 285	2 147	1 311	741	5	30.5	38.5
	2	7 060	4 157	2 730	1 677	1 047	10	39.0	47.0
	3	8 960	5 326	3 525	2 184	1 419	23	48.2	56.2

Temperature exponent [n] 1.0369 0.904



For cooling in the non-condensation zone only, i.e. above the dew-point temperature. The unit is not equipped with condensate drainage.



BASIC TECHNICAL DATA

KORAWALL Optimal-V WVO, KORAWALL Pool-V WVP							
Height [mm]	450						
Width [mm]	110						
Length [mm]	600	750	1 000	1 250	1 500	1 750	2 000
Unit weight [kg]	11	14	18	23	27	31	36
Water volume [l]	0.6	0.8	1.1	1.4	1.7	2.0	2.4
Effective part of the exchanger [mm]	L-275						

ORDER CODES

KORAWALL Optimal-V WVO

KORAWALL	Ventilator	Type	Length [cm]	Height [cm]	Width [cm]	Exchanger type	Exchanger colour	Casing material	Grille type	Connection type	Connection side	Colour code	Regulation
W	V	O Optimal-V	- ... /	45 /	11 -	V reversible	5 black RAL 9005	S steel	P perforated	S bottom	P right L left	- 10 white RAL 9016 - 39 matt black RAL 9005 ** colour code as per LICON colour chart see p. 31 99 other RAL colour	- RT standard regulation

Example order code: WVO-150/45/11-V5SPSP-10-RT

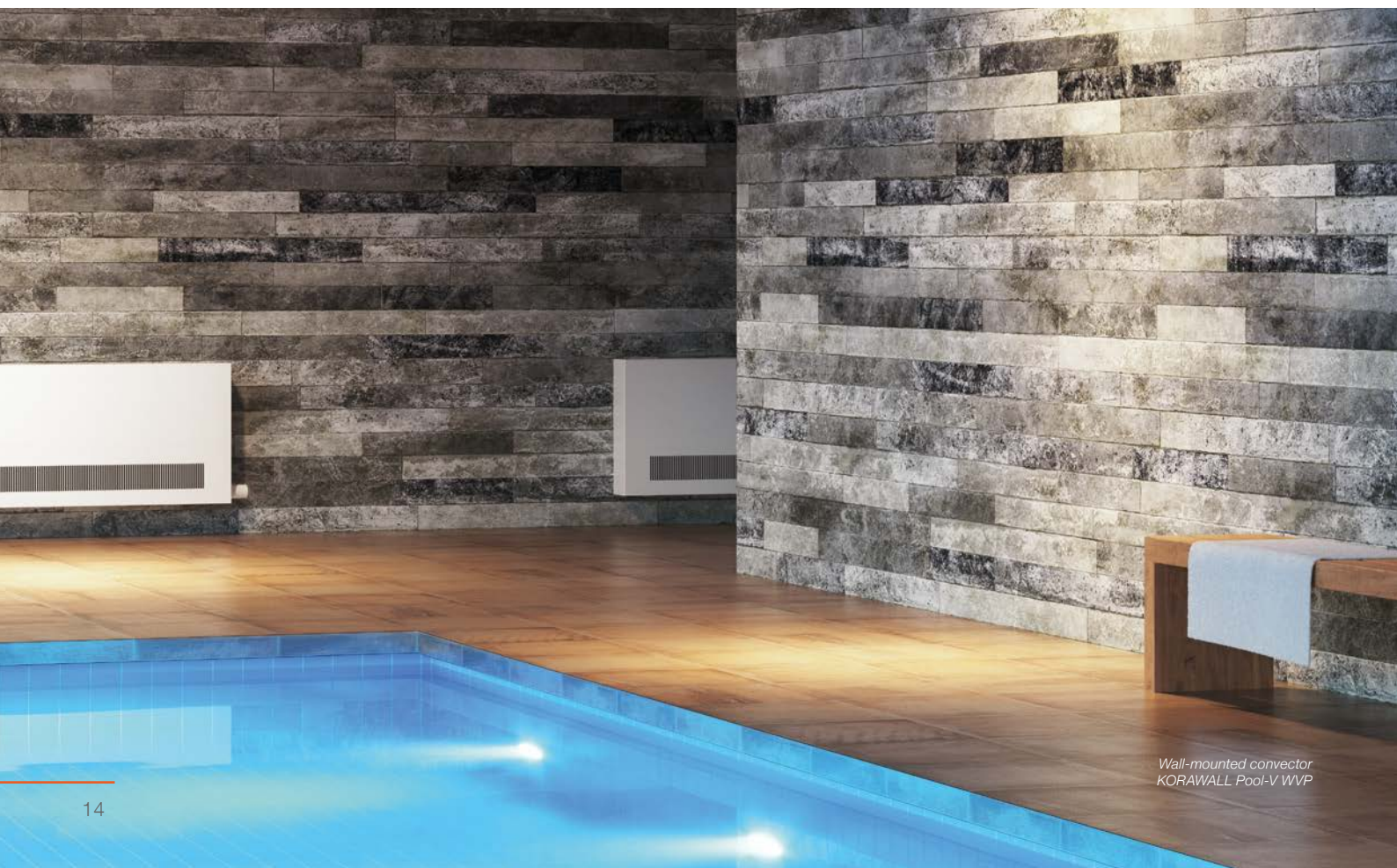
KORAWALL Optimal-V WVO wall-mounted convector, length 150 cm, height 45 cm, width 11 cm, sheet metal steel casing white RAL 9016, bottom right connection with standard regulation.

KORAWALL Pool-V WVP

KORAWALL	Ventilator	Type	Length [cm]	Height [cm]	Width [cm]	Exchanger type	Exchanger colour	Casing material	Grille type	Connection type	Connection side	Colour code	Regulation
W	V	P Pool-V	- ... /	45 /	11 -	V reversible	5 black RAL 9005	R stainless	P perforated	S bottom	P right L left	- 10 white RAL 9016 - 39 matt black RAL 9005 ** colour code as per LICON colour chart see p. 31 99 other RAL colour	- RT standard regulation

Example order code: WVP-150/45/11-V5RPSP-10-RT

Wall-mounted convector KORAWALL Pool-V WVP, length 150 cm, height 45 cm, width 11 cm, sheet metal colour white RAL 9016, connection bottom right with standard regulation.



Wall-mounted convector
KORAWALL Pool-V WVP

KORAWALL wall-mounted convectors with forced convection, autonomous control and main grid connection



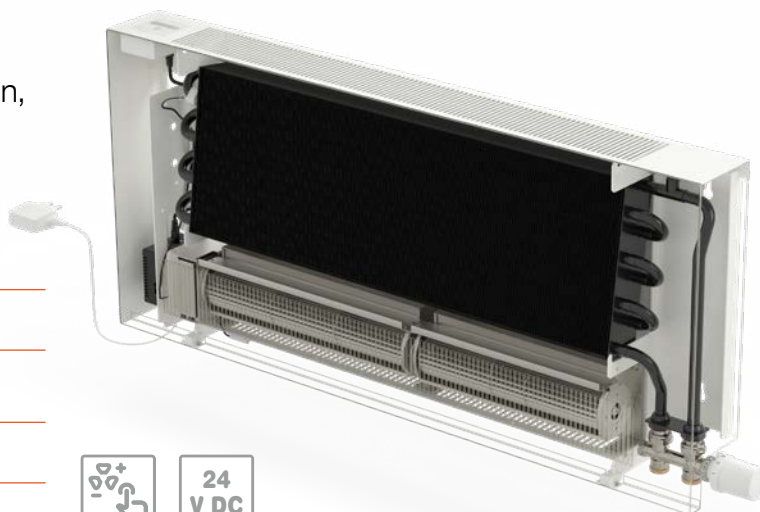
KORAWALL Direct WVD



Wall-mounted convector with forced convection, autonomous control and **24 V DC** connection.

Specification

Height	450 mm
Width	110 mm
Length	600, 750, 1 000, 1 250, 1 500, 1 750, 2 000 mm
Heat output	from 190 to 8 960 W
Cooling output	up to 1 419 W
Exchanger height	240 mm
Exchanger width	60 mm
Max. operating pressure	1.2 MPa
Max. operating temperature	90 °C
Surface temperature	40 °C*
Connection thread	internal G ½"
Hydraulic connection	bottom (right-side or left-side)



The **KORAWALL Direct WVD** wall-mounted 24 V DC convector is a powerful fan heater suitable for low temperature heating. The convector is equipped with a specially designed Al/Cu heat exchanger in RAL 9005 lacquer and a set of low energy quiet fans. The convector is equipped with an autonomous control with integrated keypad, allowing fans to be controlled directly on the unit. Connection to the mains is via a 24 V DC socket adapter. The convector achieves high heat outputs even at low temperature gradients, and in non-condensing zones it can also be used for aftercooling, which is particularly advantageous in the summer months. The convector is well suited for a range of building types from new builds, private houses, office buildings to refurbishments and wherever the heat source is a heat pump, solar system or condensing boiler.

Standard contents

- galvanized steel RAL 9016 white or RAL 9005 matt black casing
- electronic control panel with keypad in the colour of the casing (white, black)
- 230 V AC/24 V DC power supply (adapter)
- Al/Cu heat exchanger lacquered in black RAL 9005 with low water content, bleed valve and uniquely shaped fins for higher heat output
- weight-bearing part for anchoring the unit on wall in the colour of casing
- 24 V DC tangential low-energy EC fan assembly
- ambient temperature sensor and water temperature sensor located on the heat exchanger
- dust filter
- installation instructions, installation template
- durable packaging

Optional accessories

- casing finish according to RAL colour chart with control keypad in silver
- LM straight/corner connection control valve (see p. 24)
- thermostatic head (see p. 23)

Note

- regulation elements are not included in the standard delivery package



The unit is designed for cooling in the non-condensation zone only, i.e. above the dew-point temperature. The element is not equipped with condensate drainage.



forced convection heating



24 V DC connection



light cooling**



quiet operation



pencilproof grille



most RAL colour-chart lacqueres available upon request

* according to inlet water temperature
** condensation-free

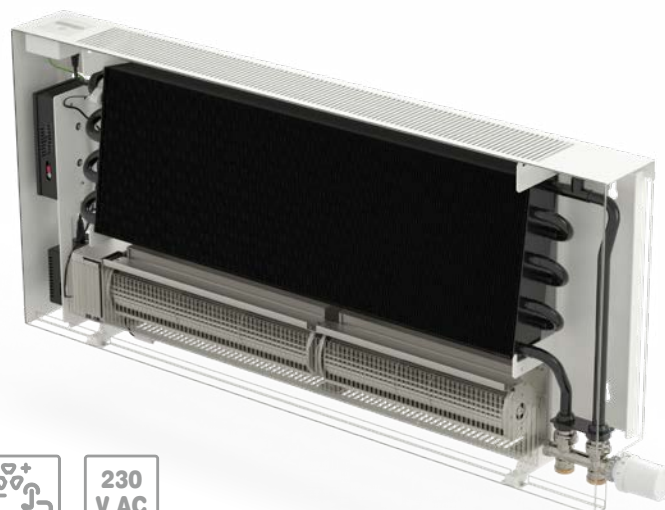
KORAWALL Energy WVE



Wall-mounted convector with forced convection, autonomous control and **230 V AC** connection.

Specification

Height	450 mm
Width	110 mm
Length	600, 750, 1 000, 1 250, 1 500, 1 750, 2 000 mm
Heat output	from 190 to 8 960 W
Cooling output	up to 1 419 W
Exchanger height	240 mm
Exchanger width	60 mm
Max. operating pressure	1.2 MPa
Max. operating temperature	90 °C
Surface temperature	40 °C*
Connection thread	internal G ½"
Hydraulic connection	bottom (right-side or left-side)



The **KORAWALL Energy WVE** wall-mounted 230 V AC convector is a powerful fan heater suitable for low temperature heating. The convector is equipped with a specially designed Al/Cu heat exchanger in RAL 9005 lacquer and a set of low energy quiet fans. The convector is equipped with an autonomous control with integrated keypad, allowing fans to be controlled directly on the unit. Connection to the mains is via a ready-to-use terminal block, securely incorporated inside the heater. The convector achieves high heat outputs even at low temperature gradients, and in non-condensing zones it can also be used for after-cooling, which is particularly advantageous in the summer months. The convector is well suited for a range of building types from new builds, private houses, office buildings to refurbishments and wherever the heat source is a heat pump, solar system or condensing boiler.

Standard contents

- galvanized steel RAL 9016 white or RAL 9005 matt black casing
- electronic control panel with keypad in the colour of the casing (white, black)
- 230 V AC/24 V DC power supply
- Al/Cu heat exchanger lacquered in black RAL 9005 with low water content, bleed valve and uniquely shaped fins for higher heat output
- weight-bearing part for anchoring the unit on wall in the colour of casing
- 24 V DC tangential low-energy EC fan assembly
- ambient temperature sensor and water temperature sensor located on the heat exchanger
- dust filter
- installation instructions, installation template
- durable packaging

Optional accessories

- casing finish according to RAL colour chart with control keypad in silver
- LM straight/corner connection control valve (see p. 24)
- thermostatic head (see p. 23)

Note

- regulation elements are not included in the standard delivery package



The unit is designed for cooling in the non-condensation zone only, i.e. above the dew-point temperature. The element is not equipped with condensate drainage.



forced convection heating



230 V AC connection



light cooling**



quiet operation



pencilproof grille



most RAL colour-chart lacquers available upon request

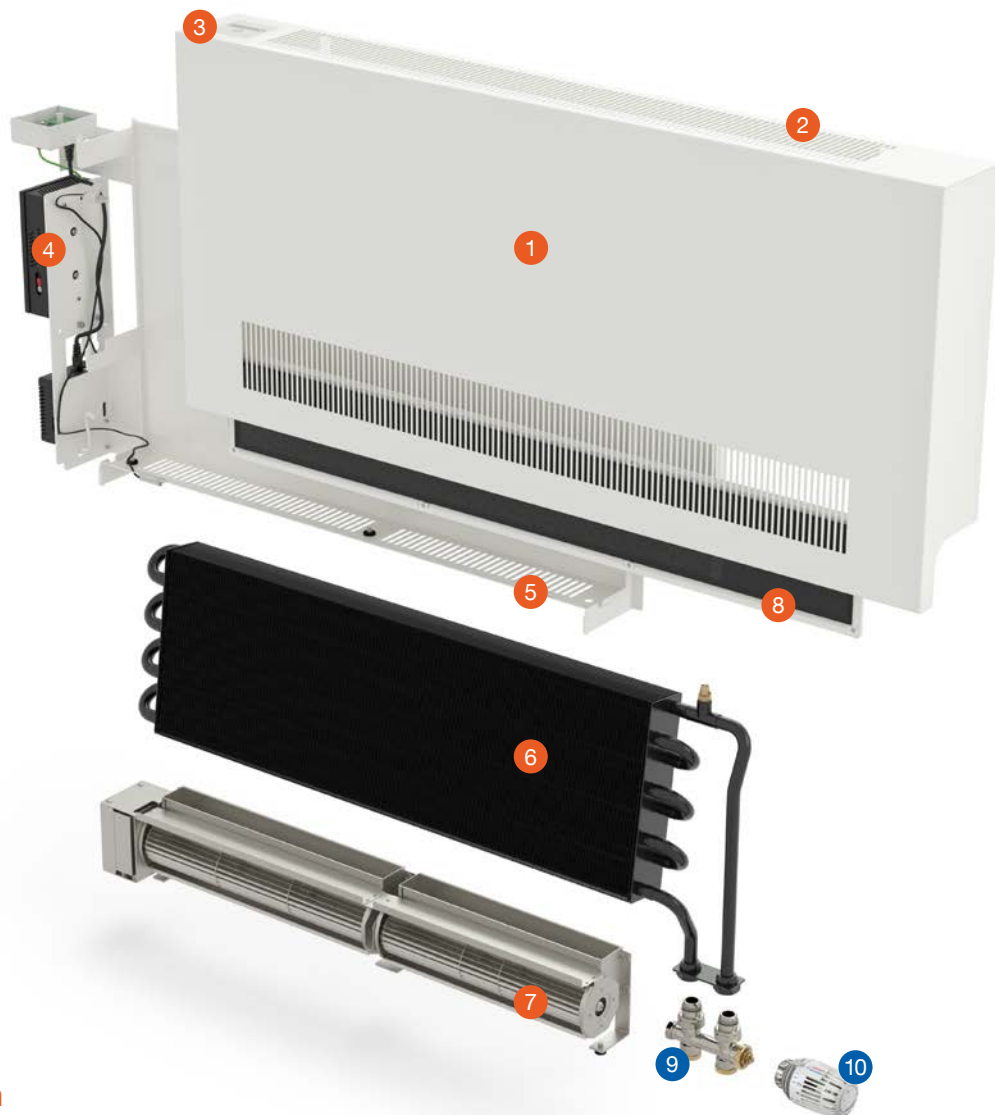
* according to inlet water temperature
** condensation-free

Convector composition

- 1 convector casing made of galvanized steel
- 2 safety cover grille, punched into the casing
- 3 control touchpad
- 4 power control
- 5 weight-bearing part for mounting the convector on the wall
- 6 Al/Cu heat exchanger lacquered RAL 9005
- 7 a set of low-energy EC fans 24 V DC
- 8 dust filter

- 9 LM thermostatic and control valve
- 10 thermostatic head heating/cooling

● standard contents
● optional accessories – see p. 16, 17



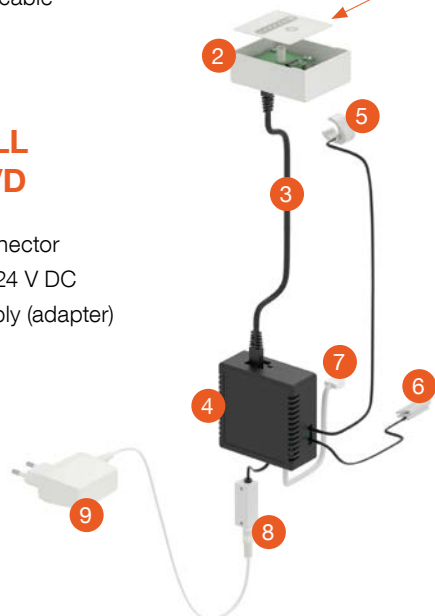
Power control composition

- 1 control touchpad
- 2 touchpad board
- 3 connecting cable
- 4 control unit
- 5 temp sensor (water)
- 6 temp sensor (room)
- 7 fan control cable



KORAWALL Direct WVD

- 8 supply connector
- 9 230 V AC/24 V DC power supply (adapter)



KORAWALL Energy WVE

- 10 grounding cable
- 11 230 V AC/24 V DC power supply



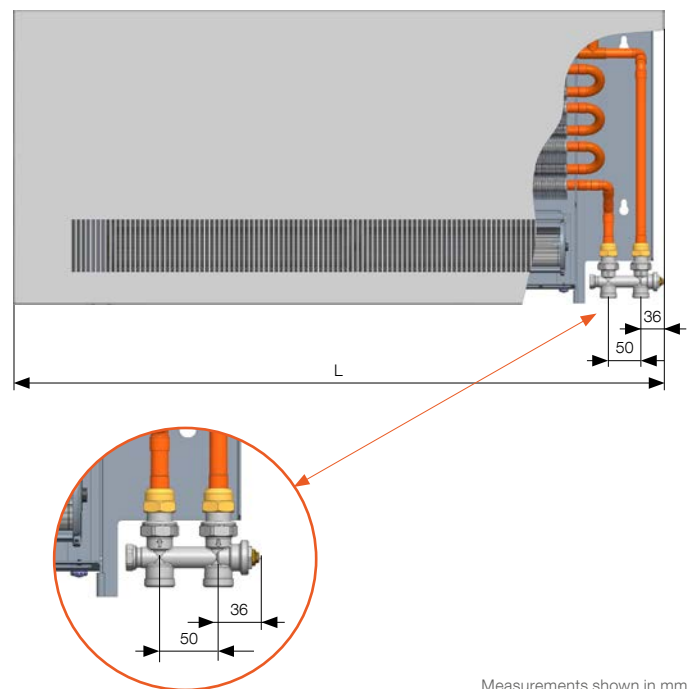
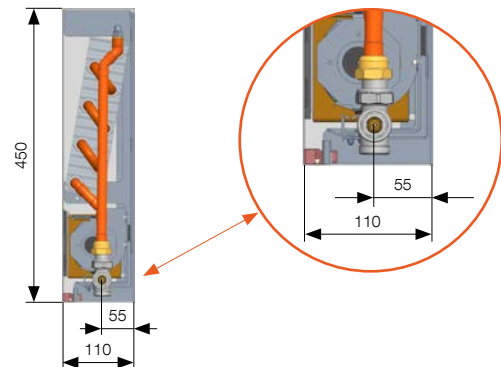
KORAWALL Direct WVD KORAWALL Energy WVE

height 450 mm / width 110 mm

Heat outputs [W] at $t_1/t_2/t_i$ / EN 16430.

Length	Fan speed setting	Heat output [W]				Light cooling output 16/18/27 [°C]	Power consumption [W]	Direct WVD Energy WVE	Acoustics	
		75/65/20 [°C]	55/45/20 [°C]	45/35/20 [°C]	35/30/20 [°C]				Sound pressure [dB(A)]	Sound power [dB(A)]
600	0	190	91	51	26	19	1.4	1.4	-	-
	1	1 058	619	404	247	140	2.1	2.2	23.2	31.2
	2	1 180	692	453	278	165	2.6	2.8	27.9	35.9
	3	1 330	783	514	316	197	3.4	3.5	32.3	40.3
	4	1 534	908	599	370	239	4.4	4.7	36.8	44.8
	5	1 688	1 003	664	411	267	5.7	6.0	40.8	48.8
750	0	278	133	75	38	28	1.4	1.4	-	-
	1	1 546	905	591	361	204	2.4	2.6	24.9	32.9
	2	1 724	1 012	663	406	242	2.8	3.1	29.6	37.6
	3	1 944	1 145	752	462	288	3.8	4.1	34.0	42.0
	4	2 243	1 327	875	540	349	4.4	4.8	38.3	46.3
	5	2 467	1 467	971	601	391	6.2	6.8	42.3	50.3
1000	0	424	204	114	58	42	1.4	1.4	-	-
	1	2 360	1 381	902	551	311	2.6	2.9	26.3	34.3
	2	2 632	1 544	1 011	619	369	3.5	3.8	30.9	38.9
	3	2 967	1 747	1 148	705	440	4.9	5.4	35.2	43.2
	4	3 423	2 026	1 336	825	533	7.1	7.8	39.8	47.8
	5	3 766	2 238	1 481	918	596	10.3	11.2	43.9	51.9
1250	0	570	274	153	78	57	1.4	1.4	-	-
	1	3 174	1 857	1 213	741	419	2.8	3.1	26.7	34.7
	2	3 539	2 076	1 360	833	496	3.8	4.1	31.3	39.3
	3	3 991	2 350	1 543	948	592	5.8	6.3	35.3	43.3
	4	4 603	2 725	1 797	1 109	717	8.3	9.0	40.5	48.5
	5	5 064	3 010	1 992	1 234	802	12.4	13.5	44.9	52.9
1500	0	716	344	192	98	71	1.4	1.4	-	-
	1	3 988	2 333	1 525	931	526	3.0	3.3	28.7	36.7
	2	4 447	2 609	1 709	1 046	623	4.1	4.5	33.3	41.3
	3	5 014	2 952	1 939	1 191	744	6.3	6.9	37.4	45.4
	4	5 784	3 423	2 258	1 394	900	9.2	10.1	42.2	50.2
	5	6 363	3 782	2 503	1 551	1 008	13.2	14.4	46.4	54.4
1750	0	862	414	232	118	85	1.4	1.4	-	-
	1	4 801	2 809	1 836	1 121	634	3.9	4.2	30.2	38.2
	2	5 354	3 141	2 057	1 260	751	5.5	6.0	34.7	42.7
	3	6 037	3 555	2 335	1 434	895	9.1	10.0	38.9	46.9
	4	6 964	4 122	2 719	1 678	1 084	11.8	12.8	43.5	51.5
	5	7 661	4 554	3 014	1 868	1 213	17.1	18.7	47.6	55.6
2000	0	1 008	485	271	138	100	1.4	1.4	-	-
	1	5 615	3 285	2 147	1 311	741	5.3	5.4	30.5	38.5
	2	6 262	3 674	2 406	1 473	878	5.7	6.3	35.0	43.0
	3	7 060	4 157	2 730	1 677	1 047	8.4	9.7	39.0	47.0
	4	8 145	4 821	3 179	1 962	1 268	13.1	14.5	43.9	51.9
	5	8 960	5 326	3 525	2 184	1 419	18.4	21.2	48.2	56.2

Temperature exponent [n] 1.0369 0.904



Measurements shown in mm.



The unit is designed for cooling in the non-condensation zone only, i.e. above the dew-point temperature. The element is not equipped with condensate drainage.

BASIC TECHNICAL DATA

KORAWALL Direct WVD, KORAWALL Energy WVE							
Height [mm]	450						
Width [mm]	110						
Length [mm]	600	750	1 000	1 250	1 500	1 750	2 000
Unit weight – KORAWALL Direct WVD [kg]	11	14	18	23	27	31	36
Unit weight – KORAWALL Energy WVE [kg]	11.5	14.5	18.5	23.5	27.5	31.5	36.5
Water volume [l]	0.6	0.8	1.1	1.4	1.7	2.0	2.4
Effective part of the exchanger [mm]	L-275						

ORDER CODES

KORAWALL Direct WVD

KORAWALL	Ventilator	Type	Length [cm]	Height [cm]	Width [cm]	Exchanger type	Exchanger colour	Casing material	Grille type	Connection type	Connection side	Colour code	Regulation
W	V	D Direct	- ... / 45	/ 11	- V reversible	5 black RAL 9005	S steel	P perforated	S bottom	P right L left	- 10 white RAL 9016 39 matt black RAL 9005 ** colour code as per LICON colour chart see p. 31 99 other RAL colour	- RT standard regulation	

Example order code: **WVD-150/45/11-V5SPSP-10-RT**

KORAWALL Direct WVD wall-mounted convector with forced convection, autonomous control, length 150 cm, height 45 cm, width 11 cm, the color of casing including weight-bearing part for mounting – white RAL 9016, bottom right connection with 230 V AC/24 V DC power supply (adapter).

KORAWALL Energy WVE

KORAWALL	Ventilator	Type	Length [cm]	Height [cm]	Width [cm]	Exchanger type	Exchanger colour	Casing material	Grille type	Connection type	Connection side	Colour code	Regulation
W	V	E Energy	- ... / 45	/ 11	- V reversible	5 black RAL 9005	S steel	P perforated	S bottom	P right L left	- 10 white RAL 9016 39 matt black RAL 9005 ** colour code as per LICON colour chart see p. 31 99 other RAL colour	- RT standard regulation	

Example order code: **WVE-150/45/11-V5SPSP-10-RT**

KORAWALL Energy WVE wall-mounted convector with forced convection, autonomous control, length 150 cm, height 45 cm, width 11 cm, the color of casing including weight-bearing part for mounting – white RAL 9016, bottom right connection with standard regulation – 230 V AC/24 V DC power supply.

Regulation, Accessories, Technical Parameters and Acoustics



REGULATION

KORAWALL Optimal-V WVO, KORAWALL Pool-V WVP

Regulation plays a central role in the heating outputs of convectors with fans. Fans and thermo-electric actuators are supplied with 24 V DC, and fan rotations are as standard controlled by a voltage of 0–10 V DC.

Standard contents

- A set of EC fans with synchronous motor in an aluminium frame. Featuring very low electrical consumption and very quiet operation.
- FCR-BOX electronic regulator which functions as a screw terminal for connecting the power cable, thermostat or BMS and the fan. Ensures smooth operation of the fan at required speed and independent control of thermoelectric valves.

Optional accessories

- 230 V AC/24 V DC direct current voltage supply according to the maximum electrical energy consumption of the convector. Five types of units are available for 60 W, 100 W, 100 W, 240 W and 480 W. Power supply units are supplied separately for mounting on the distribution board DIN rail assembly.
- Junction box for mounting 60 W, 100 W and 150 W sources.
- SIEMENS 24 V DC RDG 260T or RDG 260KN thermostats.
- 24 V DC Thermoelectric actuator, thermostatic valves, lockshield.

RAB 21-DC and RDG 260T thermostat function description

Convector output is controlled by fan speed and the flow of heating/cooling medium through the exchanger. The control voltage is 24 V. The RAB 21-DC or RDG 260T SIEMENS thermostats control the heating medium valve with a thermoelectric actuator, and in addition control fan speed with a control voltage of 0–10 V DC. Fan speed may be controlled automatically by the thermostat, or manually in three speed settings. Speed rating is set at a control signal size of 7 V. Fans may be blocked by a temperature sensor (see accessories). With the temperature sensor installed, the fan rotation is dependent on a heating medium minimum temperature of approx. 37 °C. Temperature sensors are available as optional accessories.

Function description with BMS (Building Management System)

The BMS central control system may be used to control convectors. One BMS control output directly controls the opening/closing of valves and the other 0–10 V DC output controls fan speed. Rated power is achieved at 7 V DC. Valves and fans are supplied with 24 V DC.

Using the KNX system, convectors may be controlled with the RDG 260KN thermostat. The thermostat communicates with the KNX system, which transmits and receives data for the convector. Installation must be carried out in accordance with valid regulations and safety procedures! The manufacturer cannot be held liable for any defects, damages or injuries caused by improper installation.

ACCESSORIES

SIEMENS RAB 21-DC Manual room thermostat

- optional accessory –
KORAWALL Optimal-V WVO, Pool-V WVP
- for 2-pipe heating systems
- manual 3-speed fan switch
- heating or cooling model
- 24 V DC, electrical consumption: 1 W
- 0–10 V DC EC fan
- setpoint setting range 8–30 °C
- switching differential <1 K
- IP rating IP 30
- dimensions w × h × d: 96 × 110 × 36 mm
- **order code:** REG-RAB21DC



QAA32 external room temperature sensor

- optional accessory –
KORAWALL Optimal-V WVO, Pool-V WVP
- for measuring temperature in heating systems where a thermostat cannot be placed in the room
- suitable for installation at swimming pools
- can be combined with RDG 260T and RDG 260KN
- setpoint setting range: 0–40 °C, accuracy at 25 °C: ± 0.3 K
- NTC sensor, 3 kΩ at 25 °C
- IP rating IP 30
- dimensions w × h × d: 96.4 × 99.6 × 36 mm
- **order code:** REG-S-QAA32



SIEMENS RDG 260T electronic room thermostat with LCD display

- optional accessory –

KORAWALL Optimal-V WVO, Pool-V WVP

- for 2 and 4 pipe heating systems
- 7-day time program with 8 programmable timers
- automatic or manual heating/cooling changeover
- manual or automatic 3-speed fan control
- operating modes Comfort, Economy and Protection
- three input slots for separate sensor, card reader, motion sensor, etc.
- timer back up (minimum 20 hrs)
- operating voltage 24 V DC, power consumption 4 W
- 0–10 V DC ECM fan
- setpoint setting range 5–40 °C
- switching hysteresis can be set differently for heating and cooling in the range of 0.5 to 6 K
- IP rating IP 30
- dimensions w × h × d: 92 × 134 × 25 mm
- can be commissioned using the SIEMENS PCT Go mobile application

Accessories

- can be combined with separate QAA32 room temperature sensor (NTC 4 kΩ) e.g. for placement outside public areas or for humid environments
- **order code:** REG-RDG260T



For correct operation, RDG 260T or RDG 260KN thermostats must be set according to the LICON instructions included in the thermostat package. The thermostat is supplied pre-set for heating in a 2-pipe system.



SIEMENS RDG 260KN electronic room thermostat with LCD display

- optional accessory –

KORAWALL Optimal-V WVO, Pool-V WVP

- regulation of ambient temperature and relative humidity
- for 2 and 4 pipe heating systems
- power indicator function for energy-optimized system operation
- built-in relative humidity and temperature sensor
- KNX (S-mode and LTE-mode) for integration into BMS
- 7-day programme with up to 3 temperature setting periods per day
- automatic (continuous) or manual (3-level) fan speed regulation
- Comfort, Economy and Protection operation modes
- 3 multifunctional inputs (window contact, motion detector, access card reader, heating/cooling switch...)
- operating voltage 24 V DC, power consumption 4 W
- EC fan control voltage 0–10 V DC
- setpoint setting range 5–40 °C
- adjustable hysteresis switching differential 0.5–6 K
- IP rating IP 30
- wall mounting with base mounting plate
- dimensions w × h × d: 92 × 134 × 25 mm

Accessories

- can be combined with separate QAA32 room temperature sensor, e.g. for thermostat installation out of publicly accessible spaces or for installation in humid environments
- **order code:** REG-RDG260KN
- can be controlled using the SIEMENS PCT Go mobile application



Thermoelectric actuator TEP 24

- optional accessory –

KORAWALL Optimal-V WVO, Pool-V WVP

- IP rating IP 44
- reset time 4 min
- unit height 65 mm
- M 30 × 1.5 thread
- cable length 2.5 and 5 m
- closed without voltage
- operating voltage 24 V DC
- electrical consumption <2 W
- **order code** (2.5 m cable): REG-TEP24-250
- **order code** (5 m cable): REG-TEP24-500



Thermostatic head (heating/cooling)

- optional accessory –

KORAWALL Direct WVD, Energy WVE

- VT-score 0.20
- hysteresis 0,15 K
- heating/cooling 6–28 °C
- minimum tempering 8 °C
- max. temperature lock
- M 30 × 1.5 thread
- max. water temp 120 °C
- TELL-score (Thermostatic Efficiency Labelling) A
- **order code:** REG-TCW



REGULATION AND ACCESSORIES

R-Box

- optional accessory – **KORAWALL Optimal-V WVO, Pool-V WVP**
- combined with the power supply, it creates the control voltage for the fan
- for use with thermostat at 230 V AC
- 3 programmable speed settings
- input voltage 230 V/50 Hz
- output signal 0 to 10 V/1 kΩ
- 4 K_V AC galvanic isolation opto-isolator
- IP rating IP 30
- mounted on DIN rail on distribution board
- ambient operating temperature 0–40 °C
- dimensions w × h × d: 70 × 58 × 90 mm
- electrical diagram at www.licon.cz
- **order code: REG-RBOX17**



Junction box

- optional accessory – **KORAWALL Optimal-V WVO, Pool-V WVP**
- embedded in wall
- for installation of AC power source (60 W, 100 W and 150 W)
- IP rating IP 40
- dimensions w × h × d: 318 × 258 × 72 mm
- **order code: REG-IB**



60 W, 100 W, 150 W, 240 W and 480 W DC voltage supply

- optional accessory – **KORAWALL Optimal-V WVO, Pool-V WVP**
- switch-mode DC power supply
- silent operation, high efficiency
- DIN rail assembly
- IP rating IP 20



When using a thermostat not recommended by LICON, an R-Box must be used to achieve a signal of 0–10 V.



power supply	60 W	100 W	150 W	240 W	480 W
input voltage	85–264 V AC	85–264 V AC	85–264 V AC	88–264 V AC	90–264 V AC
output voltage	24 V DC/2.5 A	24 V DC/3.9 A	24 V DC/6.25 A	24 V DC/10 A	24 V DC/20 A
dimensions w × h × d	53 × 90 × 55 mm	70 × 90 × 55 mm	105 × 90 × 55 mm	60 × 126 × 114 mm	86 × 126 × 129 mm
order code	REG-PS60	REG-PS100	REG-PS150	REG-PS240	REG-PS480



We recommend a power supply size at least 20% greater than the calculated power input. See p. 29.

Regulation fitting connection – LM valve

- optional accessory – **KORAWALL Optimal-V WVO, Pool-V WVP, Direct WVD, Energy WVE**
- In order to ensure heat output, we recommend incorporating a LM regulation fitting. This fitting achieves a greater flow.
- thermostatic and control fitting
- maximum operating pressure 10 bar
- maximum operating temperature 120 °C
- control K_V
- connection thread to body G 1/2", to the heating system G 3/4"
- connection for actuator M 30 × 1.5
- axial connection distance 50 mm
- material: nickel-plated bronze



LM-valve straight
order code: REG-TMS



LM-valve elbow
order code: REG-TMA

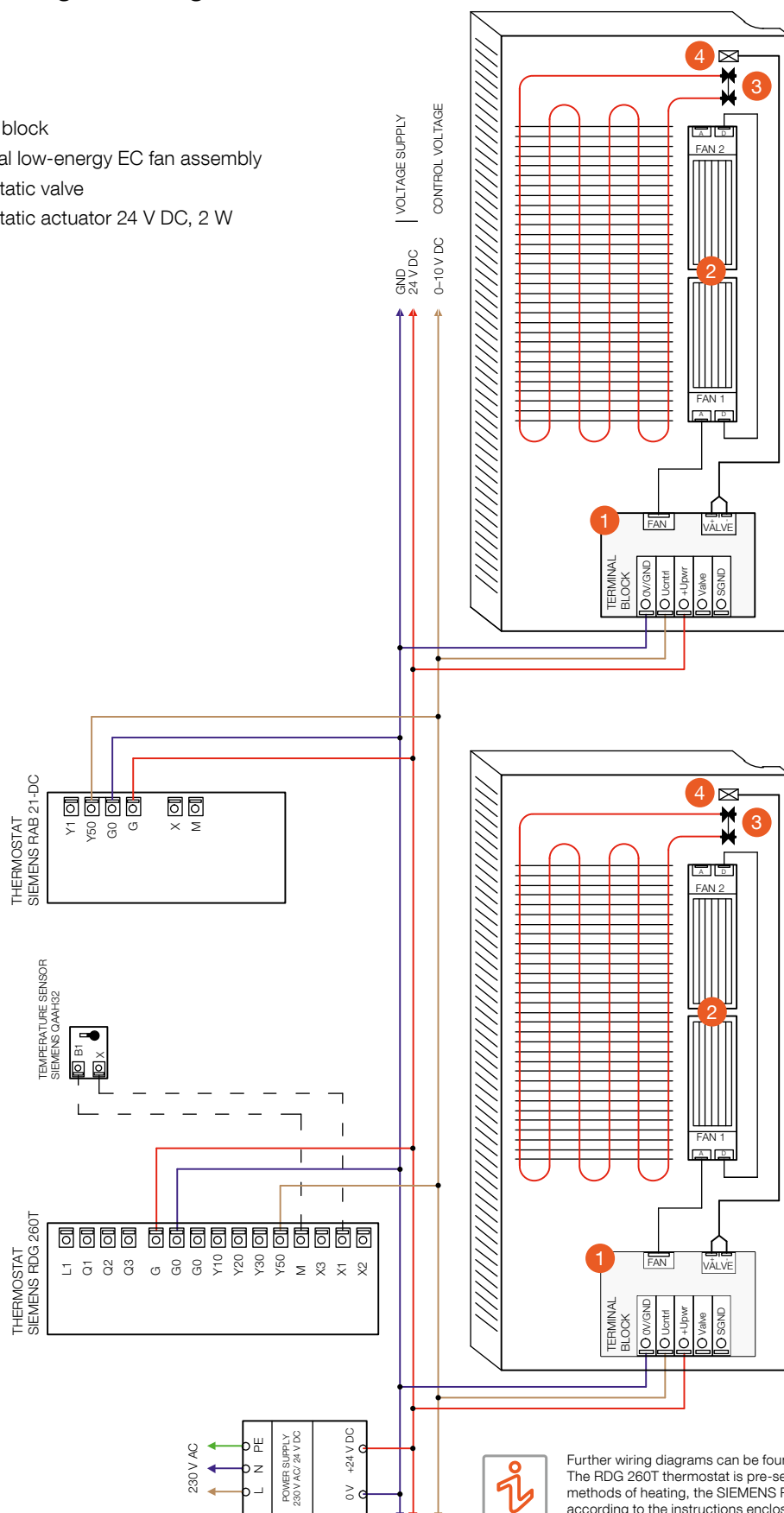
	XP [K]	K _V with preset [m³/h]						K _{vs} [m³/h]	Max. water temperature [°C]	Max. operating pressure [bar]
		0	0,5	1	2	3	4			
DN 15 (1/2")	1	0.09	0.17	0.22	0.25	0.28	0.38	1.10	120	10
	2	0.09	0.18	0.30	0.40	0.55	0.75			

Presetting 4 represents normal (operational) setting.

WIRING DIAGRAMS

**For convectors KORAWALL Optimal-V WVO, KORAWALL Pool-V WVP
controlled by thermostat SIEMENS RDG 260T or SIEMENS RAB 21-DC
Heating or light cooling**

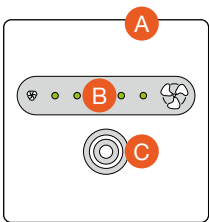
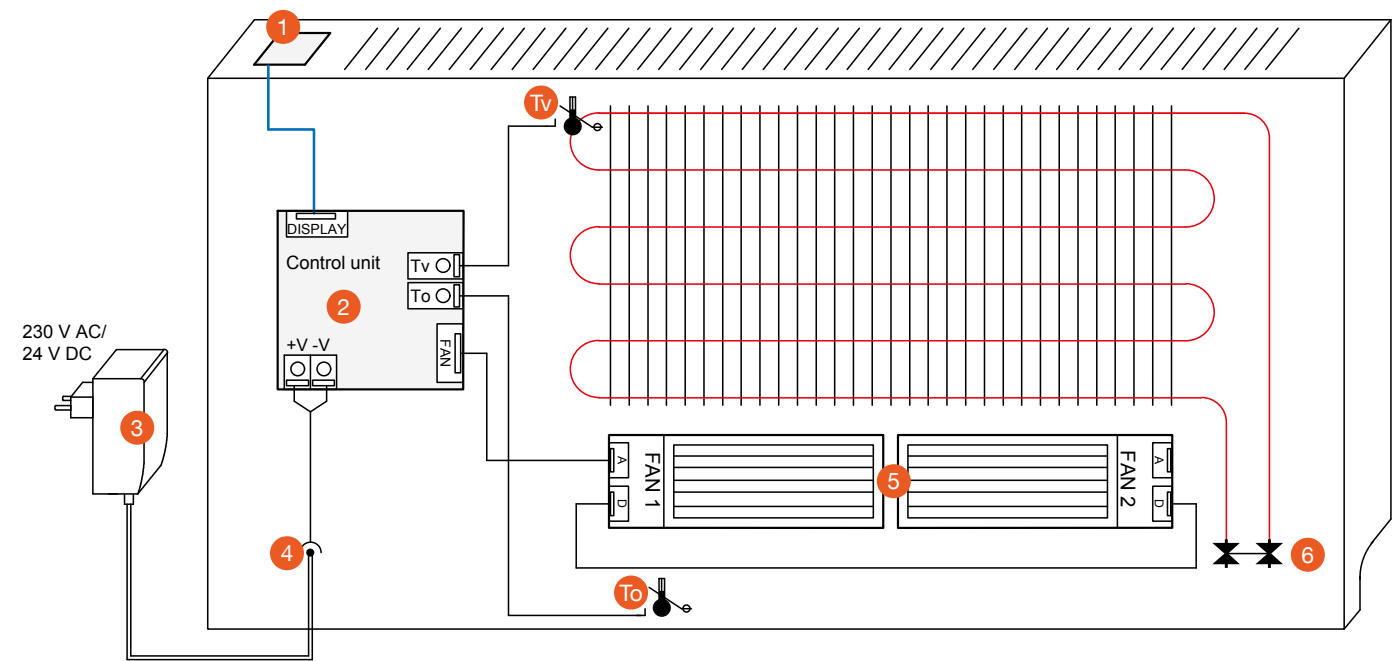
- 1 terminal block
- 2 tangential low-energy EC fan assembly
- 3 thermostatic valve
- 4 thermostatic actuator 24 V DC, 2 W



Further wiring diagrams can be found at www.licon.cz, or upon request. The RDG 260T thermostat is pre-set for 2-pipe heating systems. For alternative methods of heating, the SIEMENS RDG 260T or RAB 21-DC thermostats must be set according to the instructions enclosed or see downloads at www.licon.cz.

WIRING DIAGRAMS

Basic diagram connection for convectors KORAWALL Direct WVD Heating or light cooling



- A control touchpad
- B status indicators
- C control button

- 1 control touchpad for fan RPM heating/cooling
- 2 control unit
- 3 power supply 230 V AC/24 V DC
- 4 tangential low-energy EC fan assembly
- 5 thermostatic valve

- To temp sensor (room)
- Tv temp sensor (water)

Fan speed selection **Short, repeated press of the control button**

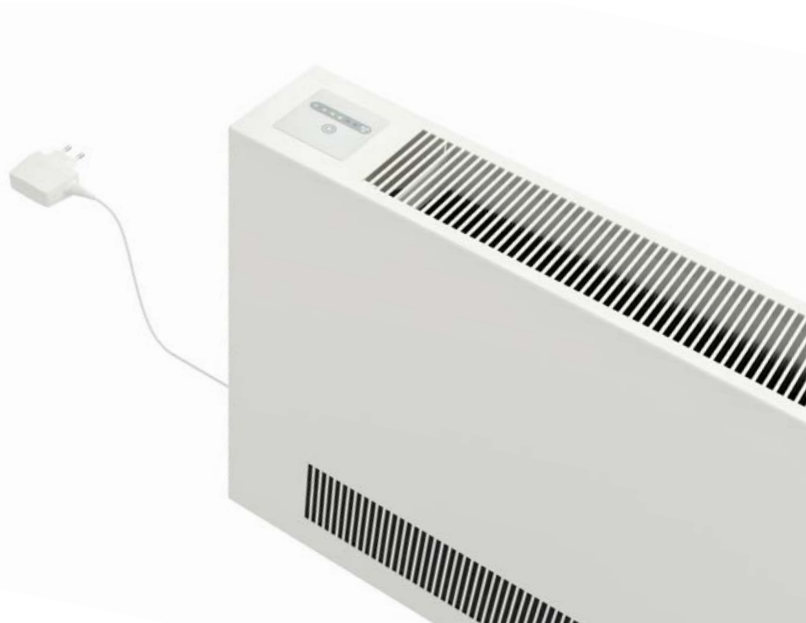
Heating mode **LEDs are lit continuously**

Cooling mode **LEDs are blinking**

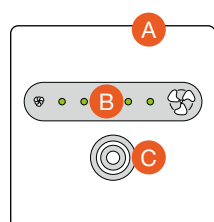
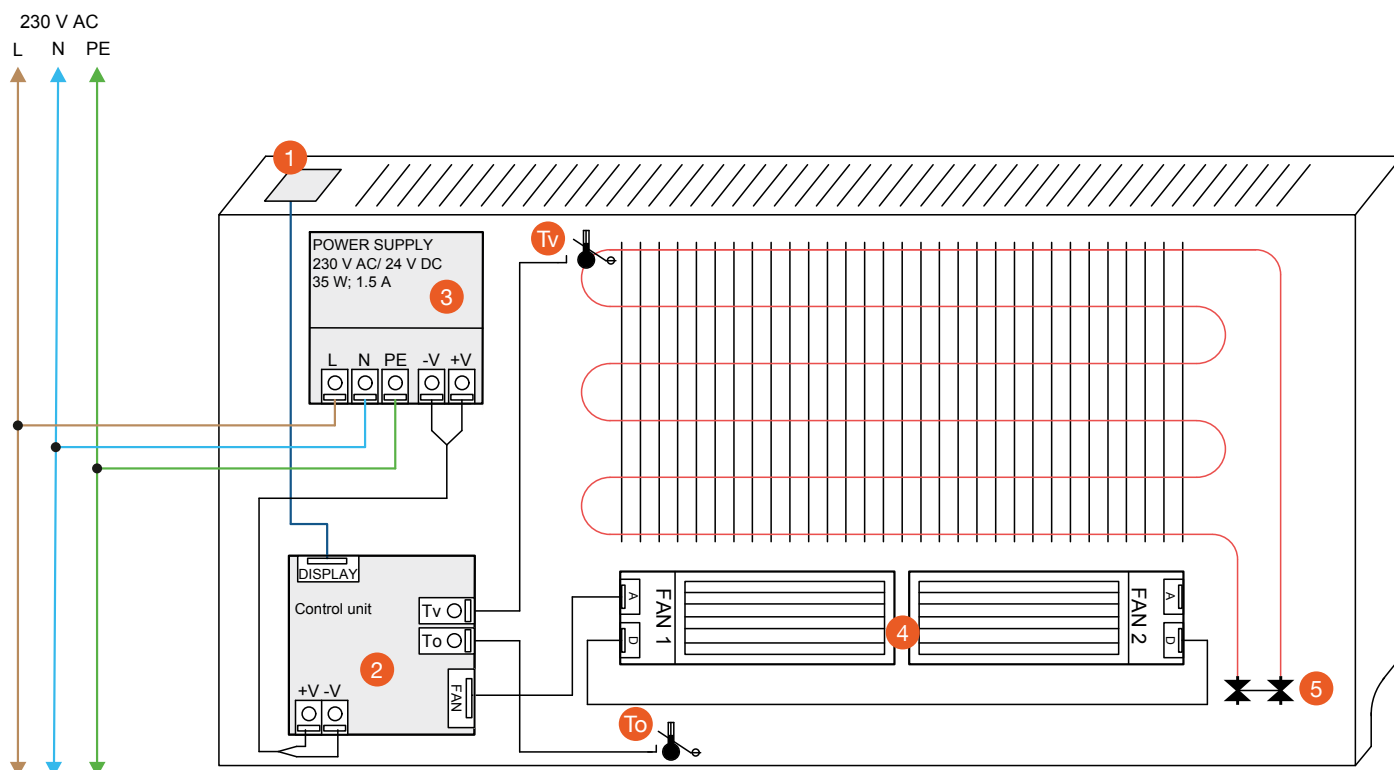
Changing between heating and cooling mode

Hold the control button for 10 seconds

Fan speed	LED	Fan RPM
0	○ ○ ○ ○ ○	0 – Off
1	● ○ ○ ○ ○	1 – Min
2	● ● ○ ○ ○	2 – Low
3	● ● ● ○ ○	3 – Medium
4	● ● ● ● ○	4 – High
5	● ● ● ● ●	5 – Max



Basic diagram connection for convectors KORAWALL Energy WVE Heating or light cooling



- A control touchpad
- B status indicators
- C control button

- 1 control touchpad for fan RPM heating/cooling
- 2 control unit
- 3 power supply 230 V AC/24 V DC
= electric terminals for main grid connection
- 4 tangential low-energy EC fan assembly
- 5 regulation fitting connection – LM valve

Fan speed selection **Short, repeated press of the control button**

Heating mode **LEDs are lit continuously**

Cooling mode **LEDs are blinking**

Changing between heating and cooling mode

Hold the control button for 10 seconds

- To temp sensor (room)
- Tv temp sensor (water)

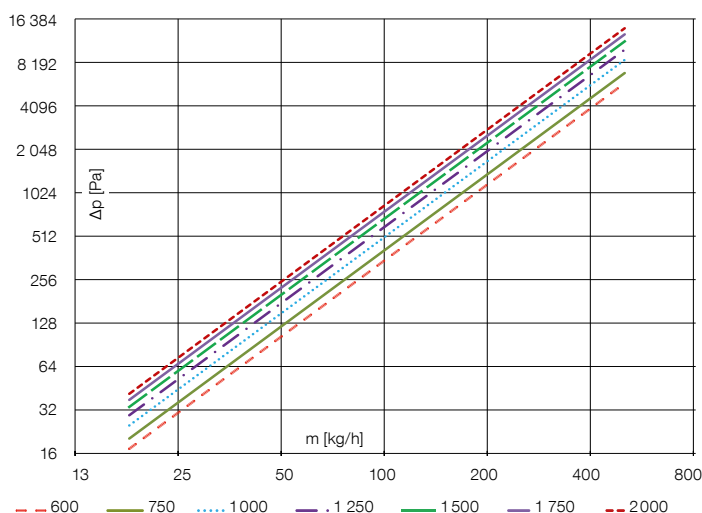
Fan speed	LED	Fan RPM
0	○ ○ ○ ○ ○	0 – Off
1	● ○ ○ ○ ○	1 – Min
2	● ● ○ ○ ○	2 – Low
3	● ● ● ○ ○	3 – Medium
4	● ● ● ● ○	4 – High
5	● ● ● ● ●	5 – Max

PRESSURE LOSSES

KORAWALL WVO, WVP, WVD, WVE type 45/11

Length L [mm]	Mass flow rate m [kg/h]											
	20	40	80	100	150	200	250	300	350	400	450	500
	Exchanger pressure losses Δp [Pa]											
500	18	61	205	303	617	1021	1508	2075	2718	3434	4220	5074
600	21	70	234	346	704	1166	1723	2370	3104	3921	4819	5795
750	24	82	276	408	829	1371	2026	2788	3652	4613	5669	6817
1000	30	101	340	503	1022	1691	2499	3438	4503	5688	6990	8406
1250	35	119	400	591	1202	1989	2940	4044	5297	6692	8224	9889
1500	40	136	457	675	1373	2272	3357	4619	6049	7642	9391	11293
1750	45	152	511	755	1536	2541	3756	5167	6768	8549	10507	12634
2000	50	167	563	833	1693	2801	4139	5695	7459	9422	11580	13924

KORAWALL WVO, WVP, WVD, WVE type 45/11

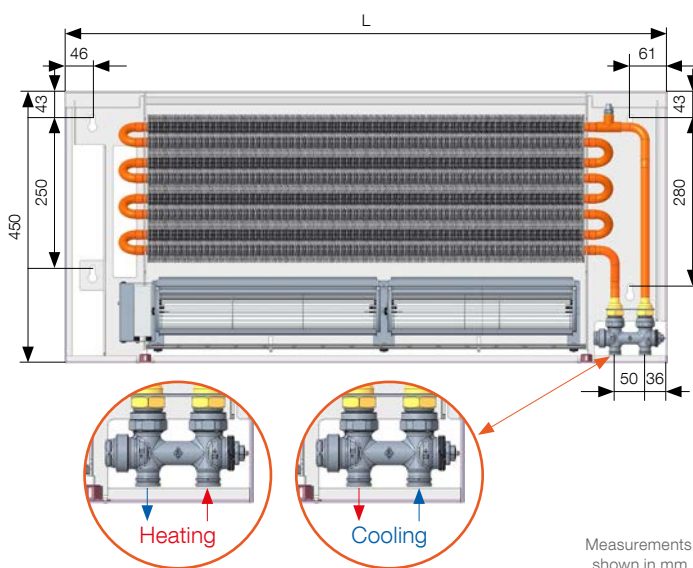


The pressure losses are shown without any regulation fitting connected.

CONVECTOR ASSEMBLY

- We recommend placing the wall-mounted unit on the perimeter wall, 100 mm above the floor.
- We recommend equipping the convector with the LM regulation valve with a higher flow rate (see Optional Accessories, p. 24).
- The water inlet must always be connected to the pipe leading to the upper part of the convector and also attach the LM regulation fitting.
- The heat exchanger and casing must be well protected against contamination. Heating units must be regularly serviced; heat exchangers and fans cleaned.
- The unit is installed on a wall using the rear weight-bearing part. We recommend to check the correct positioning of the heat exchanger with fittings and the casing prior to connecting the heat exchanger to the heating system. For more information, see the installation instructions – download at www.licon.cz.
- The regulation is identical for KORAFLEX FV trench heaters and KORALINE Optimal-V LVO free-standing convectors.
- KORAWALL WVD and WVE is to be used with thermostatic head for heating and cooling (see p. 23).

Anchoring diagram



- We recommend equipping the KORAWALL WVO and WVP with a thermo-electric actuator.
- Do not forget about power source nearby installation. For more information, see the installation instructions – download at www.licon.cz.

NOISE AND ACOUSTICS

Licon makes use of the most progressive technology in the manufacture of convectors and fans. Our fans use EC motors, which are silent, do not vibrate and display extraordinarily low power consumption (7 W). In terms of noise levels, the design of convectors must take into account the acoustic load appropriate for their intended use. Requirements for silent operation will be diverse, whether installed in living rooms and offices, or in corridors, halls, etc. For this reason, in addition to design in terms of performance and dimensions, an assessment of the correct acoustic load should not be neglected. This can be achieved using the formula below, where it is understood that sound pressure levels vary in different environments. We would recommend the maximum acoustic load in living rooms as 30 dB L_{pA} .

Acoustic parameters were measured in an accredited testing room in accordance with ČSN EN 9614-2 Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 2: Measurement by scanning.

Listed acoustic parameters

The ČSN EN 16430 standard defines the base unit of **sound power** [L_{WA}/dB], which is listed for all products equipped with fans.

To facilitate orientation, **sound pressure levels** [L_{pA}/dB] are listed in addition.

The sound pressure values listed were calculated using the following formula. They apply to a distance of 1m from the trench heater (noise source) situated in the centre of a wall beneath a window with one sound reflector surface and an otherwise sound absorbing environment (furnished room).

Definition and description of acoustic values

Sound power [L_{WA}/dB]

This is the base unit defining the noise level of a particular device. Sound power is the sound generated by the sound source (energy transmitted into a room). It is not dependent on space or distance. It is used for all further acoustic load calculations for rooms.

Sound pressure [L_{pA}/dB]

This is the measure of the level of sound registered at a certain distance from the sound source. Sound pressure is the change in air pressure generated by the sound source. It is the measure of volume heard by a person.

Example: Conversion of sound power to sound pressure

$$L_{pA} = L_{WA} + 10 \cdot \log \left(\frac{Q}{4 \cdot \pi \cdot r^2} \right)$$

L_{pA}	[dB(A)]	sound pressure level weighted by filter A
L_{WA}	[dB(A)]	sound power level weighted by filter A
Q	[-]	noise emission direction factor
r	[m]	distance from test sample

EXAMPLE DC POWER SUPPLY SIZE CALCULATIONS

For regulation, the electric power input must be correctly calculated in order to select the size of the DC power supply. The total wattage of units is calculated using the total electric power consumption of all thermostat-controlled convectors with fans and thermoelectric

actuators. Fan electrical power consumption is shown in the output tables for each type and length of convector. **Here we have selected the values for the third fan speed.**

Example

According to the project we have designed KORAWALL WVO of the following types:

2x KORAWALL WVO – 100/45/11 – in the table you can find the power consumption of 10 W

2x KORAWALL WVO – 150/45/11 – in the table you can find the power consumption of 19 W

2x KORAWALL WVO – 200/45/11 – in the table you can find the power consumption of 23 W

Optionally 6x thermoelectric drive TEP 24 V DC – 6 x 2 W = 12 W

1000	0	424	204	42	0	-	-
	1	2 360	1 381	311	3	26,3	34,3
	2	2 967	1 747	440	4	35,2	43,2
	3	3 766	2 238	596	10	43,9	51,9
1500	0	716	345	71	0	-	-
	1	3 988	2 333	526	4	28,7	36,7
	2	5 014	2 952	744	8	37,4	45,4
	3	6 363	3 782	1 008	19	46,4	54,4
2000	0	1 009	485	100	0	-	-
	1	5 615	3 285	741	5	30,5	38,5
	2	7 060	4 157	1 047	10	39,0	47,0
	3	8 960	5 326	1 419	23	48,2	56,2

Total power input

$2 \times 10 + 2 \times 19 + 2 \times 23 + 12 = 116 \text{ W}$ + increase by a reserve of 20 %. Choose 150 W power supply.

REFERENCES



Ferring
Copenhagen, Denmark



Landsbankinn
Reykjavik, Iceland



World of Volvo
Gothenburg, Sweden



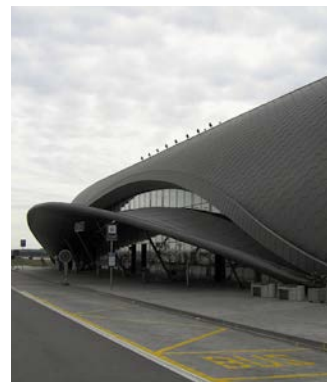
H. C. Andersen Museum
Odense, Denmark



Sky Tower
Wrocław, Poland



Lachta Centre
Saint Petersburg, Russia



Airport
Brno, Czech Republic



The Ještěd Hotel
Liberec, Czech Republic



Opera House
Copenhagen, Denmark



Philoro GOLDWERK
Korneuburg, Austria



City Green Court
Prague, Czech Republic



Hotel des Horlogers
Le Brassus, Switzerland



Main Point Karlín
Prague, Czech Republic



House of Music
Aalborg, Denmark



Triplex – Apartment block
Karlový Vary, Czech Republic



Trinity Office Centre
Brno, Czech Republic

COLOUR CHART

			
code 10 White RAL 9016	code 39 Black RAL 9005	code 59 White texture RAL 9016	code 60 Black texture RAL 9005
			
code 14 Jasmine	code 16 Bahama	code 22 Manhattan	code 26 Pergamon
			
code 32 Anthrazit Metallic	code 35 Silber RAL 9006	code 37 Red RAL 3001	code 40 Alloy Black
			
code 42 Gold	code 45 Pearl Brown	code 47 RAL 9007	code 48 RAL 9006
			
code 49 RAL 7024	code 51 RAL 7016	code 54 RAL 7015	code 57 RAL 7040

Notice: Potentially, there may be variations in colour hues between the colour chart and actual heating units. The standard colour version is white RAL 9016 or black RAL 9005. Other colours shown in the Colour Chart may be ordered at an extra charge according to the valid price list.



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Ev. č.: 03-2024-EN