

AIR-CONDITIONING UNITS - Technical installation manual

TUN



Dear Customer,

Thank you for choosing an AERMEC product. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies.




In addition, the CE mark guarantees that our appliances fully comply with the requirements of the European Machinery Directive in terms of safety. We constantly monitor the quality level of our products, and as a result they are synonymous with Safety, Quality, and Reliability.

Product data may be subject to modifications deemed necessary for improving the product without the obligation to give prior notice.

Thank you again.
AERMEC S.p.A

AERMEC S.p.A. reserves the right to make any modifications considered necessary to improve its products at any moment and is not obliged to add these modifications to machines that have already been fabricated, delivered or are under construction.

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<p>DICHIARAZIONE DI CONFORMITA'</p>		
<p>DECLARATION OF CONFORMITY</p>		
<p>DÉCLARATION DE CONFORMITÉ</p>		
<p>KONFORMITÄTSERKLÄRUNG</p>		
<p>Tipo macchina / Type of unit / Type de machine / Maschinentyp</p>	<p>Unità di condizionamento, Air conditioning units Unités de conditionnement d'air, Klimageräte</p>	
<p>Modello / Model / Modèle / Modell</p>		
<p>Matricola / Serial Nr / Numéro de série / Seriennummer</p>		
<p>La macchina è conforme alle disposizioni contenute nelle seguenti direttive: / The unit complies with the provisions contained in the following directives: / La machine est conforme aux dispositions contenues dans les directives suivantes: / Das Gerät entspricht den Bestimmungen der folgenden Richtlinien enthaltenen:</p>		
<p>2006/42/CE Direttiva Macchine / Machine Directive / Machine Directive / Maschinenrichtlinie</p>		
<p>2006/95/CE Direttiva Bassa Tensione / Low voltage Directive / Basse Tension / Niederspannungsrichtlinie</p>		
<p>2004/108/CE Direttiva EMC / EMC Directive / EMC Directive / EMV-Richtlinie</p>		
<p>La persona autorizzata a costituire il fascicolo tecnico è: / The person authorized to compile the technical file is: / La personne autorisée à constituer le dossier technique est: / Die Person berechtigt, die technischen Unterlagen zusammenzustellen:</p> <p style="text-align: center;">Alberto Foroni: via Ca' Magre, 45 - 37063 Isola della Scala (VR)</p>		
<p>Bevilacqua, 23/02/2011</p>	<p>Luigi Zucchi</p> 	

1. GENERAL STANDARDS

ATTENTION

The manufacturer reserves the right to make any modifications, at any time, considered necessary to improve the products and is not obliged to add these modifications to machines that have already been fabricated, delivered or are under construction.

Warranty conditions are however subject to general sale conditions envisioned at the time the contact is drawn up.



ATTENTION

The appliance cannot be used:

1. for outdoor air handling
2. for installation in humid environments
3. for installation in explosive atmospheres
4. for installation in corrosive atmospheres.

Make sure the environment where the appliance is installed has no substances which could corrode the aluminium fins.

This manual is an integral part of the documentation attached to the unit.

It must be kept for future reference and accompany the unit during its whole lifetime.

The manual defines the purpose for which the unit was built, establishes its correct installation and its use restrictions.

1. This manual describes all the use, installation and maintenance instructions for the unit and the main accident-prevention standards.
2. Read all the information provided in this manual carefully before installing, commissioning, using, servicing or cleaning the unit. Pay particular attention to the user regulations accompanied by "DANGER" or "ATTENTION" in so much as, if not complied with, the machine or objects may be damaged and/or persons injured.
3. For the anomalies not contemplated by this manual, contact the area After-sales Service as soon as possible.
4. Aermec S.p.A. declines all responsibility for any damage due to improper use of the machine, partial or hasty reading of the information contained in this manual.
5. Installation and maintenance must be carried out by expert and qualified personnel for electric/electronic installations and air conditioning, with the requisites foreseen by law 46/90 and/or by DPR 380/2001, registered at the local CHAMBER OF COMMERCE C.I.A.A. Otherwise Aermec S.p.A. declines all responsibility for the safety of the product.

THE MANUFACTURING COMPANY DECLINES ALL LIABILITY FOR INJURY/DAMAGE CAUSED TO PERSONS/ANIMALS OR OBJECTS DUE TO FAILURE TO COMPLY WITH THE INSTRUCTIONS AND STANDARDS CONTAINED IN THIS MANUAL.

Though an adequate risk analysis has been carried out during designing of TUN units, PAY ATTENTION to pictograms on the unit which make it easier to read the manual, quickly catching the reader's attention concerning risk situations which cannot be prevented or sufficiently limited through use of technical protective measures and equipment.



GENERIC DANGER SIGN

Meticulously observe all the indications placed next to the pictogram.

Failure to comply with these indications can trigger dangerous situations with possible consequent harm to the health of the operator and of the user in general.



DANGEROUS ELECTRICAL VOLTAGE SIGN

Meticulously observe all the indications placed next to the pictogram.

The sign indicates components of the unit or, in this manual, identifies actions which could trigger risks of an electric nature.



GENERIC PROHIBITION SIGN

Meticulously observe all the indications placed next to the pictogram which limits some actions in order to provide the operator with greater safety.

MAIN WARRANTY CONDITIONS

- The warranty does not cover damage caused by incorrect installation of the unit by the installer.
- The warranty does not cover damage caused by improper use.
- The manufacturer is not responsible for injuries to the installer or user caused by incorrect installation or improper use of the unit.
- The appliance must be installed in such a way as to make maintenance and/or repairs to be carried out possible.
- The warranty does not cover the costs for ladders, scaffolding or other elevation systems that may become necessary for carrying out servicing under warranty.

The warranty is void in the following cases:

- service and repairs carried out by personnel or companies that are not authorised;
- the unit has been previously repaired or modified using non-original spare parts;
- the unit has not undergone suitable maintenance;
- whenever the instructions explained in this manual are not followed;
- whenever unauthorised modifications are made.

2. DESCRIPTION OF THE UNIT

The air-conditioning units of the TUN series are intended for civil, commercial and hotel systems in small to medium sized environments.

The units are arranged to be installed:

1. **VERTICALLY**¹
2. **HORIZONTALLY**¹

in order to be more versatile. This type of unit can serve several rooms by means of a distribution plenum. The units in this series are distinguished by their compactness, low noise and wide range of accessories.

3. DESCRIPTION OF COMPONENTS

FRAMEWORK

Support structure made of galvanised steel panels insulated internally and **also externally on demand**². Specific brackets supplied with the unit facilitate wall fastening.

The galvanised steel condensation drip tray is provided with a drain fitting on both sides and is suitable both for horizontal and vertical installation of the unit.

ELECTRIC FAN UNIT

This consists in high performance double intake centrifugal fans with blades facing forwards. The electric motor is coupled directly to the fans. It is multi-speed, three of which can be selected on the control panel (ACCESSORY).

HEAT EXCHANGE COIL

Made with copper pipes and aluminium louvered fins blocked by mechanical expansion of the pipes. They are supplied with threaded sleeves for the hydraulic connections. A version is also available with direct expansion coils made with copper pipes and aluminium louvered fins blocked by mechanical expansion of the pipes (2 rows).

FILTRATION

Air-filtering relies on class G2 synthetic filters positioned on intake. The filters are easily accessible for maintenance and cleaning. For the FTF accessory, filtering is carried out through F6 filtering degree soft bag filters. For higher filtering degrees, please contact our Sales Technical Dept.

Key to reading

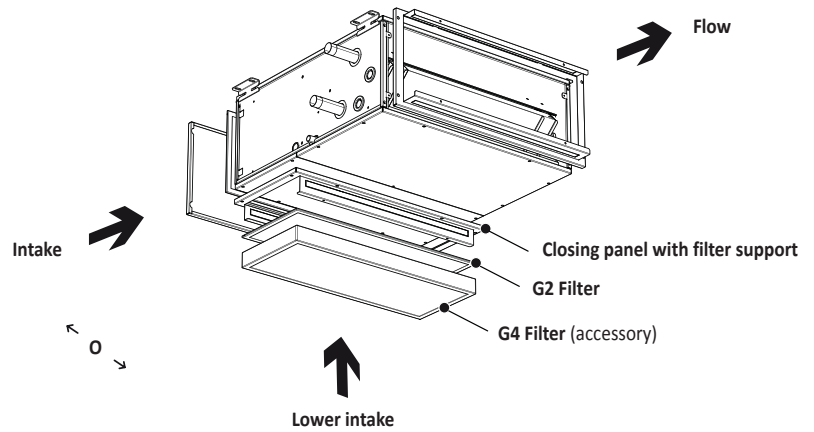
When placing an order, you must specify.

1. The type of installation (horizontal or vertical)
2. Insulated panels of support structure.
 ONLY EXTERNALLY (standard)
 OR ALSO INTERNALLY on demand

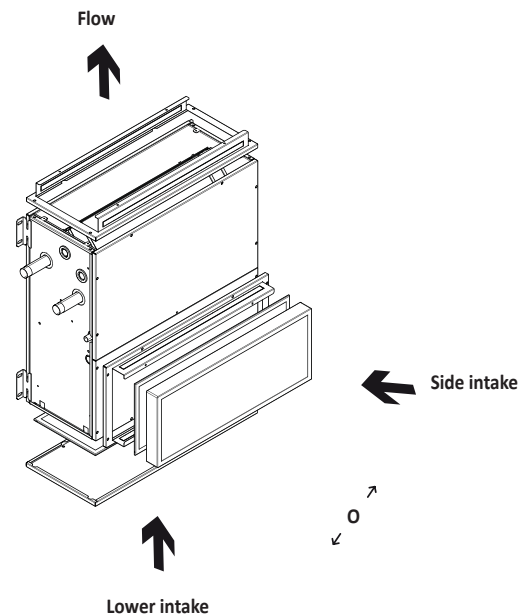
4. CONFIGURATOR

Field	Description
1,2,3	TUN
4,5	SIZE
	10 - 15 - 20 - 25 - 40
6	VERSION
4	4-row water coil
6	6-row water coil
7	CONFIGURATION
°	Standard
P	Powered (only for sizes 10 - 40)

HORIZONTAL INSTALLATION



VERTICAL INSTALLATION



5. ACCESSORIES

M2S MIXING CHAMBER 2 DAMPERS

Section made of galvanised steel sheet with two air calibration dampers and louvers made of galvanised sheet steel. 50 mm louver pitch; 8 mm motorised regulation pin made of galvanised steel.

M3S MIXING CHAMBER 3 DAMPERS

Section made of galvanised steel sheet with three air calibration dampers and louvers made of galvanised sheet steel. 50 mm louver pitch; 8 mm motorised regulation pins made of galvanised steel. It must be coupled with the VRF accessory.

FTF SOFT BAG FILTER SECTION

Section made of galvanised steel sheet with F6 filtering degree soft bag filters. For different filtering degrees, please contact the Aermec Sales Technical Dept. It must be coupled with a powered unit.

B2R 2 ROW WATER COIL

For 4-pipe systems, positioned internally, downstream the main coil. The threaded sleeves for the hydraulic connections and the air bleeding valve are supplied.

PBE SECTION WITH POST- HEATING COIL

The electric coil consists of armoured resistances fitted with a twin safety thermostat.

SSL MODULE WITH SILENCER BAFFLES

Section made of galvanised steel sheet with mineral wool silencer baffles covered in a polyethylene film in order to prevent flaking.

S2Z 2-AREA DAMPER (70-30%)

Damper made of galvanised steel sheet with opposite louvers for the external air flow to blend with the air circulation flow. 50 mm louver pitch; 8 mm motorised regulation pin made of galvanised steel.

VRF RETURN VENTILATING SECTION WITH A G4 FILTER

Ventilating unit equipped with an electronic rev shifter, contained in a galvanised steel sheet section with flat filters having a G4 efficiency (EN779).

PMM PLENUM WITH MULTIPLE CIRCULAR FLOW ATTACHMENTS

1.5 mm Plenum made of hot galvanised sheet metal. The plenum has multi-diameter circular plastic fittings (200 mm, 180 mm and 150 mm) for circular pipes to be connected.

PMC CLOSED FLOW PLENUM

1.5 mm Plenum made of hot galvanised sheet metal. The plenum allows the flow to turn 90°. The installer must make the flow aperture.

SAS INTAKE DAMPER

Air calibration damper with louvers made of galvanised sheet steel. 50 mm louver pitch; 8 mm motorised regulation pin made of galvanised steel.

GMD FLOW GRID WITH ADJUSTABLE LOUVERS

Grid with double row adjustable louvers for air to be introduced in the relative room. It can be installed directly on to the appliance by removing the flanges or on to the wall.

GAP INTAKE GRID

With louvers tilted at 45°; it can be installed directly on to the appliance by removing the flanges or on to the wall.

FPI DOOR FLANGE SUCTION FILTERS G4

CONTROL PANELS

PX CONTROL PANEL WITH ONLY THE SWITCH-OVER

WMT 05 ELECTRO-MECHANICAL THERMOSTAT

For fan coils installed in 2-pipe systems. The panel must be installed on the wall and protected electrically with an internal fuse. It has the following functions: on / off switch; cursor to select the heating / cooling modes (manual season change); cursor to select the fan speed (high, medium and low); temperature selector (+5°C to 30°C).

WMT 10 CONTROL PANEL

For fan coils installed on the wall. Controls the fan coil operation according to the set mode. The panel must be wall mounted; it is to be used in 4-pipe and 2-pipe systems and systems with 2-pipes with resistance, with the possibility of connecting two ON - OFF type valves for the cut-off of the coil supply water. The panel is protected electrically by an internal fuse. The control has the following functions:

- 1) cursor to select the cooling or heating mode;
- 2) manual season change;
- 3) manual selection of the fan speed;
- 4) selection of the desired room temperature (+ 10°C to 30°C);
- 5) 2-pipe system management;
- 6) 4-pipe system management;
- 7) 2-pipe system management (cooling) + electrical resistance (heating);
- 8) thermostatic ventilation;
- 9) continuous ventilation;
- 10) continuous ventilation in cooling mode and thermostatic in heating mode.

Compatibility	TUN10	TUN15	TUN20	TUN25	TUN40	TUN40P
M2S	M2S1	M2S2	M2S3	M2S4	M2S4	M2S5
M3S	M3S1	M3S2	M3S3	M3S4	M3S4	M3S5
FTF	FTF1	FTF2	FTF3	FTF4	FTF4	FTF5
B2R	B2R11	B2R21	B2R31	B2R41	B2R41	B2R51
PBE	PBE1	PBE3	PBE4	PBE5	PBE6	PBE7
SSL	SSL1	SSL2	SSL3	SSL4	SSL4	SSL5
S2Z	S2Z1	S2Z2	S2Z3	S2Z4	S2Z4	S2Z5
VRF	VRF1	VRF3	VRF4	VRF5	VRF6	VRF7
PMM	PMM1	PMM2	PMM3	PMM4	PMM4	PMM5
PMC	PMC1	PMC2	PMC3	PMC4	PMC4	PMC5
SAS	SAS1	SAS2	SAS3	SAS4	SAS4	SAS5
GMD	GMD1	GMD2	GMD3	GMD4	GMD4	GMD5
GAP	GAP1	GAP2	GAP3	GAP4	GAP4	GAP5
FPI	FPI1	FPI2	FPI3	FPI4	FPI4	FPI5
PX	•	•	•	•	•(2)	•(2)
WMT 05	•	•(1)	•(1)	•(1)	•(2)	•(2)
WMT 10	•	•(1)	•(1)	•(1)	•(2)	•(2)

Key to reading

1. SIT3 is to be used and the 2A fuse is to be replaced with a 4A fuse
2. Install a relay, one per speed

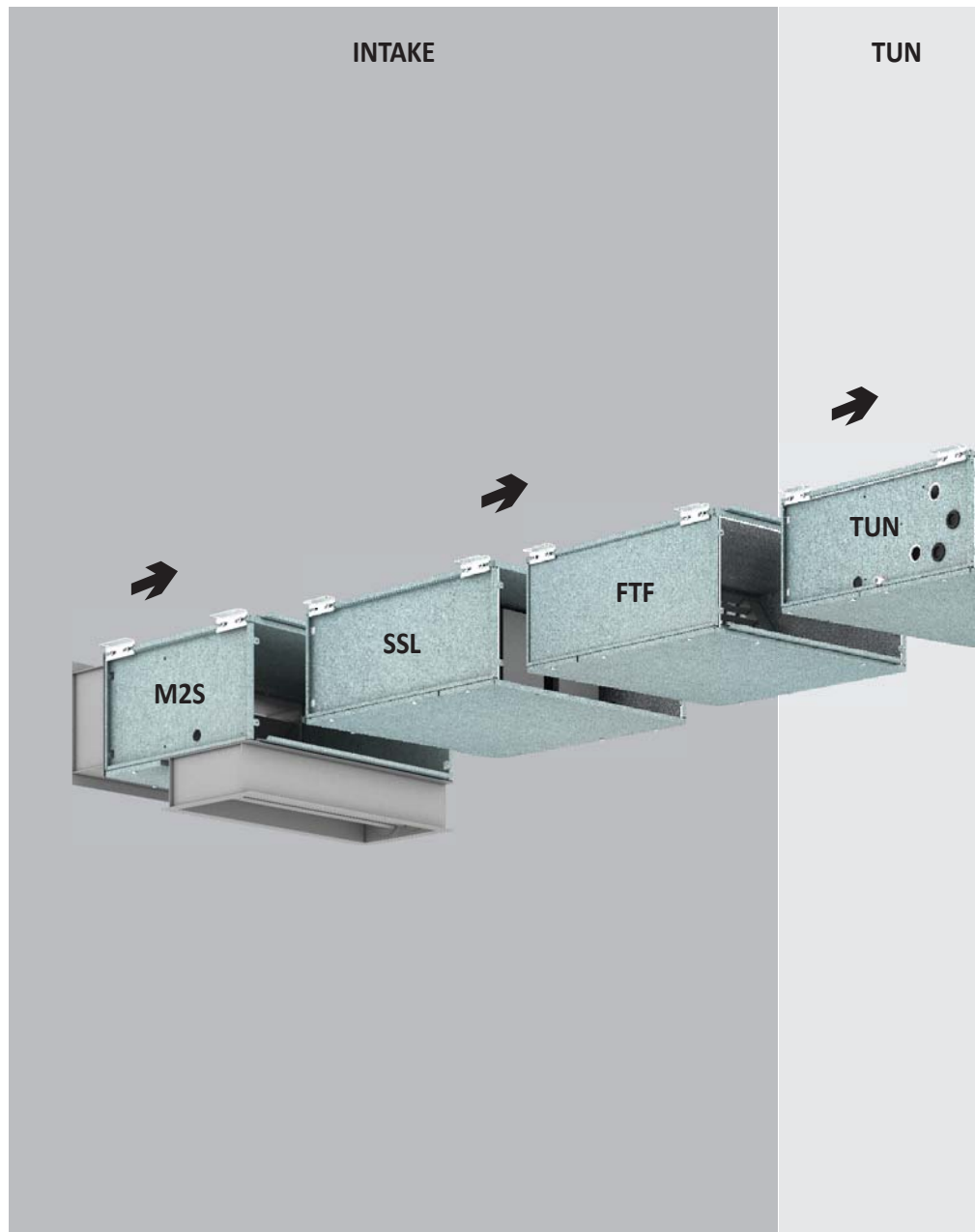
6. ACCESSORY COUPLING

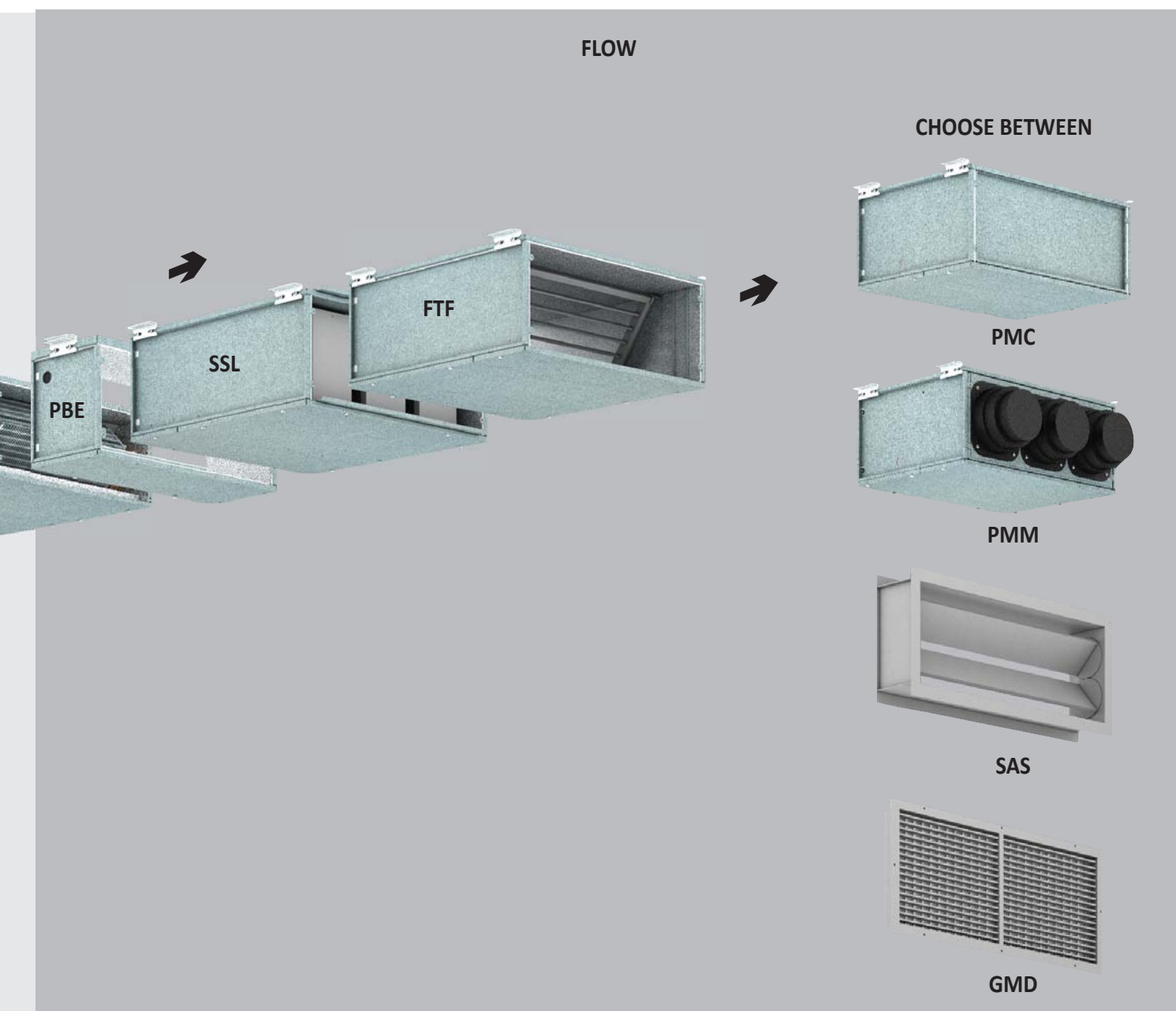
6.1. HORIZONTAL INSTALLATION "2 DAMPERS"



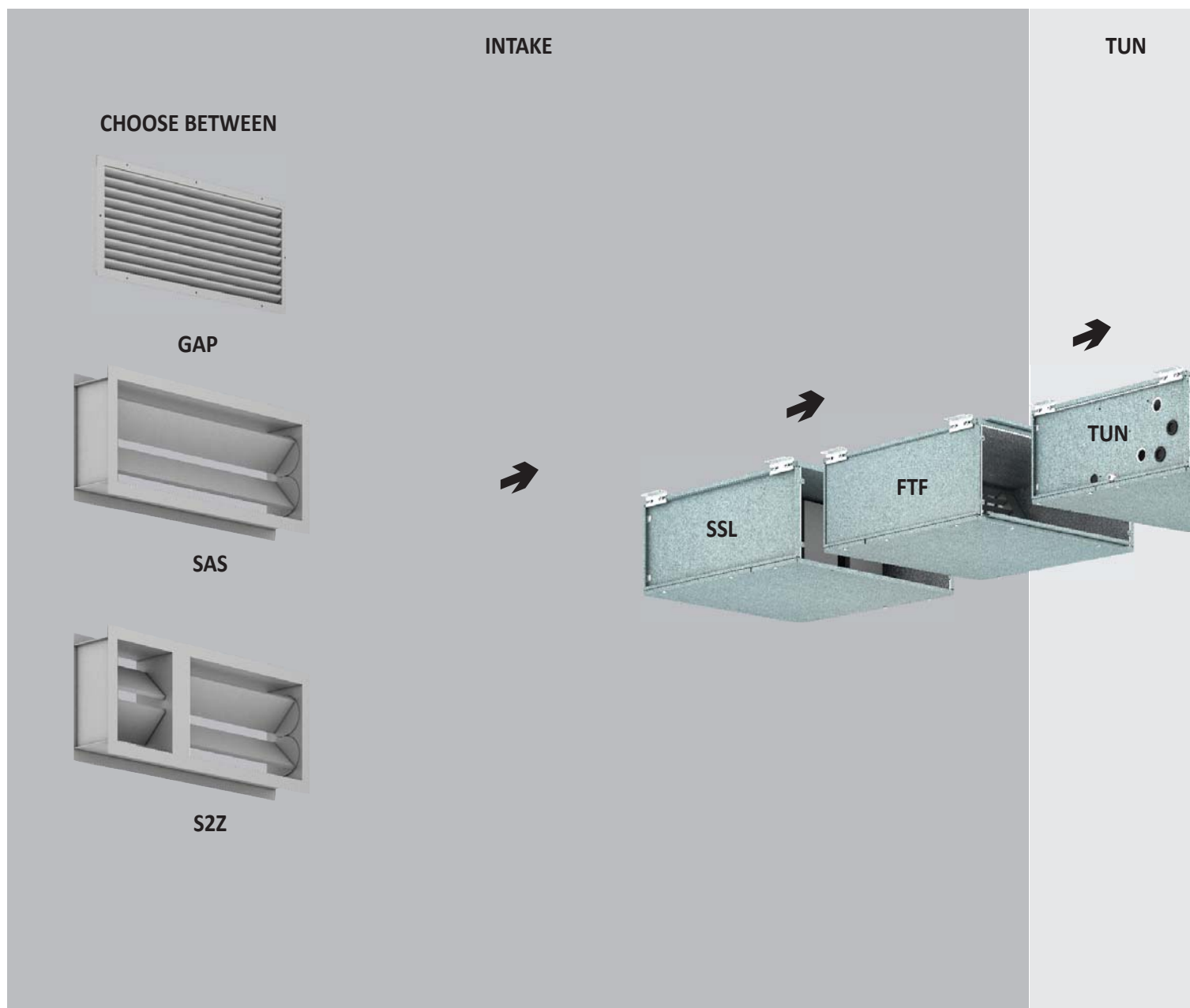
ATTENTION

The photograph is only intended to highlight how the accessories can be coupled and is not an example of the system.

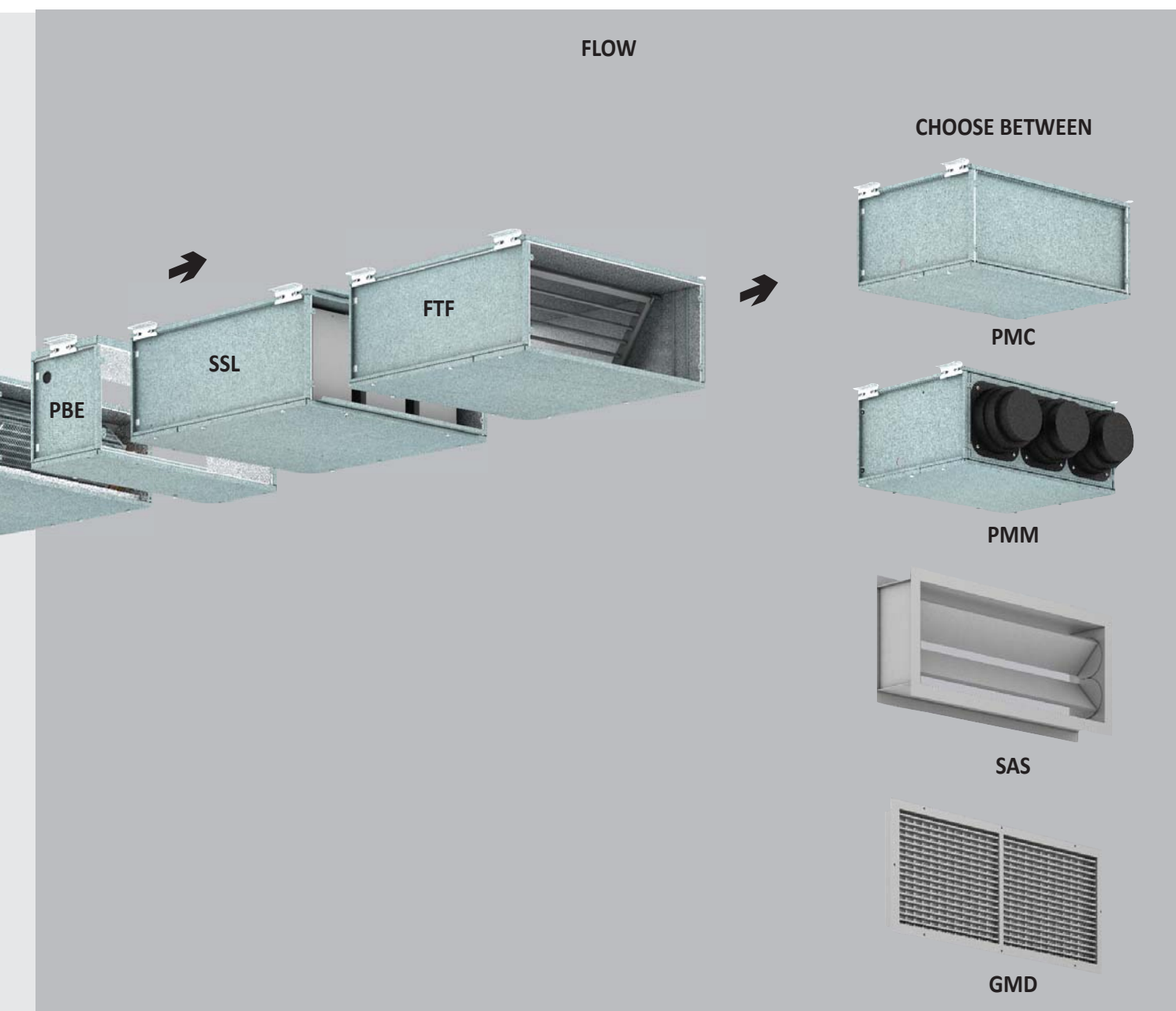




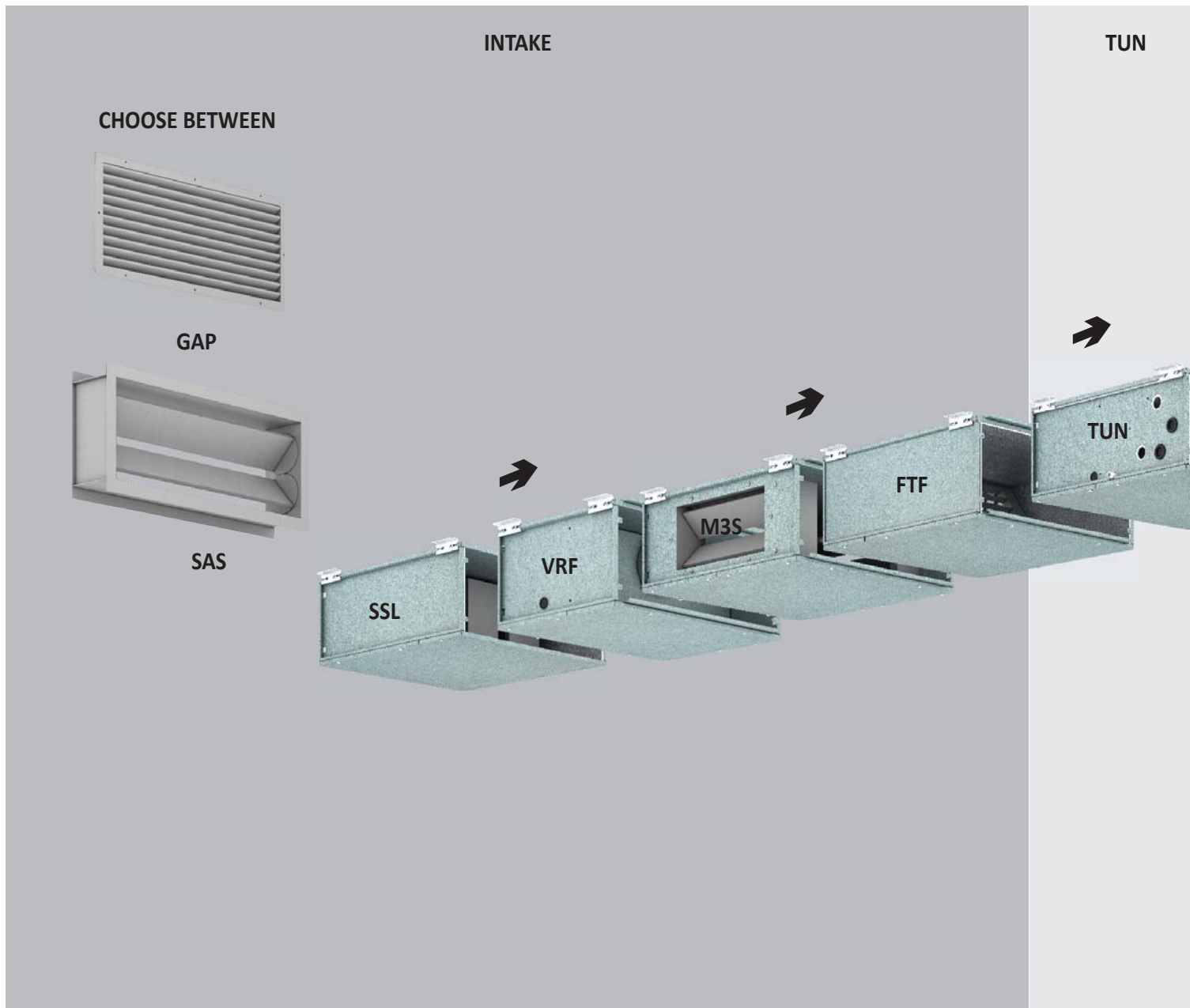
6.2. HORIZONTAL INSTALLATION "SINGLE FLOW 2 FRONT DAMPERS"

**ATTENTION**

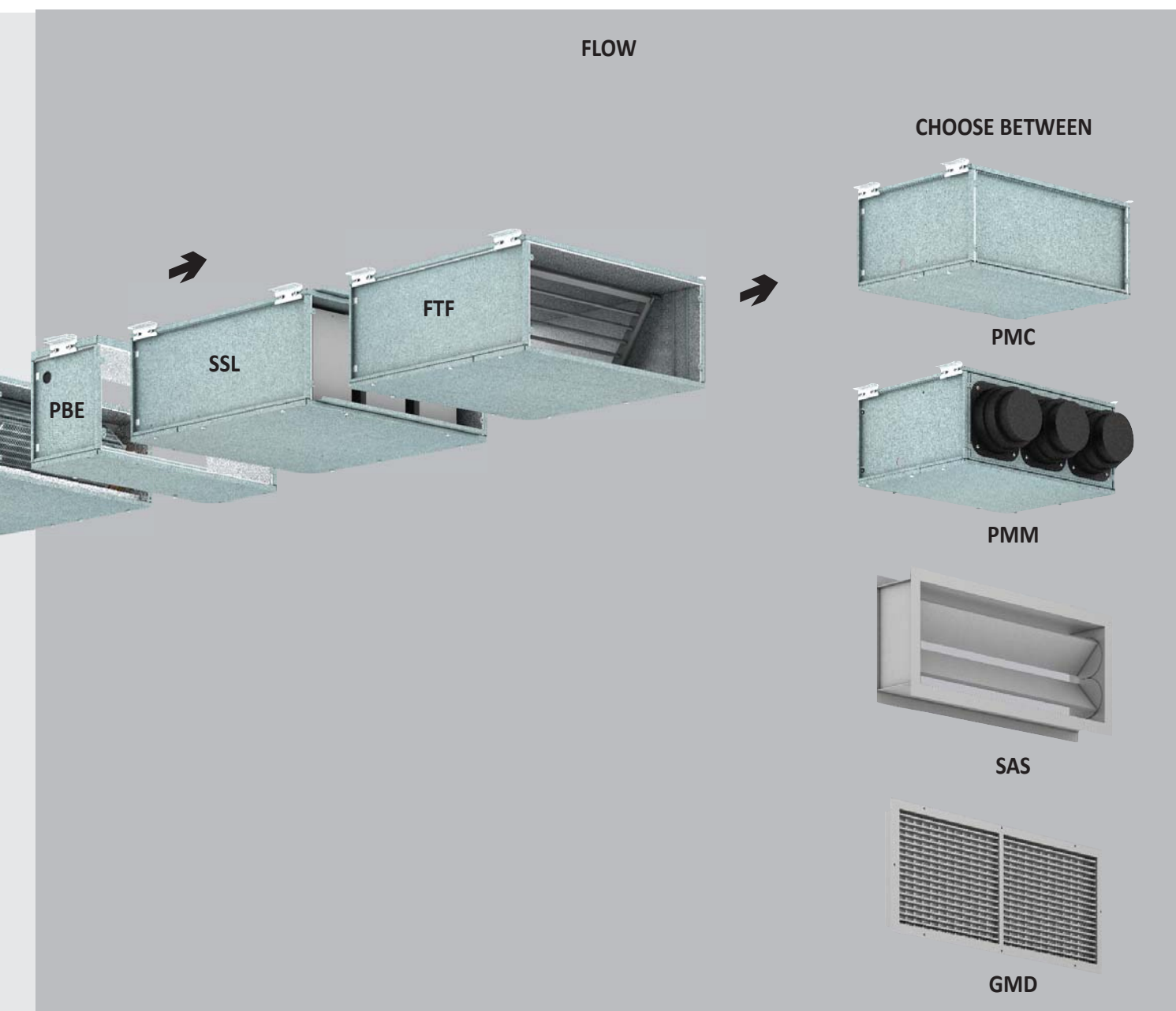
The photograph is only intended to highlight how the accessories can be coupled and is not an example of the system.

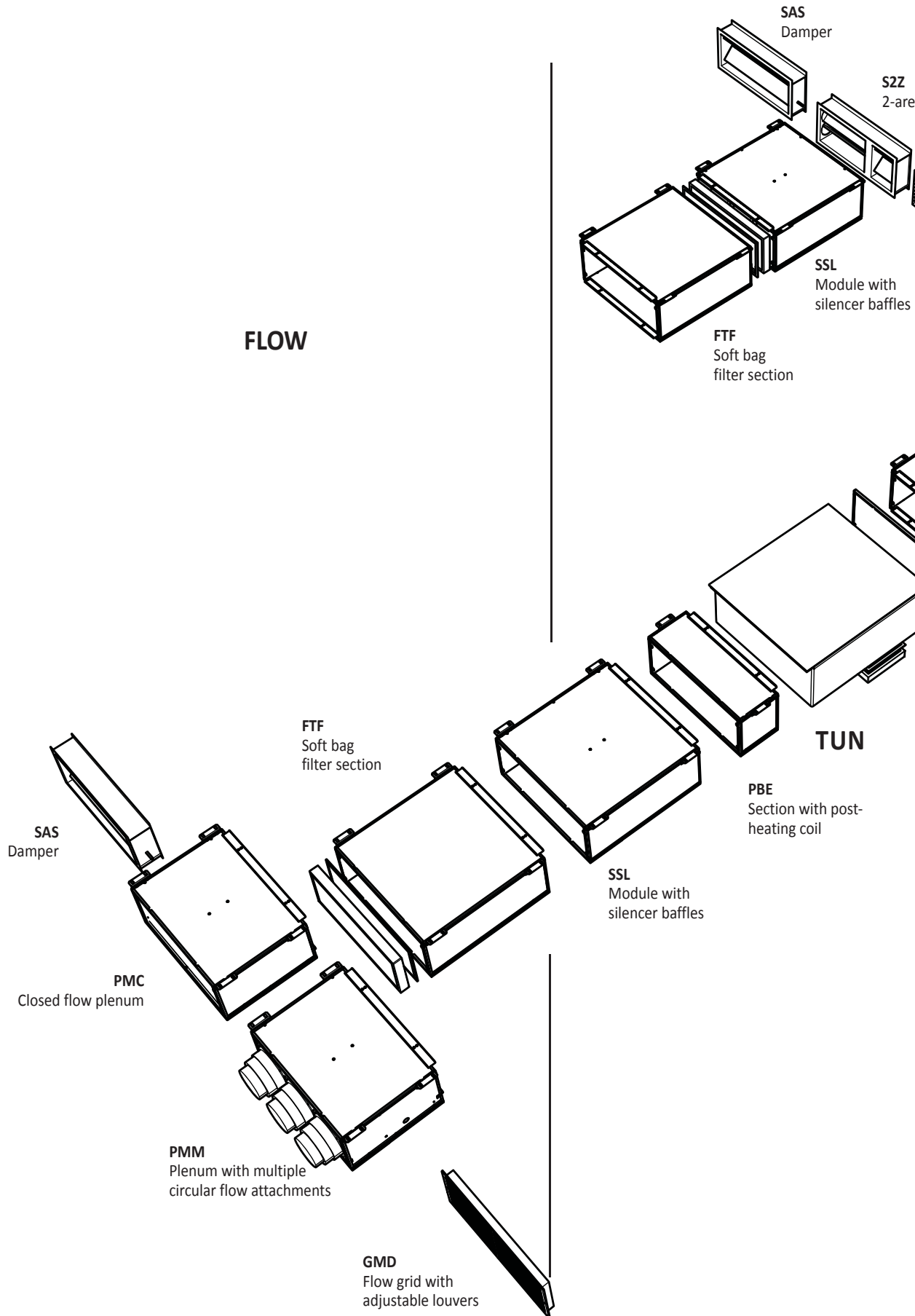


6.3. HORIZONTAL INSTALLATION "3 DAMPERS"

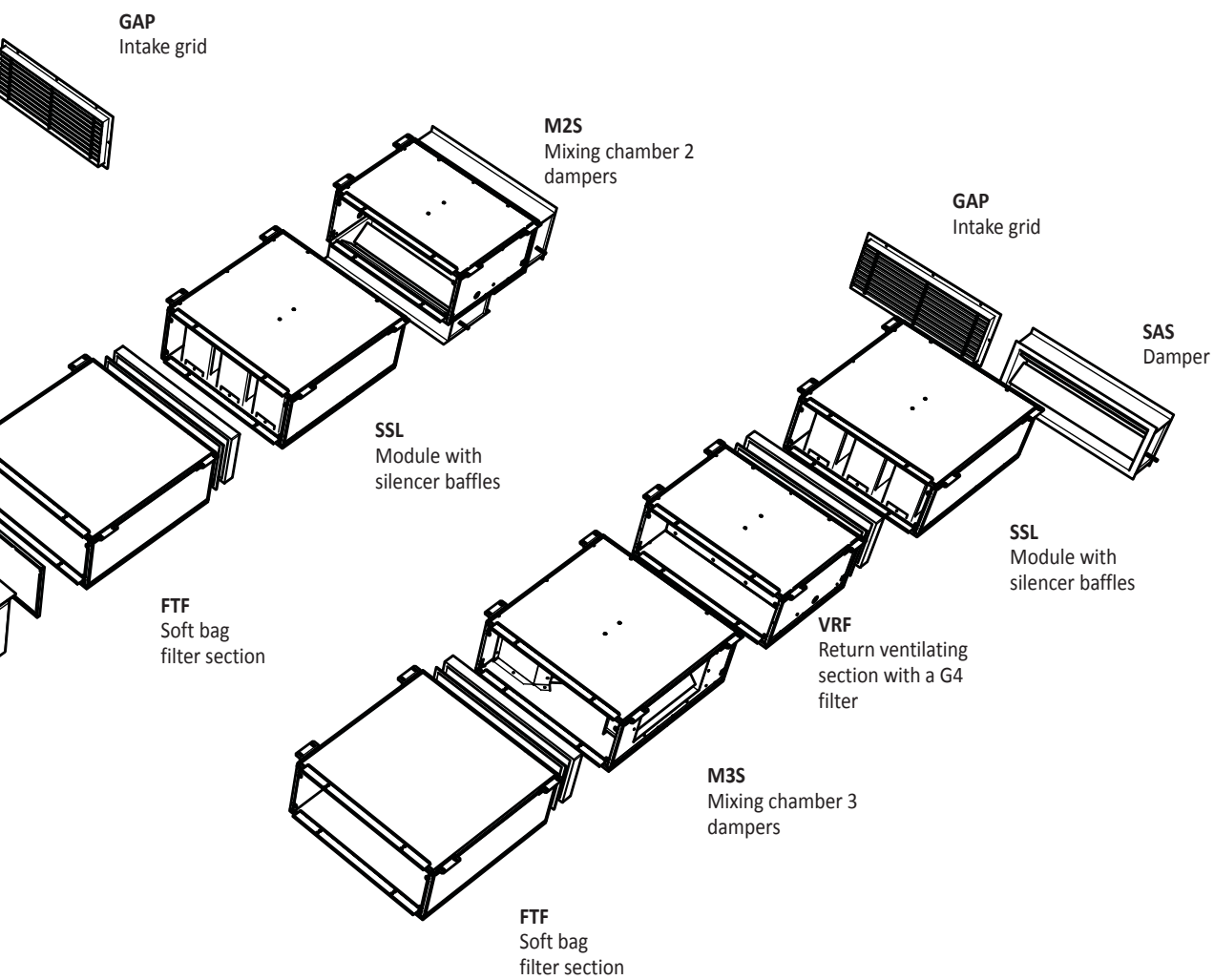
**ATTENTION**

The photograph is only intended to highlight how the accessories can be coupled and is not an example of the system.





a damper (70-30%)



INTAKE

Model			TUN10	TUN10P	TUN15	TUN20	TUN25	TUN40	TUN40P	
Cooling capacity	4-row coil ¹	total	kW	4.7	4.7	9.3	12.5	16.5	23.3	26.4
		sensitive	kW	3.6	3.6	6.6	8.7	11.4	16.3	18.2
	6-row coil ¹	total	kW	6.2	6.2	11.1	14.1	18.5	26.6	29.4
		sensitive	kW	4.4	4.4	7.6	9.8	12.7	18.5	20.1
	4-row direct expansion coil ²	total	kW	6.6	6.6	11.0	14.2	19.2	30.5	34.5
		sensitive	kW	4.2	4.2	7.0	9.1	12.1	19.4	22.3
Water flow rate	4-row coil		l/h	804	804	1599	2141	2832	4002	4536
	6-row coil		l/h	1072	1072	1910	2420	3184	4572	5051
Pressure drops	4-row coil		kPa	3	3	16	33	33	60	56
	6-row coil		kPa	9	9	34	20	20	37	28
Heating capacity	4-row coil ³		kW	11.2	16.6	19.0	24.9	32.3	46.7	51.1
	6-row coil ³		kW	12.5	18.5	21.1	27.5	35.4	52.2	56.1
	4-row coil ⁴		kW	5.5	6.4	9.3	12.1	16.0	25.9	30.8
	6-row coil ⁴		kW	6.1	7.2	10.5	13.6	17.6	28.9	34.8
Water flow rate	4-row coil		l/h	978	978	1663	2183	2831	4089	4475
	6-row coil		l/h	1097	1097	1849	2410	3101	4573	4909
Pressure drops	4-row coil		kPa	4	4	13	25	24	46	41
	6-row coil		kPa	7	7	24	15	14	28	20
4 PIPE SYSTEM YIELDS										
Heating capacity	2-row water coil ⁵		kW	7	7	11.7	15.3	20.5	27.9	31.8
Water flow rate			l/h	609	609	1026	1339	1792	2444	2786
Pressure drop			kPa	4	4	7	7	10	17	10
Nominal air flow rate		m ³ /h		900	900	1500	2000	2500	4000	4000
			l/s	250	306	417	528	667	1111	1111
Useful static pressure ⁶			Pa	110	330	150	170	150	120	220
FANS										
Fans		N°		1	2	2	1	1	2	2
Motors		N°		1	2	2	1	1	2	2
Poles		N°		2	2	2	4	4	4	4
Total input power		W		357	713	713	886	874	1771	1771
Input current		A		1.6	3.1	3.1	3.9	3.8	7.7	7.7
Fan power supply		V/Ph/Hz		230V/1/50Hz						
ELECTRIC COIL										
Electric coil capacity		kW		4	6	8	10	12	20	20
electric coil stages		n°		2	2	2	2	2	2	2
Electric power supply		V/Ph/Hz		400V/3/50Hz						
FILTERS										
Efficiency of flat filters ⁷				G2 or G4	G2 or G4	G2 or G4	G2 or G4	G2 or G4	G2 or G4	G2 or G4
Efficiency of soft bag filters ⁷				F6	F6	F6	F6	F6	F6	F6
SOUND DATA										
Sound Pressure		dB(A)								
Sound power ⁸		dB(A)		68,0	71,0	72,0	77,0	78,0	79,0	80,0
CONNECTIONS										
Coil collectors		∅		1"	1"	1"	1"	1"	1"	1"
Direct expansion coil pipes	IN	∅i mm		16	16	16	16	16	22	22
	OUT	∅i mm		22	22	22	22	22	28	28
Condensate drain		∅		3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"

Nominal reference conditions

1. Entering air temperature 27°C d.b. | 19°C w.b.
Inlet water temperature 7°C
Outlet water temperature 12°C
2. Entering air temperature 27°C d.b. | 19°C w.b.
Average evaporation temperature 2°C

3. Entering air temperature 10°C
Inlet water temperature 70°C
Outlet water temperature 60°C
4. Entering air temperature 20°C
Inlet water temperature 45°C
Outlet water temperature 50°C

5. Entering air temperature 15°C
Inlet water temperature 70°C
Outlet water temperature 60°C
6. At nominal air flow rate with a 4-row coil
7. In compliance with standard EN 779
8. In compliance with standard UNI EN ISO 9614-2

DIMENSIONS - WEIGHTS with packaging									
Height		mm							
Width		mm							
Depth		mm							
Weight		kg							

DIMENSIONS - WEIGHTS unit without packaging (HORIZONTAL CONFIGURATION AND EXTRACTOR CONFIGURATION)									
Height		mm	300	300	300	390	390	390	390
Width		mm	700	700	1050	1050	1475	1475	2100
Depth		mm	700	700	700	850	850	850	1000
Connection projection		Mm	82	82	82	82	82	82	82

NET WEIGHT UNITS WITH COILS - EXTRACTOR									
With 4-row coil		kg	33	37	47	59	88	88	108
With 6-row coil		kg	35	38	49	61	92	92	108
Extractor		kg							

8. WEIGHT OF ACCESSORIES

		Sheaves							
DESCRIPTION			TDA10	TDA10P	TDA15	TDA20	TDA25	TDA40	TDA40P
Intake grid	GAP	kg	2	2	2	3	3	4	4
Flow grid with adjustable louvers	GMD	kg	3	3	4	4	4	6	6
Intake damper	SAS	kg	3.5	3.5	4.85	6.95	7.93	7.93	11.86
2-area damper 70-30	S2Z	kg	3.10	3.10	4.15	6.10	8.21	8.21	12.33
Mixing chamber 2 dampers	M2S	kg	19	19	22	31.60	35.25	35.25	54.26
Mixing chamber 3 dampers	M3S	kg	27.5	27.5	34.30	43.10	67.88	67.88	87.47
Soft bag filters section	FTF	kg	11.59	11.59	27.29	35.48	43.95	43.95	59.60
Closed flow plenum	PMC	kg	17	17	23.10	28.30	36.57	36.57	49.41
Return ventilating section with filter	VRF	kg	17.19	17.19	30.49	38.42	57.76	57.76	73.49
Plenum with multiple circular flow attachments	PMM	kg	17	17	22.90	28	36.17	36.17	47.51
Modules with silencer baffles	SSL	kg	31.50	31.50	41.17	42.90	52.96	52.96	72.31
Section with electric post-heating coil	PBE	kg	16	16	21	23	29	57	58
4-pipe systems 2 R water post-heating coil	B2R	kg	13	13	17	19	25	33	33
Door flange suction filters G4	FPI	kg	1.48	1.48	2.14	2.14	2.22	2.22	4.20
Control panel with switch-over	PX	kg	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Control panel with thermostat	WMT05	kg	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Control panel with thermostat	WMT10	kg	0.10	0.10	0.10	0.10	0.10	0.10	0.10

9.2. TUN 10 WITH 6-ROW COIL

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
5	3	15	4.3	3.3	4.3	3.7	4.3	4.2	4.5	4.5	4.9	4.9	5.1	5.1
		17	5.6	3.3	5.6	3.7	5.6	4.2	5.6	4.6	5.5	5.1	5.6	5.3
		19	7.0	3.2	6.9	3.7	6.9	4.2	6.9	4.6	6.9	5.1	6.9	5.3
		21			8.4	3.7	8.4	4.1	8.4	4.6	8.3	5.0	8.3	5.3
		23					9.9	4.1	9.9	4.5	9.9	5.0	9.9	5.2
	5	15	3.7	3.0	3.8	3.5	4.0	4.0	4.3	4.3	4.7	4.7	4.9	4.9
		17	5.1	3.0	5.1	3.5	5.0	3.9	5.1	4.4	5.1	4.9	5.2	5.1
		19	6.5	3.0	6.4	3.5	6.4	3.9	6.4	4.4	6.4	4.8	6.4	5.0
		21			7.9	3.4	7.9	3.9	7.9	4.4	7.9	4.8	7.9	5.0
		23					9.5	3.9	9.5	4.3	9.4	4.8	9.4	5.0
	7	15	3.0	2.6	3.3	3.1	3.6	3.6	4.0	4.0	4.4	4.4	4.7	4.7
		17	4.3	2.7	4.3	3.1	4.4	3.6	4.5	4.1	4.7	4.6	4.8	4.8
		19	5.8	2.7	5.8	3.2	5.8	3.6	5.8	4.1	5.8	4.5	5.8	4.8
		21			7.4	3.2	7.3	3.6	7.3	4.1	7.3	4.5	7.3	4.8
		23					8.9	3.6	8.9	4.1	8.9	4.5	8.9	4.8
7	3	15	3.4	2.8	3.4	3.3	3.6	3.6	4.0	4.0	4.5	4.5	4.7	4.7
		17	4.6	2.8	4.6	3.3	4.6	3.7	4.6	4.2	4.7	4.6	4.7	4.7
		19	6.0	2.8	6.0	3.2	6.0	3.7	5.9	4.2	5.9	4.6	5.9	4.8
		21			7.4	3.2	7.4	3.7	5.9	4.2	7.4	4.6	7.4	4.8
		23					9.0	3.6	9.0	4.1	8.9	4.6	8.9	4.8
	5	15	2.8	2.5	3.0	3.0	3.4	3.4	3.8	3.8	4.3	4.3	4.5	4.5
		17	4.0	2.5	4.0	3.0	4.1	3.4	4.2	3.9	4.4	4.4	4.5	4.5
		19	5.4	2.5	5.4	3.0	5.4	3.5	5.4	3.9	5.4	4.4	5.4	4.6
		21			6.9	3.0	6.9	3.4	6.9	3.9	6.9	4.3	6.9	4.6
		23					8.5	3.4	8.5	3.9	8.4	4.3	8.4	4.5
	7	15	2.2	2.1	2.6	2.6	3.1	3.1	3.5	3.5	4.0	4.0	4.2	4.2
		17	3.0	2.1	3.2	2.6	3.4	3.1	3.7	3.7	4.0	4.0	4.2	4.2
		19	4.7	2.2	4.7	2.7	4.7	3.1	4.7	3.6	4.8	4.1	4.9	4.3
		21			6.3	2.7	6.2	3.2	6.2	3.6	6.2	4.1	6.2	4.3
		23					7.9	3.2	7.9	3.6	7.8	4.1	7.8	4.3
9	3	15	2.5	2.3	2.7	2.7	3.2	3.2	3.6	3.6	4.0	4.0	4.2	4.2
		17	3.6	2.3	3.6	2.8	3.6	3.2	3.7	3.7	4.0	4.0	4.2	4.2
		19	5.0	2.3	5.0	2.8	4.9	3.2	4.9	3.7	4.9	4.1	4.9	4.4
		21			6.4	2.8	6.4	3.2	6.4	3.7	6.4	4.1	6.4	4.3
		23					7.9	3.2	7.9	3.6	7.9	4.1	7.9	4.3
	5	15	2.0	2.0	2.5	2.5	2.9	2.9	3.4	3.4	3.8	3.8	4.0	4.0
		17	2.8	2.0	3.0	2.5	3.2	3.0	3.4	3.4	3.8	3.8	4.0	4.0
		19	4.3	2.1	4.3	2.5	4.3	3.0	4.3	3.4	4.4	3.9	4.5	4.1
		21			5.8	2.5	5.8	3.0	5.8	3.4	5.8	3.9	5.8	4.1
		23					7.4	3.0	7.4	3.4	7.4	3.9	7.4	4.1
	7	15	1.5	1.5	2.1	2.1	2.6	2.6	3.1	3.1	3.5	3.5	3.8	3.8
		17	1.8	1.5	2.3	2.1	2.7	2.7	3.1	3.1	3.6	3.6	3.8	3.8
		19	3.3	1.6	3.3	2.1	3.4	2.6	3.6	3.1	3.9	3.6	4.0	3.9
		21			5.0	2.2	5.0	2.7	5.0	3.1	5.0	3.6	5.1	3.8
		23					6.7	2.7	6.7	3.1	6.7	3.6	6.7	3.8

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
11	3	15	1.8	1.8	2.3	2.3	2.7	2.7	3.1	3.1	3.6	3.6	3.8	3.8
		17	2.5	1.8	2.6	2.3	2.8	2.8	3.1	3.1	3.6	3.6	3.8	3.8
		19	3.9	1.9	3.9	2.3	3.8	2.8	3.8	3.2	3.9	3.7	4.0	3.9
		21			5.3	2.3	5.3	2.8	5.3	3.2	5.3	3.7	5.3	3.9
		23					6.9	2.7	6.8	3.2	6.8	3.6	6.8	3.9
	5	15	1.5	1.5	2.0	2.0	2.5	2.5	2.9	2.9	3.4	3.4	3.6	3.6
		17	1.7	1.5	2.1	2.0	2.5	2.5	2.9	2.9	3.4	3.4	3.6	3.6
		19	3.0	1.5	3.1	2.0	3.1	2.5	3.3	3.0	3.5	3.5	3.7	3.7
		21			4.6	2.0	4.6	2.5	4.6	2.9	4.6	3.4	4.6	3.6
		23					6.2	2.5	6.2	2.9	6.2	3.4	6.2	3.6
	7	15	0.9	0.9	1.6	1.6	2.1	2.1	2.6	2.6	3.1	3.1	3.3	3.3
		17	0.9	0.9	1.6	1.6	2.1	2.1	2.6	2.6	3.1	3.1	3.3	3.3
		19	1.4	0.9	2.0	1.5	2.4	2.1	2.8	2.7	3.2	3.2	3.4	3.4
		21			3.6	1.6	3.6	2.1	3.7	2.6	3.9	3.1	4.0	3.3
		23					5.4	2.2	5.4	2.6	5.4	3.1	5.4	3.3
13	3	15	1.4	1.4	1.8	1.8	2.3	2.3	2.7	2.7	3.1	3.1	3.3	3.3
		17	1.5	1.4	1.8	1.8	2.3	2.3	2.7	2.7	3.1	3.1	3.3	3.3
		19	2.7	1.4	2.7	1.8	2.7	2.3	2.9	2.8	3.1	3.1	3.4	3.4
		21			4.1	1.8	4.1	2.3	4.1	2.7	4.1	3.2	4.1	3.4
		23					5.7	2.3	5.7	2.7	5.7	3.2	5.6	3.4
	5	15	0.9	0.9	1.5	1.5	2.0	2.0	2.5	2.5	2.9	2.9	3.1	3.1
		17	0.9	0.9	1.5	1.5	2.0	2.0	2.5	2.5	2.9	2.9	3.1	3.1
		19	1.4	0.9	1.8	1.5	2.2	2.0	2.5	2.5	2.9	2.9	3.2	3.2
		21			3.3	1.5	3.3	2.0	3.4	2.5	3.5	2.9	3.6	3.2
		23					5.0	2.0	4.9	2.5	4.9	2.9	4.9	3.1
	7	15	0.4	0.4	0.9	0.9	1.6	1.6	2.1	2.1	2.6	2.6	2.9	2.9
		17	0.4	0.4	0.9	0.9	1.6	1.6	2.1	2.1	2.6	2.6	2.9	2.9
		19	0.5	0.4	0.9	0.9	1.6	1.6	2.1	2.1	2.6	2.6	2.9	2.9
		21			1.7	1.0	2.1	1.5	2.5	2.1	2.9	2.7	3.1	2.9
		23					3.9	1.7	3.9	2.1	4.0	2.6	4.1	2.8
15	3	15	0.9	0.9	1.4	1.4	1.8	1.8	2.3	2.3	2.7	2.7	2.9	2.9
		17	0.9	0.9	1.4	1.4	1.8	1.8	2.3	2.3	2.7	2.7	2.9	2.9
		19	1.3	0.9	1.5	1.4	1.8	1.8	2.3	2.3	2.7	2.7	2.9	2.9
		21			2.8	1.4	2.8	1.8	2.9	2.3	3.0	2.8	3.1	3.0
		23					4.4	1.8	4.4	2.3	4.4	2.7	4.4	2.9
	5	15	0.4	0.4	1.0	1.0	1.5	1.5	2.0	2.0	2.5	2.5	2.7	2.7
		17	0.4	0.4	1.0	1.0	1.5	1.5	2.0	2.0	2.5	2.5	2.7	2.7
		19	0.4	0.4	1.0	1.0	1.5	1.5	2.0	2.0	2.5	2.5	2.7	2.7
		21			1.6	0.9	1.9	1.5	2.3	2.0	2.6	2.5	2.8	2.8
		23					3.5	1.5	3.5	2.0	3.6	2.4	3.6	2.7
	7	15	0.1	0.1	0.4	0.4	0.9	0.9	1.6	1.6	2.1	2.1	2.4	2.4
		17	0.1	0.1	0.4	0.4	0.9	0.9	1.6	1.6	2.2	2.2	2.4	2.4
		19	0.1	0.1	0.4	0.4	0.9	0.9	1.6	1.6	2.2	2.2	2.4	2.4
		21			0.5	0.4	0.9	0.9	1.7	1.7	2.2	2.2	2.4	2.4
		23					1.9	1.0	2.3	1.5	2.7	2.1	2.9	2.4

Key

Pc	Cooling capacity
Pcs	Sensitive cooling capacity
Tw	Temperature of produced water
R.t. w.b.	Room temperature (wet bulb)

9.3. TUN 10P WITH 4-ROW COIL

HEATING MODE

COOLING MODE

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
5	3	15	4.6	3.5	4.6	4.0	4.6	4.5	4.7	4.7	5.2	5.2	5.4	5.4
		17	5.9	3.5	5.9	4.0	5.9	4.5	5.9	5.0	5.9	5.5	5.9	5.7
		19	7.3	3.5	7.3	4.0	7.3	4.5	7.3	5.0	7.3	5.5	7.3	5.7
		21			8.9	4.0	8.8	4.4	8.8	4.9	8.8	5.4	8.8	5.7
		23					10.5	4.4	10.5	4.9	10.4	5.4	10.4	5.6
	5	15	4.0	3.2	4.0	3.7	4.2	4.2	4.5	4.5	5.0	5.0	5.2	5.2
		17	5.4	3.2	5.3	3.7	5.3	4.2	5.3	4.7	5.4	5.2	5.5	5.5
		19	6.8	3.2	6.8	3.7	6.8	4.2	6.8	4.7	6.8	5.2	6.7	5.4
		21			8.4	3.7	8.3	4.2	8.3	4.7	8.3	5.2	8.3	5.4
		23					10.0	4.2	10.0	4.7	10.0	5.1	9.9	5.4
	7	15	3.2	2.8	3.5	3.4	3.8	3.8	4.2	4.2	4.7	4.7	4.9	4.9
		17	4.6	2.9	4.5	3.4	4.6	3.9	4.8	4.4	5.0	4.9	5.1	5.1
		19	6.2	2.9	6.2	3.4	6.1	3.9	6.1	4.4	6.1	4.9	6.1	5.1
		21			7.8	3.4	7.7	3.9	7.7	4.4	7.7	4.9	7.7	5.1
		23					9.4	3.9	9.4	4.4	9.4	4.9	9.4	5.1
7	3	15	3.6	3.0	3.6	3.5	3.8	3.8	4.3	4.3	4.7	4.7	4.9	4.9
		17	4.9	3.0	4.9	3.5	4.9	4.0	4.9	4.5	4.9	4.9	5.0	5.0
		19	6.3	3.0	6.3	3.5	6.3	4.0	6.3	4.5	6.3	5.0	6.3	5.2
		21			7.8	3.5	7.8	4.0	6.3	4.5	7.8	4.9	7.8	5.2
		23					9.5	3.9	9.5	4.4	9.4	4.9	9.4	5.1
	5	15	2.9	2.7	3.2	3.2	3.6	3.6	4.0	4.0	4.5	4.5	4.7	4.7
		17	4.3	2.7	4.2	3.2	4.3	3.7	4.4	4.2	4.6	4.6	4.8	4.8
		19	5.7	2.7	5.7	3.2	5.7	3.7	5.7	4.2	5.7	4.7	5.7	4.9
		21			7.3	3.2	7.3	3.7	7.3	4.2	7.2	4.7	7.2	4.9
		23					8.9	3.7	8.9	4.2	8.9	4.7	8.9	4.9
	7	15	2.3	2.3	2.8	2.8	3.2	3.2	3.7	3.7	4.2	4.2	4.5	4.5
		17	3.2	2.2	3.4	2.8	3.6	3.4	3.9	3.9	4.3	4.3	4.5	4.5
		19	4.9	2.4	4.9	2.9	4.9	3.4	5.0	3.9	5.1	4.4	5.1	4.6
		21			6.6	2.9	6.6	3.4	6.6	3.9	6.6	4.4	6.6	4.6
		23					8.3	3.4	8.3	3.9	8.3	4.4	8.3	4.6
9	3	15	2.6	2.5	2.9	2.9	3.3	3.3	3.8	3.8	4.2	4.2	4.5	4.5
		17	3.8	2.5	3.8	3.0	3.8	3.5	3.9	3.9	4.2	4.2	4.5	4.5
		19	5.2	2.5	5.2	3.0	5.2	3.5	5.2	4.0	5.2	4.5	5.2	4.7
		21			6.8	3.0	6.7	3.5	6.7	4.0	6.7	4.4	6.7	4.7
		23					8.4	3.4	8.4	3.9	8.4	4.4	8.3	4.7
	5	15	2.1	2.1	2.6	2.6	3.1	3.1	3.6	3.6	4.0	4.0	4.3	4.3
		17	3.0	2.1	3.1	2.7	3.3	3.2	3.6	3.6	4.0	4.0	4.3	4.3
		19	4.6	2.2	4.6	2.7	4.5	3.2	4.6	3.7	4.7	4.2	4.7	4.5
		21			6.1	2.7	6.1	3.2	6.1	3.7	6.1	4.2	6.1	4.4
		23					7.8	3.2	7.8	3.7	7.8	4.2	7.8	4.4
	7	15	1.6	1.6	2.2	2.2	2.8	2.8	3.3	3.3	3.7	3.7	4.0	4.0
		17	1.9	1.7	2.4	2.3	2.8	2.8	3.3	3.3	3.8	3.8	4.0	4.0
		19	3.5	1.8	3.5	2.3	3.6	2.8	3.9	3.3	4.1	3.9	4.2	4.2
		21			5.3	2.4	5.3	2.9	5.3	3.3	5.3	3.8	5.4	4.1
		23					7.1	2.9	7.1	3.4	7.1	3.9	7.0	4.1

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
11	3	15	1.9	1.9	2.4	2.4	2.9	2.9	3.3	3.3	3.8	3.8	4.0	4.0
		17	2.6	2.0	2.7	2.5	2.9	2.9	3.3	3.3	3.8	3.8	4.0	4.0
		19	4.1	2.0	4.1	2.5	4.1	3.0	4.1	3.5	4.1	4.0	4.2	4.2
		21			5.6	2.5	5.6	3.0	5.6	3.5	5.6	3.9	5.6	4.2
		23					7.2	2.9	7.2	3.4	7.2	3.9	7.2	4.2
	5	15	1.6	1.6	2.1	2.1	2.6	2.6	3.1	3.1	3.6	3.6	3.8	3.8
		17	1.8	1.6	2.2	2.2	2.6	2.6	3.1	3.1	3.6	3.6	3.8	3.8
		19	3.2	1.7	3.2	2.1	3.3	2.7	3.5	3.2	3.7	3.7	3.9	3.9
		21			4.9	2.2	4.9	2.7	4.9	3.2	4.9	3.7	4.9	3.9
		23					6.6	2.7	6.6	3.2	6.5	3.7	6.5	3.9
	7	15	0.9	0.9	1.6	1.6	2.2	2.2	2.8	2.8	3.3	3.3	3.5	3.5
		17	0.9	0.9	1.7	1.7	2.2	2.2	2.8	2.8	3.3	3.3	3.5	3.5
		19	1.5	1.0	2.1	1.7	2.5	2.3	2.9	2.9	3.3	3.3	3.5	3.5
		21			3.8	1.8	3.8	2.3	3.9	2.8	4.1	3.3	4.2	3.6
		23					5.7	2.4	5.7	2.8	5.7	3.3	5.7	3.6
13	3	15	1.4	1.4	1.9	1.9	2.4	2.4	2.8	2.8	3.3	3.3	3.5	3.5
		17	1.5	1.5	1.9	1.9	2.4	2.4	2.9	2.9	3.3	3.3	3.5	3.5
		19	2.8	1.5	2.8	2.0	2.9	2.5	3.0	3.0	3.3	3.3	3.5	3.5
		21			4.4	2.0	4.4	2.5	4.3	3.0	4.3	3.4	4.4	3.7
		23					6.0	2.5	6.0	2.9	6.0	3.4	6.0	3.7
	5	15	1.0	1.0	1.6	1.6	2.1	2.1	2.6	2.6	3.1	3.1	3.3	3.3
		17	1.0	1.0	1.6	1.6	2.1	2.1	2.6	2.6	3.1	3.1	3.3	3.3
		19	1.5	1.0	1.9	1.6	2.3	2.2	2.7	2.7	3.1	3.1	3.3	3.3
		21			3.5	1.7	3.5	2.1	3.6	2.6	3.7	3.2	3.8	3.4
		23					5.2	2.2	5.2	2.7	5.2	3.1	5.2	3.4
	7	15	0.5	0.5	0.9	0.9	1.7	1.7	2.3	2.3	2.8	2.8	3.0	3.0
		17	0.5	0.5	0.9	0.9	1.7	1.7	2.3	2.3	2.8	2.8	3.0	3.0
		19	0.5	0.5	0.9	0.9	1.7	1.7	2.3	2.3	2.8	2.8	3.0	3.0
		21			1.8	1.0	2.3	1.7	2.7	2.3	3.1	2.9	3.2	3.1
		23					4.1	1.8	4.1	2.3	4.2	2.8	4.3	3.0
15	3	15	0.9	0.9	1.4	1.4	1.9	1.9	2.4	2.4	2.8	2.8	3.1	3.1
		17	0.9	0.9	1.4	1.4	1.9	1.9	2.4	2.4	2.8	2.8	3.1	3.1
		19	1.3	0.9	1.6	1.5	2.0	2.0	2.4	2.4	2.8	2.8	3.1	3.1
		21			3.0	1.5	3.0	2.0	3.0	2.5	3.2	3.0	3.3	3.2
		23					4.7	2.0	4.7	2.5	4.6	2.9	4.6	3.2
	5	15	0.4	0.4	1.0	1.0	1.6	1.6	2.1	2.1	2.6	2.6	2.8	2.8
		17	0.4	0.4	1.0	1.0	1.6	1.6	2.1	2.1	2.6	2.6	2.8	2.8
		19	0.4	0.4	1.0	1.0	1.6	1.6	2.1	2.1	2.6	2.6	2.8	2.8
		21			1.7	1.0	2.0	1.6	2.4	2.2	2.7	2.7	2.9	2.9
		23					3.7	1.6	3.7	2.1	3.8	2.6	3.8	2.9
	7	15	0.1	0.1	0.5	0.5	1.0	1.0	1.7	1.7	2.3	2.3	2.5	2.5
		17	0.1	0.1	0.5	0.5	1.0	1.0	1.7	1.7	2.3	2.3	2.5	2.5
		19	0.1	0.1	0.5	0.5	1.0	1.0	1.7	1.7	2.3	2.3	2.5	2.5
		21			0.5	0.5	1.0	1.0	1.8	1.8	2.3	2.3	2.5	2.5
		23					2.0	1.1	2.4	1.7	2.8	2.3	3.0	2.5

Key	
Pc	Cooling capacity
Pcs	Sensitive cooling capacity
Tw	Temperature of produced water
R.t. w.b.	Room temperature (wet bulb)

9.4. TUN 10P WITH 6-ROW COIL

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
3	5	15	5.4	4.0	5.4	4.5	5.4	5.1	5.5	5.5	6.1	6.1	6.3	6.3
		17	6.9	3.9	6.9	4.5	6.9	5.0	6.9	5.6	6.9	6.1	6.9	6.4
		19	8.6	3.9	8.6	4.5	8.6	5.0	8.6	5.6	8.5	6.1	8.5	6.4
		21			10.4	4.4	10.4	5.0	10.4	5.5	10.3	6.1	10.3	6.3
		23					12.3	4.9	12.3	5.5	12.3	6.0	12.3	6.3
	5	15	4.6	3.6	4.7	4.2	5.0	4.8	5.3	5.3	5.8	5.8	6.1	6.1
		17	6.3	3.6	6.3	4.2	6.3	4.7	6.3	5.3	6.4	5.8	6.4	6.1
		19	8.0	3.6	8.0	4.2	8.0	4.7	8.0	5.3	7.9	5.8	7.9	6.1
		21			9.8	4.1	9.8	4.7	9.8	5.2	9.8	5.8	9.7	6.1
		23					11.8	4.7	11.7	5.2	11.7	5.8	11.7	6.0
	7	15	3.7	3.1	4.1	3.8	4.4	4.4	5.0	5.0	5.5	5.5	5.8	5.8
		17	5.4	3.2	5.3	3.8	5.4	4.3	5.6	4.9	5.8	5.5	6.0	5.8
		19	7.3	3.3	7.2	3.8	7.2	4.4	7.2	4.9	7.2	5.5	7.2	5.8
		21			9.1	3.8	9.1	4.4	9.1	4.9	9.1	5.5	9.1	5.8
		23					11.1	4.4	11.1	4.9	11.0	5.5	11.0	5.7
3	5	15	4.2	3.4	4.2	3.9	4.5	4.5	5.0	5.0	5.5	5.5	5.8	5.8
		17	5.8	3.4	5.7	3.9	5.7	4.5	5.7	5.0	5.8	5.6	5.9	5.9
		19	7.4	3.4	7.4	3.9	7.4	4.5	7.4	5.0	7.4	5.5	7.3	5.8
		21			9.2	3.9	9.2	4.4	9.2	5.0	9.1	5.5	9.1	5.8
		23					11.1	4.4	11.1	4.9	11.1	5.5	11.1	5.8
	7	15	3.4	3.0	3.8	3.6	4.2	4.2	4.7	4.7	5.3	5.3	5.5	5.5
		17	5.0	3.0	5.0	3.6	5.0	4.2	5.2	4.7	5.4	5.3	5.6	5.6
		19	6.7	3.1	6.7	3.6	6.7	4.2	6.7	4.7	6.7	5.2	6.7	5.5
		21			8.6	3.6	8.5	4.1	8.5	4.7	8.5	5.2	8.5	5.5
		23					10.5	4.1	10.5	4.7	10.5	5.2	10.4	5.5
	7	15	2.7	2.6	3.2	3.2	3.8	3.8	4.4	4.4	5.0	5.0	5.2	5.2
		17	3.8	2.5	4.0	3.1	4.3	3.8	4.6	4.4	5.0	5.0	5.2	5.2
		19	5.8	2.7	5.8	3.2	5.8	3.8	5.8	4.3	6.0	4.9	6.0	5.2
		21			7.8	3.3	7.8	3.8	7.7	4.4	7.7	4.9	7.7	5.2
		23					9.8	3.8	9.7	4.4	9.7	4.9	9.7	5.2
3	5	15	3.0	2.8	3.4	3.4	3.9	3.9	4.4	4.4	5.0	5.0	5.2	5.2
		17	4.5	2.8	4.5	3.4	4.5	3.9	4.6	4.5	5.0	5.0	5.2	5.2
		19	6.2	2.8	6.1	3.4	6.1	3.9	6.1	4.4	6.1	5.0	6.1	5.3
		21			7.9	3.3	7.9	3.9	7.9	4.4	7.9	5.0	7.9	5.2
		23					9.9	3.8	9.8	4.4	9.8	4.9	9.8	5.2
	7	15	2.5	2.5	3.1	3.1	3.6	3.6	4.2	4.2	4.7	4.7	5.0	5.0
		17	3.5	2.4	3.7	3.0	3.9	3.6	4.3	4.2	4.7	4.7	5.0	5.0
		19	5.4	2.5	5.4	3.0	5.3	3.6	5.4	4.1	5.5	4.7	5.6	5.0
		21			7.2	3.0	7.2	3.6	7.2	4.1	7.2	4.7	7.2	4.9
		23					9.2	3.6	9.1	4.1	9.1	4.7	9.1	4.9
	7	15	1.9	1.9	2.6	2.6	3.2	3.2	3.8	3.8	4.4	4.4	4.7	4.7
		17	2.3	1.9	2.8	2.6	3.3	3.2	3.8	3.8	4.4	4.4	4.7	4.7
		19	4.1	2.0	4.1	2.5	4.3	3.1	4.5	3.7	4.8	4.4	5.0	4.7
		21			6.3	2.7	6.2	3.2	6.2	3.7	6.3	4.3	6.3	4.6
		23					8.3	3.2	8.3	3.8	8.3	4.3	8.3	4.6

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
3	5	15	2.3	2.3	2.8	2.8	3.4	3.4	3.9	3.9	4.4	4.4	4.7	4.7
		17	3.1	2.2	3.2	2.8	3.4	3.4	3.9	3.9	4.4	4.4	4.7	4.7
		19	4.8	2.2	4.8	2.8	4.8	3.3	4.8	3.9	4.9	4.4	4.9	4.7
		21			6.6	2.8	6.6	3.3	6.6	3.9	6.5	4.4	6.5	4.7
		23					8.5	3.3	8.5	3.8	8.5	4.4	8.5	4.7
	7	15	1.8	1.8	2.5	2.5	3.1	3.1	3.6	3.6	4.2	4.2	4.4	4.4
		17	2.1	1.8	2.6	2.5	3.1	3.1	3.6	3.6	4.2	4.2	4.5	4.5
		19	3.8	1.9	3.8	2.4	3.9	3.0	4.1	3.6	4.4	4.2	4.6	4.5
		21			5.7	2.5	5.7	3.0	5.7	3.5	5.7	4.1	5.8	4.4
		23					7.7	3.0	7.7	3.6	7.7	4.1	7.7	4.4
	7	15	1.1	1.1	1.9	1.9	2.6	2.6	3.2	3.2	3.8	3.8	4.1	4.1
		17	1.1	1.1	1.9	1.9	2.6	2.6	3.3	3.3	3.8	3.8	4.1	4.1
		19	1.8	1.1	2.5	1.9	3.0	2.6	3.5	3.2	3.9	3.9	4.2	4.2
		21			4.5	2.0	4.5	2.5	4.6	3.1	4.8	3.7	4.9	4.0
		23					6.7	2.6	6.7	3.2	6.7	3.7	6.7	4.0
3	5	15	1.7	1.7	2.3	2.3	2.8	2.8	3.3	3.3	3.9	3.9	4.1	4.1
		17	1.8	1.7	2.3	2.3	2.8	2.8	3.4	3.4	3.9	3.9	4.2	4.2
		19	3.3	1.7	3.3	2.2	3.4	2.8	3.6	3.4	3.9	3.9	4.2	4.2
		21			5.1	2.2	5.1	2.8	5.1	3.3	5.1	3.8	5.1	4.1
		23					7.0	2.8	7.0	3.3	7.0	3.8	7.0	4.1
	7	15	1.1	1.1	1.9	1.9	2.5	2.5	3.1	3.1	3.6	3.6	3.9	3.9
		17	1.1	1.1	1.9	1.9	2.5	2.5	3.1	3.1	3.6	3.6	3.9	3.9
		19	1.8	1.1	2.2	1.8	2.7	2.4	3.1	3.1	3.6	3.6	3.9	3.9
		21			4.1	1.9	4.1	2.4	4.2	3.0	4.4	3.5	4.5	3.8
		23					6.1	2.4	6.1	3.0	6.1	3.5	6.1	3.8
	7	15	0.5	0.5	1.1	1.1	2.0	2.0	2.6	2.6	3.3	3.3	3.6	3.6
		17	0.5	0.5	1.1	1.1	2.0	2.0	2.7	2.7	3.3	3.3	3.6	3.6
		19	0.6	0.5	1.1	1.1	2.0	2.0	2.7	2.7	3.3	3.3	3.6	3.6
		21			2.1	1.2	2.7	1.9	3.1	2.5	3.6	3.2	3.8	3.5
		23					4.9	2.0	4.9	2.5	5.0	3.1	5.0	3.4
3	5	15	1.1	1.1	1.7	1.7	2.2	2.2	2.8	2.8	3.3	3.3	3.6	3.6
		17	1.1	1.1	1.7	1.7	2.3	2.3	2.8	2.8	3.3	3.3	3.6	3.6
		19	1.6	1.0	1.9	1.6	2.3	2.3	2.8	2.8	3.3	3.3	3.6	3.6
		21			3.5	1.7	3.5	2.2	3.6	2.7	3.7	3.3	3.8	3.6
		23					5.5	2.2	5.5	2.7	5.5	3.3	5.5	3.5
	7	15	0.4	0.4	1.2	1.2	1.9	1.9	2.5	2.5	3.1	3.1	3.3	3.3
		17	0.4	0.4	1.2	1.2	1.9	1.9	2.5	2.5	3.1	3.1	3.3	3.3
		19	0.4	0.4	1.2	1.2	1.9	1.9	2.5	2.5	3.1	3.1	3.3	3.3
		21			2.0	1.1	2.4	1.8	2.8	2.4	3.2	3.0	3.4	3.4
		23					4.4	1.8	4.4	2.4	4.4	2.9	4.5	3.2
	7	15	0.1	0.1	0.5	0.5	1.1	1.1	2.0	2.0	2.7	2.7	3.0	3.0
		17	0.1	0.1	0.5	0.5	1.1	1.1	2.0	2.0	2.7	2.7	3.0	3.0
		19	0.1	0.1	0.5	0.5	1.1	1.1	2.0	2.0	2.7	2.7	3.0	3.0
		21			0.6	0.5	1.2	1.2	2.1	2.0	2.7	2.7	3.0	3.0
		23					2.3	1.2	2.9	1.9	3.3	2.5	3.5	2.8

HEATING MODE

COOLING MODE

Key

Pc	Cooling capacity
Pcs	Sensitive cooling capacity
Tw	Temperature of produced water
R.t. w.b.	Room temperature (wet bulb)

9.6. TUN 15 WITH 6-ROW COIL

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
3	5	15	9.4	6.3	9.4	7.2	9.4	8.1	9.7	8.9	10.6	9.8	11.1	10.2
		17	12.1	6.3	12.1	7.2	12.1	8.0	12.1	8.9	12.0	9.8	12.0	10.2
		19	15.1	6.2	15.0	7.1	15.0	8.0	15.0	8.9	14.9	9.7	14.9	10.2
		21			18.2	7.1	18.1	7.9	18.1	8.8	18.0	9.7	18.0	10.1
		23					21.5	7.9	21.5	8.7	21.4	9.6	21.4	10.1
	7	15	8.1	5.7	8.3	6.7	8.6	7.6	9.2	8.5	10.2	9.4	10.6	9.8
		17	11.0	5.8	11.0	6.7	10.9	7.5	11.0	8.4	11.1	9.3	11.2	9.8
		19	14.0	5.8	14.0	6.7	13.9	7.5	13.9	8.4	13.9	9.3	13.8	9.7
		21			17.1	6.6	17.1	7.5	17.1	8.4	17.0	9.3	17.0	9.7
		23					20.5	7.4	20.5	8.3	20.4	9.2	20.4	9.6
	9	15	6.5	5.0	7.1	6.1	7.8	7.0	8.7	8.0	9.6	8.9	10.1	9.3
		17	9.3	5.1	9.3	6.0	9.5	6.9	9.8	7.9	10.2	8.8	10.5	9.3
		19	12.7	5.2	12.6	6.1	12.6	7.0	12.6	7.9	12.6	8.7	12.6	9.2
		21			15.9	6.1	15.9	7.0	15.9	7.9	15.8	8.7	15.8	9.2
		23					19.4	7.0	19.3	7.8	19.3	8.7	19.3	9.2
5	3	15	7.3	5.4	7.4	6.3	7.8	7.2	8.7	8.0	9.6	8.9	10.1	9.3
		17	10.0	5.4	10.0	6.3	10.0	7.1	10.0	8.0	10.2	8.9	10.3	9.3
		19	13.0	5.4	13.0	6.2	12.9	7.1	12.9	8.0	12.9	8.9	12.8	9.3
		21			16.1	6.2	16.0	7.1	12.9	8.0	16.0	8.8	16.0	9.2
		23					19.4	7.0	19.4	7.9	19.4	8.8	19.3	9.2
	7	15	6.0	4.8	6.6	5.8	7.3	6.7	8.3	7.6	9.2	8.5	9.7	8.9
		17	8.7	4.9	8.7	5.7	8.8	6.6	9.1	7.6	9.4	8.5	9.8	8.9
		19	11.8	4.9	11.7	5.8	11.7	6.6	11.7	7.5	11.7	8.4	11.7	8.8
		21			15.0	5.7	14.9	6.6	14.9	7.5	14.9	8.4	14.8	8.8
		23					18.3	6.6	18.3	7.4	18.3	8.3	18.2	8.7
	9	15	4.7	4.1	5.6	5.2	6.7	6.1	7.7	7.1	8.7	8.0	9.1	8.4
		17	6.6	4.0	7.0	5.0	7.5	6.0	8.0	7.0	8.7	8.0	9.2	8.4
		19	10.1	4.2	10.1	5.1	10.1	6.0	10.2	6.9	10.4	7.8	10.6	8.3
		21			13.6	5.2	13.5	6.1	13.5	6.9	13.5	7.8	13.5	8.3
		23					17.0	6.1	17.0	6.9	17.0	7.8	17.0	8.3
7	3	15	5.3	4.5	5.9	5.4	6.8	6.3	7.8	7.1	8.7	8.0	9.1	8.4
		17	7.8	4.5	7.8	5.4	7.8	6.2	8.1	7.2	8.7	8.0	9.2	8.4
		19	10.8	4.5	10.7	5.4	10.7	6.2	10.7	7.1	10.7	8.0	10.7	8.4
		21			13.9	5.3	13.8	6.2	13.8	7.1	13.8	7.9	13.8	8.4
		23					17.2	6.1	17.2	7.0	17.1	7.9	17.1	8.3
	5	15	4.4	3.9	5.3	4.9	6.3	5.8	7.3	6.7	8.3	7.6	8.7	8.0
		17	6.1	3.8	6.4	4.8	6.8	5.8	7.4	6.7	8.3	7.6	8.7	8.0
		19	9.4	3.9	9.3	4.8	9.3	5.7	9.4	6.6	9.6	7.5	9.7	8.0
		21			12.6	4.8	12.6	5.7	12.5	6.6	12.5	7.4	12.5	7.9
		23					16.0	5.7	16.0	6.6	15.9	7.4	15.9	7.9
	7	15	3.3	3.0	4.5	4.2	5.6	5.2	6.7	6.2	7.7	7.1	8.2	7.5
		17	4.0	3.0	4.9	4.1	5.8	5.2	6.7	6.2	7.7	7.1	8.2	7.5
		19	7.1	3.1	7.2	4.0	7.5	5.0	7.9	6.0	8.4	7.0	8.7	7.5
		21			10.9	4.2	10.9	5.1	10.9	6.0	10.9	6.9	11.0	7.3
		23					14.5	5.2	14.5	6.0	14.5	6.9	14.5	7.3
11	3	15	3.9	3.6	4.9	4.5	5.9	5.4	6.8	6.3	7.7	7.1	8.2	7.5
		17	5.4	3.5	5.6	4.5	6.0	5.4	6.8	6.3	7.7	7.1	8.2	7.6
		19	8.4	3.6	8.3	4.5	8.3	5.3	8.3	6.2	8.5	7.1	8.6	7.5
		21			11.5	4.4	11.5	5.3	11.4	6.2	11.4	7.0	11.4	7.5
		23					14.8	5.3	14.8	6.1	14.8	7.0	14.8	7.4
	5	15	3.2	3.0	4.3	4.0	5.3	4.9	6.3	5.8	7.3	6.7	7.8	7.1
		17	3.7	2.9	4.5	3.9	5.3	4.9	6.3	5.8	7.3	6.7	7.8	7.2
		19	6.6	3.0	6.6	3.8	6.8	4.8	7.2	5.7	7.7	6.7	8.0	7.2
		21			10.0	3.9	10.0	4.8	10.0	5.7	10.0	6.5	10.1	7.0
		23					13.5	4.8	13.5	5.7	13.4	6.5	13.4	7.0
	7	15	1.9	1.7	3.4	3.1	4.6	4.2	5.7	5.2	6.7	6.2	7.2	6.6
		17	1.9	1.7	3.4	3.1	4.6	4.2	5.7	5.2	6.7	6.2	7.2	6.6
		19	3.1	1.8	4.3	3.0	5.2	4.1	6.0	5.1	6.8	6.2	7.3	6.7
		21			7.8	3.2	7.8	4.0	8.0	5.0	8.4	5.9	8.6	6.4
		23					11.8	4.2	11.7	5.1	11.7	5.9	11.7	6.4
13	3	15	2.9	2.7	3.9	3.6	4.9	4.5	5.8	5.4	6.8	6.2	7.2	6.7
		17	3.2	2.7	3.9	3.6	4.9	4.5	5.9	5.4	6.8	6.3	7.3	6.7
		19	5.8	2.7	5.7	3.5	5.9	4.4	6.2	5.3	6.8	6.3	7.3	6.7
		21			8.9	3.6	8.9	4.4	8.9	5.3	8.9	6.1	8.9	6.6
		23					12.3	4.4	12.3	5.3	12.2	6.1	12.2	6.5
	5	15	2.0	1.8	3.2	3.0	4.3	4.0	5.3	4.9	6.3	5.8	6.8	6.3
		17	2.0	1.8	3.3	3.0	4.3	4.0	5.3	4.9	6.3	5.8	6.8	6.3
		19	3.1	1.8	3.9	2.8	4.7	3.9	5.5	4.9	6.3	5.8	6.8	6.3
		21			7.1	3.0	7.1	3.8	7.3	4.7	7.6	5.7	7.8	6.1
		23					10.7	3.9	10.7	4.7	10.7	5.6	10.7	6.0
	7	15	1.0	0.9	1.9	1.7	3.5	3.2	4.6	4.3	5.7	5.2	6.2	5.7
		17	1.0	0.9	1.9	1.7	3.5	3.2	4.6	4.3	5.7	5.3	6.2	5.7
		19	1.0	0.8	1.9	1.7	3.5	3.2	4.6	4.3	5.7	5.3	6.2	5.7
		21			3.6	1.8	4.6	3.0	5.5	4.1	6.3	5.1	6.7	5.6
		23					8.5	3.2	8.5	4.0	8.6	4.9	8.8	5.4
15	3	15	1.9	1.7	2.9	2.7	3.9	3.6	4.9	4.5	5.8	5.4	6.3	5.8
		17	1.9	1.7	2.9	2.7	3.9	3.6	4.9	4.5	5.8	5.4	6.3	5.8
		19	2.7	1.6	3.3	2.6	4.0	3.6	4.9	4.5	5.8	5.4	6.3	5.8
		21			6.2	2.6	6.1	3.5	6.2	4.4	6.5	5.3	6.7	5.7
		23					9.6	3.5	9.6	4.4	9.5	5.2	9.5	5.6
	5	15	0.8	0.7	2.1	1.9	3.3	3.0	4.3	4.0	5.3	4.9	5.8	5.4
		17	0.8	0.7	2.1	1.9	3.3	3.0	4.3	4.0	5.3	4.9	5.8	5.4
		19	0.8	0.7	2.1	1.9	3.3	3.0	4.3	4.0	5.4	4.9	5.8	5.4
		21			3.4	1.8	4.2	2.8	4.9	3.9	5.6	4.9	6.0	5.4
		23					7.7	2.9	7.7	3.8	7.8	4.7	7.9	5.1
	7	15	0.2	0.1	1.0	0.9	2.0	1.8	3.5	3.2	4.7	4.3	5.2	4.8
		17	0.2	0.1	1.0	0.9	2.0	1.8	3.5	3.2	4.7	4.3	5.2	4.8
		19	0.2	0.1	1.0	0.9	2.0	1.8	3.5	3.2	4.7	4.3	5.2	4.8
		21			1.0	0.8	2.0	1.8	3.6	3.2	4.7	4.3	5.2	4.8
		23					4.1	1.9	5.0	3.0	5.8	4.0	6.2	4.5

HEATING MODE

COOLING MODE

Key	
Pc	Cooling capacity
Pcs	Sensitive cooling capacity
Tw	Temperature of produced water
R.t. w.b.	Room temperature (wet bulb)

9.7. TUN 20 WITH 4-ROW COIL

HEATING MODE

COOLING MODE

Tw (°C)	Δt (°C)	Room temperature d.b.(°C)													
		R.t. w.b. (°C)													
		21		23		25		27		29		30			
		Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)		
5	3	15	10.0	7.0	9.9	8.0	10.0	8.9	10.3	9.9	11.2	10.8	11.7	11.3	
		17	12.9	7.0	12.8	7.9	12.8	8.9	12.8	9.9	12.7	10.8	12.7	11.3	
		19	16.0	6.9	15.9	7.9	15.9	8.9	15.9	9.8	15.8	10.8	15.8	11.3	
		21			19.3	7.8	19.2	8.8	19.2	9.8	19.1	10.7	19.1	11.2	
		23					22.8	8.7	22.8	9.7	22.7	10.6	22.7	11.1	
	5	5	15	8.6	6.4	8.8	7.4	9.2	8.4	9.8	9.4	10.8	10.4	11.3	10.8
			17	11.7	6.4	11.6	7.4	11.6	8.4	11.6	9.3	11.8	10.3	11.9	10.8
			19	14.8	6.4	14.8	7.4	14.8	8.3	14.7	9.3	14.7	10.3	14.7	10.7
			21			18.2	7.3	18.1	8.3	18.1	9.3	18.1	10.2	18.0	10.7
			23					21.8	8.2	21.7	9.2	21.7	10.2	21.6	10.7
	7	7	15	6.9	5.5	7.5	6.7	8.2	7.8	9.2	8.8	10.2	9.8	10.7	10.3
			17	9.9	5.7	9.9	6.6	10.0	7.6	10.4	8.7	10.8	9.8	11.1	10.3
			19	13.4	5.8	13.4	6.8	13.4	7.7	13.3	8.7	13.3	9.7	13.4	10.2
			21			16.9	6.8	16.8	7.7	16.8	8.7	16.8	9.7	16.8	10.2
			23					20.5	7.7	20.5	8.7	20.4	9.6	20.4	10.1

Tw (°C)	Δt (°C)	Room temperature d.b.(°C)													
		R.t. w.b. (°C)													
		21		23		25		27		29		30			
		Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)		
5	3	15	4.2	4.0	5.2	5.0	6.2	6.0	7.2	6.9	8.2	7.9	8.7	8.3	
		17	5.7	3.9	5.9	4.9	6.3	6.0	7.2	6.9	8.2	7.9	8.7	8.4	
		19	8.9	4.0	8.8	4.9	8.8	5.9	8.8	6.9	9.0	7.8	9.1	8.3	
		21			12.2	4.9	12.2	5.9	12.1	6.8	12.1	7.8	12.1	8.3	
		23					15.7	5.8	15.7	6.8	15.7	7.8	15.6	8.2	
	11	5	15	3.4	3.3	4.6	4.4	5.7	5.4	6.7	6.4	7.7	7.4	8.2	7.9
			17	3.9	3.2	4.8	4.3	5.7	5.4	6.7	6.5	7.7	7.4	8.2	7.9
			19	7.0	3.3	7.0	4.2	7.2	5.3	7.6	6.3	8.1	7.4	8.4	7.9
			21			10.6	4.3	10.6	5.3	10.6	6.3	10.6	7.2	10.7	7.7
			23					14.3	5.3	14.3	6.3	14.2	7.2	14.2	7.7
	7	7	15	2.0	1.9	3.6	3.4	4.9	4.7	6.0	5.8	7.1	6.8	7.6	7.3
			17	2.0	1.9	3.6	3.5	4.9	4.7	6.0	5.8	7.1	6.8	7.6	7.3
			19	3.3	2.0	4.6	3.3	5.5	4.5	6.4	5.7	7.3	6.8	7.7	7.4
			21			8.3	3.5	8.3	4.5	8.5	5.5	8.9	6.6	9.1	7.1
			23					12.5	4.7	12.5	5.6	12.4	6.6	12.4	7.0

Key	
Pc	Cooling capacity
Pcs	Sensitive cooling capacity
Tw	Temperature of produced water
R.t. w.b.	Room temperature (wet bulb)

9.8. TUN 20 WITH 6-ROW COIL

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
3	5	15	12.5	8.3	12.4	9.4	12.5	10.5	12.8	11.7	14.0	12.8	14.7	13.3
		17	16.1	8.2	16.0	9.4	16.0	10.5	16.0	11.7	15.9	12.8	15.9	13.4
		19	20.0	8.1	19.9	9.3	19.9	10.5	19.8	11.6	19.8	12.7	19.7	13.3
		21			24.1	9.2	24.0	10.4	24.0	11.5	23.9	12.7	23.9	13.2
		23					28.5	10.3	28.5	11.4	28.4	12.6	28.4	13.1
	5	15	10.7	7.5	11.0	8.7	11.5	10.0	12.3	11.1	13.5	12.2	14.1	12.8
		17	14.6	7.6	14.5	8.7	14.5	9.9	14.5	11.0	14.7	12.2	14.9	12.8
		19	18.5	7.5	18.5	8.7	18.5	9.9	18.4	11.0	18.4	12.1	18.3	12.7
		21			22.7	8.6	22.7	9.8	22.6	10.9	22.6	12.1	22.6	12.7
		23					27.2	9.7	27.1	10.9	27.1	12.0	27.0	12.6
	7	15	8.6	6.5	9.4	7.9	10.3	9.2	11.5	10.4	12.8	11.6	13.4	12.2
		17	12.4	6.7	12.4	7.8	12.6	9.0	13.0	10.3	13.5	11.5	13.8	12.2
		19	16.8	6.8	16.7	8.0	16.7	9.1	16.6	10.3	16.7	11.4	16.7	12.0
		21			21.1	8.0	21.0	9.1	21.0	10.3	21.0	11.4	20.9	12.0
		23					25.7	9.1	25.6	10.3	25.6	11.4	25.5	12.0
3	5	15	9.7	7.1	9.8	8.2	10.3	9.4	11.6	10.5	12.8	11.6	13.4	12.2
		17	13.3	7.0	13.3	8.2	13.2	9.3	13.2	10.5	13.4	11.6	13.6	12.2
		19	17.2	7.0	17.2	8.2	17.1	9.3	17.1	10.4	17.0	11.6	17.0	12.1
		21			21.3	8.1	21.3	9.2	21.3	10.4	21.2	11.5	21.1	12.1
		23					25.8	9.1	25.7	10.3	25.7	11.4	25.6	12.0
	7	15	8.0	6.3	8.7	7.6	9.7	8.8	11.0	10.0	12.2	11.1	12.8	11.6
		17	11.6	6.3	11.5	7.5	11.7	8.7	12.0	9.9	12.5	11.1	12.9	11.7
		19	15.6	6.4	15.6	7.5	15.5	8.7	15.5	9.8	15.5	10.9	15.5	11.5
		21			19.8	7.5	19.8	8.6	19.7	9.8	19.7	10.9	19.7	11.5
		23					24.3	8.6	24.3	9.7	24.2	10.9	24.2	11.4
	7	15	6.2	5.3	7.5	6.8	8.8	8.0	10.2	9.2	11.5	10.4	12.1	11.0
		17	8.7	5.2	9.2	6.5	9.9	7.9	10.7	9.2	11.6	10.4	12.1	11.0
		19	13.4	5.5	13.4	6.7	13.4	7.8	13.5	9.0	13.8	10.2	14.0	10.8
		21			18.0	6.8	17.9	7.9	17.9	9.1	17.9	10.2	17.9	10.8
		23					22.6	7.9	22.6	9.1	22.5	10.2	22.5	10.8
3	5	15	7.0	5.9	7.8	7.1	9.0	8.2	10.3	9.3	11.5	10.4	12.1	11.0
		17	10.3	5.9	10.3	7.0	10.4	8.2	10.7	9.3	11.5	10.5	12.1	11.0
		19	14.3	5.9	14.2	7.0	14.2	8.1	14.1	9.3	14.1	10.4	14.1	11.0
		21			18.4	6.9	18.3	8.1	18.3	9.2	18.3	10.4	18.2	10.9
		23					22.8	8.0	22.8	9.2	22.7	10.3	22.7	10.9
	5	15	5.8	5.1	7.1	6.4	8.4	7.6	9.7	8.8	10.9	9.9	11.6	10.5
		17	8.1	5.0	8.5	6.3	9.1	7.5	9.8	8.8	11.0	10.0	11.6	10.5
		19	12.4	5.2	12.4	6.3	12.4	7.4	12.4	8.6	12.7	9.8	12.9	10.4
		21			16.7	6.3	16.6	7.5	16.6	8.6	16.6	9.7	16.6	10.3
		23					21.2	7.4	21.2	8.6	21.1	9.7	21.1	10.3
	7	15	4.4	4.0	6.0	5.5	7.5	6.8	8.9	8.0	10.2	9.2	10.8	9.8
		17	5.3	3.9	6.5	5.3	7.7	6.8	8.9	8.1	10.2	9.3	10.9	9.9
		19	9.5	4.1	9.5	5.3	9.9	6.5	10.5	7.8	11.2	9.1	11.5	9.8
		21			14.5	5.5	14.5	6.7	14.5	7.8	14.5	9.0	14.6	9.6
		23					19.3	6.7	19.2	7.9	19.2	9.0	19.2	9.6
11	3	15	5.2	4.7	6.5	5.9	7.8	7.1	9.0	8.2	10.2	9.3	10.9	9.9
		17	7.1	4.6	7.4	5.8	7.9	7.1	9.0	8.2	10.3	9.3	10.9	9.9
		19	11.1	4.7	11.1	5.8	11.0	6.9	11.0	8.1	11.3	9.3	11.4	9.8
		21			15.2	5.8	15.2	6.9	15.2	8.1	15.1	9.2	15.1	9.7
		23					19.7	6.9	19.6	8.0	19.6	9.2	19.6	9.7
	5	15	4.3	3.9	5.7	5.2	7.1	6.4	8.4	7.6	9.7	8.8	10.3	9.3
		17	4.9	3.7	5.9	5.1	7.1	6.4	8.4	7.6	9.7	8.8	10.3	9.4
		19	8.7	3.9	8.8	5.0	9.0	6.2	9.5	7.5	10.2	8.7	10.6	9.3
		21			13.3	5.1	13.3	6.3	13.3	7.4	13.3	8.5	13.3	9.1
		23					17.8	6.3	17.8	7.4	17.8	8.5	17.8	9.1
	7	15	2.5	2.3	4.5	4.1	6.1	5.5	7.5	6.8	8.9	8.1	9.5	8.7
		17	2.5	2.3	4.5	4.1	6.1	5.5	7.5	6.8	8.9	8.1	9.6	8.7
		19	4.1	2.3	5.7	3.9	6.9	5.3	8.0	6.7	9.1	8.1	9.6	8.7
		21			10.3	4.1	10.3	5.3	10.7	6.5	11.1	7.8	11.4	8.4
		23					15.6	5.5	15.6	6.6	15.5	7.8	15.5	8.3
13	3	15	3.9	3.5	5.2	4.7	6.5	5.9	7.7	7.0	9.0	8.2	9.6	8.7
		17	4.2	3.5	5.2	4.7	6.5	5.9	7.8	7.0	9.0	8.2	9.6	8.7
		19	7.6	3.5	7.6	4.6	7.8	5.8	8.3	7.0	9.0	8.2	9.6	8.7
		21			11.9	4.6	11.8	5.8	11.8	6.9	11.8	8.0	11.8	8.6
		23					16.3	5.7	16.3	6.9	16.2	8.0	16.2	8.6
	5	15	2.6	2.4	4.3	3.9	5.7	5.2	7.1	6.4	8.4	7.6	9.0	8.2
		17	2.7	2.4	4.3	3.9	5.7	5.2	7.1	6.4	8.4	7.6	9.0	8.2
		19	4.1	2.3	5.2	3.7	6.2	5.1	7.2	6.4	8.4	7.6	9.0	8.2
		21			9.5	3.9	9.5	5.0	9.7	6.2	10.1	7.4	10.3	8.0
		23					14.2	5.1	14.2	6.2	14.2	7.3	14.2	7.9
	7	15	1.3	1.1	2.5	2.3	4.6	4.2	6.1	5.6	7.5	6.9	8.2	7.5
		17	1.3	1.1	2.5	2.3	4.6	4.2	6.1	5.6	7.6	6.9	8.2	7.5
		19	1.3	1.1	2.5	2.3	4.6	4.2	6.2	5.6	7.6	6.9	8.3	7.5
		21			4.8	2.4	6.1	3.9	7.3	5.3	8.3	6.7	8.8	7.3
		23					11.2	4.2	11.2	5.3	11.5	6.5	11.6	7.1
15	3	15	2.5	2.3	3.9	3.5	5.2	4.7	6.5	5.9	7.7	7.0	8.3	7.6
		17	2.5	2.3	3.9	3.5	5.2	4.7	6.5	5.9	7.7	7.0	8.3	7.6
		19	3.6	2.2	4.4	3.4	5.3	4.7	6.5	5.9	7.7	7.0	8.4	7.6
		21			8.2	3.5	8.1	4.6	8.3	5.7	8.6	6.9	8.9	7.5
		23					12.7	4.6	12.7	5.7	12.6	6.8	12.6	7.4
	5	15	1.0	0.9	2.7	2.5	4.3	3.9	5.7	5.2	7.1	6.4	7.7	7.0
		17	1.0	0.9	2.7	2.5	4.3	3.9	5.7	5.2	7.1	6.4	7.7	7.0
		19	1.0	0.9	2.8	2.5	4.3	3.9	5.8	5.2	7.1	6.4	7.7	7.0
		21			4.5	2.3	5.5	3.7	6.5	5.0	7.4	6.3	7.9	7.0
		23					10.2	3.8	10.2	5.0	10.3	6.1	10.4	6.7
	7	15	0.2	0.2	1.3	1.1	2.6	2.4	4.6	4.2	6.2	5.6	6.9	6.2
		17	0.2	0.2	1.3	1.1	2.6	2.4	4.7	4.2	6.2	5.6	6.9	6.3
		19	0.2	0.2	1.3	1.1	2.6	2.4	4.7	4.2	6.2	5.6	6.9	6.3
		21			1.3	1.1	2.7	2.4	4.8	4.2	6.2	5.6	6.9	6.3
		23					5.4	2.5	6.6	3.9	7.7	5.3	8.2	5.9

Key

Pc	Cooling capacity
Pcs	Sensitive cooling capacity
Tw	Temperature of produced water
R.t. w.b.	Room temperature (wet bulb)

9.14. TUN 40P WITH 6-ROW COIL

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
3	5	15	27.7	21.1	27.6	24.0	27.7	26.9	28.6	28.6	31.3	31.3	32.6	32.6
		17	35.8	21.0	35.7	23.9	35.6	26.8	35.5	29.7	35.4	32.6	35.5	34.1
		19	44.5	20.8	44.3	23.7	44.2	26.7	44.1	29.6	44.0	32.5	43.9	33.9
		21			53.7	23.5	53.5	26.5	53.4	29.4	53.2	32.3	53.2	33.7
		23					63.5	26.2	63.4	29.2	63.2	32.0	63.1	33.5
	7	15	23.9	19.1	24.5	22.3	25.5	25.4	27.3	27.3	30.0	30.0	31.4	31.4
		17	32.4	19.3	32.3	22.3	32.2	25.2	32.4	28.1	32.7	31.1	33.1	32.6
		19	41.2	19.2	41.1	22.2	41.1	25.1	41.0	28.1	40.9	31.0	40.8	32.4
		21			50.6	22.0	50.4	25.0	50.3	27.9	50.2	30.8	50.2	32.3
		23					60.5	24.8	60.4	27.7	60.3	30.6	60.2	32.1
	9	15	19.2	16.7	20.9	20.2	22.9	22.9	25.5	25.5	28.4	28.4	29.8	29.8
		17	27.6	17.0	27.5	20.0	28.0	23.0	28.9	26.2	30.0	29.4	30.8	30.8
19		37.3	17.4	37.3	20.4	37.2	23.3	37.1	26.2	37.1	29.1	37.2	30.6	
21				47.0	20.4	46.8	23.3	46.8	26.2	46.7	29.2	46.6	30.6	
23						57.1	23.2	57.0	26.1	56.9	29.1	56.8	30.5	
3	5	15	21.5	18.0	21.8	21.0	23.0	23.0	25.7	25.7	28.5	28.5	29.8	29.8
		17	29.6	18.0	29.5	20.9	29.4	23.8	29.4	26.7	29.9	29.7	30.3	30.3
		19	38.3	17.9	38.2	20.8	38.1	23.7	38.0	26.6	37.9	29.5	37.8	30.9
		21			47.5	20.6	47.3	23.5	47.2	26.6	47.1	29.4	47.1	30.8
		23					57.3	23.3	57.2	26.3	57.1	29.2	57.0	30.6
	7	15	17.8	16.0	19.3	19.3	21.6	21.6	24.4	24.4	27.2	27.2	28.6	28.6
		17	25.7	16.2	25.6	19.1	26.0	22.1	26.7	25.2	27.9	27.9	28.8	28.8
		19	34.7	16.2	34.6	19.2	34.6	22.1	34.5	25.0	34.5	27.9	34.5	29.4
		21			44.1	19.1	44.0	22.1	43.9	25.0	43.8	27.8	43.8	29.3
		23					54.1	21.9	54.0	24.8	53.9	27.7	53.8	29.2
	9	15	13.8	13.6	16.6	16.6	19.7	19.7	22.6	22.6	25.5	25.5	27.0	27.0
		17	19.4	13.4	20.6	16.7	22.0	20.1	23.7	23.4	25.7	25.7	27.0	27.0
19		29.8	14.1	29.8	17.1	29.7	19.9	30.0	23.0	30.7	26.1	31.1	27.7	
21				40.0	17.3	39.9	20.3	39.9	23.2	39.8	26.1	39.8	27.5	
23						50.3	20.2	50.2	23.2	50.1	26.0	50.1	27.5	
3	5	15	15.7	15.0	17.4	17.4	20.1	20.1	22.9	22.9	25.6	25.6	27.0	27.0
		17	23.0	15.0	22.9	17.9	23.1	20.8	23.9	23.8	25.7	25.7	27.0	27.0
		19	31.7	14.9	31.7	17.9	31.6	20.8	31.5	23.6	31.4	26.5	31.5	28.0
		21			40.9	17.7	40.8	20.6	40.7	23.5	40.6	26.4	40.6	27.9
		23					50.8	20.4	50.7	23.4	50.6	26.3	50.5	27.7
	7	15	12.9	12.9	15.7	15.7	18.6	18.6	21.5	21.5	24.4	24.4	25.7	25.7
		17	18.1	12.8	18.9	15.9	20.2	19.2	21.9	21.9	24.4	24.4	25.8	25.8
		19	27.6	13.2	27.6	16.1	27.5	19.0	27.7	22.0	28.2	25.0	28.6	26.5
		21			37.1	16.1	37.1	19.0	37.0	21.9	36.9	24.8	36.9	26.2
		23					47.2	18.9	47.1	21.9	47.0	24.7	47.0	26.2
	9	15	9.7	9.7	13.4	13.4	16.6	16.6	19.7	19.7	22.7	22.7	24.1	24.1
		17	11.7	9.8	14.5	13.6	17.1	17.1	19.8	19.8	22.7	22.7	24.2	24.2
19		21.0	10.5	21.2	13.4	22.0	16.6	23.3	19.9	24.8	23.2	25.7	24.9	
21				32.2	14.1	32.2	17.0	32.2	19.9	32.2	22.9	32.5	24.4	
23						42.9	17.2	42.8	20.1	42.7	23.0	42.7	24.4	

Tw (°C)	Δt (°C)	R.t. w.b. (°C)	Room temperature d.b.(°C)											
			21		23		25		27		29		30	
			Pc (kW)	Pcs (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)	Ph (kW)	Pe (kW)
3	5	15	11.6	11.6	14.5	14.5	17.3	17.3	20.1	20.1	22.8	22.8	24.2	24.2
		17	15.9	11.8	16.4	14.9	17.7	17.7	20.1	20.1	22.8	22.8	24.2	24.2
		19	24.7	11.9	24.6	14.8	24.6	17.7	24.6	20.6	25.1	23.6	25.4	25.1
		21			33.9	14.8	33.8	17.7	33.7	20.6	33.7	23.4	33.6	24.9
		23					43.8	17.6	43.7	20.5	43.6	23.4	43.5	24.8
	7	15	9.5	9.5	12.7	12.7	15.7	15.7	18.6	18.6	21.5	21.5	22.9	22.9
		17	10.9	9.5	13.2	13.1	15.8	15.8	18.7	18.7	21.5	21.5	22.9	22.9
		19	19.5	9.9	19.5	12.8	20.1	15.8	21.2	19.0	22.7	22.3	23.5	23.5
		21			29.5	13.1	29.5	16.0	29.5	18.9	29.5	21.7	29.6	23.2
		23					39.7	16.0	39.7	18.9	39.6	21.7	39.6	23.2
	9	15	5.6	5.6	10.0	10.0	13.5	13.5	16.7	16.7	19.8	19.8	21.2	21.2
		17	5.6	5.6	10.0	10.0	13.6	13.6	16.8	16.8	19.8	19.8	21.3	21.3
19		9.2	5.9	12.7	9.9	15.3	13.6	17.8	17.2	20.2	20.2	21.4	21.4	
21				23.0	10.6	23.0	13.5	23.7	16.6	24.8	19.8	25.4	21.4	
23						34.7	14.1	34.6	16.9	34.6	19.8	34.5	21.2	
3	5	15	8.6	8.6	11.6	11.6	14.5	14.5	17.2	17.2	20.0	20.0	21.3	21.3
		17	9.3	8.9	11.6	11.6	14.5	14.5	17.3	17.3	20.0	20.0	21.4	21.4
		19	17.0	8.9	16.9	11.7	17.4	14.7	18.4	17.8	20.1	20.1	21.4	21.4
		21			26.4	11.8	26.3	14.7	26.3	17.6	26.2	20.4	26.4	21.9
		23					36.3	14.6	36.2	17.5	36.1	20.4	36.1	21.8
	7	15	5.9	5.9	9.6	9.6	12.7	12.7	15.7	15.7	18.6	18.6	20.1	20.1
		17	5.9	5.9	9.6	9.6	12.8	12.8	15.8	15.8	18.7	18.7	20.1	20.1
		19	9.2	5.9	11.6	9.5	13.8	13.0	16.1	16.1	18.7	18.7	20.1	20.1
		21			21.0	9.9	21.0	12.7	21.5	15.7	22.4	18.9	23.0	20.4
		23					31.7	13.0	31.6	15.8	31.5	18.7	31.5	20.1
	9	15	2.8	2.8	5.6	5.6	10.2	10.2	13.6	13.6	16.8	16.8	18.3	18.3
		17	2.8	2.8	5.6	5.6	10.2	10.2	13.7	13.7	16.8	16.8	18.3	18.3
19		2.9	2.8	5.6	5.6	10.3	10.3	13.7	13.7	16.8	16.8	18.4	18.4	
21				10.7	6.1	13.7	9.9	16.2	13.5	18.5	17.0	19.6	18.7	
23						25.0	10.6	25.0	13.5	25.5	16.5	25.9	18.0	
3	5	15	5.5	5.5	8.7	8.7	11.6	11.6	14.4	14.4	17.2	17.2	18.5	18.5
		17	5.5	5.5	8.7	8.7	11.6	11.6	14.4	14.4	17.2	17.2	18.6	18.6
		19	8.1	5.5	9.8	8.8	11.8	11.8	14.5	14.5	17.2	17.2	18.6	18.6
		21			18.2	8.8	18.1	11.6	18.4	14.6	19.2	17.6	19.8	19.2
		23					28.2	11.7	28.2	14.6	28.1	17.4	28.1	18.8
	7	15	2.2	2.2	6.1	6.1	9.6	9.6	12.8	12.8	15.7	15.7	17.2	17.2
		17	2.2	2.2	6.1	6.1	9.7	9.7	12.8	12.8	15.8	15.8	17.2	17.2
		19	2.3	2.3	6.1	6.1	9.7	9.7	12.8	12.8	15.8	15.8	17.2	17.2
		21			10.1	6.0	12.3	9.4	14.4	12.9	16.5	16.2	17.6	17.6
		23					22.6	9.8	22.6	12.6	22.9	15.6	23.2	17.1
	9	15	0.4	0.4	2.8	2.8	5.8	5.8	10.3	10.3	13.7	13.7	15.3	15.3
		17	0.4	0.4	2.8	2.8	5.8	5.8	10.4	10.4	13.8	13.8	15.3	15.3
19		0.4	0.4	2.8	2.8	5.9	5.9	10.4	10.4	13.8	13.8	15.4	15.4	
21				2.9	2.7	6.0	6.0	10.7	10.7	13.9	13.9	15.4	15.4	
23						12.0	6.3	14.8	9.9	17.1	13.4	18.3	15.1	

HEATING MODE

COOLING MODE

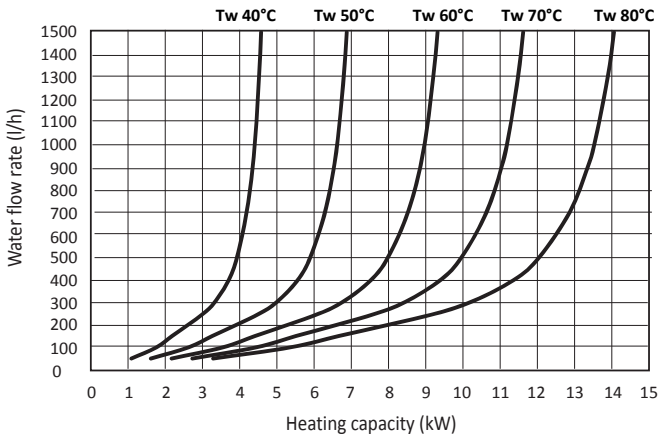
Key	
Pc	Cooling capacity
Pcs	Sensitive cooling capacity
Tw	Temperature of produced water
R.t. w.b.	Room temperature (wet bulb)

10. YIELDS AND TEMPERATURES DIFFERENT FROM THE NOMINAL FUNCTIONING VALUE IN HEATING MODE

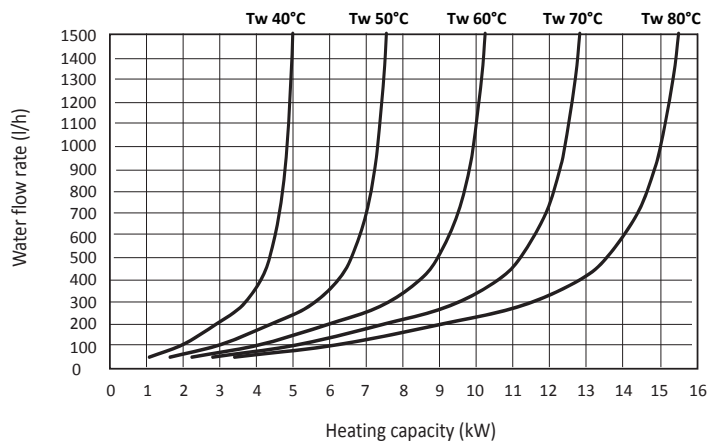
HEATING MODE

COOLING MODE

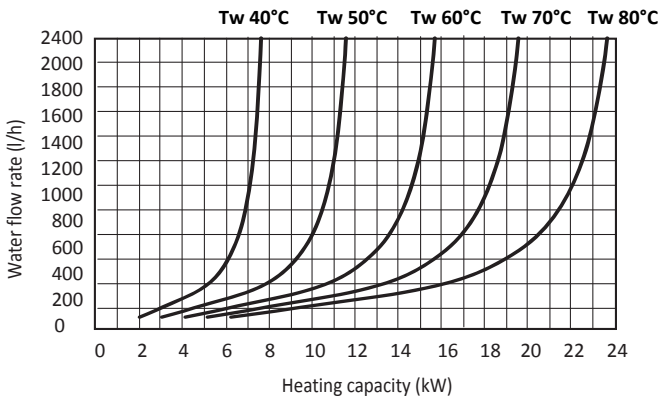
TUN104



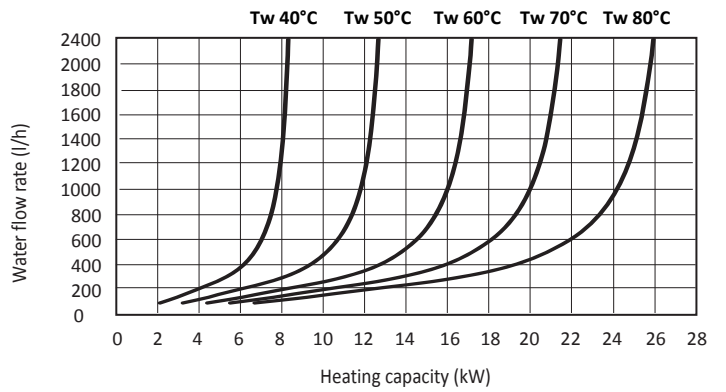
TUN106



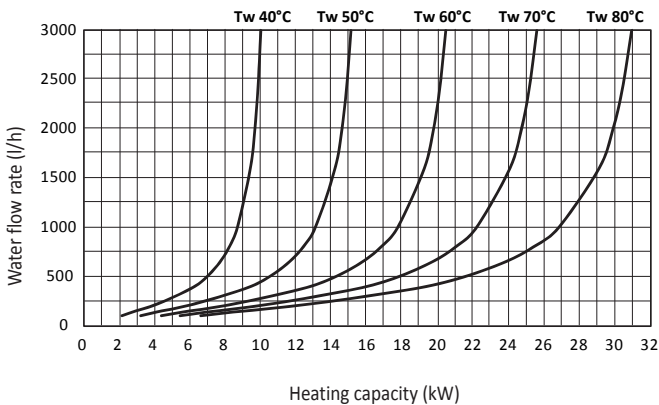
TUN154



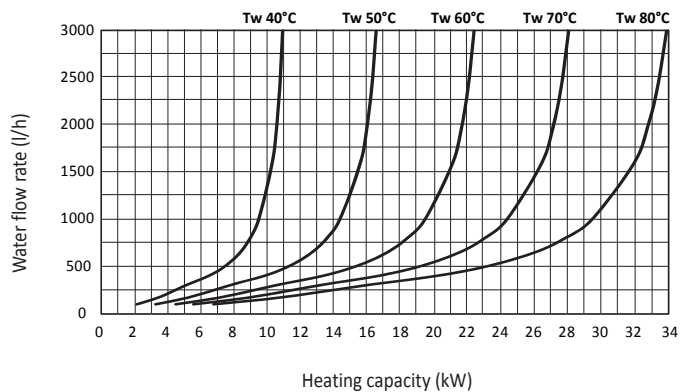
TUN156



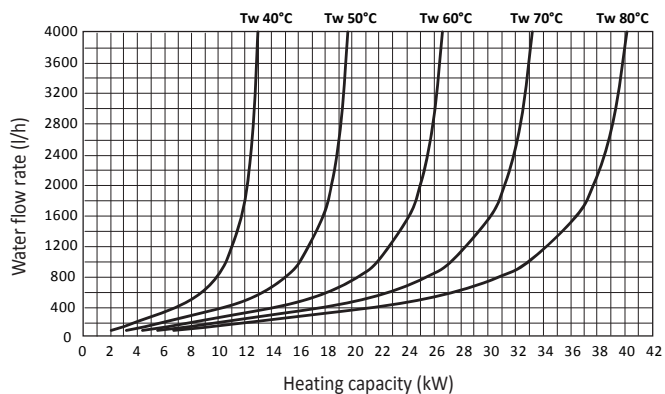
TUN204



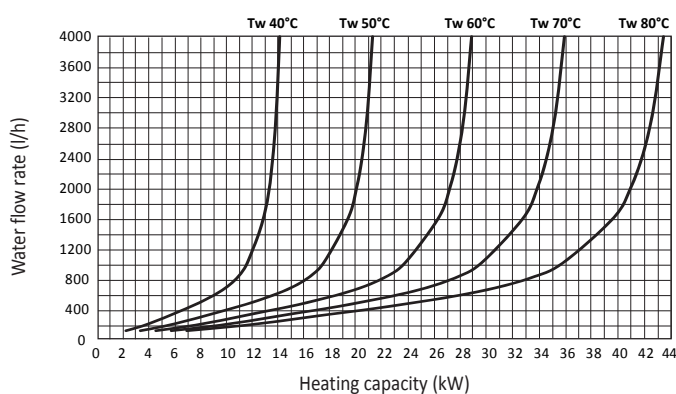
TUN206



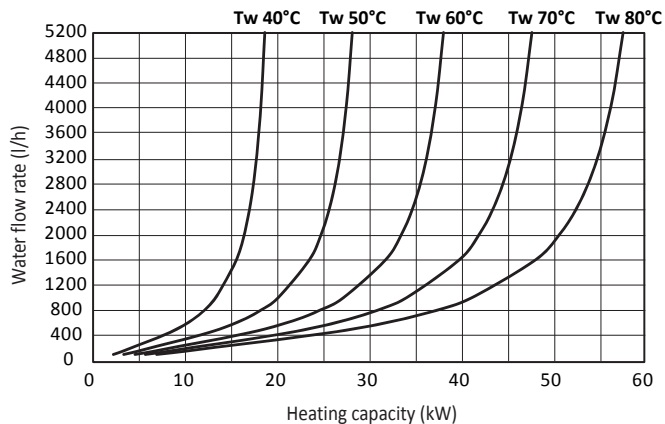
TUN254



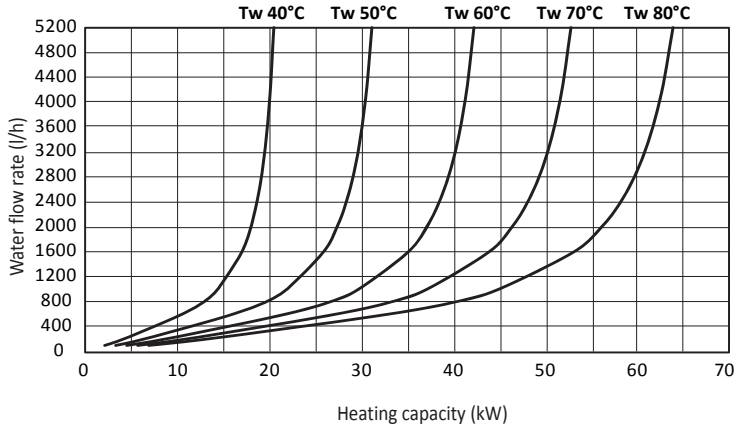
TUN256



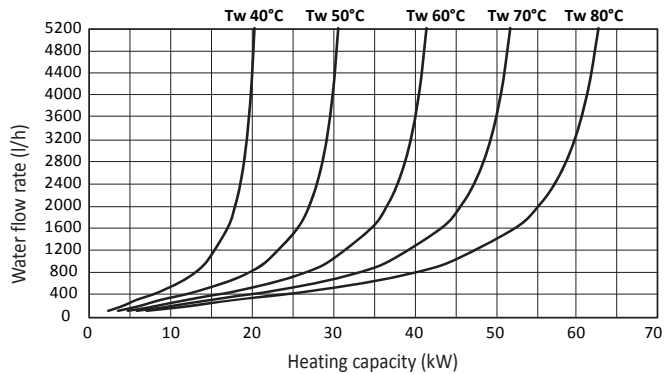
TUN404



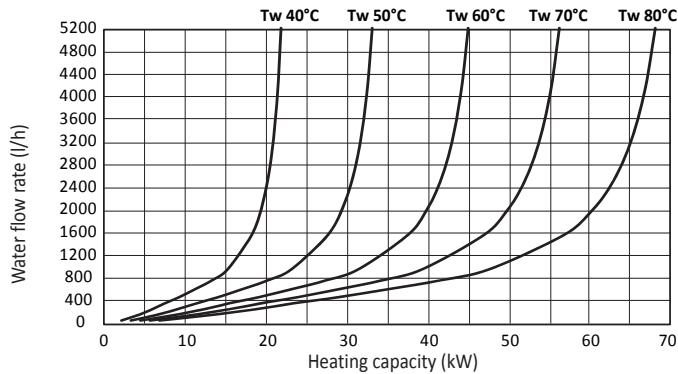
TUN406



TUN404P



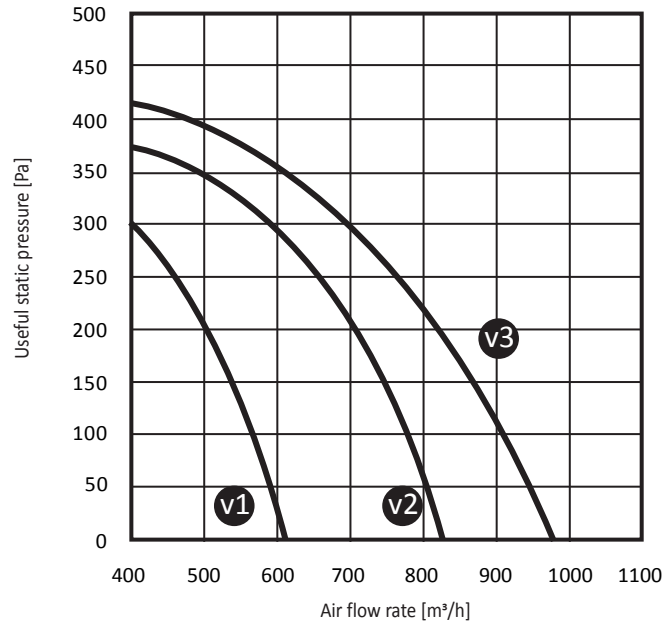
TUN406P



11. VENTILATION CHARACTERISTIC CURVES

11.1. TUN10 - 4 ROWS

The following diagrams show the flow rate-useful static pressure curves (at vent) of TUN units. These curves refer to a 4-row coil unit with a 0% clogging degree of the G2 filter. For units with different configurations or accessories, reduce the useful static pressure with the pressure drop values of the added components. The values of these pressure drops can be found on the tables below the charts.

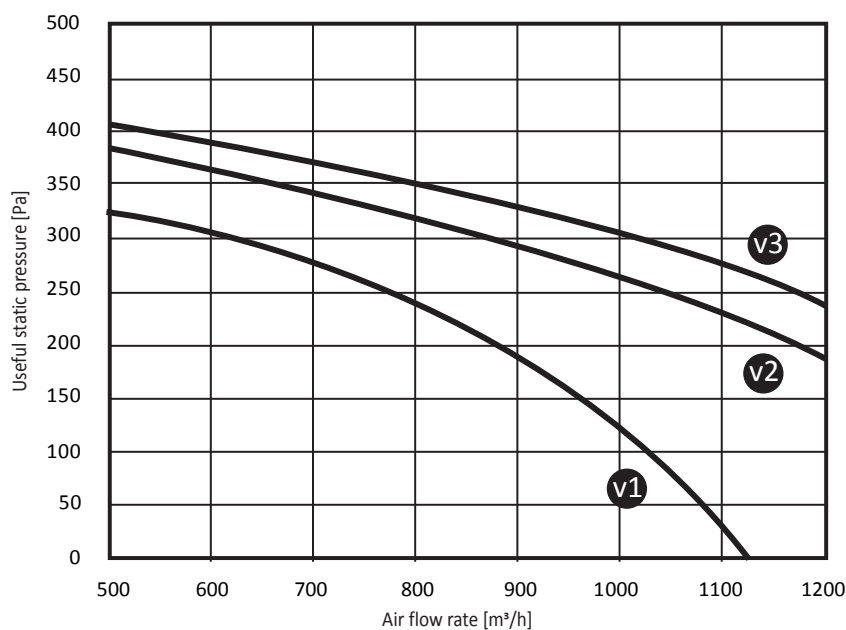


Key

v1-v2-v3 Fan speed

FLOW RATE		m ³ /h	400	500	600	700	800	900	1000
Intake grid	GAP	Pa	-4	-7	-9	-12	-15	-19	-23
Module with silencer baffles	SSL	Pa	-6	-10	-13	-18	-22	-28	-34
Return ventilating section	VRF	Pa	177	264	367	484	616	762	921
Mixing chamber 3 dampers	M3S	Pa	-1	-1	-2	-3	-3	-4	-5
Mixing chamber 2 dampers	M2S	Pa	0	0	-1	-1	-1	-1	-2
2-area damper 70-30	S2Z	Pa	-1	-1	-2	-2	-3	-3	-4
Soft bag filters	FTF	Pa	-6	-9	-12	-16	-21	-25	-31
6R coil respect to 4R		Pa	-4	-6	-9	-11	-14	-17	-21
Water post-heating coil	2R - B2R	Pa	-11	-16	-23	-30	-38	-47	-57
Water post-heating coil	1R - B1R	Pa	-3	-5	-7	-9	-11	-14	-17
Electric post-heating coil	PBE	Pa	-2	-3	-4	-5	-6	-8	-9
Closed flow plenum	PMC	Pa	0	0	0	0	0	0	0
Plenum with multiple circular flow attachments	PMM	Pa	0	0	0	-1	-1	-1	-1
Intake damper	SAS	Pa	0	0	-1	-1	-1	-1	-2
Flow grid with adjustable louvers	GMD	Pa	-1	-2	-3	-4	-5	-6	-7

11.2. TUN10P - 4 ROWS

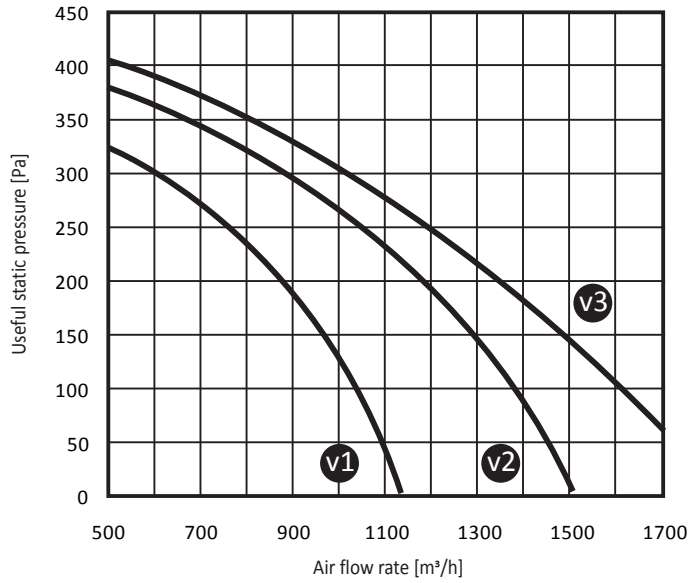


Key

v1-v2-v3 | Fan speed

FLOW RATE		m³/h	500	600	700	800	900	1000	1100	1200
Intake grid	GAP	Pa	-7	-9	-12	-15	-19	-23	-27	-32
Module with silencer baffles	SSL	Pa	-10	-14	-18	-23	-29	-35	-41	-48
Return ventilating section	VRF	Pa	71	99	131	166	205	248	295	345
Mixing chamber 3 dampers	M3S	Pa	-1	-2	-3	-3	-4	-5	-6	-7
Mixing chamber 2 dampers	M2S	Pa	-2	-3	-4	-5	-6	-7	-9	-10
2-area damper 70-30	SZZ	Pa	-6	-8	-11	-14	-17	-21	-25	-29
Soft bag filters	FTF	Pa	-9	-12	-16	-21	-25	-31	-37	-43
6R coil respect to 4R		Pa	-6	-9	-11	-14	-17	-21	-25	-29
Water post-heating coil	2R - B2R	Pa	-16	-23	-30	-38	-47	-57	-67	-78
Water post-heating coil	1R - B1R	Pa	-5	-7	-9	-11	-14	-17	-20	-23
Electric post-heating coil	PBE	Pa	-3	-4	-5	-6	-8	-9	-11	-13
Closed flow plenum	PMC	Pa	0	0	0	0	0	0	0	0
Plenum with multiple circular flow attachments	PMM	Pa	0	0	-1	-1	-1	-1	-1	-2
Intake damper	SAS	Pa	-2	-3	-4	-5	-6	-7	-9	-10
Flow grid with adjustable louvers	GMD	Pa	-2	-3	-4	-5	-6	-7	-9	-10

11.3. TUN15 - 4 ROWS

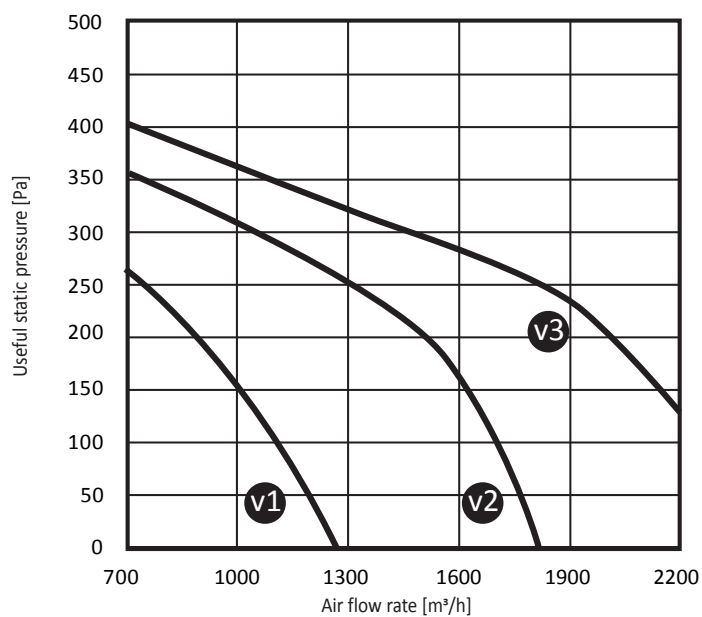


Key

v1-v2-v3 Fan speed

FLOW RATE		m³/h	500	700	900	1100	1300	1500	1700
Intake grid	GAP	Pa	-5	-8	-13	-19	-26	-33	-42
Module with silencer baffles	SSL	Pa	-3	-6	-10	-14	-19	-25	-31
Return ventilating section	VRF	Pa	75	137	215	309	417	540	676
Mixing chamber 3 dampers	M3S	Pa	-1	-3	-4	-6	-8	-10	-13
Mixing chamber 2 dampers	M2S	Pa	-1	-2	-3	-4	-5	-7	-9
2-area damper 70-30	S2Z	Pa	-3	-5	-8	-11	-15	-19	-24
Soft bag filters	FTF	Pa	-9	-16	-25	-37	-49	-64	-80
6R coil respect to 4R		Pa	-2	-5	-7	-10	-13	-18	-21
Water post-heating coil	2R - B2R	Pa	-6	-12	-19	-27	-36	-46	-58
Water post-heating coil	1R - B1R	Pa	-3	-6	-9	-13	-17	-22	-28
Electric post-heating coil	PBE	Pa	-1	-2	-3	-4	-6	-8	-10
Closed flow plenum	PMC	Pa	0	0	0	0	0	0	0
Plenum with multiple circular flow attachments	PMM	Pa	0	0	-1	-1	-1	-2	-2
Intake damper	SAS	Pa	-1	-2	-3	-4	-5	-7	-9
Flow grid with adjustable louvers	GMD	Pa	-1	-2	-3	-4	-5	-7	-9

11.4. TUN20 - 4 ROWS

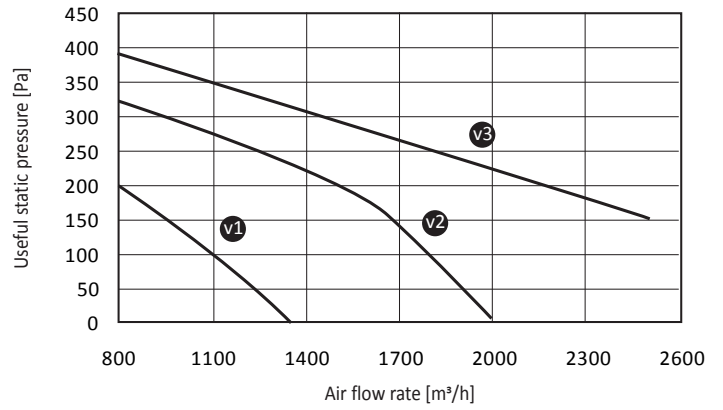


Key

v1-v2-v3 Fan speed

FLOW RATE		m³/h	700	1000	1300	1600	1900	2200
Intake grid	GAP	Pa	-5	-9	-15	-22	-30	-39
Module with silencer baffles	SSL	Pa	-1	-2	-3	-5	-6	-8
Return ventilating section	VRF	Pa	41	78	125	182	248	322
Mixing chamber 3 dampers	M3S	Pa	-1	-2	-3	-4	-5	-7
Mixing chamber 2 dampers	M2S	Pa	-1	-2	-3	-5	-6	-8
2-area damper 70-30	S2Z	Pa	-3	-5	-8	-11	-15	-20
Soft bag filters	FTF	Pa	-16	-31	-49	-72	-98	-127
6R coil respect to 4R		Pa	-3	-5	-8	-11	-16	-21
Water post-heating coil	2R - B2R	Pa	-8	-15	-24	-35	-48	-62
Water post-heating coil	1R - B1R	Pa	-4	-7	-11	-17	-23	-29
Electric post-heating coil	PBE	Pa	-1	-2	-4	-5	-7	-9
Closed flow plenum	PMC	Pa	-4	-7	-11	-16	-22	-28
Plenum with multiple circular flow attachments	PMM	Pa	-1	-1	-2	-2	-3	-4
Intake damper	SAS	Pa	-1	-2	-3	-5	-6	-8
Flow grid with adjustable louvers	GMD	Pa	-1	-2	-3	-5	-6	-8

11.5. TUN25 - 4 ROWS

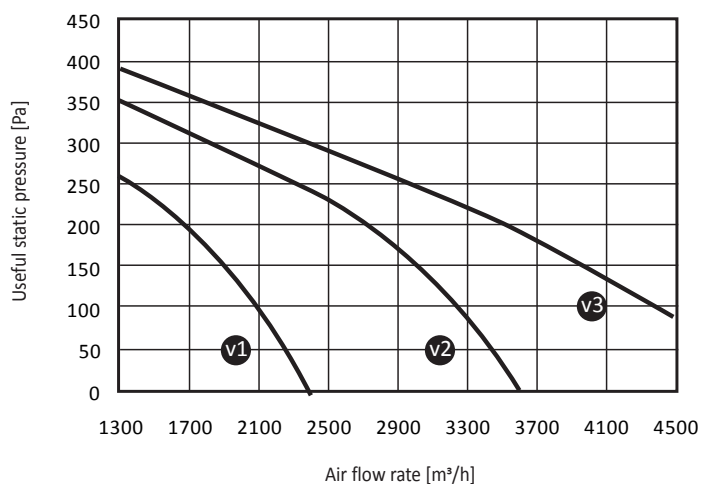


Key

v1-v2-v3 | Fan speed

FLOW RATE		m³/h	800	1200	1600	2000	2400	2800
Intake grid	GAP	Pa	-3	-7	-11	-17	-24	-31
Module with silencer baffles	SSL	Pa	-1	-1	-2	-4	-5	-7
Return ventilating section	VRF	Pa	42	87	145	217	301	398
Mixing chamber 3 dampers	M3S	Pa	-1	-2	-4	-6	-8	-10
Mixing chamber 2 dampers	M2S	Pa	-1	-1	-2	-4	-5	-7
2-area damper 70-30	S2Z	Pa	-2	-3	-6	-9	-12	-16
Soft bag filters	FTF	Pa	-6	-12	-21	-31	-43	-56
6R coil respect to 4R		Pa	-1	-3	-5	-9	-12	-16
Water post-heating coil	2R - B2R	Pa	-5	-10	-17	-25	-35	-47
Water post-heating coil	1R - B1R	Pa	-2	-5	-8	-12	-17	-22
Electric post-heating coil	PBE	Pa	-1	-2	-3	-4	-5	-7
Closed flow plenum	PMC	Pa	0	0	0	0	0	0
Plenum with multiple circular flow attachments	PMM	Pa	0	-1	-2	-2	-3	-4
Intake damper	SAS	Pa	-1	-1	-2	-4	-5	-7
Flow grid with adjustable louvers	GMD	Pa	-1	-1	-2	-4	-5	-7

11.6. TUN40 - 4 ROWS

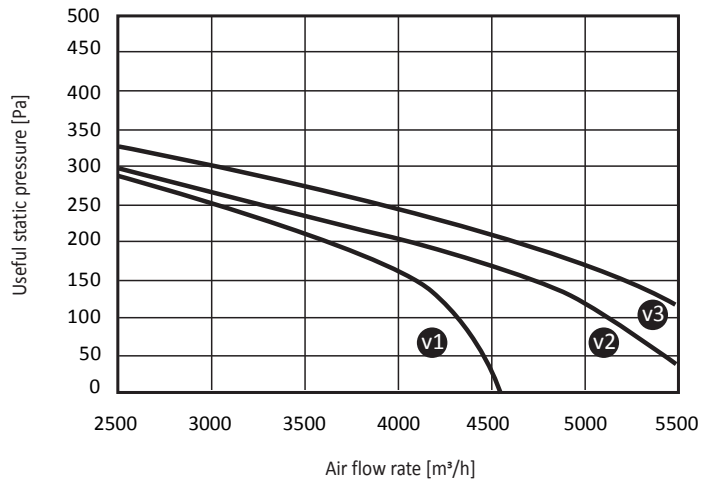


Key

v1-v2-v3 | Fan speed

FLOW RATE		m³/h	1500	2000	2500	3000	3500	4000	4500
Intake grid	GAP	Pa	-5	-9	-13	-18	-24	-31	-38
Module with silencer baffles	SSL	Pa	-5	-8	-12	-17	-22	-28	-35
Return ventilating section	VRF	Pa	47	78	117	162	214	272	337
Mixing chamber 3 dampers	M3S	Pa	-2	-3	-4	-5	-7	-9	-11
Mixing chamber 2 dampers	M2S	Pa	0	0	-1	-1	-1	-1	-2
2-area damper 70-30	S2Z	Pa	-3	-4	-6	-9	-12	-15	-18
Soft bag filters	FTF	Pa	-9	-15	-22	-31	-41	-52	-64
6R coil respect to 4R		Pa	-3	-4	-6	-8	-12	-14	-17
Water post-heating coil	2R - B2R	Pa	-7	-13	-19	-26	-34	-44	-54
Water post-heating coil	1R - B1R	Pa	-4	-6	-9	-12	-16	-21	-26
Electric post-heating coil	PBE	Pa	-1	-2	-3	-4	-5	-7	-8
Closed flow plenum	PMC	Pa	0	0	0	0	0	0	0
Plenum with multiple circular flow attachments	PMM	Pa	-2	-3	-4	-6	-8	-10	-12
Intake damper	SAS	Pa	0	0	-1	-1	-1	-1	-2
Flow grid with adjustable louvers	GMD	Pa	-1	-2	-3	-4	-5	-7	-8

11.7. TUN40P - 4 ROWS



Key

v1-v2-v3 | Fan speed

FLOW RATE		m³/h	2500	3000	3500	4000	4500	5000	5500
Intake grid	GAP	Pa	-13	-18	-24	-31	-38	-46	-55
Module with silencer baffles	SSL	Pa	-13	-17	-23	-29	-36	-44	-52
Return ventilating section	VRF	Pa	42	58	76	97	120	145	172
Mixing chamber 3 dampers	M3S	Pa	-4	-5	-7	-9	-11	-13	-16
Mixing chamber 2 dampers	M2S	Pa	-1	-1	-1	-1	-2	-2	-2
2-area damper 70-30	S2Z	Pa	-6	-9	-12	-15	-18	-22	-27
Soft bag filters	FTF	Pa	-22	-31	-41	-52	-64	-77	-92
6R coil respect to 4R		Pa	-6	-8	-12	-14	-17	-22	-25
Water post-heating coil	2R - B2R	Pa	-19	-26	-34	-44	-54	-65	-78
Water post-heating coil	1R - B1R	Pa	-9	-12	-16	-21	-26	-31	-37
Electric post-heating coil	PBE	Pa	-3	-4	-5	-7	-8	-10	-12
Closed flow plenum	PMC	Pa	0	0	0	0	0	0	0
Plenum with multiple circular flow attachments	PMM	Pa	-4	-6	-8	-10	-13	-15	-18
Intake damper	SAS	Pa	-1	-1	-1	-1	-2	-2	-2
Flow grid with adjustable louvers	GMD	Pa	-3	-4	-5	-7	-8	-10	-12

12. PRESSURE DROPS OF FILTERS DUE TO FOULING

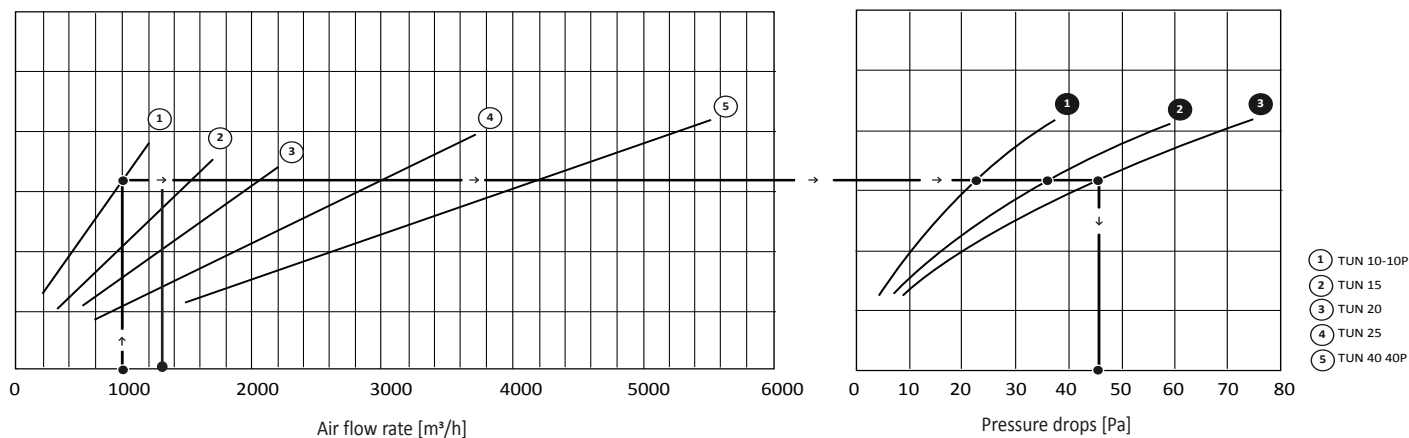
The following charts determine the pressure drops of the filters with different levels of fouling. From the chart on the left, bearing the air flow rate (m³/h) in the axis of abscissae, move up from the concerned flow rate until you intersect the straight line corresponding to the unit size. At this point, tracing a straight line parallel to the axis of abscissae intersect one

of the three curves shown on the right chart each representing the clogging degree of the filter as follows:

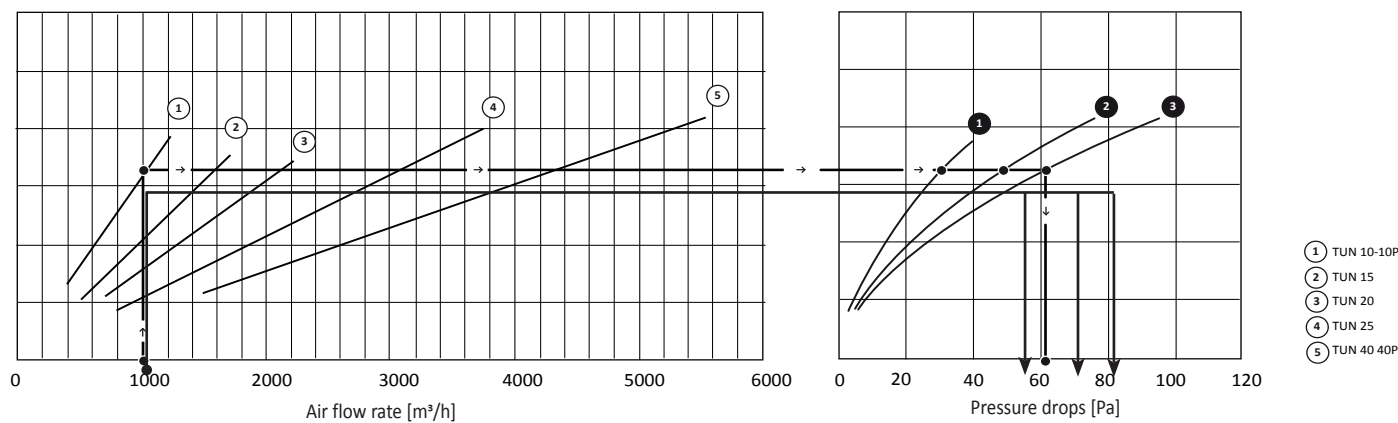
- curve ① : filter clean
- curve ② : filter clogged 25%
- curve ③ : filter clogged 50%

To determine the value corresponding to the filter pressure drop, trace a straight line until the axis of abscissae.

12.1. PRESSURE DROP OF FLAT FILTERS DUE TO FOULING:



12.2. PRESSURE DROP OF BAG FILTERS DUE TO FOULING:



13. OPERATIONAL LIMITS

Summer coil inlet air temperature	min	21 °C
	max	34 °C
Winter coil inlet air temperature	min	-5 °C ¹
	max	24 °C
Relative humidity (summer-winter)	min	20 %
	max	90 %
Coil inlet water temperature (cold H ₂ O)	min	4 °C
	max	12 °C
Heat drop H ₂ O	min	5 °C
	max	8 °C
Coil inlet water temperature (hot H ₂ O)	min	40 °C
	max	80 °C
Heat drop H ₂ O	min	5 °C
	max	25 °C
Evaporation temperature	min	2 °C
	max	12 °C

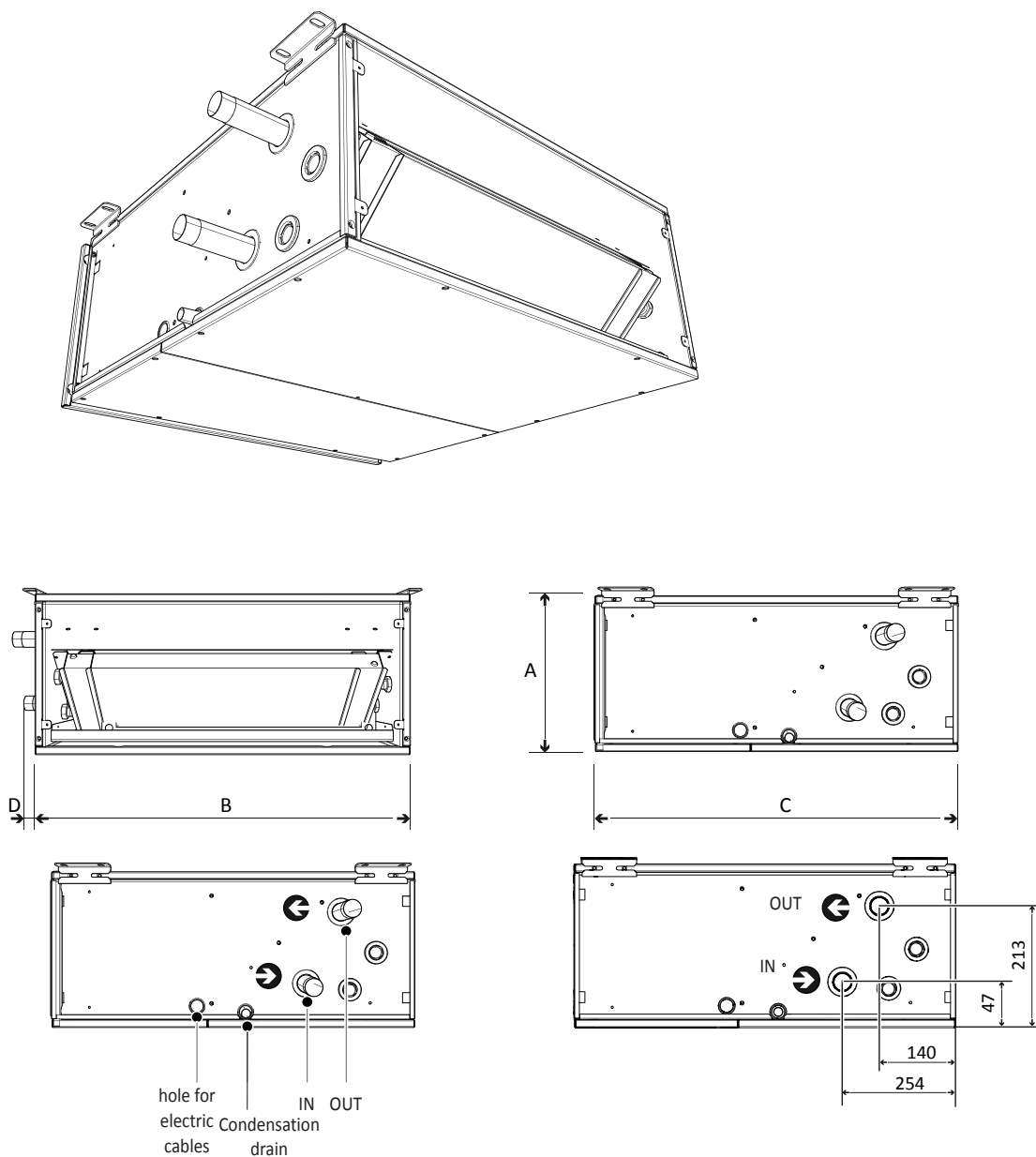
**ATTENTION**

1. Provide protection against freezing.

14. SOUND DATA

TUN	Pow. dB(A)	Octave band [Hz]																					
		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
Sound potential for central band dB (A) frequency																							
104	Total	68.04	44.48	47.03	54.47	57.94	58.68	54.68	53.74	55.76	56.59	53.31	55.07	57.06	58.67	57.35	55.49	54.12	52.17	50.05	46.96	44.28	40.49
	Irradiated intake	66.54	42.98	45.53	52.97	56.44	57.18	53.18	52.24	54.26	55.09	51.81	53.57	55.56	57.17	55.85	53.99	52.62	50.67	48.55	45.46	42.78	38.99
	Flow	61.54	37.98	40.53	47.97	51.44	52.18	48.18	47.24	49.26	50.09	46.81	48.57	50.56	52.17	50.85	48.99	47.62	45.67	43.55	40.46	37.78	33.99
154	Total	72.04	48.48	51.03	58.47	61.94	62.68	58.68	57.74	59.76	60.59	57.31	59.07	61.06	62.67	61.35	59.49	58.12	56.17	54.05	50.96	48.28	44.49
	Irradiated intake	70.54	46.98	49.53	56.97	60.44	61.18	57.18	56.24	58.26	59.09	55.81	57.57	59.56	61.17	59.85	57.99	56.62	54.67	52.55	49.46	46.78	42.99
	Flow	65.54	41.98	44.53	51.97	55.44	56.18	52.18	51.24	53.26	54.09	50.81	52.57	54.56	56.17	54.85	52.99	51.62	49.67	47.55	44.46	41.78	37.99
204	Total	77.04	53.48	56.03	63.47	66.94	67.68	63.68	62.74	64.76	65.59	62.31	64.07	66.06	67.67	66.35	64.49	63.12	61.17	59.05	55.96	53.28	49.49
	Irradiated intake	75.54	51.98	54.53	61.97	65.44	66.18	62.18	61.24	63.26	64.09	60.81	62.57	64.56	66.17	64.85	62.99	61.62	59.67	57.55	54.46	51.78	47.99
	Flow	70.54	46.98	49.53	56.97	60.44	61.18	57.18	56.24	58.26	59.09	55.81	57.57	59.56	61.17	59.85	57.99	56.62	54.67	52.55	49.46	46.78	42.99
254	Total	78.04	54.48	57.03	64.47	67.94	68.68	64.68	63.74	65.76	66.59	63.31	65.07	67.06	68.67	67.35	65.49	64.12	62.17	60.05	56.96	54.28	50.49
	Irradiated intake	76.54	52.98	55.53	62.97	66.44	67.18	63.18	62.24	64.26	65.09	61.81	63.57	65.56	67.17	65.85	63.99	62.62	60.67	58.55	55.46	52.78	48.99
	Flow	71.54	47.98	50.53	57.97	61.44	62.18	58.18	57.24	59.26	60.09	56.81	58.57	60.56	62.17	60.85	58.99	57.62	55.67	53.55	50.46	47.78	43.99
404	Total	79.04	55.48	58.03	65.47	68.94	69.68	65.68	64.74	66.76	67.59	64.31	66.07	68.06	69.67	68.35	66.49	65.12	63.17	61.05	57.96	55.28	51.49
	Irradiated intake	77.54	53.98	56.53	63.97	67.44	68.18	64.18	63.24	65.26	66.09	62.81	64.57	66.56	68.17	66.85	64.99	63.62	61.67	59.55	56.46	53.78	49.99
	Flow	72.54	48.98	51.53	58.97	62.44	63.18	59.18	58.24	60.26	61.09	57.81	59.57	61.56	63.17	61.85	59.99	58.62	56.67	54.55	51.46	48.78	44.99
104P	Total	71.04	47.48	50.03	57.47	60.94	61.68	57.68	56.74	58.76	59.59	56.31	58.07	60.06	61.67	60.35	58.49	57.12	55.17	53.05	49.96	47.28	43.49
	Irradiated intake	69.54	45.98	48.53	55.97	59.44	60.18	56.18	55.24	57.26	58.09	54.81	56.57	58.56	60.17	58.85	56.99	55.62	53.67	51.55	48.46	45.78	41.99
	Flow	64.54	40.98	43.53	50.97	54.44	55.18	51.18	50.24	52.26	53.09	49.81	51.57	53.56	55.17	53.85	51.99	50.62	48.67	46.55	43.46	40.78	36.99
404P	Total	80.04	56.48	59.03	66.47	69.94	70.68	66.68	65.74	67.76	68.59	65.31	67.07	69.06	70.67	69.35	67.49	66.12	64.17	62.05	58.96	56.28	52.49
	Irradiated intake	78.54	54.98	57.53	64.97	68.44	69.18	65.18	64.24	66.26	67.09	63.81	65.57	67.56	69.17	67.85	65.99	64.62	62.67	60.55	57.46	54.78	50.99
	Flow	73.54	49.98	52.53	59.97	63.44	64.18	60.18	59.24	61.26	62.09	58.81	60.57	62.56	64.17	62.85	60.99	59.62	57.67	55.55	52.46	49.78	45.99

15. DIMENSIONAL DATA



Model			TUN10	TUN10P	TUN15	TUN20	TUN25	TUN40	TUN40P
CONNECTIONS									
Coil collectors		∅	1"	1"	1"	1"	1"	1"	1"
Direct expansion coil pipes	IN	∅i mm	16	16	16	16	16	22	22
	OUT	∅i mm	22	22	22	22	22	28	28
Condensate drain		∅	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
DIMENSIONS - WEIGHTS unit without packaging (HORIZONTAL CONFIGURATION AND EXTRACTOR CONFIGURATION)									
Height	A	mm	300	300	300	390	390	390	390
Width	B	mm	700	700	1050	1050	1475	1475	2100
Depth	C	mm	700	700	700	850	850	850	1000
Connection projection		mm	82	82	82	82	82	82	82
NET WEIGHT UNITS WITH COILS - EXTRACTOR									
With 4-row coil		kg	33	37	47	59	88	88	108
With 6-row coil		kg	35	38	49	61	92	92	108

**Standards complied with
WHEN DESIGNING and
CONSTRUCTING the unit:
SAFETY**

1. Machinery directive 2006/42/EC
2. Low voltage directive LVD 2006/95/EC
3. Electromagnetic compatibility directive EMC 2004/108/EC
4. Directive regarding pressurised devices PED 97/23/CE, EN 378
5. UNI12735, UNI14276

ELECTRIC PART

1. IEC EN 60335-2-40
2. IEC EN 61000-6-1/2/3/4

ACOUSTIC PART

1. ISO DIS 9614/2
(intensimetric method)

PROTECTION RATING
IP24



ATTENTION

The appliance cannot be used:

1. for outdoor air handling
2. for installation in humid environments
3. for installation in explosive atmospheres
4. for installation in corrosive atmospheres.

Make sure the environment where the appliance is installed has no substances which could corrode the aluminium fins.

16. GENERAL WARNINGS FOR INSTALLER

The air-conditioning units of the TUN series are intended for civil, commercial and hotel systems in small to medium sized environments. The units, designed to guarantee elevated static pressures, are set up for vertical and horizontal installation in order to be more versatile. This type of unit can serve several rooms by means of a distribution plenum. The units in this series are distinguished by their compactness, low noise and wide range of accessories.

16.1. PRESERVATION OF THE DOCUMENTATION

1. The instructions along with all the related documentation must be given to the user of the system, who assumes the responsibility to conserve the instructions so that they are always at hand in case of need.
2. Read this sheet carefully; the execution of all works must be performed by qualified staff, according to Standards in force on this subject in different countries.
3. The appliance must be installed in such a way as to enable maintenance and/or repairs to be carried out.
4. The appliance warranty does not cover the costs for ladders, scaffolding, or other elevation systems that may become necessary for carrying out servicing under warranty.

17. GENERAL SAFETY PRESCRIPTIONS

Before installing the unit, check to make sure it has not been damaged during transportation: using a damaged machine could be dangerous.

PACKAGING

The TUN series air conditioning units are generally supplied on pallets and packed in cardboard boxes.

STORAGE ON SITE

The TUN series units must be stored indoors.

VERIFICATIONS UPON RECEPTION

On receipt of the unit, a visual control must be carried out to check that no damage has occurred during transport. If damage has occurred it must be highlighted on the accompanying transport document.

5. Do not modify or tamper with the chiller as dangerous situations can be created and the manufacturer will not be liable for any damage caused. The validity of the warranty shall be void in the event of failure to comply with the above-mentioned indications.

16.2. WARNINGS REGARDING SAFETY AND INSTALLATION STANDARDS

1. The forced air heater must be installed by a qualified and suitably trained technician, in compliance with the national legislation in force in the country of destination. AERMEC will not assume any responsibility for damage due to failure to follow these instructions.
2. Before beginning any operation, READ THESE INSTRUCTIONS CAREFULLY AND CARRY OUT THE SAFETY CHECKS TO REDUCE ALL RISK OF DANGER TO A MINIMUM. All the staff involved must have thorough knowledge of the operations and any dangers that may arise at the moment in which the installation operations are carried out.

ACCESSING UNIT

Only operators and qualified technicians may access the unit once it is installed. By operator we mean a person authorised by the owner of the machine to perform operations on it (in compliance with that provided in this manual). By technician we mean a person authorised by Aermec or under the full responsibility of an Aermec distributor to perform operations on the machine. By machine owner we mean the legal representative of the company, body or physical person who owns the system on which the Aermec unit is installed. He is responsible to make sure that all safety standards indicated in this manual and standards in force are complied with. Since this unit is generally installed on a suspended ceiling, the lower panelling must be accessible in order to inspect the filters and fans.

RESIDUAL RISKS

Installation, start-up, shutdown and maintenance of the unit must be carried out in compliance with that provided in the product's technical documentation and anyhow in such a way as not to create any situation of risk. The unit has been designed to reduce risks for the safety of the persons interacting with it to a minimum. During designing, it was not technically possible to fully eliminate the causes of risks. Therefore it is absolutely necessary to refer to the following prescriptions.

CONCERNED PART	RESIDUAL RISK	METHOD	PRECAUTIONS
Inside unit: heat exchange finned coil	small cuts	contact	avoid contact, use protective gloves
Electric heating coil	burns, injuries	contact	avoid contact
Inside unit: metal parts and electric cables	intoxication, electrocution, serious burns	faulty insulation of power cables upstream electric control board of unit; live metal parts	adequate electric protection of power line; utmost care when earthing metal parts
Outside of unit: zone around unit	serious burns	fire caused by short-circuit or overheating of power line upstream electric control board of unit	cross-section of cables and protective system of electric power line in compliance with standards in force

18. INSTALLATION

18.1. MINIMUM TECHNICAL SPACES

All the required technical spaces must be checked before starting installation, in order to envision:

1. renewal and expulsion air ducting position;
2. passage of cables for power supply;
3. proper maintenance and cleaning operations.

In particular:

1. a space of at least 200 mm must be available at the condensation drain to implement the siphon (more detailed instructions are found on the label);
2. there must be a space of at least 400 mm near the water coil collectors to install the valve;
3. there must be a space of at least 1,000 mm for routine maintenance (eye checks, replacing and cleaning filters).

18.2. INSTALLATION OF THE UNIT

The essential indications for the appliance to be installed correctly are found below.

The completion of all operations, according to specific requirements, is left to the experience of the installer. The unit is supplied with support brackets to mount it on the wall or ceiling.

The brackets can be mounted with the bends facing inwards or outwards.

For different types of assemblies, the following instructions must be modified depending on specific worksite requirements.

It is always advised to fix the brackets to the ceiling first of all (with expansion plugs or threaded tie rods) and then to fix the units to the brackets.

When performing vertical installation, the screws fastening the brackets will rest on the shorter part of the slots.

To fasten the unit to the wall, proceed as follows (see fig.):

1. mark the four holes for the expansion plugs;
2. prepare the fixing system (expansion plugs or tie rods);
3. fix the brackets to the wall or to the ceiling using nuts, washers and back nuts;
4. screw on the 4 side screws to the unit to the brackets;
5. for horizontal installation, before tightening the screws, nuts and back nuts make sure that condensation drains properly;
6. it is advised to provide a slight slope towards the drain to favour water runoff.

18.3. AERAULIC CONNECTIONS

To install the ducts, it is recommended to:

1. prepare adequate bracketing to support the ducts so that the recovery unit does not bear their weight;
2. connect the flow and return vents to the ducts placing anti-vibration joints in between (duck). The anti-vibration joint must be screwed to the panel with self-threading screws avoiding that the duck joints are taut during operation;

3. provide an earth cable as a bridge on the anti-vibration joint to guarantee equipotentiality between the ducks and the recovery unit;
4. prepare (before curves, branches, etc.) the flow duct with a straight tract measuring at least 2.5 times the smallest side of the duct to prevent the ducting from having inclinations in the branching tracts that exceed 7° so that the fan does not lose efficiency.

18.4. HYDRAULIC CONNECTIONS: DRAINING CONDENSATION

The condensation drip tray is provided with a condensation drain for a $\varnothing 20$ l rubber connection.

A drain system must envision a suitable siphon to:

- allow free condensation draining;
- prevent the undesired entry of air into the depression systems;
- prevent the infiltration of smells or insects.

The siphon must have a bleed plug on the bottom or must however allow quick disassembly for cleaning. The following rules must be followed to dimension and execute the siphon (see figure):

$$H1 = 2P \quad | \quad H2 = H1 / 2$$

where P is the pressure expressed in mm of a column of water (1 mm c.w. = 9.81 Pa).

18.5. HYDRAULIC CONNECTIONS: WATER COIL

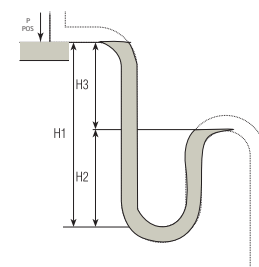
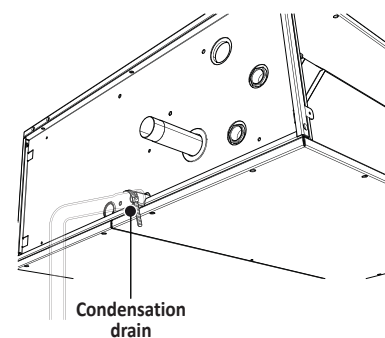
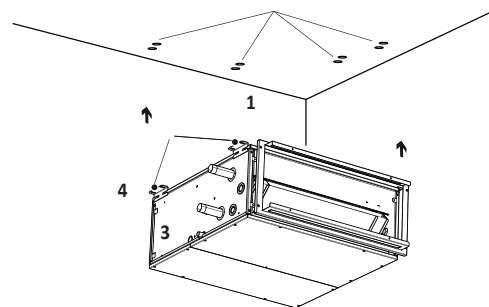
All the water coil collectors are provided with male threaded connections for water inlet and outlet.

For correct installation, abide by the following simple indications:

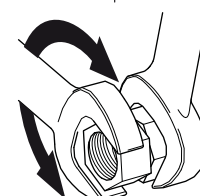
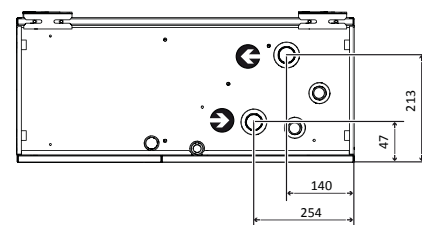
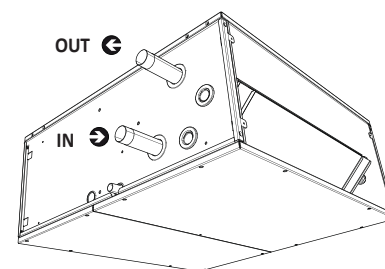
- for adverse weather conditions, it is recommended to provide anti-freeze devices;
- the pipe path must be studied in order not to create obstacles when the coil is extracted and to not make inspection and maintenance of the unit and other accessories impossible;
- while screwing the collectors and hydraulic circuit, do not generate strains which could damage the coil collectors;
- provide shut-off valves to isolate the coil from the rest of the circuit should it need to be disconnected from the hydraulic circuit;
- clamp the pipes adequately to the outside of the unit to prevent the weight being unloaded onto the coil;
- to connect the water supply pipes, respect the indications on the plates reading "WATER INLET" and "WATER OUTLET" on the outside panelling;
- mount an air bleed valve at the highest part of the circuit and a water drain valve at the lowest part.

All TUN units have been designed to facilitate the configuration and customisation requested by the customer as much as possible.

In particular, it is possible to invert the position of the water coil connections.



Siphon dimensioning layout



19. REPOSITIONING OF INTERNAL COMPONENTS

19.1. WATER HEATING OR COOLING COIL

If the water coil connections are not at the desired position, proceed as follows:

- remove the upper panel and the air flow panel (coil side);
- remove the coil cover;
- pull the coil out;
- turn the coil 180°;
- put the coil back in and fasten it;
- re-mount the closing strap;
- put the panels back on.

As for the hydraulic connections, proceed as follows:

- connect the drain pipe to the stub pipe of the tray and plug the opposite unused stub pipe;
- cut the two plastic plugs;
- screw the threaded sleeves onto the coil collectors.

Perform the connections on the system, isolate all the piping and make sure that condensation drains correctly.

If water is used as the heat carrying fluid, the danger of freezing must be absolutely avoid.

20. ELECTRIC CONNECTIONS

The forced air heaters are completely wired at the factory and only require connection to the electrical mains, downstream from a unit switch, according to that envisioned by the Standards in force on this subject in the country of installation.

It is also advised to check that:

1. The electrical mains features are suitable for the absorption values indicated in the electrical data table, also taking into consideration any other machines operating at the same time.
2. The unit is only powered when installation has been completed (hydraulic and electric).
3. Respect the connection indications of the phase, and earth wires.
4. The power supply line must have a relevant protection mounted upstream against short circuits and dispersions to earth, which isolates the system with respect to other utilities.
5. The voltage must be within a tolerance of $\pm 10\%$ of the nominal power supply voltage of the machine (for unbalanced three-phase unit max 3% between the phases). Whenever these parameters are not respected, contact the electric energy public body.
6. For electric connections, use the cables with double isolation according to the Standards in force on this subject in the different countries.

MANDATORY

1. The use of an omnipolar magnet circuit breaker switch is mandatory, in compliance with the IEC-EN Standards (contact opening at least 3 mm), with suitable cut-off power and differential protection on the basis of the electric data table shown below, installed as near as possible to the appliance.
2. It is mandatory to make an effective earth connection. The manufacturer cannot be held responsible for any damage caused by the lack of or ineffective appliance earth connection.
3. For units with three-phase power supply, check the correct connection of the phases.



All the electrical operations must be carried out by **STAFF IN POSSESSION OF THE NECESSARY QUALIFICATIONS BY LAW**, suitably trained and informed on the risks related to these operations.



The characteristics of the electrical lines and of the related components must be determined by **STAFF QUALIFIED TO DESIGN ELECTRICAL SYSTEMS**, in compliance with the international and national regulations of the place of installation of the unit and in compliance with the regulations in force at the moment of installation.



For the installation requirements refer only to the electrical diagram supplied with the appliance. The electrical diagram along with the manuals must be kept in good condition and **ALWAYS AVAILABLE FOR ANY FUTURE SERVICING ON THE UNIT**.



It is mandatory to verify that the machine is watertight before making the electrical connections and it must only be powered up after the hydraulic and electrical works have been completed.

20.1. SPECIFICATIONS OF THE CONNECTION CABLES

Use **H05V-K** or **N07V-K** power cables with **300/500 V** insulation if enclosed inside a pipe or trough.

Use cables with double **H05W-F** type insulation for visible cable installation.

20.2. CONNECTION TO MAINS POWER SUPPLY

1. Before connecting the unit electrically to the mains power supply, make sure that the disconnection switch is open.
2. Use cable glands to pass the main electric power cable and the cables of the other external connections under the installer's responsibility.
3. It is prohibited to enter electric cables in positions not specifically envisioned in this manual.
4. Avoid direct contact with non-isolated copper piping and with the compressor.
5. Identify the clamps for the electric connection, only refer to the wiring diagram supplied with the unit.
6. For the functional connection of the unit, take



ATTENTION

It is prohibited to use the water pipes to earth the appliance. Use the connectors marked with the earth symbol to perform the earth connection of the unit and of other accessories to the building.



ATTENTION

Check the tightening of all power wire terminals on commissioning and after 30 days from start-up. Subsequently they must be checked every six months. Loose terminals can cause overheating of the cables and components.

the power cable to the electric control board inside the unit and connect it to the terminals respecting their polarity.

7. Re-position the inspection panels.
8. Make sure that all protections removed for the electric connection have been restored before electrically restoring the unit.
9. Position the system master switch (external to the appliance) at "ON".

20.3. ELECTRIC BATTERY CONNECTION

Follow the indications given below for correct electric battery connection:

- provide adequate protection upstream the unit with residual circuit breaker switches;
- always connect the safety thermostats to ensure power shut-off of the electric battery in case of overtemperature;
- the safety thermostats must be in series with the control thermostat (not supplied);
- the battery power supply must be interlocked with the fans;
- always connect the earth cable of the electric battery to the proper terminal in the electric box.

20.4. ELECTRIC MOTOR CONNECTION

(See diagrams page xx)

The electric motors are connected on the terminal boards mounted inside the unit for TUN 10-10P-15 and on the screw feeder of one of the fans for TUN 20-25-40-40P units.

For units equipped with two motors, the power and earth cables are provided on a terminal board for each fan.

20.5. CONNECTION WITH ELECTRONIC THERMOSTAT WMT05

(See diagrams page 58)

For fan coils installed in 2-pipe systems. The panel must be installed on the wall and protected electrically with an internal fuse. It has the following functions:

- on / off switch;
- cursor to select the heating / cooling modes (manual season change);
- cursor to select the fan speed (high, medium and low);
- temperature selector (+5°C÷30°C);
- in the event of a power outage, it starts the fan coil keeping the settings active before the previous shutdown;
- inside environment probe.

EACH PANEL CAN CONTROL ONE UNIT ALONE.

The control panel is composed solely of electric circuits connected to the 230V mains power voltage; all inputs must therefore be insulated for this voltage.

WMT05 can only be installed by specialised personnel. Disconnect power before beginning any installation or maintenance activity. Touching live components can cause a dangerous electrical shock.

The panel must be installed on a flat, non-conductive and non-flammable wall, in closed, dry environments. After the control panel has been installed, it is ready to work, but the exact intervention point will be reached after approximately 2 hours of use.

20.6. CONNECTION WITH CONTROL PANEL WMT10

(See diagrams page 58)

Wall installation. Controls operation of the unit according to the set mode. The panel must be wall mounted; it is to be used in 4-pipe and 2-pipe systems and systems with 2-pipes with resistance, with the possibility of connecting two ON - OFF type valves for the cut-off of the coil supply water. The panel is protected electrically by an internal fuse.

The control has the following functions:

1. cursor to select the cooling, off or heating mode;
2. manual season change;
3. manual selection of the fan speed;
4. selection of the desired room temperature (+10°C to 30°C);
5. thermostated ventilation;
6. continuous ventilation;
7. continuous ventilation in cooling mode and thermostated in heating mode;
8. when switched on, it starts the unit keeping the settings active before the previous shutdown;
9. after a power outage, it restarts keeping the settings active before the previous shutdown;
10. air temperature probe incorporated in panel;
11. ventilation mode is chosen by means of the Jumper upon installation.

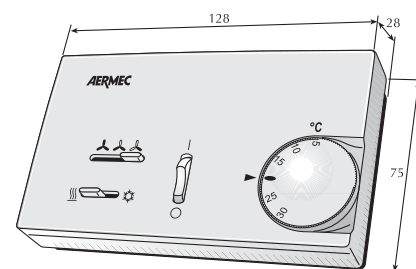
EACH PANEL CAN DIRECTLY CONTROL ONE UNIT ALONE.

The control panel is composed solely of electric circuits connected to the 230V mains power voltage; all inputs must therefore be insulated for this voltage.

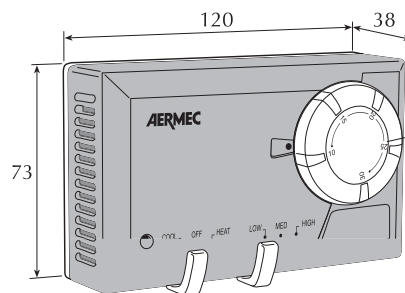
The servo controls of the valves must also be dimensioned for 230V.

WMT10 can only be installed by specialised personnel. Disconnect power before beginning any installation or maintenance activity. Touching live components can cause a dangerous electrical shock.

NOTE: For further information, refer to the accessory instructions on the website www.aermec.com



WMT05



WMT10

**ATTENTION**

We recommend to envision a machine book (not supplied, but the user's responsibility), which allows to keep track of the interventions performed on the unit. In this way it will be easy to suitably organise the interventions making troubleshooting and the prevention of any machine breakdowns easier. Use the book to record date, type of intervention made (routine maintenance, inspection or repairs), description of the intervention, measures actuated, etc.

**ATTENTION**

Inspection, maintenance and eventual repair work must be carried out only by a legally qualified technician.

**ATTENTION**

Lack of control/maintenance can cause damage to persons or objects.

**ATTENTION**

For appliances installed near the sea, the maintenance intervals must be doubled.

**ATTENTION**

Before accessing the unit for maintenance and/or cleaning, make sure that it is not live, that it cannot be powered without the operator knowing it and that the heat exchange coils are not on.

**ATTENTION**

When maintenance is finished, always close the unit with its panels, fixing them with screws.

**ATTENTION**

Envisions that disposal of the unit is carried out in conformity with the Standards in force in the different countries.

21. MAINTENANCE

Wear proper personal protective equipment (PPE) to perform maintenance.

The TUN series units have been designed to require little maintenance and to make every operation convenient. The following is simple advice for correct maintenance of the unit.

In any event the maintenance program must be carried out by a specialised technician.

21.1. ROUTINE MAINTENANCE

Routine maintenance consists in simple operations which should be performed monthly as follows:

CHECK:

1. that the screws fixing the fans to the panels are tight;
2. that the unit's electric power cable has no alterations which would jeopardise its insulation;
3. that the screws fixing the conductors to the electric components on the electric control board are tightened properly in order to guarantee correct electric connection; the same must be done for the earth connections.

21.2. MAINTENANCE OF FILTERS IF PRESENT

Cleaning the filters is fundamental to keep the air quality in the room at a high standard. The synthetic filters mounted on TUN units can be regenerated with a compressed air jet or washed with cold water.

22. DISPOSAL OF UNIT

The components of the TUN series have been designed to run continuously. The duration of some of the main components depends on the maintenance they have received.

At the end of their life, the TUN series units must be disposed of in compliance with that foreseen by standards in force.

The unit must be dismantled by specialised personnel.

To remove the filters, do as follows:

1. remove the inspection panels provided with screws;
2. pull the filters off;
3. clean the filters;
4. **put all the components back on in inverse order.**

21.3. MAINTENANCE OF FANS

It is essential to control and clean the fans to keep noise low in the room where the unit is installed.

Check yearly:

1. rotor cleanliness;
2. bearing noise.

21.4. MAINTENANCE OF COILS

Checking and cleaning the coils is fundamental to keep the air quality and renewal in the room at a high standard.

Check yearly:

1. that the finned pack is clean.

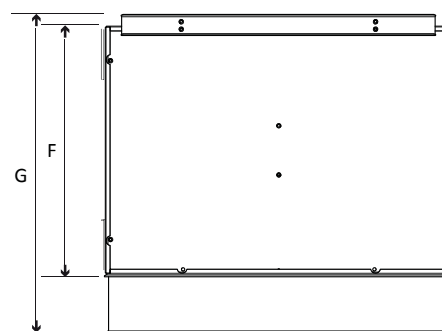
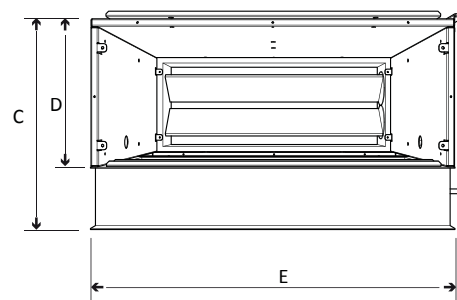
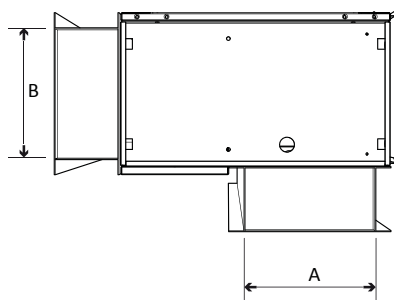
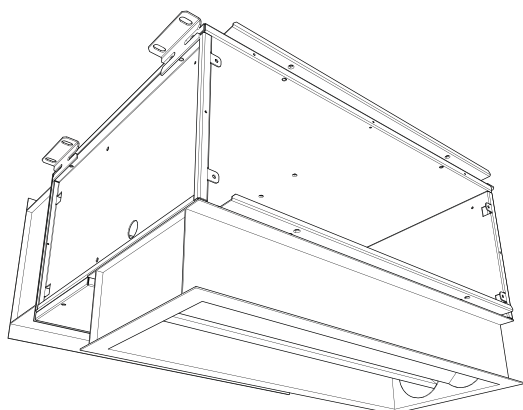
The main materials making up the units of the TUN series are:

- galvanised steel sheets (panels, fans, condensation drip tray);
- aluminium or aluminium alloy sheets (coil louvers, grids, electric motor casing);
- copper (coil pipes, electric motor windings).

ANOMALY	CAUSE	REMEDY
Air flow rate insufficient	<ul style="list-style-type: none"> • Filters clogged • Coils clogged 	<ul style="list-style-type: none"> • Clean the filters • Clean the coils
No air flow	<ul style="list-style-type: none"> • Power disconnected • Electric motor burnt 	<ul style="list-style-type: none"> • Check the presence of voltage • Replace the electric motor
Noise and vibrations	<ul style="list-style-type: none"> • Excessive flow rate • Fan bearings worn or faulty 	<ul style="list-style-type: none"> • Reduce flow rate • Replace the bearings
Dragging of water	<ul style="list-style-type: none"> • Extraneous bodies on fan rotor • No siphon or not installed properly 	<ul style="list-style-type: none"> • Clean the rotor • Provide a properly installed siphon as indicated in this manual
The unit does not reach the desired temperatures	<ul style="list-style-type: none"> • Temperature of air entering coil outside of foreseen limits 	<ul style="list-style-type: none"> • Check water temperature
	<ul style="list-style-type: none"> • Air in water coils 	<ul style="list-style-type: none"> • Bleed the coils
	<ul style="list-style-type: none"> • Insufficient water flow rate in water coils 	<ul style="list-style-type: none"> • Increase water flow rate
	<ul style="list-style-type: none"> • Insufficient coil inlet water temperature • Surface of coil pack dirty 	<ul style="list-style-type: none"> • Check water temperature • Clean pack surface

23. ACCESSORY DIMENSIONAL DATA

23.1. MIXING CHAMBER 2 DAMPERS "M2S"

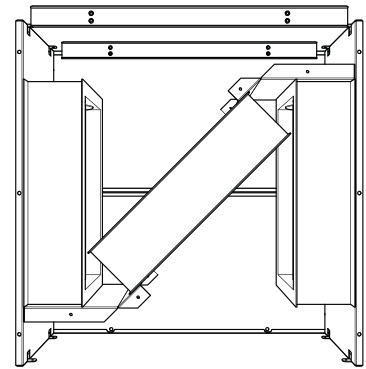
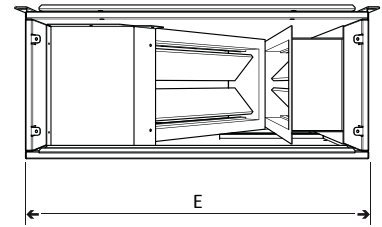
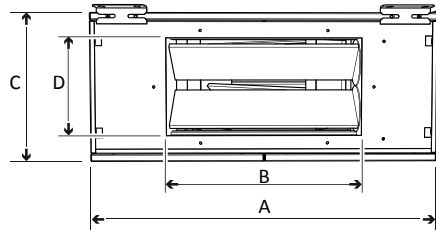
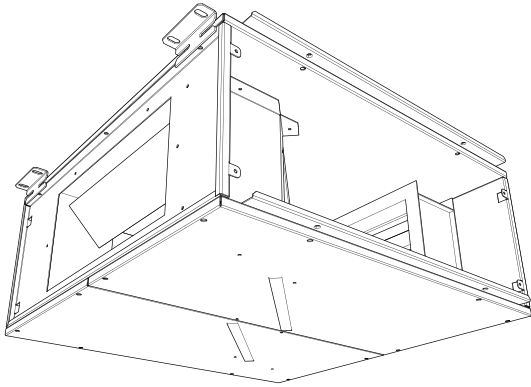


	COUPLING	dimensions						
		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
M2S1	TUN10	242	242	400	300	700	521	620
M2S2	TUN15	242	242	400	300	1050	501	600
M2S3	TUN20	332	332	490	390	1050	591	690
M2S4	TUN25-40	332	332	490	390	1475	591	690
M2S5	TUN40P	332	332	490	390	2100	591	690

23.2. MIXING CHAMBER 3 DAMPERS "M3S"

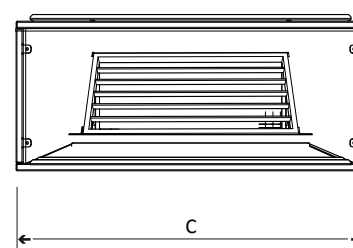
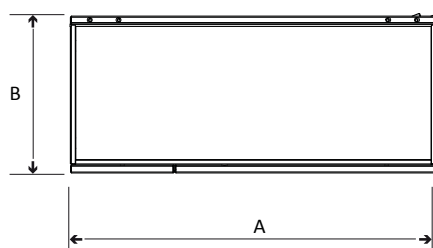
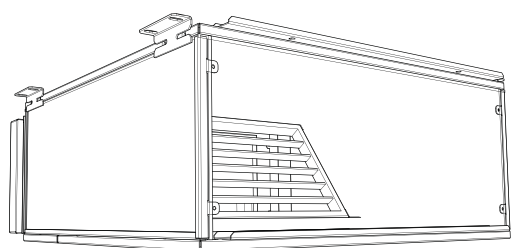
ACCESSORIES

WIRING DIAGRAMS



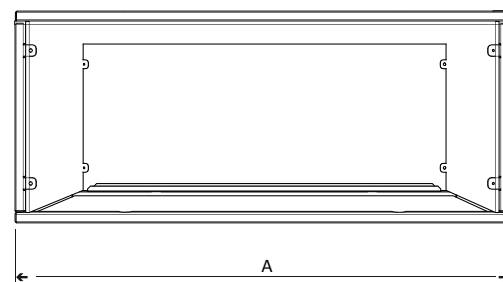
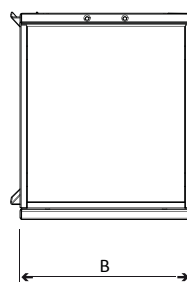
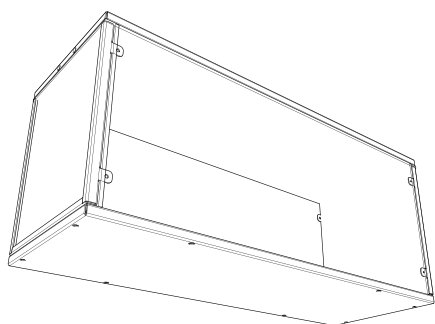
	COUPLING	dimensions				
		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
M3S1	TUN10	700	400	300	200	700
M3S2	TUN15	700	400	300	200	1050
M3S3	TUN20	850	500	390	300	1050
M3S4	TUN25-40	1142	770	390	300	2100
M3S5	TUN40P	1142	770	390	300	2100

23.3. SOFT BAG FILTER SECTION "FTF"



	COUPLING	dimensions		
		A (mm)	B (mm)	C (mm)
FTF1	TUN10	700	300	700
FTF2	TUN15	700	300	1050
FTF3	TUN20	700	390	1050
FTF4	TUN25-40	700	390	1475
FTF5	TUN40P	700	390	2100

23.4. SECTION WITH POST-HEATING COIL "PBE"

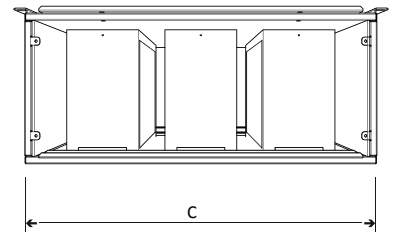
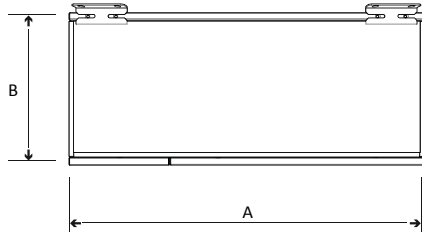
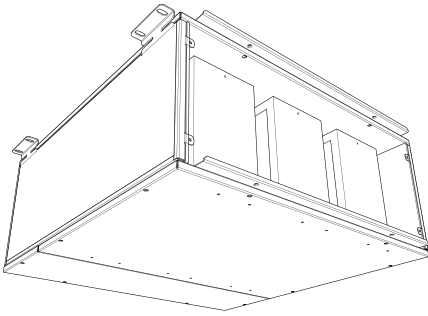


	COUPLING	dimensions		
		A (mm)	B (mm)	C (mm)
PBE1	TUN10	250	300	700
PBE3	TUN15	250	300	1050
PBE4	TUN20	250	390	1050
PBE5	TUN25	250	390	1475
PBE6	TUN40	250	390	1475
PBE7	TUN40P	250	390	2100

23.5. MODULE WITH SILENCER BAFFLES "SSL"

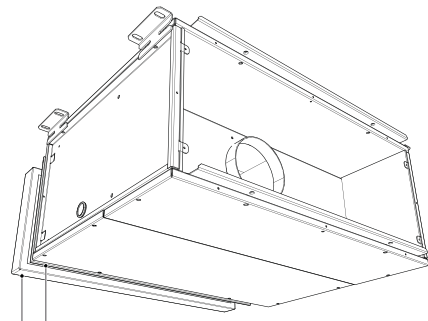
ACCESSORIES

WIRING DIAGRAMS

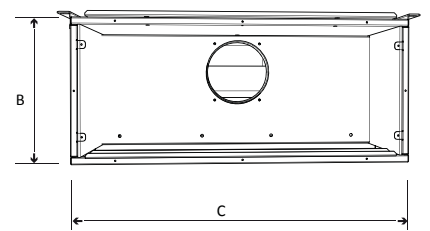
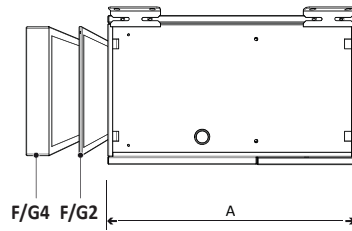


	COUPLING	dimensions			
		A (mm)	B (mm)	C (mm)	N° silencers
SSL1	TUN10	700	300	700	3
SSL2	TUN15	700	300	1050	4
SSL3	TUN20	700	390	1050	4
SSL4	TUN25	700	390	1475	5
SSL5	TUN40P	700	390	2100	7

23.6. RETURN VENTILATING SECTION WITH A G4 FILTER "VRF"

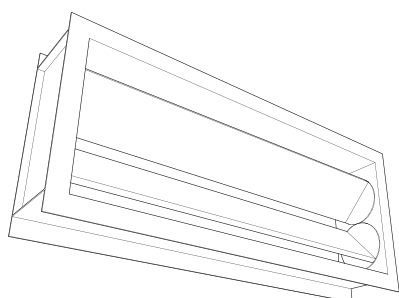


F/G4 F/G2



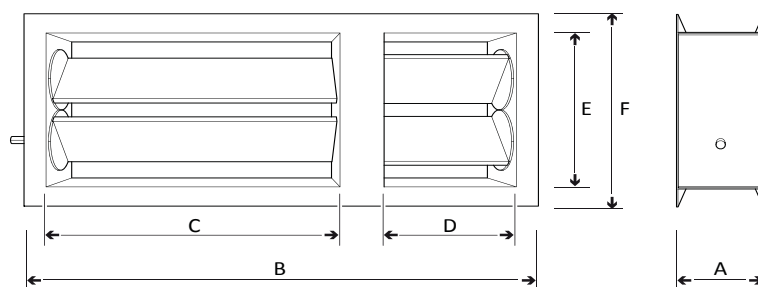
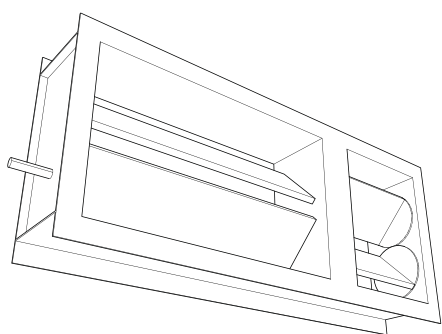
	COUPLING	dimensions			
		A (mm)	B (mm)	C (mm)	N° Fans
VRF1	TUN10	500	300	700	1
VRF3	TUN15	500	300	1050	2
VRF4	TUN20	590	390	1050	1
VRF5	TUN25	590	390	1475	1
VRF6	TUN40	590	390	1475	2
VRF7	TUN40P	720	390	2100	2

23.7. INTAKE DAMPER "SAS"



	COUPLING	dimensions		
		A (mm)	B (mm)	C (mm)
SAS1	TUN10	100	700	300
SAS2	TUN15	100	1050	300
SAS3	TUN20	100	1050	390
SAS4	TUN25-40	100	1475	390
SAS5	TUN40P	100	2100	390

23.8. 2-AREA DAMPER "S2Z" (70-30%)

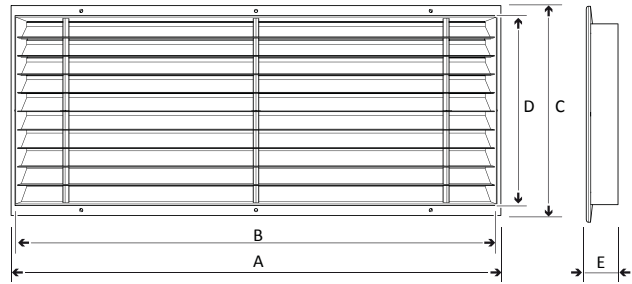
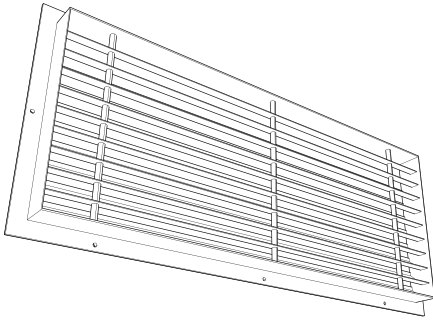


	COUPLING	dimensions					
		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
S2Z1	TUN10	100	700	400	180	240	300
S2Z2	TUN15	100	1050	650	280	240	300
S2Z3	TUN20	100	1050	650	280	300	390
S2Z4	TUN25-40	100	1475	950	405	300	390
S2Z5	TUN40P	100	2100	1380	600	330	390

23.9. FLOW GRID WITH ADJUSTABLE LOUVERS "GMD"

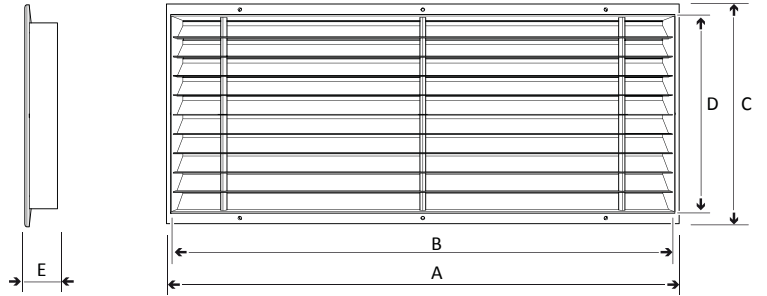
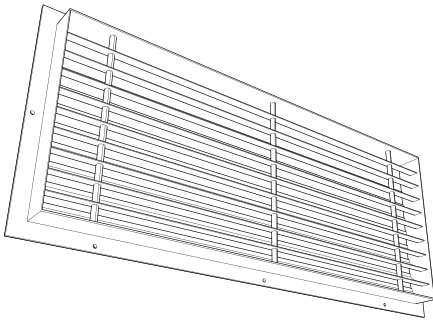
ACCESSORIES

WIRING DIAGRAMS



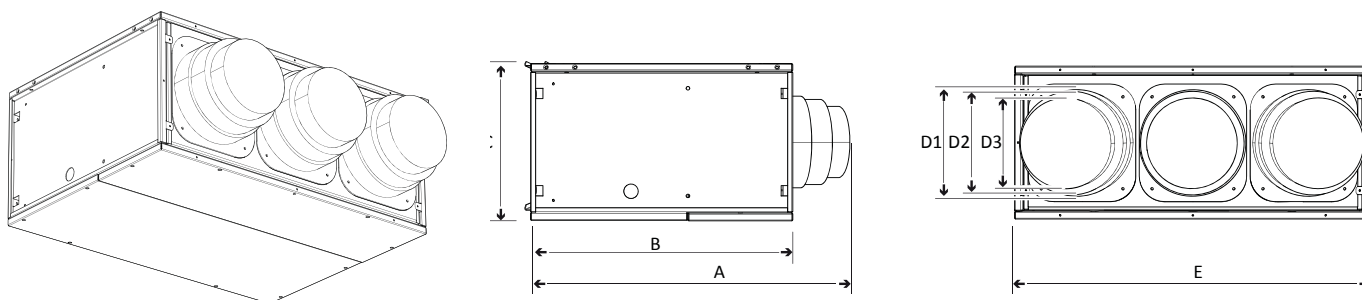
	COUPLING	dimensions				
		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
GMD1	TUN10	700	640	300	240	45
GMD2	TUN15	1050	990	300	240	45
GMD3	TUN20	1050	990	390	330	45
GMD4	TUN25-40	1475	1415	390	330	45
GMD5	TUN40P	2100	2040	390	330	45

23.10. INTAKE GRID "GAP"



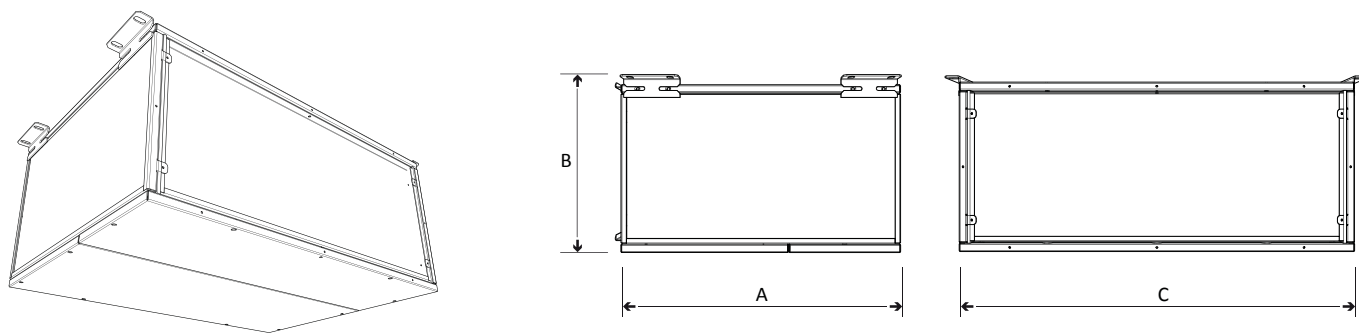
	COUPLING	dimensions				
		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
GAP1	TUN10	700	640	293	240	48
GAP2	TUN15	1050	990	300	240	45
GAP3	TUN20	1050	990	390	330	45
GAP4	TUN25-40	1475	1415	390	330	45
GAP5	TUN40P	2100	2040	390	330	45

23.11. PLENUM WITH CIRCULAR FLOW ATTACHMENTS "PMM"



	COUPLING	dimensions							
		A (mm)	B (mm)	C (mm)	E (mm)	D1 (mm)	D2 (mm)	D3 (mm)	N° Flange
PMM1	TUN10	607	500	300	700	200	180	150	3
PMM2	TUN15	607	500	300	1050	200	180	150	4
PMM3	TUN20	697,5	590	390	1050	200	180	150	4
PMM4	TUN25-40	697,5	590	390	1475	200	180	150	5
PMM5	TUN40P	697,5	590	390	2100	200	180	150	5

23.12. CLOSED FLOW PLENUM "PMC"



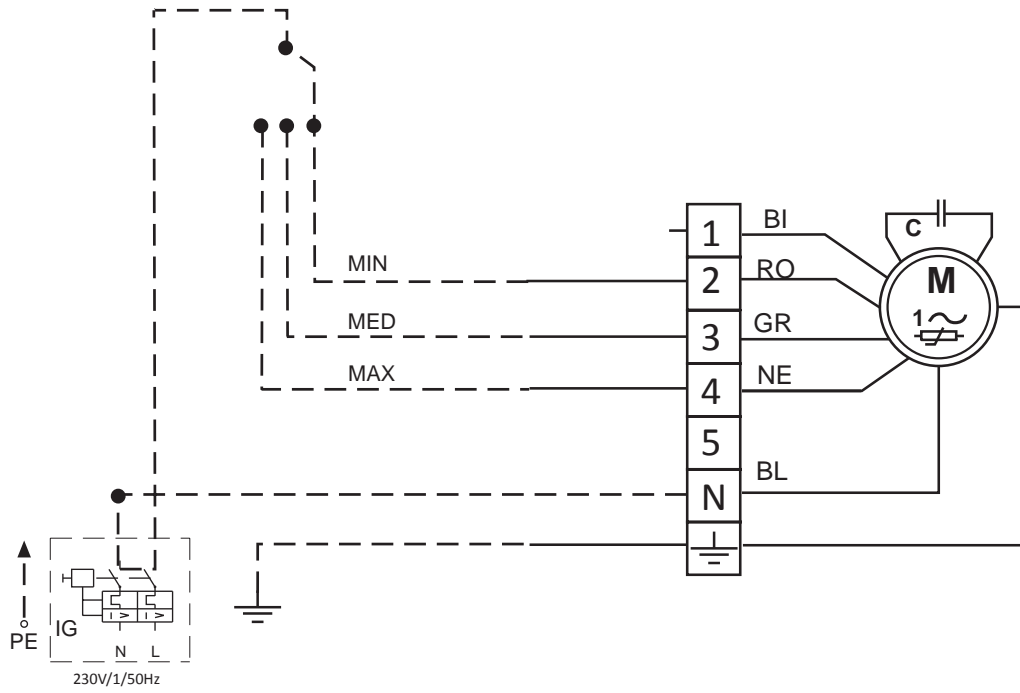
	COUPLING	dimensions		
		A (mm)	B (mm)	B (mm)
PMM1	TUN10	500	300	700
PMM2	TUN15	500	300	1050
PMM3	TUN20	590	390	1050
PMM4	TUN25-40	590	390	1475
PMM5	TUN40P	590	390	2100

24. MOTOR/S WIRING DIAGRAM

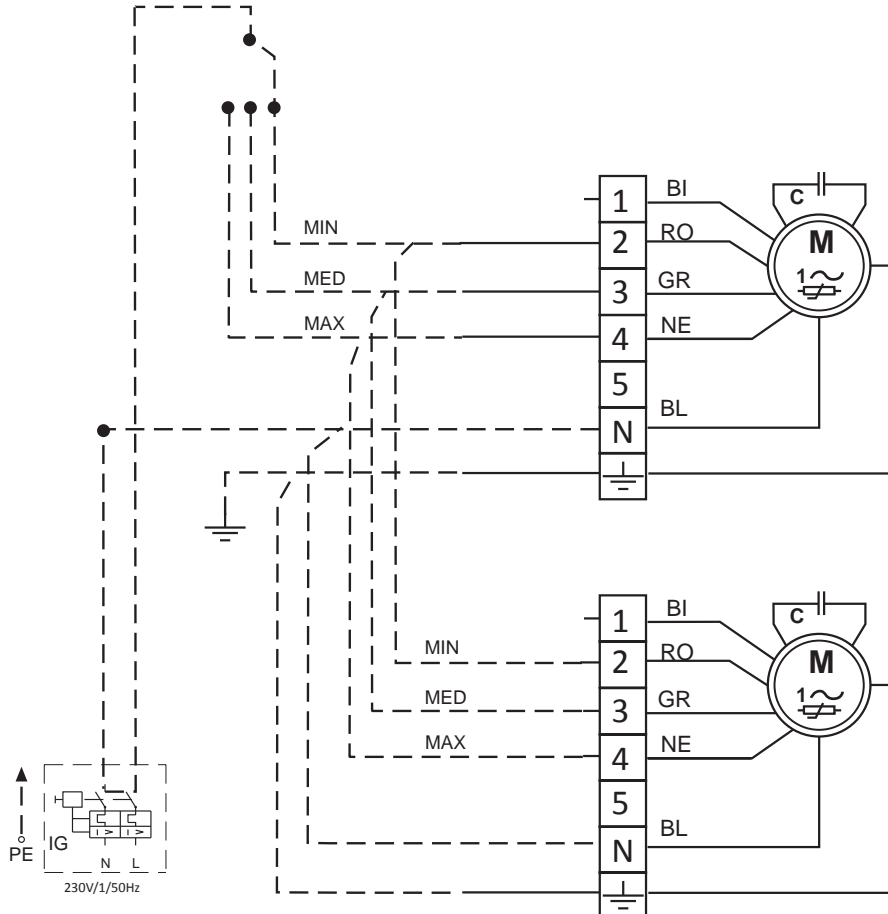
24.1. TUN 10

ACCESSORIES

WIRING DIAGRAMS

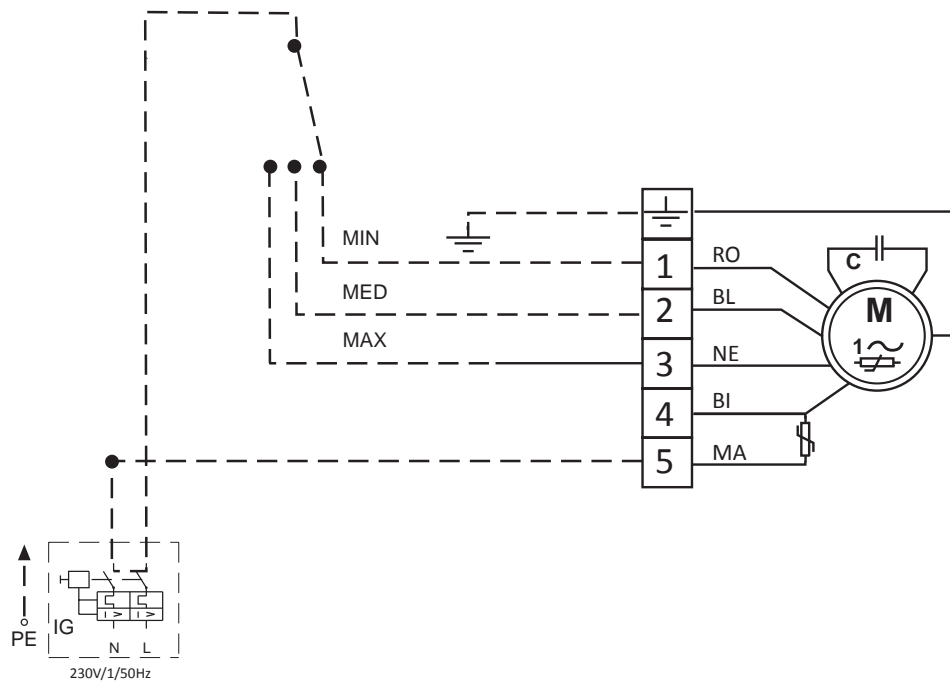


24.2. TUN 10P-15

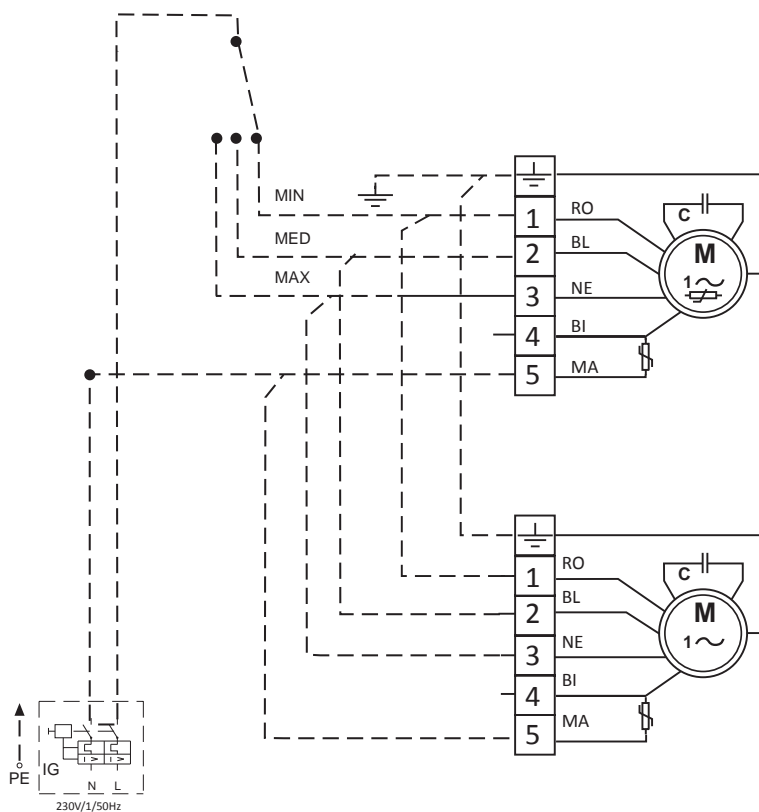


Key	
MIN	Minimum speed
MED	Medium speed
MAX	Maximum speed
BI	White
RO	Red
GR	Grey
NE	Black
BL	Blue

24.3. TUN 20-25



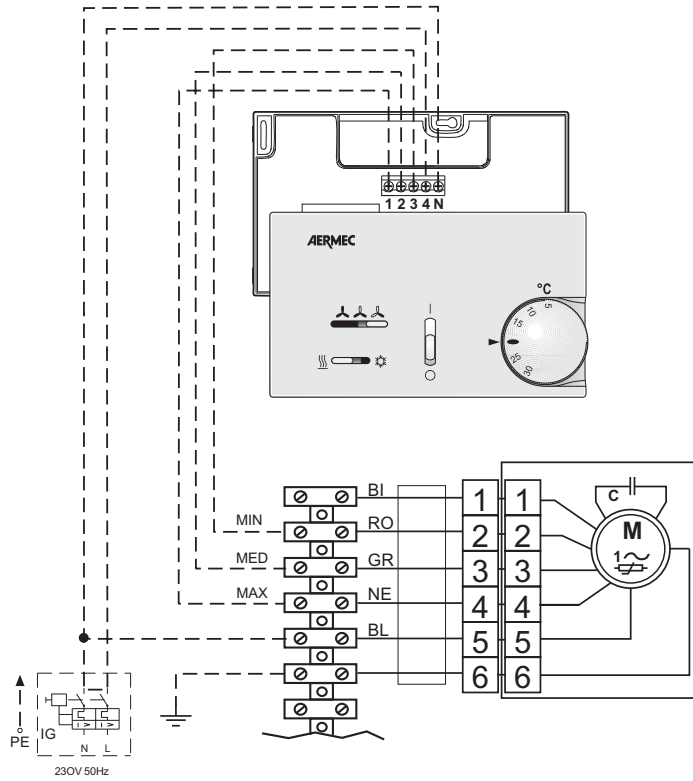
24.4. TUN 40-40P



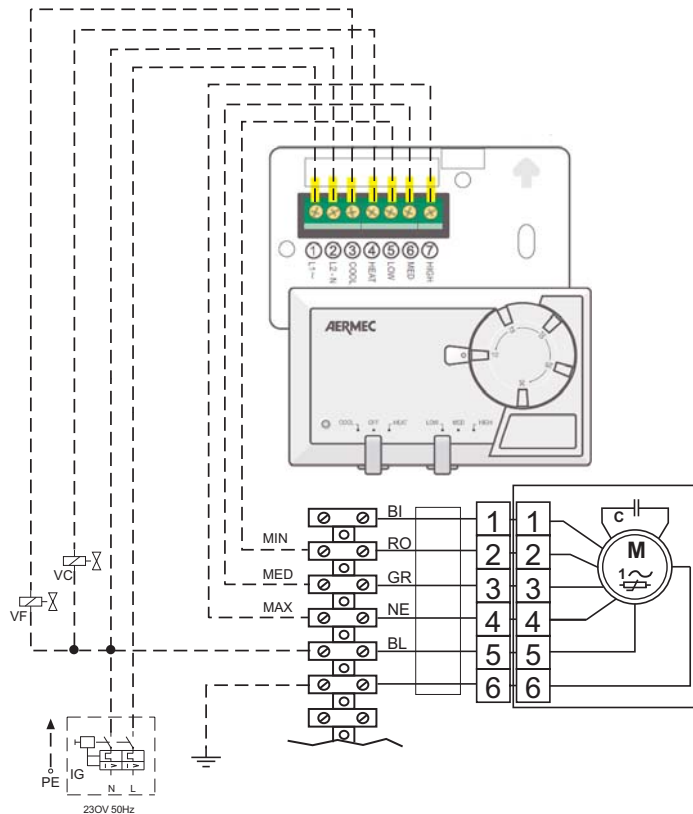
Key	
MIN	Minimum speed
MED	Medium speed
MAX	Maximum speed
BI	White
RO	Red
GR	Grey
NE	Black
BL	Blue

25. CONTROL PANEL WIRING DIAGRAM

25.1. TUN 10 WITH WMT5

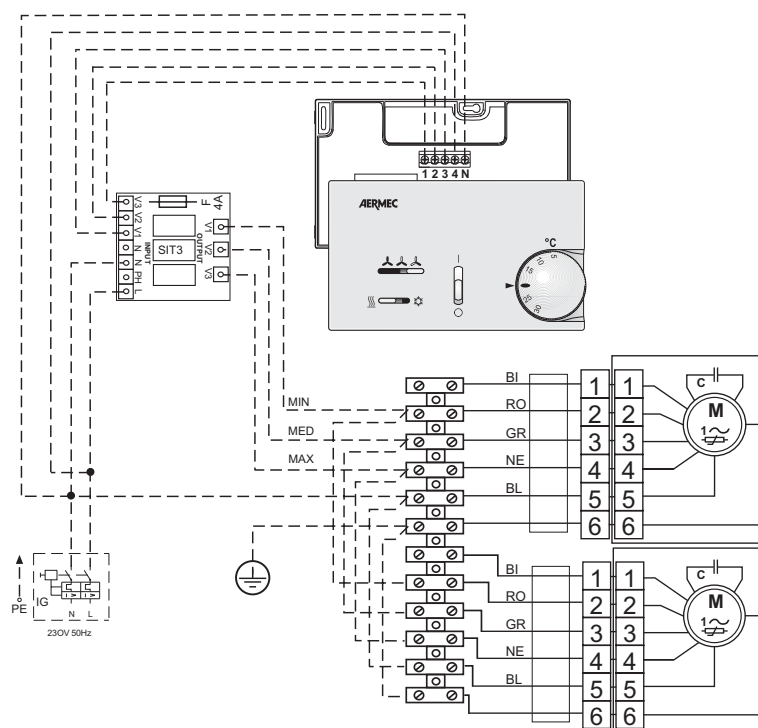


25.2. TUN 10 WITH WMT10

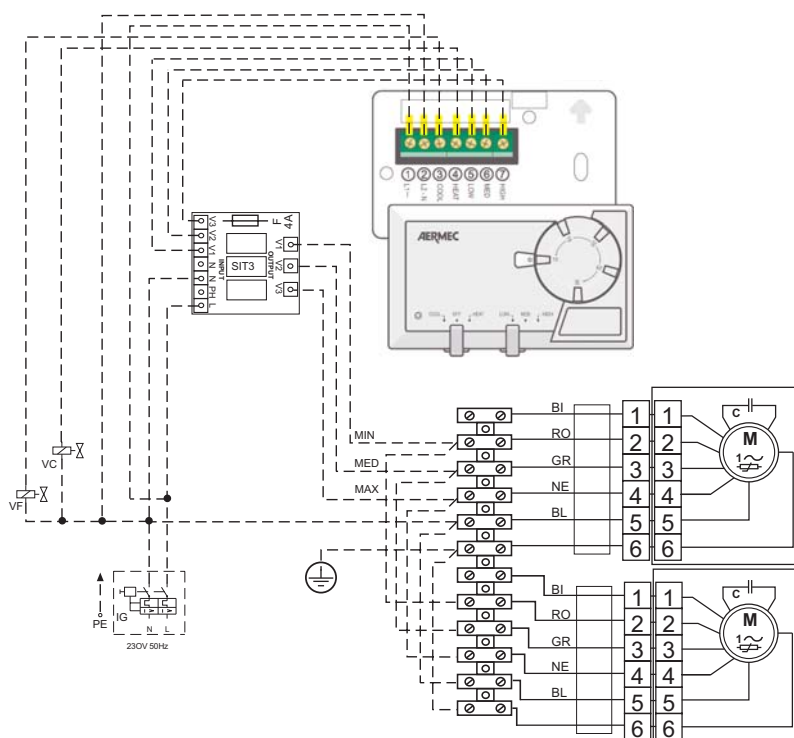


Key	
BI	White
RO	Red
GR	Grey
NE	Black
BL	Blue

25.3. TUN 10P - 15 WITH WMT5



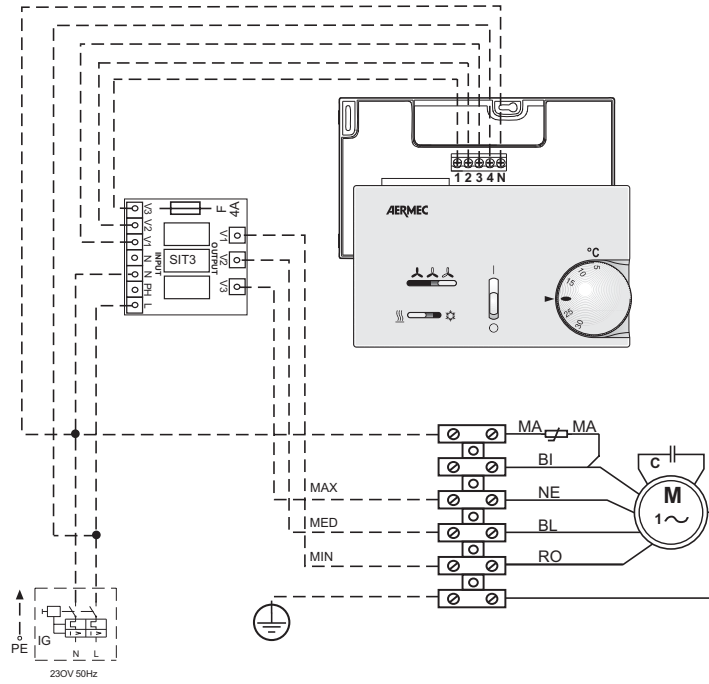
25.4. TUN 10P - 15 WITH WMT10



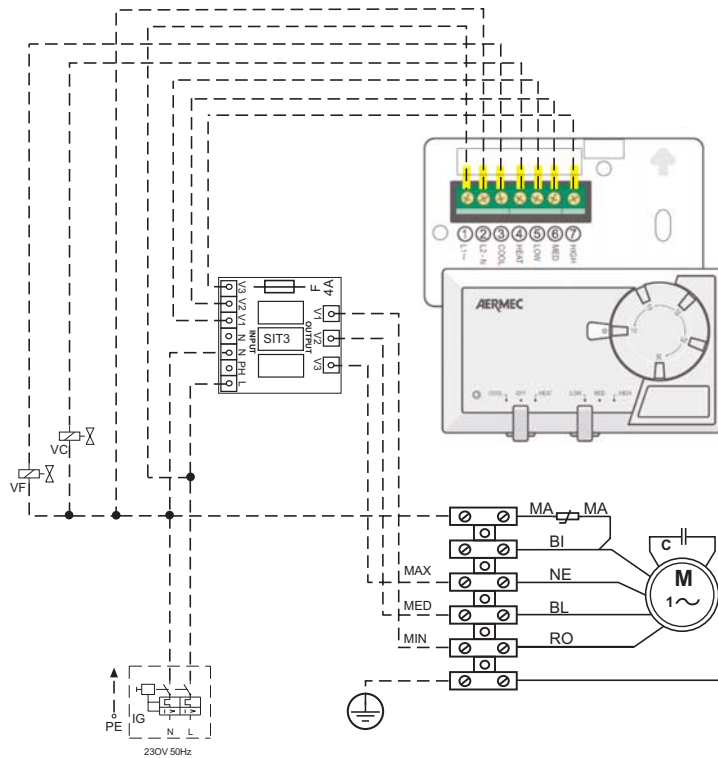
Key

BI	White
RO	Red
GR	Grey
NE	Black
BL	Blue

25.5. TUN 20 WITH WMT5

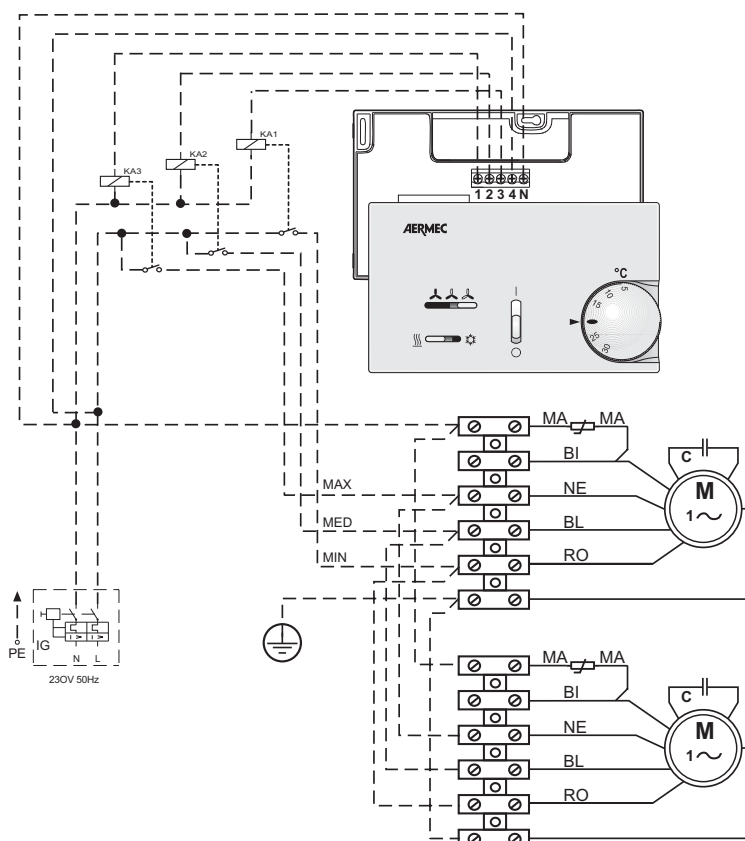


25.6. TUN 20 - 25 WITH WMT10

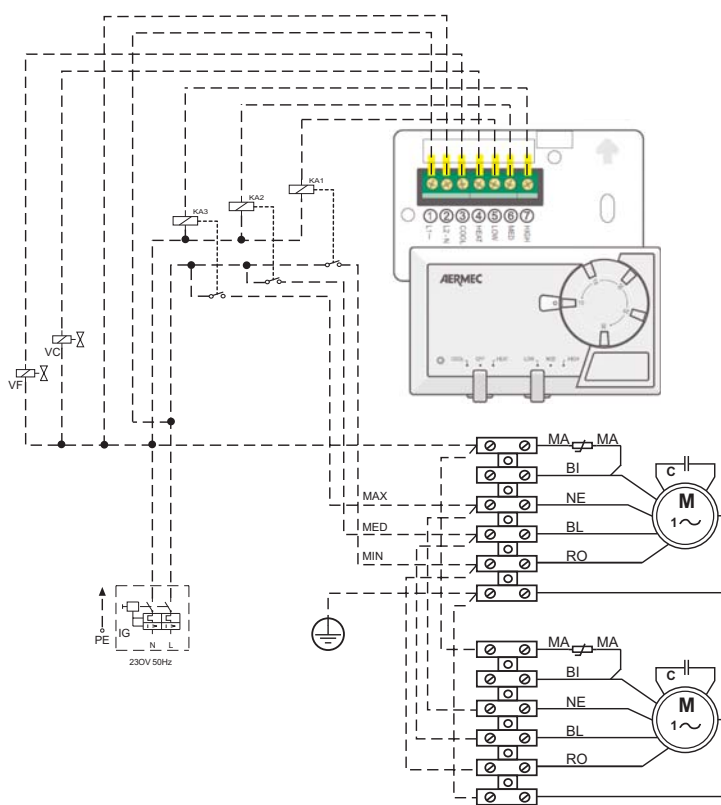


Key	
BI	White
RO	Red
GR	Grey
NE	Black
BL	Blue

25.7. TUN 40 WITH WMT5



25.8. TUN 40 WITH WMT10



Key

BI	White
RO	Red
GR	Grey
NE	Black
BL	Blue



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