



# 1.WHY CLINICABIN?

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## 7.INTERIOR FEATURES (Patient room)

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# WHY CLINICABIN?

CliniCabin is an affordable healthcare solution, born out of a desire to facilitate a restoration of respiratory diagnostic services during the ongoing COVID-19 pandemic. Due to the technology within the CliniCabin, both patient and clinician can feel safe and protected.

There are 1.2 million people in the UK with diagnosed COPD, there are an additional 2 million people with the condition who are yet to be diagnosed (BLF, 2020). Around 160,000 people are diagnosed with Asthma in the UK each year (NICE, 2020). The 'NHS Long term plan' (2019) contains specific ambitions for Respiratory disease diagnosis and management over the next ten years. It highlights the aspirations to achieve 'Early and accurate diagnosis' for all within Primary care/community hubs. The plan outlines recommendations for Regional/local NHS partners to ensure early access to high quality diagnosis and management of Respiratory conditions: 'The NHS will do more to detect and diagnose respiratory problems earlier. Currently around a third of people with a first hospital admission for a COPD exacerbation have not been previously diagnosed'

Spirometry is the main diagnostic test for both Asthma and COPD. The COVID-19 pandemic has presented significant issues in healthcare since March 2020, one of which is the cessation of respiratory diagnostic testing. This is due to lung function testing being considered an aerosol generating procedure (AGP). In such procedures, risk is posed to the clinician/technician performing the test; the patient attending for the test and for subsequent patients entering the room following lung function procedures.

From July, hospitals have resumed AGP testing as they have regained access to rooms with air changes (with a usual speed of between 6 to 10 air changes per hour) but are required to leave a fallow period of around 2-3hrs between patients. Due to fallow periods needed between patients, there is a significant reduction in the number of patients tested in a day in a hospital setting, thereby reducing capacity and resulting in a backlog in the system. During testing staff are required to don full PPE.

Primary care does not have access to air change facilities and the only ventilation would be to open a window. Primary care does not have access to full PPE (other than in 'hot sites'). Primary care does not have access to COVID-19 point of care testing which could be conducted pre-lung function. As a result of the cessation of respiratory assessments in the community, which is where approximately 90% of patients are diagnosed with lung conditions, patients are being left at risk and with often with untreated symptoms. The risks of not being tested include: delay in diagnosis; potential delay in treatment; poor quality of life; risk of admission; risk of death. Sir Simon Stevens, in his phase 3 letter published in July 2020, suggests that the NHS is required to make plans to restore services in a safe way.

## The CliniCabin solution:

- A purpose-built modular cabin (L: 5.25m x W: 2.85m x H: 3.2m)
- Disabled access
- Fully insulated
- 2 separate rooms, accessible by separate external doors
- Door entry system
- Large vision panel between 2 rooms with intercom system and hearing loop provision- allowing communication and coaching of Spirometry procedure.
- Air exchange fans in patient room - 1 air change per minute (60 per hour) 6 minutes fallow period needed between patients
- Air conditioning/heating system with Panasonic 'nanoe-G' technology
- UV-C light decontamination system
- Space for couch, chair and desk in each room- to facilitate range of diagnostic services; ie ECG, BP, Spirometry, FeNO.
- Sinks
- Lighting/emergency lighting/Double sockets

## Benefits:

- Spirometry can be performed using wireless Spirometer, coaching by the operator is facilitated via the glass partition and intercom system
- Allows for restoration of services, ensuring reinstated access to accurate diagnosis of people with COPD and Asthma. Thereby limiting disease progression through appropriate management.
- Patients have access to diagnostic services and therefore diagnosis and management of their lung condition, which would result in reduced risk of admission; inappropriate prescribing and harm.
- No full PPE needed.
- Builds resilience and sustainability into the system; helps to future-proof and safeguard against long term issues/future health challenges.

CliniCabin was originally designed with respiratory patients in mind. However due to the calibre of technology present within CliniCabin its range of uses expands beyond respiratory purposes and can be applicable in both primary and secondary care settings



# EXTERIOR



# 1.1. EXTERNAL STEEL CLADDING

The exterior of CliniCabin is constructed using Tata Steel's *Celtic 30*. A steel faced PIR insulated roof and wall panel consisting of a trapezoidal external skin with a leathergrain plastisol finish giving the weather face longterm durability.

# 1.2. ANSELL 3W EMERGENCY LIGHTS

3 Watt emergency lights are installed above each external doorway of the cabin. Ensuring full visibility and easy use of all external features.

# 1.3. DOOR ENTRY SYSTEM

Two-way door entry system who's features include lock release, exit button, digital keypad, key fob entry system, and intercom system.

# 1.4. STEEL SECURITY DOORS

High-tensile steel doors.

# 1.5. UV-C LIGHTS WARNING BEACON

Warning beacon installed above patient door /designed/ to flash during use of UVC light to ensure patients know when to enter safely.



# CLINICIAN INTERIOR



## 2.1. HYGIENIC INTERNAL WALLS

All internal walls are cladded with Roechlung Trovidur EC Clad: 2.5mm solid PVC hygienic cladding sheets. This cladding has been certified to be food grade, high chemical resistant, class 0 fire rating, and high impact resistant.

## 2.2. UV-C SYSTEM CONTROLS

Operation buttons controlling UV-C lighting for patient side; emergency stop button and key controlled start switch.

## 2.3. ANSELL DISCO EMERGENCY LIGHTS

14 Watt ceiling light with emergency battery backup.



## 2.3. INTERCOM SYSTEM

Window intercom system ensuring clear communication. It provides a dual speaker and microphone units for both patient and clinician.

## 2.4. WASTE WATER SYSTEM

Unobtrusive Sanivite pump installed to remove waste water from both patient and clinician sinks, pumping waste water into the main building's sewerage system.

## 2.5. AIR CONDITION- ING SYSTEM

Wall mounted heat pump air conditioning unit installed on both patient and clinician side. Implementing Nano G technology to ensure the effective removal of bacteria, viruses, and particulates.

# PATIENT INTERIOR





## 2.6. EXTRACTOR FAN

Wall mounted extractor fan unit able to remove 250/300L/s.

## 2.7. DISINFECT- ION BATTEN

A fixed installation of luminaries on the ceiling used at controlled times to fill the room with disinfecting UV-C radiation. Proven to inactivate 99% of SARS-CoV-2 virus on a surface with an exposure time of six seconds.

## 2.8. AIR SUPPLY SYSTEM

Dedicated air supply system that intakes air from the external terminal (located on the cabins left exterior) via a F3/F4 filter section. An energy efficient thyristor drive electric pre-heater is used to temper the air before distribution to the room.

## 2.1.a HYGIENIC INTERNAL WALLS

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# DATA SHEETS



## Celtic 30

Steel faced PIR insulated roof and wall panel

Celtic 30 is strong, durable and easy to install. Specifically designed to provide a cost effective, lightweight roof & wall solution for protection and insulation of many building types.



The steel faced insulated panel consists of a trapezoidal external skin with a leathergrain plastisol finish giving the weather face long-term durability. The bright white steel liner finish to the internal skin offers both additional strength and a clean and reflective interior.

### Celtic 30 benefits include:

- Superior 200 micron plastisol external face.
- Bright white steel internal liner.
- Quick and easy installation.
- Cost-effective roof and wall cladding solution.
- Low maintenance.
- LPCB fire approved 30mm PIR core.

### Product options:

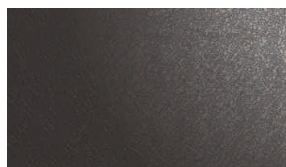
#### Choice of stock lengths available

**Colours:** Anthracite, Juniper Green and Goosewing Grey.

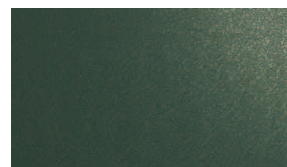
**Reaction to Fire Classification:** B s2 d0 (internal face)

**Accessories:** Rooflights; fixings and sealants available.

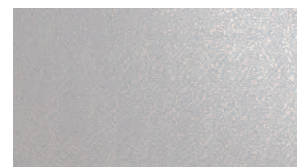
### Colour range



Anthracite



Juniper Green



Goosewing Grey

## Celtic 30 span/load tables

### Safe imposed (positive) loads (kN/m<sup>2</sup>)

Span (m)	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00	3.20
Single span	2.87	2.32	1.92	1.62	1.38	1.19	0.97	0.76	0.59	0.47	0.35
Double span	2.87	2.17	1.71	1.38	1.14	0.96	0.82	0.71	0.51	0.35	0.24
Multi span	2.87	2.32	1.92	1.60	1.32	1.12	0.96	0.83	0.65	0.47	0.32

### Safe wind suction (negative) loads (kN/m<sup>2</sup>)

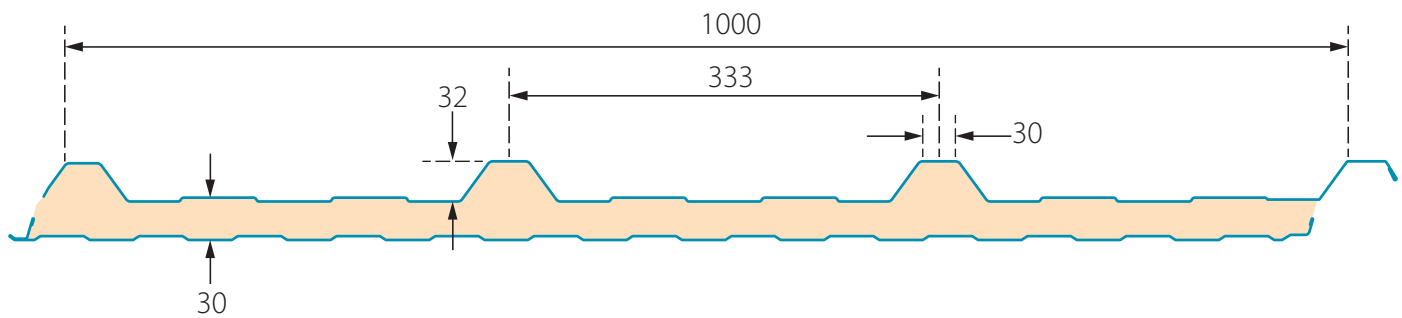
Span (m)	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00	3.20
Single span	-3.00	-2.46	-1.94	-1.47	-1.16	-0.94	-0.78	-0.66	-0.57	-0.50	-0.44
Double span	-2.92	-2.23	-1.78	-1.47	-1.16	-0.94	-0.78	-0.66	-0.57	-0.50	-0.44
Multi span	-3.00	-2.46	-1.94	-1.47	-1.16	-0.94	-0.78	-0.66	-0.57	-0.50	-0.44

#### Notes

The span tables have been created in accordance with BS EN 14509.

The values are based on a 2.0 mm minimum purlin thickness, and a maximum permitted cladding deflection of Span/200 under imposed load.

## Celtic 30 dimensions



[www.tatasteelconstruction.com](http://www.tatasteelconstruction.com)

#### Celtic 30 is available from:

Southern Sheeting Supplies Ltd  
Hill Place Farm  
Turners Hill Road  
East Grinstead  
West Sussex  
RH19 4LX

T: +44 (0) 1342 315300

E: [sales@southernsheeting.co.uk](mailto:sales@southernsheeting.co.uk)

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# Technical data sheet

## Trovidur® EC

### Product characteristics

- High resistance to acids, lyes and salt solutions
- Fire class B1 to DIN 4102 up to 4mm thickness
- Highly weldable and adherable

### Typical field of application

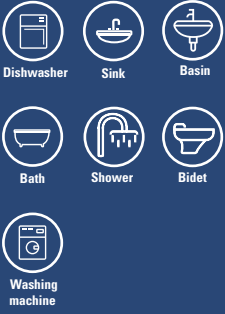
- Chemical engineering and tank building
- Ventilation manufacturing
- Electrical and electronic industries

	Test method	Unit	Value
<b>General properties</b>			
Density	DIN EN ISO 1183-1	g/cm <sup>3</sup>	1,44
Water absorption	DIN EN ISO 62	%	1,0
Flammability (Thickness 1,5 mm min./3 mm min.)	UL 94		V0
<b>Mechanical properties</b>			
Elongation at break	DIN EN ISO 527	%	20
Tensile modulus of elasticity	DIN EN ISO 527	MPa	2700
Notched impact strength (charpy)	DIN EN ISO 179	kJ/m <sup>2</sup>	4
Shore hardness	DIN EN ISO 868	scale D	80
<b>Thermal properties</b>			
Thermal conductivity	DIN 52612-1	W / (m * K)	0,16
Coefficient of linear thermal expansion	DIN 53752	10 <sup>-6</sup> K <sup>-1</sup>	60-80
Heat deflection temperature	DIN EN ISO 306, Vicat B	°C	70
<b>Electrical properties</b>			
Dielectric constant	IEC 60250		3,20
Dielectric dissipation factor (10 <sup>6</sup> Hz)	IEC 60250		0,02
Volume resistivity	IEC 60093	Ω *cm	>10 <sup>15</sup>
Surface resistivity	IEC 60093	Ω	>10 <sup>13</sup>

The data stated above are average values ascertained by statistical tests on a regular basis. They are in accordance with DIN EN 15860. The data above are provided purely for information and shall not be regarded as binding unless expressly agreed in a contract of sale.

# GREY WATER PUMPS 2.4

## APPLICATIONS



## PUMPING DISTANCE



## WARRANTY



Product Code:  
6004

Barcode:  
EAN 3308815074085

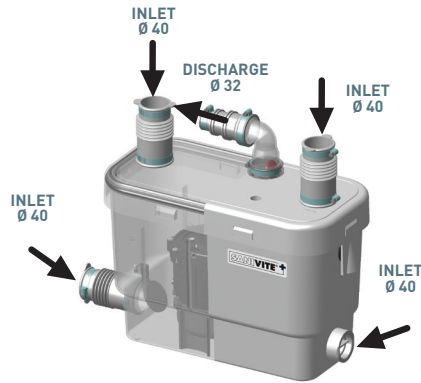


**Activated carbon filter.**  
**Low activation level.**  
**Flow rate: 80L/min.**



**Pump suitable for installing in a kitchen or utility room.**  
**Low noise level: 42dB(A).**

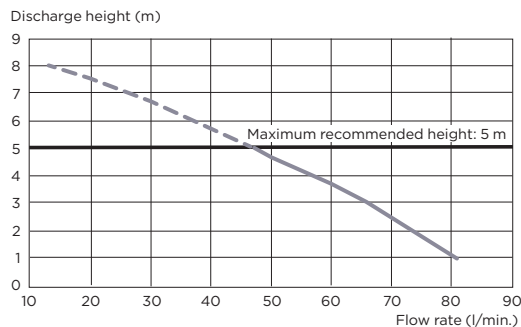
### SEMI-TRANSPARENT VIEW



### TECHNICAL FEATURES

Activation level	95 mm
Shower tray height	150 mm
Maximum flow rate	80L/min
Low noise level	42dB (A)
Number of entries	4
Ø inlet	40 mm
Ø discharge pipework	32 mm
Voltage	220-240V/50Hz
Motor power	400W
Maximum current	2A
Electrical class	Single phase
Maximum temperature	Usual 35°C, 40°C - 60°C intermittently (max. 5 min)
IP rating	IP44
Weight	6.1 kg

### PUMP CURVE



### PACKAGING

- Pump
- Non-return valve
- Connectors
- Activated carbon filter included, to neutralise odours





## NEW ETHEREA R32 GAS. THE LATEST GENERATION OF AIR CONDITIONING

- New built-in WLAN for smartphone control option
- Highest energy class A+++/A+++\*
- New nanoe™ X air-purifying technology
- New wireless remote controller
- Slim and elegant design

\* Highest energy rank from A+++ to D in models CU-Z25VKE and CU-Z35VKE



# ETHEREA STYLISH AND OUTSTANDING FEATURES

## 1 Built-in WLAN

New Etherea comes ready to connect to internet for smartphone control with Panasonic Comfort Cloud App. Control, monitor, schedule via the easy to use interface.

## 2 Even cleaner air with nanoe™ X

New nanoe™ X is and provides outstanding air purifying bringing much higher performance for better indoor air quality, compared with previous Etherea models.

## 3 New infrared control

Enjoy innovative design at your fingertips with the new stylish and sleek Backlit Sky Controller. Bigger screen and easier to use.

## 4 Simple but elegant design

We have redesigned the indoor unit to better suit European interiors. The new design is simple, clean and elegant and available in white matt or silver finishes.



## Enjoy innovative design at your fingertips with the new stylish and sleek Backlit Sky Controller

With fast access to key operations and a smooth gliding cover revealing more options, controlling your settings has become simple and intuitive. Fits comfortably in your hand.

### Backlit LED screen

Adjust your settings even in a dark room thanks to backlit screen.

### Distinctive sliding cover

A smooth sliding cover does not only enhance the remote's clean lines, but keeps the buttons free from dirt and smudges.

### Precise temperature control

Enjoy more precise temperature regulation and experience greater comfort thanks to the Sky Controller's 0,5°C temperature control.





Etherea with R32 Refrigerant Gas. An innovative refrigerant in every way imaginable: it is easy to install, and compared to other refrigerants, such as R410a, it has a lower environmental impact and saves energy.

— ETHEREA —

### Performance: highest energy class

Original Panasonic Inverter technology and a high performance compressor ensures Etherea delivers top-class operating efficiency. This lets you enjoy lower electricity bills while contributing to environmental protection.

Reaching up to A+++ in heating and cooling in a scale from A+++ to D.



### nanoe™ X. Quality air for life

#### nanoe™ X contains 10 times<sup>1</sup> more OH radicals

The newly developed nanoe™ X device produces 10x times more OH radicals (4800 billion)<sup>1</sup> than regular nanoe™ device. Greater amounts of OH radicals contained in nanoe™ X lead to outstanding effects in bacteria, viruses and allergens inhibition as well as deodorisation. A fresher and cleaner home awaits you.

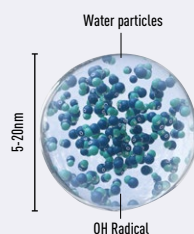
#### Get the best for your health with Etherea and nanoe™ X

Using nanoe™ X with nano-technology, nano-sized electrostatic atomised water particles purify the air in the room. It works effectively on airborne and adhesive micro-organisms such as certain types of bacteria, viruses and mould thus ensuring a cleaner living environment.

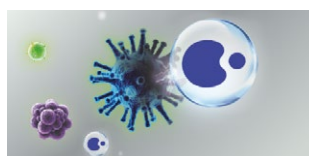
1) Based on Panasonic test



4800 Billion  
OH Radicals /  
Per second



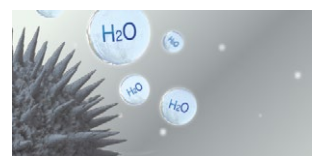
### How nanoe™ X keeps air fresh and clean



nanoe™ X reaches bacteria.



OH radicals take away hydrogen from bacteria.



OH radicals transform hydrogen in bacteria to water and inhibit bacterial activity.

### Etherea: beautifully designed, inside and out

#### The Etherea has an astonishingly slim design:

A breakthrough design that combines beautifully with the most modern environments. Selecting high quality materials and finishing for a refined design. Etherea range is available in an elegant metallic silver or pure white matt.

#### Perfect inside thanks:

- Aerowings to control air draft direction
- Mild Dry Cooling: prevent a rapid decrease in room humidity
- Super Quiet! Only 19dB(A), equivalent to night-time in the countryside
- Powerful airflow to quickly reach the desired temperature

# New Wall Mounted Etherea Inverter+ Silver / Pure White Matt • R32 GAS



Kit Silver			KIT-XZ20-VKE	KIT-XZ25-VKE	KIT-XZ35-VKE	—	KIT-XZ50-VKE	—
Kit Pure White Matt			KIT-Z20-VKE	KIT-Z25-VKE	KIT-Z35-VKE	KIT-Z42-VKE	KIT-Z50-VKE	KIT-Z71-VKE
Cooling capacity	Nominal (Min - Max)	kW	2,05 (0,75 - 2,40)	2,50 (0,85 - 3,20)	3,50 (0,85 - 4,00)	4,20 (0,85 - 5,00)	5,00 (0,98 - 6,00)	7,10 (0,98 - 8,50)
<b>Cool. seasonal efficiency SEER &amp; energy rank <sup>2)</sup></b>			<b>7,50 A++</b>	<b>8,50 A++</b>	<b>8,50 A++</b>	<b>6,90 A++</b>	<b>7,90 A++</b>	<b>6,50 A++</b>
Heating capacity	Nominal (Min - Max)	kW	2,80 (0,70 - 4,00)	3,40 (0,80 - 5,00)	4,00 (0,80 - 5,50)	5,30 (0,80 - 6,80)	5,80 (0,98 - 8,00)	8,60 (0,98 - 10,20)
<b>Heat. seasonal efficiency SCOP &amp; energy rank <sup>2)</sup></b>			<b>4,70 A++</b>	<b>5,10 A++</b>	<b>5,10 A++</b>	<b>4,00 A+</b>	<b>4,70 A++</b>	<b>4,20 A+</b>
<b>Indoor unit Silver</b>			<b>CS-XZ20VKEW</b>	<b>CS-XZ25VKEW</b>	<b>CS-XZ35VKEW</b>	—	<b>CS-XZ50VKEW</b>	—
<b>Indoor unit Pure White Matt</b>			<b>CS-Z20VKEW</b>	<b>CS-Z25VKEW</b>	<b>CS-Z35VKEW</b>	<b>CS-Z42VKEW</b>	<b>CS-Z50VKEW</b>	<b>CS-Z71VKEW</b>
Power source		V	230	230	230	230	230	230
Air volume	Cool / Heat	m <sup>3</sup> /min	9,9/10,7	10,2/11,2	11,0/12,0	11,2/12,0	19,1/20,5	19,8/21,5
Moisture removal volume		L/h	1,3	1,5	2,0	2,4	2,8	4,1
Sound pressure <sup>4)</sup>	Cool (Hi / Lo / Q-Lo)	dB(A)	37/24/19	39/25/19	42/28/19	43/31/25	44/37/30	47/38/30
	Heat (Hi / Lo / Q-Lo)	dB(A)	38/25/19	41/27/19	43/33/19	43/35/29	44/37/30	47/38/30
Dimension / Net weight	H x W x D	mm / kg	295 x 919 x 194 / 9	295 x 919 x 194 / 10	295 x 919 x 194 / 10	295 x 919 x 194 / 10	302 x 1120 x 236 / 12	302 x 1120 x 236 / 13
<b>Outdoor unit</b>			<b>CU-Z20VKE</b>	<b>CU-Z25VKE</b>	<b>CU-Z35VKE</b>	<b>CU-Z42VKE</b>	<b>CU-Z50VKE</b>	<b>CU-Z71VKE</b>
Air volume	Cool / Heat	m <sup>3</sup> /min	26,9/24,1	28,7/27,2	30,6/30,6	31,3/30,9	39,8/36,9	44,7/45,8
Sound pressure <sup>4)</sup>	Cool / Heat (Hi)	dB(A)	45/46	46/47	48/50	49/51	47/47	52/54
Dimension <sup>5)</sup> / Net weight	H x W x D	mm / kg	542 x 780 x 289 / 27	542 x 780 x 289 / 31	542 x 780 x 289 / 31	619 x 824 x 299 / 31	695 x 875 x 320 / 42	695 x 875 x 320 / 50
Pipe length range		m	3 ~ 15	3 ~ 15	3 ~ 15	3 ~ 15	3 ~ 30	3 ~ 30
Elevation difference (in/out) <sup>6)</sup>		m	15	15	15	15	15	20
Refrigerant (R32)		kg/TCO <sub>2</sub> Eq.	0,70 / 0,473	0,85 / 0,574	0,85 / 0,574	0,89 / 0,601	1,15 / 0,776	1,37 / 0,925
Operating range	Cool Min ~ Max	°C	-10 ~ +43	-10 ~ +43	-10 ~ +43	-10 ~ +43	-10 ~ +43	-10 ~ +43
	Heat Min ~ Max	°C	-15 ~ +24	-15 ~ +24	-15 ~ +24	-15 ~ +24	-15 ~ +24	-15 ~ +24

## Accessories

**CZ-CAPRA1** RAC interface adapter for integration into P Link

## Accessories

**CZ-RD514C** Wired remote controller for Wall Mounted and Floor Console

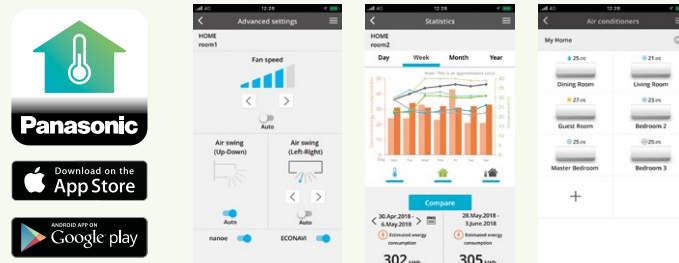
1) EER and COP calculation is based in accordance with EN14511. 2) Energy Label Scale from A+++ to D. 3) The annual energy consumption is calculated in accordance to EU/626/2011. 4) The sound pressure of the units shows the value measured of a position 1m in front of the main body and 0,8m below the unit. The sound pressure is measured in accordance with Eurovent 6/C/006-97 specification. Q-Lo: Quiet mode. Lo: The lowest fan speed. 5) Add 70mm for piping port. 6) When installing the outdoor unit at a higher position than the indoor unit.

\* Tentative data.

## New Panasonic Comfort Cloud. More than a control in your phone.

Advanced smartphone control for domestic range.

Control air to air heat pump operation with Panasonic Comfort Cloud plus additional functions only available through the Cloud from wherever and whenever. One user can manage up to 200 units and also set up different user and rights. Also energy monitoring is possible giving the chance to learn how to reduce operating costs even further.



Our heat pumps containing the refrigerant R32 show a drastic reduction in the value of Global Warming Potential (GWP) compared with R410a refrigerant.	Seasonal efficiency in cooling will bring you saving all year while heating. Energy efficiency rank from A+++ to D.	Seasonal efficiency in heating will bring you saving all year while heating. Energy efficiency rank from A+++ to D.	Inverter Plus System classification highlight the Panasonic highest performing systems	Panasonic R2 Rotary Compressor. Designed to withstand extreme conditions, it delivers high performance and efficiency.	nanoe™ X helps you deodorize, inhibit certain growth of bacteria and viruses that are harmful to you and your family's general well-being.	With Super Quiet technology our devices are much more quiet than a library (30dB(A)).	The Perfect Humidity Air controls the humidity level in the air to prevent over-dryness.	More comfort with Aerowings. Direct airflow to ceiling to create shower cooling effect by twin flap built in indoor.	The Panasonic renewal system allows good quality existing R410A or R22 pipe work to be re-used whilst installing new high efficiency R32 systems.	The communication port can be integrated into the indoor unit and provides easy connection to, and control of, your Panasonic heat pump to your home or building management system.	This unit is ready to connect to internet and be managed by smartphone, with a powerful and user friendly App to manage the comfort wherever you are.	Communication port to integrate the unit to home and building management systems most known standards.

SEER and SCOP: For KIT-XZ25-VKE, KIT-XZ35-VKE, KIT-Z25-VKE and KIT-Z35-VKE. SUPER QUIET: For KIT-XZ20-VKE, KIT-XZ25-VKE, KIT-XZ35-VKE, KIT-Z20-VKE, KIT-Z25-VKE and KIT-Z35-VKE. INTERNET CONTROL: Built-in WLAN.

# Panasonic

To find out how Panasonic cares for you, log on to: [www.aircon.panasonic.eu](http://www.aircon.panasonic.eu)

Panasonic Marketing Europe GmbH  
Panasonic Air Conditioning  
Hagenauer Strasse 43, 65203 Wiesbaden, Germany

heating & cooling solutions

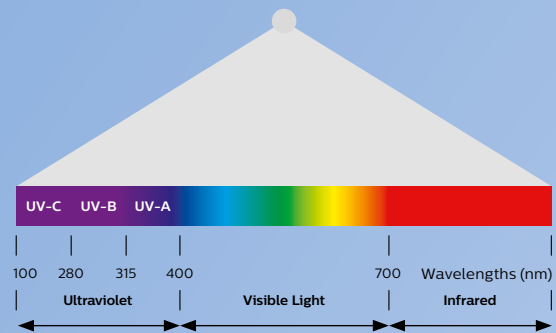


**What is UV technology?**

Ultra-Violet (UV) light is invisible to the human eye and is divided into UV-A, UV-B and UV-C.

UV-C is found within 100–280 nm range. The germicidal action is maximized at 265 nm. Philips Low pressure UV-C lamps have their main emission at 254 nm where the action on DNA is 85% of the peak value. As a result, our germicidal lamps are extremely effective in breaking down the DNA of micro-organisms. This means that they cannot replicate and cause disease<sup>2</sup>.

The technology has primarily been used in areas where there is a risk of microbiological contamination, and has been used safely and effectively for more than 40 years<sup>3</sup>.



<sup>2</sup> A comparison of pulsed and continuous ultraviolet light sources for the decontamination of surfaces. McDonald K.F., Curry R.D., Clevenger T.E., Unklesbay K., Eisenstark A., Golden J., Morgan R.D. IEEE Trans. Plasma Sci. 2000;28:1581–1587. doi: 10.1109/27.901237.

<sup>3</sup> EPA Report, "Building Retrofits for Increased Protection Against Airborne Chemical and Biological Releases" Pg. 56.

# Philips UV-C disinfection luminaires

## The power to protect

Philips has more than 35 years of experience and expertise in developing and manufacturing UV-C products. Our Philips UV-C disinfection luminaires portfolio with UV-C T8 lamps deliver on all the promises of UV technology.

### **Designed for efficacy**

The Philips UV-C disinfection luminaires are innovative, high-quality luminaires that are suitable for a wide range of applications. Designed for the disinfection of radiated surfaces and air, the Philips UV-C disinfection luminaires provide universal light distribution with homogenous illuminance. It disinfects the room overnight, when no people are present. This is enhanced by a highly-reflective and durable aluminum body, which improves its efficacy even further and directs the UV-C light to exactly where it's needed. The lamp holders in the luminaire contain UV-C resistant material and there are also a range of reflector options for even greater flexibility.

### **Cleaner air**

Philips UV-C disinfection luminaires can also be used to disinfect the air in a room, keep HVAC systems clean, and provide cleaner air. This can be done in any one three ways: using upper air systems that disinfect passing air; in open UV-C systems or using robots to disinfect spaces overnight or at times when they are not in use; or with solutions that can be used in air conditioning systems.

### **Safety first**

As UV-C light is invisible to the human eye, the Philips UV-C disinfection luminaires come with a range of safety protection features. These include a timer option to delay operation until after people are no longer in the vicinity, and a sensor option that automatically switches the luminaire off if any people or safety issues are detected. A manual for users and installers is also provided on how to use the product safely.

### **Easy installation**

The Philips UV-C disinfection luminaires have a range of mounting options. The efficient design enables a seamless line of light to be created without additional accessories, making professional installation quick and simple. We offer a training to ensure safe installation standards, including integration with a building management system (BMS), control system, or alarm system.



# Philips UV-C disinfection batten

A fixed installation of luminaires on the ceiling are used at controlled times to fill a room or enclosed space with disinfecting UV-C radiation. Provides disinfection outside of working hours for high contact areas.

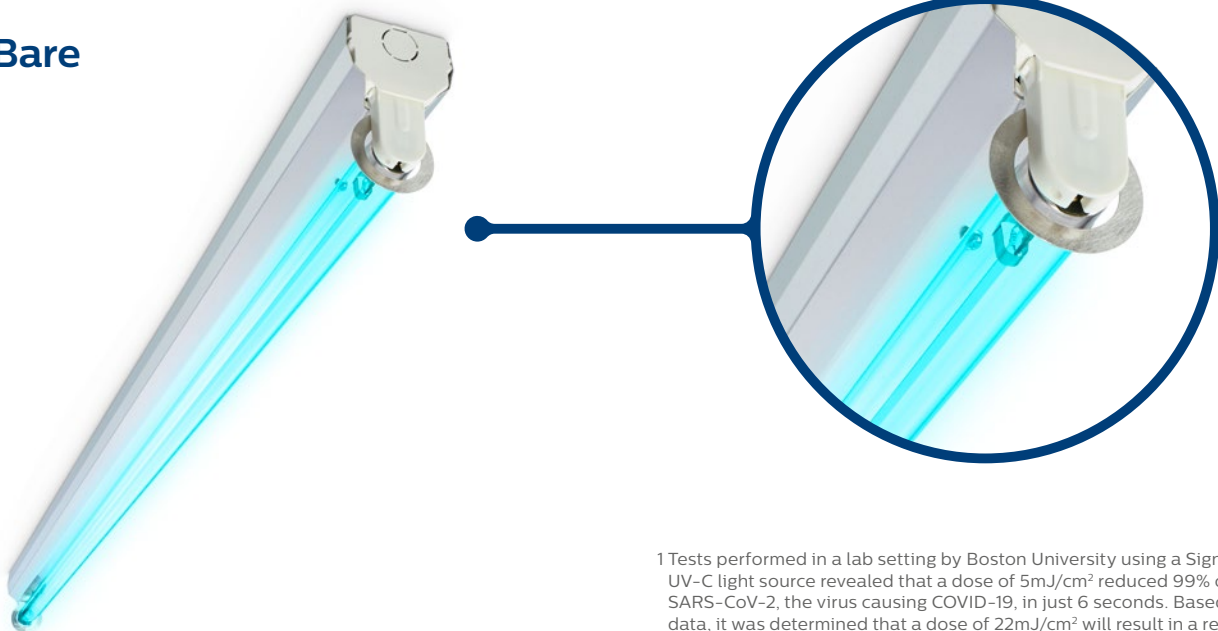
## Benefits:

- In laboratory testing, Signify's UV-C light sources inactivated 99% of SARS-CoV-2 virus on a surface with an exposure time of 6 seconds.<sup>1</sup>
- Proven, effective disinfection over the useful long lifetime of lamp and luminaire.
- Environmentally friendly - no ozone emissions during or after use.

## Features:

- Lamp configurations possible: 1-lamp or 2-lamps version.
- Available: bare batten or with reflectors.
- Philips T8 TUV lamp included: 18W or 36W.
- Shortwave UV radiation peak at 253.7 nm (UVC).
- High reflective aluminum housing for better reflectivity and performance.

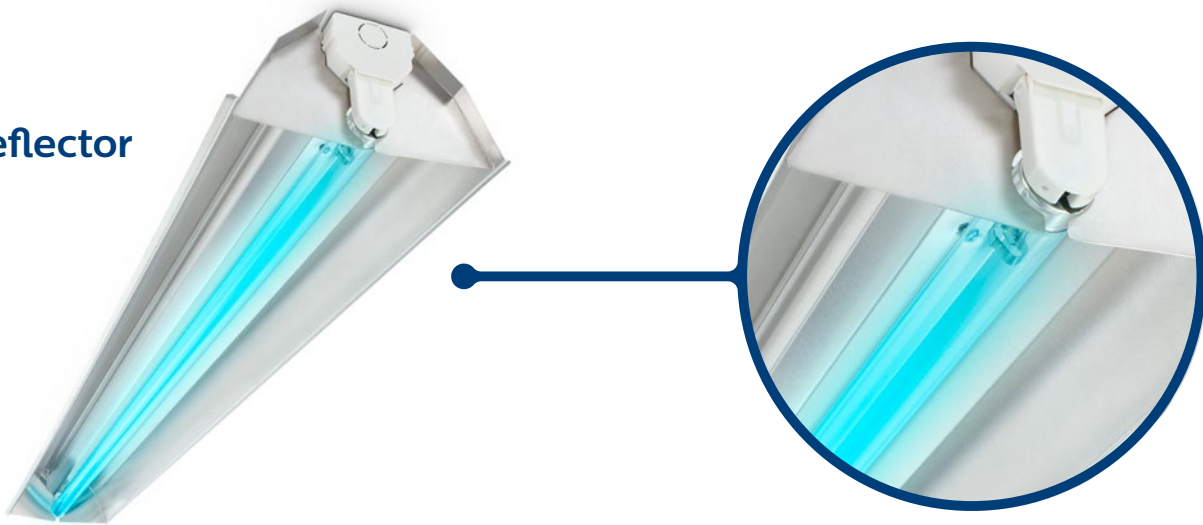
## Bare



<sup>1</sup> Tests performed in a lab setting by Boston University using a Signify UV-C light source revealed that a dose of 5mJ/cm<sup>2</sup> reduced 99% of SARS-CoV-2, the virus causing COVID-19, in just 6 seconds. Based on the data, it was determined that a dose of 22mJ/cm<sup>2</sup> will result in a reduction of 99.9999% in 25 seconds. Research variables available upon request.



**Reflector**



## Control system for safe UV-C surface disinfection

When using UV-C lighting, the safety of people is always the priority. That's why the Philips Dynalite UV-C automated control system is designed to help ensure safe and risk-free management of UV-C solutions.

### **Safety first**

While UV-C offers significant benefits in inactivating the DNA and RNA of micro-organisms, it must be used with care and consideration for the safety of people and animals. Direct exposure to UV-C damages skin and the retina, therefore it must only be used when people are out of its direct view.

Our solutions include safety mechanisms such as authorized activation, timer delays when activating, movement sensors and emergency stop switches to deactivate in case of potential hazards.

The Philips Dynalite UV-C control system ensures that authorized operators can safely use and manage the UV-C solution.



## 2.8: Rapid Air Change System

### **Design Basis: Cabin Test area**

Area: 2.4m x 2.4m x 2.4m = 13.82m<sup>3</sup> @60AC/hr=829m<sup>3</sup>/hr or 230L/sec

### **Item 1: Cabin Operator area**

Area: 2.35m x 2.4m x 2.7m = 15.228m<sup>3</sup>, @ 0AC/hr – Natural Vent

#### **Selection:**

- 1x 45 Mesh End Terminal – Galvanised
- 1x G4 Air Intake Filter Chamber / Media- Galvanised
- 1x Supply Air Fan 255L/s
- 1x Electric Preheater 6kW CW Control + Safety Devices
- 1x Ductwork, Bends, Fittings, Volume Control Damper and Brackets
- 1x Wall Mounted Air Plenum and Double Deflector Diffuser Grille
- 1x Wall Mounted Extract Fan Unit 250/300L/s

### **Item 2: Comfort Heating / Cooling CW NanoX Negative Ion Generator**

#### **Selection:**

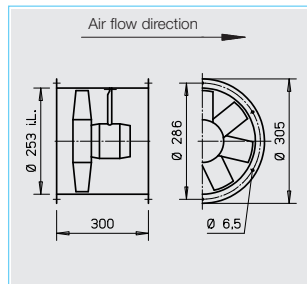
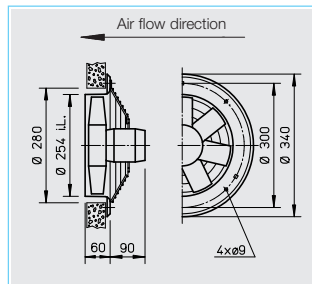
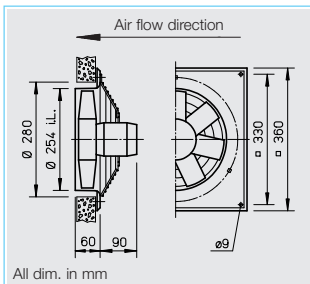
- 2x Wall Mounted Indoor Unit CW NanoX
- 2x Remote Controls
- 2x Inverter Heat Pump Outdoor Units

Total Capacity Test 5.0kW Cooling, 6.0kW Heating

Operators: 2.0kW Cooling, 2.5kW Heating

### **Description of operation / performance**

- The dedicated supply air system intakes air from the external terminal, via a F3/F4 filter section then uses an energy efficient thyristor drive electric pre heater to temper the air before distribution to the room via the
- Adjustable diffuser grille.
- The extract air is removed from the room via the wall mounted extract fan.
- The system can be positively or negatively displaced and achieve a controllable air change rate of up to 60AC/H.
- The wall mounted heat pump air conditioning unit act as a terminal re heat to offer the final setting of the heating value and or summer cooling provision.
- The Nano G technology produces negative ions that can effectively remove the virus (as demonstrated within <https://youtu.be/IAQHVFPA20> ), this will contribute to sanitising during none usage periods.
- The end user controls have been standardised to ensure user friendliness, a simple on/off switch for the ventilation and standard AC controller is all that's required.



**■ Specification for all types**

**□ Casing**

Manufactured in galvanised sheet steel. Models HQ and HW have the additional protection of two coats of papyrus white.

**□ Impeller**

Highly efficient with profiled polymer blades, aerodynamically optimised for application, dynamically balanced. Operating range from -30 to +60 °C.

**□ Motor**

Energy-saving, speed-controllable EC external rotor motor protected to IP 44 with high level of efficiency. Maintenance-free and interference-free, excellent electromagnetic compatibility (EMC), ball bearing mounted.

**□ Motor protection**

Integrated electronic temperature monitoring for EC motor and electronics.

**□ Electrical connection**

Standard terminal box (protection to IP 54) mounted to running cable and on the outside of the ducting for HRF.

**□ Guard**

Made from powder-coated steel for HQ and HW, in accordance with DIN EN ISO 13857.

**□ Speed control**

All types are steplessly controllable through the speed-potentiometer. Furthermore, control is also possible via three-step switch or steplessly via universal control system or electronic differential pressure/temperature controller. See table below. The example performance stages are shown in the characteristic curves.

**□ Installation**

Installation in any position.

**□ Sound levels**

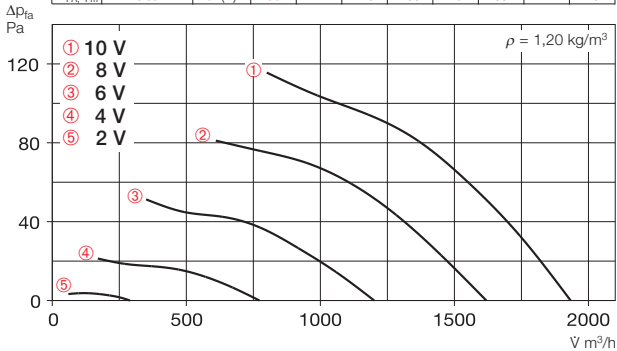
Sum levels and spectrum figures for sound power and sound pressure levels in 4 m free field conditions are specified above the characteristic curve for a medium intake/exhaust operating point. The sound pressure sum level in 4 m (free field conditions) is also shown in the table below and the table below the characteristic curve for different voltages. Sound emissions and room acoustics see page 10.

R.P.M.	Air flow volume (FID)	Motor power	Current	Sound pressure	Wiring diagram	max. air flow temperature	Weight net approx.	Type					
								HQ EC incl. guard	Ref. no.	HW EC incl. guard	Ref. no.	HRF EC	Ref. no.
min <sup>-1</sup>	V m <sup>3</sup> /h	kW	A	dB(A) in 4 m	No.	+°C	kg						
<b>1 ph. motor, 1~ 230 Volt, 50/60 Hz, EC motor, protection to IP 44</b>													
2650	1930	0.13	0.97	56	1046	40	6.5	HQW EC 250 A	4822	HWW EC 250 A	4823	HRFW EC 250 A	4824



### 250 A

Frequency	Hz	Total	125	250	500	1k	2k	4k	8k	
L <sub>WA</sub>	Air noise	dB(A)	76	47	67	70	69	70	67	60
L <sub>PA, 4m</sub>	Air noise	dB(A)	56	27	46	50	49	50	47	40



Voltage V	n min <sup>-1</sup>	Free discharge $\dot{V}$ m <sup>3</sup> /h	P <sub>st</sub> (W)	I <sub>Motor</sub> (A)	L <sub>PA, 4m</sub>
10	2650	1930	127	0,97	56
8	2230	1620	77	0,62	52
6	1670	1200	40	0,30	46
4	1090	770	15	0,14	37

Accessories for HRF EC Description see page 231 on

Technical drawings of various accessories including bell mouth, extension duct, circular attenuator, backdraught shutter, flanged connector, counter-flange, flat flange, flexible sleeve, guard, and mounting feet.

- Bell mouth + guard **ASD-SGD 250** No. 1414
- Extension duct **VR 250** No. 1402
- Circular attenuator **RSD 250/..**
- Automatic back-draught shutter **RVS 250<sup>a)</sup>** No. 2592
- Flanged flex. connector **STS 250** No. 1220
- Counter-flange **FR 250** No. 1203
- Flat flange **FF 250** No. 4941
- Flexible sleeve **FM 250** No. 1672
- Guard **SG 250** No. 1236
- 2 mounting feet **1 x MK 250** (= 2 pcs.) No. 1447
- 4 anti-vibration mounts for suspension **1 x SDZ 1** (= 4 pcs.) No. 1454
- 4 anti-vibration mounts for compression **1 x SDD 1** (= 4 pcs.) No. 1452

<sup>a)</sup> Motorised backdraught shutter see Accessories product pages

Information	Page
Techn. description	140
Selection chart	141
Information for planning	10 on

**Made to order designs**  
Alternative voltages, protection classes, air flow direction, air flow temperature, acid protection and cast aluminium impellers are available on request.

Note the technical information on page 15 on.

Other accessories	Page
Filters and attenuators	421 on
Backdraught shutters and grilles	487 on
Universal control system, electronic controller, speed-potentiometer	539 on

Universal control system		Speed-potentiometer flush		Speed-potentiometer surface		Three-step speed switch flush		Three-step speed switch surface		Electronic diff. pressure controller/switch		Electronic temperature controller/switch	
Type	Ref. no.	Type	Ref. no.	Type	Ref. no.	Type	Ref. no.	Type	Ref. no.	Type	Ref. no.	Type	Ref. no.
EUR EC <sup>1)</sup>	1347	PU 10 <sup>1)</sup>	1734	PA 10 <sup>1)</sup>	1735	SU-3 10 <sup>1)</sup>	4266	SA-3 10 <sup>1)</sup>	4267	EDR <sup>1)</sup>	1437	ETR <sup>1)</sup>	1438

<sup>1)</sup> Several EC fans can normally be connected, see Accessories

EX-PROOF  
 COMPACT FANS  
 RRK Ex e II 2G, 230 V~



## 316

CENTRIFUGAL  
 IN-LINE FANS  
 Product-specific information  
 Selection chart

## 296

MULTIVENT® MV  
 in-line fans



Compact in-line fans for space-saving installation in the ducting system.

Optional 5 types from ND 125 – 315 with highly-efficient EC motors for lowest operating costs.

## 298<sup>on</sup>

INLINEVENT®  
 RR, RRK, SVR  
 in-line fans



**RR, RRK:** Available in galvansied sheet steel or corrosion-resistant polymer casing.  
**SlimVent:** Ultra-flat, with swing-out motor-impeller unit.

Optional 14 types from ND 100 – 315 with highly-efficient EC motors for lowest operating costs.

## 318<sup>on</sup>

ACOUSTIC LINE SB, SVS,  
 SilentBox® and SlimVent®  
 Sound-insulated  
 in-line fans



Virtually silent with high volume and pressure performance. SlimVent models for spatially restricted installation situations.

Optional 18 types from ND 125 – 400 with highly-efficient EC motors for lowest operating costs.

## 342<sup>on</sup>

■ **Features**

InlineVent® and MultiVent® in-line fans have the benefits of the axial construction design and straight-line flow pattern, simple and easy installation and have the performance characteristics of high-performance centrifugal fans. There are strong reasons to choose these devices:

- Low space requirements.
- Unlimited adjustability.
- Low installation effort.
- Cost-effective installation.
- Low noise.
- High pressure reserves.

■ **Structural form – Overview**

■ **MultiVent® MV**

High-pressures and volumes with the space-saving dimensions. Universally suited to all types of rooms at 190 to 1820 m³/h and over 800 Pa. 19 types of standard diameter from 100 to 250 mm in single-level and two-level and parallel design.

□ **MV EC**

Optional 5 types of standard diameter 125 – 315 with highly efficient EC motors for minimum operating costs.

■ **RR**

Market-leading solution with excellent price/performance ratio. Centrifugal in-line fans with low to medium power with standard diameters from 100 to 315 mm. Robust galvanised sheet steel casing.

□ **RR EC**

Optional 9 types of standard diameter 100 – 315 with highly efficient EC motors for minimum operating costs.

■ **RRK**

Alternative with corrosion-resistant and impact-resistant polymer casing in standard diameters from 100 to 315 mm.

■ **SVV, SVR**

Compact flat in-line fans from 80 to 200 mm. With energy-efficient centrifugal impellers to convey small to larger air flow volumes.

□ **SVR EC**

Optional 5 types of standard diameter 100 – 200 with highly efficient EC motors for minimum operating costs.

■ **RRK Ex**

Explosion-protected small fans for 230 V, 1 ph. alternating current. Particularly suited to ventilation of chemical and pharmaceutical laboratories, workshops, etc. To be fitted in the ducting, licensed for operation in zones 1, 2 and 11 according to DIN EN 60079/VDE 0165.

■ **Acoustic Line SB**

Helios SilentBox®, the almost silent solution for high-performance centrifugal fans with duct connection in standard diameters 125 to 400 mm.

□ **SB EC**

Optional 12 types of standard diameter 125 to 400 mm with highly efficient EC motors for minimum operating costs.

■ **Acoustic Line SVS**

Completely lined with sound-absorbing mineral wool. Extremely compact design. Ideal for suspended ceilings, with duct connection in standard diameters 125 to 200 mm.

□ **SVS EC**

Optional 6 types of standard diameter 125 – 315 with highly efficient EC motors for minimum operating costs.

■ **This information supplements the "General technical information" and statements on the product pages.**

□ **Installation position, mounting and condensation outlets**

All ranges (excluding SVR, SVS) can be fitted in any location. In the SV range, the pivoting range is to be kept free and unobstructed access for inspection and cleaning must be ensured. Where there is condensate water (e.g. intermittent operation, medium conveyed volume with high moisture content and changing temperatures), the system must be fitted such that condensate can run off downwards unobstructed. Corresponding drill holes may need to be made in the fan casing. In the RR types, condensate drain openings are fitted in the impeller disc and the motor casing. If necessary, the ducting is to be insulated such that no condensation forms.

□ **Transfer of structure-born sound**

to the ducting and building must be prevented. To this end, the fan must not be rigidly connected to the ducting. Suitable support brackets are available as accessories.

□ **Explosion-protected types**

Reference is made to the statements within the "Instructions for project planning regarding explosion protection" section with regard to the conditions of use and standard. Type RRK Ex models with explosion protection are in line with equipment group II, category 2G for operation in zone 1 and 2 in accordance with Directive 2014/34/EU (ATEX).

□ **Motor, impeller**

External rotor motors with degree of protection IP 44 located in the air flow are used in all construction designs. They are compliant with DIN EN 60034/VDE 0530 and DIN EN 60335-1/VDE 0700 and are equipped with additional moisture and damp protection in ISO class F. The EC types are equipped with particularly energy-saving EC external rotor motors with controllable speed. They are low-maintenance, interference-free and suitable for continuous operation (S1). The ball bearings have a sufficient supply of grease for their lifetime. The centrifugal impellers are pressed on the motor body, i.e. they are firmly connected to the motor and are

dynamically balanced as a single unit in accordance with DIN ISO 1940 T.1 – grade 6.3.

□ **Speed control**

All InlineVent®, MultiVent® and Acoustic Line AC standard types can be regulated in terms of power from 0 to 100% by reducing the voltage. This means that the power can be set to the desired volume. The speed controllers on offer can operate one or more AC fans (until the maximum nominal current is reached). A 10% reserve is to be included in the sizing. Type SVV 80 can also be controlled using three-level switching and types SVR, SVS and RR using two-level switching. In all MultiVent® types (excluding MV EC 315), it is possible to regulate the system through two-level switching, while the AC standard types also have five-level transformer regulation. All EC types (excluding EC 125 to 250) can be steplessly controlled using a speed potentiometer. Furthermore, regulation with three-level switches or stepless regulation is possible using a universal control system or electronic differential pressure/temperature controller. Sample power levels are shown in the characteristic curve.

□ **Airflow direction**

The airflow direction cannot be changed for centrifugal fans, however, it can be defined in all devices according to the how the device is installed. The correct direction of motor rotation and airflow is marked by arrows and is to be checked upon commissioning.

□ **Incorrect direction of rotation**

Operating the device in an incorrect direction of rotation overloads the AC motor and trips the thermal contacts. Typical concomitant features for this are the practical lack of air flow capacity, vibration and abnormal noise.

□ **Air flow temperature**

All devices can be used in the range of –40 °C to at least +40 °C. The upper limit is type-specific and is shown in the table on the product page.

■ **Note**

The integration of F7 air filters and differential pressure switches DDS (Ref. no. 0445) in outside air systems fulfils the requirements of VDI 6022.

■ **Information**

**Page**

Information for planning, Acoustics, explos. protect. 10 on General techn. information, speed control 15 on

This chart enables the easy selection of in-line fans by combining the parameters of static pressure increase  $\Delta p_{\text{sta}}$ , case breakout and intake air noise as sound pressure in 1 m (free field conditions).

Type	Sound press. case breakout	Sound press. intake	Air flow volume $\dot{V} \text{ m}^3/\text{h}$ depending on static pressure												
	L <sub>PA</sub> dB(A)	L <sub>PA</sub> dB(A)	$(\Delta p_{\text{sta}})$ in Pa												
	in 1 m	in 1 m	0	50	100	150	200	250	300	350	400	500	600	700	800
MV EC 125	42	54	360	285	200	130	80	35							
MV EC 160	47	61	570	495	430	355	270	210	150	90	28				
MV EC 200	51	62	1000	840	710	575	370	95							
MV EC 250	50	65	1150	960	805	690	550	425	320	220	160				
MV EC 315	54	68	2050	1930	1810	1670	1520	1350	1150	930	710	190			
RR EC 100	45	72	360	340	320	300	280	260	230	200	170	100	20		
RR EC 125	45	71	540	490	460	420	380	340	300	250	220	110			
RR EC 160	39	67	680	650	610	570	520	480	430	380	330	220			
RR EC 200 A	45	67	950	900	840	790	730	650	570	480	350				
RR EC 200 B	46	71	1130	1075	1020	960	900	840	780	720	715	440			
RR EC 250 A	43	67	970	910	840	780	700	630	550	430					
RR EC 250 B	45	73	1160	1100	1030	960	890	835	760	675	600	454			
RR EC 315 A	47	72	1300	1210	1140	1035	940	845	750	660	555	360			
RR EC 315 B	51	70	1850	1690	1540	1420	1290	1190	1070	980	880	660	440	200	
SB EC 125 A	43	58	530	500	480	460	430	410	380	350	310	140			
SB EC 125 B	45	53	600	580	560	540	510	480	440	410	380	330	270	220	130
SB EC 160 A	41	57	540	520	490	470	450	430	400	380	350	90			
SB EC 160 B	45	56	670	650	610	580	540	500	470	440	410	360	300	240	150
SB EC 200 A	45	58	910	860	800	740	680	600	520	430	330	70			
SB EC 200 B	50	61	1160	1100	1030	940	860	780	680	590	490	310	160		
SB EC 250	50	61	1250	1160	1070	970	870	760	670	560	450	250	70		
SB EC 315 A	55	65	2160	2060	1970	1860	1750	1640	1510	1360	1190	790			
SB EC 315 B	51	61	2640	2520	2400	2270	2100	1930	1730	1450	1120				
SB EC 355	51	62	2670	2560	2420	2280	2110	1940	1740	1470	1130				
SB EC 400 A	53	65	3000	2860	2730	2590	2410	2210	2000	1680	1260				
SB EC 400 B	56	65	4760	4540	4330	4090	3870	3630	3340	3060	2750	2000	1000		
SVR EC 100	56	70	420	400	380	370	350	320	310	280	260	220	160	20	
SVR EC 125	57	70	580	560	530	500	470	440	410	380	340	270	190		
SVR EC 160 A	57	70	640	610	570	540	500	470	440	410	380	310	240	60	
SVR EC 160 B	57	71	820	770	730	690	650	610	560	520	470	360	250	110	
SVR EC 200	55	71	1030	970	910	860	800	750	690	630	580	460	330	190	20
SVS EC 125	54	61	590	550	510	480	450	420	390	360	320	260	170		
SVS EC 160 A	55	62	620	600	570	530	490	460	420	380	350	280	200		
SVS EC 160 B	55	64	800	760	720	670	630	580	530	470	420	310	200	70	
SVS EC 200	55	64	1030	970	910	860	800	740	670	600	530	400	280	170	20
SVS EC 250	52	64	1250	1170	1080	1000	900	810	700	590	510	370	250	120	
SVS EC 315	51	65	1630	1520	1390	1290	1180	1070	960	860	750	510	300	100	
MV 100 A	34/38	45/50	190												
MV 100 B	32/38	46/52	230	120	40										
MV 125	35/42	49/56	350	300	100										
MV 150	40/48	56/64	520	480	420	350	80								
MV 160	41/49	57/65	550	470	410	350	120								
MV 200	36/44	50/58	930	860	770	630	160								
MV 250	40/52	53/66	910	830	700	600	500	390	270	180	110				
RR 100 A	36	59	250	200	160	120	90	60	30						
RR 100 C	42	63	330	290	240	190	150	100	70	20					
RR 125 C	42	63	480	420	350	250	170	120	70	30					
RR 160 B	42	62	530	470	380	300	240	160	100						
RR 160 C	49	66	870	800	730	600	500	400	320	180					
RR 200 A	47	65	930	860	790	730	630	520	390	270	140				
RR 200 B	44	66	980	940	890	830	760	690	610	520	410	120			
RR 250 A	47	67	930	850	760	690	600	490	390	260					
RR 250 C	45	67	970	930	870	810	760	690	630	560	470	160			
RR 315	46	68	1260	1190	1140	1080	1010	940	870	790	700	390			
RRK 100	45	54	230	180	130	100	70	30							
RRK 125	48	54	330	290	260	220	170	110	30						
RRK 160	46	61	440	390	340	300	250	180	70						
RRK 200	56	66	770	700	620	540	440	340	210	80					
RRK 250	53	61	830	760	690	600	510	390	260	100					
RRK 315	48	72	1080	1040	980	920	900	780	720	640	560	340			
SB 125 A	28	46	230	220	200	180	150	120							
SB 125 C	37	55	440	420	400	370	340	310	270	10					
SB 160 B	36	54	360	340	330	310	290	240							
SB 160 D	43	60	580	540	510	470	440	400	360	20					
SB 200 C	44	55	810	730	650	570	470	350	240	120					
SB 200 D	48	58	1030	940	880	830	770	710	650	560	450	150			
SB 250 C	43	56													
SB 250 E	45	55	1080	990	910	840	770	700	630	550	460	200			
SB 315	51	59	2420	2250	2080	1830	1530	1020	130						
SBD 315 A	50	61	2200	2020	1830	1640	1420	1120	710	240					
SBD 315 B	47	57	2250	2150	2030	1830	1620	1430	1200						
SB 355	52	63	2960	2730	2490	2230	1950	1560	310						
SBD 355	51	65	3330	3210	3070	2920	2770	2600	2420	2200	1930				
SB 400	51	62	3930	3670	3410	3100	2750	2380	1860	1030					
SBD 400	50	65	3450	3320	3190	3060	2900	2730	2530	2280	1950				
SVR 100 C	40/45	54/59	310	290	270	240	210	160	110	50					
SVR 125 B	38/46	53/61	400	360	320	290	240	190	120	50					
SVR 160 K	37/45	51/60	450	400	360	320	270	220	160	80					
SVR 200 K	57	70	980	930	870	820	760	710	650	580	510	320	80		
SVS 125 B	35/44	45/55	400	360	330	280	240	180	130	60					
SVS 160 K	35/44	45/55	440	400	360	310	260	210	150	70					
SVS 160 L	39/50	48/58	670	620	570	510	440	370	290	210	90				
SVS 200 K	55	63	940	900	850	800	750	690	620	540	460	300	90		
SVV 80	24/26/37	25/32/43	110	100	90	80	70	60	20						

In-line fans