

Free-standing Sigma360

General Specification

Shisha Cafe
181-183 Wilmslow Road
Manchester
M14 5AP

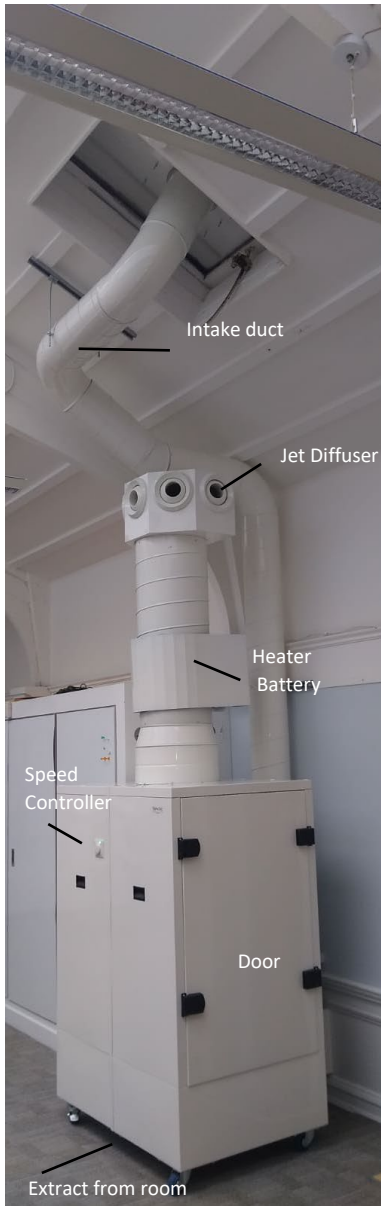
17th July 2023

Sigma EPD Systems and Services: Designed to Lead, Built to Last!

General Specification

The Sigma360 system delivers the following core benefits:

- Removal of smoke particles within the space by filtration. The system also removes gases using an activated carbon filter.
- Smoke-laden air is removed from the space at a rate of 30l/s/person. This air is pushed through a 3-stage filtration system (Sigma 360 ventilator) pre-filter, H14 HEPA filter, and Carbon filter.
- The extract grilles are positioned to catch smoke-laden air (smoke particles) as they are released from the mouths of the smokers – please see drawing attached.
- The supply is via double deflector grilles which will be placed so that the contaminated air will be driven toward the extract grilles. Please see drawing attached.
- Filtering of COVID-19 and other virus particles to reduce viral loads within the space.
- Airflow management - CO₂ monitors causing fan to react to threat increase/decrease air movement within the space.
- Thermal stability within the space due to mixing fresh filtered outside air and warm filtered inside air.
- Conserving energy by reusing heat from filtered inside air to temper outside air.
- Reducing energy using Electronically Commutated (EC) energy saving fan and high efficiency impeller design.
- Low noise levels



General Arrangement of Machine & Location

The Filtration Ventilator would tentatively be located as shown in attached drawing.

The speed controller would be located on the front of the unit.

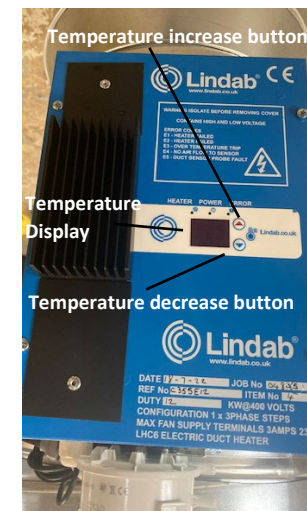
Access to the inside of the unit would be via four latches, two on the right and two on the left. The latches would allow the door to swing open to the right or to the left. If all 4 latches are opened the door could be removed completely.

The doors and body would be lagged (40ml Rockwool lagging) and double skinned for sound attenuation.

A heater battery is optional for the tempering of air being supplied.



When the isolator is turned on the red power light will come on.
When the potentiometer is activated to the correct minimum speed the pressure LED light would come on.



When the isolator is turned on the temperature display screen will illuminate. An error message would initially show. Once the correct pressure is achieved, the pre-set temperature will display.

The fan speed can be set to specific speed 1, 2, 3, 4, 5, and 6 (or settings in-between).

When sufficient pressure is being delivered to the system, the orange light will go out and the green light will illuminate.

Optionally, the system can be equipped with a CO₂ monitor that would cause the fan to ramp up and down according to the level of contaminants in the room.



FAN DETAILS	
Type:	Mixed Flow Fan
Make:	ECblue Basic (Inclusive MODBUS)
Model:	GR25i-6ID.BD.CR
Part Number:	116883/A01
Serial Numbers:	
Fan size/speed:	3730RPM
Condition:	New
Rotation direction	Clockwise
Voltage	Single Phase
Input Power	780 W
More Fan details can be found in Appendix 1	

HEATER BATTERY DETAILS	
Type:	LHC6 3 phase Temperature Controller
Make:	Lindab
Power:	Supplied with SSR max 24Kw
Current:	34.7amps per phase @ 400v
More Heater Battery details can be found in Appendix 3	

FILTER DETAILS			
Filter Type	Specifications		
Carbon Filter	VLX2-2412 EN16890 85%	594 X 292 X 45	
Prefilter	RPC-1212 Enhanced General Odour Removal	287 X 592 X 292	
HEPA	UTFM14122406 EN1822:H14/ISO 45H	305 X 610 X 150	
More Filter details can be found in Appendix 2			

APPENDIX 1

FAN DETAILS

ZAbluefin-ECblue

Size 250

RH25I



Description

Motor technology: EC

Rated frequency f_N : 50/60 Hz*

Thermal class: THCL155*

Min. permitted ambient temperature $t_{amb(min)}$: -20 °C***

Electrical connection: Integrated controller

Degree of protection : IP54

Motor protection: integrated active temperaturemanagement

Impeller made of ZAmid, uncoated, ultramarine blue

* Rated data

*** Occasional operation $\leq -20^\circ\text{C}$ and in consideration of lowest temperature according to product documentation permissible. For cooling applications with continuous operation $\leq -20^\circ\text{C}$ cold design on request.

Inlet ring

00414630

Page 288

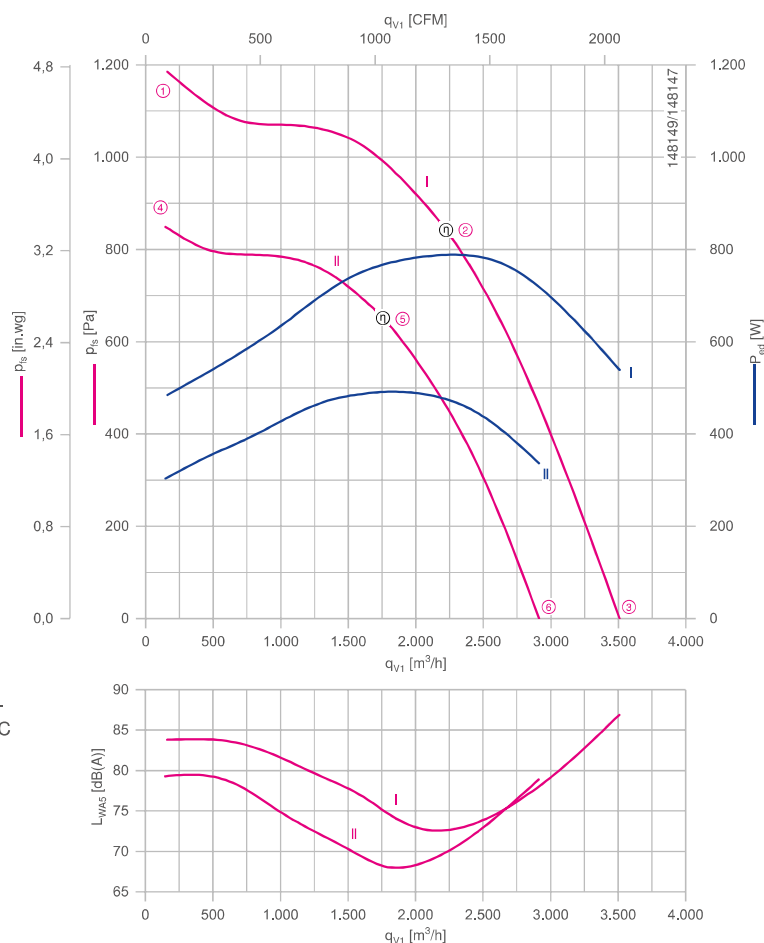
Connection diagrams

Page 358

System components

Page 286

Characteristic curve



Measured with inlet nozzle, without guard grille according to ISO 5801

Fan ordering information

	Rated voltage	Type	Motor	Article no.	Input power	Rated current	Rated speed	Efficiency	Efficiency grade	ErP	Conformity	Weight
	U_N V				P_{ed}	I_N A	n_N min^{-1}	η_{statA} %	η_{actual} %		CE	UL
I	1~ 200-277	RH25I-6ID.BD.CR	BD	116855	780 W	4.00-2.90	3730	74.1	85.7	2015	yes	
	1~ 200-277	GR25I-6ID.BD.CR	BD	116883/A01	780 W					2015		
II	1~ 200-277	RH25I-6ID.BD.CR	BD	116854	500 W	2.50-1.80	3170	73.6	87.3	2015		
	1~ 200-277	GR25I-6ID.BD.CR	BD	116882/A01	500 W					2015		

Further fans can be found in the selection program FANselect: www.fanselect.net

Other voltages and versions on request.



Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	Maximum ambient temperature	Voltage
		n min ⁻¹		I A	P _{ed} W	L _{WA5} dB(A)	t _{amb} (max.) °C	U V
__25I-6ID.BD.CR	I	3730	①	2.10	480	84		230
			②	3.50	780	73		
			③	2.40	540	87	55	
	II	3170	④	1.35	300	79		
			⑤	2.20	500	68	55	
			⑥	1.50	340	79		

Control technology

Control modules

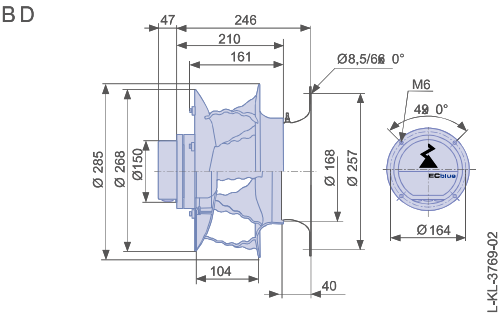

Page 326

Sensor control modules


Page 328

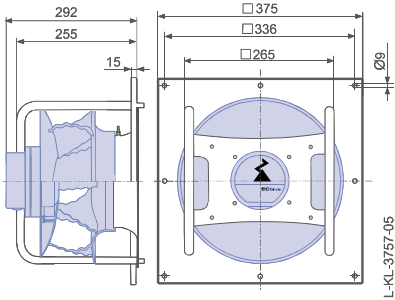
Dimensions mm

Motor Free-running motorized impeller RH
in installation position H/Vu/Vo
Inlet nozzle not included



Ventilation unit GR in installation position H/Vu/
Vo

Inlet nozzle integrated



ZAbluefin-ECblue

Size 280

RH28I



Description

Motor technology: EC

Rated frequency f_N : 50/60 Hz*

Thermal class: THCL155*

Min. permitted ambient temperature $t_{amb(min)}$: -20 °C***

Electrical connection: Integrated controller

Degree of protection : IP54

Motor protection: integrated active temperaturemanagement

Impeller made of ZAmid, uncoated, ultramarine blue

* Rated data

*** Occasional operation $\leq -20^\circ\text{C}$ and in consideration of lowest temperature according to product documentation permissible. For cooling applications with continuous operation $\leq -20^\circ\text{C}$ cold design on request.

Inlet ring

00414631

Page 288

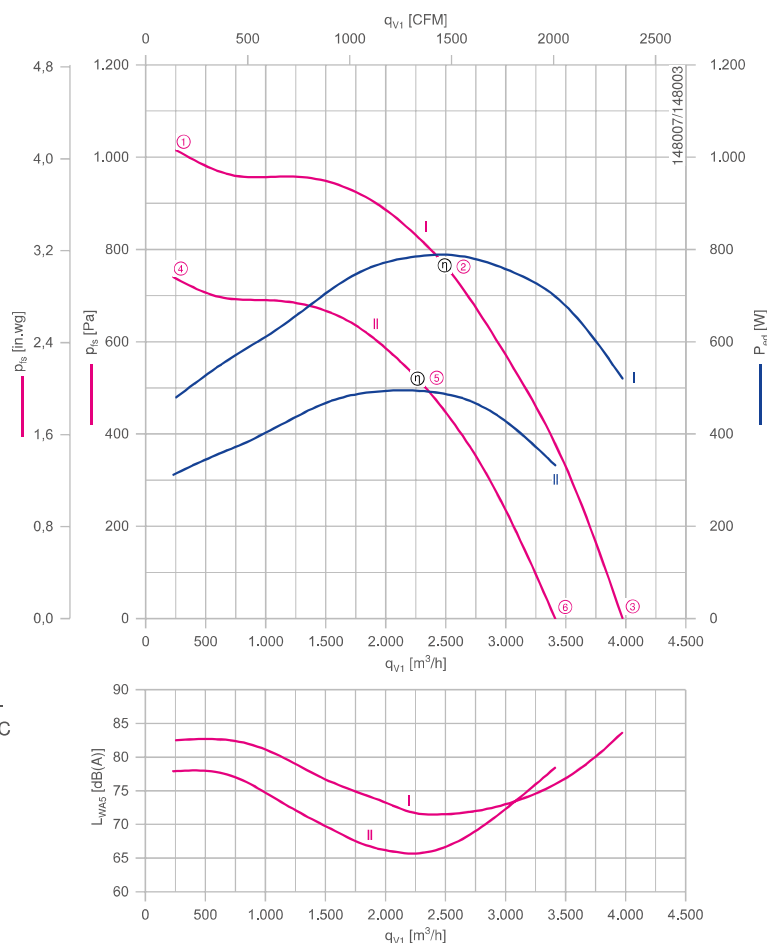
Connection diagrams

Page 358

System components

Page 286

Characteristic curve



Measured with inlet nozzle, without guard grille according to ISO 5801

Fan ordering information

	Rated voltage	Type	Motor	Article no.	Input power	Rated current	Rated speed	Efficiency	Efficiency grade	ErP	Conformity	Weight
	U_N V				P_{ed}	I_N A	n_N min ⁻¹	η_{statA} %	η_{actual} %		CE	UL
I	1~ 200-277	RH28I-6ID.BD.CR	BD	116857	780 W	4.00-2.90	3110	75.4	87.0	2015	yes	
	1~ 200-277	GR28I-6ID.BD.CR	BD	116885/A01	780 W					2015		
II	1~ 200-277	RH28I-6ID.BD.CR	BD	116856	500 W	2.50-1.80	2640	75.3	89.0	2015		
	1~ 200-277	GR28I-6ID.BD.CR	BD	116884/A01	500 W					2015		

Further fans can be found in the selection program FANselect: www.fanselect.net

Other voltages and versions on request.



Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	Maximum ambient temperature	Voltage
		n min ⁻¹		I A	P _{ed} W	L _{WA5} dB(A)	t _{amb} (max.) °C	U V
__28I-6ID.BD.CR	I	3110	①	2.10	480	83	50	230
			②	3.50	780	72		
			③	2.30	520	84		
	II	2640	④	1.35	310	78		
			⑤	2.20	500	66		
			⑥	1.45	330	78		

Control technology

Control modules

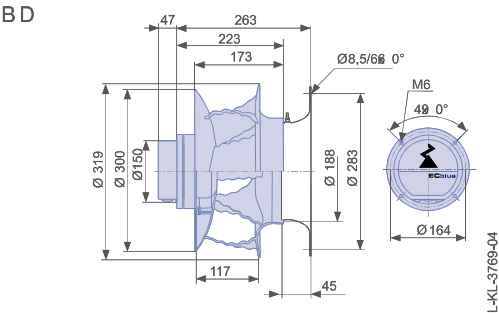

Page 326

Sensor control modules


Page 328

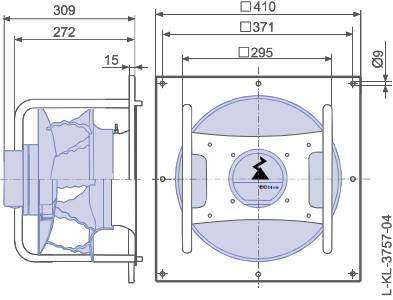
Dimensions mm

Motor Free-running motorized impeller RH
in installation position H/Vu/Vo
Inlet nozzle not included



Ventilation unit GR in installation position H/Vu/
Vo

Inlet nozzle integrated



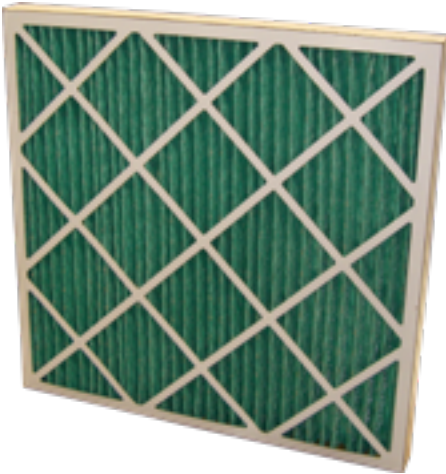
APPENDIX 2

FILTER DETAILS

Vline Extra Panel Filter

Polyester/Cotton Media

VLX2 45mm Deep



General Description

The VLine “Extra” Pleated Panel filter is an high capacity, long life filter offering a better than basic level of filtration and industry leading dust holding capacity, used for pre-filtration in HEVAC applications. This product is made using blended cotton and polyester media which offers excellent in service life. The very high media area also offers extended intervals between service visits.

Construction

This product is constructed by bonding a pleat pack of VLine Extra Media into a water repellent AquaKote® card frame.

The VLine Extra Filter Media

This media is made using a tried and tested blend of cotton and polyester fibres designed to deliver excellent filtration performance throughout the filter life.

Frame Features

Jasun Envirocare use the heaviest AquaKote board available at 710microns for the entire range of panel filters we produce. The Elmendorf wet tear strength is rated at a massive 6963mN. The adhesive used is specially formulated to maintain adhesion even under wet conditions.

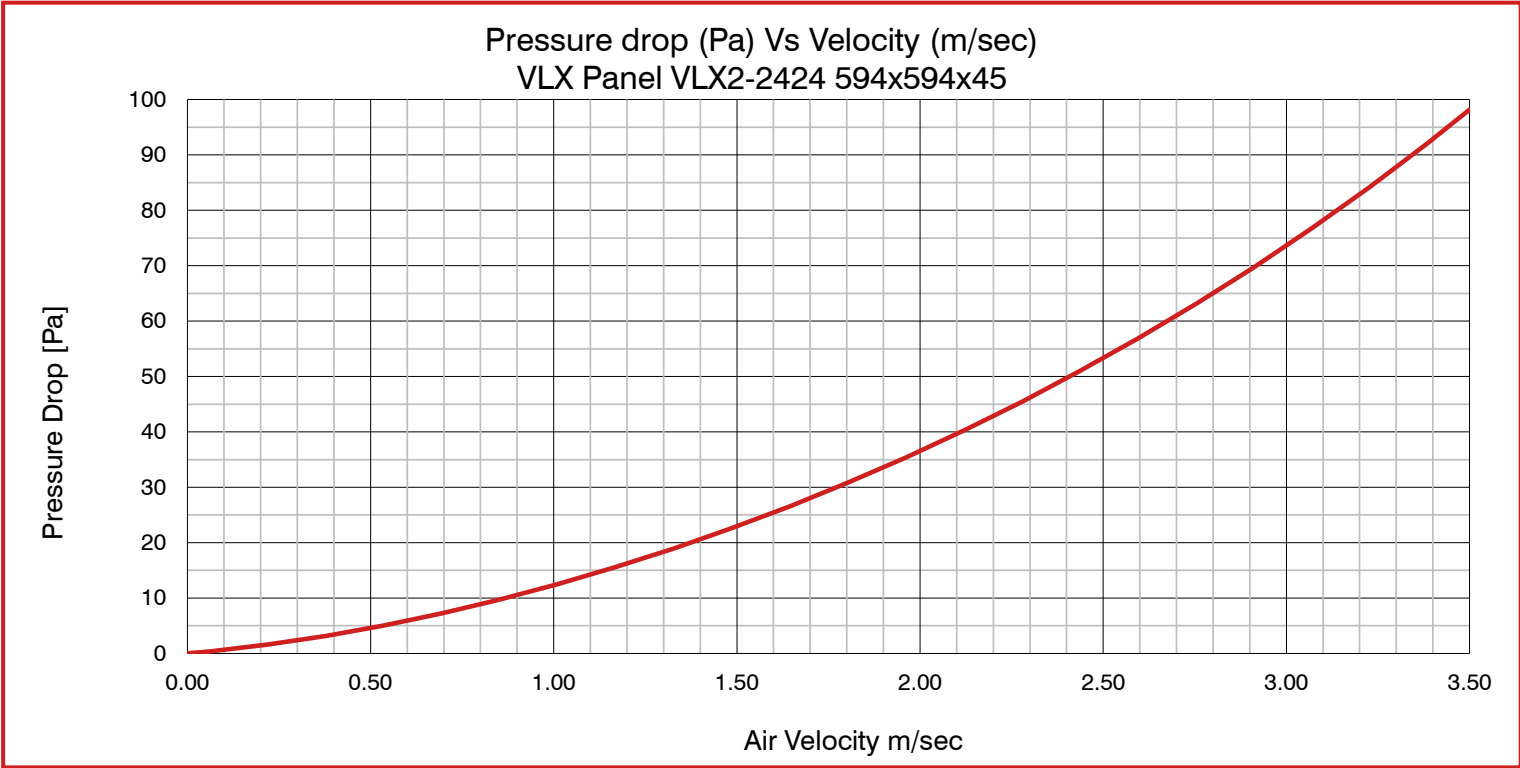
The expanded steel backing to the media is designed to provide maximum support whilst offering minimal airflow resistance

Operating Temperature

Continuous 80 °Centigrade

Part No.	Nominal Size Inches	Height (mm)	Width (mm)	Depth (mm)	Rated Airflow m³/hr
VLX2-1010	10x10x2	241	241	45	560
VLX2-1212	12x12x2	292	292	45	820
VLX2-1515	15x15x2	368	368	45	1305
VLX2-1616	16x16x2	394	394	45	1495
VLX2-1818	18x18x2	445	445	45	1905
VLX2-2010	20x10x2	495	241	45	1150
VLX2-2015	20x15x2	495	368	45	1755
VLX2-2016	20x16x2	495	394	45	1880
VLX2-2020	20x20x2	495	495	45	2360
VLX2-2412	24x12x2	594	292	45	1670
VLX2-2420	24x20x2	594	495	45	2830
VLX2-2424	24x24x2	594	594	45	3400
VLX2-2516	25x16x2	622	394	45	2360
VLX2-2520	25x20x2	622	495	45	2965

Performance	
Filter Class ISO16890	ISO Coarse 85%
Initial Gravimetric Arrestance	87%
Filter Class EN779:2012	G4
Filter Depth	45mm
Rated Airflow	2.68m/second
Initial Pressure Drop	60Pa
Final Pressure Drop*	250Pa
*This is a recommended value only	



Ultima TFM14-06

Turbulent Flow HEPA Filter

150mm Deep

Performance

Filter Class ISO29463-4	ISO 45H
Filter EN1822-4	H14
Global Efficiency % MPPS	≥ 99.995%
Local Efficiency % MPPS	99.98%
Rated Airflow	1.00m/second
Initial Pressure Drop	280Pa
Final Pressure Drop*	380Pa

Final Recommended Pressure Drop to EN13053:2019



GENERAL DESCRIPTION

A RANGE OF HEPA FILTERS WITH STEEL OR ALUMINIUM CASE AND MINIPLEAT MEDIA AREA FOR HIGHER CAPACITIES. THIS FILTER IS MOST OFTEN USED AS A MODERN AND COST EFFECTIVE REPLACEMENT FOR THE OLD STYLE DEEP PLEAT FILTERS TYPE UDP

TECHNICAL CHARACTERISTICS

- MEDIA GLASS FIBRE PAPER MINIPLEAT
- SEPARATORS HOTMELT
- SEALANT POLYURETHANE
- CASE ALUMINIUM EXTRUSION OR GALVANISED STEEL
- SEALS POLYURETHANE SINGLE PIECE D GASKET
- FACE GRILLS - OPTIONAL
- HANDLES - OPTIONAL
- DOP TEST PORTS OPTIONAL

OPERATING TEMPERATURE CONTINUOUS 80 °CENTIGRADE

Part No.	Size Inches	Height (mm)	Width (mm)	Depth (mm)	Rated Airflow m³/hr
UTFM14080806	8x8x6	203	203	150	150
UTFM14121206	12x12x6	305	305	150	335
UTFM14122406	12x24x6	305	610	150	670
UTFM14151506	15x15x6	381	381	150	525
UTFM14181806	18x18x6	457	457	150	750
UTFM14202006	20x20x6	508	508	150	930
UTFM14232306	23x23x6	575	575	150	1190
UTFM14241206N	24x12x6 (Nominal)	594	287	150	615
UTFM14242406	24x24x6	610	610	150	1340
UTFM14242406N	24x24x6 (Nominal)	594	594	150	1270
UTFM14243606	24x36x6	610	915	150	2010
UTFM14244806	24x48x6	610	1220	150	2680
UTFM14302406	30x24x6	762	610	150	1675



CarboPleat RPC filters combine gas phase filtration and particulate efficiency to provide a new generation filter designed to cope with modern environments. This super active carbon is particularly effective on airborne contaminants and will provide treated air to satisfy EN13779 and to meet cafe directive regulations.

Features

- Totally stable media presentation to the air
- Will not collapse during downtime
- Will always operate at 100% of capacity
- Fully incinerable
- Durable
- Low Pressure Drop
- Extra-Active carbon for fast VOC reduction
- Available with 20mm or 25mm Header
- Long life retrofit for any standard bag filter

Operating Temperature

Continuous 80 °Centigrade

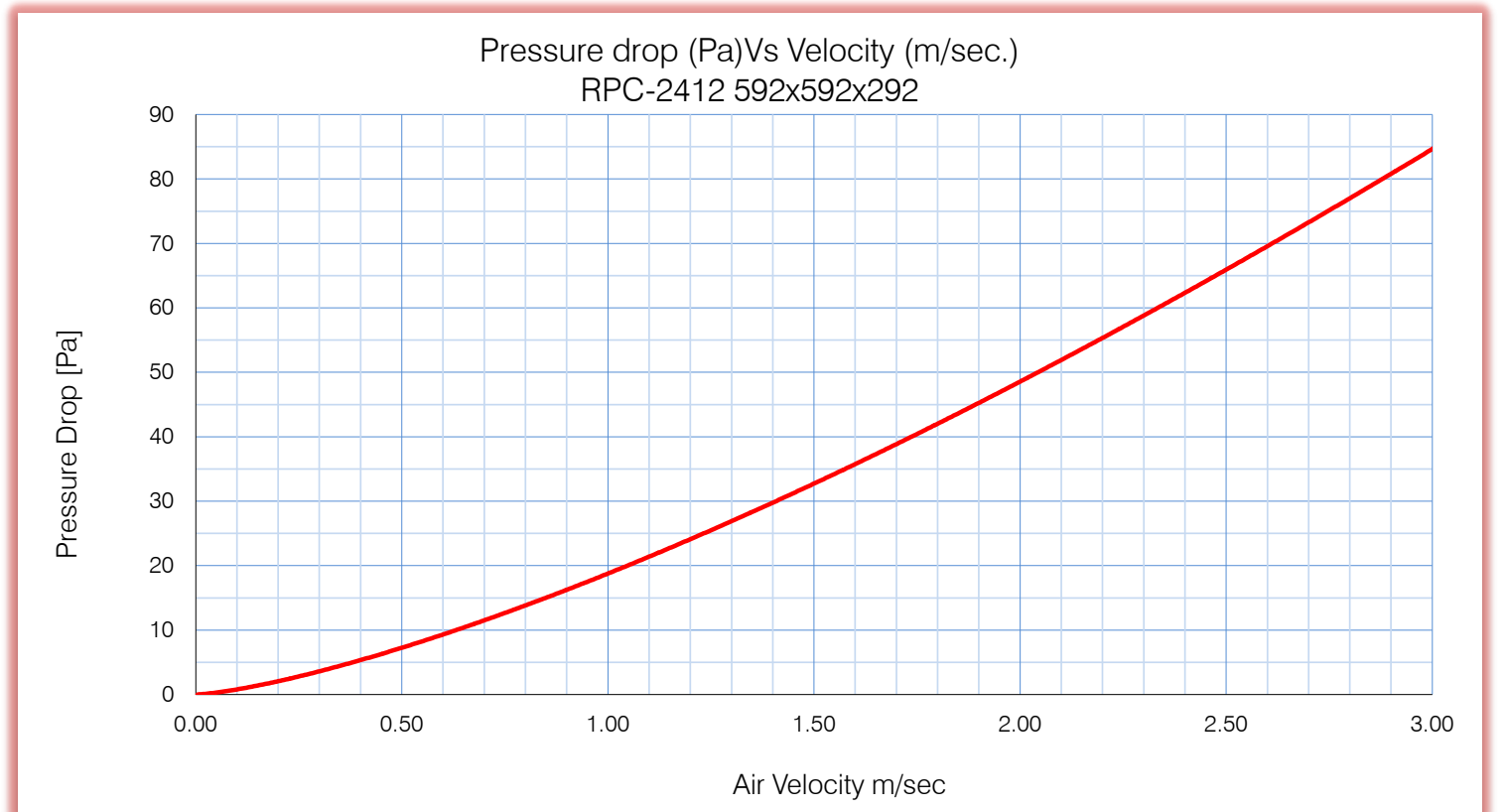
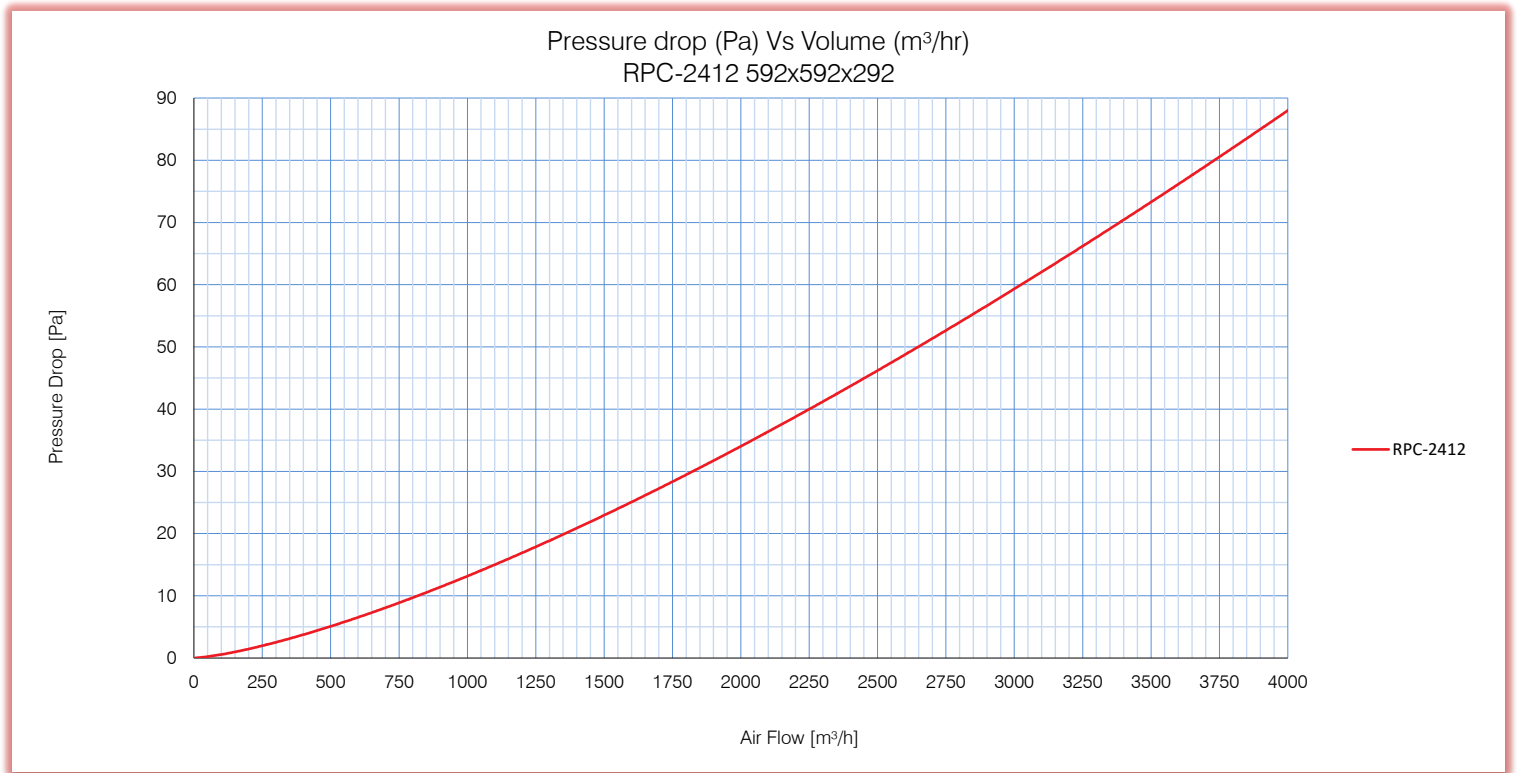
Performance Data

Class ISO16890	ePM1 > 60%
Grade to EN779:2012	F7



Part No.	Nominal Size	Height (mm)	Width (mm)	Depth (mm)	Pressure Drop (Pa)	Final Rec. PD (Pa)	Rated Airflow m³/hr
RPC-2412	24x24x20	592	592	500	70	170	3400
RPC-2012	24x20x20	592	490	500			2800
RPC-1212	24x12x20	592	287	500			1700

Contaminant	Test Concentration	Efficiency Test Result
Sulphur Dioxide SO2	30ppm +/- 1.5ppm	89.57%
Nitrogen Dioxide NO2	30ppm +/- 1.5ppm	93.76%
Butane	80ppm +/- 4ppm	89.34%
Toluene	80ppm +/- 4ppm	93.19%



APPENDIX 3

HEATER BATTERY DETAILS



Electric Heater Battery

EHB



- Actual Kw rating and supply voltage to be confirmed at time of order.
- All LHC heaters come with on-board controls ,airflow switch and duct sensor fitted as standard.
- 0-10 volt BMS connections and on/off volt free contacts are fitted as standard.
- LED Display with fault diagnosis.
- Overheat cut out protection as standard.
- A minimum airflow velocity of 1.5m/s is required.

Dimensions

Circular from 100 dia - 630 dia

Size	kw min	kw max
100	0.75	2
125	0.75	3
150	0.75	3
200	1	7.5
250	1	9
315	2	18
355	3	18
400	3	18
450	3	18
500	7	24
630	9	24

Ratings shown above are minimum and maximum .

Available in single and 3 phase

Rectangular - Sizes by request

APPENDIX 4

ROCKWOOL LAGGING

**ROCKWOOL®**

RW Semi Rigid & Rigid Slabs

Versatile building slabs for a wide range of general building applications

ROCKWOOL RW semi-rigid and rigid slabs are high quality resin bonded slabs that can be used for thermal and acoustic insulation in general building applications. The slabs are available in a wide range of thicknesses and densities to suit most requirements and are CE marked to EN 13162



RW Semi Rigid & Rigid Slabs

Advantages

- Excellent thermal, acoustic and fire insulation
- Suitable for a wide range of general building applications
Euroclass A1 to BS EN 13501-1
- Easy to handle and install
- Non-hygroscopic
- No maintenance
- Black or white tissue and aluminium foil facings available

Standards and approvals

ROCKWOOL RW Slabs conform to: BS EN 13162:2012: Thermal insulation products for buildings. Factory made mineral wool (MW) products.

Applications

ROCKWOOL RW slabs can be used for a wide range of general building applications which include acoustic insulation for partitions and ceilings as well as thermal insulation for floors, walls, and roofs

Note:

- For HVAC applications refer to the HVAC Specification Guide
- For Industrial applications, relating to high temperature services, offshore & petrochemical, etc. please visit our ProRox product range on www.rockwool-rti.co.uk

Facings

RW slabs are also available with number of facing options, which are:

- Non-woven mineral black tissue (75gsm)
- Non-woven mineral white tissue (100gsm)
- Aluminium foil

Performance

Fire

All ROCKWOOL RW slab products, either un-faced or with an aluminium foil or glass fleece on one or both surfaces, achieve an A1 classification in accordance with BS EN 13501-1 and therefore comply with the requirements of non-combustible materials/products, as defined in all UK and Ireland Building Regulations.

Water resistance

ROCKWOOL RW Slabs are highly water repellent and non-hygroscopic

Thermal performance

For general building applications (Lambda 90:90) at temperature 10°C:

ROCKWOOL RWA45 slab = 0.035 W/mK

ROCKWOOL RW3 slab = 0.034 W/mK

ROCKWOOL RW5 slab = 0.034 W/mK

Bending radius of RW slabs

The table below gives the minimum bending radius for ROCKWOOL RW slabs.

Bending to smaller radii can deform the product and increase the installation time.

Slab type	Slab thickness (mm)					
	30	40	50	60	75	100
RWA45	425	500	700	900	1200	1800
RW3	425	500	700	1000	1350	1900
RW5	550	700	1000	1500	2250	2500

RW Semi Rigid & Rigid Slabs

Dimensions

All standard un-faced slabs are manufactured 1200 x 600mm. All foil faced and tissue faced slabs are manufactured 1000 x 600mm.

The standard thickness range of ROCKWOOL RW slabs are shown in the table below.

Product	Nominal density kg/m ³	Dimension (mm)	Thickness (mm)
RWA45	45	1200 x 600	30, 40, 50, 60, 75, 100
RW3	60	1200 x 600	30*, 40, 50, 60, 75 & 100
RW5	100	1200 x 600	25, 30*, 40, 50, 60, 75 & 100

* Denotes thickness also available as 'standard' with white or black tissue facing (not foil facing). All foil faced and tissue faced slabs (other than shown above) are non-standard and will be subject to minimum order quantities.

Acoustics

Acoustic performance

ROCKWOOL stone wool products work in two distinct ways to reduce noise, either by impeding the transmission of sound through an element of the structure or by absorption of sound at the surface.

Noise absorption is expressed as a factor between 0 and 1.0. The more sound that a surface absorbs, the higher its absorption coefficient.

The structure of the fibres in ROCKWOOL RW slabs make them ideal for use as a sound absorber, with characteristically high coefficients over a wide frequency range (see table below).

Absorption coefficients for RW slabs

Product	Thickness (mm)	Mounting	Mounting Frequency (Hz)					
			125	250	500	1K	2K	4K
RWA45	50	direct	0.20	0.50	0.85	1.00	1.00	1.00
RWA45	60	direct	0.30	0.70	1.00	1.00	1.00	1.00
RW3	50	direct	0.11	0.60	0.96	0.94	0.92	0.82
RW3	75	direct	0.34	0.95	1.00	0.82	0.87	0.86
RW5	30	direct	0.10	0.40	0.80	0.90	0.90	0.90
RW5	75	direct	0.40	0.75	0.90	0.80	0.90	0.85

Note: Differences in coefficients of less than 0.15 are not significant. The absorption coefficients shown above are typical figures that can be achieved by un-faced RW slabs.

Internal partitions

Dwellings

In England and Wales, Approved Document E requires all internal walls between a bedroom or room containing a WC and another room to have a minimum sound insulation of 40 Rw dB. This applies to new walls built both in dwellings formed by a material change of use and new build extensions of existing dwellings. (For Scotland, the minimum sound insulation requirement is 43 Rw dB).

Schools

Specific performance standards are set for airborne sound insulation between spaces by Building Bulletin 93 (December 2014) 'The Acoustic Design of Schools'. This classifies each room for the purpose of airborne sound insulation by its activity purpose and sets the minimum sound insulation performance standards for each partition.

Hospitals

Similarly to schools the Healthcare Technical Manuals HTM 08-01 (previously HTM 2045) sets standards for privacy according to room type and from this the specific performance requirement for any partition can be obtained.

Fire performance requirements for internal partitions

Generally fire performance of partitions will be determined in line with the appropriate Building Regulations. In certain buildings there may be specific fire performance requirements for partitions separating specific room types, for example in Hospitals where this is set by Firecode HTM 05-02 and Building Bulletin 100 Design for fire safety in schools.

ROCKWOOL products also help to improve the fire rating of a partition by limiting the transfer of heat across the cavity.

RW Semi Rigid & Rigid Slabs

Party walls - steel frame party wall

Typical Twin light steel frame construction

Two separate steel frame walls are constructed.

Minimum 60mm RWA45 slabs are slotted into the cavity between the two steel frames and butt jointed.

(Note actual thickness of insulation will be determined by the as built cavity width between each frame)

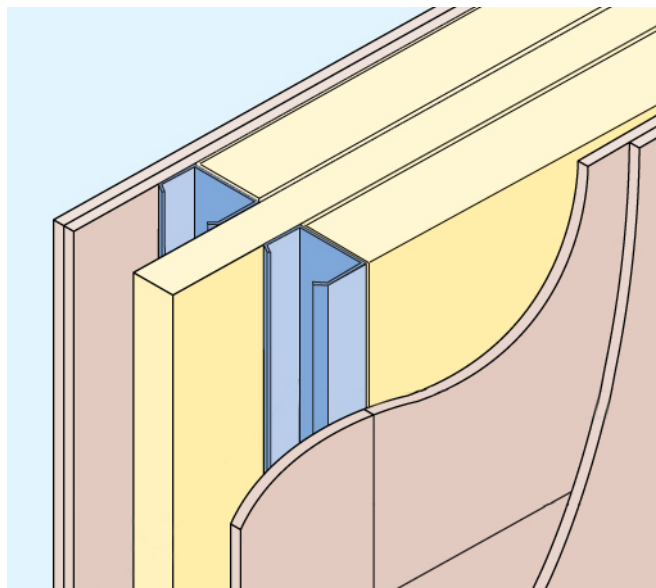
The rows of slabs should be laid 'broken bond' to avoid coincident vertical joints.

Fully fill the depth of the frame on both sides with 75mm RWA45 slabs, (or thickness to suite stud depth) with no gaps between the insulation slabs.

Wall linings: 2 layers of gypsum plasterboard each side of the party wall, with all joints staggered, to provide a total nominal mass per unit area of 22kg/m² both sides. A minimum width of 200mm is required between the inner faces of plasterboard lining.

Seal all joints in outer leaf with Joint Tape or caulk sealant. **NOTE This wall construction requires pre-completion testing.**

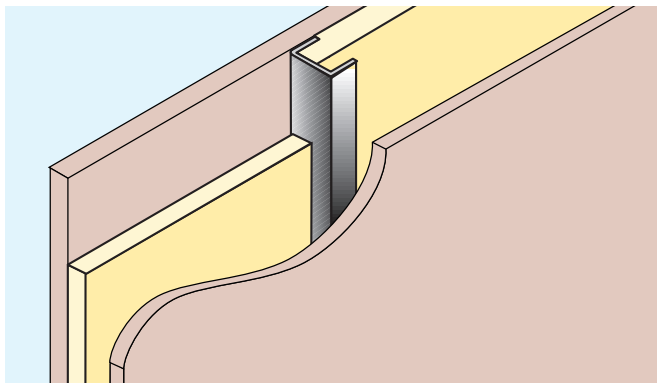
ROCKWOOL ancillary products: To meet fire, acoustic and thermal regulations cavity barriers must be installed at the interface junction between the steel frame party wall with the external cavity wall. (For further information, please refer to the ROCKWOOL Cavity Barrier data sheet).



RW Semi Rigid & Rigid Slabs

Acoustic Solutions for Internal metal stud partition walls

Lightweight 50mm metal partition - Rw 41dB



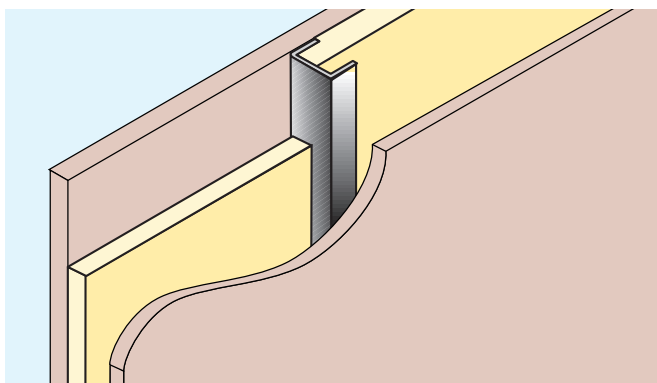
Studs: 50mm metal 'C' studs @ 600mm centres
Facings: 1 layer of 12.5mm standard plasterboard
 (total mass per unit area 8.0kg/m² each side)
Insulation: 30mm ROCKWOOL RW3 slab

Results

Weighted sound reduction:	Rw 41dB
Fire resistance :	30 minutes
Maximum height :	2.5 metres
Nominal wall thickness:	75mm
Approx .weight :	18kg/m ²

This ROCKWOOL solution exceeds the minimum requirements of the Approved Document E for a Rw 40dB internal wall partition in dwellings.

Lightweight 50mm metal partition - Rw 43dB



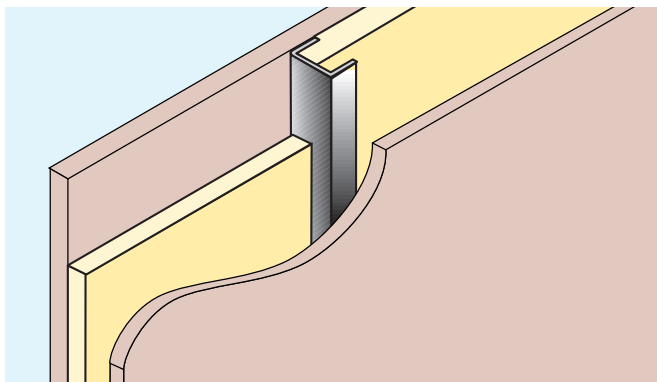
Studs: 50mm metal 'C' studs @ 600mm centres
Facings: 1 layer of 12.5mm acoustic plasterboard
 (total mass per unit area 10kg/m² each side)
Insulation: 30mm ROCKWOOL RW3 slab

Results

Weighted sound reduction:	Rw 43dB
Fire resistance :	30 minutes
Maximum height :	2.5 metres
Nominal wall thickness:	75mm
Approx .weight :	22kg/m ²

This ROCKWOOL solution also meets the minimum requirements for a Rw 43dB as required by Section 5 of the Scottish Technical Standards for internal wall partition in dwellings.

Lightweight 70mm metal partition - Rw 44dB



Studs: 70mm metal C studs @ 600mm centres
Facings: 1 layer of 12.5mm standard plasterboard
 (total mass per unit area 8.0kg/m² each side)
Insulation: 50mm ROCKWOOL RWA45 slab

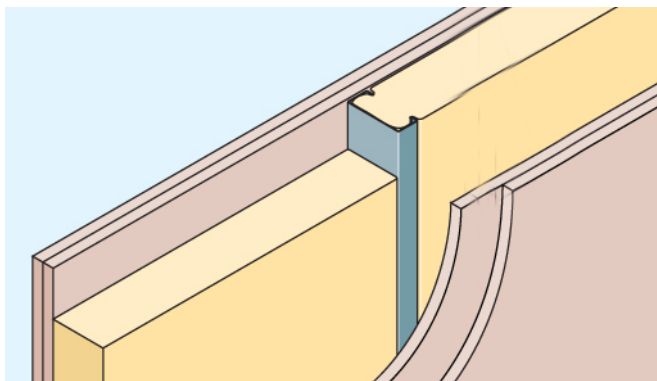
Results

Weighted sound reduction:	Rw 44dB
Fire resistance :	30 minutes
Maximum height :	3.6 metres
Nominal wall thickness:	95mm
Approx .weight :	19kg/m ²

This ROCKWOOL solution is suited to general offices and other general purpose uses.

RW Semi Rigid & Rigid Slabs

Lightweight 70mm metal partition - Rw 50dB



Studs: 70mm metal C studs @ 600mm centres

Facings: 2 layers of 12.5mm standard plasterboard (total mass per unit area 16.0kg/m² each side)

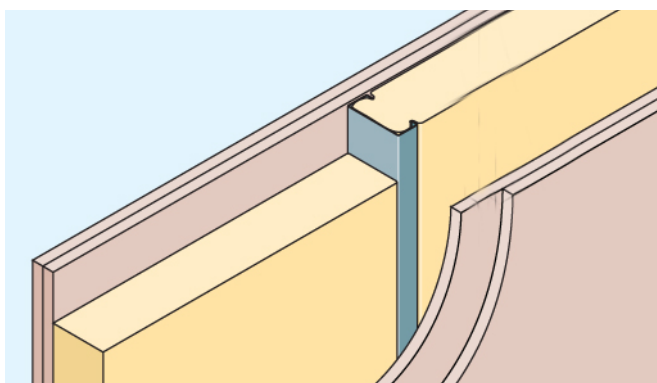
Insulation: 50mm ROCKWOOL RWA45 slab

Results

Weighted sound reduction:	Rw 50dB
Fire resistance:	60 minutes
Maximum height:	4.6 metres
Nominal wall thickness:	120mm
Approx .weight :	36kg/m ²

This ROCKWOOL solution is suited to board rooms, offices and classrooms etc.

Lightweight 70mm metal partition - Rw 55dB



Studs: 70mm metal C studs @ 600mm centres

Facings: 2 layers of 12.5mm acoustic plasterboard (total mass per unit area 20.0kg/m² each side)

Insulation: 50mm ROCKWOOL RWA45 slab

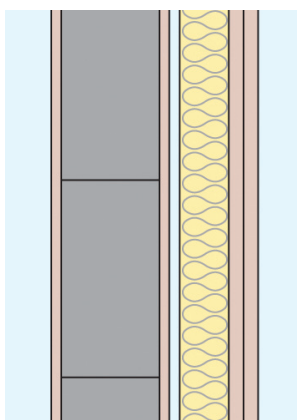
Results

Weighted sound reduction:	Rw 55dB
Fire resistance:	60 minutes
Maximum height:	4.6 metres
Nominal wall thickness:	120mm
Approx .weight :	43kg/m ²

This ROCKWOOL solution is suited to Lecture theatres, Conference rooms, etc.

Acoustic upgrade of existing solid masonry wall to party wall standard

This ROCKWOOL solution meets the requirements of ADE Section 4 'Material change of use' Wall treatment 1



Minimum Required performance standard DnTw +Ctr = 43 dB (or greater)

Existing wall: min.100mm existing solid masonry wall plastered on both faces

Studs: Independent 50mm metal 'C' studs (leaving a minimum 10mm air space between the back of the stud and the existing wall)

Insulation: min 40mm ROCKWOOL RWA45 slab between studs

Facings: 2 layers of 12.5mm standard plasterboard (8.2kg/m² per board) with staggered joints between boards.

Finishes: Plaster skim coat

Total mass per unit area ,excluding framework - 20.0kg/m²

- If existing masonry wall is not plastered or is less than 100mm thick then independent panels should be applied to both sides.
- Seal all gaps at the perimeter of the plasterboard lining and where services, such as electrical sockets, penetrate the plasterboard with ROCKWOOL Intumescent Acoustic sealant.
- This solution is only suitable for refurbishment work and will require pre-completion testing to show compliance with Building Regulation requirements.

RW Semi Rigid & Rigid Slabs

Work on site

Handling and storage

ROCKWOOL RW slabs are light and easy to cut to any shape with a sharp knife. They are shrink wrapped in polyethylene and supplied on pallets which are shrouded with a waterproof hood suitable for outside storage.

Maintenance

Once installed the ROCKWOOL RW slabs need no maintenance.

Sustainability

As an environmentally conscious company, ROCKWOOL promotes the sustainable production and use of insulation and is committed to a continuous process of environmental improvement.



All ROCKWOOL products provide outstanding thermal protection as well as four added benefits:

- **Fire resistance**
- **Acoustic comfort**
- **Sustainable materials**
- **Durability**

Health & Safety

The safety of ROCKWOOL stone wool is confirmed by current UK and Republic of Ireland health & safety regulations and EU directive 97/69/EC: ROCKWOOL fibres are not classified as a possible human carcinogen. A Material Safety Data Sheet is available and can be downloaded from www.rockwool.co.uk to assist in the preparation of risk assessments, as required by the Control of Substances Hazardous to Health Regulations (COSHH).

Environment

Made from a renewable and plentiful naturally occurring resource, ROCKWOOL insulation saves fuel costs and energy in use and relies on trapped air for its thermal properties.

ROCKWOOL insulation does not contain (and has never contained) gases that have ozone depletion potential (ODP) or global warming potential (GWP).

ROCKWOOL is approximately 97% recyclable. For waste ROCKWOOL material that may be generated during installation or at end of life, we are happy to discuss the individual requirements of contractors and users considering returning these materials to our factory for recycling.

Interested?

For further information, contact the Technical Solutions Team on 01656 868621 or email technical.solutions@rockwool.co.uk

Visit www.rockwool.co.uk to view our complete range of products and services.

Copyright ROCKWOOL February 2015

ROCKWOOL® Limited
Pencoed
Bridgend
CF35 6NY

info@rockwool.co.uk
www.rockwool.co.uk

ROCKWOOL®

ROCKWOOL Limited reserves the right to alter or amend the specification of products without notice as our policy is one of constant improvement. The information contained in this data sheet is believed to be correct at the date of publication.

Whilst ROCKWOOL will endeavour to keep its publications up to date,

readers will appreciate that between publications there may be pertinent changes in the law, or other developments affecting the accuracy of the information contained in this data sheet.

The above applications do not necessarily represent an exhaustive list of applications for ROCKWOOL RW Slabs.

ROCKWOOL Limited does not accept responsibility for the consequences of using ROCKWOOL RW Slabs in applications different from those described within this data sheet. Expert advice should be sought where such different applications are contemplated, or where the extent of any listed application is in doubt.

CREATE AND PROTECT®

APPENDIX 5

CO₂ MONITOR

**Inhaltsübersicht**

Kapitel	Seite
Information	1
Anwendung	1
Haftungsausschluss	1
Sicherheitshinweise	1
Funktion	2
Wartung	2
Transport	2
Lagerung	2
Entsorgung / Recycling	2
Montage	2
Technische Daten	3
Anschlussplan	4
Herstellerhinweis	4
Servicehinweis	4

**Information**

Die Einhaltung der nachfolgenden Vorgaben dient auch der Sicherheit des Produktes. Sollten die angegebenen Hinweise insbesondere zur generellen Sicherheit, Transport, Lagerung, Montage, Betriebsbedingungen, Inbetriebnahme, Instandhaltung, Wartung, Reinigung und Entsorgung / Recycling nicht beachtet werden, kann das Produkt eventuell nicht sicher betrieben werden und kann eine Gefahr für Leib und Leben der Benutzer und dritter Personen darstellen.

Abweichungen von den nachfolgenden Vorgaben können daher sowohl zum Verlust der gesetzlichen Sachmängelhaftungsrechte führen als auch zu einer Haftung des Käufers für das durch die Abweichung von den Vorgaben unsicher gewordene Produkt.

Anwendung

Kombinierter Sensor für die Messung von: Kohlendioxid (CO₂), relativer Feuchte (r. F.) und Temperatur (°C).
Z. B. für die optimale Belüftung von Wohnungen, Bürogebäuden und Gebäuden der Gastronomie.
LCD Anzeige: alternierend CO₂ (ppm) / r. F. (% RH) / T (°C).
Wahlweise kann einer der 3 analogen 0 - 10 V Ausgänge (einer je Messgröße) für die Kombination mit ZIEHL-ABEGG Regelgeräten verwendet werden. Es ist somit möglich, die Ventilator Drehzahl in Abhängigkeit des CO₂ Wertes, der Feuchtigkeit oder der Temperatur zu regeln.

Haftungsausschluss

Änderungen der Konstruktion und technischen Daten behalten wir uns im Interesse der Weiterentwicklung vor. Aus den Angaben, Abbildungen bzw. Zeichnungen und Beschreibungen können deshalb keine Ansprüche hergeleitet werden. Der Irrtum ist vorbehalten.
Wir haften nicht für Schäden aufgrund von Fehlgebrauch, sachwidriger Verwendung, unsachgemäßer Verwendung oder als Folge von nicht autorisierten Reparaturen bzw. Veränderungen.

**Sicherheitshinweise**

Das Gerät ist ausschließlich für die in der Auftragsbestätigung genannten Aufgaben bestimmt.
Eine andere oder darüber hinausgehende Benutzung, wenn nicht vertraglich vereinbart, gilt als nicht bestimmungsgemäß. Für hieraus resultierende Schäden haftet der Hersteller nicht. Das Risiko trägt allein das Verwenderunternehmen bzw. der Verwender.

**Contents**

Chapter	Page
Information	1
Operational area	1
Exclusion of liability	1
Safety instructions	1
Function	2
Maintenance	2
Transport	2
Storage	2
Disposal / recycling	2
Mounting	2
Technical data	3
Connection diagram	4
Manufacturer reference	4
Service information	4

**Information**

Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, start-up, maintenance, repair, cleaning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties.

Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

Operational area

Combined sensor for measurement of: carbon dioxide (CO₂), relative humidity (RH) and temperature (°C).

E.G. for the optimal ventilation of residential buildings, office buildings and buildings of catering trade.

LCD display: alternating CO₂ (ppm) / r. H. (% RH) / T (°C).
Alternatively one of the 3 analog 0 - 10 V outputs (one for each measured variable) for the combination with ZIEHL-ABEGG controllers can be used. It is thus possible to control the fan speed in dependence of the CO₂ value, the humidity or the temperature.

Exclusion of liability

To allow for future developments, construction methods and technical data given are subject to alteration. We do not accept any liability for possible errors or omissions in the information contained in data, illustrations or drawings provided.

We accept no liability for damage caused by misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

**Safety instructions**

The equipment is to be used solely for the purposes specified and confirmed in the order.

Any other use above and beyond this is considered not for the intended purpose unless agreed otherwise by contract. The manufacturer will not be liable for any damage resulting from this. The individual or company using it bears the sole risk.

- Installation, electrical connection and commissioning to be carried out by trained service personnel only. The speci-

- Montage, elektrischer Anschluss und Inbetriebnahme nur von ausgebildetem Fachpersonal vornehmen lassen. Halten Sie sich an die anlagenbezogenen Bedingungen und Vorgaben des Systemherstellers oder Anlagenbauers. Im Falle von Zuwiderhandlungen erlischt die Garantie auf unsere Regelgeräte und Zubehörteile!
- Es ist grundsätzlich verboten, Arbeiten an unter Spannung stehenden Teilen durchzuführen. Schutzart des geöffneten Gerätes ist IP00! Gefährliche Spannungen können direkt berührt werden!
- Elektrische Ausrüstungen sind regelmäßig zu überprüfen: Lose Verbindungen sind wieder zu befestigen, beschädigte Leitungen oder Kabel sofort auszutauschen.

Funktion

Die Feuchtemessung erfolgt nach dem bewährten kapazitiven Messprinzip.

Die CO₂-Messung basiert auf dem bewährten Infrarotverfahren. Ein Autokalibrationsverfahren kompensiert Alterungseffekte und sorgt für hervorragende Langzeitstabilität.

Wartung

Das Gerät muss in regelmäßigen Abständen auf Verschmutzung überprüft und gegebenenfalls gereinigt werden.



Transport

- Das Gerät ist ab Werk entsprechend der vereinbarten Transportart verpackt.
- Das Gerät sollte nur in Originalverpackung transportiert werden.
- Schläge und Stöße während des Transports sind zu vermeiden.
- Bei Transport von Hand beachten Sie die zumutbaren menschlichen Hebe- und Tragekräfte.

Lagerung

- Das Gerät muss trocken und wettergeschützt in Originalverpackung gelagert werden.
- Vermeiden Sie extreme Hitze- oder Kälteeinwirkung.
- Vermeiden Sie zu lange Lagerzeiten (wir empfehlen max. ein Jahr).

Entsorgung / Recycling

Die Entsorgung muss sachgerecht und umweltschonend, nach den gesetzlichen Bestimmungen des jeweiligen Landes erfolgen.

- Trennen Sie die Materialien sortenrein und umweltgerecht.
- Beauftragen Sie gegebenenfalls einen Fachbetrieb mit der Entsorgung.



Montage

Montage, elektrischer Anschluss und Inbetriebnahme dürfen nur von einer Elektrofachkraft, entsprechend den elektrotechnischen Regeln (u. a. EN 50110 od. EN 60204) vorgenommen werden!

- Vor der Montage Gerät aus Verpackung nehmen und auf eventuelle Transportschäden überprüfen!
- Gerät mit geeigneten Befestigungsmitteln auf sauberen, tragfähigen Untergrund montieren und nicht verspannen!
- Eine Montage auf vibrierendem Untergrund ist nicht zulässig!
- Bohrspäne, Schrauben und andere Fremdkörper dürfen nicht ins Innere des Gerätes eindringen!
- Schützen Sie das Gerät vor direkter Sonnenbestrahlung!

Achtung!

Extreme mechanische und thermische Beanspruchungen sind unbedingt zu vermeiden.

Das CO₂-Sensorelement ist ein ESD gefährdetes Bauteil, deshalb bei der Montage nicht berühren!

cations of the manufacturer or supplier, and instructions relating to the equipment, should be rigidly adhered to. Failure to comply with these conditions will invalidate the guarantee on our controllers and accessories!

- *It is strictly forbidden for work to be carried out on any components while they are connected to live voltage. The open equipment is protected to IP00. It is possible to come into direct contact with dangerous voltages!*
- *Electrical equipment must be checked regularly: Loose connections are to be re-tightened and damaged lines or cables must be replaced immediately.*

Function

The Relative Humidity measurement is based on the capacitive principle.

The CO₂ measurement is based on the infrared principle. A auto-calibration procedure compensates for the aging of the infrared source and ensures outstanding long term stability.

Maintenance

The device must be checked for soiling and, if necessary, cleaned in periodic intervals.



Transport

- *The device is packed ex factory to suit the transport method previously agreed.*
- *Always use the original packaging materials when transporting the device.*
- *Avoid shocks and impacts to the device during the transport.*
- *During manual handling the human lifting and carrying restrictions must be observed and adhered to.*

Storage

- *The device must be stored in its original packaging in a dry and weather-proof room.*
- *Avoid exposure to extreme heat and cold.*
- *Avoid over-long storage periods (we recommend a maximum of one year).*

Disposal / recycling

Disposal must be carried out professionally and in an environmentally friendly way in accordance with the respective national legal stipulations.

- *Separate the materials by type and in an environmentally friendly way.*
- *If necessary, commission a specialist company with the waste disposal.*



Mounting

Mounting, electrical connection, and start-up operation may only be carried out by an electrical specialist in accordance with electrotechnical regulations (e.g. EN 50110 or EN 60204)!

- *Before installation remove the device from the packing and check for any possible shipping damage!*
- *Assemble the device on a clean and stable base. Do not distort during assembly! Use the appropriate mounting devices for proper installation of the unit!*
- *Do not mount equipment on vibrating base!*
- *Do not allow drilling chips, screws and other foreign bodies to reach the device interior!*
- *Care must be taken to avoid direct radiation from the sun!*

Attention!

Absolutely avoid extreme mechanical and thermal strain. The CO₂ sensor element is an ESD-sensitive component therefore do not touch during installation!



Öffnen des Gehäuses:

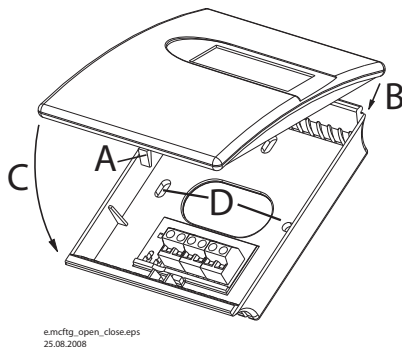
- Zapfen **A** eindrücken bis sich Deckel öffnen lässt.

Schließen des Gehäuses:

- Deckel in Nut **B** einsetzen und in Richtung **C** schließen bis Zapfen **A** einrastet.

Befestigung des Gehäuses:

- Gehäuse mittels Schrauben durch die dafür vorgesehenen Löcher **D** auf einer Unterputzdose montieren. Kabeleinführung abdichten, da sich ein Luftstrom entlang der Leitungen negativ auf die Messung auswirken kann.



e_mctfg_open_close.eps
25.08.2008

Opening the housing:

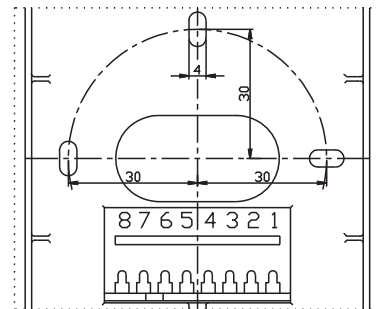
- Press pin **A** until cover can be opened.

Closing the housing:

- Set cover into flute **B** and move it to direction **C** until pin **A** snaps in.

Installation of housing:

- Mount housing on a under parget box with srews through therefore designated holes **D**. Seal cable entry because an airflow along the cables can affect the measurement negative.



e_mctfg_bohrungen.eps
25.08.2008

Technische Daten

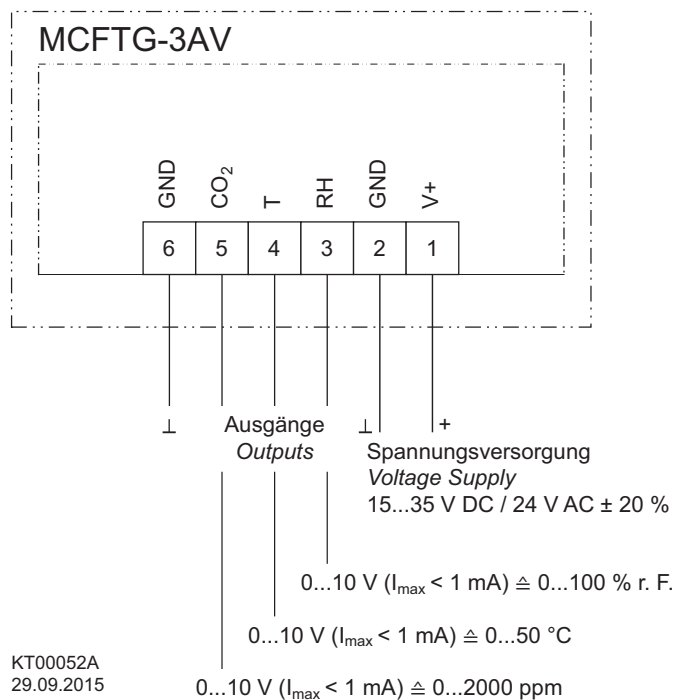
CO₂ Messung Messbereich: 0...2000 ppm Messgenauigkeit bei 20 °C und 1013 mbar: < +/- (50 ppm + 2 % von Messwert) Ansprechzeit τ 63: 110 s Temperaturabhängigkeit: typ. $\pm (1 + \text{CO}_2 \text{ Konzentration} [\text{ppm}]/1000) \text{ ppm}/^\circ\text{C}$ (-20...45 °C)
Relative Feuchte Messung Arbeitsbereich: 10...90 % r. F. Genauigkeit bei 20 °C: $\pm 3 \% \text{ r. F. (30...70 \% r. F.)} / \pm 5 \% (10...90 \% \text{ r. F.})$
Temperatur Messung Messbereich: 0...50 °C Genauigkeit bei 20 °C: $\pm 0,3 \text{ K}$
CO ₂ Ausgang 0...10 V $\pm 0...2000 \text{ ppm}$ ($I_{\text{max}} < 1 \text{ mA}$) RH Ausgang 0...10 V $\pm 0...100 \% \text{ r. F.}$ ($I_{\text{max}} < 1 \text{ mA}$) T Ausgang 0...10 V $\pm 0...50 ^\circ\text{C}$ ($I_{\text{max}} < 1 \text{ mA}$)
Versorgungsspannung: 15 - 35 V DC, 24V AC $\pm 20 \%$
Stromaufnahme konstant: 14 mA plus Ausgangsstrom Stromaufnahme pulsierend (CO ₂ Messung): 0,3 A für 0,3s (Zubehör: Netzgerät Typ STEP-PS/1AC/24DC/1.75 Art. Nr. 380067)
Nötige Aufwärmzeit zur Erreichung der Spezifikationswerte: < 5 min.
Anschluss: Schraubklemmen max. 1,5 mm ²
Gewicht: 90 g
Gehäuse: Polycarbonat, Schutzart: IP30

Technical data

Measuring CO₂ Measuring range: 0...2000 ppm Accuracy at 20 °C and 1013 mbar: < (+/- 50 ppm + 2 % of measuring value) Response time τ 63: 110 s Temperature dependence: typ. $\pm (1 + \text{CO}_2 \text{ concentration} [\text{ppm}]/1000) \text{ ppm}/^\circ\text{C}$ (-20...45 °C)
Measuring Relative Humidity Working range: 10...90 % RH Accuracy at 20 °C: $\pm 3 \% \text{ RH (30...70 \% RH)} / \pm 5 \% (10...90 \% \text{ RH})$
Measuring Temperature Measuring range: 0...50 °C Accuracy at 20 °C: $\pm 0.3 \text{ K}$
CO ₂ output 0...10 V $\pm 0...2000 \text{ ppm}$ ($I_{\text{max}} < 1 \text{ mA}$) RH output 0...10 V $\pm 0...100 \% \text{ RH}$ ($I_{\text{max}} < 1 \text{ mA}$) T output 0...10 V $\pm 0...50 ^\circ\text{C}$ ($I_{\text{max}} < 1 \text{ mA}$)
Supply voltage: 15 - 35 V DC, 24V AC $\pm 20 \%$
Current consumption constant: 14 mA plus output current Current consumption pulsating (CO ₂ measuring): 0.3 A for 0.3s (accessories: power supply unit type STEP-PS/1AC/24DC/1.75 Part.- No. 380067)
Warm up time for performance according specification: < 5 min.
Connection: screw terminals max. 1.5 mm ²
Weight: 90 g
Housing: Polycarbonate, protection IP30

Gehäusefarbe: Deckel RAL 9003 (Signalweiß), Boden RAL7035 (Lichtgrau)
Abmessungen: 85 x 100 X 26 mm (B x H x T)
Betriebsbedingungen: 0...90 % r. F. (nicht kondensierend) / -20...60 °C
Lagerbedingungen: 0...90 % r. F. (nicht kondensierend) / -20...60 °C
Elektromagnetische Verträglichkeit: EN 61326-1, EN 61326-2-3

Anschlussplan



Colour of housing: Cover RAL 9003 (signal white), Back RAL7035 (light grey)
Dimensions: 85 x 100 X 26 mm (W x H x D)
Operating conditions: 0...90 % RH (non condensing) / -20...60 °C
Storage conditions: 0...90 % RH (non condensing) / -20...60 °C
Electromagnetic compatibility: EN 61326-1, EN 61326-2-3

Connection diagram

Herstellerhinweis

Unsere Produkte sind nach den einschlägigen internationalen Vorschriften gefertigt. Haben Sie Fragen zur Verwendung unserer Produkte oder planen Sie spezielle Anwendungen, wenden Sie sich bitte an:

ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
74653 Künzelsau
Telefon: +49 (0) 7940 16-0

info@ziehl-abegg.de
http://www.ziehl-abegg.de

Servicehinweis

Bitte kontaktieren Sie bei technischen Fragen bei der Inbetriebnahme oder bei Störungen unseren technischen Support für Regelsysteme - Lufttechnik.

Telefon: +49 (0) 7940 16-800
Email: fan-controls-service@ziehl-abegg.de

Für Lieferungen außerhalb Deutschlands stehen weltweit Ansprechpartner in unseren Niederlassungen zur Verfügung, siehe www.ziehl-abegg.com.

Manufacturer reference

Our products are manufactured in accordance with the relevant international regulations. If you have any questions concerning the use of our products or plan special uses, please contact:

ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
74653 Künzelsau
phone: +49 (0) 7940 16-0

info@ziehl-abegg.de
http://www.ziehl-abegg.com

Service information

If you have any technical questions while commissioning or regarding malfunctions, please contact our technical support for control systems - ventilation technology.

phone: +49 (0) 7940 16-800
Email: fan-controls-service@ziehl-abegg.de

Our worldwide contacts are available in our subsidiaries for deliveries outside of Germany, see www.ziehl-abegg.com.