Air Handling Unit
Technical Data

Compact T

Index

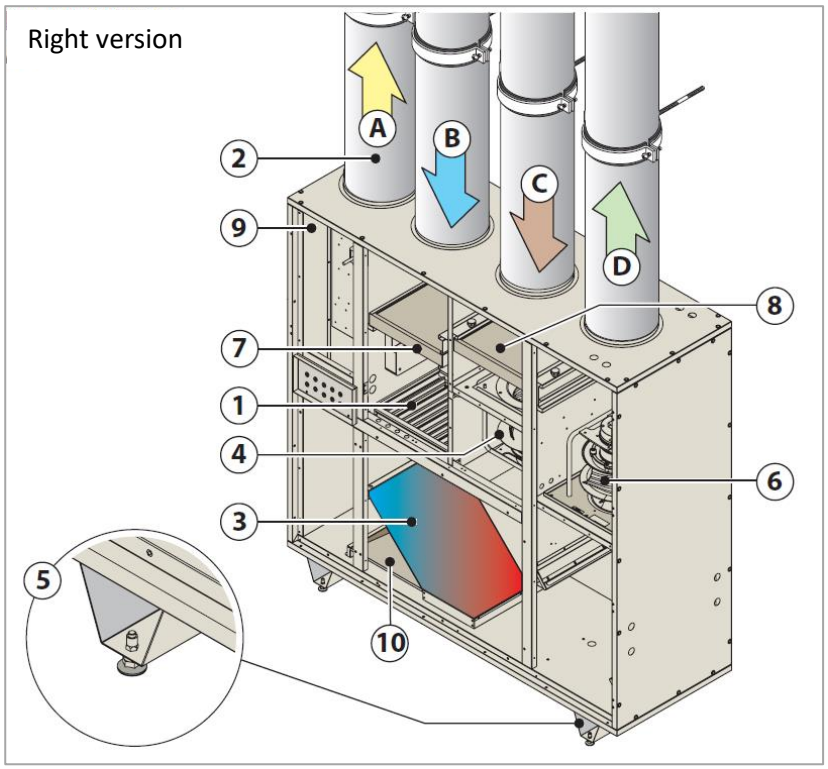
1. Features

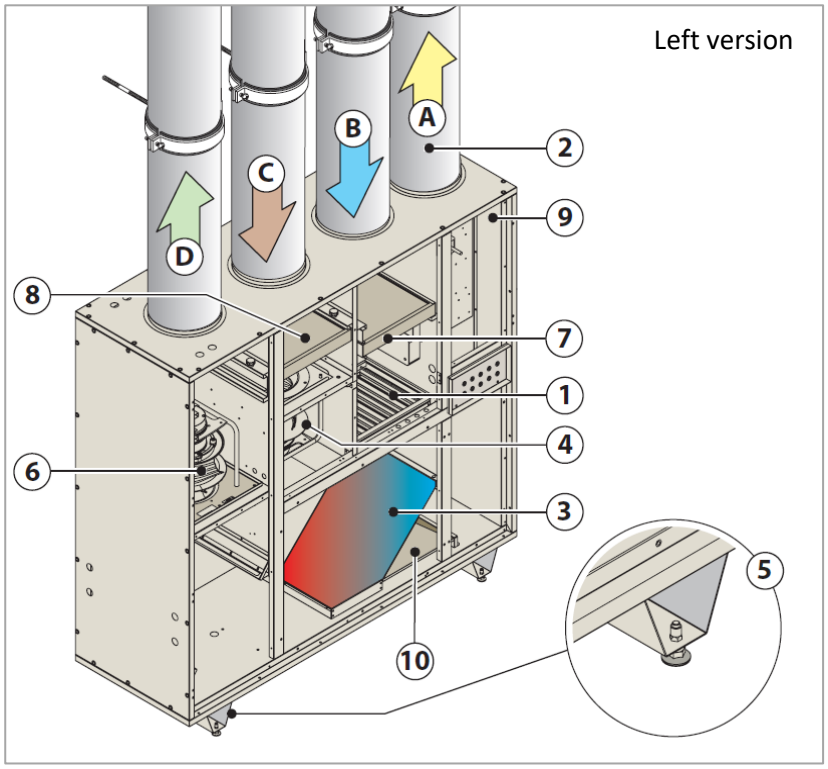
Heat recovery unit with top connections for decentralised ventilation system

- Available in 5 sizes with an air flow from 200 m^3/h up to 4200 m^3/h, ErP 2018 compliant
- More than 500 Pa of external static pressure, depending on model size and conditions
- Smallest size is 550 mm wide, while the biggest size only 890 mm
- Energy saving solution thanks to the 100% automatic bypass
- Reduced energy consumption thanks to EC fan technology and IE5 motor efficiency
- Free-cooling operation and energy efficient defrost logic
- Aluminium counter flow plate heat exchanger with efficiency up to 93%
- Up to three filters on supply side, up to ePM_{10} 75% (M5) + ePM_1 50% (F7) + ePM_1 80% (F9)
- CO2 level management thanks to optional CO2 sensor
- 50 mm double skin panels, mineral wool insulated
- Modbus and BACnet compatible (accessory)
- DX, water and electric coil available as option
- Mixing damper to allow mix/recirculated air operation, available as accessory
- Ideal solution for light commercial applications as: retail shops, small and large offices, hotels, gyms, cinemas, theatres, school, colleges, universities, etc
- Left or right hand version
- Smart (Daikin F1-F2/P1-P2 communication protocol) or Pro (Open protocol) version
- CAV and VAV control solutions

2. Unit Description and configurations

Compact T is available in two configurations for connection side, right and left (looking to the position of supply air flow standing in front of the installed unit).





Components:

1. Bypass damper
2. Ducts
3. Heat Exchanger
4. Return fan
5. V – Shaped feet
6. Supply fan
7. Supply filter
8. Return Filter
9. Control
10. Drain Pain

Airflow direction

A. Exhaust air
B. Fresh air
C. Return air
D. Supply air

3. Standard material name – base module

	Product		Components	Size		Connection side	Model revision	Controls
Digit	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	A	**T**	**B**	**0**	**3**	**R**	**B**	**M**
Character	A = AHU	T = Compact T	B = Base module	03 = Size 03 04 = Size 04 … 07 = Size 07		R = Right L = Left	A = First release B = Second release	M = Pro solution S = Smart solution

Standard unit is provided with:

- Aluminium counter flow plate heat exchanger
- EC Fan with IE5 motor efficiency class
- ePM_1 50% (F7) filter on supply air
- ePM_{10} 75% (M5) filter on return air
- Double skin panel (inner pre-coated, outer pre-coated)
- Control:
    - Pro version: programmable controller
    - Smart version: Smart controller (VAM control)

For Pro version, the room thermostat and user interface ALC00822A is included with the main unit.

For Smart version, the BRC thermostat/remocon is not included with the main unit and has to be provided separately.

Nomenclature:

Compact T Pro	Main Unit	
	Right	Left
Size 03	ATB03RBM	ATB03LBM
Size 04	ATB04RBM	ATB04LBM
Size 05	SB.ATB05RBM	SB.ATB05LBM
Size 06	SB.ATB06RBM	SB.ATB06LBM
Size 07	SB.ATB07RBM	SB.ATB07LBM

Compact T Smart	Main Unit	
	Right	Left
Size 03	ATB03RBS	ATB03LBS
Size 04	ATB04RBS	ATB04LBS
Size 05	SB.ATB05RBS	SB.ATB05LBS
Size 06	SB.ATB06RBS	SB.ATB06LBS
Size 07	SB.ATB07RBS	SB.ATB07LBS

SB. = Sales Bom: sales tool used for Make to stock products shipped in two o more sections.

4. Specifications

4.1. Technical Data

4.1.1. Nominal Data

	Material Name [1]	ATB03*B*	ATB04*B*	SB.ATB05*B*	SB.ATB06*B*	SB.ATB07*B*
	Size	03	04	05 [2]	06 [3]	07 [3]
Airflow	m3/h	800	1650	2300	2700	3900
HE Thermal efficiency [4]	%	85,2	84,2	81,0	81,4	86,8
External static pressure	Pa	100	100	100	100	100
Current	A	1,7	3,39	4,83	5,30	7,83
Power input	kW	0,39	0,78	1,11	1,22	1,80
SFPv	kW/(m3/s)	1,47	1,5	1,55	1,45	1,50
Electrical supply	Phase (ph)	1				
	Frequency (Hz)	50 - 60				
	Voltage (V)	220 - 240				
	Max internal fuse (A)	16				
Main unit Dimensions	Width (mm) [5]	550	790	790	790	890
	Heigth (mm) [6]	1600	1600	1900	1850	2050
	Length (mm)	1580	1650	2170	2620	2950
Circular duct flange	Diameter (mm)	250	315	355	400	500
Unit sound power level	dB(A)	57	53	55	55	58
Unit sound pressure level [7]	dB(A)	50	46	48	48	51
Net Weight Unit	kg	185	230	370	475	580
Gross Weight Unit	kg	195	240	390	505	610

1. For ATB03*B* we refer to all the version of Compact T size 03 (left or right and Smart or Pro)
2. Size 05 is provided in two sections (600mm + 1570mm).
3. Size 06 and 07 are provided in three sections (710mm + 1430mm + 480mm) and (810mm + 1560mm + 480mm).
4. Outdoor air condition: -5°C/80%, extract air condition: 22/50%
5. Width without hinges (15mm)
6. Height of the unit taking into account the feet, mounted on site, (100mm) and duct joints (50mm)
7. Sound pressure at 1m with in (directivity factor Q = 4) in non reverberant field. Allowances on declared values: +/- 3dB.

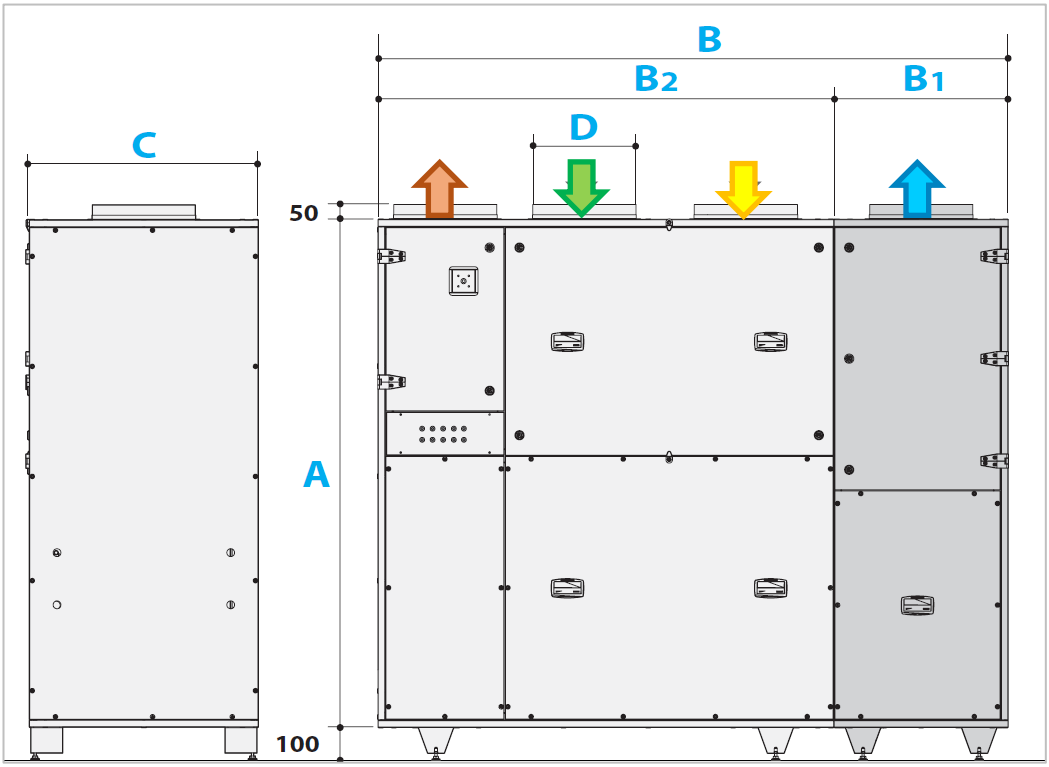
4.1.2. Sectioning

To ensure an easy and quick transportation and installation, biggest sizes are provided in more sections. The following table summarize the number of sections for each size.

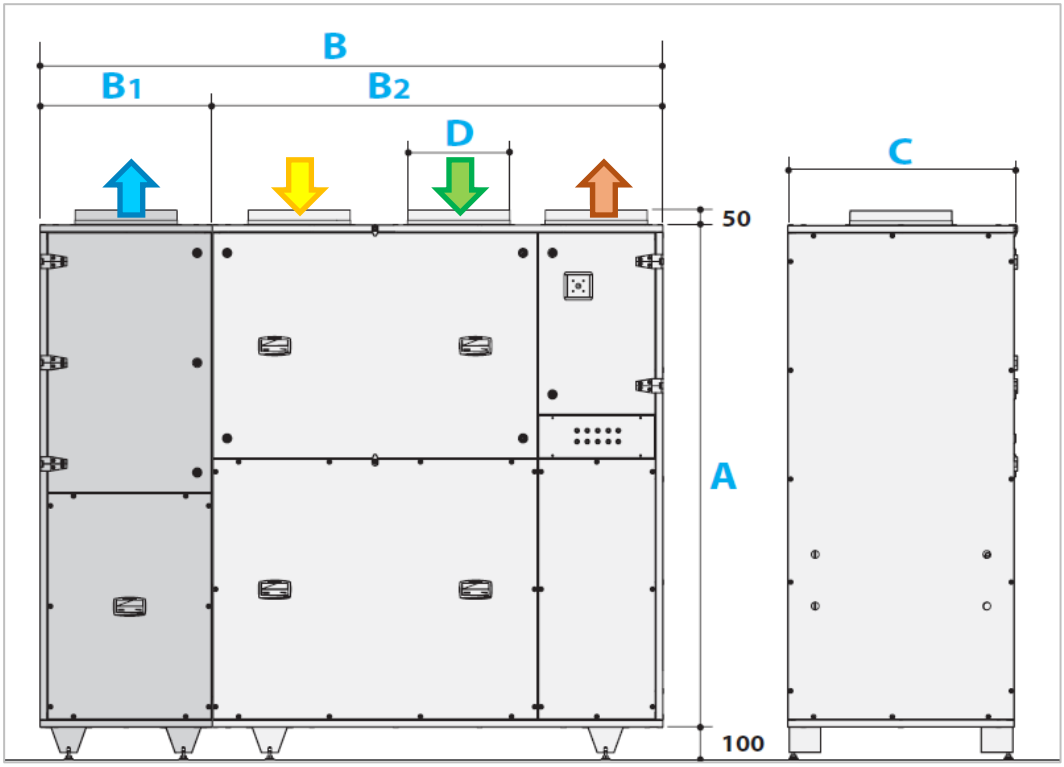
Material Name	Size	Number of sections
ATB03*B*	03	1
ATB04*B*	04	1
ATB05*B*	05	2
ATB06*B*	06	3
ATB07*B*	07	3

For the units provided in more sections, size 05, 06 and 07, there is an easy rule to follow up, to identify the position of the sections, valid for both right and left version of the unit.
Section 1 always refers at supply air flow while *section 2* contains the heat exchanger. In this way, for right version, the *section 1* is on the right of *section 2*, while for left version it is on the left.
For size 06 and 07, that are divided into three sections, the third one is the control section. It will be installed on the left of *section 2* for right version and on the right of the *section 2* for left version.

Section and size	Height (mm) [A]	Length (mm) [B]	Length (mm) [B1]	Length (mm) [B2]	Length (mm) [B3]	Width[1] (mm) [C]	Duct Collar Diameter (mm) [D]	Net Weight (kg)	Gross Weight (kg)
Main unit, size 03	1450	1580	-	-	-	550	250	185	195
Main unit, size 04	1450	1650	-	-	-	790	315	230	240
Section 1, Size 05	1750	-	600	-	-	790	355	120	130
Section 2, Size 05	1750	-	-	1570	-	790	355	250	260
Main Unit, Size 05	1750	2170	-	-	-	790	355	370	390
Section 1, Size 06	1700	-	480	-	-	790	400	135	145
Section 2, Size 06	1700	-	-	1430	-	790	400	250	260
Section 3, Size 06	1700	-	-	-	710	790	400	90	100
Main Unit, Size 06	1700	2620	-	-	-	790	400	475	505
Section 1, Size 07	1900	-	580	-	-	890	500	170	180
Section 2, Size 07	1900	-	-	1560	-	890	500	300	310
Section 3, Size 07	1900	-	-	-	810	890	500	110	120
Main Unit, Size 07	1900	2950	-	-	-	890	500	580	610

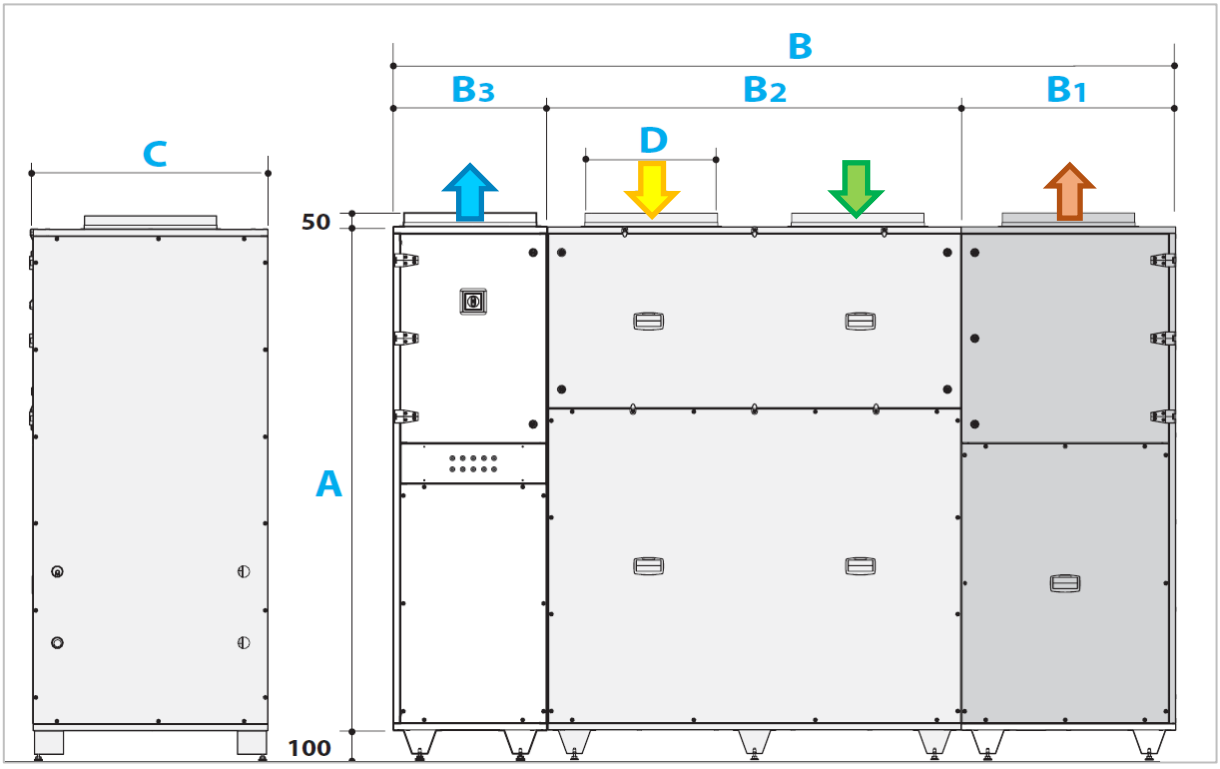


Size 05 – Right configuration

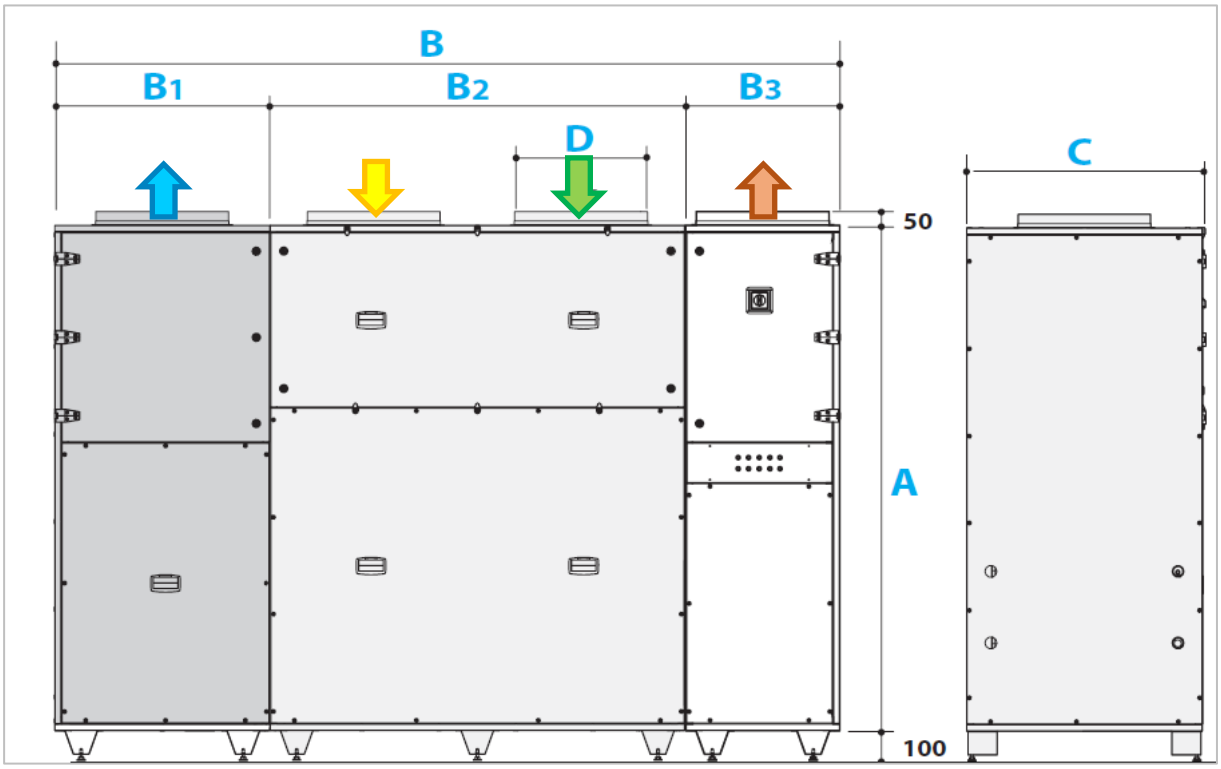


Size 05 – Left configuration

Supply air | Return air | Fresh air | Exhaust air



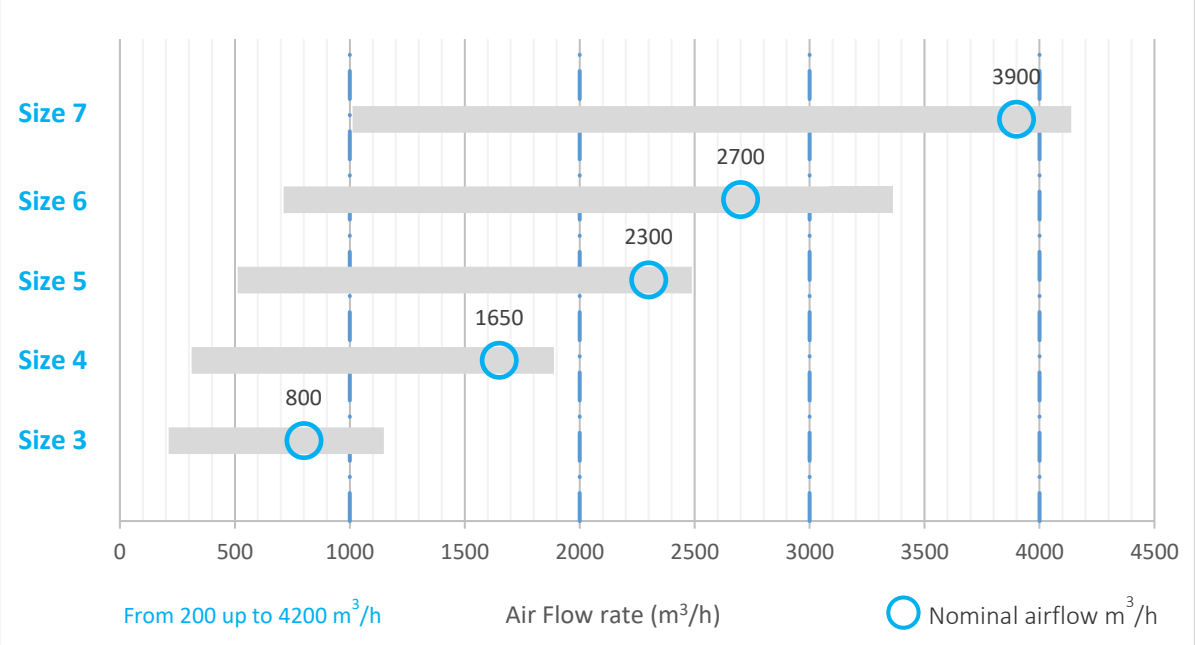
Size 06 & 07 – Right configuration



Size 06 & 07 – Left configuration

Supply air | Return air | Fresh air | Exhaust air

4.1.3. Nominal Air Flow



For any performances out of the nominal condition here above mentioned kindly refer to the online selection software available online at tools.daikinapplied.eu

4.2. Electrical Data

Material Name			ATB03*B*	ATB04*B*	SB.ATB05*B*	SB.ATB06*B*	SB.ATB07*B*
Size			03	04	05	06	07
Power Supply	Phase	-	1				
	Frequency	Hz	50 - 60				
	Voltage	V	220 - 240				
Full load condition	FLA	A	4.58	5.76	6.98	9.0	11.94
	FLI	W	1054	1325	1606	2070	2747

4.3. Declaration EU. REG. 1253/2014

Material Name			ATB03*B*	ATB04*B*	SB.ATB05*B*	SB.ATB06*B*	SB.ATB07*B*
Size			3	4	5	6	7
Manufacturer's name			Daikin Applied Europe				
Typology (NRVU, UVU / BVU) *			NRVU BVU				
Type of drive			Inverter (included on the electronic fan)				
Type of HRS			Other				
Thermal efficiency of the HR		%	76.8	75.7	74.5	74,3	78.2
Nominal NVRU Flow rate	Supply	*m3/s*	0.22	0.46	0.64	0.75	1.08
	Return	*m3/s*	0.22	0.46	0.64	0.75	1.08
Effective Electric Power input		kW	0.39	0.78	1.11	1.22	1.80
SFP internal	W/(m3/s)		748	838	857	763	844
Face velocity at design air flow rate	Supply	m/s	1.29	1.71	1.75	1.68	1.87
	Return	m/s	1.29	1.71	1.75	1.68	1.87
Internal Pressure Drop of Ventilation Components	Supply	Pa	188	265	281	243	273
	Return	Pa	189	269	288	247	277
Nominal External Pressure Drop	Supply	Pa	100				
	Return	Pa	100				
Static efficiency of fans	Supply	%	51	65	68	64	68
	Return	%	51	65	68	68	68
Maximum external Leakage	+ 400	%	3	2	2	2	2
	- 400	%	2	1	1	1	1
Maximum internal Leakage		%	1.5	1.5	1.5	1.5	1.5
Summer Outdoor Conditions	Temp.	*°C*	34				
	RH	*%*	50				
Winter Outdoor Conditions	Temp.	*°C*	-5				
	RH	*%*	90				
Filter Energy Classification			-				
Filter Service Warning **			Displayed on controller				
Sound Power Level		*dBA*	57	53	55	55	58
Pre-/Dis- assembly instructions			https://www.daikinapplied.eu/ahu-instructions-for-pre-disassembly/				

* In accordance with Commission Regulation (EU) No 1253/2014 of July 2014

** Clean/replace Filter(s) when maximum pressure drop is reached or when warning is displayed on HMI controller

4.4. Bearing structure

The units feature double-skin panels that consist of two folded steel sheets. Panel thickness is 50 mm for all unit sides. The standard version is provided with aluzinc steel for outer and inner skin. The units are constructed with removable or hinged doors allowing full maintenance access. The units are equipped with circular flanges with gasket sealing to be connected to a circular ductwork on top.

4.5. Insulation

Insulation material used is mineral wool with a density of 90 kg/m3 (EN 1602).
Thermal conductivity is 0.036 W/m*K and mineral wool is A1 class for fire classification (EN13501-1).

4.6. Heat Recovery

The units feature a counterflow plate heat exchanger (PHE). The PHE is able to recover up to 93% of thermal energy in wet conditions.
They are made of aluminium alloy with a minimum content of iron and copper (to avoid corrosion issues).
PHE is Eurovent certified and protected by minimum ePM_{10} 75% (M5) & ePM_1 50% (F7) grade pleated filters on extract and supply aire sides. PHE incorporates an automatic bypass with two counterrotating dampers with actuator and a condensation drain pan with opportune slope.

4.7. Fans

4.7.1. Pro Version

The units have IP54 EC fan/motor assemblies conform with Reg. EU No. 327/2011. EC fans are of IE5 efficiency class. Fans provide low specific fan power (SFP) and a stepless speed control.
According to their energy balance, performances, flow and noise characteristics the rotor shall be made by plastic (reinforced if necessary). The airflow rate shall be measured on the fan arrangement in real time.
Fans can provide a constant air volume regardless filter clogging or duct/system pressure drops (within the fans operation limits).
They are also able to provide a fixed pressure value regardless the supplied air volume or the pressure drops' changes in the system, while keeping the airflow information coming from the fans.
In terms of power supply, the unit must operate on 220/240 V AC, 50/60 Hz single-phase main supply.

4.7.2. Smart Version

The units have IP54 EC fan/motor assemblies conform with Reg. EU No. 327/2011. EC fans are of IE5 efficiency class. Fans provide low specific fan power (SFP) and a stepless speed control.
According to their energy balance, performances, flow and noise characteristics the rotor shall be made by plastic (reinforced if necessary).
Fans can run at least at 2 speeds (to be selected among 45 different operating points).
In terms of power supply, the unit must operate on 220/240 V AC, 50/60 Hz single-phase main supply.

4.8. Filters

Filters are panel type (compact) made with fibreglass material.
All the filters - regardless of their type – are mounted in opportune rails equipped with a mechanical frame that maintains the filters in pressure a high sealing along the full perimiter.
The available filter grades are: ISO Coarse 55% (G4), ePM_{10} 75% (M5), ePM_1 50% (F7) and ePM_1 80% (F9). They can be combined to meet any kind of requirement.
The units come standard with ePM_{10} 75% (M5) and ePM_1 50% (F7) filters respectively for extract and supply air side. In accordance with ISO 16890, the unit can reach SUP (supply air categories) 1 level from ODA (outdoor air categories) 3 level.
The recommended minimum efficiencies depending on ODA and SUP categories are summarised in the following table.

	Supply air class			
Outdoor Air Quality	SUP 1 (High)	SUP 2 (Medium)	SUP 3 (Moderate)	SUP 4 (Low)
ODA 1 (Pure Air)	ePM_1 70%	ePM_1 50%	$ePM_{2.5}$ 50%	ePM_{10} 50%
ODA 2 (Dust)	ePM_1 80%	ePM_1 70%	$ePM_{2.5}$ 70%	ePM_{10} 80%
ODA 3 (Very high concentration of dust)	ePM_1 90%	ePM_1 80%	$ePM_{2.5}$ 80%	ePM_{10} 90%

The recommended filter combination depending on ODA and SUP categories are summarised in the following table.

	Supply air class			
Outdoor Air Quality	SUP 1 (High)	SUP 2 (Medium)	SUP 3 (Moderate)	SUP 4 (Low)
ODA 1 (Pure Air)	F9 (ePM_1 80%)	F7 ($ePM_1$50%)	F7 ($ePM_1$50%)	F7 (ePM_1 50%)
ODA 2 (Dust)	F9 (ePM_1 80%)	F9 (ePM_1 80%)	F9 (ePM_1 80%)	F7 (ePM_1 50%)
ODA 3 (Very high concentration of dust)	F7 (ePM_1 50%) + F9 (ePM_1 80%)	F9 (ePM_1 80%)	F9 (ePM_1 80%)	F9 (ePM_1 80%)

For easy reference, the EN779:2012 has been replaced by the ISO 16890. The new naming is included in the following table.

Filter name (EN 779)	Filter name (ISO 16890)	ePM_1	$ePM_{2,5}$	ePM_{10}
G4	ISO Coarse 55%	N/A	N/A	N/A
M5	ePM_{10} 75%	40%	50%	75%
F7	ePM_1 50%	50%	60%	80%
F9	ePM_1 80%	80%	85%	90%

The units, in fact, can accommodate on supply air stream up to three filters at the same time: ePM_{10} 75% + ePM_1 50% + ePM_1 80% (M5+F7+F9).
In order to avoid the fast clogging of the fine filter from gross particles, units can also provide a ISO Coarse 55% (class G4) pre – filter on supply side.
According to the hygienic requirements of the VDI 6022, filter frames are designed in such a way so they can be easily extracted and cleaned.
The filter replacement is carried out from the front side opening the removable or hinged door.
The filters replacement trigger is activated through pressure differential transducers, following the provision of EU 1253/2014. Replacement filters are available as a standard accessory.

4.9. Control system

4.9.1. Pro Control

Unit control system is provided on the basis of a programmable direct digital controller (DDC). Its software allows user configuration setting based on original manufacturer logics.
The unit controls are factory mounted and fully operational at site.
A web server (HMI) is also provided as a standard feature.
The unit offers the possibility to be integrated into BACnet/IP or Modbus-RS485 based BMS through dedicated accessories. The unit is connectable to a Cloud monitoring system (optional).
The unit is able to operate either in CAV or VAV systems. For the constant air volume (CAV) logic the unit provides a constant airflow regardless of system pressure drops. For the variable air volume (VAV) logic the unit guarantees a constant static pressure in a specific point of the system, through dedicated accessory (Digital PCB for exernal accessories: ATE00DPUA), while the airflow measurement remains available for reading.
The unit is able to control the indoor air quality by controlling and monitoring the CO2 level (CO2 sensor is optional). In fact, when the threshold value is overcome, the control forces the fan to increase the extracted and supplied air volume in order to decrease the CO2 level faster.
When signals are received, the units vary its fan speed proportionally until the desired set points are met.
An optional humidity sensor is available for the control of the humidity condition when a cooling coil is present. If temperature control is also needed, a post heating coil has to be present too.
The automatic operation of the bypass, instead, is determined by an algorithm that varies output based on temperature evaluations. Bypass control provides free cooling operation based on dry bulb temperatures and enthalpies (optional) through additional humidity probes (accessories). Defrost operation together with a modulating internal water heating coil (if available) is also possible, in order to give the best solution in terms of energy efficiency and cost reduction.
Units fit four temperature probes to measure: Supply air temperature, Return Air temperature, Fresh air and Exhaust Air Temperature.

Compact T Pro Control	
Control platform	Programmable controller
Remote controller	Room controller: ALC00822A
	Commissioning tool: ALC00895A
Co2 control	Yes, ALP00COA (mandatory accessory)
RH% control	Yes, ALP00HUA (mandatory accessory)
BMS Connectivity	BACnet/IP: ALC00908A (accessory)
	Modbus – RS485: ALC00902A (accessory)
Ethernet connection	WEB – Human Machine Interface (web server)
Cloud connection	Daikin on Site

4.9.2. Smart Control

Compact T Smart can be directly integrated into DIII-net ecosystem and controlled through any Daikin local, centralised controllers (iTAB, iTM, iTC) or Cloud controllers (Daikin Cloud Service).
This communication, based on the common F1-F2 and P1-P2 protocol, guarantees also fully compatibility with SkyAir and VRV systems.
The remote controller BRC1[E/H] is not provided with the main module and has to be provided separately.
Compact T Smart comes standard with 2 sensors fitted on the fresh and return air side.
The temperature control done by the unit is to compare outside temperature with inside temperature, to decide whether to operate in “heat exchange” or in “bypass mode” in case the user selects “auto mode” (please refer to the table below).

Mode	Description
Auto mode	Using information from the air conditioner (cooling, heating, fan and set temperature) and heat reclaim ventilation unit (indoor and outdoor temperatures), this mode automatically changes between Energy Reclaim Ventilation and Bypass mode
Energy Reclaim Ventilation mode	The outdoor air is supplied to the room after passing through a heat exchanger element, where heat is exchanged with the return air
Bypass mode	The outdoor air bypasses the heat exchanger element. This means that outdoor air is supplied to the room without exchanging heat with the return air

The unit is connectable to a Cloud monitoring system (optional).
BACnet or Modbus integration is possible through interfaces (optional).
The unit is able to control the indoor air quality by controlling and monitoring the CO_2 level (CO_2 sensor is optional).

Compact T Smart Control	
Control platform	Daikin Control PCB
Remote controller	Room controller: Optional BRC 1 [E/H]
Co2 control	Optional, BRYMA2000 sensor
BACnet or Modbus integration	Through interfaces (optional)
Cloud connection	Daikin Cloud Service

4.10. Default Values

4.10.1. Pro Version

All the unit are pre factory set at nominal value summarize in the table below. All the values can be changed using the Commissioning Module (ALC00895A).

Compact T	Material Name	ATB03*BM	ATB04*BM	ATB05*BM	ATB06*BM	ATB07*BM
Costant air volume (CAV) [1]	Auto (m^3/h)	800	1650	2300	2700	3900
	Eco (m^3/h)	400	825	1150	1300	1950
Variable air volume (VAV) [2]	Auto (Pa)	100	100	100	100	100
	Eco (Pa)	50	50	50	50	50
Supply air Temperature	Winter	22 °C				
	Summer	22 °C				
CO_2 Control [3]	Trigger value (PPM)	1000	1000	1000	1000	1000
	Max forcing %	25% of the maximum fan speed				
Schedule [1]	Time	08:00 – 18:00				
	Day	Monday – Friday				
Filter Replacement [4]	M5 (Pa)	250				
	F7 (Pa)	250				

1. Pre-set values (Default)
2. Values fixed but not enabled (VAV kit required: ATE00DPUA)
3. Values fixed but not enabled (ALP00COA CO2 probe accessory mandatory)
4. Trigger value for filters' replacement. In case of non – standard filters, the installer needs to change manually the differential pressure value in accordance with the filter class. The recommended values are mentioned in the filter accessory section.

4.10.2 Smart version

Factory set values for nominal operating airflow and corresponding setting for the BRC1[E/H].
Please refer to the IOM, in order to determine new operating points and new unit setting for various speeds.

Size 03			
Supply		Exhaust	
Volume Flow rate	ESP	Volume Flow rate	ESP
800	100	800	100
RPM		RPM	
2310		2276	
Fan speed (High – Ultra High)			
17(27)-4-01			
Fan Curve Supply		Fan Curve Return	
19(29)-2-09		19(29)-3-05	

Size 04			
Supply		Exhaust	
Volume Flow rate	ESP	Volume Flow rate	ESP
1650	100	1650	100
RPM		RPM	
2835		2873	
Fan speed (High – Ultra High)			
17(27)-4-02			
Fan Curve Supply		Fan Curve Return	
19(29)-2-05		19(29)-3-10	

Size 05			
Supply		Exhaust	
Volume Flow rate	ESP	Volume Flow rate	ESP
2300	100	2300	100
RPM		RPM	
2743		2692	
Fan speed (High – Ultra High)			
17(27)-4-02			
Fan Curve Supply		Fan Curve Return	
19(29)-2-11		19(29)-3-08	

Size 06			
Supply		Exhaust	
Volume Flow rate	ESP	Volume Flow rate	ESP
2700	100	2700	100
RPM		RPM	
2284		2284	
Fan speed (High – Ultra High)			
17(27)-4-02			
Fan Curve Supply		Fan Curve Return	
19(29)-2-05		19(29)-3-10	

Size 07			
Supply		Exhaust	
Volume Flow rate	ESP	Volume Flow rate	ESP
3900	100	3900	100
RPM		RPM	
2143		2155	
Fan speed (High – Ultra High)			
17(27)-4-02			
Fan Curve Supply		Fan Curve Return	
19(29)-2-10		19(29)-3-08	

4.11. Antifreeze Logic

4.11.1. Pro Version

This function is used to avoid plate heat exchanger freezing as it activates a sequence of actions to counteract the risk of frost formation. The antifreeze logic is activated whenever exhaust temperatures fall below pre-set configurable value (T_{FREEZE}) and pressure drop across the heat exchanger, monitored thanks to a pressure transducer, exceeds a pre-set threshold (warning threshold) while it's being disabled when the T_{EXH} has returned higher than T_{FREEZE} or pressure drop on PHE comes back below the calculated threshold.

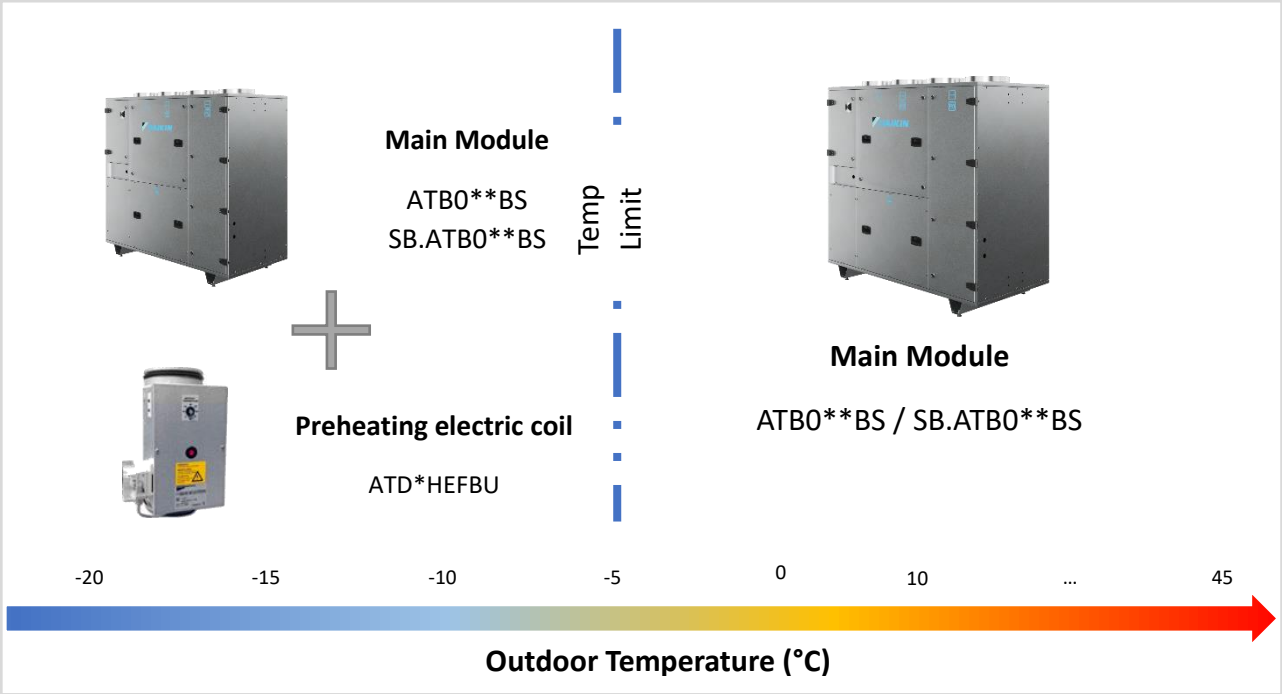
- $T_{EXH} < T_{FREEZE}$ & pressure drop on PHE > warning threshold → **Enable Antifreeze logic**
- $T_{EXH} > T_{FREEZE}$ or pressure drop on PHE < warning threshold → **Disable Antifreeze logic**

Once the logic is active, the actions performed are the following:

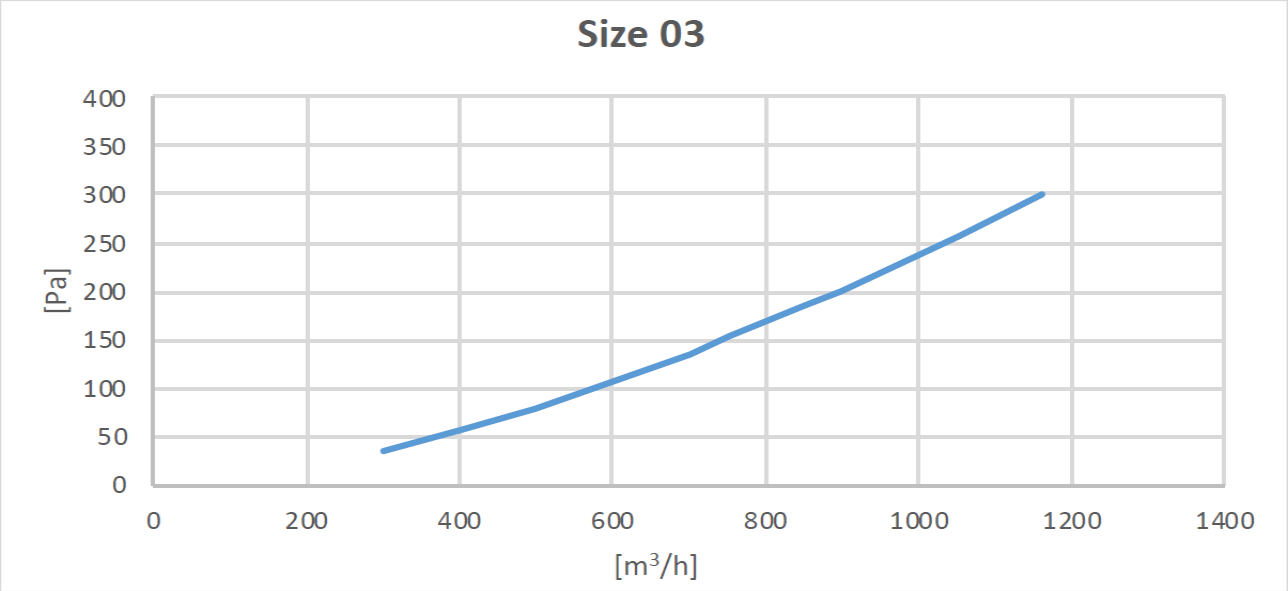
Antifreeze enabled	1) Bypass damper is gradually open up to 100% and heating coils (pre, main, post) or electric heaters (pre, post) are activated, if present
	2) Supply airflow is gradually reduced
	3) Unit goes in alarm and stops if the pressure drop on the PHE increase a pre-configured value (fault threshold)
	4) A manual reset is required to turn on the AHU

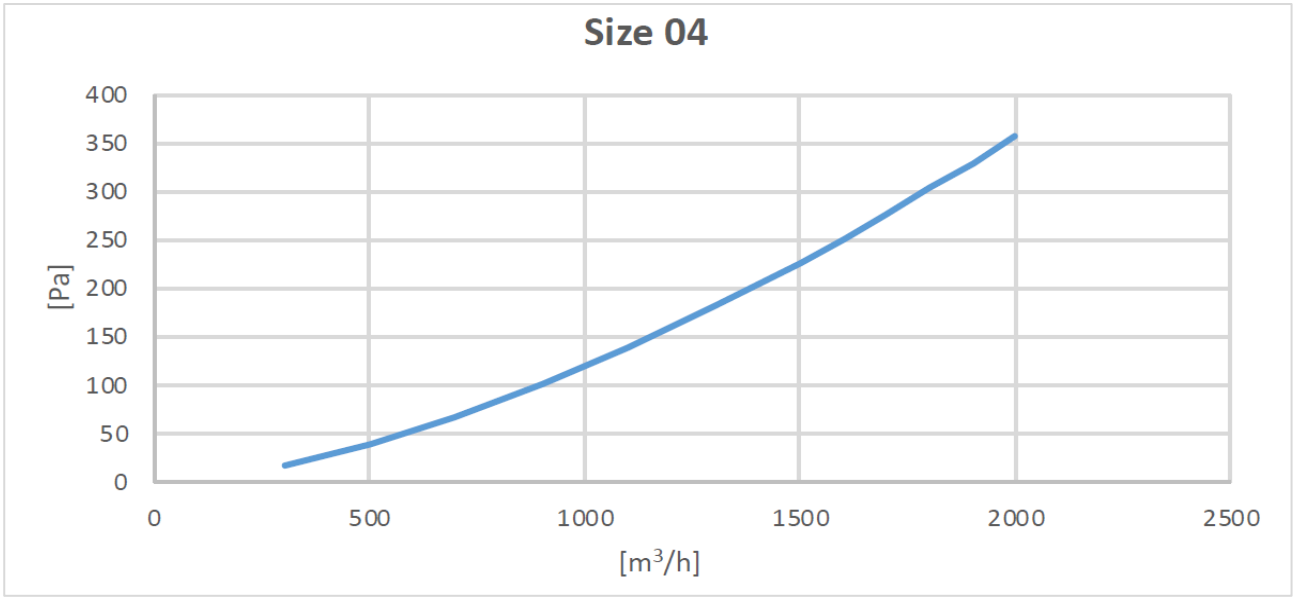
4.11.2. Smart Version

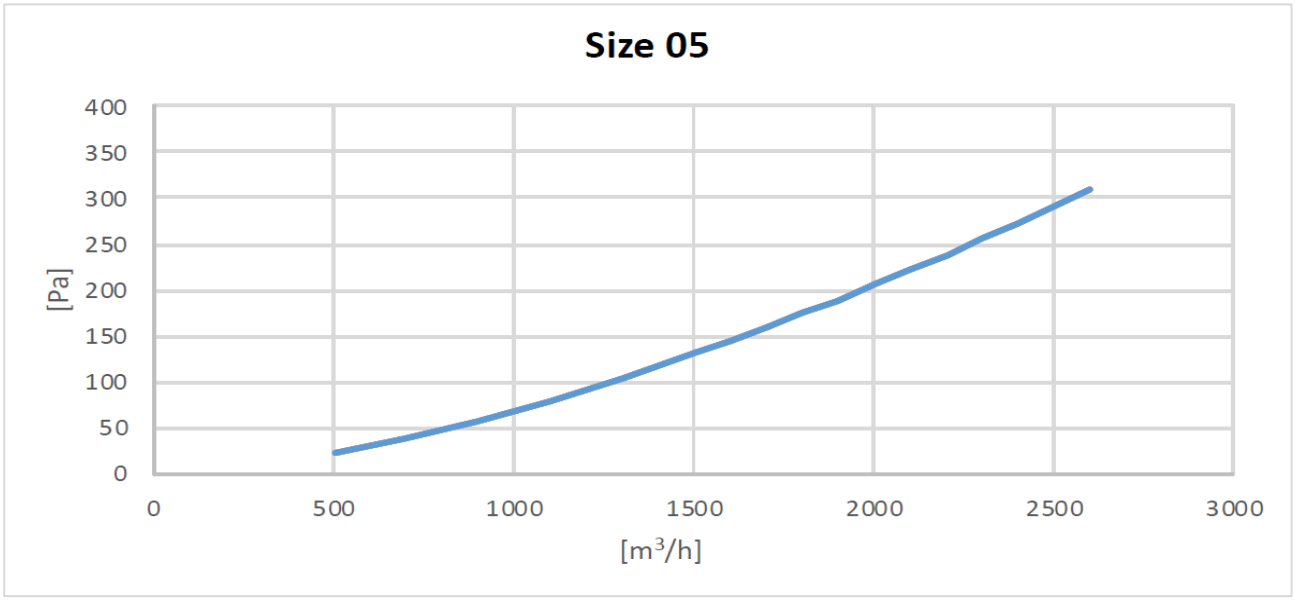
In accordance with the image here shown below, adding a pre-electrical heater (ATD**HEFBU) is mandatory for outdoor temperature lower than -5°C for either tackling or preventing frost issue.

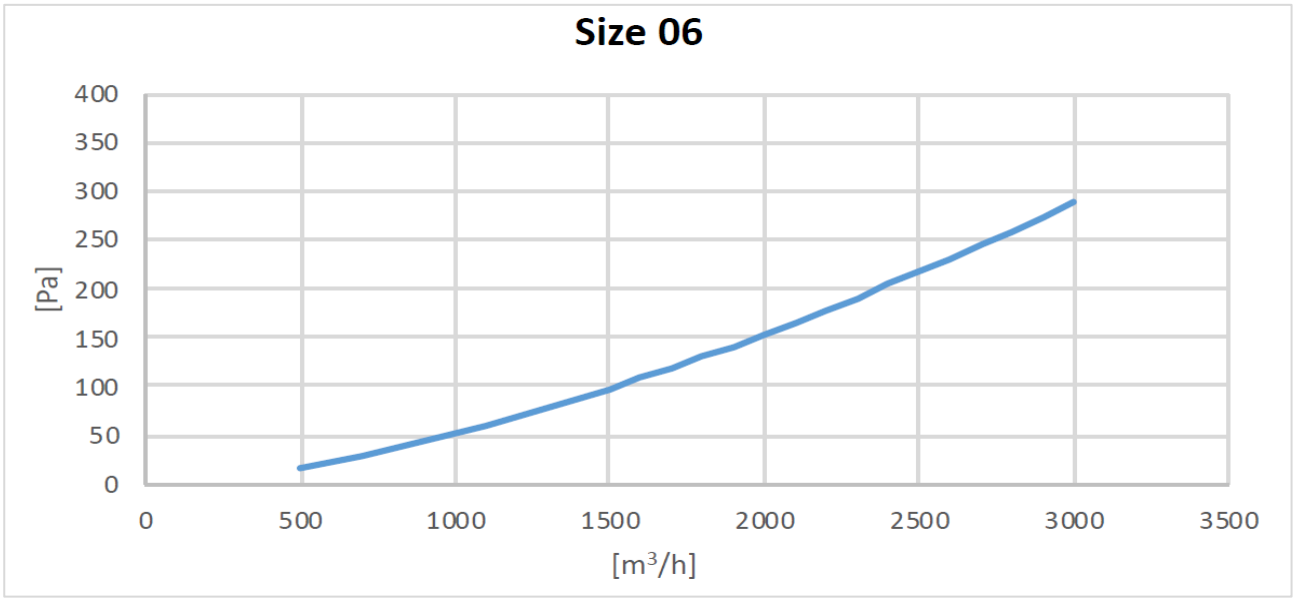


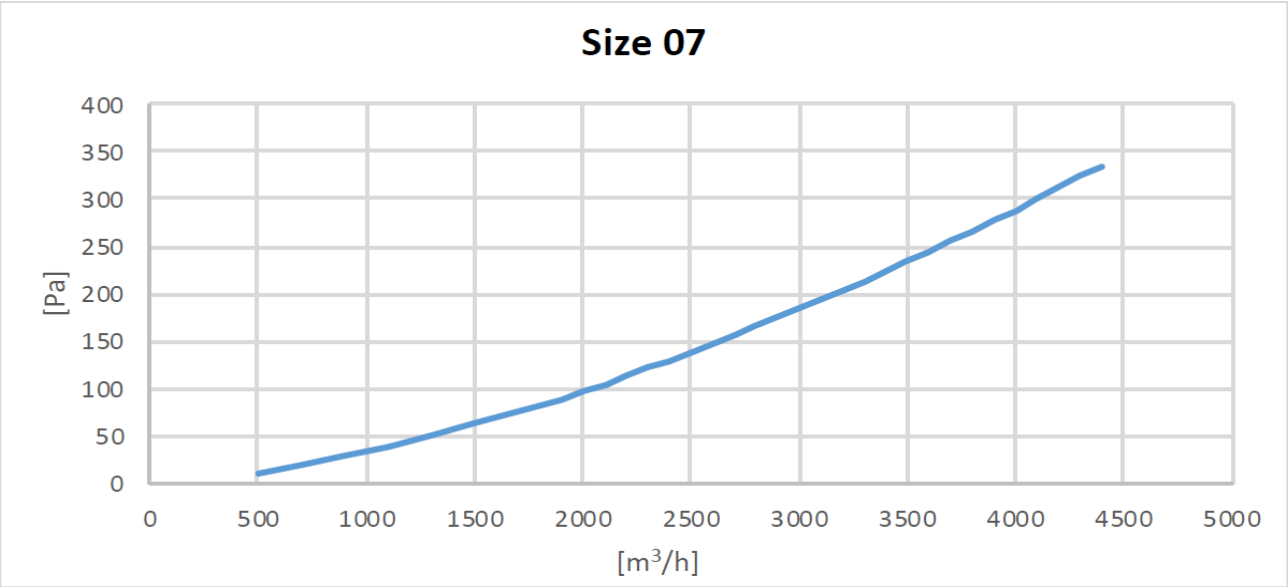
The unit has been equipped with a differential pressure switch to prevent a possible risk of icing at heat exchanger level. Depending on the working condition, the installer must adjust the setting according the charts below.




Size 04
400
350
300
250
200
150
100
50
0
[Pa]
0
500
1000
1500
2000
2500
[m³/h]


Size 05
400
350
300
250
200
150
100
50
0
[Pa]
0
500
1000
1500
2000
2500
3000
[m³/h]


Size 06
400
350
300
250
200
150
100
50
0
[Pa]
0
500
1000
1500
2000
2500
3000
3500
[m³/h]



Please refer to the Installation and Operation Manual (IOM) for further information.

4.12. Operating Limits

Compact T heat recovery units are designed for use in indoor environments, installed on the floor. The unit cannot operate in environments containing explosive material and with a high concentration of dust. Thanks to its compactness, each machine is able to adapt to different needs in terms of air flow and thermodynamic treatment. The optimised choice of every detail, the search for maximum efficiency in each component, the adoption of specific materials and constructive solutions transform environment friendliness and energy savings into valid and advanced technological solutions.

4.12.1. Pro Version

	Size	Lower limit temperature (°C)	Upper limit temperature (°C)
Outside air temperature	All	-38°C	46°C
Operating environment temperature	All	-5°C	46°C
Temperature of environment with the machine off (e.g., storage, transport, etc.)	All	-40°C	60°C

In case the inlet outdoor air temperature is below -15°C an electric preheater or water preheating coil is advised, whenver possible.
Please note the Compact T Pro controller automatically activates the antifreeze logic as explained in the dedicated paragraph 4.11 “Antifreeze logic”. The antifreeze function can be also enabled/disabled in the

software through the commissioning module (material name ALC00895A). The unit cannot operate in permanent way in the antifreeze mode.
In the report, downloaded from Astra web selection software, the heat recovery system performance calculation doesn't consider the frost formation.

4.12.2. Smart Version

	Size	Lower limit temperature (°C)	Upper limit temperature (°C)
Inlet air temperature	All	-5	46
Operating environment temperature	All	5	46
Temperature of environment with the machine off (e.g., storage, transport, etc.)	All	-40	60

Inlet air temperature has to be higher than -5°C. In case the outdoor air temperature is below -5°C electric preheater (ATD0*HEFBU) is required.

5. Accessories

5.1. Accessories list

		Size				
Accessories	Version	03	04	05	06	07
Compact Filter						
ISO Coarse 55% (G4)	Smart & Pro	ATF03G4A	ATF04G4A	ATF05G4A	ATF06G4A	ATF07G4A
ePM_{10} 75% (M5)	Smart & Pro	ATF03M5A	ATF04M5A	ATF05M5A	ATF06M5A	ATF07M5A
ePM_1 50% (F7)	Smart & Pro	ATF03F7A	ATF04F7A	ATF05F7A	ATF06F7A	ATF07F7A
ePM_1 80% (F9)	Smart & Pro	ATF03F9A	ATF04F9A	ATF05F9A	ATF06F9A	ATF07F9A
Coil Module						
DX Right – High power	Pro	ATD03UDSAR	ATD04UDSAR	ATD05UDSAR	ATD06UDSAR	ATD07UDSAR
DX Left – High power	Pro	ATD03UDSAL	ATD04UDSAL	ATD05UDSAL	ATD06UDSAL	ATD07UDSAL
DX Right – Low power	Pro		ATD04UDSBR	ATD05UDSBR	ATD06UDSBR	ATD07UDSBR
DX Left – Low power	Pro		ATD04UDSBL	ATD05UDSBL	ATD06UDSBL	ATD07UDSBL
Water Right	Pro	ATD03UWSAR	ATD04UWSAR	ATD05UWSAR	ATD06UWSAR	ATD07UWSAR
Water Left	Pro	ATD03UWSAL	ATD04UWSAL	ATD05UWSAL	ATD06UWSAL	ATD07UWSAL
Electric Preheating	Pro	ATD03HEFAU	ATD04HEFAU	ATD05HEFAU	ATD06HEFAU	ATD07HEFAU
Electric Preheating	Smart	ATD03HEFBU	ATD04HEFBU	ATD05HEFBU	ATD06HEFBU	ATD07HEFBU
Water Preheating	Pro	ATD03HWFAU	ATD04HWFAU	ATD05HWFAU	ATD06HWFAU	ATD07HWFAU
Water post heating R	Pro	ATD03HWSAR	ATD04HWSAR	ATD05HWSAR	ATD06HWSAR	ATD07HWSAR
Water post heating L	Pro	ATD03HWSAL	ATD04HWSAL	ATD05HWSAL	ATD06HWSAL	ATD07HWSAL
Electric post heating	Pro	ATD03HESAU	ATD04HESAU	ATD05HESAU	ATD06HESAU	ATD07HESAU
Valves						
2-way water cooling/heating	Pro	ATV03CW2A	ATV04CW2A	ATV05CW2A	ATV06CW2A	ATV07CW2A
3-way water cooling/heating	Pro	ATV03CW3A	ATV04CW3A	ATV05CW3A	ATV06CW3A	ATV07CW3A

Mechanical Accessories						
Silencers	Smart & Pro	ATS0360A	ATS0460A	ATS0560A	ATS0660A	ATS0760A
Mixing Damper	Pro			ATA05MDA	ATA06MDA	ATA07MDA
External Damper	Pro	ATA03EDA	ATA04EDA	ATA05EDA	ATA06EDA	ATA07EDA
Control						
Module Bacnet Interface	Pro	ALC00908A				
Module Modbus Interface	Pro	ALC00902A				
Room Thermostat	Pro	ALC00822A				
Commissioning Module	Pro	ALC00895A				
Electrical accessories						
Frost Switch	Pro	ATE00FSUA				
Modulating actuator for valves	Pro	ATE00AMVA				
Modulating actuator for mixing damper	Pro	ATE00AMDA				
Modulating actuator for external damper	Pro	ATE00AMDA				
Spring return actuator for external damper	Pro	AUE00ASDA				
Digital PCB for external accessories	Pro	ATE00DPUA				
IEQ Sensor	Pro	AIRSENSEPROPLUS				
Wifi Access Point	Pro	AUE00APCA				
Probes						
Temperature	Pro	ALP00TEA				
Humidity (%RH)	Pro	ALP00HUA				
CO_2	Pro	ALP00COA				

5.2. Accessories for Pro & Smart version

5.2.1. Filters

The unit is provided as standard with ePM1 50% (F7) filter on supply side and ePM10 75% (M5) filter on return. On supply side up to three filtration stages as available. It is not possible to install the third filtration stage and the water post heating coil at the same time. Other filters available are ePM1 80% (F9) filter and ISO Coarse 55% (G4).The table below summarizes the material names and the pressure drop for each filter, when it is clean, at nominal air flow for all the sizes.

Material Name	Main Unit Size	Description	ΔP Clean (Pa)	ΔP Mean (Pa)
ATF03G4A	03	ISO Coarse 55% (G4)	61	86
ATF04G4A	04		82	107
ATF05G4A	05		80	105
ATF06G4A	06		78	103
ATF07G4A	07		85	110
ATF03M5A	03	ePM10 75% (M5)	81	131
ATF04M5A	04		108	158
ATF05M5A	05		105	155
ATF06M5A	06		103	153
ATF07M5A	07		111	161
ATF03F7A	03	ePM1 50% (F7)	94	144
ATF04F7A	04		125	175
ATF05F7A	05		122	172
ATF06F7A	06		119	169
ATF07F7A	07		129	179
ATF03F9A	03	ePM1 80% (F9)	148	198
ATF04F9A	04		198	248
ATF05F9A	05		193	243
ATF06F9A	06		188	238
ATF07F9A	07		204	254

The pressure drop is referring to nominal airflow.

5.2.2. Silencers

Silencers for all four duct connections are available for each size as accessories. They are 600 mm long and circular; this way no duct transitions are needed. Pressure drop is negligible.

In the next table, attenuation data for each frequency are shown:

Material Name	Size	Diameter (mm)	Frequency [Hz]								
			63	125	250	500	1000	2000	4000	8000	Avg dB(A)
ATS0360A	03	250	-	2	8	14	25	12	6	7	25
ATS0460A	04	315	-	2	6	12	14	9	5	5	17
ATS0560A	05	355	-	2	6	7	12	6	3	4	14
ATS0660A	06	400	-	2	4	5	10	4	3	2	12
ATS0760A	07	500	-	1	1	4	2	1	1	1	8

For size 03 it is not possible to install:

- the silencers for exhaust and fresh air on parallel way

For size 04 it is not possible to install:

- the silencers for exhaust and fresh air on parallel way
- the silencers for return and fresh air on parallel way
- the silencer for exhaust and pre heating water/electric coil on parallel way

Please refer to the dedicated IOM for more details.

5.3. Accessories only for Pro version

5.3.1. Useful information

- Both pre (ATD**HEFAU) and post (ATD**HESAU) electric heaters have to be equipped with an additional temperature probe (ALP00TEA) fitted in the duct and wired to the dedicated terminals.
- Each size can be equipped with two different electric heaters: ATD0*HESAU (low capacity) or ATD0*HEFAU (high capacity). Both of them can be installed as pre and post heating coil. Only difference between the two coil is the maximum reachable power. Astra Web selection software, based on specific project's conditions, will automatically select the most suitable coil.
- Pre heating water coil (ATD**HWFAU) has to be equipped with an additional temperature probe (ALP00TEA) fitted in the duct and wired to the dedicated terminals.
- Post heating (ATD**HWSA*) and main water coil (ATD**UWSA*) do not require additional temperature probes.

- In addition for all the water coils, either a 2- or 3-ways regulating valves (ATV**CW2A, ATV**CW3A) can be ordered along with modulating actuators for water valve (mandatory option ATE00AMVA), supplied loose for site fitting.
- On Astra Web selection software for Compact T Pro version, the temperature probe is automatically added (if needed) when a coil is selected.
- On Astra Web selection software for Compact T Pro version, the modulating actuators is automatically added when a water valve is selected.
- The accessory compatibility might be limited on the basis of the control features and/or for the position of the accessories. Kindly refer to your sales representative in case of doubts. Main incompatibilities are summarised below:
    - DX coil and main water Coil
    - Electric pre heating and water pre heating
    - Electric post heating and water post heating
    - Third filtration stage and water post heating
- For Modbus (ALC00902A) and BACnet (ALC00908A) modules selection there is no exclusion
- Room thermostat (ALC00822A) is supplied with the main unit (ATB0**A) as a standard item
- Commissioning module (ALC00895A) is required for purpose of either airflow volumes or static pressure value changes from the ones set at factory.
- The unit gets delivered with its nominal air flow rate set up at factory. To adjust its operation to the project-specific parameters, kindly select the optional commissioning module ALC00895A or refer to Daikin Service Dept. Alternatively, you can also commission the units using the web server HMI access (default feature)
- When a mixing damper is selected, Astra will automatically add the modulating actuator (ATE00AMDA). Mixing damper is available from size 05.

5.3.2. Coils

Compact T pro version can be equipped with different types of coils, all provided as accessory, to guarantee the thermal comfort.
An electric heater or water heating coil are available as accessories as preheating coil.
To manage the thermal load in both winter and summer seasons, a DX or water-based coils are available as main coil option. Both has to be installed inside the unit along with their drip tray. Please refer to the installation manual for further information on the installation.
DX and water coils are provided in left and right version based on unit version chosen. It is not possible to install a right (left) coil version if a left (right) unit has been selected and vice-versa.
A water coil, installed inside the unit, and an electric heater, installed in the ductwork, are available as post heating options. Like DX and water main coils, also the post heating water coil is available with right and left versions.
Compact T can be equipped with up to three coils (pre, main and post) and all of them work on modulating way at the same time.
Astra Web selection software automatically adds a temperature probe (ALP00TEA) whenever needed.

For each size, users can select two different electric heating coils. Both can be mounted on fresh and supply side depending on specific project requirements.
The additional Digital PCB for external accessories (option: ATE00DPUA), is mandatory when a coil, mounted externally of the main unit, is selected. The coils mounted externally of the main unit are:

- Pre and post electric coil
- Pre heating water coil

5.3.2.1. DX coil

A cooling and heating DX coil is available as accessory to guarantee the thermal treatment.
DX coil can work with R410 and R32 refrigerant. On Astra web selection software, user can select the type of refrigerant.
The Daikin Electronic Valve Kit (EKEXV*) model which has to be site installed, is specified in the tehcnical report. It has to be ordered separately along with the control box.
For each size, except for the 03, two DX coils are available to guarantee a better compability with Daikin expansion valve.
The DX coil must be installed inside the unit along with its drip collection tray. Please follow the dedicated IOM for further information on the installation procedure.
DX coil is provided in left and right version based on unit version chosen. It is not possible to install a right (left) coil version if a left (right) unit has been selected.
External damper are available as option and they can be required in case R32 refrigerant is used to be compliant with the IEC60335-2-40 ed. 7 standard.
In the following tables, main technical info of the DX coil for Compact T are summarized.

Size 03

Material Name	ATD03UDSAL	ATD03UDSAR
Configuration	Left	Right
Type of coil	P22	
Rows	4	
Finning space (mm)	2.0	
Fluid Volume (dm^3)	1.55	
Compatible EXV class [1]	50 63 80 100	
Min power (kW) [2]	5.0	
Max power (kW) [2]	13.1	
Lenght (mm)	445	
Depth (mm)	114	
Height (mm)	400	
Weight (kg)	7.2	
Manifolds (mm)	1 x 16	
Distributors (mm)	1 x 12	

Size 04

Material Name	ATD04UDSAL	ATD04UDSAR	ATD04UDSBL	ATD04UDSBR
Configuration	Left	Right	Left	Right
Type of coil	P22			
Rows	4		2	
Finning space (mm)	2.0		2.5	
Fluid Volume (dm^3)	2.39		1.28	
Compatible EXV class [1]	80 100 125		50 63	
Min power (kW) [2]	7.9		5.0	
Max power (kW) [2]	15.4		7.8	
Lenght (mm)	685			
Depth (mm)	114			
Height (mm)	400			
Weight (kg)	10.2		7.4	
Manifolds (mm)	1 x 16		1 x 16	
Distributors (mm)	1 x 16		1 x 16	

Size 05

Material Name	ATD05UDSAL	ATD05UDSAR	ATD05UDSBL	ATD05UDSBR
Configuration	Left	Right	Left	Right
Type of coil	P22			
Rows	4		2	
Finning space (mm)	2.0		2.5	
Fluid Volume (dm^3)	4.11		2.30	
Compatible EXV class [1]	125 140 200 250		80 100 125	
Min power (kW) [2]	13.2		7.9	
Max power (kW) [2]	30.8		15.4	
Lenght (mm)	685			
Depth (mm)	114			
Height (mm)	640			
Weight (kg)	15.5		10.4	
Manifolds (mm)	1 x 28		1 x 28	
Distributors (mm)	1 x 16		1 x 16	

Size 06

Material Name	ATD06UDSAL	ATD06UDSAR	ATD06UDSBL	ATD06UDSBR
Configuration	Left	Right	Left	Right
Type of coil	P22			
Rows	4		2	
Finning space (mm)	2.0		2.5	
Fluid Volume (dm^3)	4.53		2.55	
Compatible EXV class [1]	140 200 250 300		80 100 125 140	
Min power (kW) [2]	15.5		7.9	
Max power (kW) [2]	36.9		21.0	
Lenght (mm)	685			
Depth (mm)	131			
Height (mm)	729			
Weight (kg)	18.0		12.8	
Manifolds (mm)	1 x 28		1 x 28	
Distributors (mm)	1 x 16		1 x 16	

Size 07

Material Name	ATD07UDSAL	ATD07UDSAR	ATD07UDSBL	ATD07UDSBR
Configuration	Left	Right	Left	Right
Type of coil	P22			
Rows	4		2	
Finning space (mm)	2.0		2.5	
Fluid Volume (dm^3)	6.22		3.39	
Compatible EXV class [1]	200 250 300 350 400		125 140 200	
Min power (kW) [2]	21.1		13.2	
Max power (kW) [2]	49.5		24.6	
Lenght (mm)	785			
Depth (mm)	131			
Height (mm)	850			
Weight (kg)	23.0		15.9	
Manifolds (mm)	1 x 28		1 x 28	
Distributors (mm)	1 x 16		1 x 16	

1. Electronic expansion valve (EXV) not supplied
2. Saturated evaporating temperature: 6°C. Air temperature: 27°C DB / 19°C WB

5.3.2.2. Water Coil

A cooling and heating water coil is available as accessory to guarantee the thermal treatment.
In addition, either a 2- or 3-way valves (ATV**CW2A, ATV**CW3A) has to be ordered along with modulating actuators (ATE00AMVA). Astra Web selection software will automatically add the actuator wenever the valve option is selected.
The water coil has to be installed inside the unit along with its drip collection tray.
Please follow the dedicated IOM for further information on the installation procedure.
Water coil is provided in left and right version based on unit version chosen. It is not possible to install a right (left) coil version if a left (right) unit has been selected.
In the following table, main technical info of the water coil for Compact T are summarized.

Material Name	ATD03UWSAL ATD03UWSAR	ATD04UWSAL ATD04UWSAR	ATD05UWSAL ATD05UWSAR	ATD06UWSAL ATD06UWSAR	ATD07UWSAL ATD07UWSAR
Size	03	04	05	06	07
Description	Water Coil Left (ATD0*UWSAL) and Right (ATD0*UWSAR) version				
Type of coil	P3012				
Rows	4				
Finning space (mm)	2,2				
Fluid Volume (dm^3)	2,7	3,9	6,8	8,3	11,0
Connection	¾’	¾’	1’	1 ¼’	1 ¼’
Lenght (mm)	445	685	685	685	785
Depth (mm)	115	115	115	131	131
Height (mm)	401	401	641	731	831
Weight [1] (kg)	11	15	21	23	30

1. Empty weight

5.3.2.3. Water pre-heating coil

A heating coil is available as accessory as pre heating. The coil is mounted outside the main module and it must be ducted. Following table summarizes main technical data for pre heating water coil.

Material Name	ATD03HWFAU	ATD04HWFAU	ATD05HWFAU	ATD06HWFAU	ATD07HWFAU
Size	03	04	05	06	07
Description	Pre heating Water Coil (ATD0*HWFAU)				
Type of coil	P3012				
Rows	2				
Finning space (mm)	2,0				
Fluid Volume (dm^3)	1,5	2,1	2,3	3,1	4,7
Connection	½"	½"	½"	½"	¾"
Lenght (mm)	455	530	555	605	705
Depth (mm)	280	355	380	430	530
Height (mm)	280	280	280	280	280
Weight [1] (kg)	25	32	35	40	53

1. Empty weight

In the Astra Web selection software for Compact T Pro version, the additional temperature probe (ALP00TEA) and optional PCB for accessories (ATE00DPUA) are automatically added when pre heating water coil is selected.

5.3.2.4. Water post-heating coil

A heating water coil is available as accessory and it has to be mounted on site inside the main module. It can be used as heating (in case main coil is not installed) and post heating.
Please follow the dedicated IOM for further information on the installation procedure.
Following table summarizes main technical data for heating water coil.

Material Name	ATD03HWSAL ATD03HWSAR	ATD04HWSAL ATD04HWSAR	ATD05HWSAL ATD05HWSAR	ATD06HWSAL ATD06HWSAR	ATD07HWSAL ATD07HWSAR
Size	03	04	05	06	07
Description	Post heating Water Coil Left (ATD0*HWSAL) and Right (ATD0*HWSAR) version				
Type of coil	P3012				
Rows	2				
Finning space (mm)	2,0				
Fluid Volume (dm^3)	1,3	1,8	3,0	3,5	5,4
Connection	¾'	¾'	1'	1 ¼'	1 ¼'
Lenght (mm)	445	685	685	685	785
Depth (mm)	80	80	80	80	80
Height (mm)	347	347	497	597	697
Weight [1] (kg)	7	9	12	13	20

1. Empty weight

5.3.2.5. Electrical pre and post heating coil

For each size, two electrical heaters are available for selection, with the following material name and features:

Size	Material Name	Max Power Output (kW)	Electric Data	Diameter / Depth (mm)	Length (mm)	Height (mm)	Weight (kg)
03	ATD03HEFAU	12	400/3/50	250/278	321	518	8,6
	ATD03HESAU	4,5	400/3/50		321	389	5,8
04	ATD04HEFAU	15	400/3/50	315/344	387	651	15,4
	ATD04HESAU	6	400/3/50		387	393	8,7
05	ATD05HEFAU	18	400/3/50	355/384	427	651	17,4
	ATD05HESAU	6	400/3/50		427	389	9,4
06	ATD06HEFAU	21	400/3/50	400/428	472	774	22,3
	ATD06HESAU	7,2	400/3/50		472	389	10,5
07	ATD07HEFAU	24	400/3/50	500/528	572	902	29,4
	ATD07HESAU	8,4	400/3/50		572	518	15,1

The difference between the two coils, is the power output that can be achieved. This means both can be mounted as pre heating and post heating, depending on the specific project requirement. The additional PCB for external accessories (ATE00DPUA) is required in order to enable communication between controller and external heaters. In the Astra Web selection software for Compact T Pro version, the additional temperature probe and optional PCB for accessories are automatically added when an electric heater is selected.

5.3.3. Valves

The regulating valves are needed when a water coil is selected. For each size, four types of valves are available, cooling or heating, two or three ways. Main info for the valves is summarized in the table below:

Material Name	Size	Cooling/Heating	2 or 3 ways	DN (mm)	PN (bar)	KVs (m^3/h)
ATV03CW2A	03	Cooling / Heating	2	15	40	2,5
ATV03CW3A	03	Cooling / Heating	3	15	40	2,5
ATV04CW2A	04	Cooling / Heating	2	15	40	4
ATV04CW3A	04	Cooling / Heating	3	15	40	4
ATV05CW2A	05	Cooling / Heating	2	20	40	6,3
ATV05CW3A	05	Cooling / Heating	3	20	40	6,3
ATV06CW2A	06	Cooling / Heating	2	20	40	8,6
ATV06CW3A	06	Cooling / Heating	3	20	40	10
ATV07CW2A	07	Cooling / Heating	2	25	40	10
ATV07CW3A	07	Cooling / Heating	3	25	40	10

5.3.4. Dampers

Two type of dampers are available as option for Compact T: mixing damper to allow recirculation and external dampers for AHU isolation.

5.3.4.1. Mixing Damper

A mixing damper is available as accessory to allow recirculation of the air, saving energy and consequently decrease running cost of the unit. It also enables total space air conditioning. In the table below, the material names of the mixing damper for each size are shown:

Size	03	04	05	06	07
Material Name			ATA05MDA	ATA06MDA	ATA07MDA

In order to achieve the 100% of recirculated air, if required, two external dampers (on outdoor and exhaust connections) must be installed. Astra web does not automatically add them, so these have to be manually selected whenever needed.
The mixing damper requires the modulating actuator (ATE00AMDA) which is automatically added by Astra during the selection when the mixing damper is selected by the user.
Mixing damper is available starting from size 05.

5.3.4.2. External Dampers

External dampers can be installed on all the four air flow connections at the same time.
It is advised to install the external dampers on outdoor and exhaust duct connection when a mixing damper is selected. For the external dampers it is possible select:

- modulating actuator (ATE00AMDA)
- Spring return modulating actuator (AUE00ASDA)

On Asta web selection software, dampers can only be selected in pairs, for exhaust and outdoor or for fresh and return air flow and the user can choose the type of actuator.

In the table below the material names for external dampers are summarized.

Size	03	04	05	06	07
Material Name	ATA03EDA	ATA04EDA	ATA05EDA	ATA06EDA	ATA07EDA

Please note the items in the table refers to one damper only (i.e., 1 ATA0*EDA → 1 external damper).

5.3.5. Electrical accessories

5.3.5.1. Frost Switch

The frost switch (ATE00FSUA) protects the water coils from freezing. and when air temperature is below 5°C, the unit stops to operate. The frost switch auto resets if conditions allow a safe functioning of the AHU again. It can be mounted only after pre heating water coil (in the fresh duct) or in supply duct, just after the main module.
In case both main water coil and post heating water coil are installed, it is not possible to protect the main water coil. Please refer to the dedicated IOM for more details.

5.3.5.2. Modulating actuator for valves

The modulating actuator (ATE00AMVA) is automatically added in Astra when a valve is selected.

Control Type	DC 2-10 V
Torque	5 Nm
Voltage AC/DC	AC/DC 24V
Degree of protection	IP54

5.3.5.4. Digital PCB for external accessories

For accessories mounted externally to the main unit, which require control, it is mandatory to add a further accessory (ATE00DPUA). The components which require this accessory are the following:

- Electric pre and post heating coils
- Water preheating coil

ATE00DPUA is also needed when additional filters are mounted and the individual pressure drop for each filtration stage is required (VDI6022 requirement). The commissioning module (POL895, ALC00895A) is required to show the actual pressure drop for each filter on site.
Pressure drop on the pre and standard filter can be monitored together without the PCB. In this case the total pressure drop on both filters only can be monitored. For more information, please refer to the dedicated IOM.
ATE00DPUA is also needed for VAV control (please see chapter 4.9).
Please note that the VAV control is available in master and slave configuration where the supply air flow (master) works in pressure control mode and return (slave) follows the set point of the supply air flow. It is possible to do the vice versa also (return master, supply slave).
Air flow reading is always possible during VAV control modality.
If there are two additional filtration stages which require individual pressure drop monitoring, VAV control is not available.
The following table summarize possible scenario according to the additional filtration stages:

Scenario	Additional filter monitoring	VAV control
A	No additional or 1 filter stages	Supply or return fan in master and slave configuration
B	2 additional filter stages	Not available

In either case, the PCB has to be selected by the customer in the selection software from the option list.

5.3.5.5. IEQ Sensor

IEQ Sensor (material name AIRSENSEPROPLUS) can be integrated with the Compact T (Pro version only) to offer an innovative and flexible solution. Connections between the AHU and the sensor occurs thanks to the access point (material name AUE00APCA).

On Astra web selection software, IEQ sensor can be selected among the options available for Compact T Pro. The access point is automatically added by Astra.

More details about the configuration and installtion are available on the User guide – CAELUM -IEQ and on the IEQ&AHU - Quick Setup Guide.

5.4. Accessories only for Smart version

5.4.1. Coils

5.4.1.1. Electrical pre-heating coil

Only coil available for Smart version is pre heating electric coil. In the following table, main info is summarized:

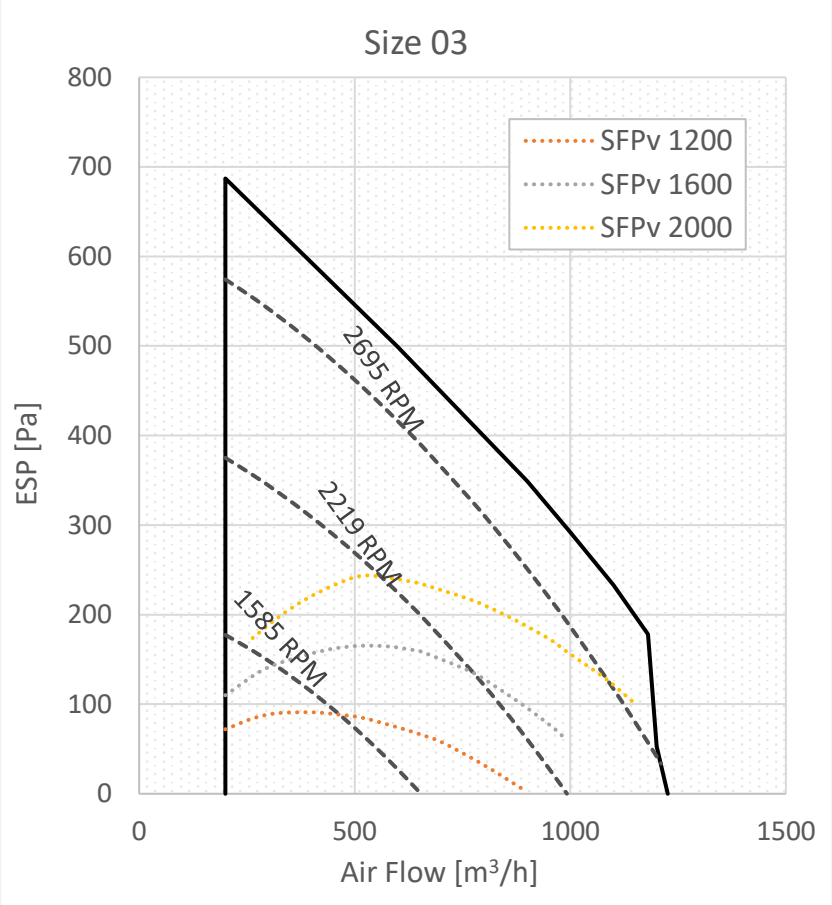
Size	Material Name	Max Power Output (Kw)	Electric Data	Diameter / Depth (mm)	Length (mm)	Height (mm)	Weight (kg)
03	ATD03HEFBU	12	400/3/50	250/278	321	518	8,4
04	ATD04HEFBU	15	400/3/50	315/344	387	651	15,2
05	ATD05HEFBU	18	400/3/50	355/384	427	651	17,2
06	ATD06HEFBU	21	400/3/50	400/428	472	774	22,0
07	ATD07HEFBU	24	400/3/50	500/528	572	902	29,2

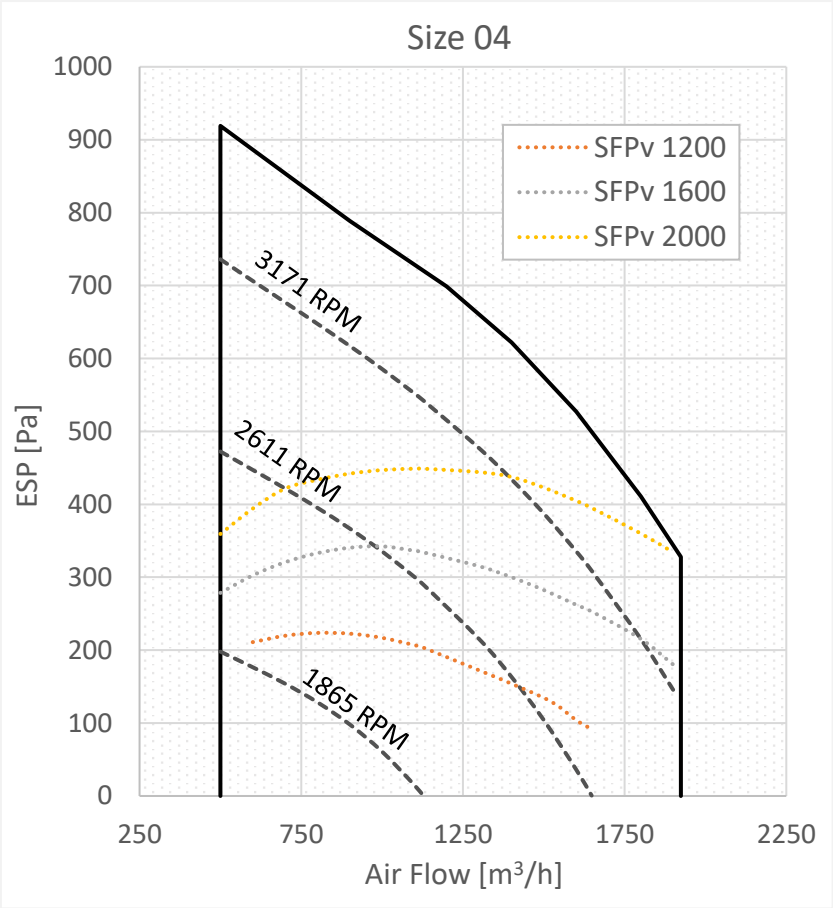
6. Performance

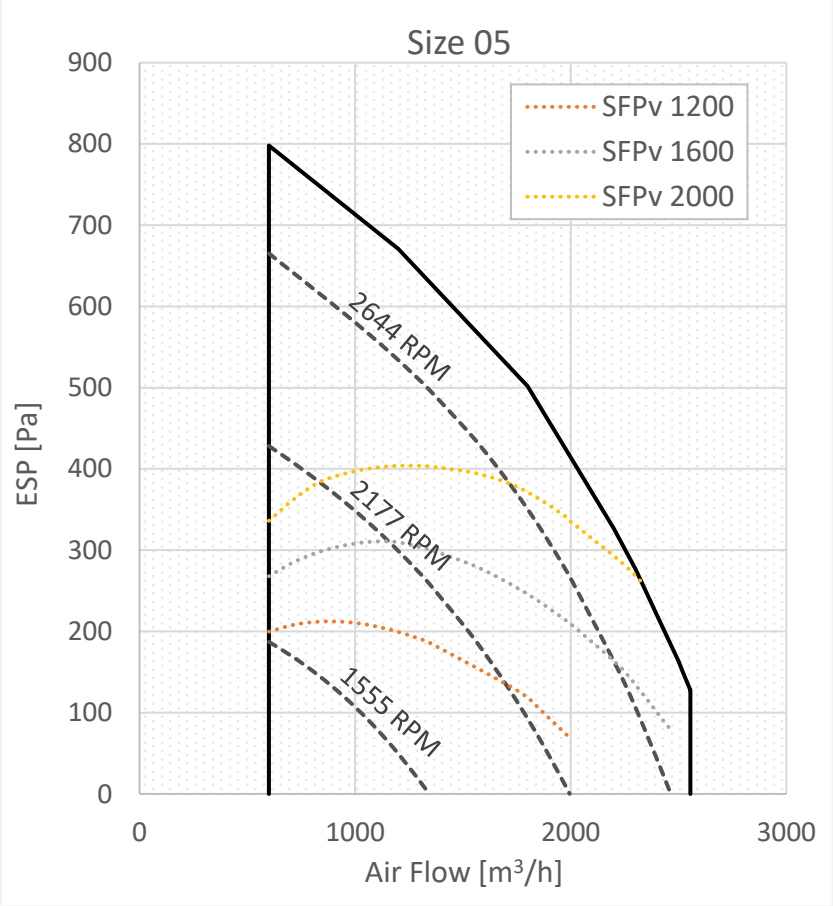
This section summarizes the main technical data for each size: envelope for each unit, thermal efficiency of the heat exchanger and sound emission at different operating points. More details about measurements done are collected in the next paragraphs.

6.1. Performance data

The diagrams show the available external pressure for the duct system given the airflow.
The SFPv (Specific Fan Power [W/m^3/s]) curves are referring to the complete unit. Moreover, it includes power to both supply and extract fans divided by either the supply or extract volume, whichever is the greatest.




Size 04
1000
900
800
700
600
500
400
300
200
100
0
ESP [Pa]
250
750
1250
1750
2250
Air Flow [m³/h]
SFPv 1200
SFPv 1600
SFPv 2000
3171 RPM
2611 RPM
1865 RPM


Size 05
900
800
700
600
500
400
300
200
100
0
ESP [Pa]
0
1000
2000
3000
Air Flow [m³/h]
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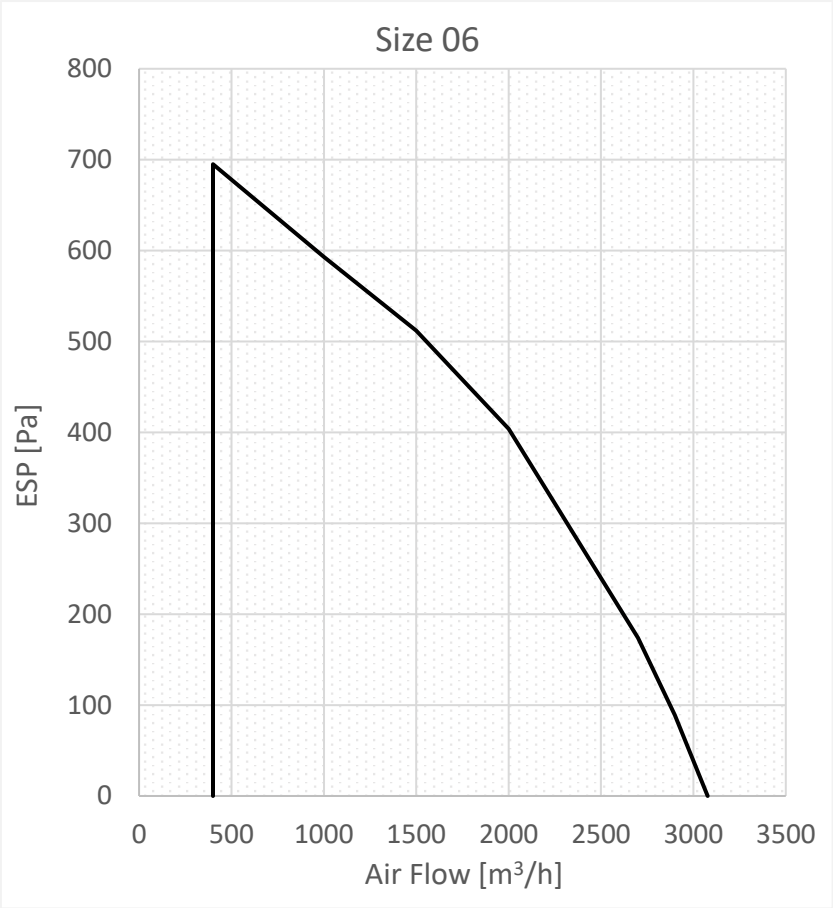
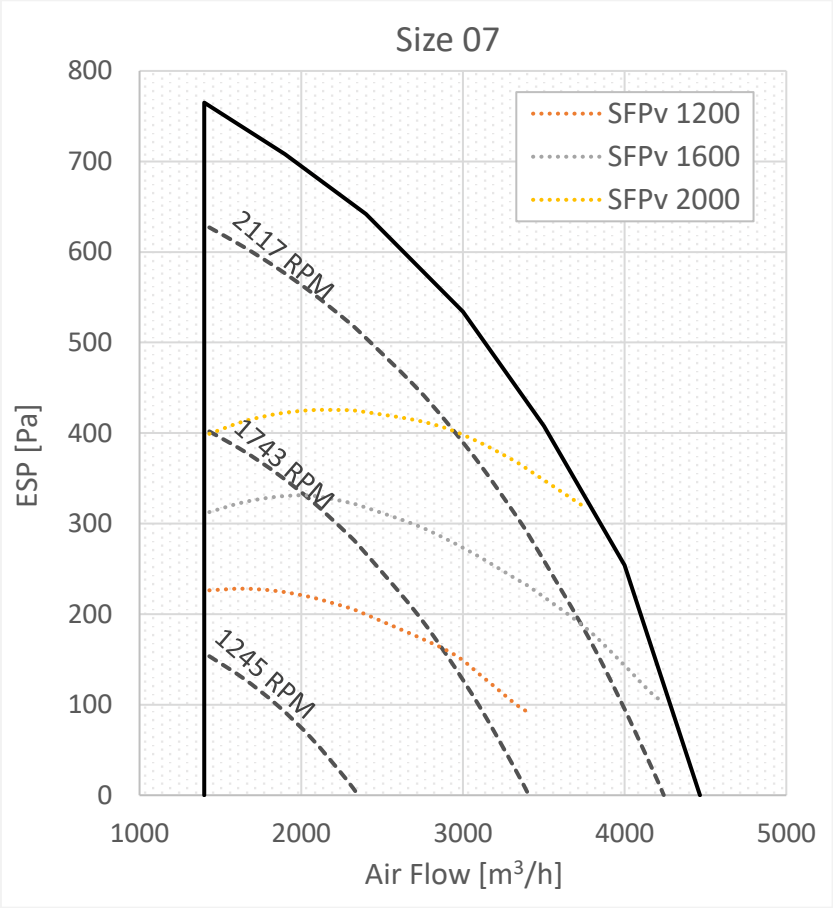
SFPv 1600
SFPv 2000
2644 RPM
2177 RPM
1555 RPM


Size 06
800
700
600
500
400
300
200
100
0
ESP [Pa]
0
500
1000
1500
2000
2500
3000
3500
Air Flow [m³/h]

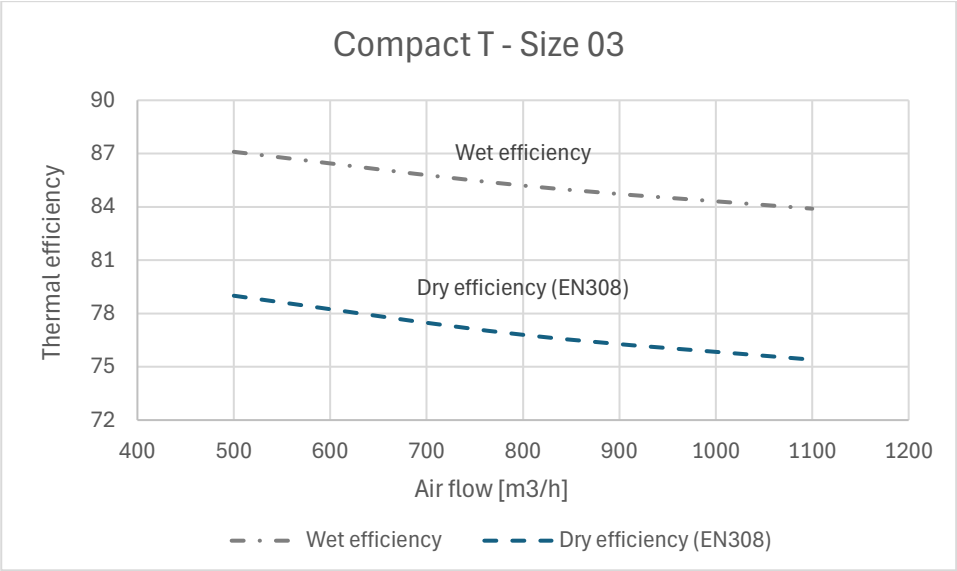

Size 07
800
700
600
500
400
300
200
100
0
ESP [Pa]
SFPv 1200
SFPv 1600
SFPv 2000
2117 RPM
1743 RPM
1245 RPM
1000
2000
3000
4000
5000
Air Flow [m³/h]

6.2. Thermal efficiency

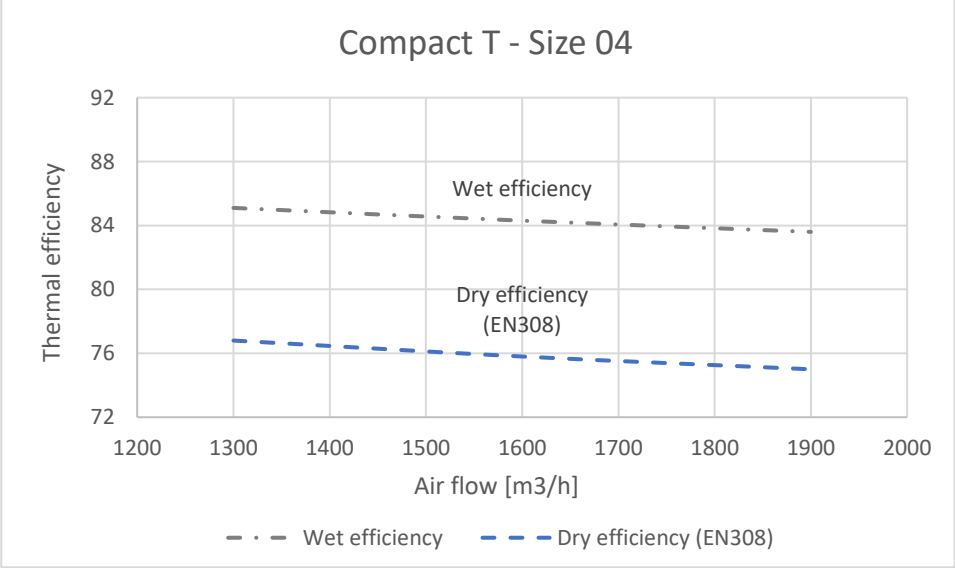
The charts indicate the thermal efficiency of the heat exchanger at the follwing conditions:

- Wet efficiency: -5°C/ RH 80% Outdoor and +22°C/50% Indoor
- With air ratio 1:1 and according to EN308

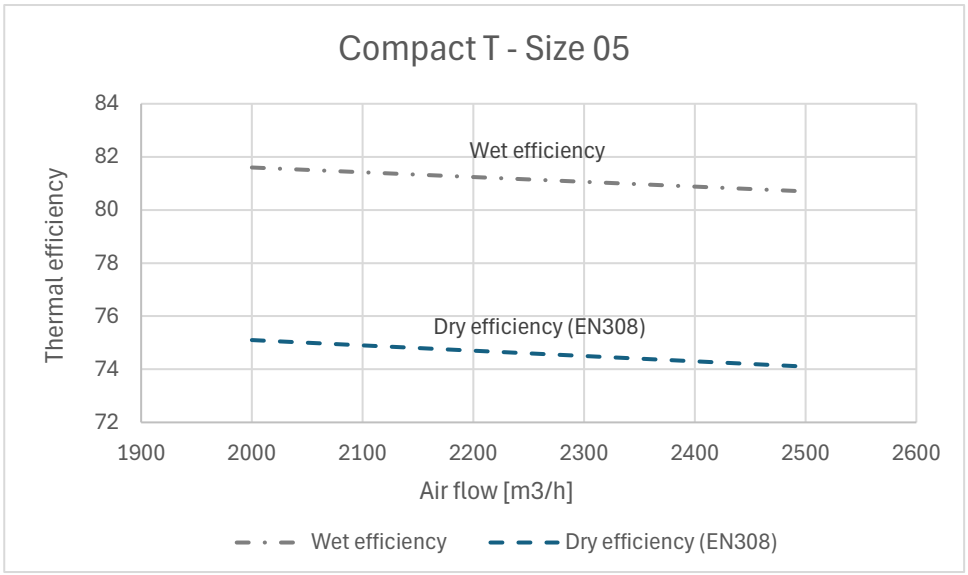
Thermal efficiency: Size 03



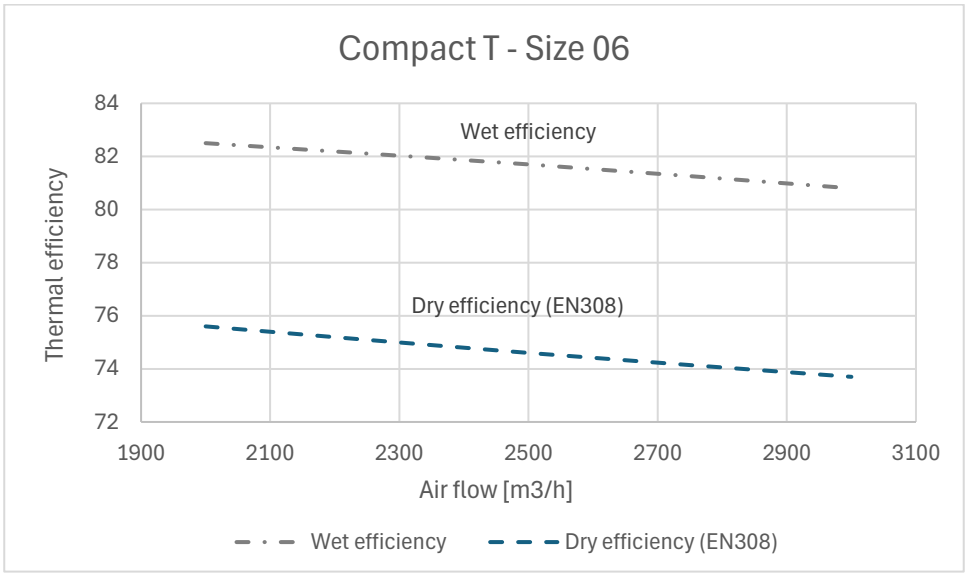
Thermal efficiency: Size 04



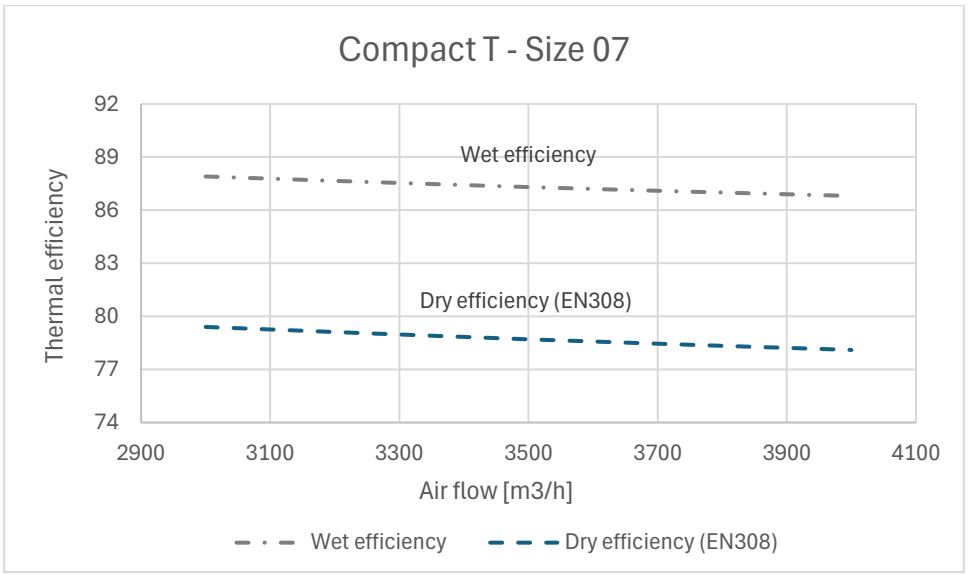
Thermal efficiency: Size 05



Thermal efficiency: Size 06



Thermal efficiency: Size 07



6.3. Sound emission

Surrounding power level: The airborne is the sound power emitted by the unit. The surrounding power level is the logarithmic sum of the two airborne values (supply and return).
Surrounding pressure level: It is calculated in accordance with EN3744. The evaluation is done at 1 meter from the source and with a directivity factor equal to 4, in non-reverberant field.

Sound Level Size 03

Air flow: 600 m^3/h, ESP: 50 Pa

Point A	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	66	72	55	42	39	36	23	12	57
	Supply outlet	65	78	67	62	58	58	49	42	66
	Return inlet	65	71	54	41	38	35	22	11	55
	Return outlet	64	77	66	61	57	57	49	42	66
	Surrounding power	68	69	50	45	38	35	27	16	53
Surrounding pressure (dBA)										46

Air flow: 1000 m^3/h, ESP: 50 Pa

Point B	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	61	69	64	46	45	41	30	21	57
	Supply outlet	62	76	81	67	64	64	57	51	74
	Return inlet	60	68	62	45	44	40	29	20	56
	Return outlet	61	76	79	66	63	63	56	50	72
	Surrounding power	65	67	64	49	44	41	35	24	57
Surrounding pressure (dBA)										50

Air flow: 600 m^3/h, ESP: 150 Pa

Point C	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	73	74	62	48	44	40	28	17	59
	Supply outlet	72	79	75	67	62	63	55	48	71
	Return inlet	72	73	61	47	43	39	28	17	59
	Return outlet	71	79	74	67	61	62	54	47	71
	Surrounding power	75	71	58	50	42	40	32	21	57
Surrounding pressure (dBA)										50

Air flow: 1000 m^3/h, ESP: 150 Pa

Point D	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	66	70	68	49	47	43	32	24	60
	Supply outlet	68	76	85	70	66	66	59	54	77
	Return inlet	65	69	67	48	46	43	32	23	60
	Return outlet	66	76	84	69	65	65	59	53	77
	Surrounding power	70	67	68	52	46	43	37	27	60
Surrounding pressure (dBA)										53

Allowances on declared data: +/- 3 dB(A)

Sound Level Size 04

Air flow: 1300 m³/h, ESP: 50 Pa

Point A	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	50	55	55	44	43	38	29	22	50
	Supply outlet	53	62	68	63	60	62	56	51	67
	Return inlet	52	54	52	42	42	38	28	20	48
	Return outlet	53	61	68	63	62	62	55	50	68
	Surrounding power	57	53	51	46	41	39	34	24	48
Surrounding pressure (dBA)										41

Air flow: 1700 m³/h, ESP: 50 Pa

Point B	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	59	54	60	47	48	43	34	30	54
	Supply outlet	61	61	74	66	64	67	61	59	72
	Return inlet	63	57	58	45	46	42	34	27	52
	Return outlet	66	63	72	67	66	67	61	57	72
	Surrounding power	68	53	57	49	46	44	39	32	53
Surrounding pressure (dBA)										46

Air flow: 1300 m³/h, ESP: 150 Pa

Point C	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	55	57	60	45	46	40	30	23	53
	Supply outlet	57	65	74	65	62	64	58	53	70
	Return inlet	55	58	59	44	44	40	30	22	53
	Return outlet	57	65	76	66	64	64	57	52	71
	Surrounding power	61	56	58	48	44	42	36	26	52
Surrounding pressure (dBA)										45

Air flow: 1700 m³/h, ESP: 150 Pa

Point D	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	62	52	61	48	49	44	35	30	55
	Supply outlet	64	60	76	67	66	68	62	59	73
	Return inlet	68	55	60	47	48	44	34	27	54
	Return outlet	72	62	74	68	68	68	62	57	74
	Surrounding power	73	52	58	50	47	45	40	32	54
Surrounding pressure (dBA)										47

Allowances on declared data: +/- 3 dB(A)

Sound Level Size 05

Air flow: 2100 m³/h, ESP: 50 Pa

Point A	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	61	62	60	47	45	42	33	28	54
	Supply outlet	62	66	73	68	65	65	59	57	72
	Return inlet	61	62	60	47	45	42	33	29	54
	Return outlet	62	66	73	68	64	65	59	57	71
	Surrounding power	66	58	56	51	45	43	37	31	53
Surrounding pressure (dBA)										46

Air flow: 2400 m³/h, ESP: 50 Pa

Point B	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	64	65	62	50	48	44	35	32	56
	Supply outlet	67	68	76	70	68	68	62	61	74
	Return inlet	64	65	62	50	47	44	35	33	56
	Return outlet	66	69	76	70	67	67	61	61	74
	Surrounding power	70	60	60	53	48	45	40	34	55
Surrounding pressure (dBA)										48

Air flow: 2100 m³/h, ESP: 150 Pa

Point C	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	66	63	63	50	49	46	36	32	57
	Supply outlet	70	68	77	71	69	69	63	61	75
	Return inlet	65	63	63	50	49	45	36	32	57
	Return outlet	69	68	76	71	68	68	62	61	75
	Surrounding power	73	59	60	54	49	46	41	34	56
Surrounding pressure (dBA)										49

Air flow: 2400 m³/h, ESP: 150 Pa

Point D	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	64	64	58	46	44	43	33	26	54
	Supply outlet	65	72	73	69	64	69	63	60	74
	Return inlet	59	63	57	48	45	41	31	25	53
	Return outlet	61	71	74	70	64	65	59	55	72
	Surrounding power	67	63	57	52	45	45	40	32	54
Surrounding pressure (dBA)										47

Allowances on declared data: +/- 3 dB(A)

Sound Level Size 06

Air flow: 2600 m³/h, ESP: 50 Pa

Point A	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	65	63	57	46	44	42	33	26	53
	Supply outlet	65	71	72	68	64	69	63	59	73
	Return inlet	62	63	56	47	44	40	32	26	52
	Return outlet	63	71	72	69	63	64	59	55	71
	Surrounding power	68	62	56	51	44	45	39	31	53
Surrounding pressure (dBA)										46

Air flow: 2800 m³/h, ESP: 50 Pa

Point B	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	66	62	59	47	45	44	34	28	54
	Supply outlet	67	70	75	69	65	70	64	61	75
	Return inlet	65	63	59	48	46	42	34	28	54
	Return outlet	65	70	76	70	65	66	61	57	73
	Surrounding power	69	62	59	53	45	46	41	33	55
Surrounding pressure (dBA)										48

Air flow: 2600 m³/h, ESP: 150 Pa

Point C	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	64	64	59	47	45	43	33	27	54
	Supply outlet	66	71	74	69	65	70	64	61	75
	Return inlet	60	62	58	48	46	41	32	26	53
	Return outlet	62	70	75	70	65	66	60	56	73
	Surrounding power	68	62	58	52	45	46	41	33	55
Surrounding pressure (dBA)										48

Air flow: 2800 m³/h, ESP: 150 Pa

Point D	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	65	63	60	48	46	45	35	28	55
	Supply outlet	67	70	77	70	66	72	65	62	76
	Return inlet	63	61	60	49	48	43	34	28	55
	Return outlet	64	69	78	71	66	67	61	58	74
	Surrounding power	69	61	61	53	46	48	42	34	56
Surrounding pressure (dBA)										49

Allowances on declared data: +/- 3 dB(A)

Sound Level Size 07

Air flow: 3000 m³/h, ESP: 50 Pa

Point A	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	63	67	56	44	41	39	30	23	53
	Supply outlet	64	72	68	67	61	64	58	54	69
	Return inlet	64	66	55	44	41	39	30	23	53
	Return outlet	64	72	68	67	61	63	57	53	69
	Surrounding power	68	64	51	50	41	41	36	27	52
Surrounding pressure (dBA)										45

Air flow: 4000 m³/h, ESP: 50 Pa

Point B	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	72	69	65	53	47	45	36	31	59
	Supply outlet	72	76	79	73	67	69	64	62	76
	Return inlet	72	70	65	52	47	44	35	31	59
	Return outlet	72	76	78	73	67	69	64	61	76
	Surrounding power	76	67	61	56	47	47	42	35	58
Surrounding pressure (dBA)										51

Air flow: 3000 m³/h, ESP: 150 Pa

Point C	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	61	69	57	46	43	41	30	24	55
	Supply outlet	63	75	70	69	63	66	59	55	71
	Return inlet	61	68	56	46	43	40	30	24	54
	Return outlet	63	74	69	68	62	65	59	55	71
	Surrounding power	66	66	53	51	43	43	37	28	54
Surrounding pressure (dBA)										47

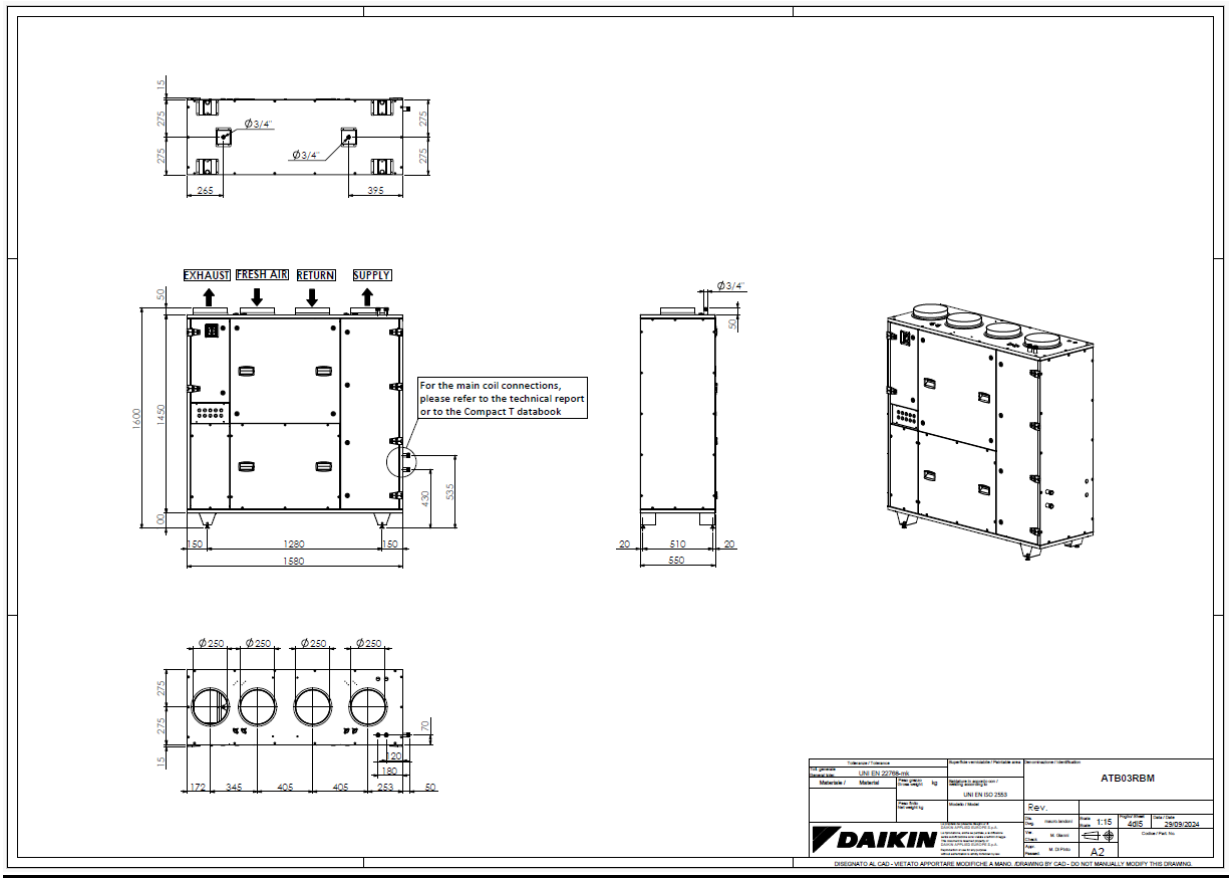
Air flow: 4000 m³/h, ESP: 150 Pa

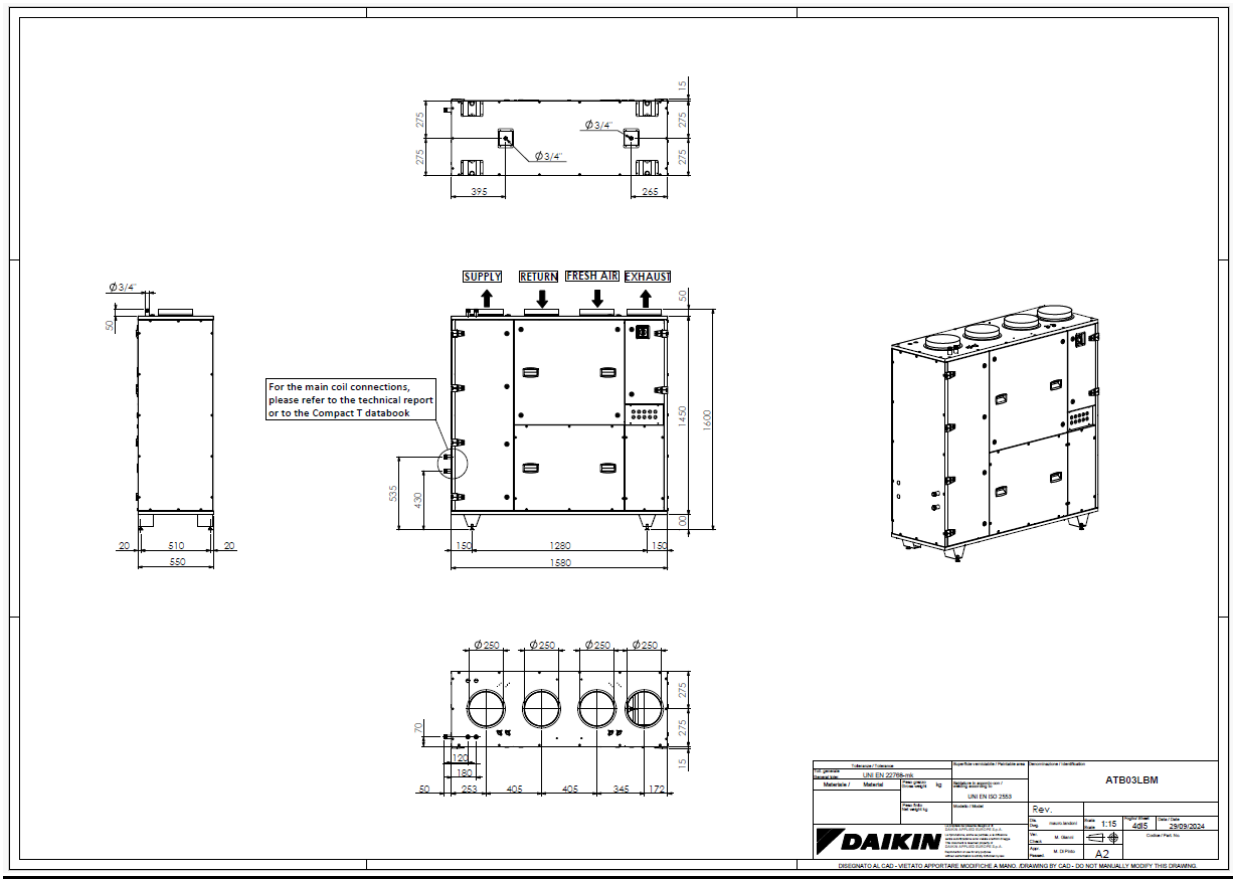
Point D	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Avg (dBA)
Sound power (dB)	Supply inlet	70	69	66	53	48	46	36	31	60
	Supply outlet	70	76	80	74	68	71	65	62	77
	Return inlet	70	69	66	53	48	45	36	31	60
	Return outlet	71	76	80	74	68	70	65	62	77
	Surrounding power	74	67	63	57	48	48	43	36	59
Surrounding pressure (dBA)										52

Allowances on declared data: +/- 3 dB(A)

6.4. Dimensional Drawings

Dimension Drawing: Size 03





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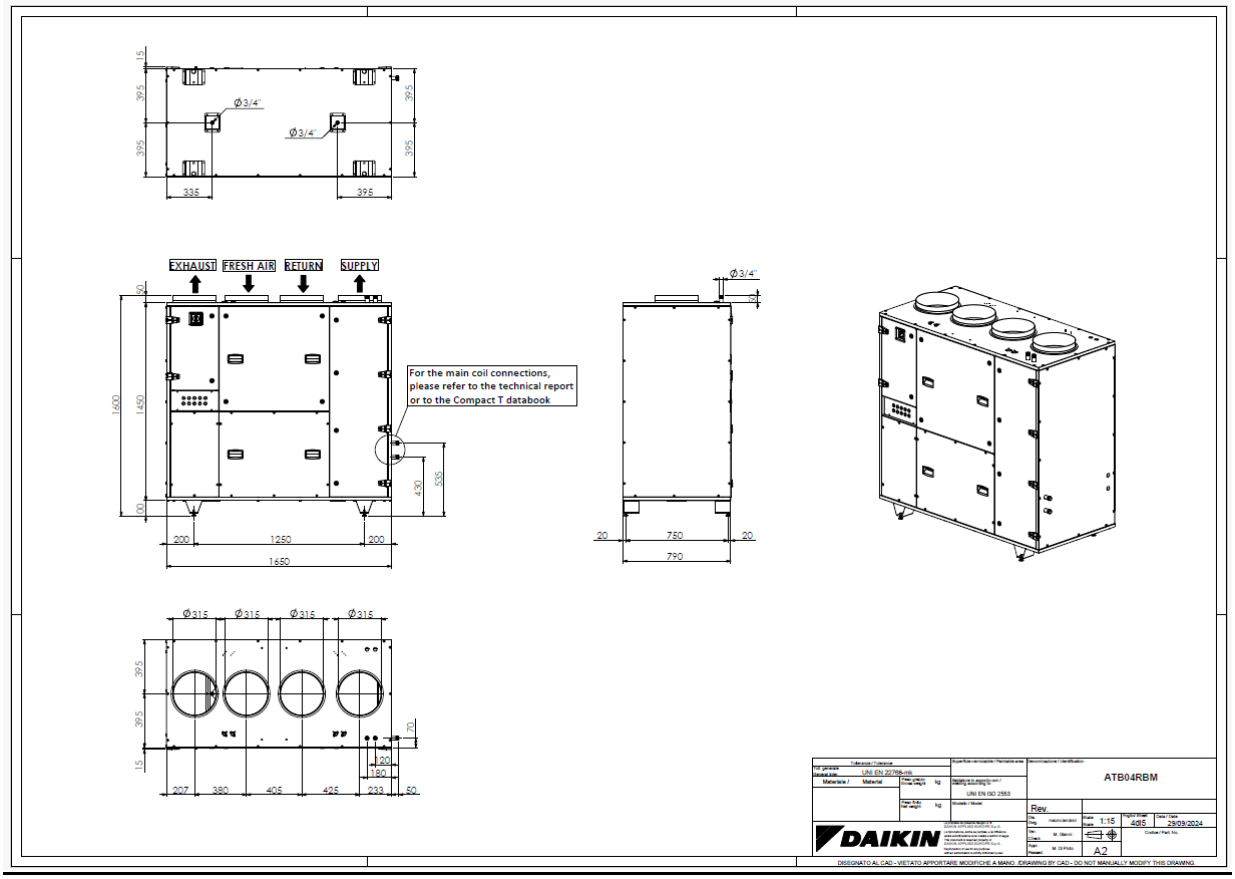

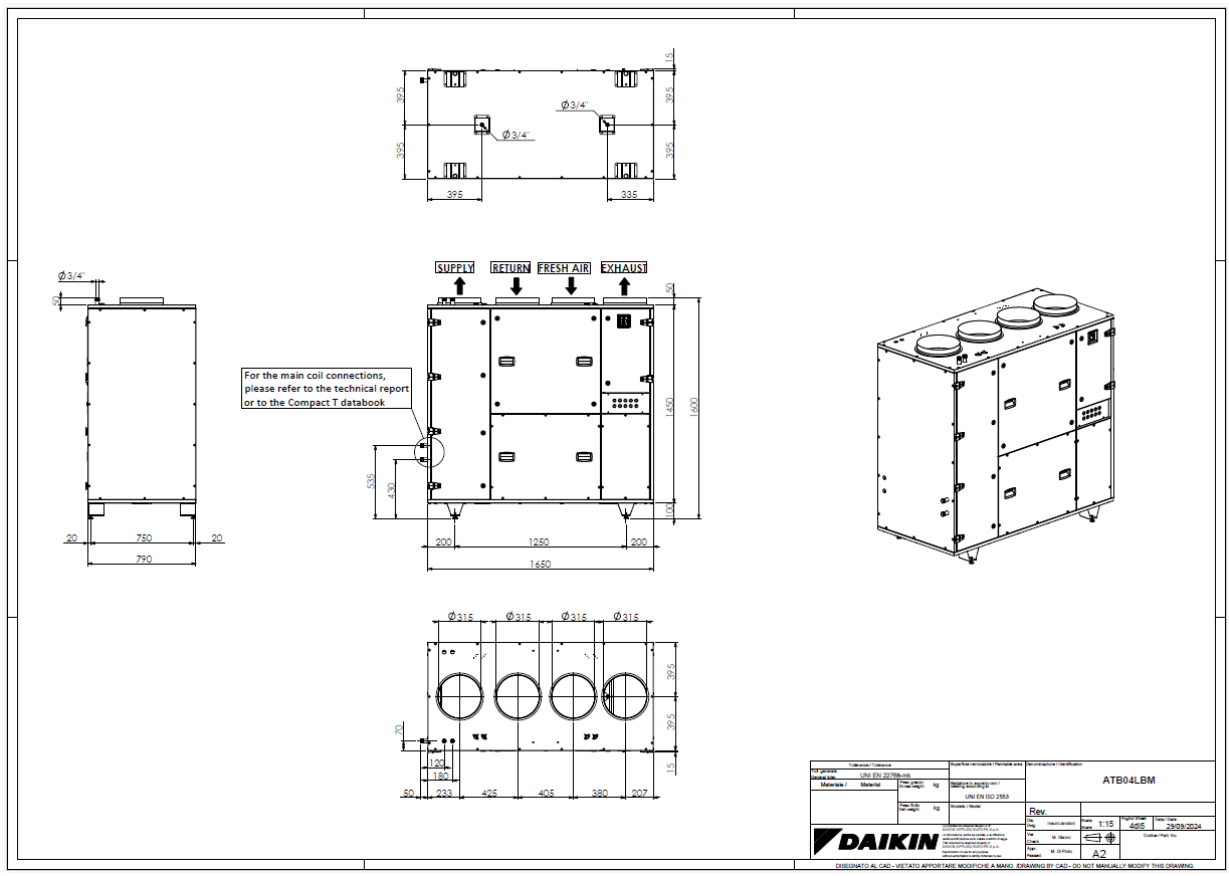

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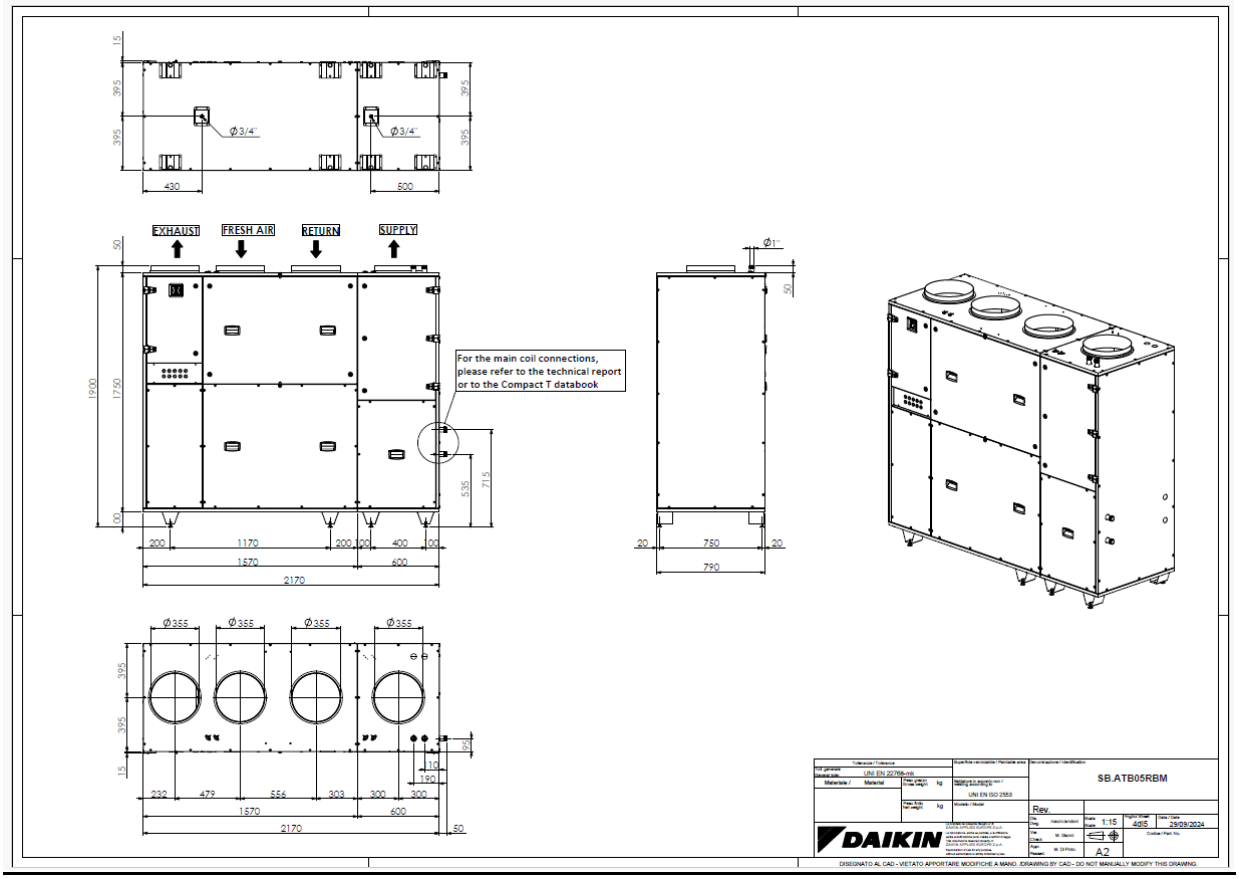

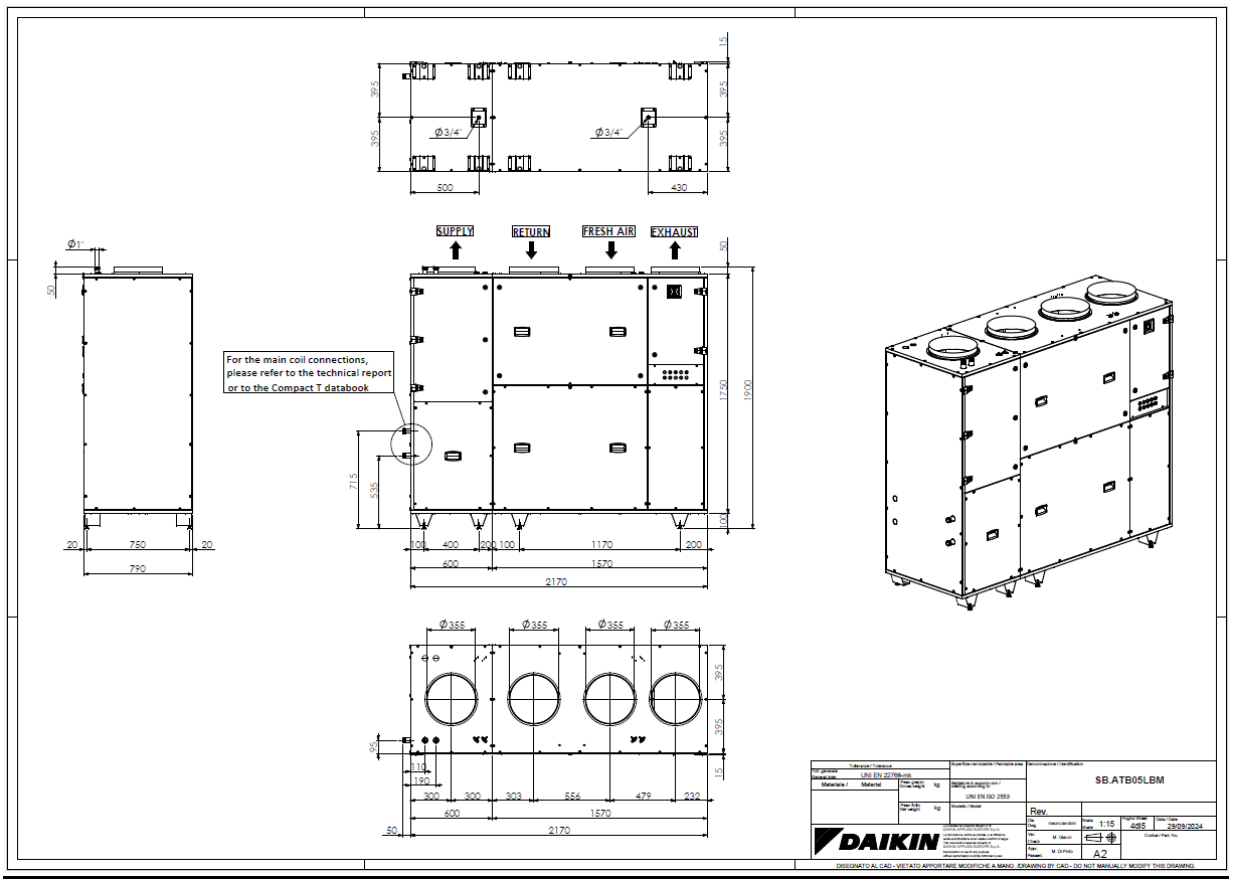

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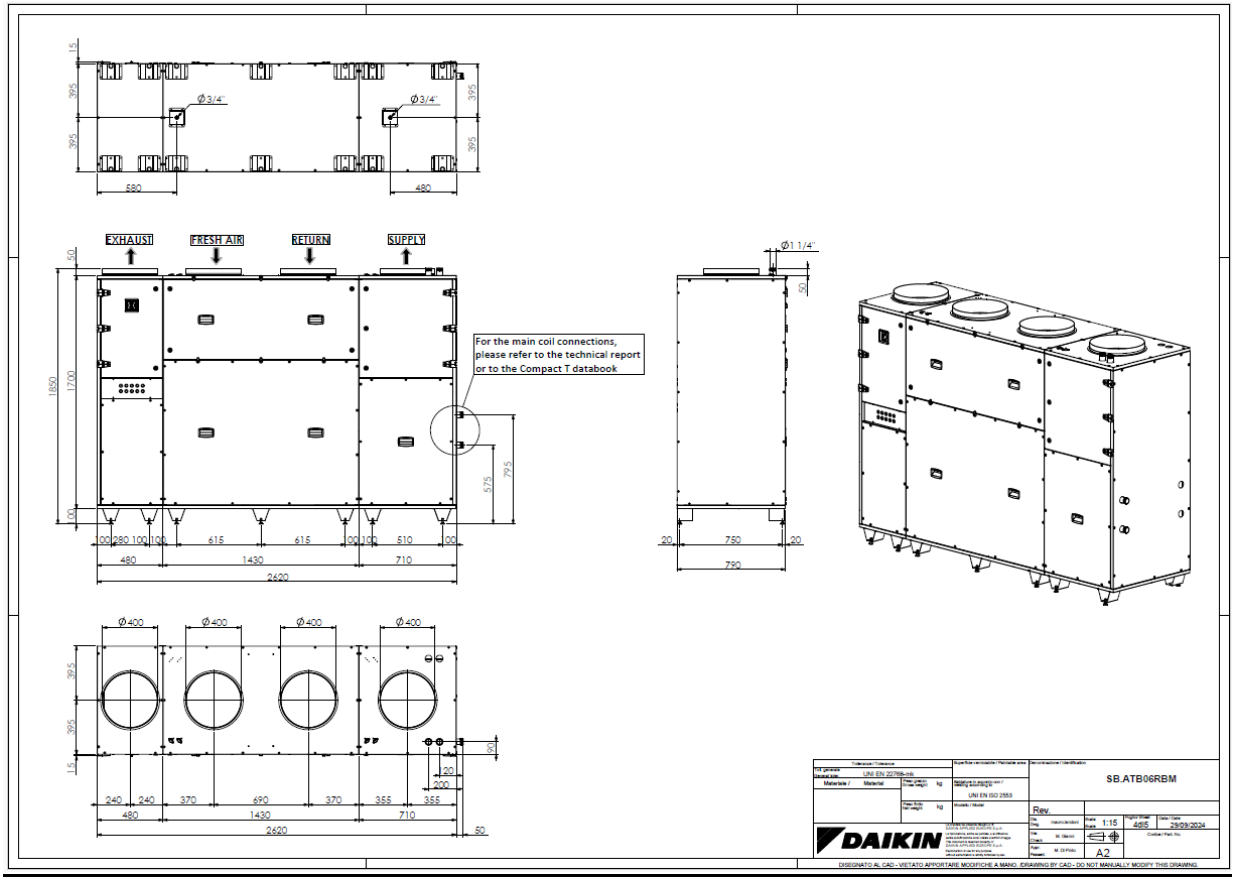
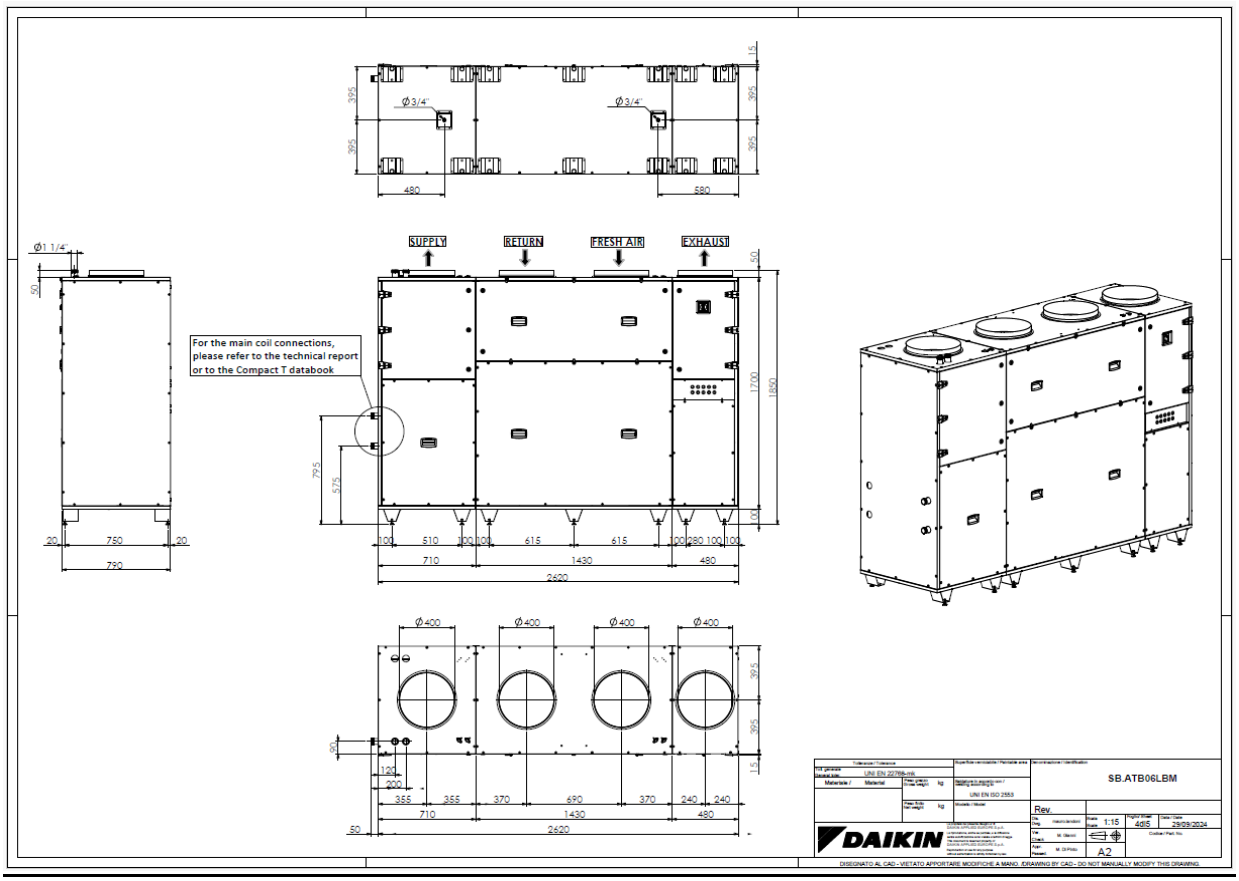
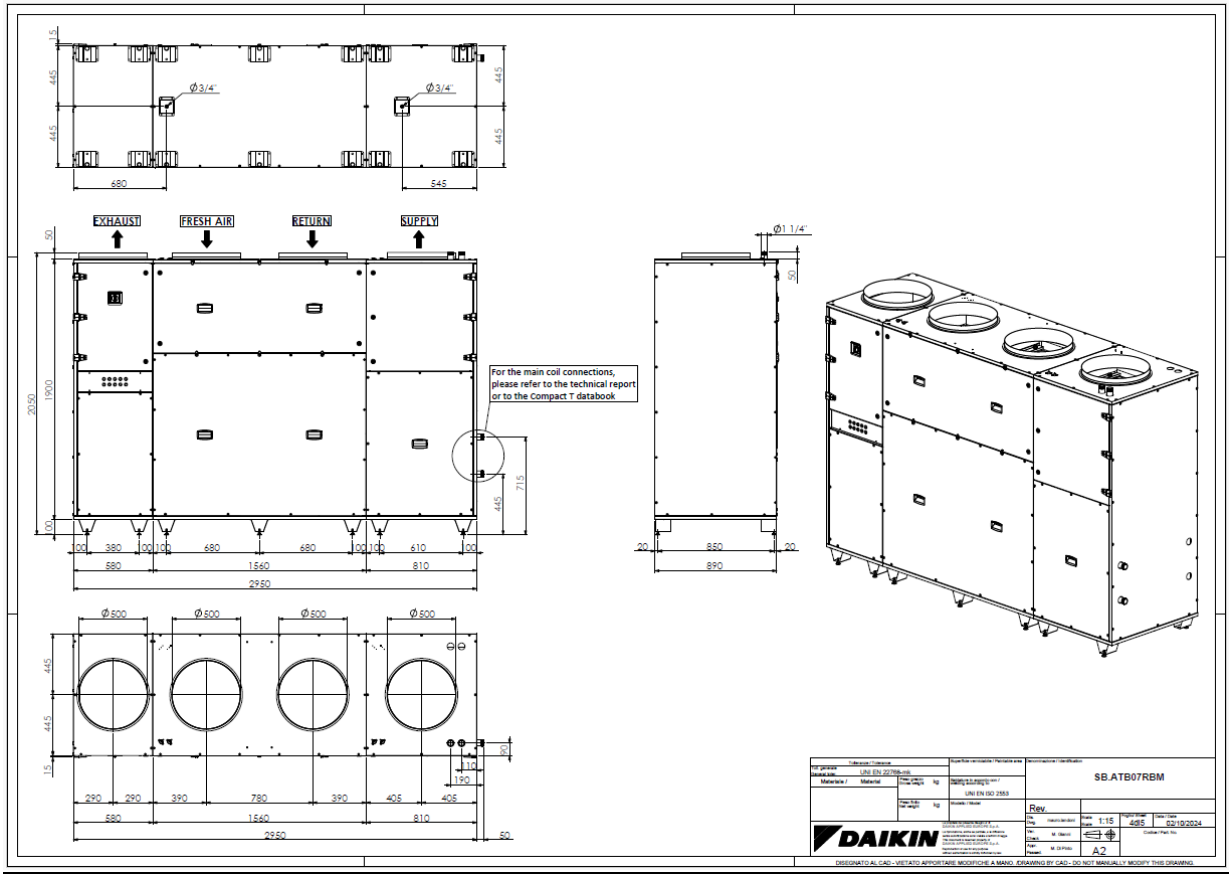
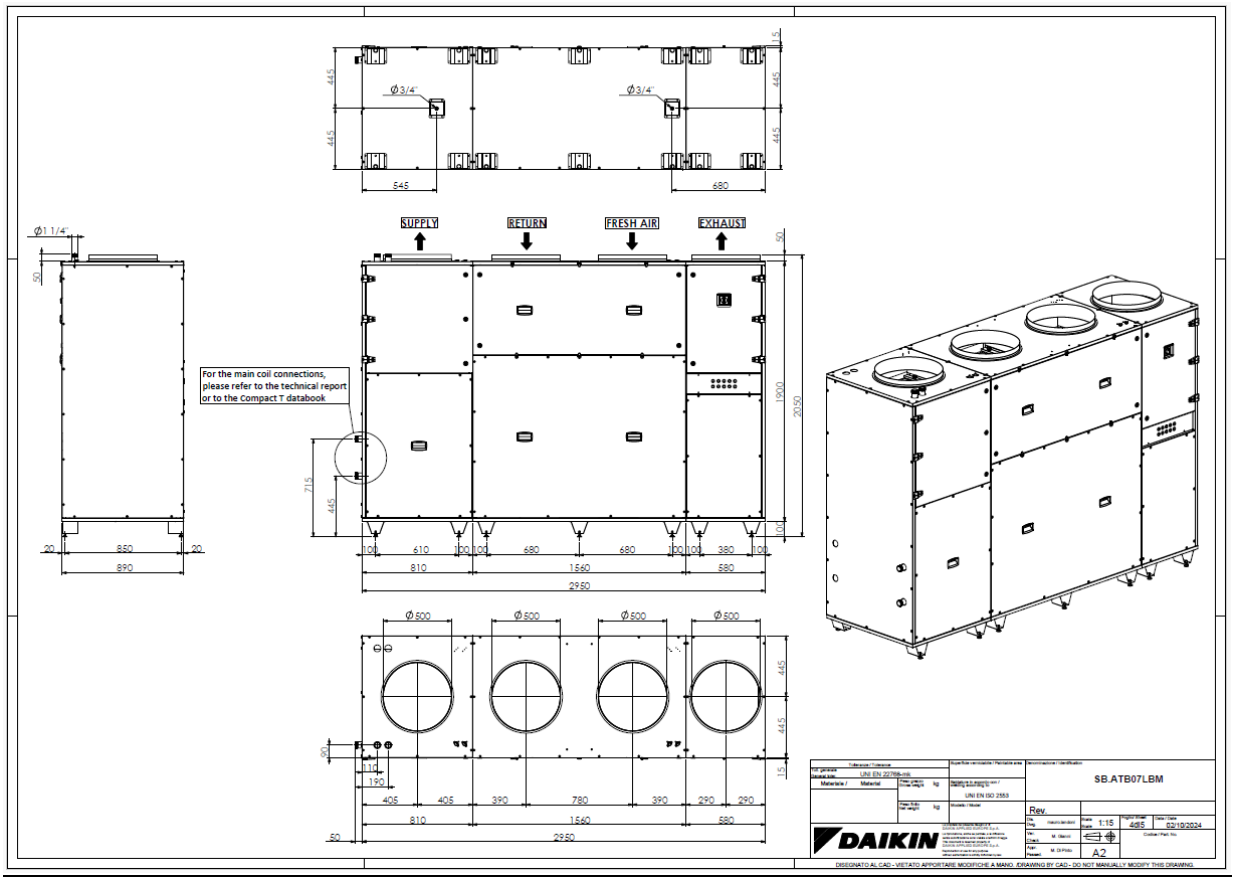


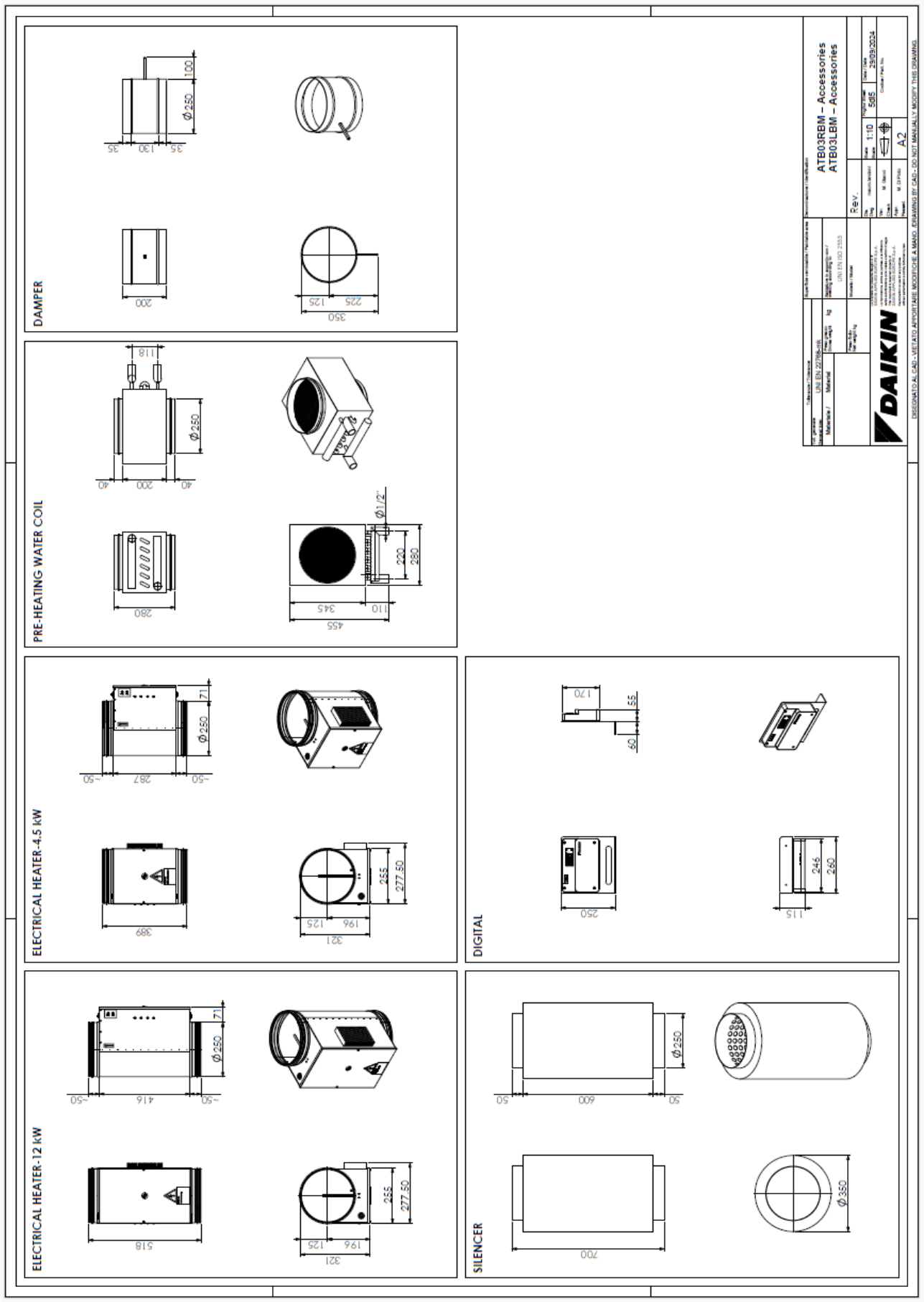


Dimension Drawing: Size 07

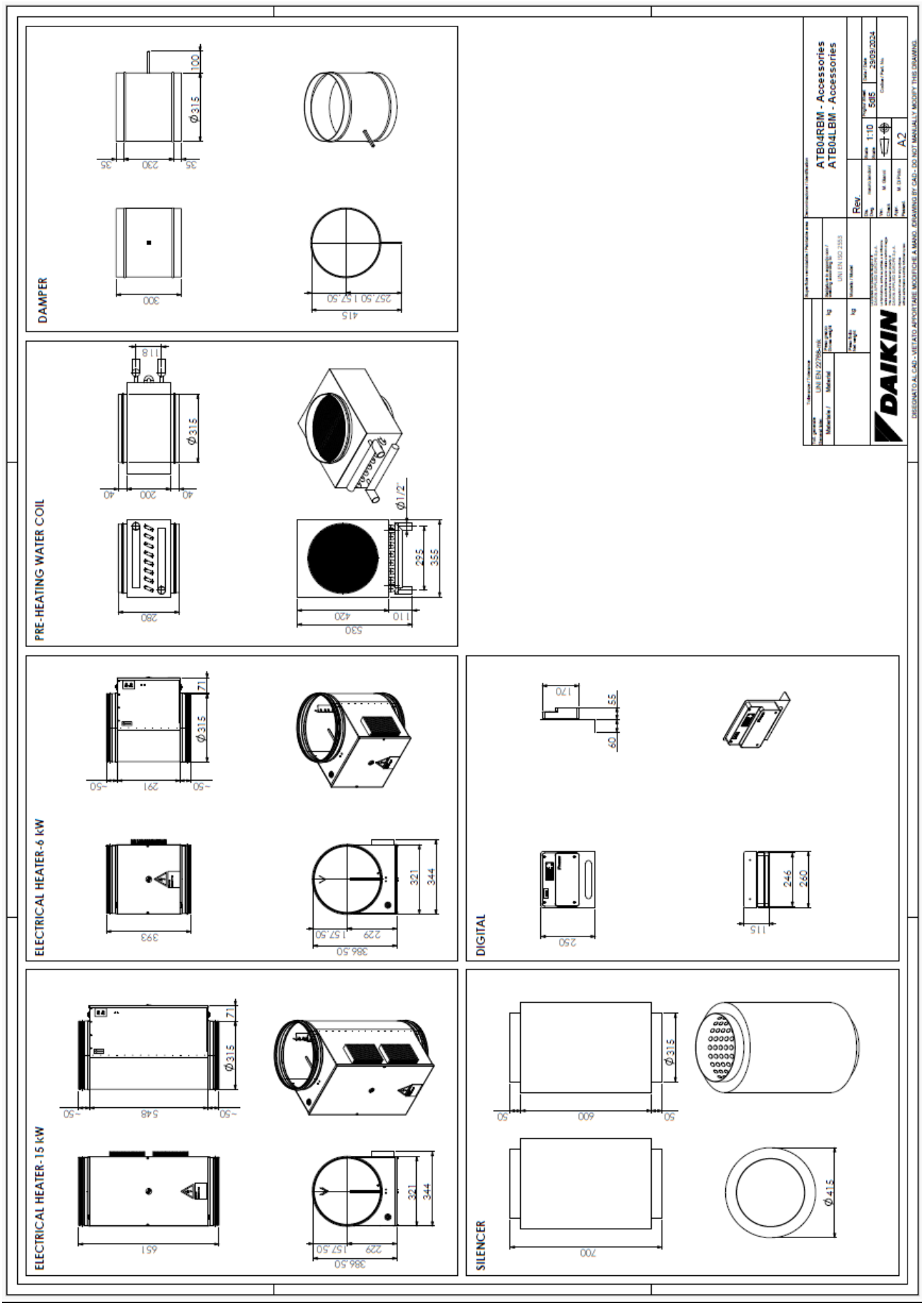




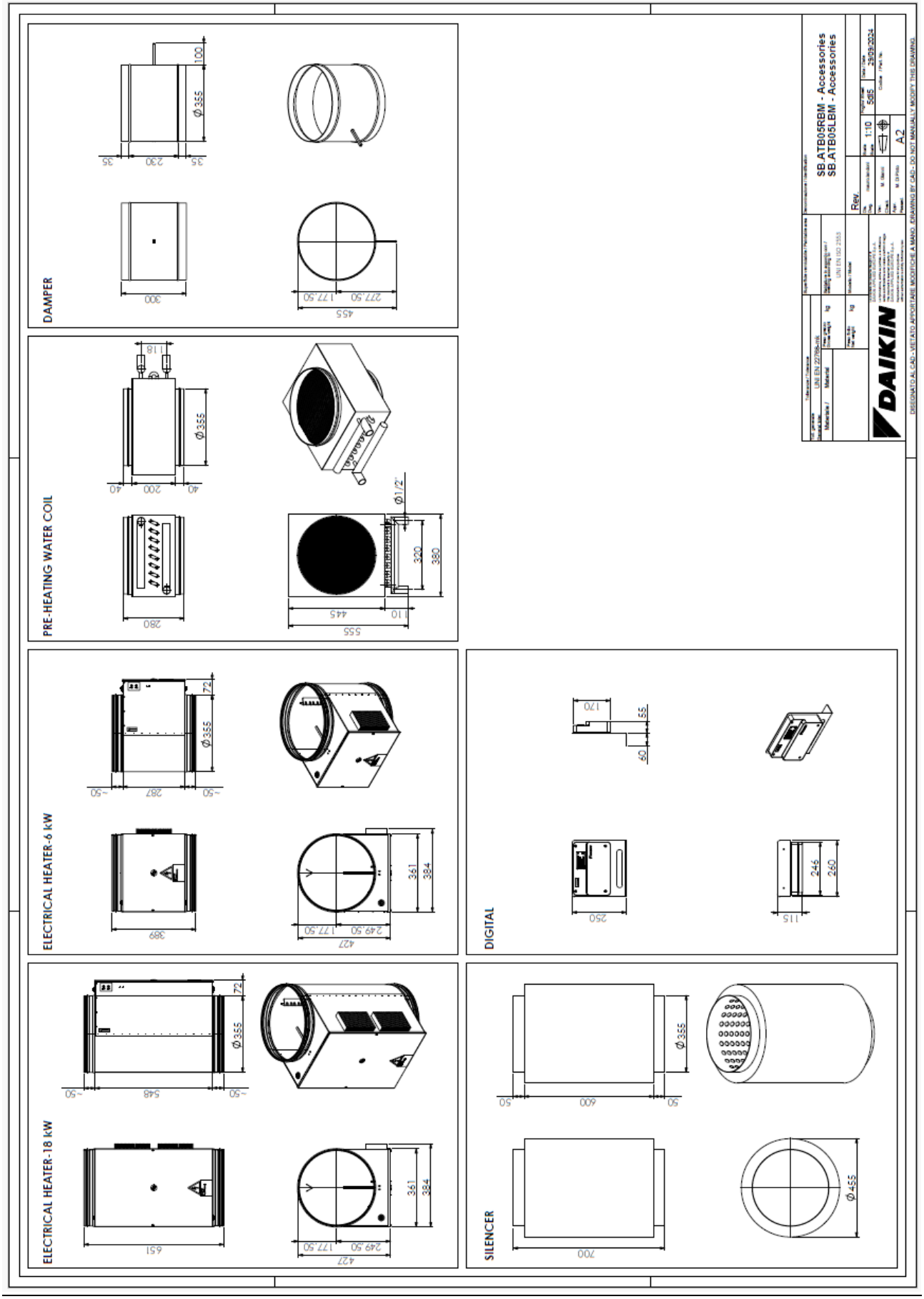
Dimension Drawing: Accessories Size 03



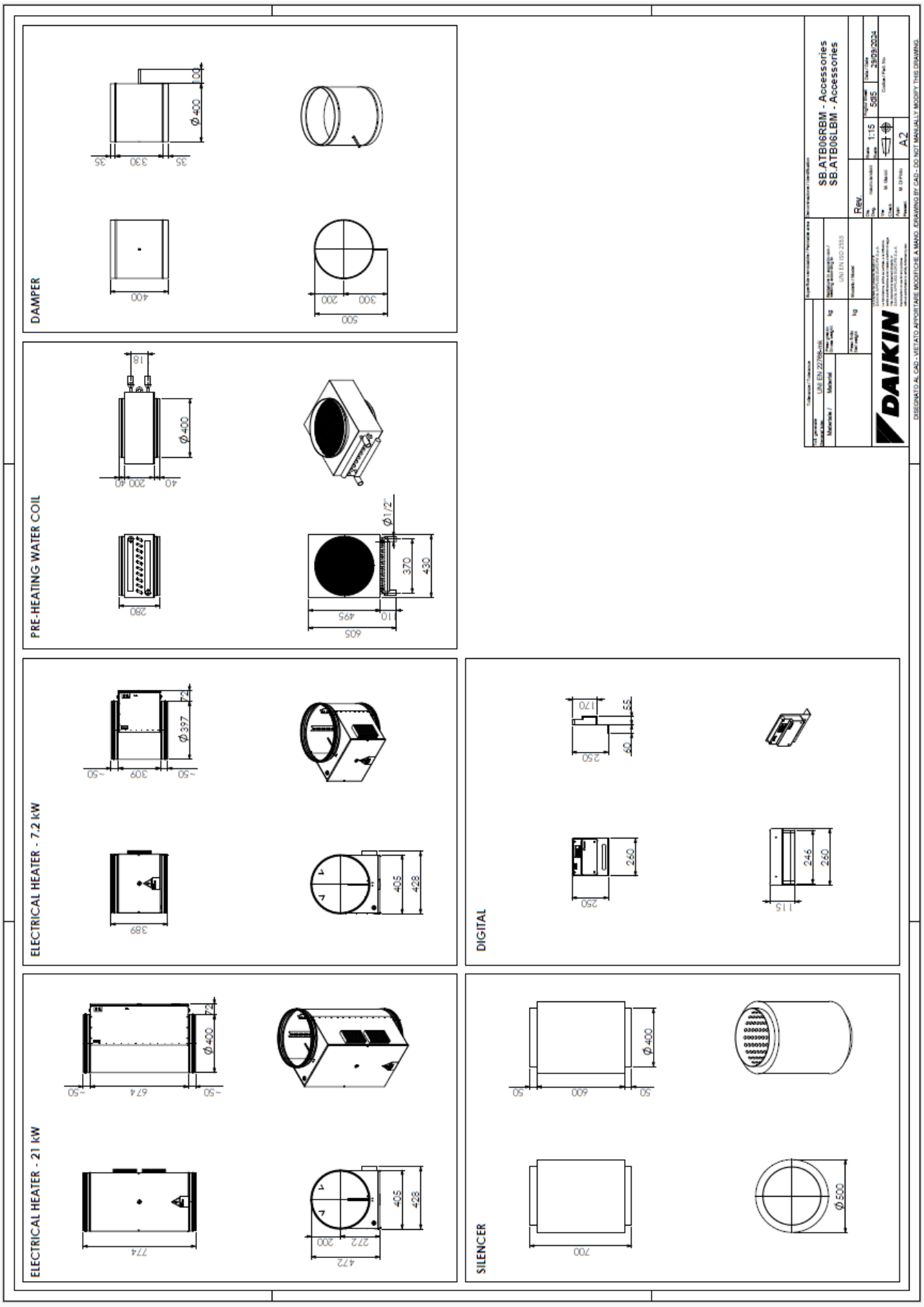
Dimension Drawing: Accessories Size 04



Dimension Drawing: Accessories Size 05



Dimension Drawing: Accessories Size 06



Dimension Drawing: Accessories Size 07