



UTBS PRO-REG ECOWATT



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1. OVERVIEW

- We appreciate the trust you have placed in us by purchasing this device. You have purchased a high-quality product that has been manufactured in strict compliance with recognized technical regulations regarding safety, and in accordance with EC standards.
- Read this instruction booklet carefully, since it contains important information for your safety during the installation, use and maintenance of this product.
- Keep this booklet in case you need to consult it in the future.
- We ask that you make sure the equipment is in perfect condition when you unpack it, since any existing defect is covered by the S&P warranty.
- Technicians responsible for installing, start-up and maintenance must read the instructions and be familiar with them before starting work.

2. SAFETY STANDARDS AND “EC” MARKING

- S&P engineers are firmly committed to research and development to achieve products with improved efficiency that complies with current safety standards.
- The standards and recommendations indicated below reflect current standards in the field of safety, and therefore are based primarily on meeting standards of a general nature. Consequently, we recommend that all personnel exposed to risks adhere strictly to local regulations in force regarding hazard prevention.
- S&P is in no way responsible for any damage or injury caused to persons or objects resulting from failure to comply with safety standards, and any possible modifications to the product. The EC seal and statement of conformity serve as proof of the product's compliance with applicable European Community standards.

3. GENERAL STANDARDS





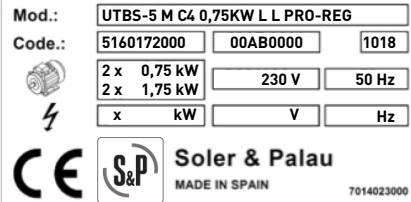
- Product risks have been analysed pursuant to the provisions of the Machinery Directive. This manual contains information intended for all personnel exposed to hazards, with the goal of preventing personal injuries or damage to objects resulting from mishandling or improper maintenance. All maintenance service work (corrective and preventive) must be performed with the equipment stopped and disconnected.
- To avoid danger of possible accidental start up ensure that the equipment is electrically isolated and locked. If this is not possible, warning signs should be placed on main distribution console that state:

“WARNING: controls disconnected for maintenance”

- Before connecting the power cable to the motors, make sure that the voltage on the line matches the voltage indicated on the unit's identification plate.

4. UNIT LABELING

- The unit comes with a variety of labels that must not be removed. Herewith sample labels and meaning:

ICON / LABEL	MEANING
	Signs on fan access door, indicates that the unit must be disconnected, followed by a waiting period, since there are moving parts that constitute danger in case of access.
	Indicates the airflow direction through the unit.
	In case of units equipped with cold water coil, it shows the water inlet and outlet.
	In case of units equipped with hot water coil, it shows the water inlet and outlet.
	Unit identification plate, which indicates: <ul style="list-style-type: none"> - Model - Code - Serial number - Date of manufacture - Output power of installed motors (Kw) - Maximum absorbed current of motor (A) - Power of installed electric heater - Electrical supply

5. TECHNICAL CHARACTERISTICS

VENTILATION SECTION

The UBTS-2 model incorporates a fan, while the UTBS-3,5 and 8 models have two. Each model has associated a certain size of fan and motor.

The integrated controller, makes it possible to adapt the working point to the needs of each installation, obtaining a high efficiency at the required working point.

Model	Maximum airflow (m³/h)			Fans				
	Chilled water coil/DX	Hot water coil	Electrical coil	Quantity	Supply voltage	Sound pressure level (r.p.m.)	Motor power (kW)	Maximum intensity* (A)
UTBS-2	1300	2150	2150	1	230/I/50	2850	0,45	2
UTBS-3	2600	4000	4000	2	230/I/50	2850	2 x 0,45	3,9
UTBS-5	3750	5800	5800	2	230/I/50	2830	2 x 0,85	7,2
UTBS-8	6100	8000	8000	2	400/III/50	2600	2 x 1	3,6

* In units with two fans, the value corresponds to the sum of both fans.

COIL SECTION

Water coils

One or two water coils can be included in the section (one heating or one cooling coil or both at the same time).

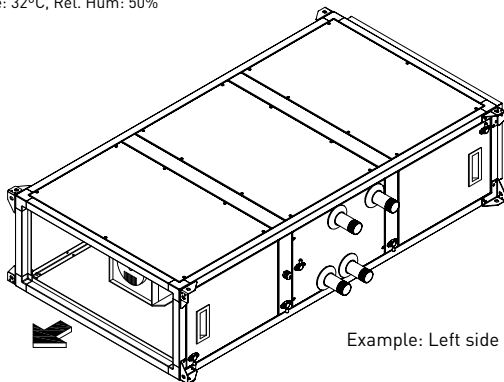
The units can be supplied with 2 or 4 rows for heating coils and 4 or 6-row for cooling coils. If the unit includes a cooling coil it is always supplied as a standard with condensate drip tray made from stainless steel AISI 304 and a droplet eliminator.

The connections of the water coil and the drip tray can be ordered on left side or right side of the unit.

Model	Airflow (m³/h)	Coils Thermal power (kW)						Inlet/Outlet connections
		Hot water coil				Chilled water coil		
		H2		H4		C4	C6	
		80°C/60°C	50°C/45°C	80°C/60°C	50°C/45°C	7°C/12°C	7°C/12°C	
UTBS-2	900	11,9	8,3	18,2	22,7	8,1	9,6	1-1/4" GM
	1.200	14,4	10,0	22,7	15,5	10,0	11,9	
UTBS-3	1.700	23,5	16,0	34,7	23,5	15,5	20,0	1-1/4" GM
	2.500	30,5	20,9	46,8	31,9	20,5	23,3	
UTBS-5	2.500	33,9	23,3	51,2	34,7	23,2	29,2	1-1/4" GM
	3.500	42,7	29,4	66,6	45,2	29,6	38,4	
UTBS-8	4.000	55,0	37,7	81,4	55,4	36,0	46,8	1-1/2" GM
	6.000	72,5	49,8	111,5	76,1	48,2	64,8	

* Air inlet temperature: -5°C, Rel. Hum: 80%

** Air inlet temperature: 32°C, Rel. Hum: 50%



Example: Left side register

Electric heaters

The unit can be supplied with electric heaters made of shielded resistances with a galvanised sheet frame. The heaters are equipped with safety protection with manual and automatic reset. The heater has an anti-radiation screen to protect the filters.

Model	Available electric power / Stages					
UTBS-2	E4,5	4,5 kW/ 1et.	E15	15,0 kW/ 2et.		
UTBS-3	E6	6,0 kW/ 1et.	E15	15,0 kW/ 2et.	E24	24,0 kW/ 2et.
UTBS-5	E9	9,0 kW/ 2et.	E15	15,0 kW/ 2et.	E36	36,0 kW/ 3et.
UTBS-8	E15	15,0 kW/ 2et.	E24	24,0 kW/ 2et.	E45	45,0 kW/ 3et.

Direct expansion coil (DX)

The unit can be supplied with expansion direct coils for R-410A gas. Compatible with the main control kits of the market.

4 rows coil

For applications with 100% recirculated air.

Model	Air flow (m³/h)	Volume (dm³)	Nº Stages	Ø Distributor (Liquid line)	Ø Collector (Gas Line)	COOLING					HEATING				
						Power* (kW)	Supply air Temp. (°C)	Rel. Hum. (%)	R410A Air-flow (kg/h)	ΔP R410A (kPa)	Power** (kW)	Supply air Temp. (°C)	Rel. Hum. (%)	R410A Air-flow (kg/h)	ΔP R410A (kPa)
UTBS-2	1.250	1,2	1	3/8"	5/8"	4,6	14,2	87	84,6	14,9	4,9	32,7	25	87,9	9,6
UTBS-3	2.500	2,21	1	1/2"	5/8"	8,8	14,4	87	163,3	13,0	8,0	33,6	28	143,4	6,1
UTBS-5	3.500	2,41	1	1/2"	5/8"	10,9	15,2	85	200,0	10,9	10,0	32,7	30	180,2	5,1
UTBS-8	6.000	4,4	1	1/2"	5/8"	19,9	14,9	86	368,3	22,1	17,2	32,7	30	310,1	8,8

* Air Inlet 24°C / 50%R.H.

** Air Inlet 21°C / 50%R.H.

6 rows coil

For applications with 50% outdoor air/ 50% recirculated air.

Model	Air flow (m³/h)	Volume (dm³)	Nº Stages	Ø Distributor (Liquid line)	Ø Collector (Gas Line)	COOLING					HEATING				
						Power * (kW)	Supply air Temp. (°C)	Rel. Hum. (%)	R410A Air-flow (kg/h)	ΔP R410A (kPa)	Power ** (kW)	Supply air Temp. (°C)	Rel. Hum. (%)	R410A Air-flow (kg/h)	ΔP R410A (kPa)
UTBS-2	1.250	2	1	1/2"	5/8"	10,0	14,5	94	185,3	8,6	10,5	34,4	17	190,5	5,1
UTBS-3	2.500	3,31	1	1/2"	5/8"	19,4	14,9	94	358,6	25,3	19,9	30,8	18	359,0	13,7
UTBS-5	3.500	4,3	1	1/2"	3/4"	26,6	15,2	94	490,5	18,6	27,6	30,6	18	498,0	10,3
UTBS-8	6.000	8,4	2	2 x 1/2"	2x 3/4"	47,8	14,6	94	882,0	25,3	49,8	31,8	17	897,0	12,3

* Air Inlet 29°C / 55%R.H.

** Air Inlet 8°C / 75%R.H.

Filtered section

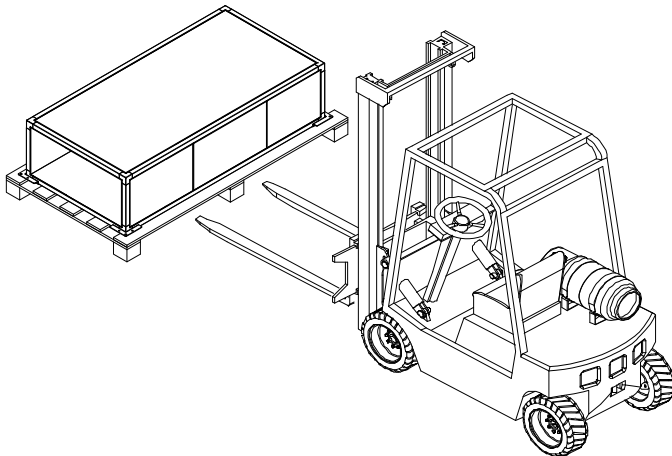
Filtration section with two alternatives:

- Long version **P F7** with capacity for mounting two filters: F7 with very low built-in pressure drop and possibility of mounting a second filter (supplied as an accessory). The filter clamping system with articulated arms ensures excellent sealing of the filter assembly. Available filters G4, M5 and F9.
- **M5** short version with the ability to fit a single M5 filter mounted using a guide system without filter clamps.

Available filters F6, F8 or F9 filters with an efficiency level above 60%.
The filters have been manufactured according to UNE 779:2013.

6. HANDLING

- When unit received, unpack and make sure the packaging is intact; any defect may indicate damage to the equipment. Review it carefully to make sure that no parts are missing.
- If there is any damage to the unit or the shipment is not complete, write down the problems on the delivery slip and send a claim to the carrier. Also report any problems to S&P.
- Components should be transported using appropriate hoist and slings. The equipment has corner lugs for loading and unloading.
- The UTBS PRO-REG units are delivered bolted in pallets.



- It is possible to manipulate by the unit using a forklift or crane. Handling machines must be adapted to the conditions of loading and lifting. In all cases, the lift must be carried out from the base of the device. The centre of gravity is NOT in the center of the unit. Before lifting the equipment ensure that gravity center of the device is entering the two blades of the forklift.
- The unit should be handled carefully and only horizontally.

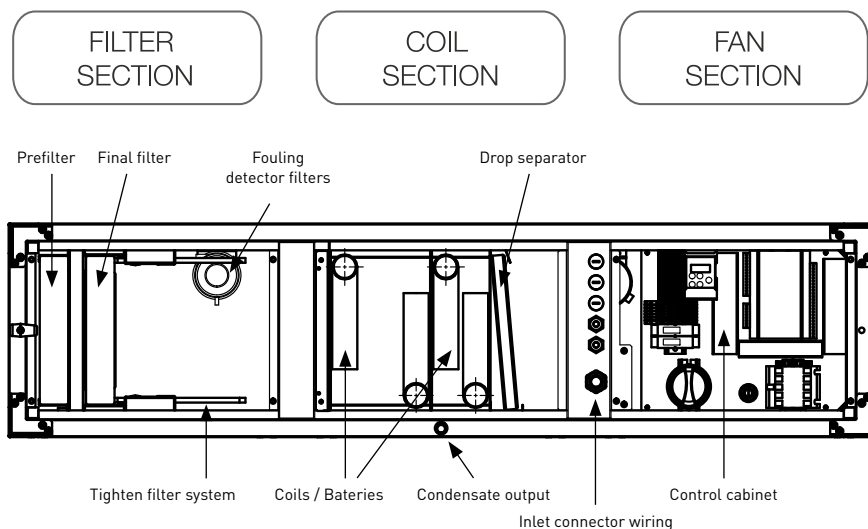
7. INSTALLATION

7.1. OVERVIEW

- The technician responsible for equipment receipt must ensure that the characteristics of the existing power supply agree with the electrical data on the unit's identification plate.
- Before installing the equipment in its final position, make sure that the place where it will be located is strong enough to support its weight.
- Under no circumstances should these units be installed in flammable or explosive environments, in environments that contain oil vapours, salt air, or corrosive environments.
- Equipment installation can present hazards due to the material used, pressures in the system and the electrical components. For this reason, only trained and qualified service personnel may install service or repair the equipment.
- As a precaution, when performing operations inside the equipment, shut off the power at a main breaker. This serves to prevent any accidents involving the equipment's moving parts, which can start accidentally, well as to prevent any direct or indirect contact with live parts.
- When installing the unit, it must be levelled to allow for a good fit between the different modules, perfect condensate drainage and proper opening of the doors.
- To test whether the fan is in perfect condition, check the centering of the intake ring by turning the impeller by hand.

7.2. IDENTIFICATION UNIT PARTS

The main module may consist of three different sections: filter, coils and fans. However, one of the first two sections may not be included. The following illustration identifies the main components of the main module.



7.3. INSTALLATION SITE

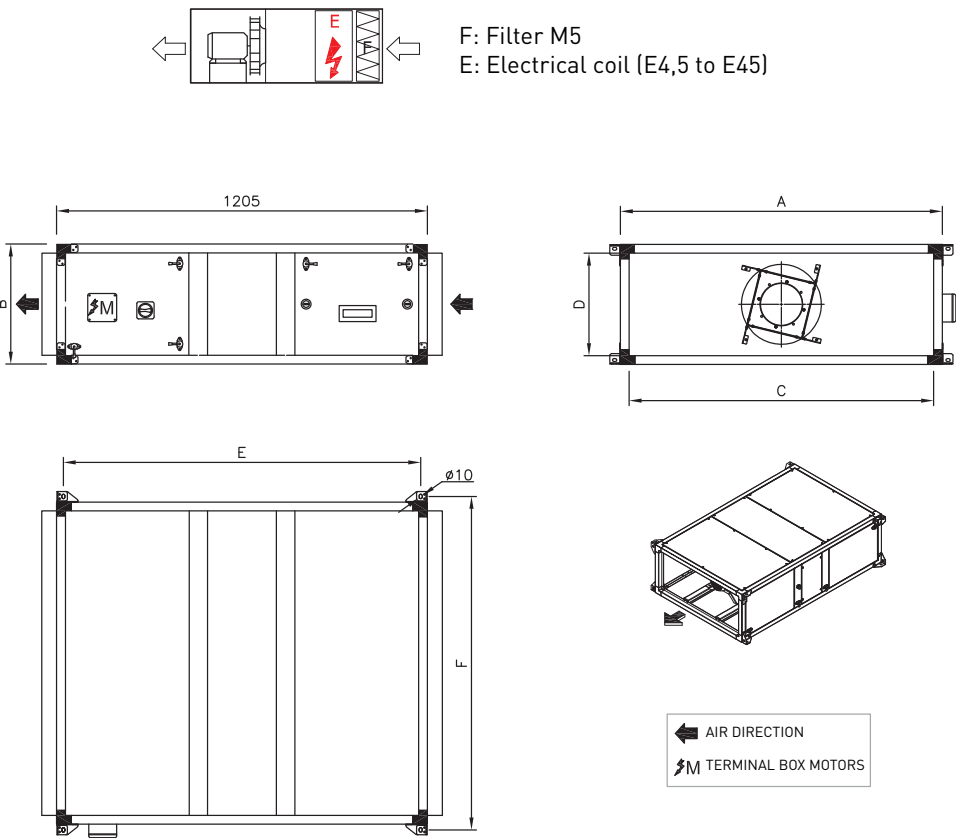
- Avoid installing the unit in areas near heat sources or in damp areas where the unit might come in contact with water.
- It is recommended that the unit be installed in a place that is easily accessible for the installation. Provide sufficient room for maintenance, connection and drainage of condensate.

7.4. MAINTENANCE SPACE

- The installer should leave sufficient unobstructed space to allow free access to the unit for maintenance. The amount of space needed will depend on which side of the unit is performing the extraction. The unit is equipped with some side access doors for access to the filters and fans. To remove the coils, the side panel must be removed. Both the filters and the fans can be removed from either side of the unit.

7.4.1. Dimensions

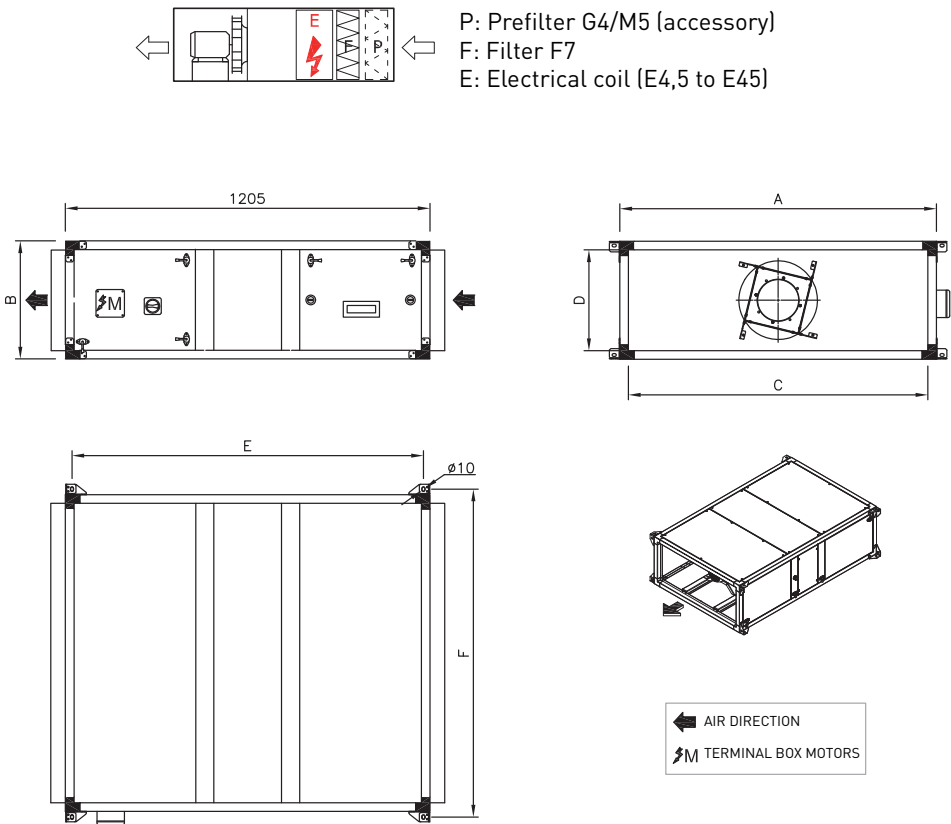
Short version: Single filter type M5
Configuration with electric coil



Model	External		Connections		Supports		Weight (kg)
	A	B	C	D	E	F	
UTBS-2	750	360	690	300	1159	790	86
UTBS-3	1100	410	1040	350	1159	1140	118
UTBS-5	1500	410	1440	350	1159	1540	174
UTBS-8	1900	500	1840	440	1159	1940	218

Long version: F7 filter with additional filter mounting capacity

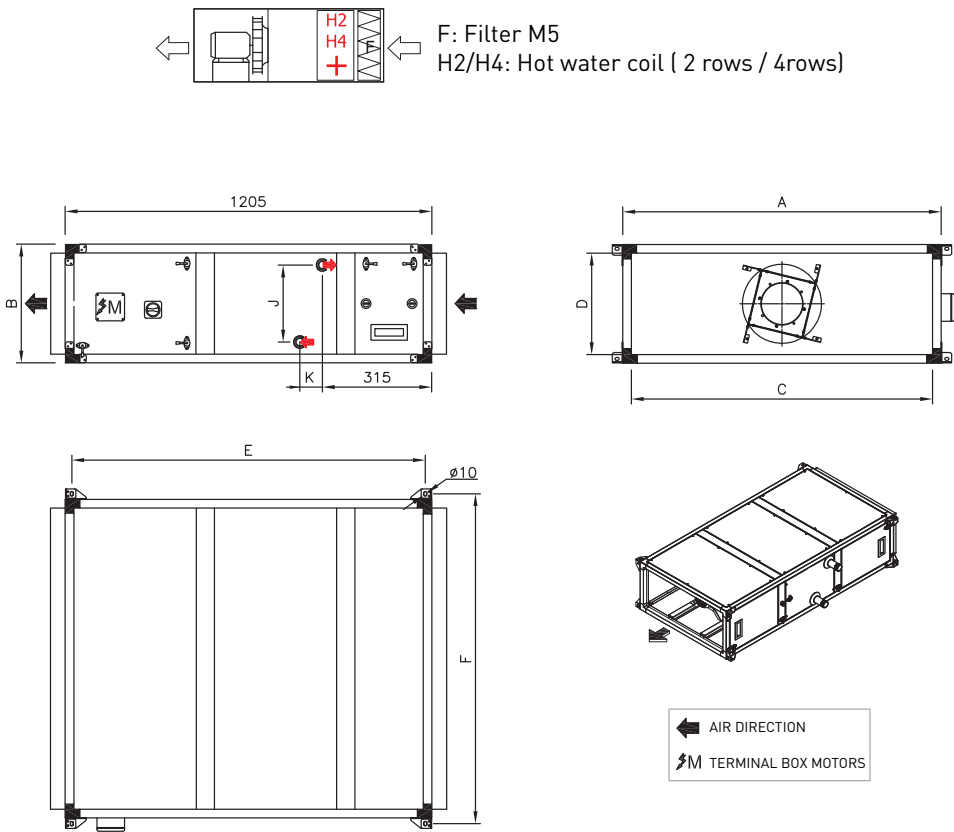
Configuration with electric coil



Model	External		Connections		Supports		Weight (kg)
	A	B	C	D	E	F	
UTBS-2	750	360	690	300	1159	790	86
UTBS-3	1100	410	1040	350	1159	1140	118
UTBS-5	1500	410	1440	350	1159	1540	174
UTBS-8	1900	500	1840	440	1159	1940	218

Short version: Single filter type M5

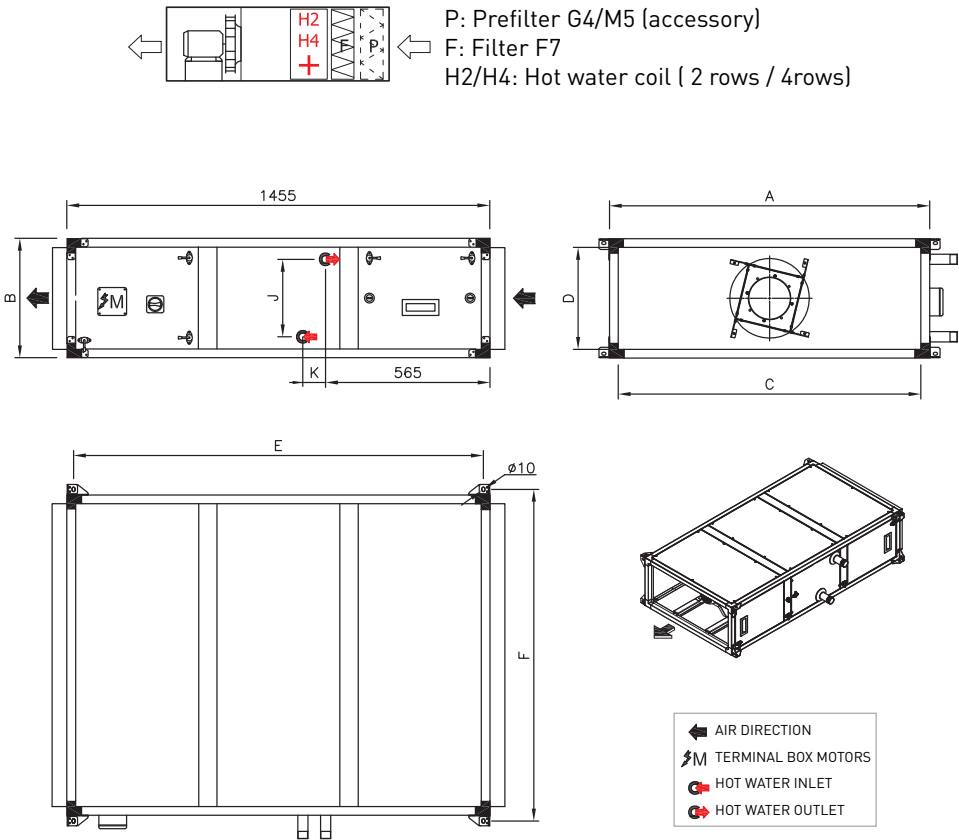
Configuration with hot water coil



	External		Conections		Supports		Coils				Weight (kg)	
Model	A	B	C	D	E	F	J	K (H2/H4)	Connections	H2	H4	
UTBS-2	750	360	690	300	1159	790	219	50	80	1-1/4"	97	100
UTBS-3	1100	410	1040	350	1159	1140	269	50	80	1-1/4"	131	135
UTBS-5	1500	410	1440	350	1159	1540	269	50	80	1-1/4"	188	204
UTBS-8	1900	500	1840	440	1159	1940	344	50	80	1-1/2"	233	245

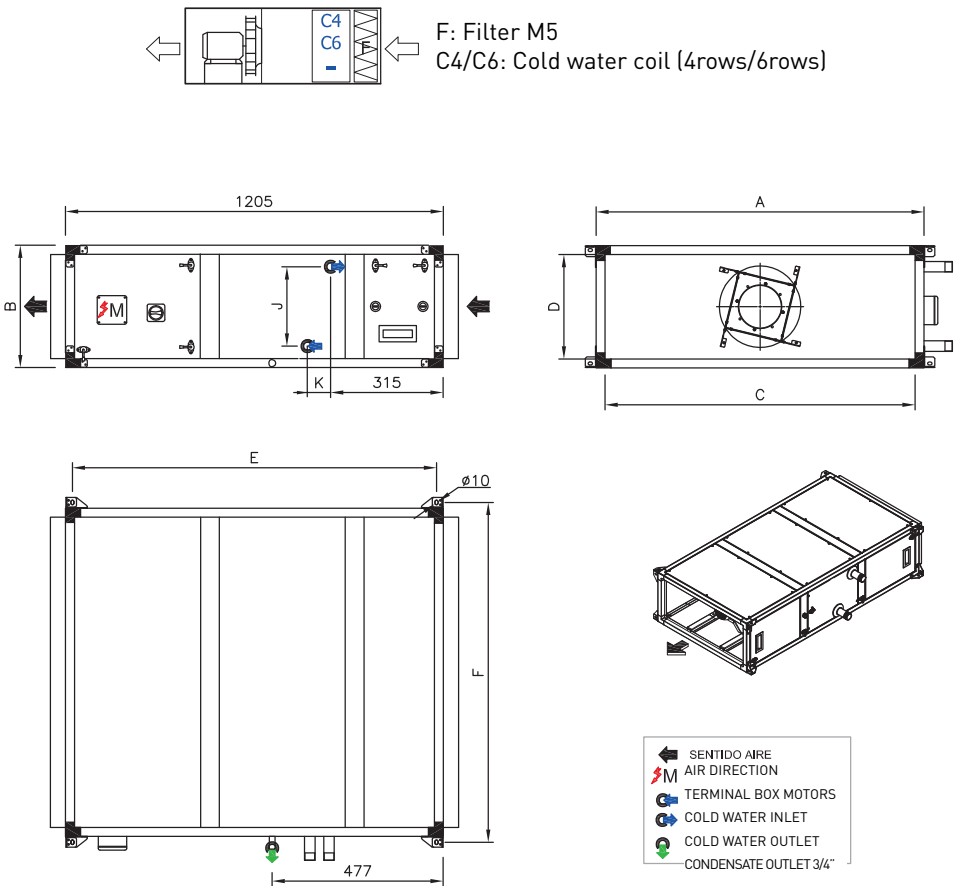
Long version: F7 filter with additional filter mounting capacity

Configuration with hot water coil



	External		Conections		Supports		Coils			Weight (kg)		
Model	A	B	C	D	E	F	J	K (H2/H4)	Connections	H2	H4	
UTBS-2	750	360	690	300	1409	790	219	50	80	1-1/4"	97	100
UTBS-3	1100	410	1040	350	1409	1140	269	50	80	1-1/4"	131	135
UTBS-5	1500	410	1440	350	1409	1540	269	50	80	1-1/4"	188	204
UTBS-8	1900	500	1840	440	1409	1940	344	50	80	1-1/2"	233	245

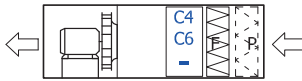
Short version: Single filter type M5
 Configuration with cold water coil



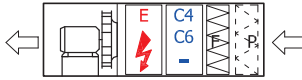
	External		Connections		Supports		Coils				Weight (kg)	
Model	A	B	C	D	E	F	J	K [C4/C6]	Connections	C4	C6	
UTBS-2	750	360	690	300	1159	790	219	80	120	1-1/4"	105	107
UTBS-3	1100	410	1040	350	1159	1140	269	80	120	1-1/4"	142	147
UTBS-5	1500	410	1440	350	1159	1540	269	80	120	1-1/4"	204	210
UTBS-8	1900	500	1840	440	1159	1940	344	80	120	1-1/2"	258	268

Long version: F7 filter with additional filter mounting capacity

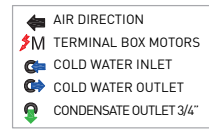
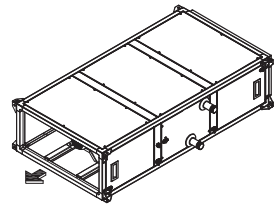
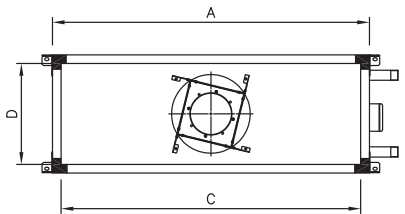
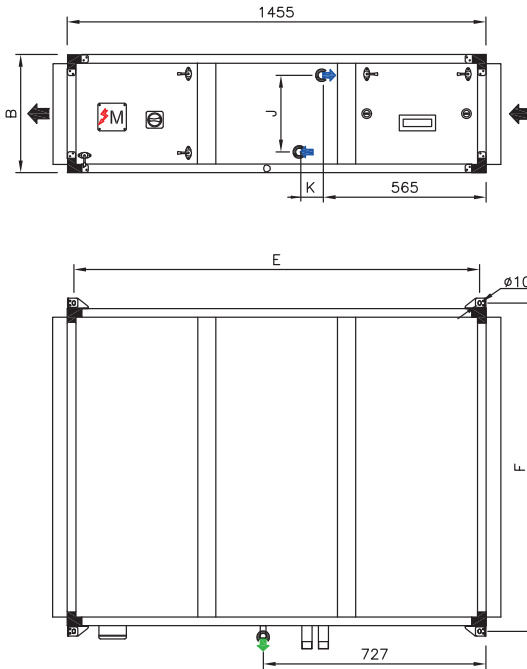
Configuration with cold water coil



P: G4/M5 prefilter (accessory)
F: Filter F7
C4/C6: Cold water coil (4rows/6rows)



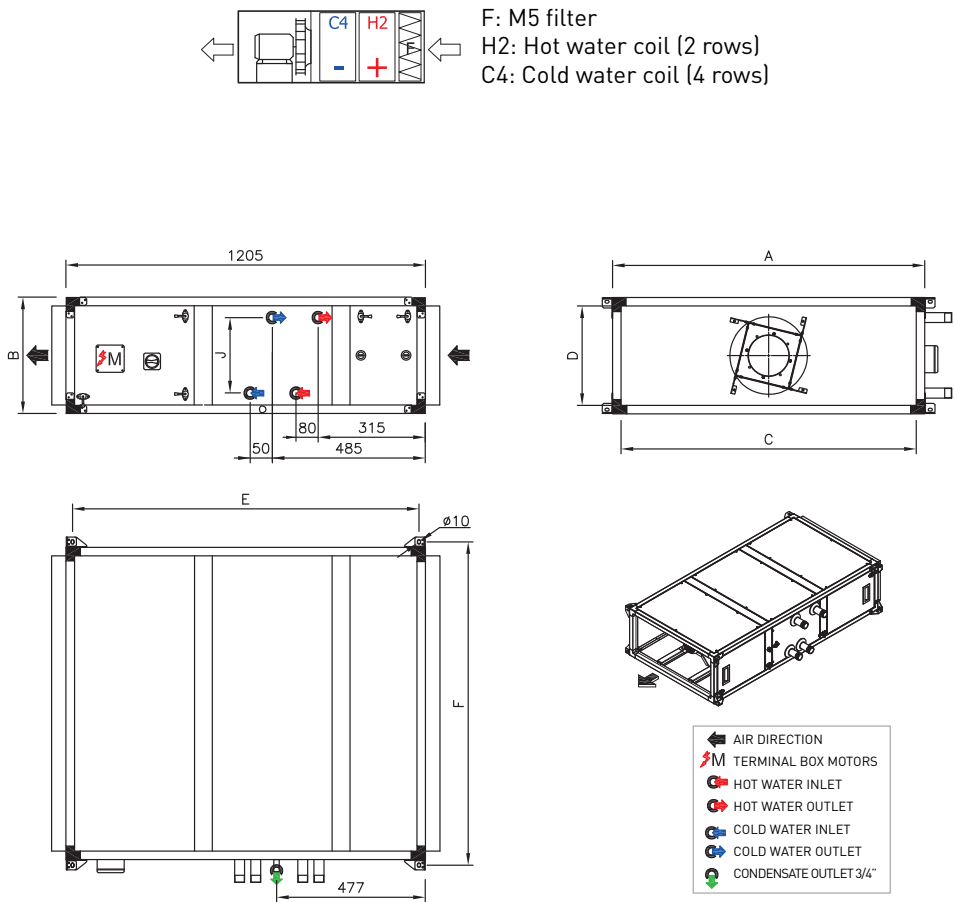
P: G4/M5 prefilter (accessory)
F: Filter F7
C4/C6: Cold water coil (4rows/6rows)
E: Electrical battery (E4,5 to E45)



	External		Connections		Supports		Coils				Weight (kg)	
Model	A	B	C	D	E	F	J	K [C4/C6]	Connections		C4	C6
UTBS-2	750	360	690	300	1409	790	219	80	120	1-1/4"	105	107
UTBS-3	1100	410	1040	350	1409	1140	269	80	120	1-1/4"	142	147
UTBS-5	1500	410	1440	350	1409	1540	269	80	120	1-1/4"	204	210
UTBS-8	1900	500	1840	440	1409	1940	344	80	120	1-1/2"	258	268

Short version: Single filter type M5

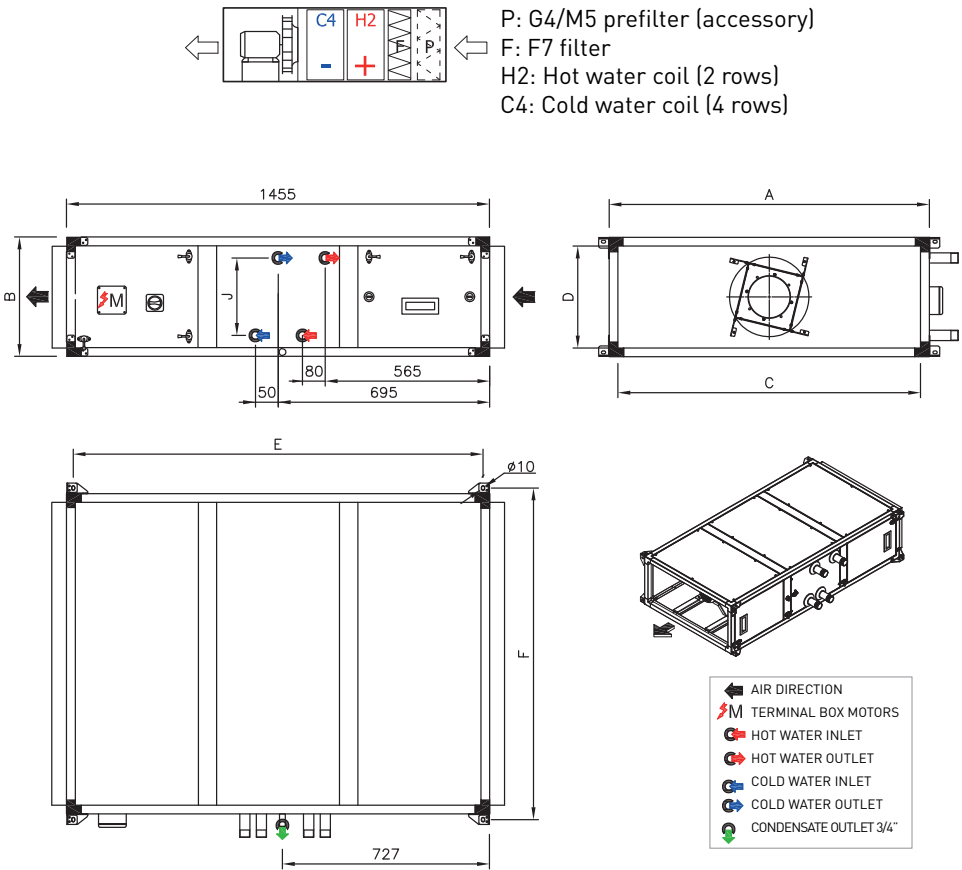
Configuration with cold water coil C4 and hot water coil H2



	External		Connections		Supports		Coils			Weight (kg)
Model	A	B	C	D	E	F	J	Connections C4 / H2		
UTBS-2	750	360	690	300	1159	790	219	1-1/4"	1-1/4"	111
UTBS-3	1100	410	1040	350	1159	1140	269	1-1/4"	1-1/4"	151
UTBS-5	1500	410	1440	350	1159	1540	269	1-1/4"	1-1/4"	216
UTBS-8	1900	500	1840	440	1159	1940	344	1-1/2"	1-1/2"	272

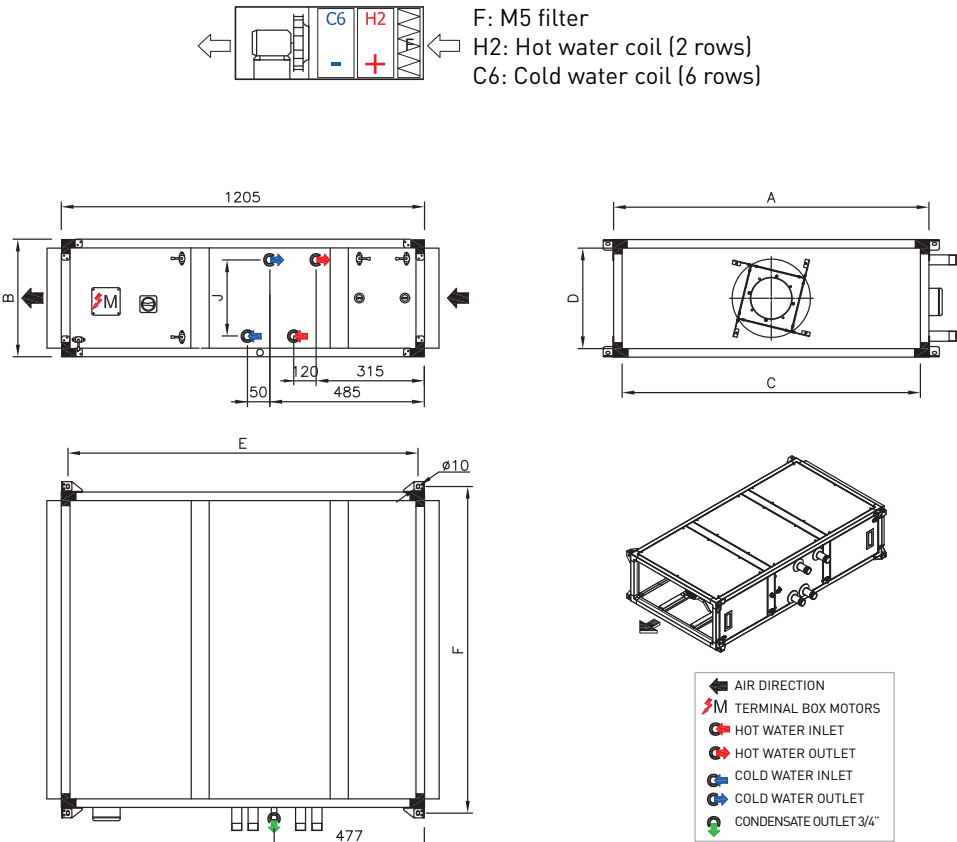
Long version: F7 filter with additional filter mounting capacity

Configuration with cold water coil C4 and hot water coil H2



	External		Connections		Supports		Coils			Weight (kg)
Model	A	B	C	D	E	F	J	Connections C4 / H2		
UTBS-2	750	360	690	300	1409	790	219	1-1/4"	1-1/4"	111
UTBS-3	1100	410	1040	350	1409	1140	269	1-1/4"	1-1/4"	151
UTBS-5	1500	410	1440	350	1409	1540	269	1-1/4"	1-1/4"	216
UTBS-8	1900	500	1840	440	1409	1940	344	1-1/2"	1-1/2"	272

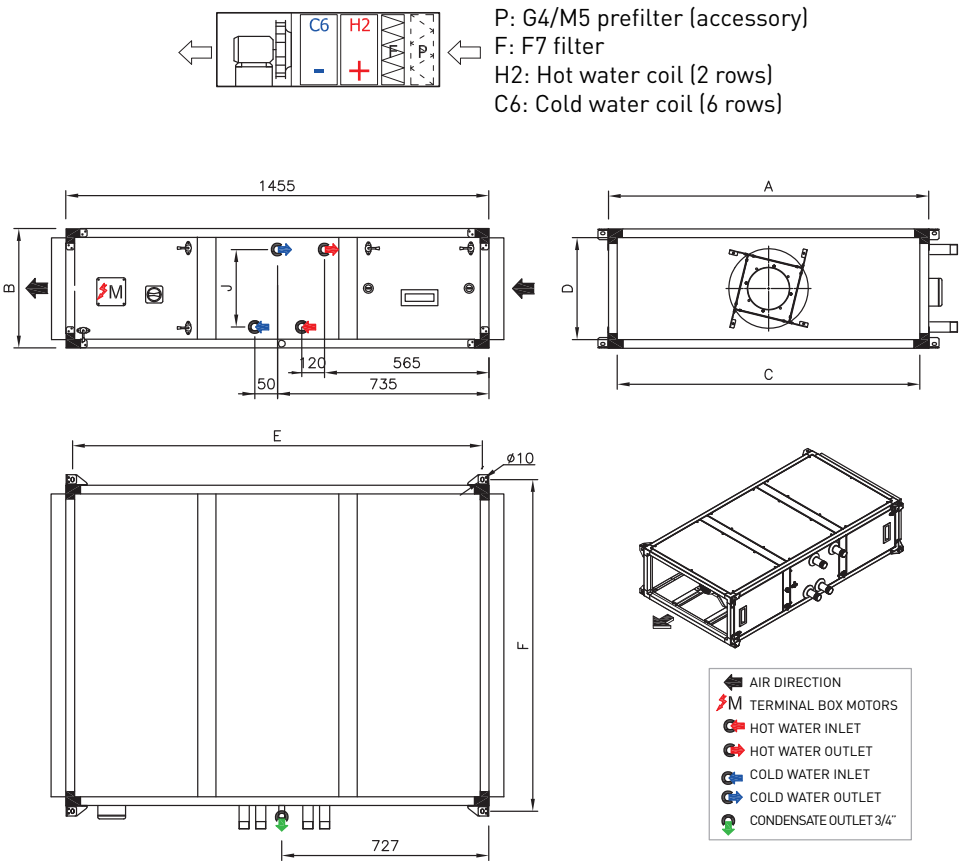
Short version: Single filter type M5
 Configuration with cold water coil C6 and hot water coil H2



	External		Connections		Supports		Coils			Weight (kg)
Model	A	B	C	D	E	F	J	Connections C6 / H2		
UTBS-2	750	360	690	300	1159	790	219	1-1/4"	1-1/4"	113
UTBS-3	1100	410	1040	350	1159	1140	269	1-1/4"	1-1/4"	156
UTBS-5	1500	410	1440	350	1159	1540	269	1-1/4"	1-1/4"	222
UTBS-8	1900	500	1840	440	1159	1940	344	1-1/2"	1-1/2"	282

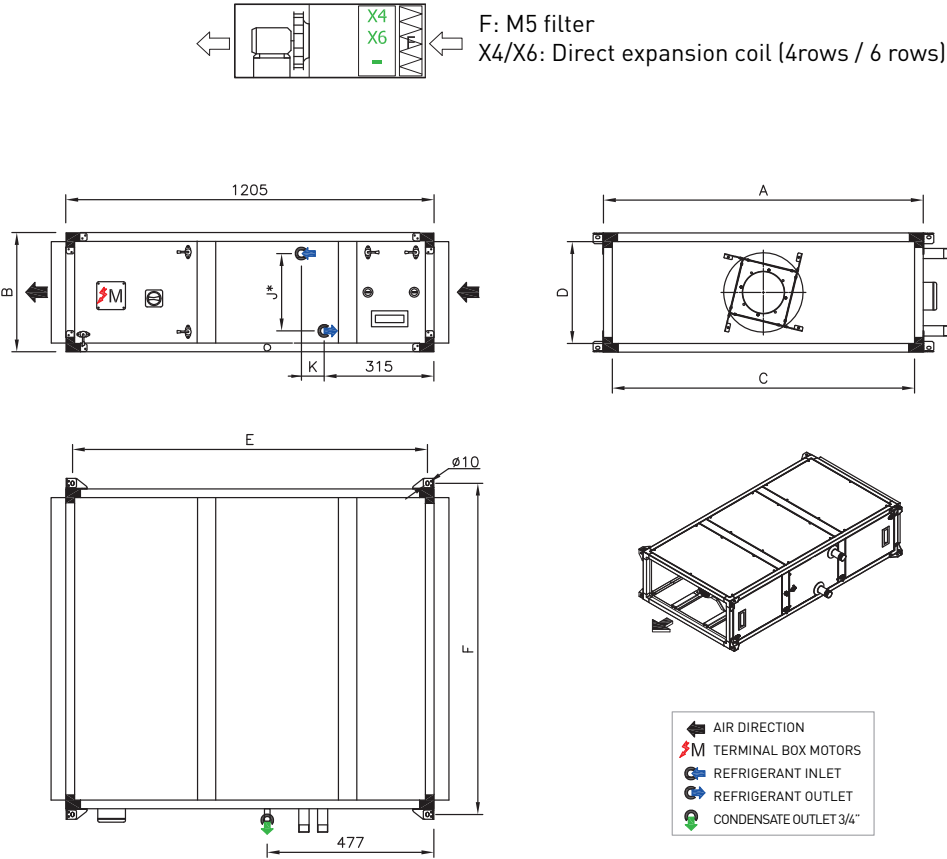
Long version: F7 filter with additional filter mounting capacity

Configuration with cold water coil C6 and hot water coil H2



	External		Connections		Supports		Coils			Weight (kg)
Model	A	B	C	D	E	F	J	Connections C6 / H2		
UTBS-2	750	360	690	300	1409	790	219	1-1/4"	1-1/4"	113
UTBS-3	1100	410	1040	350	1409	1140	269	1-1/4"	1-1/4"	156
UTBS-5	1500	410	1440	350	1409	1540	269	1-1/4"	1-1/4"	222
UTBS-8	1900	500	1840	440	1409	1940	344	1-1/2"	1-1/2"	282

Short version: Single filter type M5
 Configuration with direct expansion coil

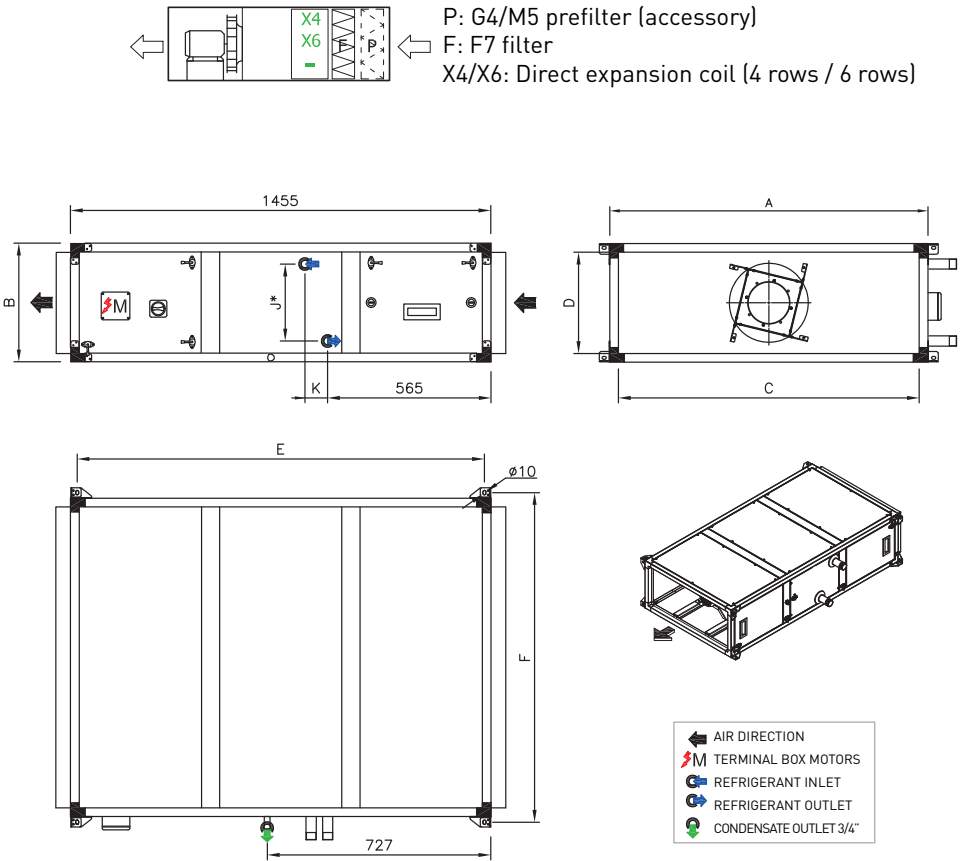


							Coils							Weight (kg)	
Model	External		Connections		Supports		J	K (X4/X6)		Inlet Connection (X4/X6)		Outlet Connection (X4/X6)		C4	C6
UTBS-2	750	360	690	300	1159	790	232	80	120	3/8"	1/2"	5/8"	5/8"	105	107
UTBS-3	1100	410	1040	350	1159	1140	280	80	108	1/2"	1/2"	5/8"	5/8"	142	147
UTBS-5	1500	410	1440	350	1159	1540	280	80	100	1/2"	1/2"	5/8"	3/4"	204	210
UTBS-8	1900	500	1840	440	1159	1940	355*	55	120	1/2"	2 x 1/2"	5/8"	2 x 3/4"	258	268

* On the UTBS-8 model with coil X6 the coil is two-stage (double inlet and outlet connection).

Long version: F7 filter with additional filter mounting capacity

Configuration with direct expansion coil

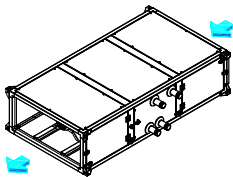


							Coils								
	External		Connections		Supports		J	K [X4/X6]		Inlet Connection [X4/X6]		Outlet Connection [X4/X6]		Weight (kg)	
Model	A	B	C	D	E	F								C4	C6
UTBS-2	750	360	690	300	1409	790	232	80	120	3/8"	1/2"	5/8"	5/8"	105	107
UTBS-3	1100	410	1040	350	1409	1140	280	80	108	1/2"	1/2"	5/8"	5/8"	142	147
UTBS-5	1500	410	1440	350	1409	1540	280	80	100	1/2"	1/2"	5/8"	3/4"	204	210
UTBS-8	1900	500	1840	440	1409	1940	355*	55	120	1/2"	2 x 1/2"	5/8"	2 x 3/4"	258	268

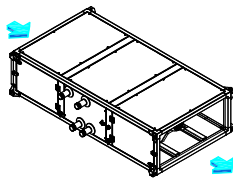
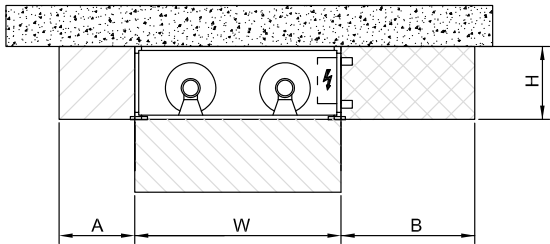
* On the UTBS-8 model with coil X6 the coil is two-stage [double inlet and outlet connection].

7.4.2. Space for maintenance

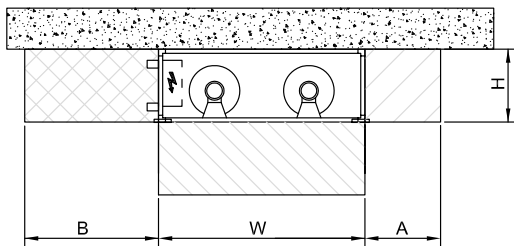
The UTBS can be ordered with access side in the desired hand (according to air sense)
Access to filters can by done throw the specific lateral registers or from the inferior panels.
The access to the electrical cabinet is from the lateral panel.
To perform the disassembly of coils and batteries, it is necessary to remove the lateral panel and slide the battery until her complete extraction.






L Versions
Left Connection side
according to air sense



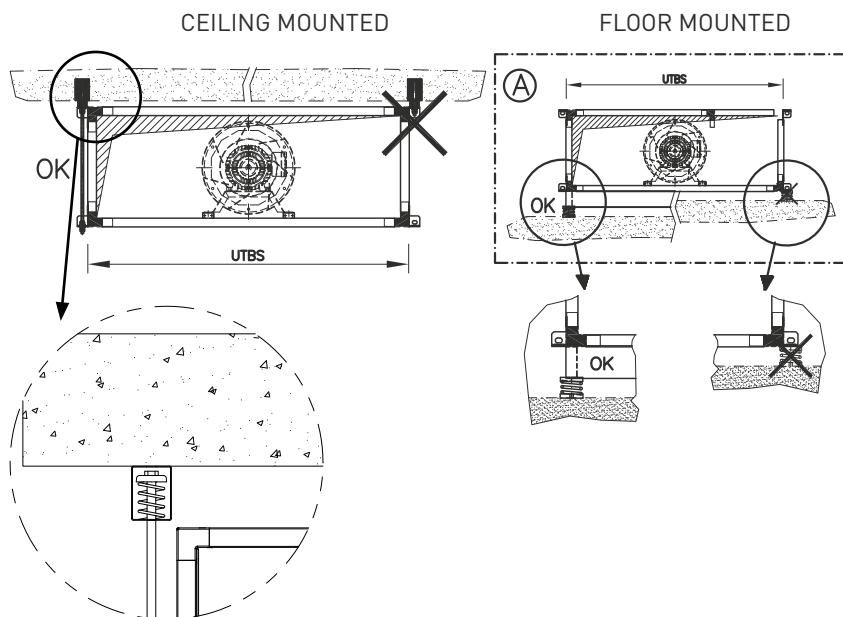
R versions
Right connection side
according to air sense



-  Access to filters, control box and water coils connections (if exist)
-  Access to filters and motors
-  Access to motors

Model	W	H	A	B
UTBS-2	750	360	500	850
UTBS-3	1100	410	500	1200
UTBS-5	1500	410	500	1600
UTBS-8	1900	500	500	2000

- For ceiling and floor-mounted applications, the unit must be suspended from the four angle brackets on each module, as follows:

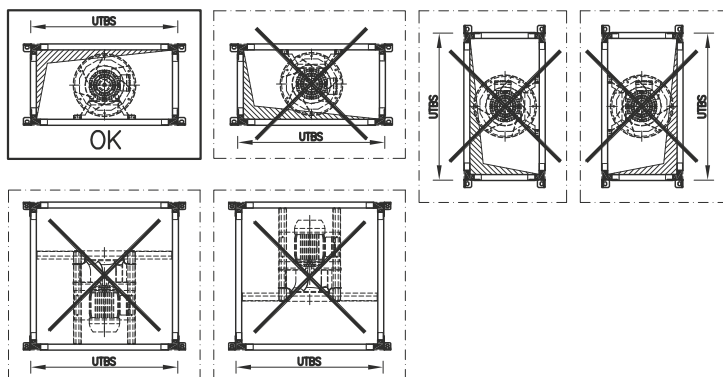


To prevent transmission of motor vibrations until wrought, it is necessary to install antivibrations on each of the anchor points. Use antivibration kits recommended in the following table:

Model	Antivibration support	Quantity per UTBS	Nominal load (Kg)	Vertical displacement (mm)
UTBS-2	AM. DE MUELLE TM-50	4	50	21-27
UTBS-3	AM. DE MUELLE TM-50	4	50	21-27
UTBS-5	AM. DE MUELLE TM-75	4	75	21-27
UTBS-8	AM. DE MUELLE TM-100	4	100	21-27

WARNING! Due to the length and weight of the units, each module must be suspended separately.

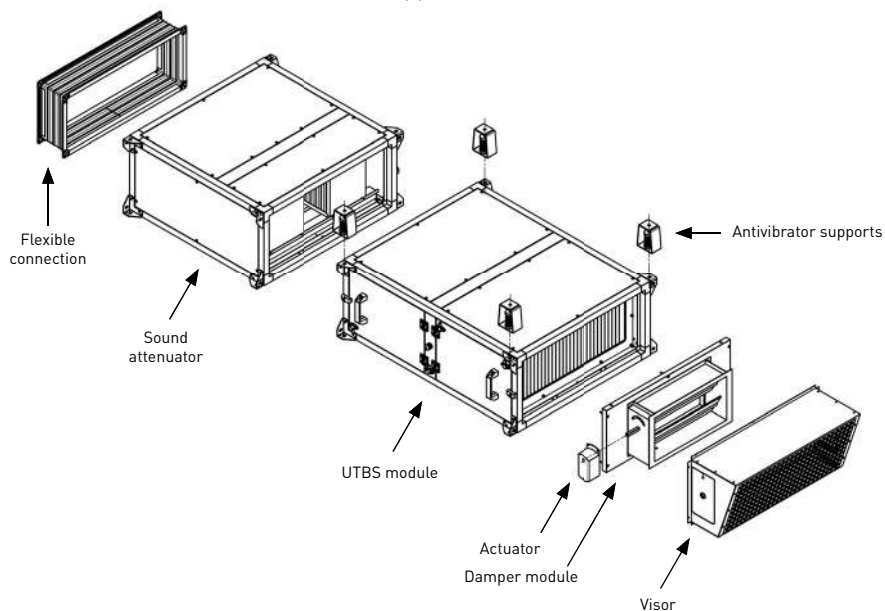
MOUNTING POSITION



Before switch on the unit, verify that the duct system is free of obstacles to prevent or modify the air circulation.

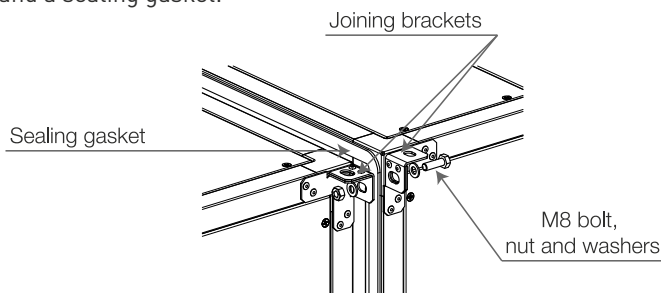
7.5. ASSEMBLING THE MODULES

Exist different accessories that can be supplied with UTBS module:

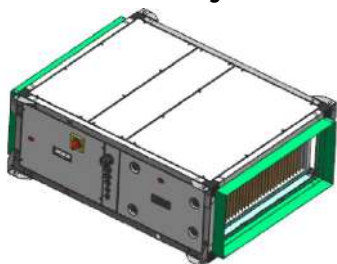


Model	Flexible connection	Sound attenuator	Antivibrations support (4 units)	Visor	Damper module	Actuator 24V
UTBS-2	JF-UTBS 650x250	SIL-2 750	AM. DE MUELLE TM-50	VF UTBS-2	ID KIT COMP. UTBS-2	LF 24 S
UTBS-3	JF-UTBS 1000x300	SIL-3 750	AM. DE MUELLE TM-50	VF UTBS-3	ID KIT COMP. UTBS-3	
UTBS-5	JF-UTBS 1400x300	SIL-5 750	AM. DE MUELLE TM-75	VF UTBS-5	ID KIT COMP. UTBS-5	
UTBS-8	JF-UTBS 1800x400	SIL-8 750	AM. DE MUELLE TM-100	VF UTBS-8	ID KIT COMP. UTBS-8	

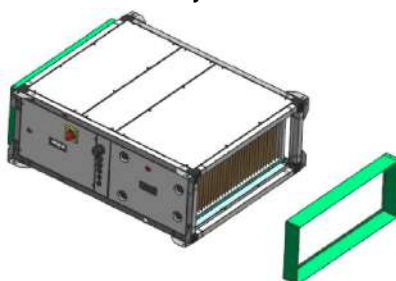
The module frames have mounting brackets on each corner that are used to secure the equipment to the ceiling and to join the various modules to one another. If the unit is made up of different modules, it will be supplied with a joining kit with 4 sets of bolts, washers, nuts and a sealing gasket.



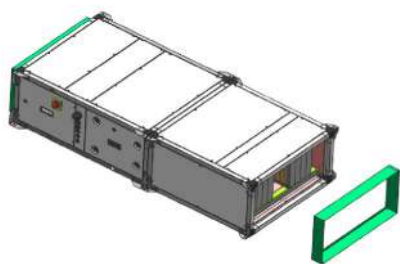
7.5.1. Move the flange from the main module to the accessory module



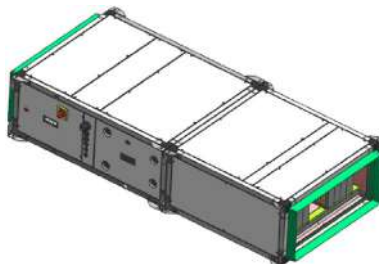
UTBS Module delivered with flanges mounted.



Remove the flange on the side where the accessory module will be mounted.



Over the accessory, mount the flange (previously retired from UTBS module).



The result is an assembly of two modules with inlet and outlet flanges:

- Silencer with inlet flange
- UTBS Module with outlet flange

7.5.2. Additional filters mounting

The air conditioner is supplied with a filter mounted inside. In the long frame versions, equipped with F7 filter from factory it is also possible to mount a second filter in the specific gap (order as accessory).

See chapter "Filter replacement" for information about the way to access filter section depending on the unit type.

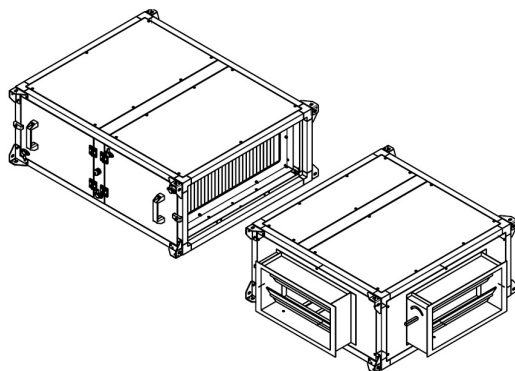
7.5.3. Assembling flexible connections

- If you have ordered flexible connections for the ends of the units, they will be supplied separately.



7.5.4. Mixing module installation

The mixing module is installed in the intake air side and allows to realize the the mixing between the outdoor air and the recirculated air with proportional regulation of existent dampers in either air intakes.



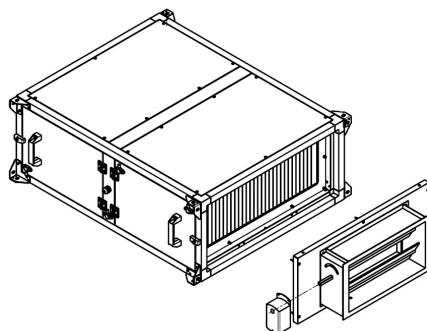
The mix module and the corresponding servomotors are supplied both as accessories. The installer should mount the damper module, using the screws and bolts supplied with the unit. After that, mount the servomotor on the damper shaft. Once mounted the servomotor, make the electrical connection between the servomotor and the electrical cabinet according to the indications in the electrical diagram.

Check that the rotation sense of the actuator is correct. If it is necessary, modify the damper rotation sense via the selector in the frontal of the actuator



7.5.5. Installation with isolation damper

To realise the unit isolation of the ductwork, each time that the unit is stopped, it is possible to install one isolation damper in the unit inlet:



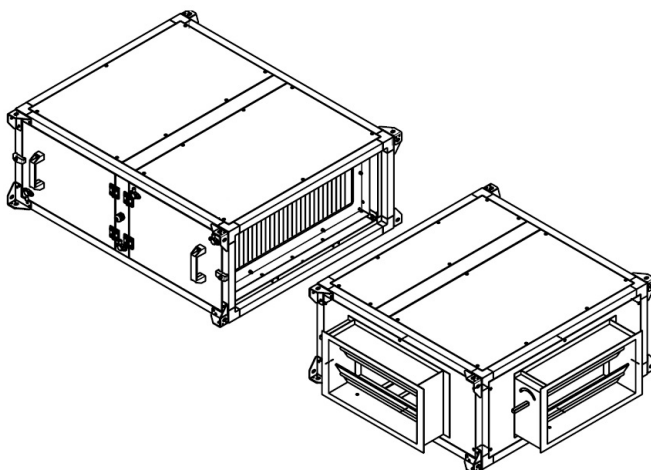
Both the damper module and the corresponding servomotors are supplied as accessories. The installer should mount the damper module, using the supplied hardware with this. Mount the servomotor on the damper shaft.

After mounting the servomotor, make the electrical connection to the electrical cabinet according the electrical diagram.

Check that the actuator sense of rotation is correct (once the unit is stopped the damper must be closed). If it is necessary, modify the damper rotation sense via the selector in the frontal of the actuator

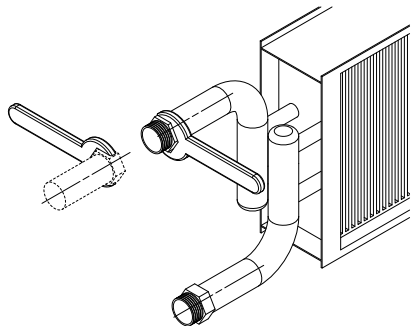


- Air 3 inlet section: It is sent with a fixed position of the dampers. If not coincide with the needs of the installation, change the frontal panel as shown.



7.6. CONNECTING THE UNIT TO THE WATER NETWORK

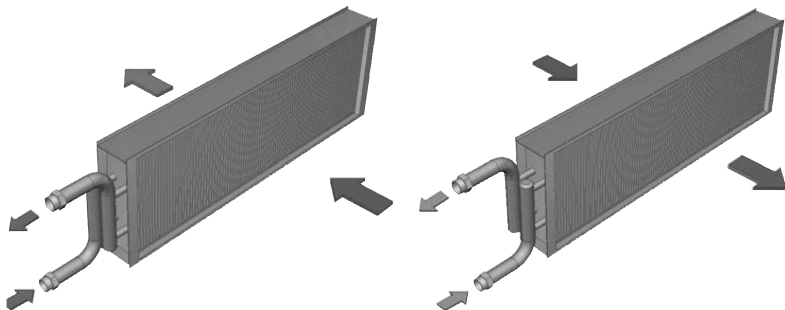
- Maximum pressure: 10 bar
- Maximum temperature: 100°C
- Minimum temperature: -20°C with the appropriate mixture of antifreeze
- For heat exchangers with threaded connections, secure the coil manifold with the appropriate tool when tightening the threads. This will prevent the force from being transmitted to the manifold, which can damage it.



- The following table gives a list of the types of thread for each UTBS:

MODEL	THREAD
UTBS-2 (2, 4 or 6 -pipes)	1-1/4"
UTBS-3 (2, 4 or 6 -pipes)	1-1/4"
UTBS-5 (2, 4 or 6 -pipes)	1-1/4"
UTBS-8 (2, 4 or 6 -pipes)	1-1/2"

- The water coils must run counter to the flow of air to provide the correct performance. This means that the fluid inlet must be connected on the manifold located on the air outlet side, and the fluid outlet must be connected on the manifold situated on the air intake side, as shown in the following illustrations:



- We suggest having all the elements needed for the installation on hand, mentioning the following devices in particular:
 - Unit intake pre-filter that traps suspended particulate matter.
 - Bleed valves should be fitted at each of the high points in the installation to maintain good water circulation.
 - It is recommended to keep water in the hydraulic system at all times (install an auto-filler valve and pressure switches that send an alarm and shut off power to the equipment, etc.)
 - Check to make sure that the flow of water circulating through the unit is appropriate.
 - Shut-off valves must be installed at each connection on the water line to allow the unit to be isolated if necessary (to clean filters, make repairs, replace parts etc.) and avoid the need to completely drain the water circuit.
 - Anti-vibration bellows should be installed at the inlet and outlet from the unit to prevent the transmission of vibrations that could result in damage to the heat exchanger coils due to excess stress on the circuits.

7.7. CONNECTING THE UNIT TO THE DUCT SYSTEM

- Never use the unit as a support or weight-bearing structure for ductwork.
- Connect the unit to the air ducts using flexible connectors to prevent vibrations from being transmitted to the duct system.
- Check to make sure air intake and flow are not being blocked and that there are no obstacles impeding good air circulation. Failure to do so will affect the efficiency of the system.

VERY IMPORTANT:

In the manufacturing process of the panels, filters and batteries, protective products are used to increase corrosion protection. During the first hours of operation after the unit commissioning, especially in those units equipped with heating stage, unpleasant smells could be produced.

7.8. DIRECT EXPANSION COILS CONNECTION (DX)

Coil characteristics

DX 4 rows coil

For applications with 100% recirculated air

UTBS	Volume (l)	Phases	Tubes	Rows	Circuits	Ø Liquid header (mm)	Ø Gaz header (mm)	Cooling power (kW)	Heating power (kW)	Airflow (m³/h)
UTBS-2	1,2	1	10	4	2	1/2" [13mm.]	3/4" [19mm.]	4,6	4,9	1.250
UTBS-3	2,21	1	12	4	4	5/8" [16mm.]	3/4" [19mm.]	8,8	8,0	2.500
UTBS-5	2,41	1	12	3	5	5/8" [16mm.]	3/4" [19mm.]	10,9	10,0	3.500
UTBS-8	4,4	1	15	3	7	5/8" [16mm.]	3/4" [19mm.]	19,9	17,2	6.000

DX 6 rows coil

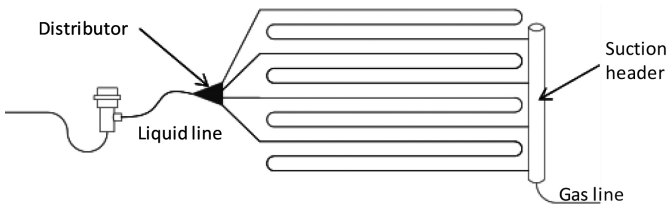
For applications with 50% outdoor air/ 50% recirculated air

UTBS	Volume (l)	Phases	Tubes	Rows	Circuits	Ø Liquid header (mm)	Ø Gaz header (mm)	Cooling power (kW)	Heating power (kW)	Airflow (m³/h)
UTBS-2	2	1	10	6	5	5/8" [16mm.]	3/4" [19mm.]	10,0	10,5	1.250
UTBS-3	3,31	1	12	5	6	5/8" [16mm.]	3/4" [19mm.]	19,4	19,9	2.500
UTBS-5	4,3	1	12	5	9	5/8" [16mm.]	7/8" [22mm.]	26,6	27,6	3.500
UTBS-8	8,4	2	15	6	10+10	5/8" [16mm.]	7/8" [22mm.]	47,8	49,8	6.000

Installation recommendations

In units that incorporate direct expansion coils it is necessary to consider the following installation recommendations:

1. The rigidity and stability of the installation ducts, should be ensured using, if necessary, expansion joints and antivibration elements, avoiding the generation of stress due to the transmission of vibrations to the distributor and suction headers.
2. When making the refrigerant circuits, allow free space enough to allow a right access for maintenance tasks.
3. The connection to the suction line (liquid) should be done from the smaller diameter manifold (recognizable because of the distributor), The gas line has to be connected to suction header (larger diameter manifold).



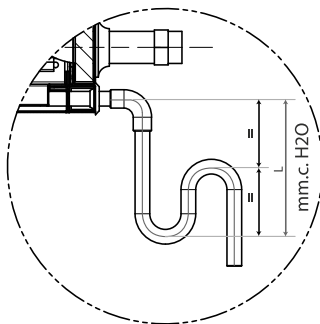
4. The dimensioning and manufacture of the refrigerant installation must be performed by qualified personnel with specific training in refrigeration techniques (authorized installers), paying particular attention to:
 - Evaporative coils are supplied with sealed ends without refrigerant charge or nitrogen load.

- The cooling pipe used in the installation must be copper suitable for its use in cooling circuits.
- Before filling with refrigerant, cleaned dehydration and deoxidized of the entire refrigerant circuit must be done.
- Both ends of the batteries (sealed points) must be cut before being welded to the refrigeration installation pipe.
- The circuit must be equipped with all the necessary components to ensure functionality and proper functioning of the entire DX system (compressor, condenser, expansion valve operation control kit, filter, desiccant, etc...).

In order to ensure oil return to the compressor, it is recommended to design the suction and gas lines, such that flow speeds of 2,6 m/s (horizontal pipes) and 5,2 m/s (vertical pipes) will be achieved.

7.9. DRAINAGE SYSTEM

- A siphon must be installed with pressure head difference in mmWG greater than the pressure provided by the fan, to facilitate draining condensate from the tray.



- The drainage system should have a minimum slope of 2%.

7.10. ELECTRICAL CONNECTION

- The unit installation must be done by a qualified professional.
- Before putting the unit in place, make sure that the nominal supply voltage matches that listed on the unit's identification plate.
- It should be installed with cables whose cross-section meets current regulations and prevents overheating and voltage drops that exceed permissible limits. Current regulations must be obeyed, and the designer's instructions must be followed at all times.
- Before connecting the cables, make sure that the electricity is turned off and that there is no voltage present in any of them.

- The unit installation must meet the following regulations:
 - Low Voltage Directive 2006/95/CE
 - Machinery Directive 2006/42/CE
 - Electromagnetic Compatibility 2004/108/CE
- The instructions in current regulations regarding the protection of electrical lines against defects and direct and indirect contact must be obeyed at all times.
- After these steps are performed, check to make sure all electrical connections are secure (loose wiring connections can cause irreparable damage).
- Check to make sure the electrical resistance between earth and any electrical terminal is greater than 1 megohms. If it is not, do not start up the unit until the electrical short has been located and repaired.
- As a safety measure, if there is no power to the fan, the necessary interlocks must be performed so that all other electrical components are also de-energised.

7.11. TEMPERATURE PROBES LOCATION

The UTBS-PRO-REG units are with the air temperature probes wired to the electrical board.

All the versions include 3 different temperature probes to manage air heating and/or cooling demand:

- T_{SUP} : Supply air temperature. Mounted at the UTBS module air outlet. Factory wired, this probe is used to control the supply air temperature. This sensor should not be manipulated.
- T_{ODA} : Outdoor air temperature. This probe is delivered inside the electric cabinet (coiled itself). Although the probe is factory wired to the PCB controller, the installer must fit the sensor inside the duct system depending on the type of installation performed.
- T_{ETA} : Extract air temperature. This probe is delivered inside the electric cabinet (coiled itself). Although the probe is factory wired to the PCB controller, the installer must fit the sensor inside the duct system depending on the type of installation performed.

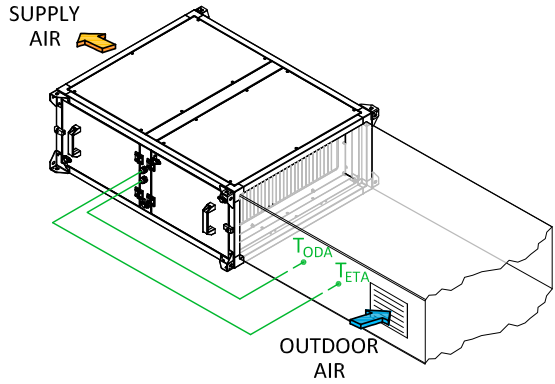
Outdoor air (ODA) and Extract air (ETA) temperature probes are 4m length, allowing that each probe will be mounted in the desired position.

IMPORTANT: Regardless of the type of installation performed, the three air probes must always be wired to the control cabinet. If any of the temperature probes is missing, it will cause the unit malfunction as well as the alarm message on the controller display.

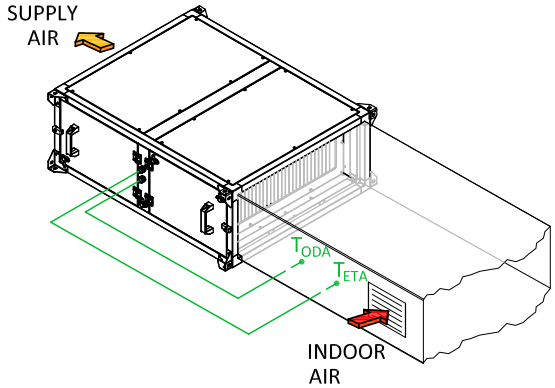
During the unit installation, the installer should retire the temperature probes from into the electrical cabinet and fit them in the definitive position according depending on the operation mode.

Detail of the location of the Outdoor Air temperature probe (T_{ODA}) and the Extract Air temperature (T_{ETA}) depending on the type of installation:

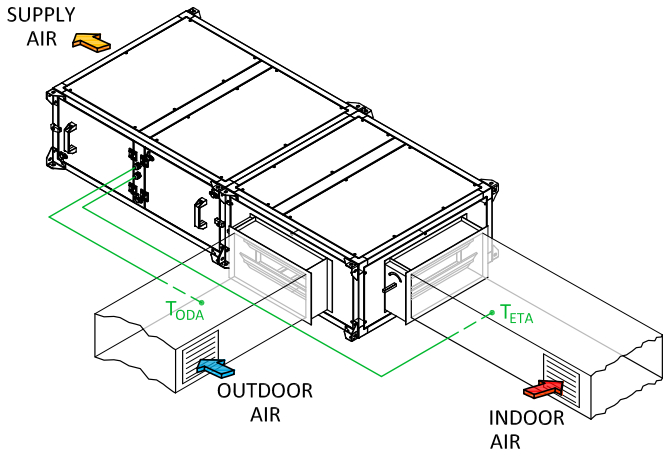
Installation with 100% of Outdoor Air



Installation with 100% of Indoor Air (Recirculation)



Installation with mixing module (Variable % Outdoor Air / Indoor Air)



Those versions with internal hot water coil or reversible coil included, also integrate a water temperature probe mounted on the coil return manifold. This probe, which is supplied already assembled and wired from factory, supervises the risk of freezing. Do not manipulate this probe in any case.

8. START-UP PROCEDURE

IMPORTANT: Before access the unit, it is obligatory to switch off the electrical supply by means of the general switch placed in the cabinet box.

- All access panels on the unit must be closed before starting.
- Make sure that the earth connection is securely connected.
- First turn on the water circulation pump. Wait several minutes to make sure the flow of circulation remains steady and that there is no variation in the flow. Make sure that any air bubbles have been drawn to the bleed points and that they have been bled off.
- Make sure that the pressures in the unit do not exceed the maximum pressure for the exchanger coils.
- Continue to run the circulation pump for at least 2 hours. Turn off the pump and then remove the filter from the unit. To do so, close the appropriate shut-off valves to prevent the water line from emptying, and to prevent air from getting in. Then clean the filter.
- Take a careful look at the particles trapped in the filter. Make sure that these particles are not coming from a source that will clog the filter again (such as pipe scale from iron pipes, hard water deposits, etc.).
- Re-insert the filter, bleed the air from the system and turn the circulation pump on again. Wait several more minutes to make sure that the flow of water remains steady and there is no variation in the flow. If good water circulation is not achieved, repeat the steps described above.
- Before turning on the power to the unit, check to make sure that nothing is hindering the movement of the regulator dampers if these are operated using a servomotor.
- If the damper are manually operated, make sure by manually tightening the control that they cannot be closed due to the force of air or anything else while the unit is running.
- Turn on the external main power switch to the unit, keeping the control switch in the off position. After that, check to make sure the input voltage at the unit's electrical terminals matches the one indicated on the identification plate (the minimum voltage will be 10% below the rated voltage indicated on the identification plate).
- Do not start up the fan if the duct network is not completely closed, since turning on the fan with no load can cause over-currents that cause wear to the motor. This can also occur if the static pressure demanded is greater than the pressure losses that occur in the duct network. To fix this, close the flow regulator dampers so that there is a greater pressure loss.
- Test the total current drawn by the unit as a whole, also checking to make sure there are no phase lags between the currents on the different lines.

9. CONTROL FUNCTIONS

The UTBS PRO-REG units are supplied with integrated electronic control in the unit. It allows to perform the following functions:

	Without batteries	With water coils	With electrical battery	With DX coil
MAIN COMPONENTS				
General proximity switch over the electrical box	•	•	•	•
Fresh air temperature probe	-	•	•	•
Extract air temperature probe	-	•	•	•
Supply air temperature probe	-	•	•	•
Defrost temperature probe		•		
CHANGE OVER thermostat to be installed on the water supply coil	-	0	-	-
3 way valve with proportional 0-10V actuator 3WV PROP 24V	-	0	-	-
Air flow transmitter	•	•	•	•
Clogged filters switch	•	•	•	•
FEATURES				
ON/OFF function (Remote ON/OFF via external power free contact)	•	•	•	•
Automatic airflow adjustment, according to time band (internal Timer)	•	•	•	•
Flow control in CAV mode. Constant airflow regardless of the state of fouling of the filters	•	•	•	•
Automatic airflow adjustment in VAV mode, according to external signal 0-10V (CO2 accessory)	•	•	•	-
Automatic speed adjustment of the fans in Constant Pressure mode (Increase of fan speed when pressure in the duct system decreases). It is necessary TDP-S accessory	•	•	•	-
BOOST function (Forced speed preset via external power free contact)	•	•	•	•
Regulation of water coil thermal power. 0-10V control of the water valve (accessory)	-	•	-	-
Regulation of electric heater battery thermal power. Proportional control via SSR	-	-	•	-
Proportional control of thermal demand (0-10V output signal) to manage expansion valve kit (verify compatibility with used DX control valve kit)	-	-	-	•
Isolation damper control (accessory)	•	•	•	•
Operation of an external mixing box (accessory)	•	•	•	-
Speed-control of an external fan (slave) with analogic signal 0-10V available	•	•	•	•

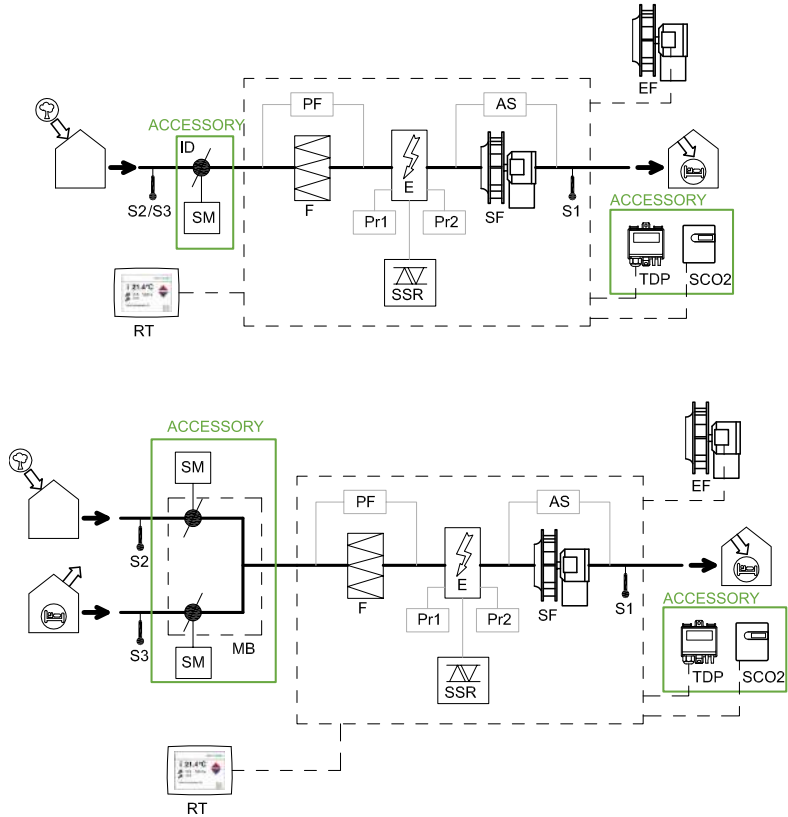
• included; 0 optional; - Non available

	Without batteries	With water coils	With electrical battery	With DX coil
SUPERVISION				
Control of polluted filters via pressure switches (included)	•	•	•	•
Failure in temperature probes	•	•	•	•
Failure in fan via pressure switches (included)	•	•	•	•
Anti-frost protection of water coils	-	•	-	-
Alarm display	•	•	•	•
COMMUNICATION				
Control via touch-screen included	•	•	•	•
Modbus RTU (RS-485)	•	•	•	•
BACNET TCP/IP	•	•	•	•

• included; O optional; - Non available

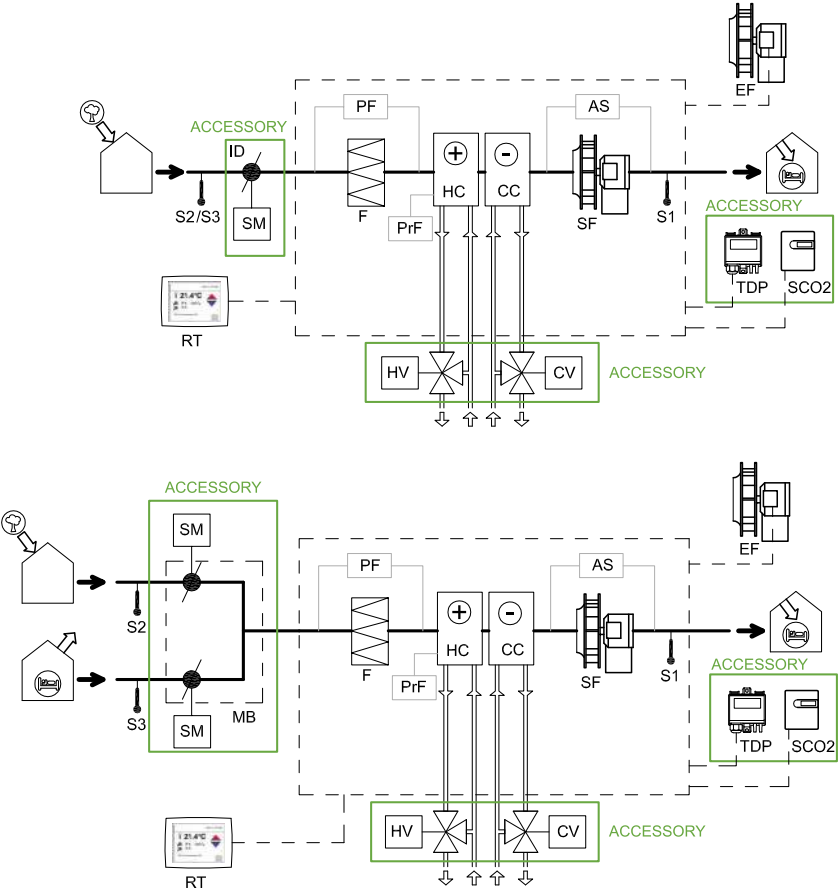
10. CONTROL DIAGRAM

Version with electric batteries



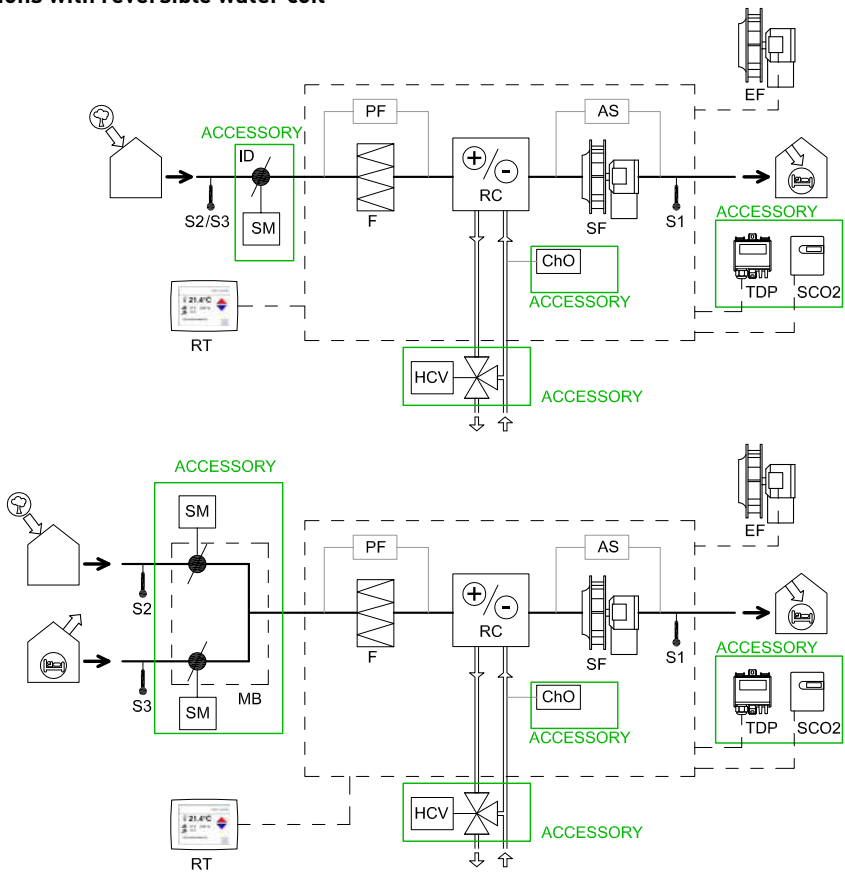
SF	Supply fan	PF	Filter clogging detector (Pressure switch)	Pr1/Pr2	Safety Thermostat (Manual /Auto)
SSR	Electrical heater proportional regulator	S1	Supply aire temperature probe	SCO2	CO2 Sensor (Accessory)
E	Electrical heater	AS	Air flow sensor	TDP	Pressure transmitter TDP-S (Accessory)
S1	Supply air temperature probe	RT	Remote hand terminal	ID	Isolation Damper (Accessory)
S2	External air temperature probe	EF	External Fan (slave mode)	MB	Mixing box (Accessory)
S3	Return air temperature probe	F	Filter	SM	Damper servo-motor (Accessory)

Versions with hot and/or cold water coils



SF	Supply fan	RT	Remote hand terminal	PrF	Freeze protection
PF	Filter clogging detector (Pressure switch)	EF	External Fan (slave mode)	ID	Isolation Damper (Accessory)
S1	Supply air temperature probe	F	Filter	MB	Mixing box (Accessory)
S2	External air temperature probe	HC	Heating coil	SM	Damper servo-motor (Accessory)
S3	Return air temperature probe	CC	Cooling coil	SCO2	CO2 Sensor (Accessory)
AS	Air flow sensor	HV	Heating regulation valve	TDP	Pressure transmitter TDP-S (Accessory)
		CV	Cooling regulation valve		

Versions with reversible water coil

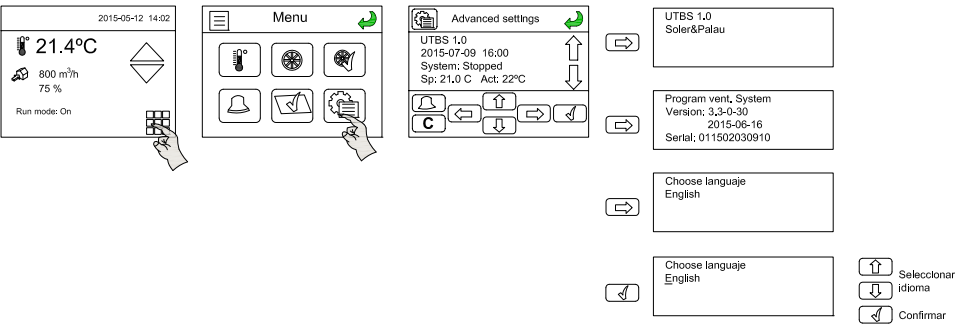


SF	Supply fan	AS	Air flow sensor	ChO	Change Over Thermostat (Accessory)
PF	Filter clogging detector (Pressure switch)	RT	Remote hand terminal	ID	Isolation Damper (Accessory)
S1	Supply air temperature probe	EF	External Fan (slave mode)	MB	Mixing box (Accessory)
S2	External air temperature probe	F	Filter	SM	Damper servo-motor (Accessory)
S3	Return air temperature probe	RC	Reversible coil	SCO2	CO2 Sensor (Accessory)
		HCV	Heating/cooling regulation valve	TDP	Pressure transmitter TDP-S (Accessory)

11. REMOTE CONTROL OPERATION

11.1. CHANGE LANGUAGE

Before you start using the remote control, select the desired language.
To make the change, follow the following sequence:



11.2. SIMPLIFIED MENUS / ACCESSES

The unit has a quick access to the main functions.

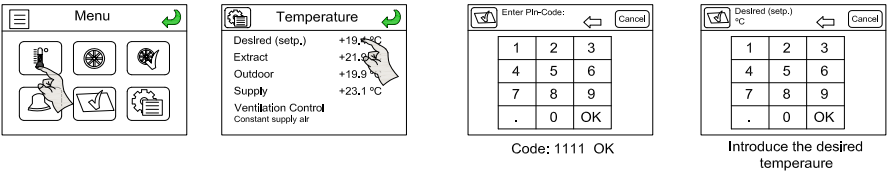
Accesses: There are 3 access levels to the controller:

- User level (no password) – Access to the start/stop – auto or PV/GV functions and increase of the set point temperature (+/- 3°C).
- Operator level (password) – Access in read and write to adjustments and parameters, but no access to the system configuration.
- Master level (password) - Access in read and write to adjustments and parameters, as well as access to the system configuration.

11.2.1. User level

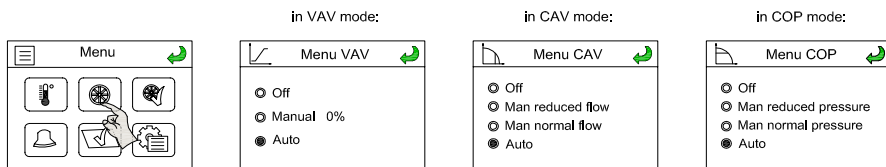
To adjust the temperature set point and the operation mode selection of the unit (use of the time program, stop the unit or possible forcing to a given speed). These two temperatures and ventilation functions are accessible in two specific menus specially dedicated to this usage:

Adjustment the temperature setpoint



To modify the temperature is necessary to enter the code 1111.

Operating mode selection

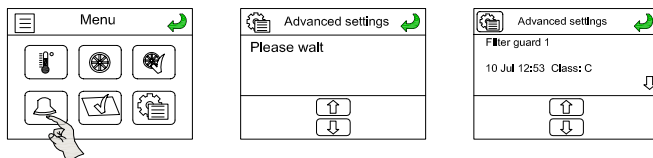


In units with electrical, if the operation mode is changed while the fans are running, the unit will stop sequentially; first switching off the electrical heater, and after 2 minutes switching off the fans, then finally the unit will re-start with the right working mode.

11.2.2. Installer level

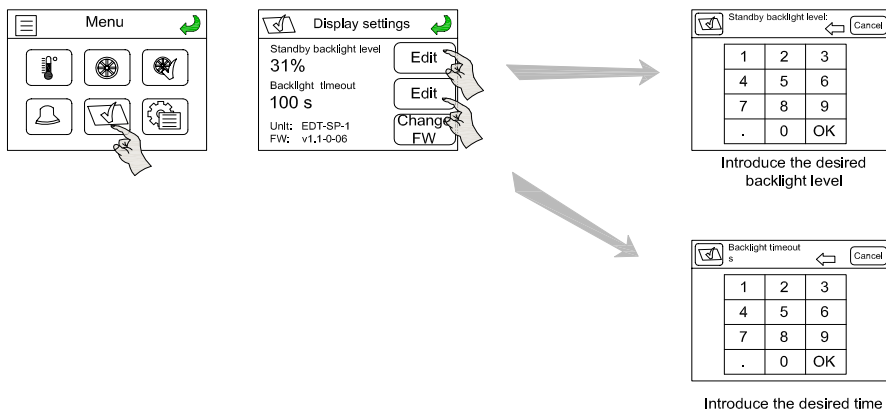
In this level is possible to adjust the operating parameters of the unit: Fan, heating, display, errors, etc..

Alarm display



Screen display settings

Adjust the brightness and display feedback.



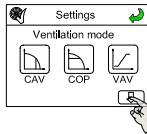
Access settings

Remember that the equipment is supplied configured and tested in factory. Only will be necessary to change the settings if you have reset the controller or if it has been replaced by another.

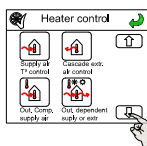
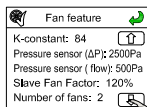
By accessing settings can be selected:

- Working mode of the fans.
- Settings used fan.

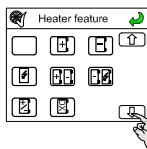
- Type of cold/hot coils that has the unit.
- Enable the mixing module control and configure the type of control.



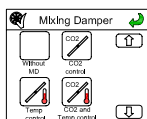
- CAV: Constants air volume working mode (CAV)
- COP: Constants pressure working mode (COP)
- VAV: Variable air flow working mode (VAV)



- Constant supply air temperature control
- Room temperature control
- Constant supply air temperature control with outdoor air compensation
- AUTO: The controller determines automatically the best operation mode for each situation. It is based on the measured temperatures, and can be fixed as "Supply control with outdoor compensation" or "Room temperature control"



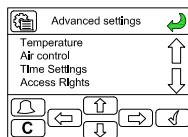
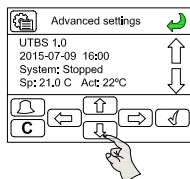
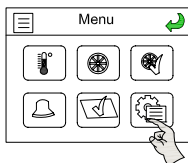
- Without coils
- Heating coil
- Cooling coil
- Electrical heater
- Cooling + Heating coil
- Cooling coil + Electrical heater
- Reversible water coil
- Direct expansion coil



- Without mixing module
- The management of the dampers is done considering the concentration of CO2 measured for an external CO2 sensor (accessory)
- The management of the dampers is done just to achieve the setpoint temperature, without consider the air quality
- The management of the dampers is done considering simultaneously the temperature setpoint and the CO2 concentration (accessory)

Advanced parameter setting

- Used to read the message of the alarm signalled on the main screen.
- Clock programming.



Navigation is done by the navigation arrows on the bottom of the display:

- Up arrow: Displacement
- Down arrow: arrows
- Right arrow: ENTER. Access to a parameter
- Left arrow: ESC. Exit from the parameter
- Checkmark: Confirm

Once in the advanced settings menu navigation is done by the arrows.

11.3. OPERATION FAN MODES

The Pro-Reg units can operate in 3 operating modes:

CAV: Operation at constant flow

VAV: Operation at variable flow

COP: operation at constant pressure

11.3.1. Constant airflow operation (CAV)

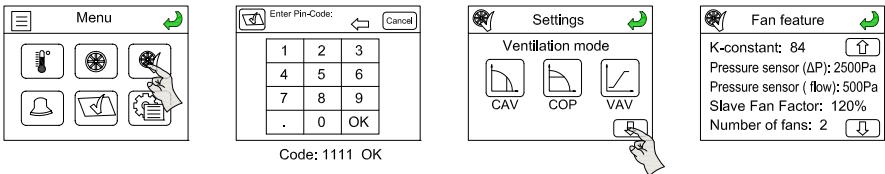
Mode recommended in installations where it is necessary to maintain a constant airflow.

The speed of the fans is defined to correspond to a precise airflow and to keep it constant.

The fan flow is controlled by a pressure transmitter integrated into the equipment in all versions.

The controller performs the conversion of the signal received from the pressure transmitter to flow, using the relation $q_v = k\sqrt{\Delta P}$. This parameter K depends on the fan construction and is different for each model.

In case CAV mode is selected, in the Main screen it is showed the actual m³/h of the fans with pressure transmitters and also a percentage of the maximum fan speed (Note that the unit has already been configured at the factory, so it is not necessary to make these adjustments except when replacing the controller or reset it):



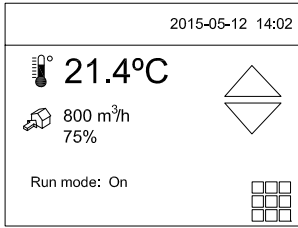
Code: 1111 OK

In order to obtain the actual flow, the parameter K has to be defined.

Factory settings

Model	K Factor	Pressure sensor	Pressure sensor (Airflow)	Slave fan factor	Number of fans
UTBS-2	62	2500 Pa	3000 Pa	100%	1
UTBS-3	75	2500 Pa	1000 Pa	100%	2
UTBS-5	100	2500 Pa	1000 Pa	100%	2
UTBS-8	116	2500 Pa	3000 Pa	100%	2

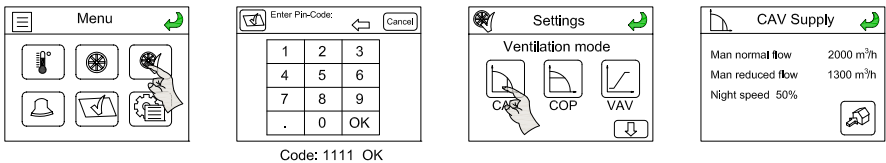
Appearance main screen when the unit is configured in CAV mode.



CAV control mode selection

Access to the simplified parameter setting menu (via the password 1111) allows:

- The selection of Normal flow and Reduced flow of each fan.
- The night set point value of the fans.



The choice between normal or reduced flow can be performed:

- manually
- automatically by programme schedule (see section Time programming)
- remotely, by external digital contact (see section stop-start remote)

The switch over between the various set points will be done manually or automatically by a time programming.

A third set point, the “night speed”, may be entered via the control panel. The value in % corresponds to the percentage of the fan’s maximum capacity; it will be used during the night for free cooling (see corresponding function).

The selection of CAV mode in this installer menu automatically configures the screen of the user menu. The user can then change the unit’s operation without modifying the settings.



Off: stop the unit.

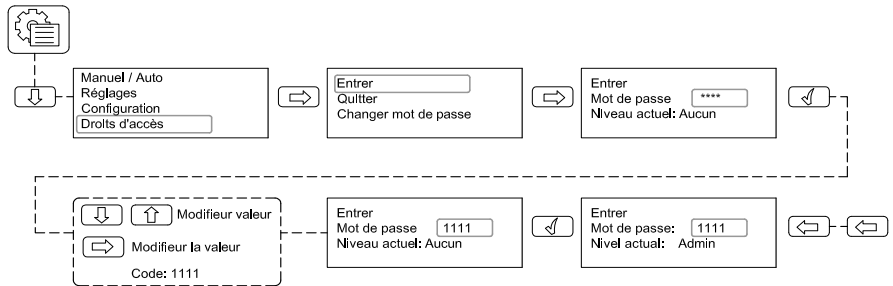
Manual Reduced flow, Manual Normal flow: set point manually selection.

Auto: selection of setpoint is done according to time programming.

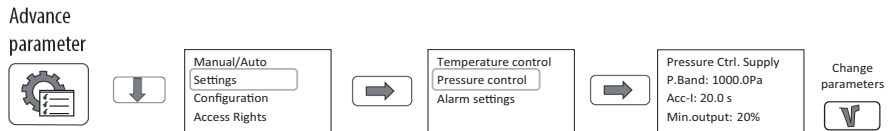
Advanced level

To modify the proportional and integral bands, from the advanced parameters menu follow the following sequence:

1- Access to system level



2- Adjust the CAV parameters



Factory setting data according to sizes

Model	Proportional band	Integral band
UTBS-2	5000 Pa	25s
UTBS-3	5000 Pa	25s
UTBS-5	5000 Pa	25s
UTBS-8	5000 Pa	25s

11.3.2. Variable airflow operation (VAV)

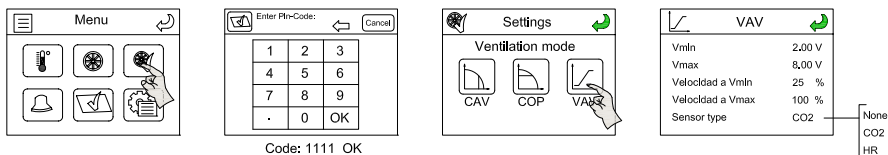
Mode recommended in single area configuration for variable airflow applications depending on a signal type 0-10v.

The set point value depends on a signal 0-10 V coming from an outdoor probe (CO₂, temperature, relative humidity, etc.) or a manual percentage. The ratio between the fans is entered in the form of a discharge/supply percentage.

Functional parameter setting:

Access to the simplified parameter setting menu (via the password 1111) allows:

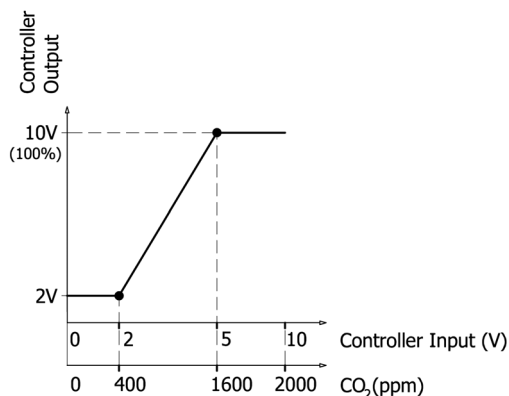
- The selection of the usage range of the signal 0-10V (see example below).
- The variation range of the supply fan's speed.
- The percentage applied to the discharge with respect to the supply.



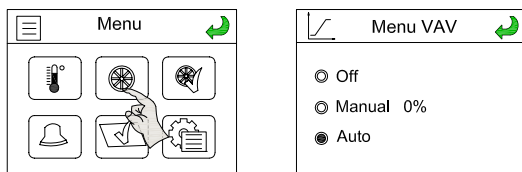
Usage example:

Connection of a CO_2 probe of a measurement range 0-2000 ppm (0-10V). Speed minimum (25%) below 400 ppm and maximum (100%) over 1600 ppm

$V_{\min} = 2 \text{ V}$ (400ppm)
 $V_{\max} = 8 \text{ V}$ (1600 ppm)
 Speed at $V_{\min} = 25\%$
 Speed at $V_{\max} = 100\%$



The selection of VAV mode in this installer menu automatically configures the screen of the user menu. The user can then change the unit's operation without touching the settings.



Off: Stop the unit.

Manual: Manually selection of fan's speed.

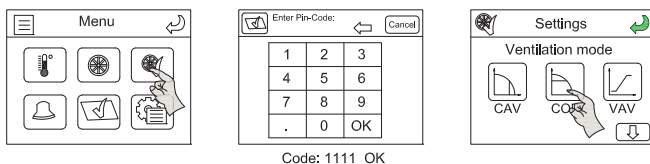
Auto: Automatic control according to external probe.

11.3.3. Constant pressure operation (COP)

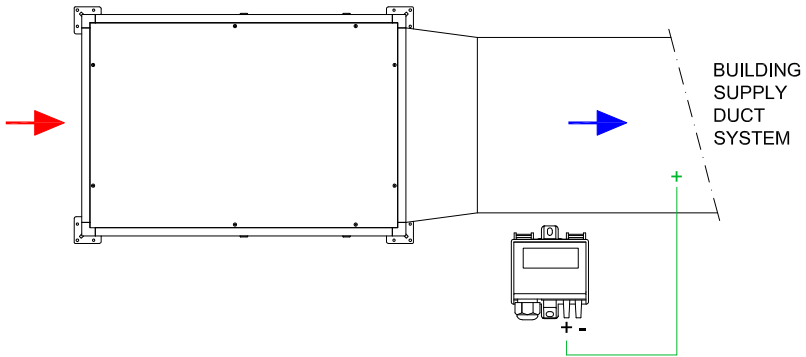
Mode recommended in a multi-area configuration for variable airflow applications with several modulation systems of the airflows installed at the network level.

Airflows automatically modulated to maintain a constant pressure value measured by an outdoor pressure sensor.

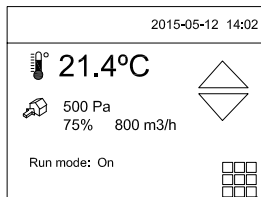
The access to the configuration menu of the COP mode is performed as follows:



Installation diagram pressure sensor



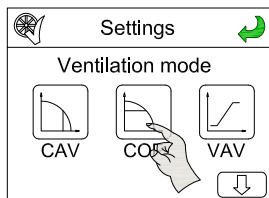
In case COP mode is selected, in the Main screen it is showed the actual Pa of the fans with pressure transmitters and also the speed of the fans (as a percentage of the maximum fan speed).



COP parameter settings mode

Access to the simplified parameter setting menu (via the password 1111) allows:

- The selection of Normal flow and Reduced flow of each fan.
- The scaling factor in case one fan is slaved.
- The night set point value of the fans.



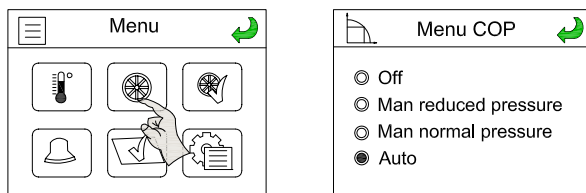
COP supply		
Man normal	ΔP	300 Pa
Man reduced	ΔP	250 Pa
Night speed		50%

The choice between normal and reduced pressure can be performed:

- manually
- automatically with programme schedule (see section Time programming)
- remotely, by external digital contact (see section force normal speed)

A third set point, the “night speed”, may be entered via the control panel. The value in % corresponds to the percentage of the fan’s maximum pressure; it will be used during the night for free cooling (see corresponding function).

The selection of COP mode in this installer menu automatically configures the screen of the user menu. The user can then change the unit's operation without modifying the settings.



Off: stop the unit.

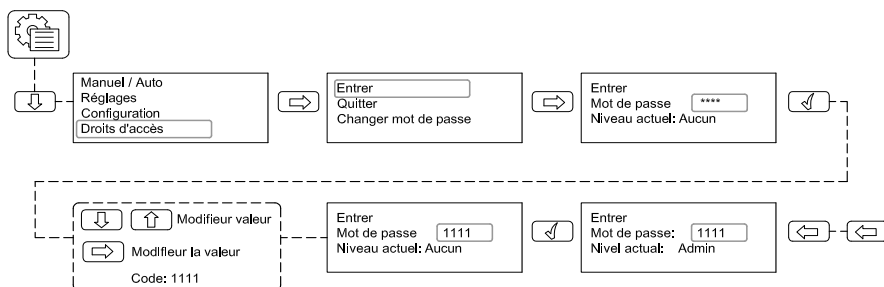
Manual Reduced pressure / Manual Normal pressure: Setting manually selection.

Auto: Selection of set point is done according to time programming (see Programme schedule section).

Advanced level

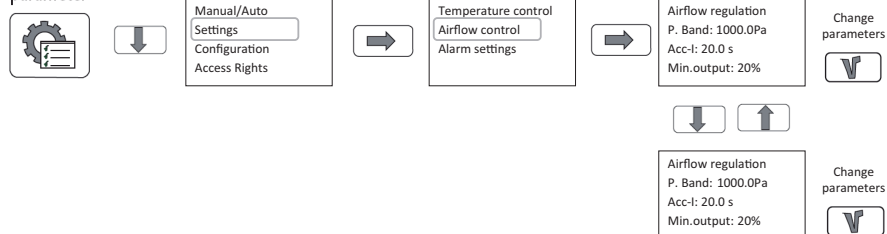
To modify the proportional and integral bands, from the advanced parameters menu follow the following sequence:

1- Access to system level



2- Adjust the COP parameters

Advance
parameter



Factory setting data according to sizes

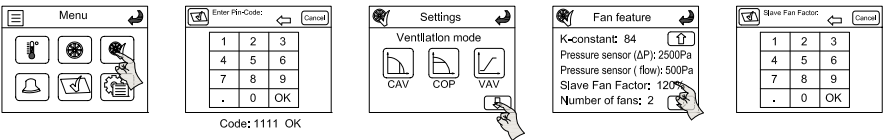
Model	Proportionnal band	Integral band
UTBS-2	5000 Pa	25s
UTBS-3	5000 Pa	25s
UTBS-5	5000 Pa	25s
UTBS-8	5000 Pa	25s

11.3.4. Control slave of an external fan (For all working modes)

The PRO-REG controller allows the control of an external fan as slave of the UTBS fan. These functionality is available for all the working modes (VAV, CAV o COP).

The control can be done though an specific output 0-10V, terminals EAF / 0-10V in the electrical board (see electrical diagrams).

Slave fan adjustment is done from the Settings screen:



The setting corresponds to a percentage of the UTBS-PRO-REG fan current speed.
Example:

UTBS PRO-REG Fan speed	Slave Factor (Settings)	Terminal Output EAF
100% Vmax	100%	10V
70%	100%	7V
50%	100%	5V
100% Vmax	80%	8V
70%	80%	4.8V
50%	80%	4V

11.4. POSTHEATER CONTROL

It is possible selecting between 4 different types of postheating control.
To select it follow the following sequence:

Menu

Enter PIN-Code:

123456789.0OK

Code: 1111 OK

Settings

Ventilation mode

CAV COP VAV

Fan feature

K-constant: 84

Pressure sensor (ΔP): 2500Pa

Pressure sensor (flow): 500Pa

Slave Fan Factor: 70%

Number of fans: 2

Heater control

Supply air T° control Cascade extr. air control Out. Comp. supply air Out. dependent supply or extr

11.4.1. Constant supply air temperature maintenance

Heating mode

Constant supply air T°C

Temperature controller works comparing supply air temperature with set point defined by console.

11.4.2. Constant ambient temperature maintenance

Heating mode

Room T°C control

Supply air temperature is controlled in cascade way with ambient temperature. Supply air temperature is defined depending on difference between ambient temperature and set point. In front of request, the controller tries to keep ambient temperature limiting duct temperature, which is maintained around 12 and 30°C, at same time.

11.4.3. Temperature set point adaptation vs. outdoor temperature



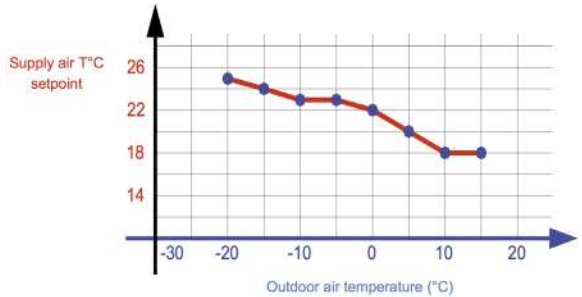
Heating mode

Constant supply air T°C with outdoor T°C compensation

Controller operation is similar to first case. In this case, main difference is defining a compensation curve defined from factory with 8 set points instead of fixing a single temperature set point.

Compensation curve

The supply set point is then adapted with respect to this curve. At any time, from the main screen you can manually change the supply temperature (range of +/-3°C).



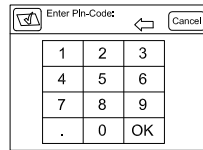
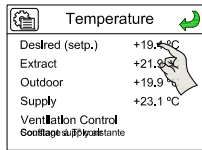
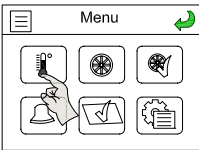
11.4.4. Automatic control mode



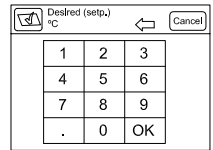
Depending on the temperatures the controller select the most suitable temperature control mode, between "Supply temperature control with compensation for outdoor temperature" and "Room temperature control".

11.5. INITIAL TEMPERATURE SETPOINT

To set the setpoint temperature to maintain, keep the following sequence:

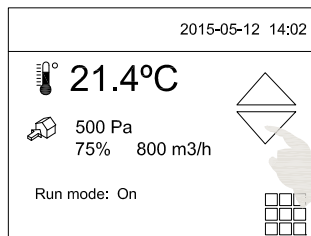


Code: 1111 OK



Introduce the desired temperature

Once selected the setpoint temperature.



11.6. TIME PROGRAMMING

The controller has several clocks which allow the individual programming of: Normal Speed, Reduced Speed and Stop.

Speed selection is not available in VAV mode.

Normal speed: corresponding to normal pressure in COP mode and to normal flow in CAV mode

Reduced speed: corresponding to reduced pressure in COP mode and to reduced flow in CAV mode

Clock parameter setting:

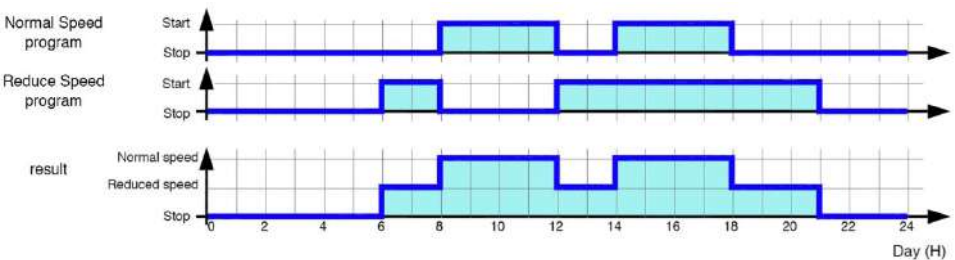
The programmer works for intervals (outside these intervals the fans are stopped). The installer can thus define two operation intervals in normal speed (only in CAV and COP modes).

It is possible define the maximum of the two intervals per day and of speed.

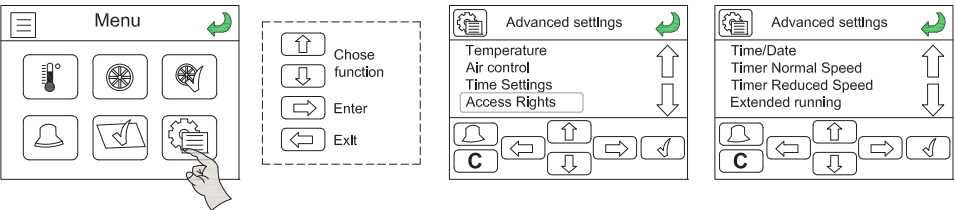
For example:

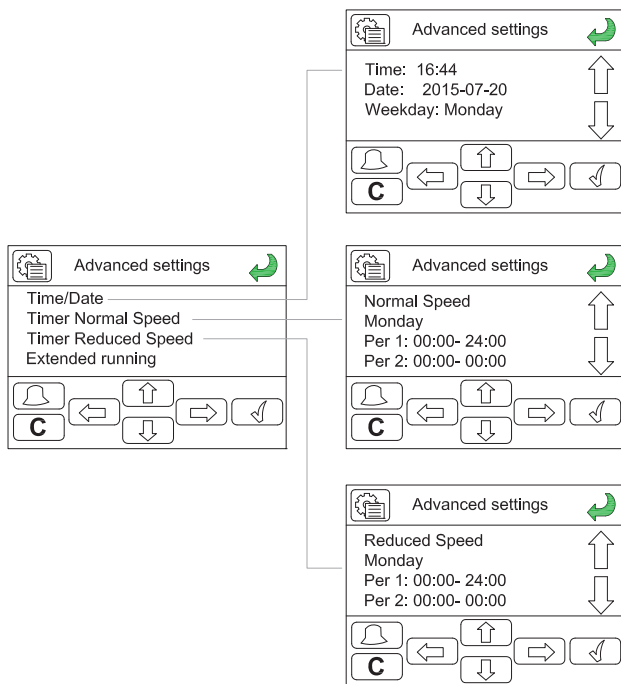
The Normal Speed can be defined from 8:00 am to 12:00 pm in period 1
and from 2:00 pm to 6:00 pm in period 2
and the Reduced Speed from 6:00 am to 8:00 am in period 1
and from 12:00 pm to 9:00 pm in period 2

The programmable logic controller will then control the fans as follows:



To access to the programme schedule, select “Time settings” in the advance parameters.



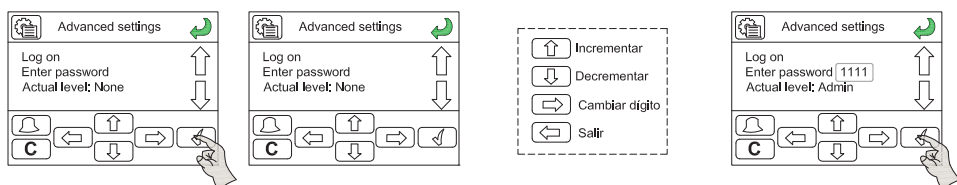


First make sure that the date and the hour set in the controller are correct.

Define the time periods when the unit will work at normal fan speed.

Define the time periods when the unit will work at reducen fan speed.

Before modify the programming it is necessary to access as "Administrator level".



In the time menu, before programming the intervals, make sure that the date and time are exact.

Time intervals parameter setting menu:

A "reduced speed prg" menu is also visible and is made up in the same way as the "normal speed prg" menu.

Time settings	Time/date	Time: hh:mm Date: yyyy:mm:dd Weekday: dddddd	
	Timer Normal Speed	Normal Speed Monday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	Normal Speed Monday->Friday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00
		Normal Speed Tuesday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		--	
		Normal Speed Thursday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		Normal Speed Friday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		Normal Speed Saturday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	Normal Speed Saturday->Holiday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00
		Normal Speed Sunday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		Normal Speed Holiday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	

The intervals are programmed day by day or copied by selecting either the same programming from Monday to Friday and/or the same Saturday and Sunday and Holidays. Holiday periods are to be selected at the end of the table (24 possible periods).

Time settings (following)	Holidays	Holidays (mm:dd)
		1: 01:01 - 01:01
		2: 01:01 - 01:01
		3: 01:01 - 01:01
		Holidays (mm:dd)
		4: 01:01 - 01:01
		5: 01:01 - 01:01
		6: 01:01 - 01:01

11.7. MIXING MODULE CONTROL (3 WAYS)

If it exists a mixing module instalated, it is necessary to specify the control type that it want to perform on it. It is possible to select between 3 control modes:

11.7.1. Without mixing module



Factory configured by default, option for equipment installations 100% outside air or 100% indoor air.

11.7.2. CO₂ control



The management of the dampers depends on the quality of indoor air (it is necessary to install CO₂ sensor). When the air quality is low (high level of CO₂), the system gives priority to the entrance of outside air. As the CO₂ level approaches to the introduced value as setpoint, it is closing the outside air damper, at the same time that opening the re-circulated air.

11.7.3. Temperature control



The management of the dampers depends only on the existing thermal demand at all times and temperature of outside and return air.

The PRO-REG controller manages the opening/closing of the dampers to obtain maximum energy savings, without consider the air quality provided in the local. (Attention: With this operating mode exists risks to obtain a low quality indoor air.)

11.7.4. CO₂ control and temperature



The position of the dampers is done by simultaneous analysis of thermal demand and air quality (signal from the CO₂). The controller tries to respond to the request of maintain the indoor air quality (ppm CO₂) limiting at the same time the supply temperature.

11.8. CONTROL OF ISOLATION DAMPER

In the case of use the isolation damper, it is not necessary to perform an specific configuration nor enable the functionality in the unit. It is only necessary to install the dampers and wiring, as indicated in the MIXING DAMPER INSTALLATION section.

When you start the unit the damper will open. To stop the unit, it will stop.

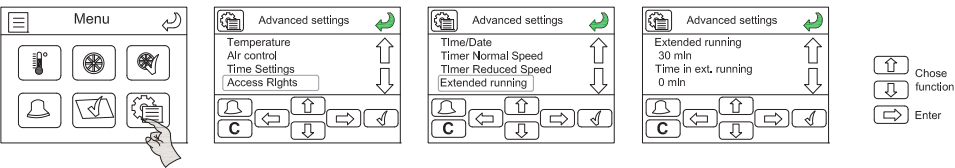
12. BOOST FUNCTION (Only available in CAV and COP modes)

By closing an external digital contact, it is possible to force the fan operation at normal speed for a setted time. (30 mins. by default)

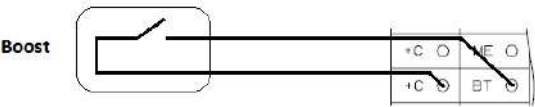
The speed corresponds to the normal pressure setpoint set in COP mode or to the normal airflow specified in CAV mode.

The Boost function can be activated, only when the unit is not within a timer period of normal speed. In this case, even if boost is executed, the timer will start to count once the period of normal speed is finished (the boost order gets delayed).

This function is not available in VAV mode.




The activation of the Boost function has to be activated with an external switch. To activate, it is necessary to close the contact between +C and BT for 3" and then open it.



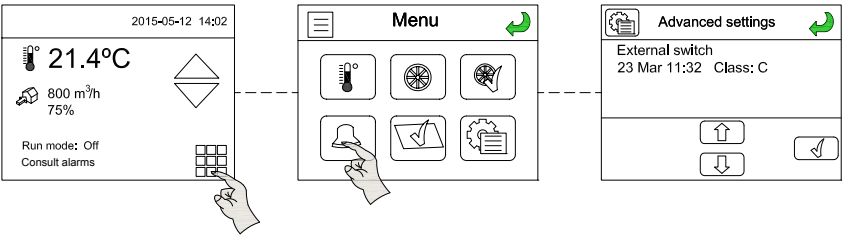
Once the Boost function has been activated, to cancel the forced normal speed period, it is necessary to do a Remote ON-OFF (see next point).

13. REMOTE STOP-START

It is possible to start-stop the unit by means of an external digital contact (see electric diagrams). The contact closure between +C and ES, will produce the unit stop.

 When the equipment is stopped remotely the control hand terminal displays an alarm message. Although this is not a real anomaly, this way it is intended to warn about the possibility that the unit will be start up from remote at any time.

When Access to alarm menú it is shown the message "External Switch".



14. FREE COOLING BY NIGHT

By default, this feature is disabled. To enable it is necessary to access from Advance Settings. This function is used during the summer to cool off buildings during the night by using fresh outdoor air. This allows reducing the need to resort to air conditioning during the day.

To use the free cooling by night function, the information received from the outdoor probe (fresh air) and from the discharge temperature probe is used. These two probes are present and integrated in the unit at the level of the taps.

The free cooling is only active if the start-up conditions are satisfied:

Start-up conditions:

- Less than 4 days have elapsed since the last start of the installation.
- The outdoor temperature during the previous operation period exceeded the force limit of 22°C⁽¹⁾.
- It is between midnight 0:00 am⁽¹⁾ and 7:00 am⁽¹⁾ In the morning.
- The timer outputs for “normal speed”, “Extended running, Normal” and “External switch” are Off.
- A time program will be activated (“Start”) within the next 24 h.

If ALL the conditions are satisfied, the free cooling starts running. It runs for 3 minutes to make sure that the temperature measurements are representative (by creating a movement of air in the ducts).

After three minutes, the controller checks the stop conditions:

Stop conditions:

- The outdoor temperature is above 18°C⁽¹⁾ or below 10°C⁽¹⁾ (risk of condensation).
- The discharge temperature is less than the stop value (18°C).
- The time programs (timer) for the normal speed, normal force run and the outdoor control are set to “Stop”.
- It is later than 7:00 am⁽¹⁾ in the morning.

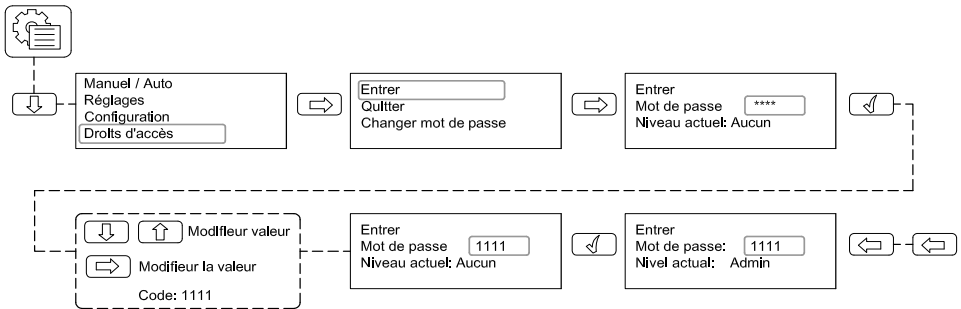
If at least one of these conditions is satisfied after the first three minutes of operation, then the unit is again stopped.

When the free cooling function is active, the fans run at maximum speed (it is possible to reduce this speed by setting the parameters); the coil and heat exchanger control outputs are switched off. The heating output remains inhibited for 60 min⁽¹⁾ after the function is stopped.

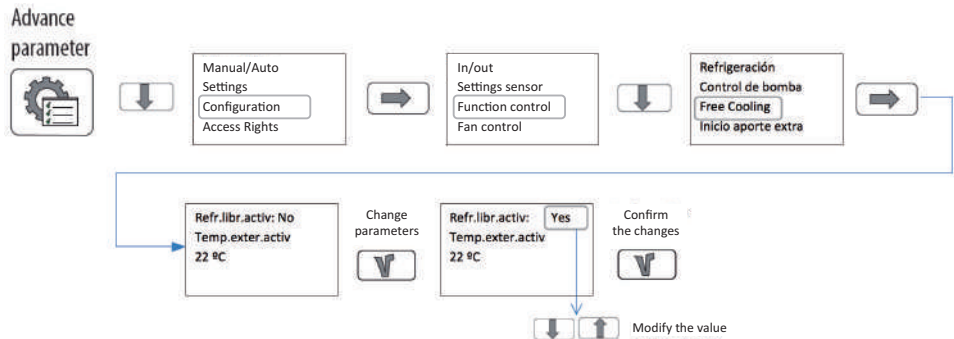
(1) default values which can be changed by a parameter setting in “expert mode”.

To activate the Free Cooling Night function it is necessary to access as administrator.

1- Access to system level



2- Activate the free cooling function and define the setpoint temperature



15. WATER HEATER FROST PROTECTION

In models with Water Heater, the temperature of the water return is continually supervised by a probe, in order to prevent it to freeze.

In case water temperature drops below 12°C, the water valve starts to open (if it already wasn't) and *Frost Risk* alarm is activated.

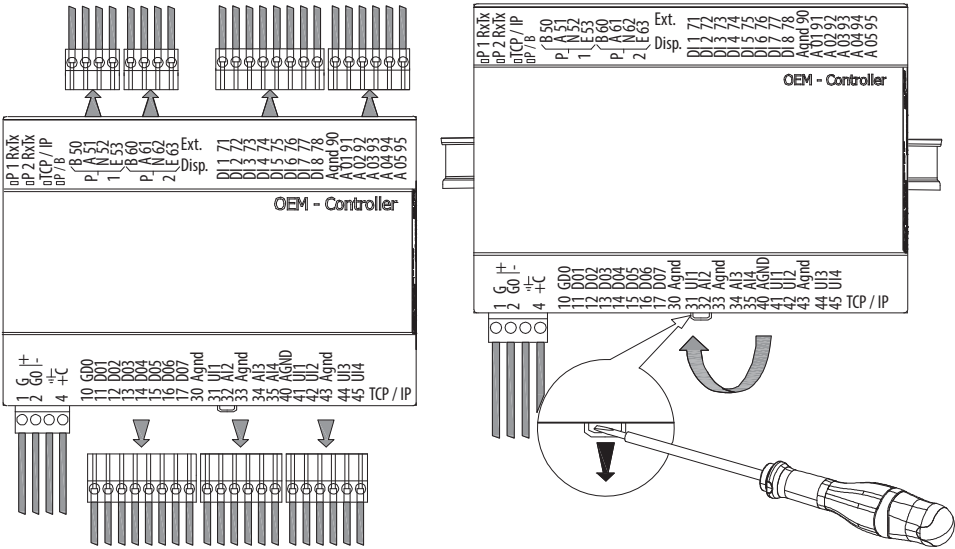
If water temperature falls below 7°C, then fans are stopped and the alarm *Water temp too low, system off* is activated. Till the temperature is not over 7°C, the unit will not turn on again.

Unit in OFF mode

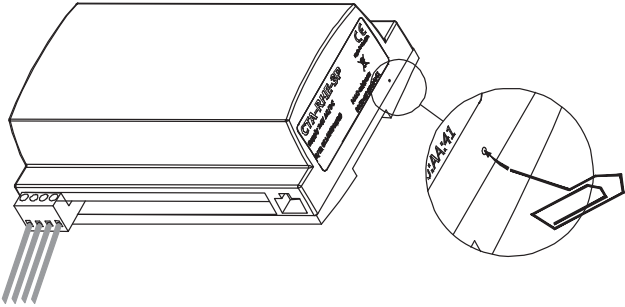
When the unit is OFF, antifrost protection remains active trying to maintain a constant re-turn water temperature of 25°C.

16. RESET THE CORRIGO CONTROLLER

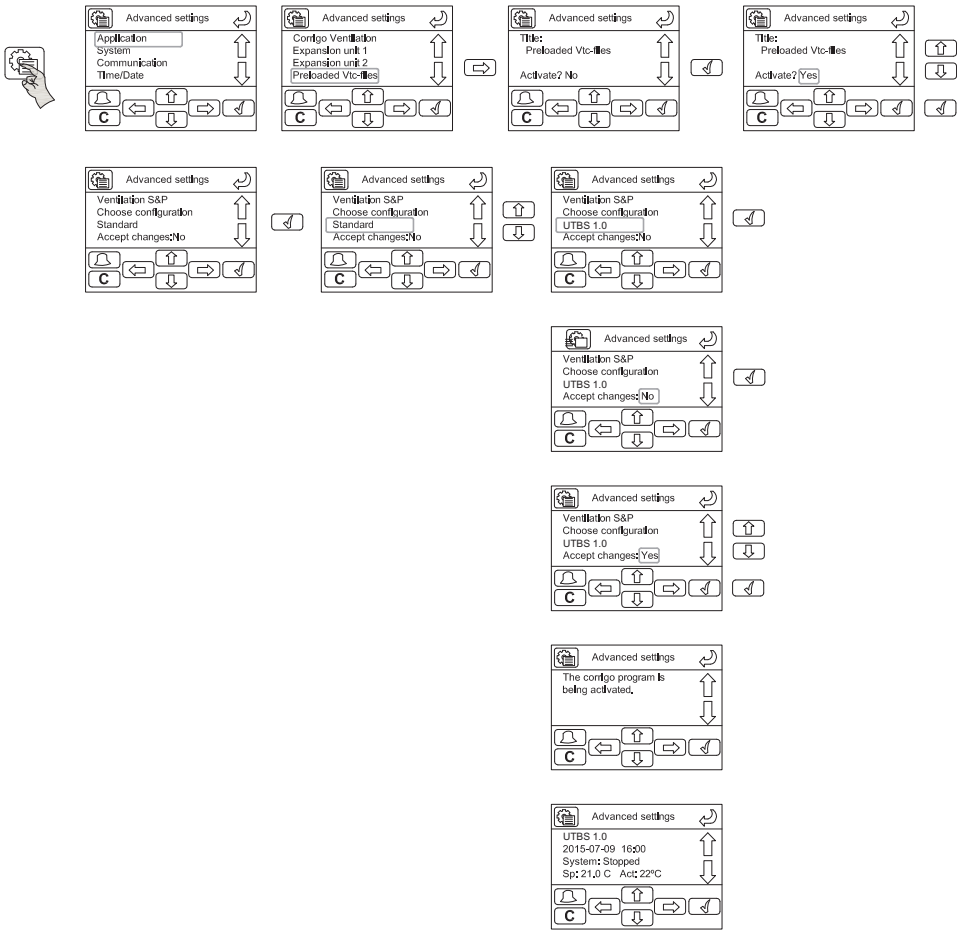
In some cases, after several adjustments or due to a bad working, it could be necessary to reset the controller. After isolating the unit and switching-off the main switch, open the door which gives access to the electronic board. Remove all the connectors attached to the controller with the exception of the 4-way electrical supply green plug connected to terminals 1,2, Earth and 4.



With a screwdriver, release the controller from the DIN rail on which it is mounted. To reset the controller, it must be under voltage so re-energise the UTBS PRO-REG at the isolator and also on the unit by switching back on the main switch. To reset the controller use a clip as shown in the picture: connect the ETD remote control cable and hook the Corrigo back onto the DIN rail. **DO NOT CONNECT ANY OTHER PLUGS – AT THIS POINT, ONLY THE ETD REMOTE CONTROL AND 4-WAY ELECTRICAL SUPPLY PLUG SHOULD BE CONNECTED TO THE CORRIGO.**



When the ETD cable and 4-Way electrical supply plug have been connected, perform the following sequence of operations:



Isolate the electrical power supply again. Re-connect all of the other cables to the CorriGO controller and finally re-energise UTBS PRO-REG and the reset procedure is now complete.

The run mode of the system (I.e VAV/CAV/COP) should now be re-set-up, together with ensuring that the additional parameters (K-Constant, heater type etc.) are correct.

CONTROLLER RECONFIGURATION

¡IMPORTANT!

After reset the controller, it is necessary to reconfigure the unit, as the factory settings are deleted.

Necessary reconfiguration:

- Language
- Cold and/or hot battery type
- Heating/cooling control
- Initial temperature setpoint
- Fan operation mode
- K factor

K values corresponding to each model:

Model	K-factor	Number of motors
UTBS-2	62	1
UTBS-3	75	2
UTBS-5	100	2
UTBS-8	116	2

- Pressure sensor:

Values of the set pressure range:

Model	Set pressure range
UTBS-2	0-3000 Pa
UTBS-3	0-1000 Pa
UTBS-5	0-1000 Pa
UTBS-8	0-3000 Pa

- Mixing box control
- Advanced parameters

Advanced parameters must also be configured after the Reset:

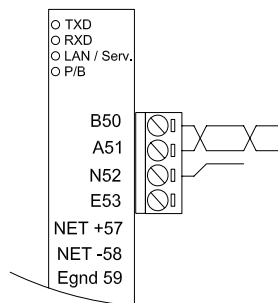
- Time settings
- Night free-cooling
- Bacnet communication activation
- Fire alarm strategy

17. CONNECTION TO BUILDING MANAGEMENT SYSTEMS (BMS)

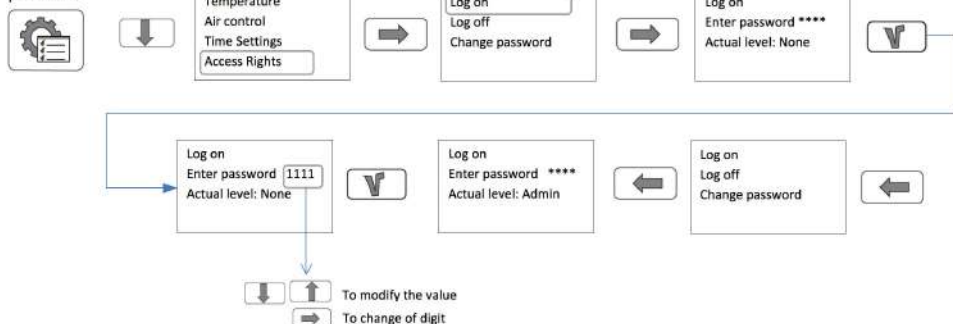
17.1. RTU MODBUS

The controller in its standard version has an integrated RS485 communication port (to be used with an STP cable). The standard controller can communicate in Modbus via its RS485 port by simply activating an internal parameter "Advance Parameters".

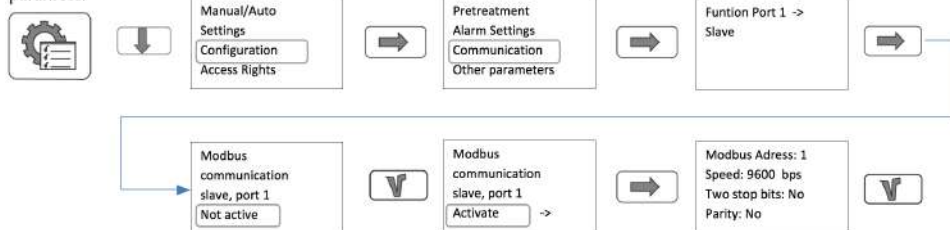
There is available a Communication manual where appear Modbus technical especifications and list of available registers.



Advance parameter



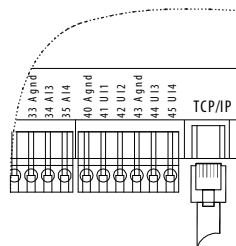
Advance parameter



17.2. TCP/IP BACNET

PRO-REG controller is equipped with an integrated RJ45 port for TCP/IP communication, as support for BACnet IP communication. It's necessary to configure the IP address on each controller, and activate and address the BACnet IP using ET00L software (E tool© is delivered as a self-installing program and can be downloaded from http://www.regincontrols.com/Root/Documentations/42_105786/CorrigoEVentilation%203.4-1-24.zip)

It is necessary to indicate the names, IP fixed directions, subnet masks and default gateway of each unit connected to the same network.



18. REPLACEMENT OF THE BATTERY FROM THE CORRIGO PROGRAMMABLE LOGIC CONTROLLER

When the "battery low" alarm appears and the red indicator light is lit, it means that the backup battery to save the memory and the real time clock is too low.

The procedure to change the battery is described below.

A capacitor allows backing up the memory and running the clock for approximately 10 minutes after the power is switched off.

If the battery can be changed in less than 10 minutes, the program does not have to be reloaded and the clock will continue to run normally.

The spare battery is type CR2032.

- Using a small screwdriver, pry up the clips on each side of the case to release the cover from the base.
- Hold the base and remove the cover.
- Grasp the battery and pull up gently until the battery exits from its holder.
- Replace the battery with a new.

Warning: be sure to respect the polarity when inserting the battery.



19. OPERATION ANOMALIES

19.1. GENERAL ANOMALIES

Anomaly	Cause	Solution
Difficult to start.	Reduced power supply voltage. Insufficient static torque of motor.	Check motor specification plate. Close the air inlets to reach the maximum speed. Change the motor is necessary. Contact the S&P Post-Sales service.
Insufficient airflow. Insufficient pressure.	Blocked pipes and/or inlet points closed. Fan obstructed. Filter overloaded. Insufficient rotation speed. Sealed batteries.	Clean inlet tubes. Clean fan. Clean or replace filter. Check power supply voltage. Clean batteries.
Reduction in performance after a period of acceptable operation.	Leaks in the circuit before and/or after the fan. Damaged roller.	Check the circuit and restore original conditions. Check the impeller and if necessary, replace with an original spare part. Contact the S&P post sales service.
Supply air temperature too low.		Insertion of post-heating resistances. Contact the S&P post sales service. Reset by pushing the button RESET, all the thermal protectors of the resistance.
Insufficient performance of water coil or direct expansion.	Fins dirty.	Clean the exchanger.
Formation of frost on the batteries.	Outside air below -5°C.	Insertion of pre-heating devices (anti-ice). Contact the S&P Customer Advice service.
Air pulsation.	Fan working in flow conditions almost 0. Flow instability, obstruction or bad connection.	Modification of the circuit and/or replacement of the fan. Clean and/or readjust the inlet channels. Operate the electronic regulator, increasing the minimum speed (insufficient voltage). Contact the S&P Customer Advice service.
There is water inside the unit.	Drain clogged or wrongly dimensioned.	Check if exists a body/object obstructing the passage of water and remove it. Verify that the drain trap exists and is correctly sized according to the instructions of this manual.
	Versions with water coils. Internal breakage of water coil.	Isolate the battery using the isolation valves. Repair the leak/ Replace the battery.

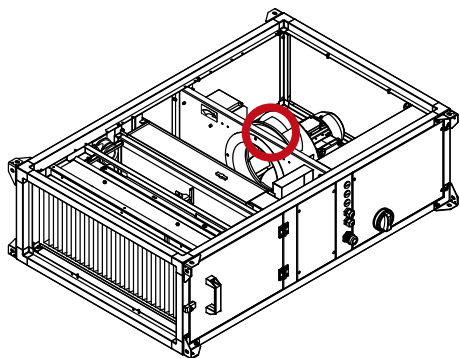


Fig.1. Location of the pulser for manual reset of thermal protectors



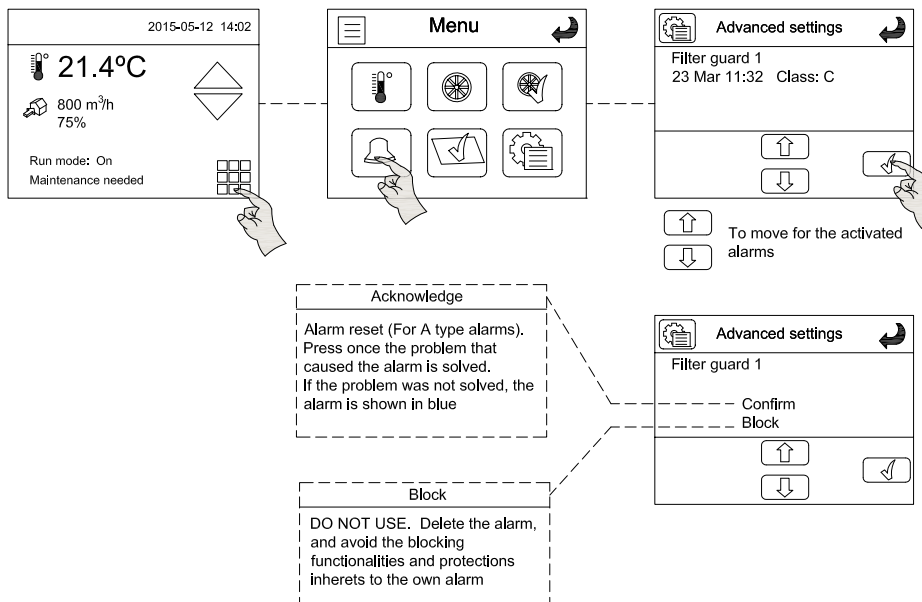
Danger of burns, there is a risk that the metal parts are at a high temperature.

19.2. FAILURE LIST

In case an alarm or a failure occurs, a “Maintenance To Do” message appears in red on the main screen. The alarm can then be consulted in the advanced menu. The error is then clearly identified on the screen. The list of error messages is given in the following subsection.

Alarms type A: they have to be acknowledged once the error has been solved to return to normal working.

Alarms type C: once the error has disappeared they turn automatically off (not needed to acknowledge).



The following table shows the mode to proceed to detect and resolve any incidents shown:

Alarm number	Alarm text	Description	Alarm type
1	Run Error Supply Air Fan	Malfunction of supply air fan	A
6	Change Filter	Prefilter % Filter need replacement	C
10	Fire Alarm	Fire alarm activated	C
11	Remote off active	Remote On/Off active	A
23	Electric heating is overheated	Electric Heater Thermal protectors activated	C
24	Frost risk	Frost protection function is overriding the control of the water heater output	C
25	Water temp too low, system off	Water temperature below frost limit value (<7°C)	A
27	Sensor error outdoor temp	Malfunction of outdoor air temperature sensor	C
41	Manual heater control	The electric heater is in manual mode	C
42	Manual exchanger control	Heat exchanger output in manual control	C
43	Manual cooler control	Cooling output is in manual control	A
48	Internal battery error	Internal battery needs replacing	A
49	Sensor error Supply Air temp	Malfunction of supply air temperature sensor	A
50	Sensor error Extract Air temp	Malfunction of extraction air temperature sensor	A
55	Sensor error SAF pressure	Malfunction of supply air pressure sensor	A
58	Sensor error Frost Protection temp	Malfunction of water temperature sensor	C
90	Change External Filter	Extraction Air Filter needs replacement	

20. EMERGENCY OPERATIONS

- If any problems are noted on the unit, turn it off using the emergency shut-off device.
- These emergency operations will generally be the result of some problem with the electrical circuit, in which case you may have problems with the motors. You will therefore need to disconnect the power to locate the fault, which may be inside the unit (short circuit) or external to it (problems with the power supply, voltage variations, etc.).
- In the event of fire, it must be extinguished using suitable extinguishers. Extinguishers should be appropriate for use on electrical fires.

21. PREVENTIVE MAINTENANCE

- Preventive maintenance is a preset programme of checks that is followed regularly to prevent equipment breakdowns.
- The supplemental Building Facility Technical Regulations are applicable at all times to maintenance standards, except when justified otherwise for technical reasons.
- The maintenance supervisor should keep a copy of the preventive maintenance recommendations given below on file, making as many copies as needed for use.
- According to the equipment's operating needs, it is crucial to make a list of those elements that are needed to quickly resolve equipment faults. This list will serve to determine the spare parts inventory needed to be able to perform repairs quickly.

- A maintenance log should record each component serviced during maintenance, as well as activities performed or repairs made.
- Maintenance staff must have access to a specific training programme.
- Before starting maintenance operations on the unit, turn off the unit's main switch. Electrical shock can cause personal injury.
- Keep the following in mind when performing maintenance operations:

21.1. WATER COILS

- We recommend cleaning the coils once a year.
- Don't use abrasive cleaner.
- Brush off the fins that need it.
- Make sure that there is no leakage from pipework.
- If the coils are not used, please drain the water to avoid damage.

21.1.1 DX COILS

- We recommend cleaning the coils once a year.
- Don't use the abrasive cleaner.
- Make sure that there is the leakage from pipework.

21.2. DRAINAGE SYSTEM

- We recommend checking periodically the condensate drip tray and clean it.
- We recommend checking the siphon.

21.3. MOTORS

- Check the power consumption has not increased.
- Periodically check the electrical connections are making good contact; this will prevent breakdowns.
- We recommend checking the fan mounting periodically.

21.4. FANS

- Every three months, clean the dirt from the fan blades and bearings, since dirt can not only reduce airflow but also lead to unbalanced operation and increase noise.
- Periodically, test the airflow on each fan.

21.5. FILTERS

- To make sure that the filters are working properly, the pressure loss across the filter must be monitored precisely (since this is an indicator of dirt levels). The following table

indicates the maximum recommended values for pressure loss before filter replacement.

Filter	G4	M5	M6	F7	F8	F9
Pressure Loss (Pa)	150	200	200	200	225	225

- Even if the maximum pressure loss has not been reached, filters should be inspected each month to make sure that the filter and filter housing are sealed.
- It is not recommended that filters be washed, since they will never recover their initial efficiency and doing so can produce wear on the filters. Although washing or vacuuming in the opposite direction from normal air circulation can achieve an optimal finish, it is recommended that you always have a set of replacement filters on hand. Under no circumstances should the unit be run without filters, since this can introduce dirt into vital components of the unit and lead to equipment wear and loss of efficiency.

Filter parts table

Climate control model	Spare part code*						Dimensions (mm)
	G4	M5	M6	F7	F8	F9	
UTBS-2	5402055800	5402056200	5402056600	5402057000	5402057400	5402057800	1 ud. 645x250x48
UTBS-3	5402055900	5402056300	5402056700	5402057100	5402057500	5402057900	1 ud. 995x300x48
UTBS-5	5402056000	5402056400	5402056800	5402057200	5402057600	5402058000	2 uds. 695x300x48
UTBS-8	5402056100	5402056500	5402056900	5402057300	5402057700	5402058100	2 uds. 895x380x48

* Only valid for the main UTBS module.

In case of filters for heat recovery module contact your dealer to define the right references.

21.5.1. Filter replacement

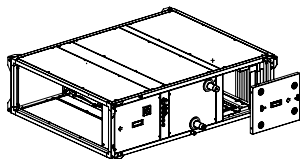
The air conditioner is supplied with a filter mounted inside. Depending on the version it is possible to mount a second filter (order as accessory).

The way to access for maintenance depends on the unit type:

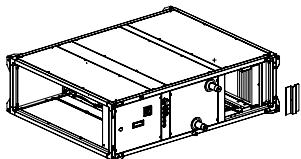
- Version UTBS-X P F7: Long frame version P F7, with capacity for mounting two filters: F7 factory mounted and possibility of mounting a second filter (supplied as an accessory).
- Version UTBS-X M5: Short frame version, equipped with a single M5 filter and without possibility to mount a second filter.

LONG FRAME VERSION P F7:

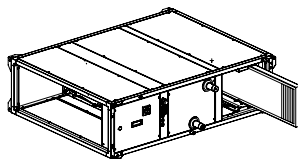
Access by the side



Loosen the fast taps in the filter access panel and retire the panel.

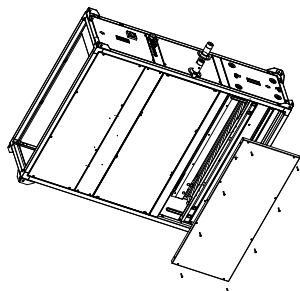


Remove the lateral metal support (a) and release the filters by the internal handle (b).

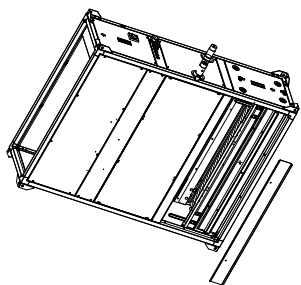


Retire the used filters.

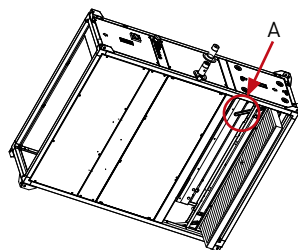
Access by the bottom



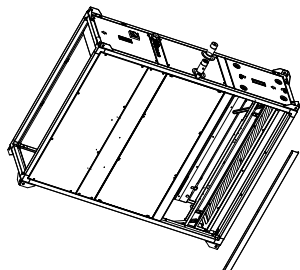
1. Loosen the fast taps in the filter bottom panel. Remove the lower panel of filter section.



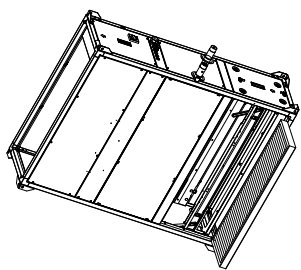
2. Remove the guide support that fix the filters.



3. Release the filters via the plastic handle (A) and retire the used filters.



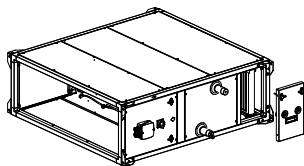
4. If the unit is equipped with a prefilter, then it is necessary to remove the guide support that fix the prefilter.



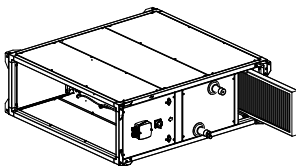
5. Retire the used prefilter.

SHORT FRAME VERSION M5:

Access by the side

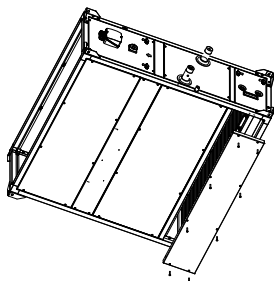


Loosen the fast taps in the filter access panel and retire the panel.

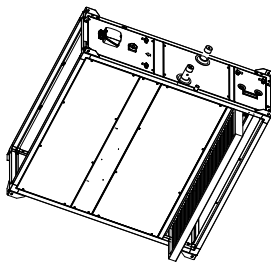


Release the filters, sliding them through its guide.

Access by the bottom



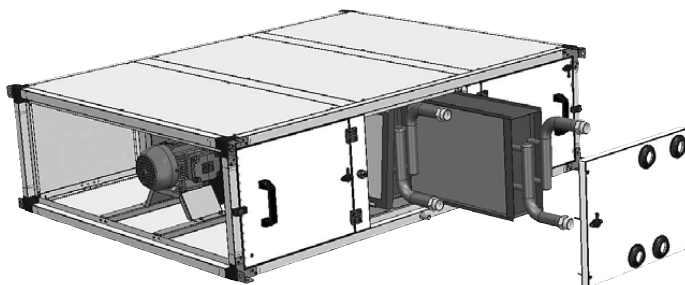
Loosen the fast taps in the filter access panel and retire the panel.



Release the filter

21.6. COILS

If you detect any problem in the coils and they need to be removed, loosen the bolts from the panel where they are located, remove the panel and extract the coils. The coils are installed in slot for easy slide in and slide out.

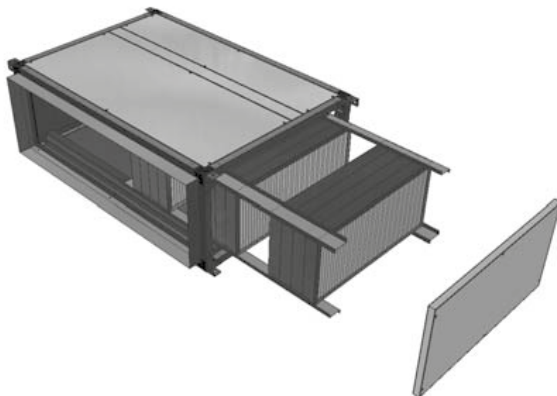


21.7. DAMPERS

- Make sure that the damper can open and close unrestrictedly and the (way) is unobstructed.
- For manually controlled dampers fix the handle firmly to prevent the damper close while the unit is running.

21.8. SILENCERS

- To remove the baffles unscrew the corresponding side panel.

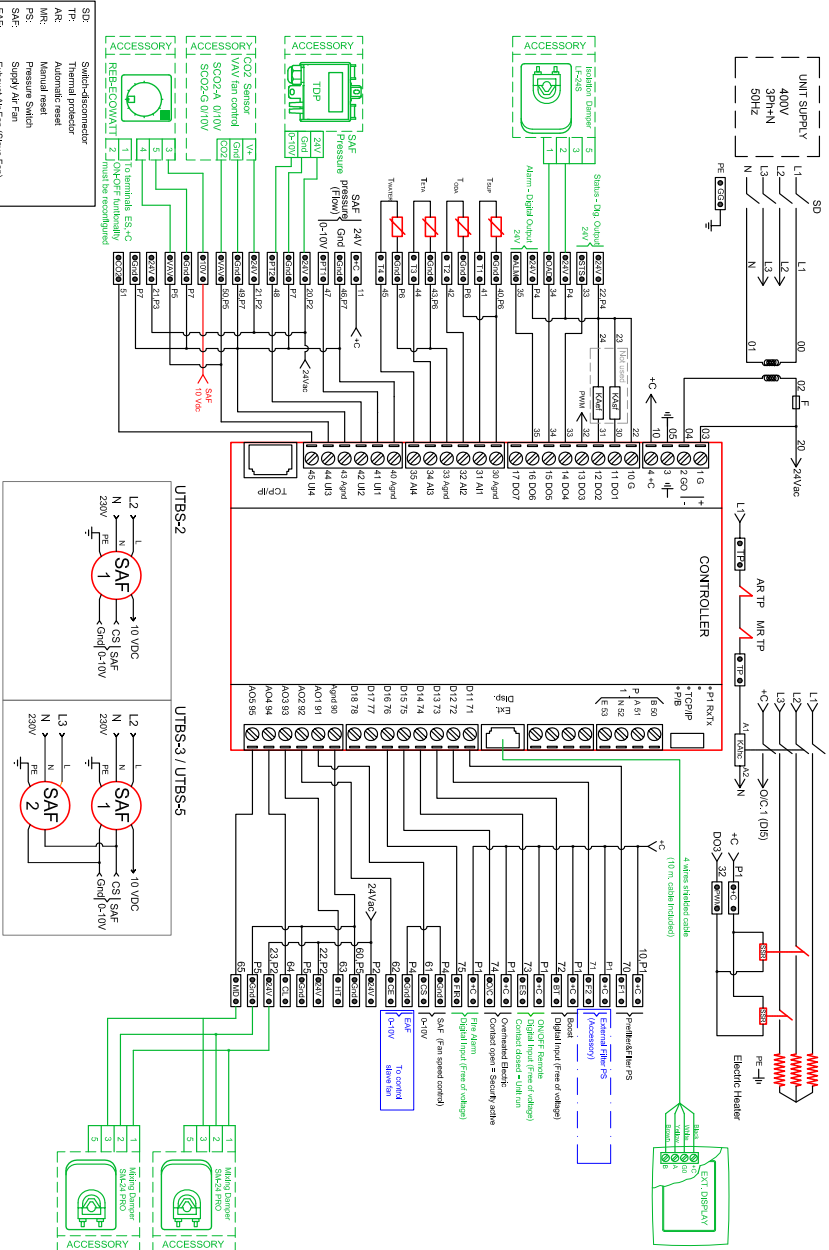


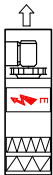
22. WIRING DIAGRAMS



UTBS-2/3/5 PRO-REG with electric heater

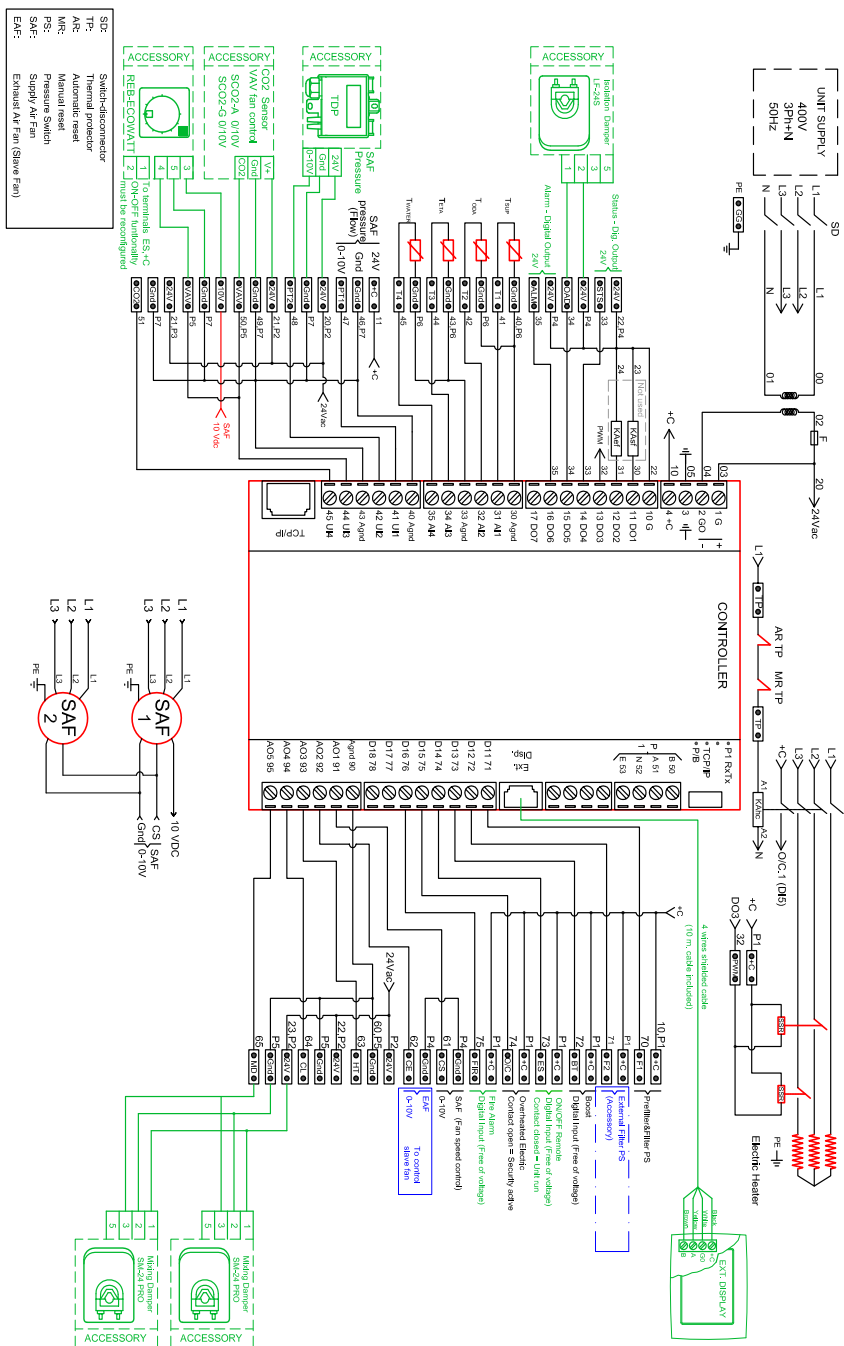
With mixing box





UTBS-8 PRO-REG with electric heater

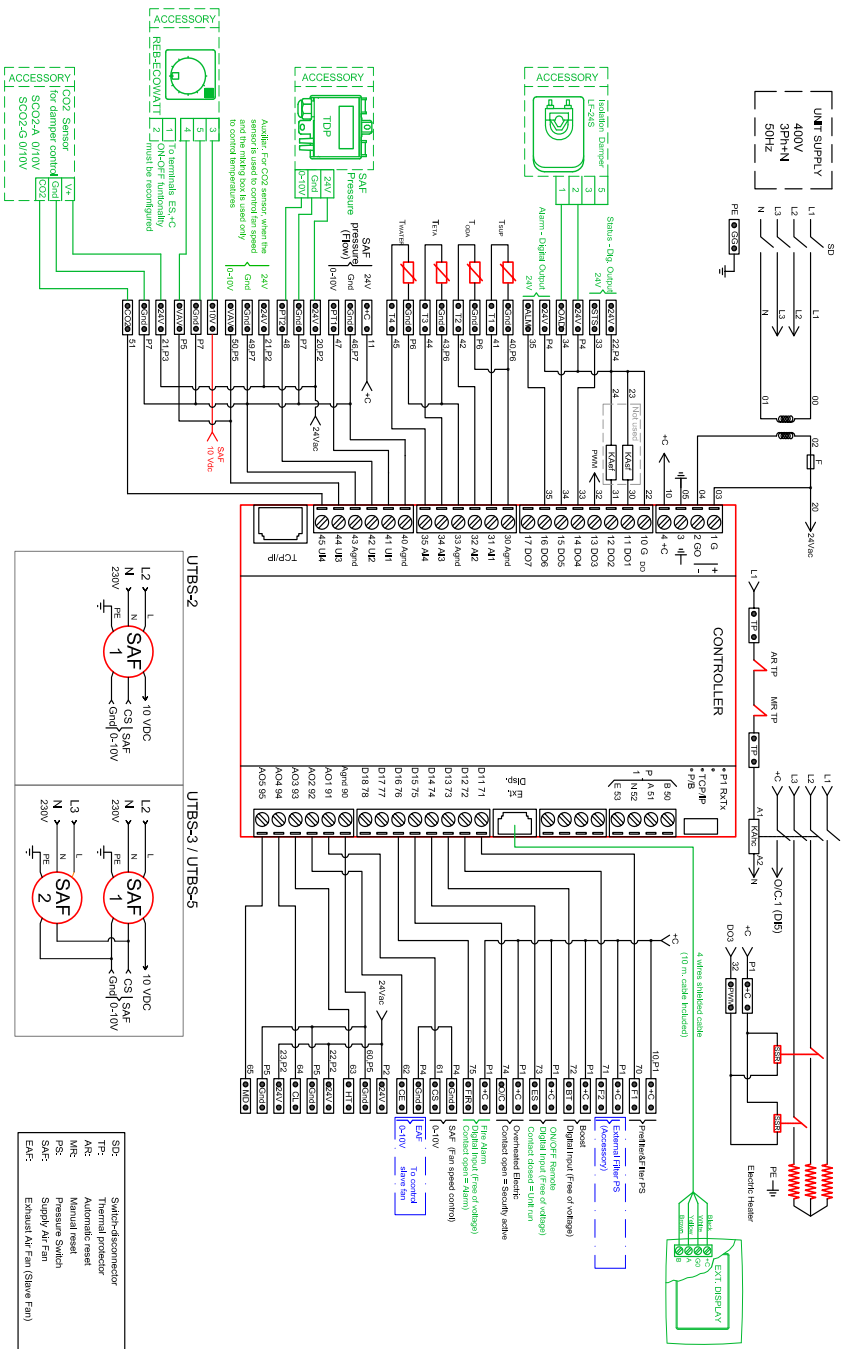
With mixing box





UTBS-2/3/5 PRO-REG with electric heater

Without mixing box



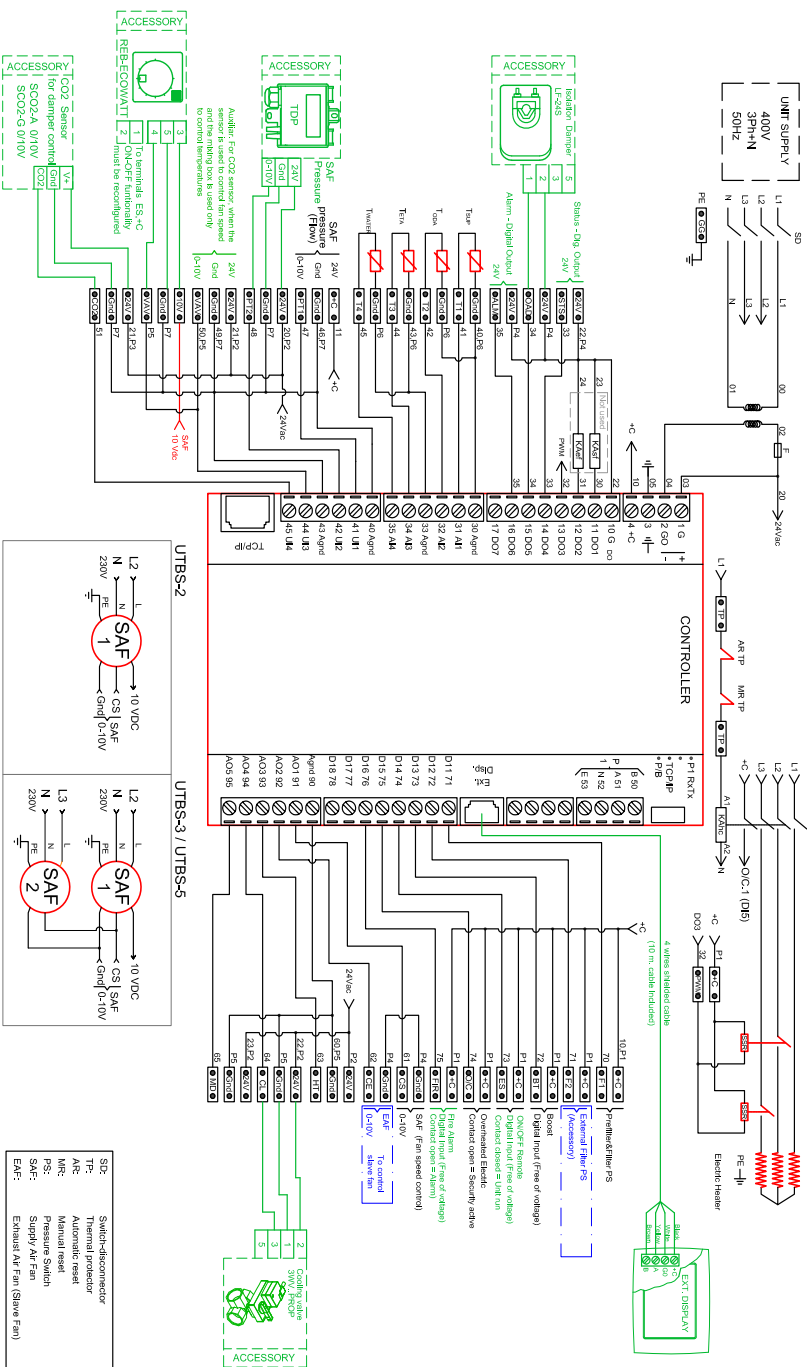






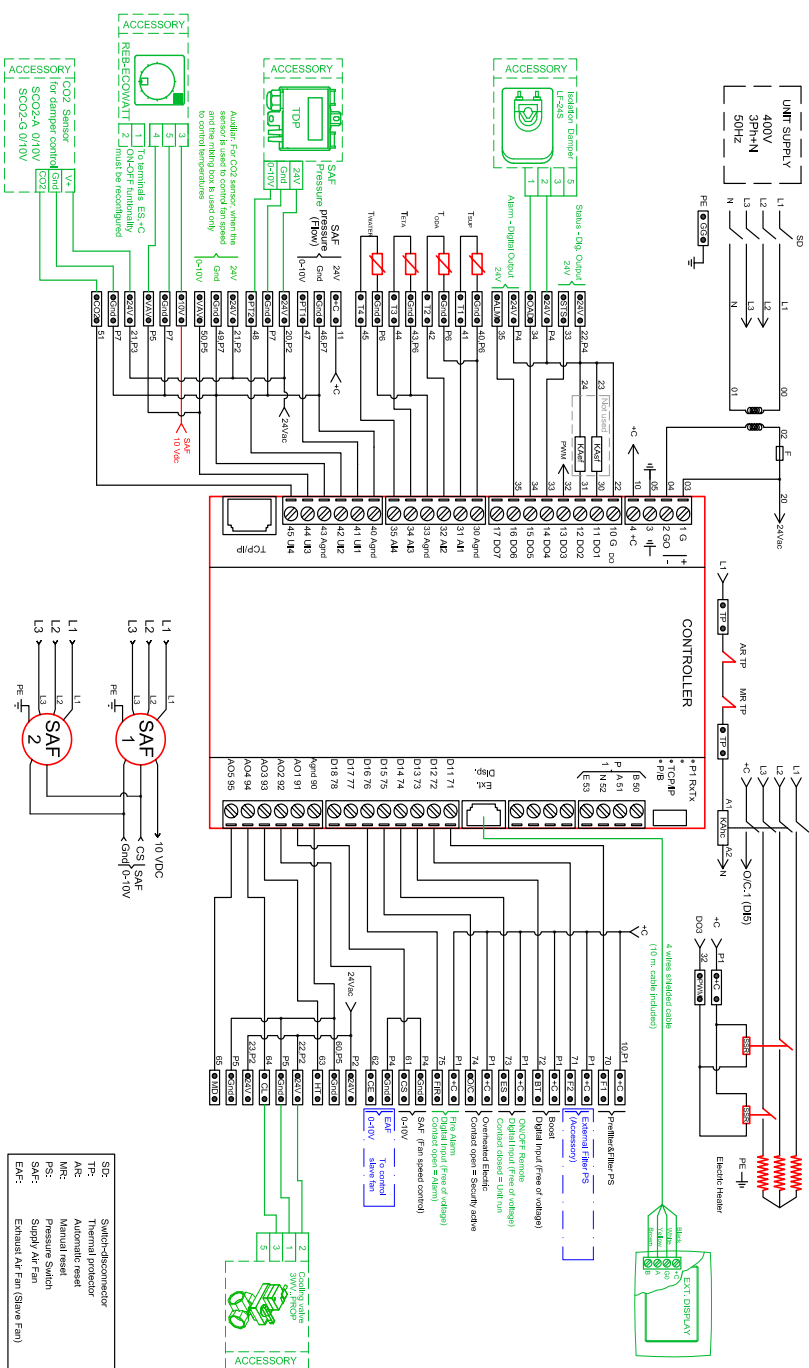
UTBS-2/3/5 PRO-REG with cooling coil + Electric heater

Without mixing box



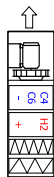
UTBS-8 PRO-REG with cooling coil + Electric heater

Without mixing box

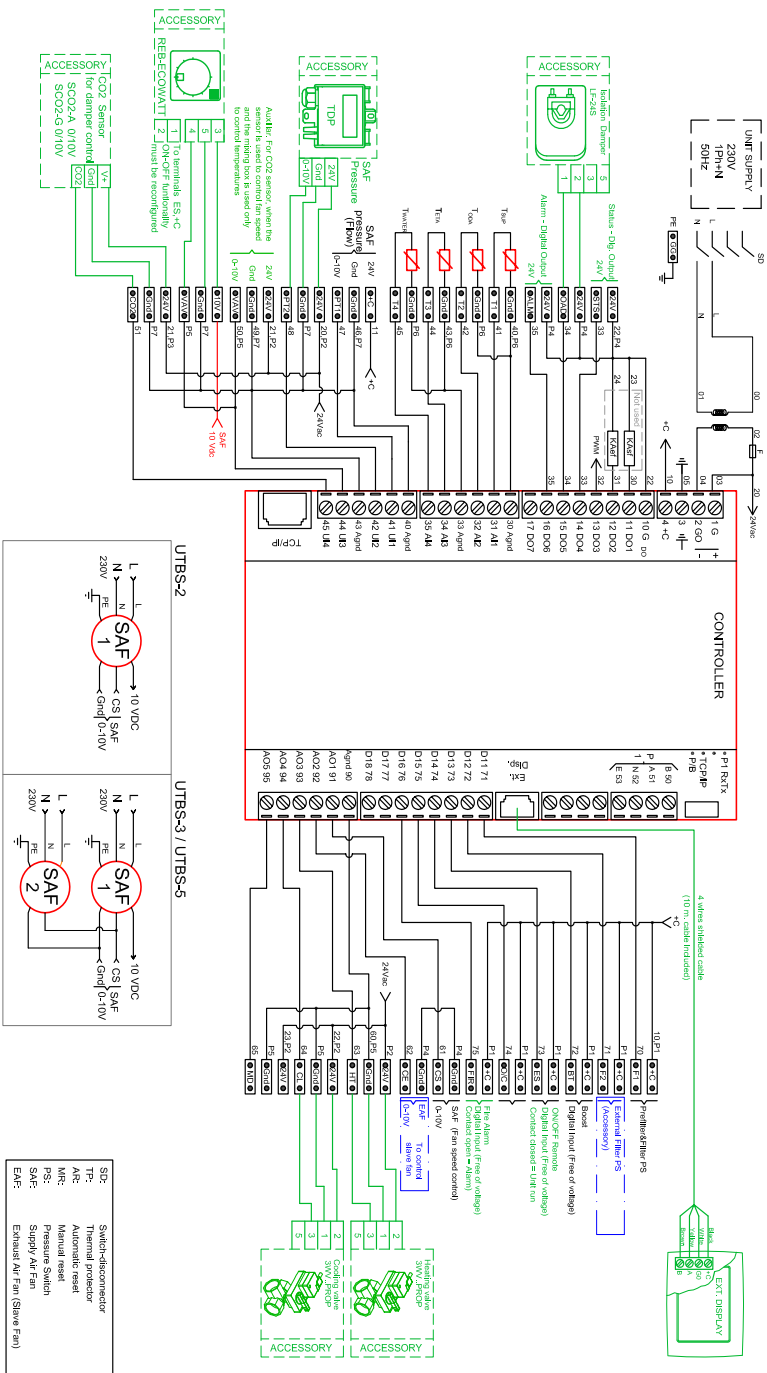


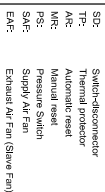
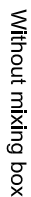






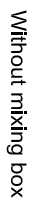
UTBS-2/3/5 PRO-REG with cooling coil + Heating coil













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