

# KORAWALL WVO and WVP

Wall-mounted convectors with forced convection

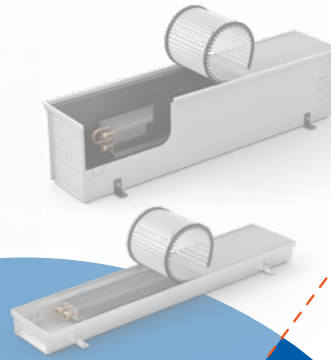




**KORALINE**  
FREE-STANDING  
CONVECTORS



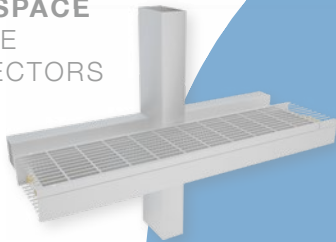
**KORAFLEX**  
TRENCH HEATERS



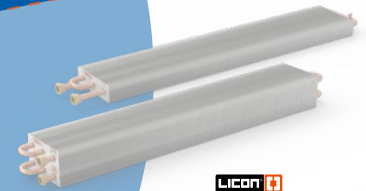
**KORAWALL**  
WALL-MOUNTED  
CONVECTORS



**KORASPACE**  
FACADE  
CONVECTORS



**KORABASE**  
HEAT  
EXCHANGERS



**RADIK** PANEL  
HEATERS



**KORABASE**  
HEAT  
EXCHANGERS



VENTILATION UNITS AND  
CENTRAL RECUPERATION

**KORASMART**  
**KORAVENT**  
**VENTBOX**



**KORATHERM**  
CUSTOMIZED DESIGN  
HEATING UNITS



**KORALUX**  
TOWEL RAILS



## 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.

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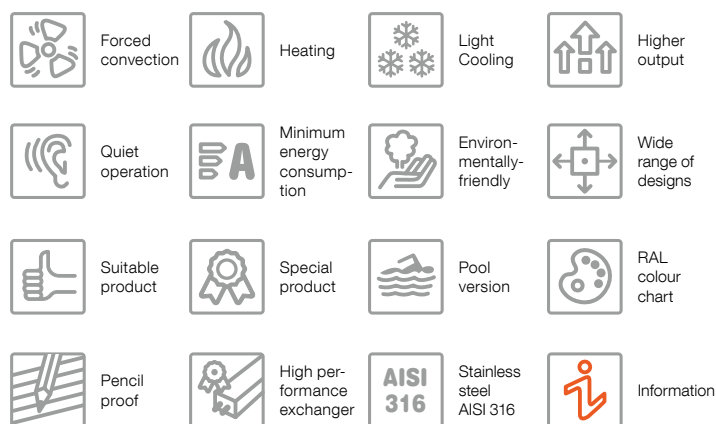
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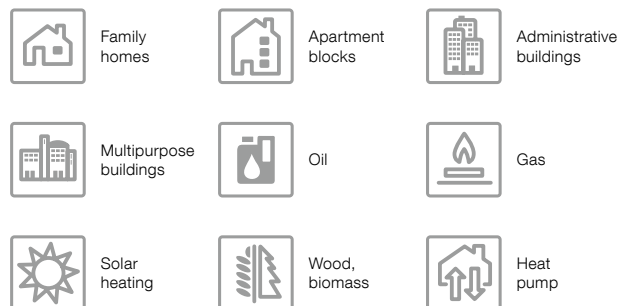
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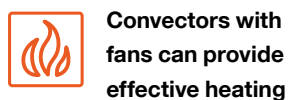
## Key to pictograms



## Suitable applications of convectors



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



**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**

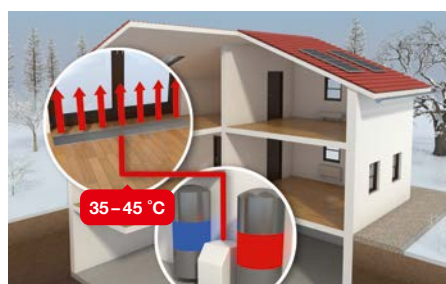
**gradients** – suitable for all types of heat pumps.



**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.



**WINTER** heat pump



**WINTER** boilers, hot-water fireplaces, heaters



**SUMMER** heat pump (dry cooling)



# KORAWALL

wall-mounted convectors  
with forced convection

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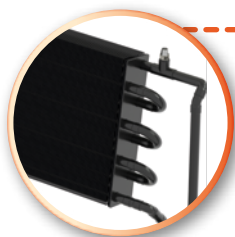


# KORAWALL WALL-MOUNTED CONVECTORS WITH FORCED CONVECTION



## 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.



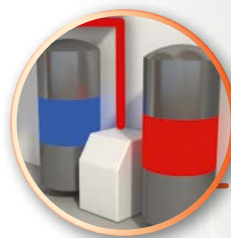
## INCREASED HEAT OUTPUT

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



## VERSATILE USE

Suitable for both high-temperature and also low-temperature heat sources.



## 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.



**OC** OPTIMIZED CONVECTION



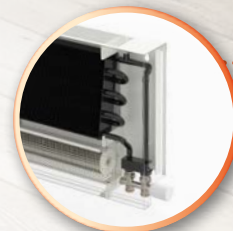
## TIMELESS DESIGN

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

# KORAWALL Optimal-V

## Specification

<b>Height</b>	450 mm
<b>Width</b>	110 mm
<b>Length</b>	600, 750, 1 000, 1 250, 1 500, 1 750, 2 000 mm
<b>Heat output</b>	from 190 to 8 960 W
<b>Cooling output</b>	up to 1 419 W
<b>Exchanger height</b>	240 mm
<b>Exchanger width</b>	60 mm
<b>Max. operating pressure</b>	1.2 MPa
<b>Max. operating temperature</b>	110 °C
<b>Max. surface temperature</b>	40 °C
<b>Connection thread</b>	internal G ½"
<b>Hydraulic connection</b>	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

- galvanised steel casing, lacquered in white RAL 9016
- 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 (FCR BOX)
- dust filter
- installation instructions
- durable packaging

## Optional accessories

- further RAL lacquers for casings available
- TEP 24 V DC thermoelectric actuator (see p. 15)
- LM thermostatic and control valve (see p. 16)
- SIEMENS RDG 160T, RDG 260KN or RAB 21-DC room thermostats (see p.s 15)
- QAA32 room temperature sensor (see p. 14)
- SIEMENS IRA 211 remote control (see p. 15)
- 24 V DC power supply (see p. 16)
- R-Box (see p. 16)

## 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).



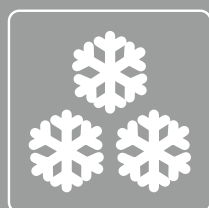
The unit is designed for cooling in the non-condensation zone only, i.e. above the dew-point temperature. The unit is not equipped with condensate drainage.



forced convection



heating



light cooling\*  
\* condensation-free



quiet operation



pencilproof grille



most RAL colour-chart  
lacqueres available  
upon request



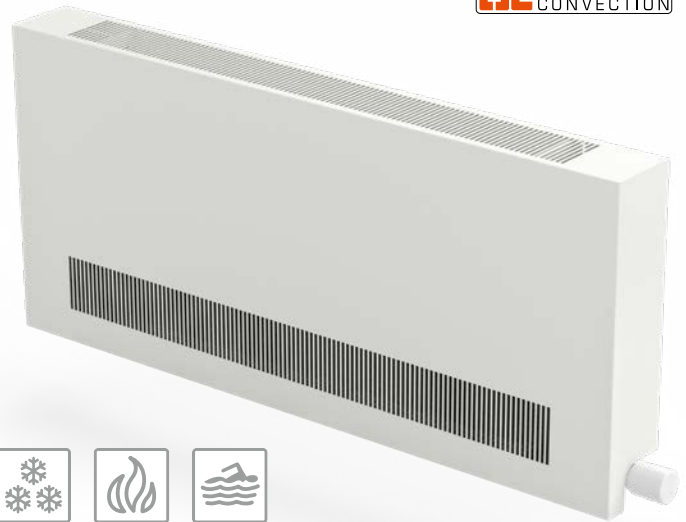
# KORAWALL Pool-V

Custom production

OC OPTIMIZED CONVECTION

## 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	110 °C
Max. 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 sum-

mer. 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 casing, laquered in white RAL 9016
- 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 (FCR BOX)
- dust filter
- installation instructions
- 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. 15)
- LM thermostatic and control valve (see p. 16)
- SIEMENS RDG 160T, RDG 260KN or RAB 21-DC room thermostats (see p.s 15)
- QAA32 room temperature sensor (see p. 14)
- SIEMENS IRA 211 remote control (see p. 15)
- 24 V DC power supply (see p. 16)
- R-Box (see p. 16)

## Note

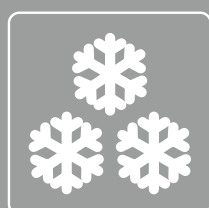
- Regulation elements are not included in the standard delivery package and must be ordered separately.
- Regulation elements are identical for all forced-convection products (OC system).



forced convection



heating



light cooling\*  
\* condensation-free



suitable for humid environments



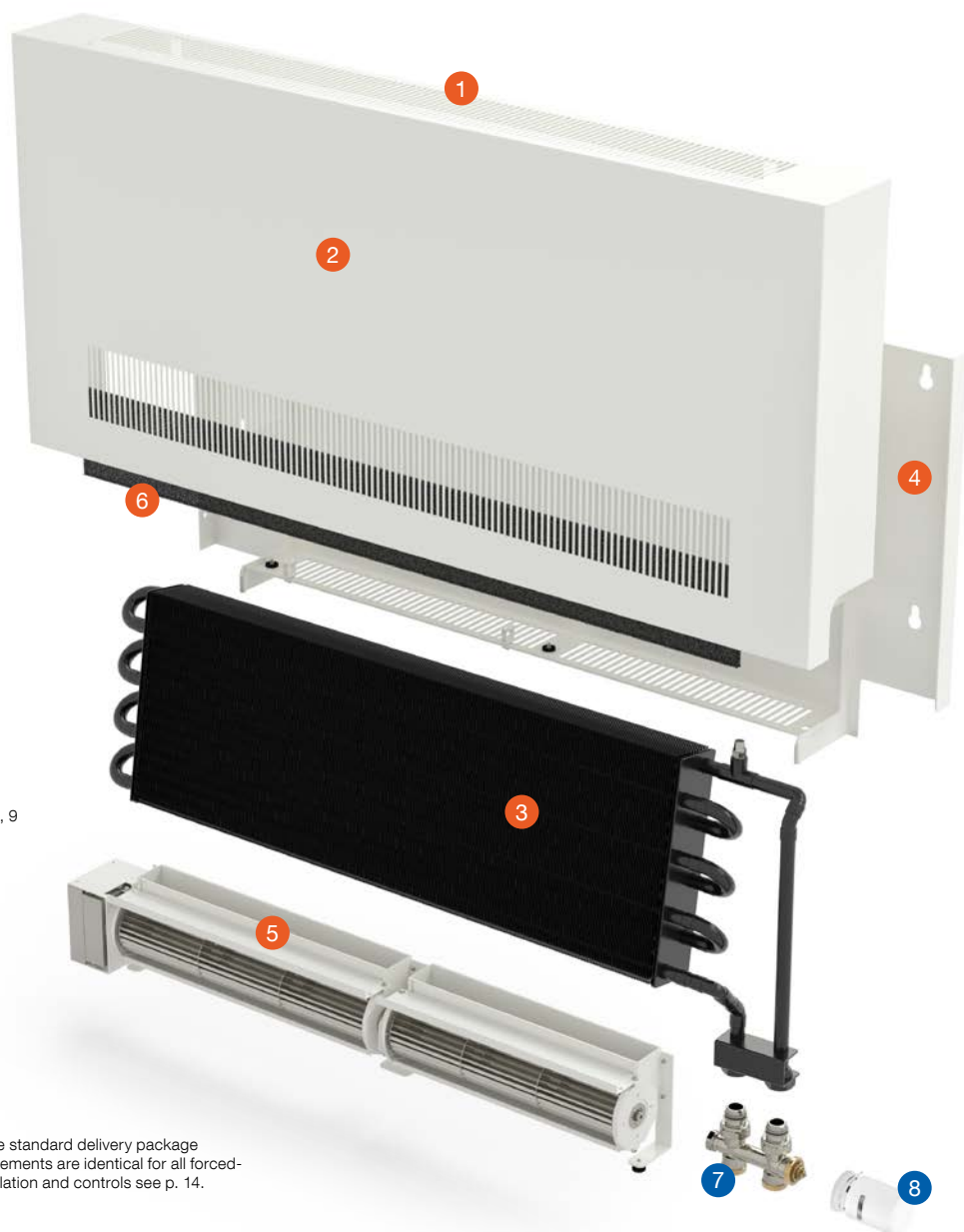
quiet operation



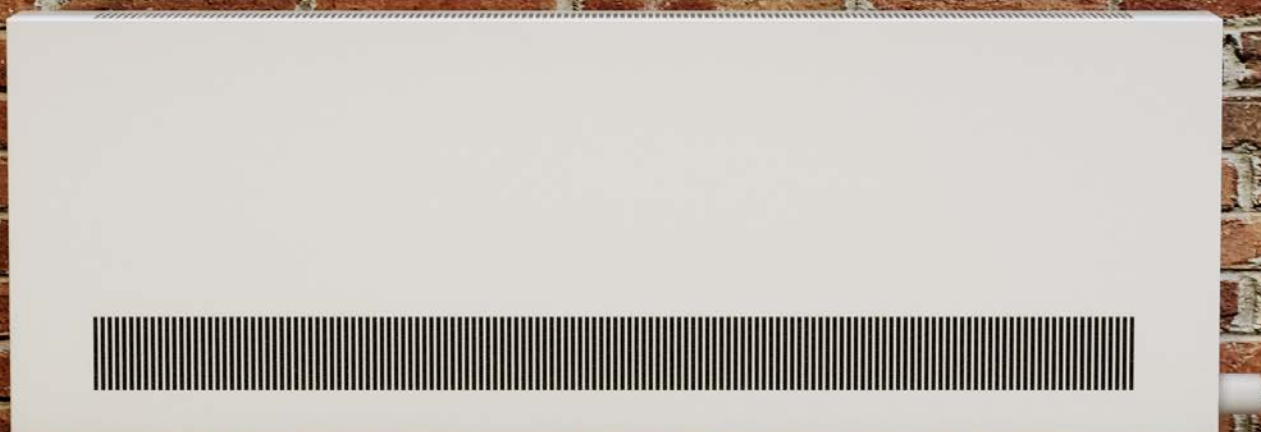
pencilproof grille

## Convector composition

- 1 safety cover grille, punched into the casing
- 2 convector casing made of galvanized steel (KORAWALL WVO) or AISI 316 stainless steel (KORAWAL WVP) sheet metal
- 3 Al/Cu heat exchanger lacquered 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 (FCR BOX)
- 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. 8, 9



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. 14.



# KORAWALL Optimal-V WVO KORAWALL Pool-V WVP



height 450 mm / width 110 mm

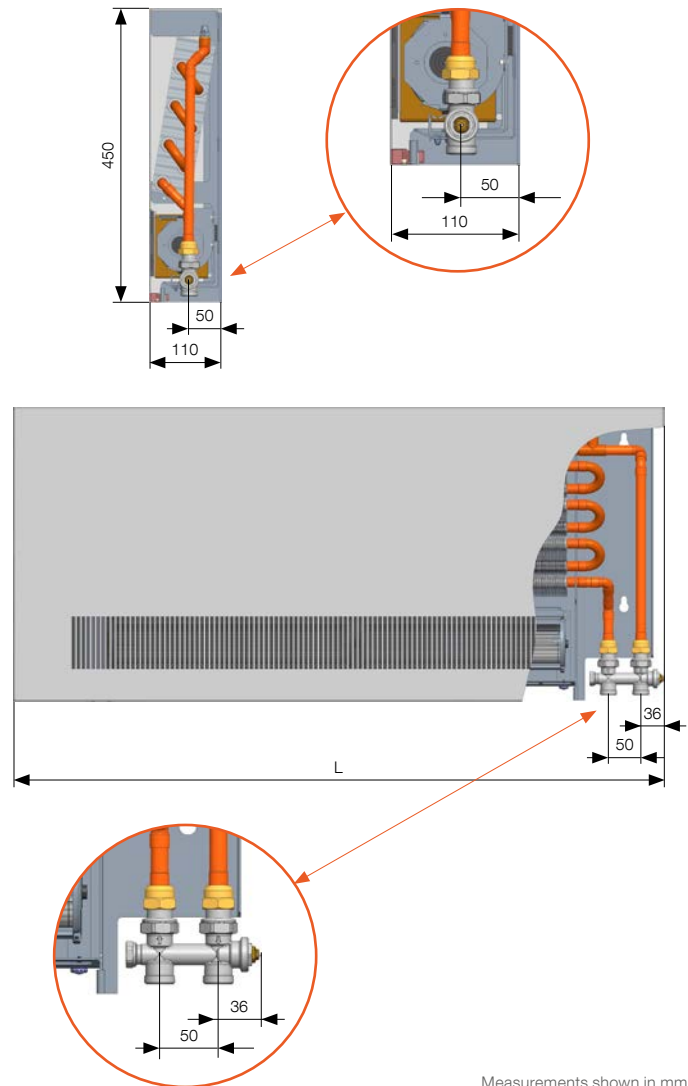
Heat outputs [W] at  $t_1/t_2/t_3$  / EN 16430.

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	<b>1 330</b>	<b>783</b>	<b>514</b>	<b>316</b>	<b>197</b>	<b>3</b>	<b>32.3</b>	<b>40.3</b>
	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	<b>1 944</b>	<b>1 145</b>	<b>752</b>	<b>462</b>	<b>288</b>	<b>3</b>	<b>34.0</b>	<b>42.0</b>
	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	<b>2 967</b>	<b>1 747</b>	<b>1 148</b>	<b>705</b>	<b>440</b>	<b>4</b>	<b>35.2</b>	<b>43.2</b>
	3	3 766	2 238	1 481	918	596	10	43.9	51.9
1250	0	541	260	145	74	54	0	-	-
	1	3 011	1 762	1 151	703	397	3	26.7	34.7
	2	<b>3 786</b>	<b>2 229</b>	<b>1 464</b>	<b>899</b>	<b>562</b>	<b>5</b>	<b>35.3</b>	<b>43.3</b>
	3	4 805	2 856	1 890	1 171	761	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	<b>5 014</b>	<b>2 952</b>	<b>1 939</b>	<b>1 191</b>	<b>744</b>	<b>8</b>	<b>37.4</b>	<b>45.4</b>
	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	<b>6 037</b>	<b>3 555</b>	<b>2 335</b>	<b>1 434</b>	<b>895</b>	<b>9</b>	<b>38.9</b>	<b>46.9</b>
	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	<b>7 060</b>	<b>4 157</b>	<b>2 730</b>	<b>1 677</b>	<b>1 047</b>	<b>10</b>	<b>39.0</b>	<b>47.0</b>
	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.



Measurements shown in mm.

## 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/m]	11	14	18	23	27	31	36
Water volume [l/m]	0.6	0.8	1.1	1.4	1.7	2.0	2.4
Effective part of the exchanger L-275 [mm]	325	475	725	975	1 225	1 475	1 725

# ORDER CODE

## KORAWALL Optimal-V

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 RAL 9016 ** colour code as per LICON colour chart see p. 23 99 other RAL colour	- RT 24 V DC 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

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 RAL 9016 ** colour code as per LICON colour chart see p. 23 99 other RAL colour	RT 24 V DC regulation

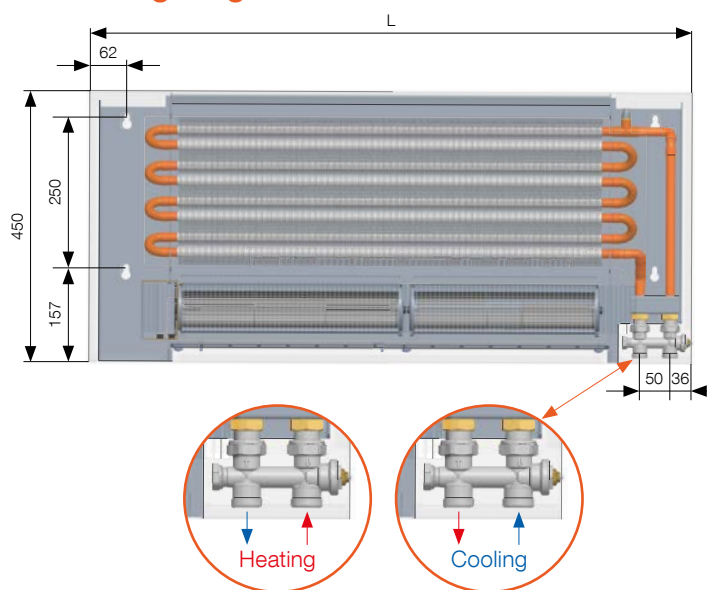
### Example order code: WVP-150/45/11-V5RPSP-10-RT

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.

# 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. 16).
- 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 (see the Anchoring diagram).
- 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](http://www.licon.cz).
- The regulation is identical for KORAFLEX FV trench heaters and KORALINE OLOC free-standing convectors.
- We recommend equipping the KORAWALL WVO and WVP with a thermo-electric actuator (see Optional Accessories, p. 15).
- Do not forget to install the power supply cable near the unit installation site.

## Anchoring diagram



Measurements shown in mm.

# Regulation, Accessories, Technical Parameters and Acoustics

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# REGULATION

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 160T or RDG 260KN thermostats.
- 24 V DC Thermoelectric actuator, thermostatic valves, lockshield.

## RAB 21-DC and RDG 160T 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 160T 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
- 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
- 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 160T 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 160T electronic room thermostat with LCD display



- optional accessory
- 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
- operating voltage 24 V DC, power consumption 1 W
- 0–10 V DC EC fan
- setpoint setting range 5–40 °C
- adjustable switching differential 0.5 to 6 K
- IP rating IP 30
- dimensions w×h×d: 93×128×31 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
- IRA211 infrared remote control
- **order code:** REG-RDG160T



For correct operation, RDG 160T 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
- 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

## SIEMENS IRA 211 infrared remote control



- optional accessory
- infrared remote control for RDG 160T
- heating or cooling operation
- temperature setting
- fan speed selection
- power supply 2× 1.5 V AAA batteries
- IP rating IP 30
- dimensions w×h×d: 42×106×18 mm
- **order code:** REG-IRA211

## TEP 24 thermoelectric actuator



- optional accessory
- 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

# REGULATION AND ACCESSORIES

## R-Box

- optional accessory
- 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 k $\Omega$
- 4 K<sub>V</sub> 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](http://www.licon.cz)
- **order code: REG-RBOX17**



## Junction box

- optional accessory
- 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
- 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. 21.

## Regulation fitting connection – LM valve

- optional accessory
- **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<sub>V</sub>
- connection thread to body G ½", to the heating system G ¾"
- 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

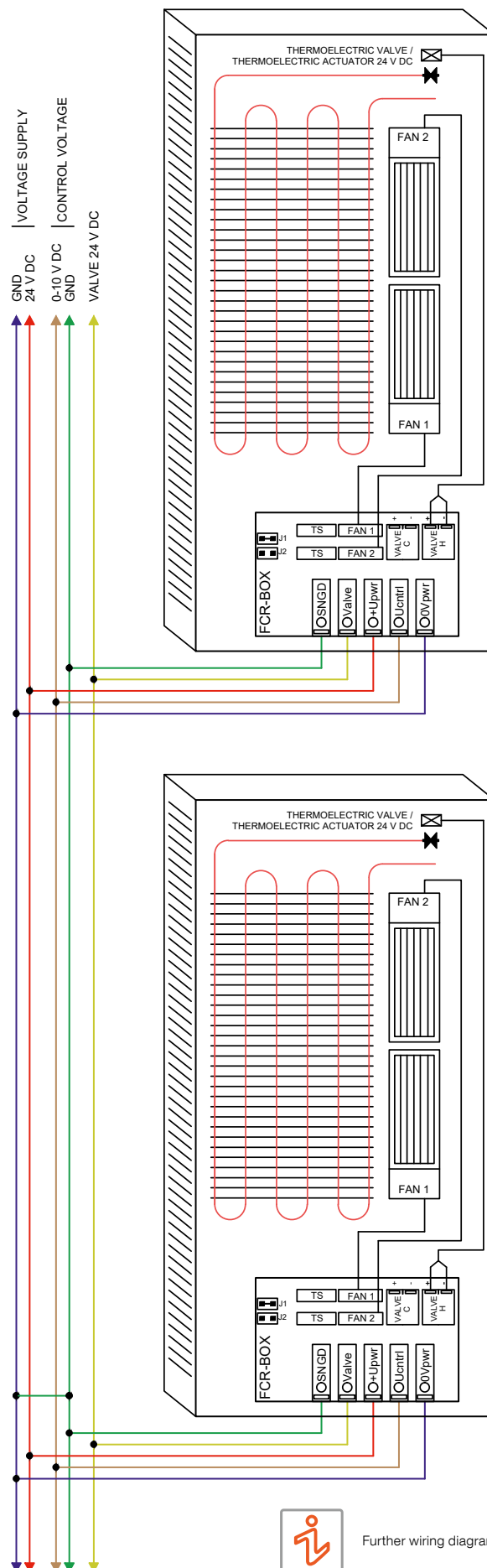
	XP [K]	K <sub>V</sub> with preset [m <sup>3</sup> /h]						K <sub>VS</sub> [m <sup>3</sup> /h]	Max. water temperature [°C]	Max. operating pressure [bar]
		0	0,5	1	2	3	4			
DN 15 (½")	1	0.09	0.17	0.22	0.25	0.28	0.38	1.10	120	10
	2	0.09	0.18	0.30	0.40	0.55	0.75			

Presetting 4 represents normal (operational) setting.



# CONVECTOR WIRING DIAGRAMS

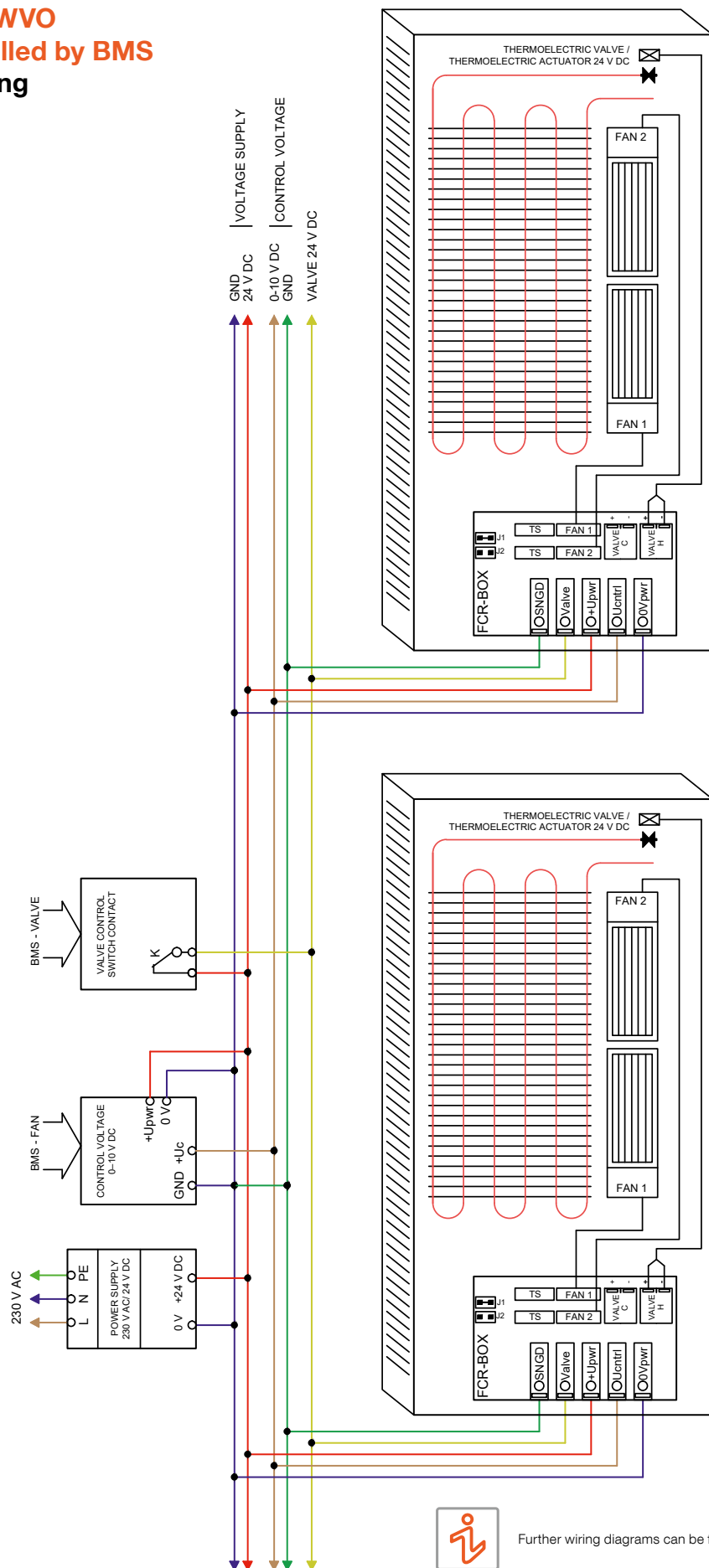
**Basic diagram connection  
for convectors  
WVO and WVP  
Heating or cooling**



Further wiring diagrams can be found at [www.licon.cz](http://www.licon.cz), or upon request.

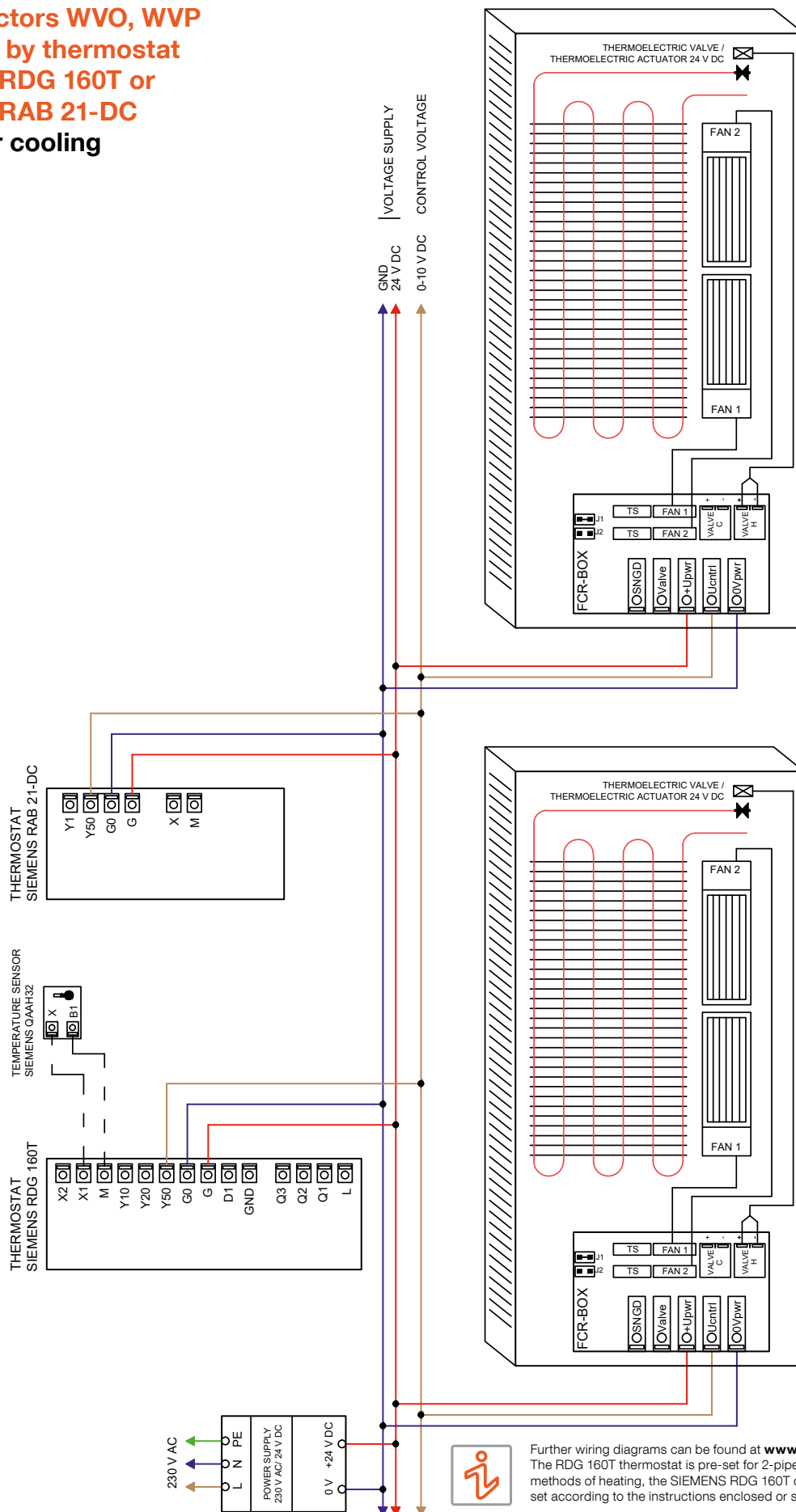
# CONVECTOR WIRING DIAGRAMS

For convectors **WVO**  
and **WVP** controlled by **BMS**  
Heating or cooling



Further wiring diagrams can be found at [www.licon.cz](http://www.licon.cz), or upon request.

**For convectors WVO, WVP  
controlled by thermostat  
SIEMENS RDG 160T or  
SIEMENS RAB 21-DC  
Heating or cooling**



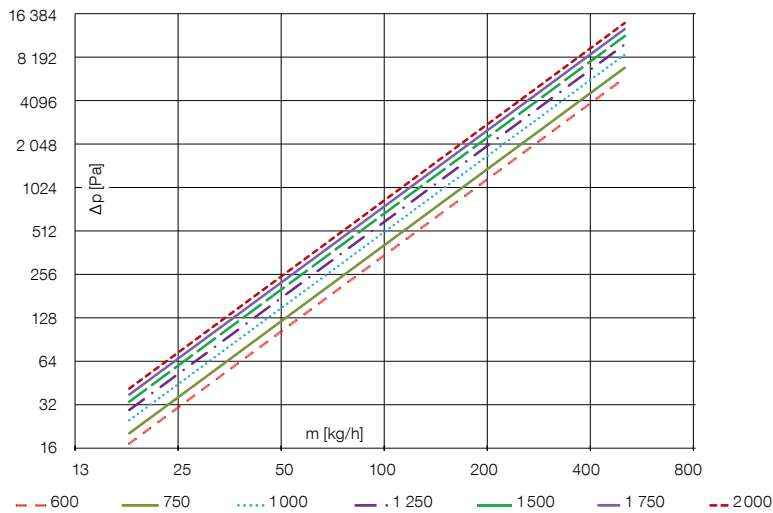
Further wiring diagrams can be found at [www.licon.cz](http://www.licon.cz), or upon request. The RDG 160T thermostat is pre-set for 2-pipe heating systems. For alternative methods of heating, the SIEMENS RDG 160T or RAB 21-DC thermostats must be set according to the instructions enclosed or see downloads at [www.licon.cz](http://www.licon.cz).

# PRESSURE LOSSES

## KORAWALL WVO, WVP 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 $\Delta p$ [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 type 45/11



The pressure losses are shown without any regulation fitting connected.

# 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 11x thermoelectric drive TEP 24 V DC – 6 x 2 W = 12 W

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



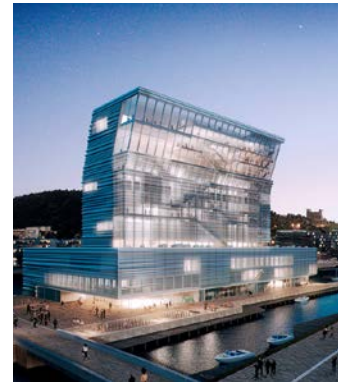
UBS Pleyad Business Centre  
Saint-Denis, France



MCBA Museum,  
Lausanne, Switzerland



Residence du Lac,  
Morges, Switzerland



Museum Munch Oslo,  
Norway



Lachta Centre,  
Saint Petersburg, Russia



Neva Towers,  
Moscow, Russia



Zolotoy Ostrov Moscow,  
Russia



Fyrstikkalléen 1 AS Oslo,  
Norway



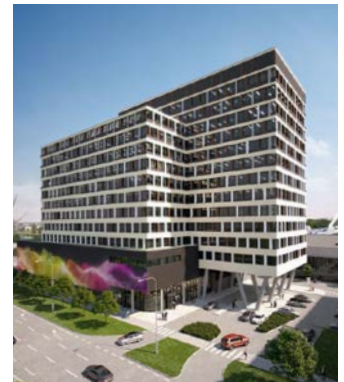
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Zurich, Switzerland



Panorama City,  
Bratislava, Slovakia



NÚSCH Children's Cardiac  
Centre, Bratislava, Slovakia



Panorama Business center,  
Bratislava, Slovakia



Einsteinova Business Centre,  
Bratislava, Slovakia



Harpa Concert Hall,  
Reykjavik, Iceland

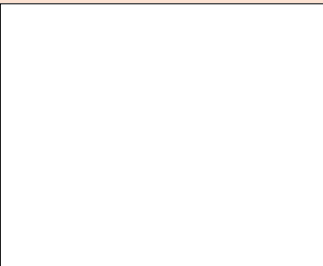
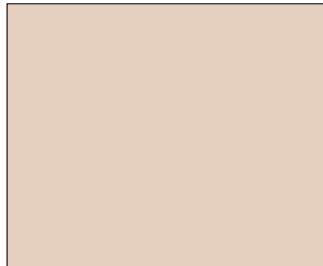
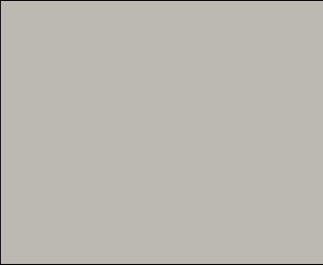
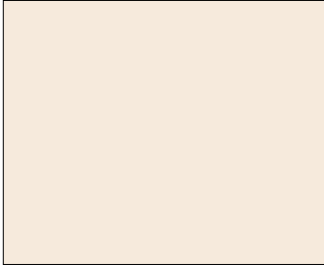





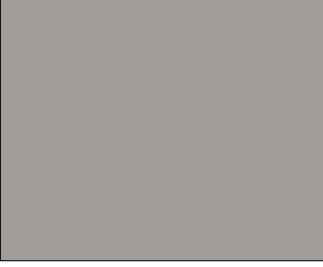
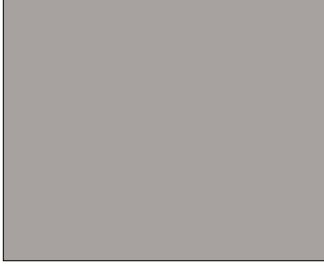

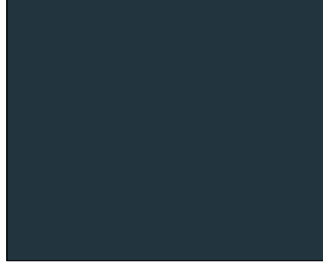
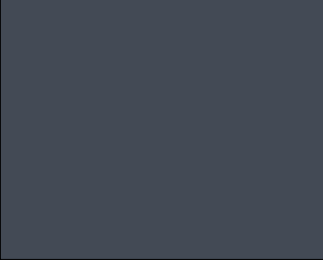
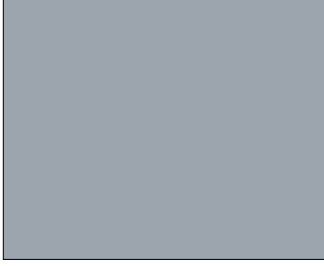


Nordea Headquarters,  
Copenhagen, Denmark



Marina Lipno apartments,  
Czech Republic

# COLOUR CHART

			
code 10 White RAL 9016	code 39 Black 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.



LICON HEAT S. R. O.  
Svárovská 699  
Průmyslová zóna Sever  
463 03 Stráž nad Nisou  
Czech Republic  
e-mail: [info@licon.cz](mailto:info@licon.cz)  
[www.liconheat.news](http://www.liconheat.news)  
[www.licon.cz](http://www.licon.cz)

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