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General project and client information

Project number:

Project name:

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Client:

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AIR HANDLING UNITS SPECIFICATIONS

EKSEMPEL

GENERAL INFORMATION

The purpose of this document is to define the minimum requirements of the ventilation and air conditioning systems employed within the building to achieve the necessary environmental criteria. For details on general configurations, performances, and required options, please refer to the equipment schedule here after.

The manufacturer as part of their tender submission shall submit full details on the air handling units, including scaled drawings, detailed performances, and prices. All deviations to these specifications will have to be clearly mentioned in the submitted offer. Failure to do so will result in the tender being disqualified.

The air handling units are to be manufactured in a plant certified in accordance with the ISO 9001 - 2015 quality standard and should consider the following harmonized Standards and Directives:

EN 13053-2006 Ventilation for Buildings - Air Handling units-rating and performance for units components and sections,
EN 1886- 2007 Ventilation for Buildings – Air Handling units-mechanical performance

The units design and the integrated components shall comply to the CE marking directives:

- Low Voltage Directive 2006/95/EC
- 2004/108/EC - EMC Directive – Conducted and Radiated Emissions
- 2006/42/EC – Machinery Directive
- Pressure Equipment Directive 97/23/EG

The units shall comply with EN 13053 requirements.
When the VDI 6022 hygienic standard is applicable, the necessary options for compliance need to be included.

PERFORMANCES

The air handling unit range and the related selection software shall be Eurovent certified and listed on the Eurovent-Certification web site.

The air handling unit manufacturer shall provide detailed technical data sheets with at least the following information:
Scaled drawings, dimensions and weight of each unit and every delivery modules

- Performances of every component
- The energy class as per Eurovent calculation
- Air pressure drops for each internal components
- Specific fan power of the unit
- Inlet, outlet and airborne sound power and sound pressure levels
- List of selected controls components

The maximum velocity through the coils finned surface area shall not exceed the values indicated in the detailed description and in any case 3,0 m/s.
The fans and motors shall be selected with medium filter pressure drops.

ENERGY EFFICIENCY CLASS

As part of the Eurovent certification program, the Efficiency Class of each fan motor set and the whole unit shall be provided. The technical data sheets shall clearly provide:

- The Energy Efficiency Class of each fan-motor set and of the complete unit
- The Specific Fan Power of each fan-motor set and of the compete unit
- The air velocity through the coils finned areac

CONSTRUCTION

The equipment shall be suitable for indoor or outdoor installation, as listed in the data sheets.
The air handling units shall be of robust design and manufactured to withstand maximum fan pressures with closed dampers, without permanent deformation.
All sections of the air handling unit shall be constructed to conform to the pressure characteristics of the system under all operating conditions to prevent drumming, distortion and vibration when tested to a pressure differential of **2500 N/m².**

The casing construction shall be made with 50 mm thick self-supporting panels, assembled together without any vertical members. To avoid dust traps, supporting or assembly frames inside the air stream are not permitted.

The panels are assembled together with concealed internal fixings from the edge of the panels. Screws or bolts crossing the panels shall be avoided to ensure completely closed panels, avoid humidity migration inside the panels, fiber carry over into the air stream and long lasting air tightness. Proper sealants shall be fitted between the panels to guaranty long lasting casing air and water tightness.
The outer skin shall be mechanically fixed to the inner skin in order to get all panels easily removable.

The unit construction shall be silicone free.
Screws or bolts protruding inside the air stream are not permitted.

To minimize internal air pressure drops and the on-site foot print, the internal dimensions of the units shall be based on the universal filter frame dimensions. Therefore, internal dimensions shall be multiple of 305 mm in the height and in the width, and 152,5 in length providing a neat exterior along the length of the unit and a clean interior appearance to ensure even distribution of air across the face of all components without blanking plates.

Top and side panels shall be fixed together with heavy duty 1,5 mm thick profiles. These profiles shall be made:
- In aluminum, protected with an anti-corrosion powder coating.
- In Stainless steel 304

The bottom panels shall be integrated into a “C” shaped bolted base frame in galvanized steel to facilitate reinforce the casing stability and facilitate the unit handling.

The air handling units shall be delivered in one piece or with separate modules to be connected together on site. The assembly between the delivered modules shall ensure perfect continuity of the air passage and a smooth interior finish without any rough points or cavities and joining surfaces to prevent any dust build-up and contamination microbial growth.

All internal electrical components and the entire unit shall be earthed.

The mechanical characteristics of the casing shall be tested by an independent laboratory and be Eurovent certified. They must be equal or better than the following values (based on EN 1886).

Casing strength / Maximum relative deflection @ 1000 Pa:	D1
Casing air leakage @ -400 Pa:	L1
Casing air leakage @ +700 Pa:	L1
Filter bypass leakage rate:	F9
Casing thermal transmittance:	T2
Thermal bridging factor:	TB2

Casing acoustical execution:

Frq. Hz	125	250	500	1000	2000	4000	8000
Attenuation dB	15	23	31	33	35	36	45

PANELS

The panels must be self-supporting, sandwich panels with a thickness of min. 50mm, perfectly closed and thermally and acoustically insulated between inside / outside with a special min. 8 mm thick PVC-strip in between the inside to the outside panel. The panels must have a smooth inside with no gaps and screws to prevent dust accumulation and facilitate cleaning.

The panels must be made of the following material:

Galvanized steel, with a 150 µm PVC coating

The internal guides shall be in galvanized steel
The internal guides shall be in stainless steel 316

The external panel must be made of

galvanized steel sheet (based on EN 142-79) with a UV, weather and scratch resistant PVC coating (PVC coating should be tested 500h based on ASTM B 117-95 and 1000h based on ASTM D 2247-94). The external PVC coating must be made in a neutral color and should have a thickness not less than 120 µm.

The panels shall be insulated with a 50 mm thick non combustible mineral fiber infill insulation having a thermal conductivity of 0.59 W/m²K maximum according to DIN 4108.

Isolation 20 Kg/m³

The panel insulation shall comply with the following fire protection class:

- Class 0 according to ISO 1182.2
- Class A1 according to DIN 4102
- A1 according to EN 13501-1:2007

The insulation must be completely separated from the air flow.

The panels shall provide a high degree of noise attenuation to minimize noise breakout, and shall be sufficient to achieve the following reduction:

ZHK Inova casing execution: (0,70/1,00 mm)

Certification proving noise reduction of the panel shall be provided with the tender.

ACCESS DOORS

Adequate access with hinged doors shall be provided to ensure that all components can be cleaned, inspected or serviced easily. Doors shall be made with the same construction as the casing panels, 50 mm thick, completely closed, internally and externally flush mounted. Hinged doors shall be provided in all sections where regular maintenance is required, such as fan, filter or humidifier sections.

Hinged doors shall be mounted on Aluminium frames, with adjustable heavy duty aluminum hinges and fastened with reinforced PA6 handles.
Hinged doors provided on positively pressurized sections shall be with inward opening or equipped with safety chains.

The door frames shall have thermal welded rubber seals designed to ensure the optimum air tightness for the life of the units.
The locking system of the handles of shall be made of wear-resistant plastic roller bearing to prevent scratching or damage to the door frame.

The hinged doors provided on fan sections shall be lockable with a key.

Removable inspection panels shall be provided on narrow sections or where regular access is not needed.

UNIT BASE FRAME

For rigidity and stability reason, each delivery module shall be supported with a continuous built heavy gauge base frame:

Base frame shall be In C type, made from Galvanized steel, with height not less then 200 mm with a min thickness of 4mm

The unit base frame shall be provided around the entire perimeter of the air handling unit and wherever a joint occurs between the sections. Lifting lugs shall be provided to facilitate the onsite lifting.

Additional counter base shall be provided loose to adapt the unit to the on-site support. The counter base shall be In C type, made from Galvanized steel, with height not less than 200 mm with a min thickness of 4mm.

PACKING

Prior to dispatch, each section of air handling units shall be provided with a packing to prevent damages during transit, storage and installation.

- On pallet, with shrink wrapping and heavy duty polythene sheeting

UNIT CONFIGURATIONS

The air handling units configuration shall comply with the attached project specification: Vertically stacked. [

ErP compliance according EU regulation no. 1253/2014

ErP ready 2018

a)	Manufacturer	Euroclima	
b)	Model identifier	23/0028 / 002	
	Unit type	aRVU - VU	
c)	Type of driv Supply	variable speed	
	Type of driv Return	variable speed	
e)	Energy rec ve system type	other DC	
	Thermal ef ienc of HRS	77,9	[%]
d)	Nomi al ai ow ra S/R	6,94 6,94	[m³/s]
h)	Effective electric power input	13,92	[kW]
i)	SFP int	741	[W/m³/s]
j)	Face velocity S/R	0,7 / 2,33	[m/s]
k)	Nominal external pressure S/R	300 / 300	[Pa]
l)	Int press.drop vent. components S/R	218 / 251	[Pa]
m)	int press.drop not vent. components S/R	95 / 46	[Pa]
n)	Static fan efficiency acc. (EU No 327/2011) S/R	70,2 / 70,2	[%]
o)	Ext leakage rate	Class L1/L1	
	Internal leakage rate	on request	
p)	Energy classification filters	see filter data	
r)	Casing sound power level LWA	63	[dB]
s)	www.euroclima.com		

COMPONENTS DESCRIPTION

Empty sections

Empty sections with hinged doors and adequate length shall be provided where access is required for inspection, cleaning or maintenance purpose.
When empty sections are required to install components at a later stage, the section shall be long enough to ensure easy and fast installation.

Inspection windows, wired lights, or other options shall be provided as indicated in the detailed description.

Dampers

Dampers shall be provided as inlet/outlet shut off devices, with ON/OFF control or as mixing or dividing devices with modulating control. They shall be controlled with either manual levers or electric motors as indicated in the detailed description.

Dampers shall be made with double skin airfoil section blades, made of galvanized steel, aluminium or stainless steel.

The blades interconnection mechanisms shall be made with gears made of either glasfiber reinforced PP, suitable for temperature up to 110°C or Ryton material, suitable up to 160°C.
They shall provide opposed rotating blade to blade interaction without slippage, and a smooth operation with minimum torque.

Aluminium blades shall be provided with edge seals in neoprene, and comply to Class 2 according to EN 1751.

The shaft shall be with a square section, suitable for standard actuator fitting and shall be fitted on low friction bearings made of reinforced glass fiber.

The damper frames shall be made with galvanized steel, aluminium or stainless steel and shall include flanges on each side with holes in the 4 corners for an easy connection to the ductwork.

Dampers longer than 1525 mm or/and higher that 1220 mm shall be sectionized in equal sized dampers.

Dampers provided on external units shall be either weatherproof or installed inside the units.

For hygienic applications, opposed rotating dampers shall comply to DIN 1946-4 and Class 4 as per EN 1751. The damper blades shall be made with double skin airfoil aluminium section, with edge seals. The blades interconnection mechanisms shall be made with gears made in fiber glass reinforced PP installed out of the air flow. Bonded aluminium profiles with special seals shall be provided between the blades and the frame, inside the air stream to ensure long lasting air tightness. The damper frames shall be made in galvanized steel or in stainless steel as indicated in the detailed description.

To ensure long lasting operation, interconnecting mechanisms with levers or rods are not permitted.

Connection flanges

The AHU shall be delivered with connection flanges on all openings to allow easily fixing of opening accessories or ducts. The flanges shall be 30mm width without holes. The flange shall be of the same material as the internal panels.

High efficiency rigid bag filters

Rigid bag filters shall have efficiency from F5 to F9 according to EN 779:2011, as specified hereafter. The rigid bag filters shall be Eurovent certified, feature low air pressure drops and long operating life cycle.

They shall be made with glass fiber media fitted in 25 mm thick ABS or polypropylene headers. They shall be lightweight, easy to install and fully incinerable.

The filters shall be suitable for 70°C in continuous service.

To optimize maintenance and storage costs, the filter dimensions shall comply with the Eurovent 2/2 recommendations:
592mm x 592mm x 290mm
592mm x 287mm x 290 mm

Other filter dimensions are not permitted.

Filters shall be fitted into the units on universal holding frames which shall be screwed and properly sealed to the casing. The optimum airtightness between the filter cells and the frames shall be insured with continuous rubber seals compliant to the VDI 6022 recommendations.

The designed pressure drop used for the fan selection shall be the mid-life pressure drop at nominal air flow.

The filter bypass leakage shall not exceed 0.5% of the nominal air flow at the nominal operating condition, Class F9 as per EN 1886.
Performances, accessories and options as indicated in the detailed description shall be provided.

Plate heat exchangers

Plate heat exchangers shall be made of heat exchanger packages and casings to recover energy from the return air to the fresh air side.
Exhaust air and supply air steams shall be separated with a maximum air leakage between both air streams of 0,022% under 250 Pa differential pressure drop. They shall be suitable for hospital or clean room applications.

The plate heat exchanger package shall consist of aluminium plates having special structure spacers to provide optimum efficiencies. Transfer of odors or humidity is excluded.
To control the leaving air temperature and the freezing of the plate heat exchangers, they shall be equipped with face and bypass dampers on the fresh air side.
The side walls shall be made of galvanized steel plates, bolted tightly to these extrusions.
Plate heat exchanger sections shall be equipped with drain trays on each side of the exchanger with a 32 mm diameter drain connection to the access side of the unit.
Droplet eliminators shall be provided on the exhaust air side when risk of water carry over are identified.
The plate heat exchangers shall be silicon free and resistant to 90°C.

Plate heat exchanger performance data shall be Eurovent-certified.
For applications with hygienic requirements or aggressive air, the plate heat exchangers shall be protected with an epoxy coating or made in stainless steel.

Performances, accessories and options as indicated in the detailed description shall be provided.

EC Plug Fans

Single inlet, backward curved motorized impeller, energy-optimized for operation without a volute casing with a rotating diffuser (without blade) for high efficiency and good acoustic performance. The impeller is made of aluminum or plastic. The radial impeller with external rotor motor is statically and dynamically balanced to ISO 1940 Part 1 and designed for mounting in horizontal and vertical position. Impeller with rotating diffuser and 7 backward curved airfoil blades. Galvanized inlet ring with flow-measuring device. The centrifugal fan has integrated electronic device. The electronic is protected by an over temperature protection with active temperature management. IP 54, Thermal Class 155 and designed for ambient temperature of -25 ° C to +60 ° C. The fan characteristics should be measured in a test station according to DIN 24163 part 2 and ISO 5801. The performance should be on accuracy class 2 according to DIN 24166 and the efficiency class of the motor should be not less then IE4.

Cable glands through casing for motor power cable shall be provided.
Performances, accessories and options as indicated in the detailed description shall be provided.

Condensing coils

Condensing coils shall be easily demountable, fitted on rails with removable front panel.
The air velocity through the finned block area shall not exceed 3,0 m/s.

Coils shall be designed for a maximum operating pressure of 16 bars, and factory tested at 30 bars.

Condensing coils shall be made of 16 mm diameter seamless copper tubes, 0,42 mm thick as a minimum and 0,12 thick aluminum fins. The coil frame shall be made of galvanized steel and the header shall be made of copper. Other materials for the fins, frames or headers or special treatment shall be provided as specified in the detailed description.

The fins shall be flat to avoid fouling and allow a proper cleaning. Fin spacing shall not be less than 2 mm.

EUROVENT certified data (“Rating Standard 6/C/005-2011”), capacity, air and water side pressure drop.

Performances, accessories and options as indicated in the detailed description shall be provided.

Hot water coils

Hot water coils shall be easily demountable with removable, fitted on rails with removable front panel.
The air velocity through the finned block area shall not exceed 3,0 m/s.

Coil performances shall be in accordance to AHRI Standard 410-2001.
Heating coils shall be designed for a maximum operating pressure of 16 bars, and factory tested at 30 bars.

Hot water coils shall be made of seamless copper tubes,0,35mm (for 9mm tubes) and 0,42 mm (for 16mm tubes) thick as a minimum and 0,12 thick aluminum fins. The coil frame shall be made of galvanized steel and the header shall be made of painted mild steel. Coil headers shall be equipped with drain and air vent. Other materials for the fins, frames or headers or special treatment shall be provided as specified in the detailed description.

The fins shall be flat to avoid fouling and allow a proper cleaning. Fin spacing shall not be less than 2 mm.

Coil connections shall be threaded and capped prior shipment.

EUROVENT certified data ("Rating Standard 6/C/005-2011"), capacity, air and water side pressure drop.

Performances, accessories and options as indicated in the detailed description shall be provided.

Anti frost frames

The anti-frost frames shall consist of a U shaped profile, fitted on rails and covering the entire surface area of the cooing coil.
The frame shall be equipped with eyelets to fit a thermostat capillary over the finned coil area. It shall be fitted on a removable panel for an easy access.
Accessories and options as indicated in the detailed description shall be provided.

High efficiency bag filters

High efficiency filters shall be bag type, rated from F5 to F9 according to EN 779:2011, as specified hereafter. The rigid bag filters shall be Eurovent certified, feature low air pressure drops and long operating life cycle.

They shall be made with glass fiber or synthetic media fitted in 25 mm thick headers. They shall be lightweight and easy to install.

The filters shall be suitable for 70°C in continuous service.

To optimize maintenance and storage costs, the filter dimensions shall comply with the Eurovent 2/2 recommendations:
592mm x 592mm x 535mm
592mm x 287mm x 535 mm

Other filter dimensions are not permitted.

Filters shall be fitted into the units on universal holding frames which shall be screwed and properly sealed to the casing. The optimum airtightness between the filter cells and the frames shall be insured with continuous rubber seals compliant to the VDI 6022 recommendations.

The designed pressure drop used for the fan selection shall be the mid-life pressure drop at nominal air flow.

The filter bypass leakage shall not exceed 0.5% of the nominal air flow at the nominal operating condition, Class F9 as per EN 1886.

Performances, accessories and options as indicated in the detailed description shall be provided.

Direct expansion cooling coils

DX cooing coils shall be easily demountable with removable, fitted on rails with removable front panel.
The air velocity through the finned block area shall not exceed 2,5 m/s.

Coils shall be designed for a maximum operating pressure of 16 bars, and factory tested at 30 bars.

The coils shall be made of 16 mm diameter seamless copper tubes, 0,42 mm thick as a minimum and 0,12 thick aluminum fins.
The coil frame shall be made of galvanized steel and the distributor shall be made of copper.
Other materials for the fins, frames or special treatment shall be provided as indicated in the detailed description.

The fins shall be flat to avoid fouling and allow a proper cleaning.
The minimum fin spacing shall not be lower than 2,5 mm and not lower than 3,0 mm when the sensible heat ratio is lower than 0,7.

Coil connections shall be threaded and capped prior shipment.

EUROVENT certified data ("Rating Standard 6/C/005-2011"), capacity, air and water side pressure drop.

To avoid risk of water carry over, cooling coils shall be provided with droplet eliminators when the air velocity trough the finned block exceeds 2,49 m/s and/or when the sensible heat ratio is below than 0,9.

The droplet eliminators shall be made of polypropylene blades having a minimum width of 110mm. The blades shall be mounted in a galvanized steel or stainless steel frame. If the AHU internal height is max. 915mm the droplet separator should be in frameless execution.

A properly sized drain tray, with 3 slopes shall be incorporated in the bottom panel of the cooling coil section, with a 32 mm diameter drain located on the side of the unit.

Coil connections shall be capped prior shipment.

Performances, accessories and options as indicated in the detailed description shall be provided.

Single mixing box sections

Single mixing box sections shall include a return air dampers and a fresh air dampers. The dampers shall be properly sized for the nominal air flows, made with the materials and positioned as indicated in the schedule. The single mixing box length shall be defined to ensure an optimum mixing of the return and fresh air streams.
When the mixing box is used to access a front removal filter set, it shall be provided with a hinged door.
When possible, the dampers shall be linked together with a linkage for an operation with one single actuator or manual lever.

Hinged doors, inspection windows, wired lights, or drain pans shall be provided as indicated in the detailed description.

Supply air

Position No.:	**002**
Drawing No.:	**002**
LV-Position:	
Identification:	**50m olympic pool**
Quantity:	**2**
Casing type and size:	**Combined unit superimposed horizontal** **Indoor Unit** **-Supply air unit:** **External dimensions WxHxL: 2540 x 1775 x 7472.5 mm** **Air flow: 25.000 m³/h** **- Exhaust air unit:** **External dimensions WxHxL: 2540 x 1470 x 6252.5 mm** **Air flow: 25.000 m³/h**

Eurovent EEC

Unit:

Performance data:

Efficiency class		C
SFP class		SFP2
SFP value	W/(m³/s)	1.933
Design temperature	°C	17,00
Density	kg/m³	1,20

Supply Air:

Performance data:

Efficiency class		C
SFP class		SFP2
SFP value	W/(m³/s)	961
Velocity class		V5

Exhaust Air:

Performance data:

Efficiency class		C
SFP class		SFP2
SFP value	W/(m³/s)	972
Velocity class		V5

Technical data of unit sections in direction of air flow

L - Empty section

Section length:	mm	305,0
Section pressure loss:	Pa	
Opening	Size	2.380,0 mm x 1.160,0mm
	Direction	Full opening
Damper	Frame	Aluminium
	Fins	Aluminium
	Sealing	Yes
	Gears	PPGF
	Drive	actuator, in air dir. right

- Accessories / Execution / Indications

1 Pcs Damper actuator SM24A-SR

TF - Filter

Section length:	mm	457,5
Section pressure loss:	Pa	52

CFT - Bag Filter

Technical data:

Filter manufacturer		Camfil
Filter type		OPAKFIL-ES-F7 °°
Air volume	m³/h	25.000
Filter class (EN779)		F7
Class ISO 16890		ePM1 60%
Filter length		296,0
Filter surface		136,00
Initial pressure	Pa	26
Final pressure	Pa	78
Design pressure	Pa	52

Filter qty and sizes:

x 592,0 mm x 592,0 mm

Filter frames or guide shell be executed in galvanized steel

- Accessories / Execution / Indications

- Accessories / Execution / Indications

1 Pcs Door lock

- Accessories / Execution / Indications

1 set Pressure test points mounted

L - Empty section

Section length:	mm	762,5
Section pressure loss:	Pa	27

- Accessories / Execution / Indications

1 Pcs Door lock

Opening	Size	2.380,0 mm x 347,5mm
	Direction	Bottom
Damper	Frame	Aluminium
	Fins	Aluminium
	Sealing	Yes
	Gears	PPGF
	Drive	actuator, in air dir. right

- Accessories / Execution / Indications

1 Pcs Damper actuator NM24A-SR

PT - Plate exchanger - diagonal

Section length:	mm	2.745,0
Section pressure loss:	Pa	178

CPT - Plate exchanger

Technical data:

Manufacturer		ERI
Frame material		Aluminium
Plates material		aluminium coated
Front and Bypass damper		315,0 mm

Heating conditions:

Supply:	m³/h	25.000
Air on temp	°C	17,00
Air on hum	%	83,0
Air off temp	°C	26,40
Air off hum	%	47,0
Pressure loss	Pa	176
Exhaust:	m³/h	25.000
Air on temp	°C	26,00
Air on hum	%	33,0
Air off temp	°C	17,00
Air off hum	%	91,0
Pressure loss	Pa	178
Efficiency	%	71
Condensate content	kg/h	4,08
Freezing temp	°C	0,00
Energy recovery	kW	79,09

- Accessories / Execution / Indications

1 Pcs PHE for POOL application

- Accessories / Execution / Indications

1 Pcs Door lock

Drain pan	Material	galvanized steel
	Dimensions	2.745,0 x 2.440,0 Ø1"
	Type	C-inclined CDB

- Accessories / Execution / Indications

1 Pcs Damper actuator SM24A-SR
2 set Pressure test points mounted

RFC - Refrigerant circuit section

Section length:	mm	1.220,0
Section pressure loss:	Pa	

Technical data refrigerant circuit:

total cooling capacity	kW	73,010
total absorbed capacity	kW	18,880
total system capacity	kW	91,890
Separate cooling circuits:		1
Compressor qta		1
Refrigerant		R410A
PED Class		Class II
Min/Max temperature	°C	-20°C / 80°C
Max Pressure HD/ND	bar	21 / 21

Compressor type		Scroll Hermetic

Technical data 1. Compressor:

Compressorname		Copeland/ZP295 KCE-TWD-522
cooling capacity	kW	73,01
Condensing capacity	kW	91,890
Power input	kW	18,880
COP		3,87
Oil qta.	kg	6,80
Hub volume	m³/h	46,70
Electrical absorbed current	A	33,27
Max work current	A	48,00
Winding type		400V Y
Massflow	kg/h	1.714.968

- Accessories / Execution / Indications

1 Pcs Door lock

Opening	Size	2.380,0 mm x 500,0mm
	Direction	Top opening
Damper	Frame	Aluminium
	Fins	Aluminium
	Sealing	YES
	Gears	PA GF
	Drive	actuator, in air dir. right

Accessories / Execution / Indications

1 Pcs Actuator support for internal damper
1 Pcs Damper actuator NM24A-SR

VF - Plug fan

Section length:	mm	915,0
Section pressure loss:	Pa	

High performance impeller with backward inclined blades, statically and dynamically balanced

Technical data fan:

Manufacturer			ebmpapst
Fan type	x 2		K3G560-PC04-32/ 3x400V
Air volume	x 2	m³/h	12.500,00
External static pressure		Pa	300
Dynamic pressure		Pa	64
Total pressure		Pa	719
Total Efficiency		%	80,15
Absorbed power	x 2	kW	3,115
Nominal speed		1/min	1.544
Sound power level		dB(A)	87,8

Frq.Hz	63	125	250	500	1000	2000	4000	8000
Okt.dB	72,7	78,8	76,7	81,5	81,6	77,0	80,6	71,9

- Accessories / Execution / Indications

1 Pcs Pressure tapping on fan inlet cone
Fan anti-corrosion protection

Motor data:

Manufacturer		ebmpapst
Motor type		M3G150NA
Protection class		IP54
Insulation class		F
Connection / Voltage		3x400 / Default
Nominal power	kW	5,000 / /
Nominal speed	1/min	1.760 / /
Nominal current	A	7,70 / /
Efficiency		89,85
El. absorb power		3,47
Motor efficiency class		analog to IEC60034: IE 5

- Accessories / Execution / Indications

Motor precabeled

1 set Gland for power cable

- Accessories / Execution / Indications

1 Pcs Door lock

- Accessories / Execution / Indications

1 set Pressure test points mounted

L - Empty section

Section length:	mm	305,0
Section pressure loss:	Pa	

H - Heating coil

Section length:	mm	305,0
Section pressure loss:	Pa	42

CH2 - Condenser coil

Materials:

Fins		aluminium coated
Tubes		copper
Frame		Aluminium
Header		copper

Technical data:

Inlet connection		DN
Outlet connection		DN
Air volume	m³/h	25.000
Air velocity	m/s	2,20
Air on temp	°C	26,40
Air off temp	°C	37,08
Capacity	kW	91,89
Pressure loss	Pa	42
Medium		R410A
Condensation	°C	47,00
Pressure loss	kPa	0,13
Content	Liter	38,500

H - Heating coil

Section length:	mm	305,0
Section pressure loss:	Pa	37

CH1 - Heating coil H2O / Glycol

Materials:

Fins	aluminium coated
Tubes	copper
Frame	Aluminium
Header	copper

Technical data:

Inlet connection		DN 32
Outlet connection		DN 32
Air volume	m³/h	25.000
Air velocity	m/s	2,14
Air on temp	°C	25,00
Air off temp	°C	39,00
Capacity	kW	117,44
Pressure loss	Pa	37
Medium		Water
Medium quantity	l/s	1,4300
Medium velocity	m/s	0,55
Entering temp	°C	60,00
Leaving temp	°C	40,00
Pressure loss	kPa	14,41
Content	Liter	42,100

- Accessories / Execution / Indications

1 Pcs H2O valve 3 Way R3[illegible]2-16-S3 | NF[illegible]4A-SR

FR - Anti frost frame

Section length:	mm	152,5
Section pressure loss:	Pa	2

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1 Pcs Antifreeze thermostat fitted on the frame
1 Pcs Anti frost frame galvanized

Opening	Size	2.380,0 mm x 1.465,0mm
	Direction	Full opening

Unit sound levels Supply air

	Unit sound levels Supply air	Tot dB (A)	63	125	250	500	1000	2000	4000	8000
1	Sound power level casing +/- 4 dB	**60,1**	64,5	64,1	53,8	56,9	55,4	50,4	51,7	43,2
2	Sound power level air inlet +/- 4 dB	**75,5**	59,2	75,8	71,9	66,9	69,1	66,5	71,0	58,1
3	Sound power level air outlet +/- 4 dB	**86,7**	73,7	79,8	77,7	84,5	82,6	76,0	77,6	72,9
4	Sound pressure 1 m appart of AHU	**40,5**	44,9	44,5	34,2	37,3	35,8	30,8	32,1	23,6
5	Sound pressure 1 m appart from air inlet	**70,4**	51,8	69,1	65,9	61,4	63,8	61,3	66,1	53,2
6	Sound pressure 1 m appart from air outlet	**81,4**	66,3	73,1	71,7	79,0	77,3	70,8	72,7	68,0

Calculated sound pressure levels are indicative only. It corresponds to: free field hemispheric sound radiation from the unit casing (4), the inlet (5) and the outlet (6) opening. Other sound sources, acoustic character of the room, air flow noise, duct connections and vibrations can influence the sound pressure in dependence. In practice, therefore measured values on site may be different from the calculated ones.

Exhaust air

Unit sections in direction of air flow:

TF - Filter

Section length:	mm	762,5
Section pressure loss:	Pa	74

CFT - Bag Filter

Technical data:

Filter manufacturer		Camfil
Filter type		HI-FLO XLT HFGX-M5
Air volume	m³/h	25.000
Filter class (EN779)		M5
Class ISO 16890		ePM10 60%
Filter length		640,0
Filter surface		60,00
Initial pressure	Pa	35
Final pressure	Pa	105
Design pressure	Pa	70

Filter qty and sizes:

8 x 592,0 mm x 592,0 mm

Filter frames or guide shell be execute in galvanized steel

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1 Pcs Door lock

Opening	Size	2.380,0 mm x 1.160,0mm
	Direction	Full opening

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1 set Pressure test points mounted

VF - Plug fan

Section length:	mm	1.220,0
Section pressure loss:	Pa	

High performance impeller with backward inclined blades, statically and dynamically balanced

Technical data fan:

Manufacturer			ebmpapst
Fan type	x 2		K3G560-PC04-32/ 3x400V
Air volume	x 2	m³/h	12.500,00
External static pressure		Pa	300
Dynamic pressure		Pa	64
Total pressure		Pa	724
Total Efficiency		%	80,09
Absorbed power	x 2	kW	3,139
Nominal speed		1/min	1.548
Sound power level		dB(A)	87,8

Frq.Hz	63	125	250	500	1000	2000	4000	8000
Okt.dB	72,7	78,9	76,7	81,5	81,7	77,1	80,5	72,0

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1 Pcs Pressure tapping on fan inlet cone

Fan anti-corrosion protection

Motor data:

Manufacturer		ebmpapst
Motor type		M3G150NA
Protection class		IP54
Insulation class		F
Connection / Voltage		3x400 / Default
Nominal power	kW	5,000 / /
Nominal speed	1/min	1.760 / /
Nominal current	A	7,70 / /
Efficiency		89,84
El. absorb power		3,49
Motor efficiency class		analog to IEC60034: IE 5

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Motor precabeled

1 set Gland for power cable

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1 Pcs Door lock

Opening Size 2[illegible]0,0 mm x 500,0 mm
Direction Bottom

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1 Pcs Walkway intake

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1 set Pressure test points mounted

PT - Plate exchanger - diagonal

Section length:	mm	2.745,0
Section pressure loss:	Pa	178

K - cooling coil

Section length:	mm	305,0
Section pressure loss:	Pa	47

CK2 - Evaporating coil

Materials:

Fins	aluminium coated
Tubes	copper
Frame	Aluminium
Header	copper

Technical data:

Inlet connection		DN
Outlet connection		DN
Air volume	m³/h	17.500
Air velocity	m/s	2,06
Air on temp	°C	20,00
Air on hum	%	98,0
Air off temp	°C	15,77
Air off hum	%	100,0
Capacity	kW	73,01
Pressure loss	Pa	41
Medium		R410A

Evaporation		7,00
Content	Liter	39,900
Drain pan	Material	galvanized steel
	Dimensions	1.067,5 x 1.525,0 Ø1"
	Type	flat
Droplet eliminator	Frame	Stainless steel 304
	Blades	PPTV

L - Empty section

Section length:	mm	457,5
Section pressure loss:	Pa	21
Opening	Size	2.380,0 mm x 347,5mm
	Direction	Top opening

M1 - Simple mixing section

Section length:	mm	762,5
Section pressure loss:	Pa	12
Opening	Size	380,0 mm x 1.[illegible]0,0mm
	Direction	Full opening
Damper	Frame	Aluminium
	Fins	Aluminium
	Sealing	Yes
	Gears	PPGF
	Drive	actuator, in air dir. right

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1 Pcs Damper actuator SM24A-SR

Opening	Size	2.380,0 mm x 245,0mm
	Direction	Rear bottom
Damper	Frame	Aluminium
	Fins	Aluminium
	Sealing	Yes
	Gears	PPGF
	Drive	actuator, in air dir. right

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1 Pcs Damper actuator LM24A-SR

Unit sound levels Exhaust air

	Unit sound levels Exhaust air	Tot dB (A)	63	125	250	500	1000	2000	4000	8000
1	Sound power level casing +/- 4 dB	**60,2**	64,5	64,2	53,8	56,9	55,5	50,5	51,6	43,3
2	Sound power level air inlet +/- 4 dB	**80,8**	65,2	78,9	76,0	70,9	73,2	71,6	77,0	65,2
3	Sound power level air outlet +/- 4 dB	**75,9**	61,9	75,9	69,7	72,5	71,7	64,1	68,5	59,0
4	Sound pressure 1 m appart of AHU	**41,3**	45,6	45,3	34,9	38,0	36,6	31,6	32,7	24,4
5	Sound pressure 1 m appart from air inlet	**75,6**	57,8	72,2	70,0	65,4	67,9	66,4	72,1	60,3
6	Sound pressure 1 m appart from air outlet	**70,6**	54,5	69,2	63,7	67,0	66,4	58,9	63,6	54,1

Calculated sound pressure levels are indicative only. It corresponds to: free field hemispheric sound radiation from the unit casing (4), the inlet (5) and the outlet (6) opening. Other sound sources, acoustic character of the room, air flow noise, duct connections and vibrations can influence the sound pressure in dependence. In practice, therefore measured values on site may be different from the calculated ones.

1	Pcs	Guides epoxy coated RAL 9003
1	Pcs	Panel insulation mineral wool
1	Pcs	Floor and walls with hygiene seal
1	set	Base frame BF3 - 200
1	set	Counter base frame BF3 - 150
1		Plug in profiles in PVC
1		Truck - Transport
1	Pcs	Front side covering
1	Pcs	Complete DX system supplied (see Attachement)
1	Pcs	Unit with ETA MATIC Control integrated controls
1	Pcs	Drain pans, connection frames, anti-frost frame and droplet eliminator frame coated