

TCL

DUCT MODULAR UNIT



- ErP 2018
- Suitable for ceiling installation
- Air flows from 1.400 to 6.000 m³/h
- EC fans adjustable with 0... 10V signal



The ductable terminal units in the TCL series complete the "Flat" range of horizontal air handling units for ceiling installation, specifically designed for all those applications where a minimal amount of height encumbrance is an essential condition for installing an air conditioning system. Produced in compliance with the requirements of the Ecodesign Directive 2009/125/CE for ventilation units, they are comply with the requirements of regulation 1253/2014 and they are ErP 2018.

The TCL series units, for horizontal installation, are produced in 6 models from 1400 m³/h to 6000 m³/h with high available static pressure. A wide range of accessories and modular components means that a vast number of air handling and filtering requirements can be achieved, based on the chosen configuration consisting of ducts, flexible pipes and plenums, which are perfect for use in domestic, commercial and industrial settings.

A rapid selection software is available.

Publication: Sales technical data sheet for duct modular unit (TCL)

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Regulatory Compliance

The TCL duct modular units are designed and manufactured in accordance with the following reference provisions:

Directive 2006/42/EU - Machinery;

UNI EN 1886

UNI EN 12100

UNI EN ISO 16890

UNI EN 13053

ISO 1940-1

DIN 24163

AMCA 210

Directive 2014/68/EU - PED

Directive 2014/30/EU Electromagnetic Compatibility (EMC)

Directive 2014/35/EU Low Voltage Directive (LVD)

Italian Legislative Decree 17/2010

Law Decree 81/08

Directive 2009/125/EU - EcoDesign

Application fields

The ductable terminal units in the TCL range have been designed to respond in a specialised manner to a wide spectrum of applications and are particularly suitable for the following applications:



Medium-small rooms



Tertiary



Offices

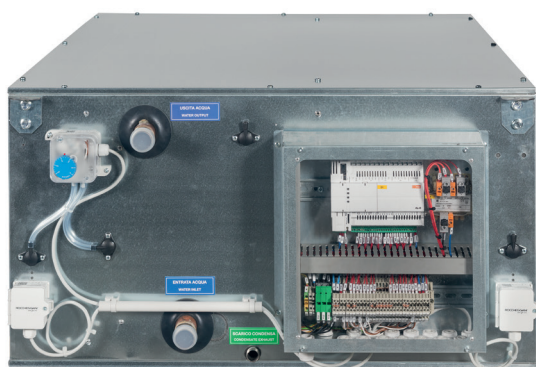


Shops

Description of the Unit and main components

Casing

Consists of self-supporting galvanised steel panels, lined on the inside with heat and sound proof material that is self-extinguishing and 10 mm thick.



Undulated synthetic filters

The filtering section consists of synthetic pleated filters, 50 mm thick, constructed with a galvanised steel frame, double electrically-welded grid, filtering media in pleated synthetic fibre that can be regenerated. The filter can be removed from the bottom and has ISO Coarse 55% efficiency according to ISO 16890 (formerly G4 EN779).



Heat exchanger coils

The coils used are of the water type and are mounted on rails for easy removal. The construction materials used are: copper pipes, aluminium fins, coated steel manifolds, frame in galvanised steel. The inner part of the handling section contains a pan for collecting condensate fitted with a drainage system.

Fan sections

The fan sections are fitted with high-efficiency electric fans of the EC plug fan type with reverse blades, which have built-in rotation speed control through 0...10V controls and also provide substantial energy savings compared to traditional ventilation systems as well as remarkable reliability and long life. Max. air temperature onto the motor during operation is 60°C (45°C for TCL35 motors).

Electronic speed control, typically from 10% to 100%, allows ample margins for adjustment to the characteristics of the plant and ensures comfort during operation of the unit.

Fully compliant with: Directive 2014/30/EU and the Low voltage Directive - 2014/35/EU.

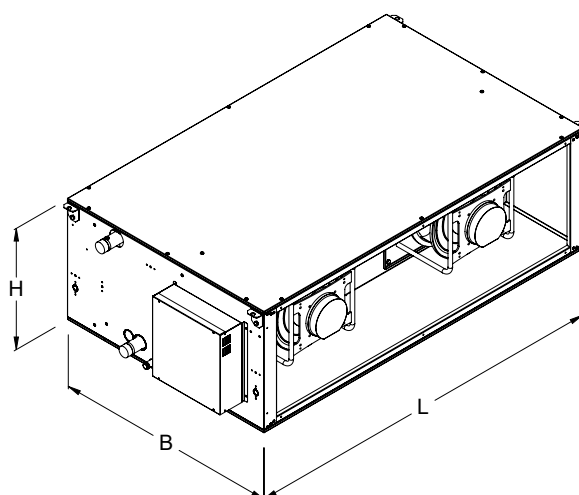
All fans are wired to an electrical box which is fully cabled with modular terminals on a DIN rail.



Dimensions and weights

Dimensions							
TCL		9	13	19	25	29	35
B	mm	840	840	840	900	900	920
H	mm	370	370	450	480	550	550
L	mm	680	1100	1100	1460	1460	1660
Weight*	kg	73	87	93	124	132	152

*Referring to a base unit with a 6-row coil.



General technical data

TCL Model		9	13	19	25	29	35
Nominal air flow	m ³ /h	1400	2300	3100	4400	5200	6000
External Static Pressure	Pa	500	600	450	560	440	720

Performance							
Total Heating Capacity with 4-row coil (1)	kW	4.7	7.6	10	14.5	17.2	20.2
Total Heating Capacity with 6-row coil (1)	kW	5.3	8.7	11.4	16.1	19.1	22.4
Total Cooling Capacity with 4-row coil (2)	kW	9.1	14.8	19.2	28.2	30.6	36.3
Sensible Cooling Capacity with 4-row coil (2)	kW	6.1	9.9	13	19	20.3	23.8
Total Cooling Capacity with 6-row coil (2)	kW	10.2	17.3	23.5	31	36.7	43.9
Sensible Cooling Capacity with 6-row coil (2)	kW	6.9	11.4	16	21.2	25.1	29.3

Fans							
Supply Fan Motor Rating	kW	0.50	2 x 0.50	2 x 0.50	2 x 0.78	2 x 0.78	2 x 1.30
Supply Fan Nominal Current	A	2.50	2 x 2.50	2 x 2.50	2 x 3.90	2 x 3.90	2 x 6.26
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

Filtration							
Fresh Air Filter (3) (4)		ISO Coarse 55% (ISO 16890) / G4 (EN 779)					
Return Air Filter (3) (4)		ISO Coarse 55% (ISO 16890) / G4 (EN 779)					

Compliance EN 1253/2014							
Unit type		-					
Ventilation Control		UVU					
Absorbed power (5)	kW	0.31	0.52	0.72	1	1.18	1.46
Specific Fan Power	W/m ³ /s	131	91	97	86	96	99
Nominal Supply Airspeed	m / s	1.59	1.61	1.78	1.74	1.8	1.83
Maximum External Leakage	%	<3	<3	<3	<3	<3	<3
Maximum Internal Leakage	%	<3	<3	<3	<3	<3	<3
Fan Static Efficiency	%	54.8	54.8	57.7	59.3	55.3	54.6
Airborne Sound Power Level	dB (A)	57.1	59.2	62.3	64.8	67.6	69.6

(1) Performance related to conditions: incoming air 20°C / 50% RH - water temperature 35°-30°C;

(2) Performance related to conditions: incoming air 27°C / 50% RH - water temperature 7°-12°C;

(3) Compliance with the Ecodesign Directive entails the presence of differential pressure switches to alert for soiled filters: if not expressly indicated, these accessories must be paid for by the customer;

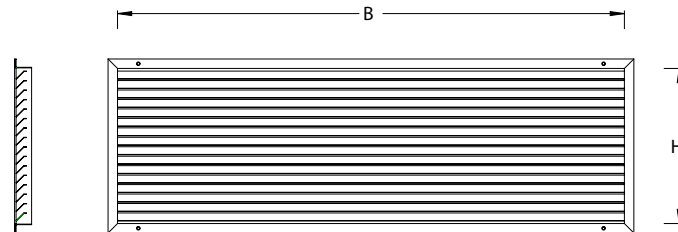
(4) Filtering efficiency according to ISO 16890;

(5) Values referring to the base configuration, with available static pressure of 250Pa.

Description and dimensions of accessories

Return air grille with fixed slanted fins (GR)

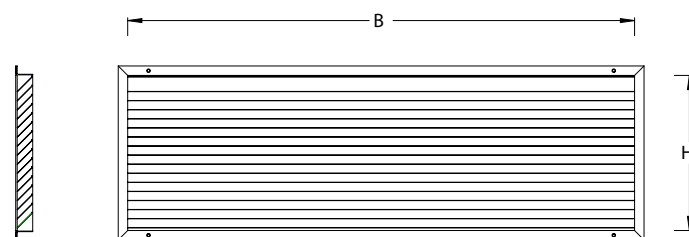
Return air grille with single row of fixed slanted fins for in-line entry, made of natural-colour, anodised aluminium; fin spacing of 25 mm.



GR-Return air grille in line							
TCL Size		9	13	19	25	29	35
B	mm	560	980	980	1340	1340	1540
H	mm	300	300	380	410	480	480

Return air grille with fixed slanted fins for lower air entry (GR1)

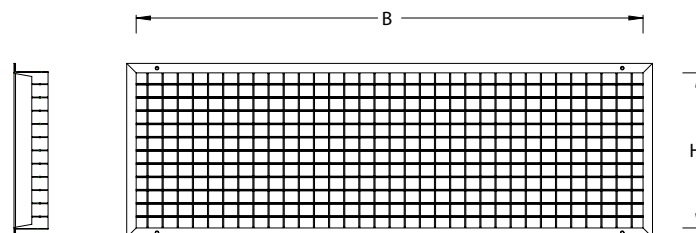
Return air grille with single row of fixed slanted fins for lower entry, made of natural-colour, anodised aluminium; fin spacing of 25 mm.



GR1-Return air grille for lower air entry							
TCL Size		9	13	19	25	29	35
B	mm	560	980	980	1340	1340	1540
H	mm	300	300	300	300	300	300

Air supply intake (BO)

Air supply intake with double row of individually-adjustable fins, made of natural-colour, anodised aluminium.

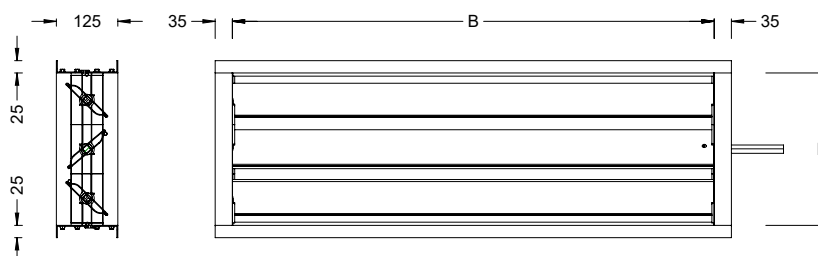


BO-Air supply intake

TCL Size		9	13	19	25	29	35
B	mm	620	1040	1040	1400	1400	1800
H	mm	310	310	390	420	490	490

Regulation damper (SE)

Air intake damper for in-line air entry with opposite-moving fin execution, frame with aluminium fins; fin spacing of 100 mm, airtight seals on fins, 12 mm unit control pin, manual control.

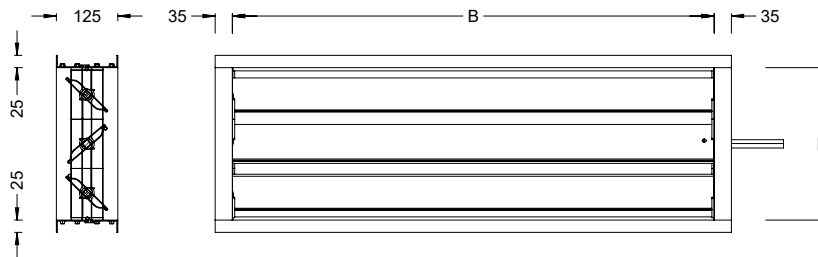


SE-Fresh air intake damper

TCL Size		9	13	19	25	29	35
B	mm	560	980	980	1340	1340	1540
H	mm	310	310	380	410	480	480

Air intake damper for lower air entry (SE1)

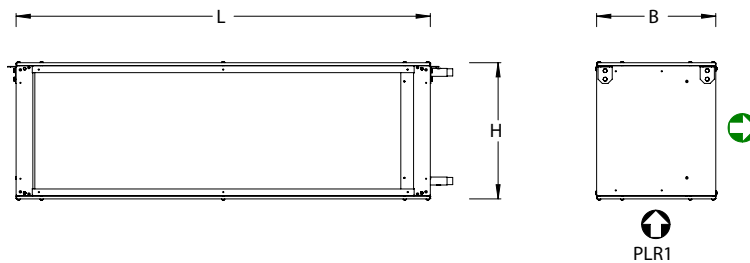
Air intake damper for lower air entry with opposite-moving fin execution, frame with aluminium fins; fin spacing of 100 mm, airtight seals on fins, 12 mm unit control pin, manual control.



SE1 - Fresh air intake damper							
TCL Size		9	13	19	25	29	35
B	mm	560	980	980	1340	1340	1540
H	mm	310	310	310	310	310	310
Weight	kg	5	7	7	9	9	11

Return plenum (PLR)

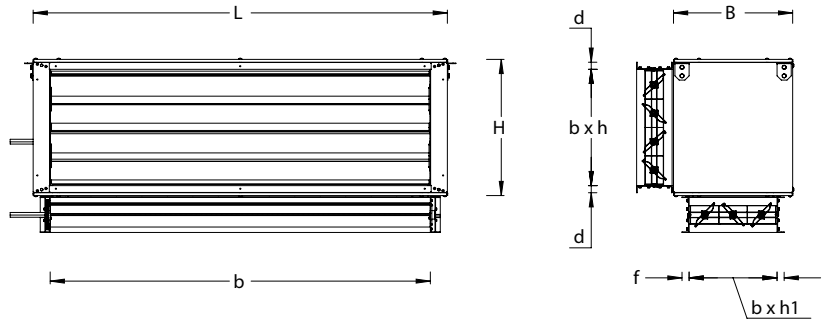
Plenum section with lower entry/exit The module can be used to hold return air grilles or air supply intakes, or for directly connecting with ducts.



PLR - Plenum with lower entry/exit							
TCL Size		9	13	19	25	29	35
B	mm	420	420	420	420	450	450
H	mm	370	370	450	480	550	550
L	mm	680	1100	1100	1460	1460	1660
Weight	kg	11	15	16	22	24	26

Plenum with mixing box with 2 dampers (MS2)

Plenum section with mixing box with two aluminium dampers configured singularly for servo-control. The section consists of a plenum in galvanised steel panels with 2 dampers, which allow fresh air regulation or recirculation from 0 to 100% of the air-flow capacity. The regulation dampers are made of aluminium with opposite movement, frame and fins made of aluminium; fin spacing of 100 mm.

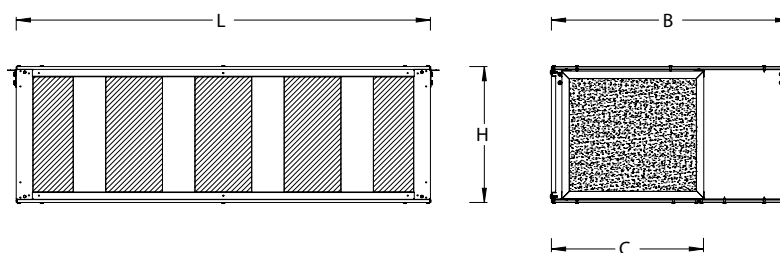


MS2-Mixing box with 2 dampers							
TCL Size		9	13	19	25	29	35
B	mm	420	420	420	420	450	450
H	mm	370	370	450	480	550	550
L	mm	680	1100	1100	1460	1460	1660
b	mm	560	980	980	1340	1340	1540
h	mm	310	310	380	410	480	480
h1	mm	310	310	310	310	310	310
d	mm	30	30	40	40	40	40
f	mm	55	55	55	55	70	70
Weight	kg	21	29	31	42	46	51

Silencer with sound-proofing baffles (SI)

Silencer section with sound-proofing baffles.

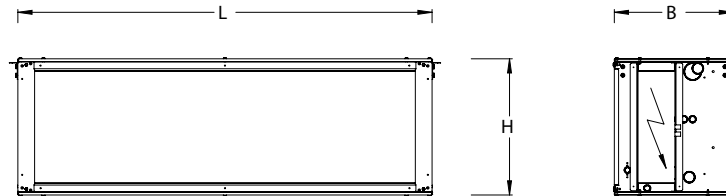
Used for noise reduction, the unit consists of a galvanised steel housing, containing the sound attenuators that are constructed with a galvanised steel frame and rockwool baffles, lined externally with erosion-proof fibreglass.



SI-Silencer with sound-proofing baffles							
TCL Size		9	13	19	25	29	35
B	mm	840	840	840	840	840	840
H	mm	370	370	450	480	550	550
L	mm	680	1100	1100	1460	1460	1660
C	mm	500	500	500	500	500	500
Weight	kg	33	48	52	67	71	82

Re-heating electric heating element (BE)

Electric coil, with 2 stages (1/2+2/3) and 400V/3Ph/50Hz power supply fitted with a safety thermostat.
Built with galvanised steel frame, armoured heat exchange elements with stainless steel pipe and spiral finning.

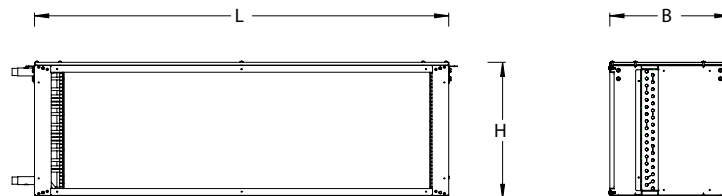


BE - Electric coil							
TCL Size		9	13	19	25	29	35
Total Heating Capacity	kW	2+4	2+4	3+6	3+6	4+8	4+8
Power supply	V/ph/Hz	400/3/50					
B	mm	420	420	420	420	450	450
H	mm	370	370	450	480	550	550
L	mm	680	1100	1100	1460	1460	1660
Weight	kg	25	33	37	51	58	61

Section with auxiliary coil (BA)

Auxiliary heat exchanger coils with 2, 4 or 6 rows.

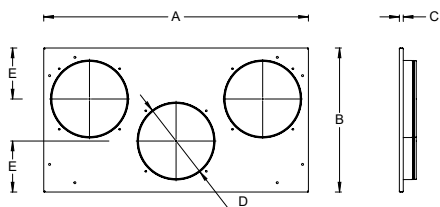
It consists of a galvanised steel housing, lined on the inside with heat and sound proof material that is self-extinguishing and 10 mm thick; it houses on the inside a water-type, finned-pack coil with 2, 4 or 6 rows and copper piping and aluminium fins fixed to the pipes via mechanical expansion. The frame is galvanised steel plate, the inlet manifolds, equipped with male gas threaded couplings, are fitted with an air release valve. The pan for collecting condensate (not supplied for the 2-row coil) is made from stainless steel with 1/2" drainage.



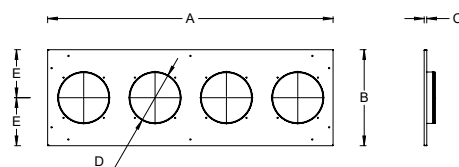
BA - Section with auxiliary coil							
TCL Size		9	13	19	25	29	35
B	mm	210	210	210	210	210	210
H	mm	370	370	420	480	550	550
L	mm	680	1100	1100	1460	1460	1660
2 rows		1/2"	1/2"	3/4"	3/4"	1"	1"
4 rows		3/4"	3/4"	1"	1"	1-1/4"	1-1/4"
6 rows		3/4"	1"	1"	1-1/4"	1-1/2"	1-1/2"

Round connectors (AC)

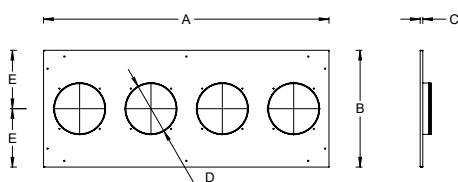
Closing panel with round connectors. Used for connecting with round ducts for air distribution and can be installed on air intake and air supply.



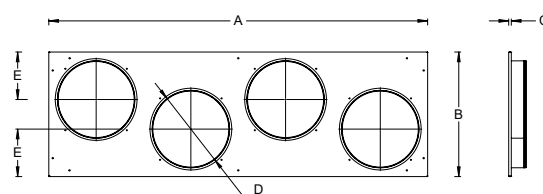
TCL 09



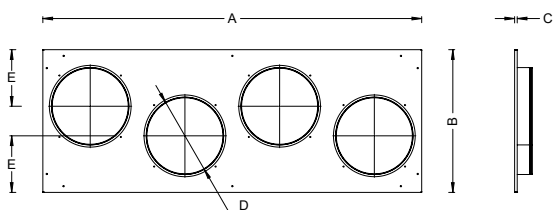
TCL 13



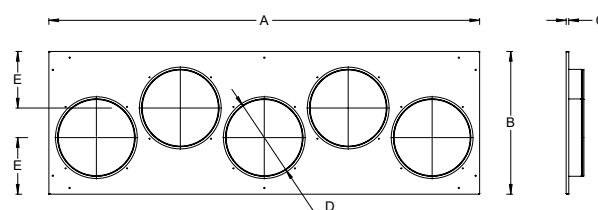
TCL 19



TCL 25



TCL 29



TCL 35

AC - Panel with round connectors							
TCL Size		9	13	19	25	29	35
A	mm	680	1100	1100	1460	1460	1660
B	mm	370	370	450	480	550	550
C	mm	420	420	420	420	450	450
D	mm	200	200	250	300	300	300
E	mm	131	185	225	183	218	218
No. of connectors		3	4	4	4	4	5

Electronic control

The TCL unit can be fitted with three different regulation systems. The first one, RIR (Roccheggiani integrated regulation), is more complete and consists of an on-board control panel plus a remote location touch screen terminal.

The second one, RAC1 (accompanying room regulator), consists of a room regulator fitted with quick access keys for the most common functions. The third one, RAC2 (simplified accompanying room regulator), consists of a more elementary room regulator than RAC1 that can regulate simpler configurations.

RIR Regulation

This type of built-in regulation system on the unit enables full control over all possible TCL configurations.

According to the various configurations, the on-board control panel is provided with a kit consisting of 3 or 4 duct temperature probes, one differential pressure switch which raises an alarm for soiled filters, a mixing box damper actuator (if present) and a touch screen terminal to be installed in the room. This element is provided with a temperature and relative humidity probe.

The probes/actuators are mounted on the respective sections and cabled to the electric panel. If they are mounted on separate sections, the connection to the electric panel is the responsibility of the customer. If there is a mixing box section, any CO2 and humidity probes are supplied together with it.

The following can be fitted as regulation accessories:

- fresh air damper actuators;
- bracelet-type water temperature probe for installation on pipe;
- the CO2 return/room probe;
- the relative humidity return/room probe;
- supply air pressure probe.



The main features are as follows:

- Constant/variable speed: minimum, medium, maximum and automatic speeds can be selected. Automatic speed is available when there are handling coils or a CO2 probe or a relative humidity probe. These three modes are alternatives to each other.
- Steady air flow.
- Variable air flow based on the return air CO2.
- Variable air flow based on return or room relative humidity.
- Variable air flow based on the heating/cooling requirement.
- Steady pressure.
- Possibility to regulate based on the room, return or supply temperature.
- Winter heating/summer cooling (H2O valve) (2-pipe system).
- Only winter heating (H2O valve) (2-pipe system).
- Only summer cooling (H2O valve) (2-pipe system).
- Only winter heating (2-stage electric coil).
- Heating (H2O valve) and cooling (H2O valve) (4-pipe system).
- Cooling (H2O valve), heating (H2O valve), dehumidification (4-pipe system).
- Heating (2-stage electric coil) and cooling (H2O valve).
- Cooling (H2O valve), heating (2-stage electric coil), dehumidification.
- Air handling logic on 4-pipe system with double water-coil configuration, with change of season on the first coil.
- Air handling logic on 4-pipe system with water coil + electric coil configuration, with change of season on the first coil.
- Programming time periods

Modulating control of the dual-damper mixing box to adjust the percentage of fresh air / recirculated air. The control can be manual by setting a percentage of opening, or automatic based on:

- the room/return humidity probe and freecooling/freeheating;
- the return CO2 probe and freecooling/freeheating;
- exclusively freecooling/freeheating;

The RIR regulation is provided with the following external connections.

- Ethernet: Bacnet IP, Modbus TCP Master/Slave, Webserver, Ftp Client/Server, SNMP.
- CANBus: CANopen.
- RS485: Modbus RTU o BACnet MS/TP.
- There is a slot for an SD micro memory card that can be used to record data or for storing on Webserver.
- USB programming portals.
- Plug-in RS-232: ASCII (optional).
- Plug-in RS-485: Modbus RTU (optional).
- Plug-in RS-485: Modbus RTU - BACnet MSTP (optional).
- Plug-in LONWORKS: LON (optional).
- Plug-in CANBus: CANopen (optional).

Regulation RAC1

The RAC1 regulation consists of a room regulator to which all utilities are connected: fans, actuators, pressure switches and probes.

Therefore, the regulator and the various accessories are supplied together with the TCL unit according to the chosen configuration.

The following accessories go together with the room regulator:

- temperature probes in the duct/wall versions;
- humidity probes in the duct/wall versions;
- the CO2 probe in the duct/wall versions;
- supply pressure probe;
- differential pressure switches to detect soiled filters;
- fresh air damper actuator in the 24V AC or 230V AC versions;
- mixing box damper actuator;
- damper manual control;
- 230/24V transformer required to supply power to the auxiliary circuit when CO2, relative humidity and accessory pressure probes are used or modulating valve actuators.

The regulator also has a relative humidity probe in addition to the room temperature probe.

RAC1 regulation is provided with Modbus RTU (slave) connectivity, according to the selected regulator model.

Time period programming is available with this type of regulation.

The regulator can be supplied with pre-programming and fitted with a simplified wiring diagram at the customer's request.



Regulation RAC2

The RAC2 regulation consists of a room regulator to which all utilities are connected: fans, actuators and probes.

Therefore, the regulator and the various accessories are supplied together with the TCL unit according to the chosen configuration.

The following accessories go together with the room regulator

- temperature probes in the duct/wall versions,
- bracelet-type water temperature probe for installation on pipe
- damper manual control
- 230/24V transformer required to supply power to the auxiliary circuit when modulating valve actuators are used

A temperature probe is fitted on the regulator.

The choice of regulator can be based on table 2.

RAC2 regulation is not fitted with time scheduling or connections to supervisor systems.



		RAC1					RAC2				
REGULATOR CODE		REG-AMB-V0/REG-AMB-V0-M					REG-AMB-V1 / REG-AMB-V1-M			CRTD EC	
I/O	REGULATOR MODEL	AHU-0SCSH1 (6) AHU-0MCSH1 (7)					AHU-1SCSH1(6) AHU-1MCSH1(7)			TF Z01M 0002 AN	
CONTEMPORARY FUNCTIONS	AO	CONTROL 0-10V VENTILATION	•	•	•	•	•	•	•	•	•
	AO	CONTROL 0-10V VALVE	•	•	•	•	•	•	•	•	•
	AO	CONTROL 0-10V VALVE	•	•	•	•				•	•
	AO	CONTROL 0-10V MIXING BOX				•					
	AI	SUPPLY TEMPERATURE PROBE	•	•	•	•	•	•	•		• (1)
	AI	RETURN TEMPERATURE PROBE	• (5)	• (5)	• (5)	• (5)	• (5)	• (5)	• (5)	• (5)	• (2)
		ROOM TEMPERATURE PROBE (INSIDE THE REGULATOR)	•	•	•	•	•	•	•	•	• (2)
		ROOM HUMIDITY PROBE (INSIDE THE REGULATOR)	•	•	•	•	•	•	•		
	AI	WATER TEMPERATURE PROBE									
	AI	FRESH AIR TEMPERATURE PROBE									•
	AI	ACTIVE CO2 PROBE (0-10V)	•				•	•			
	AI	ACTIVE HUMIDITY PROBE (0-10V)		•					•		
	AI	PRESSURE PROBE (0-10V) (4)			•					•	
	AI	HEATING COIL ANTIFREEZE TEMPERATURE PROBE				•					
	DO	ONE STAGE ELECTRIC COIL						•	•	•	
	DO	SELECTABLE BETWEEN: fan alarm, relay for EC fan switch on, heating coil antifreeze alarm	•	•	•	•	•	•	•	•	
	DI	SELECTABLE BETWEEN: season change, economy function, regulation stop, ON/OFF, motor alarm, motor speed control									•
	DI	SELECTABLE BETWEEN: season change, economy function, regulation stop, ON/OFF, motor alarm, motor speed control									•
DI	SELECTABLE BETWEEN: season change, economy function, regulation stop, ON/OFF, motor alarm, motor speed control									•	
DI	SELECTABLE BETWEEN: remote season change, remote ON/OFF, presence contact, economy/boost contact, force presence contact, coil antifreeze contact, generic alarm, condensate contact, generic filter contact, supply filter contact, return filter contact, total shut down alarm contact, fan alarm contact, recovery unit antifreeze contact	•	•	•	•	•	• (3)	• (3)	• (3)		
DI	SELECTABLE BETWEEN: remote season change, remote ON/OFF, presence contact, economy/boost contact, force presence contact, coil antifreeze contact, generic alarm, condensate contact, generic filter contact, supply filter contact, return filter contact, shut down alarm contact, fan alarm contact, recovery unit antifreeze contact	•	•	•	•	•	•	•	•		

(1) If the supply air probe is chosen as the regulation probe, the integrated probe in the regulator is for display purposes only

(2) Room regulation can only be performed without air supply limits

(3) The electric coil safety thermostat contact must be brought to the analogue input and the digital input must be set as the total shut down alarm contact

(4) Allows regulation of ventilation with constant pressure or air flow

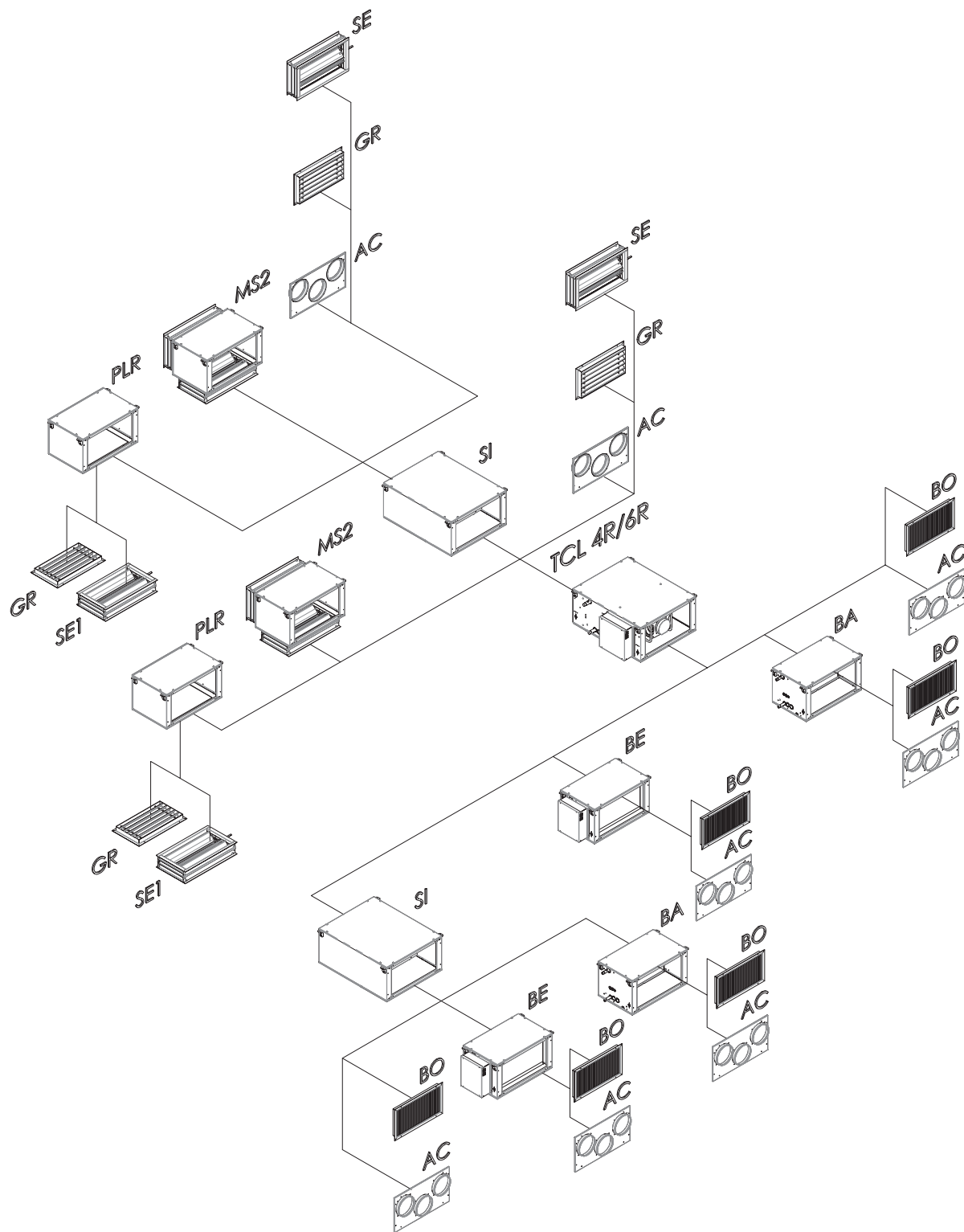
(5) If the regulator is placed in the room to be controlled, it is possible to select another one from those in the list (but not the water temperature probe) instead of the return air temperature probe. Only one active probe can be connected (CO2, humidity, pressure)

(6) without Modbus

(7) with Modbus

NB. The REG-AMB models which have a cooling coil + heating coil configuration can perform cooling/heating/dehumidification + post-heating. In post-heating mode, the supply regulation probe is followed

Configuration of units and accessories



Product performance

TCL 09

4 ROWS

Performance of a 4-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	16.1	14.2	12.4	4.7
	Supply temperature	°C	24.3	25.3	26.3	30
	Waterflow	m³h	2.8	2.4	2.1	8.1
	Water pressure drop	kPa	52.1	42.1	32.1	6.6
Water 45°C - 40°C	Total Capacity	kW	18.4	18.07	16.24	8.69
	Supply temperature	°C	29.2	33.5	34.6	38.5
	Waterflow	m³h	3.2	3.13	2.8	1.51
	Water pressure drop	kPa	63.3	61.37	50.86	17.02
Water 70°C - 60°C	Total Capacity	kW	28.7	26.87	25.05	17.64
	Supply temperature	°C	51	52.3	53.4	57.6
	Waterflow	m³h	2.52	2.34	2.2	1.54
	Water pressure drop	kPa	34.71	31	27.41	14.84

Performance of a 4-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	17.52	14.06	11.96	9.1
	Sensitive capacity	kW	8.61	7.66	7.04	6.1
	Supply temperature	°C	16.6	15.7	15	13.9
	Waterflow	m³h	3.02	2.41	2.05	1.54
	Water pressure drop	kPa	69.38	47.23	35.59	21.9
Water 10°C - 15°C	Total Capacity	kW	14.92	11.55	9.49	6.55
	Sensitive capacity	kW	7.58	6.68	6.09	5.26
	Supply temperature	°C	18.8	17.8	17	15.8
	Waterflow	m³h	2.56	1.98	1.62	1.14
	Water pressure drop	kPa	51.39	32.83	23.25	12.17

6 ROWS

Performance of a 6-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	17.2	15.6	13.6	5.3
	Supply temperature	°C	26.7	28.3	29	31.2
	Waterflow	m³h	3	2.7	2.4	1
	Water pressure drop	kPa	40.4	34.9	26.7	5.2
Water 45°C - 40°C	Total Capacity	kW	20.58	19.7	18.66	15.19
	Supply temperature	°C	33.9	37	39.8	41.5
	Waterflow	m³h	3.56	3.42	3.24	1.73
	Water pressure drop	kPa	53.02	49.11	44.64	15.19

Performance of a 6-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	19.9	15.95	13.55	10.2
	Sensitive capacity	kW	9.79	8.69	7.97	6.9
	Supply temperature	°C	14.1	13.5	13	12.3
	Waterflow	m³h	3.3	2.73	2.3	1.73
	Water pressure drop	kPa	59.6	40.49	30.43	18.62
Water 10°C - 15°C	Total Capacity	kW	16.99	13.1	10.73	7.36
	Sensitive capacity	kW	8.62	7.57	6.89	5.91
	Supply temperature	°C	16.6	15.9	15.3	14.4
	Waterflow	m³h	2.92	2.23	1.84	1.26
	Water pressure drop	kPa	44.33	28.15	19.85	10.25

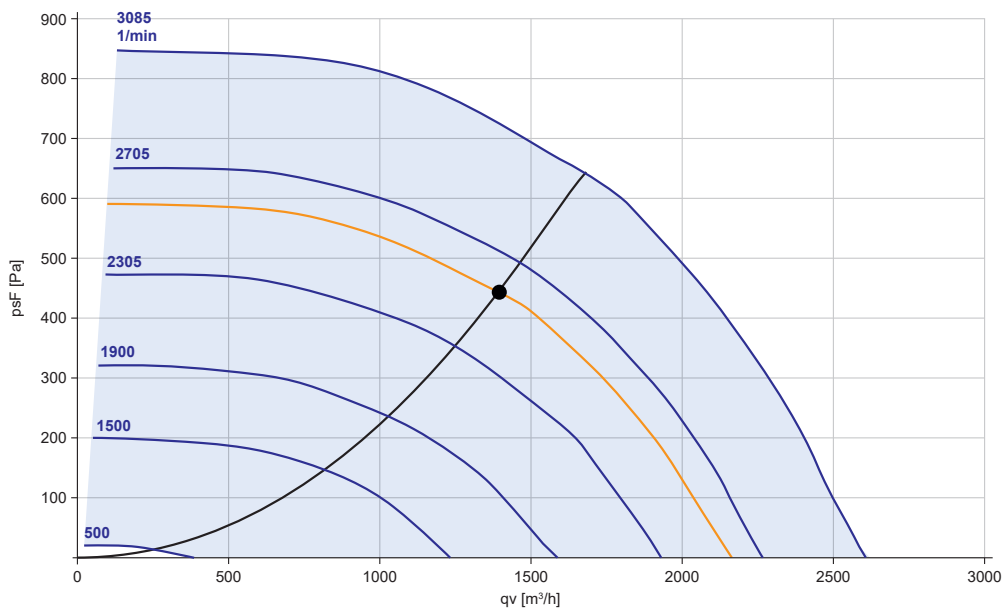
2 ROWS

Performance of a 2-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	11	9.7	8.4	3
	Supply temperature	°C	13.4	20.7	17.9	26.4
	Waterflow	m³h	1.9	1.7	1.4	0.5
	Water pressure drop	kPa	40.2	32.4	25.5	4.2
Water 45°C - 40°C	Total Capacity	kW	13.67	12.43	11.15	5.87
	Supply temperature	°C	19.2	21.5	23.8	32.5
	Waterflow	m³h	2.3	2.16	1.94	1.02
	Water pressure drop	kPa	56.7	48	39.6	12.9
Water 70°C - 60°C	Total Capacity	kW	19.6	18.4	17.2	12.2
	Supply temperature	°C	41.9	59.3	36.6	45.6
	Waterflow	m³h	1.72	1.62	1.47	1.04
	Water pressure drop	kPa	26.9	24.9	21.2	11.4

Performance of an electric coil at nominal flow rate

Fresh air conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	5°C/80% U.R.
Total Capacity	kW	6	6	6	6	6
Supply temperature	°C	2.51	7.5	12.5	32.5	
Number of stages	N°	2	2	2	2	2
Capacity step	kW	2+4	2+4	2+4	2+4	2+4
Power supply	V Ph Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50



• Work point of base unit with 6-row cooling unit with residual static pressure of 250Pa

Air pressure drops on the air side (Pa)

Flow rate m³h	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
4 R Cold	13	17	22	28	33	40	46	53	61	68	76	86	93	102	111
4 R Hot	10	14	18	22	27	32	38	44	50	57	64	71	79	87	95
2 R Hot	5	7	9	12	14	17	20	23	26	30	33	37	41	45	49
6 R Cold	19	26	34	42	51	60	71	82	93	105	118	131	144	158	173
6 R Hot	15	21	27	33	41	49	57	66	75	85	96	107	118	130	142
Synthetic Filter	14	17	20	23	25	28	31	34	37	40	42	45	48	51	54
Electric coil	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10
Damper	3	4	4	5	6	8	9	11	12	15	16	19	21	24	26
Mixing box with 2 dampers	3	4	4	5	6	8	9	11	12	15	16	19	21	24	26
Return air grille-air supply intake	3	4	4	5	6	8	9	11	12	15	16	19	21	24	26
Silencer	3	4	5	6	7	9	11	13	15	18	20	23	26	29	32

TCL 13

4 ROWS

Performance of a 4-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	26.1	23.1	20.1	7.6
	Supply temperature	°C	23.9	25	26.1	29.9
	Waterflow	m³h	4.5	4	3.5	1.3
	Water pressure drop	kPa	51.4	41.5	32.5	6.6
Water 45°C - 40°C	Total Capacity	kW	30.2	29.41	26.41	14.14
	Supply temperature	°C	29.9	32.3	34.3	38.4
	Waterflow	m³h	5.26	5.11	4.6	2.45
	Water pressure drop	kPa	63.4	60.5	50.1	16.81
Water 70°C - 60°C	Total Capacity	kW	46.6	43.69	40.75	28.7
	Supply temperature	°C	50.5	51.7	52.9	57.3
	Waterflow	m³h	4.11	3.81	3.56	2.52
	Water pressure drop	kPa	34.24	30.57	27.06	14.64

Performance of a 4-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	28.5	22.89	19.51	14.8
	Sensitive capacity	kW	13.99	12.45	11.44	9.9
	Supply temperature	°C	16.8	15.8	15.1	14.1
	Waterflow	m³h	4.89	3.94	3.34	2.55
	Water pressure drop	kPa	68.4	46.95	35.26	21.81
Water 10°C - 15°C	Total Capacity	kW	24.3	18.84	15.5	10.8
	Sensitive capacity	kW	12.31	10.85	9.9	8.55
	Supply temperature	°C	19	17.9	17.2	15.9
	Waterflow	m³h	4.17	3.24	2.66	1.84
	Water pressure drop	kPa	50.76	32.53	23.12	12.28

6 ROWS

Performance of a 6-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	23	20.5	17.6	8.7
	Supply temperature	°C	19.9	21.6	22.9	31.3
	Waterflow	m³h	4	3.6	3	1.5
	Water pressure drop	kPa	47.1	38.3	29.4	8.6
Water 45°C - 40°C	Total Capacity	kW	27.2	23.94	21.45	14.14
	Supply temperature	°C	26.6	26.1	27.8	38.4
	Waterflow	m³h	4.71	4.17	3.74	2.50
	Water pressure drop	kPa	52.84	42.49	34.86	16.81

Performance of a 6-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	22.4	21.3	22.6	17.3
	Sensitive capacity	kW	11.02	11.57	13.29	11.4
	Supply temperature	°C	20.7	17	12.7	12.2
	Waterflow	m³h	3.81	3.63	3.88	2.95
	Water pressure drop	kPa	51.24	46.9	52.2	32.65
Water 10°C - 15°C	Total Capacity	kW	22.9	21.94	18.15	12.84
	Sensitive capacity	kW	11.58	12.45	11.33	9.7
	Supply temperature	°C	20	15.8	15.3	14.4
	Waterflow	m³h	3.92	3.74	3.12	2.19
	Water pressure drop	kPa	52.23	48.4	34.76	18.96

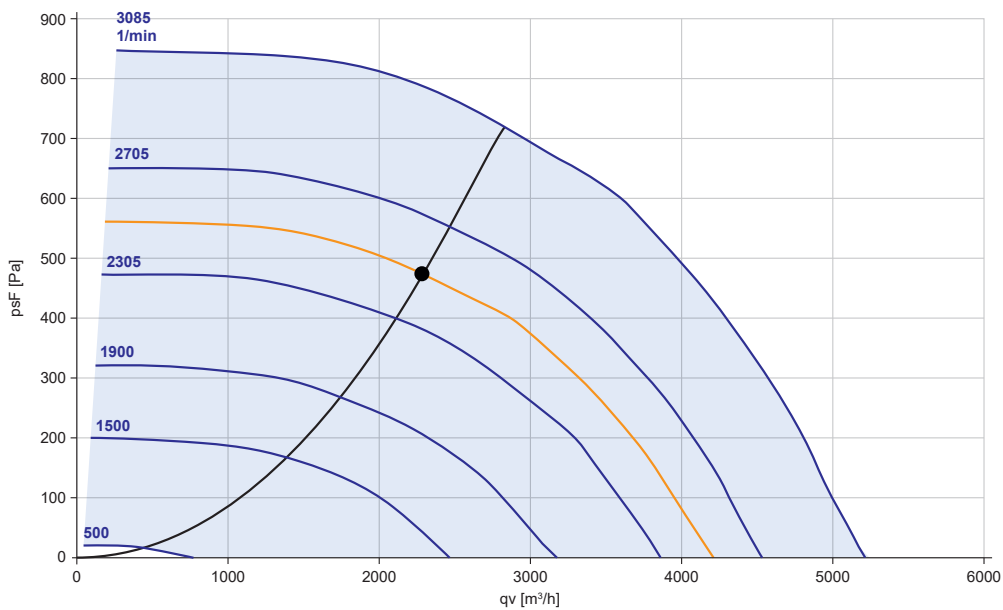
2 ROWS

Performance of a 2-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	17.7	15.7	13.6	4.9
	Supply temperature	°C	13	15.4	17.6	26.4
	Waterflow	m³h	3.1	2.7	2.3	0.8
	Water pressure drop	kPa	39.2	31.6	24.6	4.1
Water 45°C - 40°C	Total Capacity	kW	21	20.1	18.1	9.52
	Supply temperature	°C	17.1	21.1	23.4	32.4
	Waterflow	m³h	3.71	3.5	3.13	1.65
	Water pressure drop	kPa	49.9	46.7	38.6	12.6
Water 70°C - 60°C	Total Capacity	kW	31.7	30.4	36	19.44
	Supply temperature	°C	31.2	33.6	35.5	45.2
	Waterflow	m³h	2.79	2.6	2.46	1.71
	Water pressure drop	kPa	26.2	23.42	20.72	11.1

Performance of an electric coil at nominal flow rate

Fresh air conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	5°C/80% U.R.
Total Capacity	kW	9	9	9	9	9
Supply temperature	°C	1.4	6.4	11.4	31.4	
Number of stages	N°	2	2	2	2	2
Capacity step	kW	3+6	3+6	3+6	3+6	3+6
Power supply	V Ph Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50



• Work point of base unit with 6-row cooling unit with residual static pressure of 250Pa

Air pressure drops on the air side (Pa)

Flow rate m³h	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600
4 R Cold	23	26	30	34	38	42	46	51	55	60	65	71	76	80	86	91
4 R Hot	18	21	24	27	31	34	38	42	46	50	54	58	63	68	72	77
2 R Hot	9	11	12	14	16	17	19	21	23	25	27	29	32	34	36	39
6 R Cold	30	35	40	45	50	56	62	68	74	81	88	95	102	109	117	124
6 R Hot	24	28	32	36	41	46	50	56	61	66	72	78	84	90	96	103
Synthetic Filter	20	22	24	26	28	31	33	35	37	39	41	43	45	47	49	51
Electric coil	4	5	5	5	6	6	7	7	7	8	8	9	9	9	10	10
Damper	3	4	4	4	5	6	7	8	8	9	10	12	12	13	14	16
Mixing box with 2 dampers	3	4	4	4	5	6	7	8	8	9	10	12	12	13	14	16
Return air grille-air supply intake	3	4	4	4	5	6	7	8	8	9	10	12	12	13	14	16
Silencer	3	4	5	5	6	7	8	9	10	11	12	14	15	16	17	19

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4 ROWS

Performance of a 4-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	34.5	30.5	26.5	10
	Supply temperature	°C	23.2	24.4	25.5	29.6
	Waterflow	m³h	6	5.3	4.6	1.7
	Water pressure drop	kPa	45.8	36.9	28.9	5.2
Water 45°C - 40°C	Total Capacity	kW	41	38.89	34.91	18.64
	Supply temperature	°C	41	32.5	32.7	38
	Waterflow	m³h	7.12	6.76	6.1	3.24
	Water pressure drop	kPa	59.3	54.06	44.75	14.94
Water 70°C - 60°C	Total Capacity	kW	61.64	57.77	53.86	37.88
	Supply temperature	°C	49.4	50.6	51.9	56.5
	Waterflow	m³h	5.4	5.07	4.71	3.31
	Water pressure drop	kPa	30.57	27.28	24.4	13.02

Performance of a 4-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	37.22	29.88	25.42	19.2
	Sensitive capacity	kW	18.31	16.29	14.7	13
	Supply temperature	°C	17.4	16.3	15	14.4
	Waterflow	m³h	6.37	5.22	4.4	3.27
	Water pressure drop	kPa	59.7	40.6	30.6	18.83
Water 10°C - 15°C	Total Capacity	kW	31.69	24.53	20.13	13.91
	Sensitive capacity	kW	16.1	14.2	12.97	11.23
	Supply temperature	°C	19.5	18.30	17.5	16.2
	Waterflow	m³h	5.43	4.2	3.45	2.37
	Water pressure drop	kPa	44.18	28.21	19.97	10.45

6 ROWS

Performance of a 6-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	30.5	26.9	23.5	11.4
	Supply temperature	°C	19.4	21	22.6	30.9
	Waterflow	m³h	5.3	4.7	4.1	1.9
	Water pressure drop	kPa	30.2	24.3	19.1	5.4
Water 45°C - 40°C	Total Capacity	kW	34.51	32.5	29.9	16.84
	Supply temperature	°C	23.2	26.3	28.8	38
	Waterflow	m³h	6.01	5.65	5.22	3.24
	Water pressure drop	kPa	43.85	39.47	34.11	14.91

Performance of a 6-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	41.2	36.77	31.2	23.5
	Sensitive capacity	kW	20.35	20.11	18.44	16
	Supply temperature	°C	15.4	12.6	12.2	11.6
	Waterflow	m³h	7.05	6.3	5.33	4.03
	Water pressure drop	kPa	58.3	47.83	35.88	21.86
Water 10°C - 15°C	Total Capacity	kW	39.19	30.16	24.64	17.19
	Sensitive capacity	kW	15.8	17.53	15.95	13.6
	Supply temperature	°C	15.8	15.1	14.6	13.9
	Waterflow	m³h	6.73	5.18	4.21	2.94
	Water pressure drop	kPa	52.43	33.15	23.28	12.39

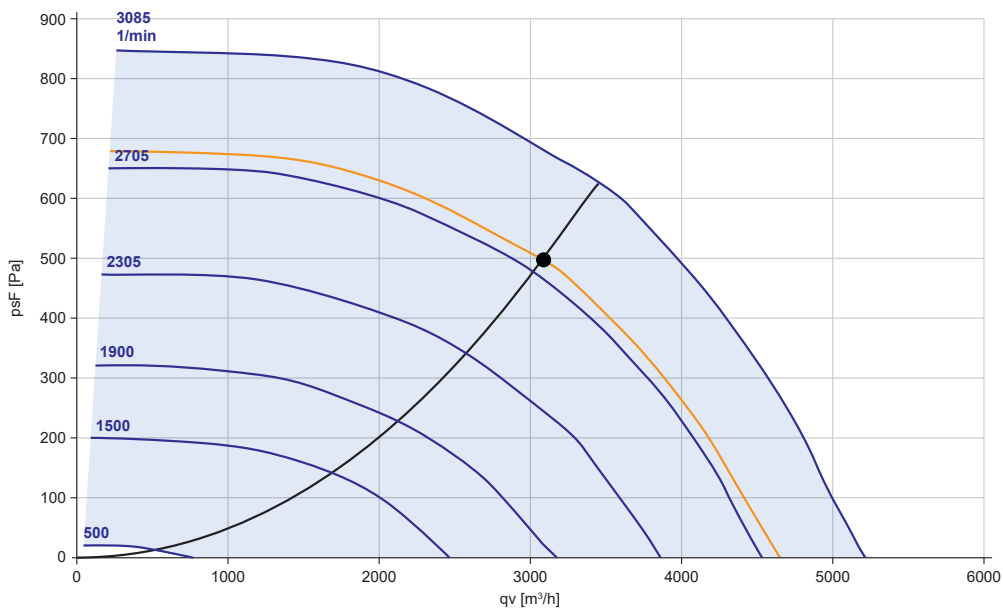
2 ROWS

Performance of a 2-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	23.3	20.6	17.9	6.5
	Supply temperature	° C	12.5	14.9	17.2	26.3
	Waterflow	m³h	4	3.6	3.1	1.1
	Water pressure drop	kPa	50.3	40.5	31.6	5.4
Water 45°C - 40°C	Total Capacity	kW	27.2	26.44	23.72	12.53
	Supply temperature	° C	16.2	20.5	22.9	32.1
	Waterflow	m³h	4.7	4.6	4.14	2.18
	Water pressure drop	kPa	62.9	59.51	49.5	16.21
Water 70°C - 60°C	Total Capacity	kW	41.7	39.12	36.48	25.57
	Supply temperature	° C	30.2	32.7	35.1	44.6
	Waterflow	m³h	3.67	3.44	3.21	2.25
	Water pressure drop	kPa	33.6	30.01	26.58	14.6

Performance of an electric coil at nominal flow rate

Fresh air conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	5°C/80% U.R.
Total Capacity	kW	9	9	9	9	9
Supply temperature	° C	-1.5	3.46	8.5	28.5	
Number of stages	N°	2	2	2	2	2
Capacity step	kW	3+6	3+6	3+6	3+6	3+6
Power supply	V Ph Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50



• Work point of base unit with 6-row cooling unit with residual static pressure of 250Pa

Air pressure drops on the air side (Pa)

Flow rate m³h	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	3500
4 R Cold	24	30	37	43	51	58	66	74	83	92	101	106
4 R Hot	20	25	30	36	42	48	55	63	70	78	87	91
2 R Hot	10	12	15	18	21	24	28	32	36	40	44	46
6 R Cold	32	40	48	57	67	77	88	99	111	124	136	143
6 R Hot	26	33	40	47	55	64	73	83	93	104	115	120
Synthetic Filter	24	27	31	34	38	41	45	48	51	55	58	60
Electric coil	2	3	4	4	5	6	7	8	10	11	12	13
Damper	4	5	7	8	10	12	14	16	18	21	24	25
Mixing box with 2 dampers	4	5	7	8	10	12	14	16	18	21	24	25
Return air grille-air supply intake	4	5	7	8	10	12	14	16	18	21	24	25
Silencer	5	6	8	10	12	14	17	20	22	26	29	31

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4 ROWS

Performance of a 4-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	49.8	44.1	38.3	14.5
	Supply temperature	°C	23.8	24.9	26	29.9
	Waterflow	m³h	8.6	7.6	6.6	2.5
	Water pressure drop	kPa	46.5	37.5	29.4	5.4
Water 45°C - 40°C	Total Capacity	kW	57	53.8	50.32	26.94
	Supply temperature	°C	28.7	31.6	34.2	38.3
	Waterflow	m³h	9.93	9.39	8.74	4.68
	Water pressure drop	kPa	56.9	51.17	45.39	15.18
Water 70°C - 60°C	Total Capacity	kW	88.84	83.26	77.64	54.66
	Supply temperature	°C	50.3	51.5	52.7	57.1
	Waterflow	m³h	7.81	7.31	6.8	4.78
	Water pressure drop	kPa	31.02	27.68	24.49	13.24

Performance of a 4-row cooling coil at nominal flow rate

Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	54.19	43.54	37.1	28.2
	Sensitive capacity	kW	26.61	23.68	21.76	19
	Supply temperature	°C	16.9	15.9	15.2	14.1
	Waterflow	m³h	9.28	7.45	6.3	4.82
	Water pressure drop	kPa	61.63	42	31.74	19.61
Water 10°C - 15°C	Total Capacity	kW	46.2	35.82	29.48	20.53
	Sensitive capacity	kW	23.41	20.63	18.83	16.26
	Supply temperature	°C	19.1	18.1	17.2	16
	Waterflow	m³h	7.9	6.15	5.07	3.53
	Water pressure drop	kPa	45.71	29.27	20.81	11.04

6 ROWS

Performance of a 6-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	43.6	38.6	37	16.1
	Supply temperature	°C	19.6	21.2	25.6	30.9
	Waterflow	m³h	7.6	6.7	6.6	2.8
	Water pressure drop	kPa	17.2	13.8	13.3	3
Water 45°C - 40°C	Total Capacity	kW	51.85	46.58	42.77	26.94
	Supply temperature	°C	25.2	26.6	29	4.68
	Waterflow	m³h	9.03	8.1	7.45	4.71
	Water pressure drop	kPa	47.8	39.64	34.14	15.18

Performance of a 6-row cooling coil at nominal flow rate

Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	60.97	48.71	41.78	31
	Sensitive capacity	kW	30.07	26.68	24.46	21.2
	Supply temperature	°C	14.6	13.9	13.4	12.6
	Waterflow	m³h	10.44	8.35	7.06	5.29
	Water pressure drop	kPa	35.24	23.78	17.8	10.76
Water 10°C - 15°C	Total Capacity	kW	51.86	39.86	32.48	21.85
	Sensitive capacity	kW	26.47	23.24	21.16	18.21
	Supply temperature	°C	17	16.2	15.6	14.6
	Waterflow	m³h	8.89	6.87	5.58	3.74
	Water pressure drop	kPa	26.03	16.41	11.47	5.73

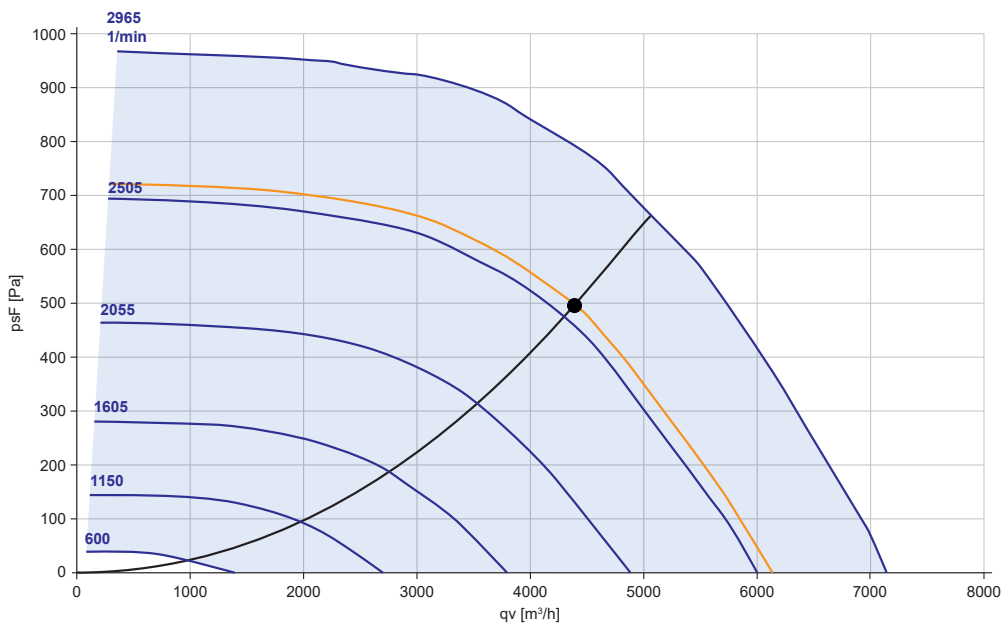
2 ROWS

Performance of a 2-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	24.8	21.6	18.2	9.7
	Supply temperature	° C	6.8	9.7	12.4	26.6
	Waterflow	m³h	4.3	3.7	3.1	1.7
	Water pressure drop	kPa	38.8	30.5	45.3	7.5
Water 45°C - 40°C	Total Capacity	kW	29.4	26.97	24.21	18.36
	Supply temperature	° C	10	13.3	16.4	32.5
	Waterflow	m³h	5.11	4.68	4.21	3.24
	Water pressure drop	kPa	50.08	43.06	35.64	21.9
Water 70°C - 60°C	Total Capacity	kW	60.78	57.01	53.18	37.38
	Supply temperature	° C	31.3	33.7	35.6	45.4
	Waterflow	m³h	5.32	5	4.68	3.29
	Water pressure drop	kPa	45.08	40.2	35.6	19.3

Performance of an electric coil at nominal flow rate

Fresh air conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	5°C/80% U.R.
Total Capacity	kW	12	12	12	12	12
Supply temperature	° C	-2	3	8.5	28	
Number of stages	N°	2	2	2	2	2
Capacity step	kW	4+8	4+8	4+8	4+8	4+8
Power supply	V Ph Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50



• Work point of base unit with 6-row cooling unit with residual static pressure of 250Pa

Air pressure drops on the air side (Pa)

Flow rate m³h	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600
4 R Cold	22	29	37	46	56	66	78	89	101	113
4 R Hot	17	24	30	38	46	55	65	75	86	97
2 R Hot	9	12	15	19	23	28	33	38	43	49
6 R Cold	29	39	50	63	76	90	107	122	138	156
6 R Hot	23	32	41	51	63	75	87	101	116	131
Synthetic Filter	22	27	32	36	41	45	50	54	59	63
Electric coil	4	5	6	7	8	9	10	12	13	15
Damper	4	5	7	9	11	14	16	19	22	26
Mixing box with 2 dampers	4	5	7	9	11	14	16	19	22	26
Return air grille-air supply intake	4	5	7	9	11	14	16	19	22	26
Silencer	4	6	8	11	13	17	20	23	27	32

TCL 29

4 ROWS

Performance of a 4-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	58.7	52.1	45.2	17.2
	Supply temperature	°C	23.8	24.9	26	29.9
	Waterflow	m³h	10.2	9	7.8	2.9
	Water pressure drop	kPa	46.3	37.4	29.2	5.4
Water 45°C - 40°C	Total Capacity	kW	68.4	63.4	59.42	31.81
	Supply temperature	°C	29.3	31.4	34.1	38.3
	Waterflow	m³h	11.91	11.05	10.36	5.54
	Water pressure drop	kPa	57.7	50.6	45.17	15.12
Water 70°C - 60°C	Total Capacity	kW	104	98.3	91.68	64.54
	Supply temperature	°C	50.2	51.5	52.6	57.1
	Waterflow	m³h	9	8.64	8.06	5.65
	Water pressure drop	kPa	30.83	27.52	24.35	13.17

Performance of a 4-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	58.04	46.82	40.01	30.6
	Sensitive capacity	kW	28.42	25.35	23.33	20.3
	Supply temperature	°C	18.7	17.4	16.6	15.3
	Waterflow	m³h	9.93	8.03	6.87	5.22
	Water pressure drop	kPa	51.74	35.52	26.98	18.86
Water 10°C - 15°C	Total Capacity	kW	49.56	38.65	31.97	22.54
	Sensitive capacity	kW	24.99	22.08	20.2	17.48
	Supply temperature	°C	20.7	19.3	18.4	17
	Waterflow	m³h	8.49	6.62	5.47	3.85
	Water pressure drop	kPa	38.48	24.9	17.86	9.69

6 ROWS

Performance of a 6-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	57.9	51.4	48	19.1
	Supply temperature	°C	23.2	27.8	27.6	30.9
	Waterflow	m³h	10.1	9.9	8.3	3.3
	Water pressure drop	kPa	22.6	22.1	16.2	3.2
Water 45°C - 40°C	Total Capacity	kW	61.9	56.25	50.5	31.81
	Supply temperature	°C	25.5	27.3	29	38.3
	Waterflow	m³h	10.8	9.79	8.78	5.54
	Water pressure drop	kPa	48.5	41.03	33.97	15.12

Performance of a 6-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	57.12	57.66	48.9	36.7
	Sensitive capacity	kW	35.5	31.54	28.93	25.1
	Supply temperature	°C	14.6	13.9	13.4	12.6
	Waterflow	m³h	12.38	9.9	8.38	6.3
	Water pressure drop	kPa	37.92	25.62	19.2	11.64
Water 10°C - 15°C	Total Capacity	kW	61.38	47.23	38.54	26.07
	Sensitive capacity	kW	31.29	27.48	25.02	21.52
	Supply temperature	°C	17	16.2	15.6	14.6
	Waterflow	m³h	10.54	8.1	6.62	4.4
	Water pressure drop	kPa	28.04	17.72	12.41	6.26

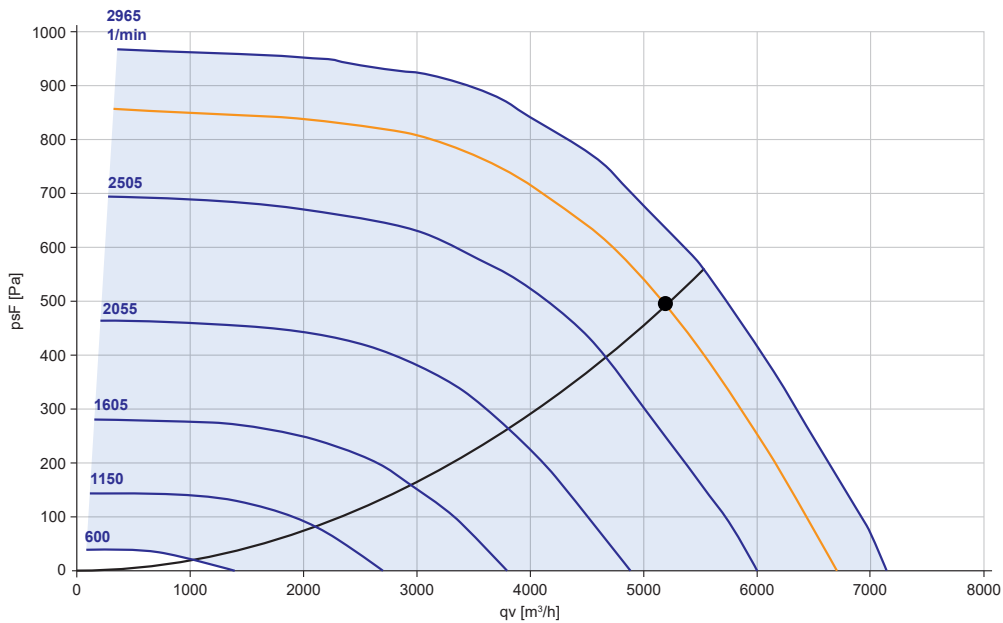
2 ROWS

Performance of a 2-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	28.1	26.7	23.2	26.6
	Supply temperature	° C	6.2	10.3	13.3	6.6
	Waterflow	m³h	4.9	4.6	4	1.9
	Water pressure drop	kPa	42.9	39.3	30.6	9
Water 45°C - 40°C	Total Capacity	kW	34	31.8	28.63	21.75
	Supply temperature	° C	9.5	13.3	16.4	32.5
	Waterflow	m³h	5.9	8.78	4.96	3.78
	Water pressure drop	kPa	57.2	50.94	42.38	26.18
Water 70°C - 60°C	Total Capacity	kW	71.83	67.41	62.88	44.22
	Supply temperature	° C	31.3	33.7	36.1	45.4
	Waterflow	m³h	6.3	5.91	5.54	3.88
	Water pressure drop	kPa	53.57	47.91	42.42	22.89

Performance of an electric coil at nominal flow rate

Fresh air conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	5°C/80% U.R.
Total Capacity	kW	12	12	12	12	12
Supply temperature	° C	-3.3	1.7	6.7	26.7	
Number of stages	N°	2	2	2	2	2
Capacity step	kW	4+8	4+8	4+8	4+8	4+8
Power supply	V Ph Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50



• Work point of base unit with 6-row cooling unit with residual static pressure of 250Pa

Air pressure drops on the air side (Pa)

Flow rate m³h	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600
4 R Cold	14	18	24	29	35	43	50	57	65	74
4 R Hot	12	16	20	25	31	37	43	50	27	64
2 R Hot	7	9	12	15	18	21	25	29	33	37
6 R Cold	22	30	39	49	59	70	82	94	108	121
6 R Hot	18	24	31	39	48	57	67	77	88	11
Synthetic Filter	19	23	27	30	34	38	42	46	50	54
Electric coil	4	5	6	7	8	9	9	10	11	12
Damper	4	4	6	8	10	12	16	18	21	24
Mixing box with 2 dampers	4	4	6	8	10	12	16	18	21	24
Return air grille-air supply intake	4	4	6	8	10	12	16	18	21	24
Silencer	4	5	7	10	12	15	19	22	26	30

TCL 35

4 ROWS

Performance of a 4-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	56.4	54.3	52	20.2
	Supply temperature	°C	20.5	22	26.1	30
	Waterflow	m³h	10.6	9.4	9.1	3.5
	Water pressure drop	kPa	56.4	45.3	42.7	8
Water 45°C - 40°C	Total Capacity	kW	67	62.5	51.75	37.02
	Supply temperature	°C	23.3	26.1	29.5	38.4
	Waterflow	m³h	11.6	10.87	10.33	6.44
	Water pressure drop	kPa	64.03	56.6	51.75	22.62
Water 70°C - 60°C	Total Capacity	kW	121.6	113.98	106.31	74.96
	Supply temperature	°C	50.5	51.7	52.9	57.3
	Waterflow	m³h	10.6	10.01	9.32	6.58
	Water pressure drop	kPa	45.9	41.04	36.32	19.67

Performance of a 4-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	68.02	55.06	47.2	36.3
	Sensitive capacity	kW	33.22	29.64	27.29	23.8
	Supply temperature	°C	18.5	17.2	16	15.2
	Waterflow	m³h	11.66	9.43	16.4	6.23
	Water pressure drop	kPa	76.82	53.06	40.52	25.63
Water 10°C - 15°C	Total Capacity	kW	58.26	45.65	37.95	27.17
	Sensitive capacity	kW	29.2	25.81	23.6	20.38
	Supply temperature	°C	20.5	19.2	18.3	16.9
	Waterflow	m³h	10.08	7.84	6.51	4.64
	Water pressure drop	kPa	57.45	37.48	27.12	15.11

6 ROWS

Performance of a 6-row heating coil at nominal flow rate						
Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	59.2	52.8	45.6	22.4
	Supply temperature	°C	19.5	21.3	22.7	31.1
	Waterflow	m³h	10.2	9.1	7.9	3.9
	Water pressure drop	kPa	26.3	21.6	16.7	4.8
Water 45°C - 40°C	Total Capacity	kW	63	59.5	52.38	37.02
	Supply temperature	°C	21.4	24.6	26.1	38.4
	Waterflow	m³h	10.8	10.36	7.23	6.44
	Water pressure drop	kPa	56.27	50.91	40.73	22.18

Performance of a 6-row cooling coil at nominal flow rate						
Fresh air conditions			35°C/50% R.H.	32°C/50% R.H.	30°C/50% R.H.	27°C/50% R.H.
Water 7°C - 12°C	Total Capacity	kW	84.52	67.84	57.76	43.9
	Sensitive capacity	kW	41.5	36.84	33.8	29.3
	Supply temperature	°C	14.3	13.7	13.2	12.4
	Waterflow	m³h	14.5	11.62	9.9	7.52
	Water pressure drop	kPa	56.19	38.23	28.84	17.81
Water 10°C - 15°C	Total Capacity	kW	72.2	55.91	45.97	31.95
	Sensitive capacity	kW	36.52	32.08	29.2	25.05
	Supply temperature	°C	16.8	16	15.5	14.5
	Waterflow	m³h	12.38	9.61	7.88	5.47
	Water pressure drop	kPa	41.82	26.72	18.96	10.03

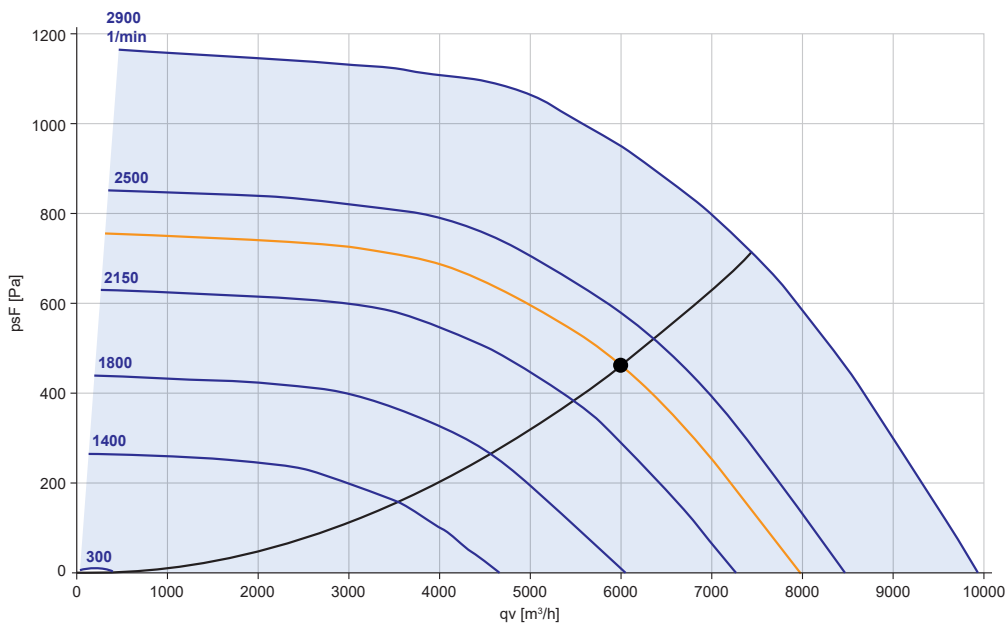
2 ROWS

Performance of a 2-row heating coil at nominal flow rate

Battery input conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	20°C/50% U.R.
Water 35°C - 30°C	Total Capacity	kW	42	32.8	28.5	13.1
	Supply temperature	°C	10.9	11.3	14.2	26.5
	Waterflow	m³h	7.3	5.7	4.9	2.3
	Water pressure drop	kPa	45.9	29.8	23.3	6
Water 45°C - 40°C	Total Capacity	kW	45.6	42.4	38	24.98
	Supply temperature	°C	12.7	16.1	18.9	12.4
	Waterflow	m³h	7.95	7.38	6.62	4.35
	Water pressure drop	kPa	50.76	44.68	36.87	17.68
Water 70°C - 60°C	Total Capacity	kW	82.84	77.67	72.45	50.89
	Supply temperature	°C	41.2	6.8	36.1	45.3
	Waterflow	m³h	7.27	6.8	6.37	4.46
	Water pressure drop	kPa	36.5	32.59	28.85	15.53

Performance of an electric coil at nominal flow rate

Fresh air conditions			-10°C/80% R.H.	-5°C/80% R.H.	0°C/80% R.H.	5°C/80% U.R.
Total Capacity	kW	12	12	12	12	12
Supply temperature	°C	-4.1	0.9	5.9	25.9	
Number of stages	N°	2	2	2	2	2
Capacity step	kW	4+8	4+8	4+8	4+8	4+8
Power supply	V Ph Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50



• Work point of base unit with 6-row cooling unit with residual static pressure of 250Pa

Air pressure drops on the air side (Pa)

Flow rate m³h	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
4 R Cold	22	29	36	43	51	59	68	77	86	96	105
4 R Hot	18	23	29	35	41	49	56	64	73	81	91
2 R Hot	10	13	17	20	24	28	33	37	42	47	53
6 R Cold	35	45	55	60	67	94	108	123	139	155	173
6 R Hot	27	35	44	54	64	75	87	99	113	126	141
Synthetic Filter	25	29	33	38	42	46	50	54	58	62	66
Electric coil	6	7	8	9	10	11	12	13	14	15	16
Damper	5	6	8	10	12	14	16	19	21	24	28
Mixing box with 2 dampers	5	6	8	10	12	14	16	19	21	24	28
Return air grille-air supply intake	5	6	8	10	12	14	16	19	21	24	28
Silencer	6	7	9	12	14	17	20	23	26	30	34

Example of rapid selection of modular unit from the TCL range

In order to find out the available pressure for the plant, based on the chosen configuration, you must subtract the total of air pressure drops of the various selected components from the total available static pressure for the fans.
The result gives the useful available static pressure for the whole unit.

Example of selection:

Unit consisting of:

1. Mixing box with 2 dampers
2. Base unit with 6-row cooling coil and air supply fan
3. Silencer section

Required air flow rate: 1300 m³/h

Size selected: TCL 09

Mixing box with 2 dampers: 15 [Pa]

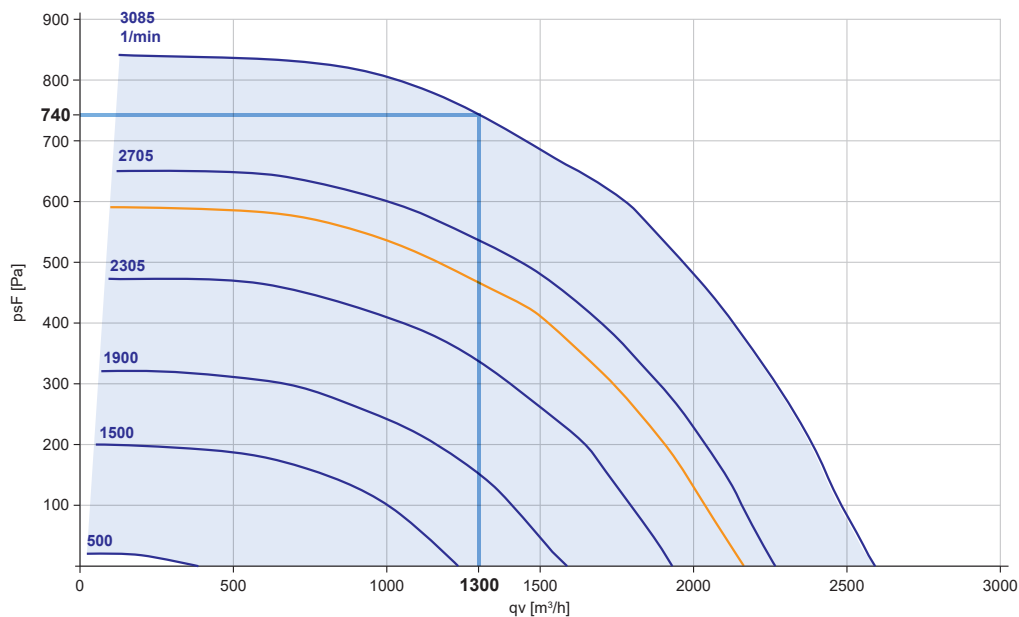
Synthetic filter: 37 [Pa]

6-row cooling coil 93 [Pa]

Silencer: 15 [Pa]

Total available static pressure at required air flow rate: 740 [Pa]

Useful available static pressure at required air flow rate: 740-15-37-93-15= 580 [Pa]



Air pressure drops on the air side (Pa)

Flow rate m ³ /h	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
4 R Cold	13	17	22	28	33	40	46	53	61	68	76	86	93	102	111
4 R Hot	10	14	18	22	27	32	38	44	50	57	64	71	79	87	95
2 R Hot	5	7	9	12	14	17	20	23	26	30	33	37	41	45	49
6 R Cold	19	26	34	42	51	60	71	82	93	105	118	131	144	158	173
6 R Hot	15	21	27	33	41	49	57	66	75	85	96	107	118	130	142
Synthetic Filter	14	17	20	23	25	28	31	34	37	40	42	45	48	51	54
Electric coil	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10
Damper	3	4	4	5	6	8	9	11	12	15	16	19	21	24	26
Mixing box with 2 dampers	3	4	4	5	6	8	9	11	12	15	16	19	21	24	26
Return air grille-air supply intake	3	4	4	5	6	8	9	11	12	15	16	19	21	24	26
Silencer	3	4	5	6	7	9	11	13	15	18	20	23	26	29	32

Sound powers

TCL 09	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
Supply	66	62	68	68	68	67	61	59	72.8
Return	68	59	66	63	60	55	53	49	65.1
Unit external radiation	60	50	56	53	53	51	40	35	57.1

TCL 13	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
Supply	69	65	74	70	70	68	62	60	74.7
Return	66	56	61	61	58	54	52	19	63.1
Unit external radiation	63	53	62	55	55	52	41	36	59.2

TCL 19	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
Supply	75	66	72	73	74	72	67	64	78.2
Return	75	60	65	66	63	60	58	55	68.3
Unit external radiation	69	54	60	58	59	56	46	40	62.3

TCL 25	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
Supply	70	66	76	74	76	75	70	66	80.6
Return	69	60	69	67	64	62	60	56	69.9
Unit external radiation	64	54	64	59	61	59	49	42	64.8

TCL 29	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
Supply	73	70	78	78	79	77	73	69	83.3
Return	73	63	72	71	67	65	63	59	73.1
Unit external radiation	67	58	66	63	64	61	52	45	67.6

TCL 35	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
Supply	69	69	79	78	81	80	74	70	85.3
Return	68	64	70	71	68	66	63	60	73.5
Unit external radiation	63	57	67	63	66	64	53	46	69.6



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