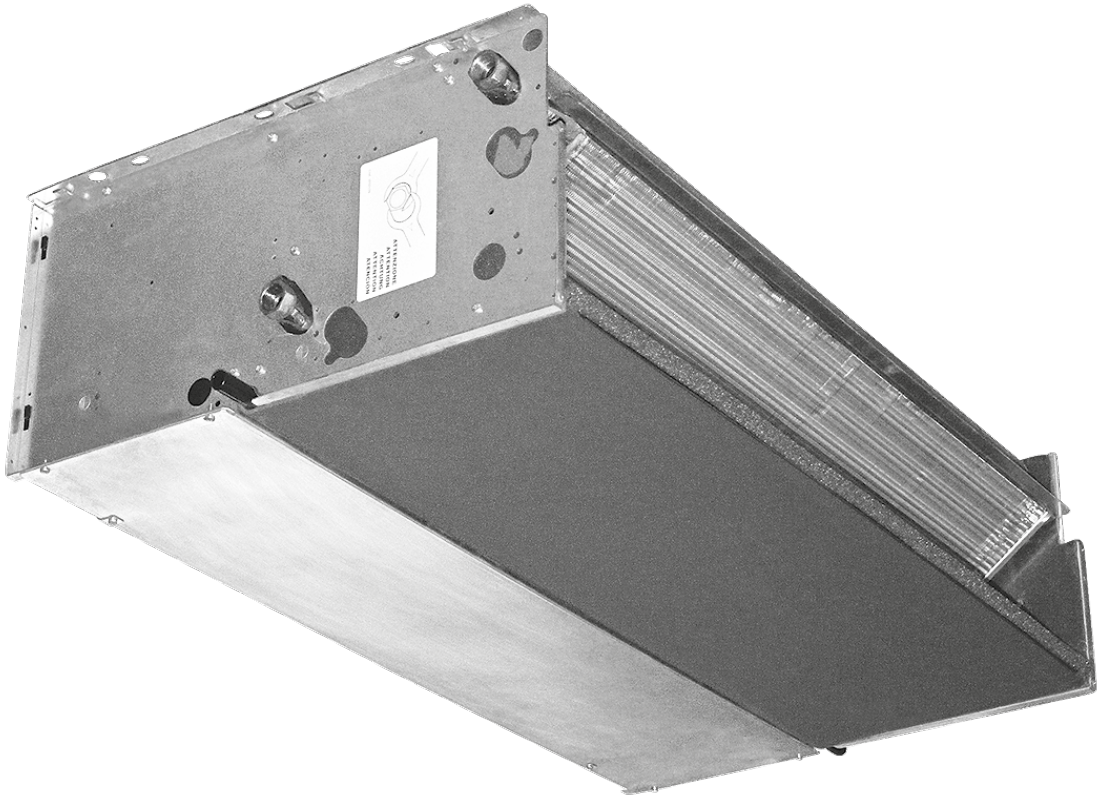

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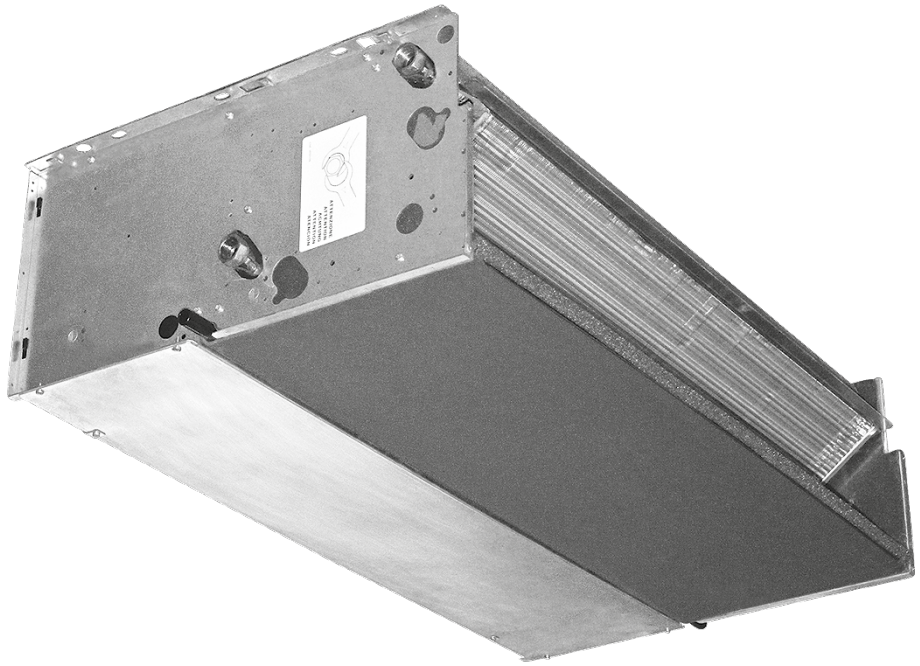
DFSL and DFEL

High Pressure Fan Coil Unit

TECHNICAL LEAFLET

DFSL

High Pressure Fan Coil Unit with Asynchronous Motor



Range includes **7 air flow rates** (from 340 to 2100 m^3/h) each equipped with 3 or 4 row coil and with the possibility to add a 1 or 2 row coil for 4 pipe systems.
It is the perfect range to meet all air-conditioning requirements of work environments like offices, shops, restaurants and hotel rooms featuring ducted installations with available pressure **up to 80 Pa**.

All range is compliant with the new **(EU) Regulation No. 327/2011** which requires **very low electric consumption ratings** in relation to performances provided.

TECHNICAL CHARACTERISTICS

Casing: made from 1 mm galvanized steel insulated with 3 mm polyolefin (PO) foam (B-s2-d0 EN 13501-1).

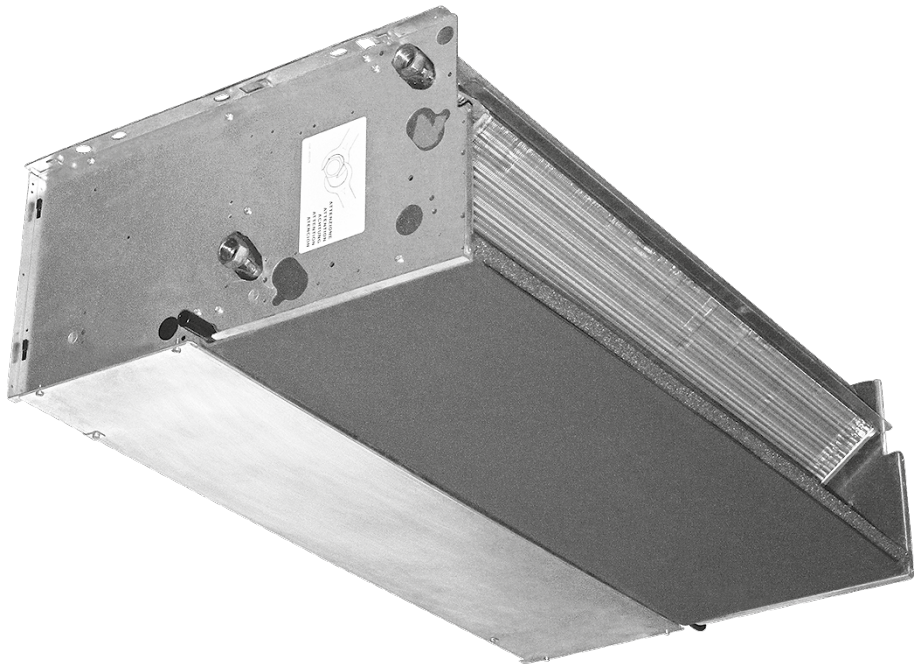
Filter: polypropylene cellular fabric regenerating filter. The filter frame of galvanized steel is inserted into special plastic sliding guides fastened to the internal structure for easy insertion and removal of the filter.

Fan assembly: the fans have aluminium or plastic blades directly keyed on the motor with double aspiration and they are dynamically and statically balanced during manufacture in order to have an extremely quiet operation.

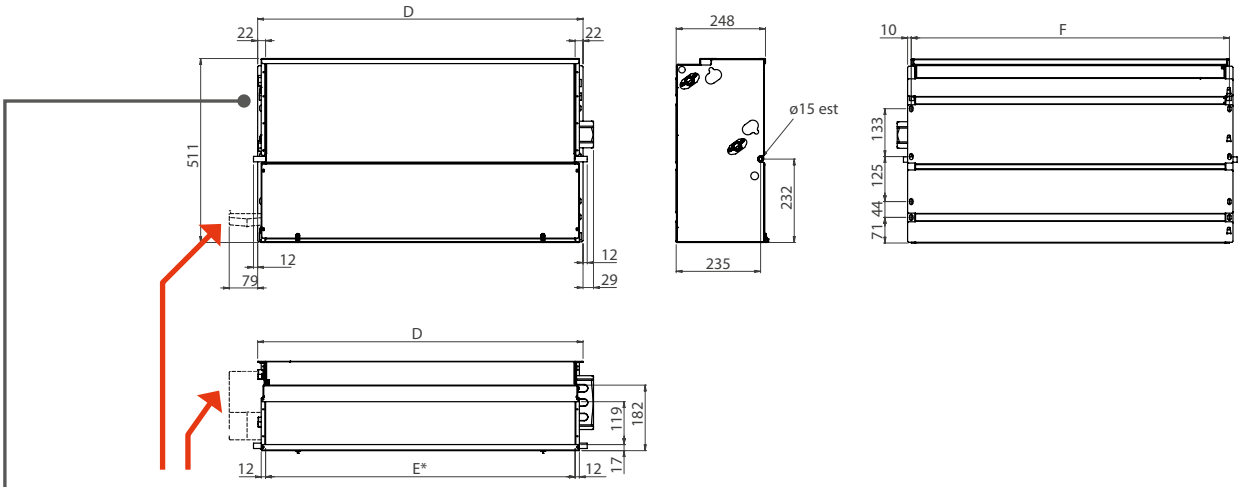
Electric motor: the motor is wired for single phase and has five speeds, with capacitor.
The motor is fitted on sealed for life bearings and is secured on anti-vibration and self-lubricating mountings.
Internal thermal protection with automatic reset, protection IP 20, class B.

Coil: it is manufactured from drawn copper tube and the aluminium fins are mechanically bonded onto the tube by an expansion process.
The coil has two 1/2inch BSP internal connections and 1/8 inch BSP air vent and drain.
The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.
The connections are on the left hand side looking from the air outlet of the unit (see picture).
On request or on the construction site the connections can be moved to the other side.

Condensate collection tray: **"L"**-shaped, fitted on the inner casing, for size 1÷4 made of plastic and for sizes 5÷7, made in painted steel; the tray is insulated with 3 mm polyolefin (PO) foam (B-s2-d0 EN 13501-1).
The outside diameter of the condensate discharge pipe is 15 mm.



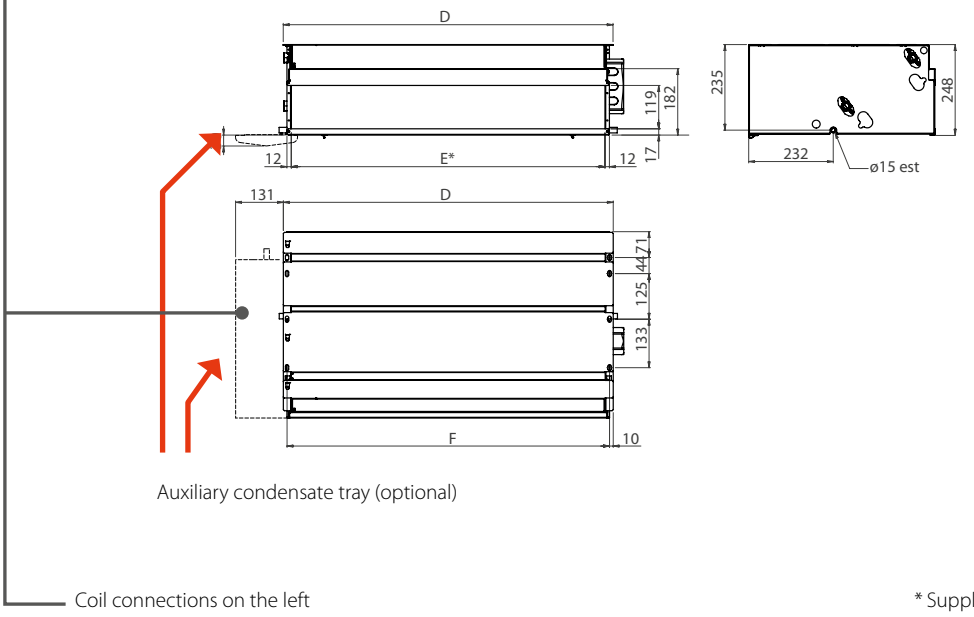
Vertical Installation



Auxiliary condensate tray (optional)

* Supply frame dimension = E x 119 mm

Horizontal Installation



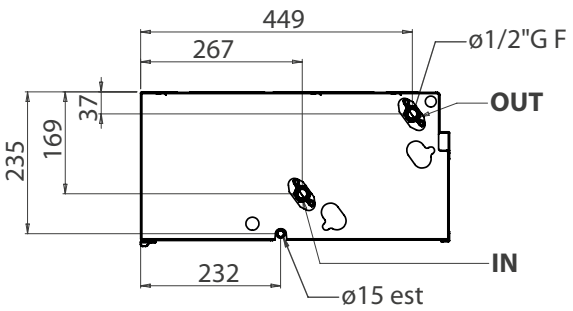
Auxiliary condensate tray (optional)

Coil connections on the left

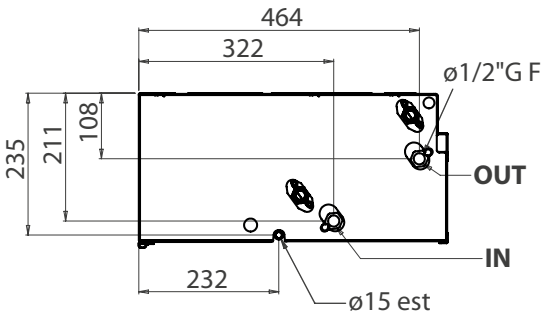
* Supply frame dimension = E x 119 mm

Coil connections

3 or 4 row coils



Heating additional coil
(1 or 2 rows)



Dimension (mm)

Model	13 14	23 24	33 34	43 44	53 54	63 64	73 74
D	689	904	1119	1119	1334	1549	1549
E	645	860	1075	1075	1290	1505	1505
F	669	884	1099	1099	1314	1529	1529

Weight (kg)

Model	Weight with packaging							Weight without packaging						
	13 14	23 24	33 34	43 44	53 54	63 64	73 74	13 14	23 24	33 34	43 44	53 54	63 64	73 74
3	19,5	26,4	29,5	30,9	42,4	52,2	52,4	18,5	25,4	26,5	27,9	38,4	47,2	47,4
3+1	20,7	27,9	31,3	32,7	44,3	54,5	54,7	19,7	26,9	28,3	29,7	40,3	49,5	49,7
3+2	21,4	28,8	32,4	33,8	-	-	-	20,4	27,8	29,4	30,8	-	-	-
4	20,5	27,7	30,9	32,0	43,8	53,9	54,1	19,5	26,7	27,9	29,0	39,8	48,9	49,1
4+1	21,7	29,2	32,7	33,8	45,7	56,2	56,4	20,7	28,2	29,7	30,8	41,7	51,2	51,4

Water content (litres)

	13 14	23 24	33 34	43 44	53 54	63 64	73 74
3	0,9	1,6	1,9	1,9	2,6	3,2	3,2
4	1,3	2,2	2,8	2,8	3,4	4,2	4,2
+1	0,3	0,5	0,6	0,6	0,8	0,9	0,9
+2	0,6	1,0	1,2	1,2	-	-	-

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Units with 3 row coil

2 pipe units. The following standard rating conditions are used:

COOLING (summer mode)
Entering air temperature: +27 °C d.b. +19 °C w.b.
Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING (winter mode)
Entering air temperature: +20 °C
Water temperature: +45 °C E.W.T. +40 °C L.W.T.

Model		DFSL 13			DFSL 23			DFSL 33			DFSL 43		
Speed		**1**	**4**	**5**	**1**	**4**	**5**	**1**	**4**	**5**	**1**	**4**	**5**
Air flow **(E)**	m^3/h	205	290	315	395	575	625	380	720	790	600	850	980
Available pressure **(E)**	Pa	25	50	58	26	50	58	14	50	60	23	50	65
Cooling total emission **(E)**	kW	1,43	1,88	2,00	2,57	3,40	3,60	2,68	4,42	4,72	3,85	4,97	5,47
Cooling sensible emission **(E)**	kW	1,01	1,35	1,44	1,85	2,53	2,70	1,90	3,30	3,55	2,82	3,77	4,22
Heating **(E)**	kW	1,43	1,96	2,11	2,67	3,70	3,98	2,71	4,82	5,22	4,10	5,56	6,27
Dp Cooling **(E)**	kPa	11	17	20	10,6	17,7	19,6	6,3	15,7	17,7	12,2	19,4	23,2
Dp Heating **(E)**	kPa	9	16	18	8,9	16,1	18,3	5,1	14,3	16,6	10,7	18,6	23,0
Fan **(E)**	W	27	45	51	59	87	94	50	96	110	88	122	148
Sound power outlet **(E)**	dB(A)	34	42	43	38	47	49	36	48	51	44	52	55
Sound power inlet + radiated **(E)**	dB(A)	42	50	52	45	55	56	43	56	58	51	59	62
Sound pressure outlet **(*)**	dB(A)	25	33	34	29	38	40	27	39	42	35	43	46
Sound pressure inlet + radiated **(*)**	dB(A)	33	41	43	36	46	47	34	47	49	42	50	53
Plenum code		9069191			9069222			9066368			9066368		

Model		DFSL 53			DFSL 63			DFSL 73		
Speed		**1**	**4**	**5**	**1**	**4**	**5**	**1**	**3**	**4**
Air flow **(E)**	m^3/h	475	810	970	580	1120	1240	905	1270	1425
Available pressure **(E)**	Pa	18	50	70	15	50	60	26	50	63
Cooling total emission **(E)**	kW	3,30	5,04	5,72	3,99	6,62	7,11	5,58	7,11	7,70
Cooling sensible emission **(E)**	kW	2,31	3,64	4,19	2,83	4,94	5,36	4,06	5,37	5,89
Heating **(E)**	kW	3,33	5,36	6,25	3,94	6,96	7,58	5,82	7,73	8,49
Dp Cooling **(E)**	kPa	12,2	26,3	33,1	6,6	16,4	18,7	12,2	18,8	21,7
Dp Heating **(E)**	kPa	9,7	23,0	30,4	5,1	14,2	16,5	10,3	17,1	20,2
Fan **(E)**	W	65	110	140	69	125	145	155	177	186
Sound power outlet **(E)**	dB(A)	37	48	53	38	50	52	46	53	56
Sound power inlet + radiated **(E)**	dB(A)	43	56	60	46	58	60	53	60	63
Sound pressure outlet **(*)**	dB(A)	28	39	44	29	41	43	37	44	47
Sound pressure inlet + radiated **(*)**	dB(A)	34	47	51	37	49	51	44	51	54
Plenum code		9069195			9069196			9069196		

(E) = EUROVENT certified performance.
(*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m3 room and a reverberation time of 0.5 sec.

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Units with 4 row coil

2 pipe units. The following standard rating conditions are used:

COOLING (summer mode)
Entering air temperature: +27 °C d.b. +19 °C w.b.
Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING (winter mode)
Entering air temperature: +20 °C
Water temperature: +45 °C E.W.T. +40 °C L.W.T.

Model		DFSL 14			DFSL 24			DFSL 34			DFSL 44		
Speed		**1**	**4**	**5**	**1**	**4**	**5**	**1**	**4**	**5**	**1**	**4**	**5**
Air flow **(E)**	m^3/h	205	290	315	395	575	625	380	720	790	600	850	980
Available pressure **(E)**	Pa	25	50	58	26	50	58	14	50	60	23	50	65
Cooling total emission **(E)**	kW	1,54	2,07	2,22	2,93	4,01	4,28	2,89	4,99	5,36	4,10	5,36	5,94
Cooling sensible emission **(E)**	kW	1,07	1,46	1,57	2,03	2,84	3,04	2,00	3,55	3,84	2,95	3,97	4,46
Heating **(E)**	kW	1,49	2,07	2,23	2,85	4,02	4,34	2,76	4,99	5,42	4,22	5,77	6,55
Dp Cooling **(E)**	kPa	5,6	9,7	11,0	15,8	27,9	31,3	11,8	31,7	36,1	7,9	12,9	15,6
Dp Heating **(E)**	kPa	5,1	9,2	10,5	12,3	22,8	26,2	8,6	24,9	28,9	6,6	11,5	14,5
Fan **(E)**	W	27	45	51	59	87	94	50	96	110	89	120	146
Sound power outlet **(E)**	dB(A)	34	42	43	38	47	49	36	48	51	44	52	55
Sound power inlet + radiated **(E)**	dB(A)	42	50	52	45	55	56	43	56	58	51	59	62
Sound pressure outlet **(*)**	dB(A)	25	33	34	29	38	40	27	39	42	35	43	46
Sound pressure inlet + radiated **(*)**	dB(A)	33	41	43	36	46	47	34	47	49	42	50	53
Plenum code		9069191			9069222			9066368			9066368		

Model		DFSL 54			DFSL 64			DFSL 74		
Speed		**1**	**4**	**5**	**1**	**4**	**5**	**1**	**3**	**4**
Air flow **(E)**	m^3/h	475	810	970	580	1120	1240	905	1270	1425
Available pressure **(E)**	Pa	18	50	70	15	50	60	26	50	63
Cooling total emission **(E)**	kW	3,48	5,44	6,22	4,23	7,25	7,82	6,10	7,92	8,62
Cooling sensible emission **(E)**	kW	2,43	3,89	4,52	2,96	5,26	5,72	4,34	5,80	6,38
Heating **(E)**	kW	3,41	5,57	6,54	4,17	7,63	8,34	6,30	8,52	9,42
Dp Cooling **(E)**	kPa	6,3	14,2	18,1	5,1	13,6	15,6	10,1	16,1	18,7
Dp Heating **(E)**	kPa	5,2	12,5	16,7	4,3	12,7	15,0	9,0	15,6	18,6
Fan **(E)**	W	65	110	140	66	125	145	155	177	186
Sound power outlet **(E)**	dB(A)	37	48	53	38	50	52	46	53	56
Sound power inlet + radiated **(E)**	dB(A)	43	56	60	46	58	60	53	60	63
Sound pressure outlet **(*)**	dB(A)	28	39	44	29	41	43	37	44	47
Sound pressure inlet + radiated **(*)**	dB(A)	34	47	51	37	49	51	44	51	54
Plenum code		9069195			9069196			9069196		

(E) = EUROVENT certified performance.
(*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m3 room and a reverberation time of 0.5 sec.

Electronic wall controls

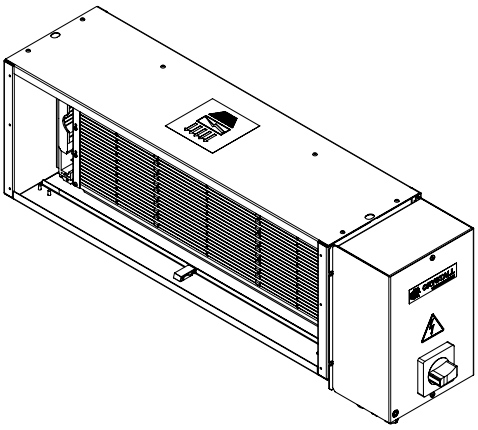
M-3V	3 speed control
T-TMO	3 speed control with electronic thermostat and manual summer/winter switch
T-REM	3 speed control with electronic thermostat and centralized/manual summer/winter switch
T-AUTO	Automatic speed control with electronic thermostat and summer/winter switch (to be used with T-POWER-M or T-POWER-A only)
IR-MB2S	IR-MB2S wall control (to be used with T-POWER-M or T-POWER-A only)
T-POWER-M	T-POWER power unit for T-AUTO and IR-MB2S remote controls, fitted on the unit
T-POWER-A	T-POWER power unit for T-AUTO and IR-MB2S remote controls, not fitted on the unit

Electronic controls for MB boards

MB-M	MB electronic board fitted on the unit
MB-A	MB electronic board supplied with separate packaging
IR-MB2S	IR-MB2S wall control (to be used with MB board only)
RT03-REC-AD	RT03-A infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03-A	RT03-A infra-red remote control supplied with separate packaging (to be used with MB board only)
REC-AD	Receiver for RT03-A infra-red remote control supplied with separate packaging (to be used with MB board only)
TODS	TODS multifunction control panel (to be used with MB board only)

Management system for a network of fan coils	
ROUTER-A	Router for BMS systems not provided by Trane
ROB-A	Relay output board

Indoor Air Quality



The filtering active electrostatic plenum for terminal unit **DFSL / DFEL**.

It is composed of three elements:

1. Active electrostatic Crystall 50 filtering assembly made of ionizing frame and filter pack
2. Metal covering frame properly equipped with flanges to allow an easy combination either towards the terminal unit and in regard to the duct or to any accessories such as flanges, silencers and plenums for a total adaptability
3. Wired control and power box available into the "fitted" on the plenum version

The active electrostatic filter allows a consistent reduction of the fine particles existing in the environment thanks to the high efficiency filtration, performance certified in accordance to the Standard in force EN ISO 16890.

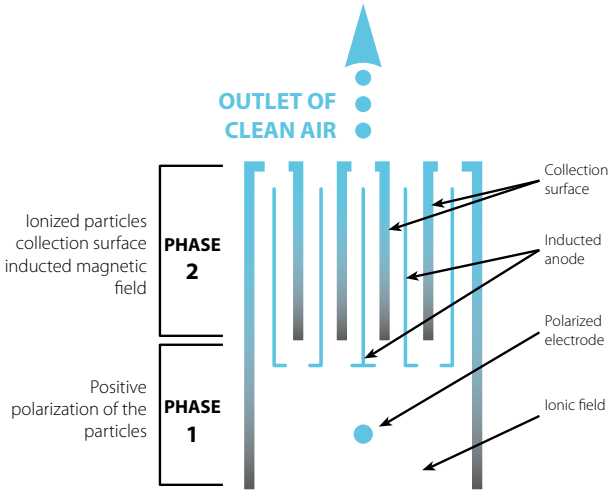
Operating principle of the electrostatic filter

The air is aspired in and first passes a mechanical prefilter, which stops away particles of more than 50 µm (dust, insects, etc.).

Then the smallest particles (50÷0.01 µm) are exposed to an intensive ionic field and are polarized **(Phase 1)**.

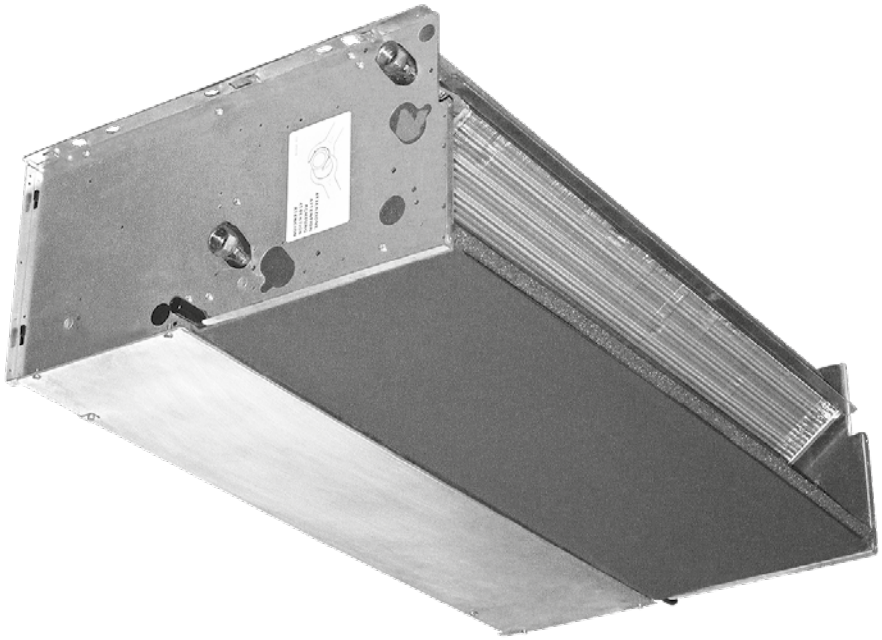
The charged particles passing through the second filter section, are pushed back by the anode and attracted by the collection surfaces by a strong, inducted magnetic field **(Phase 2)**.

The air which leaves the unit is free from polluting particles.



DFEL

High Pressure Fan Coil Unit with EC Brushless Electronic Motor and Inverter Board



Range includes **5 air flow rates** (from 120 to 2460 m³/h) each equipped with 3 or 4 row coil and with the possibility to add a 1 or 2 row coil for 4 pipe systems.
In high pressure ducted fan coils, the ability **to continuously vary** the air flow gives great regulation and control flexibility, at the same time **ensuring** excellent environmental conditions and extremely low electrical consumption.

The EC range makes use of the excellent experience gained with the Cassette fan coils with inverter board, first in the world in production since 2009, and which have had great success on all markets.

The innovative synchronous electronic motor with permanent magnets, is controlled by an inverter board designed and developed in Italy.
The board is mounted on the unit, closed to the motor, without the need to be cooled down by the air flow.

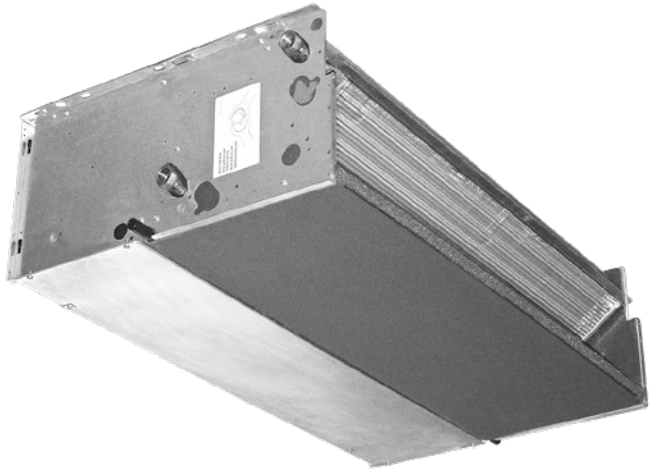
TECHNICAL CHARACTERISTICS

The air flow rate can be varied **in continuously** by means of a 1-10 V signal generated by Trane controls or by independent control systems.
The continuous air flow control improves the acoustic comfort and allows a quicker response to the variation of the thermal loads and a greater stability of the requested ambient temperature.

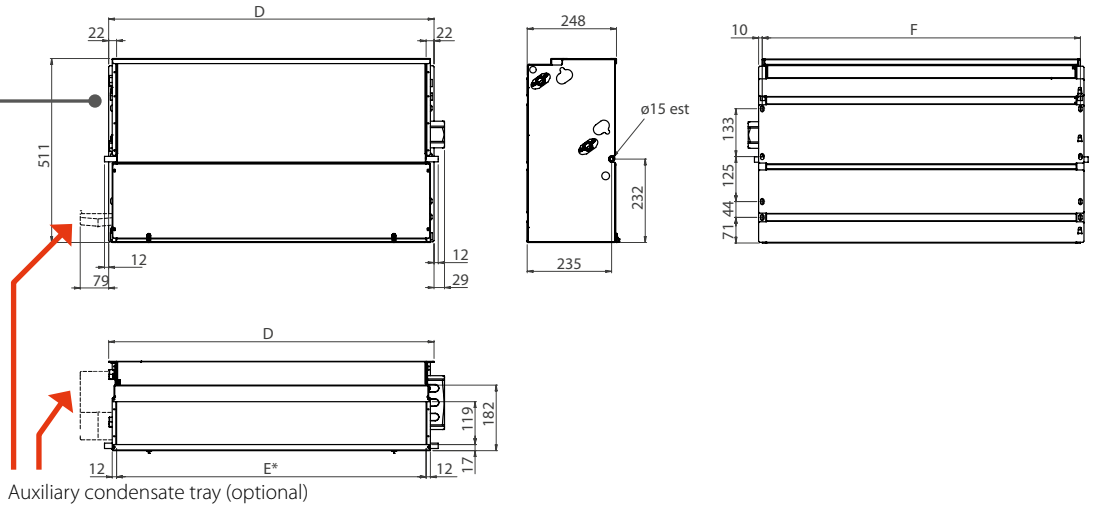
The extreme efficiency, also at low speed, makes it possible to greatly reduce electrical consumption (in comparison to DFSL AC motor) under normal operating conditions.
The excellent values of the DFEL range in terms of sound levels have been maintained **in all working conditions**, without any resonance phenomenon at any frequency.

The full compliance with the Electromagnetic Compatibility Directive and with the other severe Standards in force is certified by an independent institute.

For the technical characteristics of the various components refer to DFSL, **except for Electronic motor**:
Three phase permanent magnet electronic motor that is controlled with current reconstructed according to a **BLAC** sinusoidal wave.
The inverter board that controls the motor operation is powered by 230 Volt, single-phase and, with a **switching system**, it generates a three-phase frequency modulated, wave form power supply.
The electric power supply required for the machine is therefore single-phase with voltage of **230 V** and frequency of **50 - 60 Hz**.



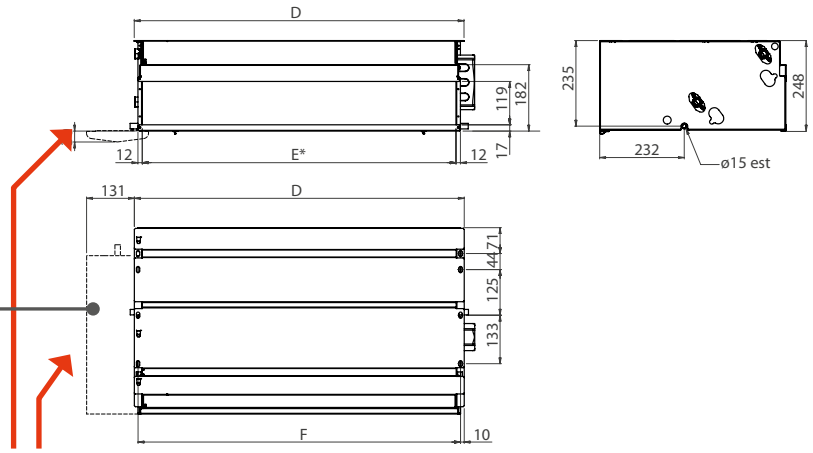
Vertical Installation



Auxiliary condensate tray (optional)

* Supply frame dimension = E x 119 mm

Horizontal Installation



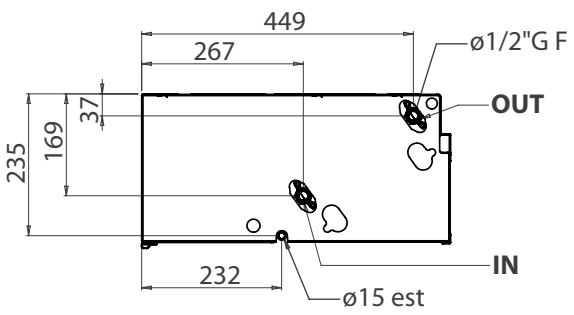
Auxiliary condensate tray (optional)

Coil connections on the left

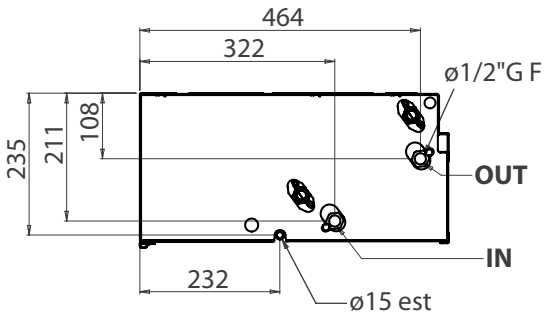
* Supply frame dimension = E x 119 mm

Coil connections

3 or 4 row coils



Heating additional coil
(1 or 2 rows)



Dimension (mm)

Model	03 04	13 14	23 24	43 44	73 74
D	474	689	904	1119	1549
E	430	645	860	1075	1505
F	454	669	884	1099	1529

Weight (kg)

Model	Weight with packaging					Weight without packaging				
	03 04	13 14	23 24	43 44	73 74	03 04	13 14	23 24	43 44	73 74
3	15,8	18,9	25,6	29,4	49,9	13,8	17,9	24,6	26,4	44,9
3+1	16,5	20,1	27,1	31,2	52,2	14,5	19,1	26,1	28,2	47,2
3+2	17,0	20,8	28,0	32,3	-	15,0	19,8	27,0	29,3	-
4	16,3	19,9	26,9	30,5	51,6	14,3	18,9	25,9	27,5	46,6
4+1	17,0	21,1	28,4	32,3	53,9	15,0	20,1	27,4	29,3	48,9

Water content (litres)

	03 04	13 14	23 24	43 44	73 74
3	0,5	0,9	1,6	1,9	3,2
4	0,7	1,3	2,2	2,8	4,2
+1	0,2	0,3	0,5	0,6	0,9
+2	0,4	0,6	1,0	1,2	-

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Units with 3 and 4 row coil

2 pipe units. The following standard rating conditions are used:

COOLING (summer mode)
Entering air temperature: +27 °C d.b. +19 °C w.b.
Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING (winter mode)
Entering air temperature: +20 °C
Water temperature: +45 °C E.W.T. +40 °C L.W.T.

Model		DFEL 03			DFEL 13			DFEL 23			DFEL 43			DFEL 73		
Inverter Power		1,5	5,5	8	4	6,3	8	4	6.5	8.5	3,5	7	9	2,5	5	8
Speed		**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Air flow **(E)**	m^3/h	110	225	290	240	305	360	430	540	630	595	850	980	900	1175	1410
Available pressure **(E)**	Pa	10	50	75	32	50	68	34	50	70	24	50	66	30	50	72
Cooling total emission **(E)**	kW	0,75	1,39	1,65	1,64	1,97	2,23	2,72	3,21	3,55	3,84	4,94	5,43	5,66	6,81	7,67
Cooling sensible emission **(E)**	kW	0,55	1,00	1,30	1,17	1,42	1,63	1,99	2,38	2,68	2,83	3,77	4,21	4,15	5,11	5,86
Heating **(E)**	kW	0,80	1,50	1,90	1,65	2,05	2,37	2,88	3,51	4,00	4,07	5,56	6,27	5,69	7,09	8,24
Dp Cooling **(E)**	kPa	3,5	6,7	9,2	13,3	18,7	23,5	11,5	15,6	18,9	11,8	18,9	22,5	12,1	17,1	21,4
Dp Heating **(E)**	kPa	1,7	5,5	8,0	11,6	17,0	22,1	10,2	14,6	18,5	10,6	18,6	23,0	9,8	14,6	19,1
Fan **(E)**	W	7	21	37	18	29	39	26	43	64	30	67	98	52	100	155
Sound power outlet **(E)**	dB(A)	29	43	48	38	44	48	42	47	49	44	52	55	47	54	57
Sound power inlet + radiated **(E)**	dB(A)	36	50	55	45	51	55	48	55	58	51	59	62	54	61	64
Sound pressure outlet **(*)**	dB(A)	20	34	39	29	35	39	33	38	40	35	43	46	38	45	48
Sound pressure inlet + radiated **(*)**	dB(A)	27	41	46	36	42	46	39	46	49	42	50	53	45	52	55
Plenum code		9069190			9069191			9069222			9066368			9069196		

Model		DFEL 04			DFEL 14			DFEL 24			DFEL 44			MTDFEL 74		
Inverter Power		1,5	5,5	8	4	6,3	8	4	6.5	8.5	3,5	7	9	2,5	5	8
Speed		**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Air flow **(E)**	m^3/h	110	225	290	240	305	360	430	540	630	595	850	980	900	1175	1410
Available pressure **(E)**	Pa	10	50	75	32	50	68	34	50	70	24	50	66	30	50	72
Cooling total emission **(E)**	kW	0,80	1,55	1,95	1,77	2,17	2,48	3,14	3,79	4,25	4,09	5,34	5,91	6,12	7,46	8,47
Cooling sensible emission **(E)**	kW	0,60	1,15	1,45	1,25	1,54	1,78	2,20	2,68	3,04	2,95	3,97	4,45	4,40	5,48	6,33
Heating **(E)**	kW	0,80	1,65	2,00	1,73	2,17	2,52	3,08	3,80	4,37	4,19	5,77	6,55	6,26	7,96	9,35
Dp Cooling **(E)**	kPa	3,5	10,8	15,4	7,2	10,3	13,2	17,5	24,7	30,6	7,7	12,6	15,2	9,9	14,3	18,1
Dp Heating **(E)**	kPa	2,6	8,1	12,3	6,7	9,9	13,1	14,1	20,6	26,6	6,5	11,5	14,5	8,9	13,8	18,4
Fan **(E)**	W	7	21	37	18	29	39	26	43	64	30	67	98	52	100	155
Sound power outlet **(E)**	dB(A)	29	43	48	38	44	48	42	47	49	44	52	55	47	54	57
Sound power inlet + radiated **(E)**	dB(A)	36	50	55	45	51	55	48	55	58	51	59	62	54	61	64
Sound pressure outlet **(*)**	dB(A)	20	34	39	29	35	39	33	38	40	35	43	46	38	45	48
Sound pressure inlet + radiated **(*)**	dB(A)	27	41	46	36	42	46	39	46	49	42	50	53	45	52	55
Plenum code		9069190			9069191			9069222			9066368			9069196		

(E) = EUROVENT certified performance.
(*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m^3 room and a reverberationtime of 0.5 sec.

Electronic wall controls

T-AUTO	Automatic speed control with electronic thermostat and summer/winter switch (to be used with T-POWER-M or T-POWER-A only)
IR-MB2S	IR-MB2S wall control (to be used with T-POWER-M or T-POWER-A only)
T-ECM	Continuous fan speed control with electronic thermostat, summer/winter switch and liquid crystal display
T-POWER-M	T-POWER power unit for T-AUTO and IR-MB2Sremote controls, fitted on the unit
T-POWER-A	T-POWER power unit for T-AUTO and IR-MB2S remote controls, not fitted on the unit

Electronic controls for MB boards

MB-ECM-M	MB electronic board fitted on the unit
MB-ECM-A	MB electronic board supplied with separate packaging
IR-MB2S	IR-MB2S wall control (to be used with MB board only)
RT03-REC-AD	RT03-A infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03-A	RT03-A infra-red remote control supplied with separate packaging (to be used with MB board only)
REC-AD	Receiver for RT03-A infra-red remote control supplied with separate packaging (to be used with MB board only)
TODS	TODS multifunction control panel (to be used with MB board only)

Management system for a network of fan coils	
ROUTER-A	Router for BMS systems not provided by Trane
ROB-A	Relay output board

IAQ accessory

Electrostatic filter accessory available also for DFEL (see DFSL dedicated page)

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TRANE TECHNOLOGIES

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